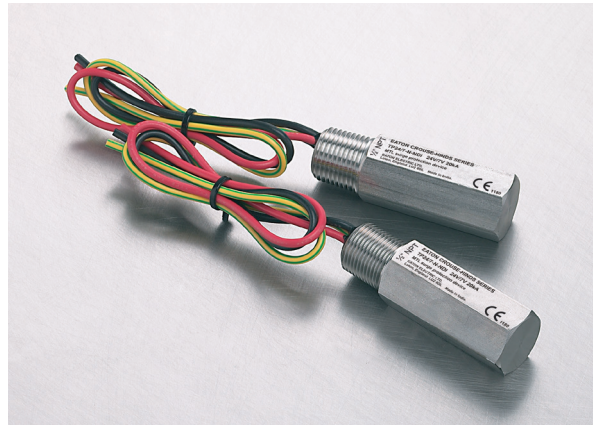


MTL TP24/7 range

Safeguards 4-wire process transmitters against induced surges and transients from field cabling

- **Specifically designed for multivariable Transmitters and Level Transmitters**
- **Four wires protected, one pair at 12V to 24V and one pair at 7V (e.g. RS485)**
- **Easy and direct mounting — simply screws into spare conduit entry**
- **Intrinsically safe and flameproof to CENELEC standards**
- **FM for US and Canada and ATEX approved**



The TP24/7 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 TP24/7 protection network consists of high-power, solid-state electronics and a gas-filled discharge tube capable of diverting 10kA 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 is simple and can easily be carried out retrospectively to existing installations. The TP24/7 is screwed into any unused conduit entry on the transmitter case and flying leads are connected to the terminal block (+ve, -ve), RS485 terminals and the internal earth stud. 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 TP24/7 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. Where transmitters are used in circuits suitable for Div 2/Zone 2 installations, the TP24/7 can be added without adversely affecting the level of safety.



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MTL TP24/7 range

January 2017

APPROVALS

Country (Authority)	Standard No.	Certificate/File	Approved for	Product
EC (BASEEFA)	EN 60079-0:2012+A11:2013 EN 60079-11:2012	BASEEFA04ATEX0251X	 II 1G Ex ia IIC T4/T5/T6 Ga  II 1D Ex ia IIIC T135°C/T100°C/T85°C Da	TP24/7-N-NDI TP24/7-I-NDI TP24/7-G-NDI
EC (BASEEFA)	EN 60079-0:2012+A11:2013 EN 60079-1:2015	BASEEFA04ATEX0053X	 II 2G Ex db IIC T6 Gb ($T_{amb} = -40^{\circ}\text{C TO } +70^{\circ}\text{C}$)	TP24/7-N-NDI TP24/7-I-NDI TP24/7-G-NDI
ATEX Directive 2014/34/EU	EN 60079-0:2012 EN 60079-15:2010	TML01ATEX0048	 II 3 G Ex nA IIC T6 ($-40^{\circ}\text{C} < T_{amb} < +60^{\circ}\text{C}$)  II 3 G Ex nA IIC T5 ($-40^{\circ}\text{C} < T_{amb} < +85^{\circ}\text{C}$)	TP24/7-N TP24/7-I TP24/7-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/0/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 Refer to certificate for T ratings	TP24/7-N-NDI TP24/7-I-NDI TP24/7-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, III/1/A-G, I/0/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 Refer to certificate for T ratings	TP24/7 All
Global	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	TP24/7-X-NDI TP24/7-TX-NDI

ORDERING INFORMATION

Model		TP24/7
Nominal voltage	U_n	24V/7V
Rated voltage (MCOV)	U_c	34V/7V
Nominal current	I_n	n/a
Nominal discharge current (8/20µs)	i_{sn}	3kA
Max discharge current (8/20µs)	I_{max}	10kA
Lightning impulse current (10/350µs)	I_{imp}	2.5kA
Residual voltage @ i_{sn}	U_p	43V/19V
Voltage protection level @ 1kV/µs	U_p	<36V/<12V
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

MTL TP24/7 range

January 2017

SPECIFICATION

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

Maximum surge current

10kA peak (8/20µs waveform)

Leakage current

Less than 10µA at max. working voltage

Working voltage

12V to 24V dc power

Bandwidth

1MHz

Resistance

No resistance introduced into loop

Ambient temperature limits

-40°C to +60°C
(-40°F to +140°F) (working)
-40°C to +85°C
(-40°F to +185°F) (storage)

Humidity

5% to 95% RH (non-condensing)

Electrical connections

4 flying leads
Wire size 32/0.2 (1.0mm², 18AWG)
Lead length 250mm (9.85") minimum

Casing

316 stainless steel suitable for harsh environments

Threads

TP24/7-N: 1/2" NPT
TP24/7-I: 20mm ISO (M20 x 1.5)
TP24/7-G: G 1/2" (BSP 1/2 inch)

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

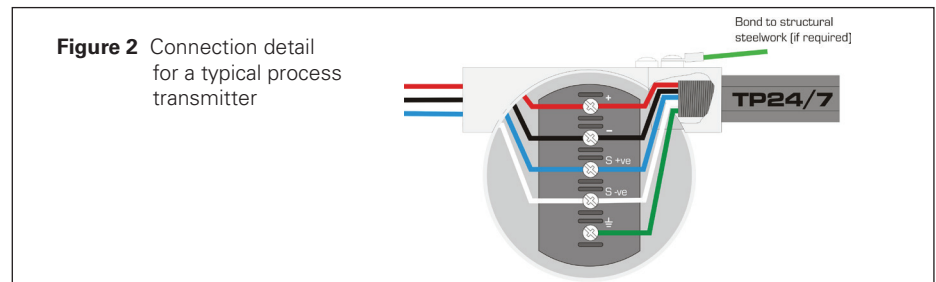
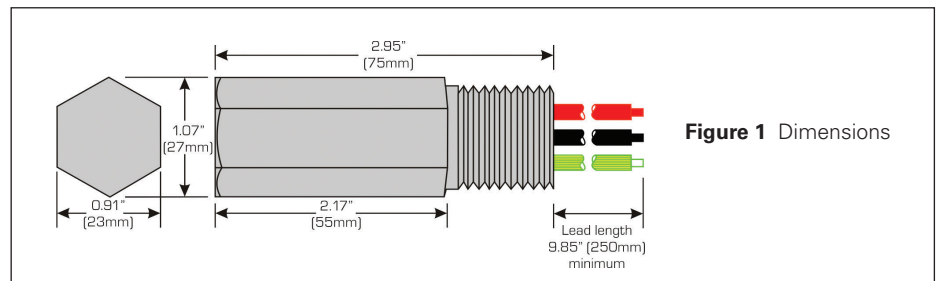
	λ_{SD}	λ_{SU}	λ_{DD}	λ_{DU}
TP24/7	0 FIT	43 FIT	11 FIT	6 FIT

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.



TO ORDER SPECIFY -

TP24/7-N-NDI	Certified process transmitter surge protection device- 1/2" NPT thread
TP24/7-I-NDI	Certified process transmitter surge protection device- 20mm ISO thread
TP24/7-G-NDI	Certified process transmitter surge protection device- G 1/2" (BSP 1/2")
TP24/7-N	Non-certified process transmitter surge protection device- 1/2" NPT thread
TP24/7-I	Non-certified process transmitter surge protection device- 20mm ISO thread



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