

Micro Motion® Model 5700 Transmitter

IECEX Zone 2/22 Installation Instructions

EPL Gc and EPL Dc



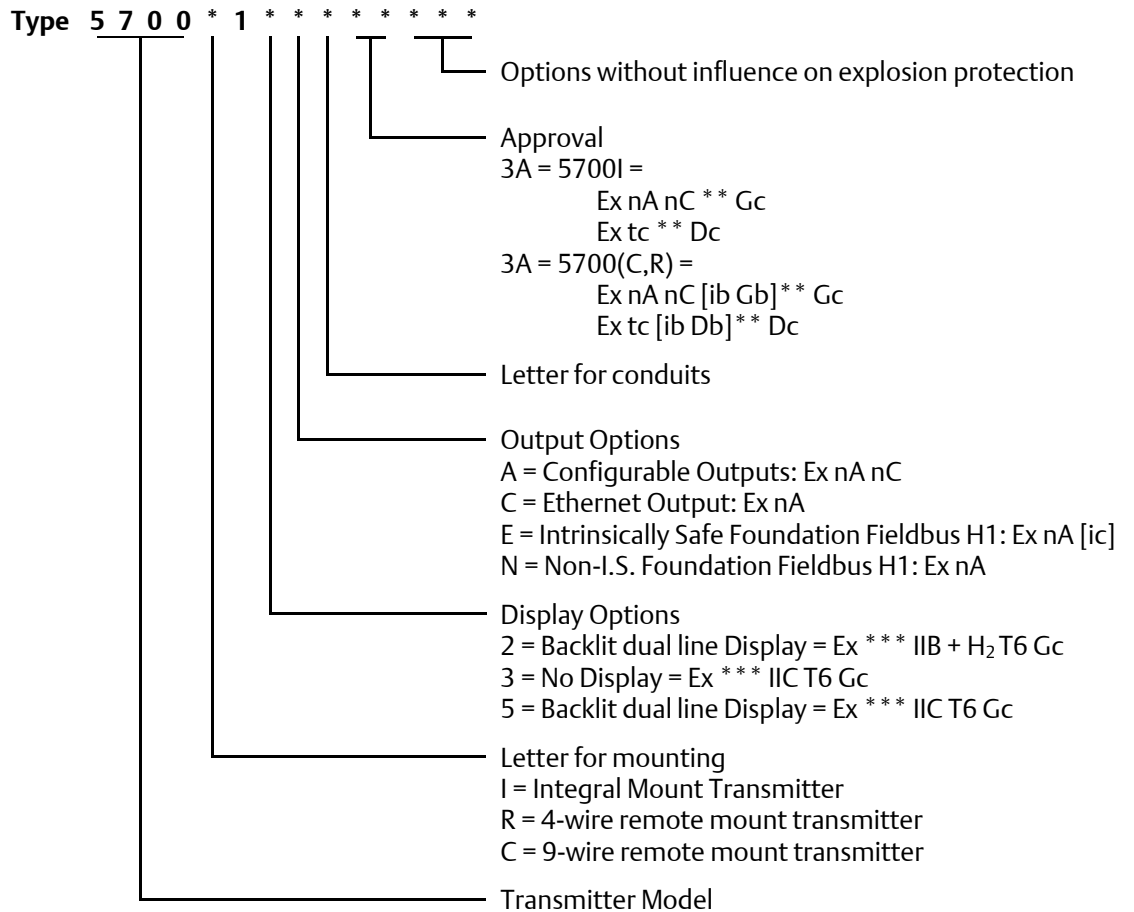
Subject:	Equipment type	Transmitter type 5700(I,C or R)1***3A***	
Manufactured and submitted for examination	Micro Motion, Inc.		
Address	Boulder, Co. 80301, USA		
Standard basis	IEC 60079-0:2011	General requirements	
	IEC 60079-11:2011	Type of protection	'i'
	IEC 60079-15:2010	Type of protection	'n'
	IEC 60079-31:2013	Dust Enclosure	't'
Code for type of protection	Ex nA nC IIB + H ₂ T4/T5 Gc or Ex nA nC IIC T4/T5 Gc and Ex tc IIIC T75°C Dc IP66/IP67 OR Ex nA nC IIB + H ₂ T4 Gc or Ex nA nC IIC T4 Gc IP66 OR Ex nA IIB + H ₂ T4 Gc or Ex nA IIC T4 Gc and Ex tc IIIC T75°C Dc IP66/67 OR Ex nA nC [ib Gb] IIB + H ₂ T4/T5 Gc or Ex nA nC [ib Gb] IIC T4/T5 Gc and Ex tc [ib Db] IIIC T75°C Dc IP66/IP67 OR Ex nA nC [ib Gb] IIB + H ₂ T4 Gc or Ex nA nC [ib Gb] IIC T4 Gc IP66 OR Ex nA [ic] [ib Gb] IIB + H ₂ T4 Gc or Ex nA [ic] [ib Gb] IIC T4 Gc and Ex tc [ib Db] IIIC T75°C Dc IP66/IP67 OR Ex nA [ic] IIB + H ₂ T4 Gc or Ex nA [ic] IIC T4 Gc and Ex tc [ib Db] IIIC T75°C Dc IP66/IP67		
Certificate of Conformity	IECEX BVS 14.0037X		

