



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: **IECEX BAS 23.0012** Page 1 of 4 [Certificate history:](#)  
Issue No: 1 [Issue 0 \(2023-05-05\)](#)

Status: **Current**

Date of Issue: 2025-05-07

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

Equipment: **MTL4500 & MTL5500 Series Galvanic Isolators – Digital Output modules**

Optional accessory:

Type of Protection: **Intrinsic Safety**

Marking: **[Ex ia Ga] IIB (Model 5522 only)**  
**[Ex ia Ga] IIC**  
**[Ex ia Da] IIIC**  
**[Ex ia Ma] I**

**-20°C ≤ Ta ≤ +60°C – All Models**  
**-20°C ≤ Ta ≤ +65°C - MTL5521-T Model only**

Approved for issue on behalf of the IECEx  
Certification Body:

**P Oates**

Position:

**Engineering Manager**

Signature:  
(for printed version)

Date:  
(for printed version)

19/5/2025

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting [www.iecex.com](http://www.iecex.com) or use of this QR Code.



Certificate issued by:

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





# IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 23.0012**

Page 2 of 4

Date of issue: 2025-05-07

Issue No: 1

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

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

**MTL Instruments PVT Limited**  
No 3 Old Mahabalipuram Road,  
Sholinganallur, Chennai, 600 119  
**India**

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEX Quality system requirements. This certificate is granted subject to the conditions as set out in IECEX Scheme Rules, IECEX 02 and Operational Documents as amended

## STANDARDS :

The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards

[IEC 60079-0:2017](#) Explosive atmospheres - Part 0: Equipment - General requirements  
Edition:7.0

[IEC 60079-11:2011](#) Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"  
Edition:6.0

This Certificate **does not** indicate compliance with safety and performance requirements other than those expressly included in the Standards listed above.

## TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in:

### Test Reports:

[GB/BAS/ExTR23.0018/00](#)

[GB/SGS/ExTR25.0057/00](#)

### Quality Assessment Reports:

[GB/BAS/QAR06.0022/11](#)

[GB/BAS/QAR07.0017/11](#)



# IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 23.0012**

Page 3 of 4

Date of issue: 2025-05-07

Issue No: 1

## **EQUIPMENT:**

Equipment and systems covered by this Certificate are as follows:

This certificate covers the following types:

- MTL452\* Series Solenoid / Alarm Drivers.
- MTL4526 Two Channel Switch-operated Relay Output.
- MTL4521Y, MTL4521YL, MTL4523Y & MTL4523YL Solenoid / Alarm Drivers.
- MTL552\* Series Solenoid / Alarm Drivers.
- MTL5526 Two Channel Switch-operated Relay Output

See Certificate Annex for a description of the types of equipment and electrical parameters

**SPECIFIC CONDITIONS OF USE: NO**



# IECEX Certificate of Conformity

Certificate No.: **IECEX BAS 23.0012**

Page 4 of 4

Date of issue: 2025-05-07

Issue No: 1

**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)**  
**Variation 1.1**

To permit the addition of the 'Ex ic' load parameters for all modules.

ExTR: **GB/SGS/ExTR25.0057/00**

File Reference: **25/0211**

**Annex:**

[IECEX BAS 23.0012 Annex Issue 1.pdf](#)

### Schedule 1 – MTL452\* Series Solenoid / Alarm Drivers

The MTL452\* Series Solenoid / Alarm Drivers are designed to control and monitor a device located in the hazardous area and restrict the transfer of energy from unspecified apparatus in the non-hazardous area to an intrinsically safe circuit in the hazardous area by the limitation of voltage and current. Opto-isolators and a transformer provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises an isolating transformer, opto-isolators, duplicated zener diode chains and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board (PCB) and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL452\* Series Solenoid / Alarm Drivers comprises a number of different models denoted by \* in the model number. All models are built on a common PCB and are configured have certain features such as Line Fault Detection (LFD) and Phase Reversal facilities. There are also models in the range that are loop powered or have low current hazardous area outputs. All models have LED indication dependent on the model configuration.

