1 # EU - TYPE EXAMINATION CERTIFICATE

2 **Safety Device, Controlling Device or Regulating Device intended for use outside a potentially explosive atmosphere but required for or contributing to the safe functioning of Equipment and Protective Systems with respect to the risks of explosion**
Directive 2014/34/EU

3 EU - Type Examination Certificate Number: **Baseefa08ATEX0322 – Issue 3**

3.1 In accordance with Article 41 of Directive 2014/34/EU, EC-Type Examination Certificates referring to 94/9/EC that were in existence prior to the date of application of 2014/34/EU (20 April 2016) may be referenced as if they were issued in accordance with Directive 2014/34/EU. Supplementary Certificates to such EC-Type Examination Certificates, and new issues of such certificates, may continue to bear the original certificate number issued prior to 20 April 2016.

4 Product: **MTL5541A / MTL5541AS Single Channel & MTL5544A / MTL5544AS Two Channel Current Repeater**

5 Manufacturer: **Eaton Electric Limited**

6 Address: **Great Marlings, Butterfield, Luton, Bedfordshire, LU2 8DL**

7 This re-issued certificate extends EC Type Examination Certificate No. Baseefa08ATEX0322 to apply to product designed and constructed in accordance with the specification set out in the Schedule of the said certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

8 SGS Baseefa, Notified Body number 1180, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential Report No. See Certificate History

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0: 2012 + A11: 2013 EN 60079-11: 2012

except in respect of those requirements listed at item 18 of the Schedule.

10 If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

11 This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

12 The marking of the product shall include the following :

Ⓔx II (1) GD [Ex ia Ga] IIC (-20°C ≤ T_a ≤ +60°C)
[Ex ia Da] IIIC (-20°C ≤ T_a ≤ +60°C)
Ⓔx I (M1) [Ex ia Ma] I (-20°C ≤ T_a ≤ +60°C)

SGS Baseefa Customer Reference No. **0703** Project File No. **16/0371**

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R S SINCLAIR PP D CRETNEY
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13 **Schedule**

14 **Certificate Number Baseefa08ATEX0322 – Issue 3**

15 **Description of Product**

The MTL5544A Two Channel Current Repeater is designed to repeat up to two 4-20mA current signals from separately powered 4/20mA transmitters located in the hazardous area to unspecified apparatus in the non-hazardous area, whilst restricting the transfer of energy from the unspecified non-hazardous area apparatus to the intrinsically safe circuits by the means of limitation of current and voltage. The apparatus also allows bi-directional signal communication between the hazardous and non-hazardous area by connection of a hand-held communicator (HHC).

The MTL5544A Two Channel Current Repeater comprises four isolating transformers that provide galvanic isolation between the hazardous and non-hazardous area circuitry, fuses, zener diodes and resistors providing voltage and current limitation on each channel. The above, together with other electronic components are mounted on a single printed circuit board (PCB) and housed in a moulded plastic enclosure. Polarised plug and sockets are provided for hazardous and non-hazardous area connections. The apparatus is fitted with a Power-on LED indication.

The MTL5541A Single Channel Current Repeater is a depopulated version of the MTL5544A and has only one channel populated.

Minor changes to the non-hazardous are circuitry of both models of the apparatus form the MTL5541AS Single Channel and MTL5544AS Two Channel Current Repeater. These models use the same common PCB and enclosure and in terms of intrinsic safety are identical.

Input / Output Parameters

Non-Hazardous Area Terminals 8, 9, 11, 12, 13 & 14)

U_m = 253V r.m.s.

The circuit connected to non-hazardous area terminals 8, 9, 11, 12, 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V.

Hazardous Area Terminals 2 w.r.t. 1 (Channel 1)
Or
Hazardous Area Terminals 5 w.r.t. 4 (Channel 2 – MTL5544A / 5544AS)

U_o = 8.6V (Diode) C_i = 0
I_o = 0 L_i = 0
P_o = 0

This output voltage does not contribute to the short circuit spark risk, but must be considered for the calculation of load capacitance.

Although the apparatus does not itself comply with the simple apparatus requirements of Clause 5.7 of EN 60079-11: 2012, when each hazardous area channel is connected in an intrinsically safe circuit the internal stored energy, voltage and current of the interface will not add more than the values specified in Clause 5.7 of EN 60079-11: 2012 to the parameters of the circuit into which it is connected.

Each hazardous area channel is also considered suitable for the connection of an external intrinsically safe source with a U_o = 30V and I_o = 100mA having a source resistance of U_o/I_o to be connected to hazardous area terminals 2 w.r.t. 1 - Channel 1 and 5 w.r.t. 4 – Channel 2.

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area cable must not exceed the values as detailed in the original schedule or the certificate relating to the external intrinsically safe source.

Each channel must be considered as a separate intrinsically safe circuit.

Hazardous Area Terminals 5 w.r.t. 1 (Channels 1 & 2 combined with terminals 2 & 4 connected together – MTL5544A / 5544AS models only

U_o = 17.2V (Diode) C_i = 0
I_o = 0 L_i = 0
P_o = 0

This output voltage does not contribute to the short circuit spark risk, but must be considered for the calculation of load capacitance.

The connection of channel 1 and 2 together is considered suitable for the connection of an external intrinsically safe source with a U_o = 30V and I_o = 100mA having a source resistance of U_o/I_o to be connected to hazardous area terminals 5 w.r.t. 1.

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area cable must not exceed the values as detailed in the original schedule or the certificate relating to the external intrinsically safe source.

