

ALTERNATION HISTORY RECORDS 变更记录

Date 日期	Version 版本	Mark 标记	Page 页码	Description 描述	Drafter 制定者	Approver 审批者
2024-05-11	A	/	/	First release 首次发行	Doris Chang	/

1. Scope

The specification defines ratings , dimensions , electrical properties, mechanical properties and climatic properties for this NTC-CWFH-332RE3970GY26.

2. Part Number System

NTC - CWFH - 332R E 3970K G Y26
 (1) (2) (3) (4) (5) (6) (7)

- (1) Thermistor class
- (2) Series
- (3) Resistance Code, 332R=3.3K Ω
- (4) Resistance Tolerance Code, E=±2.5%
- (5) B-Value (3970K)
- (6) B-Value Tolerance Code G=±2%
- (7) Type

3. Ratings

Items	Ratings	Remarks
3.1 Rated zero-power resistance R_{100}	3.3k Ω	The zero=power resistance at100℃
3.2 Tolerance of rated zero-power Resistance R_{100}	±2.5%	
3.3 B-value $B_{0/100}$	3970K	B-value is calculated with the zero-power resistance values at 0℃and 100℃
3.4 Tolerance of B-Value $B_{0/100}$	±2%	
3.5 Hi-pot test	DC1000V/1 Sec	shall be withstand between each end of sensor and the shell
3.6 Thermal time constant	About 10~15 Sec	In still air at 25℃
3.7 Dissipation factor	Min.1.6W/℃	In still air at 25℃
3.8 Category temperature range	-20℃~120℃	
3.9 Max Rated power	8mW	In still air at 25℃
3.10 Insulation	≥20M Ω	DC500V

Remark:

1) Appearance(Visual inspection):

- Product epoxy glue surface bright without spikes, bubble holes.
- Copper needle base surface tinned bright without deformation
- The top of the copper needle holder must not be stained with epoxy glue

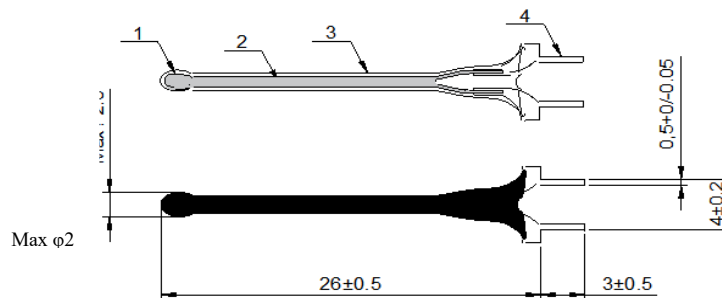
2) Size: Please see Point 4

Inspected by micrometer and steel tapeline.

3) Technical requirements

- Resistance: Put the probe of sensor in an oil tank of $25 \pm 0.01^{\circ}\text{C}$ and then measure the resistance by a resistance tester with accuracy better than 0.1%
- Hi-pot test: Measured by a dielectric and withstand voltage testing tester
- Insulation test: Measured by a insulated and withstand voltage testing tester

4. Dimensions(Y26)



	Name	Specifications
1	Thermistor	$R_{100^{\circ}\text{C}}=3.3\text{K}\Omega\pm 2.5\%$ $B_{0/100^{\circ}\text{C}}=3970\text{K}\pm 2\%$
2	Glue	KR-25(Transparency)
3	Coating	Epoxy resin Color:Black
4	Copper needle holder	0.4-0.5mm Tin plating (C5191-H)

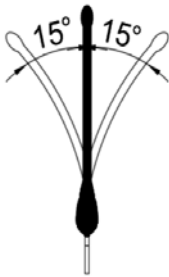
5.Mechanical properties

Items	Ratings	Remarks
Free fall	Three times five-fall to a maple board from 1m high.	The change ratio of resistance and B should be within $\pm 2.5\%$ of the initial value and there shall be no visible damage
Robustness of terminations (Tensile)	Robustness of terminations (Tensile): Hold the thermistor body so that the lead wire shall be vertical. After 29.4N loading weight is applied to the lead wire vertically for 5 seconds.	The change ratio of resistance and B should be within $\pm 2.5\%$ of the initial value and there shall be no visible damage . See drawing b
Wire bending test	Fix the sensor shell according to the figure on the right, apply tension to the head to bend it 15°, and then bend it in the reverse direction 15° once, and do 3 times	The epoxy does not break and has no abnormal electrical performance and appearance. See drawing c

