



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:** **BAS23UKEX0026 – Issue 2**
- 4 Product:** **MTL4500 & MTL5500 Series Galvanic Isolators – Analogue Input modules**
- 5 Manufacturer:** **Eaton Electric Limited**
- 6 Address:** **Great Marlings, Butterfield, Luton, Bedfordshire, LU2 8DL United Kingdom**
- 7 This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.**
- 8 SGS United Kingdom Ltd. (formerly SGS Baseefa Ltd.), Approved Body number 1180, in accordance with Regulations 42 and 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.**
- 8.1 The BAS prefix to the Certificate Number indicates that the certificate was issued by SGS Baseefa Ltd. prior to the name change to SGS United Kingdom Ltd. Such certificates remain valid with their original number.**
The examination and test results are recorded in a confidential report identified in the revision table at item 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 – All Models |
| | [Ex ia Da] IIIC | -20°C ≤ Ta ≤ +65°C – MTL5541-T Model only |
|  I (M1) | [Ex ia Ma] I | -40°C ≤ Ta ≤ +60°C – MTL5544D-L Model only |
- SGS Customer Reference No. 0703** **Project File No. 23/0605**

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 United Kingdom Limited
(formerly SGS Baseefa Ltd.)

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

Telephone +44 (0) 1298 766600 Fax +44 (0) 1298 766601
e-mail sgs.buxton@sgs.com web site www.sgs.co.uk/sgsbaseefa

Registered in England No. 1193985

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



D BREARLEY
CERTIFICATION CONSULTANT
On behalf of SGS United Kingdom Limited

Schedule 1 – MTL4541* / MTL4544* Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters

13

14

Certificate Number BAS23UKEX0026 – Issue 2

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 current and voltage. 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 plug and sockets are provided for the 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* available in a number of model variants, denoted by the last digit in the model number. All models variants are built on a common PCB.

Model Range:

Model No.	
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 Models Parameters

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

$$U_m = 253V$$

The apparatus is designed to operate on the above terminals from a d.c. supply voltage of up to 35V.

Hazardous Area Terminals 2 w.r.t. 1

or

Hazardous Area Terminals 5 w.r.t 4 (MTL4544 & MTL4544B only)

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

Hazardous Area Terminals 3 w.r.t. 1

or

Hazardous Area Terminals 6 w.r.t 4 (MTL4544 & MTL4544B only)

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

$$L_i = 0$$

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 source is connected to these terminals.

Hazardous Area Terminals 2 w.r.t. 3

or

Hazardous Area Terminals 5 w.r.t 6 (MTL4544 & MTL4544B only)

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

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

GROUP	CAPACITANCE (μ F)	INDUCTANCE (mH)	OR L/R RATIO (μ H/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

* 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 μ F for Groups IIB, IIA & I and 600nF for Group IIC.

MTL4541P Model Parameters

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

$$U_m = 253V$$

The apparatus is designed to operate on the above terminals from a d.c. supply voltage of 35V d.c.

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

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

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 terminal 2 must not be used when the source is connected to these terminals.

Hazardous Area Terminals 2 w.r.t. 3

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

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

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR L/R RATIO ($\mu H/ohm$)
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 1µF for Groups IIB, IIA & I and 600nF for Group IIC.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI4541-1	8 of 8	8	2.23	MTL4541 Certification Label Details - Baseefa

For all other drawings see SGS23ATEX0019.

**Schedule 2 – MTL4541A / MTL4541AS Single Channel &
MTL4544A / MTL4544AS Two Channel Current Repeater**

13

14

Certificate Number BAS23UKEX0026 – Issue 2

15 Description of Product

The MTL4544A 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 MTL4544A 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 MTL4541A Single Channel Current Repeater is a depopulated version of the MTL4544A and has only one channel populated.

