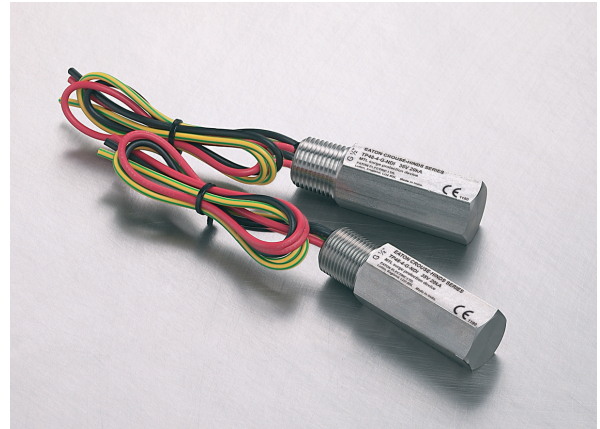


MTL TP48 range

Safeguards electronic process transmitters against induced surges and transients from field cabling

- Protects 2, 3 and 4 wire transmitters
- Easy and direct mounting — screws into spare conduit entry
- Intrinsically safe and flameproof to CENELEC standards
- Parallel connection avoids introduction of any resistance into loop
- ATEX approved
- 10 year product warranty



The TP48 range of surge protection devices uniquely provide a level of protection for 2, 3 and 4 wire field-mounted transmitters that is far in excess of the optional transient protection facilities available from the transmitter manufacturers- without involving any additional wiring, conduit modifications or other expensive extras.

The TP48 range protection network consists of high-power, solid-state electronics and a gas-filled discharge tube capable of diverting 20kA impulses. The whole unit is encased in a 316 stainless steel housing, threaded for the common conduit entries used on process transmitters. Versions are available for 1/2" NPT, 20mm ISO, and G1/2" (BSP 1/2 inch) threaded entries.

Installation can easily be carried out retrospectively to existing installations. The TP48 is screwed into any unused conduit entry on the transmitter case and flying leads are connected to the terminal block (+ve, -ve) and the internal earth stud. The 3 wire TP protects +ve, -ve and signal. The 4 wire TP48 protects +ve, -ve, signal +ve and -ve. The TPs operate without in any way affecting normal operation- passing ac or dc signals without attenuation while diverting surge currents safely to earth and clamping output voltages to specific levels.

The all-important earthing connection is made to the local casing of the transmitter with no separate earth connection or ground stake at the transmitter being needed. In operation, the TP48 makes sure that the transmitter electronics are never exposed to damaging transients between lines or between lines and casing/earth. Any surge current appearing as a series-mode or common-mode transient is converted into a common-mode voltage- whereupon the transmitter electronics are temporarily raised to some higher voltage level before 'floating' down automatically (and without damage) to resume normal operation.

For hazardous area use, approvals for both intrinsically safe and flameproof (explosion-proof) operation are available in all gas groups and apparatus temperature classification up to T4 for the TP48 3 & 4 wire and T6 for the TP48. Where transmitters are used in circuits suitable for Div 2/Zone 2 installations, the TP can be added without adversely affecting the level of safety.

For fieldbus applications, use the TP32 which meets the requirements of IEC61158-2:2004 and ANSI/ISA-50.02-2 1992 for 31.25kbit/s systems as used by FOUNDATION™ fieldbus, PROFIBUS-PA and WorldFIP.

MTL TP48 range

November 2017

SPECIFICATION

Maximum surge current

20kA peak current (8/20 μ s waveform)

Leakage current

Less than 10 μ A at max. working voltage

Working voltage

35V dc maximum

Bandwidth

1MHz

Resistance

No resistance introduced into loop

Ambient temperature limits

-40°C to +85°C
(-40°F to +185°F) (working)
-40°C to +85°C
(-40°F to +185°F) (storage)

Humidity

5% to 95% RH (non-condensing)

Electrical connections

TP48

3 flying leads (line1, line 2 & earth)

TP48 3 Wire

4 flying leads (+ve, -ve, signal & earth)

TP48 4 Wire

5 flying leads (+ve, -ve, signal +ve, signal -ve, earth)

Wire size: 32/0.2 (1.0mm², 18 AWG)

Lead length: 250mm (minimum)

Casing

316 stainless steel suitable for harsh environments

Threads

TP48-3-N & TP48-4-N - 1/2" NPT

TP48-3-I & TP48-4-I - 20mm ISO)
(M20 x 1.5)

TP48-3-G & TP48-4-G - G 1/2" (BSP 1/2")

Weight

175g. (6.2oz.)

Dimensions

See figure 1

EMC compliance

To Generic Immunity Standards
BS EN 61326-1:2013 for industrial environments

Hazardous Area

Ex ia IIC T4, Ceq=0, Leq=0; the unit can be connected without further certification into any intrinsically safe loop with open circuit voltage <60V and input power <1.2W.

