BALLUFF

BIC 1I22-P2A02-M18MN2-EPX07-050
BIC 2I22-P2A02-M18MF2-EPX07-050

User's Guide

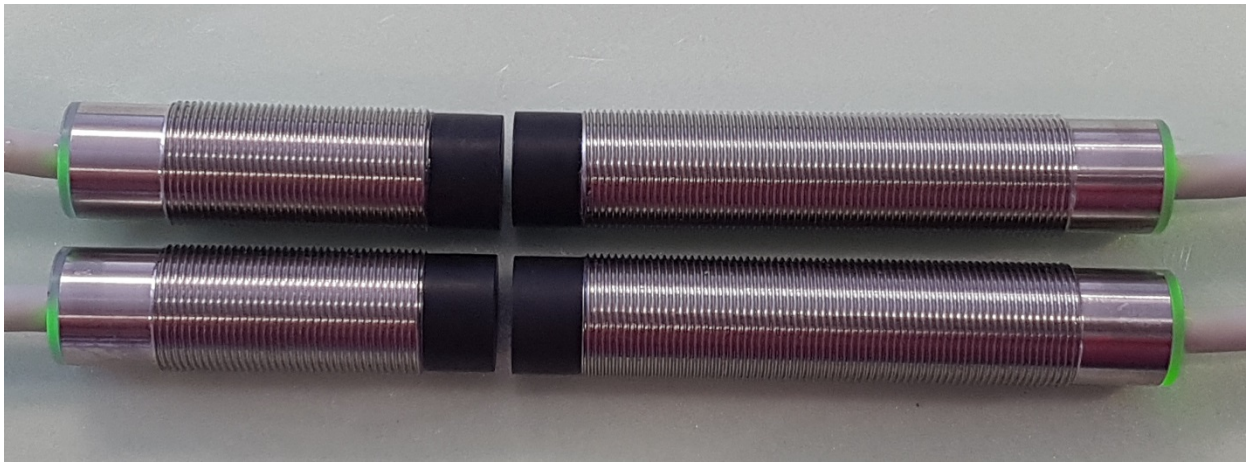


Table of Contents

1 Safety

1.1 Installation and startup

Attention!
Installation and startup are to be performed by trained technical personnel only. Skilled specialists are people who are familiar with the work such as installation and the operation of the product and have the necessary qualifications for these tasks. Any damage resulting from unauthorized tampering or improper use shall void warranty and liability claims against the manufacturer. The operator is responsible for ensuring that the valid safety and accident prevention regulations are observed in specific individual cases.

1.2 General safety notes

Commissioning and inspection
The operating company shall be responsible for observance of locally applicable safety regulations.
Before commissioning, carefully read the User's Guide.
The system must not be used in applications in which the safety of persons depends on the function of the device.
Intended use
Warranty and liability claims against the manufacturer shall be rendered void by damage from:

- Unauthorized tampering
- Improper use
- Use, installation or handling contrary to the instructions provided in this User's Guide.

Obligations of the owner/operator!
The device is a piece of equipment in accordance with EMC Class A. Such equipment may generate RF noise. The owner/operator must take appropriate precautionary measures against this for its use. The device may be used only with a power supply approved for this. Only approved cables may be connected.
Malfunctions
In the event of defects and device malfunctions that cannot be rectified, the device must be taken out of operation and protected against unauthorized use.

Dangerous voltage

Attention!
Before working on the device, switch off its power supply.

Intended use

Attention!
Inductive coupling systems (BIC) are devices for contact-free energy and signal transmission in industrial environments.

Use is particularly not allowed:

- In environments with explosive atmospheres,
- in application in which the safety of people or machines can be affected by transmitted signals. (Safety-related circuits).

1.3 Safety notes

Caution!
Metallic objects must not get in Zone A, B or between the sensing surfaces of the Base and Remote. Fire hazard!

