

TP1 Series

Temperature Probe

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

Type code

Product Name TP1: Standard version TPA: Customer specific version		TP	1	-	N	P	1	Cable length 3: 3 m 6: 6 m 12: 12 m

Selection Table

Type	Part No.	Packaging (pcs)	Type	Part No.	Packaging (pcs)
TP1-NP3	804489	1	TP1-NH3	804485	1
TP1-NP6	804490	1	TP1-NH6	804486	1
TP1-NP12	804491	1	TP1-NH12	804487	1
TP1-NP3	804489M	20	TP1-NH3	804485M	20
TP1-NP6	804490M	20	TP1-NH6	804486M	20
TP1-NP12	804491M	20	TP1-NH12	804487M	20

Technical Data

Sensing element	NTC	Cable type	26 AWG 2 x 0.16 mm ² silicone / Teflon insulated
Resistance tolerance at 25°C TP1-NP... ± 1 % TP1-NH... ± 2 %		Protection Class (EN 60529) TP1-NP... IP68 (Humidity Resistance) TP1-NH... IP67 (Humidity Resistance)	
Beta (25/85) constant TP1-NP... 3977 K ± 1 % TP1-NH... 4269 K ± 1.5 %		Cable length	3000 / 6000 / 12000 mm
Operating temperature range TP1-NP... -40...150 °C TP1-NH... -40...170 °C		Probe housing material	Stainless steel SS316L
Dielectric Strength	500 VAC	Thermal Time Constant TP1-NP... Less than 6 sec.* TP1-NH... Less than 10 sec.*	
		Standards	RoHS 11/65/EU

Sensor Resistance / Temperature CHARACTERISTIC:

