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, Plymouth, Minnesota 55441, United States of America

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 21st 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.

Certificate issued by:

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* * * * * * *
* * * * * * * *

Certification Manager, FM Approvals Europe Ltd.

Date * * * * * * * * * * * * * * * *

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

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

Epsilon X accompanied by additional marking defined in the Annex.

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	Supplement 1 to 17: See certificate dated 27th September 2022 for details.
28 March 2023	Supplement 18: Report Reference: RR236156 dated 17th March 2023. Description of the Change(s): Minor document changes.

Date	Description
28 July 2023	Supplement 19: Report Reference: RR237220 dated 25th July 2023. Description of the Change(s): Changes to drawings related to FM 7745 approval, corrections were made to product listings/descriptions.
31 January 2024	Supplement 20: Report Reference: RR239231 dated 26th January 2024. Description of the Change(s):Minor drawing changes to three (3) drawings. Changes are related to construction notes and other minor editorial changes.
* * * * * * * * * *	Supplement 21: Report Reference: RR243003 dated * * * * * * * * * * * * * * * * * * Description of the Change(s): Minor documentation change.

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 µF, L_i= 0 mH.

All other protection techniques, the electronic connection has the following values:
5 < U < 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 µF, L_i= 0 mH.

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

5 ≤ U ≤ 15 V dc; I – 60 mA

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 μF, 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 μF, L_i= 0 mH.

All other protection technics, the electronic connection has the following values:
5 ≤ U ≤ 15 V dc; I – 60 mA

Model Code Options:
a – Sensing mode D, DL, F, FP, FV, LV, LP, CV, CV4 or R.
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 V, I_{Max}= 350 mA, P_i= 750 mW, C_i= 0, L_i= 0.

All other protection technics, the electronic connection has the following values:
10 ≤ U ≤ 30 V dc; I = 25 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 V, I_{Max}= 35 mA, C_i= 0, L_i= 0.

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

5 ≤ U ≤ 15 V dc; I = 35 mA

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

All other protection techniques, the electronic connection has the following values:
5 ≤ U ≤ 15 V dc; I = 35 mA

Blueprint Report

Banner Engineering Corp (1000002544)

Class No 3610

Original Project I.D. *3046293*

Certificate I.D. *FM12.1TEX0094X*

Drawing No.	Revision Level	Drawing Title	Last Report
30469	K	FINAL ASSEMBLY T30	RR220509
30531	I	Assembly Proc., Q45	091019
30532	ZAJ	Q45 Final Assembly	RR243003
30533	S	Final Assembly, Q45	RR218277
30534	I	Lens Installation, Q45	RR225362
30535	I	Final Assembly, Q45 Packaging	RR200682
31061	C	PCB Artwork MOD Q45 NAMUR	RR227616
33396	N	CONTROL DRAWING SM912	RR206420
35015	-	LED IR, Domed	RR206420
35056	C	Led Specification, [illegible] Banner P/N: 35056, Infrared LED	RR200682
130849	C	LABEL MINI	RR229362
147281	L	LABEL Q45	RR226262
165384	G	LABEL PROGRAM 3,20IN, SM30	RR234250
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 NC30-MI-Y1 (PLA 3054373)	3054373
171143	B	TURCK cliche NC30-MI-Y1-H1141 (PLA 3054373)	3054373
171144	B	TURCK cliche FCS-MI-Y1 (PLA 3054373)	3054373
171145	B	TURCK cliche FCS-MI-Y1-H1141 (PLA 3054373)	3054373
171146	B	TURCK cliche RCS6m-MI-Y1 (PLA 3054373)	3054373
171147	B	TURCK cliche RCP2m-MI-Y1 (PLA 3054373)	3054373
171148	B	TURCK cliche RCP2m-MI-Y1-H1141 (PLA 3054373)	3054373
171149	B	TURCK cliche RCS6m-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 NC10-MI-Y1 (PLA 3054373)	3054373
171153	B	TURCK NC10-MI-Y1-H1141 (PLA 3054373)	3054373
171154	-	Cliche TURCK MI-Y1 Agency Kent 29x100 Turck label (PLA 3054373)	RR223500
213384	A	CA_37683_TABLE_B6013D12E5_METRIC	RR223500
216015	H	DWG HOUSING SM53 SENSOR	RR225362
232171	G	PROC ASSY SM30AN6XXX & SM30RN6XXX	RR235231
232479	B	PROC ASSY SM30FXXX	RR236231
30684	J	LED Specification, Banner P/N 30684, Type red	RR200682
34827	A1	Schematics, Receiver Output Board	3Y8A5AX
34839	A1	PCB ASSY SM30R I/O OUTPUT	3Y8A5AX
34843	A1	PCB ASSY SM30R DC I/O OUTPUT	3Y8A5AX
35262	A1	PCB ASSY SM30E	3046293
35263	A1	PCB ASSY SM130E	3Y8A5AX
35264	A1	PCB ASSY SM100F	3Y8A5AX
35265	A1	PCB ASSY SM100F	3Y8A5AX
35266	A1	PCB ASSEMBLY SM30E (C FREQ) 1ms (B1845)	3046293
35267	A1	Schematics, Emitter	3Y8A5AX
35265_BOM	A	BOM, Receiver Amp Board (A Freq, 10ms)	RR214593
35265	A	PCB Assembly SM130R (A Freq) AMP 10MS	100709
35286	U1	Schematics, Receiver Amp Board	3Y8A5AX
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
35306_BOM	A	BOM, Receiver Amp Board (C Freq, 1ms)	RR214593
35306	A	PCB Assembly SM130R (C Freq) AMP 1MS	100709
35351	K	CONTROL DRAWING SM30	RR236155
35740	-	PCB Artwork, Noise Shield Q45	RR227616

37623 (2 shts)	-	Bill of Materials, Q45AD9DCV NAMUR	RR216210
37657	I	PCB Assembly, Q45 NAMUR D/DLVF (B1961)	RR234253
37660	I	PCB Assembly, Q45 NAMUR LV (B1961)	RR214593
37662	I	PCB Assembly, Q45 NAMUR HP (B1961)	RR214593
37663	I	PCB Assembly, Q45 NAMUR CV/LF (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
37663	A	Cable, 2 Conductor 22 AWG, Blue Jacket	04/15/11
39343	A	CONTROL DRAWING Q45	RR237220
39616	A	CONTROL DRAWING T30 MINI BEAM MIAD9	RR228362
40156	G	PCB Assembly Namur Emitter (01950)	RR234253
40157	F	PCB Assembly Namur Receiver (01946)	RR214593
40158	F	Schematic Diagram Namur Circuit RCVR	RR214593
40159	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
40769	F	PCB Assembly, Namur DC D E (02220)	RR234253
40790	D	Schematic Diagram, NAMUR DC Agency Requirements	RR234253
41054	B	PCB ASSEMBLY NAMUR T30AD9FF150 (B1988)	RR214593
41055	B	SCHEMATIC DIAGRAM T30AD9FF150	RR214593
41240	[illegible]	CLICHE T30AD9FF150	RR228362
41241	J	CLICHE T30AD9FF150Q	RR228362
41655	H	CONTROL DRAWING T30	RR228362
58272	F	PCB Assembly, Q45 NAMUR FV (B1961)	RR214593
D101972	C	Control Drawing, MAY1(FM) Banner #106177	RR229500