

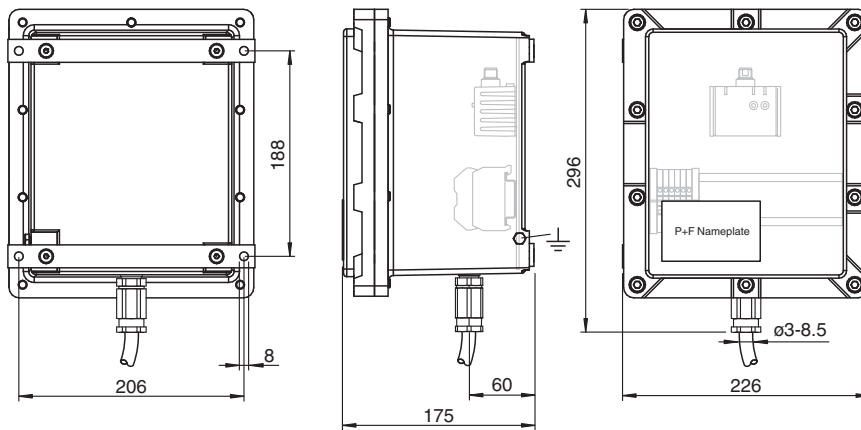


## Inclination sensor INX360D-F99-I2E2-V15-Ex

- Explosion-proof housing
- Installation in Zone 1 and Zone 21
- E1-Type approval
- Measuring range 0 ... 360°
- Analog output 4 mA ... 20 mA
- Evaluation limits can be taught-in
- 2 programmable switch outputs
- High shock resistance
- Increased noise immunity 100 V/m



### Dimensions



### Technical Data

#### General specifications

Type	Inclination sensor, 1-axis
Measurement range	0 ... 360 °
Absolute accuracy	$\leq \pm 0.5$ °
Response delay	$\leq 20$ ms
Resolution	$\leq 0.1$ °
Repeat accuracy	$\leq \pm 0.1$ °
Temperature influence	$\leq 0.027$ °/K

#### Functional safety related parameters

MTTF <sub>d</sub>	300 a
Mission Time (T <sub>M</sub> )	20 a
Diagnostic Coverage (DC)	0 %

#### Indicators/operating means

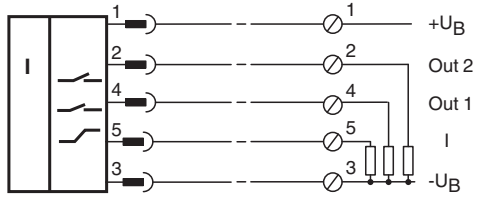
Operation indicator	LED, green
Teach-In indicator	2 LEDs yellow (switching status), flashing
Button	2 push-buttons ( Switch points programming , Evaluation range programming )
Switching state	2 yellow LEDs: Switching status (each output)

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## Technical Data

Electrical specifications		
Operating voltage	$U_B$	10 ... 30 V DC
No-load supply current	$I_0$	≤ 25 mA
Time delay before availability	$t_v$	≤ 200 ms
Switching output		
Output type		2 switch outputs PNP, NO , reverse polarity protected , short-circuit protected
Operating current	$I_L$	≤ 100 mA
Voltage drop		≤ 3 V
Analog output		
Output type		1 current output 4 ... 20 mA
Load resistor		0 ... 200 Ω at $U_B = 10 ... 18 V$ 0 ... 500 Ω at $U_B = 18 ... 30 V$
Compliance with standards and directives		
Standard conformity		
Shock and impact resistance		100 g according to DIN EN 60068-2-27
Standards		EN 60947-5-2:2007 IEC 60947-5-2:2007
Approvals and certificates		
IECEX approval		IECEX INE 14.0029X
ATEX approval		INERIS 14 ATEX 0022X Device type: EJB4A.D.CP-INX360D-F99-I2E2
Marking		Ⓜ II 2 GD Ex db IIB+H <sub>2</sub> T6 Gb, II 2 GD Ex tb IIIC T85 °C Db
E1 Type approval		10R-04
Ambient conditions		
Ambient temperature		-40 ... 60 °C (-40 ... 140 °F)
Storage temperature		-40 ... 60 °C (-40 ... 140 °F)
Mechanical specifications		
Connection type		Connection terminals, max. conductor cross-section 2.5 mm <sup>2</sup>
Conductor cross section		0.14 ... 2.5 mm <sup>2</sup>
Cable gland		for cable diameter 3 ... 8.5 mm
Cover fixing		stainless steel socket cap head screws
Screws		M6
Housing material		Seawater-resistant aluminum
Finish		epoxy coated RAL 7005 (grey)
Flamepath grease		Greasil MS4 or NEVER SEEZ Marine Grade
Degree of protection		IP66
Mass		9 kg
Factory settings		
Switching output 1		-30 ° ... 30 °
Switching output 2		-30 ° ... 30 °
Analog output		-45 ° ... 45 °

