



## Vibration monitoring unit Series HE200

MADE IN  
GERMANY

**SIL2**

**PL-d**

c **UL** US  
LISTED



IECEE



Proc. Cont. Eq.  
for Ord. Loc.  
Proc. Cont. Eq.  
for Haz. Loc.



IECEX



CCs



- Vibration speed ( mm/s, rms)  
vibration acceleration (g, rms)
- ATEX / IECEx zones 2/22 and 1/21
- cULus OrdLoc / HazLoc Div 2
- 2 potential-free semiconductor switches
- Analogue current output: 4-20 mA
- Frequency range: 10 Hz – 1000 Hz  
1 Hz – 1000 Hz



Date of manufacture: \_\_\_\_\_

Type description: \_\_\_\_\_

Serial no.: \_\_\_\_\_



These instructions apply to sensors ver-  
sion 2.0.

## **Operating instructions**

### **Vibration monitoring unit Type HE200**

Standard and ATEX / IECEx

**Version: 2025-12-04**

**Caution!**

Prior to commissioning the product, the instruction manual must be read and understood.

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Subject to modifications.

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## 2 Safety information

### 2.1 General

*The safety instructions are intended to protect people and property from damage and hazards that could arise as the result of improper use, incorrect operation or other misuse or devices, especially in explosive areas. Therefore, please read the operating instructions carefully before working on the product or operating it. The operating instructions must be accessible to operating personnel at all times.*

Please make sure that all documents are present and complete before commissioning or performing other work on the product. If the documents have not all been delivered in full or if further copies are necessary, they can also be obtained in other languages.

The product is built according to the latest state of the art. However, hazards to people, machinery and systems can still arise as a result of improper handling, unintended use or operation and maintenance by persons inadequately trained on the product.

All those who are involved in the installation, operation and maintenance of the product in the operator's plant must read and understand the operating instructions.

The product may only be assembled, disassembled, installed and repaired by instructed, sufficiently trained and authorised personnel.

### 2.2 Symbols used



This symbol indicates an explosion hazard.



This symbol indicates a hazard from electrical current.



This symbol indicates safety-related information.



This symbol indicates non-safety-related information.

### 3 Scope of this instruction manual

This instruction manual for the HE200-type vibration monitoring unit applies to the following versions:

HE200.00, HE200.01 and HE200.02 with sensor version 2.0

The variants are functionally identical. The variants HE200.01 and HE200.02 have additional certifications and labels which permit use in potentially explosive atmospheres. For further information, see chapter "Overview of application areas" on page 7.

### 4 Vibration Monitoring Unit Type HE200

The HE200 type vibration monitoring unit is used to measure and monitor absolute bearing vibrations in machines in line with DIN ISO 10816.

It offers the following features:

- Two limit values and associated delay timings can be adjusted separately.
- The two potential-free unidirectional semiconductor switches will signal any exceeding of the relevant defined limit values. This can be used to generate a pre-alarm and a main alarm.
- Measurement parameter: The rms value of the vibration velocity ( mm/s) or  
The rms value of the vibration acceleration (g).
- Analogue current output: Interference-free DC signal from 4-20 mA, proportional to the measuring range of the monitoring unit.

### 5 Intended Use

Type HE200 is used to protect machines and mechanical equipment against unduly strong vibrations. It may only be used in accordance with the specifications listed in the data sheet. It is used exclusively for measuring mechanical vibrations. **Main fields of application:** Fans, ventilators, blowers, electric motors, pumps, centrifuges, separators, generators, turbines and similar oscillating mechanical equipment.



If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

### 6 Scope of supply

All versions include:

- Vibration monitoring
- Cylinder head screw with hex socket, M8 x 20 mm
- Seal label
- Operating instructions

## **7 Documents and Certificates**

You can find the following documents and certificates for HE200 type at [www.hauber-el-ektronik.de](http://www.hauber-el-ektronik.de) where they can be viewed and downloaded:

- EU type examination certificate ATEX Zone 1 / 21, no.: UL 20 ATEX 2421 X Rev. 0
- EU type examination certificate ATEX Zone 2 / 22, no.: UL 21 ATEX 2570 X
- IECEx certificate of conformity, no.: IECEx ULD 20.0022X
- UL Ord. Loc. certificate of conformity, no.: E507077-20210204
- UL Haz. Loc. certificate of conformity, no.: E507077-20220302
- KCs Ex certificate, no.: 23-AV4BO-0277X, 23-AV4BO-0278X (Zone 1 / 21)
- KCs Ex certificate, no.: 23-AV4BO-0275X, 23-AV4BO-0276X (Zone 2 / 22)
- Functional safety certificate (SIL 2)
- Safety manual SIL2 M002-HE200











## **8 Transfer of liability when operating in potentially explosive atmospheres**

The owner of the system is exclusively liable for the appropriate configuration of the electrical connections with respect to explosion protection regulations and correct commissioning.

If the system is installed by a sub-contractor on behalf of the owner, the system may only be commissioned after the sub-contractor has issued written confirmation in the form of a certificate of installation that the system has been installed correctly and professionally in accordance with the applicable legal regulations.

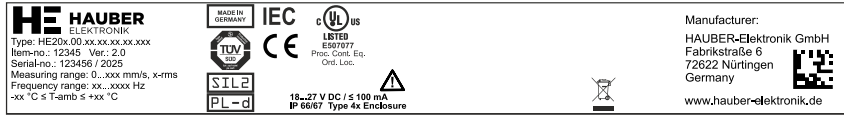
The operator is obliged to notify the responsible authorities of the initial commissioning of explosion-protected systems or system components and their re-commissioning following extensive changes or maintenance.

