CERTIFICATE OF CONFORMITY

FM Approvals

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**

2. **Certificate No:** **FM21US0123X**

3. **Equipment:**
   (Type Reference and Name) **645S, 745S and TM100 Series Thermal Mass Gas Flow Meter and Temperature Transmitter**

4. **Name of Listing Company:** **Sierra Instruments Inc**

5. **Address of Listing Company:** **20 Ryan Ranch Road, Ste 109, Monterey, California 93940, United States of America**

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

   PR461840 dated 17th May 2022

7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM 3600:2022, FM 3615:2022, FM 3616:2022, FM 3810:2021, NEMA 250:1991, ANSI/UL 60079-0:2013, ANSI/UL 60079-1:2015, ANSI/IEC 60529:2020, ANSI/UL 61010-1:2023

8. 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.

9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

10. Equipment Ratings:

    Explosionproof for Class I, Division 1, Groups B, C and D; Dust-ignitionproof for Class II, Division 1, Groups E, F and G; Class III, Division 1; Flameproof for Class I, Zone 1, AEx db IIB+H2 T4 Gb hazardous (classified) locations, indoors and outdoors (Type 4X, IP66/67) with an ambient temperature rating of -40°C to +70°C.

Certificate issued by:

J.E. Marquedant

J.E. Marquedant
VP, Manager - Electrical Systems

14 April 2025

Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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

FM Approvals LLC. One Technology Way, Norwood, MA 02062 USA
T: +1 (1) 781 762 4300 F: +1 (1) 781 762 9375 E-mail: information@fmapprovals.com www.fmapprovals.com

11. The marking of the equipment shall include:

    Class I Division 1, Groups B, C, D; T4 Ta = -40°C to +70°C; Type 4X, IP66/67

    Class II, Division 1, Groups E, F, G, Class III, Division 1; T4 Ta = -40°C to +70°C; Type 4X, IP66/67

    Class I, Zone 1, AEx db IIB+H2 T4 Gb Ta = -40°C to +70°C, Type 4X, IP66/67

12. **Description of Equipment:**

    General - The 645S, 745S and TM100 Series Thermal Gas Mass 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 645S, 745S and TM100 Series Thermal Gas Mass Flow Meter and Temperature Transmitter consists of a single compartment electronics housing with thread-on window cover and a probe inserted through the housing base forming a cylindrical joint. The enclosures are provided with two (2) ¾ inch NPT openings.

    Ratings - The 645S, 745S and TM100 Series Thermal Gas Mass Flow Meter and Temperature Transmitters operate at 12-28 Vdc (6W). The transmitters are rated for use in an ambient temperature range of -40°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.

    Refer to the Annex for model codes.

13. **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.

14. **Test and Assessment Procedure and Conditions:**

    This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

15. **Schedule Drawings**

    A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

    Details of the supplements to this certificate are described below:

SCHEDULE

US Certificate of Conformity No: FM21US0123X

Date	Description
17 May 2022	Original Issue.
18 September 2023	Supplement 1: Report Reference: PR466793 dated 18 September 2023. Description of the Change(s): Minor model code revisions and associated documentation changes. Standards updated to latest editions where changes between versions are considered non-technical.
14 November 2024	Supplement 2: Report Reference: RR243270 dated 14 November 2024. Description of the Change(s): Added 1/2 inch probes. Model code reconfigured. Other documentation updates not affecting the equipment safety. Standards have been updated to the latest editions where changes between versions are considered non-technical.
14 April 2025	Supplement 3: Report Reference: RR245662 dated 14 April 2025. Description of the Change(s): Updating company address and associated documentation changes.

ANNEX

645S Series and TM100 Series Insertion

Description of Equipment:

a-bcde-f-g-h. Thermal Mass Gas Flow Meter and Temperature Transmitter (Insertion).
a = Model: 645S or TM100.
b = Probe length: 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 or 36.
c = Retractor: I, R or C.
d = Crank retractor diameter: BLANK, 1 or 2.
e = Crank retractor flange: BLANK, A1, A2, A3, N1, N2, J1 or J2.
f = Sensor diameter and material: BLANK, H3, J3, L3, S2, H2, J2 or L2.
g = Display: D0 or DD.
h = Output: P1, BH or RS.

745S Series and TM100 Series Inline

Description of Equipment:

a-bcde-f-ghij-k-l-m. Thermal Mass Gas Flow Meter and Temperature Transmitter (Inline).
a = Model: 745S or TM100.
b = Flowbody size: 025, 05, 075, 10, 125, 15, 20, 25, 30, 40, 60 or 80.
c = Flowbody type: P, F, G, H, D, E, J or K.
d = Flowbody material: BLANK or C.
e = Flowbody conditioner: BLANK or X.
f = Flowbody pipe schedule: BLANK, S05, S10 or S80.
g = Retractor length: BLANK, 15, 18, 24, 30 or 36.
h = Retractor: BLANK, R or C.
i = Crank retractor diameter: BLANK, 1 or 2.
j = Crank retractor flange: BLANK, A1, A2, A3, N1, N2, J1 or J2.
k = Sensor diameter and material: BLANK, H3, J3, L3, S2, H2, J2 or L2.
l = Display: D0 or DD.
m = Output: P1, BH or RS.

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