Your safe link to the hazardous area

MTL3000 SERIES

isolating IS interface units



Ex STOCK
Intrinsically safe products – FAST

Selected items within this Series are available in the UK through MTL's new express service

THE MTL WEB SITE http://www.mtl-inst.com

- **Full input/output/power supply isolation**
- **No earth required**
- **24V dc or loop powered**
- **Mains-powered dc supply unit available**
- **Compatible with MTL2000 Series**
- **Rail or surface mounting**

The SD Series of surge protection devices from Telematic is compatible with these isolators.

Ask for the SD Series data sheet!

MTL3000 Series interface units offer a compact and easy-to-use means for communicating safely with process measuring, indicating, actuating and local control equipment in hazardous areas. A comprehensive range of models handles analogue, switch and serial-digital signals in both directions, amplifying or otherwise conditioning them as required and at the same time providing worldwide-certified explosion protection for equipment and wiring in all zones and all explosive atmospheres. The MTL3000 Series complements and extends the MTL2000 Series with which it is mechanically compatible. It also provides an alternative to the shunt-diode safety barrier where isolation is essential or preferred or a high-integrity earth is not readily available.

Key features of the MTL3000 Series are ease of application, high operational integrity and reliability, and low installed cost. Full 3-port isolation between the input, output and power supply circuits of each unit eliminates the need to think about relationships to earth, makes system hook-ups easier to arrange, and allows hazardous-area circuits to be left floating or earthed at any one point. Moreover, the fact that all models are IS without a special earth reduces the cost of many installations and enables some to be implemented that would otherwise be impossible. Since no IS earth is required, routine inspection of earth cables and connections is eliminated.
The plant operator will find other benefits, for example he can monitor plant conditions in the secure knowledge that an earth fault will be 'flagged' while the loop continues working. Floating circuits plus the MTL2220 earth leakage detector make this option possible for all switch applications and some others.

MTL3000 Series units are powered from a 20–35V dc supply, or in some cases from the signal itself. Most plants have 24V dc available, and the elimination of multiple mains transformers reduces size and weight, cuts down heat dissipation and increases reliability. Built-in dc regulation and an easily replaceable fuse guard against damage from fluctuating supplies, and all units are proof against short circuits in the field.

The dc isolation and intrinsically-safe segregation in all units are provided by small ferrite transformers with demodulators either side, in the manner pioneered by Evershed & Vignoles Ltd, but using modern low-loss materials and semiconductors to allow operation at higher frequencies. Analogue units 'chop' 4/20mA currents directly rather than voltages derived from them, so there are no 'high-stability' resistors to drift and cause inaccuracies.

Mounting of MTL3000 Series is on DIN-rail or any flat surface, using the built-in, extendable mounting clips. The units are half the width of those in the MTL2000 Series but identical in other dimensions, except for the MTL3991 power supply unit which is in MTL2000 Series format. All models share with the MTL2000 Series the comprehensive range of mounting accessories and weatherproof enclosures detailed on section MTL2000 & 3000 series enclosures and accessories.

MTL3011 AND 3012 SWITCH /PROXIMITY DETECTOR RELAYS

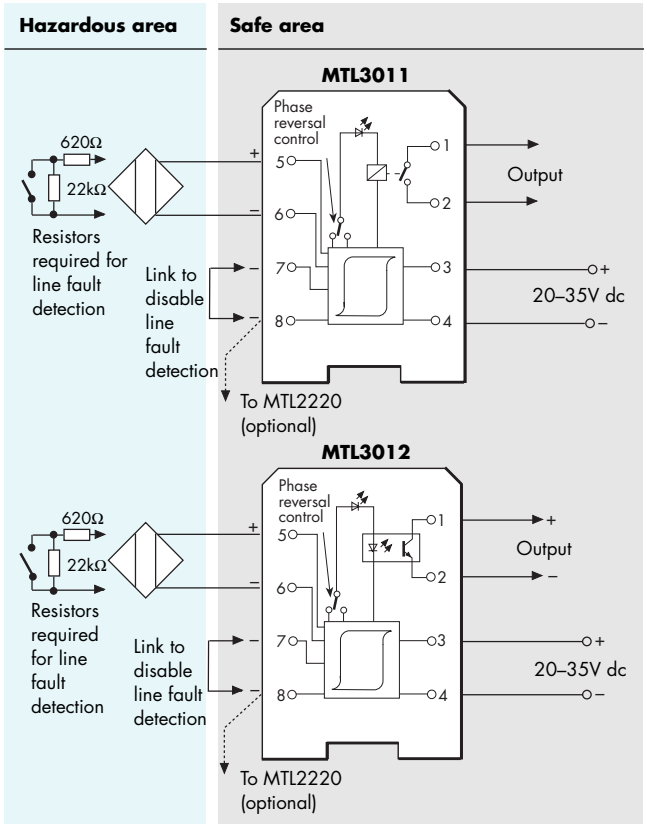
MTL3011 – volt-free contacts
MTL3012 – solid state

These basically similar units both enable a safe-area load to be controlled by a proximity detector or switch located in a hazardous area, the MTL3011 having a relay output for general use, and the MTL3012 a floating solid-state on/off switch compatible with logic circuits. In both units a built-in phase-reverse control allows an alarm condition (output open) to be signalled for either state of the sensor. A line-fault detection feature opens the output in the event of short or open-circuit lines: intended for use primarily with proximity detectors, it can also be used with switches made to resemble them electrically by adding two resistors, or disabled by a link if not required.

SPECIFICATION

See also common specification

Number of channels
One, fully floating
Location of switch
Zone 0, IIC, T6 hazardous area
Div 1, Group A, hazardous location
Location of proximity detector
Zone 0, IIC, T4–6 if suitably certified
Div 1, Group A, hazardous location
Voltage applied to sensor
7.7 to 9.0V dc from 1kΩ
Input/output characteristics
Output closed if >2.1mA* (<2kΩ) in sensor circuit
Output open if <1.2mA* (>10kΩ) in sensor circuit
Hysteresis: 200µA (650Ω) nominal
**NAMUR and DIN 19234 standards for proximity detectors*
Phase reverse facility
Operation reversed by switch on top of unit
Power supply failure protection
Output circuit opens if supply fails
Broken/shorted lines protection
By built-in line-fault detection feature (LFD)
Output open if input current <100µA (broken line)
Output open if input current >6.5mA (shorted lines)
Note: to prevent false triggering of LFD, switch-type sensors must be fitted with resistors as shown or LFD be disabled by linking terminals 7 and 8
'No-fail' earth fault protection
Enabled by connecting terminal 8 to MTL2220
Fault on either line proclaimed: unit continues working
Output characteristics, MTL3011
Response time: 1ms typical
Contact rating: 200V, 0.5A, 10VA (ac); 200V, 0.5A, 10W (dc) (USA: 60V) individual maxima, resistive loads
Contact life expectancy: 0.75 x 10^6 operations at max. load
Note: reactive loads must be adequately suppressed to protect the light-duty contacts in this unit
Output characteristics, MTL3012
Operating frequency: typically dc to 2kHz
Maximum off-state voltage: 35V
Maximum off-state leakage current: 10µA
Maximum on-state voltage drop: 1+ (0.13 x current in mA) V
Maximum on-state current: 50mA
Note: the solid-state output is Zener-diode protected against inductive loads
LED indicator
ON when output circuit is closed
Power requirement
25mA typical at 24V
35mA maximum at 20 to 35V



Power dissipation within unit
0.6W typical at 24V
1.3W maximum at 35V
Replaceable fuse
50mA, 5 x 20mm glass to DIN 41571 sht. 2, semi-time-lag (M)
Safety description
10.5V, 800Ω, 14mA, U_m = 250V rms or dc
FM max entity parameters
V_{oc} =10.5V, I_{sc} =10.7mA, C_a = 3.0µF, L_a = 300mH
Weight
140g

OTHER APPLICATIONS

The MTL3012 can be used in some flowmeter applications. The frequency response of dc to 2kHz and its ability to accept proximity type inputs make it ideal for positive displacement (PD) meters and some turbine meters.

See 'Choosing an isolator' for a basic comparison of switch input isolators

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3013 SWITCH/ PROXIMITY DETECTOR RELAY

2–channel

The MTL3013 has the same basic function as the MTL3011 but incorporates two channels in one unit. It enables two safe-area loads to be controlled independently by proximity detectors or switches located in hazardous areas. The two input circuits are interconnected but fully floating, enabling two safe-area loads to be controlled by a single changeover switch if required. Each channel is provided with a phase reversal switch so that an alarm condition (output open) can be signalled for either state of the sensor. The status of each relay is indicated by an LED on top of the unit and an additional terminal block provides the four terminals needed for the connections from the two sets of relay contacts. If the application calls for line-fault detection, MTL3011 or MTL3014 units should be used instead.

SPECIFICATION

See also common specification

Number of channels
Two, interconnected, fully floating

Location of switch
Zone 0, IIC, T6 hazardous area
Div 1, Group A, hazardous location

Location of proximity detector
Zone 0, IIC, T4–6 if suitably certified
Div 1, Group A, hazardous location

Voltage applied to sensor
7.0 to 8.5V dc from 970Ω

Input/output characteristics (each channel)
Output closed if >2.1mA* (<2kΩ) in sensor circuit
Output open if <1.2mA* (>10kΩ) in sensor circuit
Hysteresis: 200µA (650Ω) typical
**NAMUR and DIN19234 standards for proximity detectors*

Phase reverse facility
Operations reversed by switches on top of unit

Power supply failure protection
Output circuits open if supply fails

'No-fail' earth fault protection
Enabled by connecting terminal 5 or 7 to MTL2220
Fault on any line proclaimed: unit continues working

Relay characteristics
Each single-pole on/off, open when relay de-energised
Response time: 10ms typical
Contact rating: 250V 5A 100VA (ac); 250V 5A 100W (dc)
Contact life expectancy: 1.5 x 10^5 operations at max. load, >10^6 operations at 200V ac peak or dc, 10VA (resistive load)
Note: reactive loads must be adequately suppressed

