



# HV THMM



## Product description

CSM's **HV THMM 4** measurement module is especially designed for safe temperature measurements on live high-voltage parts and is therefore excellently suited for mobile and stationary use in e-mobility applications (electric and hybrid vehicles).

Thanks to their compact and robust design and a very wide operating temperature range, **HV THMM 4** measurement modules can be installed and operated directly in the engine compartment and other constrained spaces, e. g. close to the high-voltage battery and power electronics. **HV THMM 4** features a high degree of measurement accuracy over the entire operating temperature range.

## Shipping content

- ▶ Measurement module HV THMM 4
- ▶ Configuration software CSMconfig
- ▶ Documentation
- ▶ Calibration certificate in accordance with DIN EN ISO/IEC 17025
- ▶ HV isolation test certificate

## Key features



- ▶ **NiCr-Ni temperature inputs (K type), with reinforced insulation**
- ▶ **Type approval test according to safety standard EN 61010 by accredited testing laboratory**
- ▶ **Routine test according to safety standard EN 61010**
- ▶ **Excellent measurement accuracy for all temperature ranges and environmental conditions**
- ▶ **Operating temperature range: -40 °C to +100 °C**


## Maintenance

- ▶ HV isolation test according to EN 61010 at least every 12 months
- ▶ Calibration every 12 months recommended

## Accessories

- ▶ See "CAN Accessories" datasheet

## Technical data

<b>Type designation</b>	<b>HV THMM 4</b>
	
<b>Inputs</b>	4 NiCr-Ni (K type)
Measurement range	-100 °C to +1372 °C
Internal resolution	16 bit
Internal sampling rate per ch.	1 kHz
Measurement data rate per ch.	1, 2, 5, 10 Hz, adjustable per module or per channel via configurable CAN identifier
HW input filter	low-pass filter 150 Hz
SW input filter	FIR-Filter (Finite Impulse Response), averaging automatically adjusted to measurement data rate
Channel-specific comments	free text consisting of up to 100 characters per channel
Broken sensor detection	yes
Cold junction compensation	internal cold junction per channel
<b>Measurement deviation <sup>1)</sup></b>	
Gain error at 25 °C	max. ±0.05 % of measured value
Offset and scaling error	typ. ±0.15 K max. ±0.3 K ±12 µV
Gain drift	max. ±10 ppm/K of measured value
Zero drift	max. ±4 mK/K
<b>Fields of application <sup>2)</sup></b>	for measurements in HV environments <sup>3)</sup>  For details see the following document that is also applicable: "Technical Information: Fields of Application for CSM HV Measurement Modules".
Working voltages <sup>3)</sup>	up to 1,000 V DC
<b>Isolation test <sup>2)</sup></b>	
Type approval test	test voltage <sup>3)</sup> 3,510 V AC
Routine test	test voltage <sup>3)</sup> 3,100 V DC isolation test is to be performed at least every 12 months
<b>Reinforced insulation <sup>2), 3)</sup></b>	
Channel / channel	846 V
Channel / CAN	846 V
Channel / power supply	846 V
<b>Functional insulation</b>	
CAN / power supply	designed for supply voltages 12 V and 24 V
<b>Measurement categories</b>	
CAT 0	846 V
CAT II <sup>4)</sup>	600 V
CAT III <sup>4)</sup>	300 V

<b>Type designation</b>	<b>HV THMM 4</b>
<b>CAN interface</b>	CAN 2.0B (active), High Speed (ISO 11898-2:2016), 125 kbit/s to 1 Mbit/s, up to 2 Mbit/s <sup>5)</sup> with CSMcan interface, data transfer is "free running"
Configuration	via CAN bus with CSMconfig or CSM INCA AddOn settings and configurations stored in the device
<b>Power supply</b>	
Minimum	6 V DC (-10 %)
Maximum	30 V DC (+10 %)
Power consumption	typ. 1 W
LED indicator	power (green), status (red)
<b>Housing</b>	aluminum with HV designation on the front-side (RAL 2003)
Protection class	IP67
Ground connection	M6 threaded hole
Weight	approx. 350 g
Dimensions (w × h × d)	approx. 130 × 33 × 75 mm / approx. 130 × 38 × 75 mm (Slide Case)
<b>Connectors</b>	
CAN / power supply <sup>6)</sup>	LEMO 0B, 5-pole, code G
Signal inputs	LEMO Redel 2P, 8-pole, code B (grey)
<b>Operating and storage conditions</b>	
Operating temperature range	-40 °C to +100 °C
Relative humidity	5 % to 95 % (non-condensing)
Altitude	max. 5,000 m above sea level (CAT 0) max. 3,000 m above sea level (CAT II and CAT III)
Pollution degree	4
Storage temperature	-40 °C to +100 °C
<b>Conformity</b>	<b>CE</b>
<b>Device safety</b>	EN 61010-1:2010
<b>Part numbers</b>	
Standard	ART1290100
Slide Case	ART1290101

<sup>1</sup> Further information can be found in the Technical Information document on the subject of "Deviation of Measurement".

<sup>2</sup> Please also read the CSM document "Safety Instructions HV THMM".

<sup>3</sup> According to EN 61010-1:2010

<sup>4</sup> Measurement categories are valid as of hardware revision B002. Further information can be found in the Technical Information document "Measurement Categories for CSM HV Measurement Modules".

<sup>5</sup> 2 Mbit/s as of hardware revision B000.

<sup>6</sup> Optionally also available in other variants.



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