



# Safety Instructions

## HV Breakout Module



### For Products

- ▶ HV BM 1.1
- ▶ HV BM 1.2
- ▶ HV BM 3.1

### General Safety Instructions

Please observe the following safety instructions and signs provided with the measurement modules as well as the safety-specific information in the accompanying technical documentation.

#### WARNING!



HV Breakout Modules (HV BM) are used in high-voltage applications. Improper use of the HV Breakout Module may result in life-threatening electric shocks.

- ☞ Make sure that these modules are only handled by qualified and trained personnel.
- ☞ Observe safety instructions.

#### WARNING!



The orange housing cover can be opened to connect or disconnect the high-voltage cables.

- ☞ Make sure that the high-voltage cables are voltage-free before handling, especially before opening the cover.
- ☞ HV BM 1.1/1.2: Attach the high-voltage cables only with the supplied or other suitable cable lugs and nuts.
- ☞ Follow the assembly instructions in the installation manual. The cover and PG cable glands must be mounted correctly to ensure tightness of the housing.

#### WARNING!



Improper opening of the housing will impair the operational safety of the HV measurement module and bears the risk of life-threatening electric shocks.

- ☞ Do not open the module housing in any other way.
- ☞ Do not carry out any mechanical or electrical modifications on the HV measurement module.
- ☞ Do not replace the shunt module.
- ☞ Only operate the measurement module with the housing cover closed.

#### WARNING!



The temperature of the shunt module must not exceed +120 °C. Exceeding this limit will impair the operational safety of the HV measurement module and may result in life-threatening electric shocks. The HV Breakout Module sends error messages if the limit is exceeded.

- ☞ Disconnect the power supply to prevent the module from heating up further.

## CAUTION!



The measurement module heats up considerably when operated in specific environments (e.g. engine compartment). The shunt also heats up when operated at high load. Therefore, the surface and the inside of the measurement module may become very hot.

A **continuous measurement of high currents** should be avoided in order to prevent the temperature inside the module from exceeding the specified range.

**Touching the surface may cause serious burns.**

☞ Let the measurement module cool down before handling, especially before opening the orange housing cover.

☞ Wear appropriate protective gloves, if required.



- ▶ Make sure that HV Breakout Modules are only handled by qualified and trained personnel.
- ▶ Make sure that HV Breakout Modules are only operated within an operating temperature range of -40 °C to +100 °C and at a relative humidity of max. 95 % (non-condensing).
- ▶ To confirm the operational safety of an HV Breakout Module, an isolation test in accordance with EN 61010-1:2010 is required at least once per year.

### Before Putting HV Breakout Modules into Operation

- ▶ If it is possible to establish a ground connection (car body or earth), use a sufficiently large wire cross-section to connect an HV Breakout Module. This is usually done by using an adequate cable (not included in the scope of delivery). Connect the ground cable to the module housing by using the M6 threaded bore provided for this purpose. Ensure proper grounding before putting the module into operation.
- ▶ Carefully read and consider the entire documentation delivered with HV Breakout Modules before initial operation. The operating personnel must be instructed accordingly. Please contact CSM with any additional questions.



## CSM Products, Inc.

1920 Opdyke Court, Suite 200 • Auburn Hills, MI 48326 • USA  
Phone: +1 (248) 836-4995 • Fax: +1 (248) 836-4997  
info@csmproductsinc.com • www.csmproductsinc.com

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