LED indicators (each channel)
ON when output circuit is closed

Power requirement
55mA typical at 24V
75mA maximum at 20 to 35V

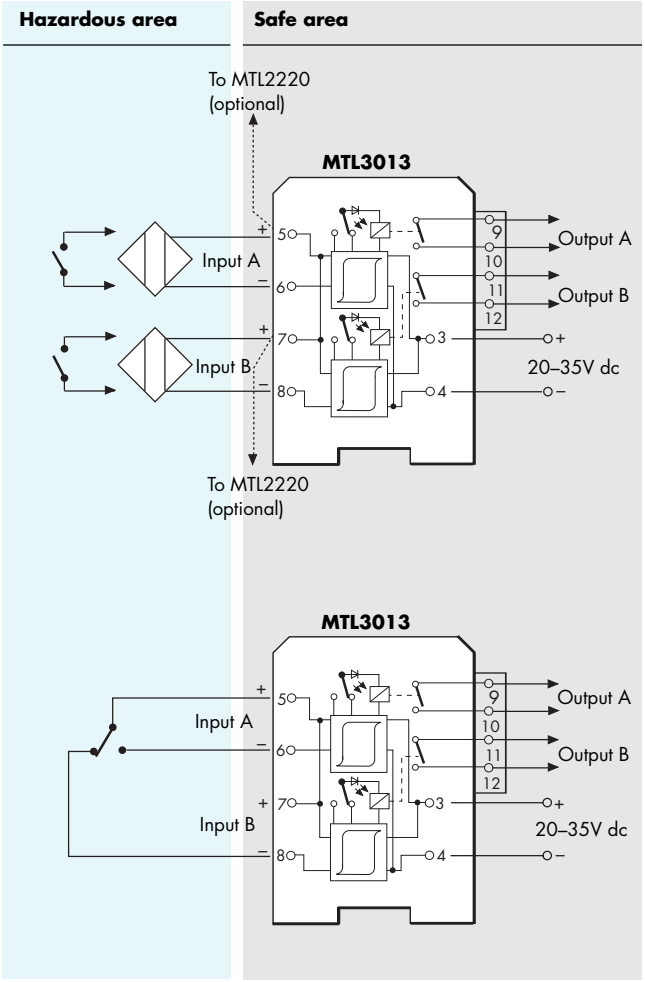
Power dissipation within unit
1.4W typical at 24V
1.6W maximum at 35V

Replaceable fuse
80mA, 5 x 20mm glass to DIN41571 sht 2, semi-time-lag (M)

Safety description (each channel)
10.5V, 800Ω, 14mA, U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 10.5V, I_{sc} = 14mA, C_a = 2.4µF, L_a = 165mH

Weight
170g



See 'Choosing an isolator' for a basic comparison of switch input isolators

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3014 SWITCH/ PROXIMITY DETECTOR RELAY

dual outputs

The MTL3014 enables two safe-area loads to be controlled by a single proximity detector or switch located in a hazardous area. It is ideal for applications where the switch status is to be fed to two separate systems, such as control and logging or control and shutdown installations. The unit – a dual-output version of the MTL3011 – features two isolated relay outputs. Relay A reflects the status of the hazardous-area sensor, and relay B is selected by a switch in the top of the unit to operate either in parallel with relay A, or independently to provide a line-fault output when the connections to the sensor go open or short circuit. The status of each relay is indicated by an LED in the top of the unit, and an additional terminal block is fitted on the safe-area side of the unit to accommodate the connections from the two sets of relay contacts. The output phase of relay A (and relay B when 'slave' mode is selected) can be reversed by a link to allow an alarm condition (output open) to be signalled for either state of the sensor. The outputs cannot be used as if they were changeover contacts from a relay.

SPECIFICATION

See also common specification

Number of channels
One, fully floating

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

Voltage applied to sensor
7.7 to 9.0V dc from 1kΩ

Modes of operation
'Slave' or 'Line fault' mode selected by switch in top of unit

Slave mode operation
Both relays energised (outputs closed) if >2.1mA* (<2kΩ) in sensor circuit
Both relays de-energised (outputs open) if <1.2mA* (>10kΩ) in sensor circuit
Hysteresis: 200µA (650Ω) nominal
**NAMUR and DIN 19234 standards for proximity detectors*

Line fault mode operation
Relay B de-energised (output open) if current in sensor circuit is <100µA (broken line) or >6.5mA (shorted lines).
Relay A operates as in 'Slave mode' above.

Phase reverse facility
Operation of relay A (and relay B if 'slave' mode selected) reversed by linking terminals 7 & 8

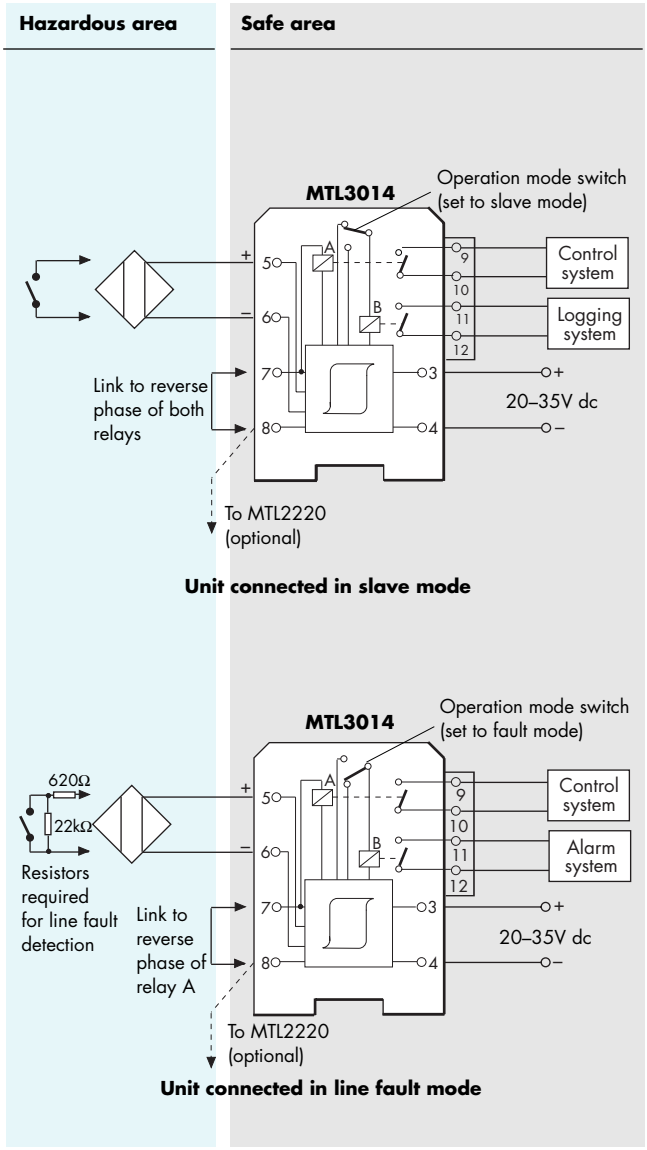
Power supply failure protection
Relays de-energise (outputs open) if supply fails

'No-fail' earth fault protection
Enabled by connecting terminal 8 to MTL2220
Fault on either line proclaimed: unit continues working

LED indicators
One provided for each relay. ON when relay energised (output closed)

Relay characteristics
Each single-pole on/off, open when relay de-energised
Response time: 15ms typical
Contact rating: 250V 5A 100VA (ac); 250V 5A 100W (dc)
Contact life expectancy: 1.5 x 10^5 operations at max. load, >10^6 operations at 200V ac peak or dc, 10VA (resistive load)
Note: reactive loads must be adequately suppressed

Power requirement
42mA typical at 24V
50mA maximum at 20 to 35V



Power dissipation within unit
1.1W typical at 24V
1.3W maximum at 35V

Replaceable fuse
63mA, 5 x 20mm glass to DIN 41571 sht. 2, semi-time-lag (M)

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

FM max entity parameters
V_{oc} = 10.5V, I_{sc} = 14mA, C_a = 2.4µF, L_a = 165mH

Weight
170g

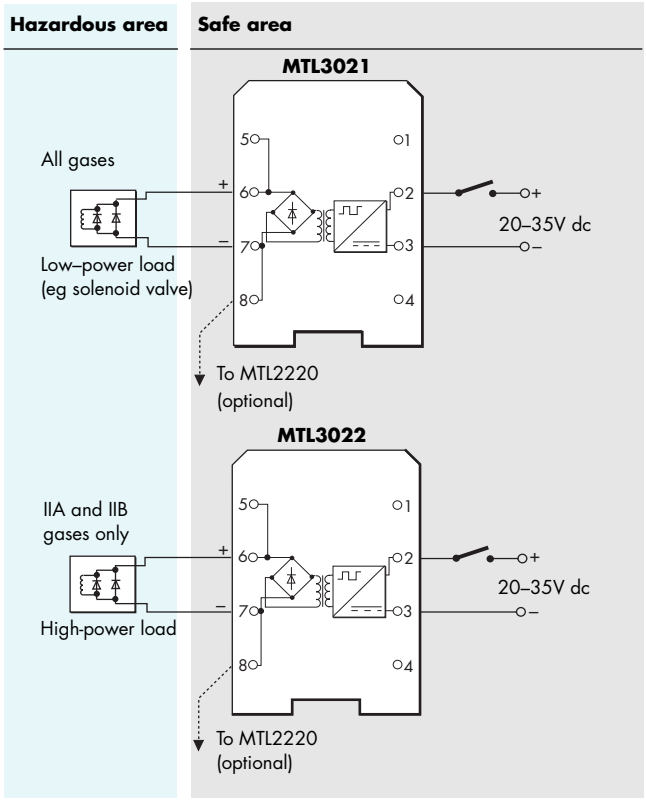
See 'Choosing an isolator' for a basic comparison of switch input isolators

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3021 AND 3022 SOLENOID/ALARM DRIVERS

MTL3021 – IIC, loop powered
MTL3022 – IIB, loop powered

The MTL3021 enables a device in a 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, for example a solenoid or alarm, as well as non-energy-storing 'simple apparatus' such as an LED. The unit's input/output isolation allows field cables to be earthed and the control switch to be connected into either side of the 24V dc supply circuit. The MTL3022 is similar but provides more power for driving heavy-duty loads eg high-powered solenoid valves in areas where the explosion risk is limited to IIB atmospheres.



SPECIFICATION

See also common specification

Number of channels
One, fully floating

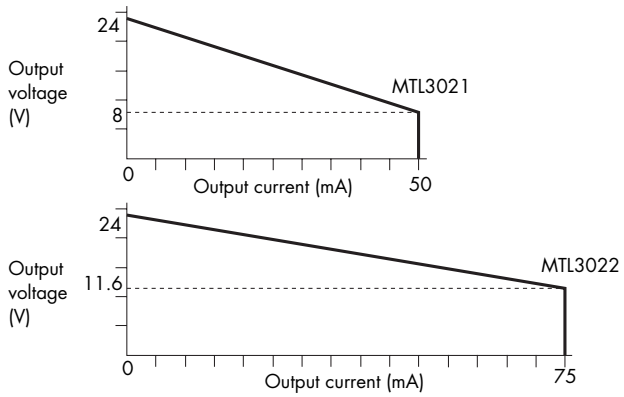
Location of load
Zone 0, IIC, T4–6 hazardous area if suitably certified (3021)
Zone 0, IIB, T4–6 hazardous area if suitably certified (3022)
Div 1, Group A, hazardous location (3021)
Div 1, Group C, hazardous location (3022)

Input voltage
20 to 35V dc

Input current
20mA + (35V ÷ input voltage) x output current in mA

Maximum input current
130mA (MTL3021)
170mA (MTL3022)

Minimum output voltage



Maximum output voltage
28V from 300Ω, current limited at 65mA (MTL3021)
28V from 151Ω, current limited at 86mA (MTL3022)

Output ripple
<0.5% of maximum output, peak-to-peak

Response time
Settles to within 10% of final value after typically 10ms

Power requirement (MTL3021)
95mA typical at 24V
130mA maximum at 20 to 35V

Power requirement (MTL3022)
130mA typical at 24V
170mA maximum at 20 to 35V

Power dissipation within unit (MTL3021)
1.9W typical at 24V with 50mA output
2.1W maximum at 35V with 50mA output

