

# 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:** FM16ATEX0008X

4 **Equipment or protective system:** ST51, ST51A, ST75, ST75A, ST75V and ST75AV  
(Type Reference and Name) Mass Flow Meter

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

6 **Address of Applicant:** 1755 La Costa Meadows Dr  
San Marcos CA 92078  
United States

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 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:

**3057895 dated 8<sup>th</sup> June 2016**

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: 2012 +A11: 2013; EN60079-1: 2014; EN 60079-31:2014 ; EN 60529 : 1991+A1: 2000**

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.

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



II 2 G Ex db IIC T6...T1 Gb;

II 2 D Ex tb IIIC T85°C...T300°C Db;

IP66/ IP67 Ta = -40°C to +65°C



cn=Mick Gower, o=FM Approvals,  
ou,  
email=mick.gower@fmapprovals.  
com, c=GB  
2017.11.13 10:28:49 Z

**Mick Gower**  
Certification Manager, FM Approvals Ltd.

Issue date: 13<sup>th</sup> November 2017

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

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS  
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# SCHEDULE



to EU-Type Examination Certificate No. FM16ATEX0008X

## 13 Description of Equipment or Protective System:

The ST51, ST75 and ST75V series flowmeters measure the flow rate of fluids. Each model consists of an integral instrument with the flow element and transmitter located within the same enclosure. The enclosures for each model were certified as Ex components under EC Type Examination Certificate FM15ATEX0047U, along with an IECEx component certificate IECEx FMG 15.0025U (both under Project ID 3056357). The flow and temperature probes used with the ST51, ST75 and ST75V series mass flowmeters were certified under EC Type Examination Certificate FM13ATEX0099X (Project ID 3048652), along with an IECEx certificate IECEx FMG 13.0040X (Project ID 3048645).

The ST51, ST75 and ST75V mass flowmeters measure the flow rate of fluids. Each model consists of an integral instrument with the flow element and transmitter located within the same enclosure. The ST75V is a slight variant of the ST75 using a different pipe tee, but is otherwise identical. The maximum pressure ratings for each flowmeter is 2000 psi. The models with the generation 3 electronics are the ST51A, the ST75A and the ST75AV, but use the same enclosure and probes as the ST51, ST75 and ST75V. The electronics are identical for each of these three models, and consists of three circuit boards: the Interface board, the Power Supply board, and the Transmitter board. Each model can be configured to operate from either 85-265 VAC power or 18-36 VDC power; in each case, a different Interface board and Power Supply board can be used.

The enclosure for the ST51, ST51A, ST75, ST75A, ST75V and ST75AV is roughly a 3 inch diameter base with two thread on blank or window covers, cast in 316 Stainless Steel. Both covers include a nitrile O-ring for ingress protection. The base has either two 1/2 -14 NPT entries, or two M20 X 1.5 entries for field wiring, and has one 3/4 -14 NPT for the probe connection. The cover is locked by screw with hex socket using hex spanner. An earth terminal is placed on the body of the enclosure.

The sensor elements for the ST51, ST51A, ST75, ST75A, ST75V and ST75AV consist of simple 1000Ω and 500Ω resistance temperature detectors (RTD) embedded in thermowells made from hastelloy or stainless steel and filled with aluminum oxide and capped with epoxy. The voltage rating of the RTD's is either 9 ma at 24 Vdc or 16 ma at 12 Vdc. Wiring to the RTD sensor is made with 28 AWG NI clad alloy wires with Kapton or 28 AWG NI clad alloy wires with PTFE. All wires are rated for 500°F (260°C). Remote mounted cable consist of 8 conductor 24 AWG copper wire, foil shield drain wire and polyurethane jacket or 8 conductor 26 AWG NI clad alloy wire with braided shield, drain wire and PTFE insulation. The sensor elements carry a rating of Ex d IIC T6...T2 Gb and Ex tb IIIC T85°C...T300°C Db with a Maximum process temperature range is -40°C to +260°C. Process temperature varies for flow element installed.

The assembly configuration of the herein equipment is as follows:

1. The sensor element probe is threaded directly to the enclosure.
2. The sensor element probe is remotely located from the enclosure.

### Model Code Structure:

#### **ST51-abcdefgh3. Mass Flowmeter.**

a – Base Unit, Enclosure Style, Power Supply: 1, 2, 3, 4, 7, 8, A, B, C, D, E, F.

b – Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction: (Horizontal: F, G, H, J, K, L) (Vertical: M, N, P, R).

c – Process Connection/Ferrule Material: 1, 2, 3, 4, 5, 6, 7 or 8.

d – Insertion Length: 1, 2, 3.

e – Gas Medium and Calibration: C, 1, F, A, B, D, E, W.

f – Calibration and Calibration Conditions: 0, A, M, N, Q, 5, T, 6, R, U.

g – Transmitter Options: 0, A, W.

h – Interconnecting Cable Length for Remote Configurations: 0, A, B, C, W.

