

RESISTANCE THERMOMETER ASSEMBLIES

RT
ISSUE B



- ▲ **Cuttable RTDs**
- ▲ **General Purpose RTDs**
- ▲ **Waterproof Housings**
- ▲ **Explosionproof Option (Model RD)**
- ▲ **Thermo-Pockets**
- ▲ **Spring Loading for Thermowells**

ENGINEERING SUPPORT

Delta - Weed's instrument applications approach to temperature measurement is backed by an excellent engineering staff. The company has applications specialists for each major market area which the company serves. Their knowledge of the company's products and the industry's specific requirements enable Delta - Weed to provide custom engineered products and services.

MANUFACTURING CAPABILITIES

Delta - Weed's manufacturing facility is specifically designed to allow for the production of state-of-the-art temperature sensing and signal conditioning instrumentation. The facility includes an environmentally controlled wire winding room which ensures the optimum conditions for the winding of RTD's. The sensor calibration laboratory is equipped with a computerized calibration system for RTD's using traceable temperature standards. Other facility features include fully equipped mechanical and electrical assembly areas as well as a comprehensively equipped machine shop.

RESEARCH AND DEVELOPMENT

A rigorous R&D program is on-going to achieve a high level of excellence and productivity in the functional areas of product development and automation engineering. The strength of the companies research and development is a major reason for our image as a leading supplier of temperature sensors and transmitters for customers unique applications.

TOTAL QUALITY MANAGEMENT

Delta - Weed actively pursues quality in all products and processes. To further this effort we seek continuous improvement through total quality management in all departments of the company. Utilizing statistical process control, employee training and increased communication. Delta - Weed continues to grow and adapt as a company committed to quality.

LONG-TERM STABILITY

The long term stability of a sensor is defined as its ability to maintain its accuracy over a period of one year at its rated temperature. Weed Instrument Sensors are rated to have a change in ice point resistance of no more than 0.14°C per year. Consult factory for stability at temperatures above 640°C.

TEMPERATURE COEFFICIENT OF RESISTANCE (TCR)

The temperature coefficient of a sensor is determined by the purity of the winding wire used in the manufacture of the sensor element. It is defined as the resistance change per ohm per degree C. Weed standard sensors utilize a high purity of winding wire with the following TCR's.

Platinum	IEC/DIN	=	.003850 ohms/ohm/°C
	ANSI	=	.003902 ohms/ohm/°C
Nickel		=	.006720 ohms/ohm/°C
Copper		=	.004274 ohms/ohm/°C

MATCHED PAIRS

This optional calibration provides two sensors matched relative to each other to within $\pm .06^\circ\text{C}$ with respect to their nominal ice point values.

REPEATABILITY

The repeatability of a sensor is defined as the ability of the sensor to repeat the same output value at a given temperature point in a spanned temperature range. This specification is normally of greater importance than absolute accuracy. Weed Instrument sensors will repeat any temperature point within its specified temperature range $\pm 0.14^\circ\text{C}$ or 0.05%, whichever is greater.

SELF HEATING

Self heating is the rise in the indicated temperature due to power dissipated in the sensor. In 20°C water flowing transverse to the sensor sheath at 1 mtr/sec the following data will apply:

Sheath Diameter	Self Heating
3mm (1/8")	75 mw/°C
4.5mm (3/16")	50 mw/°C
6mm (1/4")	50 mw/°C

STANDARD RESPONSE TIME

(Nominal values for single element sensors.)

The response time is defined as the time necessary for a sensor to reach 63.2% step change of temperature in water moving at 1 meter per second. The following values are typical for a single element sensors with a maximum temperature range of 260°C.

Sheath Diameter	Time Response
3mm (1/8")	1.5 sec
4.5mm (3/16")	2.5 sec
6mm (1/4")	5.0 sec

Consult factory for specific applications that require a faster response time.

TEMPERATURE RANGE

Temperature Range Code	Minimum Temperature	Maximum Temperature
A	-100°C	260°C
B	0°C	925°C
C	-100°C	480°C
D	0°C	650°C
E	-100	550°C

TEMPERATURE RANGE/SHEATH MATERIAL

Temperature Range Code	Max Temp Range	Sheath Material
A	260°C	316 st/st
B	925°C	Inconel 600
C	480°C	316 st/st
D	650°C	Inconel 600
E	550°C	316 st/st

MAXIMUM SHEATH PRESSURE

316 or 320 St/st Sheath			
Sheath Dia.	25°C	260°C	480°C
3mm (1/8")	3500 psi	2800 psi	2100 psi
4.5mm (3/16")	3150 psi	2550 psi	1950 psi
6mm (1/4")	2400 psi	1900 psi	1500 psi

Inconel 600 Sheath		
Sheath Dia	650°C	925°C
3mm (1/8")	2800 psi	900 psi
4.5mm (3/16")	2550 psi	800 psi
6mm (1/4")	1900 psi	600 psi

LEAD WIRE TRANSITION SEAL TEMPERATURE

Temp Range Code	Max. Temp of Transition (pot seal)
A	150°C
B	260°C
C	260°C
D	260°C

INSULATION RESISTANCE

At 21°C with dry external surfaces, the resistance between any lead wire and the sensor sheath is 100 mega-ohms or greater at 100VDC

