



Fail-safe inductive sensors

A complete range of sensors for position detection

- Certification to EN 60947-5-3 for electromechanical control gear
- Ensuring operator and machine safety
- No special actuator for electronic fail-safe sensors required
- Connection to safety interface, safety controller or safety PLC (i.e. AD SR1, Mosaic)

APPLICATIONS

- Door or flaps detection at closed position
- Cylinder shaft detection
- Treads up detection
- Bolster detection at a truck crane
- Robot cell working limitation of the working area
- Door detection
- Wind turbine lock / endposition of the blade

APPROVALS

- 2006/42/EC "Machine Directive"
- 2014/30/EC "Electromagnetic Compatibility Directive"
- 2014/35/EC "Low Voltage Directive"
- EN 60947-5-3 "Low-voltage switchgear and controlgear - Part 5-3: Control circuit devices and switching elements - Requirements for proximity devices with defined behaviour under fault conditions (PDDB)"
- IEC 61508 "Functional safety of electrical / electronic / programmable electronic safety related systems"
- ISO 13849 "Safety of machinery - Safety-related parts of control systems"



OVERVIEW

The operating principle and thus the advantages of inductive sensors can be used for safety applications.

Inductive safety applications are special applications which require a non-contact and safe detection of a metal object.

A wear-free function due to the non-contact principle together with a high protection rating, guarantee a high uptime of machines and installations.

The PI-Safe sensor increases the uptime and safety of installations and can be connected to approved evaluation units without cross-fault monitoring.

Faults such as coil break or coil short circuit are diagnosed and the sensor passes into the defined safe state. Even a cross fault between the supply voltage and one of the two outputs does not affect the safety function of the sensor.

Applications include reliable positioning on rotary indexing tables and machine tools, safe triggering of slow travel or switching off in end positions for presses, gantry robots and actuators or safe area monitoring for robots.

MAIN FEATURES

Operating voltage (VDC)	19,2 ... 30
Switching current (mA)	Max. 100
Safety output	2 OSSD
Electrical design	DC PNP
Connection	M12 4-pole connector
Signalling	LED yellow (signal), LED green (power)
Protection class	III

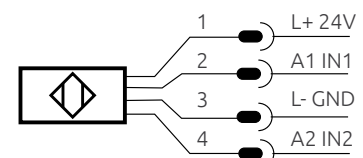
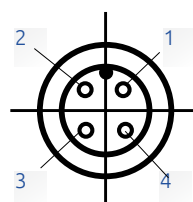


Operating temperature: -25 ... +70 °C



IP65 and IP67 protection rating
IP69K (PI M30 NF K model only)

CONNECTOR





SAFETY LEVEL

SIL 2

PL d

PART NUMBER

PI M12 NF:1293000



SAFETY LEVEL

SIL 2

PL d

PART NUMBER

PI M18 NF:1293001



SAFETY LEVEL

SIL 2

PL d

PART NUMBER

PI M18 F:1293002

PI M12 NF

METAL THREAD M12 X 1 / L = 70 MM

TECHNICAL FEATURES

Mounting	Non-flush mountable
Housing material	Body: stainless steel; Head: PBT
Enable zone (mm)	0,5 ... 4
Operating voltage (VDC)	19,2 ... 30
Current consumption (mA)	< 20
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 1

ACCESSORIES

- M12 angle bracket or M12 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)

PI M18 NF

METAL THREAD M18 X 1 / L = 70,5 MM

TECHNICAL FEATURES

Mounting	Non-flush mountable
Housing material	Body: stainless steel; Head: PBT
Enable zone (mm)	1 ... 8
Operating voltage (VDC)	19,2 ... 30
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 1

ACCESSORIES

- M18 angle bracket or M18 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)

PI M18 F

METAL THREAD M18 X 1 / L = 70 MM

TECHNICAL FEATURES

Mounting	Flush mountable
Housing material	Body: Brass white bronze coated; Head: PBT
Enable zone (mm)	1 ... 5
Operating voltage (VDC)	19,2 ... 30
Current rating (mA)	100
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 1

ACCESSORIES

- M18 angle bracket or M18 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)



