



# DURATHERM

PROCESSING SYSTEMS, INC.

## “TRUTEMP” Sensor Element Specifications And Initial Calibration Tolerances

"TRUTEMP" sensors are manufactured to rigid specifications. Thermocouple materials and testing conform to standard tolerances of ANSI Circular MC96.1-1982. Platinum RTD elements conform to DIN specification 43760, with a temperature coefficient of .000385 ohms/ohm/°C. Special tolerances and specifications are available on a special order basis, at additional cost.

For critical applications, Duratherm can provide complete calibration, traceable to the National Institute of Standards and Technology. Equipment is available to test your sensors over a wide range of temperatures. When calibration is requested, tested materials and components will be tagged and supplied with a calibration report. If calibration services are required, contact our sales office for details.

### Thermocouple Specifications And Initial Calibration Tolerances For Standard Temperature Ranges

ANSI T/C Calibration	ANSI Wire Designation	ANSI Color Codes	Typical Generic And Trade Names*	Magnetic Properties	Temperature Range		Tolerances**	
					Degrees F.	Degrees C.	Standard	Special
T	TP	Blue	Copper	None	32 - 662	0 - 350	± 1.0 °C Or ± 0.75 %	± 0.5 °C Or ± 0.4 %
	TN	Red	Constantan	None				
J	JP	White	Iron	Strong	32 - 1382	0 - 750	± 2.2 °C Or ± 0.75 %	± 1.1 °C Or ± 0.4 %
	JN	Red	Constantan	None				
E	EP	Purple	Chromel	None	32 - 1652	0 - 900	± 1.7 °C Or ± 0.5 %	± 1.1 °C Or ± 0.4 %
	EN	Red	Constantan	None				
K	KP	Yellow	Chromel	None	32 - 2282	0 - 1250	± 2.2 °C Or ± 0.75 %	± 1.1 °C Or ± 0.4 %
	KN	Red	Alumel	Weak				
R	RP	Black	Platinum 13% Rhodium	None	32 - 2462	0 - 1450	± 1.5 °C Or ± 0.25 %	± 0.6 °C Or ± 0.1 %
	RN	Red	Platinum	None				
S	SP	Black	Platinum 10% Rhodium	None	32 - 2642	0 - 1450	± 1.5 °C Or ± 0.25 %	± 0.6 °C Or ± 0.1 %
	SN	Red	Platinum	None				
B	BP	Grey	Platinum 30% Rhodium	None	1598 - 3092	870 - 1700	± 0.5 °C	N/A
	BN	Red	Platinum 6% Rhodium	None				
N	NP	Orange	Nicrosil	None	32 - 2282	0 - 1250	± 2.2 °C Or ± 0.75 %	± 1.1 °C Or ± 0.4 %
	NN	Red	Nisil	None				

### Thermocouple Specifications And Initial Calibration Tolerances For Cryogenic Temperature Ranges\*\*\*

ANSI T/C Calibration	ANSI Wire Designation	ANSI Color Codes	Typical Generic And Trade Names*	Magnetic Properties	Temperature Range		Tolerances**	
					Degrees F.	Degrees C.	Standard	Special
T	TP	Blue	Copper	None	-328 - 32	-200 - 0	± 1.0 °C Or ± 1.5 %	N/A
	TN	Red	Constantan	None				
E	EP	Purple	Chromel	None	-328 - 32	-200 - 0	± 1.7 °C Or ± 1.0 %	N/A
	EN	Red	Constantan	None				
K	KP	Yellow	Chromel	None	-328 - 32	-200 - 0	± 2.2 °C Or ± 2.0 %	N/A
	KN	Red	Alumel	Weak				

\* Trade Names - Chromel and Alumel - Hoskins Manufacturing Co.

\*\* When tolerances are given in two values, appropriate tolerances are determined by selecting the larger of the two values shown.

\*\*\* Thermocouples are normally calibrated for standard temperature ranges. If cryogenic use is intended, your order must specifically request cryogenic tolerances.

Temperature	Resistance Value	DIN 43760 Tolerances				Industrial Tolerances	
		Class A		Class B		Class C	
-200 °C	18.49 Ohms	± 0.55 °C	± 0.24 Ohms	± 1.3 °C	± 0.56 Ohms	± 2.27 °C	± 1.15 Ohms
-100 °C	60.25 Ohms	± 0.35 °C	± 0.14 Ohms	± 0.8 °C	± 0.32 Ohms	± 1.77 °C	± 0.71 Ohms
0 °C	100.00 Ohms	± 0.15 °C	± 0.06 Ohms	± 0.3 °C	± 0.12 Ohms	± 1.27 °C	± 0.50 Ohms
100 °C	138.50 Ohms	± 0.35 °C	± 0.13 Ohms	± 0.8 °C	± 0.30 Ohms	± 1.77 °C	± 0.67 Ohms
200 °C	175.84 Ohms	± 0.55 °C	± 0.20 Ohms	± 1.3 °C	± 0.48 Ohms	± 2.27 °C	± 0.83 Ohms
300 °C	212.02 Ohms	± 0.75 °C	± 0.27 Ohms	± 1.8 °C	± 0.64 Ohms	± 2.77 °C	± 0.98 Ohms
400 °C	247.04 Ohms	± 0.95 °C	± 0.33 Ohms	± 2.3 °C	± 0.79 Ohms	± 3.27 °C	± 1.10 Ohms
500 °C	280.90 Ohms	± 1.15 °C	± 0.38 Ohms	± 2.8 °C	± 0.93 Ohms	± 3.77 °C	± 1.22 Ohms
600 °C	313.59 Ohms	± 1.35 °C	± 0.43 Ohms	± 3.3 °C	± 1.06 Ohms	± 4.27 °C	± 1.32 Ohms
650 °C	329.51 Ohms	± 1.45 °C	± 0.46 Ohms	± 3.6 °C	± 1.13 Ohms	± 4.52 °C	± 1.36 Ohms