

1 UK-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 Product and Protective Systems with respect to the risks of explosion
UKSI 2016:1107 (as amended) – Schedule 3A, Part 1

3 UK-Type Examination Certificate Number: **BAS21UKEX0468**

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 product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 SGS Baseefa, Approved Body number 1180, in accordance with Regulation 43 of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016, UKSI 2016:1107 (as amended), 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 Schedule 1 of the Regulations.

The examination and test results are recorded in confidential Report No. **21(C)0386/20**

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN IEC 60079-0:2018 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 UK-TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Regulations 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:

⊗ II (1) GD [Ex ia Ga] IIC (-20°C ≤ Ta ≤ +60°C)
[Ex ia Da] IIIC (-20°C ≤ Ta ≤ +60°C)

⊗ I (M1) [Ex ia Ma] I (-20°C ≤ Ta ≤ +60°C)

SGS Baseefa Customer Reference No. **0703**

Project File No. **21/0386**

This document is issued by the Company subject to its General Conditions for Certification Services accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and the Supplementary Terms and Conditions accessible at <http://www.sgs.com/SGSBaseefa/Terms-and-Conditions.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained herein reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. It does not necessarily indicate that the equipment may be used in particular industries or circumstances. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, schedule included, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS Baseefa Limited

Rockhead Business Park, Staden Lane,
Buxton, Derbyshire SK17 9RZ

Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601

e-mail baseefa@sgs.com web site

www.sgs.co.uk/sgsbaseefa

Registered in England No. 4305578.

Registered address: Rossmore Business Park, Ellesmere Port, Cheshire,
CH65 3EN



0191

R S Sinclair

R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

13 **Schedule**

14 **Certificate Number BAS21UKEX0468**

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

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

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 - MTL4544 / MTL4544B Models Only)

$$\begin{array}{ll} U_o = 28V & C_i = 0 \\ I_o = 93mA & L_i = 0 \\ P_o = 0.65W & \end{array}$$

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)

$$\begin{array}{lll} U_o = 1.1V & C_i = 0 & U_i = 30V \\ I_o = 53mA & L_i = 0 & I_i = 121mA \\ P_o = 15mW & \end{array}$$

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)

$$\begin{array}{ll} U_o = 28V & C_i = 0 \\ I_o = 87mA & L_i = 0 \\ P_o = 0.61W & \end{array}$$

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

MTL4541P

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

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

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

$$\begin{array}{ll} U_o = 28V & C_i = 0 \\ I_o = 116.6mA & L_i = 0 \\ P_o = 0.82W & \end{array}$$

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

$$\begin{array}{lll} U_o = 1.1V & C_i = 0 & U_i = 30V \\ I_o = 53mA & L_i = 0 & I_i = 121mA \\ P_o = 15mW & \end{array}$$

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

$$\begin{array}{ll} U_o = 28V & C_i = 0 \\ I_o = 107mA & L_i = 0 \\ P_o = 0.75W & \end{array}$$

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 ($\mu\text{H}/\text{ohm}$)
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

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu\text{H}/\text{ohm}$)
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 ($\mu\text{H}/\text{ohm}$)
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:

- 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.
- 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.

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

21(C)0386/20

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
13	Protection against other hazards (LVD type requirements, etc.)	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
22(1)	External effects	User/Installer responsibility
22(2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CI4541-1	8 of 8	7	8.21	MTL4541 Certification Label Details - BASEEFA

These drawings are held with BAS21UKEX0468 (prime).

For other current drawings not re-submitted for this assessment, see Baseefa06ATEX0156 - Issue 11