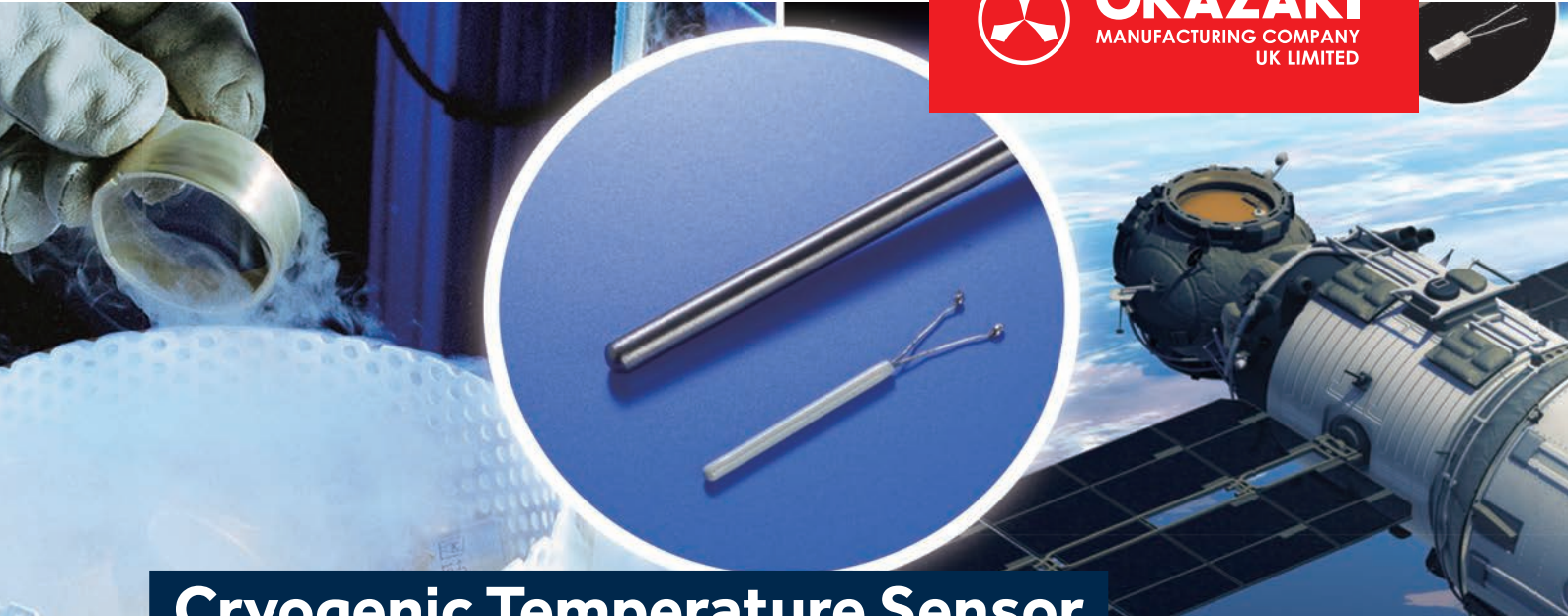


Okazaki Manufacturing Company UK Limited  
Ashwood House, 66 Cardiff Road, Taffs Well, Cardiff, CF15 7QE  
Office: +44 (0)29 2081 4333 Email: sales@okazaki-mfg.co.uk



**OKAZAKI**  
MANUFACTURING COMPANY  
UK LIMITED



## Cryogenic Temperature Sensor

### Highly accurate measurement of cryogenic temperatures as low as 1.5 K. **PATENTED**

The CERACOIL platinum cobalt resistance thermometer enables highly accurate measurements of temperatures below  $-200^{\circ}\text{C}$ , a range that is difficult to measure with widely used platinum resistance thermometers. Measurements are also provided with no effects from the environment, including medical fields and other situations that generate magnetic fields.

### Advanced performance based on sensor technology for Aerospace application.

Our platinum resistance thermometer includes technology found in temperature sensors used in space and made available for consumer use, resulting in high-precision measurements. We are also currently developing a  $10,000\Omega$  device using a thin film element.