THIS COMPONENT MUST COMPLY WITH REGULATORY AGENCY REQUIREMENTS. NO CHANGES ARE ALLOWED WITHOUT PRIOR AUTHORIZATION FROM MICRO MOTION APPROVALS ENGINEERING

Model Designation

1) Transmitter type 5700 * 1 * * * * * * * *

Instead of the * * * in the complete denomination letters and numerals will be inserted which characterize the following variations:



2) Description

- The transmitter is, in combination with a sensor, used for measurement of mass flow and data transmission.
- The electrical circuitry of the transmitters is mounted inside a metal enclosure which is divided into three compartments.
- In one compartment (electronic compartment) the EMI Terminal Board, Power Supply Board, Feature Board, Core Board and Backplane Board are mounted.
- When executed with display, there is a window cover available, either marked (for gas application) as IIB + H₂ (type 5700*12**3A***) or IIC (type 5700*15**3A***)).
- The other compartment (terminal compartment) is equipped with terminals for the connection of I/O signals and power.
- The enclosure can be constructed with a terminal compartment (compartment for sensor connection) for the connection of remotely operating intrinsically safe sensors, type 5700C1***3A*** for a 9 wire connection, or type 5700R1***3A*** for a 4 wire connection.
- Alternatively, the enclosure can be mounted directly to the sensor via a transition compartment (type 5700I1***3A***). This type of mounting has to be certified separately.
- The enclosures (electronic compartment, terminal compartment and compartment for sensor connection) also fulfil the requirements for type of protection “Protection by enclosures”. The transmitter is intended to be used in a hazardous dust environment without change to any of the electronics aspects of the design.
- Issue 1 to IECEx BVS 14.0037 X adds:
 - Added [ib] output marking for connection to intrinsically safe sensors
 - Added dust marking
 - Added SMART Wireless THUM, Model 775, Certificate of Conformity IECEx BAS 09.0058
- Issue 2 to IECEx BVS 14.0037 X adds:
 - Ethernet Output
 - Fieldbus Output (Intrinsically Safe as well as Non-Intrinsically Safe)

3) Parameters

3.1 Mains circuits:

3.1.1 for type 5700*1*(A,E,N)***** (J1, terminal 1 - 2)

voltage		AC/DC	18 - 240 V + 10 %	
max. voltage	Um	AC/DC	265	V

3.1.2 for type 5700*1*C***** (J6, terminal 1 - 2)

voltage		AC/DC	18 - 240 V + 10 %	
max. voltage	Um	AC/DC	265	V

3.2 Non intrinsically safe input/output circuits:

3.2.1 For all types(J2, USB)

voltage	Um	AC/DC	10	V
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3.2.2 for type 5700*1*A***** (J3, terminals 1-10)

voltage	Um	AC/DC	30	V
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3.2.3 for type 5700*1*N***** (J3, terminals 1-2, FF)

voltage	Um	DC	33	V
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3.2.4 for type 5700*1*N***** (J3, terminals 3-4, mA)

voltage	Um	DC	30	V
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3.2.5 for type 5700*1*N***** (J3, terminals 5-6, FO/DO)

voltage	Um	DC	30	V
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3.2.6 for type 5700*1*C***** (J5, terminals 1-2)

voltage	Um	AC/DC	30	V
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3.2.7 for type 5700*1*C***** (J7/J8, ETHERNET RJ-45)

voltage	Un	DC	2,4	V
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3.3 Intrinsically safe circuits “ic”:

