



# 1. EU-TYPE EXAMINATION CERTIFICATE

2. Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 2014/34/EU

3. EU-Type Examination Certificate No: FM12ATEX0094X

4. Equipment or protective system:  
(Type Reference and Name) MIAD9ab, MI9Eb, Q45AD9ab, Q459Eb, SMI30a, T30AD9FF150, T30AD9FF150Q Photoelectric Sensors.

5. Name of Applicant: Banner Engineering Corp

6. Address of Applicant 9714 Tenth Ave N,  
Minneapolis, Minnesota 55441, USA

7. This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and documents therein referred to.

8. FM Approvals Europe Ltd, notified body number 2809 in accordance with Article 17 of Directive 2014/34/EU of 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number:

3046293 dated 21<sup>st</sup> August 2014

9. Compliance with the Essential Health and Safety Requirements, with the exception of those identified in item 15 of the schedule to this certificate, has been assessed by compliance with the following documents:

EN IEC 60079-0:2018, EN 60079-11:2012

10. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

11. This EU-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

12. The marking of the equipment or protective system shall include:



Epsilon X accompanied by additional marking defined in the Annex.

Certificate issued by:

Digitally signed  
by Richard  
Zammit  
Location:  
Ireland  
Foxit PDF Editor  
Version: 13.0.1

Certification Manager, FM Approvals Europe Ltd.

Date 31 January 2024

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)

BANNER P/N  
1332 REV. R



## SCHEDULE

EU-Type Examination Certificate No. FM12ATEX0094X



### 13. Description of Equipment or Protective System:

See Annex.

### 14. Specific Conditions of Use:

Potential Electrostatic Charging Hazard – To prevent the risk of electrostatic sparking the non-metallic surfaces should only be cleaned with a damp cloth.

### 15. Essential Health and Safety Requirements:

The relevant EHSRs that have not been addressed by the standards listed in this certificate have been identified and assessed in the confidential report identified in item 8.

### 16. Test and Assessment Procedure and Conditions:

This EU-Type Examination Certificate is the result of testing of a sample of the product submitted, in accordance with the provisions of the relevant specific standard(s), and assessment of supporting documentation. It does not imply an assessment of the whole production.

Whilst this certificate may be used in support of a manufacturer's claim for CE Marking, FM Approvals Europe Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

This Certificate has been issued in accordance with FM Approvals Europe Ltd's ATEX Certification Scheme.

### 17. Schedule Drawings

A list of the significant parts of the technical documentation is annexed to this certificate and a copy has been kept by the Notified Body.

### 18. Certificate History

Details of the supplements to this certificate are described below:

Date	Description
22 August 2014	Original Issue.
22 May 2015 to 27 September 2022	<u>Supplement 1 to 17:</u> See certificate dated 27 <sup>th</sup> September 2022 for details.
28 March 2023	<u>Supplement 18:</u> Report Reference: RR236156 dated 17 <sup>th</sup> March 2023. Description of the Change(s): Minor document changes.
28 July 2023	<u>Supplement 19:</u> Report Reference: RR237220 dated 25 July 2023. Description of the Change(s): Changes to drawings related to FM 7745 approval, corrections were made to product listings/descriptions.

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin, Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

**SCHEDULE**

EU-Type Examination Certificate No. FM12ATEX0094X



Member of the FM Global Group

Date	Description
31 January 2024	<u>Supplement 20:</u> Report Reference: RR239231 dated 26 January 2024. Description of the Changes: Minor drawing changes to three (3) drawings. Changes are related to construction notes and other minor editorial changes.

FM Approvals

FM Approvals

FM Approvals

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin, Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

## SCHEDULE

EU-Type Examination Certificate No. FM12ATEX0094X



# ANNEX

## MI9Eb Photoelectric Sensor

### Markings:



II 1 G Ex ia IIC T5 Ga Ta =-40°C to 70°C

### Description of Equipment:

The MI9E Series Photoelectric sensors either emit or receive a light signal depending on the sensor type (emitter, receiver or combined emitter/receiver unit). The sensors consist of one circuit board, fully encapsulated in a molded plastic case equipped with either a connector or a cable. The case measures approximately 2.25 in. (57mm) x 1.25 in. (32mm) x 0.5 in. (12.5mm). The sensors use a cable/connector assembly which threads onto the sensor connector or are provided with an attached cable. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max}$  = 15 V dc,  $I_{Max}$  = 60 mA,  $P_i$  = 225 mW,  $C_i$  = 0.3  $\mu$ F,  $L_i$  = 0 mH.

All other protection techniques, the electronic connection has the following values:

$5 \leq U \leq 15$  V dc;  $I = 60$  mA

### Model Code Options:

b = Connection method Q or blank.