#### Model Range

Model No.	
MTL4521	Loop Powered Solenoid / Alarm Driver
MTL4521L	Loop Powered Solenoid / Alarm Driver
MTL4523	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL4523R	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL4523L	Loop Powered Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL4523V	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL4523VL	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL4524	Solenoid / Alarm Driver with Override
MTL4524S	Solenoid / Alarm Driver with Override
MTL4525	Solenoid / Alarm Driver with Override (Low Current Output)

#### Input / Output Parameters

#### **MTL4521, MTL4523, MTL4523R, MTL4523L, MTL4523V, MTL4524 & MTL4524S**

#### Non-Hazardous Area Terminals 7 to 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 / 3 w.r.t. 1

$$\begin{aligned} U_o &= 25V \\ I_o &= 147mA \\ P_o &= 0.92W \\ C_i &= 0 \\ L_i &= 0 \end{aligned}$$

### 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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIC	0.11	1.4		40
IIB*	0.84	7.2		159
IIA	2.97	14.4		328
I	4.87	20.2		478

'Ex ic':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIC	0.4	3.7		87
IIB*	2.36	14.8		348
IIA	9.5	29.6		696

\* 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  $600\text{nF}$  for Group IIC.

### MTL4521L & MTL4523VL

#### Non-Hazardous Area Terminals 7 to 14

$$U_m = 253\text{V}$$

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

Hazardous Area Terminals 2 / 3 w.r.t. 1

U<sub>o</sub> = 25V  
 I<sub>o</sub> = 108mA  
 P<sub>o</sub> = 0.68W  
 C<sub>i</sub> = 0  
 L<sub>i</sub> = 0

**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:

'Ex ia':

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	0.11	3.04		52
IIB*	0.84	12.19		210
IIA	2.97	24.38		421
I	4.87	40.0		691

'Ex ic':

GROUP	CAPACITANCE (µF)	INDUCTANCE (mH)	OR	L/R RATIO (µH/ohm)
IIC	0.4	6.8		117
IIB*	2.36	27.4		472
IIA	9.5	54.8		946

\*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<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the L<sub>o</sub> value or
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C<sub>o</sub> value.
- 2) The above parameters are reduced to 50% when both of the two conditions below are given:
  - the total L<sub>i</sub> of the external circuit (excluding the cable) is ≥ 1% of the L<sub>o</sub> value and
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is ≥ 1% of the C<sub>o</sub> 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.

**MTL4525**

Non-Hazardous Area Terminals 8, 9, 10, 11, 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 / 3 w.r.t. 1

$U_o = 25V$   
 $I_o = 83.3mA$   
 $P_o = 0.52W$   
 $C_i = 0$   
 $L_i = 0$

**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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu F$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu H/ohm$ )
IIC	0.11	5.3		68
IIB*	0.84	21.8		254
IIA	2.97	44.7		536
I	4.87	64.9		814

'Ex ic':

GROUP	CAPACITANCE ( $\mu F$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu H/ohm$ )
IIC	0.4	11.5		153
IIB*	2.36	46.1		571
IIA	9.5	92.2		1206

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

### **Schedule 2 – MTL4526 Two Channel Switch-operated Relay Output**

The MTL4526 Two Channel Switch-operated Relay Output is designed to enable two separate intrinsically safe circuits to be switched via relay contacts by on/off switches or logic signals from unspecified apparatus in the non-hazardous area. Configuration switches on the apparatus allow the two relay output channels to be alternatively controlled by one input. Each non-hazardous area input can also be loop powered. Two relays provide galvanic isolation between the hazardous and non-hazardous area circuitry.

Each channel of the apparatus comprises a relay, a zener diode and fuse to provide voltage and current limitation to the relay. 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. LED indication is provided for the status of each output channel and power-on.

#### **Input / Output Parameters**

##### Non-Hazardous Area Terminals 8, 9, 10, 11, 13 & 14)

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

The circuit connected to non-hazardous area terminals 8, 9, 10, 11, 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V.

##### Hazardous Area Terminals 1 to 3 (Channel 1)

Or

##### Hazardous Area Terminals 4 to 6 (Channel 2)

$$\begin{array}{ll} U_i = 30V & U_o = 0 \\ C_i = 0 & I_o = 0 \\ L_i = 0 & \end{array}$$

**Schedule 3 – MTL4521Y, MTL4521YL, MTL4523Y & MTL4523YL Solenoid / Alarm Drivers**

The MTL4521Y, MTL4521YL, MTL4523Y & MTL4523YL Solenoid / Alarm Drivers are designed to control and monitor a device located in the hazardous area and restrict the transfer of energy from unspecified apparatus in the non-hazardous area to an intrinsically safe circuit in the hazardous area by the limitation of voltage and current. Opto-isolators and a transformer provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises an isolating transformer, opto-isolators, duplicated zener diode chains and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board (PCB) and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL4521Y, MTL4521YL, MTL4523Y & MTL4523YL Solenoid / Alarm Drivers are built on a common PCB with different components fitted to give certain output parameters and features. The MTL4521Y & MTL4521YL are loop-powered Solenoid / Alarm Drivers, with the only difference between the models being the current limitation fitted on the hazardous area connections. The MTL4523Y and MTL4523YL variants are similar but are bus powered and have additional Line Fault Detection (LFD) circuitry populated. All models have LED indication fitted dependent on the model indicating output status, Power on and LFD status where applicable.