Temp. (°C)	TP1-NP...							TP1-NH...						
	R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)		ΔT (°C)		R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)		ΔT (°C)	
-40	340.7	325.7	311.4	4.6	-4.4	0.7	-0.7	4925.03	4408.94	3892.85	11.7	-11.7	1.6	-1.6
-39	319.2	305.4	292.2	4.5	-4.3	0.7	-0.7	4580.37	4104.28	3628.19	11.6	-11.6	1.6	-1.6
-38	299.2	286.5	274.3	4.4	-4.3	0.7	-0.7	4262.45	3823.00	3383.55	11.5	-11.5	1.6	-1.6
-37	280.6	268.8	257.5	4.4	-4.2	0.7	-0.7	3969.02	3563.15	3157.27	11.4	-11.4	1.6	-1.6
-36	263.2	252.3	241.9	4.3	-4.1	0.7	-0.7	3698.01	3322.93	2947.85	11.3	-11.3	1.6	-1.6
-35	247.0	236.9	227.2	4.2	-4.1	0.7	-0.7	3447.57	3100.73	2753.9	11.2	-11.2	1.6	-1.6
-34	231.9	222.6	213.6	4.2	-4.0	0.7	-0.7	3214.29	2893.59	2572.89	11.1	-11.1	1.6	-1.6
-33	217.7	209.1	200.8	4.1	-4.0	0.7	-0.7	2998.56	2701.85	2405.14	11.0	-11.0	1.6	-1.6
-32	204.6	196.6	188.9	4.1	-3.9	0.7	-0.7	2798.91	2524.25	2249.58	10.9	-10.9	1.6	-1.6
-31	192.3	184.9	177.8	4.0	-3.8	0.7	-0.6	2614.05	2359.65	2105.25	10.8	-10.8	1.6	-1.6
-30	180.7	173.9	167.3	3.9	-3.8	0.7	-0.6	2442.77	2207.01	1971.25	10.7	-10.7	1.6	-1.6
-29	170.0	163.7	157.6	3.9	-3.7	0.7	-0.6	2282.89	2064.41	1845.92	10.6	-10.6	1.6	-1.6
-28	159.9	154.1	148.4	3.8	-3.7	0.7	-0.6	2134.66	1932.08	1729.45	10.5	-10.5	1.6	-1.6
-27	150.5	145.1	139.9	3.7	-3.6	0.6	-0.6	1997.15	1809.21	1621.27	10.4	-10.4	1.6	-1.6
-26	141.7	136.7	131.8	3.7	-3.6	0.6	-0.6	1869.50	1695.05	1520.61	10.3	-10.3	1.6	-1.6
-25	133.5	128.8	124.3	3.6	-3.5	0.6	-0.6	1750.93	1588.93	1426.93	10.2	-10.2	1.6	-1.6
-24	125.8	121.4	117.3	3.6	-3.4	0.6	-0.6	1640.04	1489.59	1339.15	10.1	-10.1	1.6	-1.6
-23	118.5	114.5	110.7	3.5	-3.4	0.6	-0.6	1536.98	1397.19	1257.40	10.0	-10.0	1.6	-1.6
-22	111.8	108.0	104.5	3.4	-3.3	0.6	-0.6	1441.13	1311.19	1181.24	9.9	-9.9	1.6	-1.6
-21	105.4	102.0	98.6	3.4	-3.3	0.6	-0.6	1351.96	1231.10	1110.24	9.8	-9.8	1.6	-1.6
-20	99.43	96.26	93.15	3.3	-3.2	0.6	-0.6	1268.94	1156.48	1044.02	9.7	-9.7	1.6	-1.6
-19	93.85	90.91	88.02	3.2	-3.2	0.6	-0.6	1191.14	1086.49	981.84	9.6	-9.6	1.5	-1.5
-18	88.61	85.88	83.20	3.2	-3.1	0.6	-0.6	1118.66	1021.24	923.81	9.5	-9.5	1.5	-1.5
-17	83.69	81.16	78.67	3.1	-3.1	0.6	-0.6	1051.11	960.37	869.62	9.4	-9.4	1.5	-1.5
-16	79.07	76.72	74.42	3.1	-3.0	0.6	-0.6	988.11	903.56	819.00	9.4	-9.4	1.5	-1.5
-15	74.74	72.56	70.41	3.0	-3.0	0.6	-0.5	929.34	850.51	771.68	9.3	-9.3	1.5	-1.5
-14	70.66	68.64	66.64	2.9	-2.9	0.5	-0.5	874.15	800.66	727.173	9.2	-9.2	1.5	-1.5
-13	66.83	64.95	63.10	2.9	-2.8	0.5	-0.5	822.63	754.09	685.54	9.1	-9.1	1.5	-1.5
-12	63.22	61.48	59.76	2.8	-2.8	0.5	-0.5	774.51	710.55	646.59	9.0	-9.0	1.5	-1.5
-11	59.84	58.22	56.62	2.8	-2.7	0.5	-0.5	729.53	669.83	610.12	8.9	-8.9	1.5	-1.5
-10	56.65	55.15	53.66	2.7	-2.7	0.5	-0.5	687.48	631.72	575.96	8.8	-8.8	1.5	-1.5
-9	53.65	52.25	50.88	2.7	-2.6	0.5	-0.5	647.93	595.85	543.78	8.7	-8.7	1.5	-1.5
-8	50.82	49.53	48.25	2.6	-2.6	0.5	-0.5	610.92	562.265	513.611	8.7	-8.7	1.5	-1.5
-7	48.16	46.96	45.77	2.6	-2.5	0.5	-0.5	576.283	530.805	485.327	8.6	-8.6	1.5	-1.5
-6	45.65	44.54	43.43	2.5	-2.5	0.5	-0.5	543.847	501.321	458.795	8.5	-8.5	1.5	-1.5
-5	43.29	42.25	41.23	2.5	-2.4	0.5	-0.5	513.459	473.678	433.896	8.4	-8.4	1.5	-1.5
-4	41.06	40.10	39.15	2.4	-2.4	0.5	-0.5	484.823	447.608	410.393	8.3	-8.3	1.5	-1.5
-3	38.96	38.07	37.19	2.3	-2.3	0.5	-0.5	457.979	423.151	388.324	8.2	-8.2	1.5	-1.5
-2	36.98	36.15	35.33	2.3	-2.3	0.5	-0.5	432.803	400.197	367.59	8.1	-8.1	1.5	-1.5
-1	35.11	34.34	33.58	2.2	-2.2	0.5	-0.4	409.181	378.643	348.105	8.1	-8.1	1.5	-1.5
0	33.35	32.63	31.92	2.2	-2.2	0.4	-0.4	387.007	358.395	329.783	8.0	-8.0	1.5	-1.5
1	31.68	31.02	30.36	2.1	-2.1	0.4	-0.4	366.078	339.27	312.462	7.9	-7.9	1.4	-1.4
2	30.11	29.49	28.88	2.1	-2.1	0.4	-0.4	346.421	321.294	296.166	7.8	-7.8	1.4	-1.4
3	28.62	28.05	27.48	2.0	-2.0	0.4	-0.4	327.95	304.39	280.83	7.7	-7.7	1.4	-1.4
4	27.22	26.68	26.16	2.0	-2.0	0.4	-0.4	310.587	288.488	266.389	7.7	-7.7	1.4	-1.4
5	25.89	25.39	24.91	1.9	-1.9	0.4	-0.4	294.258	273.523	252.787	7.6	-7.6	1.4	-1.4
6	24.63	24.17	23.72	1.9	-1.9	0.4	-0.4	278.821	259.365	239.908	7.5	-7.5	1.4	-1.4
7	23.44	23.02	22.60	1.8	-1.8	0.4	-0.4	264.296	246.033	227.769	7.4	-7.4	1.4	-1.4
8	22.32	21.92	21.54	1.8	-1.8	0.4	-0.4	250.622	233.474	216.325	7.3	-7.3	1.4	-1.4
9	21.25	20.89	20.53	1.7	-1.7	0.4	-0.4	237.746	221.638	205.531	7.3	-7.3	1.4	-1.4
10	20.24	19.91	19.57	1.7	-1.7	0.4	-0.4	225.615	210.48	195.346	7.2	-7.2	1.4	-1.4