Ex d IIC T4; the unit is apparatus approved to flameproof (explosion-proof) standards, and can be fitted into a similarly approved housing.

Electrical Safety

To BS EN 61643-21:2001 for surge protection devices

SIL INFORMATION

Failure rates according to IEC 61508

	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
TP48 2 wire+earth	0 FIT	23 FIT	12 FIT	5 FIT
TP48 2 wire+earth	0 FIT	40 FIT	15 FIT	7 FIT
TP48 2 wire+earth	0 FIT	40 FIT	15 FIT	7 FIT

The user of the TP48 range can utilize these failure rates in a probabilistic model of a safety instrumented function (SIF) to determine the suitability in part for safety instrumented system (SIS) usage in a particular safety integrity level. A full table of failure rates is presented in the EXIDA report (section 4.4) along with all assumptions.

*The Residual Effect failures are included in the Safe Undetected failure category according to IEC 61508. Note that these failures alone will not affect system reliability or safety and should therefore not be included in spurious trip calculations.

Safe Failure Fraction needs to be calculated on (sub)system level.

A complete copy of the EXIDA report can be downloaded at www.mtl-inst.com.

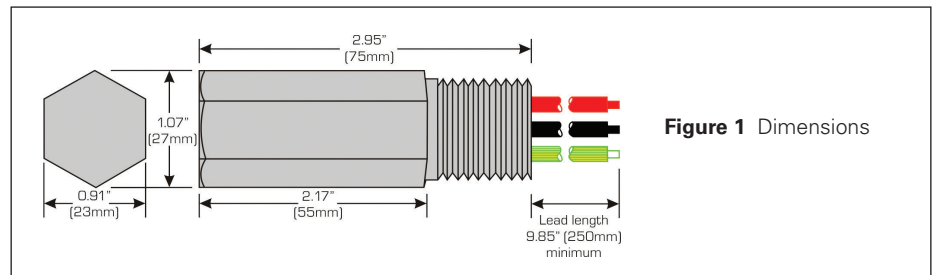


Figure 1 Dimensions

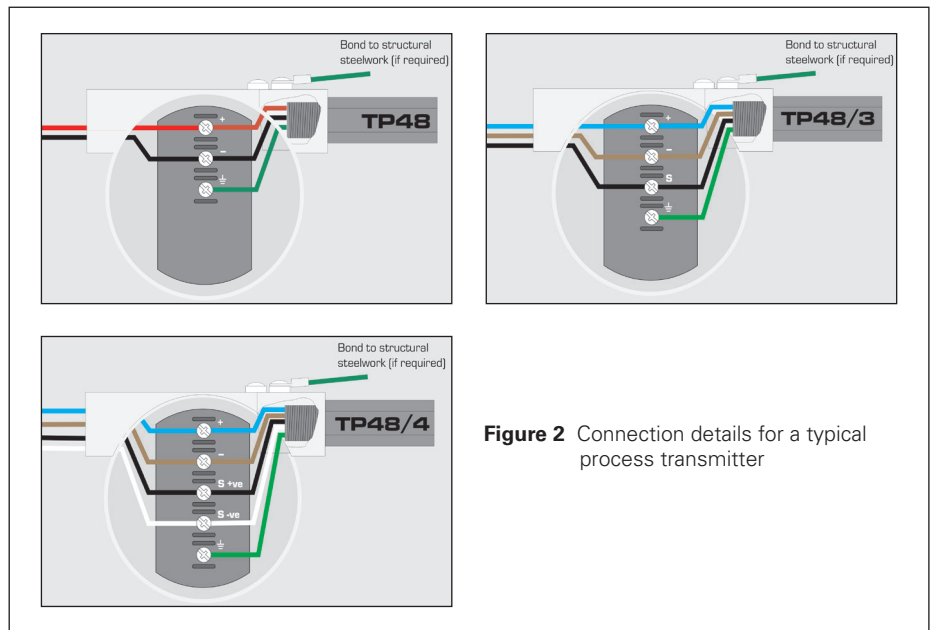


Figure 2 Connection details for a typical process transmitter

MTL TP48 range

November 2017

ORDERING INFORMATION

Model		TP48
Nominal voltage	U_n	35V
Rated voltage (MCOV)	U_c	58V
Nominal current	I_n	n/a
Nominal discharge current (8/20µs)	i_{sn}	3kA
Max discharge current (8/20µs)	I_{max}	20kA
Lightning impulse current (10/350µs)	I_{imp}	2.5kA
Residual voltage @ i_{sn}	U_p	95V L-G 500V
Voltage protection level @ 1kV/µs	U_p	<76V
Bandwidth	f_G	1MHz
Capacitance	C	100pF
Series resistance	R	n/a
Operating temperature range		-40°C to +60°C
Category tested		A2, B2, C1, C2, C3, D1
Overstressed fault mode $i_n=3kA$		12kA
Impulse durability (8/20µs)		10kA
Degree of protection		IP66
AC durability		1A _{rms} : 5T
Service conditions		80kPa - 160kPa 5% - 95% RH

