Engineering Specification

SPEC, APPVL INST 2200S ATEX Zn1
EB-20012518
Revision: AA
Number of Pages: 7
Comments:

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

Originator: RCS 6/3/08

Approved: RCS 6/3/08

Rev	ECN	Description	Approval	Date
A	1035856	Release to Approvals	RCS	6/13/08
AA	1038207	Added Output Option Codes 5 and 6 for Wireless HART	RCS	6/25/09

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Subject:	Equipment type	**Transmitter type 2200S*****Z****
Manufactured and submitted for examination		**Micro Motion, Inc.**
Address		**Boulder, Co. 80301, USA**
Basis for examination		**Annex II of Directive 94/9/EC**
Standard basis	EN 60079-0:2006	General requirements
	EN 60079-11:2007	Intrinsic safety ´i´
	EN 61241-0:2006	Dust Evaluation
	EN 61241-11:2006	Dust Evaluation "ibD".
Code for type of protection		**II 2G Ex ib IIB/IIC T4** **II 2D Ex ibD 21 T70°C**
EC-Type Examination Certificate		BVS 08 ATEX E 099 X

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1) Subject and Type

Transmitter type 2200S*****Z****

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

Type 2 2 0 0 S * * * * * Z * * * *

- Options without influence on explosion protection
- Approval
  Z = ATEX II 2G/D; Zone 1/ Zone 21
- Letter for conduits
- Display Options
  1 = Dual Line Display
- IO Terminations
- Output Options
  H = One 12-20mA with HART [Loop Power]
  K = One 4-20mA with HART [Loop Power], supplied with Level Shifting Power Supply (Model 505)
  5 = One 12-20mA with HART [Loop Power] Wireless HART
  6 = One 4-20mA with HART [Loop Power], supplied with Level Shifting Power Supply (Model 505) Wireless HART
- Letter for mounting
  I = Integral Mount Transmitter with aluminum enclosure
  J = Integral Mount Transmitter with stainless steel enclosure

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2) Description

The Micro Motion model 22**S*(H or K)***Z**** Transmitter is integrally mounted to a Micro Motion Coriolis Meter.

The model 22**S*(H or K)***Z**** integral mount transmitter system architecture consists of two circuit boards, which are encapsulated into a potting shell. The encapsulated assembly makes a 9-wire connection to the Micro Motion Coriolis Meter via a fixed 9-wire cable. Attached to the encapsulated assembly, by two mounting screws, is a User Interface (UI) that contains an optional LCD display and temporary service connections.

The model 22**S*(H or K)***Z**** has one sets of two screw terminals for connecting multifunctional wires providing both I/O communication and power input

The enclosure material is either aluminum with blue paint or stainless steel.

The enclosure has two conduit openings for customer wiring to power terminals and I/O signaling however, only one conduit opening will be used and one conduit opening will be provided with an approved blanking plug. A chassis ground terminal is located both inside the power terminal compartment and also external on the housing.

Amendment 1 to EC-Type Examination Certificate BVS 08 ATEX E 099 X incorporates the new Output options 5 and 6 for the installation of the SMART Wireless THUM Model 775 marked as Ex ia IIC T4 (EC-Type Examination Certificate Baseefa 09ATEX0125X). The THUM comes pre-installed from the factory. The denomination is 22**S*(5 or 6)***Z****. Furthermore the electrical parameter Li of 30µH in section 3.1 has changed into 45µH.

3) Parameters

3.1 Input circuit (terminals 1 - 2)

- voltage	Ui	DC	28	V
- current	Ii		120	mA
- power	Pi		0,84	W
- capacitance	Ci		2200	pF
- inductance	Li		45	µH

3.2 - Intrinsically Safe Output Circuits with type of protection Ex ib, for connection to a Micro Motion Coriolis meter

3.2.1 - drive circuit (J4 pins 7 - 8)

- voltage	Uo	DC	10,5	V
- current	Io		80	mA
- power	Po		0,84	W
- internal resistance	Ri		4,32	Ω
- for group IIC				
- max. external capacitance	Co		2,41	µF
- max. external inductance	Lo		5,9	µH
- max. external inductance/resistance ratio	Lo/Ro		5,5	µH/Ω
- for group IIB				
- max. external capacitance	Co		16,8	µF
- max. external inductance	Lo		24	µH
- max. external inductance/resistance ratio	Lo/Ro		22	µH/Ω

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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 will be inserted. Ro is the sensor coil internal resistance plus the sensor coil series resistance.