3.3.1 for type 5700*1*E***** (J3, terminals 1-2 FF)

voltage	Ui	DC	30	V
current	Ii		300	mA
power	Pi		1,3	W
effective internal inductance	Li		5	μH
effective internal capacitance	Ci		0,27	nF

3) Parameters (continued)

3.3.1.1 for type 5700*1*E***** (J3, terminals 1-2 FF) for the connection of a FIELDBUS circuit in accordance with FISCO model, Annex G of IEC 60079-11:2011

voltage	Ui	DC	33	V
current	li		380	mA
power	Pi		5,32	W
effective internal inductance	Li		5	μ H
effective internal capacitance	Ci		0,27	nF

3.3.2 for type 5700*1*E***** (J3, terminals 3-4, mA)

voltage	Ui	DC	30	V
current	li		484	mA
power	Pi		2,05	W
effective internal inductance	Li		5	μ H
effective internal capacitance	Ci		0,27	nF

3.3.3 for type 5700*1*E***** (J3, terminals 5-6, FO/DO)

voltage	Ui	DC	30	V
current	li		484	mA
power	Pi		2,05	W
effective internal inductance	Li		5	μ H
effective internal capacitance	Ci		11,27	nF

3.4 Sensor circuits for type 5700R1***** (J1 in J-box, VDC+ RED; VDC- BLK; COM A WHT; COM B GRN): "ib"

voltage	Uo	DC	17,2	V
current; instantaneous	Io		0,479	A
current; steady state	Io		0,272	A
power	Po		2,06	W

type of protection Ex ib IIC				
max. external inductance	Lo		154,9	μ H
max. external capacitance	Co		333	nF
max. induct/resistance ratio	Lo/Ro		17,26	μ H/ Ω

type of protection Ex ib IIB and IIIC				
max. external inductance	Lo		619,8	μ H
max. external capacitance	Co		2,04	μ F
max. induct/resistance ratio	Lo/Ro		69,0	μ H/ Ω

3) Parameters (continued)

3.5 Sensor circuits for type 5700(C or I)1 * * * * * * * * ; “ib”

3.5.1 Drive circuit; (J2 in J-box, DR+ BRN; DR- RED)

voltage	Uo	DC	10,5	V
current; instantaneous	Io		1,06	A
current; steady state	Io		0,272	A
power	Po		2,13	W
internal resistance	Ri		9,9	Ω

for group IIC

max. external capacitance	Co		2,41	μF
max. external inductance	Lo		31,6	μH
max. external induct/resist	Lo/Ro		12,77	μH/Ω

for group IIB and IIIC

max. external capacitance	Co		16,8	μF
max. external inductance	Lo		126,6	μH
max. external induct/resist	Lo/Ro		51,1	μH/Ω

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

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

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

3.5.2 Pick-off circuits (J1 in J-box, LPO+ GRN; LPO- WHT; RPO+ BLU; RPO- GRY)

voltage	Uo	DC	17,3	V
current	Io		6,92	mA
power	Po		30	mW

for group IIC

max. external capacitance	Co		353	nF
max. external inductance	Lo		742	mH
max. external induct/resist	Lo/Ro		1,19	mH/Ω

for group IIB and IIIC

max. external capacitance	Co		2,06	μF
max. external inductance	Lo		2,97	H
max. external induct/resist	Lo/Ro		4,75	mH/Ω

3) Parameters (continued)

3.5.3 Temperature circuit (J1 in J-box, RTD+ VIO; RTD- ORA; RTD-SIG YEL)

voltage	Uo	DC	17,3	V
current	Io		19,26	mA
power	Po		83,3	mW
for group IIC				
max. external capacitance	Co		353	nF
max. external inductance	Lo		95,8	mH
max. external induct/resist	Lo/Ro		0,42	mH/Ω
for group IIB and IIIC				
max. external capacitance	Co		2,06	μF
max. external inductance	Lo		383	mH
max. external induct/resist	Lo/Ro		1,68	mH/Ω

