IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

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Certificate No.:	**IECEx SIR 19.0032X**	Page 1 of 5	Certificate history:
Status:	**Current**	Issue No: 1	Issue 0 (2019-11-25)
Date of Issue:	2021-08-13		

Applicant: **Emerson – Rosemount, Micro Motion Inc.**
12001 Technology Drive
Eden Prairie, MN 55344
United States of America

Equipment: **8782 Slurry Transmitter and MS Slurry Sensor**

Optional accessory:

Type of Protection: **Increased Safety, Intrinsically Safe, Type n and Dust Protection by Enclosure**

Marking:

8782 Slurry Transmitter
Ex ec ic [ia Ga] IIC T4 Gc
Ex ic nA [ia Ga] IIC T4 Gc
Ex ic tc [ia Da] IIIC T80°C Dc
Ex ic tc IIIC T80°C Dc
Ta = -40°C to +60°C

MS Slurry Sensor
Ex eb ia IIC T6…T3 Ga/Gb
Ex eb ib IIC T6…T3 Gb
Ex ec ic IIC T6…T3 Gc
Ex ic nA IIC T6…T3 Gc
Ex tb IIIC T65°C …T200°C Db
Ta = Stainless Steel Enclosure: -50°C to +60°C
Ta = Carbon Steel Enclosure: -29°C to +60°C

Approved for issue on behalf of the IECEx Certification Body: **Neil Jones**

Position: **Certification Manager**

Signature: (for printed version) PP MHalliwell

Date: 2021-08-13

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Certificate issued by:

CSA Group Testing UK Ltd
Unit 6, Hawarden Industrial Park
Hawarden, Deeside CH5 3US
United Kingdom

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Manufacturer: **Emerson – Rosemount, Micro Motion Inc.**
12001 Technology Drive
Eden Prairie, MN 55344
United States of America

Additional manufacturing locations:

Emerson Process Management Flow Technologies Co., Ltd
111, Xing Min South Road, Jiangning District, Nanjing
Jiangsu Province
211100
China

Emerson SRL
Emerson Street No 4
400641 Cluj-Napoca, Romania
Romania

F-R Technologías De Flujo, S.A. De C.V.
Rosemount Flow Business Unit
Ave. Miguel de Cervantes 111
31136 Chihuahua
Mexico

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements.This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended

STANDARDS :
The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

IEC 60079-0:2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-0:2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11:2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15:2010 Edition:4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-26:2014-10 Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
IEC 60079-31:2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
IEC 60079-7:2017 Edition:5.1	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

Test Reports:

GB/CSAE/ExTR21.0037/00 GB/SIR/ExTR19.0291/00

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Quality Assessment Report:

NO/PRE/QAR15.0018/02

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EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

The Model 8782 Slurry Transmitter is a magnetic flowmeter transmitter that, when combined with the MS Flow Tubes, measures the volumetric flow rate of a conductive fluid in a pipe. The enclosure is comprised of aluminum housing approximately 0.256 m Height x 0.208 m Width x 0.071 m Thickness. The enclosure is comprised of two compartments, a field wiring compartment and an electronics compartment. Each compartment is provided with its own hinged door. The enclosure also has an optional LOI display and keypad that is attached in the electronics compartment. The 8782 Slurry Transmitter is designed to only connect to the model MS flow tube.

The enclosure is provided with 4 ½" NPT conduit entries on the bottom of the enclosure for field wiring, and optional ½" NPT to M20 thread adapters supplied with the equipment.

The 8782 Slurry Transmitter can be supplied to be powered from either a 90 to 250Vac 50/60Hz source, a 12-48 Vdc source, or 12-42 Vdc source. Each transmitter is programmed to have an IS output for the sensor electrode circuit, and a non-IS output for the Sensor Coil circuit. The transmitters are also equipped with two DIO circuits that are internally galvanically isolated. The transmitter communicates through a 4-20 mA/HART, a FIELDBUS/ PROFIBUS/FISCO, a MODBUS circuit and a pulse circuit, and they can be configured as intrinsically safe depending on the model option.

The MS Slurry Sensor is installed in-line with process piping, either vertically or horizontally. Coils located on opposite sides of the flow tube create the necessary magnetic field. A conductive liquid moving through the magnetic field generates a voltage that is detected by two electrodes.

The enclosure of the flow tube consists of two parts the junction box, and the tube. The junction box has two 1/2" NPT entries or M20 entries and contains a field wiring terminal.

There are two input circuits included in the MS flow tube. The circuits can be supplied by the Emerson remote mount transmitter models, 8712EM, 8732EM, or 8782. The MS flow tube has a connection for the coil circuit which is used to generate the magnetic field, and a connection for the electrode circuit which is used to read a voltage created by the flowing process in the magnetic field. The electrode circuit is an intrinsically safe circuit in all explosive gas installations.