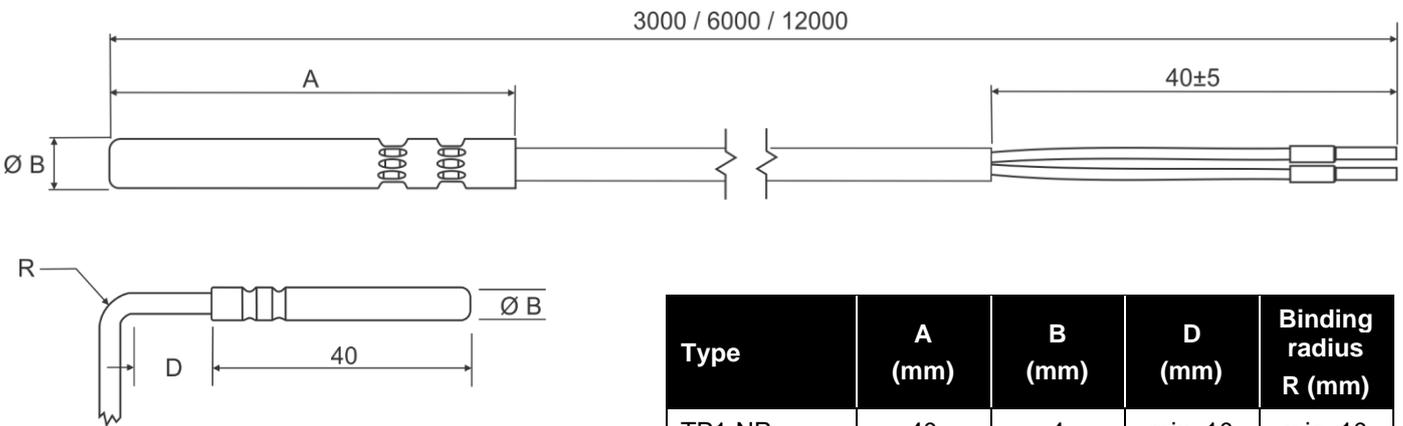
Temp. (°C)	TP1-NP...						TP1-NH...							
	R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)		R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)			
11	19.29	18.98	18.67	1.6	-1.6	0.4	-0.4	214.129	199.909	185.688	7.1	-7.1	1.4	-1.4
12	18.39	18.10	17.81	1.6	-1.6	0.3	-0.3	203.303	189.936	176.57	7.0	-7.0	1.4	-1.4
13	17.53	17.26	17.00	1.6	-1.5	0.3	-0.3	193.094	180.526	167.959	7.0	-7.0	1.4	-1.4
14	16.72	16.47	16.22	1.5	-1.5	0.3	-0.3	183.463	171.643	159.823	6.9	-6.9	1.4	-1.4
15	15.95	15.72	15.49	1.5	-1.4	0.3	-0.3	174.375	163.255	152.134	6.8	-6.8	1.4	-1.4
16	15.22	15.00	14.80	1.4	-1.4	0.3	-0.3	165.758	155.296	144.833	6.7	-6.7	1.4	-1.4
17	14.52	14.33	14.13	1.4	-1.4	0.3	-0.3	157.622	147.776	137.929	6.7	-6.7	1.3	-1.3
18	13.87	13.69	13.51	1.3	-1.3	0.3	-0.3	149.937	140.668	131.398	6.6	-6.6	1.3	-1.3
19	13.24	13.08	12.91	1.3	-1.3	0.3	-0.3	142.676	133.947	125.218	6.5	-6.5	1.3	-1.3
20	12.65	12.50	12.34	1.2	-1.2	0.3	-0.3	135.812	127.59	119.368	6.4	-6.4	1.3	-1.3
21	12.09	11.94	11.80	1.2	-1.2	0.3	-0.3	129.294	121.55	113.805	6.4	-6.4	1.3	-1.3
22	11.55	11.42	11.29	1.1	-1.1	0.3	-0.3	123.13	115.833	108.536	6.3	-6.3	1.3	-1.3
23	11.04	10.92	10.81	1.1	-1.1	0.3	-0.2	117.299	110.422	103.544	6.2	-6.2	1.3	-1.3
24	10.56	10.45	10.34	1.0	-1.0	0.2	-0.2	111.78	105.297	98.813	6.2	-6.2	1.3	-1.3
25	10.10	10.00	9.90	1.0	-1.0	0.2	-0.2	106.556	100.442	94.328	6.1	-6.1	1.3	-1.3
26	9.672	9.572	9.472	1.1	-1.0	0.2	-0.2	101.588	95.823	90.058	6.0	-6.0	1.3	-1.3
27	9.264	9.164	9.064	1.1	-1.1	0.3	-0.3	96.884	91.446	86.008	5.9	-5.9	1.3	-1.3
28	8.876	8.776	8.677	1.1	-1.1	0.3	-0.3	92.426	87.295	82.165	5.9	-5.9	1.3	-1.3
29	8.505	8.406	8.308	1.2	-1.2	0.3	-0.3	88.201	83.359	78.517	5.8	-5.8	1.3	-1.3
30	8.153	8.054	7.956	1.2	-1.2	0.3	-0.3	84.194	79.624	75.054	5.7	-5.7	1.3	-1.3
31	7.816	7.719	7.622	1.3	-1.3	0.3	-0.3	80.381	76.066	71.752	5.7	-5.7	1.2	-1.2
32	7.496	7.399	7.303	1.3	-1.3	0.3	-0.3	76.763	72.69	68.616	5.6	-5.6	1.2	-1.2
33	7.190	7.095	7.000	1.4	-1.3	0.3	-0.3	73.33	69.483	65.636	5.5	-5.5	1.2	-1.2
34	6.899	6.804	6.710	1.4	-1.4	0.3	-0.3	70.072	66.438	62.804	5.5	-5.5	1.2	-1.2