3.6 Sensor circuits for type 5700I1 * * * * * * * * ; “nA”:

3.6.1 Drive circuit; (J2 in J-box, DR+ BRN; DR- RED)

Rated voltage		DC	10,5	V
Rated current			80	mA

3.6.2 Pick-off circuits (J1 in J-box, LPO-WHT, LPO+ GRN; RPO+ BLU; RPO- GRY)

Rated voltage		DC	17,3	V
Rated current			6,92	mA

3.6.3 Temperature circuit(J1 in J-box, RTD+ VIO; RTD- ORA; RTD-SIG YEL)

Rated voltage		DC	17,3	V
Rated current			19,26	mA

3.7 Ambient temperature range

Type 5700*1***3A***	Ta			-40°C to +65°C
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4)

Marking

Type 5700*1*****

Ta

-40°C to +65°C

type	type of protection
Model 5700I12A*3A*** (Ex nA nC)	Ex nA nC IIB+H ₂ T5 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I1(3,5)A*3A*** (Ex nA nC)	Ex nA nC IIC T5 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I12C*3A*** (Ex nA nC)	Ex nA nC IIB+H ₂ T4 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I1(3,5)C*3A*** (Ex nA nC)	Ex nA nC IIC T4 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I12N*3A*** (Ex nA)	Ex nA IIB+H ₂ T4 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I1(3,5)N*3A*** (Ex nA)	Ex nA IIC T4 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I12E*3A*** (Ex nA ic)	Ex nA [ic] IIB+H ₂ T4 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I1(3,5)E*3A*** (Ex nA ic)	Ex nA [ic] IIC T4 Gc Ex tc IIIC T75°C Dc IP66/IP67
Model 5700I12**3A*** with THUM 775	Ex nA nC IIB+H ₂ T4 Gc IP66
Model 5700I1(3,5)**3A*** with THUM 775	Ex nA nC IIC T4 Gc IP66

5 min delay time after switch off

4) Marking (Continued)

Model 5700(R,C)12A*3A*** (Ex nA nC)	Ex nA nC [ib Gb] IIB+H2 T5 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)1(3,5)A*3A*** (Ex nA nC)	Ex nA nC [ib Gb] IIC T5 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)12C*3A*** (Ex nA nC)	Ex nA nC [ib Gb] IIB+H2 T4 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)1(3,5)C*3A*** (Ex nA nC)	Ex nA nC [ib Gb] IIC T4 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)12N*3A*** (Ex nA)	Ex nA [ib Gb] IIB+H2 T4 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)1(3,5)N*3A*** (Ex nA)	Ex nA [ib Gb] IIC T4 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)12E*3A*** (Ex nA ic)	Ex nA [ic] [ib Gb] IIB+H2 T4 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)1(3,5)E*3A*** (Ex nA ic)	Ex nA [ic] [ib Gb] IIC T4 Gc Ex tc [ib Db] IIIC T75°C Dc IP66/IP67
Model 5700(R,C)12**3A*** with THUM 775	Ex nA nC [ib Gb] IIB+H2 T4 Gc IP66
Model 5700(R,C)1(3,5)**3A*** with. THUM 775	Ex nA nC [ib Gb] IIC T4 Gc IP66

5 min delay time after switch off

5) Special conditions for safe use / Installation instructions

- 5.1 For the application of the transmitter in an ambient temperature of less than -20°C suitable cable and cable entries or conduit entries certified for this condition shall be used.
- 5.2 For use in explosive atmosphere caused by combustible dust, suitable cables and for that purpose certified cable entries res. blanking plugs shall be used.
- 5.3 The user interface module shall not be disconnected from the electronic module unless the unit has been de-energized.
- 5.4 The Rotary and DIP switches on the user interface shall not be switched unless the unit has been de-energized.
- 5.5 The USB connection in the terminal compartment is only for service facilities and shall only be used when there is no explosive gas or dust atmosphere present. Making connection to this port is only allowed when the equipment is de-energized.
- 5.6 The windows cover forms one unit and cannot be taken apart without destroying the cover parts. If a cover is damaged it must be replaced by a new cover.
- 5.7 The transmitter 5700I is intended to be used only in the combination with Micro Motion sensors. The integral combination with sensors must be certified separately.

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