

Translation

EU-Type Examination Certificate Supplement 6

Equipment intended for use in potentially explosive atmospheres
Directive 2014/34/EU

EU-Type Examination Certificate Number: **BVS 10 ATEX E 130 X**

Product: **Optoelectronic sensor without optical output, optoelectronic sensor with optical output, accessory Ex-fiber optic cables and accessory glass prism (clause 15)**

Manufacturer: **Matrix Elektronik AG**

Address: **Kirchweg 24, 5420 Ehrendingen, Switzerland**

This supplementary certificate extends EU-Type Examination Certificate No. BVS 10 ATEX E 130 X to apply to products designed and constructed in accordance with the specification set out in the appendix of the said certificate but having any acceptable variations specified in the appendix to this certificate and the documents referred to therein.

DEKRA Testing and Certification GmbH, Notified Body number 0158, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential Report No. BVS PP 10.2233 EU.

The Essential Health and Safety Requirements are assured in consideration of:

EN IEC 60079-0:2018
EN 60079-1:2014
EN 60079-28:2015
EN 60079-31:2014

General requirements
Flameproof enclosure "d"
Optical radiation "op is/pr/sh"
Protection by Enclosure "t"

If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Special Conditions for Use specified in the appendix to this certificate.

This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

The marking of the product shall include the following:



See clause 15.4

DEKRA Testing and Certification GmbH
Bochum, 2022-05-10

Signed: Jörg-Timm Kilisch

Managing Director

13 **Appendix**

14 **EU-Type Examination Certificate**

**BVS 10 ATEX E 130 X
Supplement 6**

15 **Product description**

15.1 **Subject and type**

Optoelectronic sensor without optical output type

- **D-***_***-NO-****
- **F-***_***-NO-****
- **G-***_***-NO-****
- **H-***_***-NO-****

Sensors without optical output are only used to receive and analyse light.

Optoelectronic sensor with optical output type

- **D-***_***-OP-****
- **D-***_***-TF-****
- **D-***_***-ZA-****
- **D-***_***-OF-****

- **F-***_***-OP-****
- **F-***_***-TF-****
- **F-***_***-ZA-****
- **F-***_***-OF-****

- **G-***_***-OP-****
- **G-***_***-TF-****
- **G-***_***-ZA-****
- **G-***_***-OF-****

- **H-***_***-OP-****
- **H-***_***-TF-****
- **H-***_***-ZA-****
- **H-***_***-OF-****

- **O-***_***-OP-****
- **O-***_***-TF-****
- **O-***_***-ZA-****
- **O-***_***-OF-****

Accessories Ex fibre optics types (without influence on explosion protection)

- V**_****_**_*_*_*-OP1/OP2-****,
- M**_****_**_*_*_*-OP1/OP2-****,
- S**_****_**_*_*_*-OP1/OP2-****,
- QW*_****_**_*_*_*-OP1/OP2-****

and

Accessory glass prism (without influence on explosion protection)

- GS-*_*_*_*_*_*_*-OP1/OP2-****,
- KM-*_*_*_*_*_*_*-OP1/OP2-****

The asterisks will be replaced by other code numbers, which indicate the models and the corresponding values. The models and the corresponding values are specified in section parameters. These modifications are not relevant for the explosion protection.

15.2 Description

The optoelectronic sensor has already been treated as a housing for the optoelectronic sensors type (see 15.1) / Subject and type) in the EU-Type Examination certificate DMT 99 ATEX E056 with the suffixes N1 to N5 and BVS 10 ATEX E 130 X N1 to N4.

The Ex-optical fibers are used for optical measurements in potentially explosive atmospheres. They may only be operated with explosionproof optoelectronic sensors. The probes (transmitter and receiver units) can be arranged in Zones 0, 20 and the adapter part (connection to sensor) can also be arranged in Zones 1, 2 and 21, 22.

The two variants LDG-***-**-**** (121 mm) and LDH-***-**-**** (121 mm) can be additionally equipped with a window heater.

Reason for this supplement:

Use of a window heater for LDG-***-**-**** (121 mm) and LDH-***-**-**** (121 mm) variants

15.3 Parameters

15.3.1 Electrical parameters

15.3.1.1 Rated voltage, optoelectronic sensor without optical output

Type	Enclosure	Rated voltage
D-*-**-NO-****	M18, M30, M42	AC/DC 230 V
F-*-**-NO-****	M18, M30, M42	AC/DC 230 V
G-*-**-NO-****	M18, M30, M42	AC/DC 230 V
H-*-**-NO-****	M18, M30, M42	AC/DC 230 V

15.3.1.2 Rated voltage, optoelectronic sensor with optical output

Type	Enclosure	Rated voltage
--**-OP-****	M18, M30, M42	DC 24 V \pm 4 V
--**-TF-****	M18, M30, M42	AC/DC 230 V
--**-ZA-****	M18, M30, M42	DC 24 V \pm 4 V
--**-OF-****	M18, M30, M42	AC/DC 230 V
LDG-***-**-OF-****	M42	DC 24 V \pm 10 %
LDH-***-**-TF-****	M42	DC 24 V \pm 10 %