## MIAD9ab Photoelectric Sensor

### Markings:



II 1 G Ex ia IIC T5 Ga Ta =-40°C to 70°C

### Description of Equipment:

The MIAD9 Series Photoelectric sensors either emit or receive a light signal depending on the sensor type (emitter, receiver or combined emitter/receiver unit). The sensors consist of one circuit board, fully encapsulated in a molded plastic case equipped with either a connector or a cable. The case measures approximately 2.25 in. (57mm) x 1.25 in. (32mm) x 0.5 in. (12.5mm). The sensors use a cable/connector assembly which threads onto the sensor connector or are provided with an attached cable. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max}$  = 15 V dc,  $I_{Max}$  = 60 mA,  $P_i$  = 225 mW,  $C_i$  = 0.3  $\mu$ F,  $L_i$  = 0 mH.

All other protection techniques, the electronic connection has the following values:

$5 \leq U \leq 15$  V dc;  $I = 60$  mA

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

## SCHEDULE

EU-Type Examination Certificate No. FM12ATEX0094X



### Model Code Options:

a = Sensing mode D, W, F, LV, LVAG, CV, CV2 or R.  
b = Connection method Q or blank.

### Q459Eb Photoelectric Sensor

#### Markings:



II 1 G Ex ia IIC T5 Ga Ta = -40°C to 70°C

#### Description of Equipment:

The photoelectric sensors either emit and receive a light signal with the same unit. The sensors consist of one circuit board, fully encapsulated in a molded plastic case equipped with either a connector or a cable. The case measures approximately 2.5 in. (63.5mm) x 1.75 in. (44mm) x 1.75 in. (44mm). The sensors use a cable/connector assembly which threads onto the sensor connector or are provided with an attached cable. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max} = 15$  V dc,  $I_{Max} = 60$  mA,  $P_i = 225$  mW,  $C_i = 0.3$   $\mu$ F,  $L_i = 0$  mH.

### Model Code Options:

b = Connection method Q or blank.

### Q45AD9ab Photoelectric Sensor

#### Markings:



II 1 G Ex ia IIC T5 Ga Ta = -40°C to 70°C

#### Description of Equipment:

The Q45AD9ab Photoelectric sensors either emit and receive a light signal with the same unit. The sensors consist of one circuit board, fully encapsulated in a molded plastic case equipped with either a connector or a cable. The case measures approximately 2.5 in. (63.5mm) x 1.75 in. (44mm) x 1.75 in. (44mm). The sensors use a cable/connector assembly which threads onto the sensor connector or are provided with an attached cable. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max} = 15$  V dc,  $I_{Max} = 60$  mA,  $P_i = 225$  mW,  $C_i = 0.3$   $\mu$ F,  $L_i = 0$  mH.

All other protection technics, the electronic connection has the following values:

$5 \leq U \leq 15$  V dc;  $I = 60$  mA

### Model Code Options:

a = Sensing mode D, DL, F, FP, FV, LV, LP, CV, CV4 or R.

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)



## SCHEDULE

EU-Type Examination Certificate No. FM12ATEX0094X



b = Connection method Q or blank.

### SMI30a

#### Markings:



II 2 Ex ib IIC T5 Gb Ta = -40°C to 70°C

#### Description of Equipment:

The SMI30 Series Photoelectric sensors either emit or receive a light signal depending on the sensor type (emitter or receiver). The sensors consist of one or two circuit boards, fully encapsulated in a threaded plastic case (barrel) which is equipped with a connector. The case measures approximately 3.87 in. (100mm) long and 1.16 in. (30mm) diameter. The sensors use a cable/connector assembly which threads onto the sensor connector. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max} = 30 \text{ V}$ ,  $I_{Max} = 350 \text{ mA}$ ,  $P_i = 750 \text{ mW}$ ,  $C_i = 0$ ,  $L_i = 0$ .

All other protection techniques, the electronic connection has the following values:

$10 \leq U \leq 30 \text{ V dc}$ ;  $I = 25 \text{ mA}$

#### Model Code Options:

a = 6EQ, 6EBQ, 6ECQ, 6EYCQ, AN6RQ, AN6RBQ, AN6RCQ, RN6RQ, RN6RBQ, RN6RCQ, 6EYQ, N6RYQ, AN6RYCQ, RN6RYQ, RN6RYCQ.