Protection from electromagnetic fields

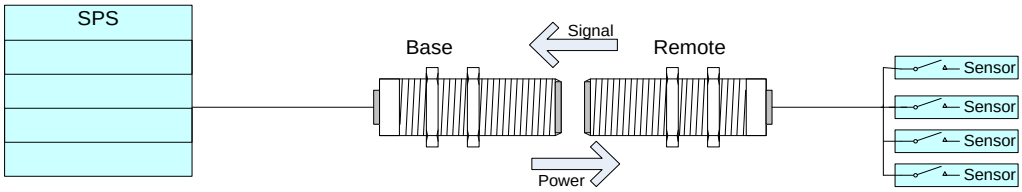
Protection from electromagnetic fields during operation and assembly
The permitted values in accordance with VDE 0848 part 3-1 are maintained starting at a distance of ≥ 10 mm. The magnetic fields emitted by the BIC system may pose a health hazard to persons with medical aids such as a pacemaker. The minimum distance for this group of persons is ≥ 15 mm. The operator is responsible for this minimum distance also being maintained through suitable measures during operation.

Note
In the interest of continuous improvement of the product,
Balluff GmbH reserves the right to change the technical data of the product and the content of these instructions at any time without notice.

2 System Overview

2.1 Topology

The BIC system transmits 4 binary signals from the mobile unit (Remote) via the air gap to the stationary unit (Base). In addition to this signal transmission, the BIC system provides electric power to the sensors connected to the Remote. The maximum permissible transmission distance between Base and Remote is 3mm at a permissible offset of ± 3mm



The components are housed in an IP 67 protected brass enclosure

Sensors
For the standard version of electronic sensors, observe the following:

- Be sure that the total current draw of the sensors is not greater than 100mA.
- Only use sensors with a voltage of 12 V DC.

Mechanical switches
For the standard version of mechanical switches, observe the following:

- Use switches for small load currents
- Use switches with a residual current I <0.1 mA in the open switching state
- The total resistance of the circuit should be less than 1 kOhm

2.2 Base indicators

Signaling	Function
Green, static	Supply voltage OK Remote coupled
Green, flashing slowly	Supply voltage OK, no Remote
Green, rapidly flashing	Overload/short-circuit

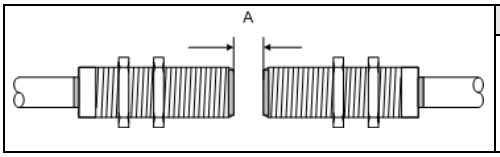
2.3 Remote indicators

Signaling	Function
Green, static	Supply voltage OK
Green, rapidly flashing	Overload/short-circuit

3 Installation

3.1 Transmission distance

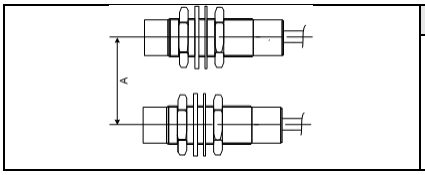
Compliance with the permitted transmission distance is a prerequisite for interference-free operation of the BIC system.



A
≤ 3mm

3.2 Mutual interference

To prevent mutual interference with adjacent Bases or Remotes, the specified minimum distances must be adhered to:



Type	A (mm)
BIC M18	≥ 30

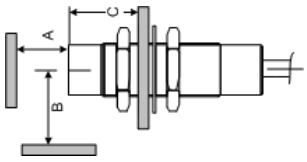
3.3 Installation in metal

Attention!
Device damage due to induction effects!
Metallic objects on the coil cap cause the objects to be heated.

- Install the components so that no metallic objects can collect on the coil cap.

When installing in metal the specified minimum distances from the surrounding sides of the metallic object must absolutely be maintained. Otherwise the transmission distance between Emitter and Receiver will change and a missing Remote will induce a magnetic short circuit The transmission distance may also be affected by the type of metal.

