Temperature Sensors:
Thermocouple Wire Specifications

Insulation Characteristics

Insulation Code	Wire Insulation Type	Shield	Abrasion Resistance	Moisture Resistance	Insulation Temperature Rating
GG	Fiberglass Braid		Fair	Fair	900ºF (482ºC)
GW	Fiberglass Wrap		Fair	Fair	900ºF (482ºC)
HTG	Ceramic Braid, High Temperature		Poor	Poor	2200ºF (1205ºC)
KK	Kapton (fused tape)		Excellent	Excellent	500ºF (260ºC)
NN	Nylon		Excellent	Excellent	350ºF (176ºC)
PM	Polyvinyl Chloride (PVC)	Mylar Drain Line	Good	Excellent	221ºF (105ºC)
PV	Polyvinyl Chloride (PVC)		Good	Excellent	221ºF (105ºC)
TF	Teflon, TFE (fused tape)		Very Good	Excellent	500ºF (260ºC)
TT	Teflon, FEP		Very Good	Excellent	400ºF (204ºC)
VS	Vitreous Silica Fibre		Poor	Poor	1400ºF (760ºC)

Upper Temperature Limits for Thermocouple Wire Gauge

Temperature limits for standard thermocouples that are protected with a closed-end protection tube are shown. These limits are suggested for continuous temperature sensing where thermal limitation of the insulation is not a factor. For unprotected thermocouples these limits should be reduced for equivalent service life.

Thermocouple Wire Type	ANSI Type Symbol	Wire Gauge(AWG) 8 ga.	14 ga.	20 ga.	24 ga.	30 ga.
Copper-Constantan	T		370°C (700°F)	260°C (500°F)	200°C (400°F)	150°C (300°F)
*Iron-Constantan	J	760°C (1400°F)	600°C (1100°F)	500°C (900°F)	370°C (700°F)	320°C (600°F)
Chromel™-Constantan	E	870°C (1600°F)	650°C (1200°F)	550°C (1000°F)	430°C (800°F)	430°C (800°F)
Chromel™-*Alumel™	K	370°C (700°F)	1100°C (2000°F)	1000°C (1800°F)	870°C (1600°F)	760°C (1400°F)
Nicrosil-Nisil	N	1260°C (2300°F)	1100°C (2000°F)	1000°C (1800°F)	870°C (1600°F)	760°C (1400°F)
Platinum-10% Rhodium	S				1480°C (2700°F)	
Platinum-13% Rhodium	R				1480°C (2700°F)	
Platinum-30% vs 6% Rhodium	B				1700°C (3100°F)	
Tungsten-26% Rhenium	WR†				2300°C (4200°F)	
Tungsten-3% vs. 25% Rhenium	W3†				2300°C (4200°F)	
Tungsten-5% vs. 26% Rhenium	W5†				2300°C (4200°F)	

*Magnetic ™Trademark Hoskins Mfg. Co. †Not ANSI symbol

Nominal Thermocouple Resistance Ohms Double Foot @ 68°F (20°C)

Wire Ga B & S	Wire Size DIA.	ANSI TYPES J	K	T	E	S	R	B
6	.162	.014	.023	.012	.027	.007	.007	.008
*7	.144	.021						
8	.128	.022	.036	.019	.044	.010	.010	.013
14	.064	.089	.147	.074	.176	.044	.044	.054
16	.050	.141	.232	.117	.277	.069	.069	.086
18	.040	.229	.377	.190	.450	.112	.113	.139
20	.032	.357	.588	.297	.702	.175	.178	.218
24	.020	.905	1.488	.745	1.778	.449	.453	.550
26	.015	1.441	2.45	1.20	2.84	.701	.708	.875
28	.012	2.297	3.59	1.92	4.33	1.062	1.073	1.392
30	.010	3.65	6.02	2.94	7.19	1.794	1.813	2.213
36	.005	14.66	24.08	12.22	28.80	7.150	7.226	8.897

American Wire Gauge (AWG)	Size DIA. Inches
7/0	
6/0	0.5800
5/0	0.5165
4/0	0.4600
3/0	0.4096
2/0	0.3648
1/0	0.3249
1	0.2893
2	0.2576
3	0.2294
4	0.2043
5	0.1819
6	0.1620
7	0.1443
8	0.1285
9	0.1144
10	0.1019
11	0.0907
12	0.0808
13	0.0720
14	0.0641
15	0.0571
16	0.0508
17	0.0453
18	0.0403
19	0.0359
20	0.0320
21	0.0285
22	0.0253
23	0.0226
24	0.0201
25	0.0179
26	0.0159
27	0.0142
28	0.0126
29	0.0113
30	0.0100
31	0.00893
32	0.00795
33	0.00708
34	0.00630
35	0.00561
36	0.0500
37	0.00445
38	0.00396
39	0.00353
40	0.00314
41	0.00280
42	0.00249
43	0.00222
44	0.00198
45	0.00176
46	0.00157
47	0.00140
48	0.00124
49	0.00111
50	0.00099