



# MTL5000 SERIES



- ◆ Straightforward 'clip-on' DIN-rail mounting
- ◆ Low cost per channel
- ◆ High packing densities
- ◆ Simplified installation and maintenance using plug-in connectors

**MTL5000 Series** makes system planning and installation as simple as possible; providing all common functions, so that most installations can be designed easily around it.

**The MTL5000 clips quickly** onto DIN rail, so it is compatible with the industry-standard mounting system. Wiring is simplified by plug-in safe- and hazardous-area connectors, and a power plug which accepts a power bus; it all leads to quicker insertion, fewer wiring errors and trouble-free, tidier installations.

**Where space is at a premium**, high packing densities are essential. With a unit width of 16mm, and with many units providing multiple channels (and hence a lower cost per channel), the MTL5000 Series takes up a minimum of space – which leaves more for other process control equipment.

**Where older installations are being updated**, there may be a need for more channels – but within the existing space. The MTL5000 Series can provide the answer, fitting extra units and channels into a space formerly occupied by bulkier isolators.

**The MTL5000 Series is designed for reliability.** It builds on the proven success of the MTL2000, 3000 and 4000 Series to bring the benefits of new developments in galvanic isolation. It is designed from the outset to meet all relevant European Directives.



# MTL5011B SWITCH/ PROXIMITY DETECTOR INTERFACE

single-channel, with line fault detection  
and phase reversal



The MTL5011B enables a safe-area load to be controlled by a switch or proximity detector located in a hazardous area. A relay output is provided. Phase reversal control allows an alarm condition to be signalled for either state of the sensor. A selectable line fault detect (LFD) facility detects an open or short circuit in the field circuit.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of switch

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detector

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

One relay with changeover contacts

### Hazardous-area input

Input conforming to NAMUR/DIN 19234 standards for proximity detectors

### Voltage applied to sensor

7 to 9V from  $1k\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:

output energised (de-energised) if  $I_{in} > 2.1mA$  or  $R_{in} < 2k\Omega$   
output de-energised (energised) if  $I_{in} < 1.2mA$  or  $R_{in} > 10k\Omega$

Hysteresis: 200 $\mu A$ , typical

### Line fault detection (LFD)

User-selectable, via switches on the top of unit. Line faults are indicated by an LED. A detected line fault de-energises the relay.

Open-circuit alarm on if  $I_{in} < 100\mu A$   
Open-circuit alarm off if  $I_{in} > 250\mu A$   
Short-circuit alarm on if  $R_{in} < 100\Omega$   
Short-circuit alarm off if  $R_{in} > 360\Omega$

*Note: Resistors must be fitted when using the LFD facility with a contact input  
500 $\Omega$  to 1k $\Omega$  in series with switch  
20k $\Omega$  to 25k $\Omega$  in parallel with switch*

### Phase reversal

User-selectable, via switches on the top of unit.

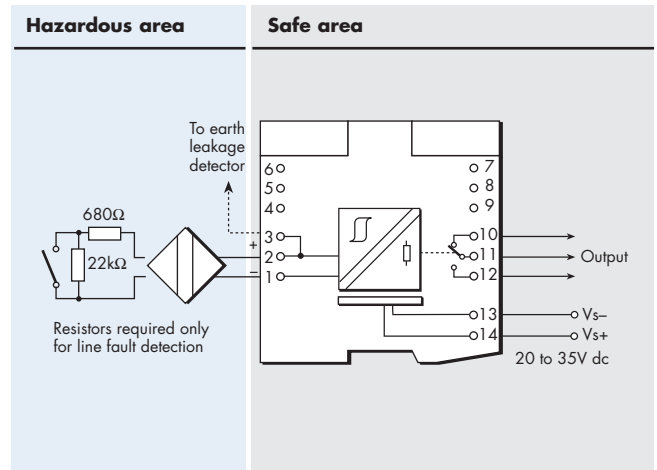
### Relay type

Single-pole changeover relay

*Note: reactive loads must be adequately suppressed*

### Relay characteristics

Response time: 10ms maximum  
Contact rating: 250V ac, 2A,  $\cos\phi > 0.7$   
40V dc, 2A, resistive load



Terminal	Function
1	Input -ve
2	Input +ve
3	Earth leakage detection
10	Normally-closed contact
11	Common
12	Normally-open contact
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication  
Yellow: status of channel (on when outputs are energised)  
Red: LFD indication (on when line fault detected)

### Maximum current consumption

40mA at 20V  
35mA at 24V  
25mA at 35V

### Maximum power dissipation

0.75W at 24V  
0.8W at 35V

### Isolation

250V ac or dc between power supply, hazardous-area circuits and relay outputs

### Safety description (each channel)

10.5V, 800 $\Omega$ , 14mA,  $U_m = 250V$  rms or dc



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# MTL5012 SWITCH/ PROXIMITY DETECTOR INTERFACE

single-channel, with line fault detection  
and phase reversal



The MTL5012 enables a solid-state output in the safe area to be controlled by a switch or proximity detector located in the hazardous area. Independent output phase reversal and line fault detection are provided.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of switch

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detector

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Floating solid-state output compatible with logic circuits

### Hazardous-area input

Input conforming to NAMUR/DIN 19234 standards for proximity detectors

### Voltage applied to sensor

7 to 9V from  $1k\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:  
output on (off) if  $I_{in} > 2.1mA$  or  $R_{in} < 2k\Omega$   
output off (on) if  $I_{in} < 1.2mA$  or  $R_{in} > 10k\Omega$

Hysteresis:  $200\mu A$ , typical

### Line fault detection (LFD)

User-selectable. Line faults are indicated by an LED. A detected line fault switches off the output.

- Open-circuit alarm on if  $I_{in} < 50\mu A$
- Open-circuit alarm off if  $I_{in} > 150\mu A$
- Short-circuit alarm on if  $R_{in} < 100\Omega$
- Short-circuit alarm off if  $R_{in} > 360\Omega$

Note: Resistors must be fitted when using the LFD facility with a contact input

$500\Omega$  to  $1k\Omega$  in series with switch

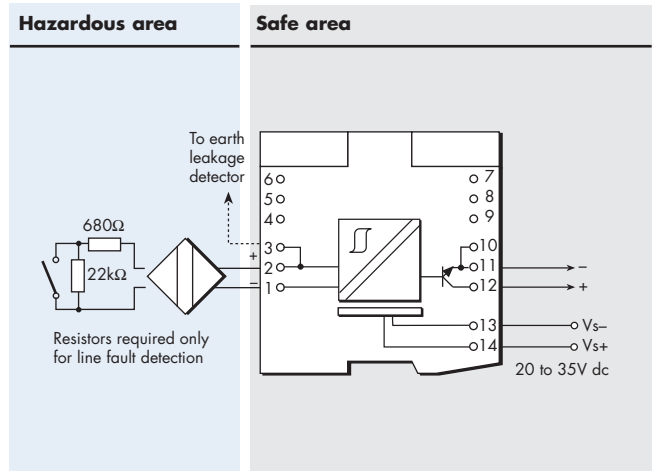
$20k\Omega$  to  $25k\Omega$  in parallel with switch

### Phase reversal

User-selectable

### Output characteristics

Operating frequency: dc to 5kHz  
Max. off-state voltage: 35V  
Max. off-state leakage current:  $10\mu A$   
Max. on-state voltage drop:  $1 + (0.13 \times \text{current in mA}) V$   
Max. on-state current: 50mA



Terminal	Function
1	Input -ve
2	Input +ve
3	Earth leakage detection
10, 11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

### LED indicators

- Green: power indication
- Yellow: status (on when output is on)
- Red: LFD indication (on when line fault detected)

### Maximum current consumption

- 28mA at 20V
- 30mA at 24V
- 32mA at 35V

### Maximum power dissipation

- 0.8W at 24V
- 1.2W at 35V

### Isolation

250V ac or dc between power supply, input and output

### Safety description

10.5V, 800Ω, 14mA,  $U_m = 250V$  rms or dc



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# MTL5012S

solid-state output with phase reversal and line fault detection for use with United Electric One series 2-wire sensor/switch



The MTL5012S enables a solid-state output in the safe area to be controlled by a switch or United Electric One series 2-wire sensor located in the hazardous area. Independent output phase reversal and line fault detection are provided.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of switch

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of sensor

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Floating solid-state output compatible with logic circuits

### Hazardous-area input

Designed to match United Electric One series 2-wire sensors

### Voltage applied to sensor

7 to 9V from  $500\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:

output on (off) if  $I_{in} > 3.8\text{mA}$  or  $R_{in} < 1.3\text{k}\Omega$

output off (on) if  $I_{in} < 2.5\text{mA}$  or  $R_{in} > 3.1\text{k}\Omega$

Hysteresis: 0.5mA, typical

### Line fault detection (LFD)

User-selectable. Line faults are indicated by an LED. A detected line fault switches off the output.

Open-circuit alarm on if  $I_{in} < 50\mu\text{A}$

Open-circuit alarm off if  $I_{in} > 150\mu\text{A}$

Short-circuit alarm on if  $R_{in} < 100\Omega$

Short-circuit alarm off if  $R_{in} > 360\Omega$

Note: Resistors must be fitted when using the LFD facility with a contact input

$500\Omega$  to  $1\text{k}\Omega$  in series with switch

$20\text{k}\Omega$  to  $25\text{k}\Omega$  in parallel with switch

### Phase reversal

User-selectable

### Output characteristics

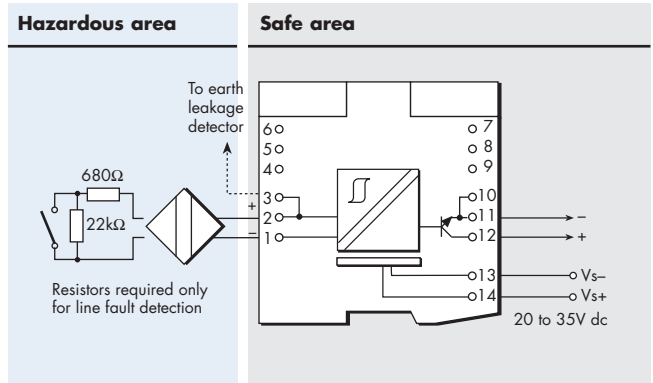
Operating frequency: dc to 5kHz

Max. off-state voltage: 35V

Max. off-state leakage current:  $10\mu\text{A}$

Max. on-state voltage drop:  $1 + (0.13 \times \text{current in mA}) \text{ V}$

Max. on-state current: 50mA



Terminal	Function
1	Input -ve
2	Input +ve
3	Earth leakage detection
10, 11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication

Yellow: status (on when output is on)

Red: LFD indication (on when line fault detected)

### Maximum current consumption

33mA at 20V

35mA at 24V

38mA at 35V

### Maximum power dissipation

0.9W at 24V

1.4W at 35V

### Isolation

250V ac or dc between power supply, input and output

### Safety description

$10.5\text{V}$ ,  $480\Omega$ ,  $22\text{mA}$ ,  $U_m = 250\text{V rms}$  or dc



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# MTL5014 SWITCH/ PROXIMITY DETECTOR INTERFACE

single-channel, dual-output, with phase reversal and line fault detection



The MTL5014 enables two safe-area loads to be controlled by a single switch or proximity detector located in the hazardous area. The safe-area interface has two changeover relays: output 1 and output 2. The output 1 relay reflects the status of the input and may be configured to operate in reverse phase. The output 2 relay may be configured either to repeat (slave) the output 1 relay, or to act as a line integrity monitor. A selectable line-fault-detect (LFD) facility enables an open- or short-circuit fault to be detected in the field wiring.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of switches

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detectors

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Two relays with changeover contacts

### Hazardous-area input

One input conforming to NAMUR/DIN 19234 standards for proximity detectors

### Voltage applied to sensor

7.0 to 9.0V from  $1k\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:

- output energised (de-energised) if  $I_{in} > 2.1mA$  or  $R_{in} < 2k\Omega$
- output de-energised (energised) if  $I_{in} < 1.2mA$  or  $R_{in} < 10k\Omega$

Hysteresis: 250 $\mu$ A typical

### Phase reversal

User selectable

### Relay type

Single pole, changeover contacts

Note: reactive loads must be adequately suppressed

### Relay characteristics

Response time: 10ms maximum

Contact rating: 250V ac, 2A,  $\cos\phi > 0.7$

40V dc, 2A, resistive load

Contact life expectancy:  $3 \times 10^5$  operations at maximum load

### Line fault detection (LFD)

User selectable: Off or On

A detected line fault de-energises Output 1 relay

Open circuit alarm on if  $I_{in} < 100\mu A$

Short circuit alarm on if  $I_{in} > 6.5mA$

Note: For contact input, resistors must be fitted

500 $\Omega$  to 1k $\Omega$  in series with switch

20k $\Omega$  to 25k $\Omega$  in parallel with switch

### Output 2 mode

User selectable: Slave or LFD mode

In LFD mode, a line fault de-energises Output 2 relay

Open circuit alarm on if  $I_{in} < 100\mu A$

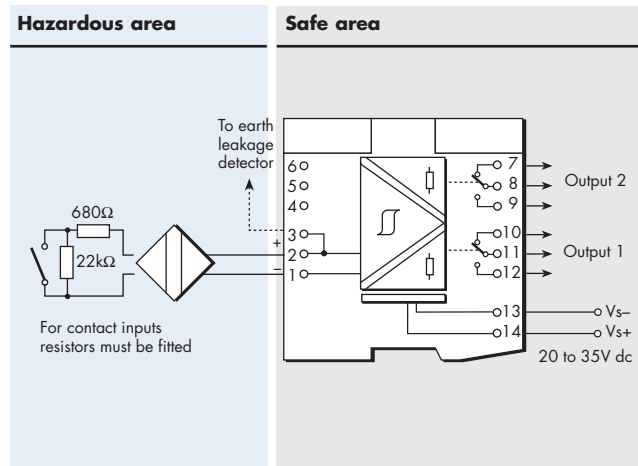
Short circuit alarm on if  $I_{in} > 6.5mA$

See note above on use of resistors

In Slave mode output 2 repeats output 1

### Power supply failure protection

Relays de-energised if supply fails



Terminal	Function
1	Input -ve
2	Input +ve
3	Earth leakage detection
7	Normally closed (output 2)
8	Common (output 2)
9	Normally open (output 2)
10	Normally closed (output 1)
11	Common (output 1)
12	Normally open (output 1)
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication

Yellow: illuminated when output 1 is energised

Red: illuminated when LFD is selected and there is an open or short circuit in the field wiring

### Supply voltage

20 to 35V dc

### Maximum current consumption

45mA at 24V

50mA at 20V

35mA at 35V

### Maximum power dissipation within unit

1.1W at 24V

1.3W at 35V

### Safety description

10.5V, 800 $\Omega$ , 14mA,  $U_m = 250V$  rms or dc



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# MTL5015 SWITCH/ PROXIMITY DETECTOR INTERFACE

two-channel, with line fault detection and  
phase reversal



The MTL5015 enables two solid-state outputs in the safe area to be controlled by two switches or proximity detectors located in the hazardous area. Independent output phase reversal and line fault detection are provided for each output.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of switches

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detectors

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area outputs

Floating solid-state outputs compatible with logic circuits

### Hazardous-area inputs

Inputs conforming to NAMUR/DIN 19234 standards for proximity detectors

### Voltage applied to sensor

7 to 9V from  $1k\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:

output on (off) if  $I_{in} > 2.1mA$  or  $R_{in} < 2k\Omega$   
output off (on) if  $I_{in} < 1.2mA$  or  $R_{in} > 10k\Omega$

Hysteresis: 200 $\mu A$ , typical

### Line fault detection (LFD)

User-selectable. Line faults are indicated by an LED for each channel. A detected line fault switches off the output.

Open-circuit alarm on if  $I_{in} < 50\mu A$

Open-circuit alarm off if  $I_{in} > 150\mu A$

Short-circuit alarm on if  $R_{in} < 100\Omega$

Short-circuit alarm off if  $R_{in} > 360\Omega$

*Note: Resistors must be fitted when using the LFD facility with a contact input*

*500 $\Omega$  to 1k $\Omega$  in series with switch*

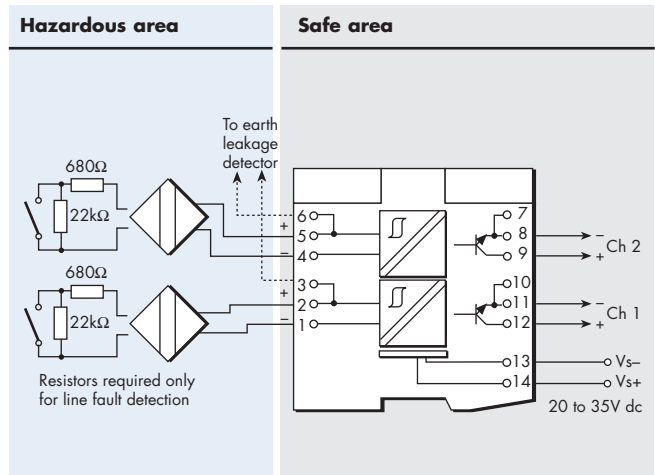
*20k $\Omega$  to 25k $\Omega$  in parallel with switch*

### Phase reversal

Independent for each channel, user-selectable

### Output characteristics

Operating frequency:	dc to 5kHz
Max. off-state voltage:	35V
Max. off-state leakage current:	10 $\mu A$
Max. on-state voltage drop:	$1 + (0.13 \times \text{current in mA}) V$
Max. on-state current:	50mA



Terminal	Function
1	Input -ve (Ch 1)
2	Input +ve (Ch 1)
3	Earth leakage detection
4	Input -ve (Ch 2)
5	Input +ve (Ch 2)
6	Earth leakage detection
8	Output -ve (Ch 2)
9	Output +ve (Ch 2)
10, 11	Output -ve (Ch 1)
12	Output +ve (Ch 1)
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication

Yellow: two: status of each channel (on when outputs are on)

Red: two: LFD indication for each channel (on when line fault detected)

### Maximum current consumption

42mA at 20V

44mA at 24V

46mA at 35V

### Maximum power dissipation

1.1W at 24V

1.6W at 35V

### Isolation

250V ac or dc between power supply, hazardous-area circuits and each output. 30V between hazardous-area circuits.