Power dissipation within unit (MTL3022)
2.3W typical at 24V with 75mA output
2.5W maximum at 35V with 75mA output

Replaceable fuse
200mA, 5x20mm glass to DIN 41571 sht.2, semi-time-lag (M)

'No-fail' earth fault protection
Enabled by connecting terminal 8 to MTL 2220
Fault on any line proclaimed: unit continues working

Safety description
28V, 300Ω, 93mA, U_m = 250V rms or dc (MTL3021)
28V, 151Ω, 185mA, U_m = 250V rms or dc (MTL3022)

FM max entity parameters
V_{oc} = 28V, I_{sc} = 93mA, C_a = 0.13µF, L_a = 4.0mH (MTL3021)
V_{oc} = 28V, I_{sc} = 185mA, C_a = 0.4µF, L_a = 4.0mH (MTL3022)

Weight
140g

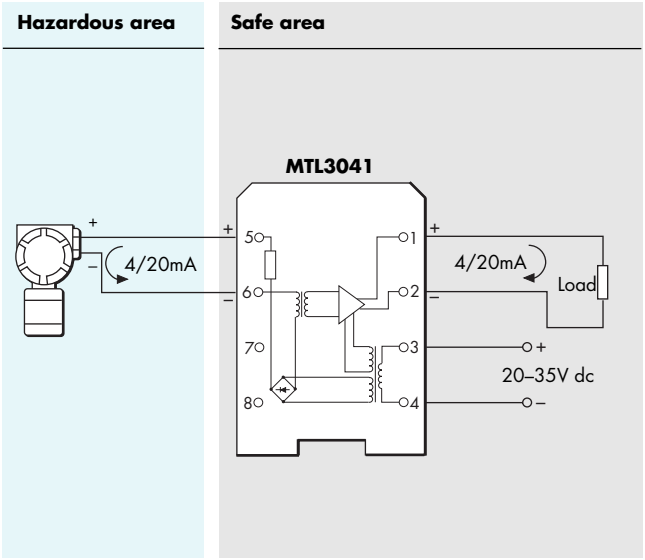
OTHER APPLICATIONS

The units can be used to drive warning devices such as beacons, audible alarms and LEDs. When used to power these devices care must be taken to ensure that the extra power available from the MTL3022 in IIB gas groups can be tolerated.

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3041 REPEATER POWER SUPPLY, 4/20mA

for 2-wire transmitters



The MTL3041 provides a fully-floating dc supply for energising a 2-wire, 4/20mA transmitter in a hazardous area, and repeats the current accurately in another floating circuit to drive a load in the safe area. The 17.5V output (at 20mA) is more than sufficient for all normal transmitter loops, and the fact that it floats allows the field cables to be earthed, either intentionally or in error. The isolation of the safe-area circuit from the 24V dc supply allows systems to be wired without difficulty so as to eliminate measurement errors due to voltage drops in shared cables, and solves the problem of feeding control computers connected independently to earth as is sometimes demanded by their makers. The transformer-coupled circuit of the MTL3041 chops the 4/20mA current directly, eliminating the need for any 'high-stability' resistors and ensuring extremely high long-term as well as short-term stability. For applications involving 'smart' transmitters, use the MTL3046B or 3047.

SPECIFICATION

See also common specification

Number of channels
One, fully floating

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

Voltage available for transmitter and lines
17.5V minimum at 20mA
Note: maximum open-circuit voltage is 28V

Maximum permitted line resistance
[(17.5V minus transmitter voltage requirement) x 50] Ω

Input and output signal range
4 to 20mA (0 to 20mA full range)

Safe-area circuit load resistance
0 to 800Ω

Safe-area circuit output resistance
>1MΩ

Safe-area circuit ripple
<10µA peak-to-peak

Transfer accuracy at 20°C
Better than 20µA

Temperature drift
<1µA/°C

Response time
Settles to within 10% of final value after typically 60ms

Power requirement
100mA typical at 24V with 20mA signal
80mA at 35V to 125mA at 20V with 20mA signal

Power dissipation within unit
2.0W typical at 24V with 20mA signal
2.5W maximum at 35V with 20mA signal

Replaceable fuse
125mA, 5x20mm glass to DIN 41571 sht.2, semi-time-lag (M)

Safety description
28V, 300Ω, 93mA, U_m = 250V rms or dc

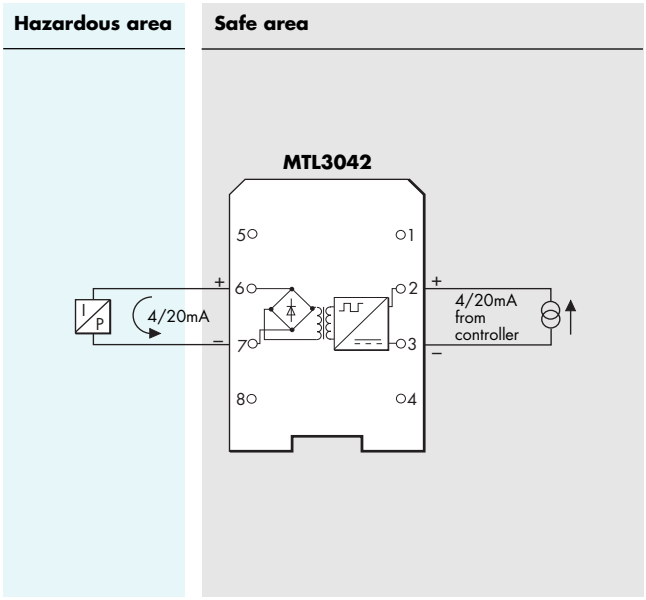
FM max entity parameters
V_{oc} = 28V, I_{sc} =93mA, C_a = 0.13µF, L_a = 4.0mH

Weight
160g

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3042 DC ISOLATOR, 4/20mA

for I/P converters



This unit acts like a direct-current transformer. Always powered from the safe-area side, it ensures that the same current flows in the safe and hazardous-area circuits and allows it to be controlled from either. It is intended primarily for isolating and passing on a 4/20mA signal from a controller to drive a current-to-pressure (I/P) converter or a position actuator. If the loop is sensitive to the volt drop introduced by the unit, then the separately powered MTL3045 should be used. Note that the lower-cost MTL3043 can also be used for driving I/P converters in many closed-loop applications with integral control where its lower accuracy is acceptable.

SPECIFICATION

See also common specification

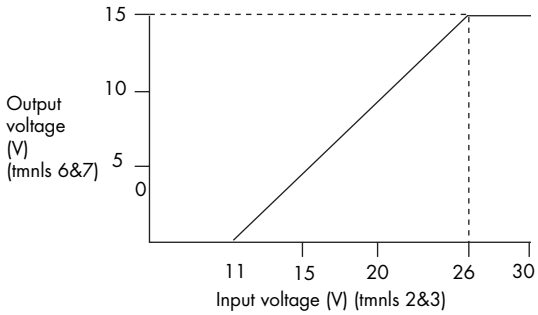
Number of channels
One, fully floating

Location of I/P converter
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div 1, Group A, hazardous location

Input voltage
11 to 35V dc

Input and output signal range
4 to 20mA

Minimum output voltage at 20mA



Maximum output voltage
28V from 300Ω

Input and output circuit ripple
<100µA peak-to-peak

Transfer accuracy at 20°C
Better than 50µA

Temperature drift
<2µA/°C

Response time
Settles to within 10% of final value after typically 70ms

Power dissipation within unit
0.4W typical at 24V with 20mA signal
0.5W maximum at 35V with 20mA signal

Replaceable fuse
50mA, 5x20mm glass to DIN 41571 sht.2, semi-time-lag (M)

Safety description
28V, 300Ω, 93mA, U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 28V, I_{sc} = 93mA, C_a = 0.13µF, L_a = 4.0mH

Weight
160g

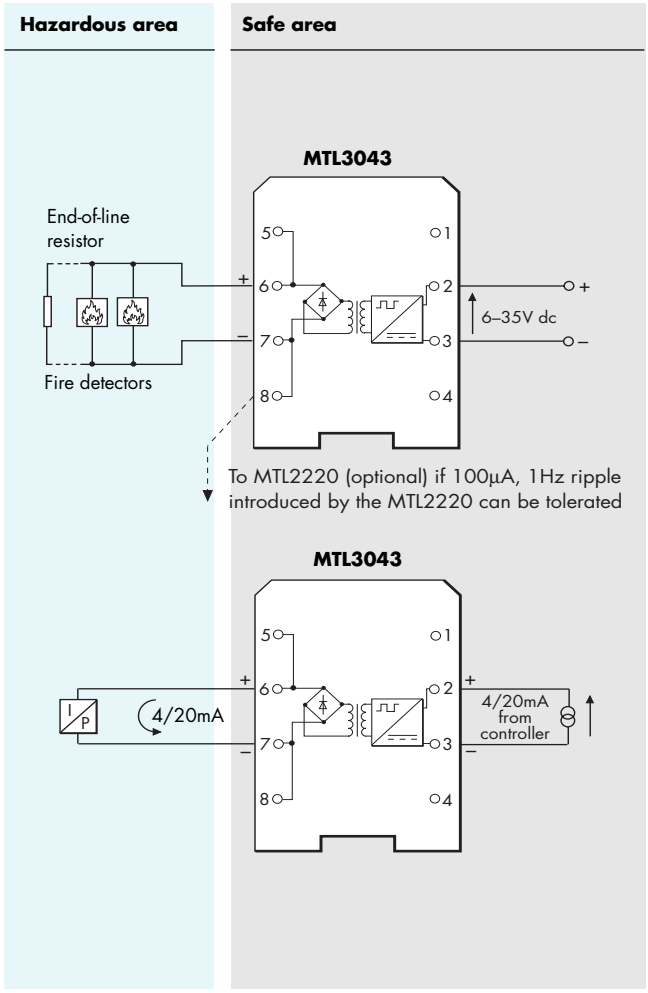
Note: See MTL3045 for separately powered unit.

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3043 DC ISOLATOR, 1/40mA

for fire and smoke detectors

The MTL3043 is similar in principle to the MTL3042, but with a higher current range for use primarily with fire and smoke detectors or similar high integrity switched-resistor systems. In these applications the unit shows, by a change in the safe-area current, when one of the detectors across the 2-wire circuit in a hazardous area has been triggered. With a suitable receiving instrument in use, line short circuits do not give a false alarm and – if an end-of-line resistor is added to the system – open circuits do not give the operator a false sense of security. Further, the isolation feature eliminates the multiple earths that can arise in conventional barrier systems when the supply is earthed, and permits earth faults in field wiring to be detected and cured while the unit continues working.