### T30AD9FF150 Photoelectric Sensor

#### Markings:



II 1 G Ex ia IIC T6 Ga Ta = -40° to 70°C

#### Description of Equipment:

The T30 Series Photoelectric sensors either emit and receive a light signal with the same unit. The sensors consist of one circuit board, fully encapsulated in a molded plastic case equipped with either a connector or a cable. The case measures approximately 1.5 in. (38mm) diameter x 1.75 in. (44mm) long. The sensors use a cable/connector assembly which threads onto the sensor connector or are provided with an attached cable. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max} = 30 \text{ V}$ ,  $I_{Max} = 35 \text{ mA}$ ,  $C_i = 0$ ,  $L_i = 0$ .

All other protection techniques, the electronic connection has the following values:

$5 \leq U \leq 15 \text{ V dc}$ ;  $I = 35 \text{ mA}$

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmaprovals.com](mailto:atex@fmaprovals.com) [www.fmaprovals.com](http://www.fmaprovals.com)

## **SCHEDULE**

EU-Type Examination Certificate No. FM12ATEX0094X



### **T30AD9FF150Q Photoelectric Sensor**

#### **Markings:**



II 1 G Ex ia IIC T6 Ga Ta = -40° to 70°C

#### **Description of Equipment:**

The T30 Series Photoelectric sensors either emit and receive a light signal with the same unit. The sensors consist of one circuit board, fully encapsulated in a molded plastic case equipped with either a connector or a cable. The case measures approximately 1.5 in. (38mm) diameter x 1.75 in. (44mm) long. The sensors use a cable/connector assembly which threads onto the sensor connector or are provided with an attached cable. The operating temperature range is -40°C to +70°C.

Energy Limitation Parameters:

$V_{Max} = 30 \text{ V}$ ,  $I_{Max} = 35 \text{ mA}$ ,  $C_i = 0$ ,  $L_i = 0$ .

All other protection techniques, the electronic connection has the following values:

$5 \leq U \leq 15 \text{ V dc}$ ;  $I = 35 \text{ mA}$

**THIS CERTIFICATE MAY ONLY BE REPRODUCED IN ITS ENTIRETY AND WITHOUT CHANGE**

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin, Ireland. D02 E440  
T: +353 (0) 1761 4200 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# Blueprint Report

**Banner Engineering Corp (1000002544)**

Class No 3610

Original Project I.D. 3046293

Certificate I.D. FM12ATEX0094X

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>
00469	K	FINAL ASSEMBLY T30	RR220509
00531	I	Assembly Prep.; Q45	091019
00532	ZAI	Q45 First Assembly	RR239231
00533	S	Final Assembly; Q45	RR219377
00534	I	Lens Installation, Q45	RR229362
00535	H	Final Assembly; Q45 Packaging	RR200982
01961	J	PCB Artwork MOD Q45 NAMUR	RR227616
03396	N	CONTROL DRAWING SMI912	RR208420
05013	-	LED IR, Domed	RR208420
05056	C	Led Specification, Hermetic Banner P/N: 05056, Infrared LED	RR200982
130848	J	LABEL MINI	RR229362
147291	J	LABEL Q45	RR229362
165384	G	LABEL PROGRAM 3.20IN; SMI30	RR234253
171113	B	TURCK cliche SO6m-Mi-Y1 (PLA 3054373)	3054373
171114	B	TURCK cliche SO6m-Mi-Y1-H1141 (PLA 3054373)	3054373
171115	B	TURCK cliche KOS2-Mi-Y1 (PLA 3054373)	3054373
171116	B	TURCK cliche KOS4-Mi-Y1 (PLA 3054373)	3054373
171117	B	TURCK cliche KOS4-Mi-Y1-H1141 (PLA 3054373)	3054373
171142	B	TURCK cliche NO30-Mi-Y1 (PLA 3054373)	3054373
171143	B	TURCK cliche NO30-Mi-Y1-H1141 (PLA 3054373)	3054373
171144	B	TURCK cliche FOS-Mi-Y1 (PLA 3054373)	3054373
171145	B	TURCK cliche FOS-Mi-Y1-H1141 (PLA 3054373)	3054373
171146	B	TURCK cliche ROS5m-Mi-Y1 (PLA 3054373)	3054373
171147	B	TURCK cliche ROP2m-Mi-Y1 (PLA 3054373)	3054373
171148	B	TURCK cliche ROP2m-Mi-Y1-H1141 (PLA 3054373)	3054373
171149	B	TURCK cliche ROS5m-Mi-Y1-H1141 (PLA 3054373)	3054373
171150	B	TURCK cliche EO6M-Mi-Y1 (PLA 3054373)	3054373
171151	B	TURCK cliche EO6M-Mi-Y1-H1141 (PLA 3054373)	3054373
171152	B	TURCK cliche NO10-Mi-Y1 (PLA 3054373)	3054373
171153	B	TURCK NO10-Mi-Y1-H1141 (PLA 3054373)	3054373
171154	F	Cliche TURCK Mi-Y1 Agency Kent 250x100 Turck label (PLA 3054373)	RR223900
215394	A	CA_37683_TABLE_B64C13D19E5_METRIC	RR223900
216016	H	DWG HOUSING SM30 SENSOR	RR229362
232171	B	PROC ASSY SMI30AN6XXX & SMI30RN6XXX	RR239231
232473	B	PROC ASSY SMI306EXXX	RR239231
30694	D	LED Specification, Banner P/N 30694, Type red	RR200982
34827	A1	Schematics, Receiver Output Board	3Y9A5.AX
34839	A1	PCB ASSY SMI30R L/O OUTPUT	3Y9A5.AX
34843	A1	PCB ASSY SMI30R DC D/O OUTPUT	3Y9A5.AX
35262	A1	PCB ASSY SMI30E	3046293
35263	A1	PCB ASSY SM130E	3Y9A5.AX
35264	A1	PCB ASSY SM130E	3Y9A5.AX
35265	A1	PCB ASSY SM130E	3Y9A5.AX
35266	A1	PCB ASSEMBLY SMI30E (C FREQ) lms (B1845)	3046293
35267	A1	Schematics, Emitter	3Y9A5.AX
35285_BOM	A	BOM, Receiver Amp Board (A Freq, 10ms)	RR214593
35285	A	PCB Assembly: SM130R (A Freq) AMP 10MS	100709
35286	01	Schematics, Receiver Amp Board	3Y9A5.AX
35302_BOM	A	BOM, Receiver Amp Board (B Freq, 10ms)	RR214593
35302	A	PCB Assembly: SM130R (B Freq) AMP 10MS	100709
35303_BOM	A	BOM, Receiver Amp Board (C Freq, 10ms)	RR214593
35303	A	PCB Assembly: SM130R (C Freq) AMP 10MS	100709
35304_BOM	A	BOM, Receiver Amp Board (A Freq, 1ms)	RR214593



