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:	**BAS23UKEX0027**
4	Product:	**MTL4500 & MTL5500 Series Galvanic Isolators – Analogue Output 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 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. **GB/BAS/ExTR23.0020/00**

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** **[Ex ia Da] IIIC**	**-20°C ≤ Ta ≤ +60°C – All Models**
I (M1)	**[Ex ia Ma] I**	**-20°C ≤ Ta ≤ +65°C – MTL5546Y-T Model only**

SGS Baseefa Customer Reference No. **0703** Project File No. **22/0560**

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UKAS PRODUCT CERTIFICATION
0191

R S SINCLAIR
TECHNICAL MANAGER
On behalf of SGS Baseefa Limited

Schedule 1 – MTL4546 / MTL4546C / MTL4546Y / MTL4546S
13 Single Channel Isolating Driver, 4/20mA for Smart I/P Converters

14 Certificate Number BAS23UKEX0027

15 Description of Product

The MTL4546 / MTL4546C / MTL4546Y / MTL4546S Single Channel Isolating Driver, 4/20mA for Smart I/P Converters accepts a 4/20mA signal from a controller located in the non-hazardous area to drive a load in the hazardous area. It permits bi-directional transmission of digital signal to and from an operator station or hand-held communicator. The equipment restricts the transfer of energy from unspecified non-hazardous area equipment to an intrinsically safe circuit by limitation of voltage and current. Three transformers provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises a power transformer, two signal transformers, zener diodes and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a single printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL4546, MTL4546C & MTL4546Y models in terms of intrinsic safety are identical. The difference between them is the MTL4546C & MTL4546Y have the Line Fault Detection (LFD) facility disabled. The MTL4546S uses the same PCB and enclosure but the PCB is populated with different voltage and current limitation components, and therefore has different output parameters to the other variants.

Input/Output Parameters

MTL4546, MTL4546C & MTL4546Y Single Channel Isolating Driver, 4/20mA for Smart I/P Converters

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

U_m = 253V r.m.s.

The circuit connected to non-hazardous area terminals 11 to 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 = 93mA L_i = 0
P_o = 0.65W

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 (µH/ohm)
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 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.

MTL4546S Single Channel Isolating Driver, 4/20mA for Smart I/P Converters

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

U_m = 253V r.m.s.

The circuit connected to non-hazardous area terminals 11 to 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 = 22V C_i = 0
I_o = 100mA L_i = 0
P_o = 0.55W

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 (µH/ohm)
IIC	0.165	3.55	64
IIB*	1.14	14.6	258
IIA	4.20	30.5	517
I	6.00	44.3	848

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

Notes:

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

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

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

16 Report Number

GB/BAS/ExTR23.0020/00

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

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

Clause	Subject
13	Protection against other hazards (LVD type requirements, etc.)
14	Overloading of equipment (protection relays, etc.)
21 (1)	External effects
21 (2)	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CI4546-1	7 of 7	8	2.23	MTL4546 Certification Label Details - Baseefa

For all other drawings see SGS23ATEX0020.

Schedule 2 – MTL4549, MTL4549C & MTL4549Y 2 Channel Isolating Driver, 4/20mA for Smart I/P Converters

13

14 **Certificate Number BAS23UKEX0027**

15 Description of Product

The MTL4549, MTL4549C & MTL4549Y 2 Channel Isolating Driver, 4/20mA for Smart I/P Converters, accepts up to two separate 4/20mA signals from controllers located in the non-hazardous to drive loads in the hazardous area. It permits bi-directional transmission of digital signals to and from an operator station or hand-held communicator. The apparatus restricts the transfer of energy from unspecified non-hazardous area apparatus to intrinsically safe circuits by limitation of voltage and current. Three transformers on each channel provide galvanic isolation between the hazardous and non-hazardous area circuitry.

Each channel of the apparatus comprise a power transformer, two current transformers, zener diodes and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL4549, MTL4549C & MTL4549Y models in terms of intrinsic safety are identical. The difference between them is the MTL4549C & MTL4549Y have the Line Fault Detection (LFD) facility disabled.

Input/Output Parameters

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

U_m = 253V r.m.s.

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

Hazardous Area Terminals 2 w.r.t. 1 (Channel 1)
or
Hazardous Area Terminals 5 w.r.t. 4 (Channel 2)

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

Each channel must be considered as a separate intrinsically safe circuit

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 for either channel:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR L/R RATIO (µH/ohm)
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 IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

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

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

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

16 Report Number

GB/BAS/ExTR23.0020/00

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

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

Clause	Subject
13	Protection against other hazards (LVD type requirements, etc.)
14	Overloading of equipment (protection relays, etc.)
21 (1)	External effects
21 (2)	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CI4549-1	8 of 8	7	2.23	MTL4549 Certification Label Details - Baseefa

For all other drawings see SGS23ATEX0020.

