

## FRK 92 Ex i

## Diffuse reflection sensor with background suppression

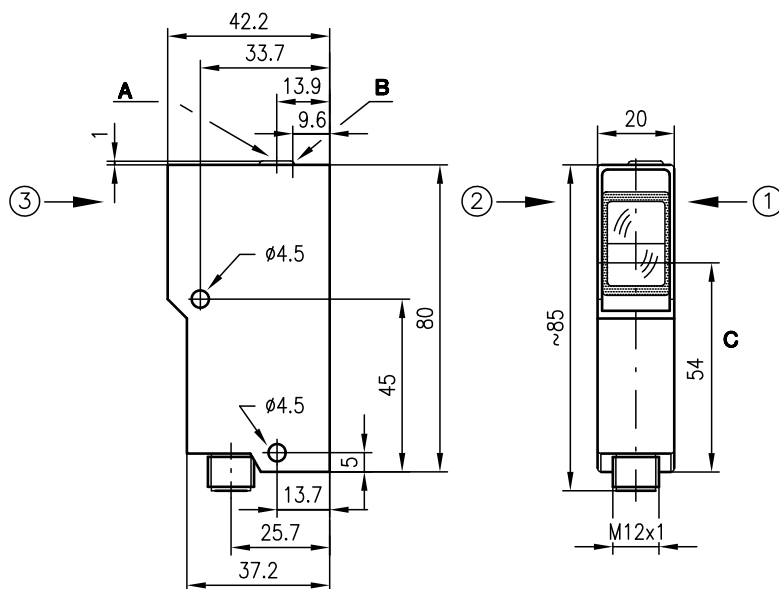
en 2020/09/24 50111476-05



**0.03 ... 0.3m**

- Compact construction with robust diecast zinc housing and glass optics for protection against environmental influences
- Switching output acc. to IEC 60947-5-6 (NAMUR)
- EU type examination certificate DMT 03 ATEX E 029
- $\text{Ex}$  II 2G Ex ia IIC T6 Gb
- $\text{Ex}$  II 2D Ex ia IIIB T 80°C Db
- For explosive gas atmospheres of subgroup IIC and non-conductive dusts acc. to subgroup IIIB

### Dimensioned drawing



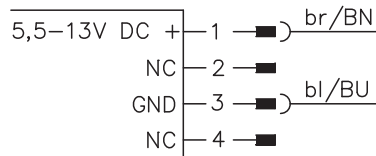
- A** Range adjustment  
**B** Indicator diode  
**C** Optical axis  
 Preferred entry direction for objects ① + ② + ③

### Accessories:

(available separately)

- Mounting systems (BT 92, UMS 1)
- Blue connection cable for intrinsically safe circuits:  
 KB-092-5000-4 ... Ex 50113399  
 KB-092-5000-4A ... Ex 50113400
- Isolated switching amplifier (VS 403...)

### Electrical connection



We reserve the right to make changes • PAL\_FRK92Ex\_en\_50111476\_05.fm

### Technical data

#### Optical data

Operating range (white 90%)	30 ... 300mm
Adjustment range	50 ... 300mm
Light beam characteristic	Divergent
Light source	LED (modulated light)
Wavelength	880nm (infrared light)
Intensity	< 1.1mW/mm <sup>2</sup>

#### Time behavior

Switching frequency	60Hz
Response time	8.5ms
Readiness delay	≤ 100ms

#### Electrical data

Nominal voltage	8.2VDC
Operating voltage $U_B$	5.5 ... 13VDC (incl. residual ripple)
Residual ripple	Max. 0.35V <sub>SS</sub>
Bias current (without reflection)	≤ 1mA
Switching output	NAMUR (IEC 60947-5-6)
Function	Light switching (light/dark setting on switching amplifier)

#### Indicators

Yellow LED

Reflection

#### Mechanical data

Housing	Diecast zinc
Surface	Anti-static epoxy coating
Optics	Glass
Weight	140g
Connection type	M12 connector

#### Environmental data

Ambient temp. (operation/storage)	-20°C ... +50°C / -30°C ... +70°C
VDE protection class <sup>1)</sup>	II
Protective circuit <sup>2)</sup>	2
Degree of protection	IP 67
Light source	Exempt group (in acc. with EN 62471)
Standards applied	IEC 60947-5-2

