

MH 1150



Specification:

Range:	-50 to +1150°C
Resolution:	1°C
Accuracy:	<1% ±1 digit from -20 to +550°C and 920 to 1150°C, <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. the following probe: 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.
Display:	approx. 13 mm high, 3 1/2digit LCD
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.
Nominal temperature:	25°C
Atmospheric humidity:	0 to 80 % r.F. (not condensing)
Power supply:	9V-battery type IEC 6F22 (included) as well as additional d.c. connector (internal pin Ø 1.9mm) for external 10-12V direct voltage supply. (suitable power supply: GNG10/3000)
Battery service life:	approx. 700 operating hours
Low battery warning:	"BAT" displayed automatically in case of low battery
Dimensions of case:	approx. 142 x 71 x 26 mm (H x W x D), Impact-resistant ABS plastic housing, Front side IP65, integrated pop-up clip for table top or suspended use.
Weight:	approx. 160g (cpl. device with battery)
EMC:	The device corresponds to the essential protection ratings established in the Regulations of the Council for the Approximation of Legislation for the member countries regarding electromagnetic compatibility (89/336/EWG). Additional error: <1%

Points to be observed during operation

1. Make sure to apply correct operating voltage as low or damaged battery will lead to measuring inaccuracies. If "BAT" is shown in the display or are the measurements obviously wrong the battery has been used up and needs to be replaced.
Please note: If the battery voltage falls even lower the voltage may not be sufficient for "BAT" to be displayed so that there will be no "BAT" indication although the battery has been used up. We recommend to make it a rule to always check the battery if the values indicated seem to be completely out of range.
2. Make sure to maintain device properly and to operate it in accordance with the specification listed (do not throw, knock etc.).
3. 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.
4. Mains operation:
When using a power supply unit please note that operating voltage has to be 10 to 12 V DC. Do not apply overvoltage!! Cheap 12V-power supply units often have excessive no-load voltage. We, therefore, recommend using regulated voltage power supply units. Trouble-free operation is guaranteed by our power supply GNG10/3000.
Prior to connecting the plug power supply unit with the mains supply make sure that the operating voltage stated at the power supply unit is identical to the mains voltage.
5. The length of the measuring sensor (GTF300) 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 device is to be connected to other devices the circuitry has to be designed most carefully. Internal connection in third party units (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.

Warning: If device is operated with a defective mains power supply (short circuit from mains voltage to output voltage) this may result in hazardous voltages at the device (e.g. sensor socket).

4. 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.

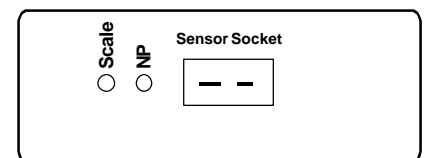
Calibration point 0°C: Put ice cubes in a glass and pour cold water till ice cubes are almost covered. Put sensor into glass, wait approx. 15 minutes, then stirr water with a spoonhandle. Wait for stable value to be displayed, then turn zero point potentiometer (NP, Potentiometer next to sensor connection)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

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	-46	160	160	370	369	580	587	790	802	1000	1007
-40	-37	170	169	380	379	590	597	800	812	1010	1016
-30	-28	180	179	390	390	600	607	810	822	1020	1026
-20	-19	190	189	400	400	610	618	820	832	1030	1035
-10	-10	200	198	410	410	620	628	830	842	1040	1045
0	0	210	208	420	421	630	639	840	852	1050	1054
10	10	220	218	430	431	640	649	850	862	1060	1063
20	20	230	228	440	441	650	659	860	871	1070	1073
30	29	240	238	450	452	660	670	870	881	1080	1082
40	39	250	248	460	462	670	680	880	891	1090	1091
50	49	260	258	470	472	680	690	890	901	1100	1100
60	59	270	268	480	483	690	700	900	911	1110	1110
70	70	280	278	490	493	700	711	910	920	1120	1119
80	80	290	288	500	504	710	721	920	930	1130	1128
90	90	300	298	510	514	720	731	930	940	1140	1137
100	100	310	308	520	524	730	741	940	949	1150	1146
110	110	320	318	530	535	740	751	950	959	1160	1155
120	120	330	328	540	545	750	762	960	969	1170	1164
130	130	340	339	550	556	760	772	970	978	1180	1173
140	140	350	349	560	566	770	782	980	988		
150	150	360	359	570	576	780	792	990	997		