



1 EU TYPE-EXAMINATION CERTIFICATE

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: **Sira 10ATEX1128X** Issue: **8**

4 Equipment: **3600 Series Flame Detectors**

5 Applicant: **Sierra Monitor Corporation**

6 Address: 1991 Tarob Court
Milpitas
California, 95035
USA

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

8 Sira Certification Service, notified body number 0518 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 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 the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 60079-0:2012+A11:2013.
EN 60079-18:2015

EN 60079-1:2014
EN 60079-28:2015

EN 60079-7:2015
EN 60079-31:2014

The above list of documents may detail standards that do not appear on the UKAS Scope of Accreditation, but have been added through Sira's flexible scope of accreditation, which is available on request.

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 and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:



II 2 G D

or

Ex db eb op is IIC T4 Gb
Ex tb op is IIIC T96°C Db
(Ta -55°C to +75°C)

or

Ex db eb mb op is IIC T4 Gb
Ex tb op is IIIC T98°C Db
(Ta = -55°C to +75°C)

* Due to restrictions applied by the applicant some products that are detailed in this certificate may not be commercially available.

Project Number 70088031


A G Boyes
Certification Support Officer

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SCHEDULE

EU TYPE-EXAMINATION CERTIFICATE

Sira 10ATEX1128X
Issue 8

13 DESCRIPTION OF EQUIPMENT

The 3600 Series Flame Detectors are manufactured from stainless steel. They are cylindrical in shape and are of three-part construction. They comprise a central assembly that is divided into two compartments, an electronics compartment and a terminal compartment, each with their own cover. The electronics compartment cover contains a circular glass window that allows the equipment to provide its monitoring function. The cover is secured by three ¼"-20 UNC-2A socket head cap screws. The cover window aperture has two moulded lugs that, along with a flat bar which is secured by cement and a No. 4-40 UNC-2A screw, provide protection of the window against impact. The terminal compartment, which contains Bartec Ex e component approved terminals and which communicates with the electronics compartment via a potted bushing, has its cover secured by three ¼"-20 UNC-2A socket head cap screws. The central assembly has either two M25 x 1.5 or ¾" x 14 NPT threaded holes in its sidewall to allow the fitting of suitably certified cable entry devices.

The 3600 Series Flame Detectors comprise the following models:

3600I-XXXXC	- IR3 Flame Detector
3600M-XXXXC	- Combined Hydrocarbon & Hydrogen Flame Detector
3600R-XXXXC	- Single IR Detector
3600L-XXXXC	- UV/IR Flame Detector without BIT
3600L4-XXXXC	- UVIR (4.5 µm) Flame Detector without BIT
3600U-XXXXC	- UV Flame Detector without BIT
3600UB-XXXXC	- UV Flame Detector with BIT
3600LB-XXXXC	- UV/IR Flame Detector with BIT
3600L4B-XXXXC	- UV/IR (4.5 µm) Flame Detector with BIT

Variation 1 - This variation introduced the following changes:

- The introduction of minor machining dimension changes and the reformatting of drawing details.
- The introduction of a spacing disc on the bushing.
- The optional use of aluminium as a material of manufacture of the enclosure.

Variation 2 - This variation introduced the following changes:

- A change of the aluminium specification.
- Minor machining and dimensional changes.

Variation 3 - This variation introduced the following changes:

- The recognition of minor drawing modifications; these changes are administrative and do not affect the aspects of the product that are relevant to explosion safety.

Variation 4 - This variation introduced the following change:

- Minor dimensional changes to the terminal compartment were endorsed.
- The recognition of minor drawing modifications; these changes are administrative and do not affect the aspects of the product that are relevant to explosion safety.

Variation 5 - This variation introduced the following changes:

- The recognition of minor drawing modifications; these amendments are administrative or involve changes to the design that do not affect the aspects of the product that are relevant to explosion safety.



SCHEDULE

EU TYPE-EXAMINATION CERTIFICATE

Sira 10ATEX1128X
Issue 8

Variation 6 - This variation introduced the following changes:

- i. The recognition of minor enclosure dimension changes was approved.
- ii. Changes to certificate schedule drawings text were endorsed.
- iii. The cover securing screws were permitted to be changed from 304 Stainless Steel to 316 Stainless Steel.
- iv. Steel.

Variation 7 - This variation introduced the following change:

- i. The gas group was changed from IIB + H₂ to IIC.

Variation 8 - This variation introduced the following changes:

- i. The introduction of two new models, type 3600UFL-XXXXC fast UV/IR flame detector and 3600UFI-XXXXC ultra fast triple IR3 flame detector. Each new model may be housed within either the aluminium or stainless steel enclosure previously approved. There are no changes to the enclosures; the changes are to the internal circuitry. The power dissipation is the same as that previously approved.
- ii. Changes to marking label to introduce the electrical ratings, as required for increased safety protection was approved.