**Model Range**

Model No.	
MTL4521Y	Loop Powered Solenoid / Alarm Driver
MTL4521YL	Loop Powered Solenoid / Alarm Driver
MTL4523Y	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL4523YL	Solenoid / Alarm Driver with Line Fault Detection Alarm

**Input / Output Parameters**

**MTL4521Y & MTL4523Y Models Parameters**

**Non-Hazardous Area Terminals 7 to 14**

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

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

**Hazardous Area Terminals 2 / 3 w.r.t. 1**

- $U_o = 25V$
- $I_o = 147mA$
- $P_o = 0.92W$
- $C_i = 0$
- $L_i = 0$

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:

**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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu$ F)	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu$ H/ohm)
IIC	0.11	1.4		40
IIB**	0.84	7.2		159
IIA	2.97	14.4		328
I	4.87	20.2		478

'Ex ic':

GROUP	CAPACITANCE ( $\mu$ F)	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu$ H/ohm)
IIC	0.4	3.7		87
IIB*	2.36	14.8		348
IIA	9.5	29.6		696

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

Notes:

- 3) 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.
  
- 4) 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.

**MTL4521YL & MTL4523YL**

Non-Hazardous Area Terminals 7 to 14

$U_m = 253V$  r.m.s.

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

Hazardous Area Terminals 2 / 3 w.r.t. 1

U<sub>o</sub> = 25V  
 I<sub>o</sub> = 108mA  
 P<sub>o</sub> = 0.68W  
 C<sub>i</sub> = 0  
 L<sub>i</sub> = 0

**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:

'Ex ia':

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO (μH/ohm)
IIC	0.11	3.04		52
IIB*	0.84	12.19		210
IIA	2.97	24.38		421
I	4.87	40.0		691

'Ex ic':

GROUP	CAPACITANCE (μF)	INDUCTANCE (mH)	OR	L/R RATIO (μH/ohm)
IIC	0.4	6.8		117
IIB*	2.36	27.4		472
IIA	9.5	54.8		946

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

Notes:

- 3) The above load parameters apply when one of the two conditions below is given:
  - the total L<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the L<sub>o</sub> value or
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is < 1% of the C<sub>o</sub> value.
- 4) The above parameters are reduced to 50% when both of the two conditions below are given:
  - the total L<sub>i</sub> of the external circuit (excluding the cable) is ≥ 1% of the L<sub>o</sub> value and
  - the total C<sub>i</sub> of the external circuit (excluding the cable) is ≥ 1% of the C<sub>o</sub> 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.

**Schedule 4 – MTL552\* Series Solenoid / Alarm Drivers**

The MTL552\* Series Solenoid / Alarm Drivers are designed to control and monitor a device located in the hazardous area and restrict the transfer of energy from unspecified apparatus in the non-hazardous area to an intrinsically safe circuit in the hazardous area by the limitation of voltage and current. A transformer and opto-isolators provide galvanic isolation between the hazardous and non-hazardous area circuitry.

The apparatus comprises an isolating transformer, opto-isolators, duplicated zener diode chains and current limiting resistors to provide voltage and current limitation. The above, together with other electronic components are mounted on a printed circuit board (PCB) and housed in a moulded plastic enclosure. Polarised plugs and sockets are provided for hazardous and non-hazardous area connections.

The MTL552\* Series Solenoid / Alarm Drivers comprise a number of different models denoted by \* in the model number. All models are built on a common PCB and are configured have certain features such as Line Fault Detection (LFD) and Phase Reversal facilities. There are also models in the range that are loop powered or have low current hazardous area outputs. All models have LED indication dependent on the model configuration.

The MTL5521-T Loop Powered Solenoid / Alarm Driver is of similar construction to the MTL5521 Loop Powered Solenoid / Alarm Driver with the same input and output parameters, but has an extended ambient temperature range of -20°C to +65°C.