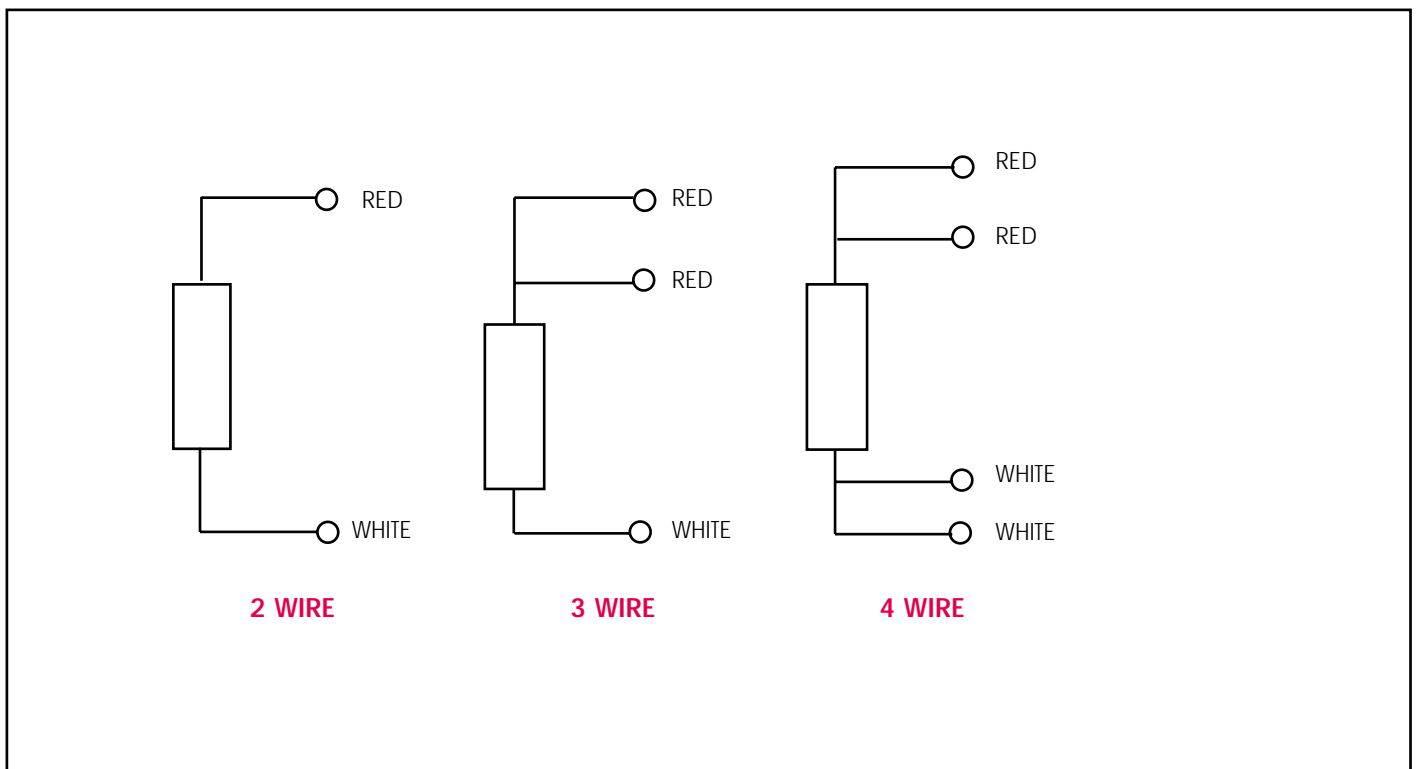
VIBRATION

The vibration capability for a typical 125mm long sensor at 25G's from 20 to 2000 Hz in any axis for no more than 15 minutes.

ACCURACY

Temp	DIN Class B		DIN Class A	
	±°C	±ohm	±°C	±ohm
-100	0.8	0.32	0.35	0.14
0	0.3	0.12	0.15	0.06
100	0.8	0.30	0.35	0.13
200	1.3	0.48	0.55	0.20
300	1.8	0.64	0.75	0.27

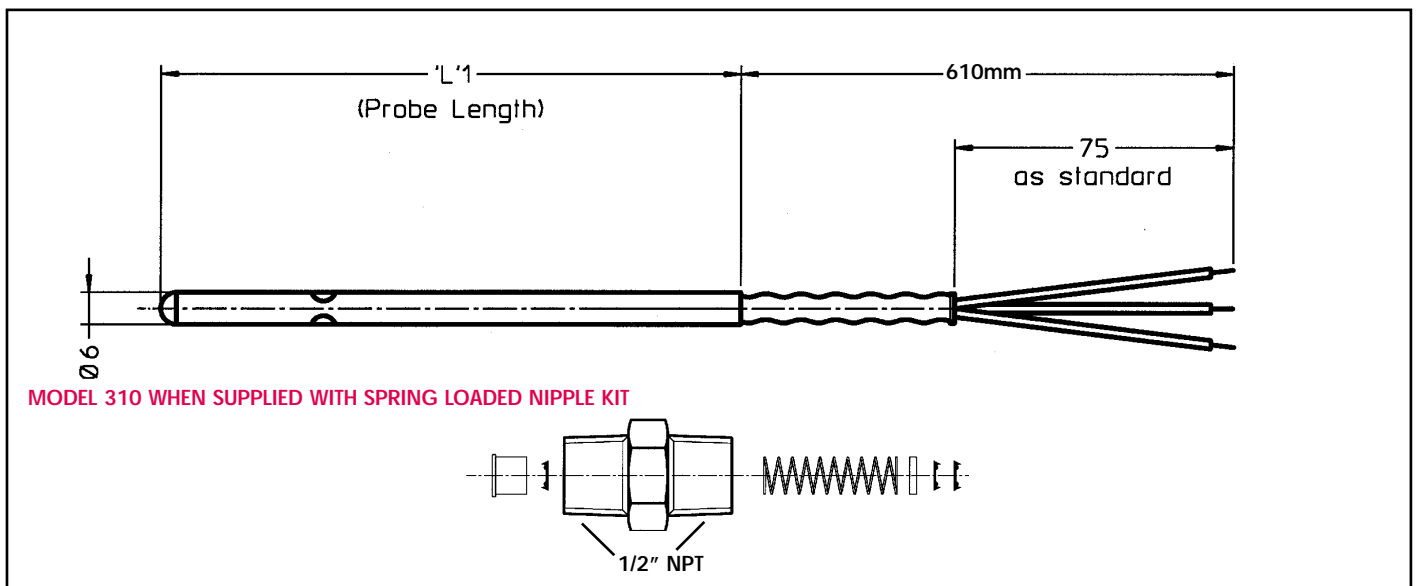
WIRING DIAGRAM



MODEL 110 CUTTABLE RTD SENSOR

Code	Model	
110	Cuttable RTD Sensor	
310	Cuttable RTD Sensor with Spring Loaded Nipple	
Code	Element (See Note 1)	
B	Simplex Pt100 Class B 4 wire	
E	Duplex Pt100 Class B 2 x 3 wire	
F	Duplex Pt100 Class B 2 x 4 wire	
I	Simplex Pt100 Class A 4 wire (480°C max)	Code M for max temperature 640°C
K	Duplex Pt100 Class A 2 x 3 wire (480°C max)	Code N for max temperature 640°C
L	Duplex Pt100 Class A 2 x 4 wire (480°C max)	Code P for max temperature 640°C
Code	Maximum Operating Temperature	
A	260°C	
C	480°C	
D	640°C	
Code	Probe Length 'L'1	
700	700mm Overall Length	
1K3	1300mm Overall Length	
Code	Sensor Diameter	
P	6mm	
Code	Compression Fitting (Optional) (See Note 2)	
000	If no fitting is required.	
1DB	Brass 1/4" BSPT to suit 6mm dia. probe.	
1DD	Brass 1/2" BSPT to suit 6mm dia. probe	
2DB	St/St 1/4" BSPT to suit 6mm dia. probe	
2DD	St/St 1/2" BSPT to suit 6mm dia probe	
Code	Optional Tube Cutter	
000	If Tube Cutter is not required please enter 000	
TC1	Model TC1 Tube Cutter included.	

