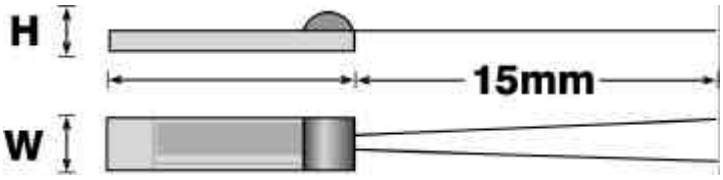
Sensor Scientific, inc.

PLATINUM THIN FILM RTD ELEMENTS



- AVAILABLE IN 100, 500, 1000, AND 2000 OHM RESISTANCE VALUES
- STANDARD IEC 751, ASTME1137 & NON-STANDARD TOLERANCES AVAILABLE
- WIDE CHOICE OF SIZES
- 2, 3, AND 4 WIRE EXTENSION LEADS AVAILABLE
- CUSTOM-ENGINEERED TEMPERATURE PROBE ASSEMBLIES

Sensor Scientific, Inc. Platinum Thin Film RTD Elements are fabricated using state-of-the-art thin film processing techniques, resulting in an element of exceptional quality and stability. The wide choice of resistance, tolerance, and size options allows for complete design flexibility.

RTD elements are available with extension leads, and incorporated in complete temperature probe assemblies. Please contact Sensor Scientific for additional information.

Assemblies:

Generally, thin film RTD elements are incorporated into some type of assembly for protection. Extension leads may be attached via soldering, crimping, brazing or welding. The attachment method must be capable of withstanding the intended maximum operating temperature.

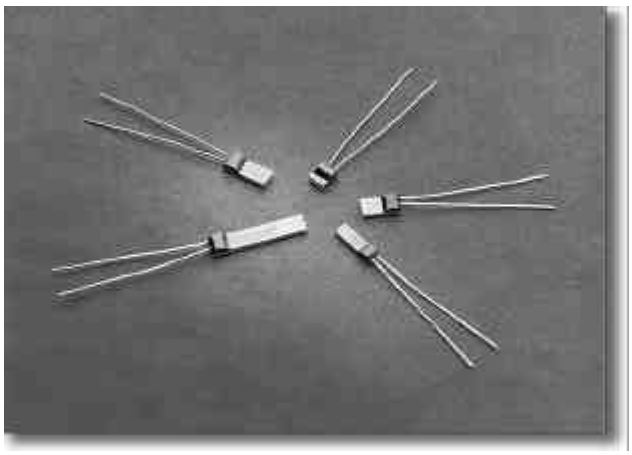
The following precautions must be taken when incorporating the element into an assembly:

1) Avoid straining the element leads.

2) If extension leads are attached via soldering or brazing, all flux residue must be removed.

3) The resistance of extension leads must be taken into consideration. Resistance value at 0°C calibrated 1mm from end of lead wire.

4) If elements are encapsulated in a potting compound, insure that the compound will not induce pressure loads, resulting in a strain-gage effect.



Resistance at 0 Deg. C. ohms	L Length mm	W Width mm	H Height mm	Part Number
100	5.0 +/- 0.2	1.0 +/- 0.2	1.3 +/- 0.2	P01●●■1
100	5.0 +/- 0.2	1.5 +/- 0.2	1.3 +/- 0.2	P01●●■2
100	2.3 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P01●●■3
100	5.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P01●●■4
100	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P01●●■5
100	5.0 +/- 0.2	4.0 +/- 0.2	1.3 +/- 0.2	P01●●■6
100	1.6+/- 0.15	1.25 +/- 0.1	1.00 +/- 0.2	P01●●M7
500	5.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P05●●■1
500	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P05●●■2
500	5.0 +/- 0.2	4.0 +/- 0.2	1.3 +/- 0.2	P05●●■3
1000	4.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P10●●■1
1000	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P10●●■2
1000	5.0 +/- 0.2	4.0 +/- 0.2	1.3 +/- 0.2	P10●●■3
1000	1.6+/- 0.15	1.25 +/- 0.1	1.00 +/- 0.2	P10●●M4
2000	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P20●●■4

Resistance value at 0°C calibrated 1mm from end of lead wire. DIN = IEC751

●● - Tolerance
01 = 1/10 DIN B at 0°C
02 = 1/5 DIN B at 0°C
03 = 1/4 DIN B at 0°C
04 = 1/3 DIN B at 0°C
0A = 1/2 DIN B (DIN A) at 0°C
0B = DIN B
05 = ASTM B
06 = 3/2 DIN B at 0°C
07 = 2 DIN B at 0°C
08 = 5 DIN B at 0°C
09 = 10 DIN B at 0°C

■ - Temperature Range
L = -50 to + 400 Deg C
M = -50 to + 550 Deg C
H = -50 to + 600 Deg C

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Reference Table For Pt RTD Elements

