IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: **IECEx SIR 19.0007X**

Page 1 of 4

Certificate history:
Issue 2 (2022-09-08)
Issue 1 (2022-03-02)
Issue 0 (2019-04-29)

Status: **Current**

Issue No: 3

Date of Issue: 2023-08-30

Applicant: **Micro Motion**
7070 Winchester Circle
Boulder
Colorado 80301
United States of America

Equipment: **Field Mount Loop Power Transmitter, 4200 Series & 4700 Series**

Optional accessory:

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

Marking: Refer to the Annexe

Approved for issue on behalf of the IECEx Certification Body: **Michelle Halliwell**

Position: **Director Operations, UK & Industrial Europe**

Signature:
(for printed version)

Date:
(for printed version)

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting www.iecex.com or use of this QR Code.

Certificate issued by:

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

IECEx Certificate of Conformity

Manufacturer: **Micro Motion**
7070 Winchester Circle
Boulder
Colorado 80301
United States of America

Manufacturing locations: **Micro Motion**
7070 Winchester Circle
Boulder
Colorado 80301
United States of America

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 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

IEC 60079-7:2015 Explosive atmospheres – Part 7: Equipment protection by increased safety "e"
Edition:5.0

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/ExTR22.0053/00 GB/SIR/ExTR19.0106/00 GB/SIR/ExTR22.0135/00
GB/SIR/ExTR23.0142/00

Quality Assessment Report:

NO/PRE/QAR16.0031/03

IECEx Certificate of Conformity

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

General:

The 4200 and 4700 Series transmitter in combination with a sensor, are used for measurement of mass flow. The 4200/4700 Series transmitters are communicating, microprocessor-based, coil drive, sensor (Pickup Coils/RTD input) interfacing instruments. In addition to the normal function of processing sensor inputs into flow rates, processed measurements are communicated via HART 4-20mA current signals.

Refer to the Annexe for Additional Information.

SPECIFIC CONDITIONS OF USE: YES as shown below:

1. If a charge-generating mechanism is present, the exposed painted metallic part on the enclosure is capable of storing a level of electrostatic charge that could become incendive for IIIC dust. Therefore, the user/installer shall implement precautions to prevent the build-up of electrostatic charge, e.g. earthing the metallic part. This is particularly important if the equipment is installed in a zone 0 location. Cleaning of the painted surface shall only be done with a damp cloth.
2. The enclosure is manufactured from Aluminium, magnesium, titanium or zirconium may be used at the accessible surface of the equipment. In rare cases, ignition sources due to impact and friction sparks could occur. This shall be considered when the Micro Motion 4200 is being installed in Zone 0 locations for group II/III level of protection Ga/Da.
3. The flameproof joints are not intended to be repaired.

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
This issue, Issue 3, recognises the following change; refer to the certificate annex to view a comprehensive history:

1. Products Description updated to include the model code description.
2. Introduction of 4700 Series; product description was updated accordingly.

Annex:

IECEx SIR 19.0007X Annexe Issue 3.pdf

The model designation and marking are as follows:

IECEx Model Code	Marking
4200 Series	
4200abcdeIAghijlmnn	Ex db [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T72°C Db IP66/IP67
4200JabcdeIAghijlmnn	Ex db [ia IIC Ga] IIB T6 Gb IP66/IP67
4200abcdeEAghijlmnn	Ex db eb [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T72°C Db IP66/IP67
4200abcdeEBghijlmnn	Ex ia IIC T4 Ga Ex ia IIIC T77°C Da IP66/IP67
4200JbcdeEBghijlmnn 4200PbcdeEBghijlmnn	Ex ia IIC T4 Ga Ex ia IIIC T77°C Da IP66/IP67
4200abcde3Aghijlmnn	Ex ec [a Ga] IIC T6 Gc Ex tc [a Da] IIIC T72°C Dc IP66/IP67
4700 Series	
4700abcdeIAghijlmnn	Flameproof Version Main Housing: Ex db eb [ia Ga IIC] IIB+H2 T6 Gb Ex db eb [ia Ga] IIC T6 Gb Ex tb [ia Da] IIIC T80°C Db IP66/IP67
4700abcdeEAghijlmnn	
4700abcde3Aghijlmnn	

