



## THE ADVANTAGES OF TERWIN 2000 SERIES

### EXTRUSION PRESSURE / TEMPERATURE TRANSDUCERS

- The Terwin 2000 Series is constructed throughout from stainless steel and do not contain any toxic products such as mercury or sodium-potassium. This enables us to apply our transducers in the production of food, film and pharmaceutical products.
- Our unique twin tube system overcomes the problems of temperature drift, which has been associated with old force rod type transducers and our temperature characteristics are equal to or better than transducers that employ mercury columns.
- We offer four different stem lengths in the 2000 series transducers, to suit all sizes of extruders i.e., 3.65", 6.0", 9.0" and 12.0".
- Our Di-Hard™ Diaphragm is both abrasion and corrosion resistant and suitable for temperatures up to 842°F/450° C.
- Our strain gauge assembly (electrical termination head) is rated to 392°F/200°C. Most competitive transducers have a head that is suitable for only 250°F/121°C and this is the reason why our competitors offer transducers with flexible stems, enabling the head to be mounted away from the heat. However, flexible stems with mercury or sodium-potassium fill material are certainly not desirable and if damaged, can render the transducer useless.
- All pressure transducers are available with type 'J' I/C or type 'K' C/A thermocouples for dual pressure and temperature measurement. Also, we can provide at no additional cost, transducers that are calibrated in other units such as kg/cm<sup>2</sup>, bar or Pascals etc.
- We offer extrusion pressure ranges from 0 - 500 psi through 0 - 30,000 psi.
- Our standard accuracy is within 0.5% of the full range (typically within 0.25% of full range).
- The 2000 series pressure transducers are mechanically and electrically interchangeable with most other competitive products. In most cases it is not necessary to change the cable assembly or the process indicator/controller. If you inform us of a competitive product part number, we will be pleased to quote for a Terwin equivalent transducer.
- Our transducers are both CE approved and calibrated to National Standards.

# ***Terwin Instruments Ltd***



**Manufacturers Of Industrial Pressure / Temperature  
Sensors & Instrumentation**



Customer Service and Product  
Quality Are Our No.1 Priority

## Terwin 2000 Series “Environmentally Friendly” Extrusion Pressure / Temperature Transducers



### Description:

The Terwin 2000 series transducers have been designed to meet the most exacting requirements in modern day extrusion technology. Fitted with the unique Di-Hard™ diaphragms, these transducers are suitable for extrudate temperatures up to 450°C / 842°F and are resilient against attack from most abrasive or corrosive products.

The 2000 series incorporates unequalled mechanical and electrical design features to overcome the problems of large zero and span shifts caused by changes in process temperatures. This has only been obtainable in the past with transducers that utilise a liquid filled system incorporating substances such as Mercury or Sodium Potassium. All Terwin 2000 series transducers are constructed throughout from stainless steel and DO NOT employ any toxic substances, thus allowing them to be used on machines involved in the process of food, film or pharmaceutical products.

When it is required to measure temperature as well as pressure, the 2000 series is available with type “J” or “K” integral thermocouples. Standard thermocouples have grounded junctions.

The 2000 series is also available with a variety of head and connection / calibration types.

### Advantages:

- ✓ Accuracy  $\pm 0.5\%$   
(typically  $\pm 0.25\%$ ).
- ✓ 4 x thicker Di-Hard™  
abrasion / corrosion  
resistant diaphragm.
- ✓ Stainless steel  
construction throughout.
- ✓ Compatible with food,  
film and pharmaceutical  
applications.
- ✓ DOES NOT contain  
Mercury, NaK (sodium  
Potassium or any other  
toxic product to  
contaminate the  
extrudate.
- ✓ Compliant with EN50082  
part 1 and EN55022-1987  
class A.
- ✓ Protected by UK patent  
No. 2,153,538 USA patent  
No. 4,625,559 and  
European patent No.  
0156081.
- ✓ Suitable for extrudate  
temperatures up to 450°C  
/ 842°F.
- ✓ Interchangeable with  
most other brands.

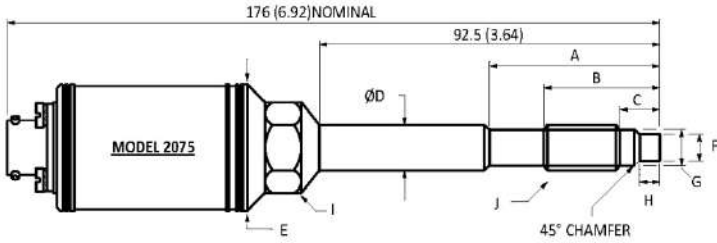
Terwin Instruments Ltd, Winterbeck Industrial Estate, Orston Lane, BOTTESFORD, Nottinghamshire, NG13 0AU – UK  
Tel: +44 (0) 1949 84 2000 Fax: +44 (0) 1949 84 2004 E-mail: [info@terwin.com](mailto:info@terwin.com) [www.terwin.com](http://www.terwin.com)



# Terwin 2000 Series “Environmentally Friendly” Extrusion Pressure / Temperature Transducers

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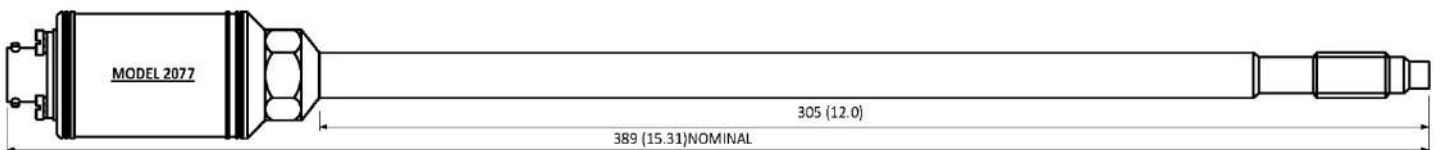
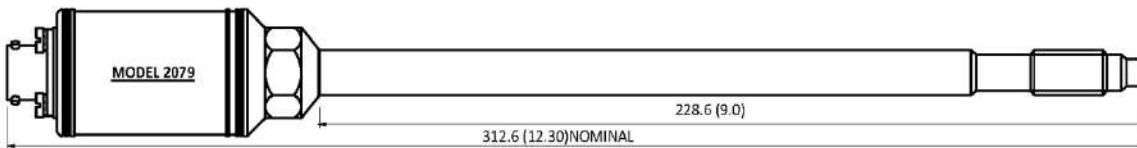
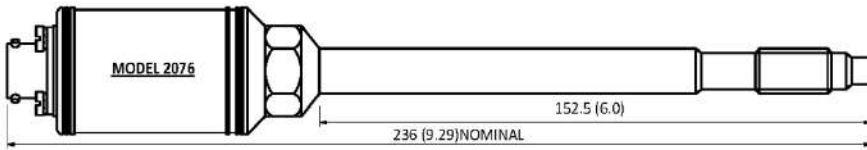
## Stem length options:



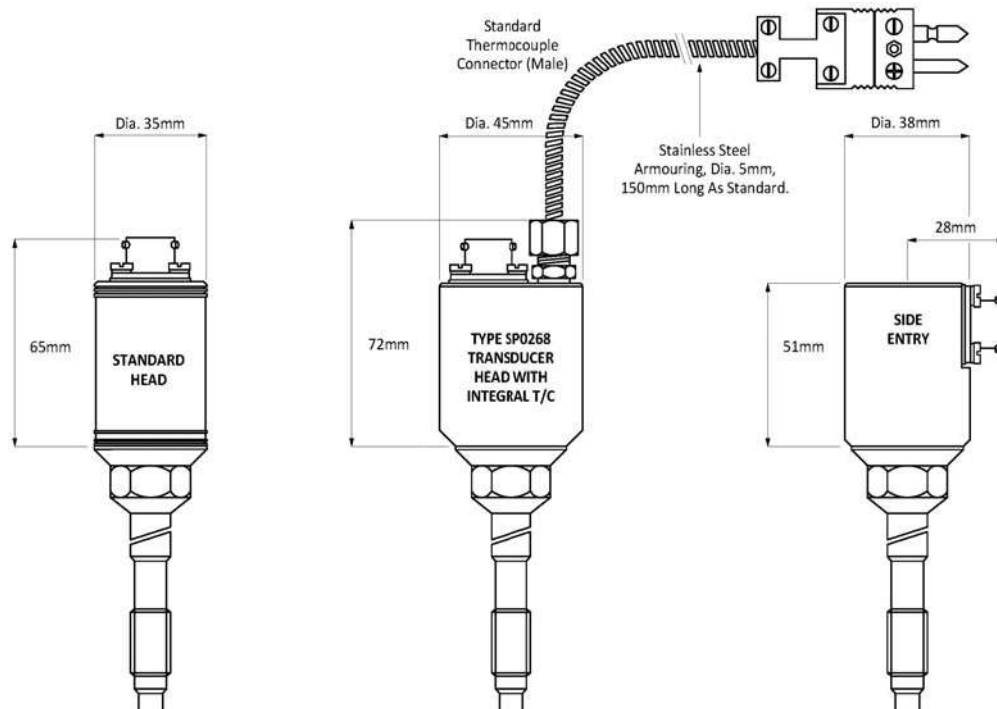
mm (INCHES)	DIMENSION
47 (1.85)	A
31.3 (1.23)	B
12.2 (0.48)	C
12.7 (0.50)	D
35.0 (1.38)	E
7.77±0.03 (0.306±0.001)	F
10.49±0.03 (0.413±0.001)	G
5.54±0.12 (0.218±0.005)	H
22 A/F	I
1/2-20-UNF-2A	J

PLEASE NOTE:

A to J dimensions are common  
to all standard models listed.



## Head options:



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## Terwin 2000 Series “Environmentally Friendly” Extrusion Pressure / Temperature Transducers

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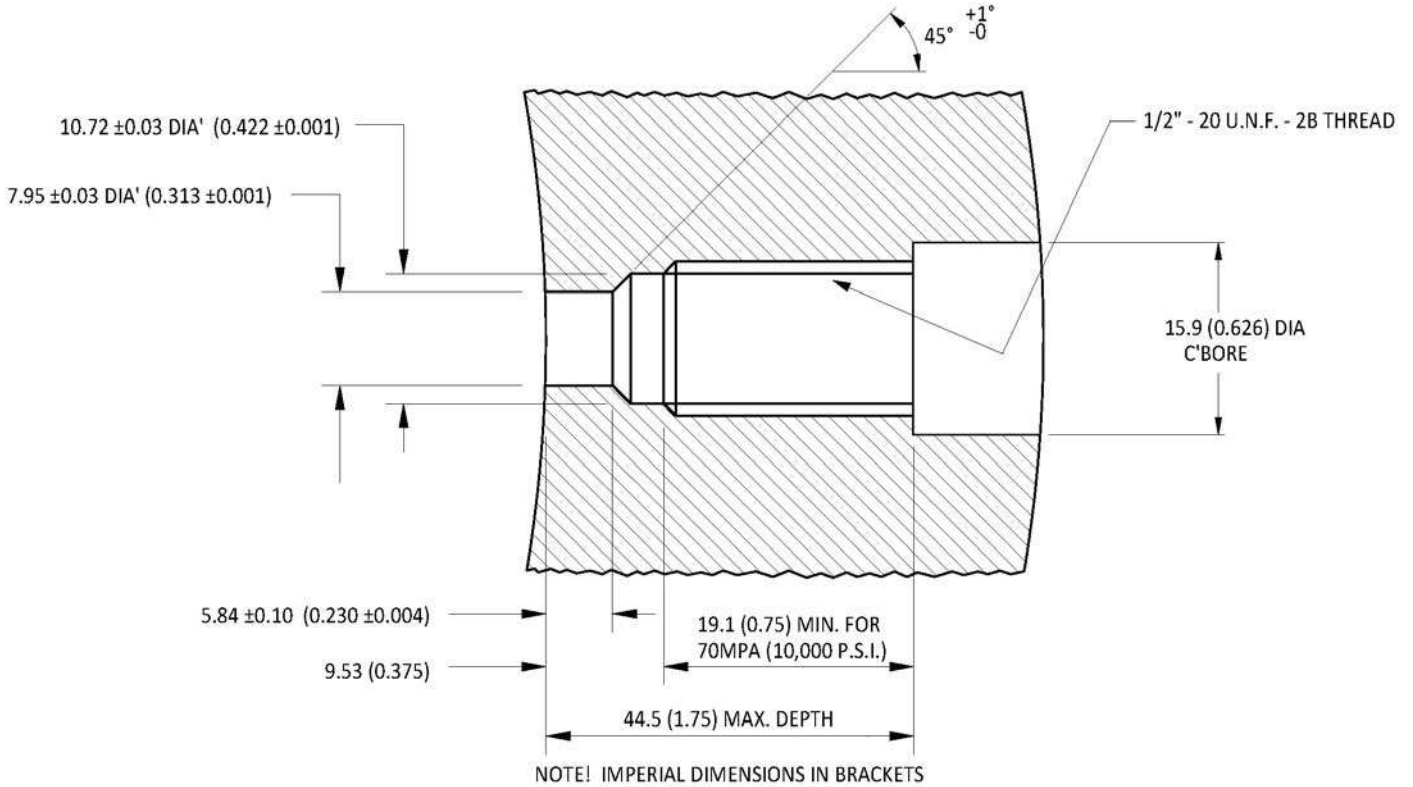
### Specifications

<b>Standard Pressure Ranges:</b>	psi	0-1,500	0-3,000	0-5,000	0-7,500	0-10,000	0-15,000
	bar	0-100	0-200	0-350	0-500	0-700	0-1,000
<b>Available Pressure Ranges</b>	psi	0-500 thru to 0-30,000					
	bar	0-35 thru to 0-2,000					
<b>Combined Error</b>	Standard ranges:			Non-standard ranges:			
	Within $\pm 0.5\%$ F.R.O. (Typically $\pm 0.25\%$ )			Within $\pm 1\%$ F.R.O. (Typically $\pm 0.5\%$ )			
<b>Repeatability</b>	Within $\pm 0.1\%$ F.R.O.						
<b>Resolution</b>	Infinite						
<b>Maximum Pressure:</b>	2 x full range or 25,000psi (1,700 bar) which ever is less.						
	On 30,000psi (2,000bar) sensors, the maximum pressure is 35,000psi (2,400 bar).						
<b>Body Material</b>	17-4PH Stainless steel.						
<b>Diaphragm Material</b>	Terwin <b>Di-Hard™</b> Extra Thick, Abrasion / Corrosion Resistant Long Life Diaphragm						
<b>Optional Diaphragm Coatings</b>	Titanium Nitride (TN)		Hastelloy C276 (H)		Double Chromium Nitride (DCN)		
	Additional anti-abrasion resistance and to prevent thread galling.		Additional anti-corrosion resistance.		Out performs TN and H coatings in most applications.		
<b>Mounting Torque</b>	20ft lbs (27Nm) (240 inch/lbs)						
<b>Standard Thread Size</b>	1/2"-20UNF-2A						
<b>Available Thread Size Adaptor</b>	M18 x 1.5mm						
<b>Electrical Specifications</b>							
<b>Excitation</b>	5-12V D.C.						
<b>Configuration</b>	Four-arm bonded foil Wheatstone bridge strain gauge						
<b>Bridge Resistance</b>	350 $\Omega$ $\pm 10\%$						
<b>Output</b>	3.0mV/V D.C. $\pm 10\%$						
<b>Zero Balance</b>	$\pm 5\%$ F.R.O.						
<b>Internal Negative Shunt Calibration</b>	6-wire 80% F.S.O. $\pm 0.1\%$ - Other calibration types are available.						
<b>Electrical Connectors</b>	6-Pin (D6)	8-Pin (D8)	9-Pin (D9)	12-Pin (D12)	Cannon 6-Pin (G) (Gentran)	Cannon 6-Pin (BC) (Barber Coleman)	1/2"-NPT direct cable outlet
	PT02A-10-6P	PT02E-12-8P					
<b>Integral Temperature Sensors</b>	"J" I/C				"K" C/A		
<b>Maximum Diaphragm Temperature</b>	450°C / 842°F						
<b>Maximum Strain Gauge Temperature</b>	200°C / 392°F						
<b>Zero Shift Due To Temperature Change</b>	$< 0.01\%$ F.S.O./°C or $< 0.02\%$ F.S.O./°F						
<b>Span Shift Due To Temperature Change</b>	$< 0.01\%$ F.S.O./°C or $< 0.02\%$ F.S.O./°F						

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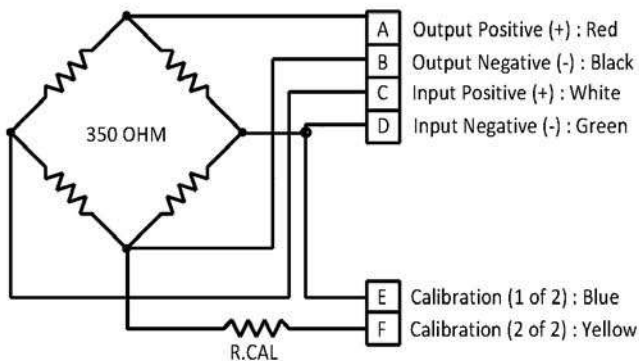
### Recommended Port Dimensions for 1/2"-20UNF Threaded Transducers:



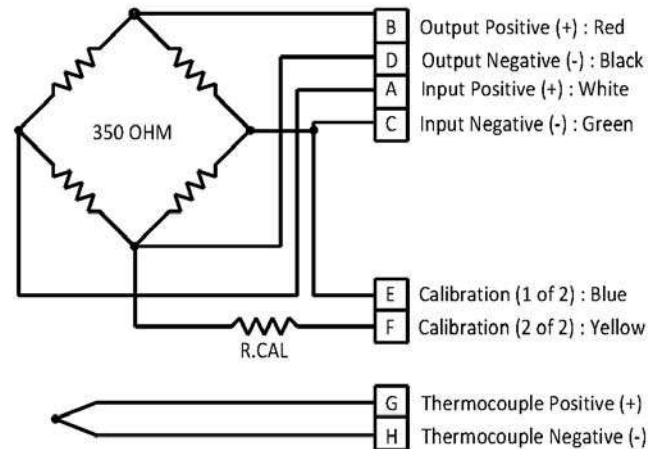
All diameters to be concentric to within 0.05 (0.002) T.I.R.

### Terwin 2000 Series Standard Wiring Connections:

"D6" PRESSURE TRANSDUCER



"D8" PRESSURE / TEMPERATURE TRANSDUCER







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## Terwin 5000 Series Melt Pressure / Temperature Transducers and Transmitters



### Description:

The Terwin 5000 Series melt pressure / temperature transducers / transmitters utilise hydraulic transmission between the sensing diaphragm that is in contact with the melt and the strain gauge assembly that produces an electrical output.

Models are available with either nominal 3.33mV/V output (transducer), 4-20mA DC or 0-10V DC (transmitter) conditioned outputs. All outputs utilise industry standard 80% calibration.

Available pressure ranges are 0-500psi through 0-30,000psi (0-35 bar through 2,000 bar). Other units of pressure measurement, such as kg/cm<sup>2</sup> or MPa etc., are available if required.

Standard thread size is ½"-20UNF, however optional European sizes such as M18 x 1.5mm, M14 x 1.5mm and Japanese sizes PF3/8 and PF3/4 are also available.

Available with a selection of stem lengths: 3", 6", 9", 12", 15" & 18".

Optional fill materials are available.

### Features:

- ✓ Low cost.
- ✓ Proven sensor design.
- ✓ High performance.
- ✓ Accuracy better than  $\pm 0.5\%$ .
- ✓ Terwin *Extru-Max*<sup>™</sup> diaphragm as standard.
- ✓ Internal 80% negative shunt calibration.
- ✓ Compatible with most competitor models

### Benefits:

- ✓ Superior abrasion resistance
- ✓ Reliable, repeatable pressure measurement
- ✓ Wide variety of pressure ranges
- ✓ Optional stems lengths
- ✓ Optional thread sizes

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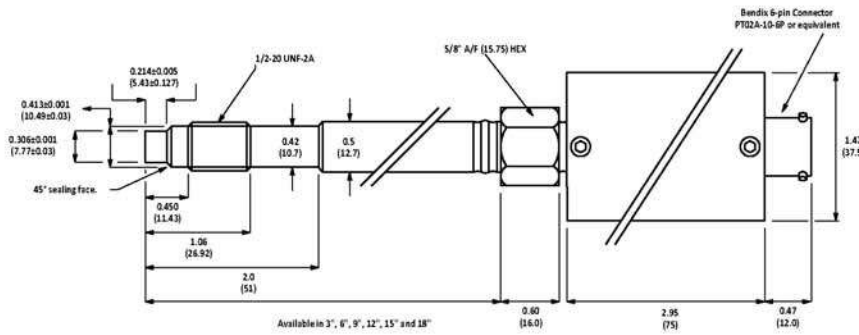


# Terwin 5000 Series Melt Pressure / Temperature Transducers and Transmitters

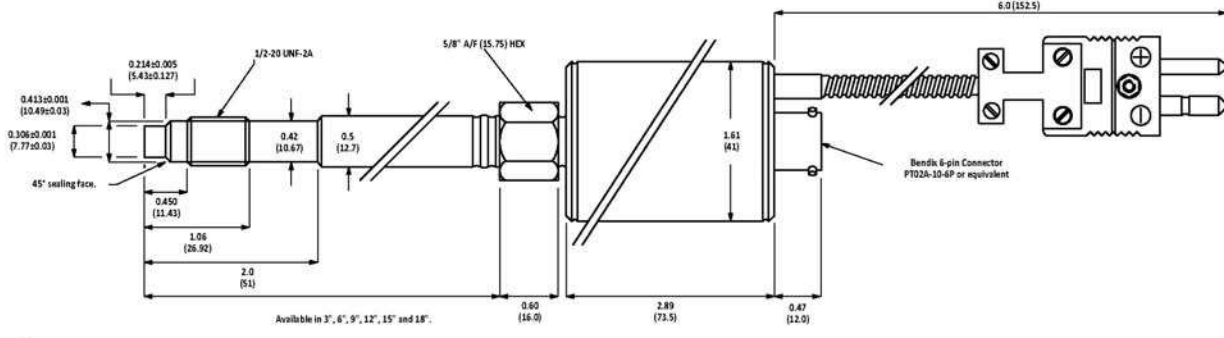
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All dimensions mm's (inches)

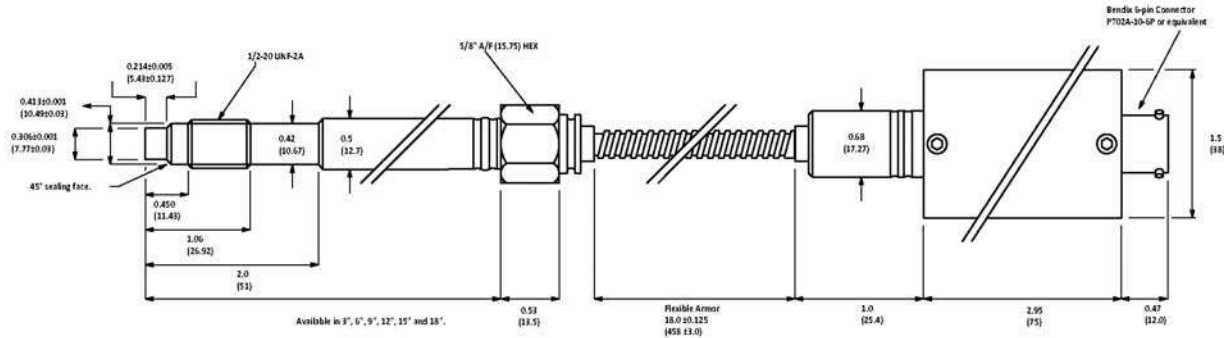
**MODEL 51**  
Pressure



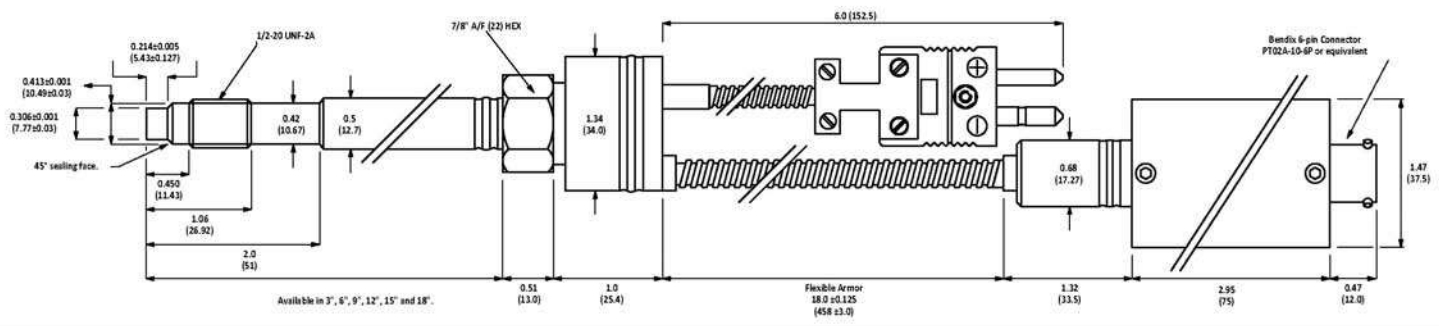
**MODEL 52**  
Pressure & Temperature



**MODEL 53**  
Pressure

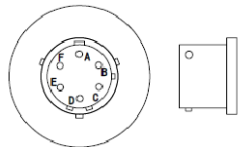


**MODEL 54**  
Pressure & Temperature

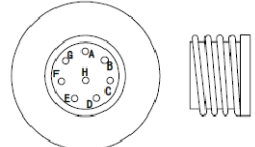


**Industry Standard Connectors:**

**6-Pin (D6)**  
(Standard)



**8-Pin (D8)**  
(Optional)



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## Terwin 5000 Series Melt Pressure / Temperature

### Transducers and Transmitters

#### 5000 Series Ordering Codes

51 - 6 - M - J - Y - D6 - 7M5 - A - OIL - H - M18 - SPXXX

MODEL:	CODE:
51 Rigid stem	51
52 Rigid stem + temperature sensor	52
53 Rigid stem + flexible capillary	53
54 Rigid stem + flexible capillary + temperature sensor	54
STEM LENGTH:	CODE:
3 inches (76.2mm)	3
6 inches (152.4mm)	6
9 inches (228.6mm)	9
12 inches (305.0mm)	12
15 inches (381.0mm)	15
18 inches (457.2mm)	18
Other (contact sales)	TBA
PRESSURE OUTPUT SIGNAL:	CODE:
3.33mV/V (standard)	M
4-20mA DC (2-wire + calibration pair)	A
0-10V DC (4-wire + calibration pair)	V
TEMPERATURE SENSOR (52 + 54 Series ONLY)	CODE:
None	X
"J" I/C (standard)	J
"K" C/A	K
PT100	P
ARMoured CAPILLARY LENGTH (53 + 54 Series ONLY)	CODE:
None	Y
18 inches (standard)	18
36 inches etc	36 etc
CONNECTOR TYPE:	CODE:
PT02A-10-6P (6-Pin bayonet)	D6
PC02E-12-8P (8-Pin threaded)	D8
½"-14NPT Threaded Process Connector With Flying Lead	NPT
Non-Standard (contact sales)	TBA



PRESSURE RANGE: 0 - (zero to)			
PSI	CODE:	BAR	CODE:
500psi	5C	35bar	35B
1,000psi	1M	70bar	70B
1,500psi	1M5	100bar	100B
3,000psi	3M	200bar	200B
5,000psi	5M	350bar	350B
7,500psi	7M5	500bar	500B
10,000psi	10M	700bar	700B
15,000psi	15M	1,000bar	1000B
20,000psi	20M	1,500bar	1500B
30,000psi	30M	2,000bar	2000B
Non-standard		TBA	
ACCURACY:			CODE:
±0.5% (standard)			A
±0.25%			B
FILL MATERIAL:			CODE:
Mercury			Left blank
Silicon Oil			OIL
Glycerine Oil			GLY
DIAPHRAGM:			CODE:
Terwin <b>Extru-Max™</b> Coating			Left blank
Hastelloy "C276"			H
Other			TBA
THREAD SIZE:			CODE:
1/2"-20UNF-2A			Left blank
M14x1.5mm			M14
M18x1.5mm			M18
PF3/8 (G3/8)			G3/8
PF3/4 (G3/4)			G3/4
Non-standard (contact sales)			TBA
SPECIAL CODE			CODE:
None			Left Blank
Code to be issued by factory			SPXXX

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# Terwin 5000 Series Melt Pressure / Temperature

## Transducers and Transmitters

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### Specifications

<b>Standard Pressure Ranges:</b>	psi	0-5,000	0-7,500	0-10,000	0-15,000
	bar	0-350	0-500	0-700	0-1,000
<b>Available Pressure Ranges</b>	psi	0-500 thru to 0-30,000			
	bar	0-35 thru to 0-2,000			
<b>Combined Error</b>	Within $\pm 0.5\%$ F.R.O. (Optional $\pm 0.25\%$ ) Oil filled units have reduced accuracy of $\pm 1\%$ with optional $\pm 0.5\%$ within standard pressure ranges. Non-standard ranges have an accuracy of $\pm 1.5\%$ .				
<b>Repeatability</b>	Within $\pm 0.1\%$ F.R.O.				
<b>Resolution</b>	Infinite				
<b>Maximum Pressure:</b>	2 x full range or 25,000psi (1,700 bar) which ever is less.				
	On 30,000psi (2,000bar) sensors, the maximum pressure is 35,000psi (2,400 bar).				
<b>Body Material</b>	17PH4 Stainless steel.				
<b>Diaphragm Material</b>	Terwin <b>Extru-Max™</b> Long Life Diaphragm				
<b>Available Fill Materials</b>	Mercury (standard)	Silicon Oil	Glycerine Oil		
<b>Mounting Torque</b>	20ft lbs (27Nm) (240 inch/lbs)				
<b>Standard Thread Size</b>	1/2"-20UNF-2A (standard).				
<b>Available Thread Sizes</b>	M14x1.5mm, M18 x 1.5mm, PF3/8 (G3/8) and PF3/4 (G3/4).				
<b>Electrical Specifications</b>					
<b>Excitation</b>	Transducers: 5-12V D.C.		Transmitters: 15-30V D.C.		
<b>Configuration</b>	Four-arm bonded foil Wheatstone bridge strain gauge				
<b>Bridge Resistance</b>	350 $\Omega$ $\pm 10\%$				
<b>Outputs</b>	Transducers		Transmitters (current)		Transmitters (voltage)
	3.33mV/V D.C. $\pm 10\%$		4-20mA D.C.		0-10V D.C.
<b>Zero Balance</b>	Transducers $\pm 10\%$ F.R.O.		Transmitters $\pm 10\%$ adjustable by customer assessable potentiometer		
<b>Internal Negative Shunt Calibration</b>	Transducers 80% F.S.O. $\pm 0.25\%$		Transmitters 80% F.S.O. $\pm 0.25\%$ adjustable by customer assessable potentiometer		
<b>Electrical Connectors</b>	6-Pin (D6) PT02A-10-6P		8-Pin (D8) PT02E-12-8P		1/2"-NPT direct cable outlet
<b>Integral Temperature Sensors</b>	"J" I/C (standard)		"K" C/A (optional)		PT100 (optional)
<b>Maximum Diaphragm Temperature</b>	Model No:	Mercury Fill	Silicon Fill	Glycerine Fill	
	51/52	350°C / 662°F	200°C / 392°F	180°C / 356°F	
	53/54	450°C / 842°F	250°C / 482°F	220°C / 428°F	
<b>Maximum Strain Gauge Temperature</b>	Transducers	121°C / 250°F.	Transmitters	85°C / 185°F	
<b>Zero Shift Due To Temperature Change</b>	<0.02% F.S.O./°C or <0.01% F.S.O./°F				
<b>Span Shift Due To Temperature Change</b>	<0.02% F.S.O./°C or <0.01% F.S.O./°F				

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## Terwin 53-SS "Space Saving" Melt Pressure Transducers and Transmitters

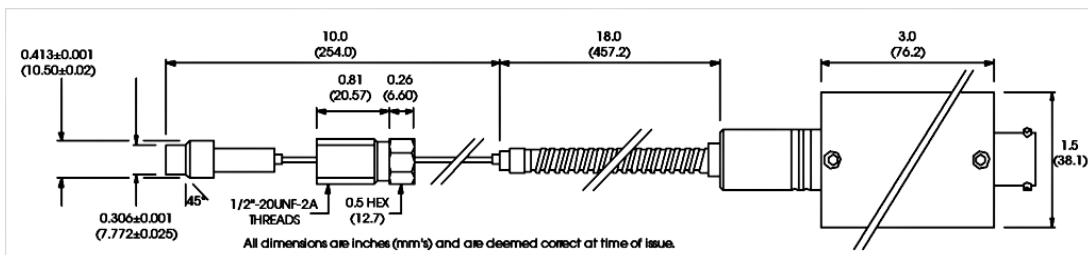


### Description:

The Terwin model 53-SS is similar to the standard model 53 but features a small diameter exposed capillary which allows 1/16" (1.6mm) radius bends in applications where mounting space is restricted.

