

Temperature Probe TP1 Series

Data Sheet

This document details the technical specification of TP1 Series (NTC type) temperature probe.

Technical Details TP1:

Sensing element	NTC	Probe housing material	Stainless steel SS316L
No-load resistance at 25°C	10 kΩ	Cable type	2 x 0.16 mm ² silicone / Teflon insulated
Resistance tolerance at 25°C	± 1%	Cable length	3000 / 6000 / 12000 mm
Beta (25/85) constant	3977 K ± 1%	Protection Class	IP68 (Humidity Resistance)
Operating temperature range	-40...150°C	Dielectric Strength	500VAC
Probe length	40 mm	Thermal Time Constant	Less than 6 sec.*
Probe diameter	4 mm	RoHS Compliant	Yes

Note: Tensile loads on the cable to the probe sleeve >20N are not permitted

** Less than 6 seconds for more than 90% of the tested probes (less than 3 sec. for 63%).

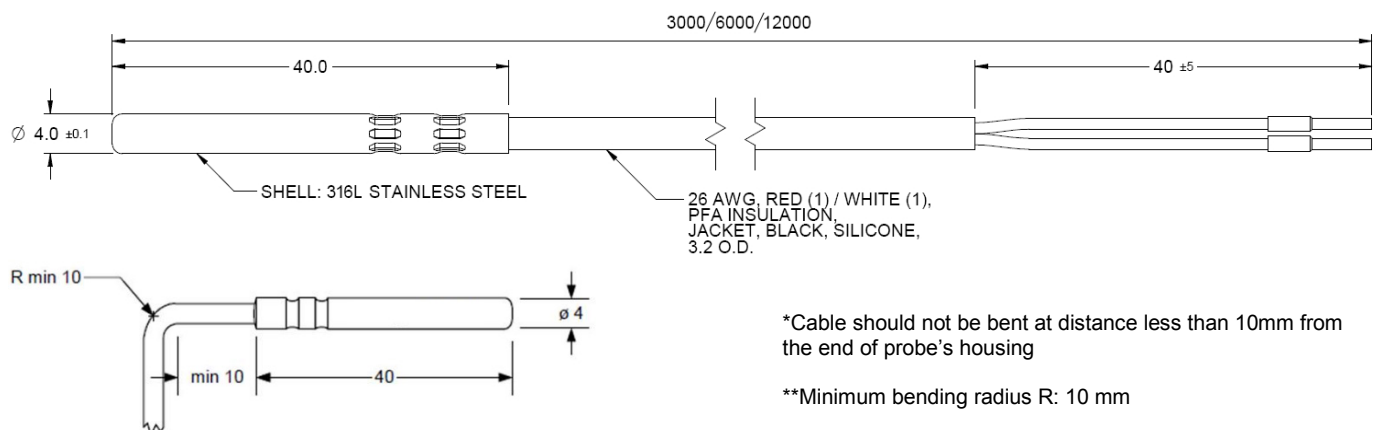
Selection table

Type	Pert No.	Packaging (pcs)
TP1-NP3	804489	1
TP1-NP6	804490	1
TP1-NP12	804491	1
TP1-NP3	804489M	20
TP1-NP6	804490M	20
TP1-NP12	804491M	20

Type Code:

Product Name TP1: Standard version TPA: Customer specific version		TP 1 - N P 1	Cable length 3: 3m 6: 6m 12: 12m
Technology N: NTC 10kΩ M: NTC 10MΩ P: PT1000		Application A: Air Sensor P: Pipe / Bulb-well F: Fin Sensor / Defrost H: High Temperature (discharge) Z: Ultra Low Temperatures	

Dimensions (mm)



*Cable should not be bent at distance less than 10mm from the end of probe's housing

**Minimum bending radius R: 10 mm

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Resistance / Temperature CHARACTERISTIC:

Temp. (°C)	Rmax (kΩ)	Ravg (kΩ)	Rmin (kΩ)	ΔR	-ΔR	ΔT (°C)	
-40	340.7	325.7	311.4	4.6%	-4.4%	0.7	-0.7
-39	319.2	305.4	292.2	4.5%	-4.3%	0.7	-0.7
-38	299.2	286.5	274.3	4.4%	-4.3%	0.7	-0.7
-37	280.6	268.8	257.5	4.4%	-4.2%	0.7	-0.7
-36	263.2	252.3	241.9	4.3%	-4.1%	0.7	-0.7
-35	247.0	236.9	227.2	4.2%	-4.1%	0.7	-0.7
-34	231.9	222.6	213.6	4.2%	-4.0%	0.7	-0.7
-33	217.7	209.1	200.8	4.1%	-4.0%	0.7	-0.7
-32	204.6	196.6	188.9	4.1%	-3.9%	0.7	-0.7
-31	192.3	184.9	177.8	4.0%	-3.8%	0.7	-0.6
-30	180.7	173.9	167.3	3.9%	-3.8%	0.7	-0.6
-29	170.0	163.7	157.6	3.9%	-3.7%	0.7	-0.6
-28	159.9	154.1	148.4	3.8%	-3.7%	0.7	-0.6
-27	150.5	145.1	139.9	3.7%	-3.6%	0.6	-0.6
-26	141.7	136.7	131.8	3.7%	-3.6%	0.6	-0.6
-25	133.5	128.8	124.3	3.6%	-3.5%	0.6	-0.6
-24	125.8	121.4	117.3	3.6%	-3.4%	0.6	-0.6
-23	118.5	114.5	110.7	3.5%	-3.4%	0.6	-0.6
-22	111.8	108.0	104.5	3.4%	-3.3%	0.6	-0.6
-21	105.4	102.0	98.6	3.4%	-3.3%	0.6	-0.6
-20	99.43	96.26	93.15	3.3%	-3.2%	0.6	-0.6
-19	93.85	90.91	88.02	3.2%	-3.2%	0.6	-0.6
-18	88.61	85.88	83.20	3.2%	-3.1%	0.6	-0.6
-17	83.69	81.16	78.67	3.1%	-3.1%	0.6	-0.6
-16	79.07	76.72	74.42	3.1%	-3.0%	0.6	-0.6
-15	74.74	72.56	70.41	3.0%	-3.0%	0.6	-0.5
-14	70.66	68.64	66.64	2.9%	-2.9%	0.5	-0.5
-13	66.83	64.95	63.10	2.9%	-2.8%	0.5	-0.5
-12	63.22	61.48	59.76	2.8%	-2.8%	0.5	-0.5
-11	59.84	58.22	56.62	2.8%	-2.7%	0.5	-0.5
-10	56.65	55.15	53.66	2.7%	-2.7%	0.5	-0.5
-9	53.65	52.25	50.88	2.7%	-2.6%	0.5	-0.5
-8	50.82	49.53	48.25	2.6%	-2.6%	0.5	-0.5
-7	48.16	46.96	45.77	2.6%	-2.5%	0.5	-0.5
-6	45.65	44.54	43.43	2.5%	-2.5%	0.5	-0.5
-5	43.29	42.25	41.23	2.5%	-2.4%	0.5	-0.5
-4	41.06	40.10	39.15	2.4%	-2.4%	0.5	-0.5
-3	38.96	38.07	37.19	2.3%	-2.3%	0.5	-0.5
-2	36.98	36.15	35.33	2.3%	-2.3%	0.5	-0.5
-1	35.11	34.34	33.58	2.2%	-2.2%	0.5	-0.4
0	33.35	32.63	31.92	2.2%	-2.2%	0.4	-0.4
1	31.68	31.02	30.36	2.1%	-2.1%	0.4	-0.4
2	30.11	29.49	28.88	2.1%	-2.1%	0.4	-0.4
3	28.62	28.05	27.48	2.0%	-2.0%	0.4	-0.4
4	27.22	26.68	26.16	2.0%	-2.0%	0.4	-0.4
5	25.89	25.39	24.91	1.9%	-1.9%	0.4	-0.4
6	24.63	24.17	23.72	1.9%	-1.9%	0.4	-0.4
7	23.44	23.02	22.60	1.8%	-1.8%	0.4	-0.4
8	22.32	21.92	21.54	1.8%	-1.8%	0.4	-0.4
9	21.25	20.89	20.53	1.7%	-1.7%	0.4	-0.4
10	20.24	19.91	19.57	1.7%	-1.7%	0.4	-0.4
11	19.29	18.98	18.67	1.6%	-1.6%	0.4	-0.4
12	18.39	18.10	17.81	1.6%	-1.6%	0.3	-0.3

Note: ΔR reflects change in resistance value and ΔB reflects change in Beta value.

