1 **EU-TYPE EXAMINATION CERTIFICATE**

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

3 Certificate Number: **Sira 13ATEX2257X** Issue: **1**

4 Equipment: **Density/Viscosity Transmitter Types: HFVM, FVM, FDM.**

5 Applicant: **Micro Motion Inc.** **Micro Motion Inc.**

6 Address:

| | |
|---|---|
| 7070 Winchester Circle<br>Boulder<br>Colorado. 80301<br>USA | AVE. Miguel de Cervantes<br>Complejo Industrial Chihuahua<br>Chihuahua 31109<br>Mexico |

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 EN 60079-1:2014 EN 60079-11:2012 EN 60079-26:2007

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 identified 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 1/2G
Ex db IIC T6 Ga/Gb
Ex db [ib] IIC T6 Ga/Gb
Ta = -40°C≤Ta≤+65°C
Refer to Section 13 for additional marking information

Project Number 70097935

N Jones
Certification Manager







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**SCHEDULE**

**EU-TYPE EXAMINATION CERTIFICATE** **Sira 13ATEX2257X**
**Issue 1**

13 **DESCRIPTION OF EQUIPMENT**

The Density/Viscosity Transmitter Types HFVM**, FVM** & FDM** are sensor combinations and are used for the measurement of fluid density and viscosity. They are also used to create I/O signals for data transmission. The transmitter and sensor together form a density or a viscosity meter. The fork transmitter is for use with the Micro Motion Fork Density Meter (FDM), Fork Viscosity Meter (FVM) and Heavy Fuel Viscosity Meter (HFVM). There are two styles of fork, 'Standard' and 'Long Stem'. The Long Stem version has a sealed tube connecting the fork/crystal assembly and the spigot/flame path, with the cable entering at the ends through Ex d cable glands. The standard fork and Long Stem crystal/fork assembly & spigot/flame path are filled with encapsulant to exclude the explosive atmosphere. The crystal/fork assembly is pressure-tested internally after welding. The maximum process temperature of the long stem is restricted by the limit of the cable glands used.

The electronic modules of these transmitters are mounted inside a universal aluminum or stainless steel enclosure. The enclosure uses the protection method Ex d. The electronic module consists of two boards, a power board and a microprocessor board; both are inserted into a plastic shell, which is filled with a potting material. There are two types of power board and one type of microprocessor board. Each board is identified with a colour.

When used with an intrinsically safe supply (such as the Micro Motion 2700 transmitter) using the power and RS485 terminals only, the interconnection is intrinsically safe (ib). The sensors may be installed in a zone 0 vessel across a zone 0/1 barrier.

Table to define Type, Description and Marking for ATEX Equipment

| Type Identification | Description | Marking |
|---|---|---|
| HFVM*********3F******<br>FDM*********3F******<br>FVM*********3F******<br>HFVM*******B*2F******<br>FDM*******B*2F******<br>FVM*******B*2F****** | Fork Density Transmitter | Ex II 1/2 G Ex db IIC T6 Ga/Gb |
| HFVM********A3F******<br>FDM********A3F******<br>FVM********A3F****** | Fork Transmitter<br>(Connected to a remote transmitter<br>type 2700**********) | Ex II 1/2 G Ex db [ib] IIC T6 Ga/Gb |

Parameters of the Equipment Configurations

Types HFVM*********3F******, FDM*********3F******, FVM*********3F******
Types HFVM*******B*2F******, FDM*******B*2F******, FVM*******B*2F******

Code: Ex db IIC T6 Ga/Gb

(Connector J1) Non Intrinsically safe main power supply.
(Connector J5) Non Intrinsically safe RS485 communication port.
(Connector J2) Non Intrinsically safe mA1 + HART communication port.
(Connector J3) Non Intrinsically safe mA or DO or time period signal output communication port.
Nominal Voltage 24V DC +10%







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**SCHEDULE**

**EU-TYPE EXAMINATION CERTIFICATE** **Sira 13ATEX2257X**
**Issue 1**

Types HFVM********A3F******, FDM********A3F******, FVM********A3F****** (ATEX)

Code: Ex db [ib] IIC T6 Ga/Gb

| | |
|---|---|
| (Connector J1) Power Supply Circuit | |
| Voltage | Ui = 17.22V DC |
| Current | Ii = 484 mA |
| Power | Pi = 2.05 W |
| Maximum internal capacitance | Ci = Negligible |
| Maximum internal inductance | Li = Negligible |
| (Connector J5) RS 485 Circuit | |
| For connection of an intrinsically safe circuit (linear) with the following values: | |
| Voltage | Ui = 17.22V DC |
| Current | Ii = 484 mA |
| Maximum internal capacitance | Ci = 1 µF |
| Maximum internal inductance | Li = Negligible |
| Voltage | Uo = 9.51V DC |
| Current (Instantaneous) | Io = 480 mA |
| Current (Steady State) | I = 106 mA |
| Power | Po = 786 mW |
| Internal resistance | Ri = 19.8 Ω |
| Maximum External Capacitance for Group IIC | Co = 85 nF |
| Maximum External Inductance for Group IIC | Lo = 25 µH |
| Maximum External Inductance/resistance ratio for Group IIC | Lo/Ro = 31.1 µH/Ω |

**Variation 1** - This variation introduced the following changes:

i. Addition of optional stainless steel housing to models HFVM, FVM and FDM, to form Types HFVM*******B*2F******, FDM*******B*2F******, FVM*******B*2F****** Transmitters.
ii. Update of Standard EN 60079-1 to 2014.