## 9 Overview of application areas

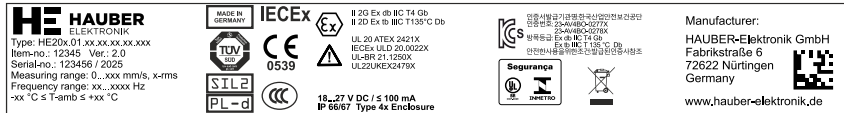
Coding		HE200.00.xx.xx.xx.00.xxx	HE200.00.xx.xx.xx.01.xxx	HE200.02.xx.xx.xx.00.xxx	HE200.02.xx.xx.xx.01.xxx	HE200.01.xx.xx.xx.00.xxx	HE200.01.xx.xx.xx.02.xxx
Pin assignment	M12 connector	x		x			
	Integrated cable		x		x	x	x
Measuring head temperature $T_M$ Ambient temperature $T_A$	$-40\text{ °C} \leq T_M \leq 85\text{ °C}$ $-40\text{ °C} \leq T_A \leq 60\text{ °C}$	x		x		x	
Restriction for the range of application cULus: $-30\text{ °C} \leq T_M \leq 80\text{ °C}$ $-30\text{ °C} \leq T_A \leq 60\text{ °C}$	$-35\text{ °C} \leq T_M \leq 125\text{ °C}$ $-35\text{ °C} \leq T_A \leq 60\text{ °C}$		x		x		
	$-20\text{ °C} \leq T_M \leq 125\text{ °C}$ $-20\text{ °C} \leq T_A \leq 60\text{ °C}$						x
Standard	CE IEC	x	x	x	x	x	x
	 Proc. Cont. Eq. Ord. Loc E507077	x	x	x	x		
Ex Zone 2 and 22	 II 3G Ex ec IIC T4 Gc II 3D Ex tc IIIC 135°C Dc	UL 21 ATEX 2570 X;		x	x		
	 Ex ec IIC T4 Gc Ex tc IIIC 135°C Dc	IECEx ULD 20.0022 Issue 0X; UL-BR 21.1250X		x	x		
	 Ex ec IIC T4 Gc Ex tc IIIC T135°C DC	23-AV4BO-0275X 23-AV4BO-0276X		x	x		
	 Proc. Cont. Eq. Haz. Loc. Class I, Division 2, Groups A, B, C and D, T4 Class II, Division 2 Groups F and G, T4	E516625		x	x		
	 Ex nA IIC T4 Gc Ex tD A22 IP66/67 T135°C	No: 2021122315114599		x	x		
Ex Zone 1 and 21	 II 2G Ex db IIC T4 Gb II 2D Ex tb IIIC 135°C Db	UL 20 ATEX 2421 X;				x	x
	 Ex db IIC T4 Gb Ex tb IIIC 135°C Db	IECEx ULD 20.0022 Issue 0X; UL-BR 21.1250X				x	x
	 Ex db IIC T4 Gb Ex tb IIIC T135°C Db	23-AV4BO-0277X 23-AV4BO-0278X				x	x
	 Ex d IIC T4 Gb Ex tD A21 IP66/67 T135°C	No: 2021122315114599				x	x

## 10 Example labels

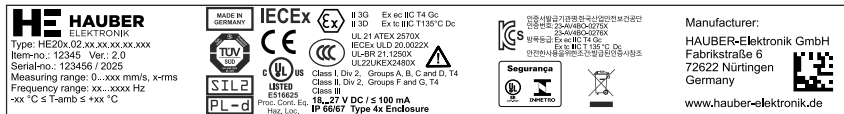
Variant 1 - HE200.00.xx.xx.xx.xx.xxx



Variant 2 - HE200.02.xx.xx.xx.xx.xxx



Variant 3 - HE200.01.xx.xx.xx.xx.xxx



## 11 Information on the cULus validity range

In order to install the device according to the UL/CSA/IEC standard, the following information must be observed.

### Electrical protection



Devices must be protected by means of fuses, circuit breakers, overheating protection, impedance-limiting circuits or similar to ensure protection against excessive power output if there is a fault in the device. Protection must be applied to supply lines and control lines.



A circuit breaker suitable for 30V/3A according to UL Standard 489/CSA Standard (C22.2) no. 5/IEC 60947-2 must be installed near the device.



A fuse suitable according to UL Standard 248 / CSA Standard (C22.2) no. 248 / IEC 60127 must be installed near the device. The fuse must have a slow triggering characteristic ("T").

### Limited temperature range

The following temperature ranges apply for variants with integrated cable:

Measuring head temperature	$-30\text{ °C} \leq T_M \leq +80\text{ °C}$
Ambient temperature	$-30\text{ °C} \leq T_{\text{Amb}} \leq +60\text{ °C}$



## **12 Functional safety instructions**

The HE200 vibration monitoring hardware was tested by TÜV Süd. The results meet the criteria according to SIL2 and PL-d.

For all matters relating to functional safety, please refer to Safety Manual M002-HE20x.

## 13 Technical data

### 13.1 General data



Each sensor has one of the listed measuring and frequency ranges. Further ranges on request.

Please indicate the measuring and frequency range in your request.

Measuring range:	0-8 mm/s rms 0-10 mm/s rms 0-16 mm/s rms 0-20 mm/s rms 0-25 mm/s rms 0-32 mm/s rms 0-50 mm/s rms 0-64 mm/s rms 0-128 mm/s rms 0-1 g rms 0-2 g rms 0-4 g rms 0-6 g rms 0-8 g rms 0-10 g rms
Measuring accuracy:	± 10% (as per DIN ISO 2954)
Transverse sensitivity:	< 5%
Frequency range:	10 Hz...1000 Hz (standard) 1 Hz...1000 Hz
Calibration point:	159.2 Hz and 90% amplitude of measuring range
Readiness delay:	10 seconds
Maximum acceleration:	±16.5 g
Lifetime:	10 years

*Tbl. 1: General data*

**13.2 Electrical data**

Output signal:	1 x 4-20 mA (proportional to the measuring range)
Semiconductor switches:	2 x potential-free unidirectional semiconductor switches (pre-and main alarm)
Switching load	1A / 30 V DC
Power supply:	18 – 27 V DC
Restart / Reset:	Disconnect power supply for at least 1 second
Power input (max.):	100 mA
Load/output load (max.):	500 $\Omega$
Automatic:	Once the threshold value is exceeded, the potential-free semiconductor switches <b>automatically</b> become conductive again.

*Tbl. 2: Electrical data*

### 13.3 Operating range of the vibration monitoring unit

The operating range is independent from the measuring range. It can be derived from the maximum acceleration, which is 16.5 g across all frequencies. The maximum measurable vibration speed is based on the following formula

$$v_{max} = \int a_{max}$$

For sinusoidal vibration, the following applies

$$v_{max} = \frac{a_{max}}{2\pi f}$$

Fig. 1: shows the operating range of the vibration monitoring unit, which is limited by the maximum measurable vibration speed in mm/s depending on the frequency in Hz.