15.3.1.3 Maximum voltage U_m , optoelectronic sensor with optical output

Type	Enclosure	Maximum voltage
--**-OP-****	M18, M30, M42	DC 30 V
--**-TF-****	M18, M30, M42	AC/DC 230 V
--**-ZA-****	M18, M30, M42	DC 30 V
--**-OF-****	M18, M30, M42	AC/DC 230 V
LDG-***-**-OF-****	M42	DC 30 V
LDH-***-**-TF-****	M42	DC 30 V

15.3.1.4 Current of operating circuit

up to 10 A

15.3.1.5 Power P_{max} for model M30 (sleeve diameter 30 mm)

Max. ambient temp.	Sleeve length	Enclosure surface	P_{max}	Gas	Dust
50 °C	200 mm	threaded	up to	3.64 W	3.27 W
50 °C	200 mm	unthreaded	up to	2.9 W	2.63 W
60 °C	200 mm	threaded	up to	2.67 W	2.4 W
60 °C	200 mm	unthreaded	up to	2.2 W	1.97 W
50 °C	80 mm	threaded	up to	1.87 W	1.68 W
50 °C	80 mm	unthreaded	up to	1.2 W	1.05 W
60 °C	80 mm	threaded	up to	0.89 W	0.8 W
60 °C	80 mm	unthreaded	up to	0.8 W	0.4 W

Installation length of enclosure 80 to 200 mm

For sleeve lengths between 80 and 200 mm intermediate values can be interpolated for the maximum permitted power.

15.3.1.6 Power P_{max} for model M18 (sleeve diameter 18 mm)

Max. ambient temp.	Sleeve length	Enclosure surface	P_{max}	Gas	Dust
50 °C	200 mm	threaded	up to	2.90 W	2.57 W
60 °C	200 mm	threaded	up to	2.65 W	2.35 W
50 °C	50 mm	threaded	up to	1.11 W	0.99 W
60 °C	50 mm	threaded	up to	0.43 W	0.38 W

Installation length of enclosure 50 to 200 mm

For sleeve lengths between 50 and 200 mm intermediate values can be interpolated for the maximum permitted power.

15.3.1.7 Power P_{max} for model M42 (sleeve diameter 42 mm)

Max. ambient temp.	Sleeve length	Enclosure surface	P_{max}	Gas	Dust
50 °C	140 mm	threaded	up to	3.64 W	3.27 W
50 °C	140 mm	unthreaded	up to	2.9 W	2.63 W
60 °C	140 mm	threaded	up to	2.67 W	2.4 W
60 °C	140 mm	unthreaded	up to	2.2 W	1.97 W
50 °C	57 mm	threaded	up to	1.87 W	1.68 W
50 °C	57 mm	unthreaded	up to	1.2 W	1.05 W
60 °C	57 mm	threaded	up to	0.89 W	0.8 W
60 °C	57 mm	unthreaded	up to	0.8 W	0.4 W

Installation length of enclosure 57 to 140 mm

For sleeve lengths between 57 and 140 mm intermediate values can be interpolated for the maximum permitted power.

15.3.2 Thermal parameters

15.3.2.1 Temperature class of enclosure (gas) at max. ambient temperature

Variant

D-*-***-OP-****	T6
D-*-***-TF-****	
D-*-***-ZA-****	
D-*-***-OF-****	
D-*-***-NO-****	

Variant

F-*-***-OP-****	T4
F-*-***-TF-****	
F-*-***-ZA-****	
F-*-***-OF-****	
F-*-***-NO-****	

Variant

G-*-***-OP-****	T4
G-*-***-TF-****	
G-*-***-ZA-****	
G-*-***-OF-****	
G-*-***-NO-****	

Variant

H-*-***-OP-****
 H-*-***-TF-****
 H-*-***-ZA-****
 H-*-***-OF-****
 H-*-***-NO-****

T3

Variant

O-*-***-OP-****
 O-*-***-TF-****
 O-*-***-ZA-****
 O-*-***-OF-****

T4

15.3.2.2 Maximum surface temperature T of enclosure (dust) at max. ambient temperature

Variant

D-*-***-OP-****
 D-*-***-TF-****
 D-*-***-ZA-****
 D-*-***-OF-****
 D-*-***-NO-****

T100 °C

T90 °C

Variant

F-*-***-OP-****
 F-*-***-TF-****
 F-*-***-ZA-****
 F-*-***-OF-****
 F-*-***-NO-****

T100 °C

Variant

G-*-***-OP-****
 G-*-***-TF-****
 G-*-***-ZA-****
 G-*-***-OF-****
 G-*-***-NO-****

T135 °C

Variant

O-*-***-OP-****
 O-*-***-TF-****
 O-*-***-ZA-****
 O-*-***-OF-****

T135 °C

15.3.2.3 Ambient temperature range

-20 °C to +50 °C
 or

Sensors type LDG-***-***-OF-**** and LDH-***-***-TF-****

-20 °C to +60 °C
 -10 °C to +35 °C

15.3.2.4 Ambient temperature range for Ex-fiber optics and glass prism

0 °C to +120 °C
 or
 -20 °C to +120 °C

15.3.3 Degrees of Protection according to EN 60529

IP67

15.3.4 Maximum permanent radiation power of sensors and permitted optical input power of accessories and optical fibers.

Type	Optical Power [mW]	Optical irradiance [mW/mm ²]
D-*-***-**_****	≤ 15	≤ 5
F-*-***-**_****	≤ 35	≤ 5
G-*-***-**_****	≤ 35	≤ 5
H-*-***-**_****	≤ 150	≤ 20
O-*-***-**_****	≤ 35	≤ 5

