

Operating Instructions




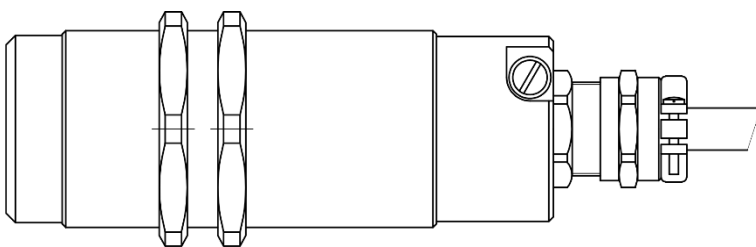
Reflex Light Barriers

JP705 Ex

JP7051 Ex

for Hazardous Areas

,4130GE'

Features	Applications
<ul style="list-style-type: none"> ✓ Large working range – typically up to 20 m in very dusty environments ✓ Explosion-proof reflex light barrier ✓  II 2G Ex db IIC T6 Gb ✓  II 2D Ex tb IIIC T80°C Db 	<ul style="list-style-type: none"> ○ Detection of material / objects in hazardous areas in Zone 1 or Zone 21 <div style="text-align: center; margin-top: 20px;">  <p>JP705 Ex / JP7051 Ex reflex light barrier</p> </div>
 <p>Sketch of JP705 Ex / JP7051 Ex</p>	

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1 Identification

1.1 Product Brand	“JP705... Ex” reflex light barrier for hazardous areas
1.2 Product Versions / Marking	Infrared light : JP705 Ex Red light : JP7051 Ex
1.3 Name and Address of the Manufacturing Company	Fotoelektrik Pauly GmbH Wahrbrink 6, 59368 Werne, Germany
1.4 Declaration of Conformity	The above products were developed and manufactured in conformance to the following standards or normative documents!

- Low-voltage directive 2014/35/EU
- EMC directive 2014/30/EU
- ATEX directive 2014/34/EU

EC-Type Examination Certificate of Equipment and Components for Use in Hazardous Areas (Directive 94/9/EC):

Certificate No.: **BVS 08 ATEX E 122 X**

Marking:  II 2G Ex db IIC T6 Gb
II 2D Ex tb IIIC T80°C Db

IECEx Certificate of Conformity, IEC Certification Scheme for Explosive Atmospheres:

Certificate No.: **IECEx BVS 12.0029X**

Marking: Ex db IIC T6 Gb
Ex tb IIIC T80°C Db

Applied Standards and Technical Specifications:

IEC 60079-0:2017	General Requirements
IEC 60079-1:2014	Equipment protection flameproof enclosure “d”
IEC 60079-31:2013	Equipment dust ignition protection by enclosure “t”

2 Product Description

2.1 General Functions and Range of Applications, Use in Accordance with the Intended Purpose

The “JP705... Ex” reflex light barrier was developed for use in hazardous areas in Zone 1 and Zone 21.

The “JP705... Ex” reflex light barrier consists of a transmitter and a receiver. The transmitter and receiver electronics are fitted onto a joint printed circuit board. The printed circuit board is accommodated in a flameproof enclosure. The transmitting and receiving beam is formed to produce a joint overlapping area. A reflector that is positioned inside this beam overlapping area is illuminated and observed at the same time. The reflection causes the receiver to respond.

When 24 VDC supply voltage is applied, the transmitter light is switched on and the receiver is in direct receiving readiness. A modulated light signal is generated by the transmitter. The type “JP705/yL Ex” works with the invisible infra-red light. The JP7051 Ex type works with visible red light. The transmitted light signal has a defined clock ratio. The receiver sees the modulated light transmitted by the transmitter and reflected by the reflector. The switching output in the receiver is switched on or off according to the selected signal mode – bright-switching or dark-switching.

When the “bright-switching” signal mode is selected, the transistor is switched on when the light path between the reflex light barrier and the reflector is unobstructed.

When the “dark-switching” signal mode is selected, the transistor is switched on if the light path between the reflex light barrier and reflector is completely obstructed.

When switched on, the switching output supplies a voltage potential of 24 VDC. When switched off, the P-N-P transistor provides a high level of impedance.

The switching state of the reflex light barrier is typically evaluated with a PLC or a monitoring device. Depending on the logical operator, it may be necessary to have pull-down resistance.

The reflex light barrier is designed for working ranges of up to 20 m, depending on the reflector. The reflex light barrier can be used for tracking materials or detecting the presence of an object in very many different automated industrial applications.

2.2 Safety information, summary (use for purposes other than those intended)



The owner / managing operator / installer must acquire information about the Ex regulations that apply to his area of application and conform to these regulations. The same applies when cables and conductors are being installed and wired. In applications in Zone 21 it must be ensured when installing the connection cable that electrostatic charging cannot lead to ignitable discharges.



When plastic reflectors are used, the projected area must be less or equal to 20 cm². The requirements of EN ISO 80079-36 must be observed.



When plastic reflectors with an area greater than 20 cm² and less than or equal to 80 cm² are used, the exposed plastic surfaces must be surrounded by a conductive earthed frame. The requirements of EN ISO 80079-36 must be observed.



The light barrier and the reflector may be installed only by an authorised and qualified person with the specialist knowledge required for the installation of electrical equipment in hazardous areas.



The requirements of EN 60079-14 must be observed.



The reflex light barrier may not be dismantled.

If connecting in a hazardous area:



the connection cable for the transmitter and receiver must be connected in an enclosure. The enclosure used must meet the requirements of a recognised type of protection (complying with EN60079-0, Section 1).



If the enclosure or cable entry is damaged or no longer leak-tight, the device must be put out of operation immediately.



External sources that radiate heat or cold and could impermissibly heat or cool the surfaces of the device are prohibited and special care must be taken to prevent them occurring.