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Resistance / Temperature CHARACTERISTIC:

Temp. (°C)	Rmax (kΩ)	Ravg (kΩ)	Rmin (kΩ)	ΔR	-ΔR	ΔT (°C)	
13	17.53	17.26	17.00	1.6%	-1.5%	0.3	-0.3
14	16.72	16.47	16.22	1.5%	-1.5%	0.3	-0.3
15	15.95	15.72	15.49	1.5%	-1.4%	0.3	-0.3
16	15.22	15.00	14.80	1.4%	-1.4%	0.3	-0.3
17	14.52	14.33	14.13	1.4%	-1.4%	0.3	-0.3
18	13.87	13.69	13.51	1.3%	-1.3%	0.3	-0.3
19	13.24	13.08	12.91	1.3%	-1.3%	0.3	-0.3
20	12.65	12.50	12.34	1.2%	-1.2%	0.3	-0.3
21	12.09	11.94	11.80	1.2%	-1.2%	0.3	-0.3
22	11.55	11.42	11.29	1.1%	-1.1%	0.3	-0.3
23	11.04	10.92	10.81	1.1%	-1.1%	0.3	-0.2
24	10.56	10.45	10.34	1.0%	-1.0%	0.2	-0.2
25	10.10	10.00	9.90	1.0%	-1.0%	0.2	-0.2
26	9.672	9.572	9.472	1.1%	-1.0%	0.2	-0.2
27	9.264	9.164	9.064	1.1%	-1.1%	0.3	-0.3
28	8.876	8.776	8.677	1.1%	-1.1%	0.3	-0.3
29	8.505	8.406	8.308	1.2%	-1.2%	0.3	-0.3
30	8.153	8.054	7.956	1.2%	-1.2%	0.3	-0.3
31	7.816	7.719	7.622	1.3%	-1.3%	0.3	-0.3
32	7.496	7.399	7.303	1.3%	-1.3%	0.3	-0.3
33	7.190	7.095	7.000	1.4%	-1.3%	0.3	-0.3
34	6.899	6.804	6.710	1.4%	-1.4%	0.3	-0.3
35	6.621	6.527	6.434	1.4%	-1.4%	0.4	-0.4
36	6.355	6.263	6.171	1.5%	-1.5%	0.4	-0.4
37	6.102	6.011	5.920	1.5%	-1.5%	0.4	-0.4
38	5.860	5.770	5.681	1.6%	-1.5%	0.4	-0.4
39	5.629	5.541	5.453	1.6%	-1.6%	0.4	-0.4
40	5.408	5.321	5.235	1.6%	-1.6%	0.4	-0.4
41	5.198	5.112	5.027	1.7%	-1.7%	0.4	-0.4
42	4.996	4.912	4.828	1.7%	-1.7%	0.4	-0.4
43	4.804	4.720	4.638	1.8%	-1.7%	0.5	-0.5
44	4.619	4.538	4.457	1.8%	-1.8%	0.5	-0.5
45	4.443	4.363	4.284	1.8%	-1.8%	0.5	-0.5
46	4.275	4.196	4.118	1.9%	-1.9%	0.5	-0.5
47	4.114	4.036	3.960	1.9%	-1.9%	0.5	-0.5
48	3.960	3.884	3.808	2.0%	-1.9%	0.5	-0.5
49	3.812	3.737	3.663	2.0%	-2.0%	0.5	-0.5
50	3.671	3.597	3.525	2.0%	-2.0%	0.5	-0.5
51	3.535	3.463	3.392	2.1%	-2.1%	0.6	-0.6
52	3.406	3.335	3.265	2.1%	-2.1%	0.6	-0.6
53	3.281	3.212	3.144	2.1%	-2.1%	0.6	-0.6
54	3.162	3.095	3.028	2.2%	-2.2%	0.6	-0.6
55	3.048	2.982	2.916	2.2%	-2.2%	0.6	-0.6
56	2.939	2.874	2.810	2.3%	-2.2%	0.6	-0.6
57	2.834	2.770	2.707	2.3%	-2.3%	0.6	-0.6
58	2.733	2.671	2.609	2.3%	-2.3%	0.7	-0.6
59	2.637	2.576	2.515	2.4%	-2.3%	0.7	-0.7
60	2.544	2.484	2.425	2.4%	-2.4%	0.7	-0.7
61	2.455	2.397	2.339	2.4%	-2.4%	0.7	-0.7
62	2.370	2.313	2.256	2.5%	-2.5%	0.7	-0.7
63	2.288	2.232	2.177	2.5%	-2.5%	0.7	-0.7
64	2.210	2.155	2.100	2.6%	-2.5%	0.7	-0.7

Note: ΔR reflects change in resistance value and ΔB reflects change in Beta value.