Minor changes to the non-hazardous area circuitry of both models of the apparatus form the MTL4541AS Single Channel and MTL4544AS 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)

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

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 – MTL4544A / 4544AS 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 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 – MTL4544A / 4544AS 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 ($\mu H/ohm$)
Hazardous Area Terminals 2 w.r.t. 1 (Channel 1) or 5 w.r.t. 4 (Channel 2 – MTL4544A/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 – MTL4544A/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:

- 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 $1\mu F$ for Groups IIB, IIA & I and $600nF$ for Group IIC.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI4541-2	8 of 8	4	2.23	MTL4541A Certification Label Details - Baseefa

For all other drawings see SGS23ATEX0019.

Schedule 3 - MTL4541S, MTL4541T, MTL4544S & MTL4544D

13 Repeater Power Supplies, 4/20mA

14 Certificate Number BAS23UKEX0026 – Issue 2

15 Description of Product

The MTL4544S Two Channel Repeater Power Supply, 4/20mA for 'Smart' Transmitters is designed to provides floating d.c. supplies for energising two 'Smart' 4/20mA Transmitters located 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 means of limitation of current and voltage. 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 MTL4544S Two Channel Repeater Power Supply, 4/20mA for 'Smart' 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. LED indication is fitted to indicate power-on.

The MTL4541S Single Channel Repeater Power Supply, 4/20mA for 'Smart' Transmitters is a depopulated version of the MTL4544S and has only one channel populated.

The MTL4544D Repeater Power Supply, 4/20mA for 2 or 3 Wire Transmitters with two outputs is designed to provide a floating d.c. supplies for energising a 2 or 3-Wire 4/20mA Transmitter located in the hazardous area and repeat the current on two channels in the non-hazardous area, whilst restricting the transfer of energy from the unspecified non-hazardous area apparatus to the intrinsically safe circuits by means of limitation of current and voltage. 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 apparatus uses the same printed circuit board and enclosure as the MTL4544S but is populated with only one hazardous area transmitter connection and two non-hazardous area outputs fitted.

The MTL4541T Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters is similar to the MTL4541S but is fitted with different voltage and current limitation components and therefore has different output parameters.

Model Range

MTL4541S	Single Channel Repeater Power Supply, 4/20mA for 'Smart' Transmitters
MTL4541T	Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters
MTL4544S	Two Channel Repeater Power Supply, 4/20mA for 'Smart' Transmitters
MTL4544D	Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters with Two Outputs

Input / Output Parameters

MTL4541S, MTL4544S & MTL4544D Input / Output Parameters

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

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

The apparatus is designed to operate on non-hazardous area terminals 8, 9, 11, 12, 13 & 14 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 – MTL4544S model)

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

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

Or

Hazardous Area Terminals 6 w.r.t. 4 (Channel 2 – MTL4544S model)

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

Although the apparatus does not comply with the simple apparatus requirements of Clause 5.7 of EN 60079-11: 2012, when terminals 3 w.r.t. 1 or terminals 6 w.r.t. 4 (MTL4544S model only) are 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.

When an external 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 source is connected.

Hazardous Area Terminals 2 w.r.t. 3 (Channel 1)

Or

Hazardous Area Terminals 5 w.r.t. 6 (Channel 2 – MTL4544S model)

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

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

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

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR L/R RATIO ($\mu H/ohm$)
Hazardous Area Terminals 2 w.r.t. 1 or 5 w.r.t. 4 (MTL4544S only)			
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 (MTL4544S only)			
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 (MTL4544S only)			
IIC	0.083	4.9	59
IIB*	0.65	20.0	222
IIA	2.15	40.9	469
I	3.76	59.1	710

* 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 1µF for Groups IIB, IIA & I and 600nF for Group IIC.