**CERACOIL platinum cobalt resistance thermometer**

Patent No.: Patent 5216947 (P5216947)

**Specifications:**

- (1) Nominal resistance: PtCo 100Ω / 1000Ω at 0°C
- (2) Measurement temperature range: 1.5 K to 373 K
- (3) Tolerance: ±0.5 K at 4 K to 40 K / ±1 K at 273.15 K
- (4) Reproducibility: ±20 mK (at 10 K) / ±10 mK (at 20 K) / ±33 mK (at 273.15 K)
- (5) Measuring current: 1 mA

**Note:** Reproducibility is the change amount from the initial value after 1000 heat cycles between 77 K and 300 K.

**CERACOIL 1000Ω platinum resistance thermometer**

**Specifications:**

- (1) Nominal resistance: 1000Ω at 0°C
- (2) Measurement temperature range: 74 K to 373 K
- (3) Tolerance: JIS CLASS A
- (4) Measuring current: 1 mA

**CERACOIL 100Ω platinum resistance thermometer**

**Specifications:**

- (1) Nominal resistance: 100Ω at 0°C
- (2) Measurement temperature range: 74 K to 373 K
- (3) Tolerance: ±0.5 K at 90 K to 130 K ±0.5 K at 273.15 K
- (4) Measuring current: 1 mA

**External spiral-type 1000Ω platinum resistance thermometer**

**Specifications:**

- (1) Nominal resistance: 1000Ω at 0°C
- (2) Measurement temperature range: 4 K to 373 K
- (3) Calibration temperature: 4 K, 77 K or 90 K, 273.15 K, 373.15 K  
A Temperature – Resistance Characteristics Table based on the calibration value is created and included.
- (4) Measuring current: 1 mA

**Reference Outline Drawings**

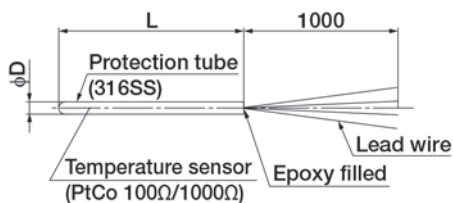


Fig 1. Capsule type

PtCo	D (mm)	L (mm)
100Ω	2.0	25
1000Ω	3.5	50

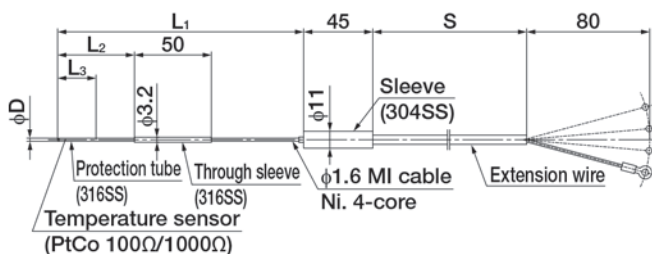


Fig 2. Sheath type

PtCo	D (mm)	L (mm)
100Ω	2.0	25
1000Ω	3.5	50

## CERACOIL platinum cobalt resistance thermometer

### PtCo 100Ω Temperature – Resistance Table

Absolute temperature	Resistance	Absolute temperature	Resistance	Absolute temperature	Resistance	Absolute temperature	Resistance
K	Ω	K	Ω	K	Ω	K	Ω
1.5	7.329	20.0	9.506	120.0	44.134	220.0	81.094
2.0	7.421	30.0	11.246	130.0	47.952	230.0	84.680
3.0	7.606	40.0	13.853	140.0	51.734	240.0	88.252
4.0	7.792	50.0	17.109	150.0	55.482	250.0	91.811
5.0	7.937	60.0	20.759	160.0	59.207	260.0	95.356
6.0	8.066	70.0	24.611	170.0	62.906	270.0	98.890
7.0	8.182	80.0	28.535	180.0	66.583	280.0	102.411
8.0	8.289	90.0	32.477	190.0	70.239	290.0	105.921
9.0	8.388	100.0	36.394	200.0	73.875	300.0	109.419
10.0	8.483	110.0	40.280	210.0	77.493		

### PtCo 1000Ω Temperature – Resistance Table

Absolute temperature	Resistance	Absolute temperature	Resistance	Absolute temperature	Resistance	Absolute temperature	Resistance
K	Ω	K	Ω	K	Ω	K	Ω
1.5	73.290	20.0	95.059	120.0	441.337	220.0	810.942
2.0	74.210	30.0	112.460	130.0	479.515	230.0	846.803
3.0	76.060	40.0	138.527	140.0	517.338	240.0	882.522
4.0	77.920	50.0	171.0889	150.0	554.820	250.0	918.106
5.0	79.370	60.0	207.587	160.0	592.068	260.0	953.562
6.0	80.660	70.0	246.107	170.0	629.065	270.0	988.895
7.0	81.820	80.0	285.346	180.0	665.831	280.0	1024.109
8.0	82.890	90.0	324.766	190.0	702.386	290.0	1059.206
9.0	83.880	100.0	363.939	200.0	738.747	300.0	1094.191
10.0	84.830	110.0	402.804	210.0	774.927		





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[www.okazaki-mfg.co.uk](http://www.okazaki-mfg.co.uk)

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