**Model Range**

Model No.	
MTL5521	Loop Powered Solenoid / Alarm Driver
MTL5521-T	Loop Powered Solenoid / Alarm Driver
MTL5522	Loop Powered Solenoid / Alarm Driver, IIB
MTL5523	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL5523V	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL5523VL	Solenoid / Alarm Driver with Line Fault Detection Alarm
MTL5524	Solenoid / Alarm Driver with Logic Control, Phase Reversal
MTL5525	Low Current Solenoid / Alarm Driver

**Input / Output Parameters**

**MTL5521, MTL5521-T, MTL5523, MTL5523V & MTL5524 Model Parameters**

Non-Hazardous Area Terminals 7 to 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 / 3 w.r.t. 1

$U_o = 25V$                        $C_i = 0$   
 $I_o = 147mA$                      $L_i = 0$   
 $P_o = 0.92W$

**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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu$ F)	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu$ H/ohm)
IIC	0.11	1.4		40
IIB*	0.84	7.2		159
IIA	2.97	14.4		328
I	4.87	20.2		478

'Ex ic':

GROUP	CAPACITANCE ( $\mu$ F)	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu$ H/ohm)
IIC	0.4	3.7		87
IIB*	2.36	14.8		348
IIA	9.5	29.6		696

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

Notes:

- 5) 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.
  
- 6) 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.

**MTL5522 Model Parameters**

Non-Hazardous Area Terminals 7 to 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 / 3 w.r.t. 1

$U_o = 25V$        $C_i = 0$   
 $I_o = 166mA$      $L_i = 0$   
 $P_o = 1.04W$

**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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIB*	0.84	5.6		132
IIA	2.97	10.4		286
I	4.87	16.0		428

'Ex ic':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIB*	2.36	11.6		297
IIA	9.5	23.2		614

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

Notes:

- 5) 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.
- 6) 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  $600\text{nF}$  for Group IIC.

**MTL5523VL Model Parameters**

Non-Hazardous Area Terminals 7 to 14

$U_m = 253\text{V}$

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

Hazardous Area Terminals 2 / 3 w.r.t. 1

$U_o = 25\text{V}$   
 $I_o = 108\text{mA}$   
 $P_o = 0.68\text{W}$   
 $C_i = 0$   
 $L_i = 0$

**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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIC	0.11	3.04		52
IIB*	0.84	12.19		210
IIA	2.97	24.38		421
I	4.87	40.0		691

'Ex ic':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIC	0.4	6.8		117
IIB*	2.36	27.4		472
IIA	9.5	54.8		946

\*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  $600\text{nF}$  for Group IIC.

**MTL5525 Model Parameters**

Non-Hazardous Area Terminals 7 to 14

$U_m = 253\text{V}$

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

Hazardous Area Terminals 2 / 3 w.r.t. 1

$U_o = 25\text{V}$                        $C_i = 0$   
 $I_o = 83.3\text{mA}$                    $L_i = 0$   
 $P_o = 0.52\text{W}$

**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:

'Ex ia':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIC	0.11	5.3		68
IIB*	0.84	21.8		254
IIA	2.97	44.7		536
I	4.87	64.9		814

'Ex ic':

GROUP	CAPACITANCE ( $\mu\text{F}$ )	INDUCTANCE (mH)	OR	L/R RATIO ( $\mu\text{H}/\text{ohm}$ )
IIC	0.4	11.5		153
IIB*	2.36	46.1		571
IIA	9.5	92.2		1206

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

Notes:

- 3) 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.
- 4) 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  $600\text{nF}$  for Group IIC.

### **Schedule 5 – MTL5526 Two Channel Switch-operated Relay Output**

The MTL5526 Two Channel Switch-operated Relay Output is designed to enable two separate intrinsically safe circuits to be switched via relay contacts by on/off switches or logic signals from unspecified apparatus in the non-hazardous area. Configuration switches on the apparatus allow the two relay output channels to be alternatively controlled by one input. Each non-hazardous area input can also be loop powered. Two relays provide galvanic isolation between the hazardous and non-hazardous area circuitry.

Each channel of the apparatus comprises a relay, a zener diode and fuse to provide voltage and current limitation to the relay. 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. LED indication is provided for the status of each output channel and power-on.

#### **Input / Output Parameters**

##### Non-Hazardous Area Terminals 8, 9, 10, 11, 13 & 14)

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

The circuit connected to non-hazardous area terminals 8, 9, 10, 11, 13 & 14 is designed to operate from a d.c. supply voltage of up to 35V.

##### Hazardous Area Terminals 1 to 3 (Channel 1)

Or

##### Hazardous Area Terminals 4 to 6 (Channel 2)

$$\begin{array}{ll} U_i = 30V & U_o = 0 \\ C_i = 0 & I_o = 0 \\ L_i = 0 & \end{array}$$