

Operating Manual for Digital Quick-Response Thermometer

GTH 1150 / GTH 1160



Specification:

Measuring range:	Range 1: -50.0 to +199.9°C (only for GTH1160) Range 2: -50 to +1150°C
Resolution:	Range 1: 0.1°C (only for GTH1160) Range 2: 1°C
Accuracy: (at nominal temperature)	better than 1% ± 1 digit from -20 to +550°C and 920 to 1150°C. Better than 1,5% ± 1 digit from 550 to 920°C. For more detailed values please refer to att. correction table.
Sensor:	NiCr-Ni, acc. to ½ DIN 43710 for plug-in operation (not included in scope of supply !) Special design sensors incl. one of the following probes:
GTF300:	2 teflon-isolated, helically wound thermoelement wires with a dia of 0,2mm each, length approx. 1m with miniature flat plug, free from thermo-voltage. Sensor suitable for surface and immersion measurements. Response time in liquids 0,3sec. Measuring range: -65 to 300°C.
GTF300GS:	2 thermoelement wires isolated with glass braiding with a dia of 0,2mm each, length approx. 1m with miniature flat plug, free from thermo-voltage. Sensor suitable for air and surface measurements (not suitable for liquids). Response time 0,3sec. Measuring range: -65 to 400°C.
GES900, GES1000:	NiCr-Ni insertion probe (1/2DIN), tube dia 3,0mm, tube length approx. 130mm, tip, plastic handle, cable approx. 1m long. The plastic handle is resistant to temperatures up to 120°C, do not immerse handle in liquids. Sensor suitable for insertion measurements in soft plastic media as well as for immersion measurements. Response time in liquids approx. 3sec. Measuring range: -50 to 1000°C.
Display:	approx. 13 mm high, 3 1/2digit LCD
Nominal temperature:	25°C
Working temperature:	0 to 45°C, please avoid quick temperature changes, if possible, otherwise a temperature adjustment time of approx. 15 minutes has to be taken into account.
Atmospheric humidity:	0 to 80 % r.F. (not condensing)
Storage temperature:	-10 to 70°C
Power supply:	9V-battery type IEC 6F22 (included)
Battery service life:	approx. 700 operating hours (GTH1150) or approx. 300 operating hours (GTH1160)
Low battery warning:	"BAT" displayed automatically in case of low battery
Dimensions of case:	approx. 106 x 67 x 30 mm (H x W x D)(sensor not included)
Weight:	approx. 150g (incl. battery)
Electromagnetic compatibility:	In accordance with EN50081-1 and EN50082-2 for unrestricted use in housing and industrial areas. Additional error: <1%

Points to be observed during operation

- As soon as „BAT“ is displayed the battery is used up and needs to be replaced immediately as too low operating voltage may result in incorrect measurements. Unless the battery is replaced immediately the voltage will not even be enough to display “BAT”. Therefore, make it a rule to always check the battery – even if no ‘BAT’ warning is displayed – if measuring results are incorrect.
- Make sure to maintain device properly and to operate it in accordance with the specification listed (do not throw, knock etc.).
- Make sure that sensor and device are always subjected to the same temperature, i.e. try to avoid holding sensor plug in your hand for a longer periode of time as well as subjecting device to an additional heat source as this may result in measuring inaccuracies.
- The length of the measuring sensor (GTF300, GTF300GS) can be reduced as desired so that it will be fully operational again after sensor has been broken. To do so, please strip both wire ends for approx. 10mm and twist well. Measurements are not possible as long as wire ends are exposed.

Safety Advices

This device has been designed, assembled and tested in accordance with the safety regulations for electronic measurement devices.

However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advices will be adhered to when using the device.

1. Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under "Specification".
2. Moving the device from a cold to a warm environment may lead to malfunctions due to condensation. In such a case we recommend waiting to allow device temperature to adjust to the ambient temperature before re-starting.
3. If there is any risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.

Operator safety may be a risk, if :

- there is visible damage done to the device.
- the device is not working as specified.
- the device has been stored under unsuitable conditions for a longer time.

In case of doubt, please return device to manufacturer for repair or maintenance

Recalibration:

The measuring device will be calibrated before leaving our works. A recalibration is, therefore, not necessary. If you want to calibrate the device for an existing sensor, please proceed as follows: (calibrate 0°C before scale as otherwise correct adjustment cannot be guaranteed)

Normally sensor adjustment by means of 0° C potentiometer is sufficient. We do not recommend a scale compensation in order to maintain the specified accuracy of the device. If an accurate reference temperature is available, choose highest temperature possible to calibrate the device.

Calibration point 0°C: Put ice cubes in a glass and pour cold water till ice cubes are almost covered. Put sensor into glass, wait approx. 15 minutes, then stir water with a spoonhandle. Wait for stable value to be displayed, then turn zero point potentiometer (NP, Potentiometer next to sensor connection) by means of a screw driver till display shows "000" resp "0.3" (for GTH1160).

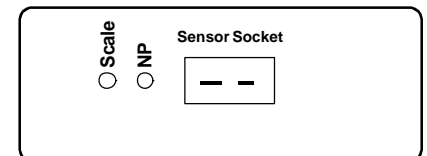
Calibration point scale: To set the pitch (Scale) a fixed reference temperature is required (the higher the better). Subject sensor to this temperature and set respective display value according to correction table value (e.g. reference temperature 700°C -> value to be set: 711) by means of pitch potentiometer (outer potentiometer).

Please note that boiling water should not be used as a temperature reference as the boiling temperature is dependent on the atmospheric pressure.

(If using a reference thermometer stating the precise temperature you may, however even use boiling water.)

Please note : During the waiting time the device should have assumed ambient temperature (we recommend a temperature of 20 to 25°C). Please avoid holding device in your hand as well as subjecting it to an additional heat source (e.g. radiator, lamp, sun).

View of frontplate



Correction table

Temperature	Display	Temperature	Display	Temperature	Display	Temperature	Display	Temperature	Display	Temperature	Display
-50	-45.8	160	159.7	370	369	580	587	790	802	1000	1007
-40	-36.9	170	169.5	380	379	590	597	800	812	1010	1016
-30	-27.9	180	179.2	390	390	600	607	810	822	1020	1026
-20	-18.6	190	188.9	400	400	610	618	820	832	1030	1035
-10	-9.3	200	198.7	410	410	620	628	830	842	1040	1045
0	0.3	210	208	420	421	630	639	840	852	1050	1054
10	10.0	220	218	430	431	640	649	850	862	1060	1063
20	19.8	230	228	440	441	650	659	860	871	1070	1073
30	29.6	240	238	450	452	660	670	870	881	1080	1082
40	39.6	250	248	460	462	670	680	880	891	1090	1091
50	49.6	260	258	470	472	680	690	890	901	1100	1100
60	59.7	270	268	480	483	690	700	900	911	1110	1110
70	69.8	280	278	490	493	700	711	910	920	1120	1119
80	80.0	290	288	500	504	710	721	920	930	1130	1128
90	90.0	300	298	510	514	720	731	930	940	1140	1137
100	100.1	310	308	520	524	730	741	940	949	1150	1146
110	110.2	320	318	530	535	740	751	950	959	1160	1155
120	120.2	330	328	540	545	750	762	960	969	1170	1164
130	130.2	340	339	550	556	760	772	970	978	1180	1173
140	140.1	350	349	560	566	770	782	980	988		
150	149.9	360	359	570	576	780	792	990	997		