



# IECEx Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEx ITS 14.0052X** issue No.: **2**  
Status: **Current**  
Date of Issue: **2015-10-14** Page 1 of 5

Certificate history:  
Issue No. 2 (2015-10-14)  
Issue No. 1 (2015-4-27)  
Issue No. 0 (2015-2-20)

Applicant: **Metal Samples Company (a Division of Alabama Specialty Products Inc)**  
152 Metal Samples Road  
Munford  
AL 36268  
United States of America

Electrical Apparatus: **MS2700E High Resolution ER RS-485 Transmitter, MS2800E Ultra Resolution ER RS-485 Transmitter, MS2701E High Resolution ER RS-485 Transmitter and MS2801E Ultra Resolution ER RS-485 Transmitter**

Optional accessory:

Type of Protection: **Intrinsic safety Ex ia**

Marking:	<b>MS2700E/ MS2800E (Single)</b> Ex ia IIC T4 Ga Ex ia IIIC T130°C Da -20°C ≤ Ta ≤ +70°C	<b>MS2701E/ MS2801E (Single)</b> Ex ia d IIC T4 Gb Ex ia d IIIC T130°C Da -20°C ≤ Ta ≤ +70°C
	<b>MS2700E/ MS2800E (Multi-drop)</b> Ex ia IIB T4 Ga Ex ia IIIB T130°C Da -20°C ≤ Ta ≤ +70°C	<b>MS2701E/ MS2801E (Multi-drop)</b> Ex ia d IIB T4 Gb Ex ia d IIIB T130°C Da -20°C ≤ Ta ≤ +70°C

Approved for issue on behalf of the IECEx  
Certification Body:

A T Austin

Position:

Certification Officer

Signature:  
(for printed version)

Date:

2015-10-14

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 the Official IECEx Website.

Certificate issued by:

**Intertek Testing & Certification Limited**  
ITS House, Cleeve Road,  
Leatherhead,  
Surrey, KT22 7SB  
United Kingdom



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Manufacturer: **Metal Samples Company (a Division of Alabama Specialty Products Inc)**  
152 Metal Samples Road  
Munford  
AL 36268  
United States of America

Additional Manufacturing location  
(s):

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 electrical apparatus 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 : 2011** Explosive atmospheres - Part 0: General requirements  
Edition: 6.0

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

*This Certificate does not indicate compliance with electrical 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 Report:

GB/ITS/ExTR14.0051/00

GB/ITS/ExTR14.0051/01

GB/ITS/ExTR14.0051/02

#### Quality Assessment Report:

GB/ITS/QAR14.0019/00



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## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

The ER RS-485 Transmitter is a field mounted microprocessor based corrosion transmitter capable of measuring and transmitting data from all types of electrical resistance (ER) corrosion probes. The High Resolution ER RS485 Transmitter comprise a digital board, an analog board and a transformer board all housed within a stainless steel enclosure.

The printed circuit boards (pcbs) contain fixed resistors, capacitors, inductor in the form of a transformer, semiconductor devices, connectors for printed circuit board interconnections, terminal block and connectors for external connections. The ER RS485 Transmitter is of four models which are MS2700E/MS2701E High Resolution ER RS-485 Transmitters and MS2800E/MS2801 Ultra Resolution ER RS-485 Transmitters. All models are electronically the same. The difference between the MS27XXE series and MS28XXE series is only in the firmware that processes the acquired data.

Enclosures for all models maintain the degree of protection of at least IP66. The enclosure for MS2700E and MS2800E transmitters is made of stainless steel while the enclosure for MS2701E and MS2801E transmitters is pre-certified flameproof enclosure made with aluminum alloys.