MTL4541T Input / Output Parameters

Non-hazardous Area Terminals 8, 9, 11, 13 & 14

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

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

Hazardous Area Terminals 2 w.r.t. 1

$$\begin{array}{ll} U_o = 22V & C_i = 0 \\ I_o = 167mA & L_i = 0 \\ P_o = 0.92W \end{array}$$

Hazardous Area Terminals 3 w.r.t. 1

$$\begin{array}{llll} U_o = 1.0V & U_i = 30V & C_i = 0 \\ I_o = 53mA & I_i = 121mA & L_i = 0 \\ P_o = 14mW \end{array}$$

Although the apparatus does not comply with the simple apparatus requirements of Clause 5.7 of EN 60079-11: 2012, when terminals 3 w.r.t. 1 are 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.

When an external 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 terminal 2 must not be used when the source is connected.

Hazardous Area Terminals 2 w.r.t. 3

$$\begin{array}{ll} U_o = 22V & C_i = 0 \\ I_o = 145mA & L_i = 0 \\ P_o = 0.80W \end{array}$$

The capacitance and either the inductance or inductance to resistance ratio (L/R) of the hazardous area 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			
IIC	0.165	0.91	39
IIB*	1.14	5.5	147
IIA	4.20	10.7	322
I	6.00	16.4	517
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	0.165	1.49	45
IIB*	1.14	7.5	174
IIA	4.20	14.9	381

I	6.00	22.5	575
---	------	------	-----

* 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.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI4541-3	8 of 8	6	2.23	MTL4541S, MTL4541T, MTL4544S, MTL4544D Certification Label Details - Baseefa

For all other drawings see SGS23ATEX0019.

Schedule 4 – MTL4541Y Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters

13

14

Certificate Number BAS23UKEX0026 – Issue 2

15 Description of Product

The MTL4541Y Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters is designed to provide a floating d.c. supply for energising a conventional 2 or 3-Wire 4/20mA Transmitter in the hazardous area and repeat these currents in the non-hazardous area, whilst restricting the transfer of energy from unspecified non-hazardous area equipment to the intrinsically safe circuits by means of limitation of current and voltage. The equipment also allows bi-directional signal communication between the hazardous and non-hazardous area by connection of a hand-held communicator (HHC).

The MTL4541Y Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters comprises two 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 plug and sockets are provided for hazardous and non-hazardous area connections. A LED is fitted to provide power on indication.

Input / Output Parameters

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

$$U_m = 253V$$

The apparatus is designed to operate on the above terminals from a d.c. supply voltage of up to 35V.

Hazardous Area Terminals 2 w.r.t. 1

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

Hazardous Area Terminals 3 w.r.t. 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 Terminal 2 must not be used when the source is connected to these terminals.

Hazardous Area Terminals 2 w.r.t. 3

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

The capacitance and either the inductance or the inductance to resistance ratio (L/R) of the hazardous area load connected 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			
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			
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	4.9	59
IIB**	0.65	20.0	222
IIA	2.15	40.9	469
I	3.76	59.1	710

** 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.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility



19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI4541Y-7	1 of 1	3	2.23	MTL4541Y Certification Label Details – Baseefa – Ex i

For all other drawings see SGS23ATEX0019.

**Schedule 5 – MTL4541YA Single Channel Current Repeater,
4/20mA Passive Input for Smart Transmitters**

13

14

Certificate Number BAS23UKEX0026 – Issue 2

15 Description of Product

The MTL4541YA Single Channel Current Repeater, 4/20mA Passive Input for Smart Transmitters is designed to repeat a current signal from a separately powered 4/20mA transmitter located in the hazardous area to unspecified equipment location in the non-hazardous area, whilst restricting the transfer of energy from the unspecified non-hazardous area equipment to the intrinsically safe equipment by means of voltage and current limitation. The equipment also allows bi-directional signal communication between the hazardous and non-hazardous area by connection of a hand-held communicator (HHC).

The equipment comprises two isolating transformers that provide galvanic isolation between the hazardous and non-hazardous area circuitry, fuses, diodes, zener diodes 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 plug and sockets are provided for hazardous and non-hazardous area connections. The equipment is fitted with a power-on LED indication.

Input / Output Parameters

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

$$U_m = 253V$$

The apparatus is designed to operate on the above terminals from a d.c. supply voltage of up to 35V.