35	6.621	6.527	6.434	1.4	-1.4	0.4	-0.4	66.978	63.545	60.111	5.4	-5.4	1.2	-1.2
36	6.355	6.263	6.171	1.5	-1.5	0.4	-0.4	64.028	60.784	57.541	5.3	-5.3	1.2	-1.2
37	6.102	6.011	5.920	1.5	-1.5	0.4	-0.4	61.226	58.161	55.095	5.3	-5.3	1.2	-1.2
38	5.860	5.770	5.681	1.6	-1.5	0.4	-0.4	58.563	55.666	52.768	5.2	-5.2	1.2	-1.2
39	5.629	5.541	5.453	1.6	-1.6	0.4	-0.4	56.032	53.293	50.554	5.1	-5.1	1.2	-1.2
40	5.408	5.321	5.235	1.6	-1.6	0.4	-0.4	53.626	51.036	48.446	5.1	-5.1	1.2	-1.2
41	5.198	5.112	5.027	1.7	-1.7	0.4	-0.4	51.329	48.88	46.431	5.0	-5.0	1.2	-1.2
42	4.996	4.912	4.828	1.7	-1.7	0.4	-0.4	49.145	46.828	44.512	4.9	-4.9	1.2	-1.2
43	4.804	4.720	4.638	1.8	-1.7	0.5	-0.5	47.066	44.875	42.683	4.9	-4.9	1.1	-1.1
44	4.619	4.538	4.457	1.8	-1.8	0.5	-0.5	45.087	43.014	40.941	4.8	-4.8	1.1	-1.1
45	4.443	4.363	4.284	1.8	-1.8	0.5	-0.5	43.203	41.242	39.28	4.8	-4.8	1.1	-1.1
46	4.275	4.196	4.118	1.9	-1.9	0.5	-0.5	41.402	39.546	37.69	4.7	-4.7	1.1	-1.1
47	4.114	4.036	3.960	1.9	-1.9	0.5	-0.5	39.686	37.93	36.173	4.6	-4.6	1.1	-1.1
48	3.960	3.884	3.808	2.0	-1.9	0.5	-0.5	38.052	36.389	34.726	4.6	-4.6	1.1	-1.1
49	3.812	3.737	3.663	2.0	-2.0	0.5	-0.5	36.494	34.92	33.346	4.5	-4.5	1.1	-1.1
50	3.671	3.597	3.525	2.0	-2.0	0.5	-0.5	35.009	33.519	32.028	4.4	-4.4	1.1	-1.1
51	3.535	3.463	3.392	2.1	-2.1	0.6	-0.6	33.59	32.179	30.768	4.4	-4.4	1.1	-1.1
52	3.406	3.335	3.265	2.1	-2.1	0.6	-0.6	32.237	30.901	29.564	4.3	-4.3	1.1	-1.1
53	3.281	3.212	3.144	2.1	-2.1	0.6	-0.6	30.946	29.681	28.415	4.3	-4.3	1.1	-1.1
54	3.162	3.095	3.028	2.2	-2.2	0.6	-0.6	29.715	28.516	27.317	4.2	-4.2	1.1	-1.1
55	3.048	2.982	2.916	2.2	-2.2	0.6	-0.6	28.539	27.403	26.268	4.1	-4.1	1	-1
56	2.939	2.874	2.810	2.3	-2.2	0.6	-0.6	27.413	26.337	25.261	4.1	-4.1	1	-1
57	2.834	2.770	2.707	2.3	-2.3	0.6	-0.6	26.338	25.318	24.299	4.0	-4.0	1	-1
58	2.733	2.671	2.609	2.3	-2.3	0.7	-0.6	25.311	24.345	23.379	4.0	-4.0	1	-1
59	2.637	2.576	2.515	2.4	-2.3	0.7	-0.7	24.329	23.414	22.499	3.9	-3.9	1	-1
60	2.544	2.484	2.425	2.4	-2.4	0.7	-0.7	23.392	22.524	21.657	3.9	-3.9	1	-1
61	2.455	2.397	2.339	2.4	-2.4	0.7	-0.7	22.492	21.67	20.848	3.8	-3.8	1	-1
62	2.370	2.313	2.256	2.5	-2.5	0.7	-0.7	21.633	20.854	20.075	3.7	-3.7	1	-1