SPECIFICATION

See also common specification

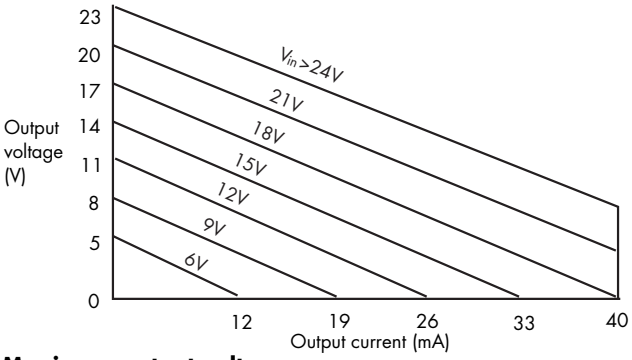
Number of channels
One, fully floating

Location of fire & smoke detectors
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div 1, Group A, hazardous location

Input voltage
6 to 35V dc

Input and output signal range
1 to 40mA, nominal

Minimum output voltage
V_{in} minus (0.42 x current in mA) minus 1V, V_{in} <24V
23V minus (0.42 x current in mA) V_{in} >24V



Maximum output voltage
28V from 300Ω

Input and output circuit ripple
<500µA peak-to-peak

Transfer accuracy at 20°C
Better than 500µA

Temperature drift
<10µA/°C

Response time
Settles to within 10% of final value after typically 50ms

Power dissipation within unit
1.0W typical at 24V with 40mA signal
1.2W maximum at 35V with 40mA signal

Replaceable fuse
50mA, 5x20mm glass to DIN 41571 sht.2, semi-time-lag (M)

'No-fail' earth fault protection (not I/P loops)
Enabled by connecting terminal 8 to MTL2220
Fault on any line proclaimed: unit continues working

Safety description
28V, 300Ω, 93mA, U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 28V, I_{sc} = 93mA, C_a = 0.13µF, L_a = 4.0mH

Weight
130g

OTHER APPLICATIONS

The MTL3043 can also be used for driving I/P converters in many closed-loop applications, especially those with integral control, where its lower accuracy is acceptable.

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3045 ISOLATING DRIVER, 4/20mA

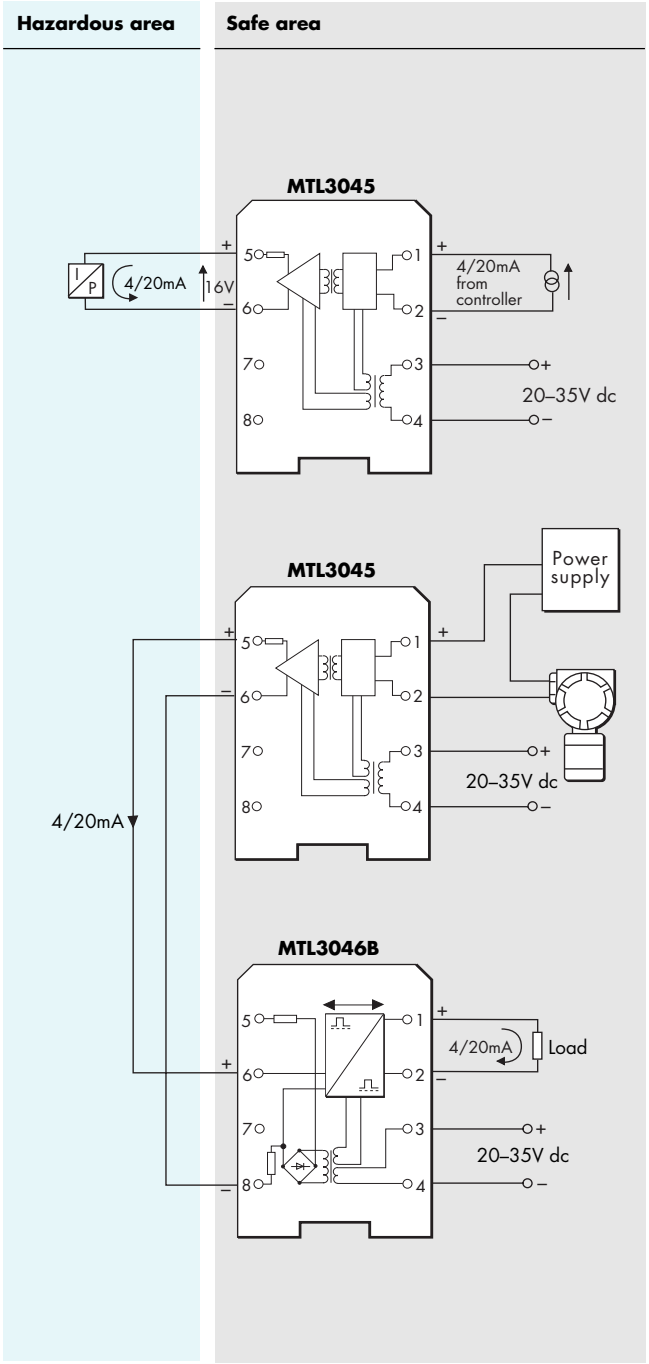
for I/P converters

The MTL3045 isolates and passes on a 4/20mA or 0/20mA signal from a controller to drive a current-to-pressure (I/P) converter, a position actuator, or any other load up to 800Ω in the hazardous area. Its high output capability of 16V at 20mA combined with the low (4V) drop across its input terminals, and its excellent accuracy, make it the first choice for these applications.

SPECIFICATION

See also common specification

Number of channels
One, fully floating
Location of I/P converter
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div 1, Group A, hazardous location
Input resistance
≤200Ω (4V at 20mA)
Input and output signal range
0 to 20mA
Maximum load resistance
800Ω (16V at 20mA)
Output resistance
>2MΩ
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 after typically 55ms
Power requirement
65mA typical at 24V
90mA maximum at 20 to 35V
Power dissipation within unit
1.5W typical at 24V with 20mA signal
2.3W maximum at 35V with 20mA signal
Replaceable fuse
125mA, 5x20mm glass to DIN 41571 sht.2, semi-time-lag (M)
Safety description
28V, 300Ω, 93mA, U_m = 250V rms or dc
FM max entity parameters
V_{oc} = 28V, I_{sc} = 93mA, C_a = 0.13µF, L_a = 4.0mH
Weight
150g



OTHER APPLICATIONS

The MTL3045 can be used, in conjunction with the MTL3046B, to transfer measurement or control signals through a hazardous area separating two safe areas.

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3046B REPEATER POWER SUPPLY, 4/20mA

for 'smart' transmitters

The MTL3046B performs a similar function to the MTL3041, but is tailored for use with 'smart' transmitters whose digital communication signals are superimposed on a standard 4/20mA analogue signal. The unit provides a minimum of 15V at 20mA to energise the transmitter while at the same time repeating the current accurately in a separate circuit to drive a load in the safe area. The transmitter can be calibrated, interrogated or tested from the host computer, or by using a hand-held communicator connected in either the safe or hazardous area. The MTL3046B is a development of the MTL3046, which it replaces, and it is compatible with the majority of 'smart' transmitters available. See MTL3047 for a unit compatible with the Bailey BCN/EQN Series of 'smart' transmitters.

SPECIFICATION

See also common specification

Number of channels
One, fully floating

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

Voltage available for transmitter and lines
15V minimum at 20mA
Note: maximum open-circuit voltage is 28V

Maximum permitted line resistance
[(15 minus transmitter voltage requirement) x 50] Ω

Input and output signal range
4 to 20mA with superimposed digital signal

Digital signal bandwidth (safe area to hazardous area)
10Hz to 8kHz

Digital signal bandwidth (hazardous area to safe area)
dc to 10kHz

Input resistance (terminals 6 & 8)
≤30Ω (600mV at 20mA)

Safe-area circuit load resistance
20 to 750Ω (250Ω ±10% for digital communications)

Safe-area circuit output resistance
>1MΩ

Safe-area circuit ripple
<160µA peak-to-peak

DC transfer accuracy at 20°C
Better than 20µA

Temperature drift
<1µA/°C

Response time
Settles to within 10% of final value after typically 40µs

Power requirement
85mA typically at 24V with 20mA signal
75mA at 35V to 125mA at 20V with 20mA signal

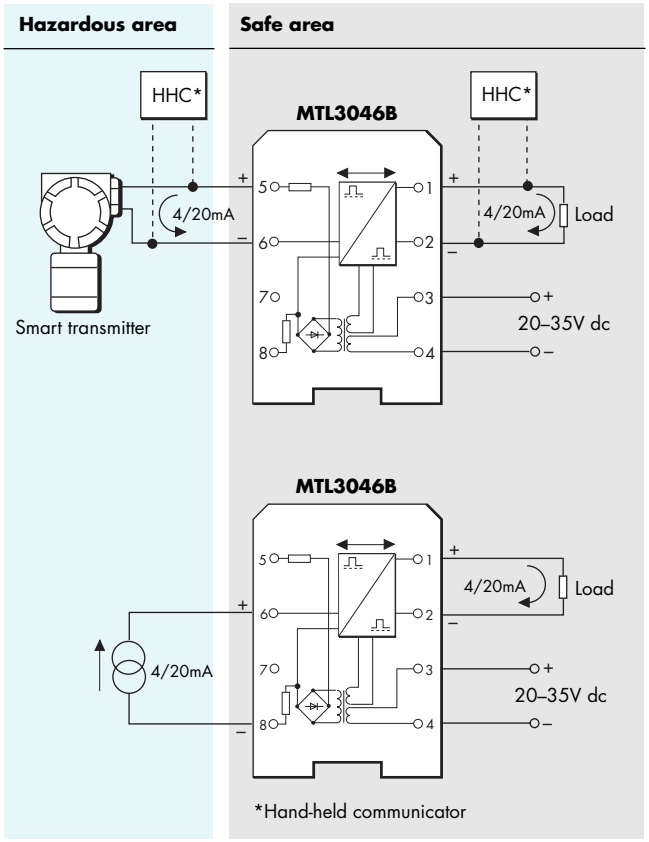
Power dissipation within unit
1.7W typical at 24V with 20mA signal
2.3W maximum at 35V with 20mA signal

Replaceable fuse
200mA, 5x20mm glass to DIN 41571 sht.2, semi-time-lag (M)

Safety description

Terminals 5 & 6
28V, 300Ω, 93mA, U_m = 250V rms or dc

Terminals 6 & 8
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 28V.
Note: Terminals 6 & 8 do not support bi-directional transmissions for HART® devices.



FM max entity parameters
Terminals 5 & 6: V_{oc} = 28V, I_{sc} = 93mA, C_a = 0.13µF, L_a = 4.0mH
Terminals 6 & 8: V_{oc} = 1.2V, I_{sc} = 100mA, C_a = 1000µF, L_a = 3.75mH

Weight
170g

OTHER APPLICATIONS

Although designed for 'smart' transmitter applications, the MTL3046B operates with standard analogue 4/20mA transmitters, and therefore can be especially useful if upgrading later to 'smart' transmitters.

The MTL3046B can be used to repeat a current generated by hazardous-area equipment in an existing barrier-protected safe-area circuit, to provide a fully isolated output with a high load handling capability.

The MTL3046B operating with an MTL3045 can pass measurement and control signals through a hazardous area separating two safe areas (see MTL3045).

The frequency response of dc to 10kHz (hazardous to safe area) makes the MTL3046B ideal for some flowmeter applications such as vortex and turbine meters.

