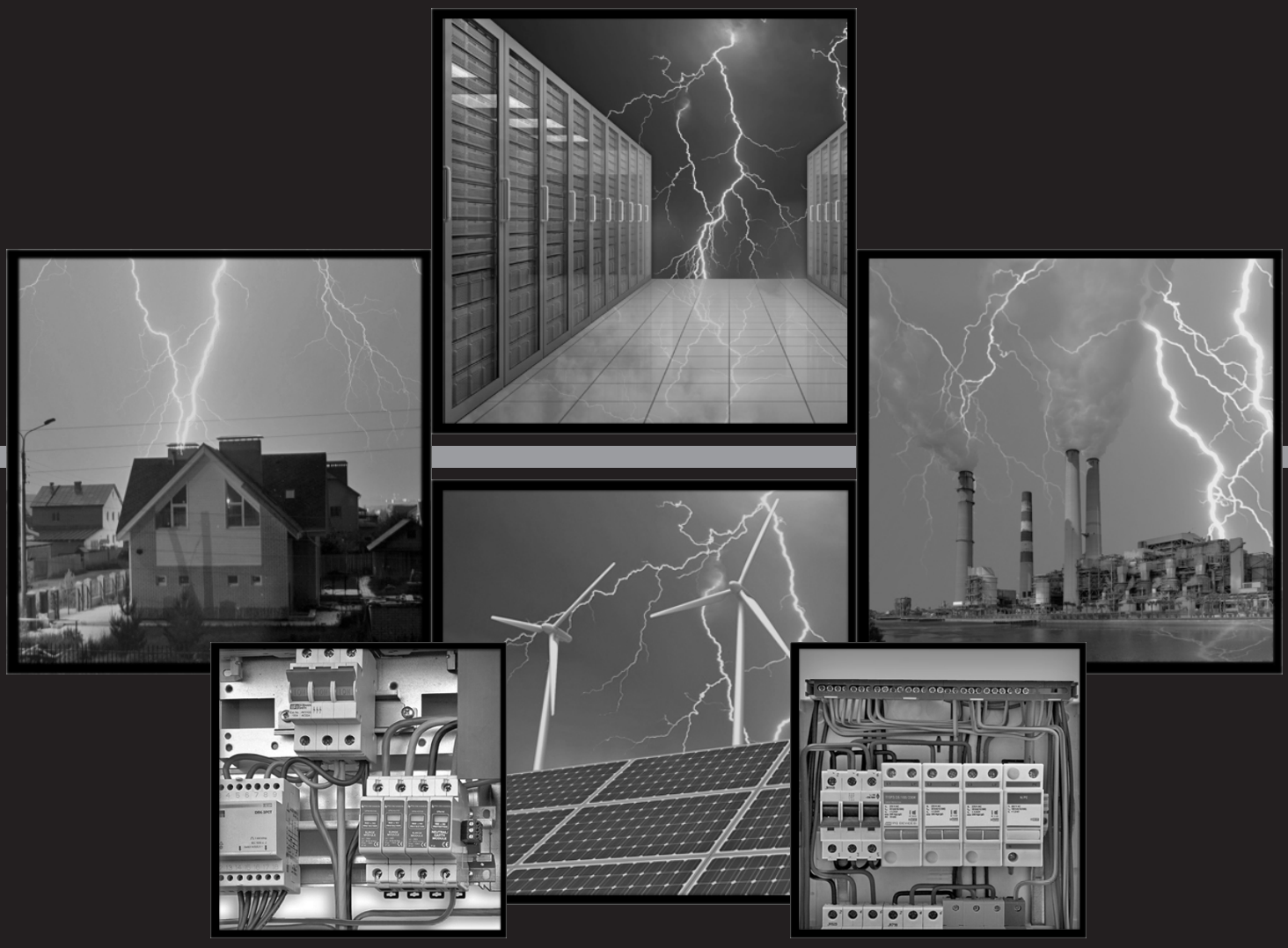
PD DEVICES LTD
POWER DEVELOPMENT

Building Surge Protection Information Pack



Quality
Service
Reliability

“For All Your Surge Solutions”

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V2-INFO 07-02-18

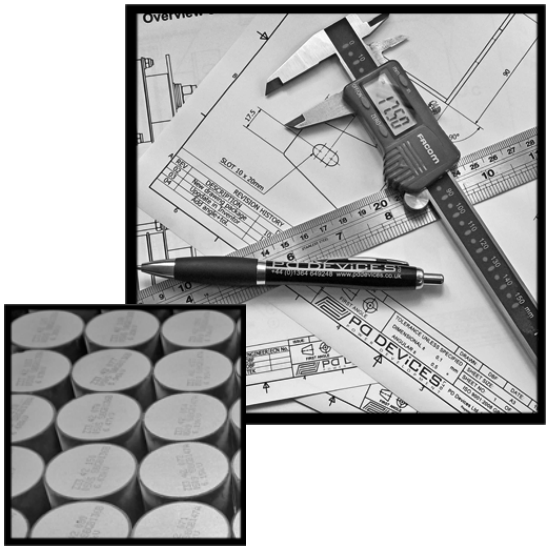
PD DEVICES LTD
POWER DEVELOPMENT

About Us

We are a leader in the design and manufacture of a wide range of products & solutions to protect against damage from lightning and transient over-voltages.

With over 50 years of experience as a UK manufacturer of surge arrester elements, our product range has continuously expanded and we now supply Surge Protection Components, Arresters and Modules for applications in numerous markets including; Rail and Tram transport, Buildings and Construction, office and Home Protection, Telecom and Data Networks, Defence and Security.

We believe that we are unique because we:

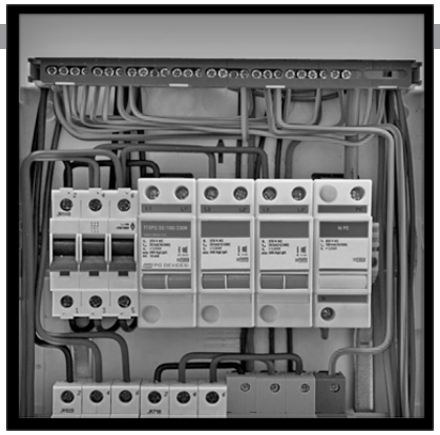


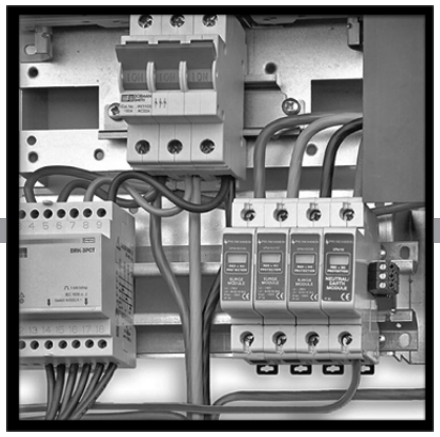
- **Are the only UK MOV manufacturer – and one of very few in Europe**
- **Have our own research and test laboratory**
- **Have our own design and manufacturing capabilities**
- **Offer customised product design and manufacture at standard product prices**
- **Respond speedily and positively to customer needs**

A diverse, worldwide customer platform, supported by local Sales & Distribution organisation has been vital in the development of our global supply capability. We ensure that all our Product Designs, Test & Manufacturing Processes and Facilities comply with all relevant International Standards and Qualification Procedures.

- **All our products are RoHS Compliant and we are WEEE registered.**
- **Our Design, Manufacturing & Quality Assurance Systems meet ISO 9001:2015 (Cert: GB05/66964)**
- **We supply products to meet National & International Standards & Recognitions including UL, CEE, BS, IEC.**

CONTENTS





An Introduction To Surge Protection

Surges or Transient Overvoltages

Surges or Transients are short duration increases in voltage measured between 2 or more conductors. These potentially harmful voltages can be induced into a building from a direct strike or the secondary effects of lightning, and can reach up to 6000 Volts.

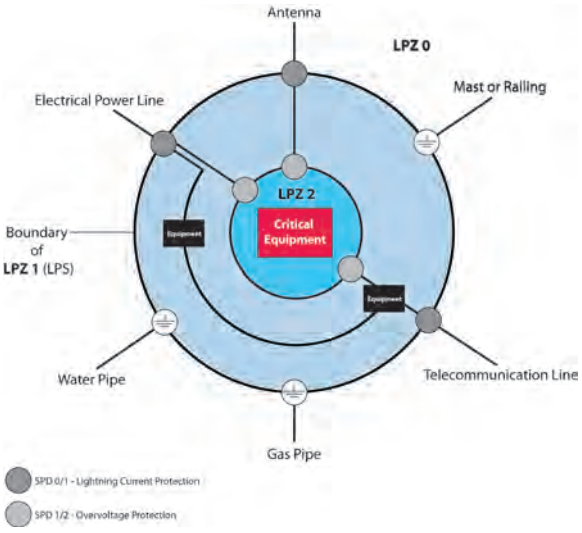
Overvoltages can arise from lightning activity or switching transients generated from within a building, although these effects tend to be of a lower magnitude.

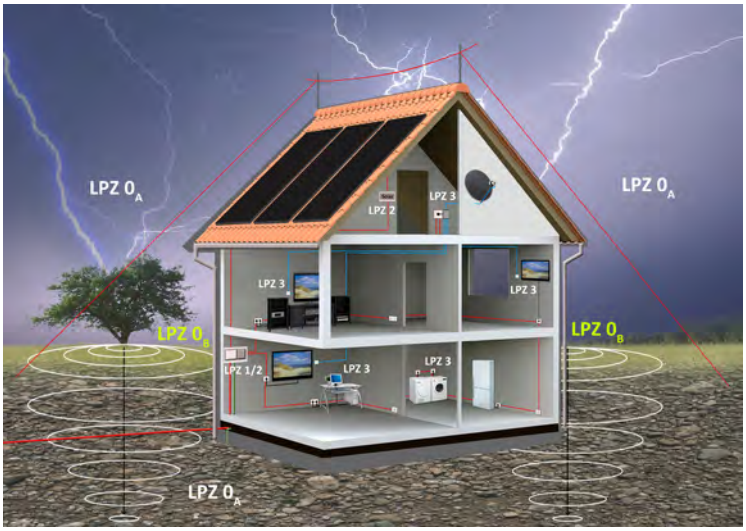
Type of protection unit or SPD

In order to protect equipment, you need to select SPD units that can deal with these effects.

A **Type I SPD** will deal with a direct strike

A **Type II** and **III SPD** will deal with the indirect effects or locally generated surges, such as switching events.
A combination of these (co-ordinated SPD's) can provide full protection to equipment within a building.





Low let-through voltage

An effective SPD should have a low let-through voltage as this is the amount of voltage the equipment being protected will be subjected to. The greater the overvoltage the greater the risk of disruption, degradation and damage to equipment connected to the electrical system. As technology moves on, components within electronic equipment continue to become smaller and therefore more sensitive to these types of influence.

Application

As a general guide, all cables that enter or leave a building should be protected being as these conductive lines offer pathways within.

Most buildings will have at least a main power supply and a copper telephone line. At the very least, power protection and telephone protection should be applied at the main distribution board and main telephone line jack or main distribution point (DP).

Surge Protective Devices (SPD's) Selection Flow Chart

Is the Mains Incoming Power supplied by overhead power line and / or, does the building have a Lightning Protection System (LPS) installed?

NO

YES → Type I, Class I 10/350 SPD's are required e.g:-
(Single Phase) – T1SP1/12.5/25/230R
or
(Three Phase) T1SP3/12.5/50/230R

Is there sensitive electronic equipment in the building e.g. PC's, Servers, Routers, Fax, Telecom equipment etc?

NO

YES → Type II, Class II 8/20 SPD's are also required e.g.
DSP Series or SPM Series

Is there a requirement for 'redundant two stage' back up surge protection?

NO

YES → Type II, Class II 8/20 DSP Series SPD's are required e.g:-
(Single Phase) DSP1/600
or
(Three Phase) DSP3/600

Is there a requirement for surge protection modules to be 'hot wire' replaceable?

NO

YES → Type II, Class II 8/20 SPM Series SPD's are required e.g:-
(Single Phase) A1SPM/40/230N
or
(Three Phase) A3SPM/40/230N

Is there a requirement for 'Fine' local Plug-In protection?

NO

YES → Type III Class III SPD's are required e.g:-
Surge Protected Adaptors, Socket Strips and
T3SP1/1.5/3.0/230S

Is surge protection already installed at all incoming and outgoing Telecom and Datacom points entering and leaving the building?

NO

YES → Data and Telecom line SPD's are required e.g:-
DBP Series or TLP Series

***ALL SECTIONS SHOULD BE CHECKED TO ENSURE PROTECTION OF ALL EQUIPMENT**

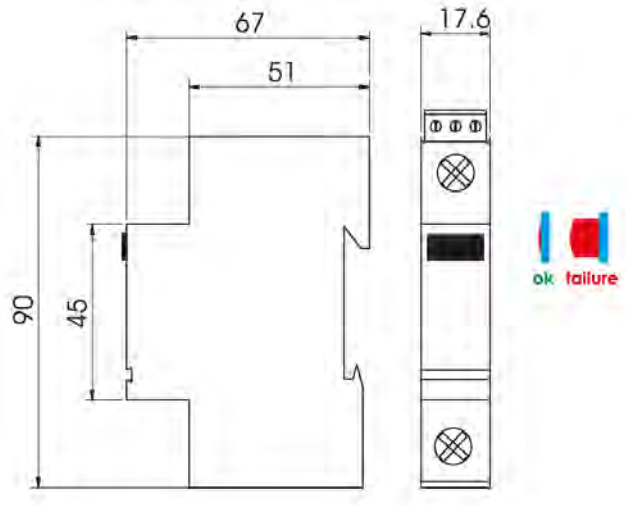
T1PD1/12.5/75R

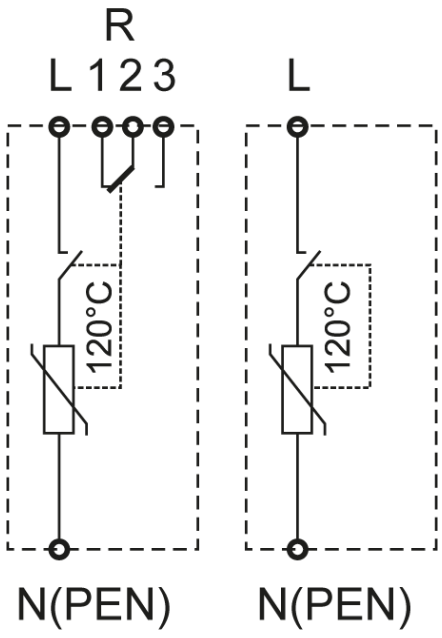
Type 1/2 Class I/II Surge Arrester

The **T1PD1/12.5/75R** is a lightning arrester type 1 or type 2 according to EN 61643-11. The main use of **T1PD1/12.5/75R** arrester is in structures of LPL III – IV according to EN 62305, e.g. residential houses with cable supply and subdistribution boards of big industrial structures and elimination of switching surges that originate in power supply systems.

Specification		
Max. continuous operating voltage	U_c	75 V AC
Lightning impulse current (10/350) -Charge -Specify Energy	I_{imp} Q W/R	12.5 kA 6.25 As 39 kJ/ Ω
Nominal discharge current (8/20)	I_n	20 kA
Max. discharge current (8/20)	I_{max}	40 kA
Voltage protection level @ I_{imp}	U_p	< 600 V
Voltage protection level @ I_n	U_p	< 1000 V
Response Time	t_A	<25 ns
Max. back-up fuse	160 AgL/gG	
Short circuit withstand	I_p	60 kA_{rms}
Remote Signalling	Yes	
Type / Class	1/2 - I/II	
Weight	100g	
Part code	**T1PD1/12.5/75R**	

Dimensions in mm





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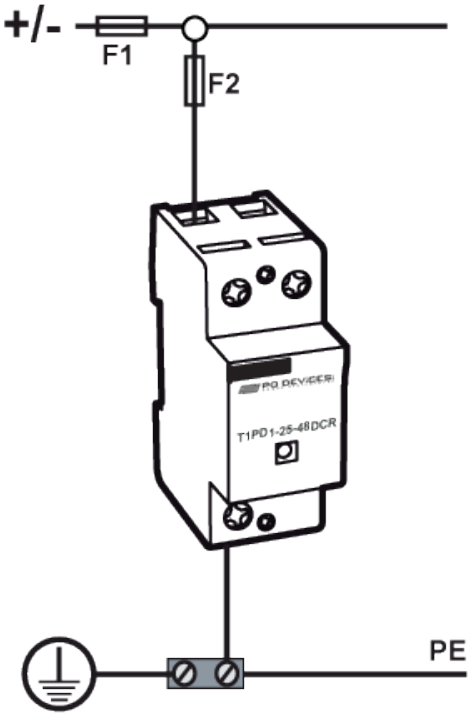
T1PD1/25/48DCR
Type 1/2 Surge Arrester

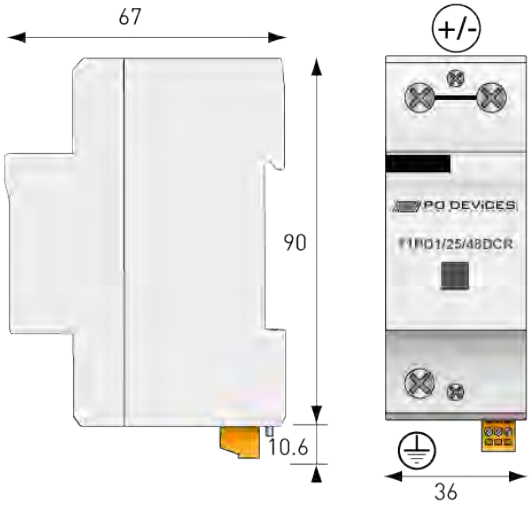
The **T1PD1/25/48DCR** is a type 1 & 2 48V DC surge protector designed to protect equipment connected to DC power supplies from lightning surges.

Specification		
Test class according to EN 61643-11 & IEC 61643-11		TYPE 1/2
Network		48V DC
Connection mode		+/PE or -/PE
Protection mode		CM
Max. PV operating voltage	U_C - DC	75V DC
Residual current - Leakage current at Uc	I_{pe}	< 0.1 mA
Nominal discharge current - 15 x 8/20 µs impulses	I_n	25kA
Max. discharge current - max. withstand @ 8/20 µs by pole	I_{max}	70kA
Impulse current by pole - max. withstand 10/350µs	I_{imp}	25kA
Max. DC operating voltage	U_p	0.5kV
Fuses		Fuse type gG -315 A
Connection to Network		by screw : 6-35 mm² / by bus
Disconnection indicator		1 mechanical indicator
Remote signalling of disconnection		output on changeover contact
Method of assembly		DIN rail 35mm
Operating temperature	ϑ	-40°C to + 85°C
Protection rating		IP20
Housing material		Thermoplastic UL94-V0
Standards compliance		IEC 61643-11 / EN 61643-11
Part Code:	**T1PD1/25/48DCR**	

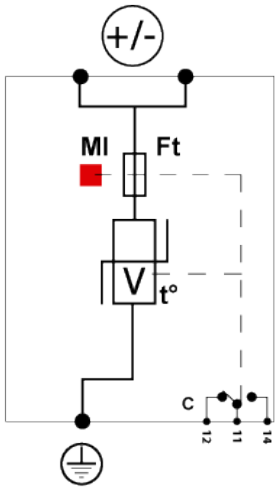
Installation



Dimensions in mm



Internal Wiring



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T1PDM1/12.5/12.5/230R

Type 1/2 Class I/II Surge Arrester

The **T1PDM1/12.5/12.5/230R** is a two-pole, Type 1 and 2 according to EN 61643-11 and IEC 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305) where they provide the equipotential bonding and discharge of both, the lightning current and the switching surge, which are generated in power supply systems entering the building. The use of the lightning current arresters **T1PDM1/12.5/12.5/230R** is mainly in the power supply lines, which are operated as TN-S system. The main use of **T1PDM1/12.5/12.5/230R** arrester is in structures of LPL III – IV according to EN 62305.

