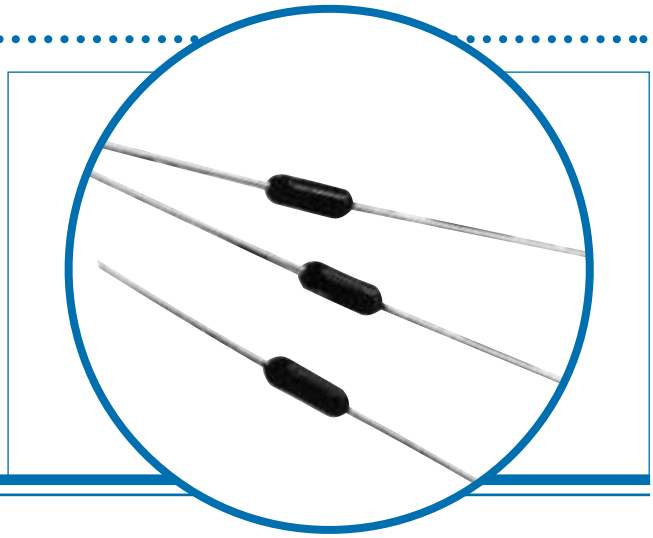
Nickel Film Temperature Sensor

TT electronics
Welwyn Components

TD4

- **Good long term stability**
- **Rugged construction**
- **Extremely economic solution**



Electrical Data

TD4			Actual
Temperature range		°C	-55 to 155
Resistance Range		ohms	20R to 1K
Alpha	R_{25} = 100 ohms	ppm/°C	6000
	R_{25} = 1000 ohms		5850
Standard value		ohms	100
Tolerance	@25°C	±°C	1.0 2.0 4.0
	Tolerance Codes		D F G
Interchangeability	@25°C	±°C	1.0 2.0 4.0
	@100		2.6 3.8 6.1
Self Heating (in air)		mW/°C	0.12
Recommended measuring current		mA	1
Time constant (time to reach 50% of 10°C, in stirred water)		secs	0.4
Insulation resistance		ohms	>1G

Note: Product can be calibrated at the factory, at extra cost

Resistance vs Temperature

Resistance ohms	Temperature °C	Resistance ohms	Temperature °C
66.6	-50	118.1	60
70.6	-40	123.6	70
74.8	-30	129.2	80
79.1	-20	135.0	90
83.5	-10	140.9	100
88.0	0	146.9	110
92.7	10	153.0	120
97.5	20	159.3	130
100	25	165.7	140
102.5	30	172.2	150
107.6	40		
112.8	50		

Resistance v temperature for 100Ω sensor

Definitions

$R = R_0 (1+At+Bt^2)$

$a = \frac{10000 (R_0 - R_{100})}{R_0 (ppm/°C)}$

R_0 : Resistance at 0°C

R_{100} : Resistance at 100°C

t : Temperature

Constants:

A = 0.005247

B = 0.00000753

Ro = 88.0

General Note
Welwyn Components reserves the right to make changes in product specification without notice or liability.
All information is subject to Welwyn's own data and is considered accurate at time of going to print.

© Welwyn Components Limited · Bedlington, Northumberland NE22 7AA, UK
Telephone: +44 (0) 1670 822181 · Facsimile: +44 (0) 1670 829465 · Email: info@welwyn-tt.com · Website: www.welwyn-tt.com

Welwyn
A subsidiary of
TT electronics plc

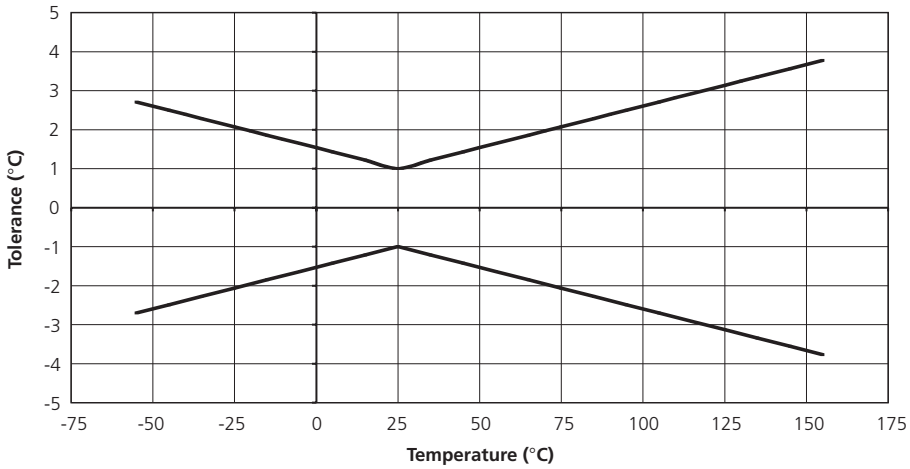
Issue D · 08.03

Nickel Film Temperature Sensor

TD4

TT electronics
Welwyn Components

TD4 tolerance vs temperature



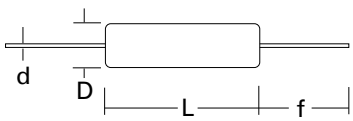
Performance Data for R0 = 100ohms

			Actual Performance
Long term stability (1000hrs @ 155°C)	Resistance @ 25°C	%	0.18
	Equivalent to	°C	0.4
Thermal shock (10 cycles -55°C to 155°C)	Resistance @ 25°C	%	0.02
	Equivalent to	°C	0.04

Physical Data

Dimensions (mm) & Weight (g)

	L max	D max	f min	d nom	PCB mounting centre	Min Bend Radius	Wt. nom
TD4	7.2	2.5	30	0.6	10.2	0.6	0.24



Construction

A nickel film is deposited onto a high quality ceramic rod.

Nickel-plated steel caps are force fitted to the rod and termination wires are welded to the caps.

A laser is used to adjust the resistance value of the sensor by cutting a helix into the film The body is protected with a high purity organic coating.

Terminations

Material Solder-coated copper wire

Strength The terminations meet the requirements of IEC 68.2.21

Solderability The terminations meet the requirements of IEC115-1 Clause 4.17.3.2

Marking

TD4: Type reference, resistance and tolerance code.

Packaging

The standard packaging is in boxes. Taped sensors (on reel or in ammo pack) can also be supplied by special request.

Standard Quantities Per Package

Type	TD4
Small box	250
Large box	1,000
Reel	5,000
Ammo pack	1,000

© Welwyn Components Limited Bedlington, Northumberland NE22 7AA, UK
Telephone: +44 (0) 1670 822181 · Facsimile: +44 (0) 1670 829465 · Email: info@welwyn-tt.com · Website: www.welwyn-tt.com
Issue D · 08.03