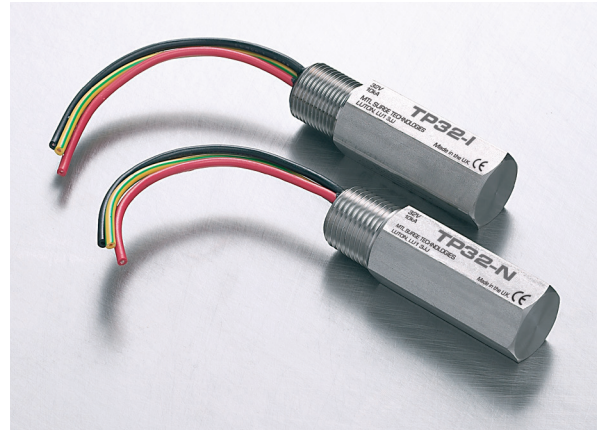


## MTL TP32 range

### Protects transmitters and smart transmitters from induced surges and transients on fieldbus cabling

- **TP32 is a fieldbus specific surge protector designed to meet the requirements of IEC 61158-2:2004 & ANSI/ISA-50.02-2:1992**
- **TP32-T includes a terminator for fieldbus in addition to surge protection**
- **Easy and direct mounting — screws into spare conduit entry on the transmitter**
- **Parallel connection ensures 'transparent' operation — zero voltage-drop across device**
- **ATEX approved, Certified FISCO Terminator**
- **10 year product warranty**



**The TP32 surge protection device** is specifically designed to protect process transmitters and devices on fieldbus systems. The TP32 builds on the high specification of the acclaimed TP48 range to provide a level of surge protection for fieldbus transmitters in excess of the optional transient protection available from some transmitter manufacturers.

**The terminated TP32-T** has the same protection circuit as the standard product, but also includes a FOUNDATION fieldbus™ termination circuit. This unique combination eliminates the need to purchase and install additional termination circuitry for the FF segment. The TP32-T provides excellent transient protection control and terminates the bus segment in one simple-to-install package. The termination circuit is designed to the requirements described in ANSI/ISA 50.02-2. Note: Two terminators are required per bus segment.

**The all-important earth connection** is made via the casing of the transmitter, negating the need for a separate earth connection or a ground stake at the transmitter. In operation, the TP32 makes sure that the transmitter electronics are never exposed to damaging transients between the lines and ground. 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.

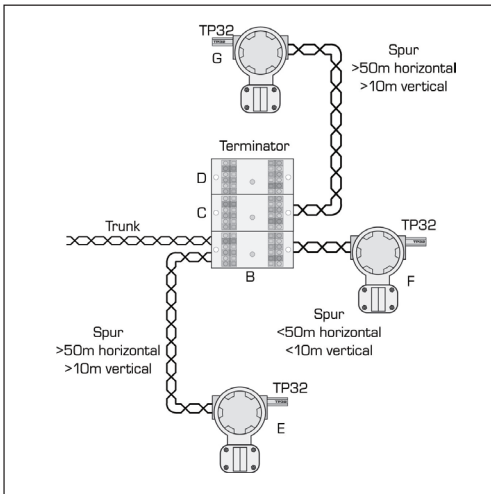
**The TP32 protection network** is a hybrid design consisting of high-power, solid state electronics and a gas discharge tube which is capable of diverting surges up to 20kA. Encased in a 316 stainless steel enclosure, the TP32 exhibits unparalleled mechanical durability providing years of maintenance-free operation in harsh environments. The enclosure is available threaded for all the common conduit entries. Versions are available for 1/2" NPT, 20mm ISO, and G 1/2" (BSP 1/2 inch) threaded entries.

**Installation is simple** and can easily be carried out retrospectively to existing installations. By connecting in parallel to the transmitter circuit the TP32 does not interfere with the normal operation of the bus – passing AC or DC signals without adding increased voltage drop across the segment while consistently diverting surge currents safely to ground and clamping output voltage to safe levels.

**Approvals for intrinsically safe, flameproof, explosion-proof** and non-incendive operation are available, in all gas groups and apparatus temperature classifications up to T6.