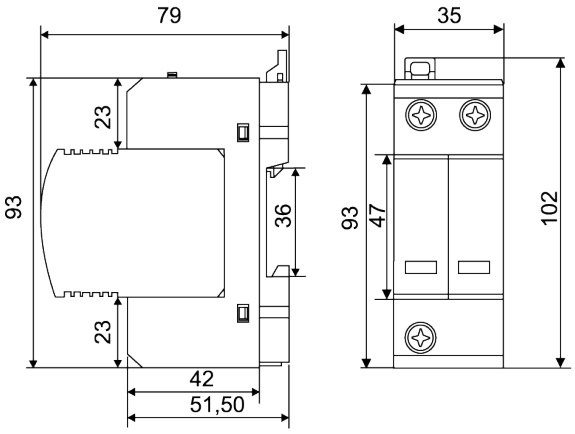
Function of Remote Monitor Terminals (RMT)

When the **T1PDM1/12.5/12.5/230R** is operating correctly, the terminations 1-2 are connected to normally closed contacts, 2-3 are normally open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.

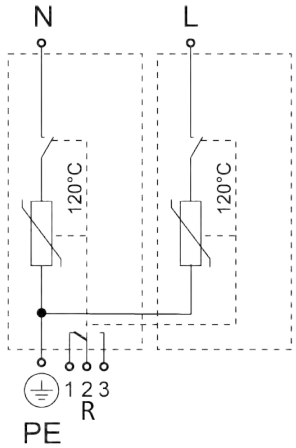
Specification

Test class according to EN 61643-11 and IEC 61643-11	Type 1/2, Class I/II	
Network type	TN-S	
Maximum continuous operating voltage	U_C	275 V AC / 350 V DC
Max. discharge current (8/20 µs)	I_{max}	50 kA
Impulse discharge current for class I test (10/350)	I_{imp}	12,5 kA
Charge	Q	6,25 As
Specific energy	W/R	39 kJ/Ω
Total lightning current (10/350) L+N->PE	I_{total}	25 kA
Nominal discharge current (8/20)	I_n	20 kA
Voltage protection level	U_p	< 1,2 kV
Temporary overvoltage (TOV)	U_T	335 V/5 s
Response time	t_A	< 25 ns
Max. back-up fuse		160 A gL/gG
Short-circuit withstand capability	I_p	60 kA_{rms}
LPZ		0-1
Housing material		Polyamid PA6, UL 94 V-0
Degree of protection of enclosure		IP20
Operating temperature	ϑ	-40°C +80 °C
Cross-section of the connected conductors (at tightening moment of clamps 4 Nm)		25 mm^2 (solid) 16 mm^2 (wire)
Method of assembly		DIN rail 35 mm
Failure signalisation (S)		green - ok / red - failure
Lifetime		min. 100 000 h
Weight	m	280 g
Part Code		**T1PDM1/12.5/12.5/230R**

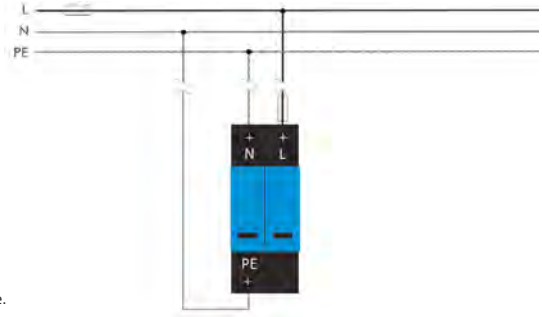
Dimensions in mm



Internal Wiring



Installation Diagram



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T1PDM1/12.5/25/230 Series

Type 1/2 Class I/II Surge Arrester

The **T1PDM1/12.5/25/230 Series** is a two-pole, Type 1 and 2 MOV + GDT lightning arrester according to EN 61643-11 and IEC 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305) where they provide the equipotential bonding and discharge of both, the lightning current and the switching surge, which are generated in power supply systems entering the building. The use of the arresters is mainly in the power supply lines, which are operated as TN-S and TT systems. The main use of arrester is in structures of LPL III – IV according to EN 62305.

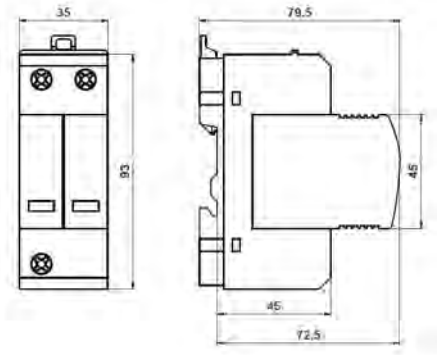
Function of Remote Monitor Terminals (RMT)*

When the **T1PDM1/12.5/25/230R** is operating correctly, the terminations 1-2 are connected to normally closed contacts, 2-3 are normally open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.

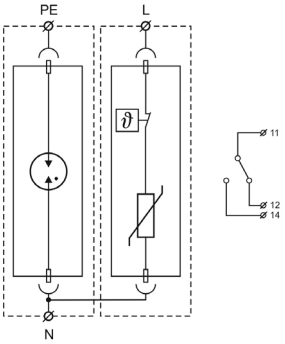
Specification		
Test class according to EN 61643-11 and IEC 61643-11	Type 1/2, Class I/II	
Network type	TN-S, TT	
Maximum continuous operating voltage	U_c	275 V AC / 350 V DC
Max. discharge current (8/20 µs) L/N	I_{max}	50 kA
Impulse discharge current for class I test (10/350) L/N	I_{imp}	12.5 kA
Charge L/N	Q	6.25 As
Specific energy for class I test L/N	W/R	39 kJ/Ω
Impulse discharge current for class I test (10/350) N/PE	I_{imp}	25 kA
Charge N/PE	Q	12.5 As
Specific energy for class I test N/PE	W/R	156 kJ/Ω
Total discharge current (10/350) L+N->PE	I_{total}	25 kA
Total discharge current (8/20 µs) L+N->PE	I_{total}	50 kA
Nominal discharge current for class II test (8/20) L/N	I_n	25 kA
Nominal discharge current for class II test (8/20) N/PE	I_n	30 kA
Voltage protection level	U_p	< 1.2 kV
Temporary overvoltage (TOV) L/N	U_T	335 V/5 s
Temporary overvoltage (TOV) N/PE	U_T	1200 V/0.2 s
Response time L/N	t_A	< 25 ns
Response time N/PE	t_A	< 100 ns
Max. back-up fuse		160 A gL/gG
Short-circuit withstand capability	I_p	60 kA_{rms}
LPZ		0-1
Housing material		Polyamid PA6, UL 94 V-0
Degree of protection of enclosure		IP20
Operating temperature	ϑ	-40°C to +80 °C
Cross-section of the connected conductors (at tightening moment of clamps 4 Nm)		25 mm² (solid) 16 mm² (wire)
Method of assembly		DIN rail 35 mm
Failure signalisation (S)		green - ok / red - failure
Weight	m	215 g
Part Codes:		
Without Remote Monitoring	**T1PDM1/12.5/25/230**	
With Remote Monitoring*	**T1PDM1/12.5/25/230R**	
Replaceable GDT Module	**T1PDM/255G**	
Replaceable Varistor Module	**T1PDM/275M**	

T1PDM1/12.5/25/230 **T1PDM1/12.5/25/230R**

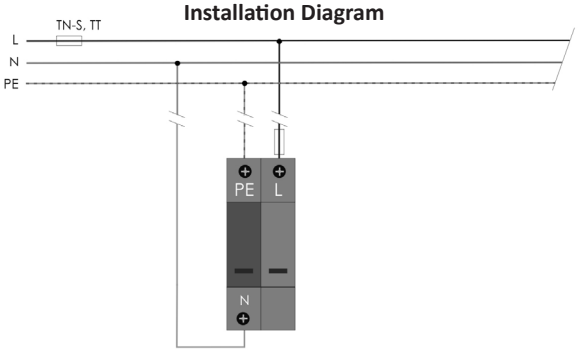
Dimensions in mm



Internal Wiring



Installation Diagram



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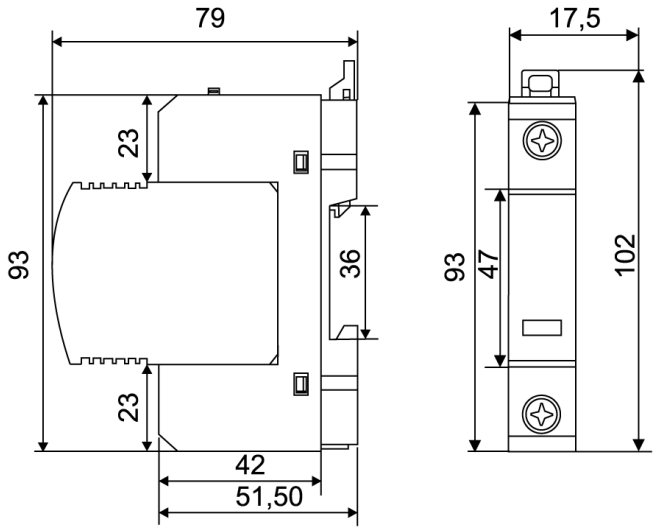
T1PDM1/7/75R

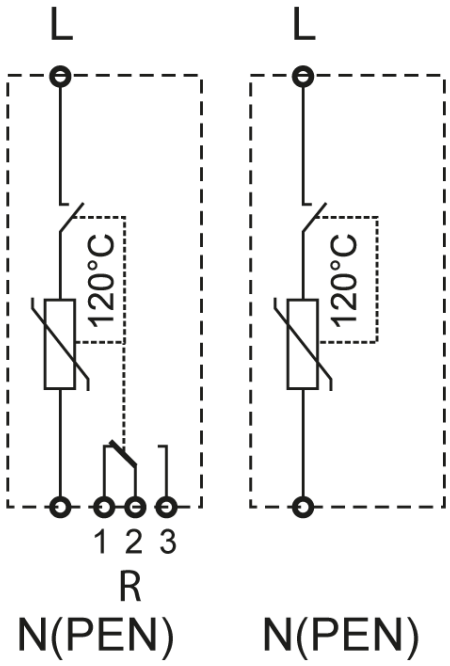
Type 1/2 Class I/II Surge Arrester

The **T1PDM1/7/75R** is a lightning arrester type 1 or type 2 according to EN 61643-11. The main use of **T1PDM1/7/75R** arrester is in structures of LPL III – IV according to EN 62305, e.g. residential houses with cable supply and subdistribution boards of big industrial structures and elimination of switching surges that originate in power supply systems.

Specification		
Max. continuous operating voltage	U_c	75 V AC
Lightning impulse current (10/350) -Charge -Specify Energy	I_{imp} Q W/R	7 kA 3.5 As 12 kJ/ Ω
Nominal discharge current (8/20)	I_n	20 kA
Max. discharge current (8/20)	I_{max}	40 kA
Voltage protection level @ I_{imp}	U_p	< 600 V
Voltage protection level @ I_n	U_p	< 1000 V
Response Time	t_A	<25 ns
Max. back-up fuse	160 AgL/gG	
Short circuit withstand	I_p	60 kA_{rms}
Remote Signalling	Yes	
Type / Class	1/2 - I/II	
Weight	98g	
Part code	**T1PDM1/7/75R**	

Dimensions in mm





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T1PDM3/12.5/12.5/230R

Type 1/2 Class I/II Surge Arrester

The **T1PDM3/12.5/12.5/230R** is a lightning arrester type 1 or type 2 according to EN 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305) for lightning current equipotential bonding and elimination of switching surges that originate in power supply systems entering the building.

The **T1PDM3/12.5/12.5/230R** is mainly intended for use in TNS, TNC-S or systems.

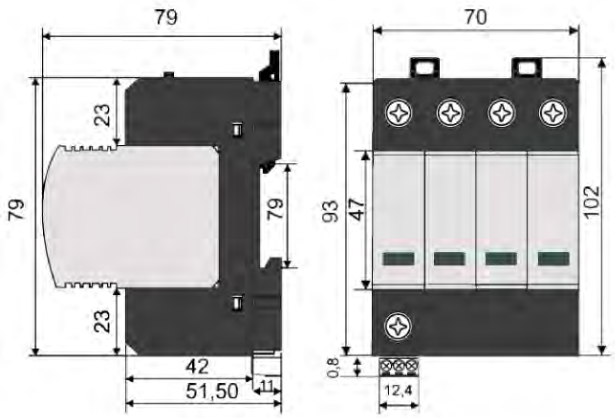
(For TT systems please refer to our product datasheet T1PDM3/12.5/50/230R)

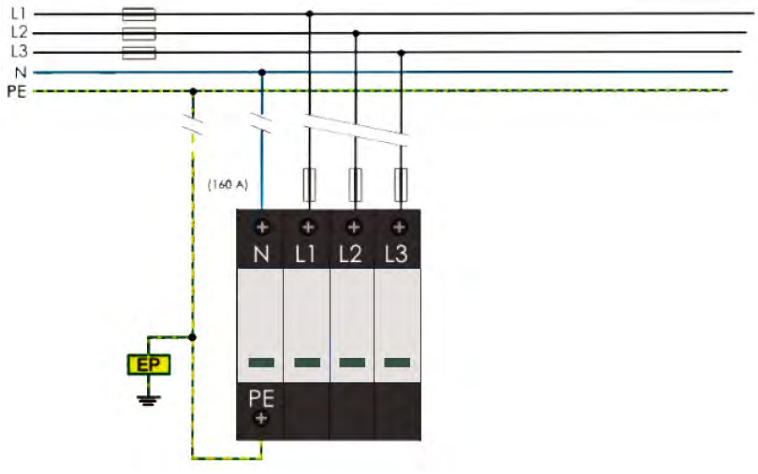
Function of remote monitor terminals

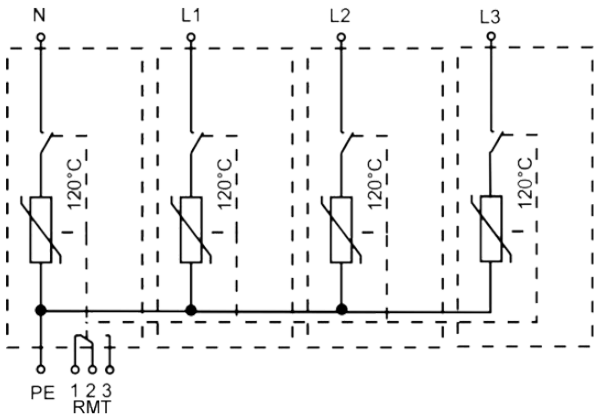
When the **T1PDM3/12.5/12.5/230R** is operating correctly, the terminations 1-2 are connected to normally closed contacts, 2-3 are normally open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.

Specification		
Max. continuous operating voltage	U_c	275 V
Lightning impulse current (10/350)	I_{imp}	12.5 kA
Nominal impulse discharge current (8/20)	I_n	20 kA
Temporary overvoltage (TOV)	U_T	335/5 V/sec
Voltage protection level @ I_{imp} Voltage protection level @ I_n	U_p U_p	< 1.2 kV < 1.3 kV
Max. back-up fuse	160 AgL/gG	
Short circuit withstand	60 kA	
Remote Signalling	Yes	
Type / Class	1/2 - I/II	
Part code	**T1PDM3/12.5/12.5/230R**	

Dimensions in mm







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T1PDM3/12.5/230R

Type 1/2 Class I/II Surge Arrester

The **T1PDM3/12.5/230R** is a lightning arrester type 1 or type 2 according to EN 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305) for lightning current equipotential bonding and elimination of switching surges that originate in power supply systems entering the building.

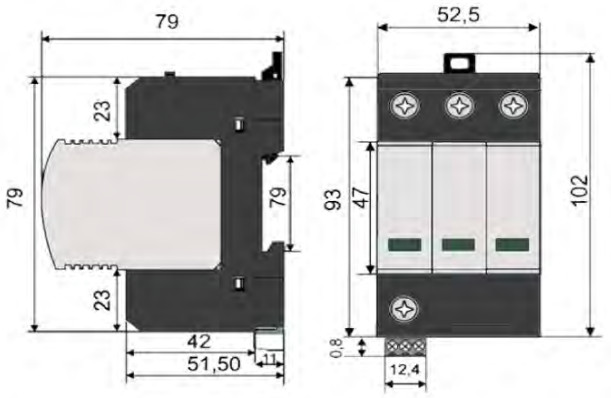
The **T1PDM3/12.5/230R** is mainly intended for use in TNC systems.

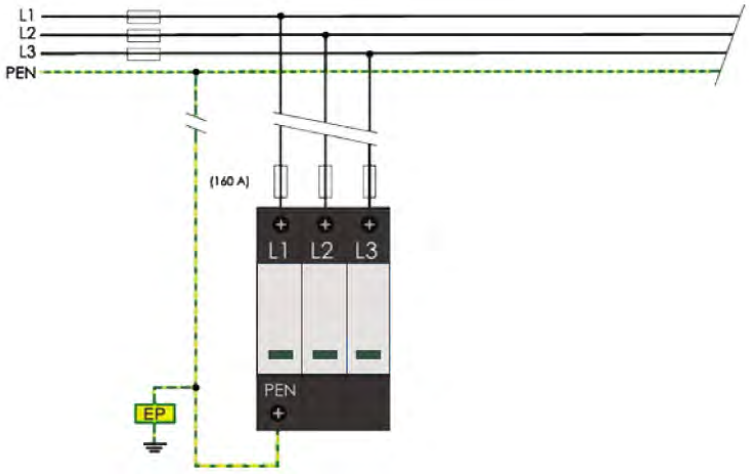
Function of Remote Monitor Terminals (RMT)

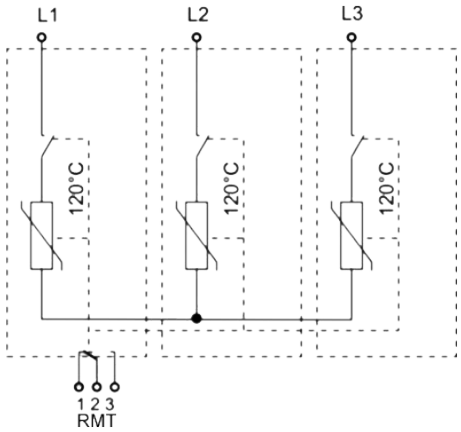
When the **T1PDM3/12.5/230R** is operating correctly, the terminations 1-2 are connected to normally closed contacts, 2-3 are normally open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.

Specification		
Max. continuous operating voltage	U_c	275 V
Lightning impulse current (10/350)	I_{imp}	12.5 kA
Nominal impulse discharge current (8/20)	I_n	20 kA
Temporary overvoltage (TOV)	U_T	335/5 V/sec
Voltage protection level @ I_{imp} Voltage protection level @ I_n	U_p U_p	< 1.2 kV < 1.3 kV
Max. back-up fuse	160 AgL/gG	
Short circuit withstand	60 kA	
Remote Signalling	Yes	
Type / Class	1/2 - I/II	
Part code	**T1PDM3/12.5/230R**	

Dimensions in mm







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T1PDM3/12.5/50/230R

Type 1/2 Class I/II Surge Arrester

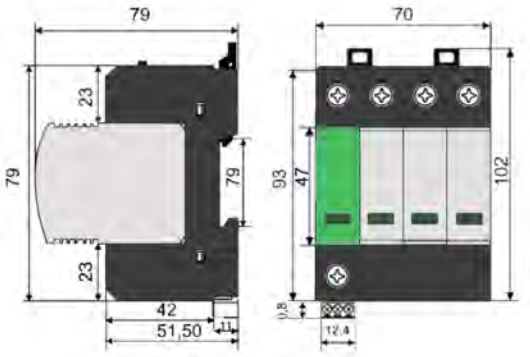
The **T1PDM3/12.5/50/230R** is a Type 1 and 2 lightning arrester according to EN 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305) for lightning current equipotential bonding and elimination of switching surges that originate in power supply systems entering the building. The main use of these arresters is structures of LPL III to IV according to EN 62305.

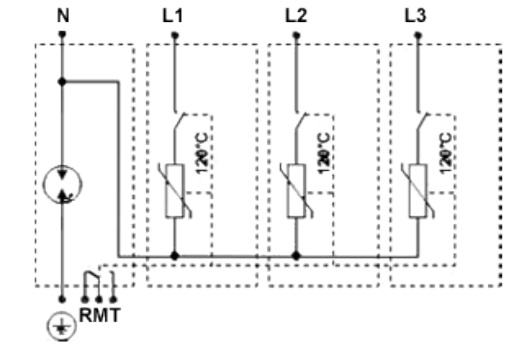
The **T1PDM3/12.5/50/230R** is mainly intended for use in TNS, TNC-S or TT systems.

