RESISTANCE TEMPERATURE DETECTORS

RTD ASSEMBLY TEMPERATURE RANGES

STYLE: R1L, R2L, R3L & R4L — The maximum rated temperature for these four styles is 500° F. Typically they are constructed with Teflon leads and the lead end is protected with an epoxy seal. This epoxy seal provides a moisture resistant barrier.

STYLE: R1M, R2M, R3M & R4M — The maximum rated temperature for these next four styles is 900° F. They are constructed with high temperature fiberglass insulated conductors. The lead end is sealed and protected with a high temperature cement.

STYLE: R1P, R2P, R3P & R4P — The maximum rated temperature for these last four styles is 1200° F. Their construction features highly compacted magnesium oxide insulation. Nickel conductors provide for extended temperature ratings and harsh environments.

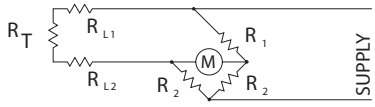
Custom manufactured RTD assemblies are available for operating temperatures up to 1500° F. Please consult Durex engineering for specifications and construction details.

AVAILABLE RTD ELEMENTS

CODE	ELEMENT TYPE	TEMPERATURE COEFFICIENT	TOLERANCE AT 0 C
A	100 ohm Platinum	.00385	.1%
B	100 ohm Platinum	.00385	.06%
C	100 ohm Platinum	.00385	.03%
D	500 ohm Platinum	.00385	.1%
E	1000 ohm Platinum	.00385	.1%
F	2000 ohm Platinum	.00385	.1%
G	100 ohm Platinum	.00392	.1%
H	100 ohm Platinum	.00392	.03%
J	120 ohm Nickel	.00672	.5%
K	604 ohm Nickel Iron	.00520	.5%

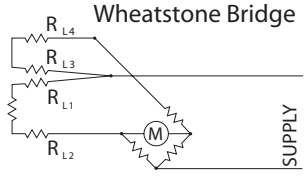
WIRING DIAGRAMS

2 Wire, Wheatstone Bridge



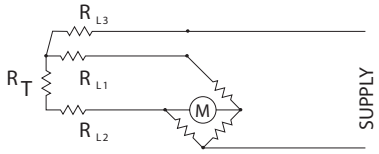
The meter reads R_T + the two lead resistances, R_{L1} and R_{L2}.

4 Wire, Compensated Wheatstone Bridge



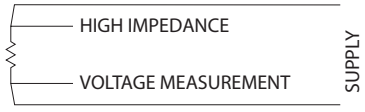
In this type R_{L3} and R_{L4} appear in one arm of the bridge. R_{L1} and R_{L2} appear in the other. Errors are $R_{L1}+R_{L2}- R_{L3}-R_{L4}$.

3 Wire, Wheatstone Bridge



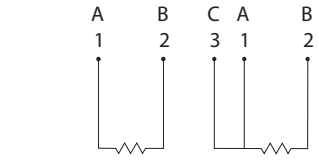
One lead resistance is included in each of two arms of the bridge. The errors reduce to $R_{L1} - R_{L2}$.

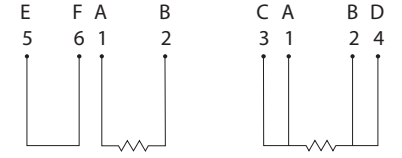
4 Wire, Connected



Errors can be made negligible by having a very high input impedance amplifier.

Internal Wiring Diagram





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RESISTANCE TEMPERATURE DETECTORS

GENERAL SPECIFICATIONS

Unless otherwise specified, Durex's RTD assemblies include photo-lithographically structured, high-purity platinum thin-film elements laser trimmed to precise resistance values. These sensors feature brief response times, excellent long term stability, low self heating and excellent resistance to vibration and temperature shocks.

Thermal Response Time:

The response time $T_{0.63}$ is the time the sensors need to respond to 63% of the change in temperature. The response time depends on the sheath dimension, but can be as low as 1.2 seconds.

Long Term Stability:

The change of ohmage after 1,000 hrs at maximum operating temperature amounts to less than 0.03%.

Self Heating:

To measure the resistance an electric current has to flow through the element, which will generate heat energy resulting in errors of measurement. To minimize error, the testing current should be kept low (approximately 1 mA for Pt-100).

Temperature error $\Delta T = \frac{R\, I^2}{E}$; with

E = self-heating coefficient in mW/K
R = resistance in kΩ,
I = measuring current in mA.

The self-heating coefficient (E) for the standard elements used in Durex RTD assemblies is 4 mW/K in air and 40mW/K in water.

Measuring Current:

Measurement current causes heating of the platinum thin-film sensor. The resulting temperature error is given by: $\Delta T = P/E$ with P (the power loss) = I^2R, and E (the self heating coefficient) in mW/K.

The amount of thermal transfer from the sensor in application determines how much measuring current can be applied. There is no bottom limit of the measurement current with platinum thin-film. The measurement current depends highly on the application in use.