### Safety description (each channel)

10.5V, 800 $\Omega$ , 14mA,  $U_m = 250V$  rms or dc



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# MTL5017 SWITCH/ PROXIMITY DETECTOR INTERFACE

two-channel, with line fault detection  
and phase reversal



The MTL5017 enables two safe-area loads to be controlled by two switches or proximity detectors located in a hazardous area. Two single-pole relay outputs are provided. Independent phase reversal control is available on each channel, allowing an alarm condition (output open) to be signalled for either state of the sensor. The automatic line fault detect (LFD) facility detects an open or short circuit in either field circuit.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of switches

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detectors

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Two relays with normally-open contacts signal status of input  
An additional relay signals line faults

### Hazardous-area input

Two inputs conforming to NAMUR/DIN 19234 standards for proximity detectors

Resistors must be fitted externally to contact inputs: 500Ω to 1kΩ in series with the switch, 20kΩ to 25kΩ in parallel with the switch.

### Voltage applied to sensor

7.0 to 9.0V from 1kΩ ±10%

### Output characteristics

Normal (reverse) phase:

output relay closed (open) if  $I_{in} > 2.1\text{mA}$  or  $R_{in} < 2\text{k}\Omega$   
output relay open (closed) if  $I_{in} < 1.2\text{mA}$  or  $R_{in} > 10\text{k}\Omega$

Hysteresis: 250μA typical

### Line fault detection (LFD)

Line faults are indicated by an LED and a safe-area relay. When a line fault is detected, the relay opens and the LED lights.

Open-circuit alarm on if  $I_{in} < 100\mu\text{A}$

Open-circuit alarm off if  $I_{in} > 250\mu\text{A}$

Short-circuit alarm on if  $R_{in} < 100\Omega$

Short-circuit alarm off if  $R_{in} > 360\Omega$

Note: For contact input, resistors must be fitted

500Ω to 1kΩ in series with switch

20kΩ to 25kΩ in parallel with switch

### Phase reversal

Independent on each channel, selected by switches on the base of the unit

### Relay type

Single-pole, normally-open contacts.

Note: reactive loads must be adequately suppressed.

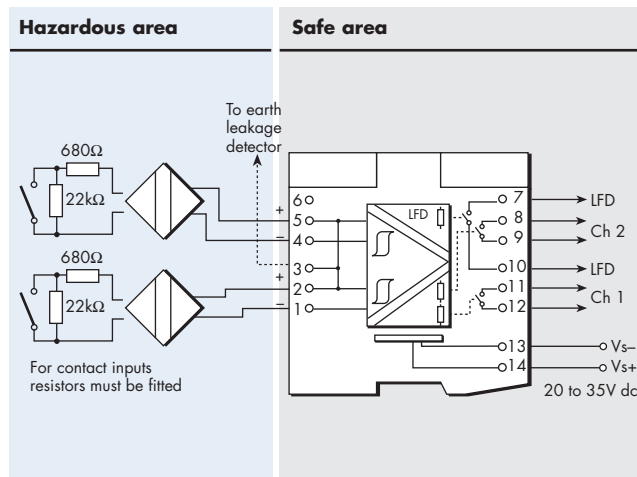
### Relay characteristics

Response time: 2ms maximum

Contact rating: 10VA, 45mA, 250V ac

10W, 0.5A, 220V dc

Contact life expectancy:  $10^7$  operations at maximum load



Terminal	Function
1	Input -ve (channel 1)
2	Input +ve (channel 1)
3	Earth leakage detection
4	Input -ve (channel 2)
5	Input +ve (channel 2)
7	Line fault detection
8	Output (channel 2)
9	Output (channel 2)
10	Line fault detection
11	Output (channel 1)
12	Output (channel 1)
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication

Yellow: two: status of each channel, on when output relay is closed

Red: two: line fault detected in channel 1/channel 2

### Supply voltage

20 to 35V dc

### Maximum current consumption

50mA at 24V

55mA at 20V

40mA at 35V

### Maximum power dissipation within unit

1.1W at 24V

1.25W at 35V

### Safety description (each channel)

10.5V, 800Ω, 14mA,  $U_m = 250\text{V rms or dc}$



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# MTL5018 SWITCH/ PROXIMITY DETECTOR INTERFACE

two-channel, with line fault detection  
and phase reversal



The MTL5018 enables two safe-area loads to be controlled by two switches or proximity detectors located in a hazardous area. Two relay outputs are provided. Independent phase reversal control allows an alarm condition to be signalled for either state of the sensor. A selectable line fault detect (LFD) facility detects an open or short circuit in either field circuit.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of switches

Zone 0, IIC, T6 hazardous area

Div. 1, Group A hazardous location

### Location of proximity detector

Zone 0, IIC, T4–6 hazardous area if suitably certified

Div. 1, Group A hazardous location

### Safe-area output

Two relays with changeover contacts

### Hazardous-area inputs

Inputs conforming to NAMUR/DIN 19234 standards for proximity detectors

### Voltage applied to sensor

7 to 9V from  $1k\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:

output energised (de-energised) if  $I_{in} > 2.1mA$  or  $R_{in} < 2k\Omega$

output de-energised (energised) if  $I_{in} < 1.2mA$  or  $R_{in} > 10k\Omega$

Hysteresis: 200 $\mu$ A, typical

### Line fault detection (LFD)

User-selectable via switches on the top of the unit. Line faults are indicated by an LED for each channel. A detected line fault de-energises the relay.

Open-circuit alarm on if  $I_{in} < 100\mu A$

Open-circuit alarm off if  $I_{in} > 250\mu A$

Short-circuit alarm on if  $R_{in} < 100\Omega$

Short-circuit alarm off if  $R_{in} > 360\Omega$

Note: Resistors must be fitted when using the LFD facility with a contact input

500 $\Omega$  to 1k $\Omega$  in series with switch

20k $\Omega$  to 25k $\Omega$  in parallel with switch

### Phase reversal

Independent for each channel, user-selectable

### Relay type

Single pole, changeover contacts

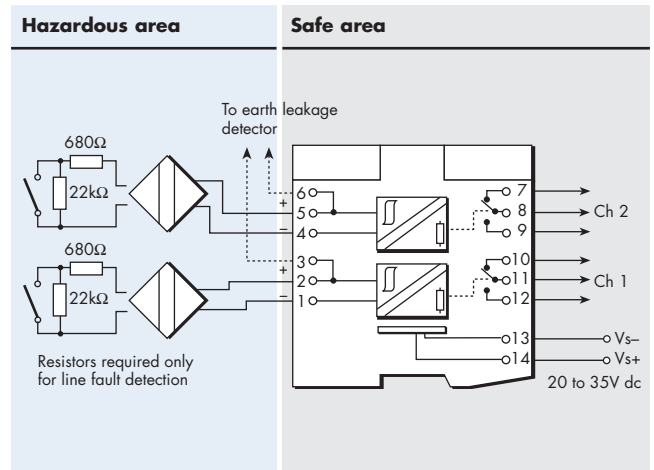
Note: reactive loads must be adequately suppressed

### Relay characteristics

Response time: 10ms maximum

Contact rating: 250V ac, 2A,  $\cos\phi > 0.7$

40V dc, 2A, resistive load



Terminal	Function
1	Input -ve (Ch 1)
2	Input +ve (Ch 1)
3	Earth leakage detection
4	Input -ve (Ch 2)
5	Input +ve (Ch 2)
6	Earth leakage detection
7	Normally-closed contact (Ch 2)
8	Common (Ch 2)
9	Normally-open contact (Ch 2)
10	Normally-closed contact (Ch 1)
11	Common (Ch 1)
12	Normally-open contact (Ch 1)
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication

Yellow: two: status of each channel (on when outputs are energised)

Red: two: LFD indication for each channel (on when line fault detected)

### Maximum current consumption

60mA at 20V

60mA at 24V

40mA at 35V

### Maximum power dissipation

1.4W at 24V

1.5W at 35V

### Isolation

250V ac or dc between power supply, hazardous-area circuits and relay outputs

### Safety description (each channel)

10.5V, 800 $\Omega$ , 14mA,  $U_m = 250V$  rms or dc



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# MTL5018AC SWITCH/ PROXIMITY DETECTOR INTERFACE

two-channel, with line fault detection  
and phase reversal



The MTL5018ac enables two safe-area loads to be controlled by two switches or proximity detectors located in a hazardous area. Two relay outputs are provided. Independent phase reversal control allows an alarm condition to be signalled for either state of the sensor. A selectable line fault detect (LFD) facility detects an open or short circuit in either field circuit.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of switches

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detector

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Two relays with changeover contacts

### Hazardous-area inputs

Inputs conforming to NAMUR/DIN 19234 standards for proximity detectors

### Voltage applied to sensor

7 to 9V from  $1k\Omega \pm 10\%$

### Input/output characteristics

Normal (reverse) phase:

output energised (de-energised) if  $I_{in} > 2.1mA$  or  $R_{in} < 2k\Omega$   
output de-energised (energised) if  $I_{in} < 1.2mA$  or  $R_{in} > 10k\Omega$

Hysteresis:  $200\mu A$ , typical

### Line fault detection (LFD)

User-selectable via switches on the top of the unit. Line faults are indicated by an LED for each channel. A detected line fault de-energises the relay.

Open-circuit alarm on if  $I_{in} < 100\mu A$

Open-circuit alarm off if  $I_{in} > 250\mu A$

Short-circuit alarm on if  $R_{in} < 100\Omega$

Short-circuit alarm off if  $R_{in} > 360\Omega$

Note: Resistors must be fitted when using the LFD facility with a contact input

$500\Omega$  to  $1k\Omega$  in series with switch

$20k\Omega$  to  $25k\Omega$  in parallel with switch

### Phase reversal

Independent for each channel, user-selectable

### Relay type

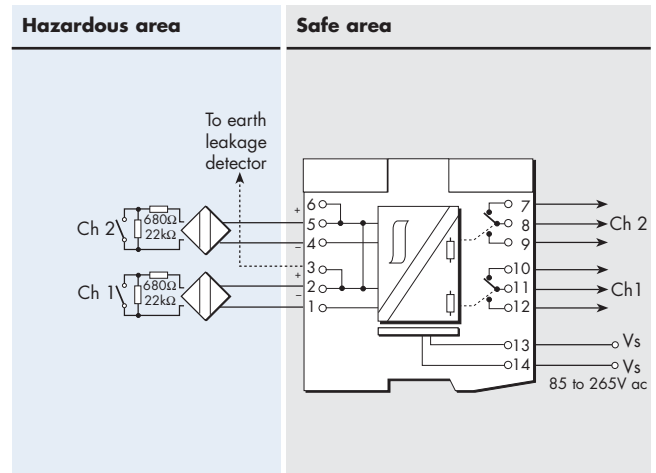
Single pole, changeover contacts

Note: reactive loads must be adequately suppressed

### Relay characteristics

Response time: 10ms maximum

Contact rating: 250V ac, 2A,  $\cos\phi > 0.7$   
40V dc, 2A, resistive load



Terminal	Function
1	Input -ve (Ch 1)
2	Input +ve (Ch 1)
3	Earth leakage detection
4	Input -ve (Ch 2)
5	Input +ve (Ch 2)
6	Earth leakage detection
7	Normally-closed contact (Ch 2)
8	Common (Ch 2)
9	Normally-open contact (Ch 2)
10	Normally-closed contact (Ch 1)
11	Common (Ch 1)
12	Normally-open contact (Ch 1)
13	AC Supply
14	AC Supply

### LED indicators

Green: power indication

Yellow: two: status of each channel (on when outputs are energised)

Red: two: LFD indication for each channel (on when line fault detected)

### Maximum power dissipation

<2.5W

### Isolation

250V ac or dc between power supply, hazardous-area circuits and relay outputs

### Safety description (each channel)

10.5V,  $800\Omega$ , 14mA,  $U_m = 250V$  rms or dc

### Power Supply

85 to 265V ac

45 to 65 Hz



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# MTL5021 SOLENOID/ ALARM DRIVER

loop-powered, IIC



The MTL5021 enables a device located in the hazardous area to be controlled by a switch in the safe area. The MTL5021 can drive a certified intrinsically safe low-power load, as well as non-energy-storing simple apparatus such as an LED. The unit's input/output isolation allows the control switch to be connected into either side of the 24V dc supply circuit.

## SPECIFICATION

See also common specification

### Number of channels

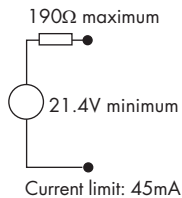
One

### Location of load

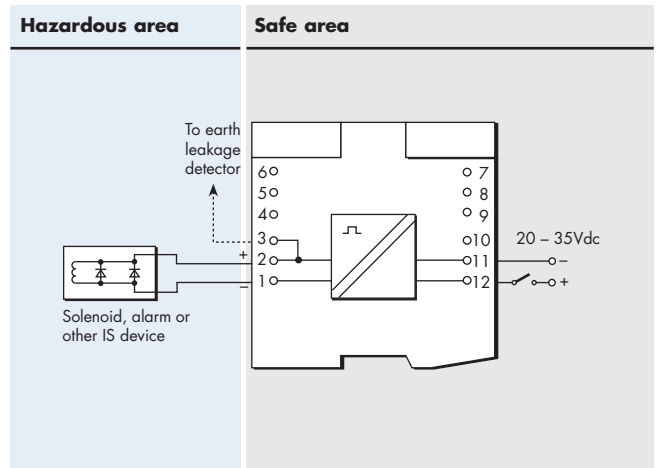
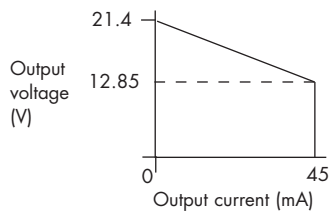
Zone 0, IIC, T4--6 hazardous area if suitably certified

Div. 1, Group A hazardous location

### Equivalent circuit



### Minimum output voltage



Terminal	Function
1	Output -ve
2	Output +ve
3	Earth leakage detection
11	Supply -ve
12	Supply +ve

### LED indicator

Yellow: status

### Input voltage

20 to 35V dc

### Hazardous-area output

Minimum output voltage: 12.85V at 45mA

Maximum output voltage: 24V from 170Ω

Current limit: 45mA

### Maximum current consumption (with 45mA output)

90mA at 24V

110mA at 20 to 35V dc

### Maximum power dissipation within unit

1.4W at 24V typical

1.8W at 35V maximum

### Safety description

25V, 170Ω, 147mA,  $U_m = 250V$  rms or dc



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# MTL5022 SOLENOID/ ALARM DRIVER

loop-powered, IIB



The MTL5022 enables a device located in the hazardous area to be controlled by a switch or voltage change in the safe area. The MTL5022 can drive any certified intrinsically safe low-power load, as well as non-energy-storing simple apparatus such as an LED. The unit's input/output isolation allows the control switch to be connected into either side of the 24V dc supply circuit.

## SPECIFICATION

See also common specification

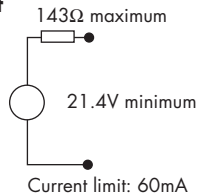
### Number of channels

One

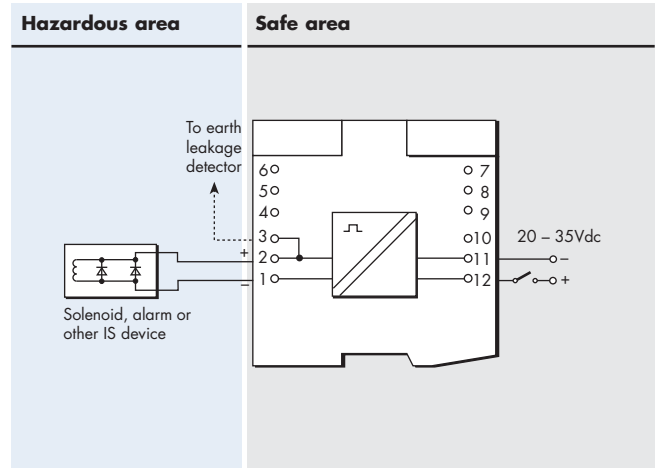
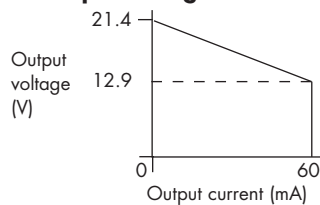
### Location of load

Zone 0, IIB, T4-6 hazardous area if suitably certified  
Div. 1, Group C hazardous location

### Equivalent circuit



### Minimum output voltage



Terminal	Function
1	Output -ve
2	Output +ve
3	Earth leakage detection
11	Supply -ve
12	Supply +ve

### LED indicator

Yellow: status

### Input voltage

20 to 35V dc

### Hazardous-area output

Minimum output voltage: 12.9V at 60mA

Maximum output voltage: 24V from 133Ω

Current limit: 60mA

### Maximum current consumption (with 60mA output)

115mA at 24V, typical

135mA at 20 to 35V dc, maximum

### Maximum power dissipation within unit

1.5W at 24V

2.1W at 35V

### Safety description

25V, 135Ω, 185mA,  $U_m = 250V$  rms or dc



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# MTL5023 SOLENOID/ ALARM DRIVER

powered, with line fault detection and phase reversal



The MTL5023 enables a device located in the hazardous area to be controlled by a volt-free contact or logic signal in the safe area. It is suitable for driving loads such as solenoids, alarms and other low-powered devices. A line fault is signalled in the safe area by a solid-state switch which de-energises if a field line is open- or short-circuited.