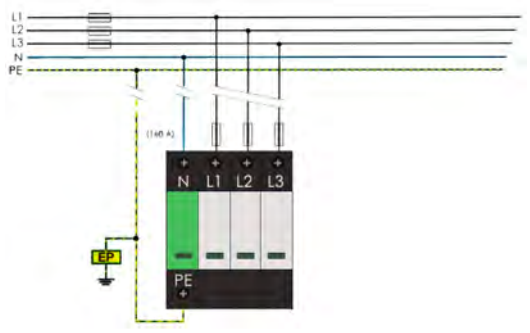
Function of Remote Monitor Terminals (RMT)

When the **T1PDM3/12.5/50/230R** is operating correctly, the terminations 1-2 are connected to normally closed contacts, 2-3 are normally open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.

Dimensions in mm







Specification		
Max. continuous operating voltage	U_c	275 V
Lightning impulse current (10/350) L/N - charge - specific energy	I_{imp} Q W/R	12.5 kA 6.25 As 39 kJ/Ω
Lightning impulse current (10/350) N/PE - charge - specific energy	I_{imp} Q W/R	50 kA 25 As 625 kJ/Ω
Total lightning current (10/350) L1+L2+L3+N to PE	I_{total}	50 kA
Nominal discharge current (8/20)	I_n	20 kA
Max. discharge current (8/20)	I_{max}	40 kA
Temporary overvoltage (TOV) L/N	U_t	335 V/5 sec
Temporary overvoltage (TOV) N/PE	U_t	1200 V/0.2 sec
Response time L/N	t_A	< 25 ns
Response time N/PE	t_A	< 100 ns
Voltage protection level	U_p	< 1.2 kV
Max. back-up fuse		160 AgL/gG
Short circuit withstand (at Max. fuse rating)	I_p	60 kA
Remote Signalling		Yes
Type / Class		1/2 - I/II
Mass	m	550g
Life		100000h Min.
Part code	**T1PDM3/12.5/50/230R**	

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T1PDM3-Series

Type 1/2 Class I/II Surge Arrester

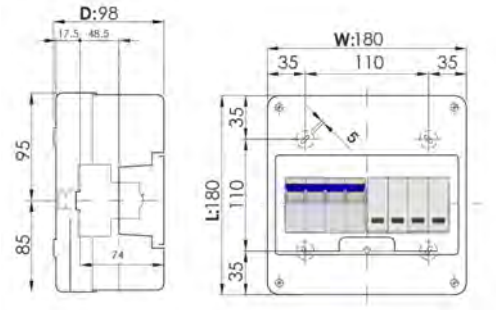
The T1PDM3-Series of lightning arrester and surge protection devices are type 1 and type 2 protection devices manufactured according to EN 61643-11.

These arresters are recommended for use in the Lightning protection zones concept at the boundaries of LPZ 0-1 (according to IEC 1312-1 and EN62305) for lightning current equipotential bonding and elimination of switching surges that originate in power supply system's entering the building. These devices are available as a standalone unit or in an enclosure (suffix E) with optional MCB protection (suffix E/M) or optional pre-wired devices (suffix E/M/W). Specific customer applications/requirements are available upon request.

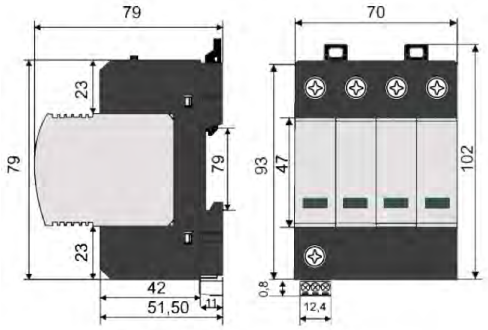
The **T1PDM3/12.5/12.5/230R** is mainly intended for use in TNS, TNC-S or systems.
(For TT systems please refer to our product datasheet T1PDM3/12.5/50/230R)

Specification		
Max. continuous operating voltage	U_c	275 V
Lightning impulse current (10/350)	I_{imp}	12.5 kA
Nominal impulse discharge current (8/20)	I_n	20 kA
Temporary overvoltage (TOV)	U_T	335/5 V/sec
Voltage protection level @ I_{imp} Voltage protection level @ I_n	U_p U_p	< 1.2 kV < 1.3 kV
Max. back-up fuse	160 AgL/gG	
Short circuit withstand	60 kA	
Remote Signalling	Yes	
Type / Class	1/2 - I/II	
Type 1/2 Class I/II TP&N arrester (stand alone) – no enclosure DIMS: **L:**102.8 x **W:**70 x **D:**79 PART CODE: **T1PDM3/12.5/12.5/230R**		
Type 1/2 Class I/II TP&N arrester c/w enclosure (4 module) IP Rated - IP55 DIMS: **L:**170 x **W:**105 x **D:**98 / Fixing = 115mm PART CODE: **T1PDM3/12.5/12.5/230R/E**		
Type 1/2 Class I/II TP&N arrester c/w enclosure (8 module) IP Rated - IP55 & 10kA 63A C curve MCB DIMS: **L:**180 x **W:**180 x **D:**98 / Fixing = 110mm PART CODE: **T1PDM3/12.5/12.5/230R/E/M**		
Type 1/2 Class I/II TP&N arrester c/w enclosure (8 module) IP Rated - IP55 & 10kA 63A C curve MCB – wired between MCB and Arrester DIMS: **L:**180 x **W:**180 x **D:**98 / Fixing = 110mm PART CODE: **T1PDM3/12.5/12.5/230R/E/M/W**		

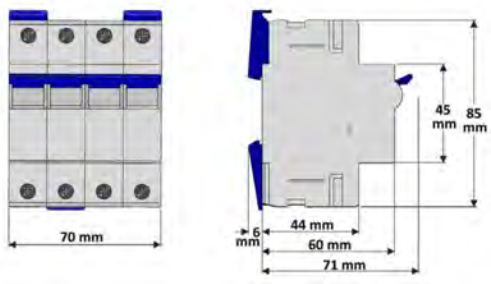
T1PDM3/12.5/12.5/230R/E/M Dimensions in mm
Material: Technpolymer - Halogen free according to EN 60754-2
Impact resistance: IK 09



T1PDM3/12.5/12.5/230R Arrester in mm



Breaker Dimensions in mm



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T1SP1/12.5/25/230R

Type 1/2 Class I/II Surge Arrester

The T1SP1 is a single phase, type 1 & 2[1] surge arrester, designed for use on the boundary between LPZs 0 & 1[2] in structures using TNS, TNC-S and TT earthing systems.

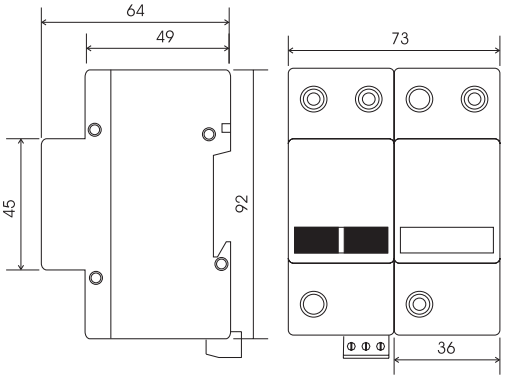
The **T1SP1/12.5/25/230R** is designed for use in structures of LPL II[3], such as industrial & administration buildings, schools, supermarkets & cathedrals. The device should be fitted as close as possible to the structures mains entry point.

[1] EN 61643-1; [2] IEC 1312 & EN 62305; [3]

Specification		
Max. continuous operating voltage	U_c	275 V AC
Temporary overvoltage (TOV), L/N	U_t	335 V/5 sec.
Temporary overvoltage (TOV), N/PE	U_t	1200 V/0.2 sec.
Response time L/N	tA	<25 ns
Response time N/PE	tA	<100 ns
Max back-up fuse		160 A gL/gG
Max back-up fuse (when 'V' connected)		63 A gL/gG
Short-circuit with stand capability at max. back-up fuse	I_p	80 kA rms
Lightning impulse current (10/350 µS) L/N	I_{imp}	12.5 kA
- charge	Q	6 As
- Specific energy	W/R	36 kJ/Ω
Lightning impulse current (10/350 µS) N/PE	I_{imp}	25 kA
- charge	Q	12.5 As
- Specific energy	W/R	156 kJ/Ω
Total lightning current (10/350 µS) L1+N →PE	I_{total}	25 kA
Max. discharge current (8/20 µS)	I_{max}	90 kA(L/N) 50kA N/PE)
Nominal discharge current (8/20 µS)	I_n	25 kA
Voltage protection level at I_{imp}	U_p	<1.2 kV
Terminals		10-35mm²
Type according to BS EN 61643-11		SPD Type 1/2 (Test Class I/II)
Weight	m	370g
Part Code		**T1SP1/12.5/25/230R**

Electrical strength - Surrounding circuits	3750 V rms
Electrical strength - Network circuits	3750 V rms
Insulation resistance	2 x 10^7 Ω
Max switching current	~ 0.5 A
Max switching voltage	~ 250 V

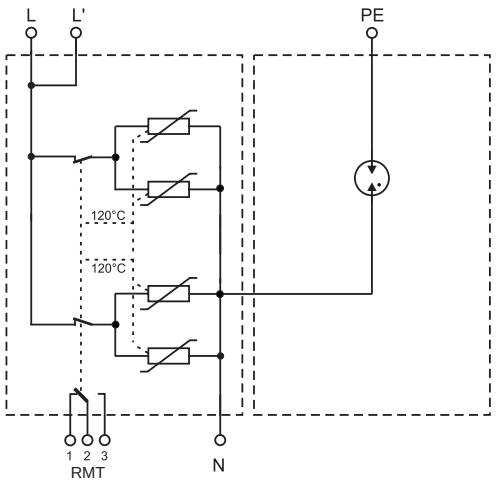
Dimensions in mm



Remote monitor terminals (RMT)

The T1SP1 range is fitted with 0v remote terminals for connection to a building management or other indication system.

Under normal operating conditions, remote terminal pins 1-2 are closed and 2-3 are open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.



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T1SP1/12.5/320R

Lightning & Surge Arrester / Varistor
Type 1 Class I

The T1SP1/12.5/320R is a lightning current arrester type 1 according to EN 61643-11. Installed at the boundary of LPZ 0-1 (according to IEC 1312-1 and EN 62305), which provides potential equalization and disposal of lightning current and switching surges that occur in power supply systems entering the building.

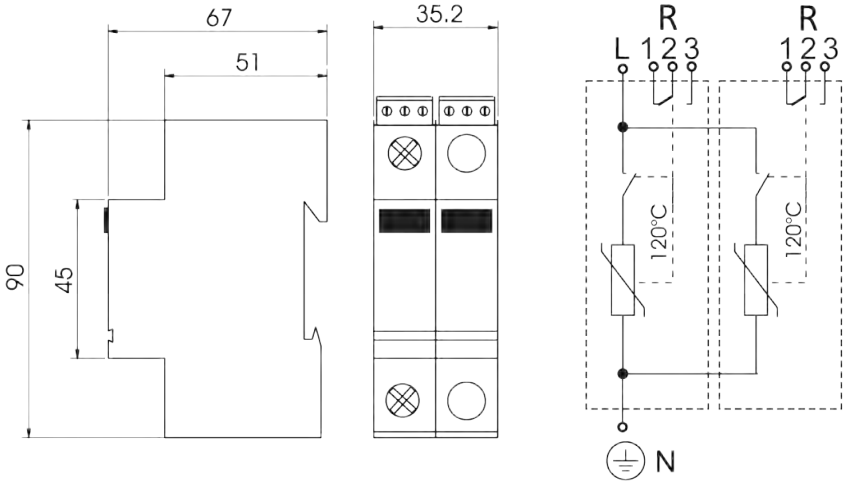
The T1SP1/12.5/320R is mainly used on the power supply lines, which are operated as a system TN-C, TN-S and TT. The main use of the T1SP1/12.5/320R is in the objects that fall under the CSN EN 62305 to protective levels of LPL II III and IV.

The T1SP1/12.5/320R is a version with remote monitoring.

T1SP1/12.5/320R

Specifications		
Test class according to EN 61643-11 and IEC 61643-11		TYPE 1 - CLASS I
Max. continuous operating voltage AC	U_C	320 V
Max. discharge current (8/20)	I_{max}	20 kA
Lightning impulse current (10/350)	I_{imp}	12.5 kA
Voltage protection level	U_P	<1.3kV
Response time	t_A	< 25 ns
Max. back-up fuse		160 A gL/gG
LPZ		0-1
Housing material		Polyamid PA6, UL94 V-0
Protection type		IP20
Operating temperature range		-40°C +70°C
Failure signalisation		pushed in - ok / pushed out - failure
Weight	m	280g
Part Codes		**T1SP1/12.5/320R**

Dimensions in mm



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T1SP1/12.5/500 & 500R

Lightning & Surge Arrester / Varistor

Type 1/2 Class I/II

T1SP1/12.5/500 & T1SP1/12.5/500R is a single-pole lightning and surge arrester Type 1+2 according to IEC EN 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC EN 1312-11 and IEC EN 62305), where they provide the equipotential bonding and discharge of both, the lightning current and the switching surge, which are generated in power supply systems entering the building.

The use of the lightning current arresters T1SP1/12.5/500 & T1SP1/12.5/500R is mainly in the power supply lines, which are operated as TN-S system. The main use of T1SP1/12.5/500 arrester is in structures of LPL III – IV according to IEC EN 62305.

The T1SP1/12.5/500R is a version with remote monitoring.

T1SP1/12.5/500

T1SP1/12.5/500R

Specifications		
Test class according to EN 61643-11 and IEC 61643-11		TYPE 1/2 - CLASS I/II
Max. continuous operating voltage	U_C	500 V AC
Max. discharge current (8/20)	I_{max}	50 kA
Lightning impulse current (10/350) - charge - specific energy	I_{imp} Q W/R	12.5 kA 6.25 As 39 kJ/Ω
Total lightning current (10/350) L1+N-PE	I_{total}	25kA
Nominal discharge current (8/20)	I_n	20kA
Voltage protection level	U_p	<1.9kV
Temporary overvoltage (TOV)	U_T	<1.9kV
Response time	t_A	< 25 ns
Max. back-up fuse		160 A gL/gG
Short-circuit withstand capability	I_p	60 kArms
LPZ		0-1
Housing material		Polyamid PA6, UL94 V-0
Protection type		IP20
Operating temperature range		-40°C +70°C
Cross-section of the connected conductors (at tightening moment of clamps 4 Nm)		25 mm2 (solid) 16 mm2 (wire)
Mounting on		DIN rail 35 mm
Failure signalisation		pushed in - ok / pushed out - failure
Potential free signal contact (DS) (recommended cross-section of remote monitoring max.1 mm^2)		AC: 250 V / 0.5 A - DC: 250 V / 0.1 A
Lifetime		min.100 000 h
Weight	m	280g
Part Codes Without Remote With Remote		 **T1SP1/12.5/500** **T1SP1/12.5/500R**

Revision: **vPD2, 31/03/17**
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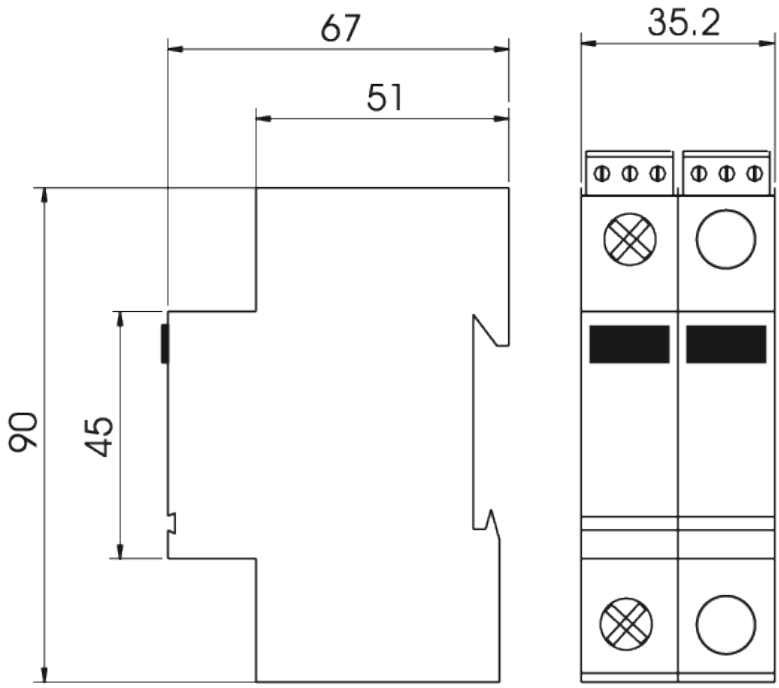
T1SP1/12.5/500 & 500R

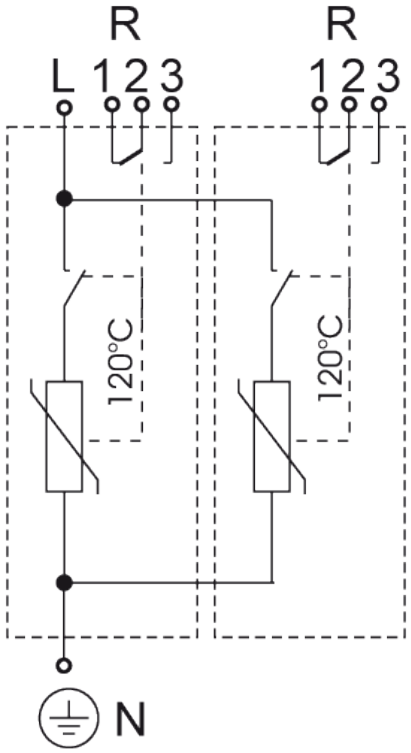
Lightning & Surge Arrester / Varistor

Type 1/2 Class I/II

T1SP1/12.5/500 **T1SP1/12.5/500R**

Dimensions in mm





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T1SP1/25/50/230R

Type 1/2 Class I/II Surge Arrester

The T1SP1 is a single phase, type 1 & 2[1] surge arrester, designed for use on the boundary between LPZs 0 & 1[2] in structures using TNS, TNC-S and TT earthing systems.

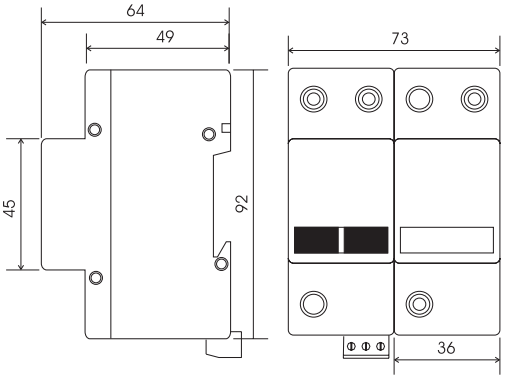
The **T1SP1/25/50/230R** is designed for use in structures of LPL I[3], such as hospitals, banks, mobile operator stations, water-works, power plants, airport buildings for air traffic control and all structures with an explosive risk.

[1] EN 61643-1; [2] IEC 1312 & EN 62305; [3]

Specification		
Max. continuous operating voltage	U_c	275 V AC
Temporary overvoltage (TOV), L/N	U_t	335 V/5 sec.
Temporary overvoltage (TOV), N/PE	U_t	1200 V/0.2 sec.
Response time L/N	tA	<25 ns
Response time N/PE	tA	<100 ns
Max back-up fuse		160 A gL/gG
Max back-up fuse (when 'V' connected)		63 A gL/gG
Short-circuit with stand capability at max. back-up fuse	I_p	80 kA rms
Lightning impulse current (10/350 µS) L/N	I_{imp}	25 kA
- charge	Q	12.5 As
- Specific energy	W/R	156 kJ/Ω
Lightning impulse current (10/350 µS) N/PE	I_{imp}	50 kA
- charge	Q	25 As
- Specific energy	W/R	625 kJ/Ω
Total lightning current (10/350 µS) L1+N →PE	I_{total}	50kA
Max. discharge current (8/20 µS)	I_{max}	120 kA(L/N, N/PE)
Nominal discharge current (8/20 µS)	I_n	50 kA
Voltage protection level at I_{imp}	U_p	<1.3 kV
Terminals		10-35mm²
Type according to BS EN 61643-11		SPD Type 1/2 (Test Class I/II)
Weight	m	460g
Part Code		**T1SP1/25/50/230R**

Electrical strength - Surrounding circuits	3750 V rms
Electrical strength - Network circuits	3750 V rms
Insulation resistance	2 x 10^7 Ω
Max switching current	~ 0.5 A
Max switching voltage	~ 250 V

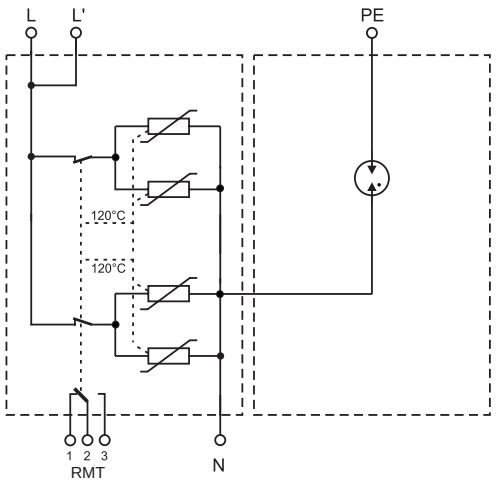
Dimensions in mm



Remote monitor terminals (RMT)

The T1SP1 range is fitted with 0v remote terminals for connection to a building management or other indication system.