## 14 DESCRIPTIVE DOCUMENTS

### 14.1 Drawings

Refer to Certificate Annexe.







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14.2 **Associated Sira Reports and Certificate History**

| Issue | Date | Report number | Comment |
|---|---|---|---|
| 0 | 03 February 2014 | R30062A/00 | The release of the prime certificate. |
| 1 | 02 December 2016 | R70097935A | This Issue covers the following changes:<br>• EC Type-Examination Certificate in accordance with 94/9/EC updated to EU Type-Examination Certificate in accordance with Directive 2014/34/EU. *(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.)*<br>• The introduction of Variation 1. |

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

15.1 For the application of the transmitter in an ambient temperature of less than -20ºC suitable cable and cable entries or conduit entries certified for this condition shall be used.

15.2 If certified conduit entries are used for the connection of the transmitter enclosure, the associated stopping boxes shall be installed immediately at the enclosure.

15.3 After de-energizing, a delay of 5 minutes shall take place before opening the enclosure.

15.4 The fork may be manufactured from a non-conductive material; it must not be installed directly in any process where the surface might be charged by the rapid flow of non-conductive media and shall only be cleaned with a damp cloth.

15.5 Models F*M********A3F****** & HF*M********A3F****** can only be connected to a Micro Motion 2700 transmitter.

15.6 Any external heating or cooling source shall not exceed the process temperature limitations of -40°C to +200°C.

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 conformity to type requirements defined in Article 13 of Directive 2014/34/EU.

17.3 The partition wall shall be routinely tested to a pressure of 1.5 times the maximum process pressure for a period of 60 seconds. The test pass criteria are that there shall be no leakage or damage to the partition wall.





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# Certificate Annexe

**Certificate Number:** **Sira 13ATEX2257X**

**Equipment:** **Density/Viscosity Transmitter**
**Types: HFVM**, FVM**, FDM**.**

**Applicant:** **Micro Motion Inc.**

**Issue 0**

| Drawing | Sheets | Rev. | Date (Sira Stamp) | Title |
|---|---|---|---|---|
| EB-20021628 | 1 to 2 | AA | 04 Dec 13 | Tower Dwg |
| EB-20021629 | 1 of 1 | AA | 04 Dec 13 | Cover –Blind dwg |
| EB-20021631 | 1 to 2 | AA | 04 Dec 13 | Housing dwg |
| EB-20021632 | 1 to 2 | AA | 13 Nov 13 | Full Assy |
| EB-20022191 | 1 to 11 | AA | 13 Nov 13 | Fork, Safety Description |
| EB-20022272 | 1 of 1 | AA | 13 Nov 13 | Module Assy |
| EB-20022280 | 1 to 4 | AA | 13 Nov 13 | Fork-BFCORE BOM |
| EB-20022282 | 1 to 4 | AB | 13 Nov 13 | Fork-Power-Remote BOM |
| EB-20022536 | 1 to 4 | AA | 13 Nov 13 | Fork-BFCORE PCB |
| EB-20022537 | 1 to 7 | AA | 13 Nov 13 | Fork-BFCORE-Circuit |
| EB-20022538 | 1 to 4 | AA | 13 Nov 13 | Fork-Power PCB |
| EB-20022539 | 1 to 5 | AB | 13 Nov 13 | Fork-Power-Circuit Remote |
| EB-20023786 | 1 to 5 | AA | 13 Nov 13 | Final Assembly |
| EB-20023788 | 1 to 4 | AA | 04 Dec 13 | ATEX-Zn0-Zn1 Labels |
| EB-20023791 | 1 to 3 | AA | 22 Nov 13 | Additional-RS-485 safety description |

**Issue 1**

| Drawing | Sheets | Rev. | Date (Sira stamp) | Title |
|---|---|---|---|---|
| EB-20029771 | 1 to 2 | AA | 11 Oct 16 | APPVL ASSY SST |
| EB-20029772 | 1 of 1 | AA | 11 Oct 16 | APPVL BLIND SST |
| EB-20029773 | 1 to 2 | AA | 11 Oct 16 | APPVL HOUSING SST |
| EB-20029782 | 1 to 2 | AA | 11 Oct 16 | APPVL DISPLAY SST |
| EB-20029868 | 1 to 9 | AA | 11 Oct 16 | SAFETY DESC DENSVISC SST ENCLOSURE |
| EB-20022272 | 1 to 2 | AB | 11 Oct 16 | MODULE ASSY |
| EB-20023788 | 1 to 4 | AB | 11 Oct 16 | ATEX-Zn0-Zn1 LABELS |
| EB-20023789 | 1 to 4 | AB | 11 Oct 16 | IECEx-Zn0-Zn1 LABELS |







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