MODEL 110



Note 1

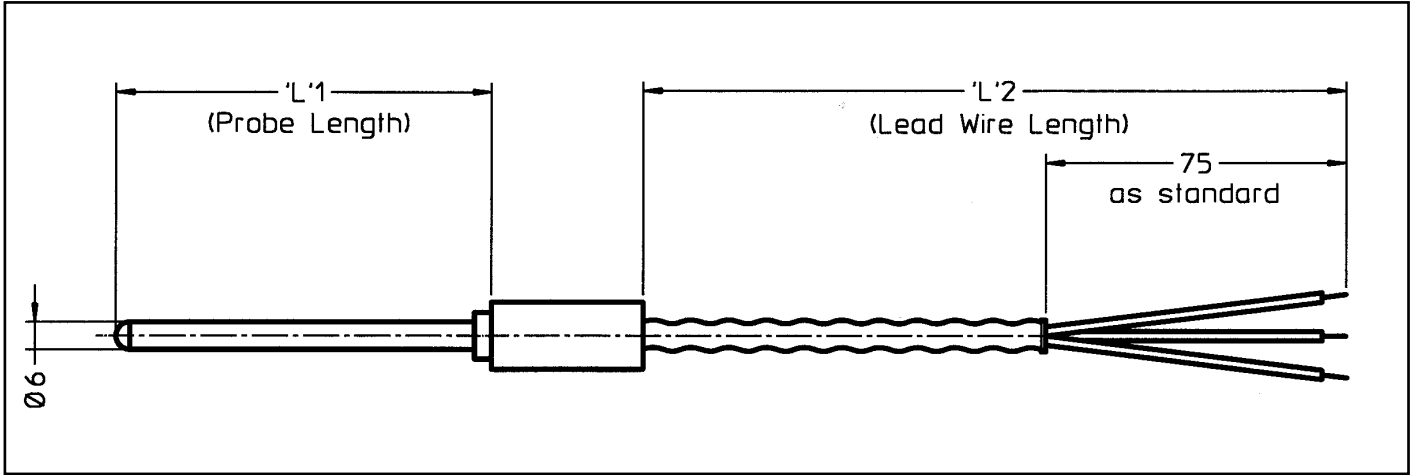
Standard RTDs conform to IEC 751 (BS1904, DIN 43760). Other resistances and connections are available, please consult our engineers.

Note 2

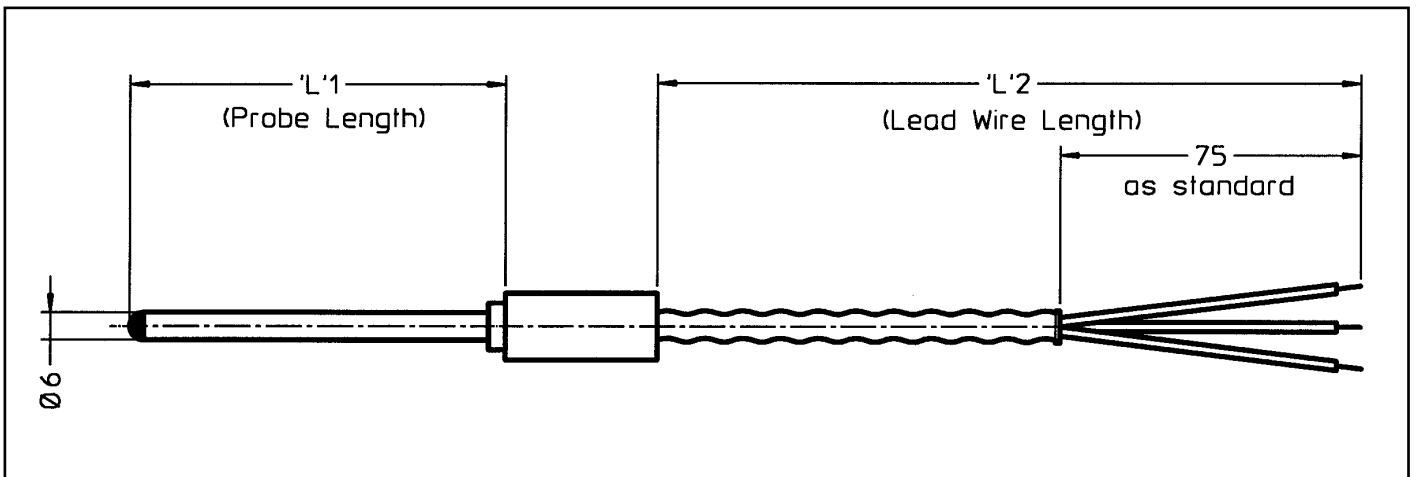
Other sizes available, please consult our engineer. These fittings are general purpose only and are not high pressure rated, if high pressure fittings are required please consult our engineers.

**MODEL R GENERAL
PURPOSE RTD**

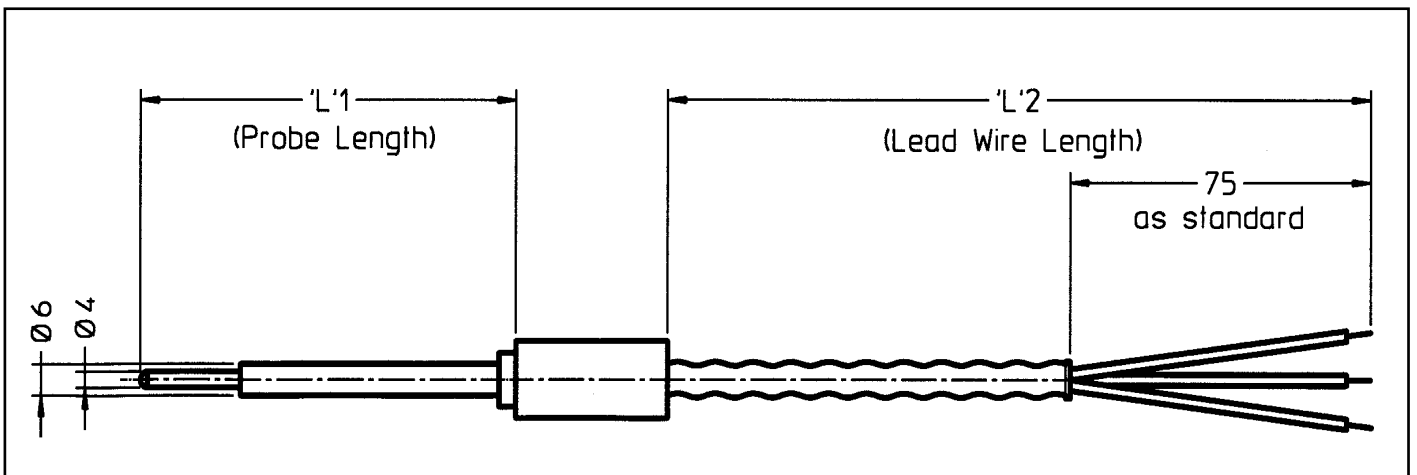
MODEL R1 - GENERAL PURPOSE



MODEL R2 - TIP SENSITIVE



MODEL R3 - FAST RESPONSE REDUCED TIP



MODEL R GENERAL PURPOSE RTD

Code	Model
R1	General Purpose RTD
R2	Tip sensitive
R3	Fast response

Code	Element (See Note 1)
B	Simplex Pt100 Class B 4 wire
E	Duplex Pt100 Class B 2 x 3 wire
F	Duplex Pt100 Class B 2 x 4 wire
I	Simplex Pt100 Class A 4 wire (480°C max) Code M for max temperature 640°C
K	Duplex Pt100 Class A 2 x 3 wire (480°C max) Code N for max temperature 640°C
L	Duplex Pt100 Class A 2 x 4 wire (480°C max) Code P for max temperature 640°C

Code	Maximum Operating Temperature
A	260°C
C	480°C
D	640°C
B	925°C (Discuss application with our engineers before order placement.)

Code	Probe Diameter
P	6mm Standard for R1 & R2. Other diameters available please consult our engineers.
B	6mm diameter with reduced tip 4mm x 25mm long. R3 only.