Temp. (°C)	TP1-NP...						TP1-NH...							
	R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)		R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)			
63	2.288	2.232	2.177	2.5	-2.5	0.7	-0.7	20.811	20.072	19.334	3.7	-3.7	1	-1
64	2.210	2.155	2.100	2.6	-2.5	0.7	-0.7	20.025	19.325	18.625	3.6	-3.6	1	-1
65	2.134	2.080	2.027	2.6	-2.6	0.8	-0.7	19.273	18.609	17.946	3.6	-3.6	0.9	-0.9
66	2.062	2.009	1.957	2.6	-2.6	0.8	-0.8	18.553	17.923	17.294	3.5	-3.5	0.9	-0.9
67	1.992	1.940	1.889	2.7	-2.6	0.8	-0.8	17.863	17.267	16.67	3.5	-3.5	0.9	-0.9
68	1.925	1.874	1.825	2.7	-2.7	0.8	-0.8	17.203	16.638	16.072	3.4	-3.4	0.9	-0.9
69	1.861	1.811	1.762	2.7	-2.7	0.8	-0.8	16.571	16.035	15.499	3.3	-3.3	0.9	-0.9
70	1.7986	1.7502	1.7025	2.8	-2.7	0.8	-0.8	15.966	15.458	14.95	3.3	-3.3	0.9	-0.9
71	1.7391	1.6917	1.6451	2.8	-2.8	0.8	-0.8	15.384	14.902	14.42	3.2	-3.2	0.9	-0.9
72	1.6818	1.6355	1.5898	2.8	-2.8	0.9	-0.8	14.826	14.369	13.913	3.2	-3.2	0.9	-0.9
73	1.6267	1.5814	1.5367	2.9	-2.8	0.9	-0.9	14.291	13.858	13.425	3.1	-3.1	0.9	-0.9
74	1.5738	1.5294	1.4857	2.9	-2.9	0.9	-0.9	13.779	13.369	12.958	3.1	-3.1	0.9	-0.9
75	1.5228	1.4793	1.4366	2.9	-2.9	0.9	-0.9	13.288	12.899	12.51	3.0	-3.0	0.8	-0.8
76	1.4737	1.4312	1.3894	3.0	-2.9	0.9	-0.9	12.815	12.446	12.077	3.0	-3.0	0.8	-0.8
77	1.4264	1.3848	1.3439	3.0	-3.0	0.9	-0.9	12.362	12.012	11.663	2.9	-2.9	0.8	-0.8
78	1.3809	1.3402	1.3002	3.0	-3.0	0.9	-0.9	11.927	11.596	11.264	2.9	-2.9	0.8	-0.8
79	1.3371	1.2973	1.2581	3.1	-3.0	1.0	-0.9	11.51	11.196	10.882	2.8	-2.8	0.8	-0.8
80	1.2949	1.2560	1.2176	3.1	-3.1	1.0	-1.0	11.109	10.812	10.514	2.8	-2.8	0.8	-0.8
81	1.2543	1.2161	1.1787	3.1	-3.1	1.0	-1.0	10.725	10.443	10.161	2.7	-2.7	0.8	-0.8
82	1.2151	1.1778	1.1411	3.2	-3.1	1.0	-1.0	10.357	10.09	9.822	2.6	-2.6	0.8	-0.8
83	1.1773	1.1408	1.1049	3.2	-3.1	1.0	-1.0	10.003	9.75	9.496	2.6	-2.6	0.8	-0.8
84	1.1409	1.1052	1.0701	3.2	-3.2	1.0	-1.0	9.663	9.423	9.183	2.5	-2.5	0.7	-0.7
85	1.1059	1.0709	1.0366	3.3	-3.2	1.1	-1.0	9.336	9.109	8.882	2.5	-2.5	0.7	-0.7
86	1.0720	1.0378	1.0042	3.3	-3.2	1.1	-1.1	9.021	8.806	8.59	2.4	-2.4	0.7	-0.7
87	1.0394	1.0059	0.9730	3.3	-3.3	1.1	-1.1	8.718	8.514	8.31	2.4	-2.4	0.7	-0.7