## SPECIFICATION

See also common specification

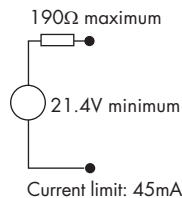
### Number of channels

One

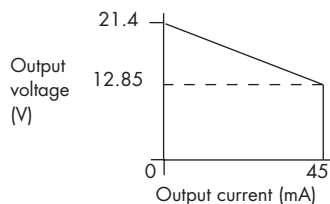
### Location of load

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Equivalent circuit



### Minimum output voltage



### Hazardous-area output

Minimum voltage: 12.85V at 45mA  
Maximum voltage: 25V  
Current limit : 45mA

### Output ripple

100mV peak-to-peak maximum

### Control input

Normal (reverse) phase: Output turns on (off) if input switch closed, transistor on or <1.4V applied across terminals 12 and 11  
Output turns off (on) if input switch open,  
transistor off or >4.5V applied across terminals 12 and 11

### Output response time

Within 10% of final value within 50ms

### Line fault detection

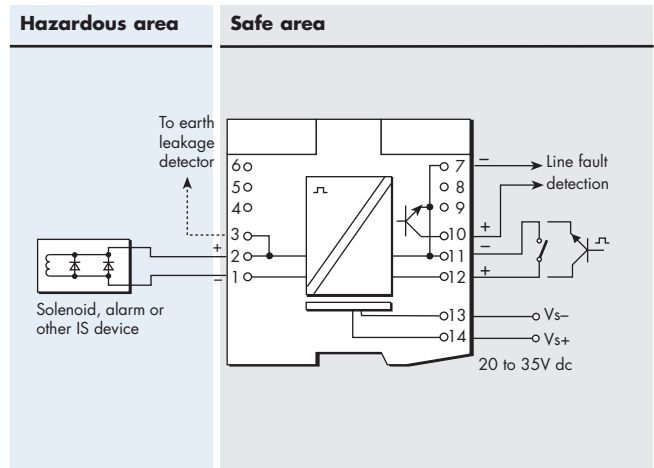
Open or short circuit in the field de-energises solid-state line-fault signal.  
No line fault will be signalled while the field-circuit impedance stays within the range 50Ω to 7kΩ.

### Line fault signal characteristics

Maximum off-state voltage: 35V  
Maximum off-state leakage current: 10μA  
Maximum on-state voltage drop:  $[1 + (0.08 \times \text{current in mA})] \text{ V}$   
Maximum on-state current: 50mA

### Phase reversal

Selected via a switch on the base of the module



Terminal	Function
1	Output -ve
2	Output +ve
3	Earth leakage detection
7	Line fault signal -ve
10	Line fault signal +ve
11	Control -ve
12	Control +ve
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication  
Yellow: status, on when output circuit is active  
Red: line fault detected

### Supply voltage

20 to 35V dc

### Maximum current consumption

100mA at 24V  
120mA at 20V  
80mA at 35V

### Maximum power dissipation within unit

1.4W with typical solenoid valve, output on  
2.0W worst case

### Safety description

25V, 170Ω, 147mA,  $U_m = 250V$  rms or dc



# MTL5024 SOLENOID/ ALARM DRIVER

powered, logic drive with phase reversal



The MTL5024 allows an on/off device in a hazardous area to be controlled by a volt-free contact or logic signal in the safe area. The MTL5024 is suitable for driving loads such as solenoids, alarms, LEDs and other low-powered devices certified as intrinsically safe or classified as non-energy-storing simple apparatus. A phase reversal switch enables the user to select which phase of input signal will drive the output on.

## SPECIFICATION

See also common specification

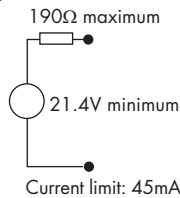
### Number of channels

One

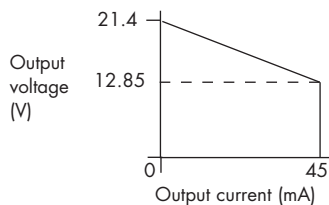
### Location of load

Zone 0, IIC, T4-6 hazardous location if suitably certified  
Div. 1, Group A hazardous location

### Equivalent circuit



### Minimum output voltage



### Safe-area input

Suitable for switch contacts, an open-collector transistor or logic drive.

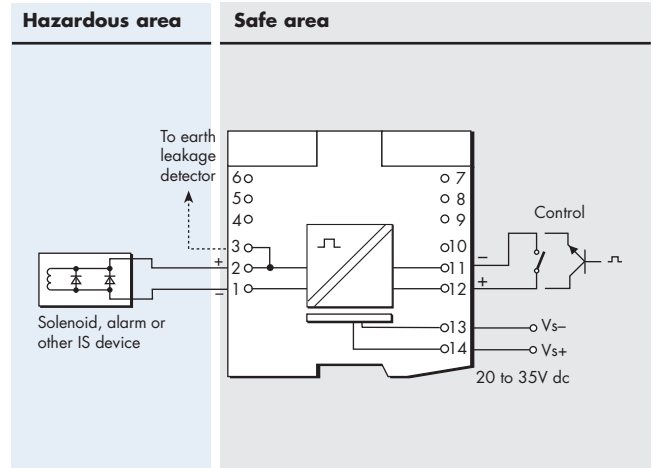
Normal (reverse) phase: output on (off) if switch closed,  
transistor on or <1.4V applied to input  
output off (on) if switch open,  
transistor off or >4.5V applied to input

### Hazardous-area output

Minimum output voltage: 12.85V at 45mA  
Maximum output voltage: 25V  
Current limit: 45mA

### Phase reversal

Selected by a switch on the base of the module



Terminal	Function
1	Output -ve
2	Output +ve
3	Earth leakage detection
11	Control -ve
12	Control +ve
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication  
Yellow: status

### Supply voltage

20 to 35V dc

### Maximum current consumption

100mA at 24V  
120mA at 20V dc  
75mA at 35V dc

### Maximum power dissipation within unit

1.4W with typical solenoid valve, output on  
2.0W worst case

### Safety description

25V, 170Ω, 147mA,  $U_m = 250V$  rms or dc



# MTL5025 SOLENOID/ ALARM DRIVER

low-current loop-powered, IIC



The MTL5025 enables an on/off device located in the hazardous area to be controlled by a switch or voltage change in the safe area. It can drive any certified intrinsically safe low-power load, as well as non-energy-storing simple apparatus such as an LED.

## SPECIFICATION

See also common specification

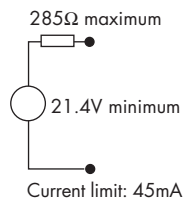
### Number of channels

One

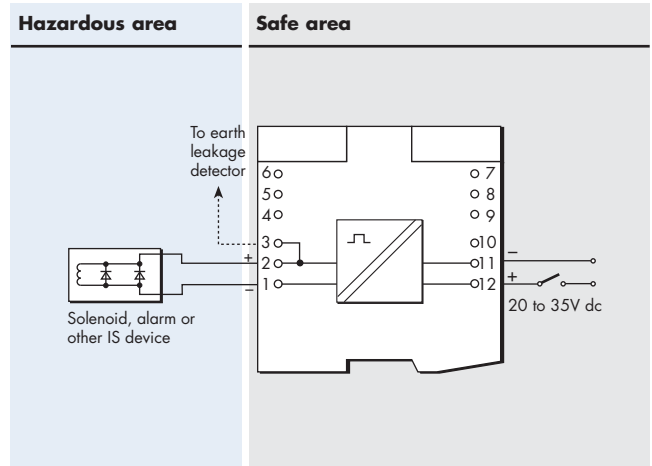
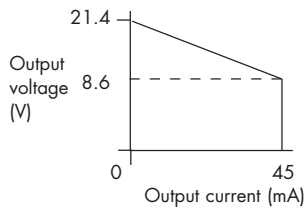
### Location of load

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Equivalent circuit



### Minimum output voltage



Terminal	Function
1	Output -ve
2	Output +ve
3	Earth leakage detection
11	Supply -ve
12	Supply +ve

### LED indicator

Yellow: status

### Hazardous-area output

Minimum output voltage: 8.6V at 45mA  
Maximum output voltage: 24V from 269Ω  
Current limit: 45mA

### Input voltage

20 to 35V dc

### Maximum current consumption (with 45mA output)

90mA at 24V  
110mA, 20 to 35V dc

### Maximum power dissipation within unit

1.6W at 24V  
2.0W at 35V

### Safety description

25V, 269Ω, 93mA,  $U_m = 250V$  rms or dc



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# MTL5031 VIBRATION TRANSDUCER INTERFACE



The MTL5031 repeats a signal from a vibration sensor in a hazardous area, providing an output for a monitoring system in the safe area. The interface is compatible with 3-wire eddy-current probes and accelerometers.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of signal source

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

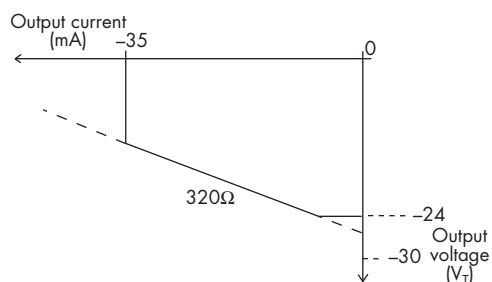
### Safe-area output

Output impedance  
(terminals 11 and 12):  $<20\Omega$

### Hazardous-area input

Input impedance  
(terminals 1 and 2):  $10k\Omega -1\%, +2\%$

### Transducer supply voltage (terminals 3 and 1)



### Signal range (terminals 1 and 2, 11 and 12)

Minimum  $-20V$ , maximum  $-0.5V$ , for dc transfer error  $<\pm 100mV$

### DC transfer accuracy at 20°C

$<\pm 100mV$

### AC transfer accuracy at 20°C

0Hz to 1kHz:  $\pm 1\%$   
1kHz to 10kHz:  $-5\%$  to  $+1\%$   
10kHz to 20kHz:  $-10\%$  to  $+1\%$

### Temperature coefficient

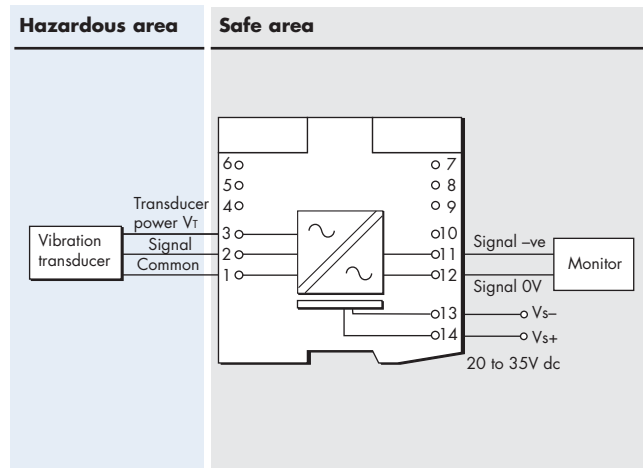
$\pm 50ppm/^{\circ}C$  (10 to  $65^{\circ}C$ )  
 $\pm 100ppm/^{\circ}C$  ( $-20$  to  $10^{\circ}C$ )

### Voltage bandwidth

$-3dB$  at 43kHz (typical)

### Phase response

$<14\mu s$ , equivalent to:  
 $-1^{\circ}$  at 200Hz  
 $-3^{\circ}$  at 600Hz  
 $-5^{\circ}$  at 1kHz  
 $-50^{\circ}$  at 10kHz  
 $-100^{\circ}$  at 20kHz



Terminal	Function
1	Common
2	Signal
3	Transducer power $V_T$
11	Signal $-ve$
12	Signal 0V
13	Supply $-ve$
14	Supply $+ve$

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with 22mA transducer load)

80mA at 24V  
88mA at 20V  
63mA at 35V

### Maximum power dissipation within unit

$<1.7W$

### Safety description

#### Terminals 3 to 1

26.6V, 94mA, 0.66W

#### Terminals 2 to 1

Non-energy-storing apparatus  $\leq 1.2V$ ,  $\leq 0.1A$ ,  $\leq 20\mu J$  and  $\leq 25mW$



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# MTL5032 PULSE ISOLATOR



The MTL5032 isolates pulses from a switch, proximity detector, current pulse transmitter or voltage pulse transmitter located in a hazardous area.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of switch

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detector or transmitter

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Maximum off-state values:  $V = 35V$ ,  $I = 10\mu A$   
Maximum on-state current: 50mA  
Voltage drop:  $[1 + (0.1 \times \text{current in mA})] V$   
Output off if supply fails

### Hazardous-area input

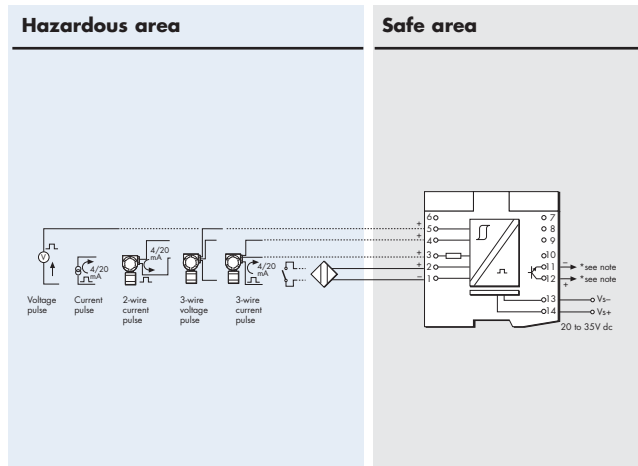
Switch: output-on (off) if switch closed (open)  
Proximity detector: meets NAMUR and DIN 19234 standards  
Pulse (I): Supply 16.5V dc at 20mA,  
Short-circuit current 24mA  
Output on (off) >8.9mA (<6.8mA)  
Switching hysteresis: 0.5mA typical  
Pulse (V): Input impedance >10k $\Omega$   
Switching point voltage ( $V_{sp}$ ): 3, 6 or 12V (selectable)  
Output on (off) if input  $>1.2 \times V_{sp}$  (< $0.8 \times V_{sp}$ )  
Switching hysteresis:  $0.11 \times V_{sp}$  typical

### Pulse width

High: 10 $\mu s$  minimum  
Low: 10 $\mu s$  minimum

### Frequency range

0 to 50kHz



Terminal	Function
1	Common -ve
2	Proximity detector +ve
3	Current +ve
4	Transmitter +ve
5	Voltage +ve
11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

### LED indicators

Green: power indication  
Yellow: status

### Supply voltage

20 to 35V dc

### Maximum current consumption

65mA at 24V dc  
70mA at 20V dc  
55mA at 35V dc

### Maximum power dissipation within unit

1.35W at 24V  
1.75W at 35V

### Safety description

#### Terminals 2 to 1

10.5V, 800 $\Omega$ , 14mA

#### Terminals 5 to 4 and 1

28V, 94mA, 0.65W

#### Terminals 4 to 3 and 1

28V, 300 $\Omega$ , 93mA

#### Terminal 3 to 1

Non-energy-storing apparatus  $\leq 1.2V$ ,  $\leq 0.1A$ ,  $\leq 20\mu J$  and  $\leq 25mW$ ;  
can be connected without further certification into any IS loop  
with an open-circuit voltage <28V



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# MTL5040 LOOP ISOLATOR

two channel 4/20 mA



MTL5040 provides a fully floating dc supply for energising a conventional 2-wire 4/20mA transmitter located in a hazardous-area and repeats the current in another floating circuit to drive a safe-area load. It also passes on a 4/20mA or 0/20mA signal from a controller located in the safe-area to a load in the hazardous-area.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of transmitter and load

Zone 0, IIC, T4-T6 hazardous area if suitably certified  
Div 1, Group A, hazardous location

### Channel 1- Transmitter (analogue input)

#### Safe-area output

Signal range: 4 to 20mA  
Over/under range: 0 to 24mA  
Safe-area load resistance: 0 to 550Ω  
Safe-area circuit output resistance: >2MΩ

#### Hazardous-area input

Signal range: 0 to 24mA (including over-range)  
Transmitter voltage: 16.5V at 20mA

### Channel 2- Driver (analogue output)

#### Safe-area input

Signal range: 4 to 20mA  
Over/under range: 0 to 24mA

#### Hazardous-area output

Maximum load resistance: 550Ω (11V at 20mA)

#### Hazardous-area circuit output resistance:

>2MΩ

#### Input voltage drop

<4V at 20mA

#### Input and output circuit ripple

<40μA peak-to-peak

#### Transfer accuracy at 20°C

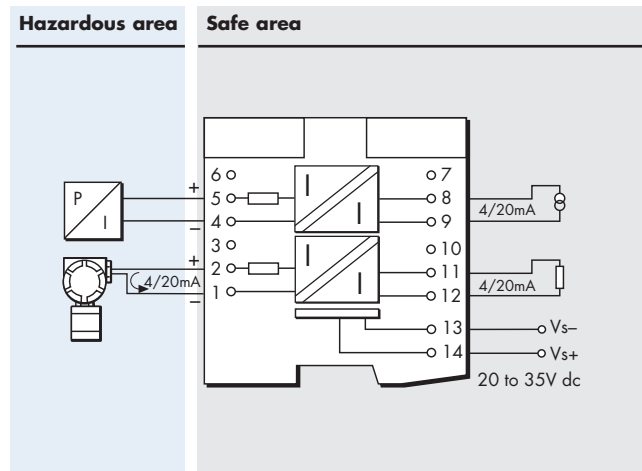
Better than 20μA (typically 5μA)

#### Temperature drift

<1μA/°C (4 to 20mA)

#### Response time

Settles to within 10% of final value within typically 250μs



Terminal	Function
1	Input -ve (transmitter), ch1
2	Input +ve (transmitter), ch 1
4	Output -ve (driver), ch2
5	Output +ve (driver), ch2
8	Input -ve (driver), ch2
9	Input +ve (driver), ch2
11	Output -ve (transmitter), ch1
12	Output +ve (transmitter), ch1
13	Supply -ve
14	Supply +ve

### LED indicator

Green: provided for power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with 20mA signal)

95mA at 24V  
110mA at 20V  
70mA at 35V

### Maximum power dissipation within unit (with 20mA signal)

1.6W at 24V  
1.8W at 35V

### Isolation

250V ac between safe circuits, hazardous circuits and power supply circuits

### Safety description

28V, 300Ω, 93mA; U<sub>m</sub>=250V rms or dc



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# MTL5041 REPEATER POWER SUPPLY

4/20mA, for 2-wire transmitters



The MTL5041 provides a fully-floating dc supply for energising a conventional 2-wire 4/20mA transmitter which is located in a hazardous area and repeats the current in another floating circuit to drive a safe-area load.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of transmitter

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Signal range: 4 to 20mA  
Over/under-range: 0 to 24mA  
Safe-area load resistance: 0 to 1k $\Omega$   
Safe-area circuit output resistance: >2M $\Omega$

### Safe-area circuit ripple

<125 $\mu$ A peak-to-peak

### Hazardous-area input

Signal range: 0 to 24mA (including over-range)  
Transmitter voltage: 16.5V at 20mA

