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: **Baseefa06ATEX0156 – Issue 11**

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: **MTL4541* / MTL4544* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters**

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. Baseefa06ATEX0156 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. **18/0066**

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PP D BREARLEY
CERTIFICATION
MANAGER

R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13 **Schedule**

14 **Certificate Number Baseefa06ATEX0156 – Issue 11**

15 **Description of Product**

The MTL4544* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters is designed to provide a floating d.c. supply for energising two conventional 2 or 3-Wire 4/20mA transmitters or a 'smart' transmitter in the hazardous area and repeat these currents 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 voltage and current. The apparatus also allows bi-directional signal communication between the hazardous and non-hazardous area by the connection of a hand-held communicator (HHC).

The MTL4544* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters comprises four isolating transformers that provide galvanic isolation between the hazardous and non-hazardous area circuitry, zener diode chains and resistors providing voltage and current limitation. The above, together with other electronic components are mounted on a single printed circuit board (PCB) and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections. All models are fitted with a power indication LED.

The MTL4541* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters is a depopulated version of the MTL4544* and has only one channel populated. Both the MTL4541* and MTL4544* are available in a number of model variants, denoted by the last digit in the model number. All model variants are built on a common PCB.

The following models are covered by this certificate: -

- MTL4541 Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters
- MTL4541B Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters
- MTL4541P Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters
- MTL4544 Dual Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters
- MTL4544B Dual Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters

Input/Output Parameters

MTL4541, MTL4541B, MTL4544 & MTL4544B

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 - MTL4544 / MTL4544B Models Only)

U_o = 28V C_i = 0
I_o = 93mA L_i = 0
P_o = 0.65W

Hazardous Area Terminals 3 w.r.t. 1 (Channel 1)
or
Hazardous Area Terminals 6 w.r.t 4 (Channel 2 - MTL4544 / MTL4544B models only)

U_o = 1.1V C_i = 0 U_i = 30V
I_o = 53mA L_i = 0 I_i = 121mA
P_o = 15mW

When an intrinsically safe source is connected to these terminals it should have a source resistance of U_i / I_i and the capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area connections must not exceed the values detailed in the certificate of the intrinsically safe source.

Hazardous area terminals 2 and 5 must not be used when the above source is connected to these terminals.

Hazardous Area Terminals 2 w.r.t. 3 (Channel 1)
Or
Hazardous Area Terminals 5 w.r.t. 6 (Channel 2 – MTL4544 / MTL4544B Models Only)

U_o = 28V C_i = 0
I_o = 87mA L_i = 0
P_o = 0.61W

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

MTL4541P

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

U_o = 28V C_i = 0
I_o = 116.6mA L_i = 0
P_o = 0.82W

Hazardous Area Terminals 3 w.r.t. 1 (Channel 1)

U_o = 1.1V C_i = 0 U_i = 30V
I_o = 53mA L_i = 0 I_i = 121mA
P_o = 15mW

When an intrinsically safe source is connected to these terminals it should have a source resistance of U_i / I_i and the capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area connections must not exceed the values detailed in the certificate of the intrinsically safe source.

Hazardous area terminals 2 must not be used when the above source is connected to these terminals.

Hazardous Area Terminals 2 w.r.t. 3

U_o = 28V C_i = 0
I_o = 107mA L_i = 0
P_o = 0.75W

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:

MTL4541, MTL4541B, MTL4544 & MTL4544B Models Parameters

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR L/R RATIO (µH/ohm)
Hazardous Area Terminals 2 w.r.t. 1 or 5 w.r.t. 4			
IIC	0.083	4.2	56
IIB*	0.65	12.6	210
IIA	2.15	33.6	444
I	3.76	53.7	668
Hazardous Area Terminals 3 w.r.t. 1 or 6 w.r.t 4			
IIC	100	12.8	2,438
IIB*	1,000	47.8	8,932
IIA	1,000	104.7	18,140
I	1,000	156.2	28,229
Hazardous Area Terminals 2 w.r.t. 3 or 5 w.r.t 6			
IIC	0.083	4.9	59
IIB*	0.65	20.0	222
IIA	2.15	40.9	469
I	3.76	59.1	710

MTL4541P Model Parameters

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR L/R RATIO (µH/ohm)
Hazardous Area Terminals 2 w.r.t. 1			
IIC	0.083	2.7	45
IIB*	0.65	11.8	175
IIA	2.15	23.5	370
I	3.76	33.5	545
Hazardous Area Terminals 3 w.r.t 1			
IIC	100	12.8	2,438
IIB*	1,000	47.8	8,932
IIA	1,000	104.7	18,140
I	1,000	156.2	28,229
Hazardous Area Terminals 2 w.r.t. 3			
IIC	0.083	3.2	50
IIB	0.65	13.7	190
IIA	2.15	27.5	401
I	3.76	39.3	596

* 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.