This table does not apply to the variants ***-***-***-***-NO-**** (without optical outputs).

15.4 Marking

Optoelectronic sensor without optical output:

Type **D-*-***-NO-******

⊕ Ex II 2G Ex db IIC T6 Gb
II 2D Ex tb IIIC T90°C Db

Type **F-*-***-NO-******

⊕ Ex II 2G Ex db IIC T4 Gb
II 2D Ex tb IIIC T100°C Db

Type **G-*-***-NO-******

⊕ Ex II 2G Ex db IIC T4 Gb
II 2D Ex tb IIIC T135°C Db

Type **H-*-***-NO-******

⊕ Ex II 2G Ex db IIA T3 Gb

Optoelectronic sensor with optical output:

Type **D-*-***-**_****** (all variants except the variant **D-***-***-***-NO-****)

⊕ Ex II 2(1) G Ex db [op is Ga] IIC T6 Gb
II 2(1) D Ex tb [op is Da] IIIC T100°C Db

Type **F-*-***-**_****** (all variants except the variant **F-***-***-***-NO-****)

⊕ Ex II 2(1) G Ex db [op is Ga] IIC T4 Gb
II 2(1) D Ex tb [op is Da] IIIC T100°C Db

Type **G-*-***-**_****** (all variants except the variant **G-***-***-***-NO-****)

⊕ Ex II 2(1) G Ex db [op is Ga] IIC T4 Gb
II 2(1) D Ex tb [op is Da] IIIC T135°C Db

Type LDG-*-***-OF-******

⊕ Ex II 2(1) G Ex db [op is Ga] IIA T4 Gb
II 2(1) D Ex tb [op is Da] IIIC T135°C Db

Type **H-*-***-**_**** and type LDH-***-***-TF-******

(variants except the variant **H-***-***-***-NO-****)

⊕ Ex II 2(1) G Ex db [op is Ga] IIA T3 Gb

Type **O-*-***-**_******

⊕ Ex II (1)G [Ex op is IIC T4 Ga]
II (1)D [Ex op is IIIC T135°C Da]

Accessory Ex-fibre optic cables:

Type V_****-**_**-OP1/OP2-****,**

Type M_****-**_**-OP1/OP2-****,**

Type S_****-**_**-OP1-****,**

Type QW*_**-**_**-OP1/OP2-******

and

Accessory glass prism:

Type GS-**-***-**-OP1/OP2-****,

Type KM-**-***-**-OP1/OP2-****

- ⊕ II 1G Ex op is IIB/IIC T4 Ga
- ⊕ II 1D Ex op is IIIB/IIIC T135°C Da

Accessory Ex-fibre optic cables:

Type S**-****-**-OP2-****

- ⊕ II 2G Ex op is IIB T4 Gb
- ⊕ II 2D Ex op is IIIB/IIIC T135°C Db

16 Report Number

BVS PP 10.2233 EU, as of 2022-05-10

17 Special Conditions for Use

17.1 In potentially explosive atmospheres, the accessories Ex-fibre optics cable of types

V**-****-**-OP1/OP2-****,

M**-****-**-OP1/OP2-****,

S**-****-**-OP1/OP2-****,

QW**-****-**-OP1/OP2-****

and glass prism of types

GS-**-****-**-OP1/OP2-****,

KM-**-****-**-OP1/OP2-****

may only be used in hazardous areas in combination with the optoelectronic sensors listed under 15.1). Here, the parameters under 15.3) are to be observed.

17.2 The widths and gaps of the flameproof joints of this apparatus are not identical with the respective minimum or maximum values required by Table 2 and 3 of EN 60079-1:2014. Information on the dimensions are to be obtained from the manufacturer. Access to the enclosure is prevented by adhesion. Repair works of the enclosure and thus of the parts forming the flameproof joint can only be carried out by the manufacturer. The instructions contain relevant hints.

17.3 The maximum permissible ambient temperature range is -20 °C resp. -10 °C to +35°C /+50 °C // +60 °C.
This can be reduced by selecting additional components.

18 Essential Health and Safety Requirements

The Essential Health and Safety Requirements are covered by the standards listed under item 9.

19 Drawings and Documents

Drawings and documents are listed in the confidential report.

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

DEKRA Testing and Certification GmbH
Bochum, 2022-05-10
BVS-AIh/Mu A 20210946



Managing Director