Code	Probe Length 'L' 1
***	0 ~ 999mm specify length in mm.
K	1mtr ~ 5.9mtrs. eg 2.5mtrs = 2K5 (Minimum increment 0.1mtr)
**M	10 mtrs ~ 99 mtrs. eg 11mtrs = 11M (Minimum increment 1mtr)

Code	Lead Length 'L' 2
***	0 ~ 999mm specify length in mm.
K	1mtr ~ 5.9mtrs. eg 2.5mtrs = 2K5
**M	10 mtrs ~ 99 mtrs. eg 11mtrs = 11M

Code	Lead Insulation Material
B	Teflon
C	Glass Braid

Code	Compression Fitting (Optional) (See Note 2)
000	If no fitting is required.
1DB	Brass 1/4" BSPT to suit 6mm dia. probe
1DD	Brass 1/2" BSPT to suit 6mm dia. probe
2DB	St/St 1/4" BSPT to suit 6mm dia. probe
2DD	St/St 1/2" BSPT to suit 6mm dia probe

The diagram illustrates various RTD probe configurations. It shows a vertical line representing the probe, with different wire counts and fittings at the bottom. From left to right, the configurations are: 2 wires, 3 wires, 4 wires, 4 wires with a different fitting, 4 wires with a different fitting, 3 wires, and 4 wires with a different fitting.

Note 1

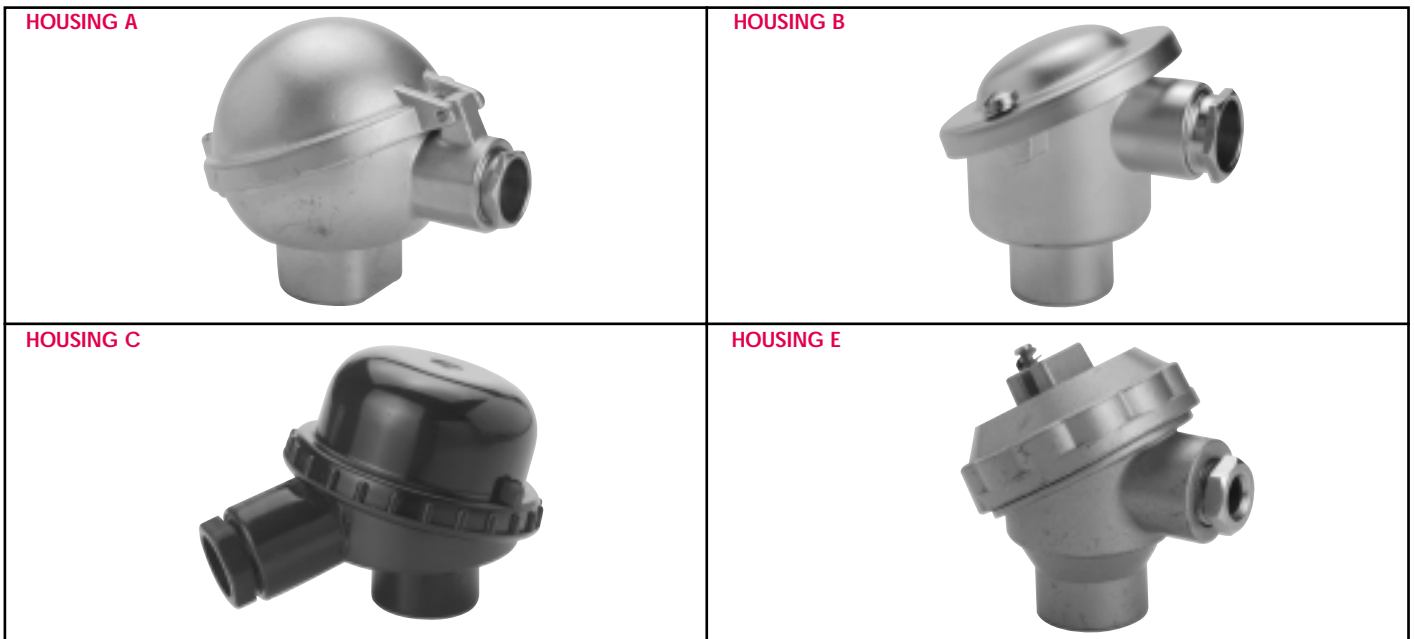
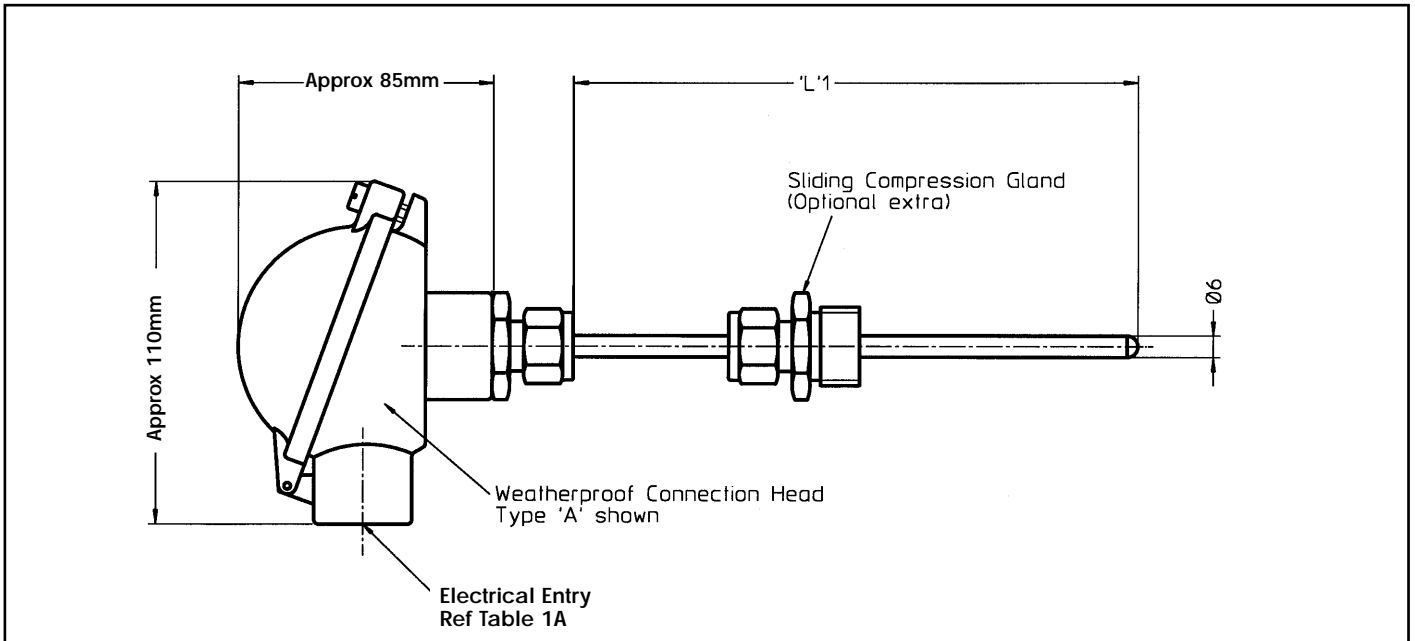
Standard RTDs conform to IEC 751 (BS1904, DIN 43760). Other resistances and connections are available, please consult our engineers.