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

# SCHEDULE



to EU-Type Examination Certificate No. FM16ATEX0008X

### **ST51A-abcdefgh3. Mass Flowmeter.**

- a – Base Unit, Enclosure Style, Power Supply: 1, 2, 3, 4, 7, 8, A, B, C, D, E, F.
- b – Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction: (Horizontal: F, G, H, J, K, L) (Vertical: M, N, P, R).
- c – Process Connection/Ferrule Material: 1, 2, 3, 4, 5, 6, 7, or 8.
- d – Insertion Length: 1, 2, 3.
- e – Gas Medium and Calibration: C, 1, F, A, B, D, E, W.
- f – Calibration and Calibration Conditions: 0, A, M, N, Q, 5, T, 6, R, U.
- g – Transmitter Options: 0, 2, C, W.
- h – Interconnecting Cable Length for Remote Configurations: 0, A, B, C, W.

### **ST75-abcdefg3. Mass Flowmeter.**

- a – Base Unit, Enclosure Style: 1, 2, 4, 5, 6, 7, A, B, C, D, E, F.
- b – Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction: (Horizontal: F, G, H, J, K, L), (Vertical: M, N, P, R).
- c – Power Supply: 1, 2.
- d – Line Size and Process Connection: A, B, C, D, E, F, G, H, J or W.
- e – Gas Medium and System Calibration in Actual Tee Fitting: B, C, E, F, H, J, K, L, M, N, P, 1, 2, W.
- f – Calibration and Calibration Temperature Conditions: 0, A, M, N.
- g – Interconnecting Cable Length for Remote Configurations: 0, A, B, C, W.

### **ST75A-abcdefgh3. Mass Flowmeter.**

- a – Base Unit, Enclosure Style: 1, 2, 4, 5, 6, 7, A, B, C, D, E, F.
- b – Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction: (Horizontal: F, G, H, J, K, L), (Vertical: M, N, P, R).
- c – Power Supply: 1, 2.
- d – Line Size and Process Connection: A, B, C, D, E, F, G, H, J or W.
- e – Gas Medium and System Calibration in Actual Tee Fitting: B, C, E, 1, 2, F, H, J, K, L, M, N, P, W.
- f – Calibration and Calibration Temperature Conditions: 0, A, M, N.
- g – Interconnecting Cable Length for Remote Configurations: 0, A, B, C, W.
- h – Transmitter options: 0, 2.

### **ST75V-abcdefghij3. Mass Flowmeter.**

- a – Base Unit, Enclosure Style: 1, 2, 4, 5, 6, 7, A, B, C, D, E, F.
- b – Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction: (Horizontal: F, G, H, J, K, L), (Vertical: M, N, P, R).
- c – Power Supply: 1, 2.
- d – Line Size: C, E, F, G, H, J.
- e – Process Connection Type: E, N, F, W.
- fg – Process Connection Size, material Rating, Finish Details: Q0, H0, T0, 10, B0, 20, HG, TG, 1G, BG, 2G, D3, E3, G3, J2, WW.
- h – Gas Medium and System Calibration: B, C, E, 1, 2, F, G, H, J, K, L, M, N, P, R, W.
- i – Calibration and Calibration Temperature Conditions: Q, T, W.
- j – Interconnecting Cable Length for Remote Configurations: 0, A, B, C, W.

### **ST75AV-abcdefghijk3. Mass Flowmeter.**

- a – Base Unit, Enclosure Style: 1, 2, 4, 5, 6, 7, A, B, C, D, E, F.
- b – Pipe Installation, Display/Transmitter Mounting Orientation and Flow Direction: (Horizontal: F, G, H, J, K, L), (Vertical: M, N, P, R).
- c – Power Supply: 1, 2.
- d – Line Size: C, E, F, G, H, J
- e – Process Connection Type: E, N, F, W.
- fg – Process Connection Size, material Rating, Finish Details: Q0, H0, T0, 10, B0, 20, HG, TG, 1G, BG, 2G, D3, E3, G3, J2, WW.
- h – Gas Medium and System Calibration: B, C, E, 1, 2, F, G, H, J, K, L, M, N, P, R, W.

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

# SCHEDULE



to EU-Type Examination Certificate No. FM16ATEX0008X

- i – Calibration and Calibration Temperature Conditions: Q, T, W.
- j – Interconnecting Cable Length for Remote Configurations: 0, A, B, C, D, W.
- k – Transmitter Options: 0, 2

## 14 **Specific Conditions of Use:**

1. The ambient temperature range and applicable temperature class of the sensor probe is based on the maximum process temperature for the particular application as follows; T6...T1 for Tambient of -40°C to +65 and Tprocess of -40°C to +260°C. Probe assembly design temperatures are part number dependent. Low temperature models have design temperatures from -40°C to +121°C. Medium temperature models have design temperatures from -40°C to +260°C.
2. Process Temperature: Maximum process temperature range is -40°C to +260°C. Process temperature varies for flow element installed. The relationship between the temperature class, the maximum surface temperature and the process temperature is as follows:  
  