Drawing b



Drawing C



6.Climatic properties

Items	Ratings	Remarks
6.1 Cold	At -20°C±3°C for 1000 hours,and then stored at room temperature and humidity for 1 hour	Appearance should be no visible damage,the change ratio of resistance and B should be within ±1% of the initial value and there shall be no visible damage. The withstand voltage and dielectric resistance accord with3.5、 3. 10. MH
6.2 Dry	At 120°C±3°C for 1000 hours,and then stored at room temperature and humidity for 1 hour.	
6.3 Damp heat	At 40°C±3°C,90%RH~95%RH for 1000 hours,and then stored at room temperature and humidity for 1 hour.	
6.4 Humidity load	At 40°C±3°C,90%RH~95%RH with the DC 1mA load for 1000 hours,and then stored at room temperature and humidity for 1 hour.	
6.5 Rapid change of temperature	-At -20°C±3°Cfor 10 minutes -At room ambient temperature for 3 minutes -At 120°C±3°C for 10 minutes -At room ambient temperature for 3 minutes 100 cycles of rapid change of temperature are applied to the test samples,and then stored at room temperature and humidity for 1 hour.	

Resistance-Temperature Characteristics

Tem.(°C)	Min.	Nomimal	Max.	Tem.(°C)	Min.	Nomimal	Max.
-30	1014.4527	884.9923	771.5707	11	103.385	94.3217	85.9992
-29	951.8689	831.4327	725.7809	12	98.492	89.9431	82.085
-28	893.557	781.4669	683.0104	13	93.8582	85.7926	78.371
-27	839.199	734.8315	643.0414	14	89.4684	81.8569	74.8461
-26	788.5023	691.2838	605.673	15	85.3085	78.1238	71.4994
-25	741.1971	650.5999	570.7194	16	81.3652	74.5818	68.3211
-24	697.036	612.5739	538.0101	17	77.6262	71.2201	65.3019
-23	655.7902	577.0159	507.3865	18	74.0797	68.0286	62.4328
-22	617.25	543.7504	478.7035	19	70.7148	64.9978	59.7057
-21	581.2211	512.6158	451.8259	20	67.5212	62.1187	57.1127
-20	547.5244	483.4624	426.6291	21	64.4894	59.3829	54.6466
-19	515.9951	456.1523	402.9978	22	61.6103	56.7827	52.3006
-18	486.4807	430.5578	380.8253	23	58.8755	54.3104	50.068
-17	458.8401	406.5607	360.0128	24	56.2768	51.9592	47.9429
-16	432.9433	384.0518	340.4685	25	53.807	49.7226	45.9196
-15	408.6699	362.9299	322.1078	26	51.4588	47.5943	43.9925
-14	385.9085	343.1013	304.8519	27	49.2257	45.5686	42.1568
-13	364.5557	324.4791	288.6277	28	47.1016	43.6399	40.4074
-12	344.5164	306.9829	273.3675	29	45.0804	41.8032	38.7401
-11	325.7019	290.5379	259.0083	30	43.1567	40.0536	37.1504
-10	308.0302	275.0748	245.4916	31	41.3253	38.3865	35.6344
-9	291.4252	260.5292	232.7632	32	39.5813	36.7976	34.1884
-8	275.8163	246.8415	220.7724	33	37.92	35.2829	32.8086
-7	261.1381	233.9559	209.4722	34	36.3373	33.8385	31.4918
-6	247.3295	221.8209	198.8188	35	34.8289	32.4608	30.2348
-5	234.3343	210.3884	188.7715	36	33.3909	31.1463	29.0345
-4	222.0997	199.6138	179.2924	37	32.0199	29.892	27.8881
-3	210.5769	189.4555	170.346	38	30.7122	28.6947	26.7929
-2	199.7206	179.8746	161.8995	39	29.4647	27.5515	25.7464
-1	189.4882	170.8351	153.9219	40	28.2743	26.4598	24.7462
0	179.8405	162.3034	146.3848	41	27.1381	25.4169	23.7901
1	170.7408	154.248	139.2612	42	26.0533	24.4205	22.8757
2	162.1549	146.6397	132.5261	43	25.0175	23.4683	22.0012
3	154.0509	139.4512	126.1563	44	24.0281	22.558	21.1646
4	146.3991	132.657	120.1298	45	23.0829	21.6876	20.364
5	139.1718	126.2333	114.4262	46	22.1796	20.8553	19.5978
6	132.3429	120.1579	109.0265	47	21.3162	20.0591	18.8642
7	125.8885	114.4099	103.9128	48	20.4908	19.2973	18.1619
8	119.786	108.9698	99.0684	49	19.7015	18.5682	17.4892
9	114.0141	103.8196	94.4776	50	18.9465	17.8703	16.8448
10	108.5533	98.9423	90.1258	51	18.2242	17.2022	16.2273