3 Definitions – Technical Data

Reflex light barrier	JP705 Ex	JP7051 Ex
Enclosure material:	Stainless steel	
Dimensions:	M42x1.5 x 147 mm	
Weight	approx. 1500 g (incl. 5 m cable)	
Protection mode	IP66 (Protection against Dust and Powerful Water Jets)	
Voltage supply	24 VDC	
Power consumption	40 mA / <1 W without load	
Connection	No. cable 4x0.75 mm ² shielded (typical length 5 m)	
Emitted light	LED 850...880 nm, invisible	LED 650 nm, visible
Switching output receiver	PNP transistor, short-circuit proof 50 mA	
Signal mode	Bright-switching (Optional: dark-switching)	
Switch indicator	green LED	
Ambient temperature (T _{amb.})	-20 to +60 °C	
Storage temperature	-20 to +70 °C	
Steady light resistance	> 80 kLux	
Access time	< 12 ms/switch transition	
Interference suppression	Forced synchronisation	
Reflector	Reflectors in accordance with data sheet	

All specification: see data sheet

4 Preparing the Product for Use

Reflex light barrier and reflector must be mounted opposite each other.

The objects to be monitored must be able to fully occupy the light path between the reflex light barrier and the reflector.

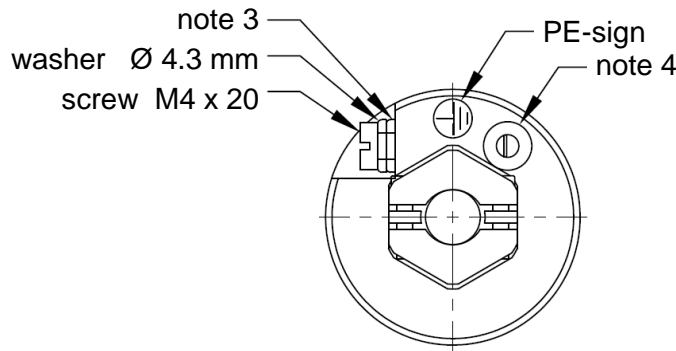
When installing, observe the operating instructions and the data sheets.

5 Connection

5.1 Wiring the Reflex Light Barrier

The JP705 Ex and JP7051 Ex reflex light barrier must be wired in accordance with the data sheet.

5.2 PE Connection at the Reflex Light Barrier



Note 3: Connection for cable lug with ring eyelet, internal diameter 4.3 mm, External diameter maximum of 9.5 mm.

Note 4: Connection of rigid conductors: 4 mm² to 6 mm².
Connection of flexible conductors with ferrule: 4 mm².



Only one of the two connection possibilities may be used, either that described in note 3 or in note 4!

5.3 Equipotential Bonding at the Reflector

When using reflectors with an exposed plastic surface of 20 cm² to 80 cm², the frame must be fastened in an electrically conductive manner to the earthed site of installation. In insulated assembly the reflector must be connected to an equipotential bonding conductor.

6 Marking the Light Barriers

Reflex light barrier:
JP705 Ex

	CE 0158 Type: JP705 Ex II 2G Ex db IIC T6 Gb II 2D Ex tb IIIC T80°C Db IP66 ATEX cert.no.: BVS 08 ATEX E 122 X IECEx CoC: IECEx BVS 12.0029X Temp.: -20 °C ≤ Ta ≤ +60 °C Art.no.: 4130x... Ser.no.: C2A.8888	光控传感器 德国制造 Ex ID A21 IP66 T80°C Certificate No.: 22-AV4B0-0096X to 22-AV4B0-0101X Date of issue: 2022-03-24 Made in Germany Fotoelektrik Pauly 59368 Werne www.fotoelektrik-pauly.de	
			+24VDC 1 0V 2 0V shield Out 3 PE GN/YE

Reflex light barrier:
JP7051 Ex

	CE 0158 Type: JP7051 Ex II 2G Ex db IIC T6 Gb II 2D Ex tb IIIC T80°C Db IP66 ATEX cert.no.: BVS 08 ATEX E 122 X IECEx CoC: IECEx BVS 12.0029X Temp.: -20 °C ≤ Ta ≤ +60 °C Art.no.: 4130M01x... Ser.no.: C2A.8888	光控传感器 德国制造 Ex ID A21 IP66 T80°C Certificate No.: 22-AV4B0-0096X to 22-AV4B0-0101X Date of issue: 2022-03-24 Made in Germany Fotoelektrik Pauly 59368 Werne www.fotoelektrik-pauly.de	
			+24VDC 1 0V 2 0V shield Out 3 PE GN/YE

7 Maintenance and Cleaning

- ❖ Maintenance and cleaning work may be done only by qualified personnel who are familiar with the location and have received the relevant instructions.
- ❖ Only a damp cloth may be used to clean the viewing glass. Do not use any aggressive cleaning agents!
- ❖ If the enclosure or cable entry is damaged or no longer leak-tight, the device must be put out of operation immediately.
- ❖ Repairs to the device itself may be done only by the manufacturing company itself.

8 Spare Parts List

Designation	Type	Version	Order Code
Infrared light reflex light barrier	JP705 Ex	/e2/5mK4/ir/24VDC [/h] or [/d]	4130x...
Red light reflex light barrier	JP7051 Ex	/e2/5mK4/rl/24VDC [/h] or [/d]	4130M01x...

For order enquiries the type, version and order code must be specified.

9 Decommissioning the Product

- ❖ The product may be decommissioned only by qualified personnel who are familiar with the location and have received the relevant instructions.

10 Annex – Supplementary Documents

Data sheet	(Infra-)red light reflex light barrier	E_41301	2023-08-17
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D-59368 Werne, 2023-10-23

* 41302 GE *

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