Note 2

Other sizes available, please consult our engineer. These fittings are general purpose only and are not high pressure rated, if high pressure fittings are required please consult our engineers.

MODEL RH GENERAL PURPOSE RTD WITH WEATHERPROOF HOUSING

MODEL RH



ELECTRICAL ENTRY OPTIONS

Head Type	Electrical Entry			IP Rating	Material
	M20	PG16	1/2"NPT		
A		✓		IP65	Aluminium
B	✓			IP54	Aluminium
C		✓		IP54	Plastic
D		✓		IP65	Aluminium
E	✓		✓	IP65	Aluminium
F	✓		✓	IP65	316 St.St

MODEL RH GENERAL PURPOSE RTD WITH WEATHERPROOF HOUSING

Code	Connection Head
A	Aluminium Weatherproof IP65. Hinged Cover. (Often referred to as BUZ)
B	Aluminium Weatherproof IP54. (Often referred to as DIN B)
C	Plastic Weatherproof IP54. Screw Cover
E	Aluminium Weatherproof IP65. Screw Cover with Retaining Chain

Code	Connection Head
RHC	Connection Head Fitted with Terminal Block.
RHS	Connection Head Fitted with Hart Programmable Temperature transmitter. Refer to Smart Sensor-Mate 9000 Data Sheet.
RHP	Connection Head Fitted with PC Programmable Temperature transmitter. Refer to Pro-Sensor-Mate 7500 Data Sheet.
RHA	Connection Head Fitted with Low Cost Analogue Temperature transmitter. Refer to Sensor-Mate Analogue 4000 Data Sheet.

Code	Electrical Entry. (Refer to Table 1A for Connection Head electrical entry compatibility)
1	M20 x 1.5
2	1/2" NPT
3	PG16

Code	Element (See Note 1)
B	Simplex Pt 100 Class B 3 Wire
C	Simplex Pt 100 Class B 4 Wire
E	Duplex Pt 100 Class B 2 x 3 Wire
H	Simplex Pt 100 Class A 3 Wire (480°C max) Code M for max temperature 640°C
I	Simplex Pt 100 Class A 4 Wire (480°C max) Code N for max temperature 640°C
K	Duplex Pt 100 Class A 2 x 3 Wire (480°C max) Code P for max temperature 640°C

Code	Maximum Operating Temperature
A	260oC
C	480oC
D	640oC
B	925oC (Discuss application with our engineers before order placement.)

Code	Probe Length 'L'1
***	0 ~ 999mm specify length in mm. Standard lengths are 200, 400, 600mm
K	1mtr ~ 5.9mtrs. eg 2.5mtrs = 2K5, 3.7mtrs = 3K7 (Minimum increment 0.1mtr)
**M	10 mtrs ~ 99 mtrs. eg 11mtrs = 11M, 25mtrs = 25M (Minimum increment 1mtr)

Code	Probe Length 'L'2
0	Not applicable this product please insert 0 in part number.

Code	Sensor Diameter / Tip Type
P	6mm diameter (standard)
B	6mm diameter. Reduced diameter tip 4mm diameter x 25mm long.
C	6mm diameter with fast response copper tip.

Code	Compression Fitting (Optional) (See Note 2)
000	If no fitting is required.
1DB	Brass 1/4" BSPT to suit 6mm dia. probe.
1DD	Brass 1/2" BSPT to suit 6mm dia. probe
2DB	St/St 1/4" BSPT to suit 6mm dia. probe
2DD	St/St 1/2" BSPT to suit 6mm dia probe

Note 1

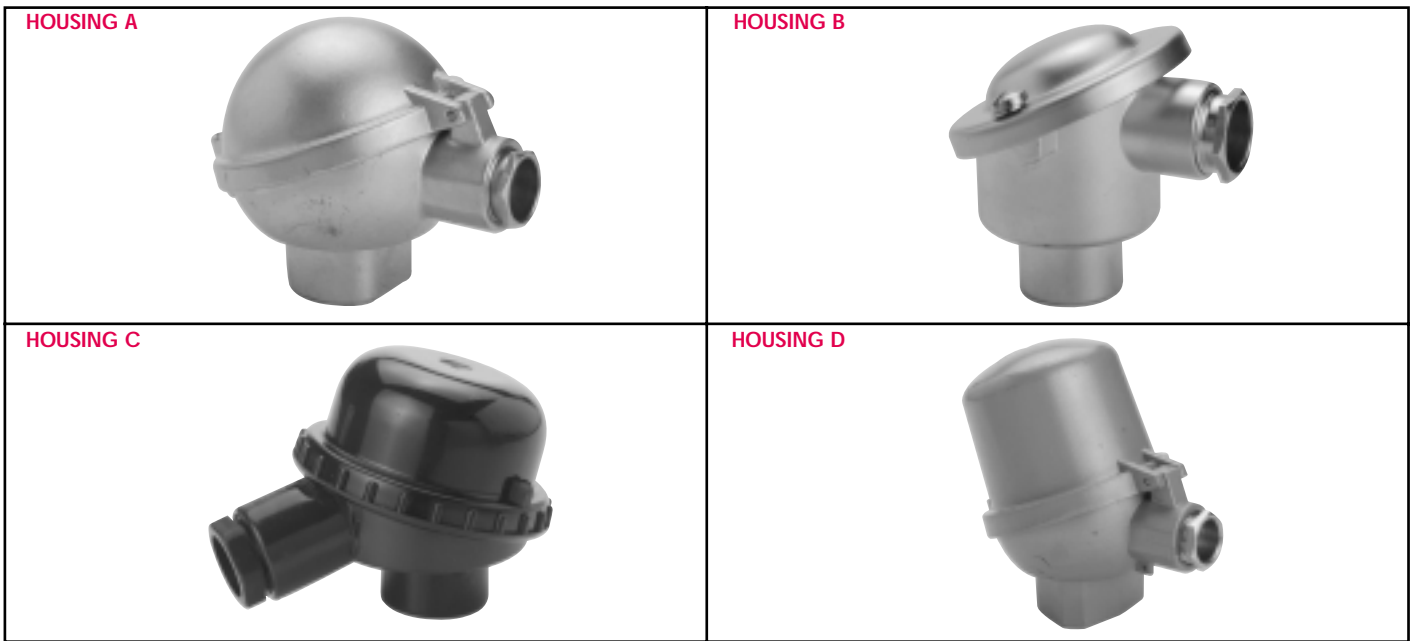
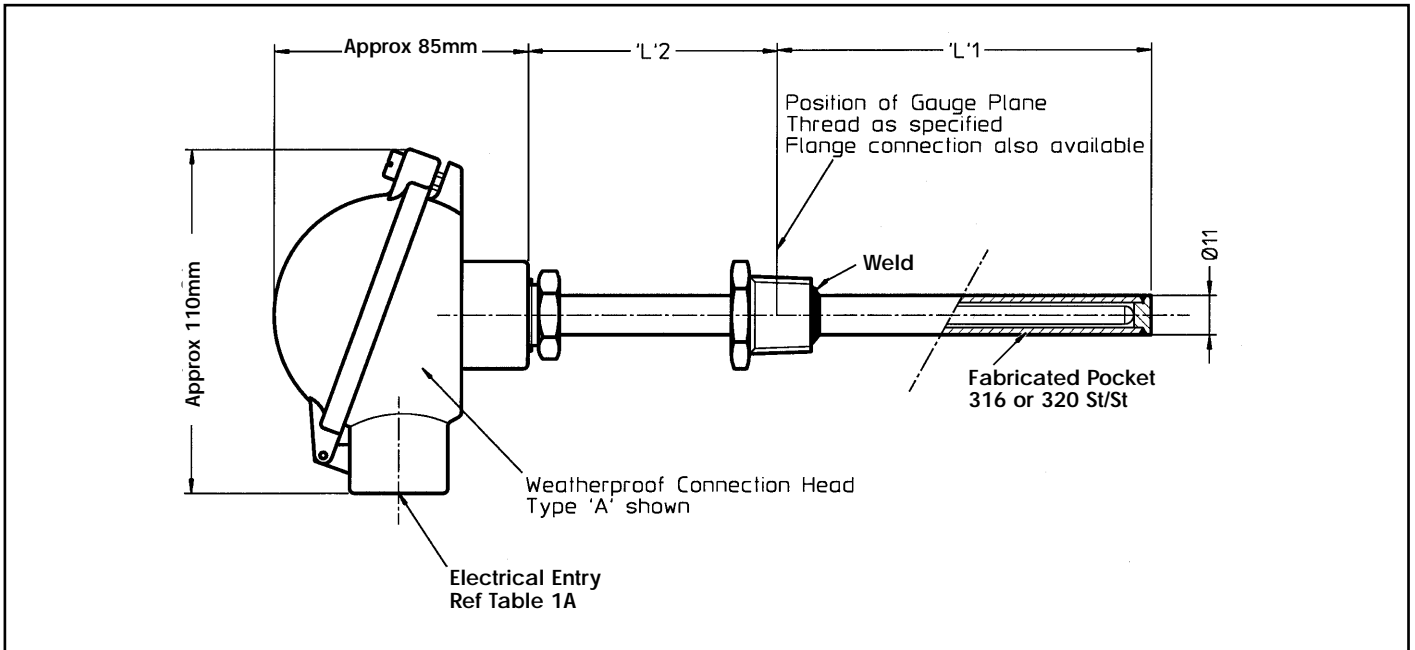
Standard RTDs conform to IEC 751 (BS1904, DIN 43760). Other resistances and connections are available, please consult our engineers.

