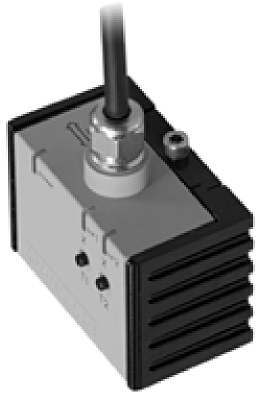


Model number

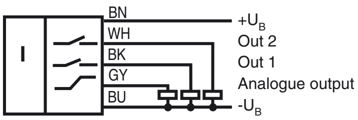
INX360D-F99-I2E2-5M

Features

- 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

Electrical connection

Standard symbol/Connection:



Technical Data

General specifications	
Type	Inclination sensor, 1-axis
Measurement range	0 ... 360 °
Absolute accuracy	≤ ± 0.5 °
Response delay	≤ 20 ms
Resolution	≤ 0.1 °
Repeat accuracy	≤ ± 0.1 °
Temperature influence	≤ 0.027 °/K
Functional safety related parameters	
$MTTF_d$	300 a
Mission Time (T_M)	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)
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
Ambient conditions	
Ambient temperature	-40 ... 85 °C (-40 ... 185 °F)
Storage temperature	-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications	
Connection type	5 m, PUR cable 5 x 0.5 mm^2
Housing material	PA
Degree of protection	IP68 / IP69K
Mass	240 g
Factory settings	
Switching output 1	-30 ° ... 30 °
Switching output 2	-30 ° ... 30 °
Analog output	-45 ° ... 45 °
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	
UL approval	cULus Listed, Class 2 Power Source
CSA approval	cCSAus Listed, General Purpose, Class 2 Power Source
CCC approval	CCC approval / marking not required for products rated ≤36 V
E1 Type approval	10R-04

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	

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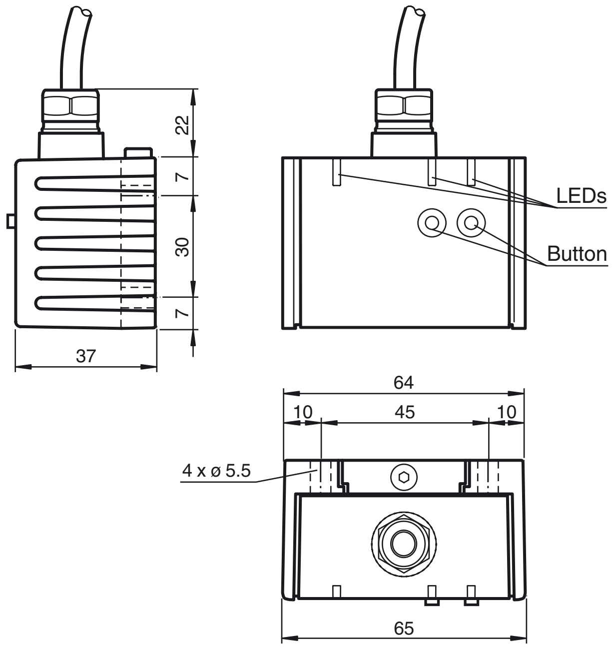
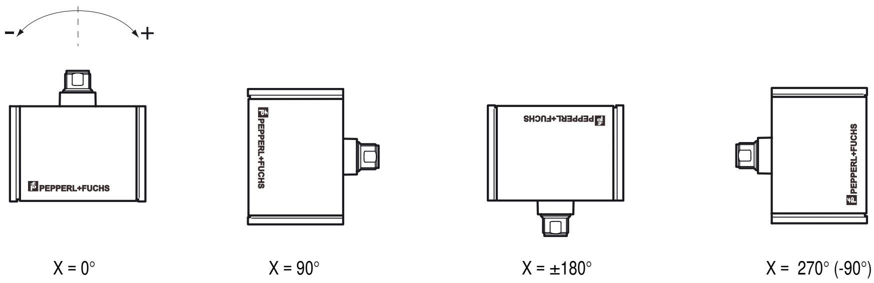
Dimensions



Sensor Orientation

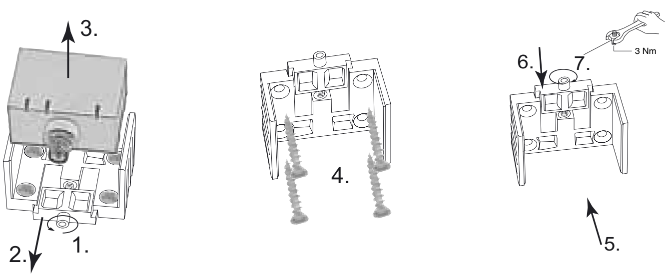
In the default setting the zero position of the sensor is reached, when the electrical connection faces straight upwards.

X Orientation



Mounting of the sensor

Sensors from the -F99 series consist of a sensor module and accompanying cast aluminum housing. Select a vertical surface with minimum dimensions of 70 mm x 50 mm to mount the sensor.
Mount the sensor as follows:



1. Loosen the central screw under the sensor connection.
2. Slide back the clamping element until you are able to remove the sensor module from the housing.
3. Remove the sensor module from the housing
4. Position the housing at the required mounting location and secure using four countersunk screws. Make sure that the heads of the screws do not protrude.
5. Place the sensor module in the housing.
6. Slide the clamping element flush into the housing. Check that the sensor element is seated correctly.
7. Finally tighten the central screw.

The sensor is now mounted correctly.

LED display

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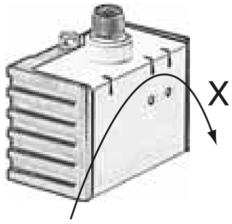
Displays dependent on the operating state	LED green: Power	LED yellow out 1	LED yellow out 2
Teach-in of switching points (output S1): Teach-in of switching points (output S2):	off off	flashes off	off flashes
Activate teach-in mode for analog limits: Teach-in of analog limits	off off	flashes flashes	flashes off
Normal operation	on	switching-state	switching-state
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 1st configured position to 2nd 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.

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.

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