



# ENCARDIO RITE

ONE STOP MONITORING SOLUTIONS | HYDROLOGY | GEOTECHNICAL | STRUCTURAL | GEODETIC  
Over 50 years of excellence through ingenuity

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USERS' MANUAL

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## RTD TEMPERATURE PROBE

MODEL ETT-10PT



Doc # WI 6002.73 R00 | May 2004

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# 1 INTRODUCTION

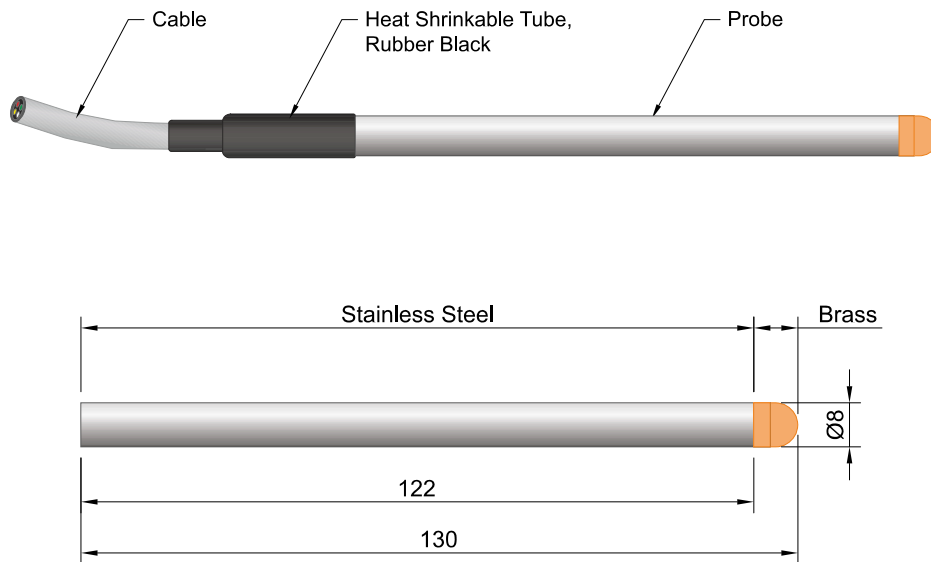
The Encardio-rite model ETT-10PT RTD temperature probe is a low mass waterproof temperature sensor for measurement of temperature between  $-20$  to  $70^{\circ}\text{C}$ . Due to its low thermal mass it has a fast response time. It can be embedded in concrete for measurement of bulk temperature inside concrete and can work submerged under water.

Probes are fully interchangeable and temperature readings will not differ by more than  $\pm 0.3^{\circ}\text{C} + 0.005 |t|^{\circ}\text{C}$  over specified working temperature range.

The temperature probe consists of a Pt 100 element epoxy encapsulated in a thin walled stainless steel tube for faster thermal response and environmental protection. Unless otherwise asked for, the sensor is dispatched from factory with a 1 m long three core cable attached to it.



A dimensional drawing of the probe is given below:



## 2 INSTALLATION

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It is recommended that probe integrity be checked before installation, specially if probe is to be used for embedded application. Measure probe resistance with a multi-meter and check with temperature derivation chart, at end of this manual. The measured value should correspond to prevailing ambient temperature.

For embedded application it should be ensured that once probe is embedded in concrete, subsequent construction work does not damage the probe cable. If required embedded length of cable may be routed through suitable conduits to prevent damage.

The temperature probe is provided with a three-core shielded cable such that it can be used as a 3 wire half bridge. The 3 wire half bridge compensates for lead resistance by assuming that the resistance of the red lead is same as resistance of the black lead.

The resistance of the probe ETT-10PT can be monitored by a 4½ digit multimeter

**Caution:** The RTD element is not self powered. A current must be passed through device to provide a voltage that can be measured. The current causes a heating of the RTD equivalent to  $I^2R$  Joule, changing its temperature. This self heating appears as a measurement error.

Consequently, attention must be paid to magnitude of measurement current supplied by ohmmeter. To reduce error, use minimum ohm measurement current that will give the required resolution.

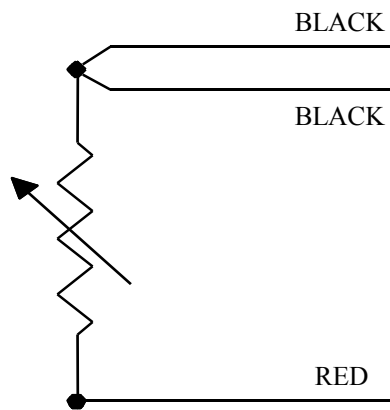
### 3 SPECIFICATIONS

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Type	Pt 100
Probe range	-20 to 70°C
Accuracy	$\pm 0.3^{\circ}\text{C} + 0.005  t ^{\circ}\text{C}$
Resistance	100 $\Omega$ at 0°C
Body material	Stainless steel.
Electrical connection	3 core shielded cable.
Calibration Curve (European)	DIN IEC 751 $\alpha = 0.00385 \text{ Ohms/Ohm/}^{\circ}\text{C}$

### 4 WIRING SCHEMATIC

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## 5 TEMPERATURE DERIVATION CHART

(For European Curve, Alpha =0.00385)

Resistance Ohms	Temp. ° C	Resistance Ohms	Temp. ° C	Resistance Ohms	Temp. ° C
92.16	-20	103.90	10	115.54	40
92.55	-19	104.29	11	115.93	41
92.95	-18	104.68	12	116.31	42
93.34	-17	105.07	13	116.70	43
93.73	-16	105.46	14	117.08	44
94.12	-15	105.85	15	117.47	45
94.52	-14	106.24	16	117.85	46
94.91	-13	106.63	17	118.24	47
95.30	-12	107.02	18	118.62	48
95.69	-11	107.40	19	119.01	49
96.06	-10	107.79	20	119.40	50
96.48	-9	108.18	21	119.78	51
96.87	-8	108.57	22	120.16	52
97.26	-7	108.96	23	120.55	53
97.65	-6	109.35	24	120.93	54
98.04	-5	109.73	25	121.32	55
98.44	-4	110.12	26	121.70	56
98.83	-3	110.51	27	122.09	57
99.22	-2	110.90	28	122.47	58
99.61	-1	111.28	29	122.86	59
100.00	0	111.67	30	123.24	60
100.39	1	112.06	31	123.62	61
100.78	2	112.45	32	124.01	62
101.07	3	112.83	33	124.39	63
101.56	4	113.22	34	124.77	64
101.95	5	113.61	35	125.16	65
102.34	6	113.99	36	125.54	66
102.73	7	114.38	37	125.92	67
103.12	8	114.77	38	126.31	68
103.51	9	115.15	39	126.69	69
				127.07	70