Hazardous Area Terminals 2 w.r.t. 1

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

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 EN 60079-11: 2012, when the hazardous area terminals are 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.

The hazardous area terminals are 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 connected to hazardous area terminals 2 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 the inductance to resistance ratio (L/R) of the hazardous area load connected must not exceed the following values:

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO ($\mu H/\Omega$)
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

* 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.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI4541YA-7	1 of 1	3	2.23	MTL4541YA Certification Label Details – Baseefa – Ex i

For all other drawings see SGS23ATEX0019.

**Schedule 6 – MTL5541 / MTL5541-T / MTL5544 Repeater Power
Supply, 4/20mA for 2 or 3-Wire Transmitters**

13

14

Certificate Number BAS23UKEX0026 – Issue 2

15 Description of Product

The MTL5544 Two Channel 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 MTL5544 Two Channel 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. A power indicator LED is fitted to the top of the equipment.

The MTL5541 Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters is a depopulated version of the MTL5544 and has only one channel populated.

The MTL5541-T Single Channel Repeater Power Supply, 4/20mA for 2 or 3-Wire Transmitters is of similar construction to the MTL5541 variants of the equipment with the same input and output parameters, but has an extended ambient temperature range of -20°C to +65°C.

Input / Output Parameters

Non-Hazardous Area Terminals 7 to 14 (10 to 14 on MTL5541 & MTL5541-T models)

$$U_m = 253V$$

The apparatus is designed to operate on the above terminals from a d.c. supply voltage of up to 35V.

Hazardous Area Terminals 2 w.r.t. 1

or

Hazardous Area Terminals 5 w.r.t 4 (MTL5544 model 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

or

Hazardous Area Terminals 6 w.r.t 4 (MTL5544 model only)

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

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 source is connected to these terminals.

Hazardous Area Terminals 2 w.r.t. 3

or

Hazardous Area Terminals 5 w.r.t. 6 (MTL5544 model only)

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

On the MTL5544 each channel must be considered as a separate intrinsically safe circuit.

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

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

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

* 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 $1\mu F$ 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

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI5541-T-1	1 of 1	3	2.23	MTL5541-T Certification Label Details & DIN Rail Fittings - Baseefa
CI5541-1	1 of 1	7	2.23	MTL5541 Certification Label Details & DIN Rail Fittings - Baseefa

For all other drawings see SGS23ATEX0019.

**Schedule 7 – MTL5541A / MTL5541AS Single Channel &
MTL5544A / MTL5544AS Two Channel Current Repeater**

13

14

Certificate Number BAS23UKEX0026 – Issue 2

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 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 area 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)

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

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 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)

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

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 $U_o = 30\text{V}$ and $I_o = 100\text{mA}$ 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:

- 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.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI5541-2	1 of 1	4	2.23	MTL5541A Certification Label Details & DIN Rail Fittings - Baseefa

For all other drawings see SGS23ATEX0019.

**Schedule 8 – MTL5541S, MTL5541S-T, MTL5544S, MTL5544D &
MTL5544D-L Repeater Power Supplies, 4/20mA**

13

14

Certificate Number BAS23UKEX0026 – Issue 2

15 Description of Product

The MTL5544S Two Channel Repeater Power Supply, 4/20mA for ‘Smart’ Transmitters is designed to provide floating d.c. supplies for energising two ‘Smart’ 4/20mA Transmitters located 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 means of limitation of current and voltage. 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 MTL5544S Two Channel Repeater Power Supply, 4/20mA for ‘Smart’ 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. LED indication is fitted to indicate power-on.

The MTL5541S Single Channel Repeater Power Supply, 4/20mA for ‘Smart’ Transmitters is a depopulated version of the MTL5544S and has only one channel populated.

The MTL5541S-T Single Channel Repeater Power Supply, 4/20mA for ‘Smart’ Transmitters is of a similar construction to the MTL5541S variant of the equipment with the same input and output parameters, but has an extended ambient temperature range of -20°C to +65°C.