We recommend at:

100 Ω : typ. 1mA max. 5 mA
500 Ω: typ. 0.5 mA max. 3 mA
1000 Ω: typ. 0.3 mA max. 2 mA
2000 Ω: typ. 0.2 mA max. 1 mA

RESISTANCE TEMPERATURE DETECTORS

GENERAL SPECIFICATIONS

Nominal Values:

The nominal or rated value of the sensor is the target value of the sensor resistance at 0˚C. The temperature coefficient α is defined as $\alpha = \frac{R_{100} - R_0}{100 - R_0}$ $[K^{-1}]$ and has the numerical value of 0.00385 K^{-1} according to DIN IEC 751.

In practice, a value multiplied by 10^6 is often entered: $TCR = 10^6 * \frac{R_{100} - R_0}{100 - R_0}$ [ppm/K].
In this case, the numerical value is 3850 ppm/K.

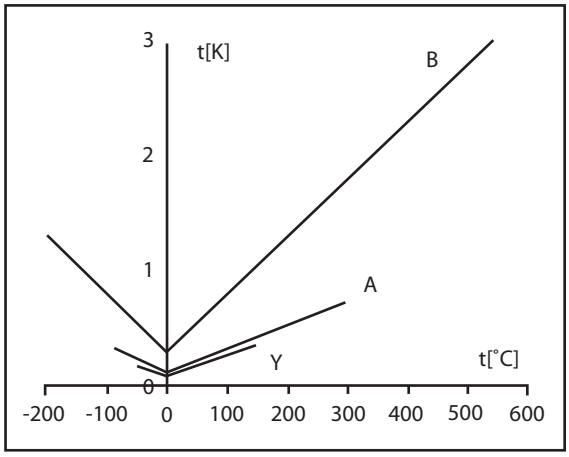
Temperature Characteristic Curve:

The temperature characteristic curve determines the dependence of the electrical resistivity on the temperature. The following definition of the temperature curve according to DIN EN 60751 standard applies:

-200 to 0˚C $R(t) = R_0 (1+A*t+B*t^2+C*[t-100]*t^3)$
0 to 850˚C $R(t) = R_0 (1+A*t+B*t^2)$

Platinum (3850 ppm/K):
$A = 3.9083 * 10^{-3}$ [˚C^{-1}]; $B = -5.775 * 10^{-7}$ [˚C^{-2}];
$C = -4.183 * 10^{-12}$ [˚C^{-4}]

Platinum (3750 ppm/K):
$A = 3.9083 * 10^{-3}$ [˚C^{-1}]; $B = -6.01888 * 10^{-7}$ [˚C^{-2}];
$C = -6 * 10^{-12}$ [˚C^{-4}]



Tolerance field

R_0 = Resistance value in ohm at 0˚C
t = temperature in accordance with ITS 90

Tolerance Classes:

The temperature sensors are divided into classes according to their limit deviations:

Class	+/- limit deviations in ˚C (K)	IST AG designation	Temperature range
DIN 60751, class B	0.30 + 0.005 x |T|	B	-200˚C to 850˚C
DIN 60751, class A	0.15 + 0.002 x |T|	A	-90˚C to 300˚C
1/3 DIN 60751, class B	0.10 + 0.0017 x |T|	Y	-50˚C to 150˚C

|T| is the numerical value of the temperature in ˚C without taking into account either negative or positive signs.
Special selection of sensors upon request (pairings, grouping, special tolerances)

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RESISTANCE TEMPERATURE DETECTORS

CODE DEFINITIONS

"L" Dimensions

"L" dimensions are specified in whole inches and a single alpha character which represents a fraction. Enter the three digit CODE as follows:

3″	=	030	9 5/8″	=	09K
22 1/8″	=	22B	17 3/4″	=	17M
6 1/4″	=	06D	7 7/8″	=	07P
15 3/8″	=	15F	10 5/8″	=	10K
4 1/2″	=	04H	12″	=	120

"B" Dimensions

"B" dimensions are specified in fractions from 1/8″ to 1″. Use the single alpha character to indicate the tip length. Enter the CODE as follows:

1/8″	=	B	5/8″	=	K
1/4″	=	D	3/4″	=	M
3/8″	=	F	7/8″	=	P
1/2″	=	H	1″	=	S

"A" Dimensions

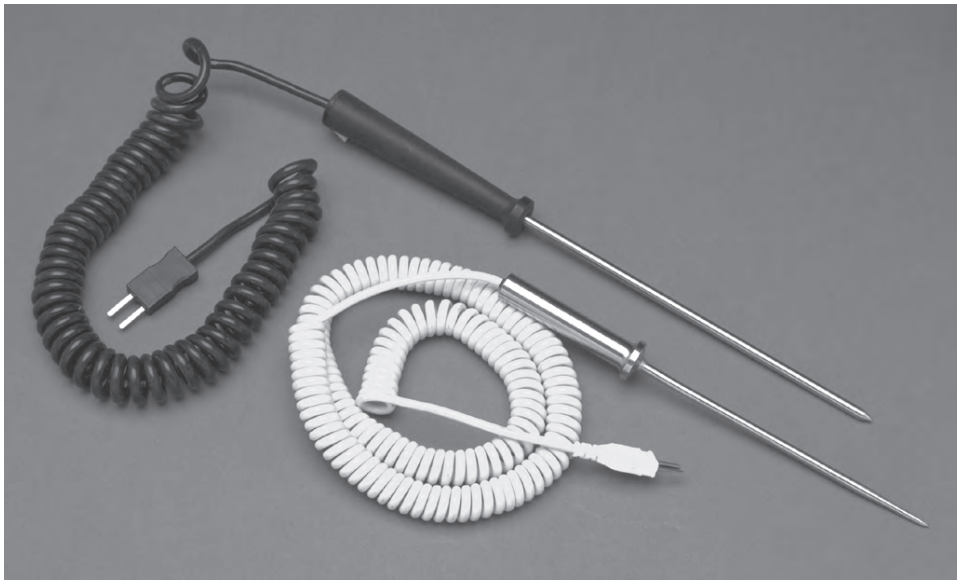
"A" dimensions are specified in whole inches only. Enter three digit CODE as follows:

36″	=	036
144″	=	144
12″	=	012
9″	=	009

Fractional Dimension Letter CODE

1/16″	=	A	5/8″	=	K
1/8″	=	B	11/16″	=	L
3/16″	=	C	3/4″	=	M
1/4″	=	D	13/16″	=	N
5/16″	=	E	7/8″	=	P
3/8″	=	F	15/16″	=	R
7/16″	=	G	1″	=	S
1/2″	=	H	0	=	NO Fraction
9/16″	=	J			

CALIBRATION SERVICES



Durex RTD calibrations are fully traceable to the National Institute of Standards and Technology (NIST) and are useful for defining the exact temperature coefficient of the sensor. For sensor applications below 32˚F (0˚C), a cryogenic range calibration is recommended. Certificates are supplied with all calibrations. Printed tables of interpolated values are only supplied with cryogenic range calibrations.

RESISTANCE TEMPERATURE DETECTORS

RTD Temperature vs. Resistance Table

For European Curve, Alpha = 0.00385, ITS-90 — **1° Celsius Increments**

°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.
-200	18.52		-140	43.88	0.42	-80	68.33	0.41	-20	92.16	0.39	±0	100.00	0.39	+60	123.24	0.38
-199	18.96	0.44	-139	44.29	0.41	-79	68.73	0.40	-19	92.55	0.39	+1	100.39	0.39	61	123.62	0.38
-198	19.39	0.43	-138	44.71	0.42	-78	69.13	0.40	-18	92.95	0.40	2	100.78	0.39	62	124.01	0.39
-197	19.82	0.43	-137	45.12	0.41	-77	69.53	0.40	-17	93.34	0.39	3	101.17	0.39	63	124.39	0.38
-196	20.25	0.43	-136	45.53	0.41	-76	69.93	0.40	-16	93.73	0.39	4	101.56	0.39	64	124.77	0.38
-195	20.68	0.43	-135	45.95	0.42	-75	70.33	0.40	-15	94.12	0.39	5	101.95	0.39	65	125.17	0.40
-194	21.11	0.43	-134	46.35	0.40	-74	70.73	0.40	-14	94.52	0.40	6	102.34	0.39	66	125.55	0.38
-193	21.54	0.43	-133	46.76	0.41	-73	71.13	0.40	-13	94.91	0.39	7	102.73	0.39	67	125.93	0.38
-192	21.97	0.43	-132	47.18	0.42	-72	71.53	0.40	-12	95.30	0.39	8	103.12	0.39	68	126.32	0.39
-191	22.40	0.43	-131	47.59	0.41	-71	71.93	0.40	-11	95.69	0.39	9	103.51	0.39	69	126.70	0.38
-190	22.83	0.43	-130	48.00	0.41	-70	72.33	0.40	-10	96.09	0.40	10	103.90	0.39	70	127.08	0.38
-189	23.26	0.43	-129	48.41	0.41	-69	72.73	0.40	-9	96.48	0.39	11	104.29	0.39	71	127.46	0.38
-188	23.69	0.43	-128	48.82	0.41	-68	73.13	0.40	-8	96.87	0.39	12	104.68	0.39	72	127.85	0.39
-187	24.12	0.43	-127	49.23	0.41	-67	73.53	0.40	-7	97.26	0.39	13	105.07	0.39	73	128.23	0.38
-186	24.55	0.43	-126	49.64	0.41	-66	73.93	0.40	-6	97.65	0.39	14	105.46	0.39	74	128.61	0.38
-185	24.97	0.42	-125	50.06	0.42	-65	74.33	0.40	-5	98.04	0.39	15	105.85	0.39	75	128.99	0.38
-184	25.39	0.42	-124	50.47	0.41	-64	74.73	0.40	-4	98.44	0.40	16	106.24	0.39	76	129.38	0.39
-183	25.82	0.43	-123	50.88	0.41	-63	75.13	0.40	-3	98.83	0.39	17	106.63	0.39	77	129.76	0.38
-182	26.25	0.43	-122	51.29	0.41	-62	75.53	0.40	-2	99.22	0.39	18	107.02	0.39	78	130.14	0.38
-181	26.67	0.42	-121	51.70	0.41	-61	75.93	0.40	-1	99.61	0.39	19	107.40	0.38	79	130.52	0.38
-180	27.10	0.43	-120	52.11	0.41	-60	76.33	0.40				20	107.79	0.39	80	130.90	0.38
-179	27.52	0.42	-119	52.52	0.41	-59	76.73	0.40				21	108.18	0.39	81	131.28	0.38
-178	27.95	0.43	-118	52.92	0.40	-58	77.13	0.40				22	108.57	0.39	82	131.67	0.39