### Transfer accuracy at 20°C

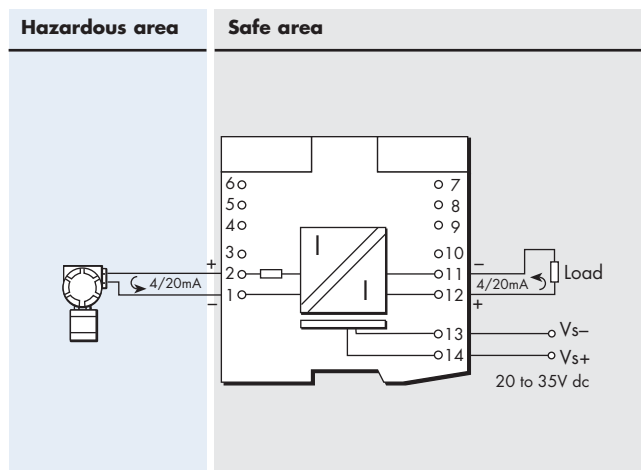
Better than 20 $\mu$ A (typically 5 $\mu$ A)

### Temperature drift

<1 $\mu$ A/°C

### Response time

Settles to within 10% of final value within 250 $\mu$ s



Terminal	Function
1	Input -ve
2	Input +ve
11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with 20mA signal)

70mA at 24V  
85mA at 20V  
55mA at 35V

### Maximum power dissipation within unit (with 20mA signal)

1.2W at 24V

### Safety description

28V, 300 $\Omega$ , 93mA;  $U_m$  = 250V rms or dc



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# MTL5042 REPEATER POWER SUPPLY

4/20mA, smart, for 2- or 3-wire transmitters



The MTL5042 provides a fully-floating dc supply for energising a conventional 2- or 3-wire 4/20mA transmitter which is located in a hazardous area, and repeats the current in another floating circuit to drive a safe-area load. For smart 2-wire transmitters, the unit allows bi-directional communications signals superimposed on the 4/20mA signal.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of transmitter

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Signal range: 4 to 20mA  
Under/over-range: 0 to 24mA  
Safe-area load resistance: 0 to 600Ω  
Safe-area circuit output resistance: >2MΩ

### Safe-area circuit ripple

<40μA peak-to-peak

### Hazardous-area input

Signal range: 0 to 24mA (including over-range)  
Transmitter voltage: 16.5V at 20mA

### Transfer accuracy at 20°C

Better than 10μA

### Temperature drift

<0.5μA/°C

### Response time

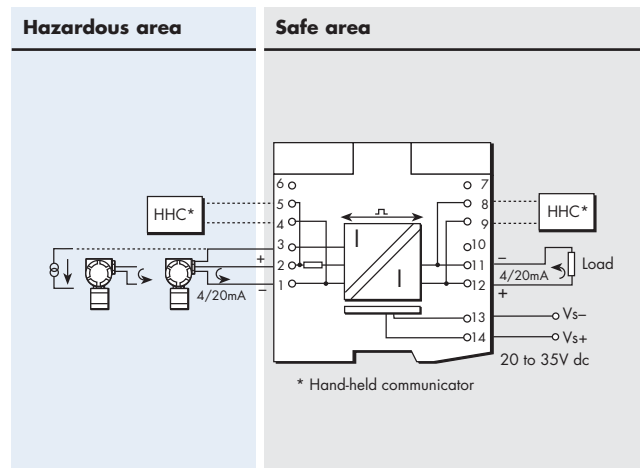
Settles to within 10% of final value within 40μs

### Digital signal bandwidth

10Hz to 12kHz

### Communications supported

HART®  
Honeywell DE  
Foxboro  
Yokogawa Brain



Terminal	Function
1	Current input
2	Transmitter supply +ve
3	Common
4	Optional HHC -ve
5	Optional HHC +ve
8	Optional HHC -ve
9	Optional HHC +ve
11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

HAZ4-6 connector reqd (for terminals 4, 5, 8, 9)  
SAF7-9 connector reqd (for terminals 7, 8, 9)

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with 20mA signal)

75mA at 24V  
85mA at 20V  
55mA at 35V

### Maximum power dissipation within unit (with 20mA signal)

1.3W at 24V

### Safety description

#### Terminals 2 to 1 and 3:

28V, 300Ω, 93mA;  $U_m = 250V$  rms or dc

#### Terminals 1 to 3:

Non-energy-storing apparatus  $\leq 1.2V$ ,  $\leq 0.1A$ ,  $\leq 20\mu J$  and  $\leq 25mW$ ;  
can be connected without further certification into any IS loop  
with an open-circuit voltage <28V

Note: Terminals 1 and 3 only support HART® communications in one direction  
from field device to safe-area connections 11 and 12

HART® is a registered trademark of the HART Communication Foundation



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Jul 2007

# MTL5043 REPEATER POWER SUPPLY

dual output, 4/20mA, for 2-wire 'smart'  
transmitters



The MTL5043 provides a fully floating dc supply for energising a conventional 2-wire 4/20mA 'smart' transmitter which is located in a hazardous area, and repeats the current in two floating circuits to drive two safe-area loads. HART is repeated through channel 1 only for bi-directional communication.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of transmitter

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area outputs

Signal range: 4 to 20mA  
Over/under-range: 0 to 24mA (load ch1 <250Ω, ch2 <450Ω)  
(21mA with max load below)  
Safe-area load resistance: ch1: 0 - 350Ω (terminals 11 & 12)  
ch1: 0 - 130Ω (terminals 10 & 11)  
Safe-area load resistance: ch2: 0 - 550Ω  
Safe-area load resistance: ch2 current sink 1kΩ (max voltage 30V)  
Safe-area circuit output resistance: >2MΩ

### Safe-area circuit ripple

<125µA peak-to-peak

### Hazardous-area input

Signal range: 0 to 24mA (including over-range)  
Transmitter voltage: 15.5V at 20mA

### Transfer accuracy at 20°C

Better than 20µA (typically <5µA)

### Temperature drift

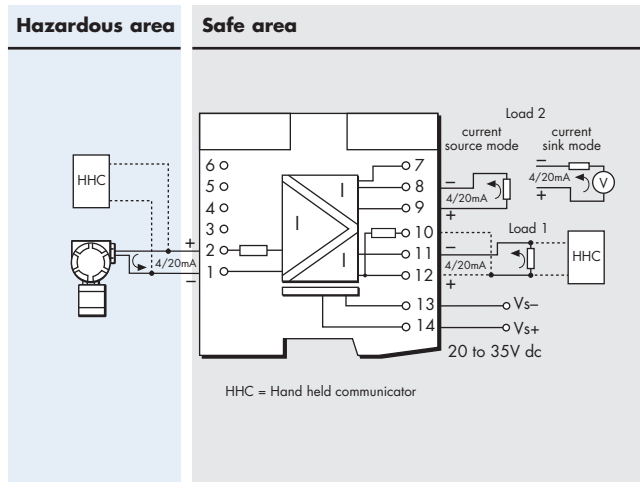
<0.5µA/°C

### Response time

Both outputs settle to within 10% of final value within 500µs  
Digital signal bandwidth: 400Hz to 4kHz

### Communication supported

HART®



Terminal	Function
1	Input -ve } HHC
2	
7	Output -ve (ch2 passive current sink)
8	Output -ve (ch2 Active/+ve current sink)
9	Output +ve (ch2 Active)
10	Output +ve (ch1 via 220W for HART Apps)
11	Output -ve (ch1)
12	Output +ve (ch1)
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption

#### (with two 20mA signals)

100mA at 24V  
120mA at 20V  
80mA at 35V

### Maximum power dissipation within unit

#### (with two 20mA signals)

1.7W at 24V

### Isolation

250V ac or dc between power supply, input and outputs

### Safety description

$U_o = 28V$ ,  $I_o = 93mA$ ,  $P_o = 0.65W$   
 $U_m = 253V$  rms.

N. B. MTL5043 marked Baseefa 03ATEX0584 pass HART and are fully compliant with this spec. Modules carrying the BAS01ATEX7154 or Ex97D2248 certification, do not pass HART, are not fitted with a current sink output on terminal 7 nor a 220 series resistor on terminal 10.

HART® is a registered trademark of the HART Communication Foundation



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Jul 2007

# MTL5044 REPEATER POWER SUPPLY

two-channel, 4/20mA, for 2-wire  
transmitters



The MTL5044 provides a fully-floating dc supply for energising two conventional 2-wire 4/20mA transmitters which are located in a hazardous area, and repeats the current in two floating circuits to drive two safe-area loads.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of transmitters

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area output

Signal range: 4 to 20mA  
Over/under range: 0 to 24mA  
Safe-area load resistance: 0 to 550Ω  
Safe-area circuit output resistance: >2MΩ

### Safe-area circuit ripple

<125µA peak-to-peak

### Hazardous-area input

Signal range: 0 to 24mA (including over-range)  
Transmitter voltage: 16.5V at 20mA

### Transfer accuracy at 20°C

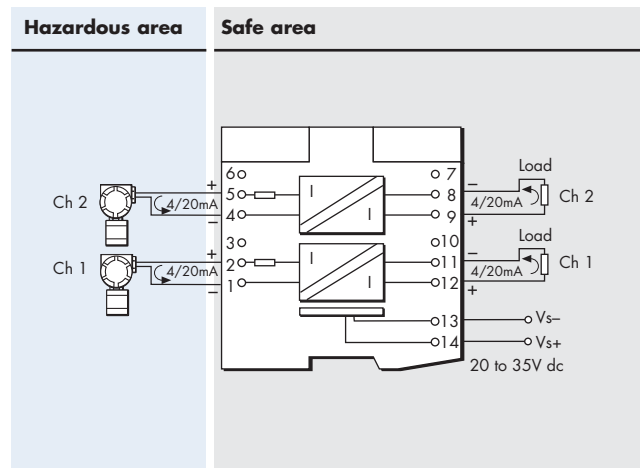
Better than 20µA (typically 5µA)

### Temperature drift

<1µA/°C

### Response time

Settles to within 10% of final value within 250µs



Terminal	Function
1	Input -ve (channel 1)
2	Input +ve (channel 1)
4	Input -ve (channel 2)
5	Input +ve (channel 2)
8	Output -ve (channel 2)
9	Output +ve channel 2)
11	Output -ve (channel 1)
12	Output +ve (channel 1)
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with two 20mA signals)

110mA at 24V  
130mA at 20V  
80mA at 35V

### Maximum power dissipation within unit (with two 20mA signals)

1.5W at 24V

### Safety description

28V, 300Ω, 93mA;  $U_m = 250V$  rms or dc



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# MTL5045 ISOLATING DRIVER

4/20mA



The MTL5045 isolates and passes on a 4/20mA signal from a controller located in the safe area to a load of up to 800Ω in the hazardous area. It has a high output capacity of 16V at 20mA combined with a low (4V) drop across its input terminals and excellent accuracy.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of load

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area input

Signal range: 4 to 20mA  
Under/over range: 0 to 24mA

### Hazardous-area output

Maximum load resistance: 800Ω (16V at 20mA)

### Output resistance

>2MΩ

### Input voltage drop

<4V at 20mA

### Input and output circuit ripple

<40μA peak-to-peak

### Transfer accuracy at 20°C

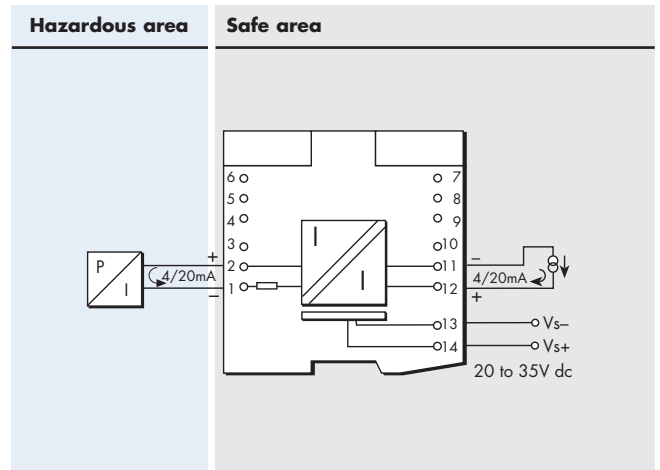
Better than 20μA

### Temperature drift

<1μA/°C

### Response time

Settles to within 10% of final value within 250μs



Terminal	Function
1	Output -ve
2	Output +ve
11	Input -ve
12	Input +ve
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption

50mA at 24V  
60mA at 20V  
40mA at 35V

### Maximum power dissipation within unit (with 20mA signal)

1.0W at 24V  
1.1W at 35V

### Safety description

28V, 300Ω, 93mA;  $U_m = 250V$  rms or dc



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# MTL5046 ISOLATING DRIVER

4/20mA, smart,  
with line fault detection



The MTL5046 accepts a 4/20mA signal from a controller located in the safe 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. A line fault detection (LFD) facility is also provided.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of load

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area input

Signal range: 4 to 20mA  
Under/over-range: 1 to 24mA

### Hazardous-area output

Load resistance: minimum 100Ω  
maximum 800Ω (16V at 20mA)

### Digital signal bandwidth

500Hz to 10kHz

### Output resistance

>2MΩ

### Input and output circuit ripple

<40μA peak-to-peak

### Transfer accuracy at 20°C

Better than 10μA

### Input voltage drop

<4V at 20mA

### Response time

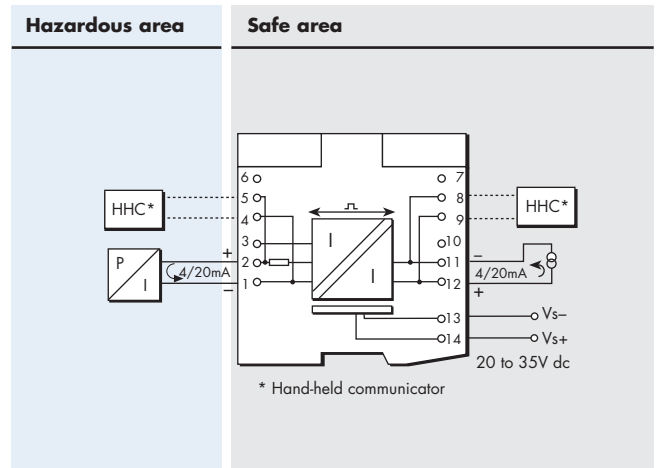
Settles to within 10% of final value within 100μs

### Temperature drift

<0.5μA/°C

### Line fault detection (LFD)

Signalled by an impedance change in the safe-area loop.  
When a line fault occurs, the impedance between pins 11 and 12 is >100kΩ.



Terminal	Function
1	Output -ve
2	Output +ve
4	Optional HHC -ve
5	Optional HHC +ve
8	Optional HHC -ve
9	Optional HHC +ve
11	Input -ve
12	Input +ve
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with 20mA signal)

65mA at 24V  
75mA at 20V  
50mA at 35V

### Maximum power dissipation within unit (with 20mA signal)

1.5W at 24V  
1.6W at 35V

### Safety description

28V, 300Ω, 93mA;  $U_m = 250V$  rms or dc



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# MTL5049 ISOLATING DRIVER

two-channel, 4/20mA



The MTL5049 isolates and passes on two 4/20mA signals from a controller located in the safe area to two loads located in the hazardous area.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of loads

Zone 0, IIC, T4–6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Safe-area input

Signal range: 4 to 20mA  
Under/over range: 0 to 24mA

### Hazardous-area output

Load resistance: maximum 550Ω (11V at 20mA)

### Output resistance

>2MΩ

### Input and output circuit ripple

<40μA peak-to-peak

### Transfer accuracy at 20°C

Better than 20μA

### Input voltage drop

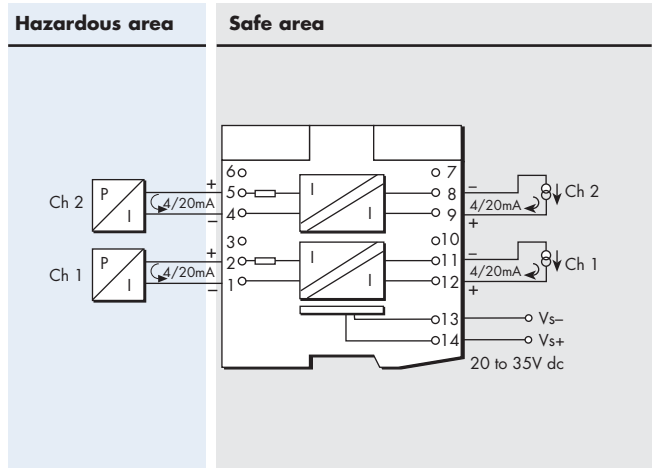
<4V at 20mA

### Response time

Settles to within 10% of final value within 250μs

### Temperature drift

<1μA/°C



Terminal	Function
1	Output -ve (channel 1)
2	Output +ve (channel 1)
4	Output -ve (channel 2)
5	Output +ve (channel 2)
8	Input -ve (channel 2)
9	Input +ve (channel 2)
11	Input -ve (channel 1)
12	Input +ve (channel 1)
13	Supply -ve
14	Supply +ve

### LED indicator

Green: power indication

### Supply voltage

20 to 35V dc

### Maximum current consumption (with two 20mA signals)

65mA at 24V  
75mA at 20V  
50mA at 35V

### Maximum power dissipation within unit (with two 20mA signals)

1.4W at 24V  
1.5W at 35V

### Safety description

28V, 300Ω, 93mA;  $U_m = 250V$  rms or dc



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# MTL5051 SERIAL-DATA COMMS ISOLATOR



The MTL5051 provides bi-directional serial data communication from a computer system in safe area to instrumentation in a hazardous area. It is used to provide a fully floating dc supply for, and serial data communications to: MTL643, MTL644, MTL646 and MTL647 IS text displays, other IS instrumentation, keyboards or a mouse. It can also be used for data communications across a hazardous area.