The MTL5544D Repeater Power Supply, 4/20mA for 2 or 3 Wire Transmitters with two outputs is designed to provide a floating d.c. supplies for energising a 2 or 3-Wire 4/20mA Transmitter located in the hazardous area and repeat the current on two channels in the non-hazardous area, whilst restricting the transfer of energy from the unspecified non-hazardous area apparatus to the intrinsically safe circuits by means of limitation of current and voltage. 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 apparatus uses the same printed circuit board and enclosure as the MTL5544S but is populated with only one hazardous area transmitter connection and two non-hazardous area outputs fitted.

The MTL5544D-L Repeater Power Supply, 4/20mA for 2 or 3 Wire Transmitters is of a similar construction to the MTL5544D variant of the equipment with the same input and output parameters, but has an extended ambient temperature range of -40°C to +60°C.

Input/Output Parameters

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

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

The apparatus is designed to operate on non-hazardous area terminals 8, 9, 11, 12, 13 & 14 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 – MTL5544S model)

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

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

Or

Hazardous Area Terminals 6 w.r.t. 4 (Channel 2 – MTL5544S model)

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

Although the apparatus does not comply with the simple apparatus requirements of Clause 5.7 of EN 60079-11: 2012, when terminals 3 w.r.t. 1 or terminals 6 w.r.t. 4 (MTL5544S model only) are 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.

When an external 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 source is connected.

Hazardous Area Terminals 2 w.r.t. 3 (Channel 1)

Or

Hazardous Area Terminals 5 w.r.t. 6 (Channel 2 – MTL5544S model)

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

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

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

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR L/R RATIO ($\mu H/ohm$)
Hazardous Area Terminals 2 w.r.t. 1 or 5 w.r.t. 4 (MTL5544S only)			
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 (MTL5544S only)			
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 (MTL5544S only)			
IIC	0.083	4.9	59
IIB*	0.65	20.0	222
IIA	2.15	40.9	469
I	3.76	59.1	710

* 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 1µF for Groups IIB, IIA & I and 600nF for Group IIC.

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:

Clause	Subject	Compliance
13	LVD type requirements	Manufacturer responsibility
14	Overloading of equipment (protection relays, etc.)	User/Installer responsibility
21 (1)	External effects	User/Installer responsibility
21 (2)	Aggressive substances, etc.	User/Installer responsibility

19 Drawings and Documents

Other than for Issue 0, Drawings and Documents that are introduced at a new edition of the certificate are marked with an asterisk symbol:

Number	Sheet	Issue	Date	Description
CI5541S-T-1	1 of 1	2	2.23	MTL5541S-T IECEx Certification Label Details and DIN Rail Fittings - Baseefa
CI5541-4	1 of 1	6	7.23	MTL5541S, MTL5544S, MTL5544D Certification Label Details & DIN Rail Fittings - Baseefa

For all other drawings see SGS23ATEX0019.

20 Certificate History

Certificate No.	Date	Comments
BAS23UKEX0026	3 May 2023	The release of the prime certificate. The associated test and assessment against the requirements of EN IEC 60079-0:2018 and EN 60079-11: 2012 is documented in Test Report No. GB/BAS/ExTR23.0019/00. Project File No. 22/0560.
BAS23UKEX0026 Issue 1	30 August 2023	This issue of the certificate permits the addition of the MTL5544D-L Repeater Power Supply, 4/20mA for 2 or 3 Wire Transmitters variant to the range covered by the certificate. The associated assessment is documented in Certification Report No. GB/SGS/ExTR23.0073/00, Project File No. 23/0360.
BAS23UKEX0026 Issue 2	8 February 2024	To permit a minor change to the product design and drawings not affecting the certification assessment. The associated assessment is documented in Certification Report No. GB/SGS/ExTR24.0008/00, Project File No. 23/0605.
For drawings applicable to each issue, see original of that issue.		