It has a free spinning rotating union with standard 1/2"-20UNF-2A threads that assists in installation.

### Dimensions:



### Features:

- ✓ Low cost.
- ✓ Proven sensor design.
- ✓ High performance.
- ✓ Accuracy better than ±0.5%.
- ✓ Terwin *Extru-Max™* diaphragm as standard.
- ✓ Internal 80% negative shunt calibration.
- ✓ Compatible with most competitor models

### Benefits:

- ✓ Superior abrasion resistance
- ✓ Reliable, repeatable pressure measurement
- ✓ Wide variety of pressure ranges
- ✓ Optional stems lengths
- ✓ Optional thread sizes

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## Terwin 53-SS "Space Saving" Melt Pressure

### Transducers and Transmitters

#### 5000 Series Ordering Codes

53 - SS - M - X - 10/18 - D6 - 7M5 - A - OIL - H - M18 - SPXXX

MODEL:		CODE:
53-SS	"Space Saving" Jam Nut + flexible capillary	53
STEM LENGTH:		CODE:
1.25 inches (32mm) Model 53-SS "Space Saving" Jam Nut Version ONLY		SS
Other (contact sales)		TBA
PRESSURE OUTPUT SIGNAL:		CODE:
3.33mV/V (standard)		M
4-20mA DC (2-wire + calibration pair)		A
0-10V DC (4-wire + calibration pair)		V
TEMPERATURE SENSOR (52 + 54 Series ONLY)		CODE:
None – Not Available On This Model		X
EXPOSED CAPILLARY & ARMoured CAPILLARY LENGTH		CODE:
10 inches exposed capillary & 18 inches armoured capillary		10/18
Non-Standard (contact sales)		TBA
CONNECTOR TYPE:		CODE:
PT02A-10-6P (6-Pin bayonet)		D6
PC02E-12-8P (8-Pin threaded)		D8
½"-14NPT Threaded Process Connector With Flying Lead		NPT
Non-Standard (contact sales)		TBA



PRESSURE RANGE: 0 - (zero to)			
PSI	CODE:	BAR	CODE:
500psi	5C	35bar	35B
1,000psi	1M	70bar	70B
1,500psi	1M5	100bar	100B
3,000psi	3M	200bar	200B
5,000psi	5M	350bar	350B
7,500psi	7M5	500bar	500B
10,000psi	10M	700bar	700B
15,000psi	15M	1,000bar	1000B
20,000psi	20M	1,500bar	1500B
30,000psi	30M	2,000bar	2000B
Non-standard		TBA	
ACCURACY:			CODE:
±0.5% (standard)			A
±0.25%			B
FILL MATERIAL:			CODE:
Mercury			Left blank
Silicon Oil			OIL
Glycerine Oil			GLY
DIAPHRAGM:			CODE:
Terwin <b>Extru-Max™</b> Coating			Left blank
Hastelloy "C276"			H
Other			TBA
THREAD SIZE:			CODE:
1/2"-20UNF-2A			Left blank
M14x1.5mm			M14
M18x1.5mm			M18
PF3/8 (G3/8)			G3/8
PF3/4 (G3/4)			G3/4
Non-standard (contact sales)			TBA
SPECIAL CODE			CODE:
None			Left Blank
Code to be issued by factory			SPXXX

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## Terwin 53-SS “Space Saving” Melt Pressure

### Transducers and Transmitters

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#### Specifications

<b>Standard Pressure Ranges:</b>	psi	0-5,000	0-7,500	0-10,000	0-15,000
	bar	0-350	0-500	0-700	0-1,000
<b>Available Pressure Ranges</b>	psi	0-500 thru to 0-30,000			
	bar	0-35 thru to 0-2,000			
<b>Combined Error</b>	Within $\pm 0.5\%$ F.R.O. (Optional $\pm 0.25\%$ ) Oil filled units have reduced accuracy of $\pm 1\%$ with optional $\pm 0.5\%$ within standard pressure ranges. Non-standard ranges have an accuracy of $\pm 1.5\%$ .				
<b>Repeatability</b>	Within $\pm 0.1\%$ F.R.O.				
<b>Resolution</b>	Infinite				
<b>Maximum Pressure:</b>	2 x full range or 25,000psi (1,700 bar) which ever is less.				
	On 30,000psi (2,000bar) sensors, the maximum pressure is 35,000psi (2,400 bar).				
<b>Body Material</b>	17PH4 Stainless steel.				
<b>Diaphragm Material</b>	Terwin <b>Extru-Max™</b> Long Life Diaphragm				
<b>Available Fill Materials</b>	Mercury (standard)	Silicon Oil	Glycerine Oil		
<b>Mounting Torque</b>	20ft lbs (27Nm) (240 inch/lbs)				
<b>Standard Thread Size</b>	1/2"-20UNF-2A (standard).				
<b>Available Thread Sizes</b>	M14x1.5mm, M18 x 1.5mm, PF3/8 (G3/8) and PF3/4 (G3/4).				
<b>Electrical Specifications</b>					
<b>Excitation</b>	Transducers: 5-12V D.C.			Transmitters: 15-30V D.C.	
<b>Configuration</b>	Four-arm bonded foil Wheatstone bridge strain gauge				
<b>Bridge Resistance</b>	350 $\Omega$ $\pm 10\%$				
<b>Outputs</b>	Transducers		Transmitters (current)		Transmitters (voltage)
	3.33mV/V D.C. $\pm 10\%$		4-20mA D.C.		0-10V D.C.
<b>Zero Balance</b>	Transducers $\pm 10\%$ F.R.O.			Transmitters $\pm 10\%$ adjustable by customer assessable potentiometer	
<b>Internal Negative Shunt Calibration</b>	Transducers 80% F.S.O. $\pm 0.25\%$			Transmitters 80% F.S.O. $\pm 0.25\%$ adjustable by customer assessable potentiometer	
<b>Electrical Connectors</b>	6-Pin (D6) PT02A-10-6P		8-Pin (D8) PT02E-12-8P		1/2"-NPT direct cable outlet
<b>Integral Temperature Sensors</b>	"J" I/C (standard)		"K" C/A (optional)		PT100 (optional)
<b>Maximum Diaphragm Temperature</b>	Model No:	Mercury Fill	Silicon Fill	Glycerine Fill	
	51/52	350°C / 662°F	200°C / 392°F	180°C / 356°F	
	53/54	450°C / 842°F	250°C / 482°F	220°C / 428°F	
<b>Maximum Strain Gauge Temperature</b>	Transducers	121°C / 250°C.	Transmitters	85°C / 185°F	
<b>Zero Shift Due To Temperature Change</b>	<0.02% F.S.O./°C or <0.01% F.S.O./°F				
<b>Span Shift Due To Temperature Change</b>	<0.02% F.S.O./°C or <0.01% F.S.O./°F				

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# Terwin

## 3000 Series Pressure Transducers

with 0 - 100mV or 0 - 10V conditioned outputs and unique silicon upon sapphire sensors

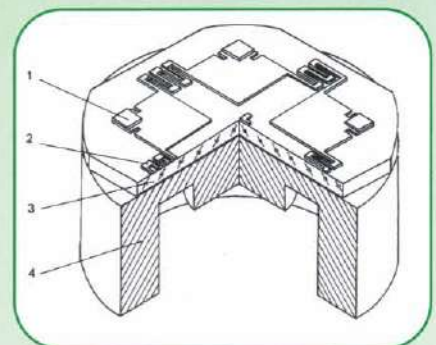


### GENERAL DESCRIPTION

The 3000 series pressure transducers offer a highly reliable and accurate method of converting pressure to an analogue electrical signal. Conditioned outputs are provided at 0 - 100mVDC or with an amplified output of 0 - 10 or 0 - 5VDC.

Available in fourteen standard pressure ranges from 0 - 1 bar VAC to 0 - 1000 barg and 0 - 15 psi VAC to 0 - 15,000 psig these products utilise the very latest technology. The pressure sensor in contact with the measured variable is constructed from titanium and to this is fused a two layer substrate of silicon upon sapphire. Outstanding insulation properties of sapphire protect the strain sensitive circuit from the influence of RF and electromagnetic fields. Additionally, the two layer substrate endures multiple overloads without changing the characteristics of the output signal and overall accuracy.

Electrical connections are made by bayonet lock or DIN connectors. The standard pressure connection is male 1/4" BSP fitting but other connections can be provided if required.



### Sensing Element Design

1. Contacts
2. Silicon strain sensitive circuit
3. Sapphire membrane
4. Titanium membrane

**Terwin**  
INSTRUMENTS LIMITED



# 3000 Series Pressure Transducers

## TECHNICAL

**Model Type**  
**Pressure Range**  
**Accuracy**  
**Resolution**  
**Output Resistance**  
**Insulation Resistance**  
**Thermal Zero Shift**  
**Thermal Sensitivity Shift**  
**Response Time**  
**Vibration**  
**Electrical Connection**  
**Wetted Parts**  
**Pressure Port**  
**Overpressure**  
**Enclosure Protection**  
**Accessories Supplied As Standard**  
**Accessories (Optional)**  
  
**Excitation Voltage**  
**Output Voltage**  
**Zero Balance**  
**Span**  
**Operating Temperature Range**  
**Weight**  
**Dimensions**

## SPECIFICATIONS

### 3000 Series (100mV)

-1, 0.5, 1, 2.5, 6, 10, 16, 25, 40, 60, 100, 160, 250, 400, 600 and 1000 bar g.  
 $\pm 0.25\%$  of span including non-linearity, hysteresis and repeatability.  
 Infinite.  
 1000 Ohms Minimum  
 1500 Maximum  
 20M Ohms @ 200VDC (Tested @ 23°C 70%RH) 5M Ohms @ 95°C 98%RH.  
 $\pm 0.025\%$  F.R.O./°C For Calibrated Temperature Range of 100°C.  
 $\pm 0.025\%$  F.R.O./°C For Calibrated Temperature Range of 100°C.  
 0.5 Milli-seconds (Maximum) From Zero to Full Scale Output.  
 Withstands 50g Peak Sinusoidal 5 to 10,000Hz.  
 DIN 4 Pole or Bayonet Lock Connector.  
 Alloy Containing 87% Titanium.  
 G1/4 (1/4" BSP Male).  
 2 x Full Scale (200%).  
 To IP65 According to DIN 40 050.

Press Port Cap & Dowty Seal.

Mating 6 Pin Bayonet Connectors and Cable Assemblies.  
 TERWIN ALSO PROVIDE PRESSURE INDICATORS, CONTROLLERS AND SIGNAL CONDITIONERS.

5 - 10VDC, (12 VDC Maximum).

10mV/V.

0mV  $\pm$  1.0mV.

100mV  $\pm$  1.0mV @ 10VDC excitation.

-50 to +120°C (Model 3120)

-196 to +200°C (Model 3200)

Approximately 140 grams

### 3000 Series (0 - 10V or 0 - 5V)

14 - 35VDC.

0 - 10 VDC or 0 - 5 VDC.

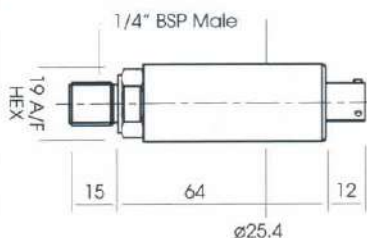
0V  $\pm$  2.5mV.

10VDC  $\pm$  2.5mV.

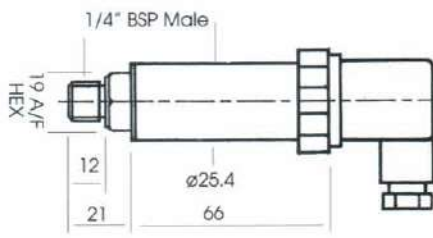
-50 to +85°C

-55 to +85°C.

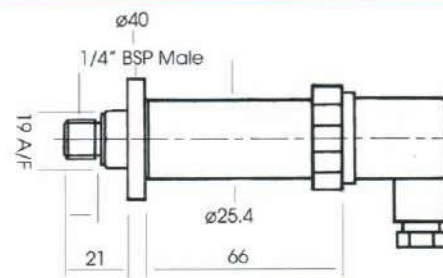
Approximately 150 grams.



B4 AND D6 SPEC CONNECTOR



DIN SPEC CONNECTOR



RANGES FROM 1BVAC TO 1barg



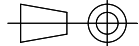
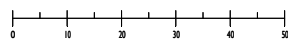
NOTE: All dimensions are in mm's

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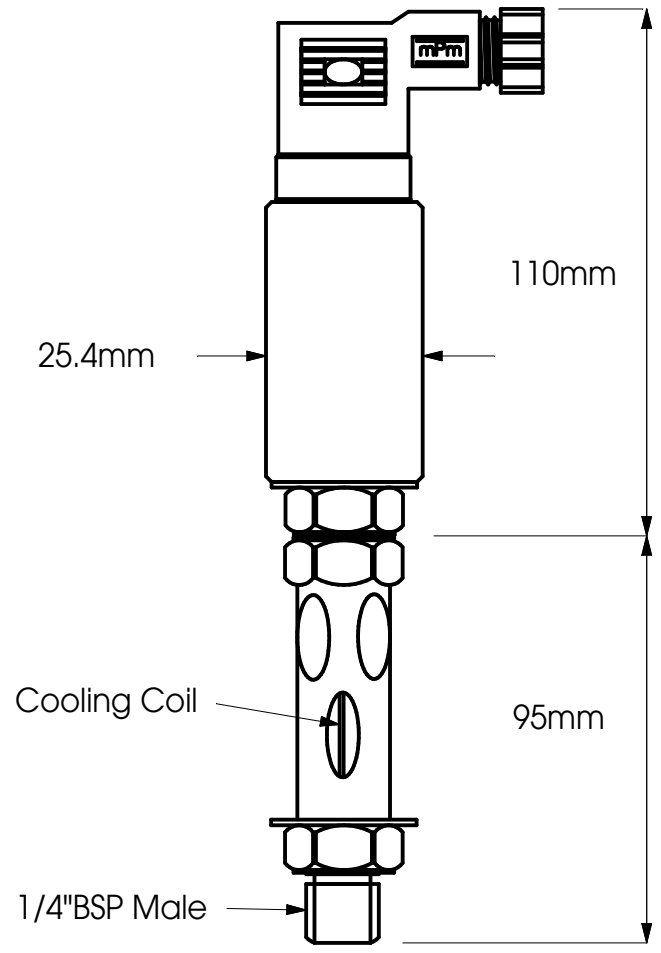
SCALE N.T.S.

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# Terwin Model 3200 Hydraulic Pressure Transducer / Xmitter Fitted with Standard Cooling Coil.

Not To Scale

Sales Aid ONLY



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Fax: +44 (0) 1949 82 2004

DRAWN	GAW
DATE	27.11.2006
CHECKED	T.W.
APPROVED	G.W.

DRG. NO.	3200 With Cooling Coil
TITLE	Model 3200 Hydraulic Pressure Transducer Fitted With Standard Cooling Coil (Sales Aid Drawing ONLY)

CAD REF.	3200 COOLING COIL AID
MATERIAL:	N/A
<b>TOLERANCES U.O.S.:</b> .xxxx ±0.005, .xxx ±0.05, .xx ±0.01 ANGLES ±0.5° CONCENTRICITY: ALL DIA'S WITHIN 0.05 T.I.R.	

ISS	DATE	DESCRIPTION	APPD
A	27.11.2006	IST ISSUE	G.W.



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## Terwin 6000 Series Analogue

### Melt Pressure Gauges



#### Description:

The Terwin 6000 Series of mechanical pressure gauges are the ideal choice for applications requiring simple maintenance free pressure indication.

Extrudate pressure is sensed by a metal diaphragm, mounted flush with the inside wall of the extruder barrel with pressure indicated on the readout gauge.

On the rigid stem version the mechanical gauge can be rotated up to 270° for unobstructed viewing.

For applications involving high temperatures or restricted spaces, gauges with flexible stems are available enabling the client to mount the gauge further away from the process.

Thermocouple or RTD configurations are available to provide melt temperature readings.

A selection of pressure ranges, stem lengths and thread sizes are available.

#### Features:

- ✓ Low cost.
- ✓ Direct local readings.
- ✓ Adjustable "Zero".
- ✓ Accuracy better than  $\pm 2.0\%$ .
- ✓ Gauge head rotates 270°
- ✓ Stem up & stem down versions.
- ✓ Stainless steel construction.

#### Benefits:

- ✓ No power required.
- ✓ Reliable, repeatable pressure measurement
- ✓ Wide variety of pressure ranges
- ✓ Optional stems lengths
- ✓ Optional thread sizes
- ✓ Easy to install & use

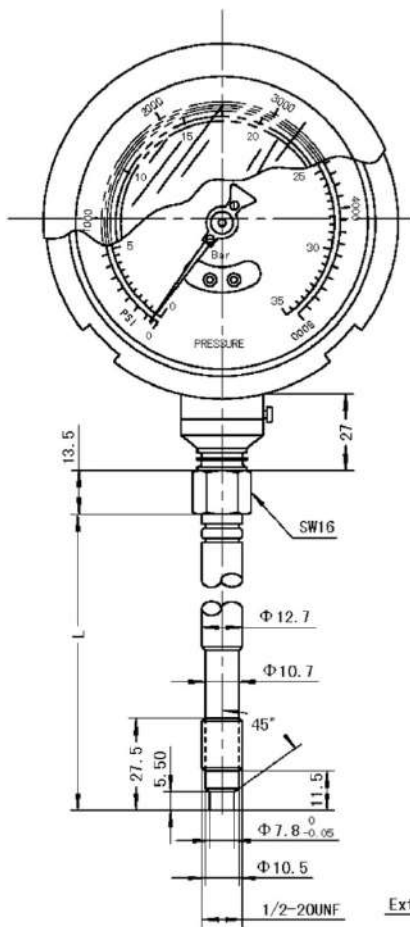
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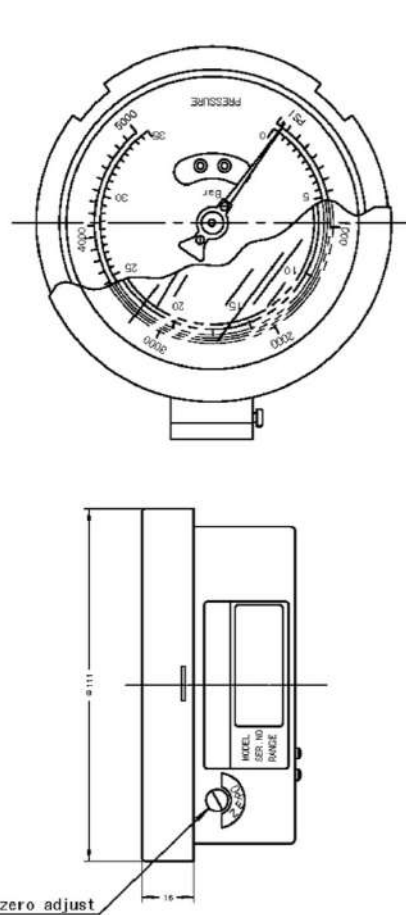
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## Terwin 6000 Series Analogue

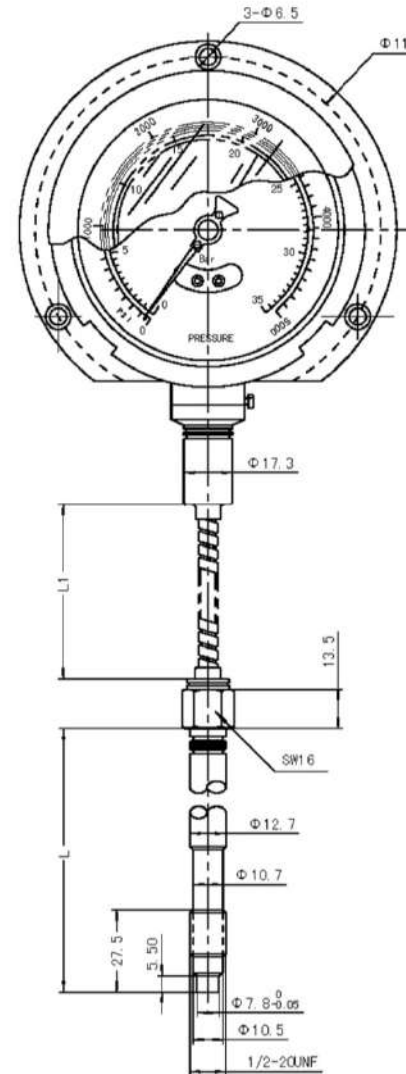
## Melt Pressure Gauges



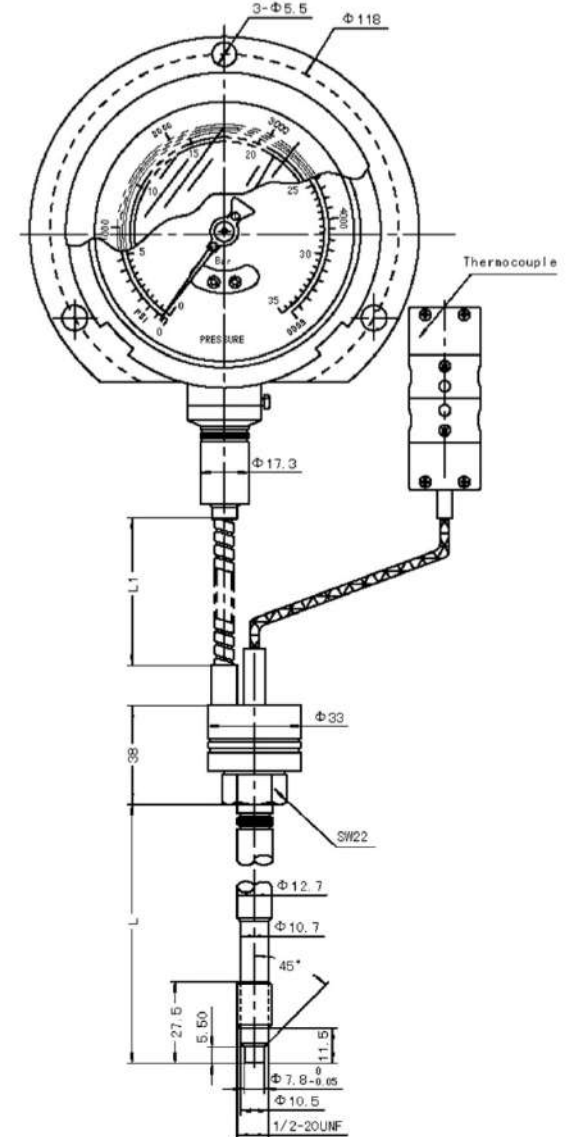
Model 61 (Stem Down)



Stem Up Configuration



Model 63 (Flexible Stem)



Model 64 With Temperature Sensor



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## Terwin 6000 Series Analogue

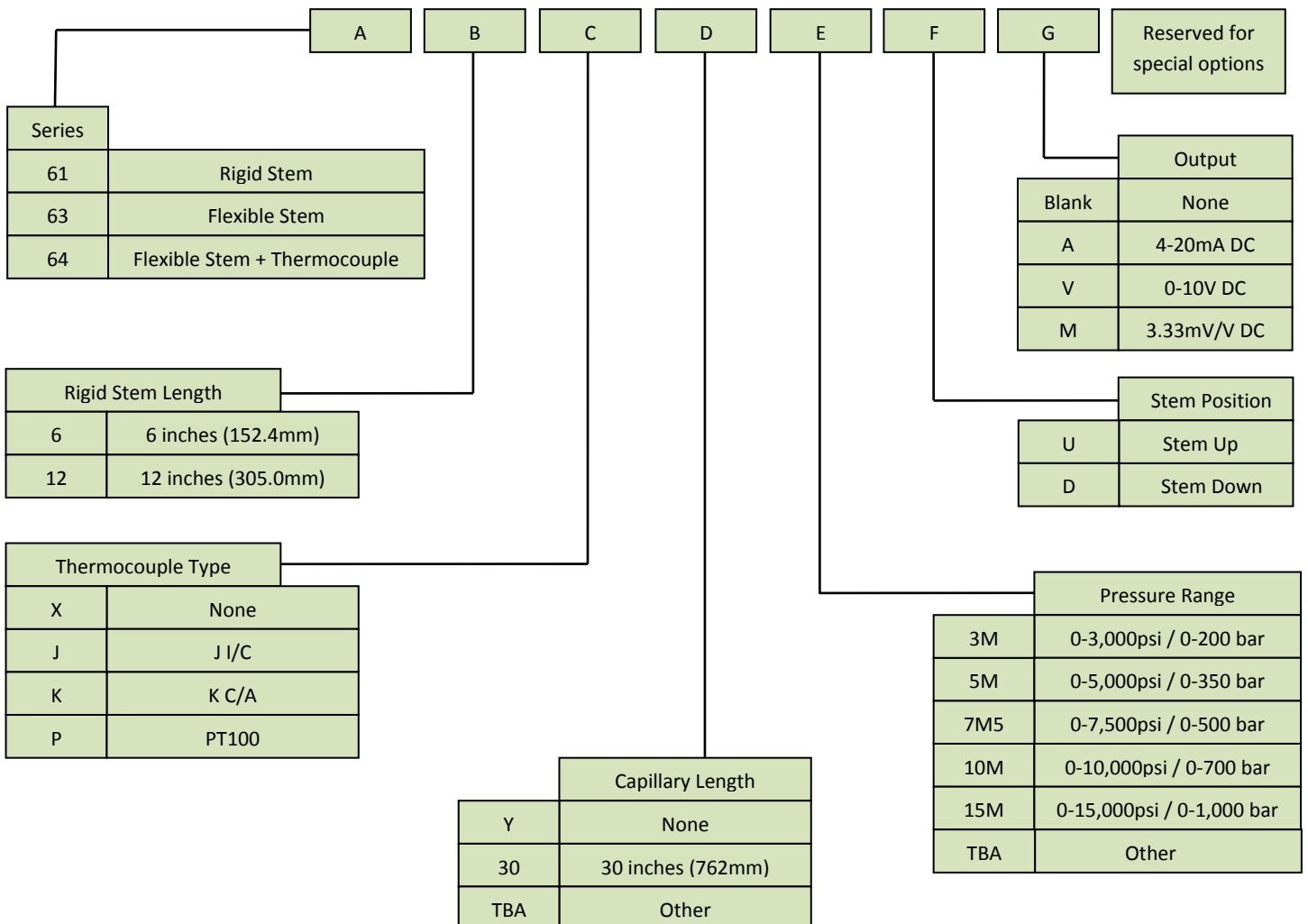
### Melt Pressure Gauges

6000 Series Part Numbers:



Example:

61 series gauge with 6 inch rigid stem, no thermocouple, no capillary, ranged 0-5,000psi with stem up configuration.



