

1. General

1.1. General

- The temperature sensor described in the operating instructions is manufactured according to the current state of the art. All components are subject to strict quality and environmental criteria during manufacture. Our management systems are certified according to ISO 9001 and ISO 14001. The GTC in the sales documents apply.
- These operating instructions are an important part of the product. It must be available to qualified personnel and must be carefully read and understood before starting any work. Please be sure to comply with all the safety and handling instructions given. In particular, observe the local accident prevention regulations and general safety regulations applicable to the area of use of the unit.
- The manufacturer's liability expires in the event of damage caused by improper use, non-observance of the instructions, use of insufficiently qualified personnel and unauthorised modifications to the unit

1.2. Security

WARNING! Before installation, commissioning and operation, please make absolutely sure that the correct temperature sensor has been selected with regard to design and specific measuring conditions. Failure to do so may result in serious personal injury and/or damage to property.

- The selection of the products and, in particular, the determination of their suitability for a specific purpose are the sole responsibility of the purchaser, who must also ensure that incorrect planning, operation or installation does not cause any further damage and that compliance with the relevant construction and safety guidelines is observed and guaranteed.
- No liability or warranty is expressly accepted for damage caused by incorrect planning, operation, installation or malfunction of the units.
- The technical data and connection conditions in the supplied installation and operating instructions apply exclusively.

1.3. Intended use





- For the intended use of the sensor, please refer to the technical data and the commissioning instructions in the operating instructions. The unit is designed and built exclusively for the intended use described there and may only be used accordingly. The technical specifications must be observed. Claims due to improper use are excluded.
- This device must not be used for safety-relevant tasks, such as monitoring or protecting persons against danger or injury, as an emergency stop switch on systems or machines, etc.

1.4. Personnel Qualification

WARNING! - Risk of injury due to insufficient professional qualification!: Improper handling can lead to considerable personal injury and damage to property.

- The activities described in these operating instructions may only be carried out by adequately qualified personnel. Special operating conditions may require further appropriate knowledge, e.g. about aggressive media, possible dangers or country-specific regulations, standards or guidelines. Please keep unqualified personnel away from the danger areas.

1.5. Signage, safety markings, type plate

Label for housing probe	Label for cable sensor (attached to the cable as a flag)
<p>Art. Nr. 801010 1011-A011-B2</p> <p>Messbereich: -30 °C bis +300 °C Pt100 Klasse A - 2-Leiter</p> <p>www.testo-sensor.de</p>  	<p>Art. Nr. 803550 1011-A011-B2- C0030-D040-E0009- F010-G01-H0</p> <p>Messbereich: -30 °C bis +105 °C Pt100 Klasse A - 2-Leiter</p> <p>www.testo-sensor.de</p>  

2. Technical data and assembly instructions

For technical data, please refer to the operating instructions or the data sheets available on our website www.testo-sensor.shop.

3. Transport, storage and packaging

3.1. Transport

Please inspect the unit immediately after delivery for any transport damage. Please inform us immediately of any obvious damage.

3.2. Packaging

Please remove the packaging only immediately before assembly and keep it, as the packaging provides optimum protection during transport.

All rights reserved. No changes may be made to the documents. We reserve the right to make technical changes. Please read the operating instructions before starting any work and keep them carefully to hand. HPE / KS / 23.05.2022 0973 9912

3.3. Storage

The permissible temperature and ambient humidity conditions at the storage location are:

- Storage temperature: -20 ... +70 °C | Humidity: preferably approx. 20 % ... 85 % relative humidity; avoid condensation

The following influences are to be avoided:

- Direct sunlight or proximity to hot objects
- Mechanical vibration, mechanical shock (hard impact)
- Exposure to soot, steam, dust or corrosive gases
- Explosive environment, flammable atmospheres

3.4. Original packaging

Please store the unit in the original packaging in a place that meets the conditions listed above. If the original packaging is not available, please pack and store the unit as follows

- Wrap the unit in an antistatic plastic sheet.
- Place the unit with the insulation material in the packaging.
- For longer storage (more than 30 days), add a bag of desiccant to the packaging.

4. Commissioning

4.1. Assembly

- The units may only be connected in a de-energised state, only to safety extra-low voltages and only by suitably qualified personnel. The installation instructions in the data sheet must be observed.
- Please observe the safety regulations of the VDE, the federal states, their monitoring bodies, the TÜV and the local EVU.
- Please observe EMC guidelines to prevent damage, faults on the unit or measured value deviations.

4.2. Requirements for achieving the protection class (IP 65)

- Only use the cable gland in the specified clamping range (select the cable Ø to match the cable gland).
- Do not use the lower clamping area when using very soft cable types.
- Only use round cables (a slightly oval cross-section may also be suitable).
- Do not twist the cable.
- Multiple opening/closing is possible, but can have a negative effect on the protection class.
- For cables with pronounced cold flow behaviour, please tighten the screw connection if necessary.

4.3. Drilling template

You will find the drilling template, if available, in the technical data.

4.4. Pin assignment

The characteristic curves of our sensors can be found on our website or in the appendix of this operating manual.