SAFETY LEVEL

SIL 2

PL d

PART NUMBER

PI M18 FR:1293003



SAFETY LEVEL

SIL 2

PL d

PART NUMBER

PI M30 NF:1293004



SAFETY LEVEL

SIL 2

PL d

PART NUMBER

PI M30 F:1293005

PI M18 FR

METAL THREAD M18 X 1 / L = 86,5 MM

TECHNICAL FEATURES

Mounting	Flush mountable
Housing material	Body: Brass white bronze coated; Head: PBT
Enable zone (mm)	> 10
Operating voltage (VDC)	10 ... 30
Current rating (mA)	50
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 5

ACCESSORIES

- M18 angle bracket or M18 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)

PI M30 NF

METAL THREAD M30 X 1,5 / L = 70 MM

TECHNICAL FEATURES

Mounting	Non-flush mountable
Housing material	Body: stainless steel; Head: PBT
Enable zone (mm)	1 ... 15
Operating voltage (VDC)	19,2 ... 30
Current rating (mA)	100
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 10

ACCESSORIES

- M30 angle bracket or M30 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)

PI M30 F

METAL THREAD M30 X 1,5 / L = 70 MM

TECHNICAL FEATURES

Mounting	Flush mountable
Housing material	Body: Brass white bronze coated; Head: PBT
Enable zone (mm)	1 ... 10
Operating voltage (VDC)	19,2 ... 30
Current rating (mA)	100
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 10

ACCESSORIES

- M30 angle bracket or M30 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)



SAFETY LEVEL

SIL 3

PL e



High protection class IP69K for use in harsh environments.

PART NUMBER

PI M30 NF K:1293006



SAFETY LEVEL

SIL 3

PL e

PART NUMBER

PI SQ F NF:1293007



SAFETY LEVEL

SIL 3

PL e

PART NUMBER

PI SQ NF:1293008

PI M30 NF K

METAL THREAD M30 X 1,5 / L = 80 MM

TECHNICAL FEATURES

Mounting	Non-flush mountable
Response time (ms)	≤ 10
Enable zone (mm)	6 ... 12
Operating voltage (VDC)	19,2 ... 30
Current rating (mA)	100
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Housing material	Body: stainless steel; Head: PBT

ACCESSORIES

- M30 angle bracket or M30 mounting clamp. See [page 8](#)
- M12 5-pole straight connectors. See [page 28](#)

PI SQ F-NF

RECTANGULAR 40X40X66 MM

TECHNICAL FEATURES

Mounting	Non-flush or flush mountable
Housing material	Body: diecast zinc; Head: PPE;
Enable zone (mm)	10 ... 15
Operating voltage (VDC)	19,2 ... 30
Current consumption (mA)	< 15
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 50

ACCESSORIES

- M12 5-pole straight connectors. See [page 28](#)

PI SQ NF

RECTANGULAR 40X40X66 MM

TECHNICAL FEATURES

Mounting	Non-flush mountable
Housing material	Body: diecast zinc; Head: PPE;
Enable zone (mm)	4 ... 20
Operating voltage (VDC)	19,2 ... 30
Current consumption (mA)	< 30
Max. capacitive load (nF)	20
Short-circuit protection	yes
Response time (ms)	≤ 50



ACCESSORIES

- M12 5-pole straight connectors. See [page 28](#)

ACCESSORIES

ANGLE BRACKET

- For mounting cylindrical sensors
- Easy, quick and inexpensive fixing
- Robust stainless steel design for use in harsh industrial environments
- Reliable mounting on a surface by means of two screws

	Ordering code	Model
	1293100	M12 bracket
	1293101	M18 bracket
	1293102	M30 bracket

CLAMPS WITH END STOP

- End stop for defined installation position
- Safe fixing of the sensor with click-fit mounting
- Easy, quick and inexpensive fixing
- Reliable mounting on a surface by means of two screws

	Ordering code	Model
	1293103	M12 mounting clamp
	1293104	M18 mounting clamp
	1293105	M30 mounting clamp

CABLES NEEDED

- M12 straight connector 5-pole for all models. See [page 28](#)