

## Instruction manual supplement

### Ex/ATEX products

Covers HBSO, HBSR, HBSC2, HBLC, HBLT, HBLS and HBX



### Introduction

The sensors and switches designed for hazardous areas all use a two-wire connection. This means the output will be 4-20 mA and the output will normally pass through a barrier before it is connected to a PLC. For level sensors normally providing an analog output will still be a 4-20 mA signal linear to the measurement. For level switches the output will be 4 mA representing off and 20 mA representing on.

The sensors and switches can be setup like normal products but when in operation only pin 1 and 4 will be in operation.

Calibration can be done using the HB-tool like normal sensors or the "R" button can be used inside the hazardous zone where you cannot bring a PC.





## Safety instruction

- Danger of explosion caused by electrostatic charge!  
If there is a sudden discharge from electrostatically charged devices or persons, there is a danger of explosion in the Ex-area.
  - Take appropriate measures to prevent electrostatic charges in the Ex-area.
  - Clean the device surface by gently wiping it with a damp or antistatic cloth.
- Only personnel with appropriate training should operate machinery and equipment. The product specified here may become unsafe if handled incorrectly.  
The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced for handling Ex products.
- Configuration by PC tool  
Only make configuration on the sensor when safety has been confirmed.
- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
  1. The inspection and maintenance of machinery/equipment should only be performed after safety has been confirmed.
  2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
  3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- Take precautions to prevent inadvertent operation or damage by unauthorized action.
- Make no changes in the device!

## Specific Conditions for Use

1. By end-installation all metallic part must be included in the local potential equalization.
2. The devices must be installed and used in such a way that electrostatic charging from operation, maintenance or cleaning is excluded.
3. The sensor may be operated in hazardous areas in which equipment of EPL Ga is required only if atmospheric pressure exists (0.8 bar to 1.1 bar).
4. A reverse heat flow from the process exceeding the permissible ambient temperature of the electronic part is not allowed and shall be avoided by a suitable thermal insulation or a suitable temperature decoupler.
5. The ambient temperature range depending on temperature class is to be taken from the operating instructions.

## Technical data

### Supply voltage and load:

12-28V DC  
2 Wire sensors

### Current draw:

Max 20 mA

### Signal output:

4-20 mA

### Measuring range:

The measuring range is depended on the mechanical part.

### Device category:

The device category is: 2G for gas zone 1 or 1G for gas Zone 0

### Type of protection:

The type of protection is: ia

### Gas resp. gas group:

The gas group is: IIC

### Temperature class:

## Intrinsically safe ratings

Intrinsically safe ratings of the sensor is:

- Maximum voltage ( $U_i$ ) = 28V
- Maximum Current ( $I_i$ ) = 116mA
- Maximum Power ( $P_i$ ) = 585mW
- Internal Capacitance ( $C_i$ ) = 20nF
- Internal Inductance ( $L_i$ ) = 150uH

The temperature class is: T1..T6

### IP-class:

The IP class is: IP66

Ambient temperature range:

Marking	Ambient temperature range on the electronic part HBCS-EX01	Temperature on PT1000 (measuring cable, rod)
Ex ia IIC T6 Ga	-40 °C...+50 °C	-60 °C...+70 °C
Ex ia IIC T5 Ga	-40 °C...+65 °C	-60 °C...+85 °C
Ex ia IIC T4...T1 Ga	-40 °C...+70 °C	-60 °C...+90 °C

Marking	Ambient temperature range at the electronic part HBCS-EX01	Temperature on mechanical parts
Ex ia IIC T6 Ga	-40 °C...+50 °C	-60 °C...+80 °C
Ex ia IIC T5 Ga	-40 °C...+65 °C	-60 °C...+90 °C
Ex ia IIC T4...T1 Ga	-40 °C...+70 °C	-60 °C...+90 °C