Under normal operating conditions, remote terminal pins 1-2 are closed and 2-3 are open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.



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T1SP1/50/255G

Type 1 Class I Surge Arrester

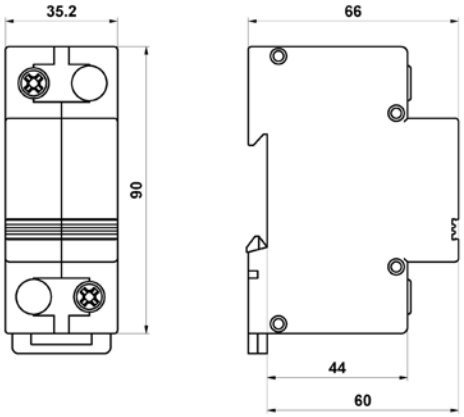
The T1SP1/50/255G is a type 1 lightning arrester according to EN 61643-11 and IEC 61643-11. These are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305), where they provide both equipotential bonding and protection from lightning current and switching surges, which are generated in power supply systems entering the building.

The lightning arresters are encapsulated, non-venting, multiple spark gaps, which do not have any special requirements for installation in main switchboards, as the device will not vent during operation. They are mainly intended for use in systems that use TN-C earthing. For TNS and TT systems it is necessary to combine these arresters with an additional module designed for Neutral – Earth use.

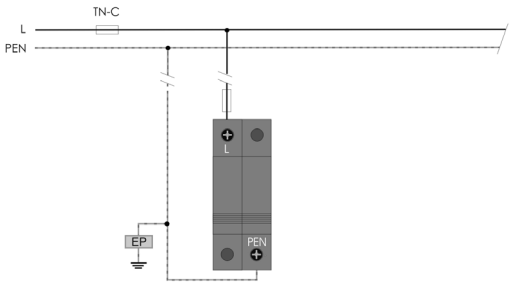
The main usage of these arresters is in structures of level LPL I according to EN 62305.

Specification		
Test class according to EN 61643-11 and IEC 61643-11		TYPE 1, CLASS I
Maximum continuous operating voltage	U_c	255V AC
Impulse discharge current for class I test (10/350)	I_{imp}	50 kA
Charge	Q	25 As
Specific energy for class I test	W/R	600 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n	50 kA
Voltage protection level at I_{imp}	U_p	< 2 kV
Temporary overvoltage (TOV)	U_T	334 V/5 s
Response time	t_A	< 100 ns
Follow current interrupt rating	I_{fi}	3 kA_{rms}
Max. back-up fuse		500 A gL/gG
Short-circuit withstand capability at max. back-up fuse	I_p	25 kA_{rms}
LPZ		0-1
Housing material		Polyamid PA6, UL 94 V-0
Protection rating level of enclosure		IP20
Operating temperature	ϑ	-40°C to +80 °C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		35 mm^2 (solid) 25 mm^2 (stranded)
Method of assembly		DIN rail 35 mm
Lifetime		min. 100,000 hrs
Weight	m	225g
Part Code		**T1SP1/50/255G**

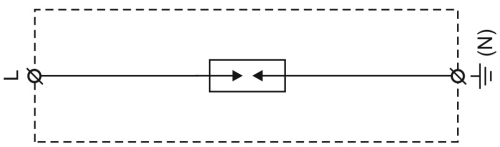
Dimensions in mm



T1SP1/50/255G Installation



T1SP1/50/255G Internal Wiring



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T1SP1/50/440G

Type 1 Class I Surge Arrester

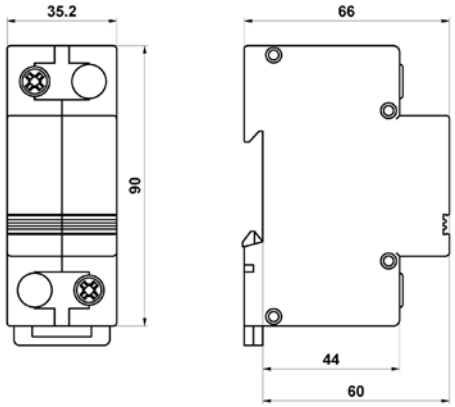
The T1SP1/50/440G is a type 1 lightning arrester according to EN 61643-11 and IEC 61643-11. These are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0 – 1 (according to IEC 1312-1 and EN 62305), where they provide both equipotential bonding and protection from lightning current and switching surges, which are generated in power supply systems entering the building.

The lightning arresters are encapsulated, non-venting, multiple spark gaps, which do not have any special requirements for installation in main switchboards, as the device will not vent during operation. They are mainly intended for use in systems that use TN-C earthing. For TNS and TT systems it is necessary to combine these arresters with an additional module designed for Neutral – Earth use.

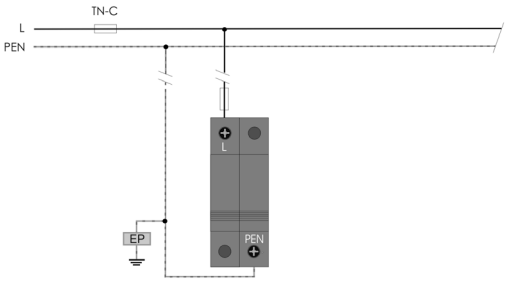
The main usage of these arresters is in structures of level LPL I according to EN 62305.

Specification		
Test class according to EN 61643-11 and IEC 61643-11		TYPE 1, CLASS I
Maximum continuous operating voltage	U_c	440V AC
Impulse discharge current for class I test (10/350)	I_{imp}	50 kA
Charge	Q	25 As
Specific energy for class I test	W/R	600 kJ/Ω
Nominal discharge current for class II test (8/20)	I_n	50 kA
Voltage protection level at I_{imp}	U_p	< 2.5 kV
Temporary overvoltage (TOV)	U_T	690 V/5 s
Response time	t_A	< 100 ns
Follow current interrupt rating	I_{fi}	3 kA_{rms}
Max. back-up fuse		500 A gL/gG
Short-circuit withstand capability at max. back-up fuse	I_p	25 kA_{rms}
LPZ		0-1
Housing material		Polyamid PA6, UL 94 V-0
Protection rating level of enclosure		IP20
Operating temperature	ϑ	-40°C to +80 °C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		35 mm^2 (solid) 25 mm^2 (stranded)
Method of assembly		DIN rail 35 mm
Lifetime		min. 100,000 hrs
Weight	m	225g
Part Code		**T1SP1/50/440G**

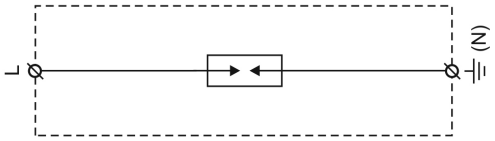
Dimensions in mm



T1SP1/50/440G Installation



T1SP1/50/440G Internal Wiring



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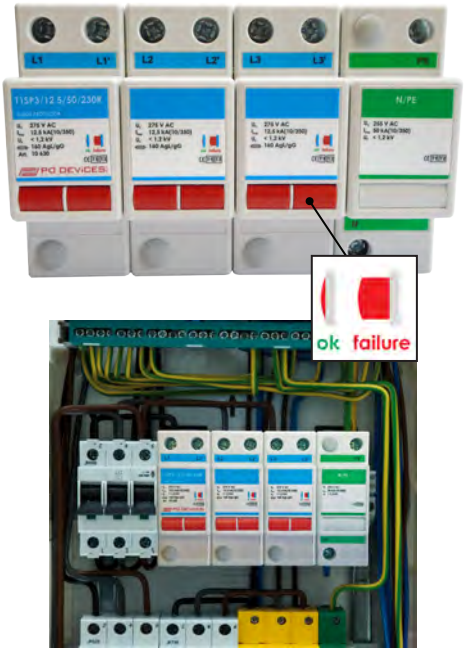
T1SP3/12.5/50/230R

Type 1/2 Class I/II Surge Arrester

The T1SP3 is a three phase, type 1 & 2[1] surge arrester, designed for use on the boundary between LPZs 0 & 1[2] in structures using TNS, TNC-S and TT earthing systems.

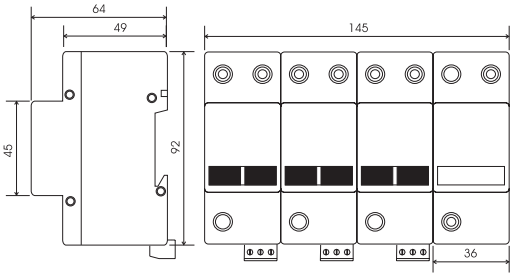
The **T1SP3/12.5/50/230R** is designed for use in structures of LPL II[3], such as industrial & administration buildings, schools, supermarkets & cathedrals. The device should be fitted as close as possible to the structures mains entry point.

[1] EN 61643-1; [2] IEC 1312 & EN 62305; [3]



Specification		
Max. continuous operating voltage	U_c	275 V AC
Temporary overvoltage (TOV), L/N	U_t	335 V/5 sec.
Temporary overvoltage (TOV), N/PE	U_t	1200 V/0.2 sec.
Response time L/N	tA	<25 ns
Response time N/PE	tA	<100 ns
Max back-up fuse		160 A gL/gG
Max back-up fuse (when 'V' connected)		63 A gL/gG
Short-circuit with stand capability at max. back-up fuse	I_p	80 kA rms
Lightning impulse current (10/350 µS) L/N	I_{imp}	12.5 kA
- charge	Q	6 As
- Specific energy	W/R	36 kJ/Ω
Lightning impulse current (10/350 µS) N/PE	I_{imp}	50 kA
- charge	Q	25 As
- Specific energy	W/R	625 kJ/Ω
Total lightning current (10/350 µS) L1+L2+L3+N →PE	I_{total}	50 kA
Max. discharge current (8/20 µS)	I_{max}	90 kA(L/N) 50kA N/PE)
Nominal discharge current (8/20 µS)	I_n	25 kA
Voltage protection level at I_{imp}	U_p	<1.2 kV
Terminals		10-35mm²
Type according to BS EN 61643-11		SPD Type 1/2 (Test Class I/II)
Weight	m	1030g
Part Code		**T1SP3/12.5/50/230R**

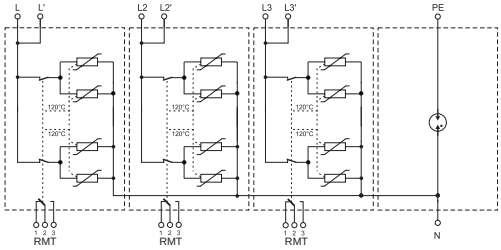
Dimensions in mm



Remote monitor terminals (RMT)

The T1SP3 range is fitted with 0v remote terminals for connection to a building management or other indication system.

Under normal operating conditions, remote terminal pins 1-2 are closed and 2-3 are open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.



Electrical strength - Surrounding circuits	3750 V rms
Electrical strength - Network circuits	3750 V rms
Insulation resistance	2 x 10^7 Ω
Max switching current	~ 0.5 A
Max switching voltage	~ 250 V

Revision: **vPD4, 19/12/16**
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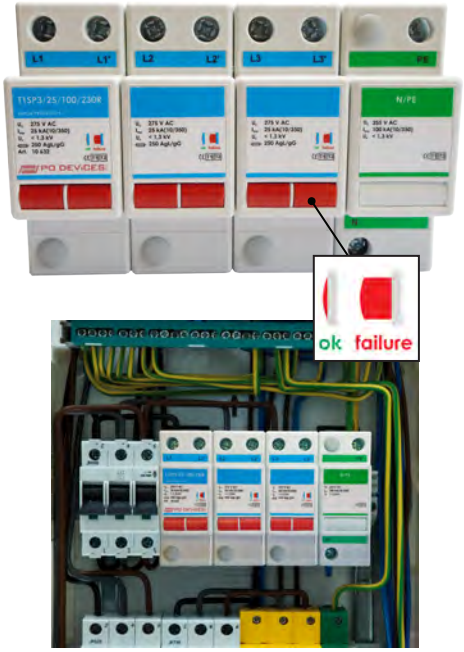
T1SP3/25/100/230R

Type 1/2 Class I/II Surge Arrester

The T1SP3 is a three phase, type 1 & 2[1] surge arrester, designed for use on the boundary between LPZs 0 & 1[2] in structures using TNS, TNC-S and TT earthing systems.

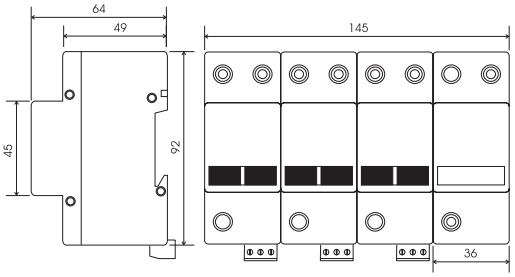
The **T1SP3/25/100/230R** is designed for use in structures of LPL I[3], such as hospitals, banks, mobile operator stations, water-works, power plants, airport buildings for air traffic control and all structures with an explosive risk.

[1] EN 61643-1; [2] IEC 1312 & EN 62305; [3]



Specification		
Max. continuous operating voltage	U_c	275 V AC
Temporary overvoltage (TOV), L/N	U_t	335 V/5 sec.
Temporary overvoltage (TOV), N/PE	U_t	1200 V/0.2 sec.
Response time L/N	tA	<25 ns
Response time N/PE	tA	<100 ns
Max back-up fuse		160 A gL/gG
Max back-up fuse (when 'V' connected)		63 A gL/gG
Short-circuit with stand capability at max. back-up fuse	I_p	80 kA rms
Lightning impulse current (10/350 µS) L/N	I_{imp}	25 kA
- charge	Q	12.5 As
- Specific energy	W/R	156 kJ/Ω
Lightning impulse current (10/350 µS) N/PE	I_{imp}	100 kA
- charge	Q	50 As
- Specific energy	W/R	2500 kJ/Ω
Total lightning current (10/350 µS) L1+L2+L3+N →PE	I_{total}	100 kA
Max. discharge current (8/20 µS)	I_{max}	120 kA(L/N, N/PE)
Nominal discharge current (8/20 µS)	I_n	50 kA
Voltage protection level at I_{imp}	U_p	<1.3 kV
Terminals		10-35mm²
Type according to BS EN 61643-11		SPD Type 1/2 (Test Class I/II)
Weight	m	1125g
Part Code		**T1SP3/25/100/230R**

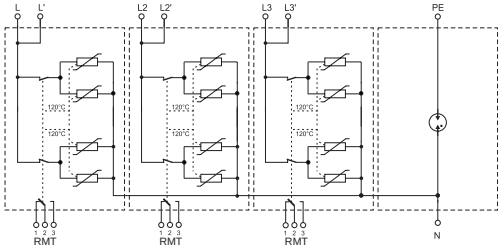
Dimensions in mm



Remote monitor terminals (RMT)

The T1SP3 range is fitted with 0v remote terminals for connection to a building management or other indication system.

Under normal operating conditions, remote terminal pins 1-2 are closed and 2-3 are open. If the internal varistor component is damaged as a result of thermal overloading, terminations 1-2 will then be open and 2-3 closed.



Electrical strength - Surrounding circuits	3750 V rms
Electrical strength - Network circuits	3750 V rms
Insulation resistance	2 x 10^7 Ω
Max switching current	~ 0.5 A
Max switching voltage	~ 250 V

Revision: **vPD4, 19/12/16**
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T2PDM1/40/440R
Type 2 Surge Arrester

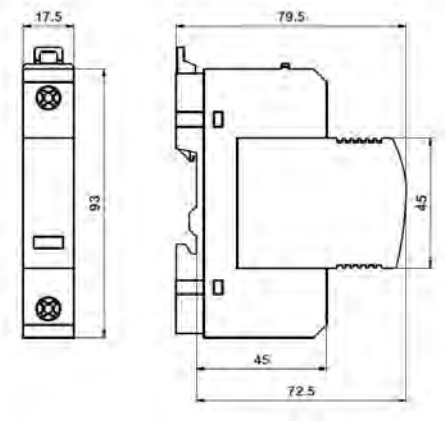
The **T2PDM1/40/440R** is a single-pole, metal oxide varistor surge arrester, Type 2 according to EN 61643-11 and IEC 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 1-2 (according to IEC 1312-1 and EN 62305), where they provide the equipotential bonding and discharge of switching overvoltage, which is generated in power supply systems entering the building.

The main use of the **T2PDM1/40/440R** arrester is in all kinds of industry, residential and administration buildings. They are to be placed into the subsidiary switchboards or control boxes.

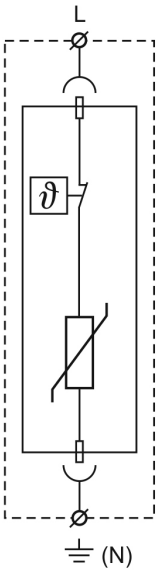
This unit has a removable and replaceable module, CODE: **T2PDM/440M**

Specification		
Test class according to EN 61643-11 & IEC 61643-11		TYPE 2, CLASS II
Network type		TN-C
Maximum continuous operating voltage	U_c	440V AC
Maximum discharge current (8/20)	I_{max}	40kA
Nominal discharge current for class II test (8/20)	I_n	15kA
Voltage protection level	U_p	< 2.15kV
Response time	t_A	<25ns
Max. back-up fuse		160A gL/gG
Short-circuit withstand capability	I_p	60kA$_{rms}$
LPZ		1-2
Housing material		Polyamid PA6, UL94 V-0
Protection rating level of enclosure		IP20
Operating temperature	ϑ	-40°C to + 80°C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		25mm² (solid) 16mm² (stranded)
Method of assembly		DIN rail 35mm
Failure Indication		green - ok / red - failure
Lifetime		min. 100,000 hrs
Weight	m	98 g
Part Codes:	**T2PDM1/40/440R**	
Replaceable Varistor Module	**T2PDM/440M**	

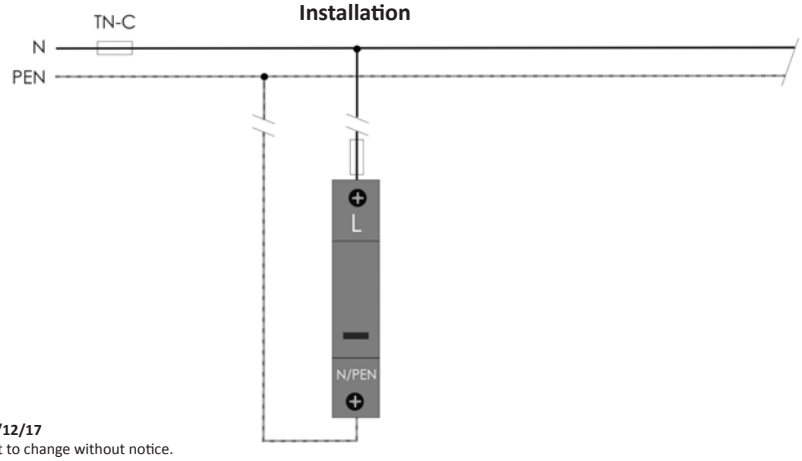
Dimensions in mm



Internal Wiring



Installation



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T2PDM1/50/275R
Type 2 Surge Arrester

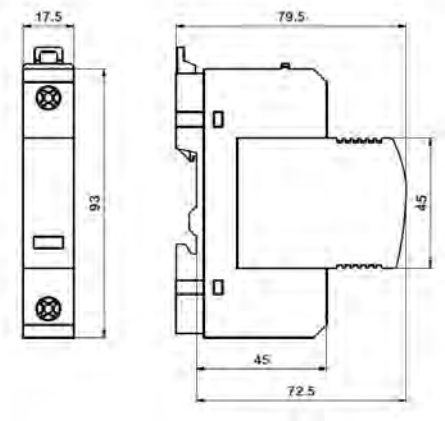
The **T2PDM1/50/275R** is a single-pole, metal oxide varistor surge arrester, Type 2 according to EN 61643-11 and IEC 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 1-2 (according to IEC 1312-1 and EN 62305), where they provide the equipotential bonding and discharge of switching overvoltage, which is generated in power supply systems entering the building.

