

**FRK 92 Ex i Diffuse reflection light scanner with background suppression**

Part No. 501 11476

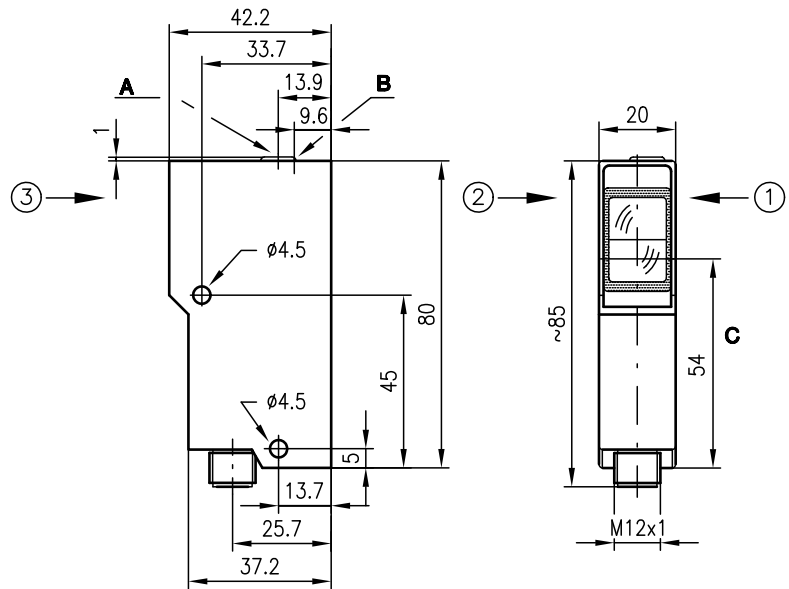


**0.03 ... 0.3m**



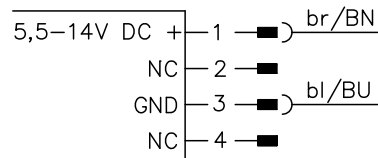
- Compact construction with robust diecast zinc housing and glass optics for protection against environmental influences
- Switching output acc. to IEC 60947-5-6 (NAMUR)
- EU type examination certificate DMT 03 ATEX E 029
- $\text{Ex}$  II 2G Ex ia IIC T6
- $\text{Ex}$  II 2D Ex iaD 21 T80°C

**Dimensioned drawing**



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

**Electrical connection**



**Accessories:**

(available separately)

- Mounting systems (BT 92, UMS 1)
- Blue connection cable for intrinsically safe circuits:  
 KB-092-5000-4 ... Ex 500 37784  
 KB-092-5000-4A ... Ex 500 37783
- Isolated switching amplifier (VS 403...)

We reserve the right to make changes • 92\_ex\_d01.gb.fm

## Specifications

### Optical data

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

### Timing

|                       |         |
|-----------------------|---------|
| Switching frequency   | 60Hz    |
| Response time         | 8.5ms   |
| Delay before start-up | ≤ 100ms |

### Electrical data

|                                   |   |
|-----------------------------------|---|
| Nominal voltage                   | 8.2VDC  |
| Operating voltage U <sub>B</sub>  | 5.5 ... 14VDC (incl. residual ripple)                       |
| Residual ripple                   | max. 0.35V <sub>SS</sub>                                    |
| Bias current (without reflection) | ≤ 1 mA  |
| Switching output                  | NAMUR (IEC 60947-5-6)                                       |
| Function characteristics          | light switching (light/dark setting on switching amplifier) |

### Indicators

|            |            |
|------------|------------|
| LED yellow | reflection |
|------------|------------|



### Mechanical data

|                 |   |
|-----------------|---|
| Housing         | diecast zinc                                |
| Surface         | antistatic epoxy coating (acc. to EN 50014) |
| Optics          | glass                                       |
| Weight          | 140g  |
| Connection type | M12 connector                               |