**The TP32 is designed to meet the requirements** of IEC 61158-2:2000 and ANSI/ISA-50.02-2:1992 for 31.25kB/sec systems as used by FOUNDATION fieldbus™, PROFIBUS-PA and WorldFIP.

## FIELD DEVICE PROTECTION USING TP32



### Non-Hazardous Installation

Install a TP32 on every instrument critical to the operation of the process system.

Install TP32 on each instrument with a spur length greater than 50m horizontal and 10m vertical.

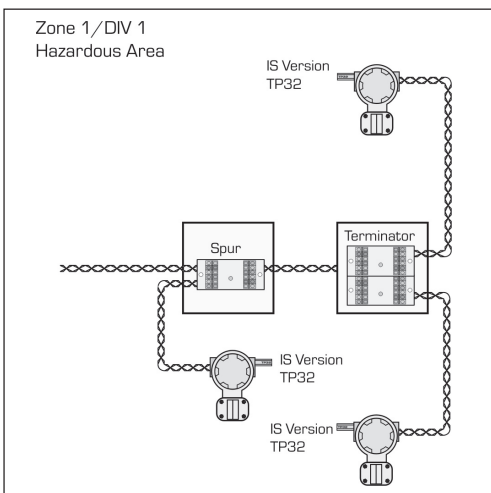
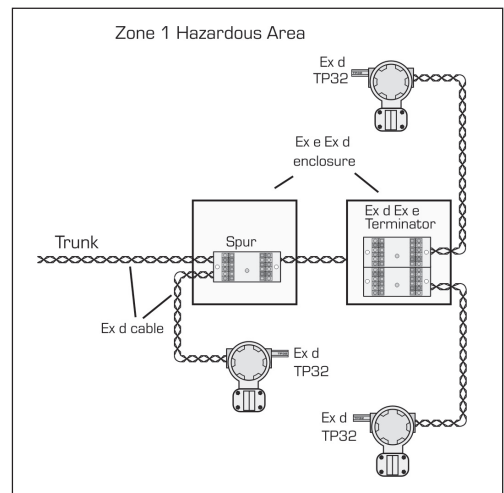
For a detailed risk analysis (to minimize the number of protectors required) and guidance for total fieldbus system protection, please see TAN 1010.

### Hazardous Area Explosion-proof, Flameproof / Increased Safety

Install TP32-X-NDI (where X = thread type) on every instrument critical to the operation of the process.

Install TP32-X-NDI on each instrument with a spur length greater than 50m horizontal, 10m vertical.

See TAN 1010 for details of total fieldbus protection.



### Hazardous Area Intrinsically Safe System; FISCO

Install TP32-X-NDI (where X = thread type) on every instrument critical to the operation of the process.

Install TP32-X-NDI on each instrument with a spur length greater than 50m horizontal, 10m vertical.

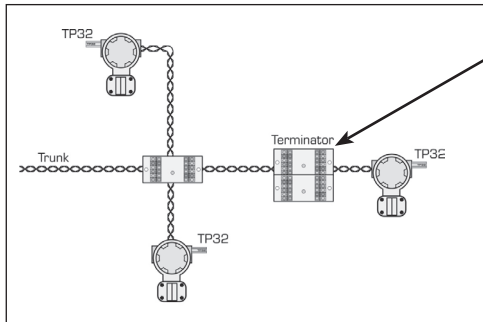
See TAN 1010 for details of total fieldbus protection.

**NOTE:** The TP32 NDI is FISCO compatible.

**NOTE:** Protection at the host end of the trunk is mandatory, see FP32 datasheet and TAN 1010 for more information.

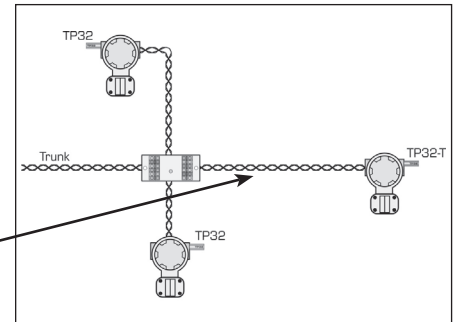
**USE OF THE TP32-T TO TERMINATE A FIELDBUS TRUNK**

**Conventional Installation**



Junction block and terminator are required at the far end of a fieldbus trunk.

**Installation Using TP32-T**



Use of TP32-T eliminates the need for an extra junction block and terminator.