Refer to the Annexe for the Entity Parameters and model nomenclature

SPECIFIC CONDITIONS OF USE: YES as shown below:
Refer to the Annexe

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Issue 1 – this Issue introduced the following changes:

1. Update drawings to incorporate editorial changes and minor design changes made to 8782 Slurry Transmitter and MS Slurry Sensor.
2. Update standard from IEC 60079-7:2015 Ed. 5.0 to IEC 60079-7:2017 Ed. 5.1.

Annex:

IECEx SIR 19.0032X Annexe Issue 1.pdf

Annexe to: **IECEx SIR 19.0032X Issue 1**

Applicant: **Emerson – Rosemount, Micro Motion, Inc.**

Apparatus: **8782 Slurry Transmitter and MS Slurry Sensor**

8782 Slurry Transmitter

Model :8782abcdeffgg
a = Revisions Level: A
b = Transmitter Mounting Options: W
c = Power Supply: 1 or 2
d = Transmitter Outputs: A, B, F, P, D or M
e = Conduit Entry: 1 or 2
ff = Safety Approvals Code Options: N1, N7, N9, ND, NF
gg = Any Alpha-Numeric characters representing product options up to fifty digits.

Entity Parameters for 8782 Slurry Transmitter

4-20 mA HART Circuit (Terminals 7 and 8):
Ui = 30 V ; Ii = 300 mA ; Pi = 1.0 W ; Ci = 924 pF ; Li = 0.0 mH
FF/PA/FISCO field Device Circuit (Terminals 7 and 8):
Ui = 30 V ; Ii = 380 mA ; Ci = 924 pF ; Li = 0.0 mH (Non-FISCO)
Ui = 30 V ; Ii = 380 mA ; Pi = 5.32 W ; Ci = 924 pF ; Li = 0.0 mH(FISCO)
Pulse Circuit (Terminals 5 and 6):
Ui = 28 V ; Ii = 100 mA ; Pi = 1.0 W ; Ci = 4.5 pF ; Li = 0.0 mH
Electrode Output Circuit (Terminals 17, 18, 19):
Um = 250 V; Uo = 28.56 V; Io = 5.77 mA; Po = 165 mW; Co = 61.7 nF; Lo = 1.0 H

MS Slurry Sensor:

Model: MSaaabcdefghijkkllm
aaa = Line size: 030 – 360(3-36 inch)
b = Rev level: A
c= Mounting option: R = Remote
d = Conduit Entry: 1=1/2" NPT, 2= M20
e = Lining Material: Any one digit alpha or numeric character
f = Electrode Material: Any one digit alpha or numeric character
g = Electrode Type: Any one digit alpha or numeric character
h = Flange Material: Any one digit alpha or numeric character
i = Flange Type: Any one digit alpha or numeric character
j = Flange Rating: Any one digit alpha or numeric character
kk = Coil Housing Configuration: M0, M1, M2, or M4.
ll = Safety Approval Options: K1, K7, K9, N1, N7, N9, ND, NF
m = Options: Any Alpha-Numeric characters representing non-safety product options up to fifty-two digits in length.

Entity Parameters for MS Slurry Sensor Electrode Circuit (Terminals 17, 18, 19):
Ui = 30 V ; Ii = 50 mA ; Pi = 1.0 W ; Ci = 1.9 nF ; Li = 630 µH

Specific Conditions of Use

1. Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. In addition, the equipment shall only be cleaned with a damp cloth.
2. The 8782 Slurry Transmitter enclosure is manufactured from Aluminum Alloy. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered during installation.

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3. The MS Slurry Sensor is intended for use only in combination with the 8782, 8732EM, 8712EM Transmitters or a Transmitter with equivalent or less output ratings.
4. The 8782 Slurry Transmitter is not capable of passing the 500 V isolation test on terminals to chassis due to integral transient protection. This must be considered upon installation.
5. Appropriately rated conduit entries must be installed to maintain the enclosure ingress ratings of IP66, IP68 or IP69.
6. The MS Slurry Sensor contains nonconductive liners over the grounded tube. For process requiring EPL Ga, precautions shall be taken to avoid the liner being charged by the flow of nonconductive media.
7. In order to maintain the ingress protection level on the M4 electrode housing for the MS Flow Tube, the copper crush washer that seals the electrode access plug shall be replaced when the plug is reinstalled. The copper crush washer is one time use only.
8. When "Special Paint Systems" are applied, instructions for safe use regarding potential electrostatic charging hazard have to be followed
9. Warning - Ignition hazard, wetted parts may contain Titanium and Zirconium. For processes requiring EPL Ga and Gb rated equipment, suitability for use must be determined by the end user to eliminate ignition hazard due to impact or friction.
10. The MS Slurry Sensor is not allowed to be thermally insulated.
11. The 8782 Slurry Transmitter and the MS Slurry Sensor are permanently (conduit) connected, intended for continuous operation in extended environmental conditions as specified. Overvoltage Category II, Pollution Degree 2.
12. The 8782 Slurry Transmitter electrode and coil circuits can be remotely connected to the 8707 Sensor or MS Slurry Sensor
13. The 8782 Slurry Transmitter is suitable for field wiring wire gauges of 22 AWG to 10 AWG that are to be tightened down with a torque of 1.2 Nm.
14. The MS Slurry Sensor is suitable for field wiring wire gauges of 14 AWG to 16 AWG that are to be tightened down with a torque of 1.2 Nm.
15. The temperature code, ambient temperature range, and maximum process temperature for the MS Slurry Sensor are as follows:

Hazardous Gas Locations (Group IIC)

T-Code	Coil Housing Material	Line Size	Ambient Temperature Range	Maximum Process Temperature
T6	Carbon Steel	All	-29°C to 35°C	45°C
T5	Carbon Steel	3″	-29°C to 60°C	60°C
T4	Carbon Steel	3″	-29°C to 60°C	105°C
T3	Carbon Steel	3″	-29°C to 60°C	177°C
T5	Carbon Steel	4″-36″	-29°C to 60°C	65°C
T4	Carbon Steel	4″-36″	-29°C to 60°C	110°C
T3	Carbon Steel	4″-36″	-29°C to 60°C	177°C
T6	Stainless Steel	All	-50°C to 35°C	45°C
T5	Stainless Steel	3″	-50°C to 60°C	60°C
T4	Stainless Steel	3″	-50°C to 60°C	105°C
T3	Stainless Steel	4″-36″	-50°C to 60°C	177°C
T5	Stainless Steel	4″-36″	-50°C to 60°C	65°C
T4	Stainless Steel	4″-36″	-50°C to 60°C	110°C
T3	Stainless Steel	4″-36″	-50°C to 60°C	177°C

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Hazardous Dust Locations (Group IIIC)

T-Code	Coil Housing Material	Line Size	Ambient Temperature Range	Maximum Process Temperature
T65	Carbon Steel	All	-29°C to 35°C	45°C
T80	Carbon Steel	All	-29°C to 60°C	60°C
T135	Carbon Steel	All	-29°C to 60°C	105°C
T200	Carbon Steel	All	-29°C to 60°C	177°C
T65	Stainless Steel	All	-50°C to 35°C	45°C
T80	Stainless Steel	All	-50°C to 60°C	60°C
T135	Stainless Steel	All	-50°C to 60°C	105°C

Conditions of Manufacture

8782 Transmitter Models (DC Models):

Mains Circuit Test:
At the conclusion of manufacture, and before shipping, each unit shall be subjected to a dielectric strength test, using a potential of 55.08V dc rms minimum, for a period of 2 seconds, without breakdown, between the following points: (voltage level is 90% of rated tolerance of the MOVs on the DC power module)

- Between Positive and Negative Power Terminal and the ground terminal with the metal enclosure.
  Notes:
  1) A potential of 55.08V dc minimum may alternatively be applied for a period of 2 seconds.

Secondary Floating Circuit Test:
At the conclusion of manufacture, and before shipping, each unit shall be subjected to a dielectric strength test, using a potential of 350V ac rms, for a period of 2 seconds, without breakdown, between the following points:

- Between output Terminals and the ground terminal with the metal enclosure.
  Notes:
  1) A potential of 354V Minimum dc may alternatively be applied for a period of 2 seconds. Voltage level is 90% MOV's Rating. On pins 5, 6, 7, 8,9, 10, 11, 12, 18 and 19 to the ground terminal with the metal enclosure
  2) A potential of 500V Minimum dc may alternatively be applied for a period of 2 seconds. Voltage level is 90% MOV's Rating. On pins 1, 2 to the ground terminal with the metal enclosure

IS Transformer Test:
At the conclusion of manufacture, and before shipping, each transformer (reference drawing 08732-0817) shall be subjected to a dielectric strength test, using a potential of 1500V, for a period of 60 seconds, without breakdown, between the following points:

- Between Primary and secondary windings of the transformer.
  Notes:
  1) A potential of 1800 V may alternatively be applied for a period of 1 seconds.

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MS Slurry Sensor Models:

At the conclusion of manufacture, and before shipping, each unit shall be subjected to a dielectric strength test, using a potential of 500V ac rms, for a period of 60 seconds, without breakdown, between the following points:

- Between terminals 1, and 2 and the ground terminal with the metal enclosure.
  Notes:
  1) A potential of 707 V dc may alternatively be applied for a period of 60 seconds.
  2) A potential of 600 Vac may alternatively be applied for a period of 0.1 seconds.
  3) A potential of 850V dc may alternatively be applied for a period of 0.1 seconds.

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