

MTL TP-Pipe range

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

- **Easy and direct mounting - screws into spare conduit entry on the transmitter**
- **Intrinsically safe and flameproof to CENELEC standards**
- **Low impedance series connection avoids signal degradation of the loop**
- **ATEX and Factory Mutual (FM) approved**
- **10 year product warranty**



The TP-Pipe surge protection device is a unique unit providing a level of protection for 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 TP-Pipe 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 an ANSI 316 stainless steel housing, threaded for the common conduit entries used on process transmitters. Versions are available for 1/2" NPT, 20mm ISO, and G 1/2" (BSP 1/2 inch) threaded entries.

Installation is very simple and can easily be carried out retrospectively to existing installations. The TP-P screws directly into the conduit entry on the transmitter case and flying leads are connected to the terminal block and the internal earth stud. Field wiring is connected to a three position socket and then connected to the provided header. They 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 TP-P 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 (explosionproof) operation are available in all gas groups and apparatus temperature classification up to T4. Where transmitters are used in circuits suitable for Div 2/Zone 2 installations, the TP-P can be added without adversely affecting the level of safety.

For fieldbus applications, use the TP-P-32 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

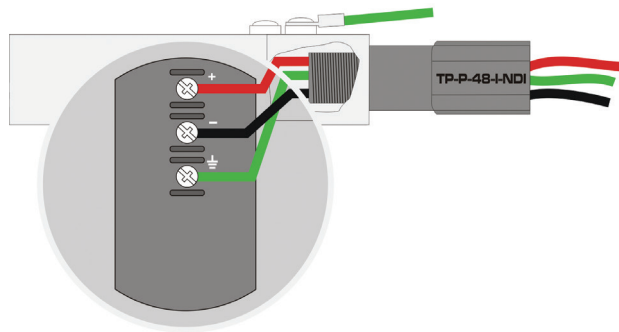
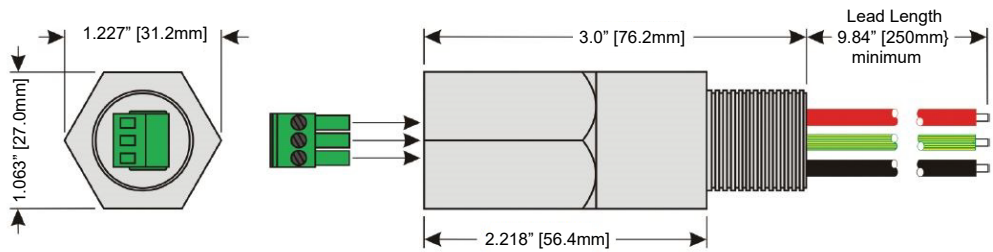


Figure 2: Connection detail for a typical process transmitter

APPROVALS

For the latest certificate information, see www.mtl-inst.com/certificates

MTL TP-Pipe range

January 2023

SPECIFICATION

All figures typical at 77°F (25°C) unless otherwise stated

Maximum surge current

20kA peak current (8/20μs waveform)

Leakage current

Less than 10μA at max. working voltage

Working voltage

48V dc and 32V dc maximum

Bandwidth

1MHz

Resistance

Loop resistance: 1ohm

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

Input:

3 position socket/header (max wire #14AWG (2mm²))

Output:

3 flying leads (line 1, line 2 & earth)
Wire size 32/0.2 (1.0mm², 18AWG)
Lead length 250mm (9.85") minimum

Casing

ANSI 316 stainless steel hexagonal barstock, male and female thread

Weight

175g (6.2oz.)

Dimensions

See figure 1

EMC compliance

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

Hazardous area connections

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 (explosionproof) standards, and can be fitted into a similarly approved housing.

Electrical Safety

To EN61643-2 for surge protection devices

Model		TP-32P	TP-48P
Nominal voltage	U_n	32V	48V
Rated voltage (MCOV)	U_c	35V	58V
Nominal current	I_n	1.5A	1.5A
Nominal discharge current (8/20μs)	i_{sn}	3kA	3kA
Max discharge current (8/20μs)	I_{max}	20kA	20kA
Lightning impulse current (10/350μs)	I_{imp}	2.5kA	2.5kA
Residual voltage @ i_{sn}	U_p	46V	92V
Voltage protection level @ 1kV/μs	U_p	<38V	<76V
Bandwidth	f_G	7.5MHz	1MHz
Capacitance	C	50pF	100pF
Series resistance	R	0.5	0.5
Operating Temperature Range		-40°C to +85°C	
Category tested		A2, B2, C1, C2, C3, D1	
Overstressed fault mode $i_n=3kA$		22kA / Mode 3	22kA / Mode 3
Impulse durability (8/20μs)		10kA	10kA
Degree of protection		IP66	IP66
AC durability		1A _{rms} , 5T	
Service conditions		80kPa- 160kPa 5% - 95% RH	

TO ORDER SPECIFY -

Fieldbus Applications	
TP-P32-N-NDI	Certified process transmitter surge protection device- 1/2" NPT thread
TP-P32-I-NDI	Certified process transmitter surge protection device- 20mm ISO thread
TP-P32-G-NDI	Certified process transmitter surge protection device- G 1/2" (BSP 1/2")
TP-P32-N	Non-certified process transmitter surge protection device- 1/2" NPT thread
TP-P32-I	Non-certified process transmitter surge protection device- 20mm ISO thread
TP-P32-G	Non-certified process transmitter surge protection device- G 1/2" (BSP 1/2")
Transmitter Applications	
TP-P48-N-NDI	Certified process transmitter surge protection device- 1/2" NPT thread
TP-P48-I-NDI	Certified process transmitter surge protection device- 20mm ISO thread
TP-P48-G-NDI	Certified process transmitter surge protection device- G 1/2" (BSP 1/2")
TP-P48-N	Non-certified process transmitter surge protection device- 1/2" NPT thread
TP-P48-I	Non-certified process transmitter surge protection device- 20mm ISO thread
TP-P48-G	Non-certified process transmitter surge protection device- G 1/2" (BSP 1/2")

INSTALLATION

The TP-Pipe units are designed for mounting directly into the conduit entry on a process transmitter housing. Generally, two such entries are provided, one of which is used for the loop wiring. The transmitter specification should provide information indicating the required thread type. TP-Pipe units can be installed using thread adaptors if necessary, including certified adaptors in hazardous area applications. Figure 2 shows connection details for typical process transmitters.



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

© 2023 Eaton
All Rights Reserved
Publication No. 901-130 Rev M 030123
January 2023

EUROPE (EMEA):
+44 (0)1582 723633
mtl-enquiry@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.