

BIC 1I1-P2A05-M12MM-BPX0-003-M45A

BIC 2I1-P2A05-M12MF-BPX0-003-M44A

User's Guide

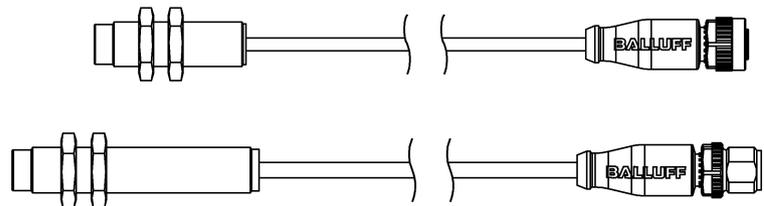


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1 General

1.1. Structure of the guide

This guide is arranged so that one chapter builds upon the other.
Chapter 1: General
Chapter 2: Safety
.....

1.2. Typographical Conventions

The following typographical conventions are used in this manual.

Enumerations

Enumerations are shown in the form of bulleted lists.

- Entry 1
 - Entry 2

1.3. Symbols



Note
This symbol indicates general notes.



Attention!
This symbol indicates a security note that must be observed.



Attention!
This symbol indicates a security note that must be observed. This is a fire hazard!



Attention!
This symbol indicates a security note that must be observed. Important for persons with physical aids, such as Pacemaker.

1.4. Disposal



This product is covered by WEEE Directive 2012/19/EU on waste electrical and electronic equipment.

Dispose of the product properly and not as part of the regular waste stream. The regulations of the respective country are to be observed. Information is provided by the national authorities.

2.1 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 manipulation or improper use voids the manufacturer's guarantee and liability claims against the manufacturer. The operator is responsible for ensuring that the valid safety and accident prevention regulations are maintained in the specified individual case.

2.2 General safety notes

Commissioning and inspection

The operating company shall be responsible for observance of locally applicable safety instructions.

Before commissioning, carefully read the operating manual.

The system must not be used in applications in which the safety of persons is dependent on the function of the device.

Intended use

Warranty and liability claims against the manufacturer are rendered void by:

- Unauthorized tampering
- Improper use
- Use, installation or handling contrary to the instructions provided in this operating manual.

Obligations of the Operating Company

The device is a piece of equipment from EMC Class A. Such equipment may generate RF noise. The operator must take appropriate precautionary measures. The device may only be used with an approved power supply. Only approved cables may be used.

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).

2.3 Safety notes



Attention!

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

2 Safety

Protection from electromagnetic fields



Protection from electromagnetic fields during operation and assembly

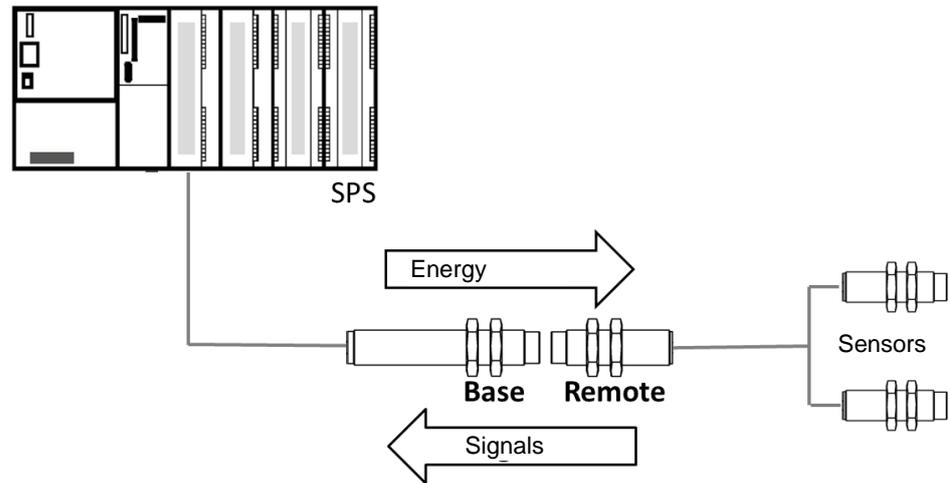
The permitted values in accordance with VDE 0848 part 3-1 are maintained starting at a distance of >3 mm. The magnetic fields emitted by the BIC system may pose a health hazard to persons with medical aids such as a pacemaker. The minimum distance for this group of persons is >5 mm. The operator is responsible 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.

3.1 Topology

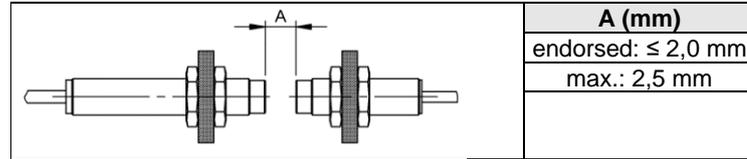


The BIC system transmits two binary sensor signals from the mobile unit (remote) via the air gap to the stationary unit (base). In addition to this signal transmission, the BIC system provides electric power to the sensors connected to the remote. The transmission distance of the base and remote is 2,5 mm, with a permitted axial offset of ± 2 mm.