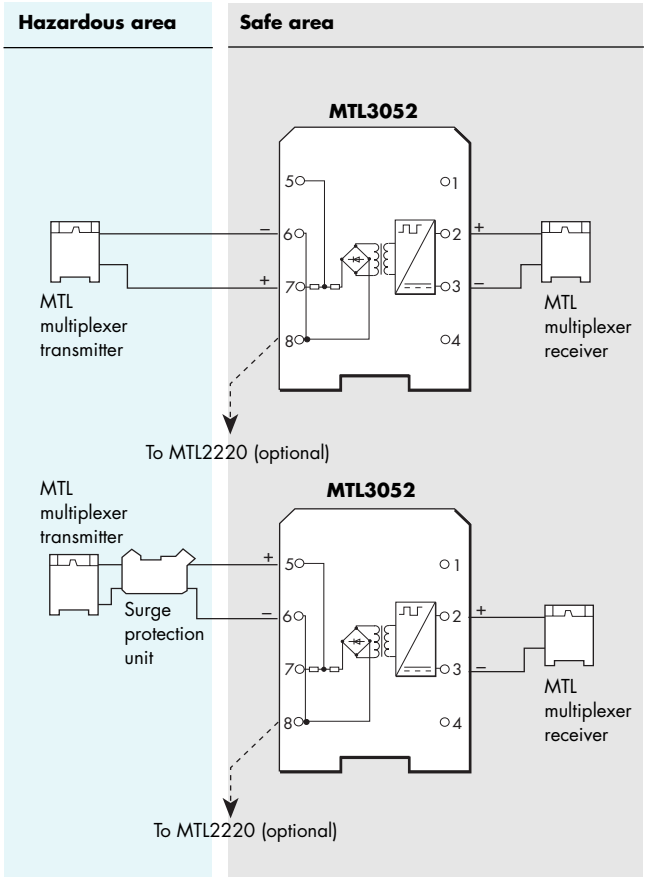
See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3052 DIGITAL ISOLATOR

for signals up to 10kHz

CE

This unit is similar in principle to the MTL3042 but operates at a higher frequency for use with digital signals. Its primary application is to provide IS protection for the data highways and transmitters in MTL800 Series multiplexer systems. This approach allows line and earth faults to be detected via an MTL2220 earth leakage unit, which is not possible when using a shunt-diode safety barrier. The MTL3052 features two output circuits: one with a 15V 180Ω safety description, and an alternative 15V 100Ω circuit which can be used if higher loop resistances need to be accommodated, for example when surge protectors are incorporated in the data highways. If the low-resistance outputs are used on two units fitted to a dual-highway system however, the multiplexer transmitters are restricted to location in IIB atmospheres.



SPECIFICATION

See also common specification

Number of channels
One, fully floating

Location of load
Zone 0, IIC, T4–6 hazardous area if suitably certified
Div 1, Group A, hazardous location
Zone 0, IIB, T4–6 (Div 1, Group C, hazardous location) for multiplexer transmitters in dual-highway systems using the low-resistance outputs of two MTL3052s

Input voltage
4 to 12V dc

Signal bandwidth
dc to 10kHz

Minimum output voltage
[V_{in} minus (0.25 x current in mA)] V

Input and output circuit ripple
<1mA peak-to-peak

Power dissipation within unit
160mW maximum at 12V with 20mA signal

Replaceable fuse
50mA, 5 x 20mm glass to DIN 41571 sht. 2, semi-time-lag (M)

'No-fail' earth fault protection
Enabled by connecting terminal 8 to MTL2220
Fault on either line proclaimed: unit continues working

Safety description

Terminals 5 & 6
15V, 100Ω, 150mA, U_m = 250V rms or dc

Terminals 6 & 7
15V, 180Ω, 83.3mA, U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 15V, I_{sc} = 83.3mA, C_a = 0.75µF, L_a = 5.2mH

Weight
130g

OTHER APPLICATIONS

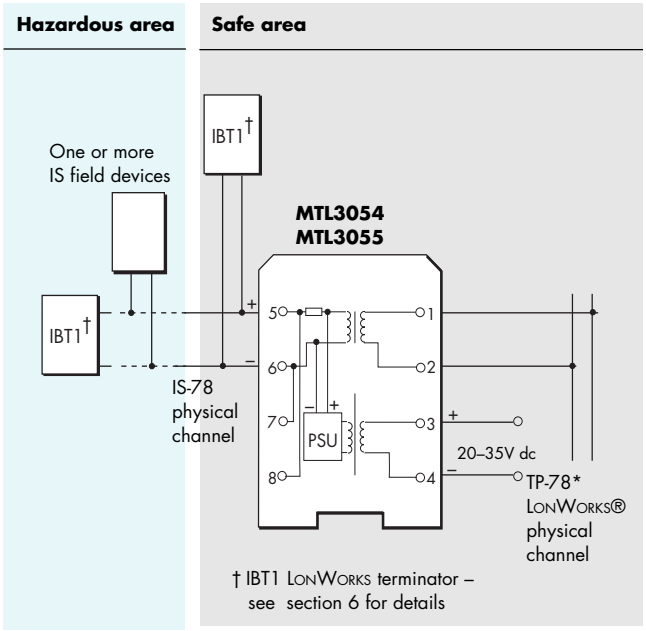
The MTL3052 is suitable for a variety of other applications, such as bringing back the status of a hazardous-area mechanical or opto-transistor switch, or a magnetic shaft encoder (all via suitable current limiting resistors).

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3054 AND MTL3055 COMMUNICATIONS ISOLATORS/REPEATERS

CE

The MTL3054 and 3055 enable the extension of LONWORKS® into hazardous areas. The units provide power and communications via the signal conductors.
MTL3054: the number of devices that can be supported is a function of the power required by each device.
MTL3055: two units may be used for communication across hazardous areas or for communication to LONWORKS nodes mounted in explosion-proof (flameproof) enclosures in a hazardous area. Two MTL3055s may be used to give dual-redundant connection to a hazardous-area node.



PROVISIONAL SPECIFICATION

See also common specification

Location of field devices (MTL3054)
Zone 0, IIC, T4–6 hazardous area if suitably certified

Location of field devices (MTL3055)
Zone 0, IIC, T4–6 hazardous area if suitably certified
Zone 0, IIC, T4–6 hazardous area if suitably certified when two MTL3055s are connected together.

Hazardous-area power supply (MTL3054)
19.4V, 105Ω dc impedance typical
Maximum current 90mA

Hazardous-area power supply (MTL3055)
19.4V, 200Ω dc impedance typical
Maximum current 45mA

Hazardous-area maximum cable length
Determined by IS requirements depending upon devices attached and maximum acceptable voltage drop along cable.
Free topology: 300m maximum (provisional value)
Bus topology: 1000m maximum

Hazardous-area digital signal transmission
78.1kbit/s, carried on same wires as power.
Signals are repeated between safe-area LONWORKS physical channel and IS physical channel.

Safe-area transceiver (MTL3054)
Similar to TPT-78 with additional safety components required by IS regulations. Operates with conventional TP-78 transceivers but maximum number of nodes and maximum bus length are reduced.

Power requirement (MTL3054)
140mA typical at 24V with full load
110mA at 35V to 170mA at 20V with full load

Power requirement (MTL3055)
100mA typical at 24V with full load
90mA at 35V to 130mA at 20V with full load

Power dissipation within unit
2.5W typical at 24V with full load
2.8W maximum at 35V with full load

Replaceable fuse
250mA

Weight
170g

Safety description (MTL3054)
Terminals 5 to 6 and 7 to 8
22V, 102Ω, 216mA, U_m = 250V rms or dc

Safety description (MTL3055)
Terminals 5 to 6 and 7 to 8
22V, 200Ω, 110mA, U_m = 250V rms or dc

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See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3058 AND MTL3059 SERIAL-DATA INTERFACES

MTL3058 – RS232C, general-purpose
MTL3059 – RS422A, general-purpose

These units enable two 'intelligent' devices mounted in safe areas to communicate, bidirectionally in serial data form, across a hazardous area. A typical application is the link between safe-area process control systems and multi-point or multi-stream analysers located in 'safe-area' instrument cabins or analyser houses in hazardous areas. Each unit is provided with a connector on the safe-area side for connecting RS232C (MTL3058) or RS422A (MTL3059) serial-data links. In all applications an interface unit is needed at each end of the cable, these being connected by three wires to provide full duplex communication. If the data flow is controlled by software (via Xon/Xoff), then one pair of units can be used for both 'transmit' and 'receive' data lines. If hardware handshaking is needed for data flow control (eg, CTS, RTS) then further pairs of units can be used.

SPECIFICATION

See also common specification

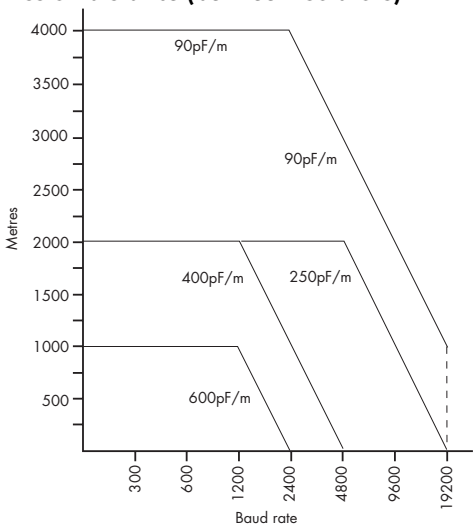
Number of channels
One two-way communication channel, fully floating

Location of connecting cable
Zone 0, IIC, T4 hazardous area
Div 1, Group A, hazardous location

Safe-area signal
RS232C, 300 to 19.2kbaud (MTL3058)
RS422A, 300 to 19.2kbaud (MTL3059)
Via 4-terminal connector on side of unit

Hazardous-area signal
Switched current 0 to 15mA at 6.8V

Transmission distance (between isolators)



Power requirement
62mA typical at 24V
55mA at 35V to 70mA at 20V

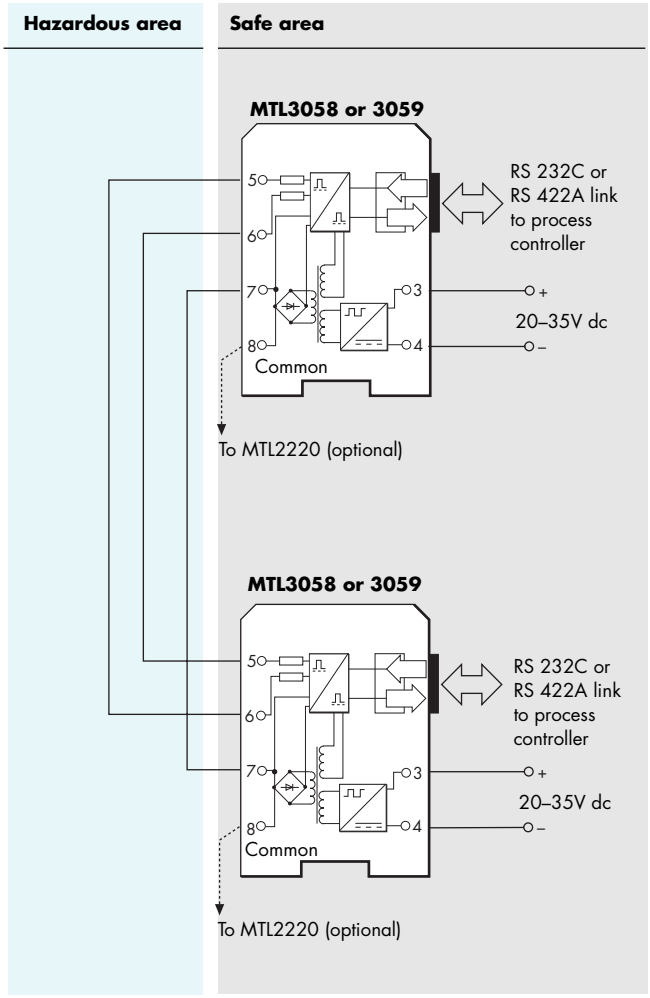
Power dissipation within unit
1.5W typical at 24V
2.0W maximum at 35V