Model Code Nomenclature applicable for both, 4200 and 4700 Series:

4(2,7)00 a b c d e f f g h i j l m n n

Mounting (a)
I = Integral Mount AL
J = Integral Mount SST
R = 4-wire remote mount transmitter AL
M = 4-wire remote mount transmitter SST
C = 9-wire remote mount transmitter AL
P = 9-wire remote mount transmitter SST
S = Integral Mount AL for retrofit

Power (b)
1 = 18 to 100 VDC and 85 to 265 VAC; self-switching

Display Options (c)
2 = Backlit dual line Display
3 = No Display
5 = Backlit dual line Display = Ex *** IIC T6 Gb
V = Backlit dual Line Display w/ WiFi

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

Output Options (d)
A = Configurable Outputs
C = Ethernet Outputs
D = IS I/O
E = IS Foundation Fieldbus H1
N = Non-IS Foundation Fieldbus H1

Conduit Connections (e)
(B, C, D) = 1/2" NPT
(E, F, G) = M20

Approval (ff)
IA = IECEx: EPL Gb, Ex d, Zone 1 and EPL Db, Ex tb, Zone 21
EA = IECEx: EPL Gb, Ex de, Zone 1 and EPL Db, Ex tb, Zone 21
EB = IECEx: EPL Ex ia, Zone 0 and EPL Da, Ex tb, Zone 20
3A = IECEx: EPL Gc, Ex ec, Zone 2 and EPL Dc, Ex tc, Zone 22

The 4200/4700 Series transmitter consists of both aluminum and stainless-steel versions of both the 4200 and 4700 transmitters, utilizing the 4200 and 4700 housings.

The 4200/4700 Series Transmitter Housing is designed to cater to two mounting versions. These mounting versions are Remote (from the Sensor) and Integral (on top of the Sensor).

The 4200/ 4700 Series Transmitter Housing consists of a two-compartment housing, classified as Terminal compartment (Ex-db, Ex-eb) and Electronic Compartment (Ex-db, Ex-ia). This compartmentalization is achieved by an enclosure wall section (Aluminum – cemented seal, SST – PTFE bushing).
The Terminal Compartment (Ex-eb, Ex-db) contains the terminals and is accessible by removing a lockout device and a threaded cover. This cover can only be a blind cover. The I/O terminals in this compartment could have either I.S. or non-I.S. I/O's, depending on the electronics option chosen. The Terminal Blocks used in this compartment are black in color and are Ex rated.
The Electronic compartment (Ex-db, Ex-ia) contains the main electronic circuits and is accessible by removing a lockout device and a threaded cover. This cover can be a blind cover or one with a window for a display.
For the integral mounting version, the 4200/4700 Series Transmitter Housing is directly fitted on the sensor using a feedthrough. Alternatively, the housing can be mounted to an adapter.
For the Remote mounting version, a Junction Box attaches to the 4200/4700 Series Transmitter Housing. This Junction Box is used to terminate wire from Sensor/core processor and feed it further into the 4200/4700 Series Transmitter Housing.

Part A: 4200 Series

The 4200 incorporates an on-board intrinsically safe (IS) shunt zener diode safety assembly, which is encapsulated. The IS shunt zener diode safety assembly then feeds the remaining electronics which are also encapsulated but protected by intrinsic safety.

The field wired connections are made inside the terminal compartment, which is protected by either Increased Safety (Ex eb, ec), Flameproof (Ex d), Intrinsic safety (Ex ia) or by enclosure (Ex t) for dust.

The electronics compartment is protected by Flameproof (Ex d), intrinsic safety (Ex ia), Increased Safety (Ex ec) or by enclosure (Ex t) for dust.