Note 2

Other sizes available, please consult our engineer. These fittings are general purpose only and are not high pressure rated, if high pressure fittings are required please consult our engineers.

MODEL RP RTD WITH POCKET

MODEL RP



ELECTRICAL ENTRY OPTIONS

Head Type	Electrical Entry			IP Rating	Material
	M20	PG16	1/2"NPT		
A		✓		IP65	Aluminium
B	✓			IP54	Aluminium
C		✓		IP54	Plastic
D		✓		IP65	Aluminium
E	✓		✓	IP65	Aluminium
F	✓		✓	IP65	316 St.St

MODEL RP RTD WITH POCKET

Code	Connection Head
A	Aluminium Weatherproof IP65. Hinged Cover. (Often referred to as BUZ)
B	Aluminium Weatherproof IP54. (Often referred to as BIN B)
C	Plastic Weatherproof IP54. (Often referred to as BK)
D	Aluminium Weatherproof IP65. High Dome Hinged Cover to accomodate 2 x transmitters.. (Often referred to as BUZ-HD.)

Code	Connection Head
RPC	Connection Head Fitted with Terminal Block.
RPS	Connection Head Fitted with Hart Programmable Temperature transmitter. Refer to Smart Sensor-Mate 9000 Data Sheet.
RPP	Connection Head Fitted with PC Programmable Temperature transmitter. Refer to Pro-Sensor-Mate 7500 Data Sheet.
RPA	Connection Head Fitted with Low Cost Analogue Temperature transmitter. Refer to Sensor-Mate Analogue 4000 Data Sheet.

Code	Electrical Entry. (Refer to Table 1A for Connection Head electrical entry compatibility)
1	M20 x 1.5
2	1/2" NPT
3	PG16

Code	Element (See Note 1)
B	Simplex Pt 100 Class B 3 Wire
C	Simplex Pt 100 Class B 4 Wire
E	Duplex Pt 100 Class B 2 x 3 Wire
H	Simplex Pt 100 Class A 3 Wire (Max temp 480°C) Code M for max temperature 640°C
I	Simplex Pt 100 Class A 4 Wire (Max temp 480°C) Code N for max temperature 640°C
K	Duplex Pt 100 Class A 2 x 3 Wire (Max temp 480°C) Code P for max temperature 640°C

Code	Maximum Operating Temperature
A	260°C
C	480°C
D	640°C
B	925°C (Discuss application with our engineers before order placement.)

Code	Probe Length 'L1
***	0 ~ 999mm specify length in mm. Standard lengths are 100,175,250mm
K	1mtr ~ 5.9mtrs. eg 2.5mtrs = 2K5, 3.7mtrs = 3K7 (Minimum increment 0.1mtr)

Code	Probe Length 'L2
A	50mm (Standard)
B	75mm
C	100mm

Code	Sensor Diameter / Tip Type
0	Not applicable this product, please enter 0.

Code	Process Connection (See Note 3)
000	If no fitting is required.
08P	1/2" BSPP
12P	3/4" BSPP
08N	1/2" NPT
12N	3/4" NPT
AIR	1" 150lb ANSI B16.5
BIR	1 1/2" 150lb ANSI B16.5
CIR	2" 150lb RF ANSI B16.5

Note 1

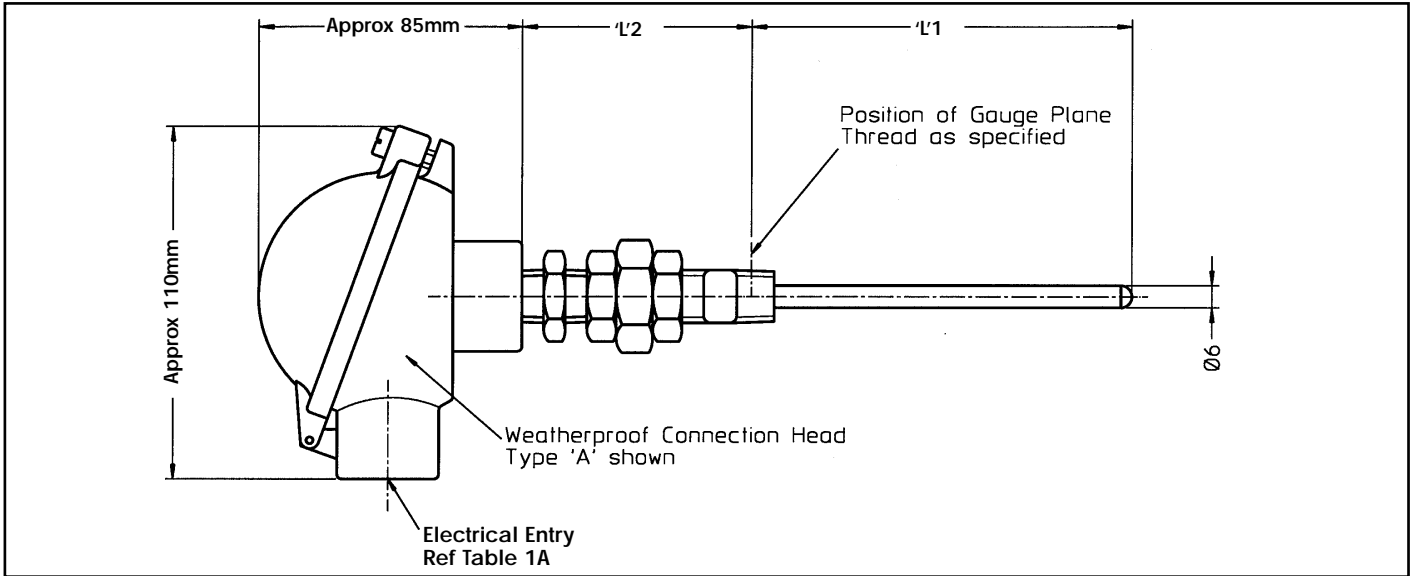
Standard RTDs conform to IEC 751 (BS1904, DIN 43760). Other resistances and connections are available, please consult our engineers.