The main use of the **T2PDM1/50/275R** arrester is in all kinds of industry, residential and administration buildings. They are to be placed into the subsidiary switchboards or control boxes.

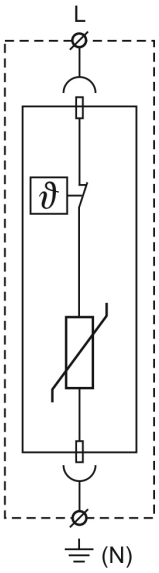
This unit has a removable and replaceable module, CODE: **T2PDM/275M**

Specification		
Test class according to EN 61643-11 & IEC 61643-11		TYPE 2, CLASS II
Network type		TN-C
Maximum continuous operating voltage	U_C	275V AC / 350V DC
Maximum discharge current (8/20)	I_{max}	50kA
Nominal discharge current for class II test (8/20)	I_n	20kA
Voltage protection level	U_p	< 1.3kV
Response time	t_A	<25ns
Max. back-up fuse		160A gL/gG
Short-circuit withstand capability	I_p	60kA$_{rms}$
LPZ		1-2
Housing material		Polyamid PA6, UL94 V-0
Protection rating level of enclosure		IP20
Operating temperature	ϑ	-40°C to + 80°C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		25mm² (solid) 16mm² (stranded)
Method of assembly		DIN rail 35mm
Failure Indication		green - ok / red - failure
Lifetime		min. 100,000 hrs
Weight	m	98 g
Part Codes:	**T2PDM1/50/275R**	
Replaceable Varistor Module	**T2PDM/275M**	

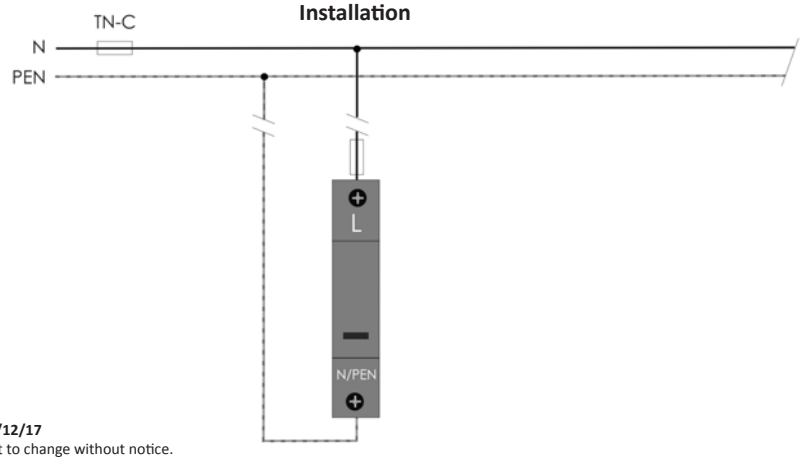
Dimensions in mm



Internal Wiring



Installation



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T2PDM3/20/50/275
Type 2 Surge Arrester

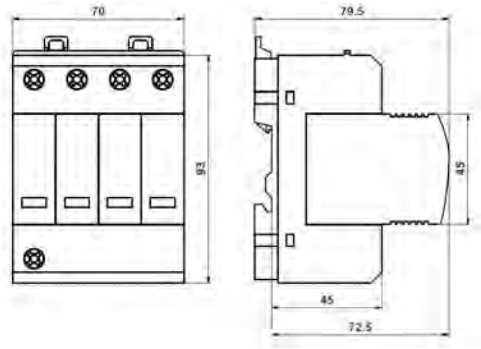
The **T2PDM3/20/50/275** is a four-pole, metal oxide varistor surge arrester combined with gas discharge tube, Type 2 according to EN 61643-11 and IEC 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 1-2 (according to IEC 1312-1 and EN 62305), where they provide the equipotential bonding and discharge of the switching overvoltage, which is generated in power supply systems entering the building.

The main use of the **T2PDM3/20/50/275** arrester is in all kinds of industry, residential and administration buildings. They are to be placed into the subsidiary switchboards or control boxes.

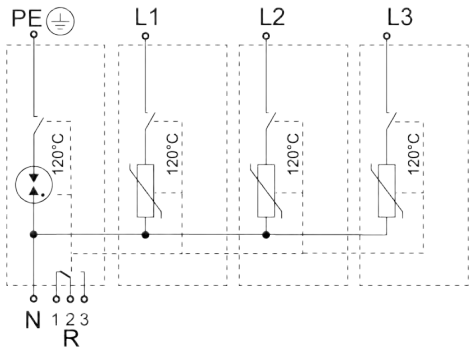
This unit has removable and replaceable modules. This version has no remote monitoring.

Specification		
Test class according to EN 61643-11 & IEC 61643-11		TYPE 2, CLASS II
Network type		TN-S & TT
Maximum continuous operating voltage	U_C	275V AC / 350 V DC
Maximum discharge current	I_{max}	50kA
Nominal discharge current for class II test (8/20)	I_n	20kA
Total discharge current (8/20) L1+L2+L3+N->PE	I_{total}	50kA
Voltage protection level	U_p	< 1.3 kV
Impulse discharge current for class I test (10/350) N/PE	I_{imp}	20 kA
Temporary overvoltage (TOV) L/N	U_T	335V/5s
Temporary overvoltage (TOV) N/PE	U_T	1200V/0.2 s
Response time L/N	t_A	<25ns
Response time N/PE	t_A	<100ns
Max. back-up fuse		160A gL/gG
Short-circuit withstand capability	I_p	60kA$_{rms}$
LPZ		1-2
Housing material		Polyamid PA6, UL94 V-0
Protection rating level of enclosure		IP20
Operating temperature	ϑ	-40°C to + 80°C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		25mm² (solid) 16mm² (wire)
Method of assembly		DIN rail 35mm
Failure Indication		green - ok / red - failure
Potential free signal contact (R) * (recommended cross-section of remote monitoring max.1 mm2)		AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Lifetime		min. 100,000 hrs
Weight	m	346 g
Part Codes:		
Without Remote Monitoring	**T2PDM3/20/50/275**	
With Remote Monitoring*	**T2PDM3/20/50/275R**	
Replaceable GDT Module	**T2PDM/255G**	
Replaceable Varistor Module	**T2PDM/275M**	

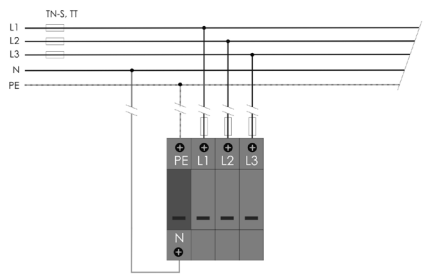
Dimensions in mm



Internal Wiring



Installation



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T2PDM3/20/50/275R
Type 2 Surge Arrester

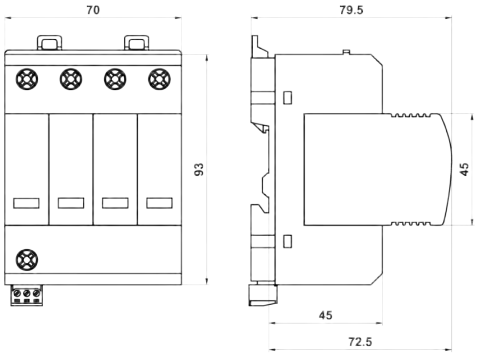
The **T2PDM3/20/50/275R** is a four-pole, metal oxide varistor surge arrester combined with gas discharge tube, Type 2 according to EN 61643-11 and IEC 61643-11. These arresters are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 1-2 (according to IEC 1312-1 and EN 62305), where they provide the equipotential bonding and discharge of the switching overvoltage, which is generated in power supply systems entering the building.

The main use of the **T2PDM3/20/50/275R** arrester is in all kinds of industry, residential and administration buildings. They are to be placed into the subsidiary switchboards or control boxes.

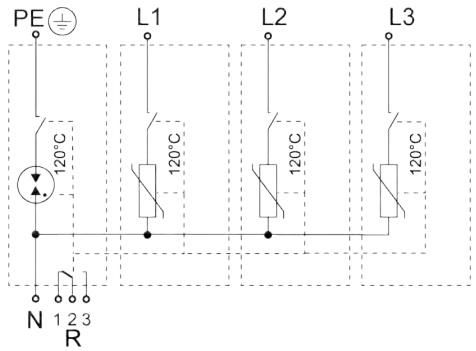
This unit has removable and replaceable modules. This version comes with remote monitoring.

Specification		
Test class according to EN 61643-11 & IEC 61643-11		TYPE 2, CLASS II
Network type		TN-S & TT
Maximum continuous operating voltage	U_C	275V AC / 350 V DC
Maximum discharge current	I_{max}	50kA
Nominal discharge current for class II test (8/20)	I_n	20kA
Total discharge current (8/20) L1+L2+L3+N->PE	I_{total}	50kA
Voltage protection level	U_p	< 1.3 kV
Impulse discharge current for class I test (10/350) N/PE	I_{imp}	20 kA
Temporary overvoltage (TOV) L/N	U_T	335V/5s
Temporary overvoltage (TOV) N/PE	U_T	1200V/0.2 s
Response time L/N	t_A	<25ns
Response time N/PE	t_A	<100ns
Max. back-up fuse		160A gL/gG
Short-circuit withstand capability	I_p	60kA$_{rms}$
LPZ		1-2
Housing material		Polyamid PA6, UL94 V-0
Protection rating level of enclosure		IP20
Operating temperature	ϑ	-40°C to + 80°C
Cross-section of the connected conductors (at tightening moment of clamps 3 Nm)		25mm² (solid) 16mm² (wire)
Method of assembly		DIN rail 35mm
Failure Indication		green - ok / red - failure
Potential free signal contact (R) * (recommended cross-section of remote monitoring max.1 mm2)		AC: 250 V / 0.5 A, DC: 250 V / 0.1 A
Lifetime		min. 100,000 hrs
Weight	m	346 g
Part Codes:		
With Remote Monitoring*	**T2PDM3/20/50/275R**	
Without Remote Monitoring	**T2PDM3/20/50/275**	
Replaceable GDT Module	**T2PDM/255G**	
Replaceable Varistor Module	**T2PDM/275M**	

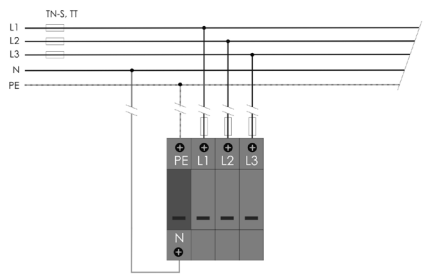
Dimensions in mm



Internal Wiring



Installation



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DSP600 Series

Distribution Surge Protector
Type 1/2/3 (Test Class I/II/III)
Single & Three Phase Surge Arresters

Ideal for industrial, commercial and domestic applications, the Distribution Surge Protector 600 (DSP600) provides an economic means of preventing damage to electrical distribution systems from mainsborne transient voltages. These transients may occur as the result of nearby lightning strikes or surges derived from the switching of inductive or capacitive loads.

Fusing:
The DSP600 is suitable for direct connection to a line rated up to 100A (6mm^2 min. connecting cables), but can be connected to lines of higher rating by the provision of series fuses rated 50A min – 100A max (BS HD 60269-2:2010, BS 88-2:2010). If MCBs are used in place of fuses they should be of type C.

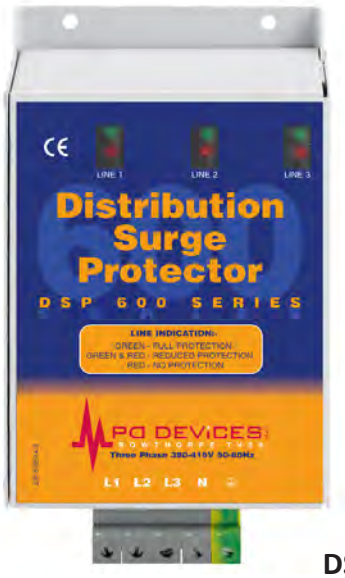
Maintenance:
The DSP600 requires no maintenance but the LEDs should be checked at regular intervals to ensure that full protection is present. The remote signalling facility version allows the DSP600 to be installed in areas that are inaccessible for regular inspection.

Surge Test:
The test waveform – 6kV 1.2/50µs O/C, 3kA 8/20µs S/C – applied to the DSP600 gives the resultant let through voltage. See tabulation below. (The 'let through voltage' will vary due to the parasitic inductance of the associated mains cable.) Values given are at protector terminals.

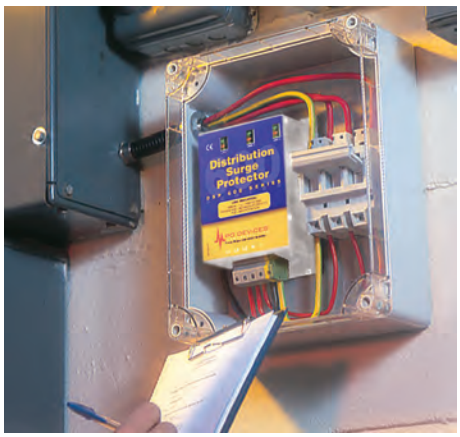
Quality Assurance:
Approved to BS EN ISO 9001

LET THROUGH VOLTAGE	
Test simulating the effects of lightning and switching transients	Phase/Neutral Phase/Earth
6kV 1.2/50µs open circuit voltage; 3kA 8/20µs short circuit current	600V
4kV 1.2/50µs open circuit voltage; 2kA 8/20µs short circuit current	560V
5kA 8/20µs	670V
6kV 0.5µs 100kHz ring wave, 500A	520V

DSP1/600



DSP3/600



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DSP600 Series

Distribution Surge Protector
Type 1/2/3 (Test Class I/II/III)
Single & Three Phase Surge Arresters

Specification	Single Phase	Three Phase
		
Voltage rating (Nominal)	230V rms	400V rms
Operating voltage range	200 - 300V rms	L-N 200 - 300 V rms L-L 350 - 500 V rms
Maximum current rating	Unlimited (Parallel Connection)	Unlimited (Parallel Connection)
Maximum surge current handling (8/20 µs)	40kA	40kA per phase
Response time	<10 ns	<10 ns
Power consumption (nominal)	10mA	10mA per phase
Leakage current to earth	200µA	600µA
Terminals	16mm² max - Line, Neutral, Earth 2.5mm² max - Remote Signalling	16mm² max - Line, Neutral, Earth 2.5mm² max - Remote Signalling
Operating temperature	-40° to +70° Celcius	-40° to +70° Celcius
Light emitting diodes status indication	Green - Full Protection	Green - Full Protection
	Red & Green - Reduced Protection	Red & Green - Reduced Protection
	Red - No Protection	Red - No Protection
Case	Steel - Epoxy Paint	Steel - Epoxy Paint
Type according to BS EN 61643-11	2	2
Dimensions (in mm)		
L	176	176
W	42	110
D	72	72
Weight (in grams)	650	1110
Part Code: without remote signalling	**DSP1/600**	**DSP3/600**
Part Code: with remote signalling	**DSP1A/600**	**DSP3A/600**

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DSP600 L & N Type Series

Distribution Surge Protector
Type 1/2/3 (Test Class I/II/III)
Single & Three Phase Surge Arresters

Ideal for industrial, commercial and domestic applications, the Distribution Surge Protector 600 Series provides an economic means of preventing damage to electrical distribution systems from mainsborne transient voltages. These transients may occur as the result of nearby lightning strikes or surges derived from the switching of inductive or capacitive loads.

The DSP600 'L' and 'N' types should be installed at the point of cable entry to a building and at the distribution point for each floor of a multi-storey building containing sensitive electrical/electronic equipment.

They are normally used as part of a totally integrated surge protection system and as such should be considered as the first line of defence. Local distribution panels and equipment connected 'downstream' should also be protected in order to achieve a systematic and co-ordinated approach to surge protection.

They provide suppression from mainsborne voltage spikes and surges that can occur between phases, phase to neutral, phase to earth and neutral to earth, thus ensuring protection in all modes. This protection is achieved by using carefully matched high energy absorbing elements.

Units feature high surge current handling capability which operates in two stages to ensure continuity of transient suppression. The **DSP600 'N'** type is provided with an on-board system of protection status monitoring Light Emitting Diode's (LED's), while the **DSP600 'L'** type is supplied with a remote monitoring unit, which allows the unit to be installed in areas that are inaccessible for regular inspection.

Under normal conditions both types will automatically reset after clamping smaller, more commonly occurring surges, and a green LED indicates that full protection is present. However, should a surge current, in excess of 30kA, appear on the line it will be clamped by the unit but the first protection stage may possibly suffer damage and fail safe.

In this instance the red LED will be illuminated in addition to the green and although the system will still be adequately protected, the unit should be replaced before a further large surge can remove the second protection stage. There is no protection present when only the red LED is illuminated, although unprotected power is still supplied

Both the DSP600 'N' and 'L' types are supplied with a site fault condition indicator. Should the light on this indicator flash or be permanently illuminated at anytime, it is to warn of a high voltage between neutral and earth lines and therefore potentially hazardous site conditions. The DSP600 'N' and 'L' types are supplied with a remote signalling facility where volt free terminals (which can be connected as either normally open or normally closed), open or close when the first protection stage is lost, (Red and Green LEDs on), and these can be used to activate a remote indicator such as a lamp or an audible alarm. The switching contacts are completely isolated from the supply and may be used for AC mains voltage 230V RMS 200mA or 30V DC 2 Amp loads.

DSP600 'N' - Single Phase

DSP600 'N' - Three Phase

DSP600 'L' - Three Phase

Quality Assurance:
Approved to BS EN ISO 9001

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DSP600 L & N Type Series

Distribution Surge Protector
Type 1/2/3 (Test Class I/II/III)
Single & Three Phase Surge Arresters

Features:

- Maximum surge current rating of 40kA far exceeds the 10kA requirements of BS6651: 1999 Annex C, to provide long life, and low maintenance.
- Meets the requirements of BS EN62305-4:2006 (which replaced BS6651:1999 Annex C in August 2008) and BS EN61643-11/12 - Type II, Class II
- Tested to IEEE C62.41
- BS6651:1999 Annex C location category C
- Low “let through” voltage of 600 volts.
- Two stage (redundant) protection, with pre-failure indication.
- Full protection status indication, with remote signalling.
- Remote Monitoring Unit model (‘L’ type) allows the unit to be installed in areas that are inaccessible for regular inspection.
- Site fault condition indicator.
- Remote Monitoring Unit is provided with a 1 metre cable and appropriate plug and socket connectors (other lengths are available on request).
- Easy installation and field serviceability.
- Rugged construction (steel enclosure).
- Compact size and small footprint.

Applications

- Front end of building protection.
- Individual protection of critical and costly equipment such as computer systems.
- Sub-distribution panel protection.

Installation:

Designed to be easily installed alongside the incoming electrical supply panel or at the sub distribution board of a multi-storey block, the 600 Series is connected in parallel with the supply, thus eliminating complicated by-pass wiring associated with series suppressors. Connected in this manner the 600 Series carries only the current associated with the transient being discharged.

The 600 Series should be installed as close as possible to the Bus Bars/Equipment being protected, with as large a conductor as possible (16mm^2 max). The connecting wires should be routed, avoiding looping, and secured together with ties. The Distribution Surge Protector must be connected in parallel to the supply via an isolating switch if the mains supply cannot be switched off for 600 Series replacement.

If RCDs are used on the supply the 600 Series must be fitted in front of such devices to avoid nuisance tripping. Provision should be made for safe replacement of the 600 Series should this become necessary. The DSP600 ‘N’ type may be installed in an existing cubicle with viewing window or in a housing with transparent cover, available separately, whereas the DSP600 ‘L’ type supplied with remote monitoring unit is ideal for installations that do not allow for regular inspection of the unit itself.

Fusing:

The 600 Series is suitable for direct connection to a line rated up to 100A (6mm^2 min. connecting cables), but can be connected to lines of higher rating by the provision of series fuses rated 50A min – 100A max (BS HD 60269-2:2010, BS 88-2:2010). If MCBs are used in place of fuses they should be of type C.