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## Cable Assemblies For Terwin Extrusion Pressure / Temperature Transducers & Transmitters



### Description:

Terwin cable assemblies can be used in conjunction with any of our pressure / temperature transducers or transmitters. Made to order, these items are quickly available in either high temperature Teflon sheaths with Teflon sheathed inner cores (maximum temperature rating 260°C/500°F). We also offer a cheaper PVC equivalent (maximum temperature rating 105°C / 221°F). All cables are offered with stainless steel armouring (conduit) that may be fitted to a section of the assembly or the entire length.

With a variety of connectors available, you may choose whether to have tails on one end or another connector.

### Advantages:

- ✓ Quality cable, increases the life of your assembly and prevents early system failures.
- ✓ High temperature Teflon cable available as standard.
- ✓ Budget PVC option.
- ✓ Stainless steel armouring (conduit) optional.
- ✓ Quality connectors fitted as standard.
- ✓ Custom cables our speciality.
- ✓ Mating connectors available from stock.
- ✓ Interchangeable with most other brand sensors.
- ✓ Quality build.

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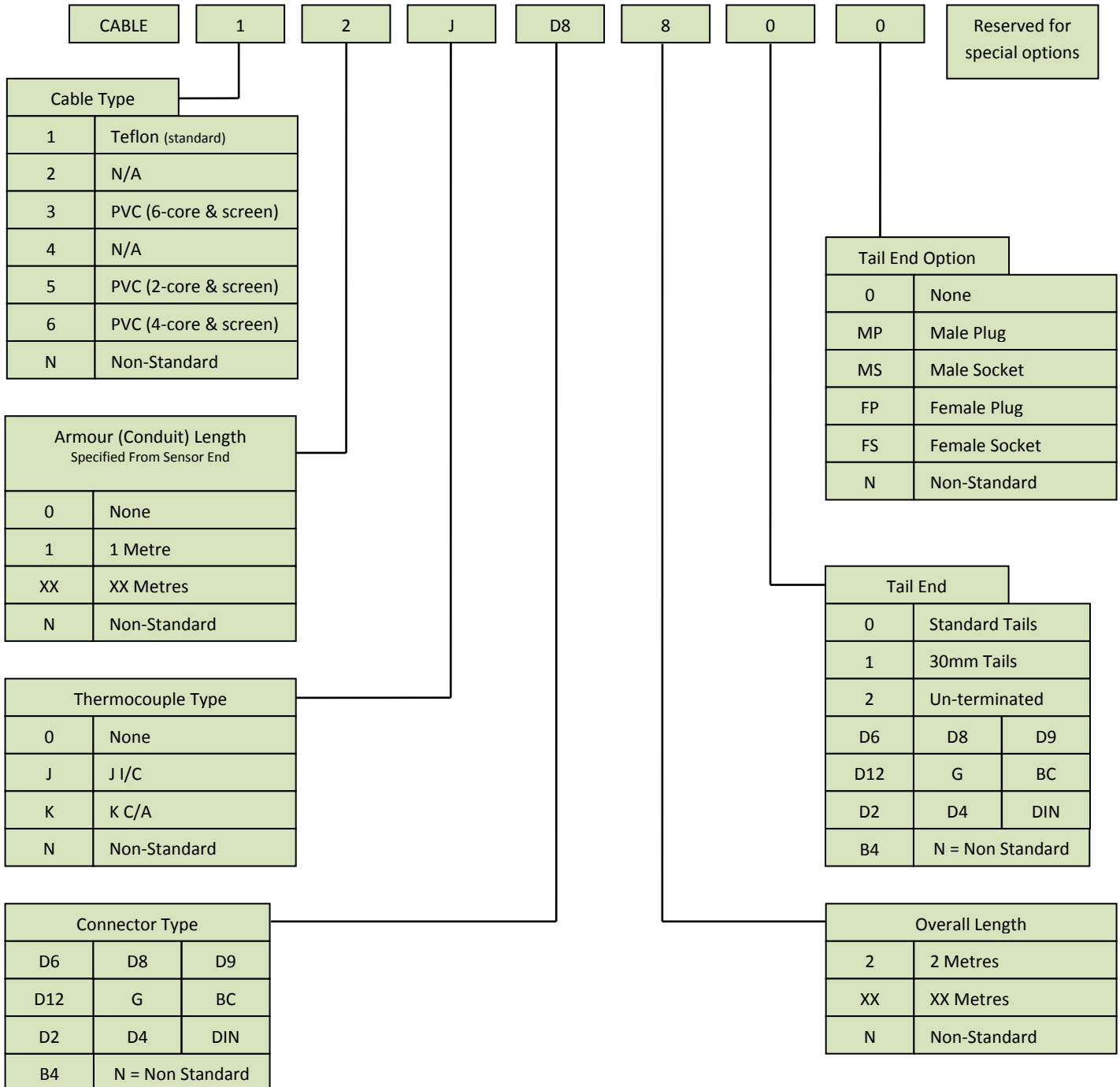


## Cable Assemblies For Terwin Extrusion Pressure / Temperature Transducers & Transmitters

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### Cable Assembly Part Numbers:

**Example:** Terwin 8 metre 8 core & screen cable assembly, including twin type J I/C thermocouple extension leads. The first 2 metres to be fitted with stainless steel armoured and fitted with a D8 strain relief connector on one end and flying tails on the other.



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## Terwin "TEBP" Series Extrusion Burst Plugs



The Terwin TEBP-Series burst plugs are specifically designed for use in extruders where the maximum process temperature does not exceed 410°C (750°F).

The TEBP Series is designed to provide a reliable last line of defence against the build up of excessive pressure. The instantaneously rupture at a predetermined pressure.

### Features:

✓ Standard burst pressures from stock.

✓ Available in 3 standard lengths.

✓ Reliable.

✓ Accuracy ±5%

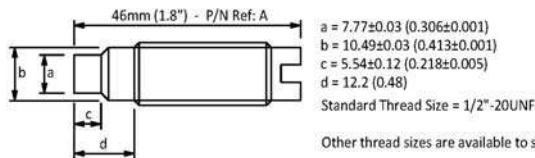
✓ Simple intrinsically safe design.

✓ Low installation & maintenance costs.

Standard Burst Pressures Are As Follows:-

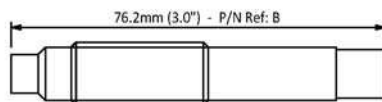
3M5 = 3,500psi  
5M5 = 5,500psi  
7M5 = 7,500psi  
9M5 = 9,500psi

Other burst pressures are available to special order.

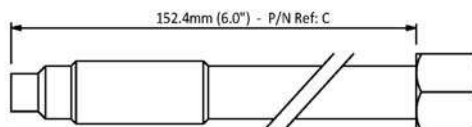


Screwdriver Slot:  
P/N ref = S

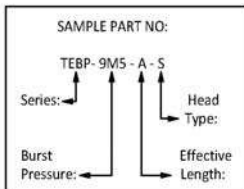
Other thread sizes are available to special order



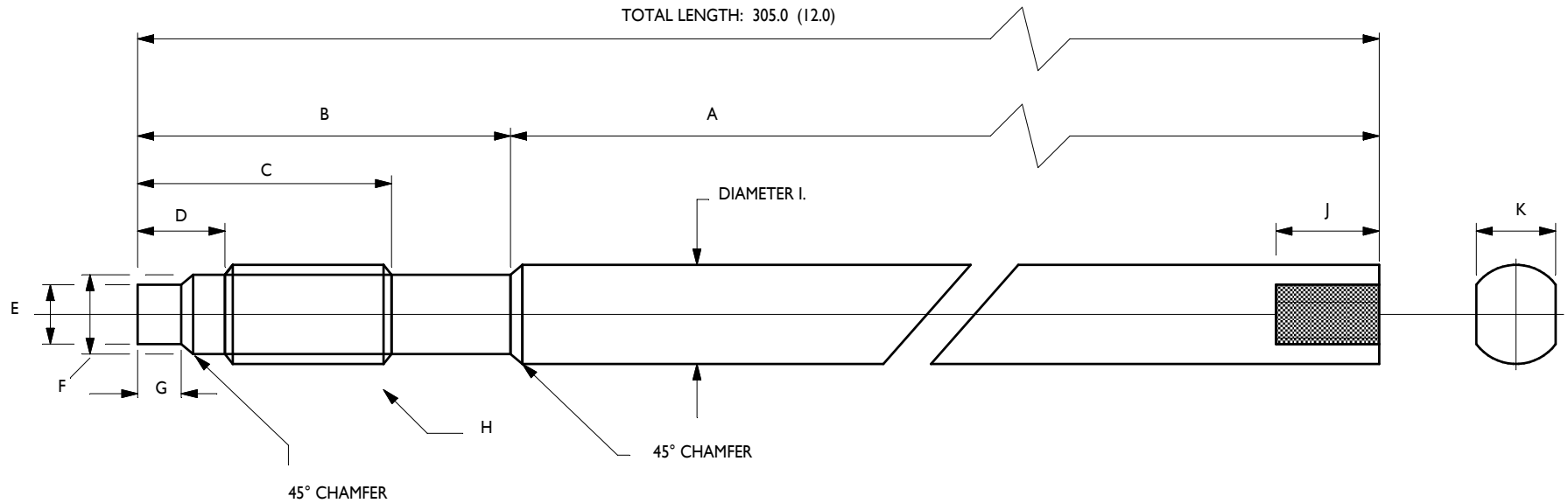
Pair Of Flats:  
P/N ref = F



5/8 Hex:  
P/N ref = H



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A	258 (10.15)
B	47 (1.85)
C	31.3 (1.23)
D	12.2 (0.48)
E	7.77±0.03 (0.306±0.001)
F	10.49±0.03 (0.413±0.001)
G	5.54±0.12 (0.218±0.005)
H	1/2-20-UNF-2A
I	12.7 (0.50)
J	12.7 (0.50)
K	10 A/F (0.39)

## Terwin Part No: 210-4000

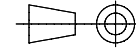
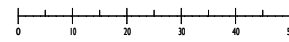
**NOTE:** Surface finish to be N6 or better.



<b>Terwin Instruments Limited</b>	Winterbeck Industrial Estate Orston Lane BOTTFESFORD Nottinghamshire NG13 0AU Tel: +44 (0) 1949 84 2000 Fax: +44 (0) 1949 84 2004	DRAWN	G.W.	DRG. NO.	CAD REF.	MATERIAL:				
			DATE	07.10.96	MPD/2000/0241	TI241	303 STAINLESS STEEL			
			CHECKED	P.W.	TITLE		TOLERANCES:			
			APPROVED	G.W.	PRESSURE TRANSDUCER BLANKING BOLT		±0.05 ANGLES ±0.25° CONCENTRICITY: ALL DIA'S WITHIN 0.05 T.I.R.			
							A	07.10.96	IST ISSUE	G.W.
							ISS	DATE	DESCRIPTION	APP'D

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IN MILLIMETRES

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n/a

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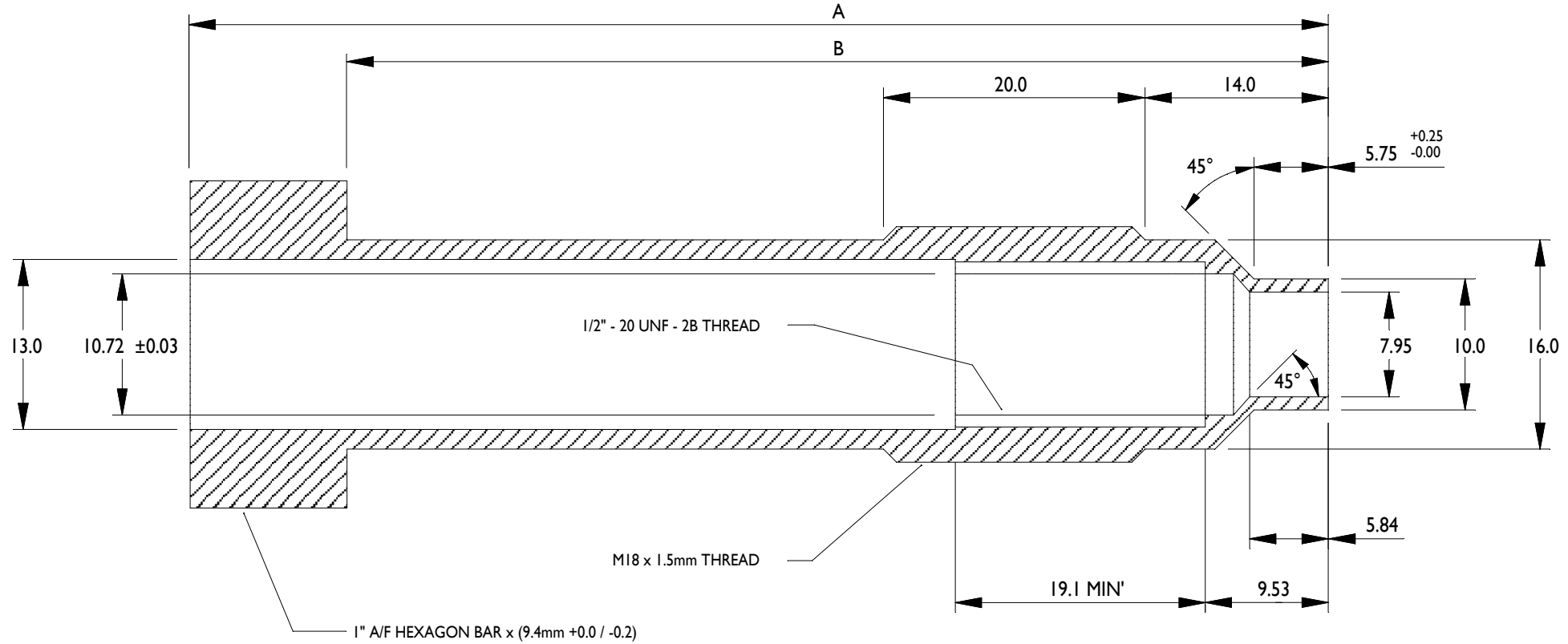
A

B

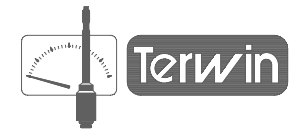
C

D

E



TRANSDUCER MODEL	STEM LENGTH	TERWIN P/N	DIM 'A' OVERALL LENGTH	DIM 'B' EFFECTIVE LENGTH
1075/2075	92.5mm (3.64")	210-3003	87.5mm	78.1mm
1076/2076	152.5mm (6.0")	210-3000	147.4mm	138.0mm
1079/2079	228.6mm (9.0")	210-3005	223.6mm	214.2mm
1077/2077	305.0mm (12.0)	T.B.A.	299.8mm	290.4mm



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DRAWN	G.W.
DATE	18.06.98
CHECKED	M.O.
APPROVED	T.W.

DRG. NO.	MCD/2000/0210 (C)
CAD REF.	TI210
TITLE	M18 x 1.5mm TRANSDUCER ADAPTORS

MATERIAL:	303 STAINLESS STEEL
TOLERANCES:	+1° / -0° ±0.05mm U.O.S. STRAIGHTNESS TO BE WITHIN 0.15 T.I.R.

C	18.6.98	HEX LENGTH REDUCED (BUHLER)	G.W.
B	24.7.96	LENGTH CORRECTION	G.W.
A	22.4.96	1ST ISSUE	G.W.
ISS	DATE	DESCRIPTION	APPD





Model  $\mu$ 400P multi function process indicator/alarm controller for use with extrusion pressure transducers, hydraulic pressure sensors, load cells, T/C's, RTD's, voltage and current loop inputs.



## GENERAL DESCRIPTION

The model  $\mu$ 400P is a high performance process indicator/alarm controller. User configurable input and output options allow this instrument to be used in a wide range of industrial and research applications, including the measurement of pressure, weight, temperature from T/C's and RTD's, DC voltage or current loop inputs.

When used with extrusion melt pressure sensors that employ 6 wire 80% negative shunt calibration such as the Terwin 2000 series transducers, the  $\mu$ 400P provides a simple automatic self-calibration feature for both zero and 80% of the applicable pressure range.

The  $\mu$ 400P is provided with two alarm relays as standard and these may be configured as 'low' or 'high' with direct or inverse action. Additionally, delays in the relays action may be introduced (up to 20 seconds) and the relays may be latched with manual reset through the front key pads. Optional outputs include Modbus/RTU RS-485 serial communications and analog user configurable outputs of 0 - 5V, 0 -10V, 0 - 20mA or 4 - 20mADC. Also, an optional 24VDC output is available for use with transmitters.

This instrument has CE Certification for Safety, EMI Susceptibility, EMI Emission, Harmonics and Voltage Fluctuations.

## Features include:

- Programmable range and set point functions.
- Auto zero and calibration.
- Dual set points with relay output on each.
- Optional analog and Modbus/RTU RS-485 outputs (isolated).
- 5 digit security password protection
- Switch mode power supply for use on 85 to 265V 50/60Hz. Optional 21 to 53V AC/DC supply.
- 1/8th DIN case (96mm wide x 48mm high) with plug-in electronics for ease of service.
- CE approved

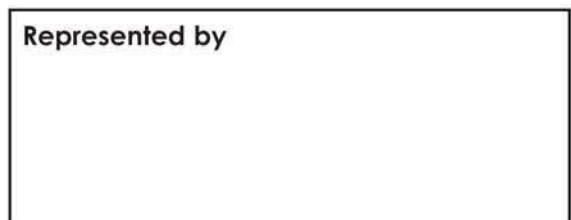
# µ400P Technical Specifications

<b>Display</b>	5 digit red LED 13mm (0.5") high, plus 2 alarm warning indicators.
<b>Indicator Accuracy</b>	Better than +/- 0.25% of full scale value
<b>Inputs</b>	<b>Strain gauge:</b> 350 ohms – gauge excitation 10VDC @ 100mA, DC voltage: 0 - 5 and 0 – 10V (Input impedance >1 MΩ), <b>Current loop:</b> 0 – 20 and 4 – 20mA (150Ω load), <b>Thermocouples:</b> Type 'J' 0 - 600°C or 1112°F, Type 'K' 0 - 1200°C or 2192°F, Type 'L' 0 - 600°C or 1112°F, Type 'N' 0 - 1200°C or 2192°F, Type 'R' 0 - 1600°C or 2912°F, Type 'S' 0 - 1600°C or 2912 °F, Type 'T' 0 – 400°C or 752°F. <b>PT100 3wire:</b> -99.9 to +200°C or -150 to +392°F and -200 to +600°C or -328 to +1112°F.
<b>Decimal Point</b>	Programmable through front key pads. (Linear inputs only).
<b>Input Sensitivity</b>	Applicable to extrusion pressure transducers only: 1mV/V to 3.7mV/VDC.
<b>Calibration</b>	Automatic zero and span calibration for melt pressure transducers is provided through the front keypads. For other sensors, please consult the instruction manual.
<b>Excitation Voltage</b>	10VDC
<b>Setpoint Relays – Alarms</b>	2 SPST relays rated at 1A @250VAC (resistive load). Configurable through front keypads.
<b>Analog Outputs</b>	Optional 0 – 5V, 0 – 10V, 0 – 20mA and 4 – 20mA. User selectable through front keypads and DIP switches.
<b>Serial Communications</b>	Optional MODBUS/RTU™ protocol.
<b>Transmitter Supply</b>	Optional 24VDC (40mA).
<b>Power Supply</b>	85 – 265V 50/60Hz or optional 21 to 53VAC/VDC.
<b>Operating Temperature</b>	0 - 50°C
<b>Storage Temperature</b>	-10 to +60°C
<b>Relative Humidity</b>	0 to 95% non condensing.
<b>Case</b>	ABS self extinguishing.
<b>Weight</b>	220 grams
<b>Dimensions</b>	96mm wide x 48mm high x 98mm deep (3.78" x 1.89" x 3.86")
<b>Mounting/Panel cutout</b>	Rear panel mounting brackets. 91.5mm w x 45.5mm h +/- 0.5mm (3.6" x 1.79") +/- 0.020"
<b>Protection</b>	IP50
<b>CE Certification</b>	Safety, EMI Susceptibility, EMI Emission, Harmonics and Voltage Fluctuations.

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Represented by







Model  $\mu$ 500PT dual channel process indicator/alarm controller. Applications include the simultaneous measurement of pressure and temperature on extruders when fitted with Terwin 2000 series transducers.



## GENERAL DESCRIPTION

The model  $\mu$ 500PT is a high performance dual channel process indicator/alarm controller, which can measure and display two process variables simultaneously. A typical application, is to use this instrument with a Terwin 2000 series extrusion pressure / temperature transducer which incorporates an integral thermocouple.

Channel 1 can be configured for process or temperature inputs and the 2nd channel for strain gauge applications. When used with extrusion melt pressure transducers that employ 6 wire 80% negative shunt calibration, the  $\mu$ 500PT provides a simple automatic self-calibration feature for both zero and 80% of the applicable pressure range.

The  $\mu$ 500PT is provided with two alarm relays as standard and these may be directed to channels 1 or 2 as required. Both relays may be configured as 'low' or 'high' with direct or inverse action and two LED indicators provide relay status. Additionally, delays in the relays action may be introduced (up to 20 seconds) and the relays may be latched with manual reset through the front key pads.

Optional outputs include Modbus/RTU RS-485 serial communications and user configurable analog outputs of 0 – 5V, 0 – 10V, 0 – 20mA or 4 – 20mADC. Also, an optional 24VDC output is available for use with transmitters.

This instrument has CE Certification for Safety, EMI Susceptibility, EMI Emissions, Harmonics and Voltage Fluctuations.

## Features include:

- Programmable range and set point functions.
- Auto zero and calibration for strain gauge pressure transducers.
- Dual set points with relay output on each.
- Optional analog and Modbus/RTU RS-485 outputs (isolated).
- 5 digit security password protection
- Switch mode power supply for use on 85 to 265V 50/60Hz. Optional 21 to 53V AC/DC supply.
- 1/8th DIN case (96mm wide x 48mm high) with plug-in electronics for ease of service.
- CE approved



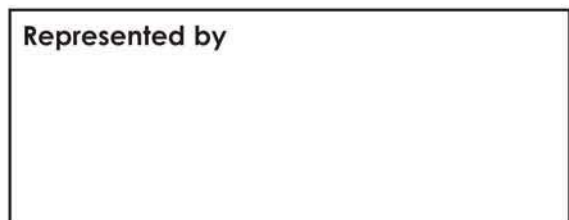
# μ500PT Technical Specifications

<b>Display</b>	Both channels 1 & 2 utilize a red LED display with a character height of 10mm (0.394") plus 2 warning indicators.
<b>Indicator Accuracy</b>	Better than +/- 0.25% of range.
<b>Inputs</b>	2 independent configurable inputs. Channel 1 is allocated for process and temperature inputs and channel 2 for strain gauge applications. Configurable inputs include: <b>Strain gauge:</b> 350 ohms – gauge excitation 10VDC @ 100mA, <b>DC Voltage:</b> 0 – 5 and 0 – 10V (input impedance > 1MΩ), <b>Current loop:</b> 0 – 20 and 4 – 20mA (150Ω load), <b>Thermocouples:</b> Type 'J' 0 - 600°C or 1112°F, Type 'K' 0 - 1200°C or 2192°F, Type 'L' 0 - 600°C or 1112°F, Type 'N' 0 - 1200°C or 2192°F, Type 'R' 0 - 1600°C or 2192°F, Type 'S' 0 - 1600°C or 2192°F, Type 'T' 0 - 400°C or 752°F. <b>PT100 3 wire:</b> - 99.9 to 200.0°C, or -150 to +392°F and -200 to +600° or -328 to +1112°F.
<b>Input Sensitivity</b>	Applicable to extrusion pressure transducers only: 1mV/V to 3.7mV/V.
<b>Calibration</b>	Automatic zero and span calibration for melt pressure transducers is provided through the front keypads. For other sensors, please consult the instruction manual.
<b>Excitation Voltage</b>	10VDC
<b>Setpoint Relays – Alarms</b>	2 SPST relays rated at 1A @ 250VAC (resistive load). Configurable through front keypads.
<b>Analog Outputs</b>	Optional 0 – 5V, 0 – 10V, 0 – 20mA and 4 – 20mA. User selectable through front keypads and DIP switches.
<b>Serial Communications</b>	Optional MODBUS/RTU™ protocol.
<b>Transmitter Supply</b>	Optional 24VDC (40mA).
<b>Power Supply</b>	85 - 265V 50/60Hz or optional 21 – 53VAC/DC
<b>Operating Temperature</b>	0 - 50°C
<b>Storage Temperature</b>	-10 to +60°C
<b>Relative Humidity</b>	0 – 95% non condensing
<b>Case</b>	ABS self extinguishing
<b>Weight</b>	240gms
<b>Dimensions</b>	96mm wide x 48mm high x 98mm deep (3.78" x 1.89" x 3.86").
<b>Mounting/Panel cutout</b>	Rear panel mounting brackets. 91.5mm w x 45.5mm h +/-0.5mm (3.6" x 1.79) +/- 0.020
<b>Protection</b>	Protection IP50
<b>CE Certification</b>	Safety, EMI Susceptibility, EMI Emission, Harmonics and Voltage Fluctuations.

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# Terwin 1809A Pressure Transducer Power Supply / Signal Conditioning Unit

Customer Service and Product  
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## Description:

The Terwin 1809A-mkII signal conditioner has been primarily designed for use with the Terwin model 2000 series & 5000 Series pressure transducers.

Each unit employs 3-way isolation, i.e. the input, output and power supply are isolated from each other.

The isolated excitation voltage normally provided is 10V D.C. with adjustable gain to cover the range of 1mV/V to 4mV/V. A zero offset of  $\pm 3\text{mV}$  can be accommodated. Other excitation voltages are available to special order.

The 1809A-mkII is provided with following **selectable** D.C. outputs:-

Current (A) Outputs	0-1mA	0-10mA	0-20mA	4-20mA
Voltage (V) Outputs	0-1V	0-5V	1-5V	0-10V

## Advantages:

- ✓ Compact & DIN rail mount.
- ✓ 3 way isolation.
- ✓ 6-wire 80% calibration as standard.
- ✓ Other calibration methods available
- ✓ Switchable mains supply voltage.
- ✓ Alternative 24V DC supply voltage
- ✓ Extremely easy to use.
- ✓ Switchable output signals.
- ✓ Interchangeable with most other brands.

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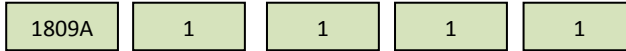




# Terwin 1809A Pressure Transducer Power Supply / Signal Conditioning Unit

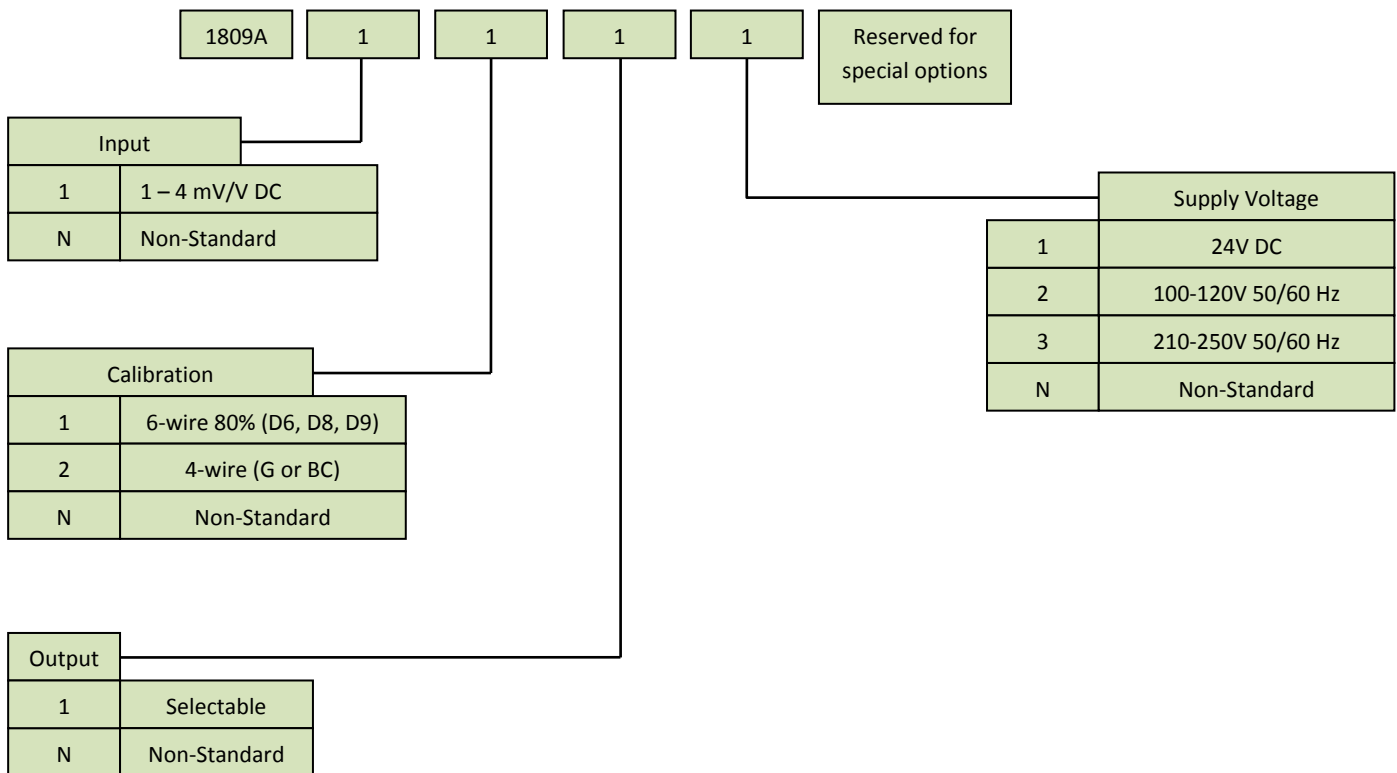
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1809A Part Numbers:



Example:

Terwin model 1809A-1-1-1-1 DIN rail mounting pressure transducer power supply / signal conditioner. Input Sensitivity: 1-4mV/V. Calibration: 6-wire 80% negative shunt. Output Type: Selectable. Supply Voltage: 24V DC.



