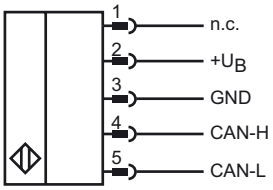
Model number

INY360D-F99-B16-V15

Features

- **Measuring range 0 ... 360°**
- **High shock resistance**
- **Extended temperature range -40 ... +85 °C**
- **CANopen interface**
- **e1-Type approval**
- **Increased noise immunity 100 V/m**

Electrical connection



Technical Data

General specifications	
Type	Inclination sensor, 2-axis
Measurement range	0 ... 360 °
Absolute accuracy	≤ ± 0.5 °
Response delay	≤ 25 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
Electrical specifications	
Operating voltage U_B	10 ... 30 V DC
No-load supply current I_0	≤ 50 mA
Time delay before availability t_v	≤ 2.5 s
Interface	
Interface type	CANopen
Device profile	CiA410, Ver. 1.2
Data output code	binary code
Transfer rate	125 kBit/s , 250 kBit/s , 500 kBit/s , 1 MBit/s , programmable
Node ID	1 ... 127 , programmable
Termination	external
Cycle time	≥ 20 ms
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	
Node ID	1
Transfer rate	250 kBit/s
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
e1 Type approval	2006/28/EG

EMC Properties

Emitted interference and interference immunity in accordance with motor vehicle directive 2006/28/EG (e1 Type approval)
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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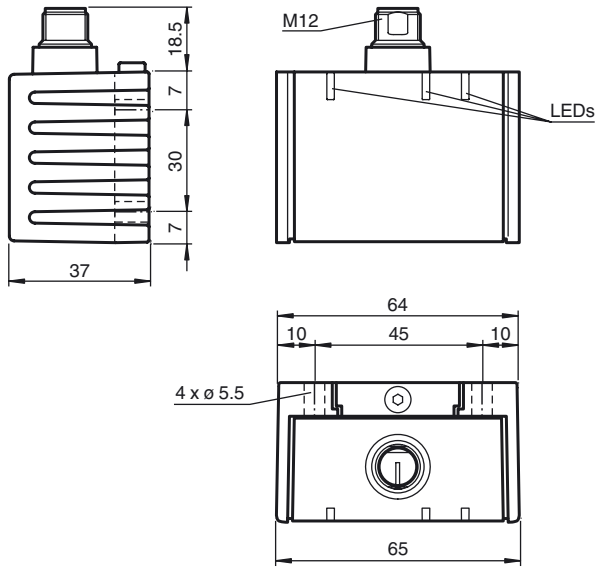
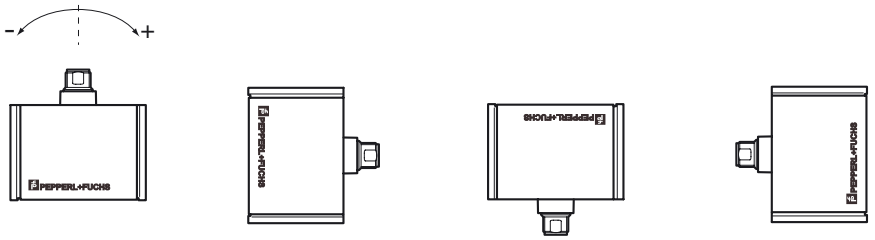
Dimensions



Sensor Orientation

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

X Orientation



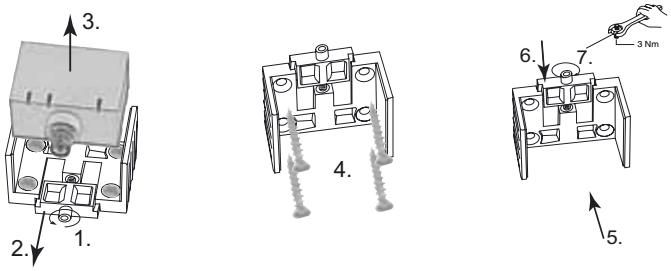
X = 0° X = 90° X = ±180° X = 270° (-90°)

Y Orientation

Y = 0° Y = 90° Y = ±180° Y = 270° (-90°)

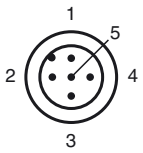
Mounting of the sensor

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.

Pinout



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-CAN-V15-G
DeviceNet/CANOpen bus cable, M12 to M12, PUR cable 5-pin

V15-G-5M-PUR-CAN-V15-G
DeviceNet/CANOpen bus cable, M12 to M12, PUR cable 5-pin

V15-G-10M-PUR-CAN-V15-G
DeviceNet/CANOpen bus cable, M12 to M12, PUR cable 5-pin

V15S-T-CAN/DN-V15
Y distributor, M12 socket on M12 connector/socket

ICZ-TR-CAN/DN-V15
Terminal resistor for DeviceNet, CANopen

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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.

Baud rate setting

Inclination sensors by Pepperl+Fuchs are supplied with a baud rate of 250 kbit/s. To change the baud rate, write the new baud rate to object 2001h “Baud rate.” If a “Reset sensor” command is issued via an NMT message or the power supply is interrupted, the sensor operates at the new baud rate. The inclination sensor supports the baud rates 125 kbit/s, 250 kbit/s, 500 kbit/s and 1 Mbit/s. Invalid values are not adopted. In this case, the current setting is retained.

Example of modifying the baud rate from 250 kbit/s to 1 Mbit/s:

601h	2Fh	01h	20h	00h	08h	xxh	xxh	xxh
CAN-ID	Com-mand	Object index		Subindex	New baud rate	not used		
	Data byte 1	Data byte 2	Data byte 3	Data byte 4	Data byte 5	Data byte 6	Data byte 7	Data byte 8

CAN ID: 601h, SDO1 channel of node 1
Command: 2Fh, write object, 1 byte of usable data
Object index: 2001h, note: low byte first, then high byte!
Subindex: 00h
New baud rate: 08h, for 1 Mbit/s
New baud rate: 04h, for 500 kbit/s
New baud rate: 02h, for 250 kbit/s
New baud rate: 01h, for 125 kbit/s

LED displays

The inclination sensor has three indicator LEDs that allow rapid visual monitoring.

- The green **power** LED indicates the state of the power supply
- The yellow **run** LED indicates the bus and sensor status
- The red **err** LED indicates an error

power (green)	run (yellow)	err (red)	Meaning
Off	Off	Off	No power supply
On	Flashing constantly	Off	Pre-operational
On	1x flashing	Off	Stopped
On	On	Off	Operational
On	Off	On	CAN bus off
On	depending on bus status	1x flashing	Warning, e.g., outside measuring range
On	depending on bus status	2x flashing	Error, e.g., EEPROM checksum incorrect
Flashing constantly	Off	On	Undervoltage

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