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Resistance / Temperature CHARACTERISTIC:

Temp. (°C)	Rmax (kΩ)	Ravg (kΩ)	Rmin (kΩ)	ΔR	-ΔR	ΔT (°C)	
65	2.134	2.080	2.027	2.6%	-2.6%	0.8	-0.7
66	2.062	2.009	1.957	2.6%	-2.6%	0.8	-0.8
67	1.992	1.940	1.889	2.7%	-2.6%	0.8	-0.8
68	1.925	1.874	1.825	2.7%	-2.7%	0.8	-0.8
69	1.861	1.811	1.762	2.7%	-2.7%	0.8	-0.8
70	1.7986	1.7502	1.7025	2.8%	-2.7%	0.8	-0.8
71	1.7391	1.6917	1.6451	2.8%	-2.8%	0.8	-0.8
72	1.6818	1.6355	1.5898	2.8%	-2.8%	0.9	-0.8
73	1.6267	1.5814	1.5367	2.9%	-2.8%	0.9	-0.9
74	1.5738	1.5294	1.4857	2.9%	-2.9%	0.9	-0.9
75	1.5228	1.4793	1.4366	2.9%	-2.9%	0.9	-0.9
76	1.4737	1.4312	1.3894	3.0%	-2.9%	0.9	-0.9
77	1.4264	1.3848	1.3439	3.0%	-3.0%	0.9	-0.9
78	1.3809	1.3402	1.3002	3.0%	-3.0%	0.9	-0.9
79	1.3371	1.2973	1.2581	3.1%	-3.0%	1.0	-0.9
80	1.2949	1.2560	1.2176	3.1%	-3.1%	1.0	-1.0
81	1.2543	1.2161	1.1787	3.1%	-3.1%	1.0	-1.0
82	1.2151	1.1778	1.1411	3.2%	-3.1%	1.0	-1.0
83	1.1773	1.1408	1.1049	3.2%	-3.1%	1.0	-1.0
84	1.1409	1.1052	1.0701	3.2%	-3.2%	1.0	-1.0
85	1.1059	1.0709	1.0366	3.3%	-3.2%	1.1	-1.0
86	1.0720	1.0378	1.0042	3.3%	-3.2%	1.1	-1.1
87	1.0394	1.0059	0.9730	3.3%	-3.3%	1.1	-1.1
88	1.0079	0.9751	0.9430	3.4%	-3.3%	1.1	-1.1
89	0.9776	0.9455	0.9140	3.4%	-3.3%	1.1	-1.1
90	0.9483	0.9169	0.8861	3.4%	-3.4%	1.1	-1.1
91	0.9200	0.8893	0.8591	3.5%	-3.4%	1.2	-1.1
92	0.8927	0.8626	0.8332	3.5%	-3.4%	1.2	-1.1
93	0.8664	0.8369	0.8081	3.5%	-3.4%	1.2	-1.2
94	0.8409	0.8121	0.7839	3.5%	-3.5%	1.2	-1.2
95	0.8164	0.7882	0.7605	3.6%	-3.5%	1.2	-1.2
96	0.7926	0.7650	0.7380	3.6%	-3.5%	1.2	-1.2
97	0.7697	0.7427	0.7162	3.6%	-3.6%	1.3	-1.2
98	0.7476	0.7211	0.6952	3.7%	-3.6%	1.3	-1.2
99	0.7262	0.7003	0.6749	3.7%	-3.6%	1.3	-1.3
100	0.7055	0.6801	0.6553	3.7%	-3.6%	1.3	-1.3
101	0.6855	0.6607	0.6364	3.8%	-3.7%	1.3	-1.3
102	0.6662	0.6419	0.6181	3.8%	-3.7%	1.3	-1.3
103	0.6475	0.6237	0.6004	3.8%	-3.7%	1.4	-1.3
104	0.6294	0.6061	0.5833	3.9%	-3.8%	1.4	-1.3
105	0.6119	0.5891	0.5668	3.9%	-3.8%	1.4	-1.4
106	0.5950	0.5726	0.5508	3.9%	-3.8%	1.4	-1.4
107	0.5787	0.5567	0.5353	3.9%	-3.8%	1.4	-1.4
108	0.5628	0.5414	0.5204	4.0%	-3.9%	1.4	-1.4
109	0.5475	0.5265	0.5060	4.0%	-3.9%	1.5	-1.4
110	0.5327	0.5121	0.4920	4.0%	-3.9%	1.5	-1.4
111	0.5183	0.4981	0.4785	4.1%	-4.0%	1.5	-1.5
112	0.5044	0.4846	0.4654	4.1%	-4.0%	1.5	-1.5
113	0.4909	0.4716	0.4527	4.1%	-4.0%	1.5	-1.5
114	0.4779	0.4589	0.4404	4.1%	-4.0%	1.5	-1.5
115	0.4653	0.4467	0.4286	4.2%	-4.1%	1.6	-1.5
116	0.4530	0.4348	0.4171	4.2%	-4.1%	1.6	-1.5
117	0.4412	0.4233	0.4059	4.2%	-4.1%	1.6	-1.6