Specifications:

Load stability	0.02%	Ripple	0.3% (peak)
Response time	<350ms to 99%	Isolation	1.5kV rms 50Hz
Linearity	Proportional to input $\pm 0.1\%$ F.S.	Temperature coefficient	$\pm 0.01\%$ per $^{\circ}\text{C}$
Operating temperature	0-60 $^{\circ}\text{C}$	Storage temperature	-20 to +65 $^{\circ}\text{C}$
Power consumption	3VA maximum	Housing	75 x 55 x 110mm Grey Makrolon case, suitable for surface or DIN rail mounting

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Customer Service and Product  
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## Terwin 1100 Series Two Wire Loop Powered Pressure Transducer Conditioning Unit



### Description:

The Terwin 1100 Series two wire loop pressure transducer conditioning unit was primarily designed for use with our 2000 series melt pressure transducers, to convert a low level mill volt output into a process signal of 4-20mA DC. However, due to the flexibility of design, they can be used with any 350Ω strain gauge pressure transducer or load cell etc.

The 1100 series requires a supply voltage of between 12 – 36V DC and are provided with tamperproof calibration facilities to enable extruder pressure systems to be adjusted at working temperature, ensuring the best possible accuracy.

When used with our 2000 series transducers, both sections conform to minimum IP65 and are fully compliant with the European electromagnetic compatibility directive for CE approval.

The 1100/2000 series are constructed throughout from stainless steel and do not contain Mercury, Sodium-Potassium or indeed any other toxic substances, allowing them to be used for extrusion of food, film and pharmaceutical products.

### Features:

- ✓ Detachable pressure transducer for ease of mounting and cost saving in the event of service being required.
- ✓ **Constructed throughout from stainless steel and suitable for use with any 350Ω strain gauge transducer.**
- ✓ High performance.
- ✓ **Accuracy better than ±0.25%.**
- ✓ IP65/NEMA 4 rated.
- ✓ **Compliant with EN50082 part 1 and EN55022-1987 class A.**
- ✓ Built in "Zero" and "80% calibration" adjustment for standard 6-wire melt pressure transducers.

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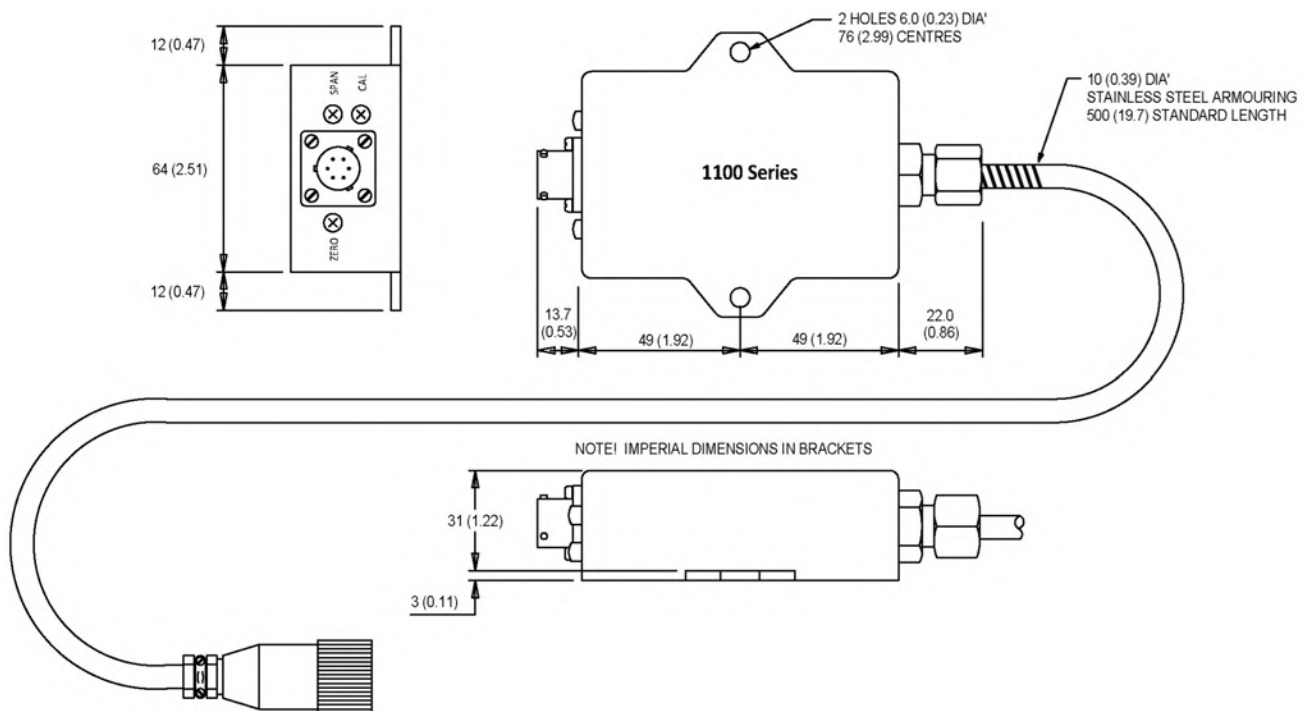


# Terwin 1100 Series Two Wire Loop Powered Pressure Transducer Conditioning Unit

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## Specifications

<b>Combined Error</b>	Within $\pm 0.5\%$ F.R.O. (Typically $\pm 0.25\%$ )					
<b>Repeatability</b>	Within $\pm 0.1\%$ F.R.O.					
<b>Resolution</b>	Infinite					
<b>Case Material</b>	316 Stainless steel.					
<b>Electrical Specifications:</b>						
<b>Input Voltage:</b>	12 – 36V DC.					
<b>Output:</b>	4-20mA DC.					
<b>Load Resistance:</b>	Please refer to the installation instruction data sheet.					
<b>Zero Balance Adjustment:</b>	$\pm 5\%$					
<b>Span (calibration) Balance Adjustment:</b>	$\pm 5\%$					
<b>Transmitter Electrical Connections:</b>	Fitted with in-line Bendix connector PT02A-10-6P (D6) or equivalent as standard and supplied complete with mating 2.5 metre PVC coated 2-wire input/output lead.					
<b>Pressure Transducer Connections:</b>	<b>Choose:</b>	D9	D8	D6	G	BC
<b>Temperature Specifications</b>						
<b>Transmitter Operating Range:</b>	-40°C to +85°C		-40°F to +185°F			
<b>Transmitter Compensating Range:</b>	0-65°C		32 – 150°F			
<b>Transmitter Zero Drift:</b>	<0.01% of F.R.O./°C		<0.02% of F.R.O./°F			
<b>Transmitter Sensitivity Drift:</b>	<0.01% of F.R.O./°C		<0.02% of F.R.O./°F			
<b>Compliance:</b>	IP65 / NEMA4	EN50082 part 1	EN55022-1987 class A	CE Approved		



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## Terwin MC Series PID/Fuzzy Logic/Auto Tune Temperature Controllers



### Description:

The Terwin MC Series is the ultimate microprocessor based temperature controller for use on extruders, injection and blow moulding machines, ovens and furnaces.

Utilising the latest PID algorithms, the control loop is one of the most accurate available on the market to date.

The versatility of this product also means that it may be used for controlling humidity, pressure and flow etc.

Available with two process outputs and two alarms as standard.

Can be run fully automatically or in manual mode.

### Advantages:

- ✓ Two process outputs as standard (Heat and Cool)
  - ✓ Two programmable alarms as standard.
  - ✓ Fully Programmable.
  - ✓ Auto Tune (on or off)
  - ✓ Multi level P.I.D.
  - ✓ Fuzzy Logic (on or off)
  - ✓ Multi-Input.
  - ✓ Interchangeable with most other brands.
  - ✓ Accurate and reliable.
  - ✓ Attractively priced
- £ - \$ - €

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# Terwin MC Series PID/Fuzzy Logic/Auto Tune Temperature Controllers

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## Specifications

<b>Display 7 segments:</b>	Measure value (PV) RED LED 4 digits.	Set Value (SV) YELLOW LED 4 digits.				
<b>Display Accuracy:</b>	±0.3% F.S. + 1 digit @23.5°C. Refer to input measuring range codes in manual.					
<b>Display Resolution:</b>	(0.001, 0.01, 0.1 & 1) Depending upon measuring range set.					
<b>Sample Rate:</b>	0.3 seconds.					
<b>Display Actions / Colours:</b>	Control (OUT):	Green	Alarm:	Red	Auto Tuning (AT):	Red
	Manual Control (MAN):	Green	O/P %:	Green	Program (PRG):	Red
<b>Users Settings:</b>	By front membrane panel.		Setting Range:		As input range.	
<b>Setting Limit:</b>	Individual Low / High limits. Set as desired within measuring range.					
<b>Inputs:</b>	Thermocouple types: B, E, J, K, R, S, T, N		PT100		Linear voltage / current.	
<b>External Resistance</b>	100Ω max.		Input Impedance:		600KΩ minimum	
<b>Burnout:</b>	Standard Up-Scale Bias.		Cold Junction Compensation Accuracy		±1°C (-5° to +70°C)	
<b>Amperage</b>	Approx. 0.25mA		Lead Wire Tolerable Resistance:		5Ω max.	
<b>Voltage Inputs:</b>	-10~10, 0~10, 0~20, 0~50, 0~100mV DC or 0~1, 0~2, 0~5, 1~5, 0~10V DC Multi input, programmable range: Refer to Table Of Measurement Range Codes In Manual				<b>Input Impedance:</b>	500KΩ max.
<b>Current Inputs:</b>	4~20, 0~20mA DC. Multi input, programmable range: Refer to Table Of Measurement Range Codes In Manual				<b>Input Impedance:</b>	250Ω max.
<b>Sampling Time:</b>	0.3 seconds		PV Bias:	-2,000 ~ 2000 units	PV Filter:	0.001 ~ 1.000
<b>Isolation:</b>	Insulated between input and output.					
<b>Control:</b>	Control Mode	Auto-tuning PID		Proportional Band	0~3,000 units (0=On-Off Action)	
	Integral Time (I)	0-3,600 sec (0=P. PD Action)		Derivative Time (D)	0~900 sec (0=P.PI Action)	
	On-Off Hysteresis	0.0~2,000 units		Proportional Cycle	0~150 sec	
	Higher and Lower Output Limits			0.0~100.0% (lower limit < higher limit)		
<b>Control Output Type / Rating:</b>	Contact	240V AC 6A / resistive load		Current	4~20mA DC / load resistance 600Ω max.	
	SSR	24±2V DC / load current 20mA max.		Voltage	0~10V DC / load current 2mA max.	
<b>Manual Control:</b>	Output Setting Range			0.0~100.0% (setting resolution 0.1%) Within range of higher / lower output limits.		
	Output Resolution			0.1%		
<b>Alarm Outputs:</b>	Method:	Individual setting and output. Higher and lower alarm limits				
	Type:	Deviation or absolute selectable.				
	Setting Range:	Deviation:	±2,000 units	Absolute:	0~2,000 units	
	Action:	On-Off	Action Hysteresis	1~999 units (high and lower limits)		
	Inhibit Mode:	Selectable	Alarm Output Rating:	Contact 1A (common) / 240V AC 6A (resistive load)		
<b>Environmental</b>	-10~+50°C			90% RH Maximum (no condensation)		
<b>Supply Voltage:</b>	100~240V AC ±10% 50/60Hz		Power Consumption:		Max. 3.5VA (AC)	
<b>Insulation Resistance</b>	500V DC 4MΩ minimum		Dielectric Strength:		1 min. at 2.3KV AC	
<b>IP Rating</b>	Front panel - IP65 (when panel mounted using watertight gasket between instrument and panel).					

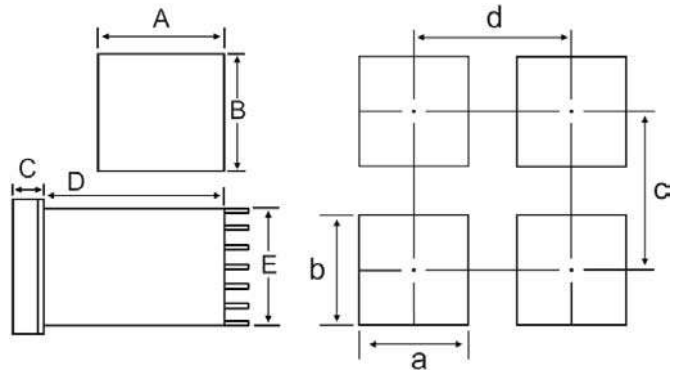
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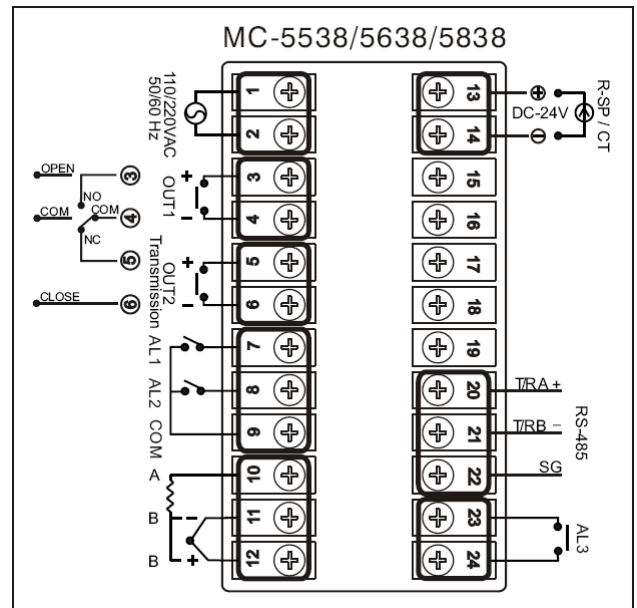
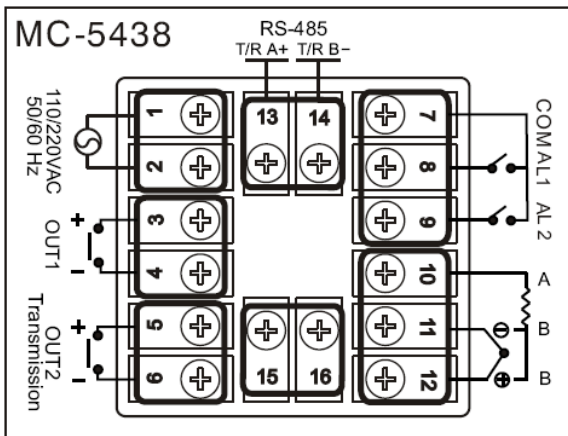
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### Dimensions :

Type	A	B	C	D	E	a	b	c	d
MC-5838	96	96	10.5	83	90	$91_{-0}^{+0.5}$	$91_{-0}^{+0.5}$	120	120
MC-5738	72	72	10.5	83	67	$68_{-0}^{+0.5}$	$68_{-0}^{+0.5}$	100	100
MC-5638	96	48	10.5	83	43	$91_{-0}^{+0.5}$	$46_{-0}^{+0.5}$	70	120
MC-5538	48	96	10.5	83	90	$46_{-0}^{+0.5}$	$91_{-0}^{+0.5}$	120	70
MC-5438	48	48	10.5	83	45	$46_{-0}^{+0.5}$	$46_{-0}^{+0.5}$	70	70



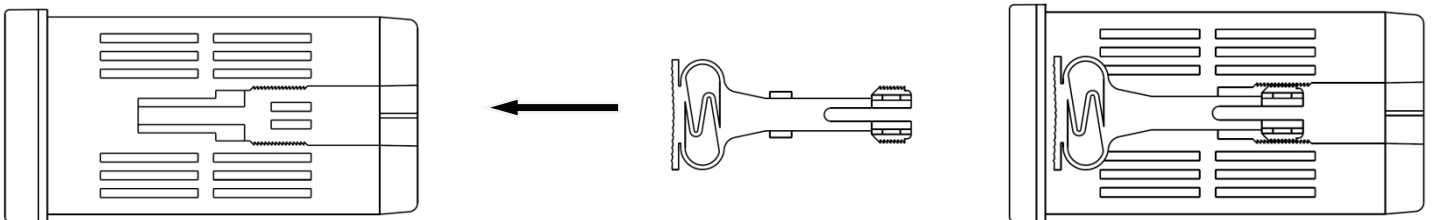
### Wiring Information :



### Panel Mounting Clips - Procedure:

Insert instrument through the front of the instrument panel. Once in place, push the fixing clips into the grooves provided.

To remove clips, squeeze ends of clips together and pull.





# Terwin MC Series PID/Fuzzy Logic/Auto Tune Temperature Controllers

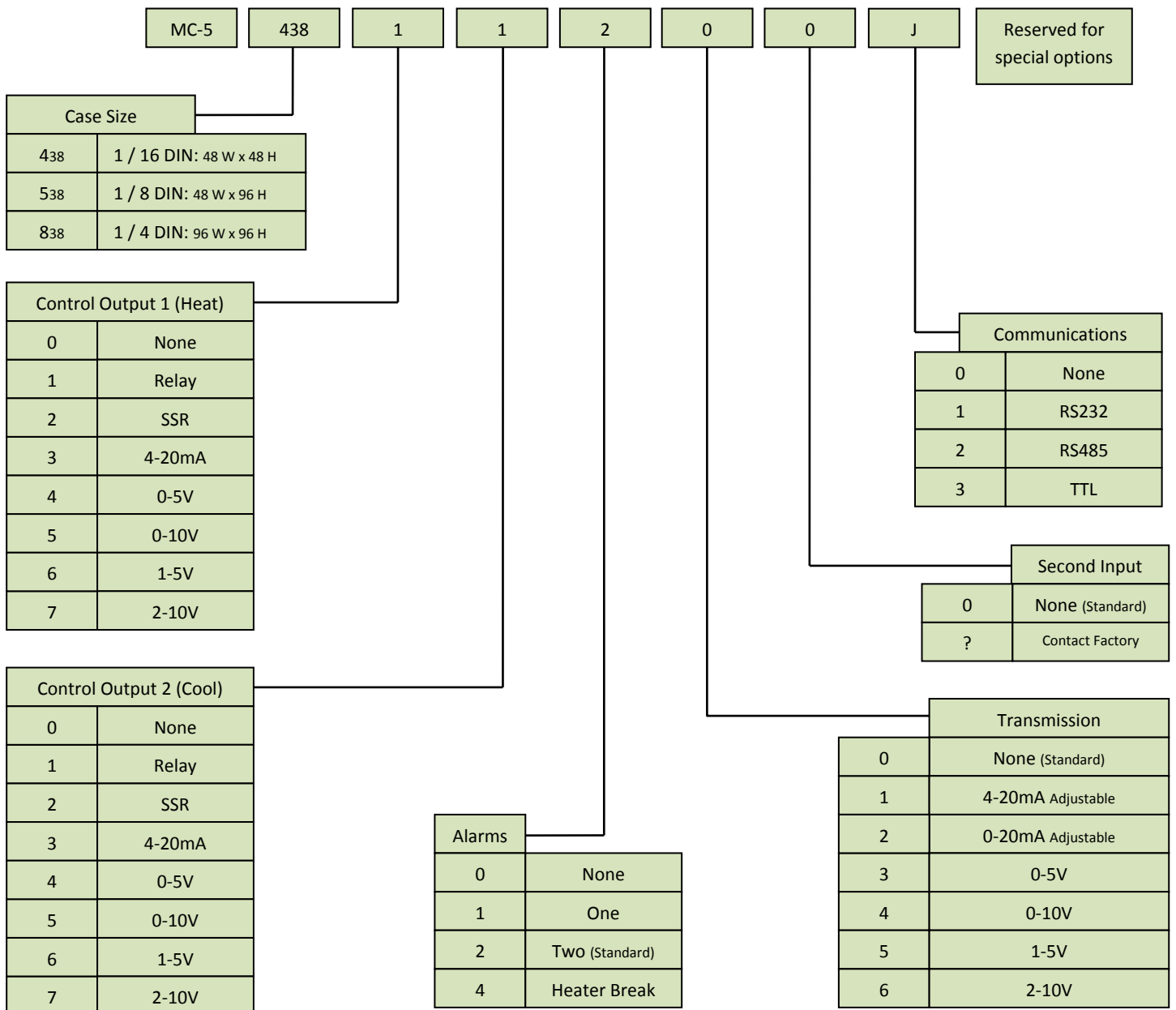
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## MC Series Part Numbers:

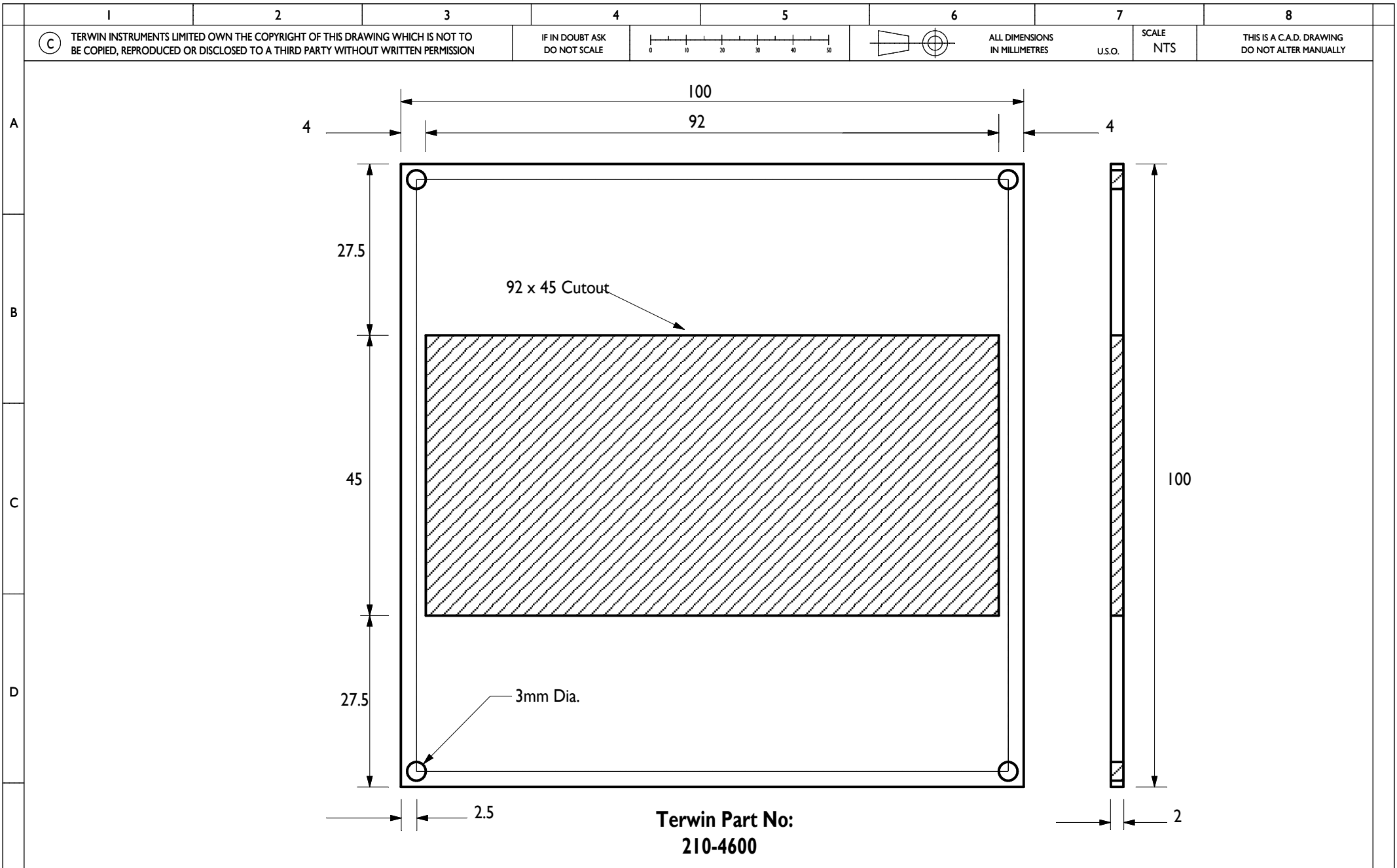


### Example:

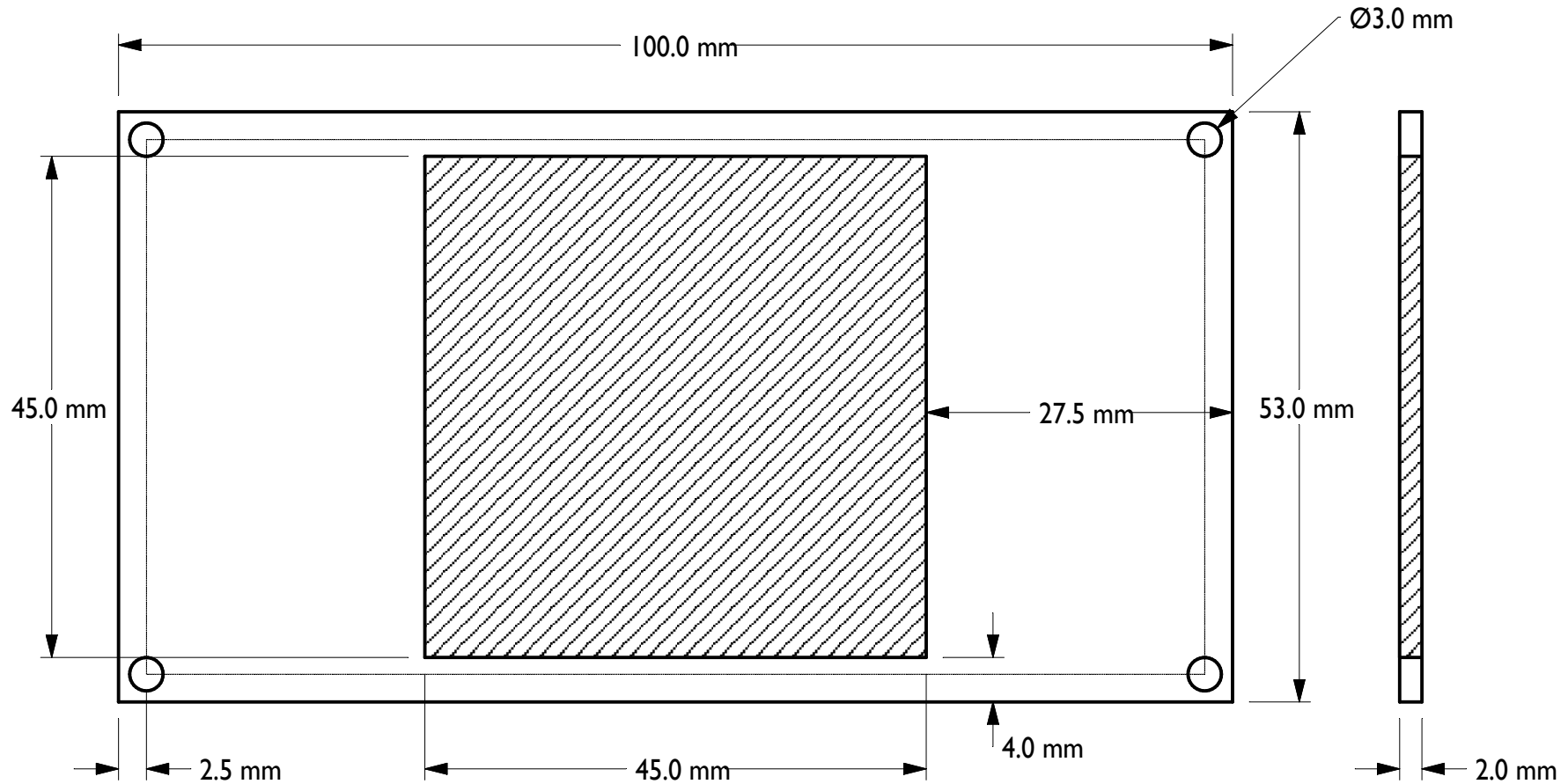
Temperature Controller (48w x 48hmm bezel DIN 1/16), SPST 5amp/240VAC resistive heating process output, SPST 5amp/240VAC resistive cooling process output, two alarm relays 3A @ 240VAC (as standard), no transmission output, no secondary input, configured for type "J" I/C thermocouple input.