### Pressure:

Max 120 bar



## Approvals

### IECEX and ATEX

IEC 60079-0:2017

IEC 60079-11:2011

### EMC Test

EMC Emission EN61000-3-2

EMC Immunity EN61000-4-2

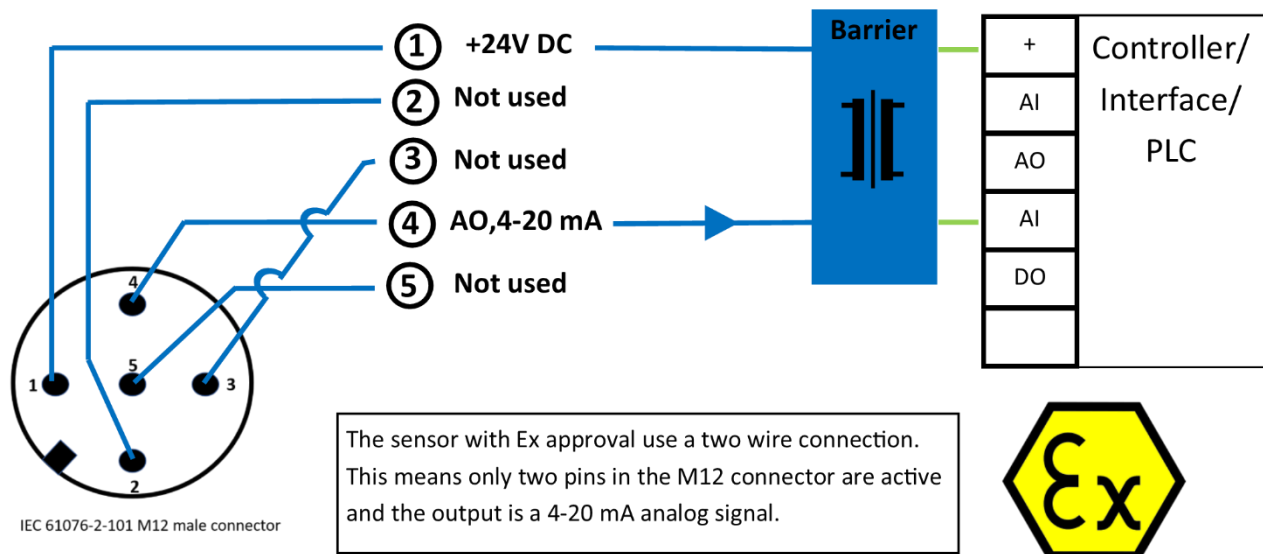
### Vibration resistance:

IEC 68-2-6, 10g, 10 to 2000Hz

Environmental test, incl.

Damp heat cyclic, Low storage temperature, Sinus vibration, Shock test, Dry heat test, and Cooling test.

### Connection diagram for two wire Ex/ATEX/IECEX version



## Electrical connection and output

The electrical connection is normally done using a barrier for additional safety. The sensor is connected two wires only as shown here.

### Output

HBSR, HBSC2 & HBSO: approx. 4 mA for off and approx. 20 mA for on

HBLC, HBLT, HBLS: 4 to 20 mA linear to the level from Zero to 100%

HBX: 4 to 20 mA linear to vapor quality from dry to end of Span

## LED indication

The green LED is flashing and indicates 24 V DC supply. (normal operation mode)

The yellow LED (Control) is used for calibrating using the "R" button.

The red LED (Alarm) is not used.

The red and green LEDs flashing indicate no connection between mechanical and electrical unit.

All three LEDs are flashing when the sensor is connected to the HB tool.

## Calibration instructions:

The sensors can be calibrated by using the HB tool or by using the "R" button. The 0% or 100% calibration can be carried out independently of each other. The sensor is delivered pre-calibrated. For normal use, calibration is not necessary. If the signal changes over time, we recommend a 0% calibration.

Instruction for 0% calibration/dry calibration:

- 1) Make sure the sensor is dry and power supply is connected.
- 2) Press the "R" for approx. 20 seconds until the yellow LED turns off.
- 3) Activate "R" once = Yellow LED flash once.

"Calibration mode" is complete and the sensor is then running normally.

Instruction for 100% calibration - for level sensor only:

- 1) Make sure the sensor is filled with liquid and power supply is connected.
- 2) Press the "R" for approx. 20 seconds until the yellow LED turns off.
- 3) Activate "R" **twice** = Yellow LED flash **twice**.

"Calibration mode" is complete and the sensor is then running normally.

## Calibration using the HB Configuration Tool



NOTE! To be able to change the sensor parameters, you need a special USB/M12 configuration cable, as well as a configuration tool installed on a PC, also see safety instruction before using the PC tool.



Please follow the instructions in the manual for the standard product. The sensor setup will be simpler with less parameters, but the principle will be the same.

## Installation

The sensor is installed like the similar products without ATEX/Ex certification.

## Labeling of the electronic unit

The Electronic unit has a label with a lot of information - here is a guide to the meaning.

### The EX label – what is the meaning of the text

