1 EC-TYPE EXAMINATION CERTIFICATE

2 **Equipment or Protective systems intended for use in Potentially Explosive Atmospheres - Directive 94/9/EC**

3 **EC-Type Examination Certificate No:** **FM12ATEX0016X**

4 **Equipment or protective system: (Type Reference and Name)** **Model ST100 Series Thermal Mass Flow Meter**

5 **Name of Applicant:** **Fluid Components International LLC**

6 **Address of Applicant:** **1755 La Costa Meadows Drive**
San Marcos, CA 92078 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 Ltd, notified body number 1725 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, 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:

3043588 dated 21 November 2012

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 60079-0: 2009, EN 60079-1: 2007, EN 60079-31: 2009, EN 60529 1991+A1:2000

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

11 This EC-Type Examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC. 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:

II 2 G Ex d IIC T6/T1 Gb Ta = -40°C to +65°C

II 2 D Ex tb IIIC T85°C/ T450°C Db Ta= -40°C to +65°C; IP67

Mick Gower
Certification Manager, FM Approvals Ltd..

Issue date: 4th December 2012

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

The ST100 Series is a thermal mass flow meter, industrial process grade air/gas flow meter. It is suitable for air and gas flow measurement applications in line sizes from 1 inch to 100 inches and larger. The instrument provides direct mass flow measuring and measures flow rate, totalized flow and temperature, and the STP versions add pressure measurement. The measurements are made available to the user by way of 4-20mA analog output channels with HART or pre-selected digital bus protocols. The optional graphics display provides real-time process variable values along with flow range and process description information. There are no moving parts to clean or maintain. It is offered in a wide selection of process connections to fit with any process piping and versions are available for temperature service from -40°F (-40°C) to 850°F (454°C). The ST100's electronics / transmitter can be integrally mounted with the flow sensor or remote mounted up to 1000 feet (300m) from the sensor element.

The enclosure is roughly a 5 inch diameter base with two thread on covers, cast in aluminum alloy (European Standard EN AC 46000 and US Standard 360) or 316L stainless steel. The base has either four ½ - 14 NPT entries, or four M20 X 1.5 entries for field wiring, and one ¾" - 14 NPT, ¾" – 16 UNF or M24 X 1.5 for a probe or process connection. The painted exterior is an polyester powder coated, color yellow.

The enclosure includes a blank (solid) cover, and a window cover, both include environmental sealing of the base-to-cover joint provided by a nitrile o-ring. The window cover includes a tempered lime window epoxied in place with potting compound Loctite E-40EXP and has mechanical retention of the window provided by an internal retaining ring.

Product Listing:

STa – bcdefg – hijkl - mnopq - 3. Thermal Mass Flow Meter
a = Type: 100, 102 (A, D, E), 110, 112 (A, D, E), P100, P102 (A, D, E), P110 and P112 (A, D, E).
b = Flow Element: 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F, G, H, J, K, L, M, N, T, V, Y, W.
c = Pressure Measurement: 0, 1, 2,3,4,5, 6, 7, 8, W.
d = Process Connection: C, D, G, M, N, J, P, H, Q, K, R, L, T, V, Y, F, W.
e = Flange: 0, 1, 2, 3, 6, A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, T, V, Y, W.
f = Insertion Length: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.
g = Pipe Mounting and Flow Direction: 1, 2, A, B, C, D, E and F.
h = Transmitter Mounting and Enclosure Options: 1, 2, 3, 4, 5, 6, 7, 8, A, B, C, D, E, F, N, P and W.
i = Interconnecting Cable: 0, A, B, C, D, 1, 2, 3, 4 or W.
j = Power Supply and Display: 0, A, B, C, D.
k = Outputs and Communications: 0, 1, 2, F, M, P, W.
l = Language: Variable.
m = Calibration Application: A, B, C, D, E, F, G, T, Z, W.
n = Calibration Setup: 0,1 ,2, 3, 4, A, B, C, D, E, F, G, H, K, L
o = Second Calibration 1: 0, A, B, C, D, E, F, G, T, V, Z, W.
p = Second Calibration 2: 0, 1, 2, 3, 4, A, B, C, D, E, F, G, H, K, L.
q = Additional Calibration Group: 0, X

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ST100L – abcdef - ghijk - lmnop – 3. Thermal Mass Flow Meter

a = Flow Element: 4, D, 7, G, W.
b = In-line Body Material of Construction: 1, 2.
c = In-line Body Type/Diameter: A, B, C, D, E, F, G, H, J, K, W.
d = In-Line Process Connection: 1, 2, 3, 6, 7, 8, A, B, C, D, E, F, G, H, J, K, L, M, N, P, R, T, V, Y, W, Z.
e = Insertion Length: 0.
f = Pipe Mounting and Flow Direction: 1, 2.
g = Transmitter Mounting and Enclosure Options: 1, 2, 3, 4, A, B, C, D, E, F and W.
h = Interconnecting Cable: 0, A, B, C, D, 1, 2, 3, 4, 5, 6, E, F and W.
i = Power Supply and Display: A, B, C, D.
j = Outputs and Communications: 1, 2, F, M, P, W.
k = Language: Variable.
l = Calibration Application: B, C, E, F, G, H, J, K, L, M, N, P, R, S, Z, W.'
m = Calibration Setup: 0, A, B, C, E, F, H, K, and T
n = Second Calibration 1: 0, B, C, E, F, G, H, J, K, L, M, N, P, R, S, Z, W.
o = Second Calibration 2: 0, A, B, C, E, F, H, K and T.
p = Additional Calibration Group: 0, X

14 **Specific Conditions of Use:**

1. Consult the manufacturer if dimensional information on the flameproof joints is necessary.
2. The painted surface of the ST100 Series Flow Meter may store electrostatic charge and become a source of ignition in applications with a low relative humidity < 30% relative humidity where the painted surface is relatively free of surface contamination such as dirt, dust, or oil. Cleaning of the painted surface should only be done with a damp cloth.
3. Do not replace internal battery when an explosive gas atmosphere is present.
4. The relationship between the temperature class, the maximum surface temperature, the ambient temperature and the process temperature is as follows:
   - Electronic enclosure: T6/T85°C for an ambient temperature range of -40°C to +65°C.
   - Sensing Element: T5/ T100°C for a process temperature range of -40°C to +65°C.
     T4/ T135°C for a process temperature range of -40°C to +65°C.
     T2/ T300°C for a process temperature range of -40°C to +177°C.
     T1/ T450°C for a process temperature range of -40°C to +450°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 EC-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 Ltd accepts no responsibility for the compliance of the equipment against all applicable Directives in all applications.

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This Certificate has been issued in accordance with FM Approvals 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
4th December 2012	Original Issue.

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