

# RTD SPECIFICATIONS

## STANDARD RTD ELEMENT SPECIFICATIONS

ELEMENT MATERIAL*	RESISTANCE @ 0°C	TEMPERATURE COEFFICIENT	OPERATING RANGE†	AVAILABLE ACCURACIES @ 0°C
Platinum	100 Ohm	.00385	-200 to 850°C	± .5% ± .1% ± .06% ± .01%
Platinum	100 Ohm	.00391	-200 to 600°C	± .1% ± .06%
Copper	10 Ohm	.00427	-200 to 204°C	± .2% ± .5%
Nickel	120 Ohm	.00672	-200 to 204°C	± .3% ± .5%

\* Sensing elements of other materials and temperature coefficients are available upon request.

† Stated operating ranges are typical values and are dependant upon the sensing element and the construction style of the sensor assembly. Assemblies to exceed the stated limits may be available upon request.

### RTD Elements

Aircom can supply elements of several different materials, base resistances, temperature coefficients, accuracies and configurations for installation into RTD assemblies that meet customer supplied requirements. The most common element we use is Platinum with a base resistance of 100 ohms @ 0°C, accuracy of ± 0.5% and temperature coefficient of 0.00385 ohms/ohm/°C. The second most common element is a 392 curve (0.00392 ohms/ohm/°C) element found in most Japanese and a few American made assemblies. Our most common construction of these elements is a Platinum wound element enclosed in a ceramic housing. Process conditions may dictate use of other types of element construction such as Thin-Film, Glass Bulb, or Kapton insulated. The following standards dictate the specifications to which our elements are manufactured to:

#### For 0.00385 ohms/ohm/°C elements

- International Electromechanical Commission Standard IEC 751, 1995
- British Standards Institution BS 1904, 1984
- Deutsches Institut fur Normung (Germany) DIN 43760, 1987

#### For 0.00392 ohms/ohm/°C elements

- Scientific Apparatus Manufacturers Association SAMA RC21-4-196
- Japanese Standards Association JIS C 1604-1989

RESISTANCE/TEMPERATURE		
	Copper	Nickel
Base resistance:	10 Ω at 25°C	120 Ω at 0°C
TCR (Ω/Ω°C)	.00427	.00672
Sensitivity (Average Ω/°C)	0.039	0.806
Temperature (°C)	Resistance (ohms)	
-100	5.128	120.00
-80	5.923	66.60
-60	6.712	79.62
-40	7.490	92.76
-20	8.263	106.15
0	9.035	120.00
20	9.807	134.52
40	10.580	149.79
60	11.352	165.90
80	12.124	182.84
100	12.897	200.64
120	13.669	219.29
140	14.442	238.85
160	15.217	259.30
180	15.996	280.77
200	16.776	303.46
220	17.555	327.53
240	18.335	353.14
260	19.116	380.31

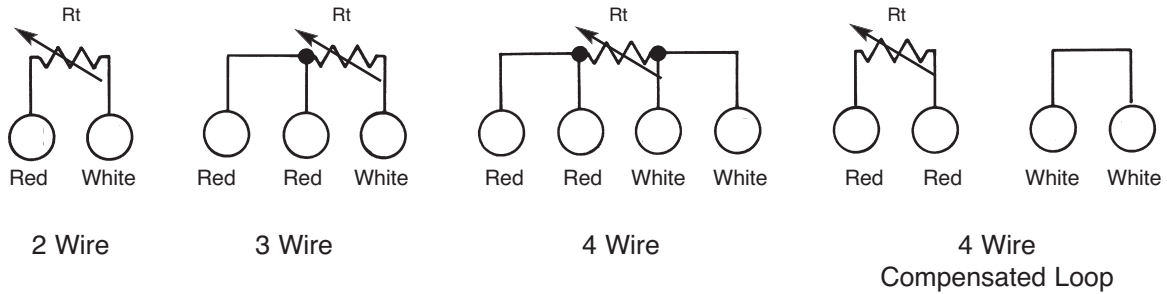
RESISTANCE/TEMPERATURE			
Platinum Elements			
Resistance at 0°C: TCR (Ω/Ω°C)	100 Ω .00392	100 Ω .00391	100 Ω .00385
Sensitivity (Average Ω/°C)	0.392	0.391	0.385
Temperature (°C)	Resistance (Ohms)		
-200	17.00	17.26	18.52
-180	25.72	25.97	27.10
-160	34.31	34.54	35.54
-140	42.80	43.01	43.88
-120	51.19	51.37	52.11
-100	59.49	59.64	60.25
-80	67.71	67.83	68.32
-60	75.87	75.96	76.33
-40	83.96	84.03	84.27
-20	92.01	92.04	92.16
0	100.00	100.00	100.00
20	107.95	107.92	107.79
40	115.85	115.78	115.54
60	123.70	123.60	123.24
80	131.50	131.38	130.90
100	139.26	139.11	138.51
120	146.97	146.79	146.07
140	154.64	154.42	153.58
160	162.25	162.01	161.05
180	169.82	169.55	168.48
200	177.35	177.04	175.86
220	184.82	184.49	183.19
240	192.25	191.89	190.47
260	199.64	199.24	197.71
280	206.97	206.55	204.90
300	214.26	213.81	212.05
320	221.50	221.02	219.15
340	228.70	228.19	226.21
360	235.85	235.31	233.21
380	242.95	242.38	240.18
400	250.00	249.41	247.09
420	257.01	256.39	253.96
440	263.97	263.32	260.78
460	270.88	270.21	267.56
480	277.75	277.04	274.29
500	284.57	283.84	280.98
520	291.34	290.58	287.62
540	298.06	297.28	294.21
560	304.74	303.93	300.75
580	311.37	310.54	307.25
600	317.96	317.09	313.71
620	324.49	323.60	320.12
640	330.98	330.07	326.48
660	337.43	336.49	332.79
680	343.82	342.86	339.06
700	350.17	349.18	345.28
720			351.46
740			357.59
760			363.67
780			369.71
800			375.70
820			381.65
840			387.54
850			390.48