-177	28.37	0.42	-117	53.33	0.41	-57	77.52	0.39				23	108.96	0.39	83	132.05	0.38
-176	28.80	0.43	-116	53.74	0.41	-56	77.92	0.40				24	109.35	0.39	84	132.43	0.38
-175	29.22	0.42	-115	54.15	0.41	-55	78.32	0.40				25	109.73	0.38	85	132.81	0.38
-174	29.65	0.43	-114	54.56	0.41	-54	78.72	0.40				26	110.12	0.39	86	133.19	0.38
-173	30.07	0.42	-113	54.97	0.41	-53	79.11	0.39				27	110.51	0.39	87	133.57	0.38
-172	30.49	0.42	-112	55.38	0.41	-52	79.51	0.40				28	110.90	0.39	88	133.95	0.38
-171	30.92	0.43	-111	55.78	0.40	-51	79.91	0.40				29	111.28	0.38	89	134.33	0.38
-170	31.34	0.42	-110	56.19	0.41	-50	80.31	0.40				30	111.67	0.39	90	134.71	0.38
-169	31.76	0.42	-109	56.60	0.41	-49	80.70	0.39				31	112.06	0.39	91	135.09	0.38
-168	32.18	0.42	-108	57.00	0.40	-48	81.10	0.40				32	112.45	0.39	92	135.47	0.38
-167	32.61	0.43	-107	57.41	0.41	-47	81.50	0.40				33	112.83	0.38	93	135.85	0.38
-166	33.03	0.42	-106	57.82	0.41	-46	81.89	0.39				34	113.22	0.39	94	136.23	0.38
-165	33.45	0.42	-105	58.22	0.40	-45	82.29	0.40				35	113.61	0.39	95	136.61	0.38
-164	33.86	0.41	-104	58.63	0.41	-44	82.69	0.40				36	113.99	0.38	96	136.99	0.38
-163	34.28	0.42	-103	59.04	0.41	-43	83.08	0.39				37	114.38	0.39	97	137.37	0.38
-162	34.70	0.42	-102	59.44	0.40	-42	83.48	0.40				38	114.77	0.39	98	137.75	0.38
-161	35.12	0.42	-101	59.85	0.41	-41	83.88	0.40				39	115.15	0.38	99	138.13	0.38
-160	35.54	0.42	-100	60.26	0.41	-40	84.27	0.39				40	115.54	0.39	100	138.51	0.38
-159	35.96	0.42	-99	60.67	0.41	-39	84.67	0.40				41	115.93	0.39	101	138.89	0.38
-158	36.38	0.42	-98	61.07	0.40	-38	85.06	0.39				42	116.31	0.38	102	139.27	0.38
-157	36.80	0.42	-97	61.48	0.41	-37	85.46	0.40				43	116.70	0.39	103	139.65	0.38
-156	37.22	0.42	-96	61.87	0.41	-36	85.85	0.39				44	117.08	0.38	104	140.03	0.38
-155	37.63	0.41	-95	62.29	0.42	-35	86.25	0.40				45	117.47	0.39	105	140.39	0.36
-154	38.05	0.42	-94	62.69	0.40	-34	86.64	0.39				46	117.85	0.38	106	140.77	0.38
-153	38.47	0.42	-93	63.10	0.41	-33	87.04	0.40				47	118.24	0.39	107	141.15	0.38
-152	38.89	0.42	-92	63.50	0.40	-32	87.43	0.39				48	118.62	0.38	108	141.53	0.38
-151	39.31	0.42	-91	63.91	0.41	-31	87.83	0.40				49	119.01	0.39	109	141.91	0.38
-150	39.72	0.41	-90	64.30	0.39	-30	88.22	0.39				50	119.40	0.39	110	142.29	0.38
-149	40.14	0.42	-89	64.70	0.40	-29	88.62	0.40				51	119.78	0.38	111	142.66	0.37
-148	40.56	0.42	-88	65.11	0.41	-28	89.01	0.39				52	120.16	0.38	112	143.04	0.38
-147	40.97	0.41	-87	65.51	0.40	-27	89.40	0.39				53	120.55	0.39	113	143.42	0.38
-146	41.39	0.42	-86	65.91	0.40	-26	89.80	0.40				54	120.93	0.38	114	143.80	0.38
-145	41.80	0.41	-85	66.31	0.40	-25	90.19	0.39				55	121.32	0.39	115	144.18	0.38
-144	42.22	0.42	-84	66.72	0.41	-24	90.59	0.40				56	121.70	0.38	116	144.56	0.38
-143	42.64	0.42	-83	67.12	0.40	-23	90.98	0.39				57	122.09	0.39	117	144.94	0.38
-142	43.05	0.41	-82	67.52	0.40	-22	91.37	0.39				58	122.47	0.38	118	145.32	0.38
-141	43.46	0.41	-81	67.92	0.40	-21	91.77	0.40				59	122.86	0.39	119	145.69	0.37