## SPECIFICATION

See also common specification

### Location of field equipment

- Zone 0, IIC, T4-6 hazardous area
- Div 1, Group A hazardous location

### Safe-area signal

RS232 or RS422

### Hazardous-area signal

#### MTL640 Series mode:

- To hazardous area: 3V signal superimposed on 12V (nominal) supply
- From hazardous area: 5mA signal superimposed on quiescent current

#### Across hazardous area communications mode:

- To hazardous area: 10mA current source
- From hazardous area: 10mA current source

#### IS RS232/TTL devices mode:

- To hazardous area: RS232-compatible signal levels
- From hazardous area: TTL/RS232 signals

### LED Indicators

Green: power indication

### Max. power dissipation within unit

1.7W at 24V, 25mA load

### Maximum power consumption (25mA load)

- At  $V_s=20V$ , 105mA
- At  $V_s=24V$ , 90mA
- At  $V_s=35V$ , 70mA

### Comms bandwidth

- 643/4 mode 1200 to 9600 baud
- Other modes up to 19.2 kbaud

### Safety description

- Terminals 1,2,3,4 only 14V, 800mW, 192mA
- Terminals 1,3,4 only 14V, 350mW, 88mA
- Terminals 1,2,3 only 14V, 450mW, 108mA
- Terminals 1,5,6 only 15V, 70mW, 35mA
- Terminals 1,2,5,6 only 20V, 460mW, 139mA
- Terminals 1,2,3,4,5,6 only 20V, 810mW, 227mA

### Hazardous area supply terminal 2

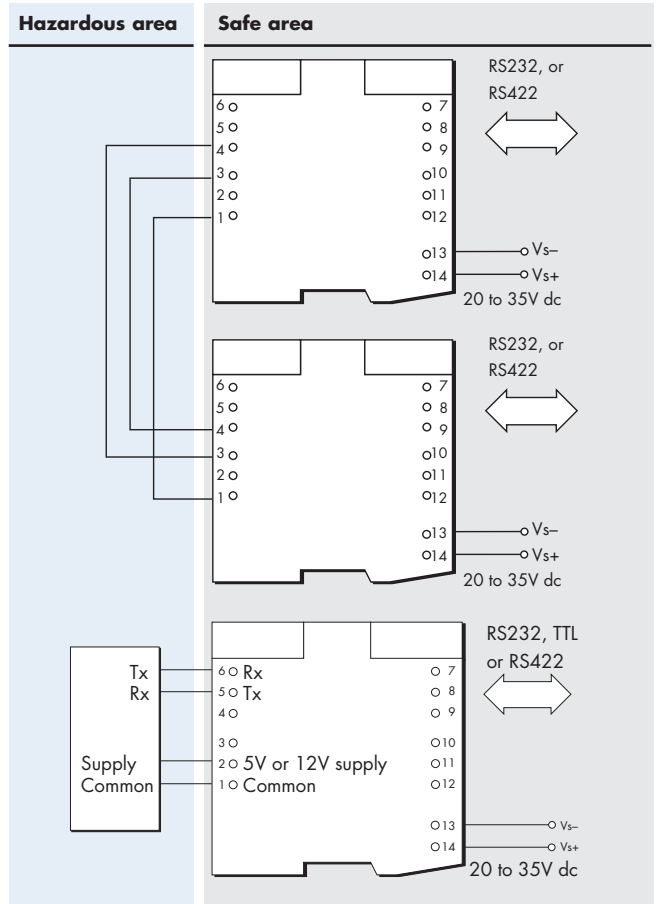
- +12V mode 12.0V  $\pm$  5% (load <23mA)
- +12V mode 8.0V min (load >23 to <50mA)
- +5V 5.6V  $\pm$  5% (load >23 to <50mA)

### Hazardous Interfacing

See MTL640 Series for details of interfacing with MTL643, MTL644, MTL646 and MTL647 IS text displays.

### Across hazardous areas communications mode

The MTL5051 is used in pairs to transfer bi-directional full-duplex data across hazardous areas, as shown above. Current switching is used to minimise the bandwidth-limiting effects of long cables.



MTL5051 Terminals	MTL640 mode	Comms mode	Other IS devices
1	Common	Common	Common
2	V signal	-	5V/12V
3	I return	Rx	-
4	-	Tx	-
5	-	-	Tx
6	-	-	Rx
Switch			
1a	ON	OFF	OFF
1b	ON	ON	OFF/ON

Terminals	RS232 mode	TTL mode	RS422 mode
7	-	-	Rx -
8	-	-	Rx +
9	-	Tx	Tx +
10	Tx	-	Tx -
11	Common	Common	Common
12	Rx	Rx	-
13	Supply - ve	Supply - ve	Supply -ve
14	Supply +ve	Supply +ve	Supply +ve
Switch			
2a	OFF	ON	ON
2b	ON	OFF	OFF

### Interfacing to an IS keyboard, mouse or other device

Communicating with RS232-level interfaces, such as an IS keyboard, mouse, etc. is achieved by using one or more MTL5051 units as required by the device. (TTL level interfaces are also accommodated by the TTL-compatibility feature of RS232 receivers.) The supply to the IS equipment may be selected to be either 5V or 12V by switch on top of unit.

Note: the normal RS232 limitations of bandwidth versus cable length are applicable. As a rule of thumb,  $speed( baud ) \times length( metres ) < 150,000$ .



# MTL5053 ISOLATOR/ POWER SUPPLY

31.25kbit/s fieldbus



The MTL5053 has been specifically developed to extend 31.25kbit/s (H1) fieldbus networks into hazardous areas. It provides power and communication to devices powered through the signal conductors. For installations in which the safe-area bus length is small an internal terminator can be enabled by a switch on top of the module.

The MTL5053 complies with requirements of Fieldbus Foundation™ specified power supply Type 133† (IS power supply).

## SPECIFICATION

See also common specification

### Location of fieldbus device(s)

Zone 0, IIC, T4–6 hazardous area if suitably certified

### Hazardous-area fieldbus power supply

18.4V ± 2%  
105Ω ± 3% dc impedance  
80mA maximum current

### Maximum cable length

Determined by IS requirements, depending on other devices attached and maximum acceptable voltage drop along cable

### Digital signal transmission

Compatible with 31.25kbit/s fieldbus systems and complies with fieldbus standards†

### Supply voltage

20 to 35Vdc

### LED indicator

Green: one provided for power indication

### Power requirement, Vs, with 80mA output load

135mA typical at 24V  
105mA at 35V

### Power dissipation within unit, with 80mA output load

2.3W typical at 24V  
2.6W maximum at 35V

Note: To allow adequate heat dissipation under all likely thermal conditions, it is recommended that MTL5053's are installed on a horizontal DIN-rail mounted on a vertical surface\* with a 10mm space between adjacent units. MTL MS010 10mm DIN-rail module spacers are available for this purpose.

\* If an MTL5053 is mounted in a non-optimum orientation, the maximum operating temperature is reduced to 45°C.

### Isolation

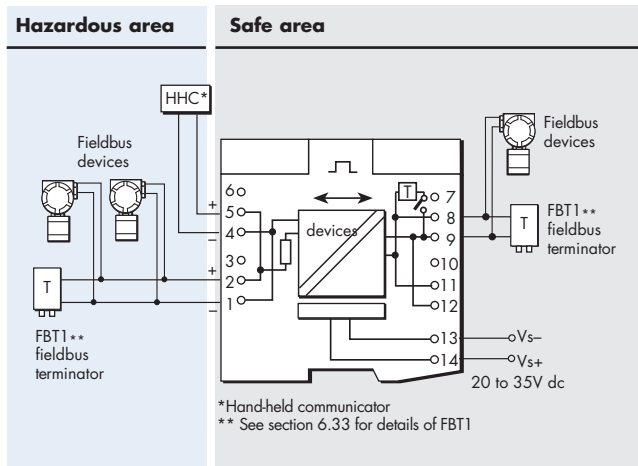
250V ac between safe- and hazardous-area circuits and power supply

### Safety description

#### Terminals 1 and 2

22V, 102Ω, 216mA;  $U_m = 250V$  rms or dc

† The applicable fieldbus specifications and standards are: Foundation fieldbus™ 31.25kbit/s Physical Layer Profile Specification, document FF-816, IEC 61158-2: 1993 and ISA-S50.02-1992 for 31.25kbit/s fieldbus systems



Terminal	Function
1	Hazardous-area fieldbus device(s) connection –ve
2	Hazardous-area fieldbus device(s) connection +ve
4	Optional HHC connection –ve
5	Optional HHC connection +ve
8 & 11	Safe-area fieldbus device(s) connection –ve
9 & 12	Safe-area fieldbus device(s) connection +ve
13	Supply –ve
14	Supply +ve

Note: To assist the process of terminating cable screens, screw terminals have been provided in terminals 3, 6, 7 and 10. Please note, however, that there is no internal connection for these terminals so they are not earthed.

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# MTL5061 FIRE/SMOKE DETECTOR INTERFACE

two-channel, loop-powered



The MTL5061 is a loop-powered two-channel interface for use with conventional fire and smoke detectors located in hazardous areas. In operation, the triggering of a detector causes a corresponding change in the safe-area circuit. The unit has reverse input polarity protection, while 'non-fail' earth fault detection on either line can be provided by connecting an earth leakage detector to terminals 3 or 6.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of detectors

Zone 0, IIC, T4-6 hazardous area if suitably certified  
Div. 1, Group A hazardous location

### Current range

1 to 40mA, nominal

### Integral input polarity protection

Input circuit protected against reverse polarity

### 'No-fail' earth fault protection (optional)

Enabled by connecting terminals 3 and 6 to the MTL4220 earth leakage detector. If a fault on either line of each channel is proclaimed: unit continues working.

*Note:1. The earth leakage detector introduces a 100µA, 1Hz ripple to the field circuit.*

### Minimum output voltage $V_{out}$ at 20°C

whichever is the lower of:

$V_{in} - (0.38 \times \text{current in mA}) - 2V$  or  
 $21V - (0.35 \times \text{current in mA})$

### Response time to step input

Settles to within 500µA of final value within 30ms

### Hazardous-area output

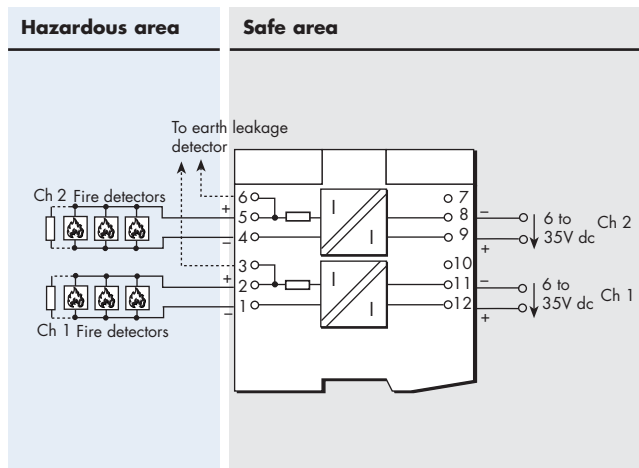
Maximum output voltage 28V from 300Ω

### Transfer accuracy at 20°C

Better than 400µA

### Temperature drift

<10µA/°C (-20 to 60°C)



Terminal	Function
1	Output -ve (channel 1)
2	Output +ve (channel 1)
3	Earth leakage detection (channel 1)
4	Output -ve (channel 2)
5	Output +ve (channel 2)
6	Earth leakage detection (channel 2)
8	Input -ve (channel 2)
9	Input +ve (channel 2)
11	Input -ve (channel 1)
12	Input +ve (channel 1)

### Loop supply voltage

6 to 35V dc

### Quiescent safe-area current at 20°C

(hazardous-area terminals open-circuit)  
<400µA/ channel,  $V_{in} = 24V$  dc

### Maximum power dissipation within unit

0.7W at 24V with 40mA signal (each channel)  
1.2W at 35V with 40mA signal (each channel)

### Safety description

28V, 300Ω, 93mA;  $U_m = 250V$  rms or dc



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# MTL5074 TEMPERATURE CONVERTER

THC or RTD input



The MTL5074 converts a low-level dc signal from a temperature sensor mounted in a hazardous area into a 4/20mA current for driving a safe-area load. Software selectable features include linearisation, ranging, monitoring, testing and tagging for eight thermocouple types and 2-, 3- or 4-wire RTDs. For thermocouples requiring cold-junction compensation, the HAZ-CJC plug can be ordered with the product, and includes an integral CJC sensor.

## SPECIFICATION

See also common specification

### Number of channels

One

### Signal source

Types J, K, T, E, R, S, B or N THCs to BS 4937  
EMF input  
2/3/4-wire platinum RTDs to BS 1904/DIN43760 (100Ω at 0°C)

### Location of signal source

Zone 0, IIC, T4 hazardous area  
Div.1, Group A, hazardous location

### Input signal range

-75 to +75mV, or 0 to 400Ω (Input impedance 10MΩ)

### Input signal span

3 to 150mV, or 10 to 400Ω

### RTD excitation current

200µA nominal

### Cold junction compensation

Automatic or selectable

### Cold junction compensation error

≤1.0°C

### Common mode rejection

120dB for 240V at 50Hz or 60Hz

### Series mode rejection

40dB for 50Hz or 60Hz

### Calibration accuracy (at 20°C)

(includes hysteresis, non-linearity and repeatability)

#### Inputs:

**mV/THC:** ±15µV or ±0.05% of input value  
(whichever is greater)

**RTD:** ±80mΩ

**Output:** ±11µA

#### Temperature drift (typical)

##### Inputs:

**mV/THC:** ±0.003% of input value/°C

**RTD:** ±7mΩ/°C

**Output:** ±0.6µA/°C

#### Example of calibration accuracy and temperature drift (RTD input)

**Span:** 250Ω

**Accuracy:** ±(0.08/250 + 11/16000) x 100%  
= 0.1% of span

**Temperature drift:** ±(0.007/250 x 16000 + 0.6) µA/°C  
= ±1.0µA/°C

#### Safety drive on sensor burnout

Upscale, downscale, or off

#### Output range

4 to 20mA nominal (direct or reverse)

#### Maximum load resistance

600Ω

#### LED indicator

Green: one provided for power and status indication

#### Power requirement, Vs with 20mA signal

68mA at 24V

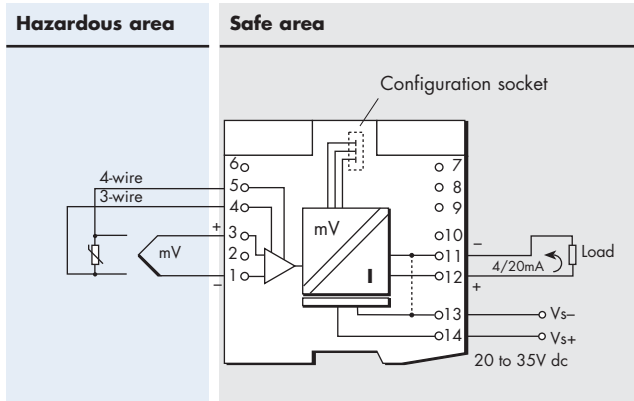
82mA at 20V

52mA at 35V

#### Power dissipation within unit with 20mA signal

1.5W at 24V

1.6W at 35V



Terminal	Function
1	THC/EMF/RTD input -ve
3	THC/EMF/RTD input +ve
4	3-wire RTD input -ve
5	4-wire RTD input +ve
11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

#### Isolation

250V ac between safe- and hazardous-area circuits and power supply

#### Safety description

##### Terminals 1 and 3

i) Without CJ plug

$V_{out} = 1.1V$

$I_{out} = 7mA$

$P_{out} = 2mW$

Non-energy-storing apparatus ≤1.2V, ≤0.1A, ≤20µJ and ≤25mW.

Can be connected without further certification into any IS loop with open-circuit voltage not more than 10V.

ii) With CJ plug

$V_{out} = 6.6V$ ,  $I_{out} = 10mA$

$P_{out} = 17mW$

##### Terminals 1 and 3, 4 and 5

$V_{out} = 6.6V$ ,  $I_{out} = 76mA$

$P_{out} = 0.13W$

##### Configuration socket (CON6)

$V_{out} = 8.3V$ ,  $I_{out} = 15mA$

$P_{out} = 26mW$

#### Standard configuration

Input type	RTD, 3-wire
Linearisation	enabled
CJ Compensation	disabled
Units	°C
Damping/Smoothing value	0 seconds/0 seconds
Output zero	0°C
Output span	250°C
Tag and description fields	blank
Open circuit alarm	set high (upscale)
Transmitter failure alarm	set low (downscale)
CJ failure alarm	set low (downscale)
Line frequency	50Hz

#### Configurator

A personal computer running MTL PCS45 software with a PCL45 interface.

#### TO ORDER, specify:

**MTL5074** Includes HAZ-CJC signal plug (with internal CJC sensor). For use with thermocouple, mV or RTD inputs.

**MTL5074-RTD** Includes standard HAZ1-3 signal plug. For use with mV or RTD inputs. (Can be used with thermocouples with cold-junction compensation if HAZ-CJC plug is fitted.)

**HAZ-CJC** Hazardous-area signal plug for terminals 1 to 3 including cold-junction compensation sensor.



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# MTL5081 MILLIVOLT/ THERMOCOUPLE ISOLATOR



MTL5081 takes a low-level dc signal from a voltage source in a hazardous area, isolates it and passes it to a receiving instrument located in the safe area. The module is intended for use with thermocouples utilising external cold junction compensation. A switch located on top of the module enables or disables the safety drive in the event of thermocouple burnout or cable breakage; a second switch permits the selection of upscale or downscale drive as required.

## SPECIFICATION

See also common specification

### Number of channels

One

### Signal source

Any dc millivolt source

### Location of millivolt source

Zone 0, IIC, T4–T6 hazardous area if suitably certified  
Div 1, Group A, hazardous location

### Input and output signal range

0 to  $\pm 50\text{mV}$ , overrange to  $\pm 55\text{mV}$

### Output resistance

$60\Omega$  nominal

### Transfer accuracy

Linearity and repeatability  $< 0.05\%$  of reading or  $\pm 5\mu\text{V}$ , whichever is the greater

### Temperature drift

$\pm (2\mu\text{V} + 0.002\%$  of input) per  $^{\circ}\text{C}$

### Response time

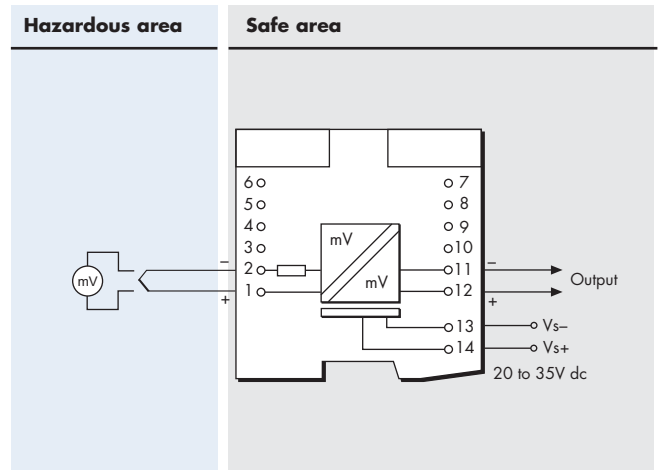
Settles to within 10% of final value within typically  $150\mu\text{s}$

### Frequency response

DC to 4kHz

### Safety drive on THC burnout

Two switches on top of the module enable or disable the safety drive and select upscale or downscale drive



Terminal	Function
1	THC/mV input -ve
2	THC/mV input +ve
11	Output -ve
12	Output +ve
13	Supply -ve
14	Supply +ve

### LED indicator

Green: provided for power indication

### Power requirement, $V_s$

20mA max, 20 to 35V dc

### Maximum power dissipation within unit

0.5W at 24V

0.7W at 35V

### Isolation

250V ac between safe circuits, hazardous circuits and power supply circuits

### Safety description

#### Terminals 1 and 2

Non-energy-storing apparatus ( $\leq 1.2\text{V}$ ,  $\leq 0.1\text{A}$ ,  $\leq 20\mu\text{J}$  and  $\leq 25\text{mW}$ ). Can be connected without further certification into any IS loop with an open circuit voltage  $< 28\text{V}$ .