**ORDERING INFORMATION**

Model		TP32 & TP32-T
Nominal voltage	$U_n$	32V
Rated voltage (MCOV)	$U_c$	35V
Nominal current	$I_n$	n/a
Nominal discharge current (8/20 $\mu$ s)	$i_{sn}$	3kA
Max discharge current (8/20 $\mu$ s)	$I_{max}$	20kA
Lightning impulse current (10/350 $\mu$ s)	$I_{imp}$	2.5kA
Residual voltage @ $i_{sn}$	$U_p$	46V
Voltage protection level @ 1kV/ $\mu$ s	$U_p$	<38V
Bandwidth	$f_G$	7.5MHz
Capacitance	C	50pF
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 (8/20 $\mu$ s)		10kA
Degree of protection		IP66
AC durability		1A <sub>rms</sub> , 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	⊕ II 1 G Ex ia IIC T4 Ga (-40°C ≤ Ta ≤ +60°C), or Ex ia IIC T5 Ga (-40°C ≤ Ta ≤ +80°C), or Ex ia IIC T6 Ga (-40°C ≤ Ta ≤ +60°C) ⊕ II 1 D Ex ia IIIC T135°C/T100°C/T85°C Da (-40°C ≤ Ta ≤ See certificate)	TP32-N-NDI TP32-I-NDI TP32-G-NDI
EC (BASEEFA)	EN 60079-0:2012 + A11:2013 EN 60079-1:2015	BASEEFA04ATEX0053X	⊕ II 2 G Ex db IIC T6 Gb (-40°C ≤ Ta ≤ +70°C)	TP32-N-NDI TP32-I-NDI TP32-G-NDI
ATEX Directive 2014/34/EU	EN 60079-0:2012 + A11:2013 EN 60079-15:2010	TML01ATEX0048	⊕ II 3 G Ex nA IIC T6 (-40°C ≤ T <sub>amb</sub> ≤ +60°C) ⊕ II 3 G Ex nA IIC T5 (-40°C ≤ T <sub>amb</sub> ≤ +85°C)	TP32-N TP32-I TP32-G
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/EFG Special protection: II/2/FG	TP32-N-NDI TP32-I-NDI TP32-G-NDI
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, II/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/EFG Special protection: II/2/FG	TP32 All
Global	IEC 60079-0:2011, IEC 60079-11:2011	IECEX BAS 07.0045X	Ex ia IIC T6 Ga (-40°C ≤ Ta ≤ +60°C) Ex ia IIC T5 Ga (-40°C ≤ Ta ≤ +80°C) Ex ia IIIC T135°C/T100°C/T85 Da (-40°C ≤ Ta ≤ See certificate)	TP32-X-NDI TP32-FX-NDI

# MTL TP32 range

September 2016

## SPECIFICATION

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

### Maximum surge current

20kA peak (8/20µs waveform)

### Leakage current

Line-line: < 1µA at working voltage

Line-earth: < 1µA at 120V common-mode

### Working voltage

±32V dc maximum

±120V peak (or DC) maximum common-mode

### Maximum continuous operating voltage

35V

### Limiting voltage

Line-line with 250mm cable:

< 49V (10A, 10/1000µs pulse)

Line-earth with 75mm cable:

< 635V (3kA, 8/20µs waveform)

< 635V (6kV, 1.2/50µs waveform)

### Line resistance

No resistance introduced into the loop

### Capacitance

Line-line: < 50pF

Line-earth: < 100pF

Terminator (TP32-T only): 100 ohm, 1µF

### Attenuation

7.8KHz–7.5MHz monotonic & better than -1dB typical bandwidth, 150MHz on 100W system

### Ambient temperature limits

T6: -40°C to +60°C (-40°F to +140°F)

T5: -40°C to +85°C (-40°F to +185°F)

### Humidity

5% to 95% RH (non-condensing)

### Electrical connections

3 flying leads: line 1 & line 2 plus non-polarised earth

Wire size: 32 / 0.2 (1.0mm<sup>2</sup>, 18 AWG)

Lead length: 250mm minimum supplied

≤75mm recommended

### Casing

316 stainless steel suitable for harsh environments

### Threads

TP32-N: 1/2" NPT

TP32-I: 20mm ISO (M20 x 1.5)

TP32-G: G 1/2" (BSP 1/2 inch)

### Weight

175g (6.2oz)

### Dimensions

See figure 1

### ATEX compliance

See Approvals table for details

### EMC compliance

BS EN 61326-1:2013

### Electrical Safety

BS EN 61326-21:2001

## Electrical Safety

EEx ia IIC T6, Ceq=0, Leq=0; the unit can be connected without further certification into any intrinsically safe loop with open circuit voltage <30V and input power <1.2W.