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RESISTANCE TEMPERATURE DETECTORS

RTD Temperature vs. Resistance Table

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°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.
+120	146.07	0.38	+180	168.48	0.37	+240	190.47	0.36	+300	212.05	0.36	+360	233.21	0.35	+420	253.96	0.34
121	146.45	0.38	181	168.85	0.37	241	190.83	0.36	301	212.40	0.35	361	233.56	0.35	421	254.30	0.34
122	146.82	0.37	182	169.22	0.37	242	191.20	0.37	302	212.76	0.36	362	233.91	0.35	422	254.65	0.35
123	147.20	0.38	183	169.59	0.37	243	191.56	0.36	303	213.12	0.36	363	234.26	0.35	423	254.99	0.34
124	147.58	0.38	184	169.96	0.37	244	191.92	0.36	304	213.47	0.35	364	234.60	0.36	424	255.33	0.34
125	147.95	0.37	185	170.33	0.37	245	192.28	0.36	305	213.83	0.36	365	234.95	0.35	425	255.67	0.34
126	148.33	0.38	186	170.69	0.36	246	192.66	0.38	306	214.19	0.36	366	235.30	0.35	426	256.01	0.34
127	148.71	0.38	187	171.06	0.37	247	193.02	0.36	307	214.55	0.36	367	235.65	0.35	427	256.35	0.34
128	149.08	0.37	188	171.43	0.37	248	193.38	0.36	308	214.90	0.35	368	236.00	0.35	428	256.70	0.35
129	149.46	0.38	189	171.80	0.37	249	193.74	0.36	309	215.26	0.36	369	236.35	0.35	429	257.04	0.34
130	149.83	0.37	190	172.17	0.37	250	194.10	0.36	310	215.61	0.35	370	236.70	0.35	430	257.38	0.34
131	150.21	0.38	191	172.54	0.37	251	194.47	0.37	311	215.97	0.36	371	237.05	0.35	431	257.72	0.34
132	150.58	0.37	192	172.91	0.37	252	194.83	0.36	312	216.32	0.35	372	237.40	0.35	432	258.06	0.34
133	150.96	0.38	193	173.27	0.36	253	195.19	0.36	313	216.68	0.36	373	237.75	0.35	433	258.40	0.34
134	151.34	0.38	194	173.64	0.37	254	195.55	0.36	314	217.03	0.35	374	238.09	0.34	434	258.74	0.34
135	151.71	0.37	195	174.01	0.37	255	195.90	0.35	315	217.39	0.36	375	238.44	0.35	435	259.08	0.34
136	152.09	0.38	196	174.39	0.38	256	196.26	0.36	316	217.73	0.34	376	238.79	0.35	436	259.42	0.34
137	152.46	0.37	197	174.75	0.36	257	196.62	0.36	317	218.08	0.35	377	239.14	0.35	437	259.76	0.34
138	152.84	0.38	198	175.12	0.37	258	196.98	0.36	318	218.44	0.36	378	239.48	0.34	438	260.10	0.34
139	153.21	0.37	199	175.49	0.37	259	197.35	0.37	319	218.79	0.35	379	239.83	0.35	439	260.44	0.34
140	153.58	0.37	200	175.86	0.37	260	197.71	0.36	320	219.15	0.36	380	240.18	0.35	440	260.78	0.34
141	153.95	0.37	201	176.23	0.37	261	198.07	0.36	321	219.50	0.35	381	240.52	0.34	441	261.12	0.34
142	154.32	0.37	202	176.59	0.36	262	198.43	0.36	322	219.85	0.35	382	240.87	0.35	442	261.46	0.34
143	154.71	0.39	203	176.96	0.37	263	198.79	0.36	323	220.21	0.36	383	241.22	0.35	443	261.80	0.34
144	155.08	0.37	204	177.33	0.37	264	199.15	0.36	324	220.56	0.35	384	241.56	0.34	444	262.14	0.34
145	155.46	0.38	205	177.70	0.37	265	199.51	0.36	325	220.91	0.35	385	241.91	0.35	445	262.48	0.34
146	155.83	0.37	206	178.06	0.36	266	199.87	0.36	326	221.27	0.36	386	242.25	0.34	446	262.83	0.35
147	156.21	0.38	207	178.43	0.37	267	200.23	0.36	327	221.62	0.35	387	242.60	0.35	447	263.17	0.34
148	156.58	0.37	208	178.80	0.37	268	200.59	0.36	328	221.97	0.35	388	242.95	0.35	448	263.50	0.33
149	156.96	0.38	209	179.16	0.36	269	200.95	0.36	329	222.32	0.35	389	243.29	0.34	449	263.84	0.34
150	157.33	0.37	210	179.53	0.37	270	201.31	0.36	330	222.68	0.36	390	243.64	0.35	450	264.18	0.34
151	157.71	0.38	211	179.90	0.37	271	201.67	0.36	331	223.03	0.35	391	243.98	0.34	451	264.52	0.34
152	158.08	0.37	212	180.26	0.36	272	202.03	0.36	332	223.38	0.35	392	244.33	0.35	452	264.86	0.34
153	158.45	0.37	213	180.63	0.37	273	202.38	0.35	333	223.73	0.35	393	244.67	0.34	453	265.20	0.34
154	158.83	0.38	214	180.99	0.36	274	202.74	0.36	334	224.09	0.36	394	245.02	0.35	454	265.54	0.34
155	159.20	0.37	215	181.36	0.37	275	203.10	0.36	335	224.45	0.36	395	245.36	0.34	455	265.87	0.33
156	159.56	0.36	216	181.73	0.37	276	203.46	0.36	336	224.80	0.35	396	245.71	0.35	456	266.21	0.34
157	159.94	0.38	217	182.09	0.36	277	203.82	0.36	337	225.15	0.35	397	246.05	0.34	457	266.55	0.34
158	160.31	0.37	218	182.46	0.37	278	204.18	0.36	338	225.50	0.35	398	246.40	0.35	458	266.89	0.34
159	160.68	0.37	219	182.82	0.36	279	204.54	0.36	339	225.85	0.35	399	246.74	0.34	459	267.22	0.33
160	161.05	0.37	220	183.19	0.37	280	204.90	0.36	340	226.21	0.36	400	247.09	0.35	460	267.56	0.34
161	161.43	0.38	221	183.55	0.36	281	205.25	0.35	341	226.56	0.35	401	247.43	0.34	461	267.90	0.34
162	161.80	0.37	222	183.92	0.37	282	205.61	0.36	342	226.91	0.35	402	247.78	0.35	462	268.24	0.34
163	162.17	0.37	223	184.28	0.36	283	205.97	0.36	343	227.26	0.35	403	248.12	0.34	463	268.57	0.33
164	162.54	0.37	224	184.65	0.37	284	206.33	0.36	344	227.61	0.35	404	248.46	0.34	464	268.91	0.34
165	162.91	0.37	225	185.01	0.36	285	206.70	0.37	345	227.96	0.35	405	248.81	0.35	465	269.25	0.34
166	163.28	0.37	226	185.38	0.37	286	207.05	0.35	346	228.31	0.35	406	249.15	0.34	466	269.58	0.33
167	163.66	0.38	227	185.74	0.36	287	207.41	0.36	347	228.66	0.35	407	249.50	0.35	467	269.92	0.34
168	164.03	0.37	228	186.11	0.37	288	207.77	0.36	348	229.01	0.35	408	249.84	0.34	468	270.26	0.34
169	164.40	0.37	229	186.47	0.36	289	208.13	0.36	349	229.36	0.35	409	250.18	0.34	469	270.59	0.33
170	164.77	0.37	230	186.84	0.37	290	208.48	0.35	350	229.72	0.34	410	250.53	0.35	470	270.93	0.34
171	165.14	0.37	231	187.20	0.36	291	208.84	0.36	351	230.07	0.35	411	250.89	0.34	471	271.27	0.34
172	165.51	0.37	232	187.56	0.36	292	209.20	0.36	352	230.42	0.35	412	251.21	0.34	472	271.60	0.33
173	165.88	0.37	233	187.93	0.37	293	209.55	0.35	353	230.77	0.35	413	251.55	0.34	473	271.94	0.34
174	166.25	0.37	234	188.29	0.36	294	209.91	0.36	354	231.12	0.35	414	251.90	0.35	474	272.27	0.33
175	166.62	0.37	235	188.65	0.36	295	210.27	0.36	355	231.47	0.35	415	252.24	0.34	475	272.61	0.34
176	167.00	0.38	236	189.02	0.37	296	210.62	0.35	356	231.81	0.36	416	252.59	0.35	476	272.95	0.34
177	167.37	0.37	237	189.38	0.36	297	210.98	0.36	357	232.16	0.35	417	252.94	0.35	477	273.28	0.33
178	167.74	0.37	238	189.74	0.36	298	211.34	0.36	358	232.51	0.35	418	253.28	0.34	478	273.62	0.34
179	168.11	0.37	239	190.11	0.37	299	211.69	0.35	359	232.86	0.35	419	253.62	0.34	479	273.95	0.33