Resistance-Temperature Characteristics

Tem.(°C)	Min.	Nomimal	Max.	Tem.(°C)	Min.	Nomimal	Max.
52	17.533	16.5623	15.6356	93	4.2023	4.0824	3.9634
53	16.8715	15.9494	15.0683	94	4.0723	3.9585	3.8455
54	16.2382	15.3622	14.5245	95	3.9468	3.839	3.7317
55	15.6317	14.7996	14.0029	96	3.8258	3.7235	3.6217
56	15.0509	14.2603	13.5027	97	3.7091	3.6121	3.5154
57	14.4946	13.7433	13.0228	98	3.5963	3.5044	3.4127
58	13.9615	13.2475	12.5622	99	3.4876	3.4005	3.3135
59	13.4505	12.7721	12.1202	100	3.3825	3.3	3.2175
60	12.9608	12.316	11.6959	101	3.285	3.203	3.1211
61	12.4913	11.8784	11.2885	102	3.1908	3.1093	3.0279
62	12.041	11.4585	10.8973	103	3.0996	3.0187	2.938
63	11.6091	11.0554	10.5215	104	3.0115	2.9311	2.851
64	11.1948	10.6685	10.1605	105	2.9262	2.8464	2.7671
65	10.7973	10.2969	9.8136	106	2.8438	2.7646	2.6859
66	10.4157	9.94	9.4802	107	2.764	2.6854	2.6075
67	10.0495	9.5973	9.1597	108	2.6867	2.6089	2.5318
68	9.6978	9.2679	8.8515	109	2.612	2.5349	2.4585
69	9.3602	8.9514	8.5552	110	2.5397	2.4633	2.3877
70	9.0359	8.6473	8.2702	111	2.4696	2.394	2.3192
71	8.7243	8.3548	7.996	112	2.4018	2.3269	2.2529
72	8.4249	8.0737	7.7322	113	2.3362	2.262	2.1889
73	8.1372	7.8033	7.4784	114	2.2726	2.1992	2.1269
74	7.8607	7.5432	7.234	115	2.211	2.1384	2.067
75	7.5949	7.293	6.9988	116	2.1513	2.0796	2.0089
76	7.3392	7.0523	6.7723	117	2.0935	2.0226	1.9528
77	7.0934	6.8206	6.5542	118	2.0375	1.9674	1.8984
78	6.8569	6.5976	6.3442	119	1.9832	1.9139	1.8458
79	6.6294	6.3829	6.1418	120	1.9306	1.8621	1.7949
80	6.4105	6.1762	5.9468	121	1.8796	1.8119	1.7456
81	6.1998	5.9772	5.7589	122	1.8302	1.7633	1.6978
82	5.997	5.7854	5.5778	123	1.7823	1.7162	1.6516
83	5.8018	5.6007	5.4032	124	1.7358	1.6706	1.6068
84	5.6137	5.4227	5.2349	125	1.6907	1.6263	1.5634
85	5.4327	5.2512	5.0725	126	1.647	1.5834	1.5213
86	5.2583	5.0858	4.916	127	1.6046	1.5418	1.4806
87	5.0902	4.9264	4.7649	128	1.5635	1.5015	1.4411
88	4.9283	4.7728	4.6192	129	1.5235	1.4624	1.4028
89	4.7723	4.6246	4.4786	130	1.4848	1.4244	1.3657
90	4.6219	4.4817	4.343	131	1.4472	1.3876	1.3297
91	4.4769	4.3438	4.212	132	1.4107	1.3519	1.2948
92	4.3371	4.2108	4.0855	133	1.3753	1.3173	1.261