Replaceable fuse
80mA, 5 x 20mm glass to DIN41571 sht.2, semi-time-lag (M)

Safety description
Terminals 5 & 6 wrt 7 & 8
15V, 194Ω, 77mA, U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 15V, I_{sc} = 154mA, C_a = 0.11µF, L_a = 1.55mH

Weight
170g



OTHER APPLICATIONS

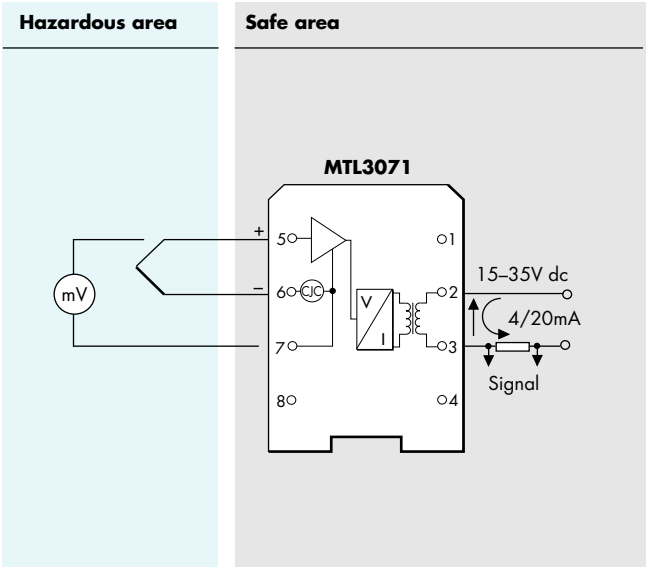
Since both the MTL3058 and MTL3059 convert the safe-area signal into a common hazardous-area format, it is possible to convert between RS232C and RS422A by using one MTL3058 and one MTL3059.

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3071 TEMPERATURE CONVERTER

THC or emf input

The MTL3071 accepts a low-level dc signal from a temperature sensor in a hazardous area, and converts it into a 4/20mA loop current in the safe area proportional to millivolts (but not temperature). It can monitor any one of six types of thermocouple, or a millivolt signal from an emf source. Calibration is carried out by the user via controls located in the top and the side of the unit. This can be effected without the use of a thermocouple since the unit's built-in cold junction compensation (CJC) is zeroed at 0°C, and can be bypassed. Thermocouple type is switch-selectable, as is the optional safety drive which initiates either a high or low output in the event of thermocouple burnout or any cable breakage. Input zero and span are selected by switches (coarse adjustment) and potentiometers (fine adjustment).



SPECIFICATION

See also common specification

Number of channels
One, fully floating

Signal source (selected by switches)
Type E, J, K, N, R or T thermocouple to BS 4937 – terminals 5 & 6
EMF input – terminals 5 & 7

Location of signal source
Zone 0, IIC, T4 hazardous area if suitably certified
Div 1, Group A, hazardous location

Span (fully adjustable by switches and potentiometers)
4 to 60mV

Zero (fully adjustable by switches and potentiometers)
–12 to +60mV

Common-mode ac rejection
<0.1% error for 250V rms, 50Hz

Series-mode ac rejection
<0.1% error for 50Hz rms input equal to half of span

Loop supply voltage
15 to 35V dc

Output range
4 to 20mA

Maximum load resistance
50(Vs –15) Ω

Response time
Settles to within 10% of final value after typically 350ms

Calibration accuracy at 20°C
(including non-linearity, hysteresis and repeatability)
Within 0.1% of span (emf input)
Within 0.1% of span ± 1°C (THC input)

Temperature drift (maximum)
Zero: the greater of the following:–
±0.01% of span/°C or ±1µV/°C (emf input)
as above, ±0.03°C/°C (THC input except type R)
as above, ±0.07°C/°C (THC type R input)
Span: ±0.005% of input span/°C
Suppression/elevation (E): ±0.01% of E/°C

Cold junction compensation (CJC)
Referenced to 0°C

Safety drive on THC burnout (selected by switches)
Upscale or downscale, or off

Input current
<1nA (safety drive off)
<75nA (safety drive on)

Power dissipation within unit
0.46W maximum at 35V with 20mA signal

Replaceable fuse
50mA, 5 x 20mm glass to DIN 41571 sheet 2, semi-time-lag (M)

Safety description
11V, 3.79kΩ, 2.9mA, C_{eq} = 0, L_{eq} = 2.2mH,
U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 11.0V, I_{sc} = 2.9mA, C_a = 1.9µF, L_a = 1000mH

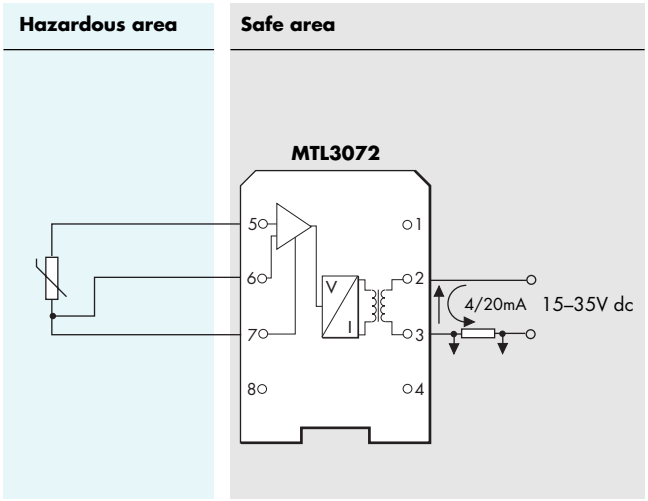
Weight
170g

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3072 TEMPERATURE CONVERTER

RTD input

The MTL3072 accepts a signal from a 3-wire resistance temperature detector (RTD) in the hazardous area, and converts it to a 4/20mA loop current in the safe area proportional to resistance (but not temperature). Calibration is carried out by the user via controls located in the top and the side of the unit. Input zero and span are selected by switches (coarse adjustment) and potentiometers (fine adjustment).



SPECIFICATION

See also common specification

Number of channels
One, fully floating

Signal source
3-wire platinum RTD to BS1904/DIN 43760 (100Ω at 0°C)
–terminals 5, 6 & 7

Location of signal source
Zone 0, IIC, T4 hazardous area if suitably certified
Div 1, Group A, hazardous location

Span (fully adjustable by switches and potentiometers)
25 to 800°C

Zero (fully adjustable by switches and potentiometers)
–200 to +400°C

Common-mode ac rejection
<0.1% error for 250V rms, 50Hz

Series-mode ac rejection
<0.1% error for 50Hz rms input equal to 2mV or (span in Ω/30)mV, whichever is the greater

Loop supply voltage
15 to 35V dc

Output range
4 to 20mA

Maximum load resistance
50(Vs –15) Ω

Response time
Settles to within 10% of final value after typically 250ms

Calibration accuracy at 20°C
(including non-linearity, hysteresis and repeatability)
Within 0.1% of span

Temperature drift (maximum)
Zero: the greater of the following:–
±0.01% of span/°C or 10mΩ/°C
Span: ±0.005% of input span/°C
Suppression/elevation (E): ±0.01% of E/°C

RTD excitation current
400µA

Line resistance
100Ω maximum in each line

Power dissipation within unit
0.46W maximum at 35V with 20mA signal

Replaceable fuse
50mA, 5 x 20mm glass to DIN 41571 sheet 2, semi-time-lag (M)

Safety description
13.6V, 142Ω, 95.3mA, C_{eq} = 56.5nF, L_{eq} = 2.2mH,
U_m = 250V rms or dc

FM max entity parameters
V_{oc} = 13.6V, I_{sc} = 95.3mA, C_a = 1.15µF, L_a = 1.8mH

Weight
170g

OTHER APPLICATIONS

The MTL3072 can monitor a low-value potentiometer, up to 375Ω, in a hazardous area to give a 4/20mA output in the safe area .

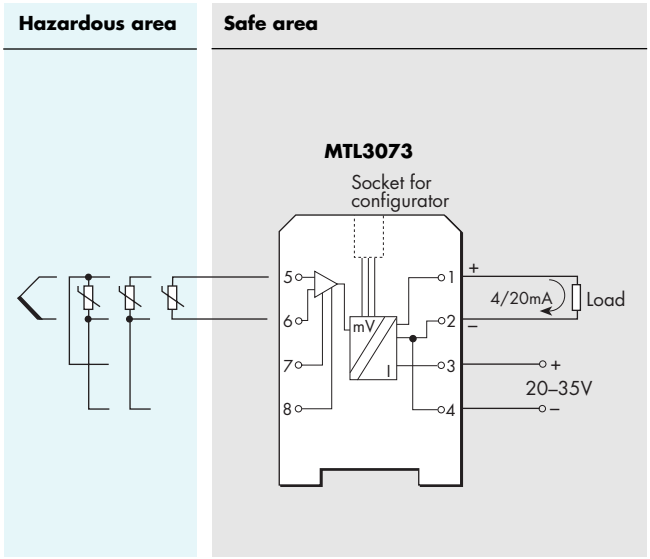
See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3073 TEMPERATURE CONVERTER

THC or RTD input

CE

The MTL3073 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-, and 4-wire RTDs. For THC inputs requiring cold-junction compensation, an integral CJC sensor is provided within the module. Configuration is carried out through a port on top of the module using an MTL611B IS pocket data terminal fitted with a CNF41 interface and CAB73 cable assembly or a personal computer running MTL PCC73 software.



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/DIN 43760 (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 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

Configurator
MTL611B IS pocket data terminal fitted with a CNF41 interface or PCC73 software for PC

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
57mA at 24V
55mA at 20V
60mA at 35V with 20mA signal

Power dissipation within unit
1.2W at 24V with 20mA signal
2.0W at 35V

Replaceable fuse
100mA, 5 x 20mm glass to DIN41571 sht. 2, semi-time-lag (M)

Isolation
250V ac between safe- and hazardous-area circuits

Safety description

Terminals 5 and 6
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.

Terminals 7 and 8
7.2V, 950Ω, 8mA

Configuration socket
$U_{max: in}$ = 11.2V, $I_{max: in}$ = 12mA, $W_{max: in}$ = 280mW
$U_{max: out}$ = 7.2V, $I_{max: out}$ = 8mA, $W_{max: out}$ = 15mW

FM entity parameters

Terminals 5, 6, 7 and 8
V_t ≤7.2V, I_t ≤11.5mA, C_a ≤11.0µF, L_a ≤245mH

Terminals 5 and 6 only
V_t ≤1.2V, I_t ≤3.8mA, C_a ≤1000µF, L_a ≤3.6mH

Weight
170g

Default configuration

Unless ordered differently, every module is supplied with the following default configuration.