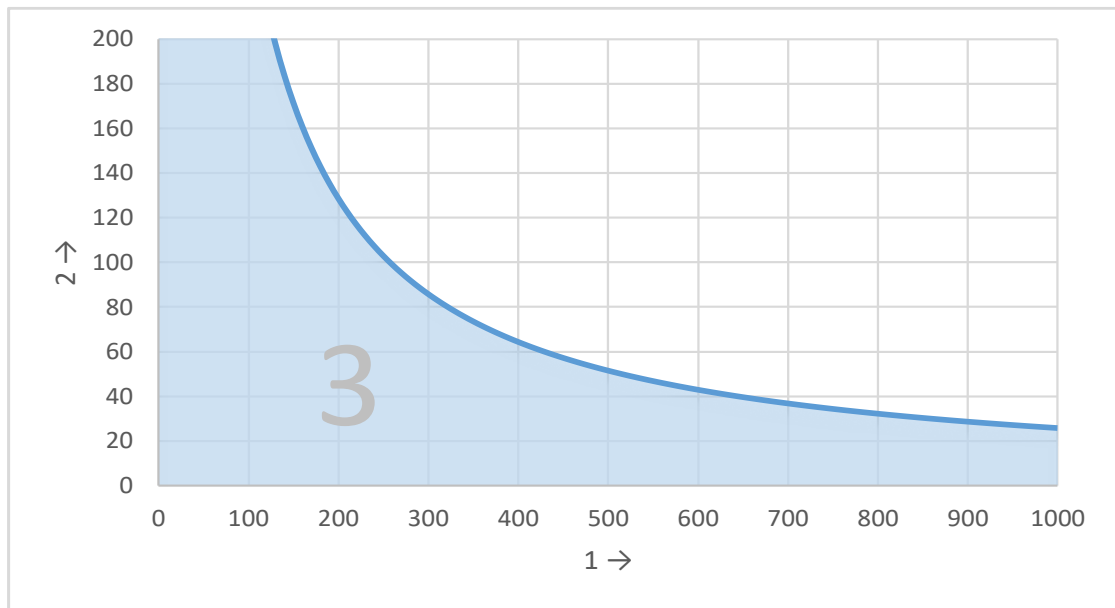


Fig. 1: Operating range diagram

- 1 Frequency in Hz
- 2 Vibration velocity in mm/s
- 3 Operating range of the vibration monitoring unit

#### Reading example:

Frequency (Hz)	Maximum measurable vibration speed (mm/s)
250	103
400	64
1000	25

Tbl. 3: Reading example of operating range

## 13.4 Typical frequency response

### 10 Hz–1,000 Hz (standard)

The frequency response is recorded using a reference sensor.

- 4 Hz. . . 1200 Hz acceleration sensor

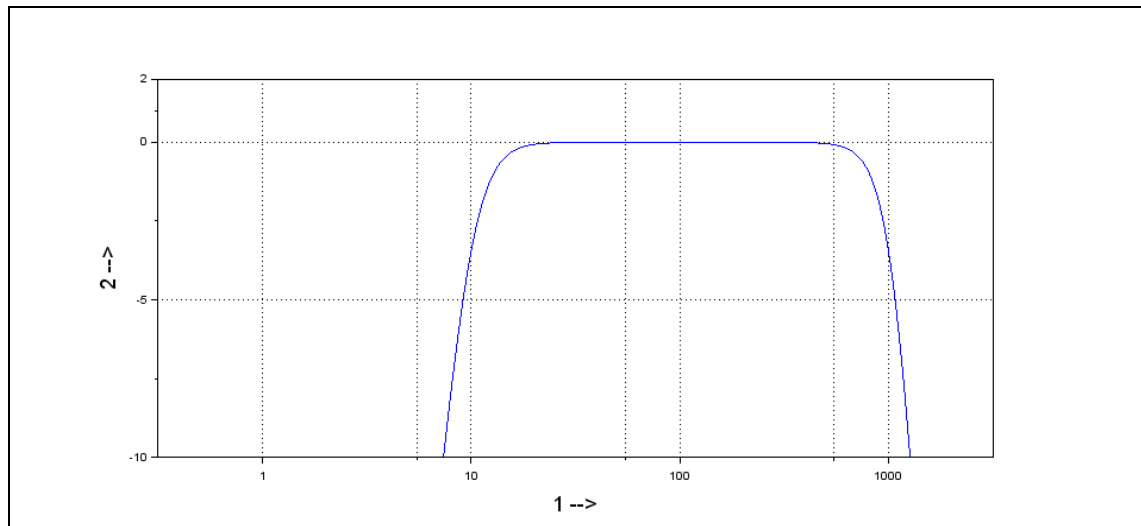


Fig. 2: Typical frequency response 10 Hz–1000 Hz

- 1 Frequency in Hz
- 2 Amplification in dB

### 1 Hz–1000 Hz

The frequency response is recorded using two reference sensors.

- 1 Hz. . . 10 Hz laser sensor
- 10 Hz. . . 1200 Hz acceleration sensor

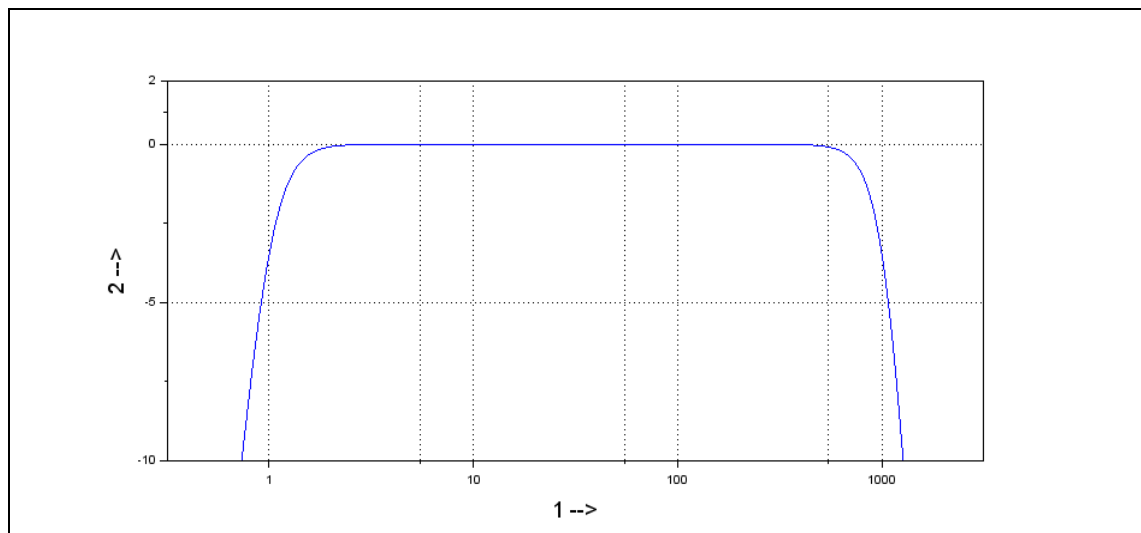


Fig. 3: Typical frequency response 1 Hz–1000 Hz

- 1 Frequency in Hz
- 2 Amplification in dB

**13.5 Properties of the integrated cable**

Cable type	Li9YC11Y 8x0.25 mm <sup>2</sup>
Conductor material	E-Cu stranded wire
Conductor insulation	PP 9Y
Coating	PUR 11Y Etherbase
Coating diameter	6.0 ± 0.2 mm
Temperature range	-40 °C ... +90 °C fixed -20 °C ... +90 °C moving
Minimum bending radius	30 mm fixed 60 mm moving
Flame resistant	Yes, according to UL FT2
Halogen-free	Yes, according to VDE 0472 Part 815

*Tbl. 4: Technical data of the integrated cable***13.6 Mechanical data**

Additional materials can be found in section "Coding" on page 33.