Maintenance:

The 600 Series requires no maintenance but the LED’s should be checked at regular intervals to ensure that full protection is present. The remote signalling facility of the‘L’ and ‘N’ types is provided for remote indication of the units protection status, for instance in control rooms, mimic panels etc.

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DSP600 L & N Type Series

Distribution Surge Protector
Type 1/2/3 (Test Class I/II/III)
Single & Three Phase Surge Arresters

Specification	Single Phase	Three Phase
		
Voltage rating (Nominal)	230V rms	400V rms
Operating voltage range	200 - 300V rms	L-N 200 - 300 V rms L-L 350 - 500 V rms
Maximum current rating	Unlimited (Parallel Connection)	Unlimited (Parallel Connection)
Maximum surge current handling (8/20 µs)	40kA	40kA per phase
Response time	<10 ns	<10 ns
Power consumption (nominal)	18mA	18mA per phase
Leakage current to earth	200µA	600µA
Terminals	16mm² max - Line, Neutral, Earth 2.5mm² max - Remote Signalling	16mm² max - Line, Neutral, Earth 2.5mm² max - Remote Signalling
Remote signalling terminals	Rated at 230V rms 0.2 Amp or 30V DC 2 Amp	Rated at 230V rms 0.2 Amp or 30V DC 2 Amp
Remote Monitoring Unit Connectors ('L' type only)	N/A	15 Way 'D'
Operating temperature	-40° to +70° Celcius	-40° to +70° Celcius
Light emitting diodes status indication	Green - Full Protection	Green - Full Protection
	Red & Green - Reduced Protection	Red & Green - Reduced Protection
	Red - No Protection	Red - No Protection
Site Fault Condition Indicator	Red Lit / Flashing	Red Lit / Flashing
	Check Neutral / Earth supply voltage	Check Neutral / Earth supply voltage
Case	Steel - Epoxy Paint	Steel - Epoxy Paint
Type according to BS EN 61643-11	2	2
Dimensions (in mm)		
L	176	176
W	42	110
D	72	72
Weight (in grams)	650	1110
Part Codes:	**DSP1N/600**	**DSP3L/600**
		DSP3N/600

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DSP600 L & N Type Series

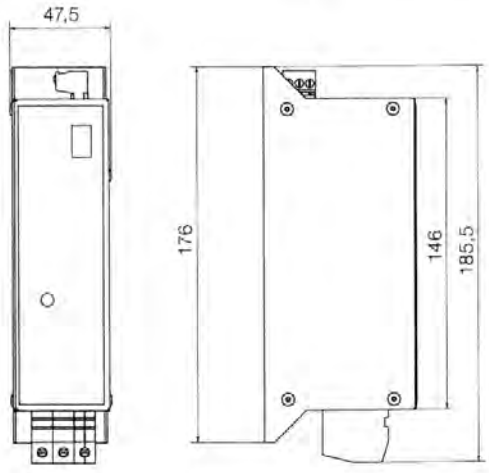
Distribution Surge Protector
Type 1/2/3 (Test Class I/II/III)
Single & Three Phase Surge Arresters

Surge Test:
The 600 Series complies with, or is tested to, the requirements of: BS EN62305-4:2006, BS EN61643-11/12, IEEE C62.41, UL1449.1985, BS6651:1999 Annex C. The test waveform – 6kV 1.2/50µs O/C, 3kA 8/20µs S/C – applied to the 600 series gives the resultant let through voltage. ***See tabulation below.***

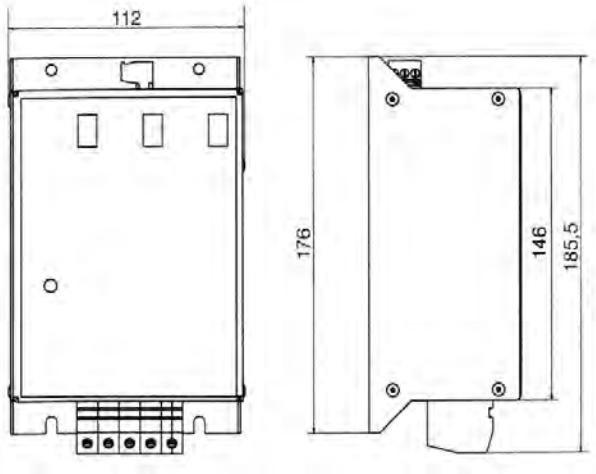
(The 'let through voltage' will vary due to the parasitic inductance of the associated mains cable.)
Values given are at protector terminals.

Let Through Voltage	
Test simulating the effects of lightning and switching transients	Phase/Neutral Phase/Earth
6kV 1.2/50µs open circuit voltage; 3kA 8/20µs short circuit current	600V
4kV 1.2/50µs open circuit voltage; 2kA 8/20µs short circuit current	560V
5kA 8/20µs	670V
6kV 0.5µs 100kHz ring wave, 500A	520V

DSP1N/600 Dimensions in mm



DSP3L/600 & DSP3N/600 Dimensions in mm



600 Series Optional Enclosure	
Optional Enclosure Case	Polycarbonate
IP Rating (before installation)	56
Dimensions (mm)	
L	245
W	195
D	100
Part Code	**2IP-7-0244**

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MDSP-Series
90kA, 150kA, 300kA
Modular Distribution Surge Protector
Type 2 Class II Surge Arrester

These modular distribution panel protectors for three phase power systems are designed to prevent damage to electrical distribution systems from mainsborne transient voltages which can occur as the result of nearby lightning strikes or surges derived from the switching of inductive or capacitive loads.They feature exceptionally high surge handling capabilities of 90kA,150kA or 300kA and are intended for high lightning exposure areas and critical systems where long life and low maintenance are required.

The Modular Distribution Surge Protector (MDSP) should be installed at the point of cable entry to a building containing sensitive electrical or electronic equipment. The MDSP is normally used as part of a totally integrated surge protection system and as such should be considered as the first line of defence. Local distribution panels and equipment connected “downstream” should also be protected in order to achieve a systematic and co-ordinated approach to surge protection.

The MDSP features exceptionally high surge current handling capabilities which operates in two stages to ensure continuity of transient suppression. Under normal conditions the MDSP will automatically reset after clamping smaller, more commonly occurring surges, and two green lights on each of the Line modules indicate that full protection is present. However, should a surge current in excess of 90kA, 150kA or 300kA (depending on the model selected), appear on the line it will be clamped by the MDSP but the first protection stage may possibly suffer damage and fail safe.

In this instance one green light from each damaged module will be extinguished and although the system will still be adequately protected, affected Line modules should be replaced before a further large surge can remove the second stage.

There is no protection present when the green module lights are not illuminated, although unprotected power is still supplied. The Neutral/Earth module is provided with a red warning light. Should this light glow at any time it is not a warning of suppressor failure, but is to warn of a high voltage between neutral and earth lines, and therefore potentially hazardous site conditions.

Each MDSP module is fitted with a remote signalling facility where volt free terminals (which can be connected as either normally open or normally closed), open or close when the first protection stage is lost, (one green light on) and these can be used to activate a remote indicator such as a lamp or audible alarm or notify a building management system (BMS).

The switching contacts are completely isolated from the supply and may be used for AC mains voltage 230V RMS 1 Amp or 30V DC 2 Amp loads.

An alternative version of the MDSP is available which in addition to the above is also provided with Silicon Avalanche Diode (SAD) modules which offer extremely low clamping and exceptionally fast response time. This makes them ideal for the stringent and demanding requirements of, for instance, mobile / wireless telecom applications.

Quality Assurance
Approved to BS EN ISO 9001

Maintenance
The MDSP requires no maintenance but the lights should be checked regularly, particularly following lightning activity to ensure full protection is present. The remote signalling facility allows the MDSP to be installed in areas that are inaccessible for regular inspection.

Applications
- Front end of building protection for mission critical sites and applications.
- Protection of expensive power assets
- Individual protection of critical and costly equipment such as computer systems
- SAD model particularly suited to mobile / wireless telecom applications.

Surge Test
The MDSP complies with or is tested to the requirements of: BS EN62305-4:2006, BS EN61643-11/12, IEEEC62.41, UL1449.1985, BS6651:1999 Annex C. The test waveform - 6kV 1.2/50µs O/C, 3kA 8/20µs S/C - applied to the MDSP gives the resultant let through voltage.
See tabulation overleaf.
(The “let through voltage” will vary due to the parasitic inductance of the associated mains cable.) Values given are at protector terminals.

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MDSP-Series
90kA, 150kA, 300kA
Modular Distribution Surge Protector
Type 2 Class II Surge Arrester

LET THROUGH VOLTAGE		
Tests simulating the effects of lightning and switching transients	Phase/Neutral Line MOV Modules	Phase/Neutral Line SAD Modules
6kV 1.2/50µs open circuit voltage 3kA 8/20µs short circuit current	**<800V**	**<600V**
4kV 1.2/50µs open circuit voltage 2kA 8/20µs short circuit current	**<700V**	**<600V**
5kA 8/20µs	**<800V**	**<600V**
6kV 0.5µs 100kHz ring wave 500A	**<700V**	**<600V**

Features
- Exceptionally high surge handling capabilities of 90kA, 150kA or 300kA far exceeds the 10kA requirements of BS6651:1999 Annex C, to provide long life, and low maintenance.
- Meets the requirements of BS EN62305-4:2006 (which replaced BS6651:1999 Annex C in August 2008) and BS EN61643 11/12 – Type 2, Class II
- BS6651:1999 Annex C location category C
- Two stage (redundant) protection with pre-failure indication.
- Replaceable DIN rail mounted surge protection modules.
- Dual thermal and current overload fusing.
- Full protection status indicators with remote signalling.
- Silicon Avalanche Diode (SAD) and/or Metal Oxide Varistor (MOV) technology.
- SAD models available for extremely low clamping and exceptionally fast response time.
- Flame retardant IP67 rated enclosure.
- Site fault condition indicator.
- Easy installation and field serviceability.

Installation
Designed to be installed alongside the incoming electrical supply panel the MDSP is connected in parallel (or in “shunt”) across the supply to be protected. The connecting cable does not carry the supply current, only the current associated with suppressing the transient overvoltage. The MDSP should be installed as close as possible to the supply cables being protected, with as large a conductor as possible (35mm^2 max). The connecting wires should be routed, avoiding looping, and secured together with ties. See installation data sheet instructions.

The Modular Distribution Surge Protector must be connected in parallel to the supply via an isolating switch if the mains supply cannot be switched off for module replacement. If RCD’s are used the MDSP must be fitted in front of such devices to avoid nuisance tripping. Provision should be made for safe replacement of the MDSP and/or modules should this become necessary

Fusing
The MDSP is suitable for direct connection to a line rated up to 100A with 16mm^2 min connecting cables. However it should be remembered that if the unit were to see a surge in excess of its designed capability then the main fuse would be ruptured and the supply disconnected.

Provision of additional inline disconnecting fuses to the unit will overcome the above and also provide isolation for maintenance and exchange.

The MDSP can be connected to a supply greater than 100A providing inline fuses rated 50A min – 100A max (BS HD 60269-2:2010, BS88-2:2010) are fitted. In order to discriminate with the supply fuse the inline fuse should be in the ratio of 1:2. The inline fuses can be replaced by MCBs providing they are type C.

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MDSP-Series
90kA, 150kA, 300kA
Modular Distribution Surge Protector
Type 2 Class II Surge Arrester

MDSP3-90 SERIES

MDSP3/90
This three phase DIN rail mounted modular surge protector comprises three 90kA Line/Neutral MOV modules and one 90kA Neutral / Earth MOV module all of which are housed in a high impact plastic enclosure with clear cover. All modules have dual thermal and current overload fusing and are so arranged as to provide a redundancy feature should one of the discs be damaged due to excessive energy. Status indication of the modules is by lights and the Neutral/Earth module provides indication of high neutral to earth voltages. All modules have a remote indication facility.

MDSP3/90/12
The MDSP3/90/12 offers the same features as above but additionally is supplied with three Line/Neutral 12kA SAD modules for improved clamping and response performance. Should the SAD modules be damaged due to excessive energy the MOV modules will continue to provide protection.

MDSP3-150 SERIES

MDSP3/150
This three phase DIN rail mounted modular surge protector comprises three 150kA Line/Neutral MOV modules and one 150kA Neutral/Earth MOV module all of which are housed in a high impact plastic enclosure with clear cover. All modules have dual thermal and current overload fusing and are so arranged as to provide a redundancy feature should one of the discs be damaged due to excessive energy. Status indication of the modules is by lights and the Neutral/Earth module provides indication of high neutral to earth voltages. All modules have a remote indication facility.

MDSP3/150/12
The MDSP3/150/12 offers the same features as above but additionally is supplied with three Line/Neutral 12kA SAD modules for improved clamping and response performance. Should the SAD modules be damaged due to excessive energy the MOV modules will continue to provide protection.

MDSP3-300 SERIES

MDSP3/300
This three phase DIN rail mounted modular surge protector comprises six 150kA Line/Neutral MOV modules, paralleled up to provide 300 kA and two 150kA Neutral/Earth MOV modules all of which are housed in a high impact plastic enclosure with clear cover. All modules have dual thermal and current overload fusing and are so arranged as to provide a redundancy feature should one of the discs be damaged due to excessive energy. Status indication of the modules is by lights and the Neutral/Earth module provides indication of high neutral to earth voltages. All modules have a remote indication facility.

MDSP3/300/12
The MDSP3/300/12 offers the same features as The MDSP3/300 but additionally is supplied with three Line /Neutral 12kA SAD modules for improved clamping and response performance. Should the SAD modules be damaged due to excessive energy the MOV modules will continue to provide protection.

Single phase models of the above are available

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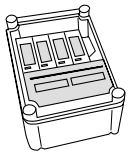
MDSP-Series
90kA, 150kA, 300kA
Modular Distribution Surge Protector
Type 2 Class II Surge Arrester

Replacement Suppression Modules
DIN rail mounted with two stage (redundant) protection, on-board monitoring, remote signalling, internal fusing and diagnostics.

Description	Part Number	Technology	Voltage Rating	Max Current Surge Handling (8/20µs)	Dimensions	Weight (gms)
90kA Line MOV Module	**DSPM/90/230R**	MOV	**230V**	90kA	**L: 98 D: 77 W: 35**	259
90kA Neutral / Earth Module	**DSPM/90/230NR**	MOV	**230V**	90kA	**L: 98 D: 77 W: 35**	208
150kA Line MOV Module	**DSPM/150/230R**	MOV	**230V**	150kA	**L: 98 D: 77 W: 35**	259
150kA Neutral / Earth Module	**DSPM/150/230NR**	MOV	**230V**	150kA	**L: 98 D: 77 W: 35**	208
12kA Line SAD Module	**DSPM/12/230R**	SAD	**230V**	12kA	**L: 98 D: 77 W: 35**	221

Alternative voltage ratings of the suppression modules are available.

Optional Extras
- MCB or fuse switch
- DIN rail mounting kit.

Specifications	**MDSP3/90** **MDSP3/150** **MDSP3/300** 	**MDSP3/90/12** **MDSP3/150/12** **MDSP3/300/12** 
Voltage Rating	**400V rms - 3 phase 4 wire star & earth**	**400V rms - 3 phase 4 wire star & earth**
Operating Voltage Range	**380-515V rms Max**	**380-515V rms Max**
Maximum Supply Current Rating	**Unlimited (Modules Parallel Connected)**	**Unlimited (Modules Parallel Connected)**
Maximum Surge Current Handling (8/20µs)	**90kA Line MOV modules (90 Series)** **150kA Line MOV modules (150 Series)** **300kA Line MOV modules (300 Series)** **Neutral / Earth module – 90 or 150kA**	**90kA Line MOV modules (90 Series)** **150kA Line MOV modules (150 Series)** **300kA Line MOV modules (300 Series)** **Neutral / Earth module – 90 or 150kA** **12kA Line SAD modules**
Response Time	**<10ns**	**<10ns Line and Neutral/Earth MOV modules** **5ns Line SAD modules**
Power Consumption	**Negligible**	**Negligible**
Leakage Current to Earth	**3mA**	**3mA**
Remote Signalling Terminals	**Rated at 230V AC 1 Amp or 30V DC 2 Amp**	**Rated at 230V AC 1 Amp or 30V DC 2 Amp**
No System Impairments Auto Reset After Surge Has Occurred	**YES**	**YES**

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MDSP-Series
90kA, 150kA, 300kA
Modular Distribution Surge Protector
Type 2 Class II Surge Arrester

Terminals	**35mm² max 2.5mm² max - Remote Signalling**	**35mm² max 2.5mm² max - Remote Signalling**
Operating Temperature	**-40° to +70° Celsius**	**-40° to +70° Celsius**
Light Emitting Diodes Module Status Indication	**2 Green - Full Protection 1 Green - Reduced Protection No Green - No Protection or No Power Red - Warning, high neutral/earth voltage present (Neutral/Earth module only)**	**2 Green - Full Protection 1 Green - Reduced Protection No Green - No Protection or No Power Red - Warning, high neutral/earth voltage present (Neutral/Earth module only)**
Type according to BS EN61643-11	**2**	**2**
Module Case	**Light Grey FR ABS**	**Light Grey FR ABS**
Enclosure	**Polycarbonate**	**Polycarbonate**
IP Rating (before installation)	**67**	**67**
Location Category BS6651:1999 Annex C	**C**	**C**
Dimensions (in mm) * L W D	**90kA 150kA 300kA 280 280 300 190 190 230 130 130 110**	**90kA 150kA 300kA 300 300 300 230 230 230 110 110 110**
Weight (in kg)	**2.8 2.8 4.4**	**4.3 4.3 5.1**
Order Code	**90kA - MDSP3/90, 150kA - MDSP3/150 300kA - MDSP3/300**	**90kA - MDSP3/90/12, 150kA - MDSP3/150/12 300kA - MDSP3/300/12**

* Dimensions and weights subject to change due to differing customer specific configurations

Silicon Avalanche Diode (SAD) and Metal Oxide Varistor (MOV) replaceable DIN rail mountable modules for MDSP3-90, 150 and 300 series

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SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

The SPM series of modular surge protection devices provides protection of equipment connected to incoming low voltage AC power supplies against the damaging effects of transient over voltages caused by local lightning strikes, or the switching of electrical inductive or capacitive loads.

SPM devices are ideally suited for the protection of electrical distribution systems in buildings, generator set standby power supplies, combined heat and power, and co-generation applications against corrupted data and software, equipment failure and structural damage.

The SPM comprises separate 1, 2, 3 or 4 modular DIN rail connection bases, and a comprehensive range of 6kA or 40kA replaceable plug-in protection modules with integral mechanical status indication, which simply plug in.

Connection bases are available with or without, an additional remote indication facility for the communication of status information into building management or SCADA systems. For installation convenience the SPM series allows the selection and configuration of any number of modules to suit individual applications, or complete assemblies of the most popular configurations.

A1SPM/6/230R

Description
The SPM series provides protection of expensive power assets against the damaging effects of mainsbourne transients through carefully matched high energy absorbing elements. Each type of plug-in protection module has a colour coded label to enable easy identification, eg: 6kA modules are purple, 40kA modules are blue, and neutral/ earth modules are green. The highly flexible characteristics of the SPM allow the selection and configuration of any number of modules to suit the surge protection requirements of individual applications.

A3SPM/40/230

DIN Rail Modular Connection Bases
The SPM series offers DIN rail mount connection bases in 1, 2, 3 or 4 modules, into which the chosen surge protection module(s) simply plug-in. Connection bases can be supplied either with, or without, additional remote indication facility for communication of status information into building management or SCADA systems.

6kA SAD Plug-in Surge Protection Modules
Silicon avalanche diode (SAD) models conduct maximum current without any increase in clamping voltage. They offer extremely low clamping of <500 volts and an exceptionally fast response time of <5 nano seconds. The robust nature of this component technology offers long product life expectancy, ideally suited for high risk mobile telecom or other mission critical applications. 6kA modules are available in phase, and neutral to earth versions.

40kA MOV Plug-in Surge Protection Modules
Metal oxide varistor (MOV) models provide excellent clamping of transients within <10 nano seconds and are ideally suited for high/medium/low risk applications, as detailed in BS EN61643-11. 40kA modules are available in phase, and neutral to earth versions.

6kA and 40kA Neutral to Earth Plug-in Surge Protection Modules
SPM series offers neutral to earth protection for use in conjunction with 6kA SAD or 40kA MOV surge protection modules. Surge voltages affect system earth to neutral to a lesser degree than the main incoming AC supply, but should be protected against damaging transients.