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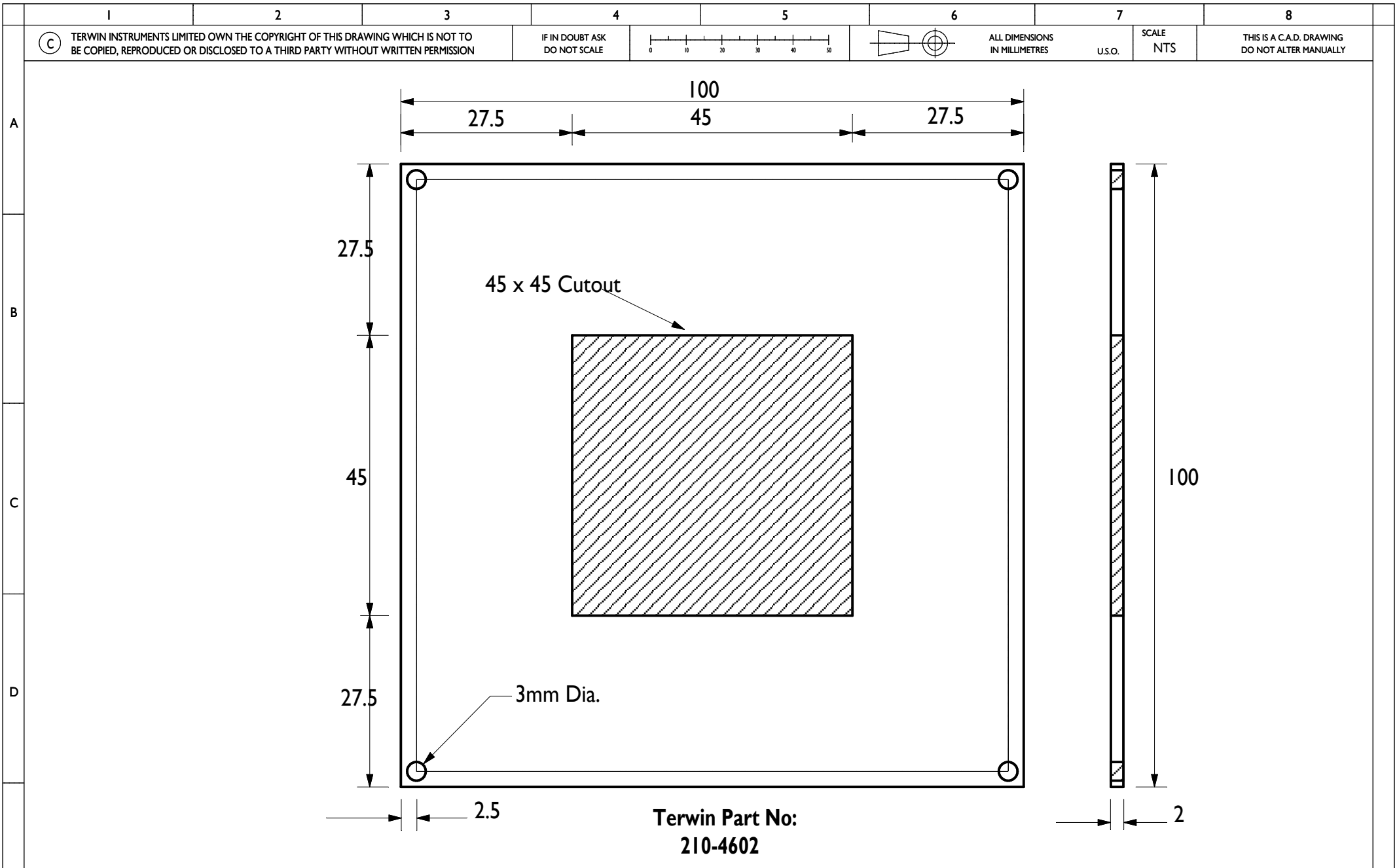


<b>E</b>	<b>Terwin Instruments Limited</b>	Winterbeck Industrial Estate Orston Lane BOTTFESFORD Nottinghamshire NG13 0AU Tel: +44 (0) 1949 84 2000 Fax: +44 (0) 1949 84 2004		DRAWN	G.W.	DRG. NO. MCD/1706/0300 (B)	CAD REF. TI300	MATERIAL: 2mm SHEET ALUMINIUM ANODIZED BLACK				
		DATE	02/04/96									
		CHECKED	R.W.	TITLE	TOLERANCES: ±0.25 ANGLES ±0.25° CONCENTRICITY: ALL DIA'S WITHIN 0.25 T.I.R.	B	26/01/01	P/N 210-4600 added	G.W.			
		APPROVED	T.W.	1/4 DIN to 1/8 DIN ADAPTOR PLATE		A	02/04/96	IST ISSUE	G.W.			
						ISS	DATE	DESCRIPTION	APP'D			



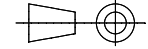
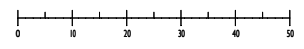
**Terwin Part No:  
210-4601**

<b>Terwin Instruments Limited</b>	Winterbeck Industrial Estate Orston Lane BOTTFESFORD Nottinghamshire NG13 0AU Tel: +44 (0) 1949 84 2000 Fax: +44 (0) 1949 84 2004	DRAWN	G.W.	DRG. NO. MCD/1706/0301 (B)	CAD REF. T1301	MATERIAL: 2mm SHEET ALUMINIUM Finish - Anodized Black			
		DATE	12.08.99						
		CHECKED	TW	TITLE	TOLERANCES: ±0.25 U.O.S. ANGLES ±0.25 DEGREES STRAIGHTNESS TO BE WITHIN 0.15 T.I.R.				
		APPROVED	GW	1/8 DIN to 1/16 DIN ADAPTOR PLATE					
							B	26/01/01	P/N 210-4601 added
						A	12.08.99	1ST ISSUE	G.W.
						ISS	DATE	DESCRIPTION	APP'D



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IF IN DOUBT ASK  
DO NOT SCALE



ALL DIMENSIONS  
IN MILLIMETRES

U.S.O.

SCALE  
NTS

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**Terwin  
Instruments  
Limited**

Winterbeck Industrial Estate  
Orston Lane  
BOTTFESFORD  
Nottinghamshire  
NG13 0AU  
Tel: +44 (0) 1949 84 2000  
Fax: +44 (0) 1949 84 2004

DRAWN	G.W.
DATE	26.01.01
CHECKED	M.O.
APPROVED	T.W.

DRG. NO.	MCD/1706/0302 (A)
CAD REF.	TI302
TITLE	1/4 DIN to 1/16 DIN ADAPTOR PLATE

MATERIAL:	2mm SHEET ALUMINIUM ANODIZED BLACK
TOLERANCES:	±0.25 ANGLES ±0.25° CONCENTRICITY: ALL DIA'S WITHIN 0.25 T.I.R.

A	26/01/01	1ST ISSUE	G.W.
ISS	DATE	DESCRIPTION	APP'D





Customer Service and Product  
Quality Are Our No.1 Priority

## Terwin Model T1300 Comparison Test Pump



### Description:

The Terwin model T1300 comparison test pump is a lightweight pressure source that is used to smoothly generate pressure to test pressure sensors and gauges. The calibration is performed by comparing the result of a master pressure gauge with the unit which is under test.

The maximum pressure of the T1300 is 1,000 bar (15,000psi) and the operating liquid is standard hydraulic oil.

The T1300 can be supplied with either a 150mm (6.0") or 250mm (10") diameter pressure gauge with an accuracy of either  $\pm 1\%$  or  $\pm 0.25\%$  of full range. 0.25% test gauges are fitted with a mirror dial to prevent parallax error.

Supplied with the T1300 is an adaptor which has been designed for the Terwin 2000 / 5000 series Extrusion Pressure transducers / transmitters. The internal threads of the adaptor are  $\frac{1}{2}$ "-20UNF-2B. Other adaptors are also available.

### Application:

Site calibration of pressure  
transducers, transmitters,  
analogue gauges and pressure  
switches.

### Standard Accessories:

$\frac{1}{8}$ " ,  $\frac{1}{4}$ " ,  $\frac{3}{8}$ " ,  $\frac{1}{2}$ " BSP Adaptors  
Instruction Manual  
Spare Seal Set  
Hydraulic Oil

### Optional Accessories:

$\frac{1}{8}$ " ,  $\frac{1}{4}$ " ,  $\frac{3}{8}$ " ,  $\frac{1}{2}$ " NPT Adaptors  
Angle Adaptor for rear mounting  
gauges.  
Pointer Puller  
Pointer Punch

### Features:

Pressure Range:  
0-1,000 bar (0-15,000psi)  
Accuracy:  
Subject to master gauge used.  
Pressure Generation:  
Direct via ram screw.  
Weight:  
10 kg  
Dimensions:  
361 x 382 x 245 mm

Terwin Instruments Ltd, Winterbeck Industrial Estate, Orston Lane, BOTTESFORD, Nottinghamshire, NG13 0AU – UK  
Tel: +44 (0) 1949 84 2000 Fax: +44 (0) 1949 84 2004 E-mail: [info@terwin.com](mailto:info@terwin.com) [www.terwin.com](http://www.terwin.com)



**Model Shown:** SIMULATOR D6/D8

**Description:**

The Terwin pressure transducer simulator has been designed as a service aid to engineers that are involved in the extrusion of plastics, rubber and food.

Should a fault occur on an extrusion pressure monitoring / control system, the simulator will enable the plant engineer to check the cable assembly and associated indicator / controller / signal conditioner by simply plugging the transducer cable assembly into the simulator and checking all the functions with the eleven point rotary switch.

This simple device may avoid the unnecessary removal of the pressure transducer from the machine, thus saving valuable down time.

SPECIFICATIONS	
Accuracy	±0.25%
Full Scale Output	Nominal 3mV/V
Configuration	350 ohm Wheatstone bridge
Input Resistance	350 ohm ±0.5%
Output Resistance	350 ohm ±0.5%
Range	0-100% of F.R.O. in 10% steps
Zero Balance	±0.25% of F.R.O.
Calibration Type	6-wire 80% Negative Shunt
Excitation	5 – 12V D.C.

Also available with other connectors and calibration types.

**Features:**

✓ Suitable for most makes of Melt Pressure systems.

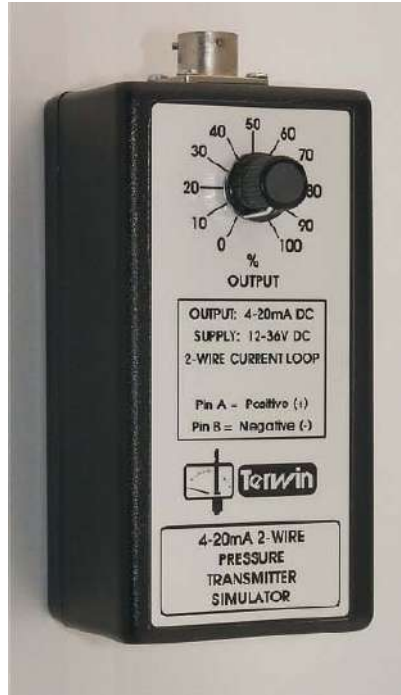
✓ Helps fault finding.

✓ Reduces valuable downtime.

✓ Accuracy ±0.25%

✓ Simple rugged design.

✓ Low installation & maintenance costs.



**Model Shown: I-SIM D6**

**Description:**

The Terwin I-SIM 2-wire 4-20mA pressure transmitter simulator has been designed as a service aid to engineers who are involved in the extrusion of plastics, rubber and food and are using 2-wire 4-20mA pressure monitoring systems.

Should a fault occur on an extrusion pressure monitoring / control system, the simulator will enable the plant engineer to check the cable assembly and associated indicator / controller by simply plugging the transmitter cable assembly into the simulator and checking all the functions with the eleven point rotary switch.

The I-SIM unit incorporates the industry standard 80% calibration system. This is very helpful in testing the calibration relay in the process indicator / controller or plc.

This simple device may avoid the unnecessary removal of the pressure transmitter from the machine, thus saving valuable down time.

SPECIFICATIONS	
Accuracy	±0.25%
Output	4-20mA DC
Range	0-100% of F.R.O. in 10% steps
Zero Balance	±0.25% of F.R.O.
Calibration Type	6-wire 80% Negative Shunt
Supply Voltage	12 – 36V D.C.

**Features:**

✓ Suitable for most makes of Melt Pressure systems.

✓ Helps fault finding.

✓ Reduces valuable downtime.

✓ Accuracy ±0.25%

✓ Simple rugged design.

✓ Low installation & maintenance costs.



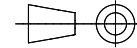
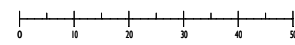
TERWIN manufacture Pressure & Temperature Instrumentation,  
Sensors & Controls, for use in the Plastics, Rubber, Food  
& Pharmaceutical Industries.

# THERMOCOUPLE AND RTD CATALOGUE

Tel: +44 (0) 1949 84 2000      Fax: +44 (0) 1949 84 2004  
E-mail: [info@terwin.com](mailto:info@terwin.com)  
[www.terwin.com](http://www.terwin.com)

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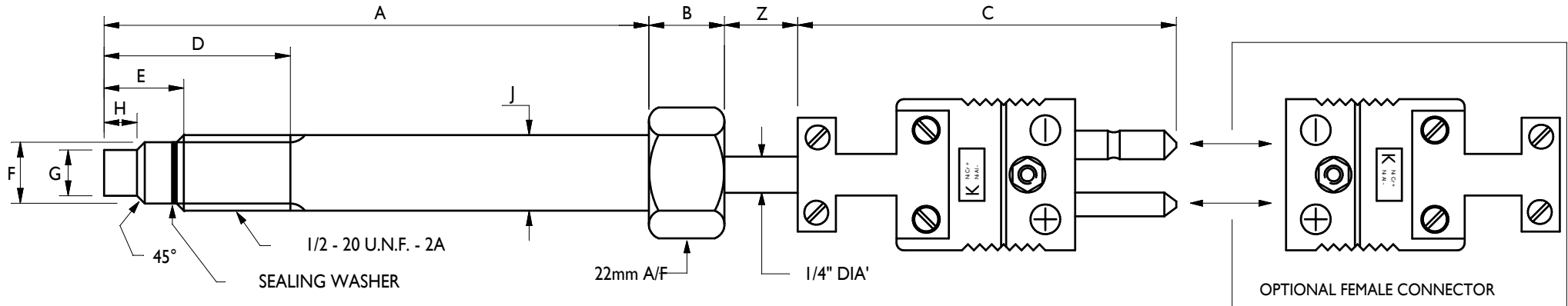


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**DIMENSIONS**

**A = TO BE SPECIFIED**

B = 12.7 (1/2")

C = 63.5 (2.5")

D = 31.30 (1.23)

E = 12.20 (0.48)

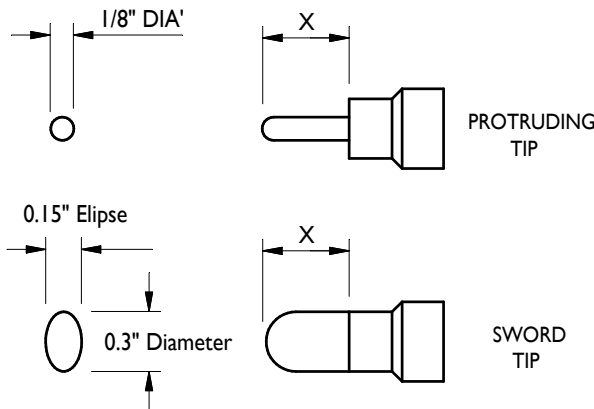
F = 10.49±0.03 (0.413±0.001)

G = 7.77±0.03 (0.306±0.001)

H = 5.54±0.12 (0.218±0.005)

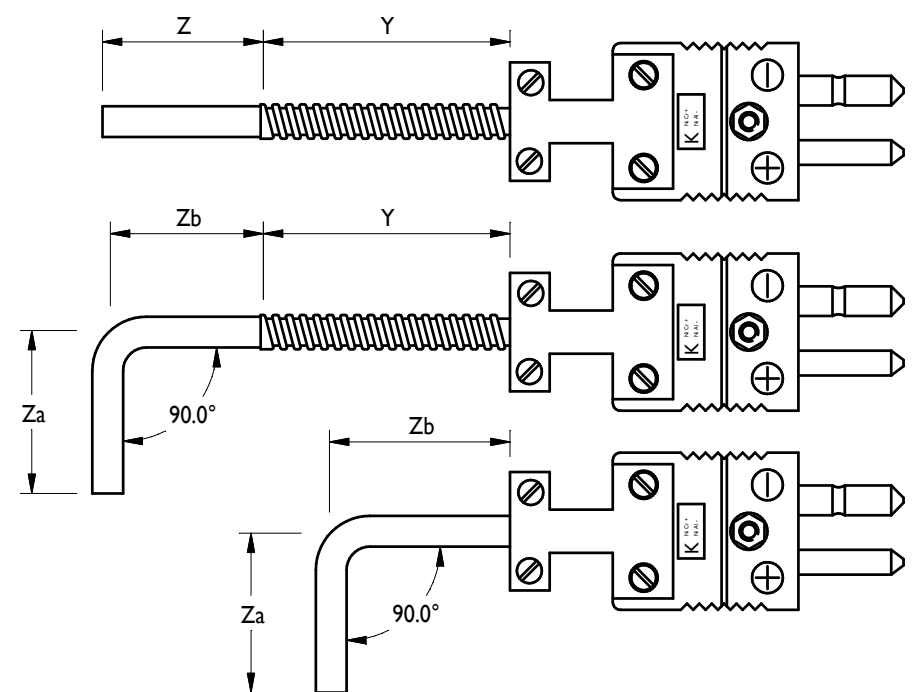
J = 12.7 DIA' (0.50)

**NON-FLUSH TIP OPTIONS:**



OTHER NON STANDARD TIPS ARE AVAILABLE PLEASE ENQUIRE WITH OUR SALES OFFICE

**ALTERNATIVE TERMINATIONS ARE AS FOLLOWS**



**PLEASE QUOTE:**

1. TYPE OF TIP
2. LENGTH OF BOLT
3. TYPE & LENGTH OF TERMINATION
4. THERMOCOUPLE TYPE
5. GROUNDED OR ISOLATED JUNCTION

PLEASE CONTACT OUR SALES OFFICE IF YOU SHOULD REQUIRE ANY ADDITIONAL INFORMATION



**Terwin Instruments Limited**

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Orston Lane  
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Fax. +44 (0) 1949 84 2004

DRAWN	P.S.
DATE	11.1.97
CHECKED	T.W.
APPROVED	T.W.

DRG. NO.	MCD/TC/0002
TITLE	TERWIN STANDARD EXTRUSION THERMOCOUPLE

CAD REF.  
TI286

MATERIAL:  
BOLT - 316 STAINLESS STEEL

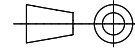
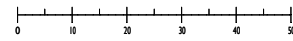
TOLERANCES:  
±0.1 U.O.S.  
+1 / -0 Degree

C	19.10.00	X DIM. DUPLICATED - NOW Y DIM.	GW
ISS	DATE	DESCRIPTION	APP'D



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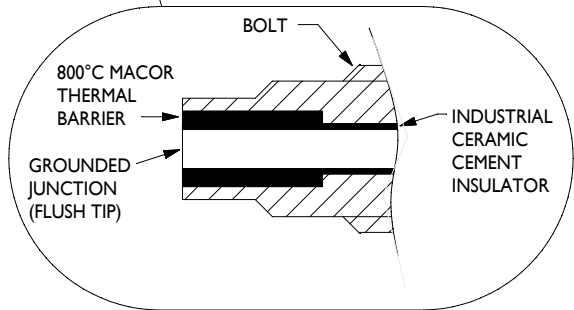
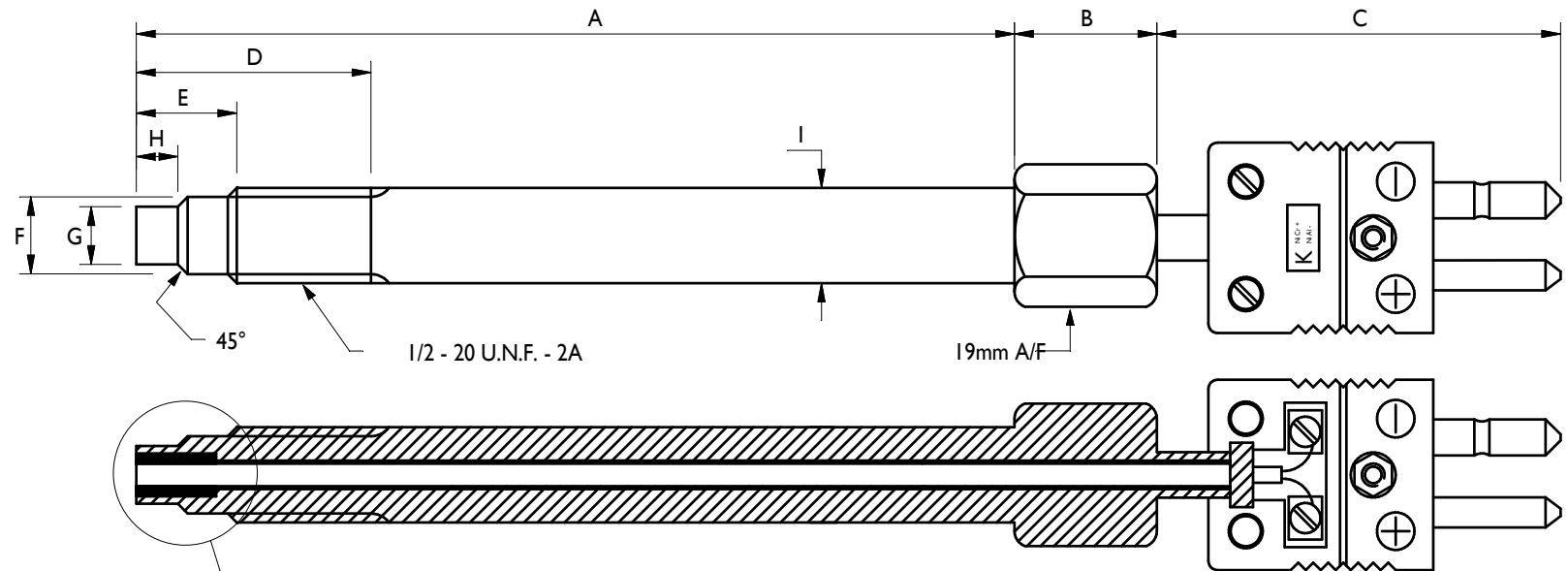
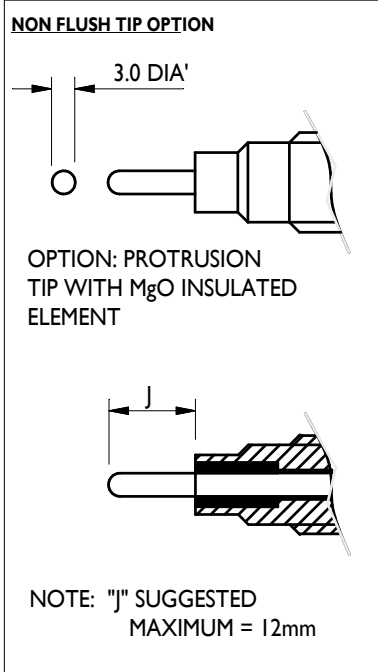
A

B

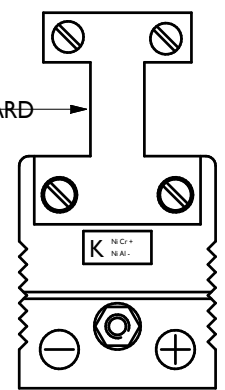
C

D

E



MATING FEMALE THERMOCOUPLE CONNECTOR SUPPLIED AS STANDARD COMPLETE WITH CABLE CLAMP



DIMENSIONS	
A = TO BE SPECIFIED	F = 10.49±0.03 (0.413±0.001)
B = 19.05 (0.75)	G = 7.77±0.03 (0.306±0.001)
C = 50.80 (2.00)	H = 5.54±0.12 (0.218±0.005)
D = 31.30 (1.23)	I = 12.7 DIA' (0.50)
E = 12.20 (0.48)	

**ORDERING INFORMATION:**  
**PLEASE SPECIFY THE FOLLOWING -**  
 1. THERMOCOUPLE TYPE: 'J' I/C OR 'K' C/A  
 2. GROUNDED or ISOLATED JUNCTION  
 3. BOLT LENGTH (A DIMENSION)  
 4. TIP TYPE: FLUSH OR PROTRUSION (SPECIFY PROTRUSION LENGTH IN MM)

UNLESS OTHERWISE SPECIFIED, THE FOLLOWING SPECIFICATIONS SHALL BE CONSIDERED STANDARD

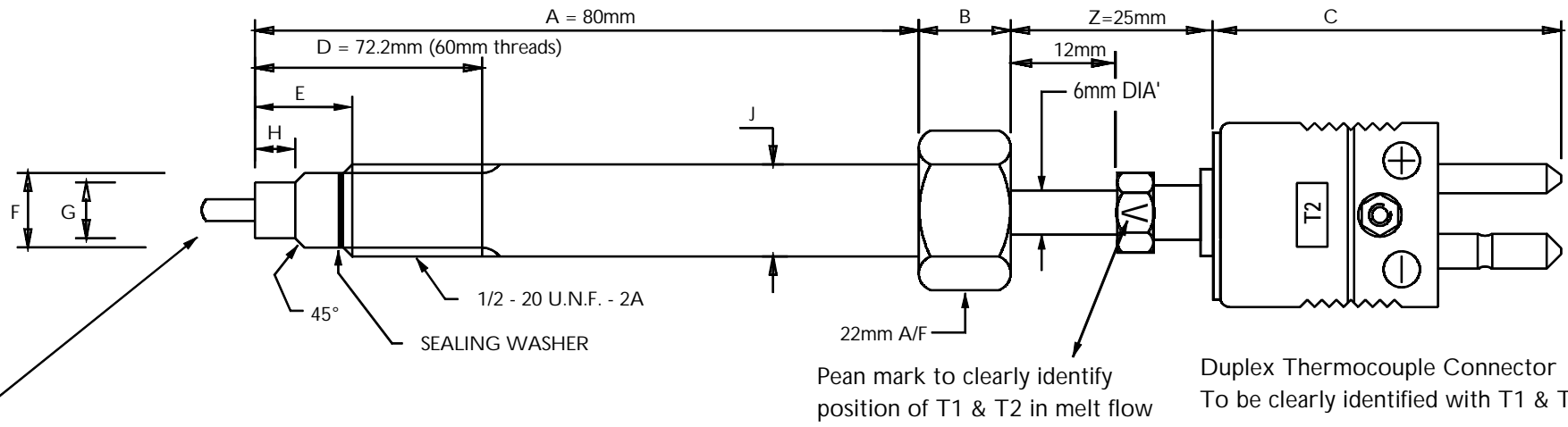
1. SHEATH & BOLT MATERIAL: 303 STAINLESS STEEL
2. JUNCTION: GROUNDED
3. INSULATION: MgO
4. THERMOCOUPLE CONDUCTORS: STANDARD GRADE
5. THERMAL BARRIER: MACOR (MACOR IS A REGISTERED TRADEMARK OF CORNING INC.)

**Terwin Instruments Limited**

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 Orston Lane  
 BOTTESFORD  
 Nottinghamshire  
 NG13 0AU  
 Tel. +44 (0) 1949 84 2000  
 Fax. +44 (0) 1949 84 2004

DRAWN	P.S.	DRG. NO.	CAD REF.	MATERIAL:
DATE	30.12.96	MCD/TC/0004	TI283	BOLT - 303 STAINLESS STEEL
CHECKED	T.W.	TITLE	TOLERANCES:	
APPROVED	T.W.	EXTRUDER THERMOCOUPLE WITH MACOR THERMAL BARRIER	±0.1 U.O.S. +1 / -0 Degrees	

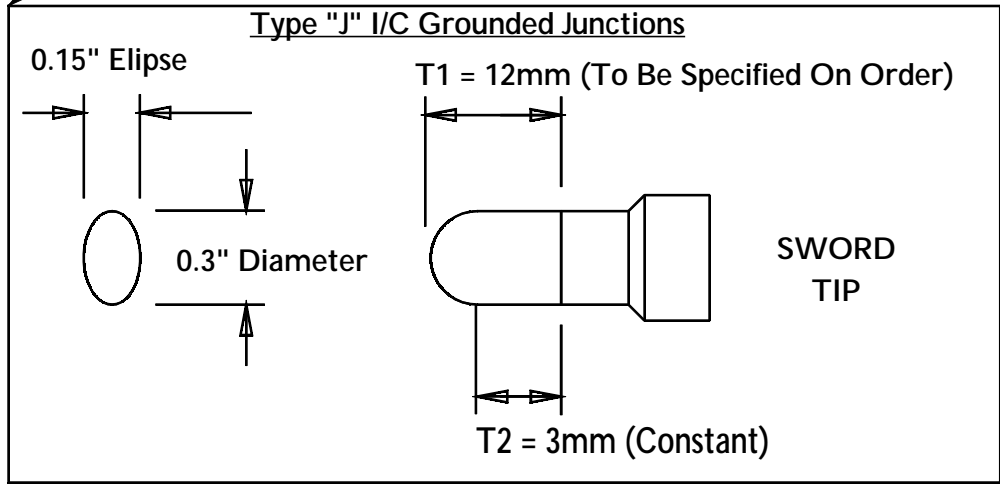
ISS	DATE	DESCRIPTION	APP'D
B	22.09.98	F & G DIMS CORRECTED	GW
A	30.12.96	1st Issue	GW



Pean mark to clearly identify position of T1 & T2 in melt flow

Duplex Thermocouple Connector  
 To be clearly identified with T1 & T2.