Housing material:	Stainless steel V2A, material no.: 1.4305 (standard)
Fastening:	Cylinder head Allen screw M8 x 20 mm Thread pitch: 1.25 mm (standard)
Mounting:	Housing must be earthed via the M8 fastening
Cover tightening torque:	5 Nm
Measuring direction:	Along the fastening axis
Weight:	approx. 500 g
Protection class:	Cover and plug connection closed: IP 66/67 Type 4X enclosure Product is suitable for outdoor use
Max. humidity:	100%

*Tbl. 5: Mechanical data*

### 13.7 Housing dimensions

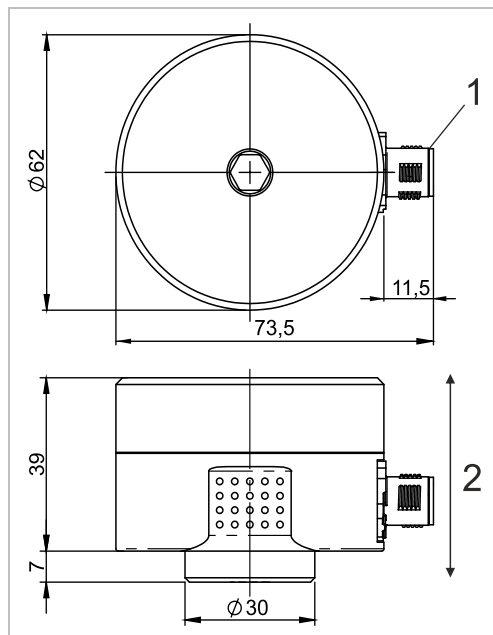


Fig. 4: Housing with M12 connector

- 1 M12 connector
- 2 Measuring direction

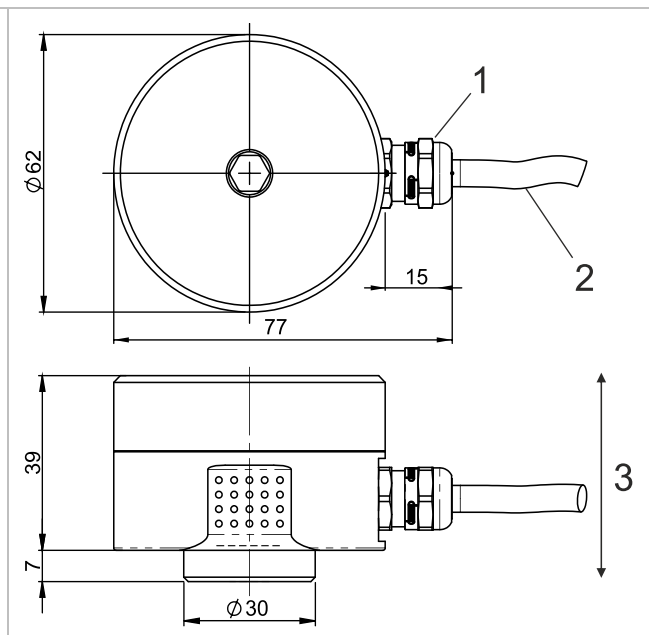


Fig. 5: Housing with integrated cable

- 1 Cable gland
- 2 Connecting cable
- 3 Measuring direction

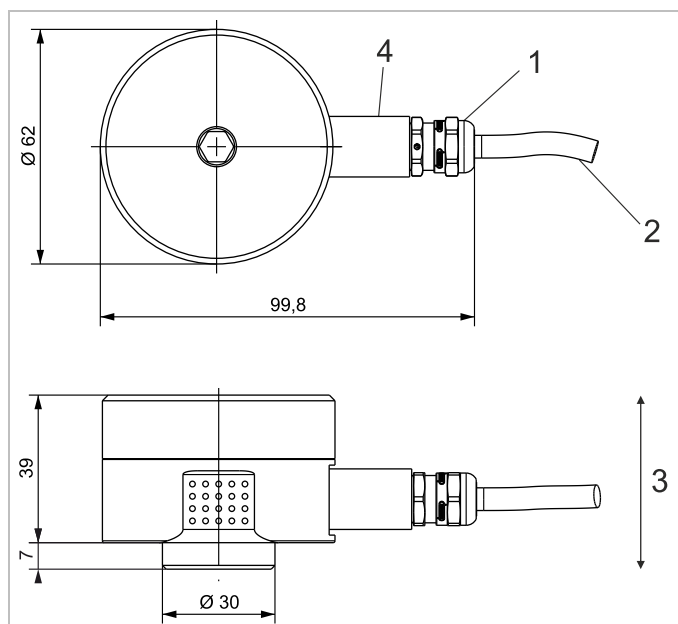
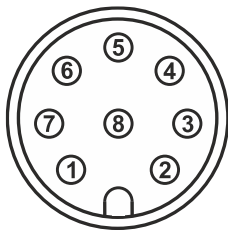


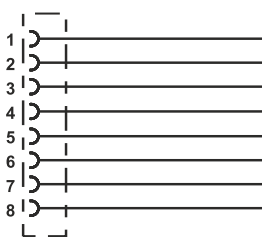
Fig. 6: Housing with integrated cable and clamping sleeve base for metal protection hose

- 1 Cable gland
- 2 Connecting cable
- 3 Measuring direction
- 4 Clamping sleeve base for metal protection hose