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# MTL5082 RESISTANCE ISOLATOR



The MTL5082 connects to a 2-, 3-, or 4-wire resistance temperature device (RTD) or other resistance located in a hazardous area, isolates it and repeats the resistance to a monitoring system in the safe area. The module is intended typically (but not exclusively) for use with Pt100 3-wire RTDs. Switches located on top of the module allow selection of 2-, 3-, or 4-wire RTD connection. The MTL5082 should be considered as an alternative, non-configurable MTL5074, for use in RTD applications where a resistance input is preferred or needed instead of 4/20mA. The design is notable for its ease of use and repeatability. The number of wires which can be connected on the safe-area side of the unit is independent of the number of wires which can be connected on the hazardous-area side. The module drives upscale in the case of open-circuit detection.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of RTD

Zone 0, IIC, T4 hazardous area  
Div 1, Group A hazardous location

### Resistance source

2-, 3-, or 4-wire\* RTDs to BS 1904/DIN 43760 (100Ω at 0°C)  
\*user selectable by switches located on top of the module (factory set for 3-wire)

### Resistance range

10Ω to 400Ω

### RTD excitation current

200μA nominal

### Output configuration

2, 3 or 4 wires (independent of mode selected for hazardous-area terminals)

### Output range

10Ω to 400Ω (from a 100μA to 5mA source)

### Temperature drift

±10mΩ/°C typical (0.01%/°C @ 100Ω)

### Response time

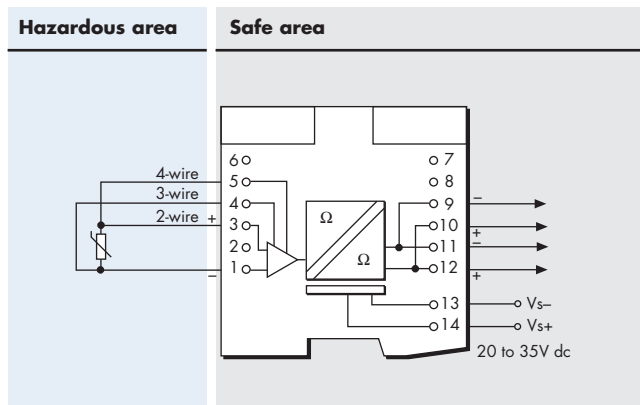
To within 4% of final value within 1s

### Safety drive on open-circuit sensor

Upscale to 420Ω nominal

### Transfer accuracy

Input		Output accuracy								
		At excitation current of								
		0.2mA			0.5mA			1 to 5mA		
Temp. °C	Pt100 resist. Ω	Ω	Ω, % Input	°C	Ω	Ω, % input	°C	Ω	Ω, % input	°C
-	10.0	0.25	2.5%	0.65	0.24	2.4%	0.62	0.23	2.3%	0.60
-200	18.5	0.26	1.4%	0.68	0.24	1.3%	0.62	0.23	1.2%	0.60
-100	60.3	0.28	0.5%	0.73	0.24	0.4%	0.62	0.23	0.4%	0.60
0	100.0	0.31	0.3%	0.81	0.24	0.2%	0.62	0.23	0.2%	0.60
100	138.5	0.34	0.2%	0.88	0.24	0.2%	0.62	0.23	0.2%	0.60
200	175.8	0.37	0.2%	0.96	0.25	0.1%	0.65	0.23	0.1%	0.60
400	247.0	0.44	0.2%	1.14	0.26	0.1%	0.68	0.23	0.1%	0.60
600	313.6	0.51	0.2%	1.32	0.27	0.1%	0.70	0.24	0.1%	0.62
-	400.0	0.59	0.1%	1.53	0.28	0.1%	0.73	0.24	0.1%	0.62



Terminal	Function
1	RTD input -ve
3	RTD input +ve
4	3-wire RTD input -ve
5	4-wire RTD input +ve
9	RTD output -ve
10	RTD output +ve
11	RTD output -ve
12	RTD output +ve
13	Supply -ve
14	Supply +ve

### LED indicator

Green: one provided for power and status indication

### Power requirements, Vs

55mA at 24V  
65mA at 20V  
45mA at 35V

### Maximum power dissipation within unit

1.4W at 24V  
1.6W at 35V

### Isolation

250V ac between safe- and hazardous-area circuits and power supply

### Safety description

#### Terminals 1 and 3

U<sub>o</sub> = 1.1V  
I<sub>o</sub> = 4mA  
P<sub>o</sub> = 1mW

These terminals meet clause 5.4 of EN50020 : 1994 'simple apparatus' (U ≤ 1.5V, I ≤ 0.1A, P ≤ 25mW) and can be connected without further certification into any IS loop with open circuit voltage of not more than 10V. For higher voltages contact MTL. See certificate for further details.

#### Terminals 1 and 3 and 4 and 5

U<sub>o</sub> = 6.6V  
I<sub>o</sub> = 27mA  
P<sub>o</sub> = 50mW



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# MTL5113P FAILSAFE SWITCH/PROXIMITY DETECTOR INTERFACE

with LFD



With the MTL5113P, a fail-safe switch/proximity detector located in the hazardous area can control an isolated fail-safe electronic output. The MTL5113P unit also provides line-fault detection alarm contacts. The MTL5113P is for use with P + F TÜV approved fail-safe sensors.

## SPECIFICATION

See also common specification

### Number of channels

One

### Location of switches

Zone 0, IIC, T6 hazardous area  
Div. 1, Group A hazardous location

### Location of proximity detector

Zone 0, IIC, T4-6, hazardous location  
Div 1, Group A, hazardous location

### Voltage applied to sensor

8.6V dc max from 1k $\Omega$

### Input/output characteristics

Input value in sensor circuit	Fail-safe output	Operation	LFD contacts
$2.9\text{mA} < I_s < 3.9\text{mA}$	ON	Normal	CLOSED
$I_s < 1.9\text{mA} \ \& \ I_s > 5.1\text{mA}$	OFF	Normal	CLOSED
$I_s < 50\mu\text{A}$	OFF	Broken line	OPEN
$I_s > 6.6\text{mA}$	OFF	Shorted line	OPEN

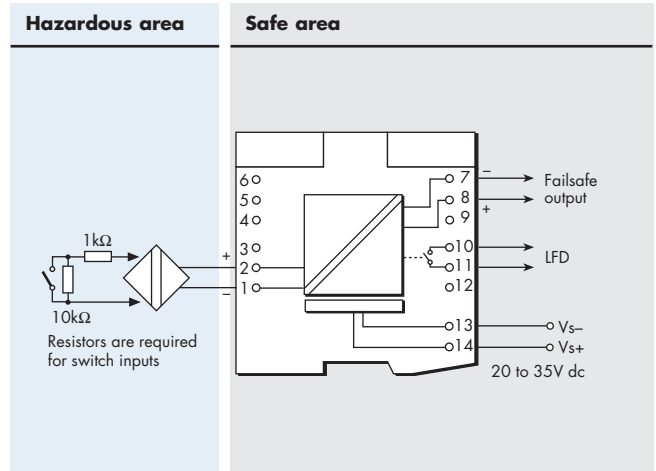
Note:  $I_s$  = sensor current

### Fail-safe electronic output

Output on: > 22.8V  
Output off: 0V dc, max <5V dc  
Load: 2.4k $\Omega$  to 10k $\Omega$   
Maximum on-state current: 11mA  
Short-circuit current: 25mA

### Line fault detection (LFD)

Relay output for line fault (contacts open when line fault detected)  
Switch characteristics: 0.3A 110V ac/dc, 1A 30V dc, 30W/33VA



Terminal	Function
1	Input -ve
2	Input +ve
7	Output -ve
8	Output +ve
10	LFD
11	LFD
13	Supply -ve
14	Supply +ve

### LED indicators

Yellow: one provided for output status, ON when fail-safe output is energised  
Green: one provided for power indication  
Red: one provided for LFD, ON when line fault is detected

### Power requirements, $V_s$

80mA at 20V dc  
70mA at 24V dc  
65mA at 35V dc

### Isolation

253V ac between safe- and hazardous-area circuits

### Power dissipation within unit

1.4W at 20V dc  
1.5W at 24V dc  
2.0W at 35V dc

### Safety description

$U_o=9.7\text{V}$ ,  $I_o=30\text{mA}$ ,  $P_o=70\text{mW}$ ,  $C_i=33\text{nF}$ ,  $L_i=0\text{mH}$ ,  $U_m=253\text{V}$

### Weight

160g approx.



# MTL5314 TRIP AMPLIFIER

4/20mA, for 2- or 3-wire transmitters



The MTL5314 connects to a 2- or 3-wire 4/20mA transmitter or current source located in the hazardous area. It supplies one or two configurable alarm signals to the safe area via changeover relays. Each relay may be configured individually to signal an alarm condition (relay de-energised) when the input signal is greater than or less than a pre-set value.

In addition, the MTL5314 can be connected in series to the hazardous-area side of an MTL5042 4/20mA repeater power supply (or equivalent device) to provide two trip alarm outputs direct from the transmitter signal (see schematic diagram). Looping the transmitter signal through the MTL5314 (via terminals 1 and 3) does not affect HART® communications.

## SPECIFICATION

See also common specification

### Number of channels

One, with two configurable alarms

### Location of field equipment

Zone 0, IIC, T4–T6 hazardous area, if suitably certified  
Div 1, Group A, hazardous location

### Safe-area output

Two relays with changeover contacts

### Hazardous-area input

Signal range: 0 to 24mA  
(including over-range)

### Voltage available for transmitter (terminals 1 and 2)

>17V at 20mA

### Current input (terminals 1 to 3)

Input resistance 25Ω maximum

### Response time

<75ms

### Trip-points

Trip-points can be adjusted by the user via multiturn potentiometers accessible on the top of the unit.

Trip-point range	0.5 to 22mA
Effective resolution	20μA
Trip-point drift with temperature	1.5μA/°C max.
Hysteresis	min 1% of trip-point range max 1.7% of trip-point range

### Relay type

Single pole, changeover contacts

Note: reactive loads must be adequately suppressed

### Relay characteristics

Contact rating	250V ac, 2A, $\cos\phi > 0.7$ 40V dc, 2A, resistive load
Contact life expectancy	$3.3 \times 10^5$ operations

### LED indicators

Power LED green, illuminated when the power is connected to the module  
Status LED yellow, one per trip, illuminated when relay is energised (not tripped)

### Supply voltage

20 to 35V dc

### Maximum current consumption (with 20mA signal)

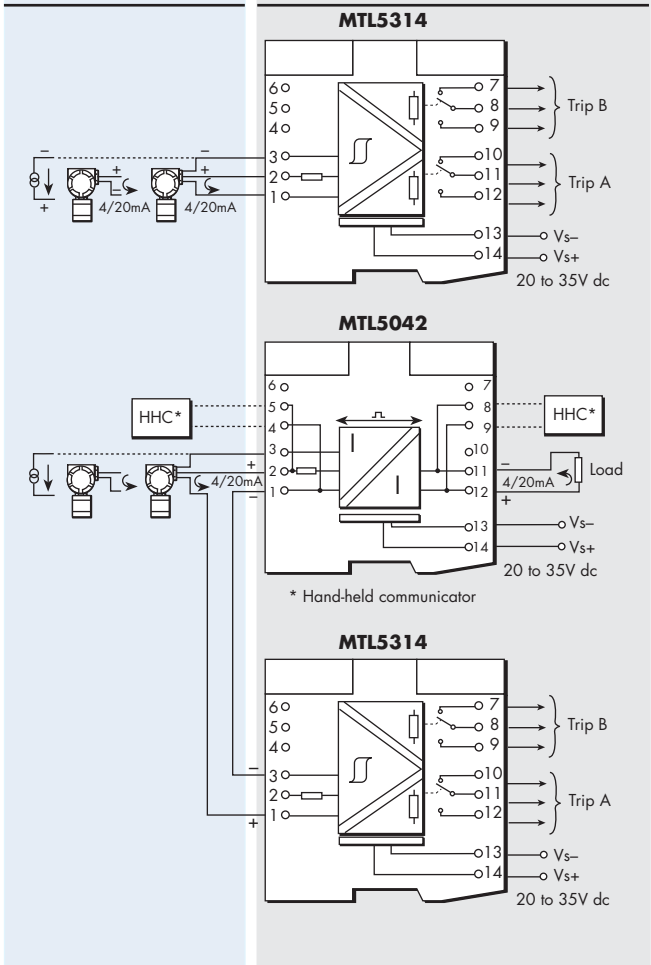
85mA at 24V  
100mA at 20V  
60mA at 35V

### Maximum power dissipation within the unit (with 20mA signal)

1.7W at 24V  
1.8W at 35V

Hazardous area

Safe area



Terminal	Function
1	Current input
2	Transmitter supply +ve
3	Common
7	Trip B (NC)
8	Trip B (COM)
9	Trip B (NO)
10	Trip A (NC)
11	Trip A (COM)
12	Trip A (NO)
13	Supply -ve
14	Supply +ve

### Safety description

Terminals 2 to 1 and 3 28V, 300Ω, 93mA

Terminals 1 and 3

These terminals meet clause 5.4 of EN50020 : 1994 and have the following parameters:  $U \leq 1.5V$ ,  $I \leq 0.1A$ ,  $P \leq 25mW$ . They can be connected without further certification into an IS loop with open circuit voltage of not more than 28V. See certificate for further details.

HART® is a registered trademark of the HART Communication Foundation.

See also MTL5000 Series cable parameters and approvals



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# MTL5344 REPEATER POWER SUPPLY

two channel, for 2 wire transmitters



The MTL5344 provides a fully floating dc supply for energising two conventional 2 wire 4/20mA transmitters located in the hazardous area, and repeats the current in other circuits to drive safe-area loads.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of transmitters

Zone 1, IIC, T4-6, hazardous area if suitably certified

### Safe-area output

Signal range: 4 to 20mA  
Over / under range: 0 to 20.1mA  
Safe-area load resistance: 0 to 550Ω  
Safe-area output resistance: 2MΩ

### Safe-area circuit ripple

<125μA peak-to-peak

### Hazardous-area input

Signal range: 0-20 1mA (including over-range)  
Transmitter voltage: >14V at 20mA

### Transfer accuracy at 20°C

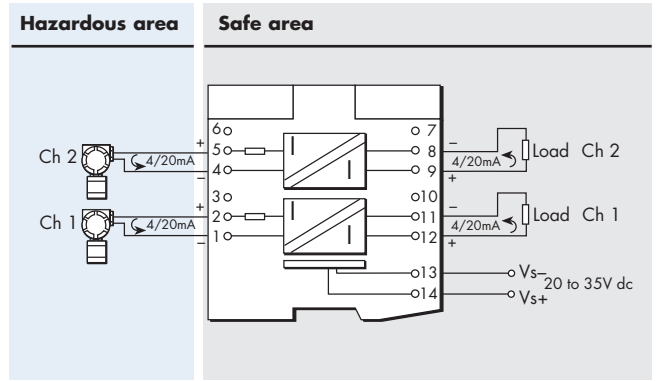
Better than 20μA (typically 5μA)

### Temperature drift

<1μA/°C

### Response time

Settles within 10% of final value within 250μs



Terminal	Function
1	Input -ve(channel 1)
2	Input +ve(channel 1)
4	Input -ve(channel 2)
5	Input +ve(channel 2)
8	Output -ve(channel 2)
9	Output +ve(channel 2)
11	Output -ve(channel 1)
12	Output +ve(channel 1)
13	Supply -ve
14	Supply +ve

### LED indicator

Green: one provided for power indication

### Supply voltage

20 to 35V dc

### Power requirement, Vs

122mA at 24V  
150mA at 20V  
90mA at 35V

### Power dissipation within unit

2.0W max

### Isolation

250V between safe and hazardous area circuits, and power supply.

### Safety description

#### Terminals 1 and 2 or 4 and 5

[EEExib] IIC

$U_o = 19V$ ,  $I_o = 24mA$  (non-linear),  $P_o = 450mW$

[[ $C_o = 120nF$ ,  $L_o = 3mH$ ] Group IIC]

$U_m = 253V$  rms or dc



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# MTL5349 ISOLATING DRIVER

two channel, 4/20mA



The MTL5349 isolates and passes on two 4/20mA signals from a controller located in the safe-area to two loads located in the hazardous-area.

## SPECIFICATION

See also common specification

### Number of channels

Two

### Location of transmitters

Zone 0, IIC, T4-6, hazardous area if suitably certified

### Safe-area input

Signal range: 4 to 20mA

Over / under range: 0 to 24mA

### Hazardous-area output

Load resistance: maximum 530Ω (20.1mA max)

(Signal range: 0-24mA if output load <360Ω)

### Output resistance

>2MΩ

### Input and output circuit ripple

<40μA peak to peak

### Transfer accuracy at 20°C

Better than 20μA

### Input voltage drop

<4V at 20mA

### Temperature drift

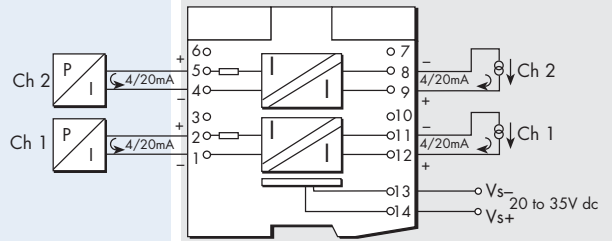
<1μA/°C

### Response time

Settles within 10% of final value within 250μs

Hazardous area

Safe area



Terminal	Function
1	Input -ve(channel 1)
2	Input +ve(channel 1)
4	Input -ve(channel 2)
5	Input +ve(channel 2)
8	Output -ve(channel 2)
9	Output +ve(channel 2)
11	Output -ve(channel 1)
12	Output +ve(channel 1)
13	Supply -ve
14	Supply +ve

### LED indicator

Green: one provided for power indication

### Supply voltage

20 to 35V dc

### Power requirement, Vs

67mA at 24V

80mA at 20V

50mA at 35V

### Power dissipation within unit

1.5Wmax at 24V dc

### Isolation

250V between safe and hazardous area circuits, and power supply.