Resistance-Temperature Characteristics

Tem.(°C)	Min.	Nomimal	Max.	Tem.(°C)	Min.	Nomimal	Max.
134	1.3409	1.2837	1.2282	175	0.5162	0.4846	0.4547
135	1.3075	1.2511	1.1964	176	0.5053	0.4742	0.4447
136	1.275	1.2194	1.1655	177	0.4946	0.464	0.435
137	1.2435	1.1887	1.1355	178	0.4842	0.454	0.4254
138	1.2129	1.1589	1.1065	179	0.4741	0.4443	0.4162
139	1.1832	1.1299	1.0783	180	0.4642	0.4349	0.4071
140	1.1544	1.1018	1.0509	181	0.4545	0.4256	0.3983
141	1.1263	1.0744	1.0243	182	0.4451	0.4166	0.3898
142	1.099	1.0479	0.9985	183	0.4359	0.4079	0.3814
143	1.0725	1.0221	0.9735	184	0.427	0.3993	0.3732
144	1.0468	0.9971	0.9492	185	0.4182	0.391	0.3653
145	1.0218	0.9728	0.9256	186	0.4097	0.3829	0.3575
146	0.9974	0.9491	0.9026	187	0.4014	0.3749	0.35
147	0.9738	0.9262	0.8804	188	0.3932	0.3672	0.3426
148	0.9508	0.9039	0.8587	189	0.3853	0.3596	0.3354
149	0.9284	0.8822	0.8377	190	0.3776	0.3522	0.3284
150	0.9066	0.8611	0.8173	191	0.37	0.3451	0.3216
151	0.8855	0.8406	0.7974	192	0.3626	0.338	0.3149
152	0.8649	0.8206	0.7781	193	0.3554	0.3312	0.3084
153	0.8449	0.8012	0.7594	194	0.3484	0.3245	0.302
154	0.8254	0.7824	0.7412	195	0.3415	0.318	0.2958
155	0.8064	0.764	0.7235	196	0.3348	0.3116	0.2898
156	0.7879	0.7462	0.7062	197	0.3283	0.3054	0.2839
157	0.77	0.7289	0.6895	198	0.3218	0.2993	0.2781
158	0.7525	0.712	0.6732	199	0.3156	0.2933	0.2725
159	0.7355	0.6955	0.6574	200	0.3095	0.2876	0.267
160	0.7189	0.6796	0.642	201	0.3035	0.2819	0.2616
161	0.7028	0.664	0.627	202	0.2977	0.2764	0.2564
162	0.6871	0.6489	0.6124	203	0.292	0.271	0.2513
163	0.6718	0.6341	0.5982	204	0.2864	0.2657	0.2463
164	0.6569	0.6198	0.5844	205	0.281	0.2605	0.2414
165	0.6424	0.6058	0.571	206	0.2756	0.2555	0.2367
166	0.6282	0.5922	0.5579	207	0.2704	0.2506	0.232
167	0.6145	0.579	0.5452	208	0.2653	0.2458	0.2275
168	0.601	0.5661	0.5328	209	0.2604	0.2411	0.2231
169	0.588	0.5535	0.5207	210	0.2555	0.2365	0.2187
170	0.5752	0.5413	0.509	211	0.2507	0.232	0.2145
171	0.5628	0.5293	0.4976	212	0.2461	0.2276	0.2103
172	0.5507	0.5177	0.4864	213	0.2416	0.2233	0.2063
173	0.5389	0.5064	0.4756	214	0.2371	0.2191	0.2024
174	0.5274	0.4954	0.465	215	0.2328	0.215	0.1985