Load Parameters

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the load connected must not exceed the following values:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR L/R RATIO (µH/ohm)
Hazardous Area Terminals 2 w.r.t. 1 (Channel 1) or 5 w.r.t. 4 (Channel 2 – MTL5544A/44AS models only)			
IIC	6.2	5.01	1,351
IIB*	55	20.06	5,406
IIA	1,000	40.12	10,813
I	1,000	65.82	17,740
Hazardous Area Terminals 5 w.r.t. 1 (Channels 1 & 2 combined – MTL5544A/44AS models only)			
IIC	0.36	5.01	675
IIB*	2.11	20.06	2,703
IIA	8.7	40.12	5,406
I	12.16	65.82	8,870

* Group IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

1) The above load parameters apply when one of the two conditions below is given:
- the total L_i of the external circuit (excluding the cable) is < 1% of the L_o value or
- the total C_i of the external circuit (excluding the cable) is < 1% of the C_o value.

2) The above parameters are reduced to 50% when both of the two conditions below are given:
- the total L_i of the external circuit (excluding the cable) is ≥ 1% of the L_o value and
- the total C_i of the external circuit (excluding the cable) is ≥ 1% of the C_o value.

The reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for Groups IIB, IIA & I and 600nF for Group IIC.

16 Report Number

GB/BAS/ExTR16.0238/00

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

In addition to the Essential Health and Safety Requirements (EHSRs) covered by the standards listed at item 9, the following are considered relevant to this product, and conformity is demonstrated in the report:

Clause	Subject	Compliance
1.2.7	Protection against other hazards (LVD type requirements, etc.)	Manufacturer responsibility
1.2.8	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
1.4.1	External effects	User/Installer responsibility
1.4.2	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

New drawings submitted for this issue of certificate:

Number	Sheet	Issue	Date	Description
CI5541-2	1 of 1	3	7.16	MTL5541A Certification Label Details & DIN Rail Fittings – Baseefa

The above drawing is associated and held with IECEx BAS 08.0106 Iss. 5

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
CI4541-2	1 of 8	1	10.08	Parts List for MTL4541A / MTL4544A
CI4541-2	2 of 8	1	12.08	Certification Diagram for MTL4544A & 4541A
CI4541-2	3 of 8	1	12.08	Certification Diagram for MTL4544A & 4541A
CI4541-2	4 of 8	1	11.08	MTL4541A & MTL4544A Track Layout
CI4541-2	5 of 8	2	1.13	MTL4541A & MTL4544A Component Layout
CI4541-2	6 of 8	1	11.08	PCB Detail for TPL300
CI4541-2	7 of 8	1	11.08	PCB Detail for TPL301
CI4500-3	1 of 1	1	12.10	MTL4500 & MTL5500 – Alternative Zener Diodes (Panjit)
CI4500-5	1 of 1	1	11.10	MTL5500 – Alternative DIN Rail Mechanism
CI4500-6	1 of 1	1	20.12.10	MTL4500 & MTL5500 – Conformal Coating
CI5500-100	1 of 1	3	1.13	New 5500 Outline

The above drawings are associated and held with IECEx Certificate No. IECEx BAS 08.0106

20 Certificate History

Certificate No.	Date	Comments
Baseefa08ATEX0322	12 December 2008	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0: 2006, EN 60079-11: 2007 and EN 61241-11: 2006 is documented in Certification Test Report No. GB/BAS/ExTR08.0223/00.

Certificate No.	Date	Comments
Baseefa08ATEX0322/1	31 January 2011	i) To permit the addition of output parameters for the interconnection of hazardous area channel 1 & 2 on the MTL5544A & MTL5544AS Current Repeater models. The combination of the two channels does not affect the original assessment. ii) To permit the notes associated with the load parameters of all models specified in the original certificate schedule to be revised. iii) To permit the alternative fitting of 1SMB3EZ** zener diodes in place of 1SMB59**BT3 components currently fitted. iv) An alternative method of applying the conformal coating to the PCB fitted in the equipment not affecting the original assessment. v) To permit the use of an alternative DIN rail mechanism not affecting the original assessment. vi) To confirm the current designs of the MTL5541A / MTL5541AS Single Channel & MTL5544A / MTL5544AS Two Channel Current Repeaters have been reviewed against the requirements of EN 60079-0: 2009 in respect of the differences from EN 60079-0: 2006, and with exception of the marking, none of the differences affect the equipment. In accordance with the requirements of EN 60079-0: 2009, the equipment markings were revised to include the Equipment Protection Level (EPL) markings. The associated test and assessment is documented in Certification Report No. GB/BAS/ExTR10.0281/00.
Baseefa08ATEX0322/2	5 March 2014	i) To permit minor component and drawing changes not affecting the original assessment. ii) To confirm the current design of the MTL5541A / MTL5541AS Single Channel & MTL5544A / MTL5544AS Two Channel Current Repeaters have been reviewed against the requirements of EN 60079-0: 2012 and EN 60079-11: 2012 in respect of the differences from EN 60079-0: 2009, EN 60079-11: 2007 and EN 61241-11: 2006 and none of the differences affect the equipment. In accordance with EN 60079-11: 2012, the Group I capacitive load parameters were corrected and the associated load parameter notes were updated. The associated assessment is documented in Certification Report No. GB/BAS/ExTR14.0043/00.
Baseefa08ATEX0322 Issue 3	5 October 2016	This issue of the certificate incorporates previously issued primary & supplementary certificates into one certificate and confirms the current designs meet the requirements of EN 60079-0: 2012 + A11: 2013 & EN 60079-11: 2012. The certificate also permits the manufacturer's name to be changed on page 1 of the certificate and on the equipment marking. The associated assessment is documented in Certification Report No. GB/BAS/ExTR16.0238/00.
For drawings applicable to each issue, see original of that issue.		