Note 3

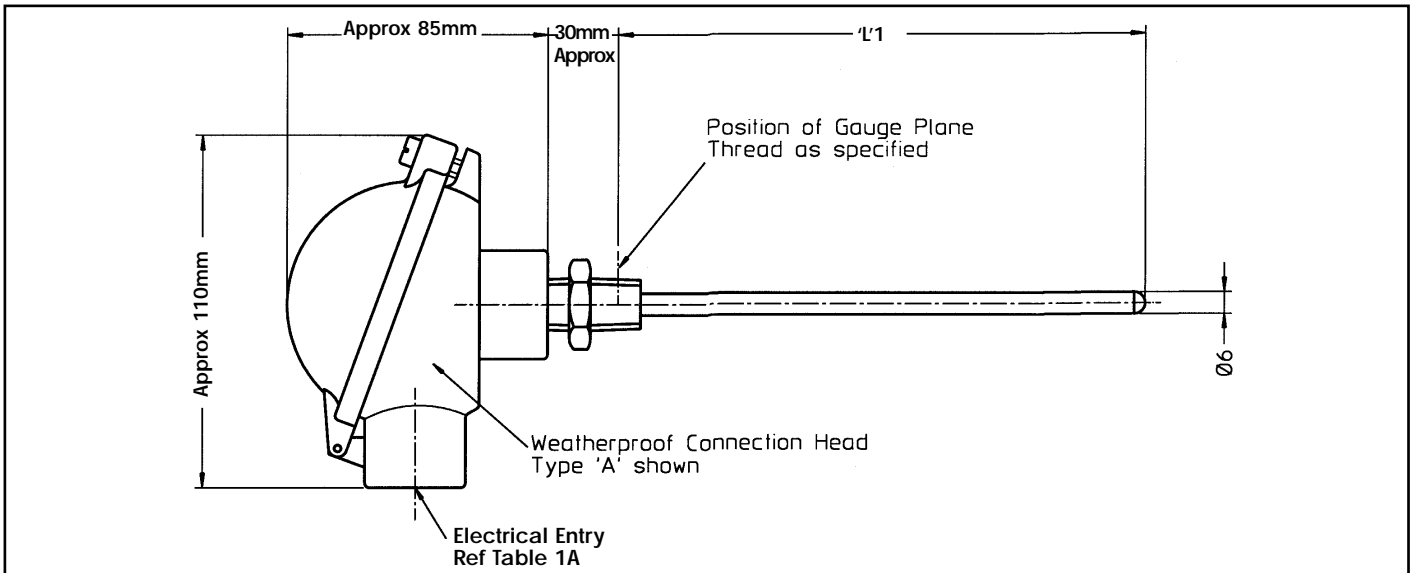
Other process connections such as screwed 1" NPT or flanged 300lb/600lb ratings, RF or FF, BS4504 are available. Please consult our engineers.

**MODEL RN/RU SPRING LOADED RTD
FOR USE WITH THEMOWELL**

MODEL RU



MODEL RN



HOUSING A



HOUSING D



HOUSING E



HOUSING F



MODEL RU/RN SPRING LOADED RTD FOR USE WITH THEMOWELL

Code	Connection Head
A	Aluminium Weatherproof IP65. Hinged Cover. (Often referred to as BUZ)
D	Aluminium Weatherproof IP65. High Dome Hinged Cover to accommodate 2 x transmitters.. (Often referred to as BUZ-HD.)
E	Aluminium Weatherproof IP65. Screw Cover with Retaining Chain
F	316 st/st Weatherproof IP65. Screw Cover with Retaining Chain

Code	Connection Head
RNC	Connection Head Fitted with Spring Nipple & Terminal Block.
RNS	Connection Head Fitted with Spring Nipple & Hart Programmable Temperature transmitter. Refer to Smart Sensor-Mate 9000 Data Sheet.
RNP	Connection Head Fitted with Spring Nipple & PC Programmable Temperature transmitter. Refer to Pro-Sensor Mate 7500 Data Sheet.
RNA	Connection Head Fitted with Spring Nipple & Low Cost Analogue Temperature transmitter. Refer to Sensor-Mate Analogue 4000 Data Sheet.
RUC	Connection Head Fitted with Spring Nipple & Union with Terminal Block.
RUS	Connection Head Fitted with Spring Nipple & Union with Hart Programmable Temperature transmitter. Refer to Smart Sensor-Mate 9000 Data Sheet.
RUP	Connection Head Fitted with Spring Nipple & Union with PC Programmable Temperature transmitter. Refer to Pro-Sensor Mate 7500 Data Sheet.
RUA	Connection Head Fitted with Spring Nipple & Union with Low Cost Analogue Temperature transmitter. Refer to Sensor-Mate Analogue 4000 Data Sheet.

Code	Electrical Entry. (Refer to Table 1A for Connection Head electrical entry compatibility)
1	M20 x 1.5
2	1/2" NPT
3	PG16

Code	Element (See Note 1)
B	Simplex Pt 100 Class B 3 Wire
C	Simplex Pt 100 Class B 4 Wire
E	Duplex Pt 100 Class B 2 x 3 Wire
H	Simplex Pt 100 Class A 3 Wire (Max temp 480°C) Code M for max temperature 640°C
I	Simplex Pt 100 Class A 4 Wire (Max temp 480°C) Code N for max temperature 640°C
K	Duplex Pt 100 Class A 2 x 3 Wire (Max temp 480°C) Code P for max temperature 640°C

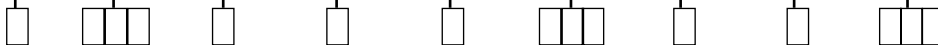
Code	Maximum Operating Temperature
A	260°C
C	480°C
D	640°C
B	925°C (Discuss application with our engineers before order placement.)

