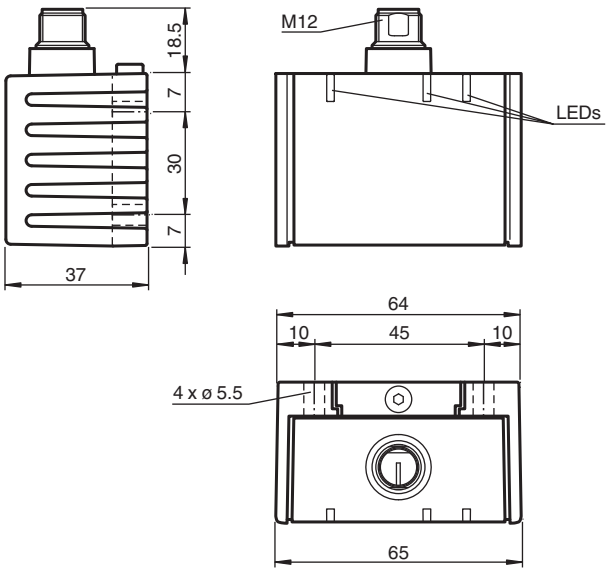
Inclination sensor

INY030D-F99-2U-V15

- E1-Type approval
- Measuring range -15° ... +15°
- Analog output 0 ... 10 V
- Fixed evaluation limits
- High shock resistance
- Increased noise immunity 100 V/m

Dimensions



Technical Data

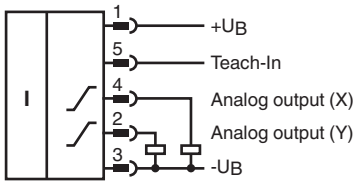
General specifications		
Type		Inclination sensor, 2-axis
Measurement range		-15 ... 15 °
Absolute accuracy		≤ ± 0.2 °
Response delay		≤ 25 ms
Resolution		≤ 0.01 °
Repeat accuracy		≤ ± 0.02 °
Temperature influence		≤ 0.004 °/K
Functional safety related parameters		

Release date: 2020-04-24 Date of issue: 2020-06-03 Filename: 239183_eng.pdf

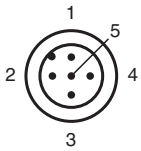
Technical Data

$MTTF_d$		390 a
Mission Time (T_M)		20 a
Diagnostic Coverage (DC)		0 %
Indicators/operating means		
Operation indicator		LED, green
Teach-In indicator		LED, yellow
Electrical specifications		
Operating voltage	U_B	18 ... 30 V DC
No-load supply current	I_0	≤ 25 mA
Time delay before availability	t_v	≤ 200 ms
Analog output		
Output type		2 voltage outputs 0 ... 10 V (one output for each axis)
Load resistor		≥ 1 kΩ
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
CCC approval		CCC approval / marking not required for products rated ≤36 V
E1 Type approval		10R-04
Ambient conditions		
Ambient temperature		-40 ... 85 °C (-40 ... 185 °F)
Storage temperature		-40 ... 85 °C (-40 ... 185 °F)
Mechanical specifications		
Connection type		5-pin, M12 x 1 connector
Housing material		PA
Degree of protection		IP68 / IP69K
Mass		240 g
Factory settings		
Analog output (X)		-15 ° ... 15 °
Analog output (Y)		-15 ° ... 15 °

Connection



Connection Assignment



Release date: 2020-04-24 Date of issue: 2020-06-03 Filename: 239183_eng.pdf

Wire colors in accordance with EN 60947-5-2

1	BN	(brown)
2	WH	(white)
3	BU	(blue)
4	BK	(black)
5	GY	(gray)

Accessories

	**V15-G-2M-PUR**	Female cordset, M12, 5-pin, PUR cable

Release date: 2020-04-24 Date of issue: 2020-06-03 Filename: 239183_eng.pdf

Mounting

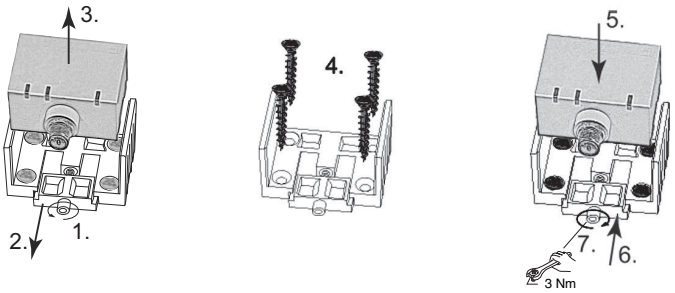
Sensor Orientation

In the default setting the zero position of the sensor is reached, when the sensor is mounted on a horizontal plane and electrical connection faces sidewards.

Mounting

Mounting of the sensor

Sensors from the -F99 series consist of a sensor module and accompanying cast aluminum housing. Select a horizontal flat 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.

Additional Information

LED display

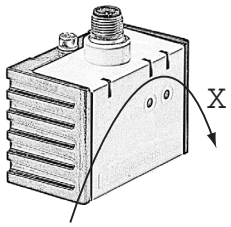
Displays dependent on the operating state	LED green: Power	LED yellow Teach In
Normal operation	on	off
Teach In of reference point **Teach In connected to +U_B for 1 s ... 10 s** falling slope at Teach In input then sensor returns to normal operation.	 on on on	 on flashes 3 x off
Reset to factory settings: **Teach In connected to +U_B for 20 s ... 25 s** falling slope at Teach In input then sensor returns to normal operation.	 on on on	 on flashes 3 x off
Undervoltage	flashes	off

Factory settings

see Technical Data

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 reference point (output S1)

1. Move sensor to reference position
2. Apply supply voltage (+Ub) to Teach In input for 1 s ... 10 s
3. Teach In LED lights up for confirmation
4. Disconnect Teach In input (Pin 4) before the 10 s time elapses
5. Teach In LED flashes 3 x for confirmation
6. Reference point is now programmed and the sensor returns to normal operation (see LED display)

Resetting the sensor to factory settings

1. Apply supply voltage (+Ub) to Teach In input for 20 s ... 25 s
2. Teach In LED lights up for confirmation
3. Disconnect Teach In input (Pin 4) before the 25 s time elapses

Release date: 2020-04-24 Date of issue: 2020-06-03 Filename: 239183_eng.pdf

4. Teach In LED and Out LED flash 3 x for confirmation
5. The sensor is now reseted to factory settings and returns to normal operation (see LED display)

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 rises above 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	2 a	2 b	3 a	3 b	4
Severity level	I I I	I I I	I I I	I I I	I I I	I I I
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	

Release date: 2020-04-24 Date of issue: 2020-06-03 Filename: 239183_eng.pdf