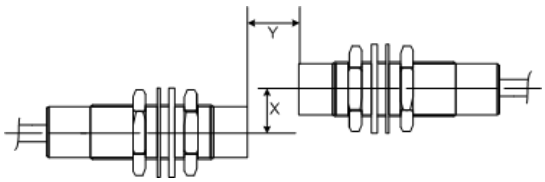
Type	A (mm)	B (mm)	C (mm)
BIC 1I22-P2A02-M18MN2-EPX07-050	≥ 4	≥ 15	≥ 20
BIC 2I22-P2A02-M18MF2-EPX07-050	≥ 4	≥ 15	≥ 20



3.4 Offset

Permitted distances / offset of the axes

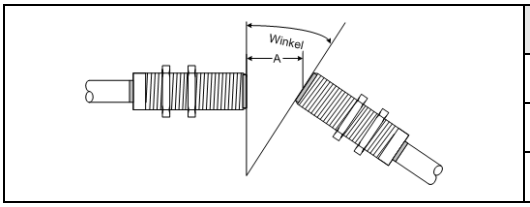
Type	x (mm)	Y (mm)
BIC 1I22-P2A02-M18MN2-EPX07-050	≤ 3	≤ 3
BIC 2I22-P2A02-M18MF2-EPX07-050	≤ 3	≤ 3



3 Installation

3.5 Angular offset

The permitted angular offset enables functioning in particular installation positions.



Distance A (mm)	Angle
1	15°
2	8°
3	0°

3.6 Startup

Attention!
Device damage due to incorrect voltage supply!
Malfunctions may occur if the ripple is too high or if the output voltage is not regulated.

- Use only approved, regulated voltage supplies.

Attention!
The Remote (receiver) may be damaged by voltage spikes if cables that are too long are used!

- To satisfy the EMC requirements, the cable on the receiver must not be longer than 5 m.

Of a longer cable is used nonetheless, take all possible measures to protect the receiver from overvoltage peaks.

Note
Use Base Coupler (BIC 1I22-P2A02-M18MN2-EPX07-050) exclusively with Remote Coupler (BIC 2I22-P2A02-M18MF2-EPX07-050)

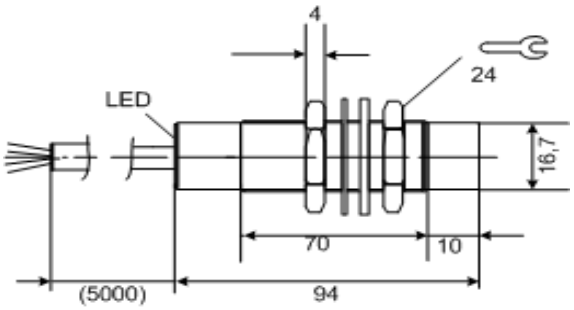
Commissioning cannot occur until assembly of the entire actuation line, including the Base, Remote and sensors, is complete
For safety considerations the components must always be installed with power off.
The BIC system is designed so that a polarity reversal of the supply voltage on the Base side does not cause any damage. The signal outputs from the Base must not ever be charged with the supply voltage!
For safety reasons, it is recommended that the primary 24 V power supply on the Base side of the BIC system be limited to a maximum current of 0.5 A.
Be sure that the design of the machine ensures that the total current of the sensors in addition to the sensors does not exceed the maximum output current of mA for the Remote.
The Remote system is protected for a short-time short circuit, but a long-time short circuit or a connection with the sensor signal outputs of the Base can cause lasting damage.
The Base transmits an "In Zone" signal to check/monitor the connection between the Base and the Remote. This can be interpreted by the PLC as "transmitted sensor data valid."

3.7 InZone output

The output is active as soon as the Remote is in the transmission range of the Base. As long as the signal is active, the relevant information is valid at the outputs and the LED is on.