RESISTANCE TEMPERATURE DETECTORS

RTD Temperature vs. Resistance Table

For European Curve, Alpha = 0.00385, ITS-90 **1° Celsius Increments**

°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.	°C	Ohms	Diff.
+480	274.29	0.34	+542	294.87	0.33	+604	315.00	0.32	+666	334.68	0.32	+728	353.91	0.30	+790	372.71	0.30
481	274.62	0.33	543	295.20	0.33	605	315.32	0.32	667	334.99	0.31	729	354.22	0.31	791	373.01	0.30
482	274.96	0.34	544	295.53	0.33	606	315.64	0.32	668	335.31	0.32	730	354.53	0.31	792	373.31	0.30
483	275.29	0.33	545	295.85	0.32	607	315.96	0.32	669	335.62	0.31	731	354.83	0.30	793	373.61	0.30
484	275.63	0.34	546	296.18	0.33	608	316.28	0.32	670	335.93	0.31	732	355.14	0.31	794	373.91	0.30
485	275.96	0.33	547	296.51	0.33	609	316.60	0.32	671	336.25	0.32	733	355.44	0.30	795	374.21	0.30
486	276.31	0.34	548	296.84	0.33	610	316.92	0.32	672	336.56	0.31	734	355.75	0.31	796	374.51	0.30
487	276.64	0.33	549	297.16	0.32	611	317.24	0.32	673	336.87	0.31	735	356.06	0.31	797	374.80	0.29
488	276.97	0.33	550	297.49	0.33	612	317.56	0.32	674	337.18	0.31	736	356.37	0.31	798	374.10	0.30
489	277.31	0.34	551	297.82	0.33	613	317.88	0.32	675	337.50	0.32	737	356.68	0.31	799	375.40	0.30
490	277.64	0.33	552	298.14	0.32	614	318.20	0.32	676	337.81	0.31	738	356.98	0.30	800	375.70	0.30
491	277.98	0.34	553	298.47	0.33	615	318.52	0.32	677	338.12	0.31	739	357.29	0.31	801	376.00	0.30
492	278.31	0.33	554	298.80	0.33	616	318.85	0.33	678	338.43	0.31	740	357.59	0.30	802	376.29	0.29
493	278.64	0.33	555	299.12	0.32	617	319.17	0.32	679	338.75	0.32	741	357.90	0.31	803	376.59	0.30
494	278.98	0.34	556	299.45	0.33	618	319.49	0.32	680	339.06	0.31	742	358.20	0.30	804	376.89	0.30
495	279.31	0.33	557	299.78	0.33	619	319.81	0.32	681	339.37	0.31	743	358.51	0.31	805	377.19	0.30
496	279.64	0.33	558	300.10	0.32	620	320.12	0.31	682	339.68	0.31	744	358.81	0.30	806	377.49	0.30
497	279.98	0.34	559	300.43	0.33	621	320.44	0.32	683	339.99	0.31	745	359.12	0.31	807	377.79	0.30
498	280.31	0.33	560	300.75	0.32	622	320.76	0.32	684	340.30	0.31	746	359.42	0.30	808	378.09	0.30
499	280.64	0.33	561	301.08	0.33	623	321.08	0.32	685	340.62	0.32	747	359.72	0.30	809	378.39	0.30
500	280.98	0.34	562	301.41	0.33	624	321.40	0.32	686	340.94	0.32	748	360.03	0.31	810	378.68	0.29
501	281.31	0.33	563	301.73	0.32	625	321.72	0.32	687	341.25	0.31	749	360.33	0.30	811	378.98	0.30
502	281.64	0.33	564	302.06	0.33	626	322.03	0.31	688	341.55	0.30	750	360.64	0.31	812	379.28	0.30
503	281.97	0.33	565	302.38	0.32	627	322.34	0.31	689	341.87	0.32	751	360.94	0.30	813	379.57	0.29
504	282.31	0.34	566	302.71	0.33	628	322.66	0.32	690	342.18	0.31	752	361.24	0.30	814	379.87	0.30
505	282.64	0.33	567	303.03	0.32	629	322.98	0.32	691	342.49	0.31	753	361.55	0.31	815	380.17	0.30
506	282.97	0.33	568	303.36	0.33	630	323.30	0.32	692	342.80	0.31	754	361.85	0.30	816	380.46	0.29
507	283.30	0.33	569	303.68	0.32	631	323.61	0.31	693	343.11	0.31	755	362.15	0.30	817	380.76	0.30
508	283.63	0.33	570	304.01	0.33	632	323.93	0.32	694	343.42	0.31	756	362.46	0.31	818	381.05	0.29
509	283.97	0.34	571	304.33	0.32	633	324.25	0.32	695	343.73	0.31	757	362.76	0.30	819	381.35	0.30