88	1.0079	0.9751	0.9430	3.4	-3.3	1.1	-1.1	8.427	8.234	8.041	2.3	-2.3	0.7	-0.7
89	0.9776	0.9455	0.9140	3.4	-3.3	1.1	-1.1	8.147	7.964	7.781	2.3	-2.3	0.7	-0.7
90	0.9483	0.9169	0.8861	3.4	-3.4	1.1	-1.1	7.878	7.705	7.532	2.2	-2.2	0.7	-0.7
91	0.9200	0.8893	0.8591	3.5	-3.4	1.2	-1.1	7.618	7.454	7.291	2.2	-2.2	0.7	-0.7
92	0.8927	0.8626	0.8332	3.5	-3.4	1.2	-1.1	7.368	7.214	7.059	2.1	-2.1	0.7	-0.7
93	0.8664	0.8369	0.8081	3.5	-3.4	1.2	-1.2	7.128	6.982	6.835	2.1	-2.1	0.6	-0.6
94	0.8409	0.8121	0.7839	3.5	-3.5	1.2	-1.2	6.897	6.759	6.62	2.0	-2.0	0.6	-0.6
95	0.8164	0.7882	0.7605	3.6	-3.5	1.2	-1.2	6.675	6.544	6.413	2.0	-2.0	0.6	-0.6
96	0.7926	0.7650	0.7380	3.6	-3.5	1.2	-1.2	6.467	6.337	6.207	2.0	-2.0	0.6	-0.6
97	0.7697	0.7427	0.7162	3.6	-3.6	1.3	-1.2	6.266	6.137	6.009	2.1	-2.1	0.7	-0.7
98	0.7476	0.7211	0.6952	3.7	-3.6	1.3	-1.2	6.073	5.945	5.818	2.1	-2.1	0.7	-0.7
99	0.7262	0.7003	0.6749	3.7	-3.6	1.3	-1.3	5.886	5.76	5.634	2.2	-2.2	0.7	-0.7
100	0.7055	0.6801	0.6553	3.7	-3.6	1.3	-1.3	5.707	5.582	5.457	2.2	-2.2	0.7	-0.7
101	0.6855	0.6607	0.6364	3.8	-3.7	1.3	-1.3	5.533	5.409	5.286	2.3	-2.3	0.7	-0.7
102	0.6662	0.6419	0.6181	3.8	-3.7	1.3	-1.3	5.366	5.243	5.121	2.3	-2.3	0.7	-0.7
103	0.6475	0.6237	0.6004	3.8	-3.7	1.4	-1.3	5.204	5.083	4.962	2.4	-2.4	0.8	-0.8
104	0.6294	0.6061	0.5833	3.9	-3.8	1.4	-1.3	5.048	4.929	4.809	2.4	-2.4	0.8	-0.8
105	0.6119	0.5891	0.5668	3.9	-3.8	1.4	-1.4	4.898	4.78	4.662	2.5	-2.5	0.8	-0.8
106	0.5950	0.5726	0.5508	3.9	-3.8	1.4	-1.4	4.752	4.636	4.519	2.5	-2.5	0.8	-0.8
107	0.5787	0.5567	0.5353	3.9	-3.8	1.4	-1.4	4.612	4.497	4.381	2.6	-2.6	0.8	-0.8
108	0.5628	0.5414	0.5204	4.0	-3.9	1.4	-1.4	4.476	4.362	4.249	2.6	-2.6	0.9	-0.9
109	0.5475	0.5265	0.5060	4.0	-3.9	1.5	-1.4	4.345	4.233	4.121	2.7	-2.7	0.9	-0.9
110	0.5327	0.5121	0.4920	4.0	-3.9	1.5	-1.4	4.219	4.108	3.997	2.7	-2.7	0.9	-0.9
111	0.5183	0.4981	0.4785	4.1	-4.0	1.5	-1.5	4.096	3.987	3.878	2.7	-2.7	0.9	-0.9
112	0.5044	0.4846	0.4654	4.1	-4.0	1.5	-1.5	3.978	3.87	3.762	2.8	-2.8	0.9	-0.9
113	0.4909	0.4716	0.4527	4.1	-4.0	1.5	-1.5	3.864	3.758	3.651	2.8	-2.8	1	-1
114	0.4779	0.4589	0.4404	4.1	-4.0	1.5	-1.5	3.754	3.649	3.544	2.9	-2.9	1	-1