4 Technical Data

4.1 Base



LED

LED	Indicator	Function
Green	Static	Connection established
	Slowly flashing	Power on, no Remote found
	Quickly flashing	Overload/short-circuit

Mechanical data

Housing material	Brass, CuZn coated
Thread	M18 x 1
Sensing surface material	PA66
Housing degree of protection	IP 67
Pigtail	Cable PUR 7x0.34^2
Dimensions (D x L in mm) without pigtail	M18 x 94
Weight	350 g
Tightening torque	70 Nm

Electrical data

Operating voltage	24 V DC ±10%
Current consumption	≤ 500 mA
No-load current	≤ 100 mA
Number of digital outputs	4 x PNP
Max. current load for outputs (mA)	≤. 50 mA
In Zone signal/ data valid	yes
Operational readiness	< 80 ms
Transfer frequency	60 Hz
Overload protection	yes
Polarity reversal protection	yes
Short-circuit protection	yes

4 Technical Data

Pigtail

Number of conductors	7
Cable length in mm	5000
Conductor cross-section	0.34 mm^2
Cable diameter D	4.5 mm
Bending radius fixed cable	5 x D
Bending radius repeated	10 x D
Cable jacket material	PUR

Operating conditions

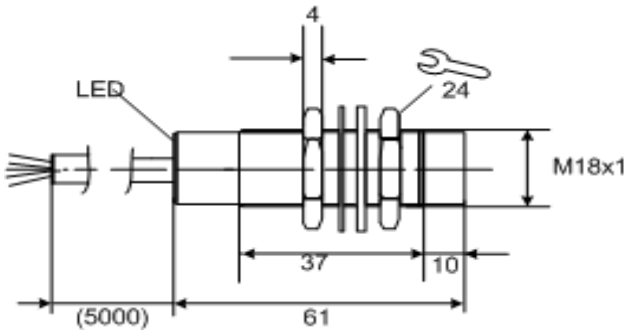
Transmission distance	1…..3 mm
Operating temperature T_a Storage temperature	0°C …….50 °C -10 C …..70 °C

Connection configuration

Color	Signal	Function
White/WH	+24 V	Input voltage
Blue/BU	GND	Ground
Gray/GY	DAV	In Zone
Brown/BN	Signal 1	Signal 1
Pink/PK	Signal 2	Signal 2
Yellow/YE	Signal 3	Signal 3
Green/GN	Signal 4	Signal 4

4 Technical Data

4.2 Remote



LED

LED	Indicator	Function
Green	Static	Connection established
	Fast flashing	Overload/short-circuit

Mechanical data

Housing material	Brass, CuZn coated
Thread	M18 x 1
Sensing surface material	PA 66
Housing degree of protection	IP 67
Weight	310 g
Dimensions (D x L in mm) without pigtail	M18 x 61
Pigtail	Cable PUR 7x0.34^2

Electrical data

Operating voltage	12 V DC ±10%
No. of digital inputs	4 x PNP
Operational readiness	≤ 80ms
Transfer frequency	60 Hz
Output current	≤ 100 mA
Permitted inductive load	< 200 mH
Permitted capacitive load	< 20 µF
Short-circuit protection	yes
In Zone Signal	yes

4 Technical Data

Pigtail

Number of conductors	7
Cable length in mm	5000
Conductor cross-section	0.34mm^2
Cable diameter D	4.5 mm
Bending radius fixed cable	5xD
Bending radius repeated	10xD
Cable jacket material	PUR

Operating conditions

Transmission distance	1…..3 mm
Operating temperature T_a Storage temperature	0 °C ... 50 °C -10 °C ... 70 °C

Connection configuration

Color	Signal	Function
White/WH	+12 V	Output voltage
Blue/BU	GND	Ground
Gray/GY	not connected	
Brown/BN	Signal 1	Input signal 1
Pink/PK	Signal 2	Input signal 2
Yellow/YE	Signal 3	Input signal 3
Green/GN	Signal 4	Input signal 4

5 Appendix

5.1 Ordering information

Product name	Order code
BIC 1I22-P2A02-M18MN2-EPX07-050 (Base)	BIC007T
BIC 2I22-P2A02-M18MF2-EPX07-050 (Remote)	BIC007U

Notes

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