Resistance-Temperature Characteristics

Tem.(°C)	Min.	Nomimal	Max.	Tem.(°C)	Min.	Nomimal	Max.
216	0.2285	0.211	0.1947	259	0.1096	0.0997	0.0907
217	0.2243	0.2071	0.191	260	0.1079	0.0982	0.0892
218	0.2203	0.2032	0.1874	261	0.1062	0.0966	0.0878
219	0.2163	0.1995	0.1839	262	0.1046	0.0951	0.0863
220	0.2124	0.1958	0.1804	263	0.103	0.0935	0.0849
221	0.2086	0.1922	0.1771	264	0.1014	0.0921	0.0836
222	0.2048	0.1887	0.1738	265	0.0998	0.0906	0.0822
223	0.2012	0.1853	0.1706	266	0.0983	0.0892	0.0809
224	0.1976	0.1819	0.1674	267	0.0968	0.0878	0.0796
225	0.1941	0.1787	0.1643	268	0.0953	0.0864	0.0784
226	0.1907	0.1754	0.1613	269	0.0939	0.0851	0.0771
227	0.1873	0.1723	0.1584	270	0.0924	0.0838	0.0759
228	0.1841	0.1692	0.1555	271	0.091	0.0825	0.0747
229	0.1809	0.1662	0.1526	272	0.0897	0.0812	0.0735
230	0.1777	0.1633	0.1499	273	0.0883	0.08	0.0724
231	0.1746	0.1604	0.1472	274	0.087	0.0788	0.0713
232	0.1716	0.1575	0.1445	275	0.0857	0.0776	0.0702
233	0.1687	0.1548	0.142	276	0.0844	0.0764	0.0691
234	0.1658	0.1521	0.1394	277	0.0832	0.0752	0.068
235	0.1629	0.1494	0.1369	278	0.082	0.0741	0.067
236	0.1602	0.1468	0.1345	279	0.0808	0.073	0.066
237	0.1574	0.1443	0.1321	280	0.0796	0.0719	0.065
238	0.1548	0.1418	0.1298	281	0.0784	0.0708	0.064
239	0.1522	0.1394	0.1275	282	0.0773	0.0698	0.063
240	0.1496	0.137	0.1253	283	0.0762	0.0688	0.062
241	0.1471	0.1346	0.1231	284	0.0751	0.0677	0.0611
242	0.1447	0.1323	0.121	285	0.074	0.0668	0.0602
243	0.1423	0.1301	0.1189	286	0.0729	0.0658	0.0593
244	0.1399	0.1279	0.1169	287	0.0719	0.0648	0.0584
245	0.1376	0.1257	0.1148	288	0.0708	0.0639	0.0575
246	0.1353	0.1236	0.1129	289	0.0698	0.0629	0.0567
247	0.1331	0.1216	0.111	290	0.0688	0.062	0.0559
248	0.1309	0.1195	0.1091	291	0.0679	0.0611	0.055
249	0.1288	0.1176	0.1072	292	0.0669	0.0603	0.0542
250	0.1267	0.1156	0.1054	293	0.066	0.0594	0.0534
251	0.1247	0.1137	0.1036	294	0.0651	0.0586	0.0527
252	0.1227	0.1118	0.1019	295	0.0642	0.0577	0.0519
253	0.1207	0.11	0.1002	296	0.0633	0.0569	0.0512
254	0.1188	0.1082	0.0985	297	0.0624	0.0561	0.0504
255	0.1169	0.1064	0.0969	298	0.0615	0.0553	0.0497
256	0.115	0.1047	0.0953	299	0.0607	0.0545	0.049
257	0.1132	0.103	0.0937	300	0.0599	0.0538	0.0483
258	0.1114	0.1014	0.0922				