### Environmental data

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| Ambient temp. (operation/storage) | -20°C ... +50°C / -30°C ... +70°C |
| VDE safety class <sup>1)</sup>    | II                                |
| Protective circuit <sup>2)</sup>  | 2                                 |
| Protection class                  | IP 67                             |
| LED class                         | 1 (acc. to EN 60825-1)            |
| Standards applied                 | IEC 60947-5-2                     |

### Explosion protection

|                                     |  |   |
|-------------------------------------|--|---|
| Certification                       |  II 2G Ex ia IIC T6 |  II 2D Ex ia D21 T80°C |
| Maximum safe voltage                | U <sub>max</sub> 13V   |   |
| Maximum safe current                | I <sub>max</sub> 40mA  |   |
| Internal capacitance C <sub>i</sub> | ≤ 70nF   |   |
| Internal inductance L <sub>i</sub>  | ≤ 200µH  |   |

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

## Tables

## Diagrams

## Order guide

| Designation       | Part No.  |
|-------------------|-----------|
| FRK 92/3-300 L Ex | 500 80724 |

## Remarks

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

## FRK 92 Ex i      Diffuse reflection light scanner with background suppression

### 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 light scanner) were designed for use in potentially explosive areas of Zones 1 and 21 (device group II, device category 2) in compliance with standards EN 60079 and EN 61241.

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.



#### Notes!

- 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 connection cable KB-092-5000-4 Ex (angular connector, part no. 500 37784) or KB-092-5000-4A Ex (axial connector, part no. 500 37783) 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.

the **sensor** people**EG-Konformitätserklärung**

*-EC Declaration of Conformity  
-Déclaration CE de conformité  
-Declaración de conformidad CE*

Name des Herstellers:

*-Name of the manufacturer:  
-Le constructeur:  
-Nombre del fabricante:*

**Leuze electronic GmbH+Co. KG**

Anschrift:

*-Address:  
-domicilé:  
-Dirección:*

**In der Braike 1 D-73277 Owen/ Teck**

Erklärt unter alleiniger Verantwortung, dass das Produkt mit der Bezeichnung:

*-declares under sole responsibility that the products with the designation:  
-assumant sa pleine et entière responsabilité déclare que les produits avec la Référence:  
-declara bajo su propia responsabilidad, que los productos con el Número de pedido:*

**FRK 92/3-300 L Ex  
LS 92/3 Se-L Ex  
LS 92/3 E-L Ex  
PRK 92/3 L Ex**

**50080724  
50080722  
50080721  
50080723**

Kennzeichnung Gas:

*-Marking for gas:  
-Certification gaz:  
-Certificación gas:*

 **II 2G Ex iA IIC T6**

Kennzeichnung Staub:

*-Marking for dust:  
-Certification poussière:  
-Certificación polvo:*

 **II 2D Ex iAD 21 T80°C**

Folgenden Richtlinien und Normen für die Gerätegruppe II, Gerätekategorie 2 entsprechen und bei bestimmungsgemäßer Verwendung und Beachtung der Betriebsanleitung die grundlegenden Sicherheits- und Gesundheitsanforderungen erfüllen.

*-conform to the following directives and standards for equipment group II, equipment category 3. They fulfill the basic health and safety requirements if used as intended and in accordance with the operating manual.  
-sont conformes aux directives et normes ci-dessous pour les appareils du groupe II, catégorie 3 et que sous réserve d'utilisation conforme et du respect des consignes du manuel d'utilisation ceux-ci répondent aux exigences fondamentales pour la sécurité et la santé.  
-corresponden a las directivas y normas para grupo de aparatos II categoría de aparatos 3 y que cumplen los requerimientos de seguridad y de salud al ser empleados debidamente teniendo en cuenta las instrucciones de uso.*

Richtlinie 94/9/EG / Richtlinie 89/336/EWG

*-Directive 94/9/EC / Directive 89/336/EEC  
-Directive 94/9/CE / Directive 89/336/CEE  
-Directiva 94/9/CE / Directiva 89/336/CEE*

**EN 60079-0:2006****EN 60079-11:2007****EN 61241-0:2006****EN 61241-11:2006**

Owen, den 4. März 2009

  
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Geschäftsführer Dr. Harald Grübel (Vorsitzender), Karsten Just  
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