



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:** FM23ATEX0042X

4. **Equipment or protective system:
(Type Reference and Name)** 645i, 745i and TM500 Series Thermal Mass Gas Flow Meter and Temperature Transmitter

5. **Name of Applicant:** Sierra Instruments Inc

6. **Address of Applicant** 5 Harris Court,
Monterey, California 93940, 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:

PR466793 dated 18 September 2023

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 60079-1:2014, EN 60079-31:2014, EN 60529:1991+A1:2000+A2:2013

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: Martin Crowe

21 September 2023

Certification Manager, FM Approvals Europe Ltd.

Date

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

FM Approvals Europe Ltd. One Georges Quay Plaza, Dublin. Ireland. D02 E440
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SCHEDULE

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



Main Enclosure:

II 2 G Ex db IIB+H₂ T6 or T4 Gb Ta = -20°C to +70°C
II 2 D Ex tb IIIC T85°C or T135°C Db Ta = -20°C to +70°C

Remote Enclosure:

II 2 G Ex db IIB+H₂ T4 Gb Ta = -20°C to +70°C
II 2 D Ex tb IIIC T135°C Db Ta = -20°C to +70°C

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

General - The 645i, 745i and TM500 Series Thermal Mass Gas Flow Meter and Temperature Transmitters are used for measuring the mass flow of gases as well as the process gas temperature all in one package. The flowmeters are available for inline or insertion applications. The product features 4-20mA and/or pulse outputs and is also available with an optional display/configuration panel. Digital communications options include USB, HART and RS485 Modbus.

Construction - The 645i, 745i and TM500 Series Thermal Mass Gas Flow Meter and Temperature Transmitter consists of a dual-compartment electronics housing with thread-on blank or window covers and a probe threaded into the housing base. The remote version of the 645i, 745i and TM500 Series and Thermal Mass Gas Flow Meter and Temperature Transmitter consists of the same dual-compartment electronics housing attached to a smaller remote enclosure with probe. The equipment enclosures are separately certified by NB 1026 (see certificates FTZU03ATEX0074U and FTZU04ATEX0332U). The enclosures are provided with 3/4 inch NPT openings. Probe mounting can be provided integrally, directly to the electronics housing, or can be remotely mounted, using the remote enclosure, up to 100 feet from the electronics housing.

Ratings - The 645i, 745i and TM500 Series Thermal Mass Gas Flow Meter and Temperature Transmitters operate at 12-28 Vdc (6W) or 100-240 Vac (7W). The transmitters are rated for use in an ambient temperature range of -20°C to +70°C. The transmitter probes are rated for use in a process temperature range of -40°C to +121°C at a maximum pressure of 740 psi.

The enclosures have an ingress protection rating of IP67.

See Annex for model codes.

14. **Specific Conditions of Use:**

1. The flamepaths of the equipment are not intended to be repaired. Consult the manufacturer if repair of the flamepath joints is necessary.
2. Refer to the manufacturer's instructions to reduce the potential of an electrostatic charging hazard on the equipment enclosure.
3. The equipment temperature code ratings are dependent on the enclosure configuration (local or remote). Refer to the following table for specific temperature code markings.

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| Model Code | Temperature Code Marking-Gas | | Temperature Code Marking-Dust | |
|------------|------------------------------|------------------|-------------------------------|------------------|
| | Main Enclosure | Remote Enclosure | Main Enclosure | Remote Enclosure |
| E1 | T4 | N/A | T135°C | N/A |
| E2 | T4 | N/A | T135°C | N/A |
| E3 | T6 | T4 | T85°C | T135°C |
| E4 | T6 | T4 | T85°C | T135°C |

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 |
|-------------------|-----------------|
| 21 September 2023 | Original Issue. |

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ANNEX

645i Series and TM500 Series Insertion

Description of Equipment:

a-b-c-d-e. Thermal Mass Flow Meter and Temperature Transmitter (Insertion).

a = Model 645i or TM500.

b = Probe 04I, 05I, 06I, 07I, 08I, 09I, 10I, 11I, 12I, 13I, 14I, 15I, 16I, 17I, 18I, 19I, 20I, 21I, 22I, 23I, 24I, 25I, 26I, 27I, 28I, 29I, 30I, 31I, 32I, 33I, 34I, 35I, 36I, 15R, 18R, 24R, 30R or 36R.

c = Enclosure E1, E2, E3 or E4.

d = Communication BH, BN, B0 or RS.

e = Data logger, display and sensor BLANK, DL, D0, LD0, SH, SJ or SI.

745i Series and TM500 Series Inline

Description of Equipment:

a-b-c-d-e. Thermal Mass Flow Meter and Temperature Transmitter (Inline).

a = Model 745i or TM500.

b = Flow body 05F, 075F, 10F, 15F, 20F, 25F, 30F, 40F, 60F, 125F, 20FC, 25FC, 30FC, 40FC, 60FC, 075G, 10G, 15G, 20G, 25G, 30G, 40G, 60G, 125G, 20GC, 25GC, 30GC, 40GC, 60GC, 025P, 05P, 075P, 10P, 15P, 20P, 25P, 30P, 40P, 125P, 20PC, 25PC, 30PC or 40PC.

c = Enclosure E1, E2, E3 or E4.

d = Communication BH, BN, B0 or RS.

e = Data logger, display and sensor BLANK, DL, D0, LD0, SH, SJ or SI.

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Blueprint Report

Fox Thermal Instruments Inc (1000008198)

Class No 3615

Original Project I.D. 3061039

Certificate I.D. FM23ATEX0042X

| <u>Drawing No.</u> | <u>Revision Level</u> | <u>Drawing Title</u> | <u>Last Report</u> |
|--------------------|-----------------------|--|--------------------|
| 109637 | D | BioTrak 645i/745i Instruction Manual | PR466793 |
| 109638 | B | LABEL, SERIAL NUMBER, ELEC ENCLOSURE LOCAL, 645i/745i | PR466793 |
| 109639 | B | LABEL, SERIAL NUMBER, ELEC ENCLOSURE REMOTE, 645i/745i | PR466793 |
| 109640 | B | LABEL, SERIAL NUMBER REMOTE ENCLOSURE 645i/745i | PR466793 |
| 109641 | B | CONFIGURATION DRAWING, INSERTION, MODEL 645i | PR466793 |
| 109642 | B | CONFIGURATION DRAWING, INLINE, MODEL 745i | PR466793 |
| 109709 | B | LABEL, SERIAL NUMBER, ELEC ENCLOSURE, LOCAL, AC, 645i/745i | PR466793 |
| 109710 | B | LABEL, SERIAL NUMBER, ELEC ENCLOSURE REMOTE, AC, 645i/745i | PR466793 |
| 110069 | B | TM500 Thermal Mass Flow Meter Instruction Manual | PR466793 |