All measurements in mm

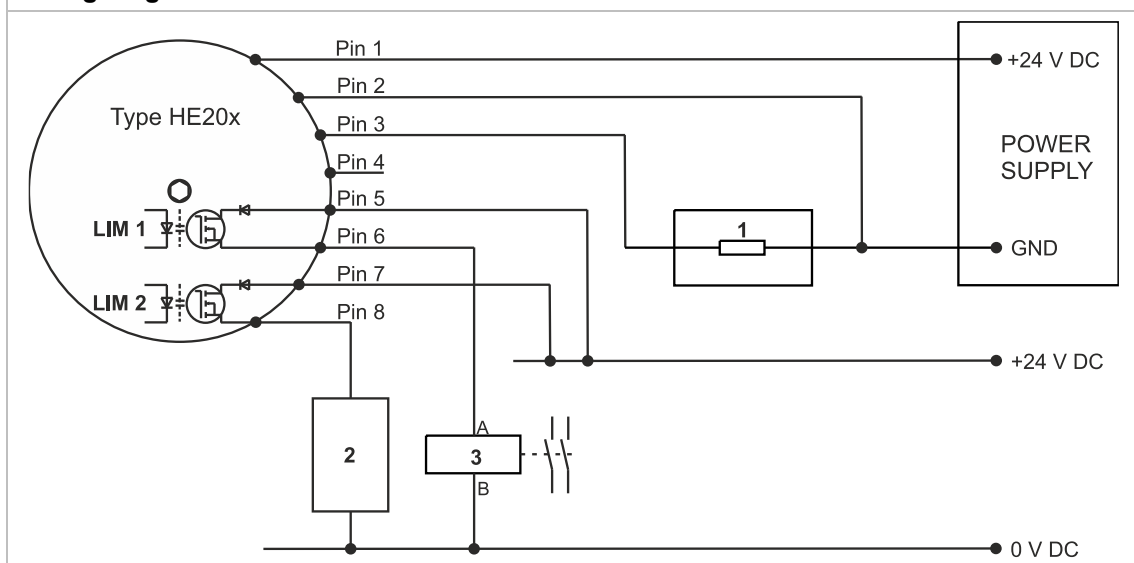
## 14 Connection

Version:	M12 connector		
	Pin 1:		24 V DC
	Pin 2:		GND
	Pin 3:		4-20 mA output signal
	Pin 4:		NC (not connected)
	Pin 5:		Potential-free semiconductor switch 1 +
	Pin 6:		Potential-free semiconductor switch 1 -
	Pin 7:		Potential-free semiconductor switch 2 +
	Pin 8:		Potential-free semiconductor switch 2 -

Version:	Integrated cable		
	Pin 1:	white	24 V DC
	Pin 2:	brown	GND
	Pin 3:	green	4-20 mA output signal
	Pin 4:	yellow	NC (not connected)
	Pin 5:	grey	Potential-free semiconductor switch 1 +
	Pin 6:	pink	Potential-free semiconductor switch 1 -
	Pin 7:	blue	Potential-free semiconductor switch 2 +
	Pin 8:	red	Potential-free semiconductor switch 2 -



**Wiring diagram:**



*Fig. 7: Wiring diagram*

LIM 1 Potential-free semiconductor switch 1 (unidirectional, pin 5: + , Pin 6: -)

LIM 2 Potential-free semiconductor switch 2 (unidirectional, pin 7: +, Pin 8: -)

1 Analogue input (4-20 mA) of an evaluation unit (e.g. safety controller, PLC, etc.)

2 Application example: Digital input (I/O) of a safety controller

### 3 Application example: Safety relay



The potential-free semiconductor switches LIM 1 and LIM 2 are blocking ('open') in alarm state or de-energised state.



If the power output is not required, pin 3 must be connected to GND.

## 15 Functional description



In an explosive atmosphere, the vibration monitoring unit HE200 will only be opened in a de-energised state.

The HE200 type has two limit values Lim1 and LIM2 and the corresponding delay times, which can be adjusted separately. If the defined limit value is exceeded and after the set delay time has expired, the corresponding potential-free unidirectional semiconductor switch is opened. This can be used to generate a pre-alarm and a main alarm.

A subsequent fall below the limit value is also signalled at potential-free unidirectional semiconductor switches 1 and 2, i.e. the respective semiconductor switch automatically closes.

The HE200 type also has an analogue current output. This supplies direct current of 4-20 mA proportional to the vibration amplitude.

### 15.1 Operating conditions

Operating state	Measured value	Semiconductor switches	Status LEDs	LED circuits
OK	$\leq$ limit value	Closed	green	Setting accepted (permanently on)
WARNING	$>$ Limit value, delay time runs	Closed	green + yellow	Setting accepted (permanently on)
ALARM	$>$ Limit value, delay time expired	Open	red	Setting accepted (permanently on)
Fail-safe state	0 mA	Open	red + yellow + green	Event and error codes (permanently on)
Configuration mode (Config Safe State)	0 mA	undefined	undefined	Setting not accepted (flashing)
De-energised	0 mA	Open	All LEDs off	all LEDs off

*Tbl. 6: Operating conditions*

## 15.2 Configuration mode (alarm and limit setting)



While the sensor is in configuration mode, the safety functions are deactivated.

By pressing the “Save Config” button, the current configuration is displayed by the LEDs around the HEX switches. For further information, see chapter "Limit values and delay times" on page 20.

The limit values and delay times are calibrated using the respective HEX switch. As soon as a switch position is changed, all LEDs start flashing. Press and hold the **“Save Config” button for three seconds** to save the configuration. Acceptance of the configuration is signalled by steady lighting up of the LEDs in the selected HEX switch position.

The configuration can only be accepted if  $LIM1 \leq LIM2$ .

After five minutes, the LEDs turn off automatically.

### 15.3 Limit values and delay times

The **SET rotary button** has 16 positions, representing the limit value of an alarm. The measuring range of the vibration monitoring unit is divided into 16 linear steps.

In general:  $Grenzwert = \frac{Messbereich\ Obergrenze}{16} \times SET\ Position$

**Example:** Limit setting

Measuring range: 0-32 mm/s

SET rotary button Pos.: 8 (9)

Limit value: 16 mm/s (18 mm/s)

SET Position ↓ Measu-→ ring range	Limit values (mm/s)								
	0 – 8 mm/s	0 – 10 mm/s	0 – 16 mm/s	0 – 20 mm/s	0 – 25 mm/s	0 – 32 mm/s	0 – 50 mm/s	0 – 64 mm/s	0 – 128 mm/s
0	0.0	0	0	0	0	0	0.00	0	0
1	0.5	0.625	1	1.25	1.563	2	3.13	4	8
2	1.0	1.25	2	2.5	3.125	4	6.25	8	16
3	1.5	1.875	3	3.75	4.688	6	9.38	12	24
4	2.0	2.5	4	5	6.25	8	12.50	16	32
5	2.5	3.125	5	6.25	7.813	10	15.63	20	40
6	3.0	3.75	6	7.5	9.375	12	18.75	24	48
7	3.5	4.375	7	8.75	10.938	14	21.88	28	56
8	4.0	5	8	10	12.5	16	25.00	32	64
9	4.5	5.625	9	11.25	14.063	18	28.13	36	72
10	5.0	6.25	10	12.5	15.625	20	31.25	40	80
11	5.5	6.875	11	13.75	17.188	22	34.38	44	88
12	6.0	7.5	12	15	18.75	24	37.50	48	96
13	6.5	8.125	13	16.25	20.313	26	40.63	52	104
14	7.0	8.75	14	17.5	21.875	28	43.75	56	112
15	7.5	9.375	15	18.75	23.438	30	46.88	60	120