IMPORTANT NOTE:  
 Please note position of T2 (above) and polarity of plug pins.



**Production Test:**  
 Each unit to be pressure tested at 10,000psi.

DIMENSIONS	
A =	80.0mm
B =	12.7 (1/2")
C =	63.5 (2.5")
D =	72.2mm
E =	12.20 (0.48)
F =	10.49±0.03 (0.413±0.001)
G =	7.77±0.03 (0.306±0.001)
H =	5.54±0.12 (0.218±0.005)
J =	12.7 DIA' (0.50)

**Terwin Instruments Limited**

Tollemache Road,  
 Spittlegate Level Industrial Estate,  
 Grantham,  
 Lincolnshire.  
 NG31 7UH  
 Tel. +44 (0) 1476 565797  
 Fax. +44 (0) 1476 590139

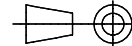
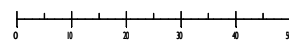
DRAWN	G.W.	DRG. NO.	MCD/TC/0292
DATE	27.10.99		
CHECKED	M.F.	TITLE	Cryovac Sealed Air (New Zealand) EXTRUSION THERMOCOUPLE
APPROVED	B Cleland		

CAD REF.	MATERIAL:
Ti292	BOLT - 316 STAINLESS STEEL
TOLERANCES:	±0.1 U.O.S. +1 / -0 Degree

(B)	1 May 2001	Duplex plug mounted incorrectly	B Cleland
ISS	DATE	DESCRIPTION	APP'D

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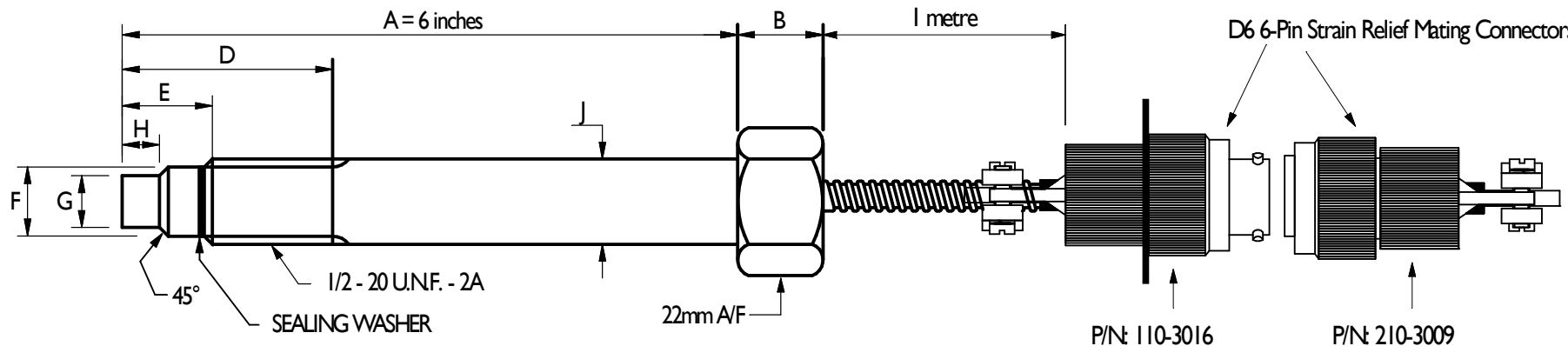


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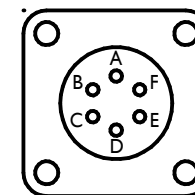
U.S.O.

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PT 100 3-wire - Wiring:  
Red 1 of 2 = A  
Red 2 of 2 = B  
White 1 of 1 = D



**DIMENSIONS**

A = 6 inches
B = 12.7 (1/2")
C = 63.5 (2.5")
D = 31.30 (1.23)
E = 12.20 (0.48)
F = 10.49±0.03 (0.413±0.001)
G = 7.77±0.03 (0.306±0.001)
H = 5.54±0.12 (0.218±0.005)
J = 12.7 DIA' (0.50)



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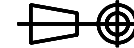
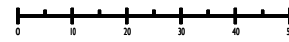
DRAWN	G.V.V.	DRG. NO.	MCD/TC/0002 - JLS PT100 3-wire
DATE	30.1.2008	CAD REF.	JLS-USA (b)
CHECKED	B.P.	TITLE	TERWIN EXTRUSION 3-wire PT100
APPROVED	T.V.V.	MATERIAL:	BOLT - 316 STAINLESS STEEL

TOLERANCES:	±0.1 U.O.S. +1 / -0 Degree
-------------	-------------------------------

ISS	DATE	DESCRIPTION	APPD
B	30.01.08	Production approved	GW
A	24.09.07	1st Issue	GW

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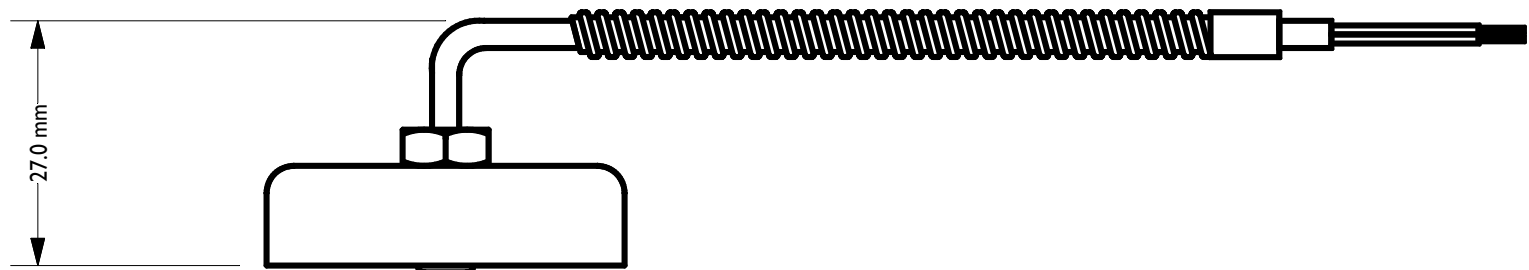


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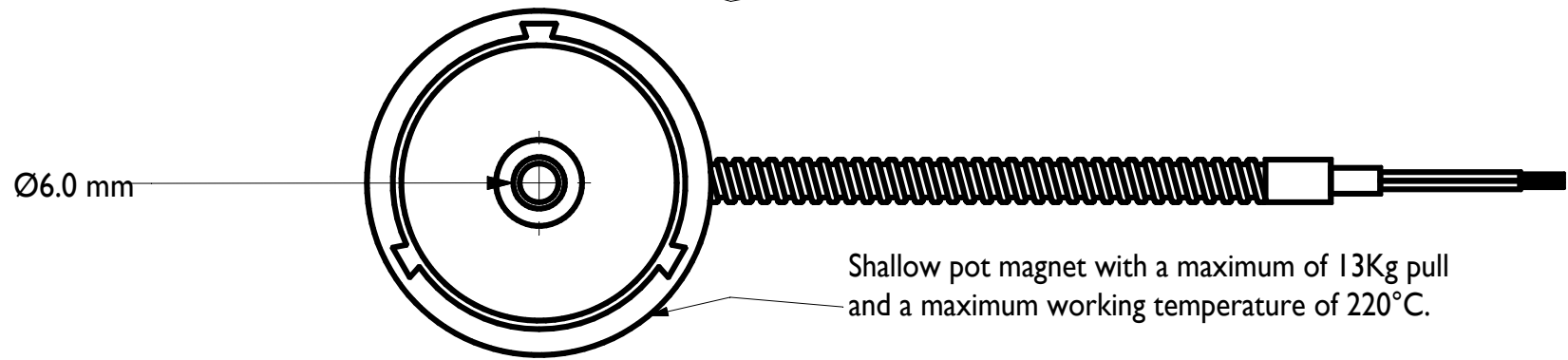
SCALE 1:1

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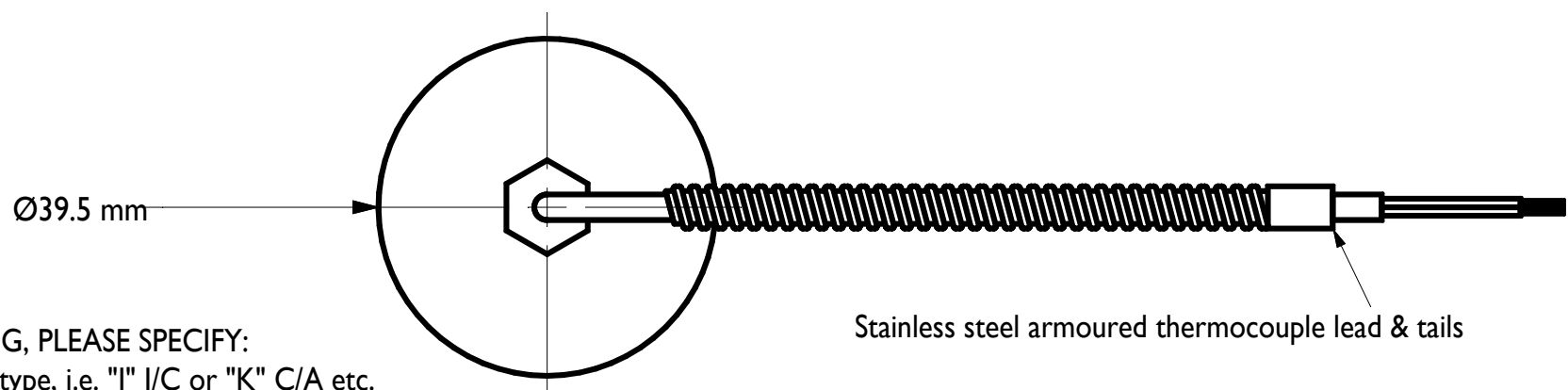
27.0 mm

Spring loaded junction (Grounded only)



Ø6.0 mm

Shallow pot magnet with a maximum of 13Kg pull and a maximum working temperature of 220°C.



Ø39.5 mm

Stainless steel armoured thermocouple lead & tails

WHEN ORDERING, PLEASE SPECIFY:

- a) Thermocouple type, i.e. "J" I/C or "K" C/A etc.
- b) Lead length.

<b>Terwin Instruments Limited</b>	Winterbeck Industrial Estate Orston Lane BOTTFESFORD Nottinghamshire NG13 0AU Tel: +44 (0) 1949 84 2000 Fax: +44 (0) 1949 84 2004	DRAWN	G.W.	DRG. NO.	CAD REF.	MATERIAL:				
		DATE	8.11.2000	MCD/TC/0006 (A)	MAG-TC					
		CHECKED	R.W.	TITLE	TERWIN MAGNETIC THERMOCOUPLE SALES AID DRAWING		TOLERANCES:			
		APPROVED	M.F.							
							A	09.11.00	1ST ISSUE	G.W.
							ISS	DATE	DESCRIPTION	APP'D

# Thermocouples TC GP FL



The GP FL Series of Thermocouples comprises of a range of high quality low cost general purpose probes.

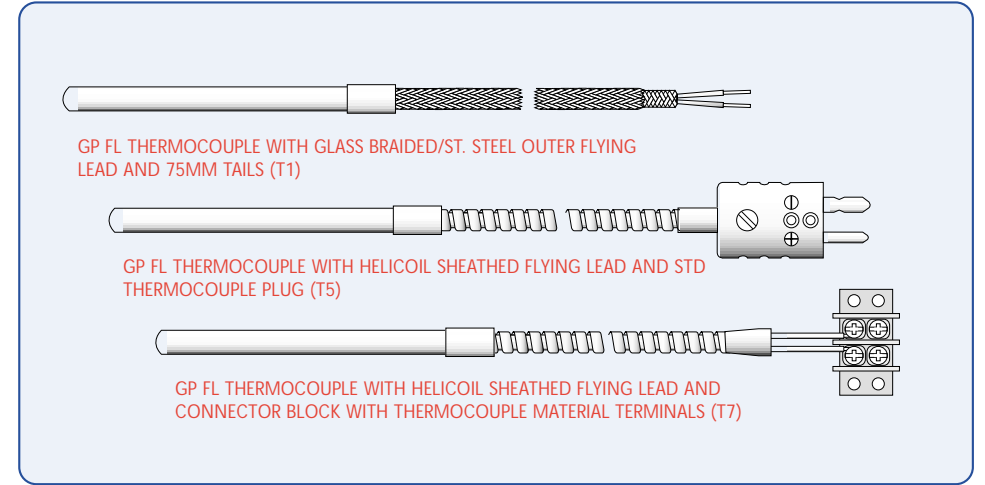
Sheaths are manufactured in 316 stainless steel in a choice of sizes, connected to various types of flying leads.

Having a maximum tip temperature of 400°C they are suitable for many applications.

A wide variety of installation fittings is available along with a choice of wire terminations.

The sheaths are available in 3mm, 4.5mm or 6mm diameters.

*These thermocouples are supplied, as standard, to Thermocouple Tolerance Class 1 for greater accuracy.*



CALIBRATION TYPE	
K	
J	
T	

JUNCTION TYPE	
Type	Code
Insulated	I
Grounded	G

*Grounded junctions have a silver soldered tip*

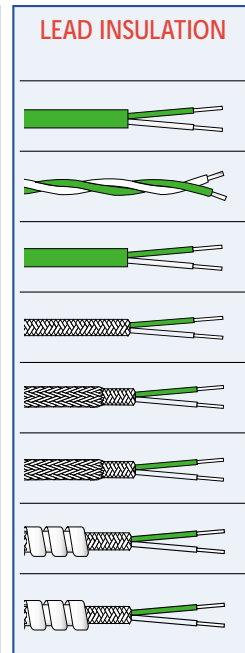
SHEATH DIAMETER	
Size	Code
3.0mm	30
4.5mm	45
6.0mm	60

SHEATH LENGTH	
Size	Code
50mm	050
100mm	100
200mm	200
250mm	250
300mm	300
400mm	400

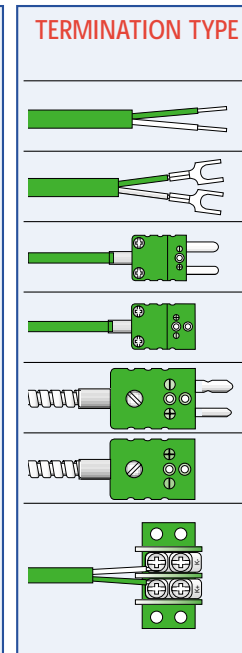
LEAD LENGTH	
Length	Code
250mm	0250
500mm	0500
1.0mtr	1000
1.5mtr	1500
2.0mtr	2000
3.0mtr	3000
4.0mtr	4000
5.0mtr	5000

**ORDER CODE**  
TC GP FL - J - D - - SL - - - LL - - - LI - - T - - F - -

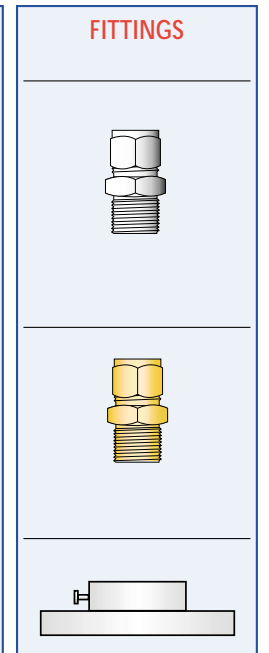
LEAD INSULATION		
	Max. Temp	Code
PVC leads/PVC Outer	100°C	L1
Teflon Twisted	260°C	L2
Teflon leads/Teflon outer	260°C	L3
Flat Twin		
Glass Braided	400°C	L4
Glass braided/ tin copper braid outer	400°C	L5
Glass braided/ st/st braid outer	400°C	L6
Glass braided/ Galv helicoil outer	400°C	L7
Glass braided/ St/St helicoil outer	400°C	L8



TERMINATION TYPE	
	Code
75mm tails	T1
T/C spade terminals	T2
Miniature T/C plug	T3
Miniature T/C socket	T4
Std T/C plug	T5
Std T/C socket	T6
T/C connector block (with thermocouple material terminals)	T7



FITTINGS		
Size		Code
No fitting		F0
1/8" BSPT	St/St	F1
1/8" BSP	St/St	F2
1/4" BSPT	St/St	F3
1/4" BSP	St/St	F4
1/2" BSPT	St/St	F5
1/2" BSP	St/St	F6
No fitting		F0
1/8" BSPT	Brass	F7
1/8" BSP	Brass	F8
1/4" BSPT	Brass	F9
1/4" BSP	Brass	F10
1/2" BSPT	Brass	F11
1/2" BSP	Brass	F12
Flange 50mm dia	St/St	F13
Flange 50mm dia	Aluminium	F14



*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

*Colours of Leads and Terminations are for Type K Calibration, colours will change according to Calibration.*

Flange fixing holes  
3x4mm on 40 mm PCD

# Thermocouples TC IM SR

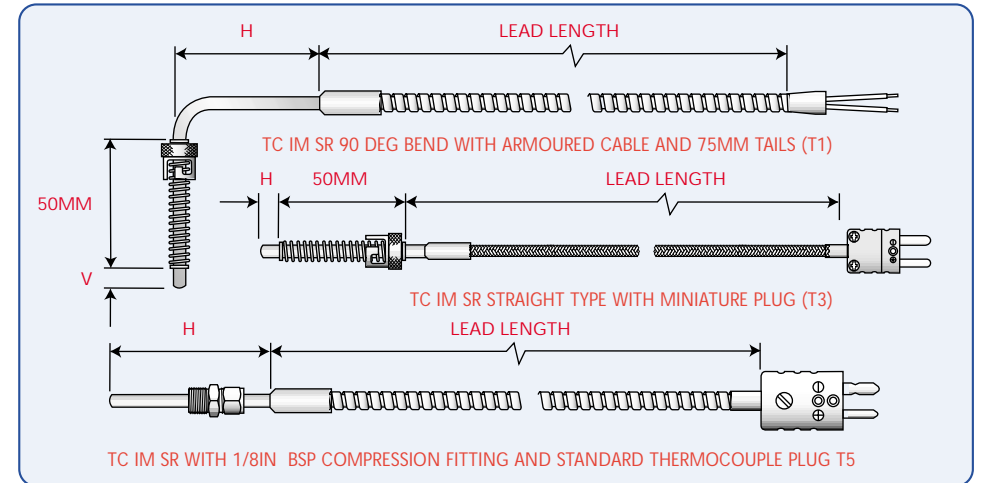


The TC IM SR Range of Thermocouples is designed primarily for use in plastics machinery although they are suitable for many temperature measuring applications. They are commonly used in Injection Moulding Machines, Plastic Extruders and Moulding Tools etc.

The thermocouples are ruggedly constructed having a stainless steel sheath housing multi-stranded glass insulated thermocouple wire. The flexible extension is protected by a choice of insulation and covering. All thermocouples are coded by coloured tails to identify the calibration of the element. (IEC colour coded.) Double (DUPLEX) elements are available.

The standard probe diameter is 4.76mm (3/16"), 3.2mm (1/8"), 4.5 & 3.0mm diameters are offered as alternatives. Maximum operating temperature for the standard range is 400°C although higher ranges are made to order.

*These Thermocouples are all supplied, as standard, to Thermocouple Tolerance Class 1 for greater accuracy.*



## ORDER CODE

TC IM SR - E - J - D - B - H - V - B - LL - LI - T - F

*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

CALIBRATION TYPE	
K	
J	
T	

ELEMENTS	
Type	Code
Single	S
Duplex	D

JUNCTION TYPE	
Type	Code
Insulated	I
Grounded	G

*Grounded junctions have a silver soldered tip*

SHEATH DIAMETER	
Size	Code
3.00mm	30
3.2mm (1/8")	32
4.50mm	45
4.76mm (3/16")	48

SHEATH STYLE	
Description	Code
90° Bend	Y
Straight Sheath	N

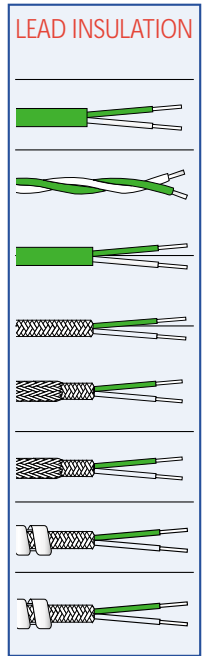
HORIZONTAL SHEATH LENGTH	
Insert dimension in mm	
Example	Code
5mm	005
50mm	050
500mm	500

VERTICAL SHEATH LENGTH	
Insert dimension in mm	
Example	Code
8mm	008
80mm	080
800mm	800
Only applicable to 90° bent probes, if sheath is straight with no vertical dimension insert	
	XXX

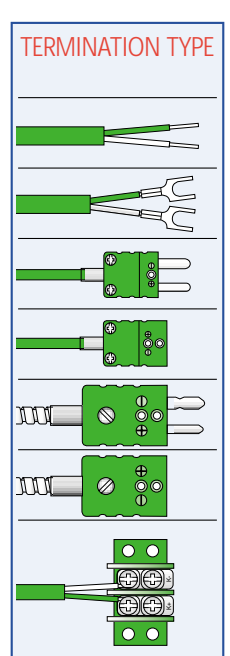
BAYONET FITTING	
Description	Code
With Bayonet assembly	Y
Without Bayonet assembly	N
Standard Bayonet Cap I/D 11.5mm. Please note Bayonet assembly (cap & spring) is 50mm long. H & V dimensions are additional lengths.	

LEAD LENGTH	
Length	Code
250mm	0250
500mm	0500
1.0mtr	1000
1.5mtr	1500
2.0mtr	2000
3.0mtr	3000
4.0mtr	4000
5.0mtr	5000

LEAD INSULATION		
	Max. Temp	Code
PVC leads/PVC Outer	100°C	L1
Teflon Twisted	260°C	L2
Teflon leads/Teflon outer	260°C	L3
Glass Braided	400°C	L4
Glass braided/ tin copper braid outer	400°C	L5
Glass braided/ St/St braid outer	400°C	L6
Glass braided/ Galv helicoil outer	400°C	L7
Glass braided/ St/St helicoil outer	400°C	L8

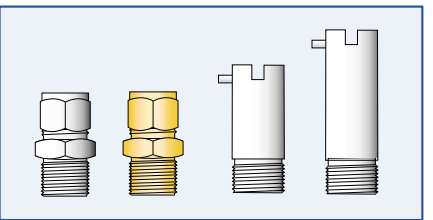


TERMINATION TYPE	
75mm tails	T1
T/C spade terminals	T2
Miniature T/C plug	T3
Miniature T/C socket	T4
Std T/C plug	T5
Std T/C socket	T6
T/C connector block (with thermocouple material terminals)	T7



COMPRESSION FITTINGS		
Size/Code	St/St	Brass
No fitting	F0	F0
1/8" BSPT	F1	F7
1/8" BSP	F2	F8
1/4" BSPT	F3	F9
1/4" BSP	F4	F10

BAYONET ADAPTORS				
STYLE 1				
Thread	O/D	No of Pegs	Length	Code
1/8" BSP	11mm	1 Peg	24mm	B1
1/8" BSP	11mm	1 Peg	35mm	B2



*Colours of Leads and Terminations are for Type K Calibration, colours will change according to Calibration.*



# Thermocouples TC IM WB



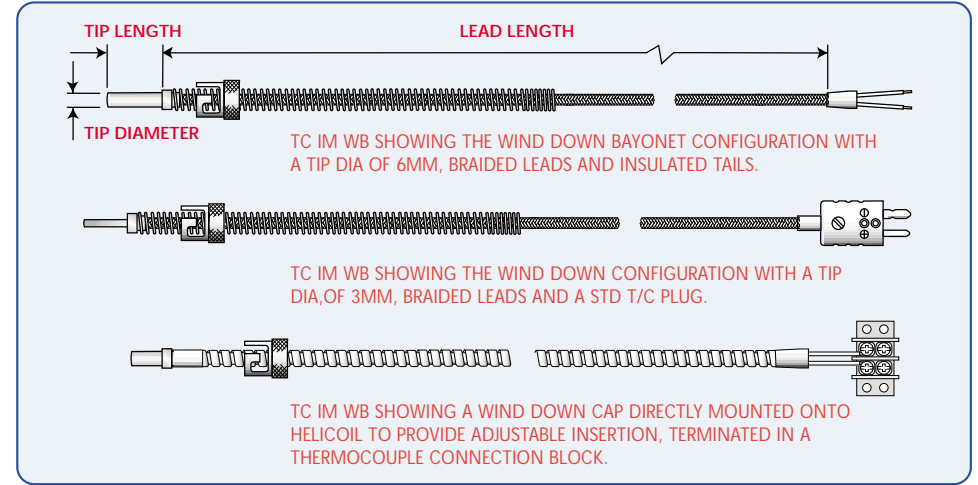
The TC IM WB Series of Thermocouples comprises of a range of probes with adjustable bayonet fittings.

The insertion length of the probe is variable by means of a Bayonet Cap that can be wound along a compression spring to give fine adjustment over a large immersion range.

They are available with a choice of lead insulation and termination as shown in the order code below.

In addition to being specified in many new applications the very wide range of bayonet caps available means it is often possible to retro fit these probes into existing machines, primarily in the Plastics Industry. A range of bayonet adaptors is also available.

*The thermocouple element/cable are supplied, as standard, to Thermocouple Tolerance Class 1 for greater accuracy.*



## CALIBRATION TYPE

K
J
T

## JUNCTION TYPE

Type	Code
Insulated	I
Grounded	G

*Grounded junctions have a silver soldered tip*

## TIP DIAMETER

Size	Code
3.00mm	30
4.50mm	45
4.80mm	48
6.00mm	60

## TIP LENGTH

Example	Code
5mm	05
10mm	10
12mm	12
etc.	

### BAYONET CAP

Description	Code
Single slot 10mm ID	BC01
Double slot 10mm ID	BC02
Single slot 11.5mm ID	BC03
Double slot 12.5mm ID	BC04
Double slot 15mm ID	BC05
Single slot 11.5mm ID	BC06
Double slot 15mm ID	BC07
Double slot 14mm ID	BC08
Double slot 16mm ID	BC09
Double slot 17mm ID	BC10
2 Peg 10mm OD	BC11
2 Peg 12mm OD	BC12

*BC06/BC07 are wound onto the helicoil outer*

*The order code information above is shown as a guide to specifying the probe.*

*Please contact our sales office if any features that you require are not shown.*

## ORDER CODE

TC IM WB - J - D -- TL -- B --- SL --- LL ---- LI -- T --

### SPRING LENGTH

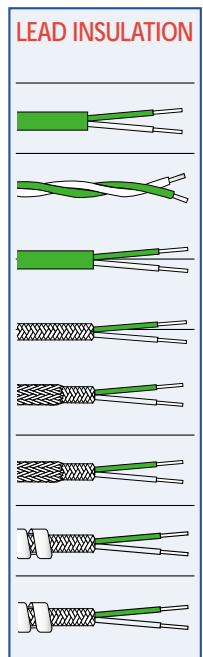
Length	Code
100mm	100
150mm	150
180mm	180
300mm	300

### LEAD LENGTH

Length	Code
250mm	0250
500mm	0500
1.0mtr	1000
1.5mtr	1500
2.0mtr	2000
3.0mtr	3000
4.0mtr	4000
5.0mtr	5000

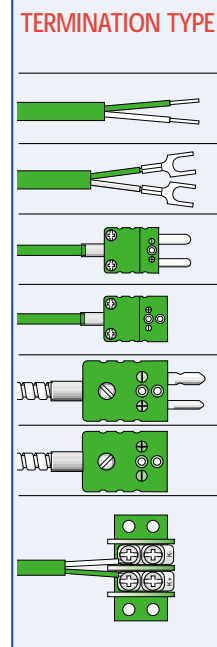
### LEAD INSULATION

	Max. Temp	Code
PVC leads/PVC Outer	100°C	L1
Teflon Twisted	260°C	L2
Teflon leads/Teflon outer	260°C	L3
Glass Braided	400°C	L4
Glass braided/ tin copper braid outer	400°C	L5
Glass braided/ St/St braid outer	400°C	L6
Glass braided/ Galv helicoil outer	400°C	L7
Glass braided/ St/Steel helicoil outer	400°C	L8



### TERMINATION TYPE

	Code
75mm tails	T1
T/C spade terminals	T2
Miniature T/C plug	T3
Miniature T/C socket	T4
Std T/C plug	T5
Std T/C socket	T6
T/C connector block (with thermocouple material terminals)	T7



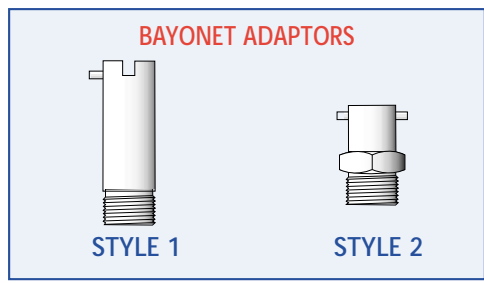
## BAYONET ADAPTORS

### STYLE 1

Thread	O/D	No of Pegs/Slots	Length	Code
1/8" BSP	11mm	1 Peg	24mm	B1
1/8" BSP	11mm	1 Peg	35mm	B2
1/8" BSP	11mm	1 Peg	48mm	B3
1/8" BSP	11mm	1 Peg	22mm	B4
1/8" BSPT	11mm	2 Pegs	22mm	B5
1/8" BSPT	11mm	1 Peg	35mm	B6
1/8" BSPT	11mm	1 Peg	22mm	B7
1/8" BSPT	11mm	2 Pegs	70mm	B8
1/8" NPT	11mm	1 Peg	22mm	B9
M10x1	11mm	2 Pegs	22mm	B10

### STYLE 2

M12x1.5	12mm	2 Pegs	50mm	B11
M14x1.5	14mm	2 Slots	50mm	B12
M14x1.5	14mm	2 Slots	60mm	B13
M14x1.5	14mm	2 Pegs	50mm	B14
M14x1.5	14mm	2 Pegs	60mm	B15



*The range of bayonet caps & adaptors are from our standard range - others can be manufactured to your requirements. Colours of Leads and Terminations are for Type K Calibration, colours will change according to Calibration.*

# Thermocouples TC MI FL



The TC MI FL Series of Mineral Insulated Thermocouples comprises of a range of high quality multi purpose probes. Sheaths are manufactured in ductile sheath material in a choice of sizes and are connected to various types of flying leads. Having a maximum temperature of 1250°C they are suitable for many applications. An indication of suitable applications is given below.