510	284.30	0.33	572	304.66	0.33	634	324.57	0.32	696	344.04	0.31	758	363.06	0.30	820	381.65	0.30
511	284.63	0.33	573	304.98	0.32	635	324.88	0.31	697	344.35	0.31	759	363.36	0.30	821	381.94	0.29
512	284.96	0.33	574	305.30	0.32	636	325.21	0.33	698	344.66	0.31	760	363.67	0.31	822	382.24	0.30
513	285.29	0.33	575	305.63	0.33	637	325.53	0.32	699	344.97	0.31	761	363.97	0.30	823	382.53	0.29
514	285.62	0.33	576	305.95	0.32	638	325.85	0.32	700	345.28	0.31	762	364.27	0.30	824	382.83	0.30
515	285.95	0.33	577	306.28	0.33	639	326.16	0.31	701	345.59	0.31	763	364.57	0.30	825	383.12	0.29
516	286.30	0.35	578	306.60	0.32	640	326.48	0.32	702	345.90	0.31	764	364.88	0.31	826	383.42	0.30
517	286.63	0.33	579	306.92	0.32	641	326.79	0.31	703	346.21	0.31	765	365.18	0.30	827	383.71	0.29
518	286.96	0.33	580	307.25	0.33	642	327.11	0.32	704	346.52	0.31	766	365.49	0.31	828	384.01	0.30
519	287.29	0.33	581	307.57	0.32	643	327.43	0.32	705	346.83	0.31	767	365.79	0.30	829	384.30	0.29
520	287.62	0.33	582	307.89	0.32	644	327.74	0.31	706	346.15	0.32	768	366.09	0.30	830	384.60	0.30
521	287.95	0.33	583	308.22	0.33	645	328.06	0.32	707	347.46	0.31	769	366.40	0.31	831	384.89	0.29
522	288.28	0.33	584	308.54	0.32	646	328.38	0.32	708	347.76	0.30	770	366.70	0.30	832	385.18	0.29
523	288.61	0.33	585	308.86	0.32	647	328.69	0.31	709	348.07	0.31	771	367.00	0.30	833	385.48	0.30
524	288.94	0.33	586	309.19	0.33	648	329.01	0.32	710	348.38	0.31	772	367.30	0.30	834	385.77	0.29
525	289.27	0.33	587	309.51	0.32	649	329.32	0.31	711	348.69	0.31	773	367.60	0.30	835	386.07	0.30
526	289.60	0.33	588	309.83	0.32	650	329.64	0.32	712	349.00	0.31	774	367.90	0.30	836	386.37	0.30
527	289.93	0.33	589	310.15	0.32	651	329.95	0.31	713	349.31	0.31	775	368.20	0.30	837	386.66	0.29
528	290.26	0.33	590	310.48	0.33	652	330.27	0.32	714	349.61	0.30	776	368.50	0.30	838	386.96	0.30
529	290.59	0.33	591	310.80	0.32	653	330.58	0.31	715	349.92	0.31	777	368.81	0.31	839	387.25	0.29
530	290.92	0.33	592	311.12	0.32	654	330.90	0.32	716	350.23	0.31	778	369.11	0.30	840	387.55	0.30
531	291.25	0.33	593	311.45	0.33	655	331.21	0.31	717	350.54	0.31	779	369.41	0.30	841	387.84	0.29
532	291.58	0.33	594	311.78	0.33	656	331.53	0.32	718	350.85	0.31	780	369.71	0.30	842	388.13	0.29
533	291.90	0.32	595	312.10	0.32	657	331.84	0.31	719	351.15	0.30	781	370.01	0.30	843	388.42	0.29
534	292.23	0.33	596	312.43	0.33	658	332.16	0.32	720	351.46	0.31	782	370.31	0.30	844	388.72	0.30
535	292.56	0.33	597	312.75	0.32	659	332.47	0.31	721	351.77	0.31	783	370.61	0.30	845	389.01	0.29
536	292.90	0.34	598	313.07	0.32	660	332.79	0.32	722	352.07	0.30	784	370.91	0.30	846	389.31	0.30
537	293.23	0.33	599	313.39	0.32	661	333.10	0.31	723	352.38	0.31	785	371.21	0.30	847	389.61	0.30
538	293.56	0.33	600	313.71	0.32	662	333.41	0.31	724	352.69	0.31	786	371.52	0.31	848	389.90	0.29
539	293.89	0.33	601	314.04	0.33	663	333.73	0.32	725	352.99	0.30	787	371.82	0.30	849	390.19	0.29
540	294.21	0.32	602	314.36	0.32	664	334.04	0.31	726	353.30	0.31	788	372.12	0.30	850	390.48	0.29
541	294.54	0.33	603	314.68	0.32	665	334.36	0.32	727	353.61	0.31	789	372.41	0.29			