Variation 9 - This variation introduced the following changes:

- i. The introduction of minor constructional changes, not affecting compliance. This includes the addition of four 'strength poles' in the lid of the Increased Safety compartment.
- ii. Additional information added to marking labels. The certification code and essential marking for ATEX is unchanged.

Variation 10 - This variation introduced the following changes:

- i. Following appropriate re-assessment, reference to any previous standards, EN 60079-0:2006, EN 60079-1:2007, EN 60079-7:2007, EN 61241-0:2006 and EN 61241-1:2004, were replaced by, EN 60079-0:2012, EN 60079-1:2007, EN 60079-7:2007 and EN 60079-31:2009, the markings were updated accordingly. Special Conditions for Safe Use were introduced to recognise the requirements of the latest standards and therefore an 'X' suffix was added to the certificate number.
- ii. The O-ring material was changed to address new requirements for elastomeric materials detailed in the latest standards.
- iii. The external earth facility arrangement was modified.
- iv. The introduction of optional, external accessories which are described as follows:
 - Weather Cover, P/N 777263 (plastic) or P/N 777163 (stainless steel) – This part consists of a partial cylindrical stainless steel or plastic hood covering the top and back of the enclosure. It is secured to the enclosure by two hexagon socket screws, one in the top and one in the back of the enclosure. The stainless steel version may be painted.



SCHEDULE

EU TYPE-EXAMINATION CERTIFICATE

Sira 10ATEX1128X
Issue 8

- Air Shield, P/N 777650 – This part consists of a clamp for attachment to the front of the enclosure. There are six screws which secure the clamping part to the main body of the air shield. The main body is cylindrical with a hole in the centre situated over the enclosure window, with a sintered part around the inside edge. There is a valve/connector on the top for connection of a pipe. The pipe carries air which blows through the sinter for the purpose of cleaning the sapphire window of the enclosure. The process temperature range is detailed in the manufacturer's instructions.
- Duct Mount, P/N 777670 – This part is for mounting the enclosure to the outside wall of an air duct. It has a bar which is mounted to the existing brackets on the base of the enclosure. The bar runs along the base of the enclosure to a plate with a window which is situated in front of the existing window on the front of the enclosure. Another square plate is mounted to this plate with a gasket in between and secured by four studs and nuts. On the front face there is a gasket for mounting on the outside wall of the air duct and two strips with studs which are intended to come through from the inside wall of the air duct and are secured by four nuts. The process temperature range is detailed in the manufacturer's instructions.
- Tilt Mount, P/N 40/40-001 – This part consists of a square plate with four holes for screws which are used to mount the assembly. Mounted on the square plate is a hinged arrangement to allow for positioning of the flame detector, which is secured to the tilt mount by two screws.

These accessories are fixed to mounting arrangements already present on the enclosures.

- v. The recognition of model 3600UFL on the label drawing which was introduced at Variation 8.

Variation 11 - This variation introduced the following changes:

- i. The option to fit an End of Line, Encapsulated Resistor was recognised, this necessitated EN 60079-18:2009 to be added to the listed standards. This Resistor is certified under Sira 14ATEX5071U and is installed in the Ex e or Ex tb part of the enclosure. Models which incorporate the Resistor have model numbers which end in "E", e.g. 3600X-XXXE and are marked with the following information:



II 2 G D
Ex d e mb IIC T4 Gb
Ex tb IIIC T98°C Db
Ta = -55°C to +75°C

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Variation 12 - This variation introduced the following changes:

- i. The use of an alternative terminal block was permitted.
- ii. Alternative drilling option on the housing cover was permitted.
- iii. Conduct appropriate assessment to demonstrate compliance with the requirements of EN 60079-28:2015; the marking was amended accordingly to include "op is" and the temperature class revised to T4 in all cases, EN 60079-28:2015 was therefore added to the list of standards.
- iv. Following appropriate assessment to demonstrate compliance with the latest technical knowledge EN 60079-1:2007, EN 60079-7:2007, EN 60079-18:2009 and EN 60079-31:2009 were replaced by EN 60079-1:2014, EN 60079-7:2015, EN 60079-18:2015 and EN 60079-31:2014; the marking was amended accordingly.
- v. Assessment standard EN 60079-0:2012 was replaced by EN 60079-0:2012+A11:2013.