The terminal compartment, accessible via the threaded enclosure cover, allows electrical connection via two cable/conduit entries to a terminal block. Electrical connection to the remainder of the equipment is then made through the terminal PC Board.

The electronics housing contains three PC Boards, the Power PCB, 2WCORE PCB, and Display PCB. All of the circuitry, except for the Display PCB, is encapsulated.

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

The 4200 Series transmitters are assessed for (a) Intrinsic Safety "ia", (b) Flameproof "db", (c) Dust Ignition protected "tb" and (d) Increased Safety type "eb" or "ec" protection methods.

Intrinsic Safety and Dust-Ignition Protected (Ex ia IIC and Ex ia IIIC)	Flameproof or Increased Safety (Zone 1) and Dust-Ignition Protected (Ex db IIC and Ex tb IIIC) Or (Ex eb IIC and Ex tb IIIC)	Increased Safety (Zone 2) and Dust-Ignition Protected (Ex ec IIC and Ex tc IIIC)
Ui = 30 Vdc Ii = 300 mA Pi = 1000 mW Ci = 1320pF Li = 2.86 µH	18 to 30 Vdc, 4 to 20mA 22mA Max.	18 to 30 Vdc, 4 to 20mA 22mA Max.

Input Entity Parameters (Intrinsically Safe Zone 0/1/2):

Parameters	Series 4200	
	gas application	dust application
Terminals	CH A, CH B, Terminals 1 -4	CH A, CH B, Terminals 1 -4
Voltage U_i	DC 30 V	DC 30 V
Current I_i	300mA	300mA
Power P_i	1.0W	1.0W
Effective internal capacitance C_i	1320pF	1320pF
Effective internal inductance L_i	2.86uH	2.86uH

Output Entity Parameters, Group IIC (Zone 0/1/2):

Parameters	Series 4200
	gas application
Terminals	Drive +, Drive - Drive Circuit (J2 in J-box, DR+ BRN; DR- RED)
U_o	6.51VDC
I_o	1.52A Instantaneous 0.136A Steady State
P_o	0.81W
C_o	22µF
U_o/I_o	4.28Ω
L_o	15.4µH
L_o/R_o	14.4µH/Ω

Output Entity Parameters, Group IIB/Group IIIC (Zone 0/1/2)

Parameters	Series 4200	
	gas application(Group IIB)	dust application(Group IIIC)
Terminals	Drive +, Drive – Drive Circuit (J2 in J-box, DR+ BRN; DR- RED)	Drive +, Drive – Drive Circuit (J2 in J-box, DR+ BRN; DR- RED)
U_o	6.51VDC	6.51VDC
I_o	1.52A Instantaneous 0.136A Steady State	1.52A Instantaneous 0.136A Steady State
P_o	0.81W	0.81W
C_o	500µF	500µF
U_o/I_o	4.28Ω	4.28Ω

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

L_o	61.6µH	61.6µH
L_o/R_o	57.5µH/Ω	57.5µH/Ω

The maximum external inductance L (sensor coil) can be calculated with the following term:

$$L = 2 \times E \times \left(\frac{(Uo / Ioinst) + Ro}{1.5 \times Uo} \right)^2$$

whereby E = 40 µJ for group IIC and E = 160 µJ for group IIB & IIIC will be inserted.