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THERMISTOR SENSORS

RESISTANCE CURVES

Durex thermistor assemblies are designed to be reliable low-cost probes for a wide variety of temperature control applications. Configurations can be built for surface measurements, liquid immersion and gas temperature measurements.

	CURVE 3	CURVE 4	CURVE 5	CURVE 6	CURVE 7
Temp.°C	10K	30K	50K	100K	500K
-50	670,090	1,693,200	3,066,000	6,702,000	53,450,000
-40	336,450	884,600	1,572,500	3,365,000	25,200,000
-30	176,960	481,000	841,500	1,770,000	12,465,000
-20	97,072	271,200	468,100	970,800	6,435,000
-10	55,326	158,000	269,400	553,300	3,454,000
0	32,650	94,980	159,950	326,500	1,919,000
10	19,899	58,750	98,400	199,000	1,093,500
20	12,492	37,300	62,250	124,900	644,000
*25	10,000	30,000	50,000	100,000	500,000
0	8,057	24,270	40,400	80,570	390,850
40	5,326	16,150	26,835	53,260	243,700
50	3,602	10,970	18,205	36,020	155,750
60	2,488	7,599	12,600	24,880	101,650
70	1,752	5,359	8,885	17,520	67,850
80	1,255	3,843	6,370	12,560	46,215
90	915.4	2,799	4,642	9,162	32,075
100	678.6	2,069	3,431	6,786	22,645
110	510.6	1,550	2,572	5,102	16,235
120	389.6	1,176	1,953	3,894	11,810
130	301.0	903	1,502	3,010	8,720
140	235.4	701	1,169	2,354	6,525
150	186.1	550	919	1,860	4,944

* Thermistors are ordered usually at their resistance reading at 25°C.*

- Resistance values are nominal and are dependant on specified tolerance of thermistor element.
- Other curves and resistance values are available.
- Negative Temperature Coefficient (NTC) thermistors have a very predictable resistance gain that is inversely proportional to change in ambient temperature. Each thermistor curve has its own slope over a given temperature range.