Note: ΔR reflects change in resistance value and ΔB reflects change in Beta value.

Temperature Probe TP1 Series

Resistance / Temperature CHARACTERISTIC:

Temp. (°C)	Rmax (kΩ)	Ravg (kΩ)	Rmin (kΩ)	ΔR	-ΔR	ΔT (°C)	
118	0.4297	0.4122	0.3951	4.2%	-4.1%	1.6	-1.6
119	0.4186	0.4014	0.3847	4.3%	-4.2%	1.6	-1.6
120	0.4078	0.3909	0.3746	4.3%	-4.2%	1.7	-1.6
121	0.3973	0.3808	0.3648	4.3%	-4.2%	1.7	-1.6
122	0.3871	0.3710	0.3553	4.4%	-4.2%	1.7	-1.7
123	0.3773	0.3615	0.3460	4.4%	-4.3%	1.7	-1.7
124	0.3678	0.3522	0.3371	4.4%	-4.3%	1.7	-1.7
125	0.3585	0.3433	0.3285	4.4%	-4.3%	1.8	-1.7
126	0.3495	0.3346	0.3201	4.5%	-4.3%	1.8	-1.7
127	0.3408	0.3262	0.3119	4.5%	-4.4%	1.8	-1.7
128	0.3323	0.3180	0.3040	4.5%	-4.4%	1.8	-1.8
129	0.3241	0.3100	0.2964	4.5%	-4.4%	1.8	-1.8
130	0.3162	0.3023	0.2889	4.6%	-4.4%	1.8	-1.8
131	0.3084	0.2949	0.2817	4.6%	-4.5%	1.9	-1.8
132	0.3009	0.2876	0.2747	4.6%	-4.5%	1.9	-1.8
133	0.2936	0.2806	0.2679	4.6%	-4.5%	1.9	-1.9
134	0.2865	0.2738	0.2614	4.7%	-4.5%	1.9	-1.9
135	0.2797	0.2671	0.2550	4.7%	-4.6%	1.9	-1.9
136	0.2730	0.2607	0.2487	4.7%	-4.6%	2.0	-1.9
137	0.2665	0.2544	0.2427	4.7%	-4.6%	2.0	-1.9
138	0.2602	0.2483	0.2368	4.8%	-4.6%	2.0	-1.9
139	0.2541	0.2424	0.2312	4.8%	-4.6%	2.0	-2.0
140	0.2481	0.2367	0.2256	4.8%	-4.7%	2.0	-2.0
141	0.2423	0.2311	0.2203	4.8%	-4.7%	2.1	-2.0
142	0.2367	0.2257	0.2150	4.9%	-4.7%	2.1	-2.0
143	0.2312	0.2204	0.2100	4.9%	-4.7%	2.1	-2.0
144	0.2259	0.2153	0.2050	4.9%	-4.8%	2.1	-2.1
145	0.2207	0.2103	0.2002	4.9%	-4.8%	2.1	-2.1
146	0.2157	0.2055	0.1956	5.0%	-4.8%	2.2	-2.1
147	0.2108	0.2008	0.1911	5.0%	-4.8%	2.2	-2.1
148	0.2060	0.1962	0.1867	5.0%	-4.9%	2.2	-2.1
149	0.2014	0.1917	0.1824	5.0%	-4.9%	2.2	-2.2
150	0.1969	0.1874	0.1782	5.1%	-4.9%	2.3	-2.2

Note: ΔR reflects change in resistance value and ΔB reflects change in Beta value.

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