Input type	Type K thermocouple
Linerisaton	enabled
Units	°C
CJ Compensation	enabled
Damping value	0 seconds
Smoothing value	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

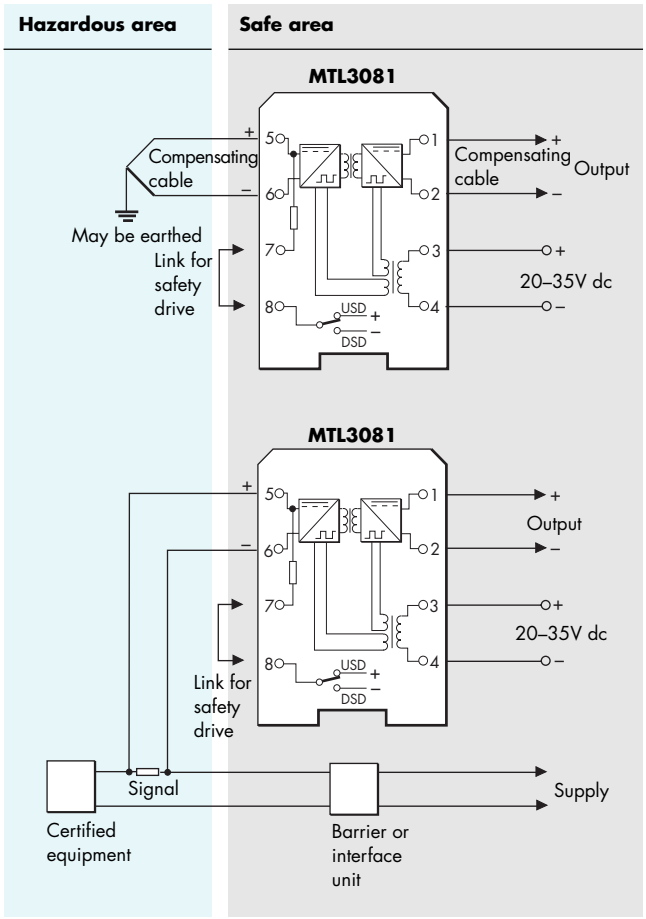
Note: the MTL3073 must be configured before use, either by MTL or on-site, using an MTL611B pocket data terminal and accessories (see displays section) or a personal computer running MTL PCC73 software (see MTL PCC73).

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3081 MILLIVOLT ISOLATOR

for low-level signals

The MTL3081 takes the signal from a thermocouple or dc millivolt source in a hazardous area, isolates it, and passes it on to the receiving instrument in the safe area. It is ideally suited to applications where the thermocouple signal is fed directly into the receiving instrument, rather than converted beforehand into 4/20mA. The safety drive, which is optional, can be enabled by a link to initiate either a high or low output in the event of thermocouple burnout or cable breakage. The direction of the safety drive is set by a switch in the top of the unit. The unit is very easy to use since its ±50mV input range is sufficient to cope with all common thermocouple outputs, and so there are no calibration procedures to worry about. Furthermore, its input terminals are non-energy-storing which allows installation in virtually any IS system without further certification.



SPECIFICATION

See also common specification

Number of channels
One, fully floating

Signal source
Any dc millivolt source

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

Location of millivolt source
Zone 0, IIC, T4 hazardous area if suitably certified
Div 1, Group A, hazardous location

Input and output signal range
0 to ±50mV

Output impedance
≤250Ω

Transfer accuracy at 20°C
0.05% of reading (input ≥ ±10mV)
±5µV (input < ±10mV)

Temperature drift (with source impedance of <500Ω)
(1µV + 0.002% of input) per °C, typically
(2µV + 0.004% of input) per °C, maximum

Response time
Settles to within 10% of final value after typically 50ms

Safety drive on THC burnout (selectable)
Upscale or downscale at >10mV/s, or off

Power requirement
10mA maximum at 20 to 35V

Power dissipation within unit
0.35W maximum at 35V

Replaceable fuse
50mA, 5x20mm glass to DIN 41571 sht. 2, semi-time-lag (M)

Safety description
Input terminals (Nos. 5 & 6): 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 28V.

FM max entity parameters
V_{oc} = 1.2V, I_{sc} = 22.5mA, C_a = 1000µF, L_a = 75mH

Weight
170g

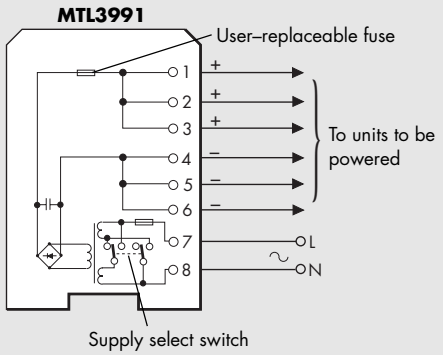
See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3991 24V dc POWER SUPPLY

CE

The MTL3991 provides a convenient source of power for MTL3000 Series units in locations where a dc supply is not readily available. The 500mA capability at 20–35V dc is sufficient to drive at least three units, or more in appropriate combinations – see specification. A slide switch mounted inside the MTL3991 allows it to be set for 240 or 120V ac operation, the switch being accessed by a screwdriver through an aperture in one end, and its setting being visible to the user. The MTL3991 can also be used to power other types of unit, provided that the 4V ripple component of the unregulated output can be tolerated.

Safe area



SPECIFICATION

See also common specification

Power supply
240 or 120V ac
Selectable via switch on end of unit

Supply requirement
240V ac operation: 200–255V
120V ac operation: 100–130V
} 48–65Hz

Power dissipation within unit
10W maximum

Mounting
Because of its higher dissipation, the MTL3991 should be spaced 5mm apart from other units

Output current
0–500mA

Output ripple
<4V peak-to-peak at 500mA

Output voltage, including ripple
20–35V dc

Replaceable fuse
500mA, 5 x 20mm, glass, to DIN 41571 sheet 3

Tagging
By one 18-digit row of Klippon BSG $^1/_2$ marking tags

Weight
500g

APPLICATIONS

Load unit	Maximum current requirement
MTL3011 or 3012	35mA
MTL3013	70mA
MTL3014	50mA
MTL3021 (loop-powered)	130mA
MTL3022 (loop-powered)	170mA
MTL3041	125mA
MTL3045	90mA
MTL3046B	125mA
MTL3058	70mA
MTL3059	70mA
MTL3073	60mA
MTL3081	10mA
MTL825B (inc. other units loop powered by this)	350mA
MTL825B-MB (inc. other units loop powered by this)	250mA
MTL838B-MBF (inc. other units loop powered by this)	500mA

The MTL3991's unregulated output is not suitable for connection directly to the MTL3042, 3043, 3052, 3071 and 3072 loop-powered units.

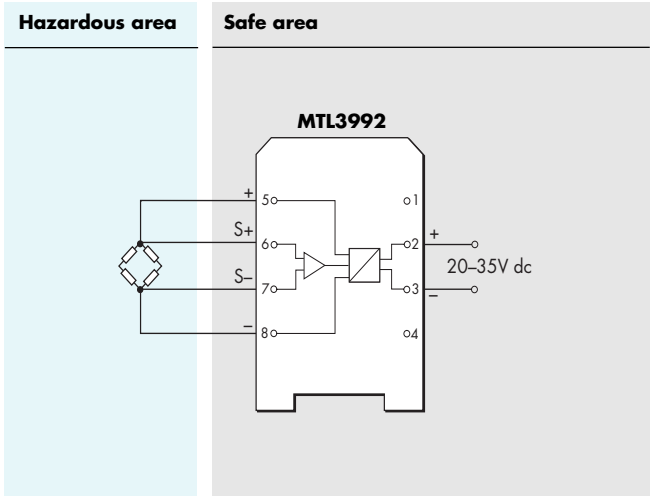
See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3992 HIGH STABILITY POWER SUPPLY

for strain-gauge bridges, etc

CE

The MTL3992 is a galvanically isolated power supply unit designed to provide an accurate and stable voltage suitable for powering bridge circuits in hazardous areas. An integral voltage sensing circuit maintains a constant and stable bridge voltage enabling bridge outputs to be measured directly. A typical use for the unit is powering up to four 350Ω load-cells in hazardous areas as part of a complete weighing system application (which may also include MTL interfaces, transmitters, and indicators).



SPECIFICATION

Location of strain-gauge bridges
Zone 0, IIC, T4 hazardous area
Division 1 Group A hazardous location

Bridge excitation voltage
7.0V with setting accuracy of 0.03%

Sense line resistance R_s
0.1% error for 200Ω

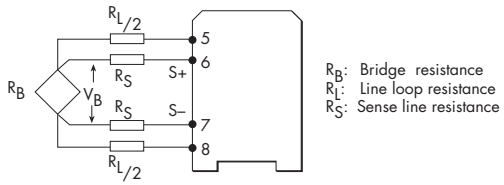
Stability/drift
<50ppm/°C, ie 0.005%/°C

Output ripple
<20mV at 100kHz

Load and line regulation
±0.04%

Response times
No load to 350Ω: 100ms
No load to 175Ω: 135ms
No load to 116Ω: 165ms
No load to 87Ω: 185ms
350Ω to no load: 18ms
175Ω to no load: 22ms
116Ω to no load: 28ms
87Ω to no load: 33ms
Measured at V_{in} = 24V dc, line resistance = 7Ω

Line resistance
Varies with bridge resistance as follows:–



For loads ≥87Ω:
$R_L = R_B - 72.45$

For loads from 76Ω to 87Ω:

Load resistance:	86Ω	84Ω	82Ω	80Ω	78Ω	76Ω
Line loop resistance:	12.2Ω	9.6Ω	7.0Ω	4.5Ω	2.2Ω	0Ω

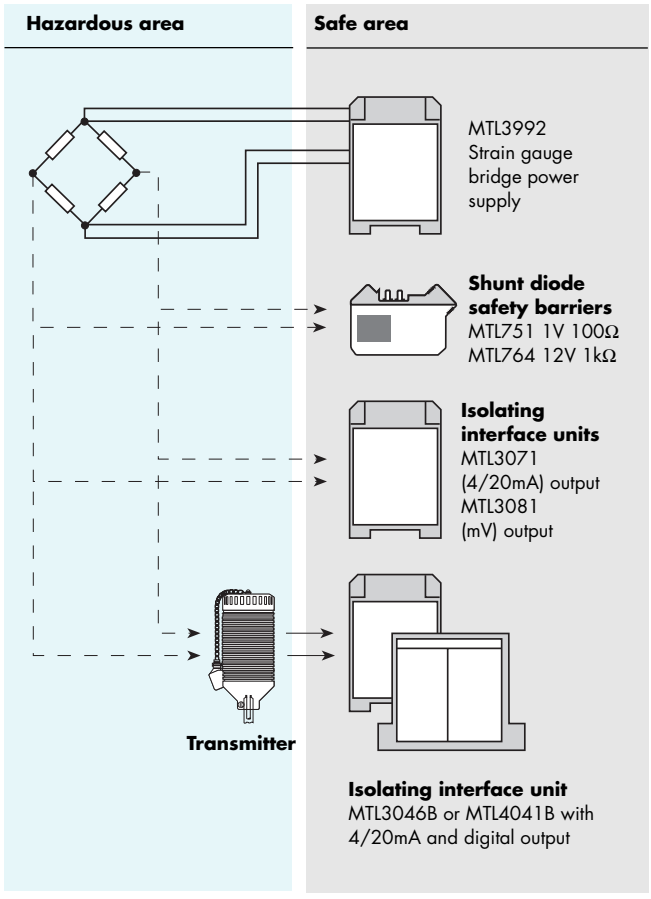
For loads below 76Ω the voltage regulation is not guaranteed

