

PRTDs sold by TDI are manufactured by hand, to very high standards, under the most rigorous of Quality Control Conditions. A TDI Quality Assurance Manual is available to any prospective customer upon request. All materials used in their manufacture are traceable to Quality Control assurance by the various suppliers. All production is carried out under clean conditions with much of the production assembled with the use of microscopes. The units are visually checked for quality at least 4 times during production. In a final check **all** units are checked against a known standard which has been calibrated in the Calibration Laboratory of Isotech, whose U.K.A.S. accreditation enables us to have a close quality control. During the manufacture, all units are aged at temperatures higher than those specified by the various standard bodies. This treatment gives our units a high degree of stability at normal working temperature. During the final grading, units are selected to higher tolerances than those stipulated. Alpha value of sensing wire is better than 0.003850 +/-0.000006. This is better than the Class B requirement of +/-0.000012.

### Vibration

When correctly supported, units will withstand a minimum vibration level of 30g over the frequency range 10hz to 1Khz. Units from normal production have been subjected to many varied ranges of vibration, and we have in-house ability to test to a Customer's needs should they have any special requirement.

### Stability

Detectors typically conform to BSEN Stability figures. Drift of less than ±0.05% of its initial value after ten thermal cycles from 0°C to 600°C and from -200°C to 0°C. Stability is a compromise between vibration performance and there are various options available.

### Self Heating

Less than 0.3°C with 10mW dissipation when tested in a stirred ice bath.

### Detector Specification

Normally 3 types of alpha value platinum are available for use in the construction of our PRTDs.

#### 1 Designated P - (White Cap)

Specification to:

**A** BS EN 60751 1996    **B** DIN 43760 1980    **C** IEC 751 1995

(The European Standard EN 60751:1995 has the status of the BS EN 60751:1996 British Standard)

Resistance at 0°C 100 ohms  
Alpha Value - 0.003850°C<sup>-1</sup>

#### Other Tolerances

As well as the standard tolerances, TDI produce closer tolerance versions of their products:

Typically:	±0.05%	(1/2DIN B)
	±0.03%	(1/3 DIN B)
	±0.02%	(1/5 DIN B)
	±0.01%	(1/10 DIN B)

being the interchangeability at 0°C.

As the detector is used further away from 0°C these errors can be expected to increase in accordance with an alpha uncertainty of ±3ppm.

If further requirements pertain, then Calibration in our sister company Isotech's U.K.A.S. Laboratory is essential.

NB Great care in assembly is required to maintain the accuracy provided by the close tolerance detector.

#### 2 Designated A - (Pink cap)

Specification to:

**A** JIS C1604 - 1981 (Japanese Industrial Standard)

**B** US Standard Curve

Resistance at 0°C 100 ohms or 50 ohms.

Alpha Value - 0.003916°C<sup>-1</sup>

Tolerance at 0°C for

**A** JIS C1604 1981

±0.15°C

±0.2°C

±0.5°C

**B** US Standard ±0.1 ohms

Variations as required under various SAMA Standard can be made to order with variations of Ro.

#### 3 Designated S - (Blue Cap)

Originally specified for British Aircraft Industry.

Specification to BS 2G 148

Resistance at 0°C = 130 ohms

Alpha Tolerance - 0.003900°C<sup>-1</sup>

Tolerance at 0°C - ±0.1% or Ro.

Variations of Ro are available on request.

### Thermal response time

BS EN 60751:1996 & IEC 751: 1995

Require that the response time for a 50% change (~0.5) in resistance to a step temperature change be recorded. The normal 63.2% value is not recommended. However it is the accepted figure. Hence the table below gives the 63.2% figure. The 50% figure may be obtained by reducing the times given by approximately 10%. 90% response times can be obtained by multiplying the the times given by a factor of 3. To obtain the time constants at other flow rates and for other liquids and gases, the times may be multiplied by the inverse of the ratio masses of fluids per second passing the element.

Ceramic diameter (mm)	4.5	3.2	2.8	2.4	2.0	1.6	1.5	1.2	0.9
Typical time (secs)	0.7	0.4	0.4	0.3	0.25	0.15	0.1	0.08	0.03

to 63% of final value,  
50% step, water flowing at 1m/s.