Temp. (°C)	TP1-NP...						TP1-NH...							
	R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)		R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)			
115	0.4653	0.4467	0.4286	4.2	-4.1	1.6	-1.5	3.647	3.544	3.44	2.9	-2.9	1	-1
116	0.4530	0.4348	0.4171	4.2	-4.1	1.6	-1.5	3.544	3.442	3.34	3.0	-3.0	1	-1
117	0.4412	0.4233	0.4059	4.2	-4.1	1.6	-1.6	3.444	3.343	3.243	3.0	-3.0	1	-1
118	0.4297	0.4122	0.3951	4.2	-4.1	1.6	-1.6	3.347	3.248	3.149	3.1	-3.1	1.1	-1.1
119	0.4186	0.4014	0.3847	4.3	-4.2	1.6	-1.6	3.254	3.156	3.059	3.1	-3.1	1.1	-1.1
120	0.4078	0.3909	0.3746	4.3	-4.2	1.7	-1.6	3.164	3.067	2.971	3.1	-3.1	1.1	-1.1
121	0.3973	0.3808	0.3648	4.3	-4.2	1.7	-1.6	3.076	2.981	2.886	3.2	-3.2	1.1	-1.1
122	0.3871	0.3710	0.3553	4.4	-4.2	1.7	-1.7	2.991	2.898	2.805	3.2	-3.2	1.1	-1.1
123	0.3773	0.3615	0.3460	4.4	-4.3	1.7	-1.7	2.909	2.818	2.726	3.3	-3.3	1.2	-1.2
124	0.3678	0.3522	0.3371	4.4	-4.3	1.7	-1.7	2.83	2.74	2.649	3.3	-3.3	1.2	-1.2
125	0.3585	0.3433	0.3285	4.4	-4.3	1.8	-1.7	2.753	2.664	2.575	3.3	-3.3	1.2	-1.2
126	0.3495	0.3346	0.3201	4.5	-4.3	1.8	-1.7	2.679	2.591	2.503	3.4	-3.4	1.2	-1.2
127	0.3408	0.3262	0.3119	4.5	-4.4	1.8	-1.7	2.607	2.52	2.434	3.4	-3.4	1.2	-1.2
128	0.3323	0.3180	0.3040	4.5	-4.4	1.8	-1.8	2.537	2.452	2.367	3.5	-3.5	1.3	-1.3
129	0.3241	0.3100	0.2964	4.5	-4.4	1.8	-1.8	2.469	2.386	2.302	3.5	-3.5	1.3	-1.3
130	0.3162	0.3023	0.2889	4.6	-4.4	1.8	-1.8	2.404	2.321	2.239	3.6	-3.6	1.3	-1.3
131	0.3084	0.2949	0.2817	4.6	-4.5	1.9	-1.8	2.34	2.259	2.178	3.6	-3.6	1.3	-1.3
132	0.3009	0.2876	0.2747	4.6	-4.5	1.9	-1.8	2.279	2.199	2.119	3.6	-3.6	1.3	-1.3
133	0.2936	0.2806	0.2679	4.6	-4.5	1.9	-1.9	2.219	2.141	2.062	3.7	-3.7	1.4	-1.4
134	0.2865	0.2738	0.2614	4.7	-4.5	1.9	-1.9	2.162	2.084	2.007	3.7	-3.7	1.4	-1.4
135	0.2797	0.2671	0.2550	4.7	-4.6	1.9	-1.9	2.106	2.03	1.953	3.8	-3.8	1.4	-1.4
136	0.2730	0.2607	0.2487	4.7	-4.6	2.0	-1.9	2.051	1.976	1.901	3.8	-3.8	1.4	-1.4
137	0.2665	0.2544	0.2427	4.7	-4.6	2.0	-1.9	1.998	1.925	1.851	3.8	-3.8	1.5	-1.5
138	0.2602	0.2483	0.2368	4.8	-4.6	2.0	-1.9	1.947	1.875	1.802	3.9	-3.9	1.5	-1.5
139	0.2541	0.2424	0.2312	4.8	-4.6	2.0	-2.0	1.897	1.826	1.755	3.9	-3.9	1.5	-1.5
140	0.2481	0.2367	0.2256	4.8	-4.7	2.0	-2.0	1.849	1.779	1.709	4.0	-4.0	1.5	-1.5
141	0.2423	0.2311	0.2203	4.8	-4.7	2.1	-2.0	1.803	1.733	1.664	4.0	-4.0	1.5	-1.5
142	0.2367	0.2257	0.2150	4.9	-4.7	2.1	-2.0	1.757	1.689	1.621	4.0	-4.0	1.6	-1.6
143	0.2312	0.2204	0.2100	4.9	-4.7	2.1	-2.0	1.713	1.646	1.579	4.1	-4.1	1.6	-1.6
144	0.2259	0.2153	0.2050	4.9	-4.8	2.1	-2.1	1.671	1.605	1.539	4.1	-4.1	1.6	-1.6
145	0.2207	0.2103	0.2002	4.9	-4.8	2.1	-2.1	1.629	1.564	1.499	4.1	-4.1	1.6	-1.6
146	0.2157	0.2055	0.1956	5.0	-4.8	2.2	-2.1	1.589	1.525	1.461	4.2	-4.2	1.7	-1.7
147	0.2108	0.2008	0.1911	5.0	-4.8	2.2	-2.1	1.55	1.487	1.424	4.2	-4.2	1.7	-1.7
148	0.2060	0.1962	0.1867	5.0	-4.9	2.2	-2.1	1.512	1.45	1.389	4.3	-4.3	1.7	-1.7
149	0.2014	0.1917	0.1824	5.0	-4.9	2.2	-2.2	1.475	1.415	1.354	4.3	-4.3	1.7	-1.7
150	0.1969	0.1874	0.1782	5.1	-4.9	2.3	-2.2	1.44	1.38	1.32	4.3	-4.3	1.7	-1.7
151	-	-	-	-	-	-	-	1.405	1.346	1.287	4.4	-4.4	1.8	-1.8
152	-	-	-	-	-	-	-	1.371	1.313	1.255	4.4	-4.4	1.8	-1.8
153	-	-	-	-	-	-	-	1.338	1.281	1.224	4.4	-4.4	1.8	-1.8
154	-	-	-	-	-	-	-	1.306	1.25	1.194	4.5	-4.5	1.8	-1.8
155	-	-	-	-	-	-	-	1.275	1.22	1.165	4.5	-4.5	1.9	-1.9
156	-	-	-	-	-	-	-	1.245	1.191	1.137	4.6	-4.6	1.9	-1.9
157	-	-	-	-	-	-	-	1.216	1.163	1.109	4.6	-4.6	1.9	-1.9
158	-	-	-	-	-	-	-	1.187	1.135	1.082	4.6	-4.6	1.9	-1.9
159	-	-	-	-	-	-	-	1.16	1.108	1.056	4.7	-4.7	1.9	-1.9
160	-	-	-	-	-	-	-	1.133	1.082	1.031	4.7	-4.7	2	-2
161	-	-	-	-	-	-	-	1.107	1.057	1.007	4.7	-4.7	2	-2
162	-	-	-	-	-	-	-	1.081	1.032	0.983	4.8	-4.8	2	-2
163	-	-	-	-	-	-	-	1.056	1.008	0.96	4.8	-4.8	2.1	-2.1
164	-	-	-	-	-	-	-	1.032	0.985	0.937	4.8	-4.8	2.1	-2.1
165	-	-	-	-	-	-	-	1.009	0.962	0.915	4.9	-4.9	2.1	-2.1
166	-	-	-	-	-	-	-	0.986	0.94	0.894	4.9	-4.9	2.1	-2.1