APPROVALS

Country (Authority)	Standard No.	Certificate/File	Approved for	Product
EC (BASEEFA)	EN 60079-0:2012+A11:2013 EN 60079-11:2012	BASEEFA04ATEX0251X	Ex II 1G Ex ia IIC T4/T5/T6 Ga Ex II 1D Ex ia IIIC T135°C/T100°C/T85°C Da	TP48-X-YZ*
EC (BASEEFA)	EN 60079-0:2012+A11:2013 EN 60079-1:2015	BASEEFA04ATEX0053X	Ex II 2G Ex db IIC T6 Gb (T_{amb} = -40°C TO +70°C)	TP48-X-YZ*
ATEX Directive 2014/34/EU	EN 60079-0:2012 EN 60079-15:2010	TML01ATEX0048	Ex II 3 G Ex nA IIC T6 (-40°C<T_{amb}<+60°C) Ex II 3 G Ex nA IIC T5 (-40°C<T_{amb}<+85°C)	TP48-X-YZ*
USA (FM)	Class 3600 (1998), Class 3610 (2010), Class 3611 (1999), Class 3615 (1989), Class 3810 (1989) Incl Suppl #1 (1995) ANSI/NEMA 250 (1991) ISA-S12.0.01 (1998) ANSI/ISA 60079-0 (2009) ANSI/ISA 60079-11 (2009)	3011208	Intrinsically Safe: I, II, III/1/A-G, I/O/IIC Explosion-proof: I/1/A-D Non-incendive: I/2/A-D, I/2/IIC Dust ignition proof: II, III/1/EFEG Special protection: II/2/FG	TP48-X-YZ*
Canada (FM)	C22.2 No 213 (1987), C22.2 No 142 (1987), C22.2 No 94 (1991), C22.2 No 157 (1992), C22.2 No 30 (1986) ANSI/NEMA 250 (1991) CAN/CSA-E79-0 (2002) CAN/CSA-E79-11 (2002)	3025374	Intrinsically Safe: I, II, III/1/A-G, I/O/IIC Explosion-proof: I/1/A-D Non-incendive: I/2/A-D, I/2/IIC Dust ignition proof: II, III/1/EFEG Special protection: II/2/FG	TP48-X-YZ*
Global (IEC)	IEC 60079-0:2011, IEC 60079-11:2011	IECEX BAS 07.0045X	Ex ia IIC T4/T5/T6 Ga Ex ia IIIC T135°C/T100°C/T85°C Da	TP48-X-YZ*

*KEY: X = 3 or 4 or blank Y = N, I or G Z = NDI or blank

TO ORDER SPECIFY -

TP48-N	Non-certified SPD- 1/2" NPT thread
TP48-I	Non-certified SPD- 20mm ISO thread
TP48-G	Non-certified SPD- G 1/2" (BSP 1/2 inch)
TP48-3-N	Non-certified SPD- 1/2" NPT thread
TP48-3-I	Non-certified SPD- 20mm ISO thread
TP48-3-G	Non-certified SPD- G 1/2" BSP 1/2 inch
TP48-4-N	Non-certified SPD- 1/2" NPT thread
TP48-4-I	Non-certified SPD- 20mm ISO thread
TP48-4-G	Non-certified SPD- G 1/2" BSP 1/2 inch

TP48-N-NDI	Certified SPD- 1/2" NPT thread
TP48-I-NDI	Certified SPD- 20mm ISO thread
TP48-G-NDI	Certified SPD- G 1/2" (BSP 1/2 inch)
TP48-3-N-NDI	Certified SPD- 1/2" NPT thread
TP48-3-I-NDI	Certified SPD- 20mm ISO thread
TP48-3-G-NDI	Certified SPD- 20mm ISO thread
TP48-4-N-NDI	Certified SPD- 1/2" NPT thread
TP48-4-I-NDI	Certified SPD- 20mm ISO thread
TP48-4-G-NDI	Certified SPD- G 1/2" - BSP 1/2 inch



Eaton Electric Limited,
Great Marlings, Butterfield, Luton
Beds, LU2 8DL, UK.
Tel: + 44 (0)1582 723633 Fax: + 44 (0)1582 422283
E-mail: mtlenquiry@eaton.com
www.mtl-inst.com

© 2017 Eaton
All Rights Reserved
Publication No. EPS 901-100 Rev X 061117
November 2017

EUROPE (EMEA):
+44 (0)1582 723633
mtlenquiry@eaton.com

THE AMERICAS:
+1 800 835 7075
mtl-us-info@eaton.com

ASIA-PACIFIC:
+65 6 645 9888
sales.mtlsing@eaton.com

The given data is only intended as a product description and should not be regarded as a legal warranty of properties or guarantee. In the interest of further technical developments, we reserve the right to make design changes.