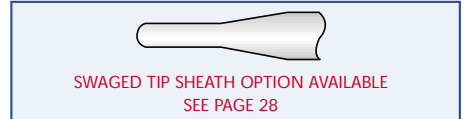
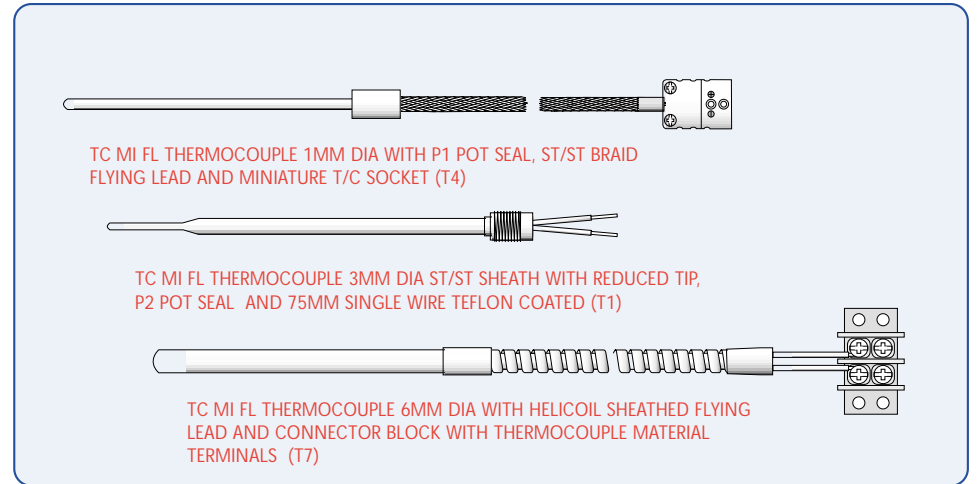
316 stainless steel - Excellent corrosion resistance often specified for food and medical applications.

321 stainless steel - Good corrosion resistance and high ductility. Widely used in industry.

310 stainless steel - Good corrosion resistance at high temperatures and recommended for use in sulphurous atmospheres.

600 Inconel alloy - Good resistance to oxidation and extremely corrosive atmospheres at high temperature. Not recommended for use in sulphurous atmospheres.

Nicrobell - Recommended for use with type N conductors. Nicrobell is a Ni/Ch/Si alloy that is suitable for use in reducing, oxidising and vacuum atmospheres.



The order code information below is shown as a guide to specifying the probe.  
Please contact our sales office if any features that you require are not shown.

CALIBRATION TYPE	
K	
N	
J	
T	

**ORDER CODE**  
TC MI FL - J - D -- SL ---- SM --- P -- LL ---- LI --- T -- F --

JUNCTION TYPE	
Type	Code
Insulated	I
Grounded	G

SHEATH LENGTH	
Size	Code
50mm	0050
75mm	0075
100mm	0100
200mm	0200
250mm	0250
300mm	0300
400mm	0400
500mm	0500
750mm	0750
1mtr	1000
2mtr	2000
3mtr	3000
5mtr	5000

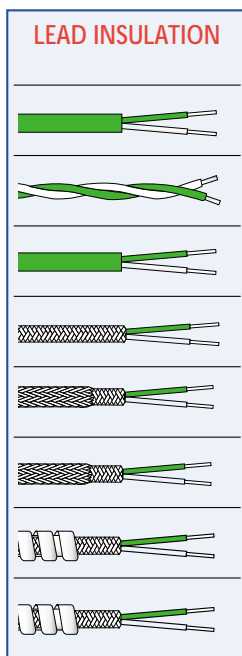
POT SEAL	
Type	Code
6.3mm x 25mm	P1
For sheaths up to 3.0mm	
8.0mm x 25mm	P2
With 8 x 1mm ISO thread	
for sheaths up to 3.0mm	
10.0mm x 25mm	P3
For sheaths 4.5 & 6mm dia	

LEAD LENGTH	
Length	Code
75mm	0075
250mm	0250
500mm	0500
1.0mtr	1000
1.5mtr	1500
2.0mtr	2000
3.0mtr	3000
4.0mtr	4000
5.0mtr	5000

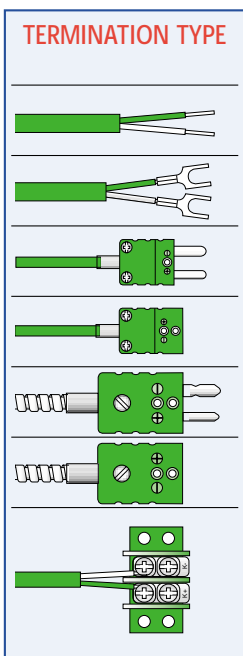
SHEATH DIAMETER	
Size	Code
1.0mm	10
1.5mm	15
2.0mm	20
3.0mm	30
4.5mm	45
6.0mm	60

SHEATH MATERIAL & TEMPERATURE		
Type	Max Temp °C	Code
316 St/St	800	316
321 St/St	800	321
310 St/St	1100	310
INC 600	1100	600
Nicrobell	1250	NBL

LEAD INSULATION		
	Max. Temp	Code
PVC leads/PVC Outer	100°C	L1
Teflon Twisted	260°C	L2
Teflon leads/Teflon outer	260°C	L3
Flat Twin		
Glass Braided	400°C	L4
Glass braided/ tin copper braid outer	400°C	L5
Glass braided/ St/St braid outer	400°C	L6
Glass braided/ Galv helicoil outer	400°C	L7
Glass braided/ St/Steel helicoil outer	400°C	L8



TERMINATION TYPE	
	Code
75mm tails	T1
T/C spade terminals	T2
Miniature T/C plug	T3
Miniature T/C socket	T4
Std T/C plug	T5
Std T/C socket	T6
T/C connector block (with thermocouple material terminals)	T7



FITTINGS		
Size/Code	St/St	Brass
No fitting	F0	F0
1/8" BSPT	F1	F7
1/8" BSP	F2	F8
1/4" BSPT	F3	F9
1/4" BSP	F4	F10
1/2" BSPT	F5	F11
1/2" BSP	F6	F12
 Compression Fittings		
Flange 50mm dia	F13	F14
 Aluminium		

*These sensors are supplied, as standard, to Thermocouple Class 1 providing greater accuracy. Colours of Leads and Terminations are for Type K Calibration, colours will change according to Calibration.*

Flange fixing holes 3x4mm on 40 mm PCD

# Thermocouples TC MI PS



The TC MI PS Series of Thermocouples consists of a range of Mineraally Insulated Thermocouples which are terminated directly onto either a plug or a socket that has contacts of thermocouple material. They are available in a range of sheath materials, a variety of sheath lengths and diameters.

Having a maximum temperature of 1250°C they are suitable for many applications. An indication of suitable applications is given below.

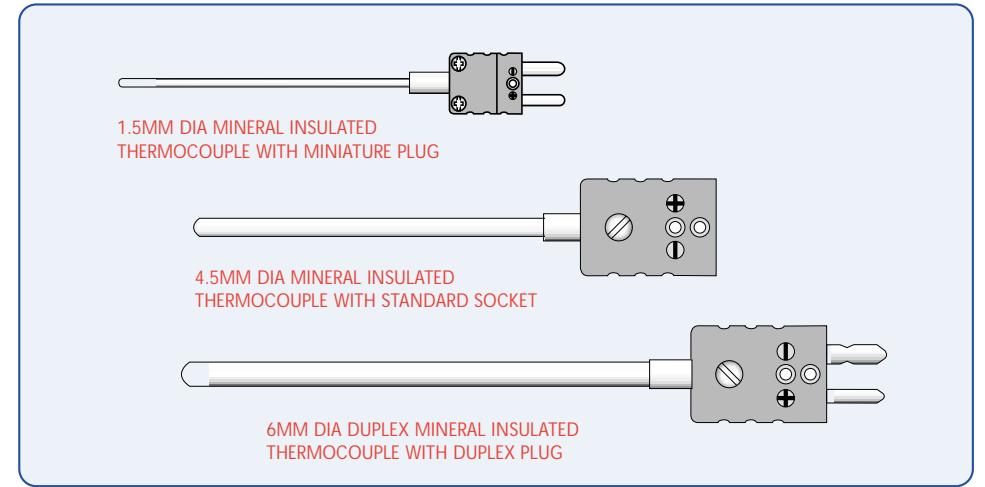
316 stainless steel - Excellent corrosion resistance often specified for food and medical applications.

321 stainless steel - Good corrosion resistance and high ductility. Widely used in industry.

310 stainless steel - Good corrosion resistance at high temperatures and recommended for use in sulphurous atmospheres.

600 Inconel alloy - Good resistance to oxidation and extremely corrosive atmospheres at high temperature. Not recommended for use in sulphurous atmospheres.

Nicrobell - Recommended for use with type N conductors. Nicrobell is a Ni/Ch/Si alloy that is suitable for use in reducing, oxidising and vacuum atmospheres.



All our thermocouples are supplied, as standard, to Class 1 tolerance for improved accuracy.

**ORDER CODE**  
TC MI PS - E - J - SM --- D -- SL ---- T --- F --

The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.

CALIBRATION TYPE	
K	
N	
J	
T	

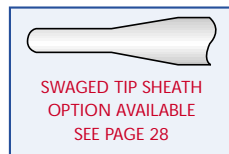
ELEMENTS	
Type	Code
Single	S
Duplex	D

JUNCTION TYPE	
Type	Code
Insulated	I
Grounded	G

SHEATH MATERIAL & TEMPERATURE		
Type	Code	Max Temp °C
316 St/St	316	800
321 St/St	321	800
310St/St	310	1100
INC 600	600	1100
Nicrobell	NBL	1250

SHEATH DIAMETER	
Size	Code
1.0mm	10
1.5mm	15
2.0mm	20
3.0mm	30
4.5mm	45
6.0mm	60

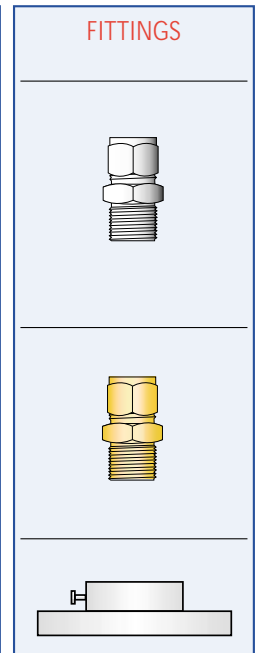
SHEATH LENGTH	
Size	Code
50mm	0050
75mm	0075
100mm	0100
200mm	0200
250mm	0250
300mm	0300
400mm	0400
500mm	0500
750mm	0750
1mtr	1000
2mtr	2000
3 mtr	3000
5 mtr	5000



TERMINATION TYPE & TEMPERATURE		
Type	Code	Max Temp °C
Mini T/C Plug	T01	200
Mini T/C Socket	T02	200
Mini T/C Plug High Temperature Plastic	T03	350
Mini T/C Socket High Temperature Plastic	T04	350
Mini T/C Plug Ceramic	T05	600
Mini T/C Socket Ceramic	T06	600
Std. T/C Plug	T07	200
Std. T/C Socket	T08	200
Std. T/C Plug High Temperature Plastic	T09	350
Std. T/C Socket High Temperature Plastic	T10	350
Std. T/C Plug Ceramic	T11	600
Std. T/C Socket Ceramic	T12	600

TERMINATION TYPE	

FITTINGS		
Size		Code
No fitting		F0
1/8" BSPT	St/St	F1
1/8" BSP	St/St	F2
1/4" BSPT	St/St	F3
1/4" BSP	St/St	F4
1/2" BSPT	St/St	F5
1/2" BSP	St/St	F6
No fitting		F0
1/8" BSPT	Brass	F7
1/8" BSP	Brass	F8
1/4" BSPT	Brass	F9
1/4" BSP	Brass	F10
1/2" BSPT	Brass	F11
1/2" BSP	Brass	F12
Flange 50mm dia	St/St	F13
Flange 50mm dia	Alum	F14



Flange fixing holes:  
3x4mm on 40 mm PCD

Duplex available for 3.0, 4.5 & 6mm sheaths

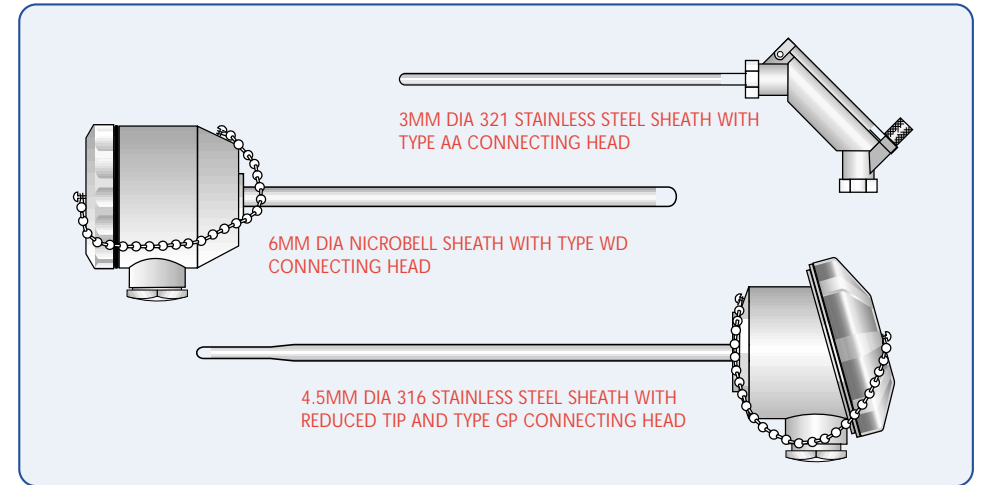
# Thermocouples TC MI CH

The TC MI CH Range of Thermocouples comprises a series of Mineral Insulated probes complete with terminal heads. A variety of connecting heads provide a convenient method of termination for connecting cables and offer a choice of styles, terminal access and cable entry.

An indication of suitable sheath materials/applications is given below.

- 316 Stainless Steel** Excellent corrosion resistance often specified for food and medical applications.
- 321 Stainless Steel** Good corrosion resistance and high ductility. Widely used in industry.
- 310 Stainless Steel** Good corrosion resistance at high temperatures and recommended for use in sulphurous atmospheres.
- 600 Inconel Alloy** Good resistance to oxidation and extremely corrosive atmospheres at high temperature. Not recommended for use in sulphurous atmospheres.
- Nicrobell** Recommended for use with type N conductors. Nicrobell is a Ni/Ch/Si alloy that is suitable for use in reducing, oxidising and vacuum atmospheres.

*These sensors are supplied, as standard, to Thermocouple Class 1 providing greater accuracy.*



*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

**ORDER CODE**  
TC MI CH - E - J - SM --- D -- SL --- CH -- F --

CALIBRATION TYPE	
K	
J	
T	
N	

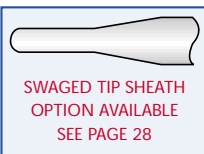
ELEMENTS	
Type	Code
Single	S
Duplex	D

JUNCTION TYPE	
Type	Code
Insulated	I
Grounded	G

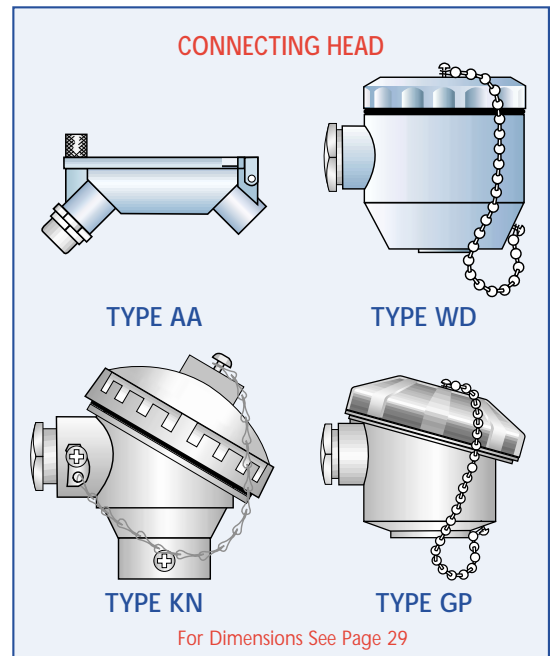
SHEATH MATERIAL & TEMPERATURE		
Type	Max Temp °C	Code
316 St/St	800	316
321 St/St	800	321
310 St/St	1100	310
INC 600	1100	600
Nicrobell	1250	NBI

SHEATH DIAMETER	
Size	Code
3.00mm	30
4.50mm	45
6.00mm	60
8.00mm	80

SHEATH LENGTH	
Size	Code
100mm	100
150mm	150
200mm	200
250mm	250
300mm	300
350mm	350
400mm	400
450mm	450
500mm	500



CONNECTING HEAD	
Description	Code
Angled Alloy Connecting Head with hinged lid. Sealed to IP54	AA
Die Cast Aluminium Connecting Head with screw on cap with 'O' Ring Seal Sealed to IP67.	WD
Die Cast Angled Screw Cap with 'O' Ring Seal. Sealed to IP67.	KN
Glass reinforced Polymer Terminal Head with compression seal & angled cap Sealed to IP68.	GP



*The connecting head houses a ceramic or moulded block with terminals of thermocouple material to maintain accuracy of sensor calibration.*

FITTINGS		
Size/Code	St/St	Brass
No fitting	F0	F0
1/8" BSPT	F1	F7
1/8" BSP	F2	F8
1/4" BSPT	F3	F9
1/4" BSP	F4	F10
1/2" BSPT	F5	F11
1/2" BSP	F6	F12
		Code
Flange 50mm dia		F13
Aluminium		F14

Flange fixing holes 3x4mm on 40 mm PCD



# Thermocouples TC HT CH

The Series TC HT CH comprises of a range of thermocouples designed for use at elevated temperatures.

The protection sheath is manufactured from ceramic material in a choice of either Aluminous Porcelain or Recrystallised Alumina.

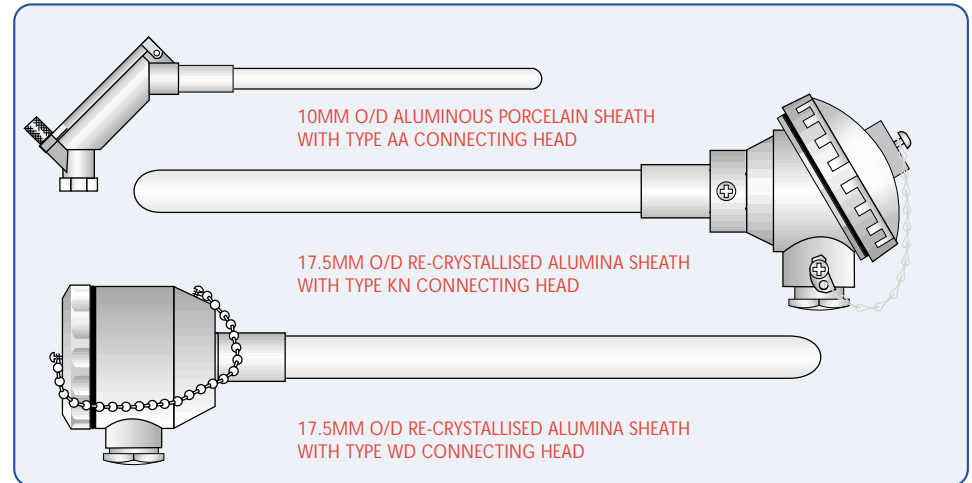
They have an Inconel extension piece 25mm or 75mm long to enable mounting fittings to be used.

Thermocouple elements type K N R & S are supplied as standard.

For use up to 1600°C they are used in a variety of applications from pottery kilns to large industrial furnaces.

Types WD & KN connecting heads house ceramic blocks with terminals of thermocouple material, (compensating for types R & S), to maintain accuracy of sensor calibration.

*These Thermocouples are all supplied, as standard, to Thermocouple Tolerance Class 1 for greater accuracy.*



**ORDER CODE**  
TC HT CH - E - SS - - - - SL - - - - EX - - CH - - F - -

*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

**CALIBRATION TYPE**

Type/Code	Max Temp
K	1150
N	1250
R	1600
S	1500

**SHEATH LENGTH**

Size	Code
200mm	0200
250mm	0250
300mm	0300
350mm	0350
400mm	0400
500mm	0500
600mm	0600
700mm	0700
1000mm	1000

**EXTENSION PIECE**

Length	Code
25mm	25
75mm	75

**ELEMENTS**

Type	Code
Single	S
Duplex	D

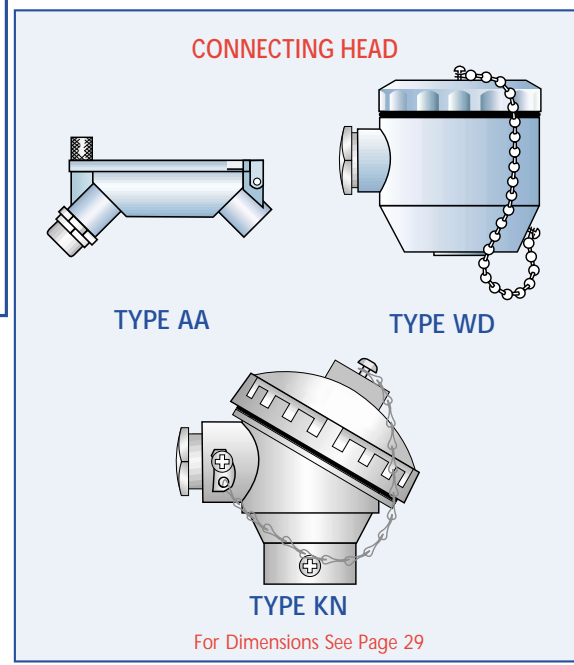
**CONNECTING HEAD**

Description	Code
Angled Alloy Connecting Head with hinged lid (10mm dia sheaths) IP54	AA
Die Cast Aluminium Connecting Head with screw on cap with 'O' Ring Seal (all dia sheaths) IP67	WD
Die Cast Angled Screw Cap with 'O' Ring Seal (all dia sheaths) IP67	KN

**SHEATH SPECIFICATION & TEMPERATURE**

Type	Max Temp °C	Code
Aluminous Porcelain 10mm dia	1400	AP10
Aluminous Porcelain 17.5mm dia	1400	AP20
Recrystallised Alumina 10mm dia	1600	RA10
Recrystallised Alumina 17.5mm dia	1600	RA20

*Some applications may require a double protection sheath (inner & outer)*



**FITTINGS**

Size/Code	Code
No fitting	F0
3/4" BSPT Compression (10mm sheaths only)	F1
For clamping on extension piece	
Flange 50mm dia (10mm sheaths only)	F2
Flange 115mm dia	F3

Flange fixing holes:  
3x4mm on 40 mm PCD - F2  
3x11.5mm on 80mm PCD - F3

# Thermocouples TC HD CH

The TC HD CH Range of Thermocouples comprise of a series of Heavy Duty Probes. The sheath diameter and material can be chosen to give optimum life and performance.

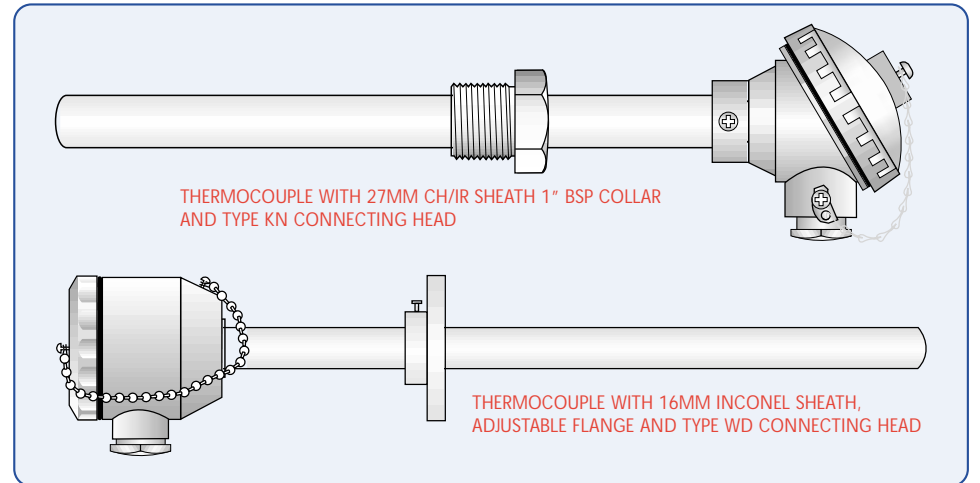
The construction is of heavy gauge thermocouple wire with ceramic insulation.

The hot junction is isolated and termination is made via a robust industrial connecting head.

A choice of protective sheaths along with a guide to suitable applications is given below.

The connecting head houses a ceramic block with types WD and KN having terminals of thermocouple material to maintain accuracy of sensor calibration.

*These Thermocouples are all supplied, as standard, to Thermocouple Tolerance Class 1 for greater accuracy.*



**ORDER CODE**  
TC HD CH - E - SS - SL ---- CH -- F --

*The order code information below is shown as a guide to specifying the probe.  
Please contact our sales office if any features that you require are not shown.*

CALIBRATION TYPE	
Type	Max Temp
K	1150
J	750
N	1250
R	1600
S	1500

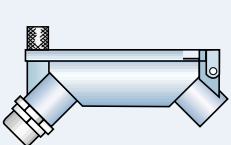
ELEMENTS	
Type	Code
Single	S
Duplex	D

SHEATH SPECIFICATION & TEMPERATURE			
Type	Max Temp °C	Code	
<b>16mm Stainless Steel 316</b> Excellent corrosion resistance up to the maximum operating temperature	800°C	1	
<b>16mm Inconel 600</b> Very good corrosion resistance up to maximum operating temperatures. Not recommended for Sulphur bearing atmospheres.	1100°C	2	
<b>26mm Inconel 600</b> Very good corrosion resistance up to maximum operating temperatures. Thick wall provides extended service life. Not recommended for use in sulphur bearing atmospheres.	1100°C	3	
<b>27mm CH/IB446</b> Chromium Iron composition. Excellent corrosion resistance up to maximum operating temperatures. Suitable for use in Sulphur bearing atmospheres.	1150°C	4	
<b>26mm Kanthal APM</b> Extremely versatile sheath which has a very high maximum temperature when compared to other metallic sheaths. High resistance to sulphur bearing atmospheres and rapid response time. Excellent service life in harsh conditions (Lengths available 400,500,600,750 & 1000mm)	1400°C	5	
<b>25.5mm Microbell C</b> Especially recommended for use with Type N conductors but can be used with all calibrations. Suitable for oxidising and reducing atmospheres. Not recommended for sulphur bearing atmospheres.	1250°C	6	

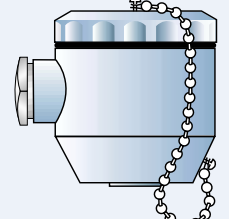
SHEATH LENGTH	
Size	Code
200mm	0200
250mm	0250
300mm	0300
350mm	0350
400mm	0400
500mm	0500
600mm	0600
700mm	0700
750mm	0750
800mm	0800
900mm	0900
1000mm	1000
1200mm	1200
1500mm	1500

*Most of the above listed sheath lengths are stock items - please contact our Sales office for availability of other lengths.*

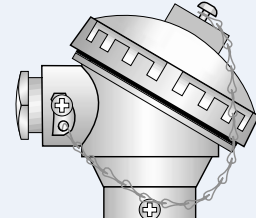
**CONNECTING HEAD**



**TYPE AA**



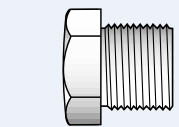
**TYPE WD**



**TYPE KN**

For Dimensions See Page 29

CONNECTING HEAD	
Description	Code
Angled Alloy Connecting Head with hinged lid (16mm dia sheaths) IP54	AA
Die Cast Aluminium Connecting Head with screw on cap with 'O' Ring Seal (all dia sheaths) IP67	WD
Die Cast Angled Screw Cap with 'O' Ring Seal (all dia sheaths) IP67	KN

FITTINGS	
Description	Code
No fitting	F0
1" BSP Welded Collar (State Position - not available for Kanthal Sheaths)	F1
 115mm dia Adjustable Flange	F3

Flange fixing holes: 3x11.5mm on 80mm PCD - F3



# Thermocouples TC MM CH

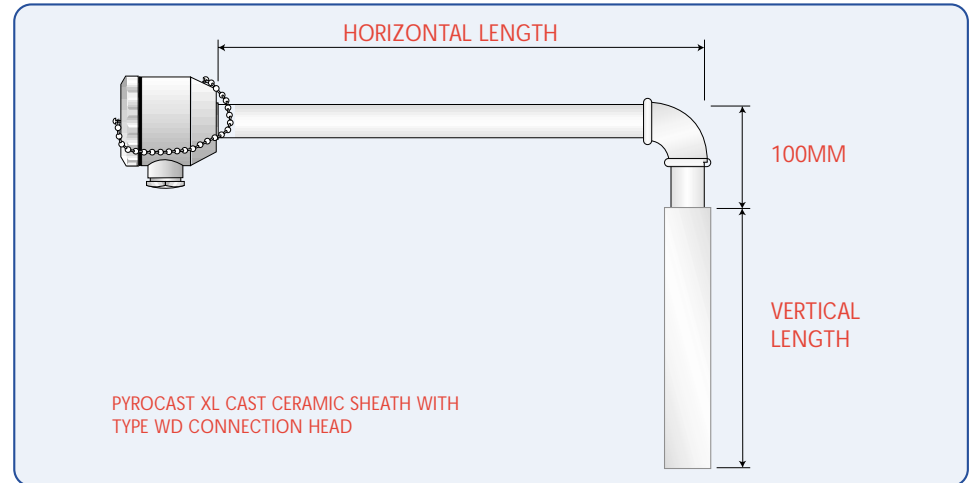
The TC MM CH Series of Thermocouples is used in the metal casting industry to monitor the temperature of molten metal.