3.2.2 - Pick-off circuits (J4 pins 3 to 6)

- voltage	Uo	DC	12,6	V
- current	Io		4,29	mA
- power	Po		13,52	mW
- for group IIC				
- max. external capacitance	Co		1,15	µF
- max. external inductance	Lo		1,93	H
- max. external inductance/resistance ratio	Lo/Ro		2,2	mH/Ω
- for group IIB				
- max. external capacitance	Co		7,4	µF
- max. external inductance	Lo		7,7	H
- max. external inductance/resistance ratio	Lo/Ro		8,9	mH/Ω

3.2.3 - Temperature circuit (J4 pins 1, 2 and 9)

- voltage	Uo	DC	12,6	V
- current	Io		3,31	mA
- power	Po		2,2	mW
- for group IIC				
- max. external capacitance	Co		1,15	µF
- max. external inductance	Lo		3,24	H
- max. external inductance/resistance ratio	Lo/Ro		3,0	mH/Ω
- for group IIB				
- max. external capacitance	Co		7,4	µF
- max. external inductance	Lo		12,9	H
- max. external inductance/resistance ratio	Lo/Ro		12,0	mH/Ω

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3.3 - Temporary HART and Service Port connections

- voltage	Uo	DC	12,6	V
- current	Io		15,6	mA
- power	Po		84,0	mW
- for group IIC				
- max. external capacitance	Co		1,15	µF
- max. external inductance	Lo		7,0	µH
- max. external inductance/resistance ratio	Lo/Ro		11,8	µH/Ω
- for group IIB				
- max. external capacitance	Co		7,4	µF
- max. external inductance	Lo		28,0	µH
- max. external inductance/resistance ratio	Lo/Ro		47,0	µH/Ω

Note: While the Temporary Service Port terminals meet I.S. requirements, they are not available for customer use. The terminals are covered by a plug and labeled “Factory Use Only”. When the service port is utilized by service personnel for upgrade purposes, the circuits are protected from incidental damage potentially caused by non-I.S. devices temporarily connected to the port.

3.4 - Ambient temperature range Ta -40 °C up to +60 °C

4) Marking

4.1 -40 °C ≤ Ta ≤ +60°C

- type	- type of protection
2200SI(H or K)*1*Z**** With Aluminum Housing	CE 0575 Ex II 2G Ex ib IIB/IIC T4 II 2D Ex ibD 21 T70°C
2200SJ(H or K)*1*Z**** With Stainless Steel Housing	CE 0575 Ex II 2G Ex ib IIB/IIC T4 II 2D Ex ibD 21 T70°C
2200SI(5 or 6)*1*Z**** With Aluminum Housing	CE 0575 Ex II 2G Ex ib IIB/IIC T4
2200SJ(5 or 6)*1*Z**** With Stainless Steel Housing	CE 0575 Ex II 2G Ex ib IIB/IIC T4

5) Special conditions for safe use / Installation instructions

5.1 The permissible ambient temperature range for the transmitter is -40 °C up to +60 °C. The use of the transmitter at an ambient temperature under - 20 °C is only admissible, if the cables and cable entries or conduit entries are suitable for that temperature and use.

5.2 The cable entries or conduit entries shall have a degree of protection of at least IP54.

5.3 The HART and Temporary Service Port connections meet the I.S. requirements, however they are not available for customer use. The terminals are covered by a plug and labeled “Factory Use Only”. When the service port is utilized by service personnel for upgrade purposes, the circuits are protected from incidental damage potentially caused by non-I.S. devices temporarily connected to the port.

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5.4 The marking "ibD" indicates how safe power is to be routed to the 2200S. Safe power from a barrier is required to claim compliance with surface temperature and for routing power in “normal” cables.

5.5 For wiring instructions of the SMART Wireless THUM Model 775, see Installation drawing ATEX-D-IS EB-20015854.

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