Code	Probe Length 'L1
***	0 ~ 999mm specify length in mm.
K	1mtr ~ 5.9mtrs. eg 2.5mtrs = 2K5, 3.7mtrs = 3K7 (Minimum increment 0.1mtr)

Code	Nipple Length 'L2 (See Note 4)
0	Not applicable on Model RN please insert 0 in part number.
C	With Spring Nipple & St.St Union 'L2 = 100mm
D	With Spring Nipple & St.St Union 'L2 = 150mm

Code	Sensor Diameter / Tip Type
0	Not applicable this product.

Code	Connection to Thermowell	
08T	1/2" BSPT	Other connections available, please consult our engineers.
08N	1/2" NPT	



Note 1

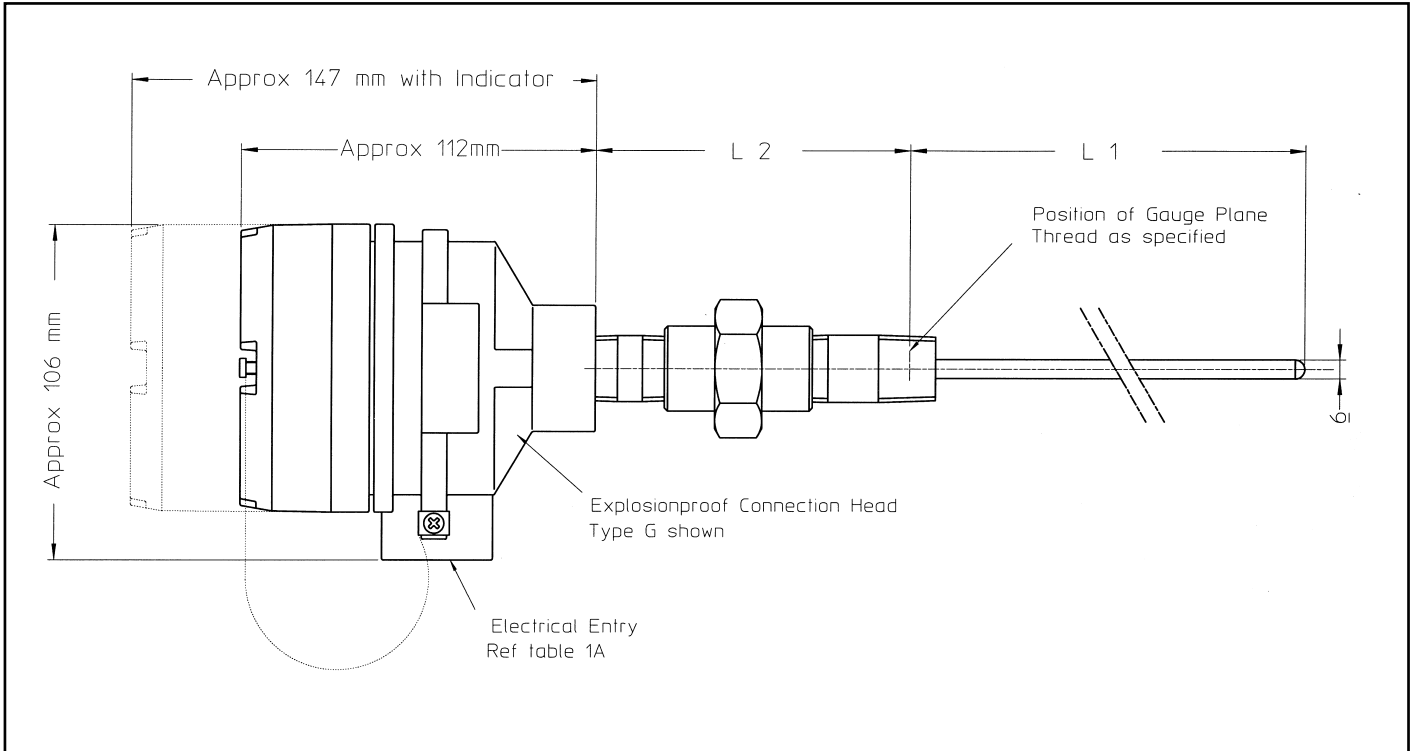
Standard RTDs conform to IEC 751 (BS1904, DIN 43760). Other resistances and connections are available, please consult our engineers.

Note 4

Carbon Steel Nipple & Union also available, please consult our engineers.

**EXPLOSIONPROOF MODEL RD SPRING
LOADED RTD FOR USE WITH THEMOWELL**

MODEL RD



HOUSING G/H



HOUSING J/K



EXPLOSIONPROOF MODEL RD SPRING LOADED RTD FOR USE WITH THEMOWELL

Code	Connection Head
G	Aluminium Explosionproof EExd IIC T6 (TAMB 55°C), Weatherproof IP67, Screw cover, blind
H	316 St/St Explosionproof EExd IIC T6 (TAMB 55°C), Weatherproof IP67, Screw cover, blind
J	Aluminium Explosionproof EExd IIC T6 (TAMB 55°C), Weatherproof IP67, Screw cover, with local indicator
K	316 St/St Explosionproof EExd IIC T6 (TAMB 55°C), Weatherproof IP67, Screw cover, with local indicator

Code	Connection Head
RDC	Connection Head Fitted with Spring Nipple & Union with Terminal Block.
RDS	Connection Head Fitted with Spring Nipple & Union with Hart Programmable Temperature transmitter. Refer to Smart Sensor-Mate 9000 Data Sheet.
RDP	Connection Head Fitted with Spring Nipple & Union with PC Programmable Temperature transmitter. Refer to Pro-Sensor Mate 7500 Data Sheet.
RDA	Connection Head Fitted with Spring Nipple & Union with Low Cost Analogue Temperature transmitter. Refer to Sensor-Mate Analogue 4000 Data Sheet.

Code	Electrical Entry. (Refer to Table 1A for Connection Head electrical entry compatibility)
1	M20 x 1.5
2	1/2" NPT

Code	Element (See Note 1)
B	Simplex Pt 100 Class B 3 Wire
C	Simplex Pt 100 Class B 4 Wire
E	Duplex Pt 100 Class B 2 x 3 Wire
H	Simplex Pt 100 Class A 3 Wire (Max temp 480°C)
I	Simplex Pt 100 Class A 4 Wire (Max temp 480°C)
K	Duplex Pt 100 Class A 2 x 3 Wire (Max temp 480°C)

Code	Maximum Operating Temperature
E	550°C

Code	Probe Length 'L'1
***	0 ~ 999mm specify length in mm.
K	1mtr ~ 5.9mtrs. eg 2.5mtrs = 2K5, 3.7mtrs = 3K7 (Minimum increment 0.1mtr)

Code	Nipple Length 'L'2 (See Note 4)
D	With Spring Nipple & St.St Union 'L'2 = 150mm

Code	Sensor Diameter / Tip Type
0	Not applicable this product.

Code	Connection to Thermowell	
08T	1/2" BSPT	Other connections available, please consult our engineers.
08N	1/2" NPT	

Note 1

Standard RTDs conform to IEC 751 (BS1904, DIN 43760). Other resistances and connections are available, please consult our engineers.

Note 4

Carbon Steel Nipple & Union also available, please consult our engineers.

*In the interest of development and improvement Delta Controls Ltd, reserve the right to amend, without notice, details contained in this publication.
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