Power supply requirement

Worst case	Typical with four-bridge load and 15Ω line resistance
155mA at 24V	105mA at 24V
183mA at 20V	127mA at 20V
112mA at 35V	79mA at 35V

Power dissipation within unit
Typical (with four-bridge load and 15Ω line resistance):
1.9W at V_{in} 24V
Worst case: 3.9W (can occur only when sense wires and load are disconnected)

STRAIN GAUGE APPLICATIONS



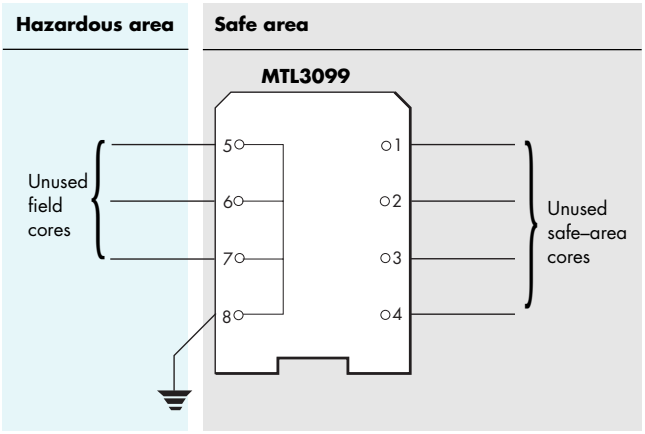
Note: 1. The unit should be spaced 5mm apart from other units.
2. If sense terminals 6 and 7 are left unconnected when the MTL3992 is powered, the unit will become very warm. During installation/commissioning, connect terminal 6 to terminal 5 and terminal 7 to terminal 8 to avoid this.

Replaceable fuse
200mA, 5 x 20mm glass to DIN41571 sht.2, semi-time-lag (M)

Safety description
Combined hazardous-area terminals: 17.69V, 65.5Ω, 270mA
This safety description includes the fault energy available from terminals 6 and 7

See also MTL3000 cable parameters, approvals, common specification, dimensions, and ordering information.

MTL3099 DUMMY ISOLATING INTERFACE UNIT



The primary function of the MTL3099, which can be used with all other MTL3000 and 2000 Series isolating interface units, is to provide termination and earthing facilities for unused cable cores from hazardous areas. This addresses the concerns about electrostatic charging of unused cores. The unit is therefore ideal for new projects where spare cable capacity is included for future expansion and for installations using multicore cable with unused cores.

Weight
80g

MTL3000 SERIES COMMON SPECIFICATION

Isolation
250V ac between input, output and power supply terminals
Tested at 1500V rms minimum between safe and hazardous-area terminals

Terminals
Accommodate conductors up to 4mm² (12AWG)

Mounting
On 35mm DIN (top-hat) rail (to EN 50 022 – 35 x 7.5; BS 5584; 35 x 27 x 7.3 DIN 46277) or any flat surface*
**MTL3991 and 3992 require surface-mounting clip SMC2 for this purpose*

Location of units
Safe area

Ambient temperature limits
–20 to +60°C continuous working
–40 to +80°C storage
The MTL3991 and 3992 should be spaced 5mm apart from other units

Humidity
5 to 95% RH

EMC Compliance
The modules that comply with EMC EN 050 081-2 generic emission/ EN 050 082-2 immunity standards (which refer to appropriate IEC/ CISPR standards) are marked accordingly.

CONDITIONS OF USE

The conditions governing the use of MTL3000 Series interface units are given in the relevant certificates and schedules, copies of which are available from MTL.

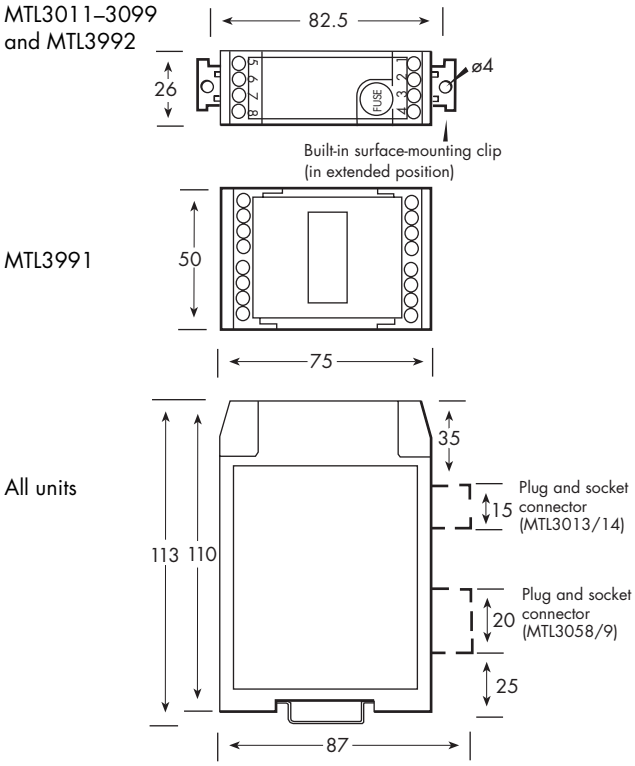
ENCLOSURES AND ACCESSORIES

A range of enclosures is available, and provides IP65 protection for up to 4, 8, 16 or 36 units. Alternatively, units can be installed in users' own racks or panels using the MTL700 Series accessories, which also provide full tagging and cable screen earthing facilities. Details of these arrangements are given in the MTL700 series accessories section.

TO ORDER, specify:

1. **Model number**
2. **MTL3000 series enclosures and accessories**
3. **INM3000 instruction manual**
   AN9008 application note

DIMENSIONS (mm)



Model	BASEEFA(CENELEC) Group	µF		mH	or	µH/Ω	FM Group	µF		mH
MTL3011 and MTL3012	IIC	2.4	(0.44*)	165		825	A & B	3	(0.44*)	300
	IIB	7.2	(1.32*)	495		2475	C	9	(1.32*)	900
	IIA	19.2	(3.52*)	1320		6600	D	24	(3.52*)	2400
MTL3013	Terminals 5 and 6 or 7 and 8									
	IIC	2.4	(0.44*)	165		825	A & B	2.4		165
	IIB	7.2	(1.32*)	495		2475	C	7.2		495
	IIA	19.2	(3.52*)	1320		6600	D	19.2		1000
MTL3014	IIC	2.4	(0.44*)	165		825	A & B	2.4		165
	IIB	7.2	(1.32*)	495		2475	C	7.2		495
	IIA	19.2	(3.52*)	1320		6600	D	19.2		1000
MTL3021	IIC	0.13	(0.08*)	4.2		55	A & B	0.13	(0.065*)	4
	IIB	0.39	(0.24*)	12.6		165	C	0.39	(0.195*)	12
	IIA	1.04	(0.64*)	33.6		440	D	1.04	(0.52*)	32
MTL3022	IIB	0.39	(0.24*)	4.3		110	C	0.4	(0.2*)	4
	IIA	1.04	(0.64*)	8.2		215	D	1.06	(0.54*)	8
MTL3041	IIC	0.13		4.2		55	A & B	0.13		4
	IIB	0.39		12.6		165	C	0.39		12
	IIA	1.04		33.6		440	D	1.04		32
MTL3042	IIC	0.13		4.2		55	A & B	0.13		4
	IIB	0.39		12.6		165	C	0.39		12
	IIA	1.04		33.6		440	D	1.04		32
MTL3043	IIC	0.13	(0.08*)	4.2		55	A & B	0.13	(0.065*)	4
	IIB	0.39	(0.24*)	12.6		165	C	0.39	(0.195*)	12
	IIA	1.04	(0.64*)	33.6		440	D	1.04	(0.52*)	32
MTL3045	IIC	0.13		4.2		55	A & B	0.13		4
	IIB	0.39		12.6		165	C	0.39		12
	IIA	1.04		33.6		440	D	1.04		32
MTL3046B	Terminals 5 and 6									
	IIC	0.13		4.2		55	A & B	0.13		4
	IIB	0.39		12.6		165	C	0.39		12
	IIA	1.04		33.6		440	D	1.04		32
MTL3047	Terminals 5 and 6									
	IIC	0.22		0.45		30	A & B	0.3		0.7
	IIB	0.66		1.35		90	C	0.9		5.16
	IIA	1.76		3.6		240	D	2.42		9.52
MTL3052	Terminals 5 and 6									
	IIC	0.75	(0.26*)	1.65		65	A & B	0.75		1.65
	IIB	2.25	(0.78*)	4.95		195	C	2.25		4.95
	IIA	6	(2.08*)	13.2		520	D	6		13.2
	Terminals 6 and 7									
	IIC	0.75	(0.26*)	5.2		109	A & B	0.75		5.2
	IIB	2.25	(0.78*)	15.6		327	C	2.25		15.6
	IIA	6	(2.08*)	41.6		872	D	6		41.6
MTL3054	Terminals 5/8 and 6/7									
	IIC	0.25		3.1		61				
	IIB	0.75		9.3		183				
	IIA	2.0		24.8		488				
MTL3055	Terminals 5/8 and 6/7									
	IIC	0.25		0.35		31				
	IIB	0.75		1.05		93				
	IIA	2.0		2.8		248				
MTL3058 † and MTL3059 †	IIC	0.11		1.55		45	A & B	0.11		1.55
	IIB	0.33		4.65		135	C	0.33		4.65
	IIA	0.88		12.4		360	D	0.88		12.40
MTL3071	IIC	1.9		1000		190	A & B	1.9		1000
	IIB	5.7		1000		570	C	5.7		1000
	IIA	15.2		1000		1520	D	15.2		1000
MTL3072	IIC	1.15		1.8		120	A & B	1.15		1.8
	IIB	3.45		9.8		360	C	3.45		9.8
	IIA	9.2		29.8		960	D	9.2		29.8
MTL3081	IIC	10000		100		390	A & B	1000		75
	IIB	10000		300		1170	C	1000		225
	IIA	10000		800		3120	D	1000		600

* Value when unit connected to MTL2220
† Cable parameters apply when the two units (MTL3058 and 3059) are connected together

Model	Grp	µF		mH		or	µH/Ω	
		5,6,7,8	Config skt	5,6,7,8	Config skt		5,6,7,8	Config skt
MTL3073	IIC	0.26	0.60	6.0	47.0		164	135
	IIB	0.78	1.80	18.0	141		492	405
	IIA	2.08	4.80	48.0	376		1312	1080