Tbl. 7: Limit values for vibration velocities

SET Position ↓	Limit values (g)					
Measu- ring range →	0-1 g	0-2 g	0-4 g	0-6 g	0-8 g	0-10 g
0	0	0	0	0	0	0
1	0.063	0.125	0.25	0.375	0.5	0.625
2	0.125	0.25	0.5	0.75	1	1.25
3	0.188	0.375	0.75	1.125	1.5	1.875
4	0.25	0.5	1	1.5	2	2.5
5	0.313	0.625	1.25	1.875	2.5	3.125
6	0.375	0.75	1.5	2.25	3	3.75
7	0.438	0.875	1.75	2.625	3.5	4.375
8	0.5	1	2	3	4	5
9	0.563	1.125	2.25	3.375	4.5	5.625
10	0.625	1.25	2.5	3.75	5	6.25
11	0.688	1.375	2.75	4.125	5.5	6.875
12	0.75	1.5	3	4.5	6	7.5
13	0.813	1.625	3.25	4.875	6.5	8.125
14	0.875	1.75	3.5	5.25	7	8.75
15	0.938	1.875	3.75	5.625	7.5	9.375

Tbl. 8: Vibration acceleration limit values

**Delay times**

TIME Position	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Delay time (secs)	0	1	2	3	4	5	7.5	10	12.5	15	17.5	20	25	30	45	60

Tbl. 9: Delay times

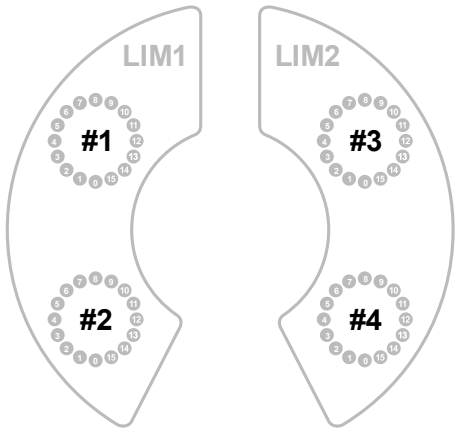
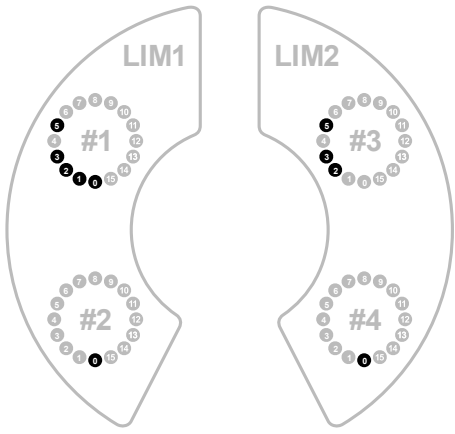
**15.4 Fail-safe state**

When a fault is detected that the sensor cannot correct automatically, the sensor switches to the fail-safe state. The fail-safe state can be recognised when the following 3 conditions occur at the same time:

1. All status LEDs are switched (red, yellow, green).
2. All semiconductor switches are open (as in the de-energised or fault state).
3. The analogue current output supplies 0 mA.


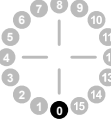
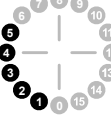
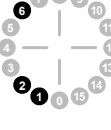
## 15.5 Event and error code

In fail-safe state, the 4 LED circuits display the 4 most recent event and error codes.

Event/error code sequence	Typical event and error code image
	
<p>(#1 is the newest code and #4 is the oldest code)</p>	

## 15.6 Most common event and error codes

The event and error codes are displayed in binary code on the LED circuit. An 8-digit binary code is displayed in the LED circuit using the digits 0 to 7. When a digit lights up in the LED circuit, it represents binary 1. When a digit does not light up in the LED circuit, it represents binary 0. The following section presents four of the most common event and error codes by way of illustration.

LED circuit	Code	LEDs								Event/error
		7	6	5	4	3	2	1	0	
	0x00	0	0	0	0	0	0	0	0	Initial value
	0x01	0	0	0	0	0	0	0	1	Successful start
	0x3E	0	0	1	1	1	1	1	0	Supply voltage outside of specification
	0x46	0	1	0	0	0	1	1	0	Analogue output feedback measurement outside tolerance
Troubleshooting measures and a complete list of error codes can be found in Chapter 18.2 – Troubleshooting.										

## 15.7 Exiting the fail-safe state

To return the sensor to its normal operating state, a power cycle must be performed. To do this, the sensor must be de-energised for at least 1 second.

## **16 Assembly and disassembly**

### **16.1 General notes**

Assembly and disassembly work on and with the monitoring unit may only be performed by an authorised specialist familiar with the safety regulations governing handling electrical components! When using EX-certified monitoring units in potentially explosive atmospheres, the professional must also be familiar with the relevant safety regulations!



Before assembly and disassembly disconnect the monitoring unit from the supply voltage! Detached plug connectors must always be de-energised. If EX-certified monitoring is operated in a potentially explosive atmosphere, there is otherwise an explosion hazard, due to spark formation!



The monitoring unit housing must be earthed via the fastening - through the machine earth of the mounting surface or through a separate protective conductor (PE)!



## 16.2 Fixing the vibration monitoring unit to the mounting surface

### Prerequisites

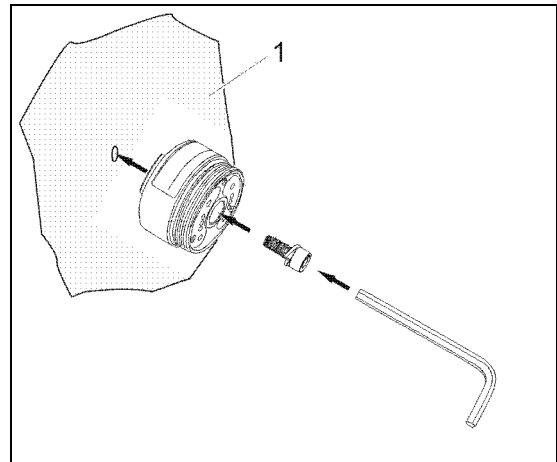
- Mounting surface is clean and flat; i.e. free of paint, rust, etc.
- Threaded hole in mounting surface:  
15 mm, M8

### Tools and material

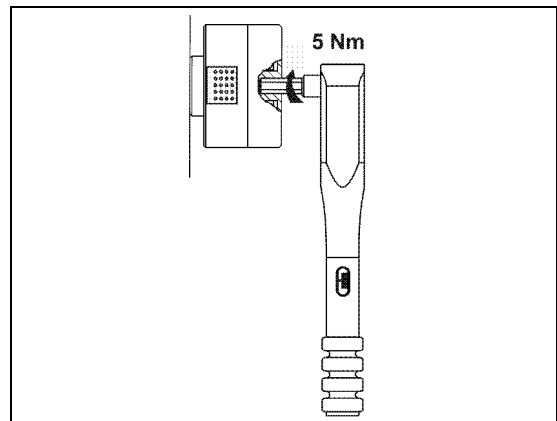
- Hex socket key SW 6, SW 8
- Torque wrench SW 6, SW 8
- Cylinder head screw with hex socket M8x20
- Spring washers for M8

### Work steps and instructions

- Unscrew housing cover from housing base;  
hex socket key SW 8
- Attach monitoring unit using cylinder head screws and spring washers with 8 Nm on mounting surface;  
Torque wrench SW 6
- Screw the housing cover back onto the housing base and tighten to 5 Nm;  
Torque wrench SW 8



Fastening on mounting surface (1)



Tighten housing cover with torque wrench (2)



In order to avoid cold welding of the housing cover to the housing base, the thread is treated ex-works with an assembly paste for stainless steel connections.