Sensing Element:  
T6/ T85°C for a process temperature range of -40°C to +39°C.  
T5/T100°C for a process temperature range of -40°C to +54°C.  
T4/ T135°C for a process temperature range of -40°C to +89°C.  
T3/ T200°C for a process temperature range of -40°C to +154°C.  
T2/ T300°C for a process temperature range of -40°C to +177°C.  
T1 for a process temperature range of -40°C to +260°C.
3. Consult the manufacturer if dimensional information on the flameproof joints is necessary.
4. The painted surfaces of the Mass 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. Guidance on protection against the risk of ignition due to electrostatic discharge can be found in IEC TR60079-32 (in preparation). Cleaning of the painted/unpainted surface should only be done with a damp cloth.
5. The probe when remotely located from the enclosure has flying lead conductors and requires the remote probe to be connected to a suitably certified Ex d or Ex e terminal box for connecting to external supply circuit.
6. Customer to supply wire rated 10°C minimum above maximum ambient temperature of installation location to a suitably certified Ex d or Ex e terminal box.

## 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.

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

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS  
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# SCHEDULE



to EU-Type Examination Certificate No. FM16ATEX0008X

**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 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 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
15 <sup>th</sup> June 2016	Original Issue.
15 <sup>th</sup> May 2017	<u>Supplement 1:</u> Report Reference: RR209558 dated 11 <sup>th</sup> May 2017. Description of the Change: Product model code has been updated. A stainless steel enclosure has been added. Documentation updated.
01 <sup>st</sup> September 2017	<u>Supplement 2:</u> Report Reference: RR210739 dated 28 <sup>th</sup> August 2017. Description of the Change: Product model code listing updated
13 <sup>th</sup> November 2017	<u>Supplement 3:</u> Report Reference: RR210945 dated 10 <sup>th</sup> November 2017. Description of the Change: Minor product and model code changes to the ST51 and ST51A products. Documentation updated.

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

FM Approvals Ltd. 1 Windsor Dials, Windsor, Berkshire, UK. SL4 1RS  
T: +44 (0) 1753 750 000 F: +44 (0) 1753 868 700 E-mail: [atex@fmapprovals.com](mailto:atex@fmapprovals.com) [www.fmapprovals.com](http://www.fmapprovals.com)

# Blueprint Report

**Fluid Components International LLC (1000001156)**

**Class No 3615**

**Original Project I.D. 3057895**

**Certificate I.D. FM16ATEX008X**

<u>Drawing No.</u>	<u>Revision Level</u>	<u>Drawing Title</u>	<u>Last Report</u>	<u>Electronic Drawing</u>
01SA011465	E	ST51 Order Information Sheet (OIS), Biogas & Natural Gas Insertion Flow Meter	RR210945	Yes (pdf)
01SA011466	G	ST75 Order Information Sheet (OIS), Air/Gas Flow Meter	RR210739	Yes (pdf)
01SA011484	D	ST75V Order Information Sheet (OIS), Mass Flow Meter with Vortab® Flow Conditioner	RR210739	Yes (pdf)
01SA011494	C	ST51A Order Information Sheet (OIS), Biogas & Natural Gas Insertion Flow Meter	RR210945	Yes (pdf)
01SA011495	B	ST75A Order Information Sheet (OIS), Air/Gas Flow Meter	RR209558	Yes (pdf)
01SA011496	B	ST75AV Order Information Sheet (OIS), Mass Flow Meter with Vortab® Flow Conditioner	RR209558	Yes (pdf)
021118	E	ST51/ ST51A/ ST75/ ST75A/ ST75V/ ST75AV TAG, EXPLOSION PROOF ENCLOSURE, IECEX, ATEX, FMCU CERTIFICATION	3057895	Yes (pdf)
022241	A	O-RING, VITON FLUOROELASTOMER	3057895	Yes (pdf)
022706	E	O-RING, SILICONE, HIGH TEMP.	3057895	Yes (pdf)
023413	A	PROBE CERTIFICATION, FM/ FMC DIV 1, GPS A, B, C, D, ST50/ ST51, ST75, FS10 & OEM	3057895	Yes (pdf)
024387	-	ENCLOSURE CERTIFICATION, STAINLESS STEEL, FM C, US, ATEX, IECEX	3057895	Yes (pdf)
024996	-	ENCLOSURE CERTIFICATION, ALUMINUM ALLOY, FM C, US, ATEX, IECEX	3057895	Yes (pdf)
025869	A	Packing Gland Assembly, ST50/51/51A	RR210945	Yes (pdf)
06EN003368	F	ST75/ST75V MASS FLOW METER Installation and Operation Guide	3057895	Yes (pdf)
06EN003389	A	ST51 MASS FLOW METER Installation and Operation Guide	3057895	Yes (pdf)
06EN003426	A	ST51A/ ST75A/ ST75AV MASS FLOW METER Installation and Operation Guide	3057895	Yes (pdf)