### Safety description

$U_o = 17V$ ,  $I_o = 50mA$ ,  $P_o = 0.3W$ ,  $U_m = 253V$  rms or dc



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Jul 2007

# MTL5991 24V DC POWER SUPPLY



The MTL5991 provides a convenient source of power for MTL5000 series units in locations where a dc supply is not readily available. The 2A capability at 24V dc is sufficient to drive at least 13 MTL5000 series modules, or more in appropriate combinations. The wide mains power supply range makes this unit universally applicable.

## SPECIFICATION

### Power supply

85 to 264V ac  
47 to 63Hz

### Power dissipation within unit

7.2W @ 2A

### Mounting

35mm DIN (top hat) rail

### Output voltage

24V dc nom  
(23.64 min/24.36 max)

### Output current

2A maximum  
(1.7A with <105V ac input)

### LED indicators

Green: Power

### Weight

310g

### Ambient temperature

Operating temperature -10°C to +50°C  
Storage temperature -40°C to +85°C

### Dimensions

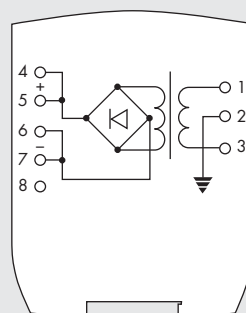
Height (above rail) 107mm  
Width 90mm  
Rail length required 38mm

### Terminals

Cage clamp type accommodating conductors up to 2.5mm<sup>2</sup>, stranded or single-core

*Note: Segregation between hazardous and safe area wiring must be maintained.*

## Safe area



Terminal	Function
1	AC line
2	Earth
3	AC neutral
4	+24V
5	+24V
6	0V
7	0V
8	Do not use

MTL5000 unit	Current Drawn mA (Vs=24V)	Maximum number of units
MTL5011B	35	46
MTL5012	30	53
MTL5014	45	36
MTL5015	44	36
MTL5017	50	32
MTL5018	60	27
MTL5023	100	16
MTL5024	100	16
MTL5031	80	20
MTL5032	65	25
MTL5040	95	17
MTL5041	70	23
MTL5042	75	21
MTL5044	110	15
MTL5045	50	32
MTL5046	65	25
MTL5049	65	25
MTL5051	90	18
MTL5073	57	28
MTL5074	68	24
MTL5081	20	80
MTL5082	55	29
MTL5113	70	23
MTL5114	60	27
MTL5314	85	19
MTL5344	122	14
MTL5349	67	25

*Note: The maximum current draw from the load unit is taken at 24V. The maximum current drawn from the MTL5991 was taken to be 1.6A*



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# MTL5995 FIELDBUS POWER SUPPLY

31.25kbit/s fieldbus



The MTL5995 is a general purpose power supply unit designed for use in 31.25kbit/s (H1) fieldbus systems. The MTL5995 complies with the requirements of Fieldbus Foundation™ power supply Type 131† (non-IS supply intended for feeding an IS barrier).

To comply with fieldbus standards, each bus must be terminated at both ends. MTL's FBT1-IS or FCS-MBT fieldbus terminators can be supplied for this purpose or, for installations in which the MTL5995 is located at one end of the fieldbus trunk, it includes an internal terminator which is switch enabled.

When designing a fieldbus segment the total current consumption of the fieldbus devices should be calculated for normal operation. This should be within the range of the published design current for the power supply. For the MTL5995 power supply, the current limit is at least 20mA higher than the maximum design current. This provides a margin for inrush current when a new device is added to the network. Therefore, with a fieldbus loaded with its maximum design current, a fieldbus device can be disconnected and reconnected without the risk that other devices on the bus will reset.

## SPECIFICATION

See also common specification

### OUTPUT

#### Voltage

19V±2%  
<2Ω dc impedance

#### Design current

0 to 350mA,

#### Current limit

>370mA

#### Output ripple

Complies with clause 22.6.2 of the fieldbus standards† for output current >10mA.

#### Internal termination

Selected by a switch in the base of the unit.

### INPUT

#### Supply voltage

20 to 30V dc -20°C to +60°C

#### Power requirement, with 350mA output load

420mA typical at 24V

370mA typical at 30V

520mA typical at 20V

#### Power dissipation within unit, with 350mA output load

3.4W typical at 24V

4.5W maximum at 30V

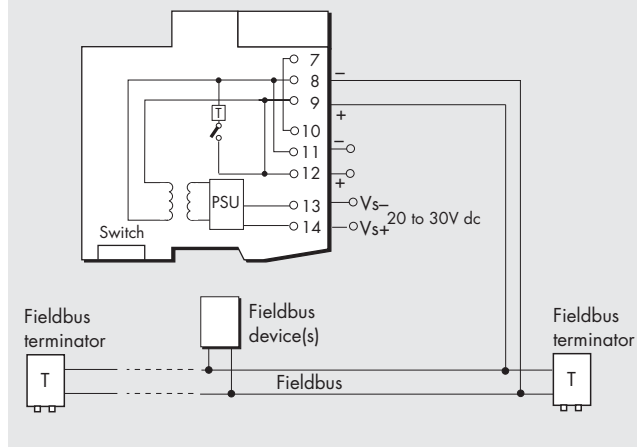
Note: To allow adequate heat dissipation under all likely thermal conditions, it is recommended that MTL5995s are installed on DIN-rail with a 10mm space between adjacent units. MTL MS010 10mm DIN-rail module spacers are available for this purpose.

#### LED indicator

Green: one provided for power indication

† The applicable fieldbus specifications and standards are: Foundation™ Fieldbus 31.25kbit/s Physical Layer Profile Specification, document FF-816, IEC 61158-2: 1993 and ISA-S50.02-1992 for 31.25kbit/s fieldbus

### Safe or Division 2/Zone 2 hazardous area



Terminal	Function
7	Internally linked to 10
8 & 11	Fieldbus device(s) connection -ve
9 & 12	Fieldbus device(s) connection +ve
10	Internally linked to 7
13	Supply -ve
14	Supply +ve

Note: Terminals 7 and 10 are linked internally to assist in the process of terminating cable screens.

Fieldbus Foundation™ is a trademark of Fieldbus Foundation, Austin, Texas, USA. Foundation™ is a trademark of Fieldbus Foundation, Austin, Texas,



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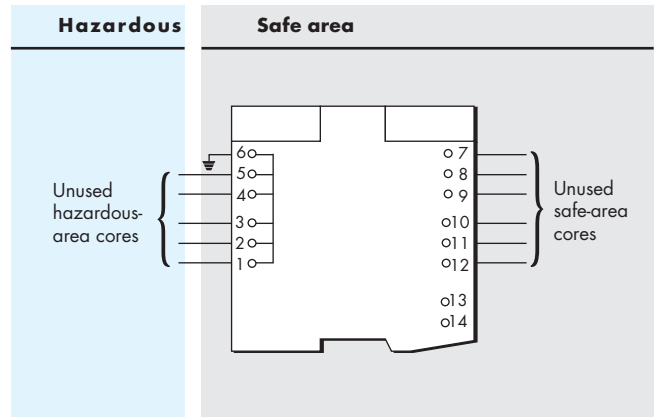
Tel: +44 (0)1582 723633  
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# MTL5099 DUMMY ISOLATOR

The MTL5099 is used with other MTL5000 Series units to provide termination and earthing facilities for, unused cable cores from hazardous areas.



Terminal	Function
1	Hazardous-area core
2	Hazardous-area core
3	Hazardous-area core
4	Hazardous-area core
5	Hazardous-area core
6	Earth
7	Safe-area core
8	Safe-area core
9	Safe-area core
10	Safe-area core
11	Safe-area core
12	Safe-area core

# MTL5000 SERIES COMMON SPECIFICATION



## Connectors

Each MTL5000 unit is supplied with signal and power connectors, as applicable.

When using crimp ferrules for the hazardous and non-hazardous (safe) signal connectors the metal tube length should be 12mm and the wire trim length 14mm. For the power connectors the metal tube length should be 10mm and the wire trim length 12mm.

See INM5000 for recommended ferrules.

## Isolation

250V rms between input, output and power supply terminals, tested at 1500V rms minimum between safe- and hazardous-area terminals. MTL5073, output and power supply not isolated.

## Location of units

Safe area

## Terminals

Accommodate conductors of up to 2.5mm<sup>2</sup> stranded or single-core

## Mounting

On 35mm (top hat) rail to :  
EN 50022-35 x 7.5; BS 5584;  
35 x 27 x 7.3 DIN 46277

## Ambient temperature limits

-20 to +60°C (-6 to +140°F) operating  
-40 to +80°C (-40 to +176°F) storage

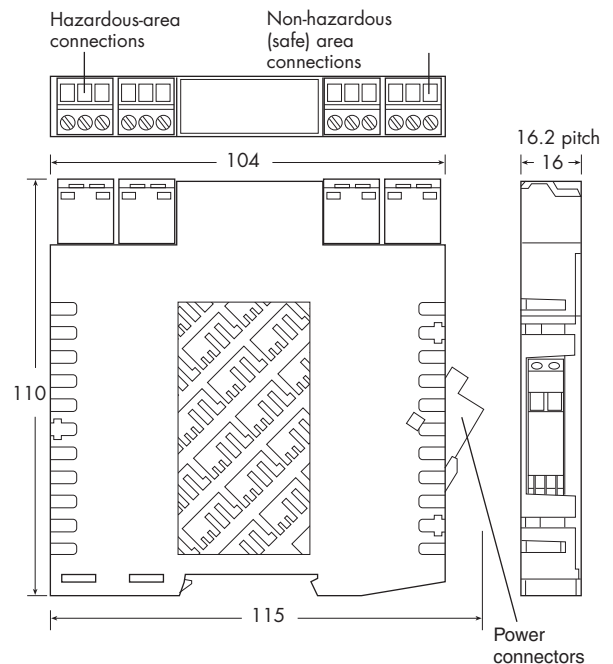
## Humidity

5 to 95% relative humidity

## Weight

110g approx (except where indicated)

## DIMENSIONS



## CABLE PARAMETERS

Module	Group	BASEEFA			or	$\mu\text{H}/\Omega$	Group	FM	
		$\mu\text{F}$	mH					$\mu\text{F}$	mH
MTL5011B/5018	IIC	2.41	175		983	A+B	2.4	165	
	IIB	16.8	680		1333	C	7.2	495	
	IIA	75	1000		1333	D	19.2	1320	
MTL5012/5015 5017	IIC	2.4	165		825	A+B	2.4	165	
	IIB	7.2	495		2475	C	7.2	495	
	IIA	19.2	1320		6600	D	19.2	1320	
MTL5014	IIC	2.41	170		681	A+B	2.41	170	
	IIB	16.8	510		2045	C	16.8	510	
	IIA	75	1360		5454	D	75	5454	
MTL5021	IIC	0.11	1.30		40	A+B	0.17	1.32	
	IIB	0.84	3.90		159	C	0.51	3.96	
	IIA	2.97	10.4		328	D	1.36	10.56	
MTL5023/5024	IIC	0.17	1.32		37	A+B	0.17	1.32	
	IIB	0.51	3.96		111	C	0.51	3.96	
	IIA	1.36	10.56		296	D	1.36	10.56	
MTL5022	IIB	0.51	3.96		90	C	0.51	3.96	
	IIA	1.36	10.56		240	D	1.36	10.56	
MTL5025	IIC	0.11	4.3		63	A+B	0.17	4.2	
	IIB	0.84	17.72		235	C	0.51	12.6	
	IIA	2.97	36.02		497	D	1.36	33.6	
MTL5031/5051	Consult MTL								
MTL5032	terminals 2 to 1								
	IIC	2.4	165		825	A+B	2.4	165	
	IIB	7.2	495		2475	C	7.2	495	
	IIA	19.2	1320		6600	D	19.2	1320	
	terminals 4 to 3 and 1								
	IIC	0.13	1.57		55	A+B	0.13	4.2	
	IIB	0.39	4.71		165	C	0.39	12.6	
	IIA	1.04	12.56		440	D	1.04	33.6	
	Terminals 5 to 4 and								
IIC	0.13	4.2		55	A+B	0.13	4.2		
IIB	0.39	12.6		165	C	0.39	12.6		
IIA	1.04	33.6		440	D	1.04	33.6		
MTL5040	IIC	-	-		-	A+B	-	-	
	IIB	-	-		-	C	-	-	
	IIA	-	-		-	D	-	-	
MTL5041/5042/ 5044/5046/ 5061/5043 5045/5049	IIC	0.083	3.05		55	A+B	0.13	4.2	
	IIB	0.65	9.15		210	C	0.39	12.6	
	IIA	2.15	24.4		444	D	1.04	33.6	
MTL5053	IIC	0.165	0.32		31	A+B	-	-	
	IIB	1.14	3.00		126	C	-	-	
	IIA	4.20	7.00		242	D	-	-	
MTL5073/5074	Terminals 1&3 and 4&5								
	IIC	0.26	6.0		164	A+B	0.26	6.0	
	IIB	0.78	18.0		492	C	0.78	18.0	
	IIA	2.08	48.0		1312	D	2.08	48.0	
	Config. Socket								
	IIC	0.6	47		135	A+B	0.60	47	
IIB	1.80	141		405	C	1.30	141		
IIA	4.8	376		1080	D	4.8	376		
MTL5081	IIC	100	15		2,972	A+B	-	-	
	IIB	1,000	60		11,889	C	-	-	
	IIA	1,000	120		23,779	D	-	-	
MTL5082	IIC	22.0	48.7		322	TBA	TBA	TBA	
	IIB	500	178.4		1,250				
	IIA	1,000	363.7		1,705				
MTL5314	IIC	-	-		-	A+B	-	-	
	IIB	-	-		-	C	-	-	
	IIA	-	-		-	D	-	-	



# MTL5000 SERIES ACCESSORIES

MTL5000 Series isolators mount quickly and easily onto standard DIN rail. A comprehensive range of accessories simplifies earthing and tagging arrangements.

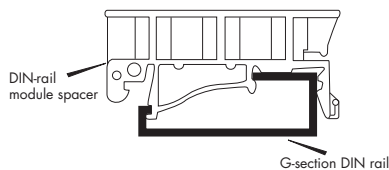
## MOUNTING

### THR2 DIN rail, 1m length

DIN rail to EN50022; BS5584; DIN46277

### MS010 DIN rail module spacer, 10mm, pack of 5

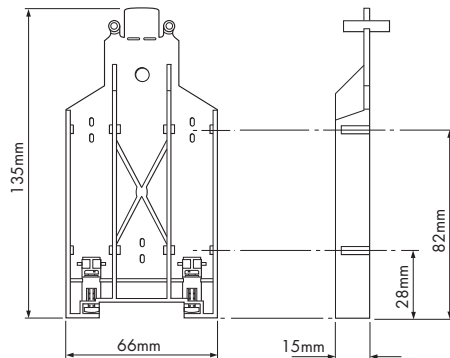
Grey spacer, one required between each MTL5995 and any adjacent module on a DIN rail, to provide 10mm air-circulation space between modules



## EARTH RAIL AND TAG STRIP

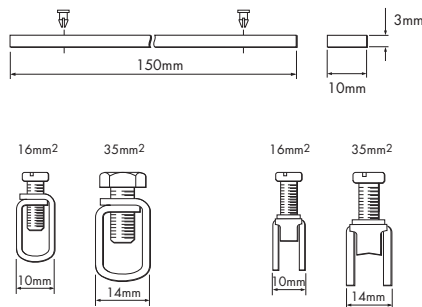
### IMB57 Insulating mounting block

One required at each end of a tagging strip/earth rail. Suitable for low-profile (7.5mm) and high-profile (15mm) symmetrical



### ERB57S Earth-rail bracket, straight

Nickel-plated; supplied with two push fasteners, one (14mm, 35mm<sup>2</sup>) earth-rail clamp and one (10mm, 16mm<sup>2</sup>) earth clamp.

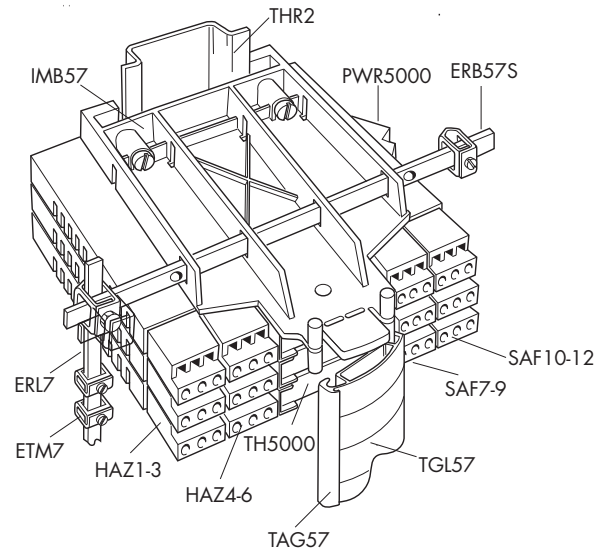


### ERL7 Earth rail, 1m length

Nickel-plated; may be cut to length.

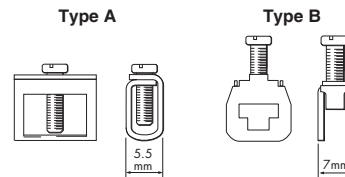


## MOUNTING DETAILS



### ETM7 Earth terminal, bag of 50

For terminating cable screens and 0V returns on the ERL7 earth rail. For cables  $\leq 4\text{mm}^2$ . Exact dimension dependent on manufacturer.



### TAG57 Tagging strip, 1m length

Cut to size. Supplied with reversible tagging strip label suitable for either MTL5000 or MTL7000 Series module spacing.