4 Installation

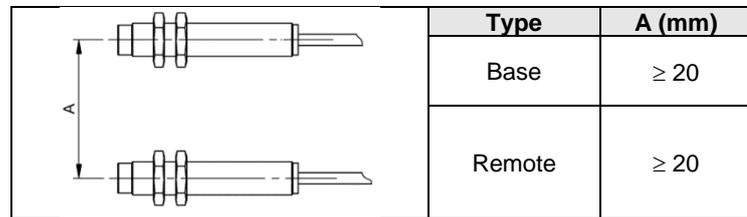
4.1 Transmission distance

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



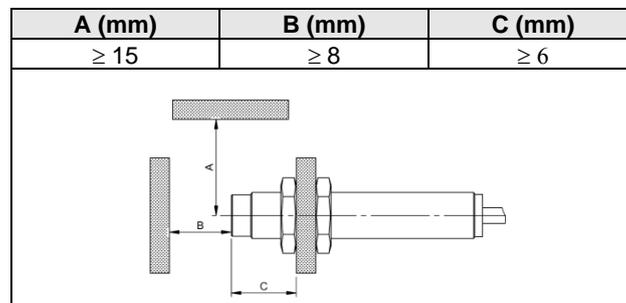
4.2 Mutual Interference

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



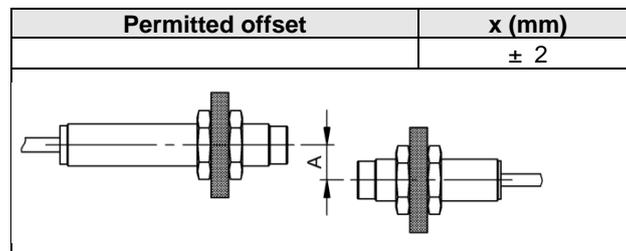
4.3 Installation in metal

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 sensing surface.
 Metallic objects in the vicinity of the coil cap can lead to overheating and a possible failure of the BIC system. When performing installation in metal, the specified minimum distances must be observed.



4.4 Offset

Permitted distances / offset of the axes

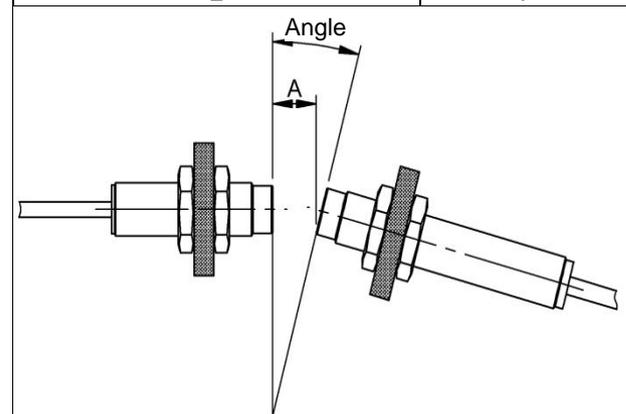


4 Installation

4.5 Angular offset

The permitted angular offset enables functioning in particular installation positions.

Distance D (mm)	Angle
0.5	20°
1	15°
2	7°



4.6 Startup



Note

Operate the base coupler (BIC 111-P2A05-M12MM-BPX0-003-M45A) with the remote coupler (BIC 211-P2A05-M12MF-BPX0-003-M44A) exclusively!

Startup cannot occur until assembly of the entire actuation line, including the base, remote and sensors, is complete.

For safety reasons, component installation must only occur when all devices are in a de-energized state.

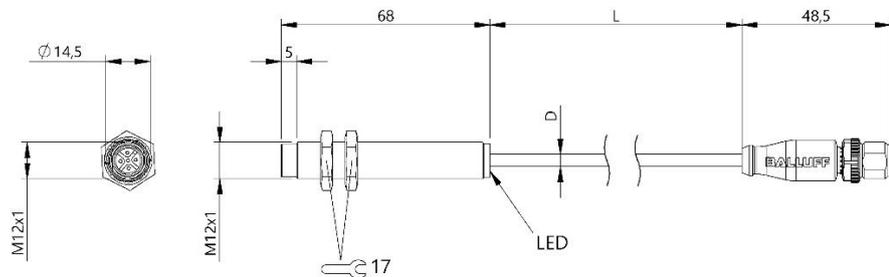
The BIC system is designed so that a polarity reversal of the supply voltage on the base side does not cause any damage. The signal outputs from the base must not ever be charged with the supply voltage!

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 0.3 A. The Base unit does not have a protective circuit for overload.

In addition to the binary sensors, be sure that the design of the machine ensures that the total current of the sensors does not exceed the maximum output current for the remote. The remote component has short-term protection against short-circuits. A long-term 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."