- The units are designed for operation on safety extra-low voltages (SELV).
- For the electrical connection of the units, the technical data of the units apply.
- Especially with passive sensors (e.g. Pt100 etc.) in a two-wire circuit, the lead resistance of the supply line must be taken into account and, if necessary, corrected in the subsequent electronics in order to correct measured value deviations (offset).
- Due to self-heating, the measuring current influences the measuring accuracy and should therefore not be greater than 1 mA.
- The LM235Z sensor is a semiconductor. The correct polarity must be ensured when connecting it. The measuring current is between 400 µA and 5 mA, the resolution is 10 mV / K.

Circuit diagrams					
Probes with cable	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire
M8 / M12	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire

All rights reserved. No changes may be made to the documents. We reserve the right to make technical changes. Please read the operating instructions before starting any work and keep them carefully to hand. HPE / KS / 23.05.2022 0973 9912

Circuit diagrams					
Angle plug	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire
					Nicht verfügbar
Housing probes	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire
Indoor probes	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire
B-Head	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire
B-Head Duplex		2 x 2-Wire	2 x 3-Wire	B-Head Duplex	2 x 4-Wire
J-Head	LM235Z	2-Wire	3-Wire	3-Wire DS Sensor	4-Wire
J-Head Duplex	2 x 2-Wire				

All rights reserved. No changes may be made to the documents. We reserve the right to make technical changes. Please read the operating instructions before starting any work and keep them carefully to hand. HPE / KS / 23.05.2022 0973 9912

4.5. Characteristic curves

Temp.	NTC 5kOhm	NTC 10kOhm	NTC 20kOhm	Ni1000	LM235Z	LM34	KTY 81-210	KTY 81-110	Pt100	Pt500	Pt1000
°C	Ω	Ω	Ω	Ω	mV	mV	Ω	Ω	Ω	Ω	Ω
-50				742,55	2.232		1.030,00	515	80,31	401,55	803,06
-40	148.330	308.163	829.134	791,31	2.332	-400	1.135,00	567	84,27	421,35	842,71
-30	81.682	165.777	427.896	841,46	2.432	-220	1.247,00	624	88,22	441,10	882,22
-20	47.184	93.738	227.561	892,96	2.532	-40	1.367,00	684	92,16	460,80	921,60
-10	27.752	54.528	125.066	945,82	2.632	140	1.495,00	747	96,09	480,45	960,86
0	16.521	32.446	71.101	1.000,00	2.732	320	1.630,00	815	100,00	500,00	1.000,00
10	10.012	19.791	41.797	1.055,52	2.832	500	1.772,00	886	103,90	519,50	1.039,03
20	6.243	12.444	25.375	1.112,36	2.932	680	1.922,00	961	107,79	538,95	1.077,94
25	5.000	10.000	20.000	1.141,29	2.982	770	2.000,00	1.000	109,74	548,70	1.097,35
30	4.037	8.127	15.880	1.170,56	3.032	860	2.080,00	1.040	111,67	558,35	1.116,73
40	2.665	5.385	10.222	1.230,11	3.132	1.040	2.245,00	1.122	115,54	577,70	1.155,41
50	1.794	3.620	6.751	1.291,05	3.232	1.220	2.417,00	1.209	119,40	597,00	1.193,97
60	1.234	2.485	4.564	1.353,40	3.332	1.400	2.597,00	1.299	123,24	616,20	1.232,42
70	867	1.746	3.150	1.417,21	3.432	1.580	2.785,00	1.392	127,08	635,40	1.270,75
80	622	1.254	2.215	1.482,50	3.532	1.760	2.980,00	1.490	130,90	654,50	1.308,97
90	455	918	1.582	1.549,34	3.632	1.940	3.182,00	1.591	134,71	673,55	1.347,07
100	339	684	1.145	1.617,79	3.732	2.120	3.392,00	1.696	138,51	692,55	1.385,06
110	256	516	839	1.687,89	3.832	2.300	3.607,00	1.805	142,29	711,45	1.422,93
120	197	393	620	1.759,72	3.932	2.480	3.817,00	1.915	146,07	730,35	1.460,68
130				1.833,35	4.032	2.660	4.008,00	2.023	149,83	749,15	1.498,32
140				1.908,87	4.132	2.840	4.166,00	2.124	153,58	767,90	1.535,84
150				1.986,35	4.232		4.280,00	2.211	157,33	786,65	1.573,25

4.6. Maintenance

The temperature sensor is maintenance-free. Repairs are to be carried out exclusively by the manufacturer or by appropriately qualified personnel.

4.7. Disposal

The product is to be classified as electrical and electronic equipment and must therefore be disposed of as electrical / electronic waste. The product must not be disposed of as household waste. Special treatment for special components may be legally mandatory and ecologically sensible. Please also observe the local legislation applicable to disposal.

All rights reserved. No changes may be made to the documents. We reserve the right to make technical changes. Please read the operating instructions before starting any work and keep them carefully to hand. HPE / KS / 23.05.2022 0973 9912