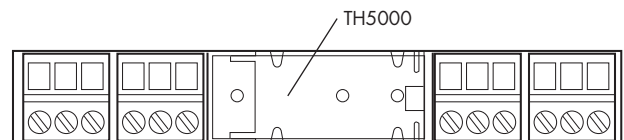
### TGL57 Tagging strip labels, set of 10 x 0.5m

Spares replacement, for use with TAG57 tagging strip. Labels are reversible - one side for MTL5000, the other for MTL7000.

## INDIVIDUAL ISOLATOR IDENTIFICATION

### TH5000 tag holders

Each isolator may be fitted with a tag holder, as shown below. Order TH5000, pack of 20.



## CONNECTORS

Each MTL5000 unit is supplied with signal and power connectors, as applicable.

Spares replacement connectors are available separately; see ordering information.

**See also  
'MTL5000 Series powerbus kits'**



# MTL5000 SERIES ACCESSORIES ~ RING TERMINALS

Ring terminal plugs are available for all of the popular modules in the MTL5000 series. The safe and hazardous area plugs are ordered separately since the internal connections depend on the module type. Labels fitted on the side of each plug identify the terminal number with respect to the module and the standard tagging accessories can be used with the terminals fitted

## SPECIFICATION

### Ring Terminal dimensions

3.5mm (M3.5) Internal  
8.5mm External

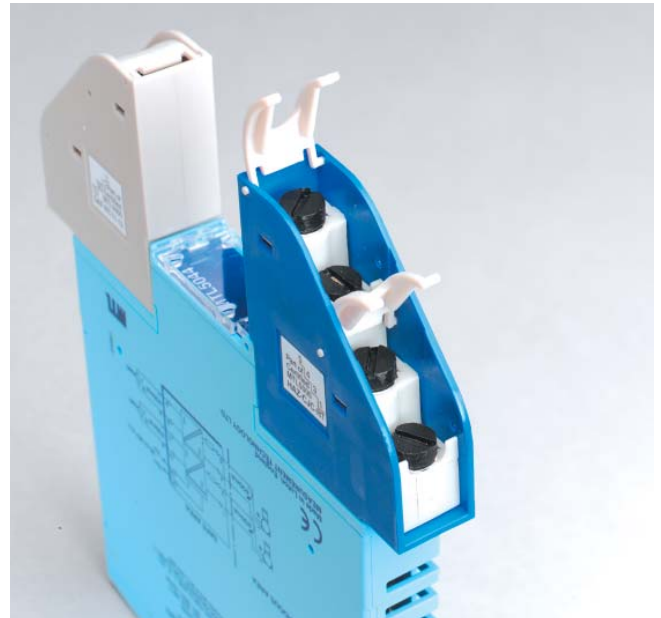
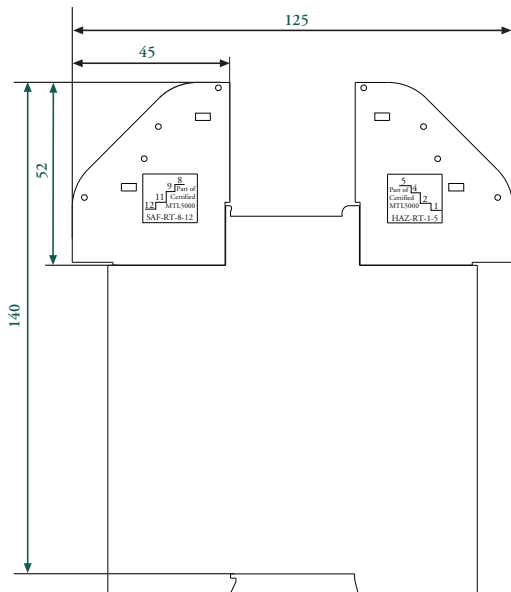
### Mechanical Protection

IP20

### Safety

Conforms to EN61010-1 Electrical standard and EN50020 Intrinsic Safety standard. IS Certification is included in the MTL5000 Series ATEX approvals.

## DIMENSIONS (mm)



## ORDERING INFORMATION

5000 Series HAZ-AREA Part No.	Model No.	5000 Series SAFE-AREA Part No.
HAZ-RT-1-3	5011B	SAF-RT-10-12
HAZ-RT-1-3	5012	SAF-RT-11-12
HAZ-RT-1-3	5014	SAF-RT-10-12 <sup>2</sup>
HAZ-RT-1-5 <sup>1</sup>	5015	SAF-RT-8-12
HAZ-RT-1-5 <sup>1</sup>	5017	SAF-RT-10-12 <sup>2</sup>
HAZ-RT-1-5 <sup>1</sup>	5018	SAF-RT-10-12 <sup>2</sup>
HAZ-RT-1-3	5021	SAF-RT-11-12
HAZ-RT-1-3	5022	SAF-RT-11-12
HAZ-RT-1-3	5023	SAF-RT-7-12
HAZ-RT-1-3	5024	SAF-RT-11-12
HAZ-RT-1-3	5025	SAF-RT-11-12
HAZ-RT-1-3	5031	SAF-RT-11-12
HAZ-RT-1-4 <sup>3</sup>	5032	SAF-RT-11-12
HAZ-RT-1-5	5040	SAF-RT-8-12
HAZ-RT-1-2	5041	SAF-RT-11-12
HAZ-RT-1-3 <sup>4</sup>	5042	SAF-RT-8-12

### Notes:

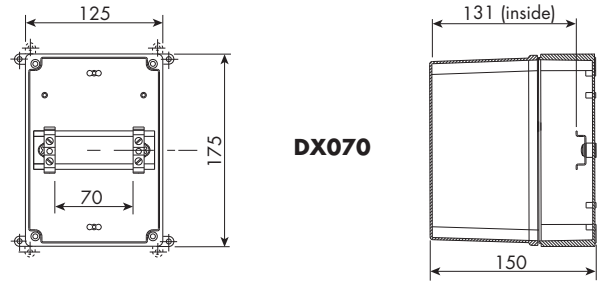
- 1** No earth terminal for earth leakage detection.
- 2** No output 2.
- 3** No voltage pulse or 3-wire voltage pulse.
- 4** No HHC terminals.
- 5** No trip B.



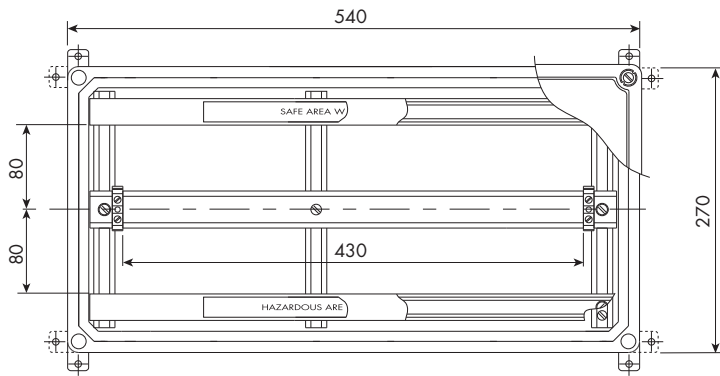


# MTL5000 SERIES ENCLOSURES

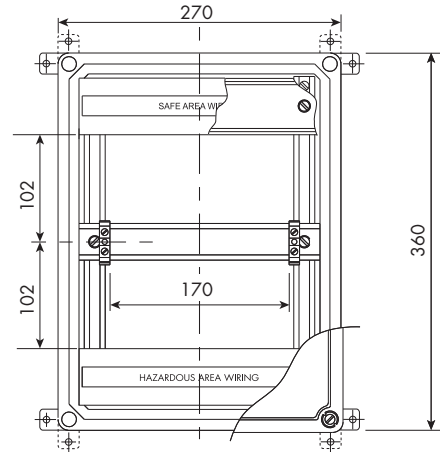
## DIMENSIONS (mm) AND MOUNTING



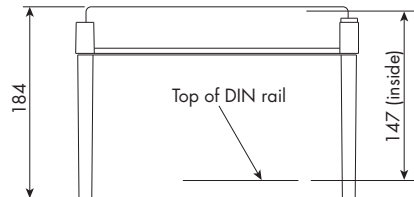
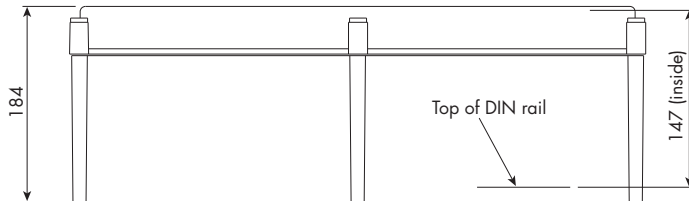
**DX070**



**DX430**



**DX170**



## SPECIFICATION

### Construction

- Glass reinforced polycarbonate base - DX070
- Glass reinforced polyester base - DX170, DX430
- Transparent polycarbonate lid

### Protection

- Dust-tight and water-jet proof to IEC529:IP65

### Lid fixing

- Captive fixing screws

### Weight (excluding barriers/isolators) kg

- DX070 0.8
- DX170 2.6
- DX430 4.1

### Items provided

- DIN rail - fitted
- ETL7000 Earth terminals (2 x) - fitted
- "Take care IS" front adhesive label
- Cable trunking (except DX070)

**Note: Barriers or isolators are not included.**

### Mounting

- Wall fixing lugs provided. For further details refer to INM5000.

### Tagging and earth rail

- Accommodates MTL5000 Series accessories.

### Permitted location

- Safe area
- FM and CSA Div. 2, Class I (gases)
- Not** Div. 2, Class II (dust ignition proof)

### Approximate capacities (on DIN rail between earth terminals)

	MTL5000 isolator	
<b>DX070</b>	4	(2)*
<b>DX170</b>	10	(8)*
<b>DX430</b>	26	(24)*

\* Use these figures when IMB57 mounting blocks for tagging/earth are included.

### Ambient temperature limits

- Dependent on units fitted. See instruction manual INM5000.



# MTL5000 SERIES POWERBUS KITS

PB - 8T,16T,24T,32T

The MTL5000 Series powerbus kit enables quick and easy wiring to power up to 32 MTL 5000 Series modules using a standard 24V power supply. Each powerbus kit includes 4 single ferrules, 4 twin ferrules and 2 insulation displacement connectors (Scotchlok).

## SPECIFICATION

### Available in 4 different lengths:

PB - 8T	= 8 connectors and loops
PB - 16T	= 16 connectors and loops
PB - 24T	= 24 connectors and loops
PB - 32T	= 32 connectors and loops

## CABLE PARAMETERS

### Insulation material :

PVC

### Conductor :

24 strands of 0.2mm dia (0.75mm<sup>2</sup>) standard copper

### Insulation thickness :

0.5 to 0.8 mm

### Current rating :

12A max

### Operating temperature range :

- 20°C to +60°C

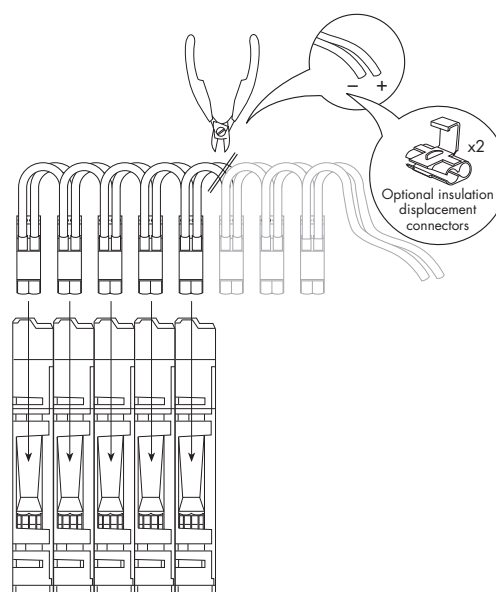
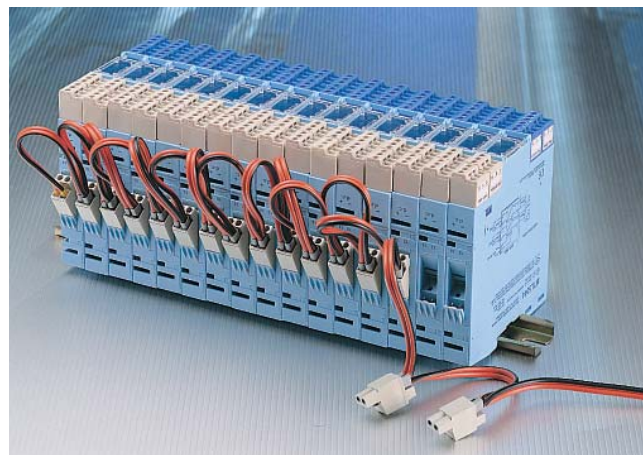
### Max voltage drop on 32 modules drawing 130mA max :

0.5V

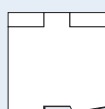
## CHOOSING A POWERBUS

Choose a powerbus where the number of power plugs is greater than or equal to the number of isolators to be powered and if necessary cut the powerbus to the required number of terminations.

**Note: To reduce the risk of excessive voltage drop or overcurrent do not connect powerbuses in series.**



## ORDERING INFORMATION



### MTL5000 Series isolators

Specify part number: eg, **MTL5011B**  
*MTL5073/4: see data sheet for specific ordering instructions*

**FBT1** Fieldbus terminator

### Mounting accessories

**THR2** 1m length of DIN rail to EN 50022;  
 BS 5584; DIN 46277

**MS010** DIN-rail module spacer, 10mm (pack of 5)

### Earth-rail and tag strip accessories

**IMB57** Insulating mounting block

**ERB57S** Earth-rail bracket, straight

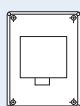
**ERL7** Earth-rail, 1m length

**ETM7** Earth terminal, bag of 50

**TAG57** Tagging strip, 1m length

**TGL57** Tagging strip labels, set of 10 x 0.5m

### Enclosures



**DX070** Enclosure for MTL5000 x 4

**DX170** Enclosure for MTL5000 x 10

**DX430** Enclosure for MTL5000 x 26

### Individual isolator identification

**TH5000** Tag holder (Pack of 20)

### Connectors

**HAZ1-3** Hazardous-area plug, terminals 1, 2 and 3

**HAZ4-6** Hazardous-area plug, terminals 4, 5 and 6

**HAZ-CJC** Hazardous-area plug, terminals 1 and 3 with cold-junction sensor

**PWR5000** Power connector, terminals 13 and 14

**SAF7-9** Safe-area plug, terminals 7, 8 and 9

**SAF10-12** Safe-area plug, terminals 10, 11 and 12

**PB-8T** Powerbus Kit for up to 8 isolators

**PB-16T** Powerbus Kit for up to 16 isolators

**PB-24T** Powerbus Kit for up to 24 isolators

**PB-32T** Powerbus Kit for up to 32 isolators

### Configurator (MTL5073/4)

**PCC73** Configurator (PC interface and software)

**PCS45/PCL45** Configurator (PC interface and software)

### Literature

**INM5000** MTL5000 Series instruction manual



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# PCS45/PCL45 CONFIGURATOR FOR MTL TEMPERATURE CONVERTERS

The PCS45/PCL45 configurator allows MTL isolating temperature converters to be configured from a standard PC running Windows® 9x/ME/NT®/2000/XP operating systems. The configurator comprises PC software on a 3½-inch floppy disk (PCS45) and an ATEX certified interfacing link (PCL45). Temperature converters can be configured from the safe area, while on-line, and the software allows configurations to be saved to disk and printed out when required.

## SPECIFICATION

### Suitable for converter models:

**MTL3073, MTL4073, MTL5073, MTL5074 and E01073**

### Location

Safe area

### PCL45 connections

PC side: cable with 9 pin D plug, to any RS232 serial port

Converter side: cable with 3.5 mm jackplug, 3-pole

### Cable length

1.6m

### Ambient temperature

-10 to +60°C (+14 to +140°F) (operating)

-20 to +70°C (-4 to +158°F) (storage)

### Humidity

5 to 95% relative humidity (non-condensing)

### Weight

200g

### Configuration software

PCS45 for Windows® 9x/ME/NT®/2000/XP

### Software medium

3½-inch floppy disk

Updates are available at [www.mtl-inst.com](http://www.mtl-inst.com)

### Recommended PC minimum configuration

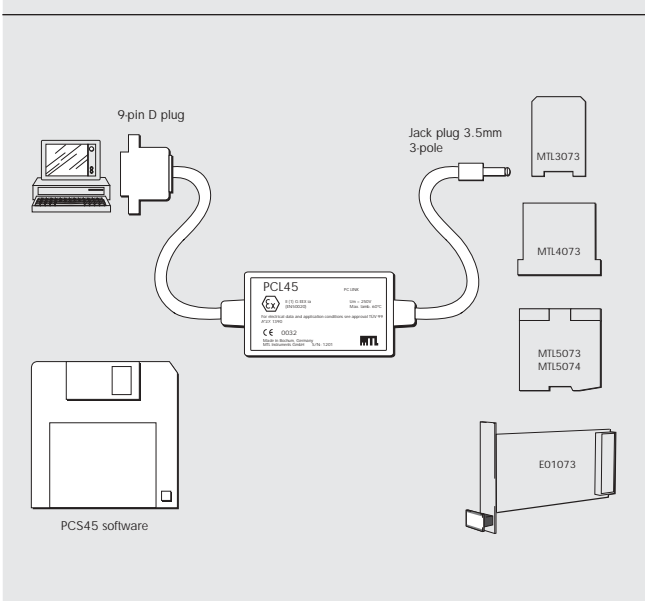
Standard PC running Windows® 95 or higher

2MB free RAM and hard disc resources

1 x RS232 serial comms port or USB/RS232 converter

Local or network printer access

## Safe area



## Safety notes

The PCL45 can only be used with authorised converters. Authorisation is valid if either the converter type is stated on the PCL45 certificate or the PCL45 is specified on the converter certificate. It is not permitted to connect the PCL45 to any other device except approved MTL devices.

Repairs are not permitted.

## Setting up

The equipment can be used only in the safe area. The cable should be connected to the PC, using the D-type connector, before the PC is switched on. However, the cable jack plug does not have to be connected to the device being configured before the power is switched on. The PCL45 is powered from the data lines and therefore requires at least 15 seconds charge time after plugging the 3.5mm connector to the device socket before communication can be established. There must not be a gap between the 3.5mm jack plug and the enclosure.

Further operation notes are available on-line at [www.mtl-inst.com](http://www.mtl-inst.com).

## Maintenance

The PCL45 must be returned to the factory if suspected faulty.

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