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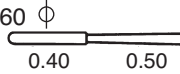
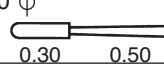
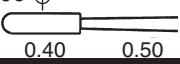
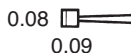
RTD INTERCHANGEABILITY			
Temperature °C	Platinum RTD		
	±0.06% at 0°C	±0.1% at 0°C	±0.5% at 0°C
-200	±0.55°C	±1.3°C	±2.1°C
-100	±0.35°C	±0.8°C	±1.7°C
0	±0.15°C	±0.3°C	±1.3°C
20	±0.19°C	±0.4°C	±1.6°C
100	±0.35°C	±0.8°C	±2.9°C
200	±0.55°C	±1.3°C	±4.4°C
260	±0.67°C	±1.6°C	±5.5°C
300	±0.75°C	±1.8°C	
400	±0.95°C	±2.3°C	
500	±1.15°C	±2.8°C	
600	±1.35°C	±3.3°C	
700		±3.8°C	
800		±4.3°C	
850		±4.6°C	

Temperature °C	Copper RTD		Nickel RTD	
	±0.02% at 25°C	±0.5% at 25°C	±0.3% at 0°C	±0.5% at 0°C
-100	±1.5°C	±2.2°C		
0	±0.7°C	±1.5°C	±0.5°C	±0.8°C
20	±0.5°C	±1.3°C	±0.8°C	±1.2°C
100	±1.5°C	±2.5°C	±1.8°C	±2.2°C
150	±2.2°C	±3.3°C	±2.5°C	±3.0°C
200	±2.8°C	±4.1°C	±3.1°C	±3.7°C
260	±3.6°C	±5.1°C	±3.4°C	±4.0°C

### WIRING CONFIGURATIONS:



### ELEMENT DIMENSIONS:

Dimensions in inches	R (0°C)	Temperature Range	Leads	63% response time Sec. in water, 0.4 m/s
<b>550°C wire-wound elements</b>				
 0.060 $\phi$ 0.40 0.50	100 $\Omega$	-100 to 550°C	0.010" (0.25 mm) $\phi$ Platinum alloy	0.14
 0.080 $\phi$ 0.30 0.50	100 $\Omega$	-100 to 550°C	0.010" (0.25 mm) $\phi$ Platinum alloy	0.18
 0.100 $\phi$ 0.40 0.50	100 $\Omega$	-100 to 550°C	0.014" (0.35 mm) $\phi$ Platinum alloy	0.22
<b>400°C and 600°C thin-film elements</b>				
0.055 THICK  0.08 0.09 Lead Length: 0.4	100 $\Omega$	-70 to 400°C	0.010" $\phi$ Ag 0.004 $\Omega$ /mm/lead	0.2
	100 $\Omega$	-70 to 600°C	0.008" (0.20 mm) $\phi$ Pd 0.036 $\Omega$ /mm/lead	0.2