35304	A	PCB Assembly; SM130R (A Freq) AMP 1MS	100709
35305_BOM	A	BOM, Receiver Amp Board (C Freq, 10ms)	RR214593
35305	A	PCB Assembly; SM130R (C Freq) AMP 1MS	100709
35331	K	CONTROL DRAWING SMI30	RR236156
35740	E	PCB Artwork, Noise Shield Q45	RR227616
37623 (2shts)	-	Bill of Materials, Q45AD9DCV NAMUR	RR216213
37657	I	PCB Assembly; Q45 NAMUR D/DL/F (B1961)	RR234253
37660	I	PCB Assembly; Q45 NAMUR LV (B1961)	RR214593
37662	I	PCB Assembly; Q45 NAMUR FP (B1961)	RR214593
37663	I	PCB Assembly; Q45 NAMUR CV/LP (B1961)	RR214593
37664	G	Schematic Diagram, Q45 NAMUR Circuit	RR234253
37665	J	PCB Assembly Q45 NAMUR (B1961)	RR214593
37667	K	PCB Assembly; Q45 NAMUR E (B1961)	RR234253
37683	A	Cable, 2 Conductor 20 AWG, Blue Jacket	04/15/11
38343	N	CONTROL DRAWING Q45	RR237220
39616	N	CONTROL DRAWING T30 MINI BEAM MIAD9	RR229362
40156	G	PCB Assembly Namur Emitter (01960)	RR234253
40157	F	PCB Assembly Namur Receiver (01948)	RR214593
40158	E	Schematic Diagram Namur Circuit RCVR	RR214593
40195	E	Schematic Diagram namur Circuit Emitter	RR234253
40247	F	PCB Assembly Namur DC W (02220)	RR234253
40248	F	PCB Assembly; NAMUR DC LV/CV/CV2 (02220)	RR214593
40789	F	PCB Assembly, Namur DC D/F (02220)	RR234253
40790	D	Schematic Diagram, NAMUR DC Agency Requirements	RR234253
41034	B	PCB ASSEMBLY NAMUR T300AD9FF150 (B1989)	RR214593
41035	B	SCHEMATIC DIAGRAM T30AD9FF150	RR214593
41246	J	CLICHE T30AD9FF150	RR229362
41247	J	CLICHE T30AD9FF150Q	RR229362
41685	H	CONTROL DRAWING T30	RR229362
58272	F	PCB Assembly, Q45 NAMUR FV (B1961)	RR214593
D101972	C	Control Drawing, Mi-Y1(PLA) Banner #168177	RR223900