EEx ia IIC T4, Ceq=0, Leq=0; the unit can be connected into any FISCO application with the following input parameters Pi=5.32W.

EEx d IIC T6; the unit is apparatus-approved to explosion-proof (flameproof) standards, and can be fitted into a similarly approved housing.

## SIL INFORMATION

### Failure rates according to IEC 61508

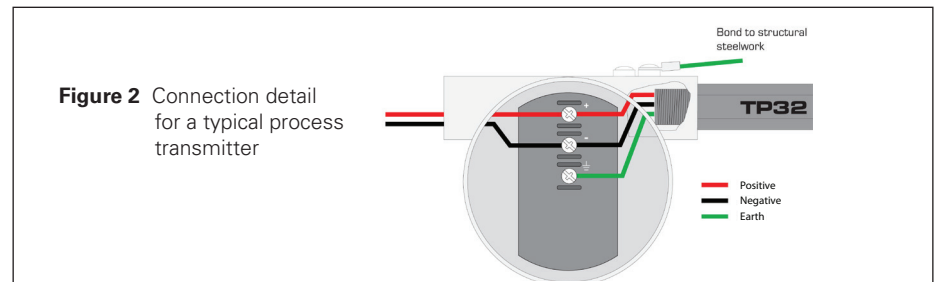
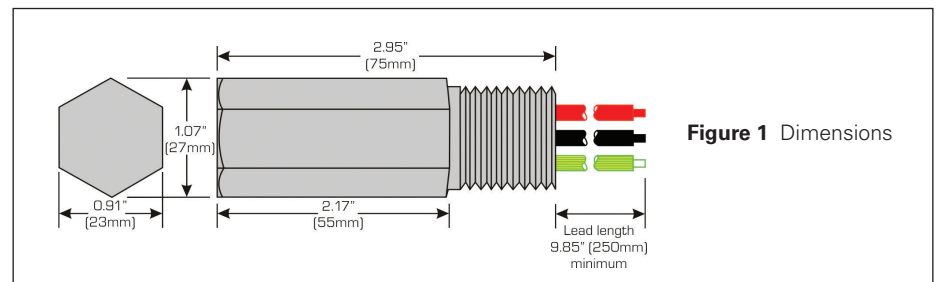
	$\lambda_{SD}$	$\lambda_{DD}$	$\lambda_{DU}$
TP32	0 FIT	12 FIT	5 FIT

The user of the TP 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](http://www.mtl-inst.com).



## TO ORDER SPECIFY -

TP32	TP32-T	
TP32-N	TP32-T-N	1/2" NPT thread
TP32-N-NDI	TP32-T-N-NDI	1/2" NPT thread, with EEx ia, EEx d, approval
TP32-I	TP32-T-I	20mm ISO thread
TP32-I-NDI	TP32-T-I-NDI	20mm ISO thread, with EEx ia, EEx d, approval
TP32-G	TP32-T-G	G 1/2" (BSP 1/2 inch)
TP32-G-NDI	TP32-T-G-NDI	G 1/2" (BSP 1/2 inch), with EEx ia, EEx d, approval



Powering Business Worldwide

**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](mailto:mtlenquiry@eaton.com)  
[www.mtl-inst.com](http://www.mtl-inst.com)

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**EUROPE (EMEA):**  
+44 (0)1582 723633  
[mtlenquiry@eaton.com](mailto:mtlenquiry@eaton.com)

**THE AMERICAS:**  
+1 800 835 7075  
[mtl-us-info@eaton.com](mailto:mtl-us-info@eaton.com)

**ASIA-PACIFIC:**  
+65 6 645 9888  
[sales.mtlsing@eaton.com](mailto:sales.mtlsing@eaton.com)

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