Connection



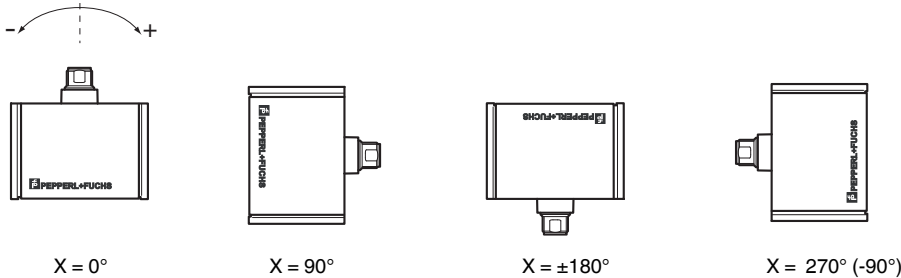
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**Mounting**

**Sensor Orientation**

In the default setting the zero position of the sensor is reached, when the electrical connection faces straight upwards.

**X Orientation**



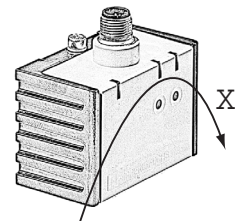
**Additional Information**

**LED display**

Displays dependent on the operating state	LED green: Power	LED yellow out 1	LED yellow out 2
<b>Teach-in of switching points (output S1):</b>	off	flashes	off
<b>Teach-in of switching points (output S2):</b>	off	off	flashes
<b>Activate teach-in mode for analog limits:</b>	off	flashes	flashes
<b>Teach-in of analog limits</b>	off	flashes	off
Normal operation	on	switchingstate	switchingstate
Reset to factory settings: 2 s ... 10 s > 10 s ... end of reset process Followed by normal operation	off flashes	flashes off	flashes off
Undervoltage	flashes	off	off

**Axis definition**

The definition of the X-axis is shown on the sensor housing by means of an imprinted and labeled double arrow. The figure shows the clockwise direction of rotation.



**Teach-in of switching points (output S1)**

1. Press key T1 > 2 s (see LED display)
2. Move sensor to switching position 1
3. Press key T1 briefly. LED "out 1" lights for 1.5 s as confirmation. Switching point 1 has been taught
4. Move sensor to switching position 2
5. Press key T1 briefly. LED "out 1" lights for 1.5 s as confirmation. Switching point 2 has been taught
6. Sensor returns to normal operation (see LED display)



The NC (active output state) is always defined in the range from the 1<sup>st</sup> configured position to 2<sup>nd</sup> configured position.

As an example :

Case #1: configure position #1 at +45degree, configure position #2 at +90 degree; NC is from +45 ' +90 in the CW direction

Case #2: configure position #1 at +90degree ; configure position #2 at +45 degree; NC is from +90 ' +45 in the CW direction

**Teach-in of switching points (output S2)**

Similar to the process for "Teach-in of switching points (output S1)", but with key T2 instead of key T1.

**Teach-in of analog limits**

1. Activate the teach-in mode for the analog limits by simultaneously pressing keys T1 and T2 until the green LED is extinguished and the two yellow LEDs flash. Then release the keys.
2. Press key T1 > for 2 s (see LED display)
3. Move the sensor into the position of minimum evaluation limit
4. Press key T1 briefly. LED "out 1" lights for 1.5 s as confirmation. The minimum evaluation limit has been taught. In this position the analog output will provide its minimum output value.
5. Move the sensor into the position of maximum evaluation limit
6. Press key T1 briefly. LED "out 1" lights for 1.5 s as confirmation. The maximum evaluation limit has been taught. In this position the analog output will provide its maximum output value.
7. Sensor returns to normal operation (see LED display)



If the sensor inclination exceeds one of the analog limits, the last value of the analog output is retained.

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**Resetting the sensor to factory settings**

1. Press keys T1 and T2 > 10 s (see LED display)
2. The sensor has been reset when the green LED "Power" lights again after approx. 10 s.

**Undervoltage detection**

If the supply voltage falls below a value of approx. 7 V, all outputs and yellow LEDs are deactivated. The green "power" LED flashes rapidly. If the supply voltage falls below a value of approx. 8 V, the sensor continues with normal operation.

## Technical Features

**EMC Properties**

Interference immunity in accordance with  
DIN ISO 11452-2: 100 V/m

Frequency band 20 MHz up to 2 GHz

Mains-borne interference in accordance with ISO 7637-2:

Pulse	1	2a	2b	3a	3b	4
Severity level	III	III	III	III	III	III
Failure criterion	C	A	C	A	A	C

EN 61000-4-2: CD: 8 kV / AD: 15 kV

Severity level IV IV

EN 61000-4-3: 30 V/m (80...2500 MHz)

Severity level IV

EN 61000-4-4: 2 kV

Severity level III

EN 61000-4-6: 10 V (0.01...80 MHz)

Severity level III

EN 55011: Klasse A