Temp. (°C)	TP1-NP...					TP1-NH...						
	R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)	R _{max} (kΩ)	R _{avg} (kΩ)	R _{min} (kΩ)	ΔR (%)	ΔT (°C)		
167	-	-	-	-	-	0.964	0.919	0.873	4.9	-4.9	2.1	-2.1
168	-	-	-	-	-	0.942	0.898	0.853	5.0	-5.0	2.2	-2.2
169	-	-	-	-	-	0.921	0.877	0.833	5.0	-5.0	2.2	-2.2
170	-	-	-	-	-	0.901	0.857	0.814	5.0	-5.0	2.2	-2.2
171	-	-	-	-	-	0.881	0.838	0.796	5.1	-5.1	2.2	-2.2
172	-	-	-	-	-	0.861	0.819	0.778	5.1	-5.1	2.3	-2.3
173	-	-	-	-	-	0.842	0.801	0.76	5.1	-5.1	2.3	-2.3
174	-	-	-	-	-	0.824	0.783	0.743	5.2	-5.2	2.3	-2.3
175	-	-	-	-	-	0.806	0.766	0.726	5.2	-5.2	2.3	-2.3
176	-	-	-	-	-	0.789	0.749	0.71	5.2	-5.2	2.4	-2.4
177	-	-	-	-	-	0.772	0.733	0.694	5.3	-5.3	2.4	-2.4
178	-	-	-	-	-	0.755	0.717	0.679	5.3	-5.3	2.4	-2.4
179	-	-	-	-	-	0.739	0.701	0.664	5.3	-5.3	2.4	-2.4
180	-	-	-	-	-	0.723	0.686	0.649	5.4	-5.4	2.5	-2.5
181	-	-	-	-	-	0.708	0.671	0.635	5.4	-5.4	2.5	-2.5
182	-	-	-	-	-	0.693	0.657	0.621	5.4	-5.4	2.5	-2.5
183	-	-	-	-	-	0.678	0.643	0.608	5.5	-5.5	2.5	-2.5
184	-	-	-	-	-	0.664	0.629	0.595	5.5	-5.5	2.6	-2.6
185	-	-	-	-	-	0.65	0.616	0.582	5.5	-5.5	2.6	-2.6
186	-	-	-	-	-	0.637	0.603	0.569	5.6	-5.6	2.6	-2.6
187	-	-	-	-	-	0.623	0.59	0.557	5.6	-5.6	2.6	-2.6
188	-	-	-	-	-	0.61	0.578	0.545	5.6	-5.6	2.7	-2.7
189	-	-	-	-	-	0.598	0.566	0.534	5.7	-5.7	2.7	-2.7
190	-	-	-	-	-	0.586	0.554	0.523	5.7	-5.7	2.7	-2.7
191	-	-	-	-	-	0.574	0.543	0.512	5.7	-5.7	2.7	-2.7
192	-	-	-	-	-	0.562	0.531	0.501	5.8	-5.8	2.8	-2.8
193	-	-	-	-	-	0.551	0.521	0.49	5.8	-5.8	2.8	-2.8
194	-	-	-	-	-	0.54	0.51	0.48	5.8	-5.8	2.8	-2.8
195	-	-	-	-	-	0.529	0.5	0.47	5.9	-5.9	2.9	-2.9
196	-	-	-	-	-	0.518	0.489	0.461	5.9	-5.9	2.9	-2.9
197	-	-	-	-	-	0.508	0.48	0.451	5.9	-5.9	2.9	-2.9
198	-	-	-	-	-	0.498	0.47	0.442	5.9	-5.9	2.9	-2.9
199	-	-	-	-	-	0.488	0.46	0.433	6.0	-6.0	3	-3
200	-	-	-	-	-	0.478	0.451	0.424	6.0	-6.0	3	-3

Dimensions (mm)



Type	A (mm)	B (mm)	D (mm)	Binding radius R (mm)
TP1-NP...	40	4	min. 10	min. 10
TP1-NH...	40	5	min. 10	min. 10

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

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