°C	Ω	°C	Ω	°C	Ω
-200	18.52	+160	161.05	+510	284.30
-190	22.83	+170	164.77	+520	287.62
-180	27.10	+180	168.48	+530	290.92
-170	31.34	+190	172.17	+540	294.21
-160	35.54	+200	175.86	+550	297.49
-150	39.72	+210	179.53	+560	300.75
-140	43.88	+220	183.19	+570	304.01
-130	48.00	+230	186.84	+580	307.25
-120	52.11	+240	190.47	+590	310.49
-110	56.19	+250	194.10	+600	313.71
-100	60.26	+260	197.71		
-90	64.30	+270	201.31		
-80	68.33	+280	204.90		
-70	72.33	+290	208.48		
-60	76.33	+300	212.05		
-50	80.31	+310	215.61		
-40	84.27	+320	219.15		
-30	88.22	+330	222.68		
-20	92.16	+340	226.21		
-10	96.09	+350	229.72		
0	100.00	+360	233.21		
+10	103.90	+370	236.70		
+20	107.79	+380	240.18		
+30	111.67	+390	243.64		
+40	115.54	+400	247.09		
+50	119.40	+410	250.53		
+60	123.24	+420	253.96		
+70	127.08	+430	257.38		
+80	130.90	+440	260.78		
+90	134.71	+450	264.18		
+100	138.51	+460	267.56		
+110	142.29	+470	270.93		
+120	146.07	+480	274.29		
+130	149.83	+490	277.64		
+140	153.58	+500	280.98		

Reference Tables are available in 5°C and 1°C increments upon request

Nominal Resistance: 100 ohms @ 0°C

For Nominal resistance values other than 100 Ω @ °C resistance values from the table are corrected using the equation $R_0 X10^{-2}$ where R_0 = nominal resistance at 0°C.

- Mean temperature coefficient between 0 and 100°C = $3.85 \times 10^{-3} \times K^{-1}$ (in accordance with IEC 751,2:1995-07 [DIN EN 60751;1996-07])
- Calculation of Resistance values:
  Equations acc. to IEC 751,2: 1995-07 (DIN EN 60751: 1996-07)
  Temperature range from -200 to 0°C:
  $R_t + R_0 (1 + At + Bt^2 + C(t - 100°C) t^3]$
  Temperature range from 0 to +850°C:
  $R_t + R_0 (1 + At + Bt^2)$
  Where: $A = 3.9083 \times 10^{-3}$ °C^{-1}; $B = -5.775 \times 10^{-7}$ °C^{-2}; $C = -4.183 \times 10^{-12}$ °C^4
  R_t is the resistance in Ω at temperature t
  t is the temperature in °C
- Resistance values from -200 to -250°C were obtained by our own fixed point measurement

The permissible deviations for platinum resistance elements are determined by the following equations (in accordance with IEC 751,2: 1995- 07 [DIN EN 60751: 1996-07]):

Permissible deviation in °C = ±(0.15 + 0.002 [t]) for Class A
Permissible deviation in °C = ±(0.3 + 0.005 [t]) for Class B

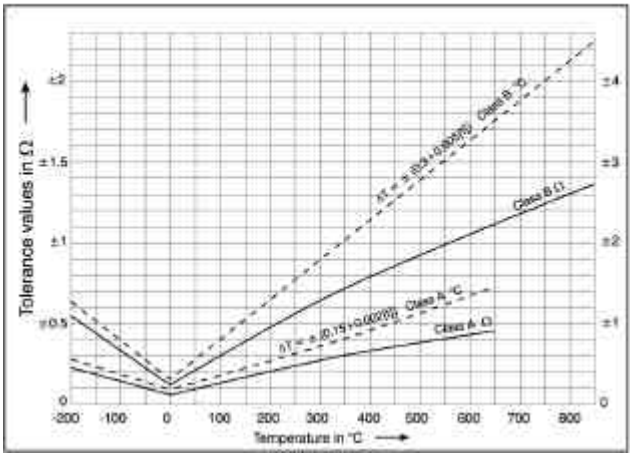
Where [t] is the temperature value (in °C)

Deviations in °C apply to all nominal resistances; deviations in Ω only to 100 Ω.

For nominal resistance values other than 100 Ω the deviation values in Ω must be multiplied by the factor $R_0 X 10^{-2}$.

Other tolerances are available

Tolerance				
	Class A		Class B	
temp°C	Ω	°C	Ω	°C
-200	±0.24	±0.55	±0.56	±1.3
-100	±0.14	±0.35	±0.32	±0.8
0	±0.06	±0.15	±0.12	±0.3
100	±0.13	±0.35	±0.30	±0.8
200	±0.20	±0.55	±0.48	±1.3
300	±0.27	±0.75	±0.64	±1.8
400	±0.33	±0.95	±0.79	±2.3
500	±0.38	±1.15	±0.93	±2.8
600	±0.43	±1.35	±1.06	±3.3
650	±0.46	±1.45	±1.13	±3.6
700	-	-	±1.17	±3.8
800	-	-	±1.28	±4.3
850	-	-	±1.34	±4.6



Part Number	Response time in seconds				Self-heating			
	Water v=0.2 m/s flow		Air 1 m/s flow		Coefficient mW/K		Current (mA) required to self heat 0.1K at 20°C	
	T 0.5	T 0.9	T 0.5	T 0.9	water 0.2 m/s flow	air 1 m/s flow	water 0.2 m/s flow	air 1 m/s flow
P01●●■1	0.05	0.2	4	10	40	4	6	2
P01●●■2	0.07	0.3	6	20	40	6	6	2
P01●●■3	0.05	0.2	4	10	40	4	6	2
P01●●■4	0.07	0.3	6	20	40	6	6	2
P01●●■5	0.07	0.3	6	20	89	6	10	2
P01●●■6	0.11	0.3	6	20	89	6	10	2
P05●●■1	0.07	0.3	6	20	35	6	3	1
P05●●■2	0.07	0.3	6	20	110	6	4	1
P05●●■3	0.11	0.3	6	20	100	6	4	1
P10●●■1	0.07	0.3	6	20	35	6	2	1
P10●●■2	0.07	0.3	6	20	110	6	3	1
P10●●■3	0.11	0.3	6	20	100	6	3	1

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