### 16.3 Variant HE200.02 (Zone 2 / 22)



The Zone 2/22 variant may not be operated without the safety clip to guard against accidental disconnection of the plug connection! If operated in a potentially explosive atmosphere, there is otherwise an explosion hazard, due to spark formation!

#### 16.3.1 Attaching the safety clip

1. Insert the connecting cable socket into the M12 connector as far as it will go (mind the position of the code cam).
2. Tighten the knurled rotating ring of the socket by hand.
3. Attach the safety clip to guard against accidental disconnection of the plug connection.
  - Place both shell halves of the clip around the plug connection.
  - Press both shell halves firmly together with your hands until the lock snaps into place.
  - Place the arrow connected to the two shell halves around the cable and pull it through the eyelet at the other end so that the notice "DO NOT DISCONNECT UNDER VOLTAGE" can be read alongside the cable.

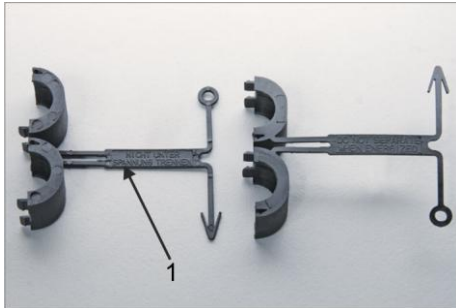


Fig. 8: Safety clip

1 Notice

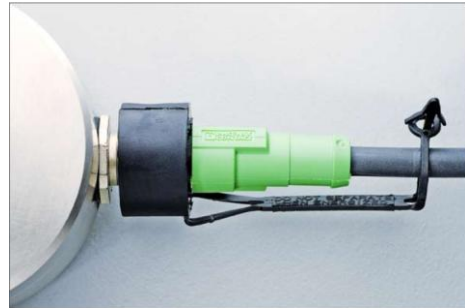


Fig. 9: Attached safety clip

#### 16.3.2 Attaching the protection cap

After disconnecting the plug, the protection cap must be attached to the M12 plug! Detach the safety clip and attach the protection cap.

1. Disconnect voltage.
2. Pry apart both shell halves of the sleeve with a screwdriver.
3. Close off the M12 plug well with the protection cap.



Fig. 10: Protection cap



Fig. 11: Attached protection cap

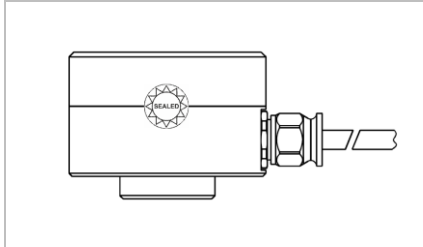
## 16.4 Tamper protection

### Attach seal labels

The "SEALED" seal label reveals any unauthorised opening of the housing cover.

After installation of the housing cover by the system operator, the seal label shall be attached to the side above the housing joint.

If any tampering is attempted, the seal label is destroyed and the tampering will be visible to the system operator.



*Fig. 12: Seal label*

## 17 Installation and commissioning

### 17.1 General notes

Installation and commissioning of the vibration monitoring unit may only be performed by an authorised specialist familiar with the safety regulations governing handling electrical components. When installing and commissioning EX-certified monitoring units in potentially explosive atmospheres, the professional must also be familiar with the relevant safety regulations!



The commissioning will only be carried out with the housing cover correctly screwed on (tightening torque = 5 Nm)! If EX-certified monitoring is operated in a potentially explosive atmosphere, there is otherwise an explosion hazard, due to spark formation!



Protect the connection cable and any extension cable from electrical interference and mechanical damage! Local regulations and instructions must be observed in doing so!

### 17.2 Earthing concept

The earthing concept stipulates that the sensor cable shield is electrically connected to the sensor housing through the knurled nut and is at earth potential on the evaluation unit or the switch cabinet. For longer wires, it is recommended to disconnect the shield at the evaluation unit (4) to prevent compensating currents through the shield.

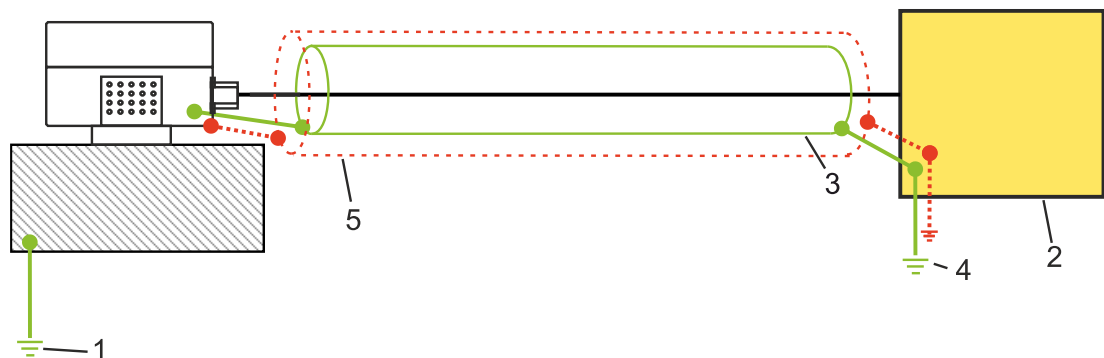


Fig. 13: Earthing concept HE200

- 1 Machine earth
- 2 Evaluation unit (measuring instrument, SPS, ...)
- 3 Cable shield
- 4 Evaluation unit earth potential
- 5 Optional flexible metal tubing (available for version with integrated cable only)

## 18 Maintenance and repair

### 18.1 General notes



Repair and cleaning of vibration monitoring units may only be performed by authorised specialists familiar with the safety regulations for handling electrical components.



Before repair and cleaning, disconnect the monitoring unit from the supply voltage. Detached plug connectors must always be de-energised.



Replace defective connection cables immediately.  
A defective vibration monitoring unit must be replaced.