5 Technical data

5.1 Base



LED

LED	Display	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	M12 x 1
Sensing surface material	Plastic, PA30
Housing degree of protection	IP 67 (only in plugged-in and screwed-down state)
Connection type	Pigtail M12, 5-pin, pins, A-coded
Dimensions (D x L in mm) without pigtail	M12 x 68
Weight	40 g

Electrical Data

Supply voltage	24 V DC \pm 10%
Current consumption	< 300 mA
No-load supply current	\leq 100 mA
Number of digital outputs	2 x PNP
Max. current load for outputs	35 mA
In Zone signal/ data valid	Yes
Operational readiness	< 100 ms
Transfer frequency	60 Hz
Overload protection	No
Short circuit protection	Yes
Polarity reversal protection	Yes

5 Technical data

Pigtail

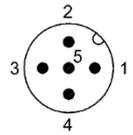
Number of conductors	5
Connector design	Connector M12, A-coded
Number of pins	5
Cable length	0.3 m
Conductor cross-section	5 x 0.14mm ²
Cable diameter D	4,05 mm
Bending radius fixed cable	5 x D
Bending radius repeated	10 x D
Grip material	PUR
Cap nut material	GD-Zn
Cable jacket material	PUR
Contact carrier material	PUR
Contact material	CuZn
Tightening torque pigtail	0.6 Nm

Operating conditions

Permitted transmission distance	Endorsed ≤ 2.0 mm, maximum 2.5 mm
Permitted offset	± 2 mm
Ambient temperature Storage temperature	-10 °C ...50 °C -20 °C ...60 °C
Interference immunity EN 61000-4-2/3/4/5/6, EN55011	3/3/3/3 severity level Size 1 CL. A

Pin allocation

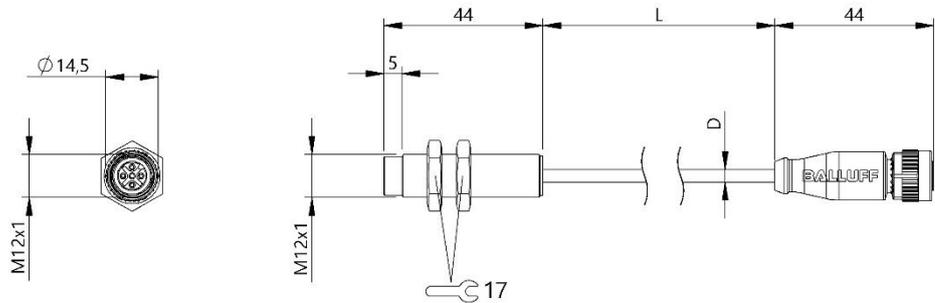
The base device is equipped with a pigtail and 5-pin connector.

M12, 5-pin, connector		
	PIN	Signal
	1	24V
	2	Output 1
	3	GND
	4	Output 2
	5	In Zone

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5 Technical data

5.2 Remote



Mechanical data

Housing material	Brass, CuZn coated
Thread	M12 x 1
Sensing surface material	Plastic, PA30
Housing degree of protection	IP 67 (only in plugged-in and screwed-down state)
Connection type	Pigtail M12, 5-pin female, A-coded
Dimensions (D x L in mm) without pigtail	M12 x 44
Weight	30 g

Electrical Data

Output voltage	24 V DC $\pm 10\%$
Number of digital inputs	2 x PNP
Operational readiness	< 100 ms
Transfer frequency	60 Hz
Max. output current at: Distance 0 to 2 mm Distance 2 \leq 2,5 mm	50 mA 35 mA
Permitted inductive load	< 200 mH
Permitted capacitive load	< 10 μ F

5 Technical data

Pigtail

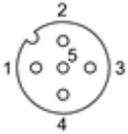
Number of conductors	4
Connector design	Socket M12, A-coded
Number of sockets	5
Cable length	0.3 m
Conductor cross-section	4 x 0.14mm ²
Cable diameter D	3.5 mm
Drag chain-compatible	Yes
Max. acceleration (drag chain)	5 m/s ²
Bending radius fixed cable	5 x D
Bending radius repeated	10 x D
Bending cycles (in millions) > 2	10 x D
Grip material	PUR
Cap nut material	GD-Zn
Cable jacket material	PUR
Contact carrier material	PUR
Contact material	CuZn
Tightening torque pigtail	0.6 Nm

Operating conditions

Permitted transmission distance	Endorsed ≤ 2.0 mm, maximum 2.5 mm
Permitted offset	± 2 mm
Ambient temperature Storage temperature	-10 °C ... 50 °C -20 °C ... 60 °C
Interference immunity EN 61000-4-2/3/4/5/6, EN55011	3/3/3 severity level Size 1 CL. A

Pin allocation

The remote device is equipped with a pigtail and 5-pin socket.

Power (M12, 5-pin socket)		
	PIN	Signal
	1	+24 V
	2	Input 1
	3	GND
	4	Input 2
	5	n. c.

Balluff BIC system
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6 Appendix

6.1 Ordering information

Product name	Ordering code
BIC 1I1-P2A05-M12MM-BPX0-003-M45A (Base)	BIC0077
BIC 2I1-P2A05-M12MF-BPX0-003-M44A (Remote)	BIC0078

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