The values of L_o and C_o determined by this method shall not be exceeded by the sum of all the L_i plus cable inductances in the circuit and the sum of all of the C_i plus cable capacitances respectively.

16 Report Number

See Certificate History

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
CI4541-1	1 of 8	4	9.15	Parts List for MTL4541 / MTL4544
CI4541-1	4 of 8	5	1.18	MTL4541 / MTL4544 Track Layout
CI4541-1	4A of 8	5	1.18	MTL4541 / MTL4544 Track Layout

The above drawings are associated and held with IECEx BAS 06.0034 Iss. 12

Current drawings which remain unaffected by this issue:

Number	Sheet	Issue	Date	Description
CI4541-1	2 of 8	5	07.09	Circuit Diagram for MTL4541 / 4544
CI4541-1	3 of 8	5	07.09	Circuit Diagram for MTL4541 / 4544
CI4541-1	5 of 8	6	1.13	MTL4541 Component Layout
CI4541-1	6 of 8	2	1.07	PCB Detail for TPL300
CI4541-1	7 of 8	2	1.07	PCB Detail for TPL301
CI4541-1	8 of 8	6	7.16	MTL4541 Certification Label Details – Baseefa
CI4500-3	1 of 1	1	12.10	MTL4500 & MTL5500 – Alternative Zener Diodes (Panjit)
CI4500-6	1 of 1	1	20.12.10	MTL4500 & MTL5500 – Conformal Coating
CI4500-100	1 of 1	2	1.13	MTL4500 Case

The above drawings are associated and held with IECEx Certificate No. IECEx BAS 06.0034

20 Certificate History

Certificate No.	Date	Comments
Baseefa06ATEX0156	6 September 2006	The release of the prime certificate. The associated test and assessment against the requirements of EN 60079-0: 2004, EN 50020: 2002, IEC 61241-0: 2004 and IEC 61241-11: 2005 is documented in Certification Report No. 05(C)0863/4.

Certificate No.	Date	Comments
Baseefa06ATEX0156/1	31 January 2007	To permit minor changes to the transformer PCB's not affecting the original assessment.
Baseefa06ATEX0156/2	28 March 2007	To permit minor circuit changes not affecting the original assessment.
Baseefa06ATEX0156/3	2 July 2007	To permit minor changes to the circuit and layout of the PCB.
Baseefa06ATEX0156/4	12 November 2007	i) To permit the connection of an external intrinsically safe source to hazardous area terminals 3 w.r.t. 1 (Channel 1) and 6 w.r.t. 4 (Channel 2 – where fitted). ii) To permit minor drawing changes not affecting the original assessment. i) To confirm the current design of the equipment meets the requirements of EN 60079-0: 2006 and EN 60079-11: 2007. The associated test and assessment is documented in Certification Report No. GB/BAS/ExTR07.0122/00.
Baseefa06ATEX0156/5	4 January 2008	To permit minor changes to the PCB layout not affecting the original assessment.
Baseefa06ATEX0156/6	21 August 2009	i) To permit an alternative printed circuit board to be fitted in all models of the equipment not affecting the original assessment. ii) To permit minor drawing changes not affecting the original assessment. The associated test and assessment is documented in Certification Report No. GB/BAS/ExTR09.0124/00.
Baseefa06ATEX0156/7	28 June 2010	i) To permit minor component changes to all models of the equipment not affecting the original assessment. ii) To permit the notes associated with the load parameters of all models specified on the original schedule to be revised. iii) To confirm the current designs of the MTL4541* / MTL4544* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters 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/ExTR10.0101/00.
Baseefa06ATEX0156/8	31 January 2011	i) To permit the alternative fitting of 1SMB3EZ** zener diodes in place of 1SMB59**BT3 components currently fitted. ii) To permit an alternative method of applying the conformal coating to the PCB fitted in the equipment not affecting the original assessment. The associated test and assessment is documented in Certification Report No. GB/BAS/ExTR10.0298/00.

Certificate No.	Date	Comments
Baseefa06ATEX0156/9	5 March 2014	i) To permit minor component and drawing changes not affecting the original assessment. ii) To confirm the current designs of the MTL4541* / MTL4544* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters 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 & 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 test and assessment is documented in Certification Report No. GB/BAS/ExTR14.0043/00.
Baseefa06ATEX0156 Issue 10	7 September 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/ExTR16.0237/00.
Baseefa06ATEX0156 Issue 11	9 February 2018	This issue of the certificate permit minor drawing changes not affecting the original assessment. The associated assessment is documented in Certification Report No. GB/BAS/ExTR18.0016/00, Project File No. 18/0066.
For drawings applicable to each issue, see original of that issue.		