The vibration monitoring unit HE200 is maintenance-free.

**18.2 Troubleshooting table**

<b>Fault</b>	<b>Cause</b>	<b>Action</b>
No measured value (4-20 mA)	No supply voltage	Check the power source and/or supply line
	Discontinuity in the connecting cable	Replace the connecting cable
	The fuse is faulty	Replace the fuse
	The connection has an incorrect polarity	Ensure that the connection has correct polarity
	The vibration monitoring unit is faulty	Replace the vibration monitoring unit
	Fail-safe state is active	See fault "Fail-safe state is active"
The semiconductor switch does not switch	The wrong limit value is set	Set the correct limit value
	No supply voltage	Check the power source and/or supply line
	Discontinuity in connection	Replace the connecting cable
	The fuse is faulty	Replace the fuse
	The connection has an incorrect polarity	Ensure that the connection has correct polarity
	The monitoring unit is faulty	Replace the monitoring unit
False reading	The vibration monitoring unit is not friction-locked	Mount the vibration monitor with friction lock
	The vibration monitoring unit is installed in the wrong place	Install the vibration monitoring unit in the correct place
	EMC problems	"Earthing concept" on page 28.
Fail-safe state is active	See also Event and error code table , page 31.	

*Tbl. 10: Troubleshooting table*

## 19 Event and error code table

In addition to the measures listed in this table, more detailed error causes and measures are listed in the manual in the troubleshooting table. For each error code, another recommended measure is a power cycle (sensor is de-energised for at least 1 second).

LED circuit								Description of event and error codes	Action
7	6	5	4	3	2	1	0		
0	0	0	0	0	0	0	0	Initial value	-
0	0	0	0	0	0	0	1	Successful start	
Supply voltage									
0	0	1	1	1	1	1	0	Supply voltage outside of specification	Check supply voltage
0	0	1	1	1	1	0	1	Internal voltage outside of specification	
0	1	0	0	0	1	0	1	Internal voltage outside of specification	
0	0	1	0	1	0	1	0	Measurement 1 of internal voltage failed	
0	0	1	0	1	0	1	1	Measurement 2 of internal voltage failed	
0	0	1	0	1	1	0	0	Measurement 3 of internal voltage failed	
Analogue output									
0	1	0	0	0	1	1	0	Analogue output feedback measurement outside tolerance	Check connections
0	0	1	0	1	1	1	1	Measurement of analogue output monitoring failed	
Potential-free semiconductor switch / Hex switch									
0	0	1	1	0	0	0	0	Measurement of potential-free semiconductor switch monitoring failed	Check connections
0	0	0	0	1	0	1	1	Hex switches are malfunctioning	Check hex switches

Temperature									
0	0	1	1	1	1	0	0	Temperature outside specification	Check ambient and measuring head temperature
0	0	1	0	1	1	0	1	Measurement 1 of temperature failed	
0	0	1	0	1	1	1	0	Measurement 2 of temperature failed	
Data storage									
0	0	1	1	1	0	0	1	Data storage fault	Contact the manufacturer
0	0	1	1	1	0	1	0	Data storage fault	

## 20 Transport, storage and disposal

The sensor must be protected from damaging environmental factors and mechanical damage during transport with the use of adequate packing.

The sensor may not be stored in ambient temperatures outside the permitted operating temperature.

The product contains electronic components and must be disposed of properly in accordance with local laws and regulations.



## 21 Coding HE200

HE200.	00.	16.	01.	00.	00.	000
HE series						
200 = monitoring SIL2 4-20 mA ~ mm/s rms + free limit values						
ATEX / IECEx						
00 = no ATEX / IECEx 01 = ATEX / IECEx (Zone 1 / 21) 02 = ATEX / IECEx (Zone 2 / 22) / UL DIV2						
Measuring range						
8 = 8 mm/s rms 10 = 10 mm/s rms 16 = 16 mm/s rms 20 = 20 mm/s rms 25 = 25 mm/s rms 32 = 32 mm/s rms 50 = 50 mm/s rms 64 = 64 mm/s rms 128 = 128 mm/s rms 1g = 1 g rms 2g = 2 g rms 4g = 4 g rms 6g = 6 g rms 8g = 8 g rms 10g = 10 g rms						
Frequency range						
00 = 10 – 1000 Hz (standard) 01 = 1 – 1000 Hz						
Housing material						
00 = 1.4305 (V2A) (standard) 01 = 1.4404 (V4A) 50 = 1.4305 (V2A) with adaptation for metal protection hose 51 = 1.4404 (V4A) with adaptation for metal protection hose						
Measuring head temperature range						
00 = -40°C to 85°C 01 = -35°C to 125°C 02 = -20°C to 125°C						
Pin assignment						
000 = M12 connector (standard) 020 = 2 m integrated cable 050 = 5 m integrated cable 100 = 10 m integrated cable						



Don't see your desired configuration listed? Please contact us and we can offer you a solution for your specific needs.

## 22 EU Declaration of Conformity

### Declaration of conformity

HAUBER-Elektronik GmbH  
Fabrikstrasse 6  
D-72622 Nürtingen, Germany

declares under our sole responsibility that the products listed below that relate to this declaration meet the basic health and safety requirements of the norms and directives below.

### Product series

HE200, HE205

### ATEX Annex

UL International Demko A/S certifies as **Notified Body No. 0539** according to the Directive of the Council of the European Community of 26 February 2014 (2014/34/EU) that the manufacturer maintains a quality assurance system for production that complies with Annex IV of this Directive.

### Affixed CE marking



CE 0539

### Norms and directives



EU Directive	Norms
<b>2014/30/EU /</b>	EN 61000-6-3:2007 + A1:2011 EN 61000-6-2:2005 + AC:2005-09 EN 55011:2016 + A1:2017 + A11:2020
<i>Supplementary:</i>	<i>EN 61000-6-7:2015</i>
<b>2014/34/EU /</b>	EN IEC 60079-0:2018 + AC:2020-02 EN 60079-1:2014 + AC:2018-09 EN IEC 60079-7:2015 + A1:2018 EN 60079-31:2014
<b>2011/65/EU /</b>	EN IEC 63000:2018

### Marking and certificates

HE200.02 / HE205.02

Marking	Certificate
 II 3G Ex ec IIC T4 Gc	ATEX: UL 21 ATEX 2570 X
 II 3D Ex tc IIIC 135°C Dc	

HE200.01 / HE205.01

Marking	Certificate
 II 2G Ex db IIC T4 Gb	ATEX: UL 20 ATEX 2421 X Rev. 0
 II 2D Ex tb IIIC 135°C Db	

### Signature

Nürtingen, Germany 04.12.2025

Place and date



Tobias Bronkal, Managing Owner