Output Entity Parameters, Group IIC (Zone 0/1/2)

Parameters	Series 4200
	gas application
Terminals	Pick Off's (RPO-), (RPO+), (LPO-), (LPO+) Pick Off Circuit (J1 in J-box, LPO+ GRN; LPO- WHT; RPO+ BLU; RPO- GRY)
U_o	6.51VDC
I_o	2.63mA
P_o	4.3mW
C_o	22µF
L_o	5.1H
L_o/R_o	8.3mH/Ω

Output Entity Parameters, Group IIB/Group IIIC (Zone 0/1/2)

Parameters	Series 4200	
	gas application(Group IIB)	dust application(Group IIIC)
Terminals	Pick Off's (RPO-), (RPO+), (LPO-), (LPO+) Pick Off Circuit (J1 in J-box, LPO+ GRN; LPO- WHT; RPO+ BLU; RPO- GRY)	Pick Off's (RPO-), (RPO+), (LPO-), (LPO+) Pick Off Circuit (J1 in J-box, LPO+ GRN; LPO- WHT; RPO+ BLU; RPO- GRY)
U_o	6.51V	6.51V
I_o	2.63mA	2.63mA
P_o	4.3mW	4.3mW
C_o	500µF	500µF
L_o	20.5H	20.5H
L_o/R_o	33.2mH/Ω	33.2mH/Ω

Output Entity Parameters, Group IIC (Zone 0/1/2):

Parameters	Series 4200
	gas application
Terminals	J6 Pins 1(RTD_SNS),2(RTD_LO),9(RTD_HI) Temp Circuit (J1 in J-box, RTD+ VIO; RTD- ORA; RTD-SIG YEL)
U_o	6.51V
I_o	12.3mA
P_o	20mW
C_o	22µF

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

L_o	235mH
L_o/R_o	1.78mH/Ω

Output Entity Parameters, Group IIB/Group IIIC (Zone 0/1/2)

Parameters	Series 4200	
	gas application(Group IIB)	dust application(Group IIIC)
Terminals	J6 Pins 1(RTD_SNS),2(RTD_LO),9(RTD_HI) Temp Circuit (J1 in J-box, RTD+ VIO; RTD- ORA; RTD-SIG YEL)	J6 Pins 1(RTD_SNS),2(RTD_LO),9(RTD_HI) Temp Circuit (J1 in J-box, RTD+ VIO; RTD- ORA; RTD-SIG YEL)
U_o	6.51V	6.51V
I_o	12.3mA	12.3mA
P_o	20mW	20mW
C_o	500µF	500µF
L_o	940mH	940mH
L_o/R_o	7.1mH/Ω	7.1mH/Ω

Part B: 4700 Series

The 4700 Series transmitter, using the HART communication protocol, gives easy access to information critical to measuring flow rates. Information from the measured flow rate, the instrument, or the sensor can be obtained downstream via HART communications.

The 4700 Series transmitter can be configured, calibrated, or tested with FACTORY USE ONLY clip lead connections in the terminal compartment.

Type	Associated Apparatus	
Supply Voltage Range	18V to 100V DC, 85V_{rms} to 250V_{rms} AC (auto-ranging supply)	
Um	240V_{rms}, 375V pk	
Classification	Model 4700abcdeffghijlmnn Zone 1 (Exd)	II 2 G Ex db [ia Ga IIC] IIB+H_2 T6 Gb II 2 G Ex db [ia Ga] IIC T6 Gb II 2 D Ex tb [ia Da] IIIC T80°C Db IP66/IP67
	Model 4700abcdeffghijlmnn Zone 1 (Exde)	II 2 G Ex db eb [ia Ga IIC] IIB+H_2 T6 Gb II 2 G Ex db eb [ia Ga] IIC T6 Gb II 2 D Ex tb [ia Da] IIIC T80°C Db IP66/IP67
	Model 4700abcdeffghijlmnn Zone 2	II 3 G Ex ec nC [ia Ga] IIC T5 Gc II 3 D Ex tc [ia Da] IIIC T80°C Dc IP66/IP67
	Model 4700abcdeffghijlmnn North America	Explosion Proof with I.S. output to sensor for Class I, Div 1, Groups C, D Non-Incendive for Class I, Div 2, Groups A, B, C, D Dust ignition Proof for Class II, Div. 1, Groups E, F, G
Ambient Temperature Rating	ALUMINUM (ALL MODELS): -52°C Ta 65°C 4700 STAINLESS-STEEL: -60°C Ta 60°C	