#### Explosion protection

Certification	$\text{Ex}$ II 2G Ex ia IIC T6 Gb	$\text{Ex}$ II 2D Ex ia IIIB T 80°C Db
Maximum safe voltage	$U_{\text{max}}$ 13V	
Maximum safe current	$I_{\text{max}}$ 40mA	
Internal capacitance $C_i$	≤ 70nF	
Internal inductance $L_i$	≤ 200μH	

- 1) Rating voltage 250VAC  
2) 2=polarity reversal protection

### Order guide

Designation	Part no.
FRK 92/3-300 L Ex	50080724

### Tables

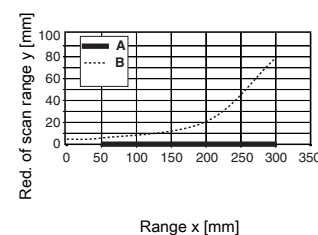
1	30	300
2	40	250
3	40	220

1	White 90%
2	Gray 18%
3	Black 6%

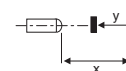
Operating range [mm]

### Diagrams

Typ. black/white behavior



- A White 90%  
B Black 6%



### Notes

#### Observe intended use!

- ⚠ This product is not a safety sensor and is not intended as personnel protection.
- ⚠ The product may only be put into operation by competent persons.
- ⚠ Only use the product in accordance with its intended use.

- For operation in potentially explosive atmospheres, an isolated switching amplifier is required.

### Operating instructions for the 92 Ex series for use in potentially explosive areas.

The sensors produced by Leuze electronic GmbH + Co. KG for use in potentially explosive areas are sensors which function on the optical electronic principle. Without making physical contact, these sensors detect objects which are located in or which pass through the light beam.

The devices of the 92 Ex series (LS throughbeam photoelectric sensor, PRK retro-reflective photoelectric sensor and FRK diffuse reflection sensor) were designed for use in explosive gas atmospheres of group II, subgroup IIC (according to EU Directive 94/9/EC, corresponds to device group II, device category 2G, zone 1) and for non-conductive dusts (subgroup IIIB) in compliance with standards EN 60079-0:2012 + A11:2013 and EN 60079-11:2012. The EU Declaration of Conformity can be found under [www.leuze.com](http://www.leuze.com).

The intrinsic safety of the sensors is ensured only in combination with corresponding electrical equipment according to IEC 60947-5-6 (NAMUR), e.g. isolated switching amplifier VS 403.

#### NOTE



- An isolated switching amplifier must be used for each sensor. In the case of the throughbeam photoelectric sensor, an isolated switching amplifier is required for both the transmitter and the receiver.
- The sensors must not be connected together at an isolated switching amplifier.
- When using an isolated switching amplifier, it must be ensured that the characteristic data specific to explosion protection of both devices are not exceeded.

### Installation, commissioning

#### ⚠ ATTENTION!



- Due to the physical circumstances, the photoelectric sensors of the 92 Ex series must not be used for the protection of persons or for purposes of emergency shutdown.
- The photoelectric sensors of the 92 Ex series must only be installed and maintained by trained electricians.
- The respective applicable national regulations for the installation of electrical equipment in potentially explosive areas must be observed.

During installation and commissioning of the devices, the EC type examination certificate DMT 03 ATEX E 029 is to be observed.

To connect the intrinsically safe sensors with corresponding equipment, it is possible to use, for example, the blue interconnection cable KB-092-5000-4 Ex (angular connector, part no. 50113399) or KB-092-5000-4A Ex (axial connector, part no. 50113400) from Leuze electronic GmbH + Co. KG.

#### Maintenance

No changes may be made to the devices of the 92 Ex series for potentially explosive areas.

Repairs to the sensors may only be performed by persons trained for such work or by the manufacturer.

Defective devices must be replaced immediately.

Cyclical maintenance of the sensors is not necessary.

Depending on the environmental conditions, it may occasionally be necessary to clean the light-emission surfaces of the sensors.

This cleaning must only be performed by persons trained for performing this task.

#### Chemical resistance

The 92 Ex series sensors demonstrate good resistance against many diluted acids and bases.

Exposure to organic solvents is possible only under certain circumstances and only for short periods of time.

Resistance to chemicals should be examined on a case by case basis.