Schedule 3 - MTL4545Y Isolating Driver, 4/20mA for Smart I/P Converters

13

14 **Certificate Number BAS23UKEX0027**

15 Description of Product

The MTL4545Y Isolating Driver, 4/20mA for Smart I/P Converters accepts a 4/20mA signal from a controller located in the non-hazardous area to drive a load in the hazardous area. It permits bi-directional transmission of a digital signal to and from an operator station or hand-held communicator. The equipment restricts the transfer of energy from unspecified non-hazardous area equipment to an intrinsically safe circuit by limitation of voltage and current. Three transformers provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises a power transformer, two signal transformers, zener diodes and current limiting resistors to provide voltage and current limitation. The above, together with electronic components are mounted on a single printed circuit board 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

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

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 (µH/ohm)
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 IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

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

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

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

16 Report Number

GB/BAS/ExTR23.0020/00

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

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

Clause	Subject
13	Protection against other hazards (LVD type requirements, etc.)
14	Overloading of equipment (protection relays, etc.)
21 (1)	External effects
21 (2)	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CI4545Y-7	1 of 1	3	2.23	MTL4545Y Certification Label Details – Baseefa – Ex i

For all other drawings see SGS23ATEX0020.

Schedule 4 – MTL5546 / MTL5546Y / MTL5546Y-T Single Channel Isolating Driver, 4/20mA for Smart I/P Converters

13

14 **Certificate Number BAS23UKEX0027**

15 Description of Product

The MTL5546 / MTL5546Y Single Channel Isolating Driver, 4/20mA for Smart I/P Converters accepts a 4/20mA signal from a controller located in the non-hazardous area to drive a load in the hazardous area. It permits bi-directional transmission of digital signals to and from an operator station or hand-held communicator. The apparatus restricts the transfer of energy from unspecified non-hazardous area apparatus to an intrinsically safe circuit by limitation of voltage and current. Three transformers provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises a power transformer, two current transformers, zener diodes and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL5546 & MTL5546Y models in terms of intrinsic safety are identical. The difference between them is the MTL5546Y has the Line Fault Detection (LFD) facility disabled.

The MTL5546Y-T Single Channel Isolating Driver, 4/20mA for Smart I/P Converters is of a similar construction to the MTL5546Y variant 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 11 to 14

U_m = 253V r.m.s.

The circuit connected to non-hazardous area terminals 11 to 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 = 93mA L_i = 0
P_o = 0.65W

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 (µH/ohm)
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 IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

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

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

- the total C_i of the external circuit (excluding the cable) is ≥ 1% of the C_o value.
The reduced capacitance of the external circuit (including cable) shall not be greater than 1µF for Groups IIB, IIA & I and 600nF for Group IIC.

16 Report Number

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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
13	Protection against other hazards (LVD type requirements, etc.)
14	Overloading of equipment (protection relays, etc.)
21 (1)	External effects
21 (2)	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CI5546Y-T-1	1 of 1	3	2.23	MTL5546 Certification Label Details & DIN Rail Fittings - Baseefa
CI5546-1	1 of 1	6	2.23	MTL5546 Certification Label Details & DIN Rail Fittings - Baseefa

For all other drawings see SGS23ATEX0020.

Schedule 5 – MTL5549 & MTL5549Y 2 Channel Isolating Driver, 4/20mA for Smart I/P Converters

13

14 **Certificate Number BAS23UKEX0027**

15 Description of Product

The MTL5549 & MTL5549Y 2 Channel Isolating Driver, 4/20mA for Smart I/P Converters accepts up to two separate 4/20mA signals from controllers located in the non-hazardous to drive loads in the hazardous area. It permits bi-directional transmission of digital signals to and from an operator station or hand-held communicator. The apparatus restricts the transfer of energy from unspecified non-hazardous area apparatus to intrinsically safe circuits by limitation of voltage and current. Three transformers on each channel provide galvanic isolation between the hazardous and non-hazardous area circuitry.

Each channel of the apparatus comprises a power transformer, two current transformers, zener diodes and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL5549 & MTL5549Y models in terms of intrinsic safety are identical. The difference between them is the MTL5549Y has the Line Fault Detection (LFD) facility disabled.

Input/Output Parameters

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

U_m = 253V r.m.s.

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

Hazardous Area Terminals 2 w.r.t. 1 (Channel 1)
or
Hazardous Area Terminals 5 w.r.t. 4 (Channel 2)

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

Each channel must be considered as a separate intrinsically safe circuit

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 for either channel:

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR L/R RATIO (µH/ohm)
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 IIB parameters also applicable for associated apparatus [Ex ia Da] IIIC

Notes:

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

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

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

16 Report Number

GB/BAS/ExTR23.0020/00

17 Specific Conditions of Use

None

18 Essential Health and Safety Requirements

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

Clause	Subject
13	Protection against other hazards (LVD type requirements, etc.)
14	Overloading of equipment (protection relays, etc.)
21 (1)	External effects
21 (2)	Aggressive substances, etc.

19 Drawings and Documents

Number	Sheet	Issue	Date	Description
CI5549-1	1 of 1	6	2.23	MTL5549 Certification Label Details & DIN Rail Fittings - Baseefa

For all other drawings see SGS23ATEX0020.