A3SPM/40/230NR

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SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

Complete Assemblies
For installation convenience, the SPM series offers the most popular configurations of connection bases and surge protection modules as complete protection assemblies.

- 1, 2, 3 or 4 modular connection bases
- With or without remote indication facility
- 6kA or 40kA protection
- Single or three phase
- With or without neutral/earth protection

Features
- 1, 2, 3 or 4 modular DIN rail mount connection bases.
- 6kA SAD and 40kA MOV plug-in protection modules.
- Neutral to earth plug-in modules,
- Meets the requirements of BS EN62305-4:2006 (which replaced BS6651:1999 Annex C in August 2008) and BS EN61643-11/12 – SPD Type II, Class II (MOV models) and SPD Type III, Class III (SAD models)
- Tested to IEEE C62.41
- BS6651:1999 Annex C location category C (MOV models) and B (SAD models)
- Complete assemblies of the most popular configurations.
- Hot working replaceable plug-in modules.
- Thermal and current overload fusing.
- Protection status indication, Remote status indication option.

Benefits
- Protection of expensive power assets
- 6kA SAD models provide low clamping of <500V and <5 nano second response time
- Single and three phase options
- Remote monitoring into building management or SCADA systems
- Nuisance tripping avoidance of RCD's
- Simple installation
- Maintenance free
- Suitable for new or retrofit applications

Applications
- LV switchboards
- Sub distribution boards
- Generator sets
- Mobile telecommunications
- Windfarms
- PV Systems
- Railways

Approvals
- BS EN 61643-11

Quality Assurance
Approved to BS EN ISO9001

6kA SAD Modules

A1SPM/6/230N

40kA MOV Modules

A3SPM/40/230N

Operation
SPM surge protection devices offer 6kA or 40kA surge handling capabilities, which automatically reset after clamping lesser, more frequent surges. In the event of a surge exceeding the maximum capability of the chosen SPM device, the integral suppressor will fail, and the internal fusing will safely isolate the unit to protect the equipment connected to the supply. The mechanical status indicator, incorporated on the front face of every protection module, appears green when full protection is present. When the indicator shows red, there is no protection present, and the affected plug-in protection module must be replaced.

The DIN rail connection bases offer an additional remote indication option, where volt free terminals can be used to activate an alarm, or communicate the fault condition directly into a building management system. The switching contacts are completely isolated from the internal circuitry of the SPM device and may be used for AC mains voltage 230V RMS 1 Amp or 30V DC 2 Amp loads. Provided the live terminals of the connection base have been safely isolated, the plug-in modules can be installed or replaced without switching off the main supply.

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SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

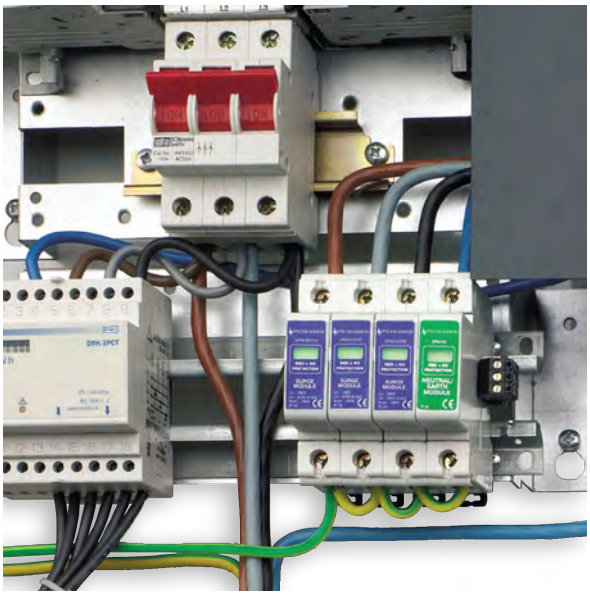
Installation

SPM surge protection devices should be installed as close as possible to the incoming AC supply position. For example, in buildings, the SPM should be installed at the supply side of the main LV switchboard.

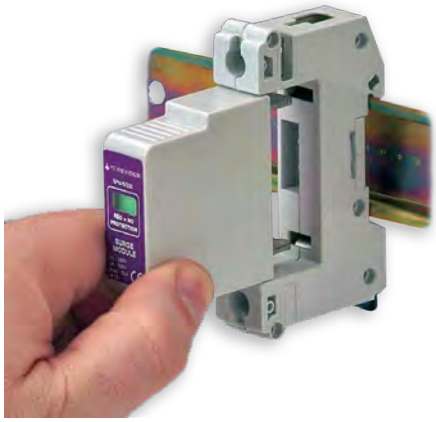
Ideally, sub-distribution panels servicing specific areas, electronic equipment, or systems should also incorporate SPM surge protection modules. To provide isolation for maintenance and protection in high load circuits, it is recommended that SPM devices be installed on the load side of an MCB - Type C, or a fuse disconnector 63A.

The modular connection bases are easily fitted onto a standard 35mm DIN rail for single or three phase system connection. The system rating or the peak current rating of the system to be protected will dictate the number and type of protection modules required, and therefore the number of connection bases used. The remote indication facility offered within connection bases is ideally suited for applications where inspection is restricted, allowing status information of SPM devices to be monitored through building management systems via volt free contacts.

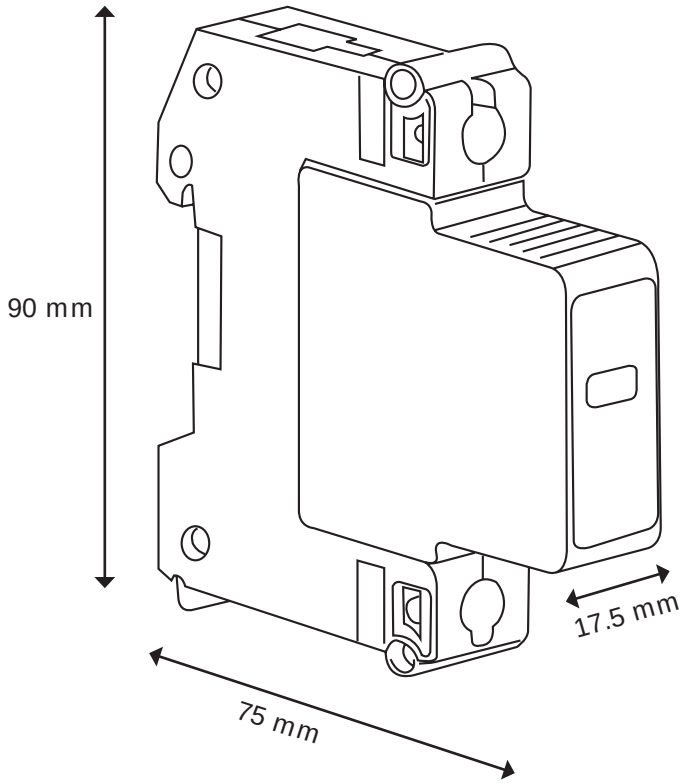
The replaceable surge protection modules simply plug-into the connection bases, and should be connected in parallel across the supply, either as multiples per phase or as a common neutral. Provided the live terminals of the connection base have been safely isolated, the plug-in modules can be installed or replaced without switching off the main supply. SPM surge protection devices are maintenance free, however, status indicators incorporated within the protection modules should be checked regularly to ensure full protection is present, particularly following local lightning activity



Easy Replaceable Modules



Dimensions (mm)



Add 15mm to width if remote indication facility required

Assembly	High	Wide	Deep
1 Module	90	17.5	75
2 Module	90	35	75
3 Module	90	52.5	75
4 Module	90	70	75

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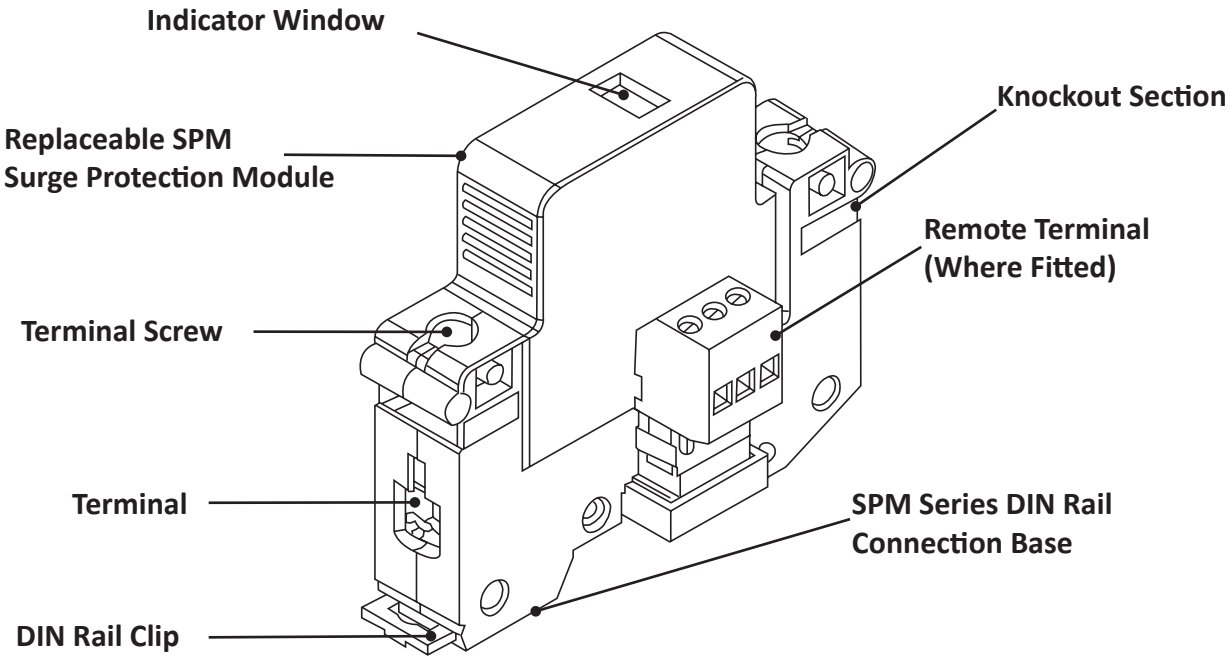
SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

SPM Composition



A1SPM/40/230

A1SPM/NE/40/230

A1SPM/40/230R

Fusing

SPM surge protection devices are suitable for direct connection to a system with line protection rated up to 100A using 16mm^2 min connecting cables, or above 100A providing in-line over current protection is fitted. In the event of a surge exceeding the maximum surge capability of the chosen SPM device, additional in-line disconnecting fuses will prevent rupture of the main fuse and disconnection of the supply. In order to discriminate with the supply fuse, the in-line fuse should be in the ratio of 1:2. The in-line fuses can be replaced by MCB's Type C.

Wiring Connections

SPM connection bases should be connected in parallel across the supply to be protected. The connecting cable does not carry the supply current, only the current associated with suppressing the transient overvoltage. SPM surge protection devices should be installed on the load side of an MCB or fuse disconnector, enabling isolation for maintenance if required, and protection of high load circuits. Each module is internally fused for both thermal and over current protection and will discriminate with the supply MCB or fuse disconnector. If RCD's are used, the SPM must be fitted in front of the device to avoid nuisance tripping.

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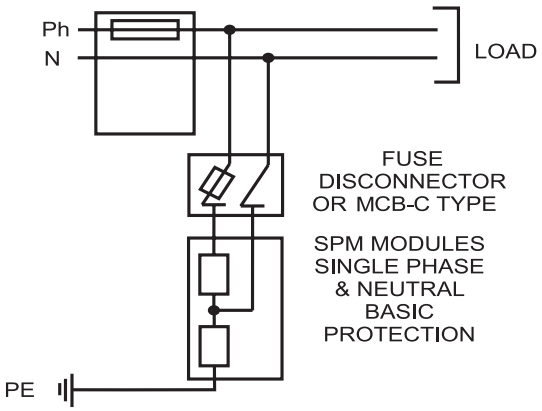
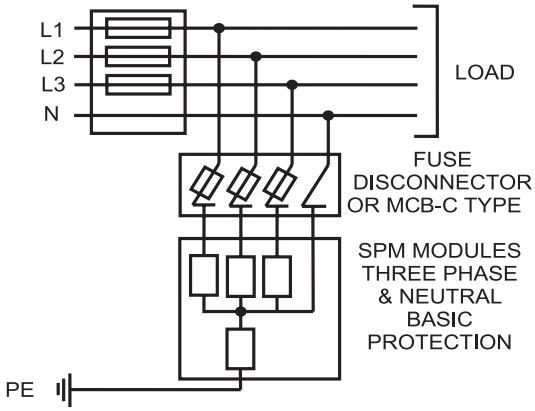
SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

Single Phase Wiring

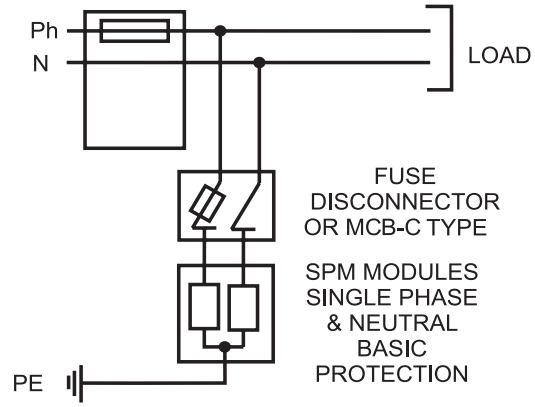


Three Phase Wiring

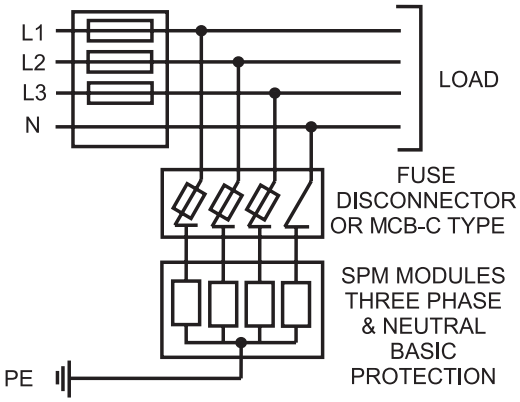


TNS wiring: the neutral conductor and the earth conductor are separated.

Single Phase TNS Wiring

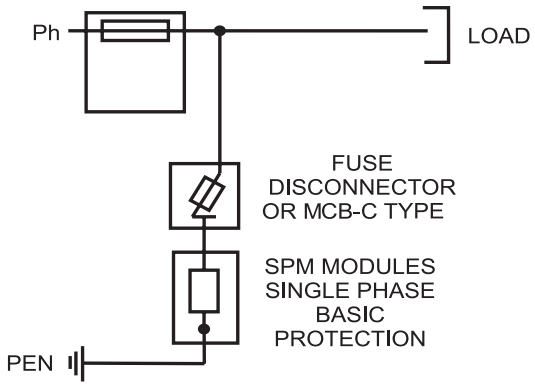


Three Phase TNS Wiring

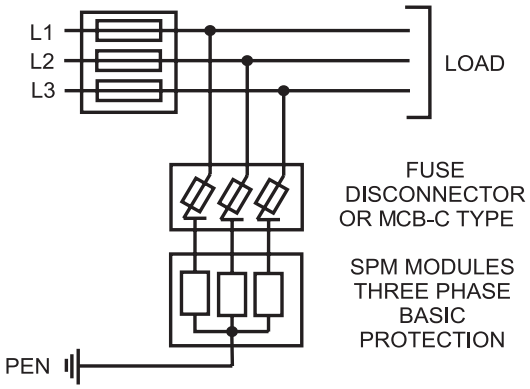


TNC wiring: the neutral conductor and the protective conductor merge into one (PEN) conductor

Single Phase TNC Wiring



Three Phase TNC Wiring



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SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

Specification	
Surge Handling Capabilities	6kA or 40kA
Surge Protection Technologies	6kA: SAD 40kA: MOV
Nominal Voltage Rating	Single phase: 230V RMS Three phase: 400V RMS
Operating Voltage Range	Single phase: 200-300 Volts Three phase: 380-515 Volts
Frequency	48/62 Hz
Maximum Current Rating	Not applicable (parallel connected)
Nominal Discharge Current (8/20µs) [In]	6kA SAD 20kA MOV
Max Surge Current Handling (8/20µs) [Imax]	6kA SAD 40kA MOV
Response Time	6kA SAD Models: <5ns 40kA MOV Models: <10ns
Short-circuit Withstand Capability	40kA with backup fuse 100A gL/gG max
Thermal Overload Fusing	120°C
Nominal Power Consumption	<10 µA
Operating Temperature	-40 to +70°C
Protection at 5kA Up (8/20µs)	6kA SAD: <550V peak 40kA MOV: <1100V peak
Protection at Imax (8/20µs)	6kA SAD: <550V peak 40kA MOV: <1600V peak

Tested or Compliant With	BS EN 61643-11, BS EN 62305-4:2006, BS6651:1999 Annex C
Replaceable Plug-in Modules	2 pin connection to base
Protection Status Indicators	Mechanical flag mechanism Full protection present: Green No protection: Red
Remote Status Indication Option	Hard wired
Remote Indication Connections	Volt free N/O or N/C contacts
Terminals	Base: 16-35mm^2 Remote: 2.5mm^2 max
Remote Signalling Terminals	Rated at 230V RMS 1A or 30V DC 2A
Module and Base Material	Flame retardant ABS
Device Style	35mm DIN Rail mounted to EN 50022
Type According to BS EN 61643-11	SPD Type II, Class II (MOV models) SPD Type III, Class III (SAD models)
Protection Rating	IP20
Dimensions (Single Module Assembly)	90mm H x 17.5mm W x 75mm D

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SPM Series

Plug-in Surge Protector
Type 2/3 (Test Class II/III)
Single & Three Phase Surge Arresters

Product Codes	
6kA SAD Plug-In Surge Protection Modules & Base Assemblies	**Catalogue No**
6kA Single Phase (L-N, L-E)	A1SPM/6/230
6kA Single Phase with Remote Indication (L-N, L-E)	A1SPM/6/230R
6kA Single Phase with Neutral/Earth	A1SPM/6/230N
6kA Single Phase with Neutral/Earth & Remote Indication	A1SPM/6/230NR
6kA Three Phase (L-N, L-E)	A3SPM/6/230
6kA Three Phase with Remote Indication (L-N, L-E)	A3SPM/6/230R
6kA Three phase with Neutral/Earth	A3SPM/6/230N
6kA Three Phase with Neutral/Earth & Remote Indication	A3SPM/6/230NR
6kA Neutral/Earth	A1SPM/NE/6/230
40kA MOV Plug-In Surge Protection Modules & Base Assemblies	**Catalogue No**
40kA Single Phase (L-N, L-E)	A1SPM/40/230
40kA Single Phase with Remote Indication (L-N, L-E)	A1SPM/40/230R
40kA Single Phase with Neutral/Earth	A1SPM/40/230N
40kA Single Phase with Neutral/Earth & Remote Indication	A1SPM/40/230NR
40kA Three Phase (L-N, L-E)	A3SPM/40/230
40kA Three phase with Remote Indication (L-N, L-E)	A3SPM/40/230R
40kA Three Phase with Neutral/Earth	A3SPM/40/230N
40kA Three Phase with Neutral/Earth & Remote Indication	A3SPM/40/230NR
40kA Neutral/Earth	A1SPM/NE/40/230
Replacement Plug-In Surge Protection Modules	**Catalogue No**
6kA SAD Module	SPM/6/230
6kA SAD Neutral/Earth Module	SPM/NE/6/230
40kA MOV Module	SPM/40/230
40kA MOV Neutral/Earth Module	SPM/NE/40/230
DIN Rail Modular Connection Bases	**Catalogue No**
Single Module Base	SPMB1
Single Module Base With Remote Indication	SPMB1/R
Two Module Base	SPMB2
Two Module Base With Remote Indication	SPMB2/R
Three Module Base	SPMB3
Three Module Base With Remote Indication	SPMB3/R
Four Module Base	SPMB4
Four Module Base With Remote Indication	SPMB4/R

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6651C-Series

Type 2/3 Class II/III Surge Arrester

The 6651C unit is a Type 2 surge protector (BS EN 61643-11), suitable for use at the boundary of Lightning Protection Zones 1-2 (BS EN 62305). The protector provides an economical means of preventing damage to electrical installations from induced voltage transients caused by switching or nearby lightning strikes.