SCHEDULE

EU TYPE-EXAMINATION CERTIFICATE

Sira 10ATEX1128X
Issue 8

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report number	Comment
0	02 June 2010	R22172A/00	The release of the prime certificate, incorporating variations 1 to 4 inclusive.
1	18 October 2010	R23520A/00	The introduction of Variation 5.
2	19 April 2011	R24659E/00	The introduction of Variation 6.
3	31 January 2012	R26065D/00	The introduction of Variation 7.
4	06 November 2012	R28225D/00	The introduction of Variation 8.
5	03 May 2013	R30675C/00	The introduction of Variation 9.
6	11 February 2015	R70004697C	The introduction of Variation 10.
7	15 June 2015	R70024317B	This Issue covers the following changes: <ul style="list-style-type: none">• The standards in Section 9 were aligned with those detailed in Variation 10.• The introduction of Variation 11.
8	12 June 2017	R70088031C	EC-Type Examination Certificate in accordance with 94/9/EC updated to EU-Type Examination Certificate in accordance with Directive 2014/34/EU. <ul style="list-style-type: none">• <i>(In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Variations to such EC-Type Examination Certificates may continue to bear the original certificate number issued prior to 20 April 2016.)]</i>• The introduction of Variation 12.

15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)

- 15.1. The dimensions of the flamepaths are other than the relevant minimum or maximum, as required by Table 2 of EN 60079-1:2014, as detailed below:

Flamepath Location	Type of Joint	Maximum Gap, i_c	Minimum Length, L
Sapphire Window	Flanged	0.04 mm	10.5 mm
Main Spigot	Cylindrical	0.15 mm	15.5 mm

Gaps, i_c , shall not be modified to be any larger and lengths, L, shall not be modified to be any shorter than the values shown in the table above.

- 15.2. Units may be painted or fitted with optional accessories; some of which are made of a non-metallic material or have a non-metallic coating which could potentially generate an ignition-capable level of

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Sira Certification Service

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SCHEDULE

EU TYPE-EXAMINATION CERTIFICATE

Sira 10ATEX1128X
Issue 8

electrostatic charge under certain extreme conditions. Therefore, these units shall not be installed in a location where they may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on the non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.

- 15.3. The three fastening screws used to secure the cover of the flameproof compartment have a yield stress of 344 N/mm². Any replacement fasteners shall have a yield stress of at least this value.
- 15.4. When the duct mount is fitted and the equipment is intended to be mounted to a heated/cooled air duct/process vessel, it shall be verified that the temperature of the air duct/process vessel shall not be capable of heating or cooling any part of the equipment enclosure to a temperature outside the marked maximum ambient temperature range prior to switching the equipment on, when taking into account surrounding ambient temperature.
- 15.5. The fasteners used to secure the flameproof parts of the enclosure shall have a yield stress of at least 344 N/mm².

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)**

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 **CONDITIONS OF MANUFACTURE**

- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.
- 17.2 Holders of EU type-examination certificates are required to comply with the production control requirements defined in Article 13 of directive 2014/34/EU.
- 17.3 Each 3600 Series Flame Detector shall be subject to a routine pressure test of 19.0 bar for at least 10 s as required by clause of 16.1 EN 60079-1:2014. There shall be no permanent deformation or damage to the enclosure.
- 17.4 Each 3600 Series Flame Detector shall be subject to a routine dielectric strength test of 500 V rms applied between the terminal block and the enclosure for a period of 60 s as required by clause 6.1 of EN 60079-7:2015. Alternatively, the test voltage may be 600 V for a period of 100 ms as specified by clause 7.1 of EN 60079-7:2015.

Certificate Annexe

Certificate Number: Sira 10ATEX1128X
Equipment: 3600 Series Flame Detectors
Applicant: Sierra Monitor Corporation



Issue 0

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
777129	1 of 1	B	02 Jun 10	Label
777130	1 of 1	B	02 Jun 10	Label

Issue 1

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
777129	1 of 1	C	18 Oct 10	Label
777130	1 of 1	C	18 Oct 10	Label

Issue 2 (No new drawings were introduced).

Issue 3

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
777129	1 of 1	D	31 Jan 12	Label
777130	1 of 1	D	31 Jan 12	Label

Issue 4

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Title
777129	1 of 1	F	30 Oct 12	Label
777130	1 of 1	E	30 Oct 12	Label

Issue 5

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
777129	1 of 1	G	03 May 13	Label
777130	1 of 1	F	03 May 13	Label

Issue 6

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
777129	1 of 1	K	15 Jan 15	Label
777130	1 of 1	J	15 Jan 15	Label

Issue 7

Drawing	Sheets	Rev.	Date (Sira stamp)	Title
777289	1 of 1	B	28 May 15	Label

Issue 8

Drawing	Sheets	Rev	Date (Sira stamp)	Title
777129	1 of 1	M	24 Oct 16	Label, Sierra Monitor Corporation
777130	1 of 1	M	31 Oct 16	Label, Sierra Monitor Corporation

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