



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

Certificate No.: IECEx BAS 08.0106 issue No.:5

Status: **Current**

Date of Issue: **2016-10-05** Page 1 of 4

Certificate history:
Issue No. 5 (2016-10-5)
Issue No. 4 (2014-3-5)
Issue No. 3 (2012-3-30)
Issue No. 2 (2011-1-31)
Issue No. 1 (2009-5-6)
Issue No. 0 (2008-12-15)

Applicant: **Eaton Electric Limited**
Great Marlings
Butterfield
Luton
Bedfordshire LU2 8DL
United Kingdom

Equipment: **MTL5541A / MTL5541AS Single Channel & MTL5544A / MTL5544AS Two Channel
Current Repeater**
Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: **[Ex ia Ga] IIC
[Ex ia Da] IIIC
[Ex ia Ma] I
-20°C ≤ Ta ≤ +60°C**

Approved for issue on behalf of the IECEx
Certification Body:

R S Sinclair *PP O'BRIEN/ALLEY*

Position: Technical Manager

Signature:
(for printed version)

[Signature]
7/10/16

Date:

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](http://www.iecex.com).

Certificate issued by:

SGS Baseefa Limited
Rockhead Business Park
Staden Lane
Buxton, Derbyshire, SK17 9RZ
United Kingdom





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Manufacturer: **Eaton Electric Limited**
Great Marlings
Butterfield
Luton
Bedfordshire
LU2 8DL
United Kingdom

Additional Manufacturing location(s):

**MTL Instruments PVT
Limited**
No 3 Old Mahabalipuram
Road
Sholinganallur
Chennai 600119
India

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/BAS/ExTR08.0223/00
GB/BAS/ExTR16.0238/00

GB/BAS/ExTR10.0281/00

GB/BAS/ExTR14.0043/00

Quality Assessment Report:

GB/BAS/QAR06.0022/06

GB/BAS/QAR07.0017/05



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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

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 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.

See Annex for electrical data.

CONDITIONS OF CERTIFICATION: NO



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

Variation 5.1

To permit the manufacturer's name to be changed on the certificate and equipment marking. No other changes are made to the equipment design.

ExTR: **GB/BAS/ExTR16.0238/00**

File Reference: **16/0371**

| | | |
|---|--|------------------|
| SGS Baseefa Limited Rockhead Business Park Staden lane, Buxton, Derbyshire SK17 9RZ United Kingdom |  | |
| ANNEX to IECEx BAS 08.0106 | Issue No. 3 | Date: 2014/03/05 |

MTL5541A / MTL5541AS Single Channel and MTL5544A / MTL5544AS Two Channel Current Repeater

Input/Output Parameters

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

$$U_m = 253V \text{ r.m.s.}$$

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 models only)

$$\begin{array}{ll} U_o = 8.6V \text{ (Diode)} & C_i = 0 \\ I_o = 0 & L_i = 0 \\ P_o = 0 & \end{array}$$

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 IEC 60079-11: 2006, 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 IEC 60079-11: 2006 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)

$$\begin{array}{ll} U_o = 17.2V \text{ (Diode)} & C_i = 0 \\ I_o = 0 & L_i = 0 \\ P_o = 0 & \end{array}$$

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 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 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 hazardous area load connected to the apparatus must not exceed the following values:

| GROUP | CAPACITANCE (μF) | INDUCTANCE (mH) | OR | L/R RATIO ($\mu\text{H}/\text{ohm}$) |
|---|----------------------------------|--------------------|----|---|
| 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 $\geq 1\%$ of the L_o value and
 - the total C_i of the external circuit (excluding the cable) is $\geq 1\%$ of the C_o value.

The reduced capacitance of the external circuit (including cable) shall not be greater than $1\mu\text{F}$ for Groups IIB, IIA & I and 600nF for Group IIC.