They are configured to be immersed into the melt and have a 25mm O/D horizontal extension of mild steel to provide a terminal connection which operates at an acceptable temperature.

The thermocouple element is isolated from the sheath and the ceramic protection sheaths are replaceable.

The connecting head houses a ceramic block with terminals of thermocouple material to maintain accuracy of sensor calibration.

*These Thermocouples are all supplied, as standard, to Thermocouple Tolerance Class 1 for greater accuracy.*



**ORDER CODE**  
TC MM CH - E - H - - - - SS - - - VL - - - - CH - -

*The order code information below is shown as a guide to specifying the probe.*

*Please contact our sales office if any features that you require are not shown.*

CALIBRATION TYPE	
Type	Max Temp.
K	1150
J	900

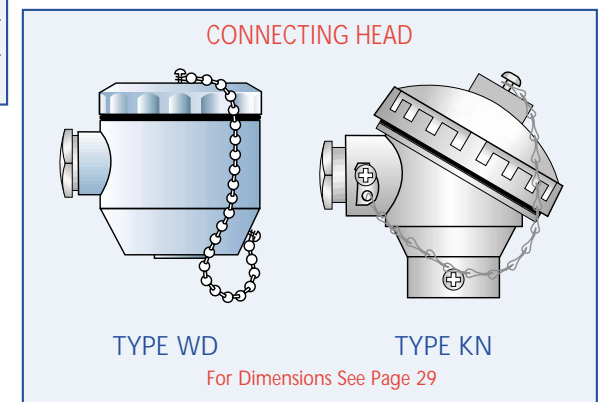
ELEMENTS	
Type	Code
Single	S
Duplex	D

HORIZONTAL LENGTH	
Size	Code
300mm	0300
400mm	0400
500mm	0500
600mm	0600
750mm	0750
1000mm	1000

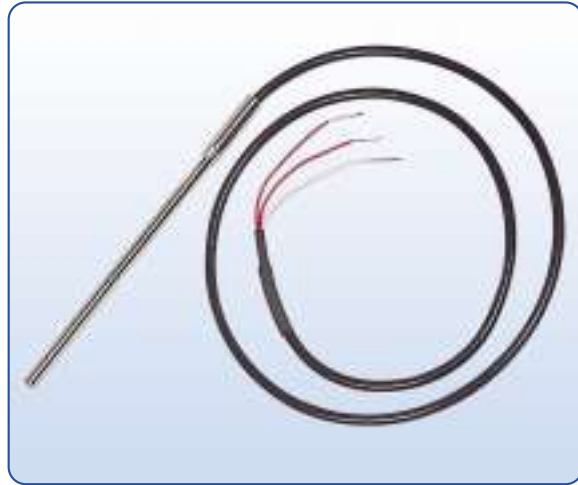
SHEATH SPECIFICATION	
Description	Code
Ceramic Coated Cast Iron 42mm dia.robust construction with thick wall for optimum life. Suitable for molten metal such as Zinc, Mazak etc. (Not recommended for use in molten Aluminium)	CCI
Pyrocast XL Cast Ceramic Sheath for molten metals. It is particularly suitable for use in molten Aluminium as the cast ceramic material is inert to molten Aluminium and its alloys. This sheath combines high strength with excellent thermal shock resistance.	PXL

VERTICAL LENGTH	
Size	Code
300mm	0300
450mm	0450
600mm	0600
915mm	0915
CCI SHEATHS ONLY	
1070mm	1070
1200mm	1200

CONNECTING HEAD	
Description	Code
Die Cast Aluminium Connecting Head with Screw On cap with 'O' Ring Seal IP67	WD
Die Cast Angled Screw Cap with 'O' Ring Seal IP67	KN



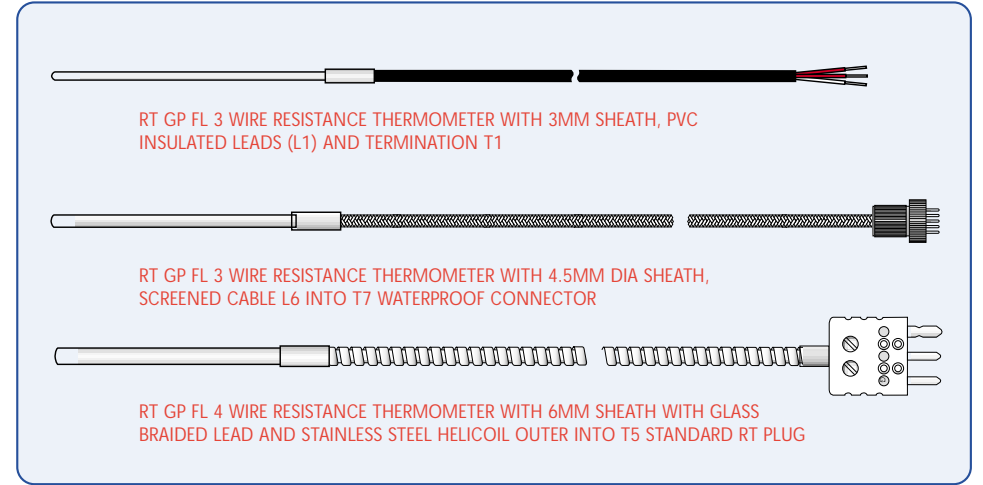
# Resistance Thermometers RT GP FL



The RT GP FL Series of Resistance Thermometers comprise of a range of PT 100 probes. Having a maximum tip temperature of 400°C they are suitable for many applications. The connecting wire insulation and termination options are given below.

The wires are colour coded as per BS EN60751 - IEC 751. Calibration and accuracy also conforms to the above standard.

*Please note all of our Platinum Resistance Thermometers sensors are supplied to Class A tolerance for improved accuracy.*

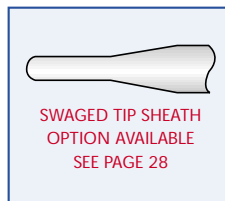


**ORDER CODE**  
RT GP FL - SD -- SL --- LL ---- LI -- T -- F --

*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

CONFIGURATION TYPE	
Description	Code
2 Wire	2
3 Wire	3
4 Wire	4

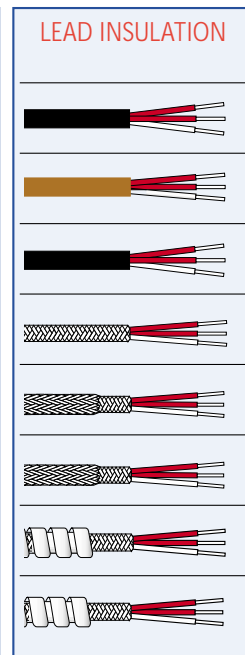
SHEATH DIAMETER	
Size	Code
3.0mm	30
4.5mm	45
4.8mm (3/16")	48
6.0mm	60



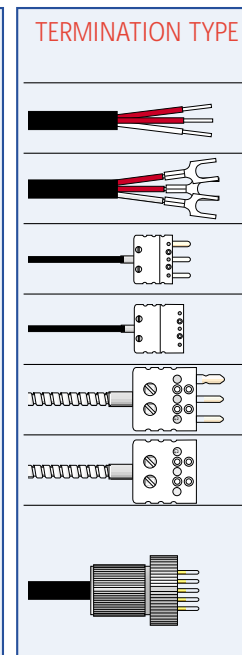
SHEATH LENGTH	
Size	Code
50mm	050
100mm	100
200mm	200
250mm	250
300mm	300
400mm	400
500mm	500

LEAD LENGTH	
Length	Code
250mm	0250
500mm	0500
1.0mtr	1000
1.5mtr	1500
2.0mtr	2000
3.0mtr	3000
4.0mtr	4000
5.0mtr	5000

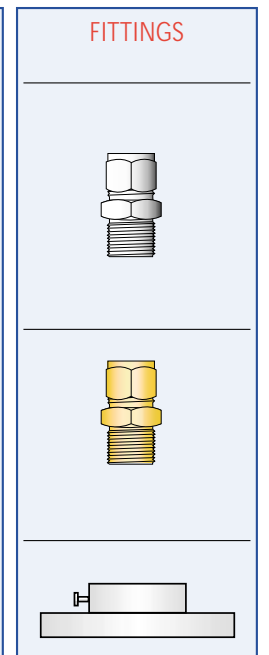
LEAD INSULATION		
	Max. Temp	Code
PVC leads/PVC Outer	100°C	L1
Silicon Rubber/ Silicon Rubber Outer	180°C	L2
Teflon leads/Teflon outer	260°C	L3
Glass Braided	400°C	L4
Glass braided/ tin copper braid outer	400°C	L5
Glass braided/ St/St braid outer	400°C	L6
Glass braided/ Galv helicoil outer	400°C	L7
Glass braided/ St/St helicoil outer	400°C	L8



TERMINATION TYPE	
	Code
75mm tails	T1
Spade terminals	T2
Miniature RT plug	T3
Miniature RT socket	T4
Std RT plug	T5
Std RT socket	T6
Circular, waterproof (gold plated) plug	T7



FITTINGS		
Size		Code
No fitting		F0
1/8" BSPT	St/St	F1
1/8" BSP	St/St	F2
1/4" BSPT	St/St	F3
1/4" BSP	St/St	F4
1/2" BSPT	St/St	F5
1/2" BSP	St/St	F6
No fitting		F0
1/8" BSPT	Brass	F7
1/8" BSP	Brass	F8
1/4" BSPT	Brass	F9
1/4" BSP	Brass	F10
1/2" BSPT	Brass	F11
1/2" BSP	Brass	F12
Flange 50mm dia	St/St	F13
Flange 50mm dia	Alum	F14



*Note: The terminations shown above apply to 3 wire termination types. In all cases the termination supplied will correspond with the relevant configuration specified: either 2, 3, or 4 wire.  
To specify a probe complete with mating connector suffix termination code with M, i.e. T1/M, T2/M T5/M etc.*

Flange fixing holes  
3x4mm on 40 mm PCD

# Resistance Thermometer RT GP PS

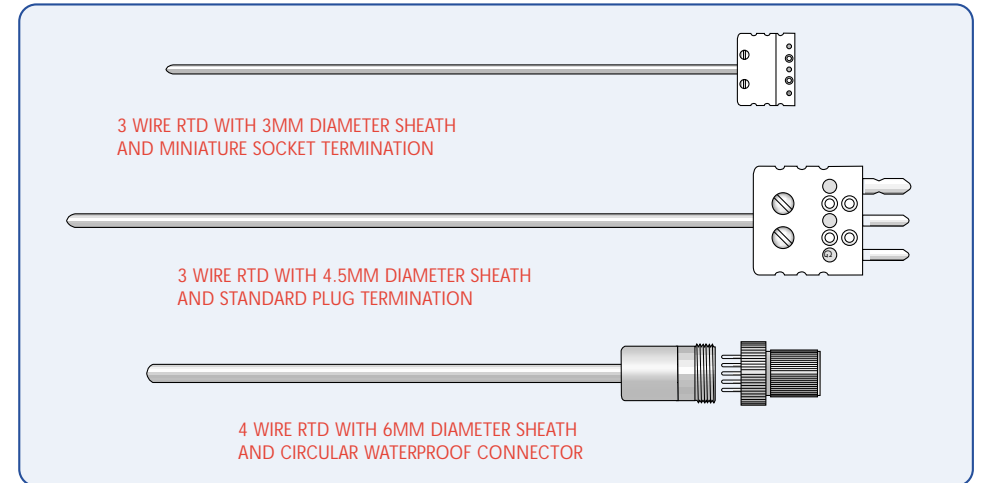
The RT GP PS Series of Platinum Resistance Sensors comprises of a range of probes terminating directly into plug or socket connectors.

They are constructed with a 316 stainless steel sheath housing a PT 100 detector.

A choice of sheath diameters, lengths and connector types is shown below.

Calibration and accuracy is to BS EN60751, IEC 751. *These detectors are supplied to Class A tolerance for greater accuracy.*

They have a maximum tip temperature of 400°C and the connector should be kept below 120°C.



**ORDER CODE**  
RT GP PS - SD --- SL --- T -- F --

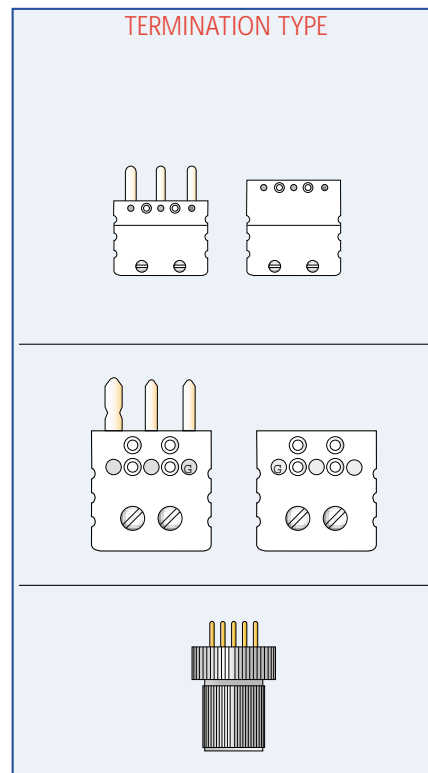
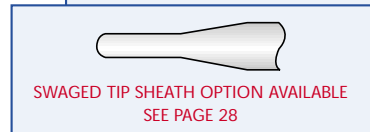
*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

CONFIGURATION	
Description	Code
2 Wire	2
3 Wire	3
4 Wire	4

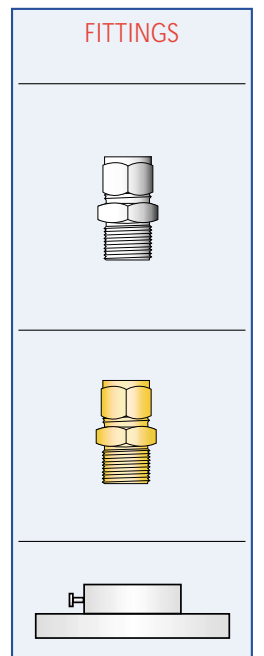
SHEATH DIAMETER	
Size	Code
3.0mm	30
4.5mm	45
4.8mm (3/16")	48
6.0mm	60

SHEATH LENGTH	
Size	Code
50mm	050
100mm	100
200mm	200
250mm	250
300mm	300
400mm	400
500mm	500

TERMINATION TYPE & TEMPERATURE	
Type	Code
Mini R/T Plug	T1
Mini R/T Socket	T2
Std. R/T Plug	T3
Std. R/T Socket	T4
Circular Waterproof Connector Socket (gold plated contacts)	T5



FITTINGS		
Size		Code
No fitting		F0
1/8" BSPT	St/St	F1
1/8" BSP	St/St	F2
1/4" BSPT	St/St	F3
1/4" BSP	St/St	F4
1/2" BSPT	St/St	F5
1/2" BSP	St/St	F6
No fitting		F0
1/8" BSPT	Brass	F7
1/8" BSP	Brass	F8
1/4" BSPT	Brass	F9
1/4" BSP	Brass	F10
1/2" BSPT	Brass	F11
1/2" BSP	Brass	F12
Flange 50mm dia	St/St	F13
Flange 50mm dia	Brass	F14



*To specify a probe complete with mating connector suffix termination code with M, i.e. T1/M, T2/M T5/M etc.*

Flange fixing holes 3x4mm on 40 mm PCD

# Resistance Thermometers RT GP CH

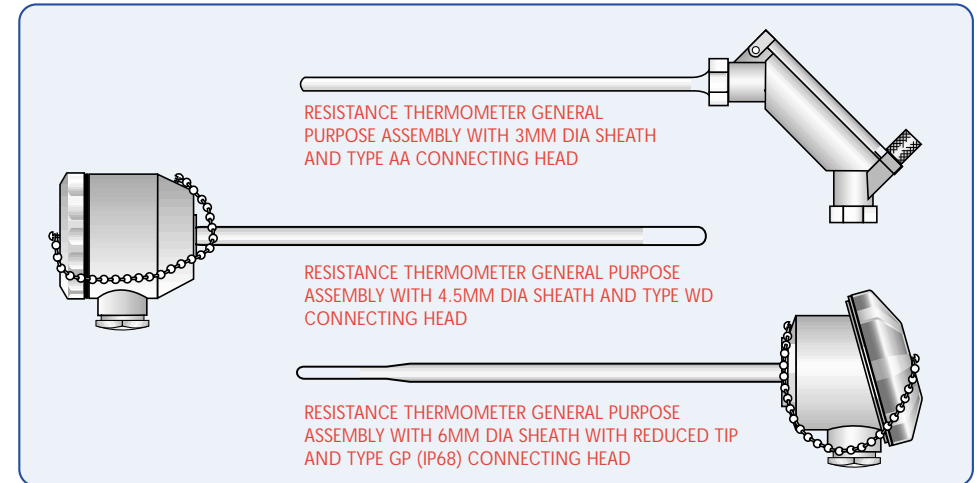
The RT GP CH Series of Resistance Thermometers comprises of a range of sensors housed in 316 stainless steel sheaths and terminated directly into a connecting head.

This provides a convenient method of termination and the terminal head contains connections in accordance with the wiring configuration chosen (2, 3 or 4 wire).

A choice of sheath diameters, lengths and connecting heads is given below.

The calibration and accuracy of these sensors conforms to BS EN60751 - IEC 751, 100Ω at 0°C.

*All sensors are supplied to Class A tolerance for enhanced accuracy.*



**ORDER CODE**  
RT GP CH - SD -- SL --- CH -- F--

*The order code information below is shown as a guide to specifying the probe.*

*Please contact our sales office if any features that you require are not shown.*

**CONFIGURATION**

Description	Code
2 Wire	2
3 Wire	3
4 Wire	4

**SHEATH DIAMETER**

Size	Code
3.0mm	30
4.5mm	45
6.0mm	60

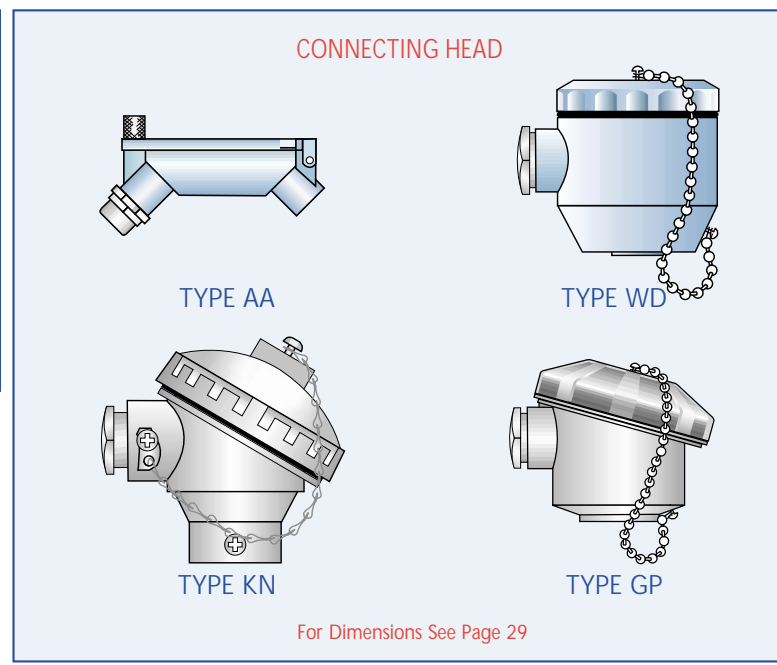
**SHEATH LENGTH**

Size	Code
50mm	050
100mm	100
200mm	200
250mm	250
300mm	300
400mm	400
500mm	500

**CONNECTING HEAD**

Description	Code
Angled Alloy Connecting Head with hinged lid Sealed to IP54.	AA
Die Cast Aluminium Connecting Head with screw on cap with 'O' Ring Seal Sealed to IP67.	WD
Die Cast Angled Screw Cap with O Ring Seal (all dia sheaths) IP67	KN
Glass reinforced Crastine Terminal Head with compression seal, angled cap. Sealed to IP68.	GP

*These assemblies can house double elements, 2x2 wire using Type AA head and either 2x2 wire or 2x3 wire using WD, KN and GP connecting heads. Please call with your requirements.*



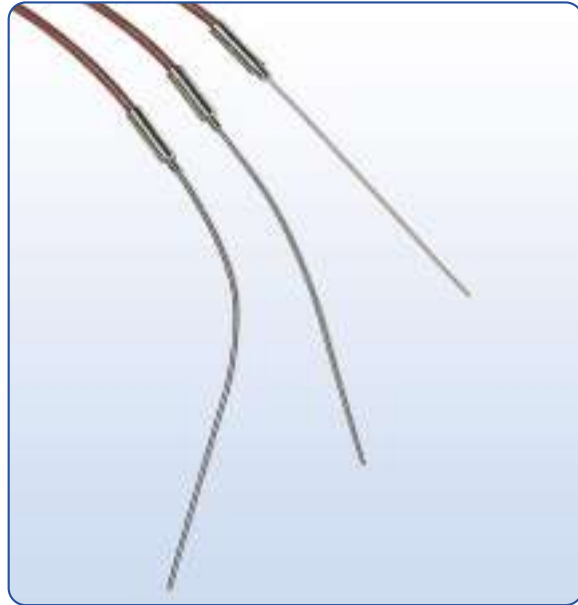
**FITTINGS**

Size/Code	St/St	Brass
No fitting	F0	F0
1/8" BSPT	F1	F7
1/8" BSP	F2	F8
1/4" BSPT	F3	F9
1/4" BSP	F4	F10
1/2" BSPT	F5	F11
1/2" BSP	F6	F12
Flange 50mm dia	F13	F14

Flange fixing holes 3x4mm on 40 mm PCD



# Miniature Resistance Thermometer MI RT MN

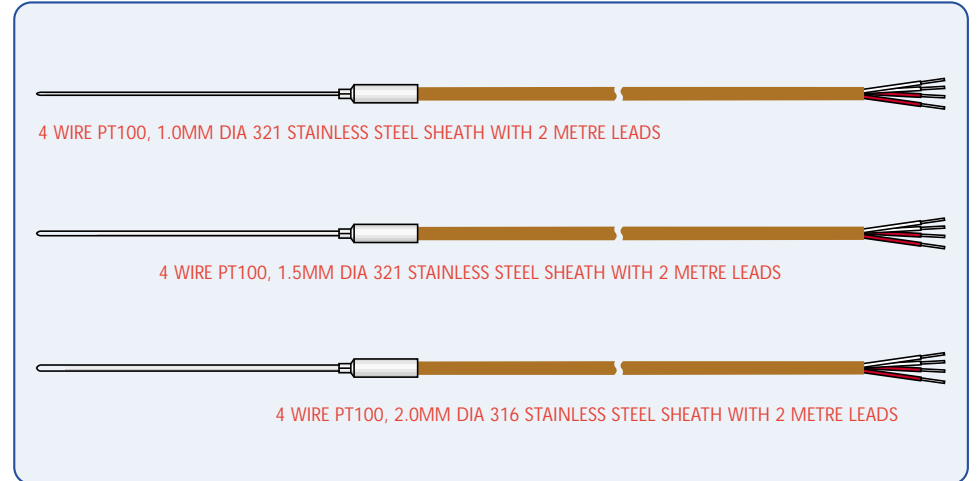


The MI RT MN Series is a series of Miniature Resistance Thermometers encased in small diameter stainless steel sheaths. The connector lead is Silicon Rubber insulated and has a maximum temperature of 180°C. The sheath has an operating temperature of -200 to +600°C.

The PT100 element is housed in a semi flexible minerally insulated sheath and produces very fast response times.

Connected in a 4 wire configuration they can be used in 2, 3 or 4 wire systems.

*The PT100 is supplied as standard as Class A for greater accuracy.*



*The order code information below is shown as a guide to specifying the probe. Please contact our sales office if any features that you require are not shown.*

## TYPICAL RESPONSE TIMES MI RT MN SERIES

Time taken for a Step Change of 90% in Liquid

Dia	Step Change	Response Time
1.0mm	90%	1.5 Seconds
1.5mm	90%	2.0 Seconds
2.0mm	90%	2.5 Seconds

Time taken for all above Diameters to realise a Step Change of 63.2% in Liquid is less than 1.5 Seconds.

### SHEATH DIAMETER

Size	Code
1.0mm	10
1.5mm	15
2.0mm	20

### SHEATH LENGTH

Size	Code
100mm	100
125mm	125
150mm	150
175mm	175
200mm	200
250mm	250
300mm	300
350mm	350
400mm	400
450mm	450
500mm	500

### LEAD LENGTH

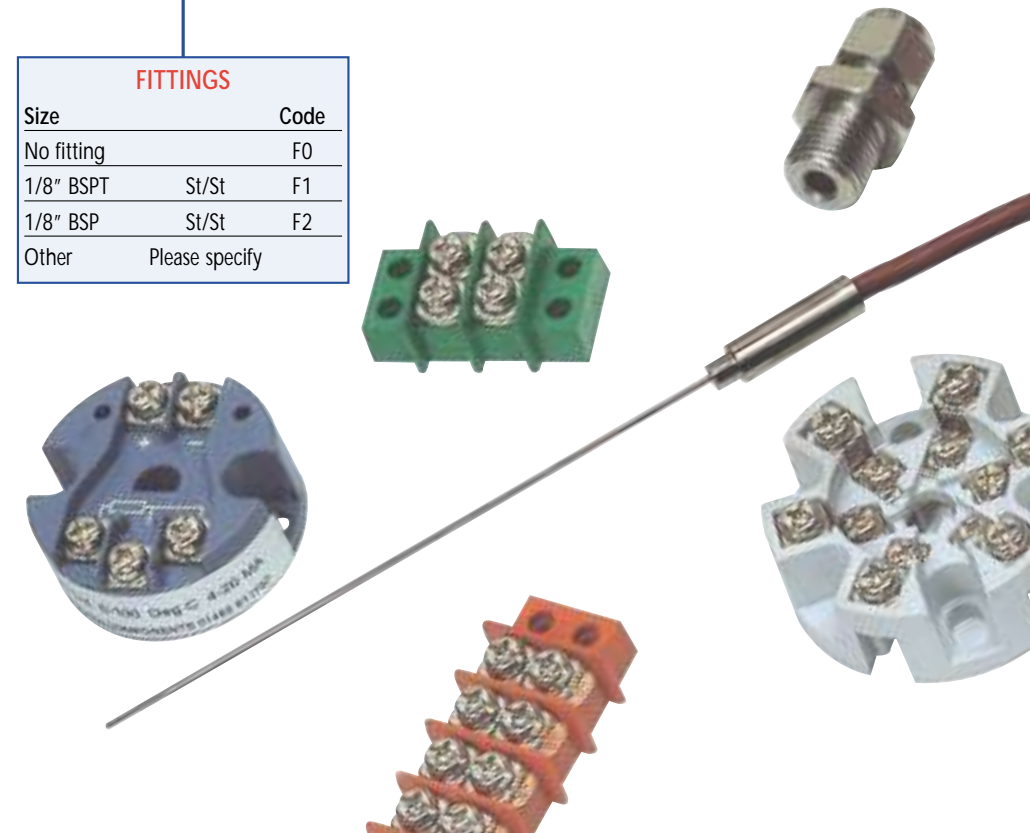
Length	Code
500mm	0500
1.0mtr	1000
1.5mtr	1500
2.0mtr	2000
3.0mtr	3000
3.5mtr	3500
4.0mtr	4000
4.5mtr	4500
5.0mtr	5000

### FITTINGS

Size		Code
No fitting		F0
1/8" BSPT	St/St	F1
1/8" BSP	St/St	F2
Other	Please specify	



*The sheath is semi flexible but should not be bent for 50mm from the sensing tip.*





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