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

Type	Associated Apparatus	
Max Internal Ambient Temperature Rise	20°C	
Housing Temperature Rise	7°C	
Connection Facilities	Integral	Power: 2 (Exe rated terminals) I/O: 6 (Exe rated terminals)
	4-Wire Remote	Power: 2 (Exe rated terminals) I/O: 6 (Exe rated terminals) Sensor: 4 (Exi)
	9-Wire Remote	Power: 2 (Exe rated terminals) I/O: 6 (Exe rated terminals) Sensor: 9 (Exi)
Entity Parameters	9-Wire circuit	o Drive Circuit § Uo = 10.5V § Rs = 9.9 Ω § Lo/Ro = 12.77 µH / Ω o Pick-Off Circuit § Uo = 21 V § Rs = 9990 Ω § Lo/Ro = 3.22 mH / Ω o RTD Circuit § Uo = 21 V § Rs = 3630 Ω § Lo/Ro = 1.17 mH / Ω
	4-Wire Circuit	• Uo = 17.2 V • Ro = 35.91 Ω • Lo/Ro = 17.26 µH / Ω
PC Board Tracking Index	175 Minimum	

The 4700 Series Transmitter employs a PCA connector which connects the Electronics located in the Electronics compartment to the user interface terminals in the Terminal compartment. It consists of two sections of rigid PCB connected by a flexible section. The flexible section is an integral part of, and serves as the inner layers of, both rigid sections. One of the rigid sections passes through an aperture between the two housing compartments.

Conditions of Manufacture

Protection type: Intrinsic safety "i" items

i. In accordance with IEC 60079-11:2011 clause 10.3, each manufactured sample of the equipment shall be subjected to an electric strength test using a test voltage of 500 Vac applied between all input terminals and the enclosure for 60 seconds. Alternatively, a voltage of 20% higher may be applied for 1s. There shall be no evidence of flashover or breakdown and the maximum current flowing shall not exceed 5 mA.

ii. In accordance with IEC 60079-11:2011 clause 11.2, each manufactured sample of the equipment shall be subjected to an electric strength test using a test voltage of 1500 Vac applied between all input terminals and sensor output terminals for 60 seconds. Alternatively, a voltage of 20% higher may be applied for 1s. There shall be no evidence of flashover or breakdown and the maximum current flowing shall not exceed 5 mA

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

Protection type: Increased safety "eb", "ec" items

i. In accordance with IEC 60079-7:2015 clause 7.1, each manufactured sample of the equipment shall be subjected to an electric strength test using a test voltage of 500 Vac applied between all input terminals and the enclosure for 60 seconds. Alternatively, a voltage of 20% higher may be applied for 1s. There shall be no evidence of flashover or breakdown and the maximum current flowing shall not exceed 5 mA.

ii. In accordance with IEC 60079-7:2015 clause 7.1, each manufactured sample of the equipment shall be subjected to an electric strength test using a test voltage of 500 Vac applied between all input terminals and sensor output terminals for 60 seconds. Alternatively, a voltage of 20% higher may be applied for 1s. There shall be no evidence of flashover or breakdown and the maximum current flowing shall not exceed 5 mA.

Full certificate change history

Issue 1 – this Issue introduced the following changes:

1. Introduction of 4200J Version; new flameproof-only 4200 model with single-compartment stainless steel (SST) enclosure. Results of custom testing report to be assessed for acceptability of markings "Ex db IIB T6 Gb". No other changes to device construction or ratings.
2. Marking and the Product Description sections revised to include the introduced 4200J Version Marking and Description.

Issue 2 – this Issue introduced the following change:

1. To add a stainless-steel housing option for the intrinsically safe model. 4200(J,P)*****EB***** (IECEx version).

Issue 3 – this Issue introduced the following changes:

1. Products Description updated to include the model code description.
2. Introduction of 4700 Series; product description was updated accordingly.

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