The maximum intrinsically safe input and output parameters at the external connections are as follows:

**Input supply terminal:**

$U_i = 23 \text{ Vdc}$ ,

$I_i = 88.2 \text{ mA}$

$P_i = 0.52 \text{ W}$

$C_i = 0$

$L_i = 0$

**RS-485 channel at each line:**

$U_i = 3.7 \text{ Vdc}$

$I_i = 225 \text{ mA}$

$P_i = 0.206 \text{ W}$

$U_o = 5 \text{ V}$

$I_o = 51 \text{ mA}$

$P_o = 64 \text{ W}$

**Terminal connector J1 (probe connections):**

$U_o = 5 \text{ V}$

$I_o = 503 \text{ mA}$

$P_o = 0.7 \text{ W}$

**RS-485 channel and Terminal connector J1 (Combined)**

$C_i = 68 \mu\text{F}$

$L_i = 0$

$C_o = 32 \mu\text{F}$

$L_o = 0.14 \text{ mH}$

### CONDITIONS OF CERTIFICATION: YES as shown below:

1. The Corrosion Probe is not capable of withstanding the 500 V r.m.s electric strength test as required by clause 6.3.13 of IEC 60079-11:2011. This must be taken into account when installing the Probe.
2. Only the ER RS-485 Transmitter can be installed in explosive dust atmosphere. The ER probe cannot be installed in the explosion dust atmosphere (Group III).
3. The equipment shall be classified as Group IIB/IIIB when networked in daisy chain arrangement.
4. Maximum number of 32 transmitters are allowed in the daisy arrangement.
5. Only cable glands and blanking plugs certified for protection types 'd', 'tb', and have an IP66 rating may be used in the Ex d enclosure.
6. The equipment must be supplied via an Ex-certified Intrinsically safe barrier with the specified entity parameters irrespective of the flameproof enclosure utilized.





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## DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

### Issue 1; Intertek Project Ref G101693610-1; IECEx Test report No. GB/ITS/ExTR14.0051/01 dated March 2015

1. MS2701E and MS2801E models added as part of this certification.
2. Allow the equipment to be networked in daisy chain arrangement.
3. Changes to appropriate documents to reflect the above changes.

### Issue 2; Intertek Project Ref G102139087; IECEx Test report No. GB/ITS/ExTR14.0051/02 dated October 2015

1. Entity parameters at the input supply terminal for the Group IIB ER RS485 Transmitters (used in daisy chain arrangement) changed from  $U_i = 23 \text{ Vdc}$ ,  $I_i = 88.2 \text{ mA}$ ,  $P_i = 0.52 \text{ W}$  to  $U_i = 23.6 \text{ Vdc}$ ,  $I_i = 352.8 \text{ mA}$ ,  $P_i = 2.3 \text{ W}$ .
2. Entity parameters at the probe output connection for the Group IIB ER RS485 Transmitters (used in daisy chain arrangement) changed from  $U_o = 5 \text{ V}$ ,  $I_o = 503 \text{ mA}$ ,  $P_o = 0.7 \text{ W}$  to  $U_o = 5 \text{ V}$ ,  $I_o = 352.8 \text{ mA}$ ,  $P_o = 0.44 \text{ W}$ .
3. Value of current limiting resistor R1 changed from  $180 \Omega \pm 1\% 3W$ , changed to  $300 \Omega \pm 1\% 3W$ .
4. Changes to appropriate documents to reflect the above changes.



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## Additional information:

The new entity parameters for the Group IIB ER RS485 Transmitters are:

### Input supply terminal:

$U_i = 23.6 \text{ Vdc}$ ,  
 $I_i = 352.8 \text{ mA}$   
 $P_i = 2.3 \text{ W}$   
 $C_i = 0$   
 $L_i = 0$

### RS-485 channel at each line:

$U_i = 3.7 \text{ Vdc}$   
 $I_i = 225 \text{ mA}$   
 $P_i = 0.206 \text{ W}$   
 $U_o = 5\text{V}$   
 $I_o = 51 \text{ mA}$   
 $P_o = 64 \text{ mW}$

### Terminal connector J1 (probe connections):

$U_o = 5 \text{ V}$   
 $I_o = 352.8 \text{ mA}$   
 $P_o = 0.44 \text{ W}$

### RS-485 channel and Terminal connector J1 (Combined)

$C_i = 68\mu\text{F}$   
 $L_i = 0$   
 $C_o = 32\mu\text{F}$   
 $L_o = 1.2 \text{ mH}$