### Hermetically sealed units

For optimum stability, air should be allowed to circulate around the platinum coil. For this reason our detectors are not Hermetically sealed. Care must therefore be taken to prevent the ingress of moisture or gases from contaminating the detector by enclosing it in a suitable sheath. However applications have arisen where detectors have to be totally immersed; or to operate in conditions of high humidity. For special cases units can be hermetically sealed. These units are made to order only.

### PRTD Standards

For producing working standards to the International Temperature Scale of 1990 (ITS-90) an alpha Value of at least 0.003925 is required. TDI produce a 25.5 ohm detector which when correctly assembled will meet the ITS-90 requirements.

A full working standard sensor assembly is produced by our sister company Isothermal Technology Ltd. For full details ask for model 909.

# Thermal Developments International produce a wide range of Detectors using wire conforming to IEC 751 - 1995

All dimensions in mm Detectors shown same size		Resistance tolerance at 0°C	Ceramic length (mm)	Ceramic diameter (mm)	Sensing length (mm)
P100/7040		0.1%	70 + 0 - 0.5	4 + 0 - 0.03	65 ± 1
P100/6548		0.1%	65 + 0 - 0.5	4.75+0 - 0.03	62 ± 1
P100/5024 P2100/5024		0.1%	50 + 0 - 0	2.4 + 0 - 0.03	47 ± 1
P100/5015 P2100/5015		0.1%	50 + 0 - 0.5	1.5 + 0 - 0.03	47 ± 1
P100/3045 P2100/3045		0.1%	30 + 0 - 0.5	4.5 + 0 - 0.03	27 ± 1
P100/3038 P2100/3038		0.1%	30 + 0 - 0.5	3.8 + 0 - 0.03	27 ± 1
P100/2532 P2100/2532		0.1%	25 + 0 - 0.5	3.2 + 0 - 0.03	22 ± 1
P100/2528 P2100/2528		0.1%	25 + 0 - 0.5	2.8 + 0 - 0.03	22 ± 1
P100/2524 P2100/2524		0.1%	25 + 0 - 0.5	2.4 + 0 - 0.03	22 ± 1
P100/2516 P2100/2516		0.1%	25 + 0 - 0.5	1.6 + 0 - 0.03	22 ± 1
P100/2515 P2100/2515		0.1%	25 + 0 - 0.5	1.5 + 0 - 0.03	22 ± 1
P100/2020 P2100/2020		0.1%	20 + 0 - 0.5	2.0 + 0 - 0.03	17 ± 1
P100/1545 P2100/1545		0.1%	15 + 0 - 0.5	4.5 + 0 - 0.03	12 ± 1
P100/1532 P2100/1532		0.1%	15 + 0 - 0.5	3.2 + 0 - 0.03	12 ± 1
P100/1530 P2100/1530		0.1%	15 + 0 - 0.5	3.0 + 0 - 0.03	12 ± 1
P100/1528 P2100/1528		0.1%	15 + 0 - 0.5	2.8 + 0 - 0.03	12 ± 1
P100/1524 P2100/1524		0.1%	15 + 0 - 0.5	2.4 + 0 - 0.03	12 ± 1
P100/1520 P2100/1520		0.1%	15 + 0 - 0.5	2.0 + 0 - 0.03	12 ± 1
P100/1516 P2100/1516		0.1%	15 + 0 - 0.5	1.6 + 0 - 0.03	12 ± 1
P100/1516/16 Square		0.1%	15 + 0 - 0.5	1.6 + 0/-5% X 1.6 ± 0/-5%	12 ± 1
P100/1515 P2100/1515		0.1%	15 + 0 - 0.5	1.5 + 0 - 0.03	12 ± 1
P100/1512		0.1%	15 + 0 - 0.5	1.2 ± 0 - 0.03	12 ± 1
P100/1509		0.1%	15 + 0 - 0.5	0.9 ± 5%	12 ± 1
P100/1508		0.1%	15 + 0 - 0.5	0.8 + 0 - 0.1	12 ± 1
P100/1016		0.1%	10 + 0 - 0.5	1,6 + 0 - 0.03	8 ± 1