The 6651C unit provides three mode system protection from mainsborne voltage spikes and surges that can occur between phase and neutral, phase and earth, neutral and earth and additionally phase to phase for the three phase model.

This protection is achieved by using high energy elements which absorb or redirect incoming mainsborne transients. Every unit has two stages of protection, the status of which are clearly indicated by lights incorporated in the front panel, thus ensuring continuity of protection by allowing time for replacement once the first stage has ceased to protect.

6651C-1 Single Phase

Installation

Designed to be quickly and easily installed either alongside the incoming electrical supply or sub-distribution panels, the unit is connected in parallel with the mains supply, thus eliminating complicated by-pass wiring associated with series suppressors. Connected in this manner the 6651C thereby carries only the current associated with the transient being discharged.

By connecting the 6651C ahead of a RCD the incidence of nuisance tripping may be reduced. The unit is suitable for direct connection to a line rated up to 60 Amps but can be connected via 60 Amp series fuses (BS HD 60269-2:2010, BS 88-2:2010) for lines up to 100 Amps (*If MCBs are used in place of fuses they should be of type C*).

Since the 6651C should be installed as close as possible to the distribution panel the half metre cable supplied should be reduced in length if possible and as appropriate. The 6651C unit may be installed at any angle to achieve minimum cable length, so the cable entry may be at the top, bottom, right or left of the housing.

6651C-3 Three Phase

Operation

The 6651C will automatically reset after clamping surges up to the required 10kA level and the Green light(s) indicates that full protection is present. However, after clamping a number of 10kA surges the energy handling capability of the unit's first stage may be exceeded causing the 6651C's internal fuses to operate thus safely disconnecting this stage.

The Red light(s) will then also be illuminated and, whilst the system will still be adequately protected, the unit should be replaced before a further large surge can remove the second protection stage. There is no protection present when only the Red light(s) is illuminated, but unprotected mains power will still be supplied to the system.

Revision: **vPD2, 07/04/17**
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6651C-Series

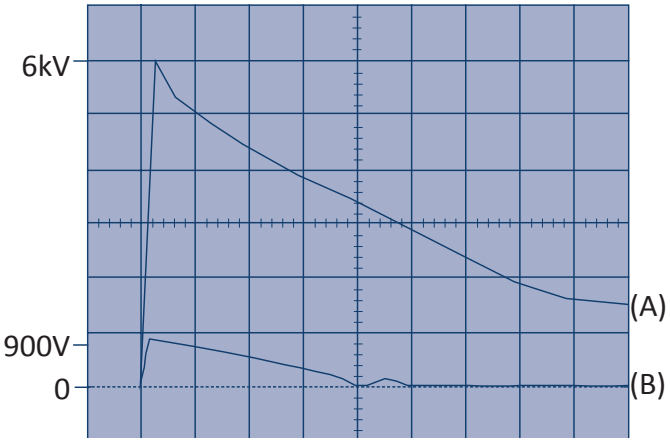
Type 2/3 Class II/III Surge Arrester

Let Through Voltage
The let-through voltage of the 6651C, including 0.5 metre of cable, is less than 900 volts in all modes when tested at 6kV 1.2/50µs o/c 3kA 8/20µs s/c

Maintenance
The unit requires no maintenance other than a routine examination of the status of the lights and replacement if required.

Safety
The 6651C unit includes internal fuses to ensure that suppression components are adequately protected in the event of violent electrical discharge.

Example of 6651C Voltage Clamping



Specifications	Single Phase 	Three Phase 
Voltage rating (Nominal)	230V rms	400V rms
Maximum Operating voltage	300V rms	L-N 300 V rms
		L-L 500 V rms
Maximum current rating	Unlimited (Parallel Connection)	Unlimited (Parallel Connection)
Maximum surge current handling (8/20 µs)	10 kA	10 kA
Response time	<10 ns	<10 ns
Power consumption	Negligible	Negligible
Leakage current	0.15 mA	0.40 mA
Cable Supplied (0.5 m)	3 Core	5 Core
	2.5mm²	2.5mm²
Operating temperature	-40° to +70° Celcius	-40° to +70° Celcius
Indicator Lights	Green - Full Protection	Green - Full Protection
	Red & Green - Reduced Protection	Red & Green - Reduced Protection
	Red - No Protection	Red - No Protection
Case	Powder Coated Mild Steel	Powder Coated Mild Steel
IP Rating	54	54
Type according to BS EN 61643-11	2	2
Dimensions (in mm)		
L:	182	182
W:	81	81
D:	61	61
Weight (in grams)	900	1100
Part Code	**6651C/1**	**6651C/3**

Revision: **vPD2, 07/04/17**
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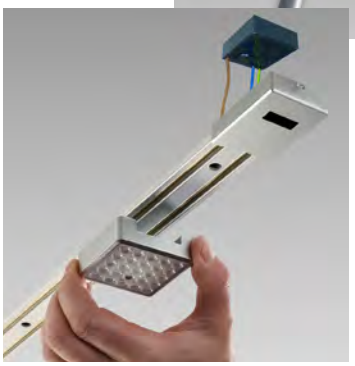
T3SP1/1.5/3.0/230S

Type 3 Class III Surge Arrester

A class 3 surge arrestor that is a flexible solution to protecting individual pieces of equipment. Perfectly suited to protecting – ring mains & individual sockets, switch fuse spurs, lighting, fire alarm panels, CCTV cameras etc.

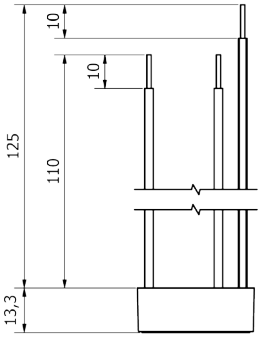
Its small size means that it can be mounted in confined spaces and the audible alarm will indicate if the arrestor needs to be replaced

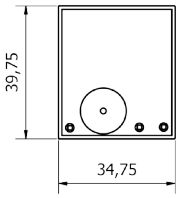
The T3SP1/1.5/3.0/230S will offer up to 10 metres of protection either side of the device it is installed on.



Specification	
SPD according to EN 61643-11	Type 3
SPD according to IEC 61643-1/-11	Class III
Nominal a.c. voltage (U_N)	230 V
Max. continuous operating a.c. voltage (U_c)	250 V
Nominal discharge current (8/20 µs) (I_n)	1.5 kA
Total discharge current (8/20 µs) [L+N-PE] (I_{total})	3 kA
Combined impulse (U_{oc})	3 kV
Combined impulse [L+N-PE] (U_{oc} total)	6 kV
Voltage protection level [L-N] (U_p)	≤ 1.25 kV
Voltage protection level [L/N-PE] (U_p)	≤ 1.5 kV
Response time [L-N] (t_A)	≤ 25ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	32 A gL/gG
Short-circuit withstand capability for mains-side	6 kA_{ms}
Temporary overvoltage (TOV) [L-N] (U_T)	335 V / 5 sec.
Temporary overvoltage (TOV) [L/N-PE] (U_T)	400 V / 5 sec.
Temporary overvoltage (TOV) [L+N-PE] (U_T)	1200 V + U_{CS} / 200 ms
Fault indication	Acoustic signal on
Number of ports	1
Operating temperature range (T_u)	-25°C... + 70
Terminal wires	1 mm², 125 mm long
Enclosure material	Epoxy encapsulation, black, uL 94 VØ
Place of installation	Indoor installation
Degree of protection of installed device	IP 50
Dimensions	35 x 40 x 13.5
Part Code:	**T3SP1/1.5/3.0/230S**

Dimensions in mm





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SPLB1/13
Spur Protector
Type 3 Class III Surge Arrester

The SPLB1/13 'Spur Protector' provides an economic means of preventing damage to sensitive electronic equipment on individual ring mains, from the dangers of transients, which can occur as the result of a nearby lightning strike or surges derived from the switching of inductive or capacitive loads.

The SPLB1/13 'Spur Protector' is ideally designed for use in industrial and commercial applications.

The Spur Protector can either be wired to the equipment as an inline protector or can be hardwired into wall mounted conduits. The Spur Protector is best used as part of a totally integrated surge protection system and should be considered as the 'final link in the chain' when planning a systematic and coordinated approach to surge protection and it is therefore essential that main service and distribution panel protection is provided as a 'first line' of defence.

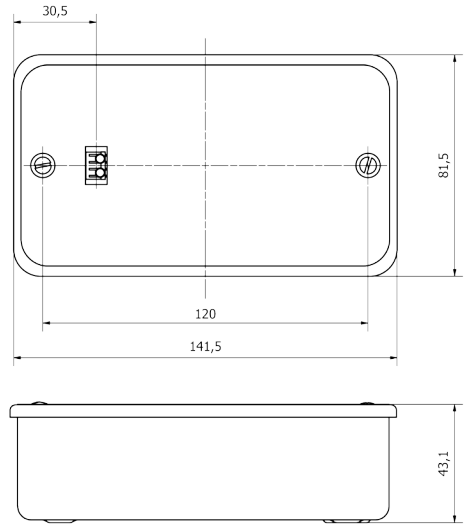
The Spur Protector provides suppression from mainsborne voltage spikes and surges between live and earth, live and neutral and neutral and earth conductors, thus ensuring protection in all three modes. This protection is achieved by using high energy absorbing elements which are accurately matched to the internal fuse protection of the Spur Protector. Two status lights are provided - red and green. The green LED indicates mains power 'ON'. The red LED when lit indicates loss of protection.

The Spur Protector features high surge current handling capability which under normal conditions will automatically reset after clamping smaller, more frequently occurring surges. However, should a large surge current, in excess of 6.5kA appear on the line it will be clamped by the Spur Protector, but protection will be lost.

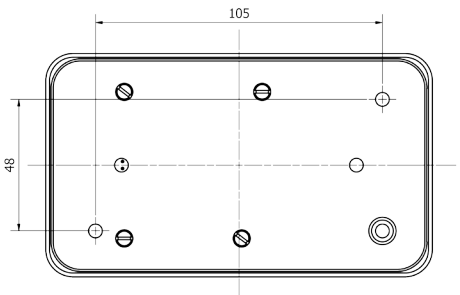
In this instance, the red LED illuminates to indicate that protection is no longer present and the unit should be replaced. With both lights on, power will still be supplied to the load, but without surge protection.

Specification	
Operating Voltage	230 Volts rms nominal 280 Volts rms max
Maximum Current Rating	13Amps
Leakage Current*	125µA at 230V rms
Maximum Surge Current (8/20us) [Per Element]	6.5kA
Response Time	<10ns
Let Through Voltage at 3kA 8/20µs	850 volts L-N, L-E, N-E
Type (BS EN 61643-11)	Type 3 Class III
Status Indication	Green - Power 'ON' Protection Operational Green & Red - Power 'ON' No Protection
Case	Steel - epoxy paint
Dimensions in (mm) L	142
W	82
D	44
Weight (in grams)	431g
Part Code	**SPLB1/13**

Dimensions in mm



Reverse Fixing in mm



*The surge protection devices commence clamping surges as low as 450 volts and therefore appear as less than 2 MΩ resistance at 500V DC.

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MBP Series
Mains Barrier Protection
In-Line Surge Protectors

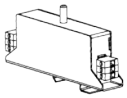
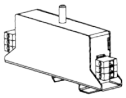
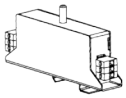
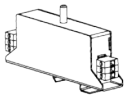
The PD Devices MBP In-line Mains Barrier Protectors are designed for business and industrial applications, these products are designed to provide protection as standalone modules or in combination with In-line Data Surge Protectors to protect any combination of data and power lines against the damaging effects of transient overvoltage caused by lightning, switching and electrically “noisy” sources.

Applications:

- Building-to-building power supplies.
- Long-range data acquisition and display systems. E.g. Sports venues.
- Plant and process control systems.
- Signalling and telemetry to remote sites.
- “Intelligent” stage lighting.
- Computer networks.
- Electronic cash registers (EPOS).
- Closed circuit television (CCTV security).

Standard Features:

- Rugged construction (powder coated steel).
- DIN rail mounting for modular installation.
- Two part push in terminal connectors for ease of installation or replacement.
- Earth stud provided for ease of multiple earthing of units.
- Low “let through” voltage.
- Fast response times.
- High surge handling capabilities

Specifications				
Part Code	**MBP/5/110**	**MBP/5/230**	**MBP/16/110**	**MBP/16/230**
Description	Mains Barrier Protector	Mains Barrier Protector	Mains Barrier Protector	Mains Barrier Protector
Operating Voltage	110 Volts rms nominal 135 Volts rms Max	230 Volts rms nominal 280 Volts rms Max	110 Volts rms nominal 135 Volts rms Max	230 Volts rms nominal 280 Volts rms Max
Maximum Current Rating	5 Amp	5 Amp	16 Amp	16 Amp
Response Time	<10ns	<10ns	<10ns	<10ns
Full Premium Three Mode Protection (L-N, L-E and N-E)	YES	YES	YES	YES
Power Consumption	Negligible	Negligible	Negligible	Negligible
Maximum Surge Current Handling (8/20µs)	10kA	10kA	10kA	10kA
Leakage Current	150µA	150µA	150µA	150µA
No system impairments auto reset after surge has occurred	YES	YES	YES	YES

Revision: **vPD3, 13/02/18**
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MBP Series
Mains Barrier Protection
In-Line Surge Protectors

Terminals	3mm2 max - Line, Neutral, Earth	3mm2 max - Line, Neutral, Earth	3mm2 max - Line, Neutral, Earth	3mm2 max - Line, Neutral, Earth
Operating Temperature	-25° to +70°C	-25° to +70°C	-25° to +70°C	-25° to +70°C
Location Category BS6651:1999 Annex C	C	C	C	C
Enclosure	Steel - epoxy paint	Steel - epoxy paint	Steel - epoxy paint	Steel - epoxy paint
Response Time	<10ns	<10ns	<10ns	<10ns
Dimensions (in mm) W D H	130 45 25	130 45 25	130 45 25	150 50 23

LET THROUGH VOLTAGE OF MBP SERIES	
Tests simulating the effects of Lightning and switching transients	Phase/Neutral Phase/Earth
6kV 1.2/50µs open circuit voltage 3kA 8/20µs short circuit current	590V
4kV 1.2/50µs open circuit voltage 2kA 8/20µs short circuit current to IEC 801-5 (draft)	550V
5kA 8/20µs to NFC 61-740	660V
6kV 0.5µs 100kHz ring wave 500A	490V

OPTIONAL EXTRAS:

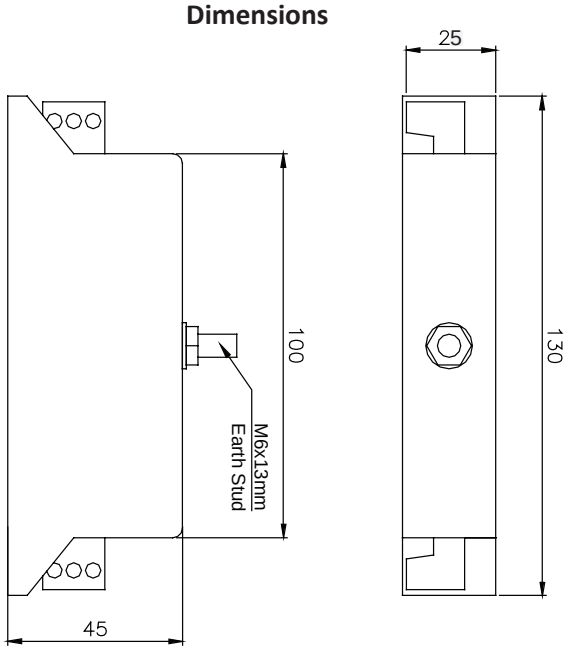
An extensive range of DIN rail mounting kits and

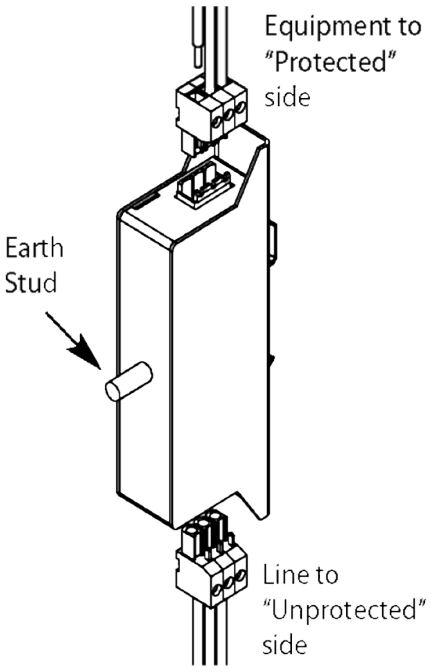
IP rated enclosures are available for the above.

Specifications:

- 5 or 16A units available
- Can be fitted to single or 3 phase systems (NB cannot be connected phase to phase).
- Supply must be fused at or below rated current.

Dimensions





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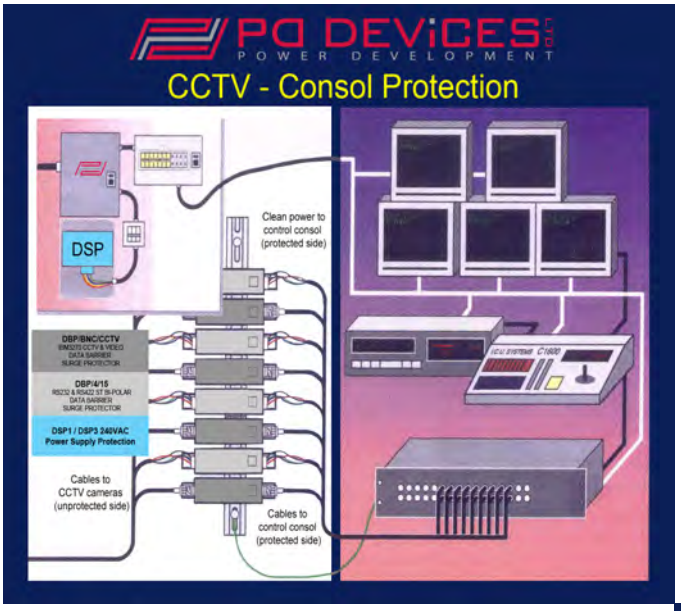
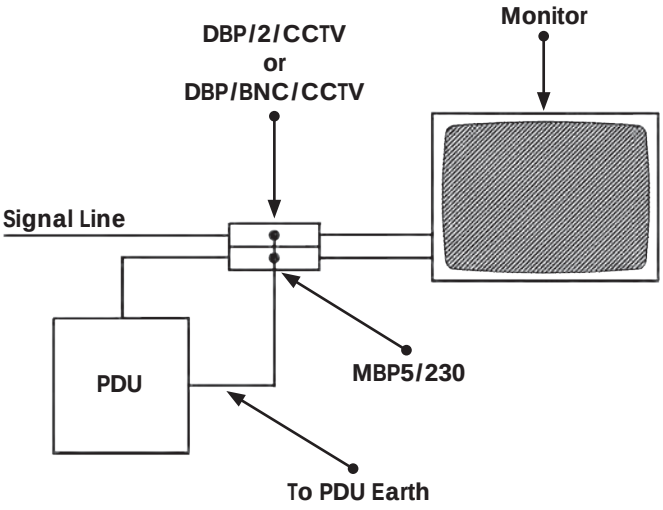
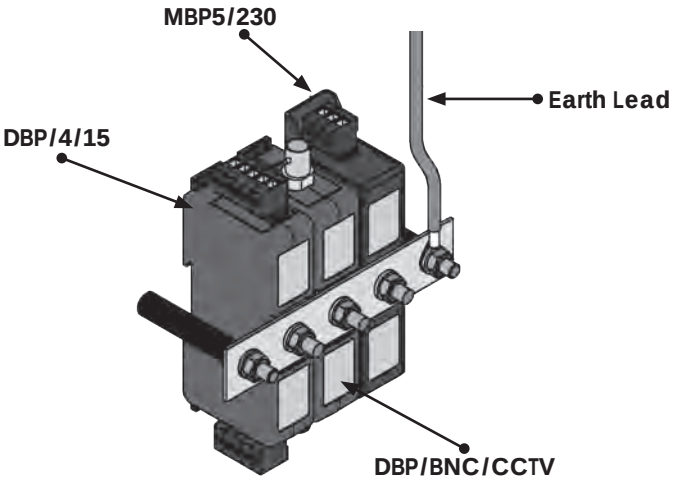
MBP Series
Mains Barrier Protection
In-Line Surge Protectors

MBP SERIES FOR CCTV PROTECTION

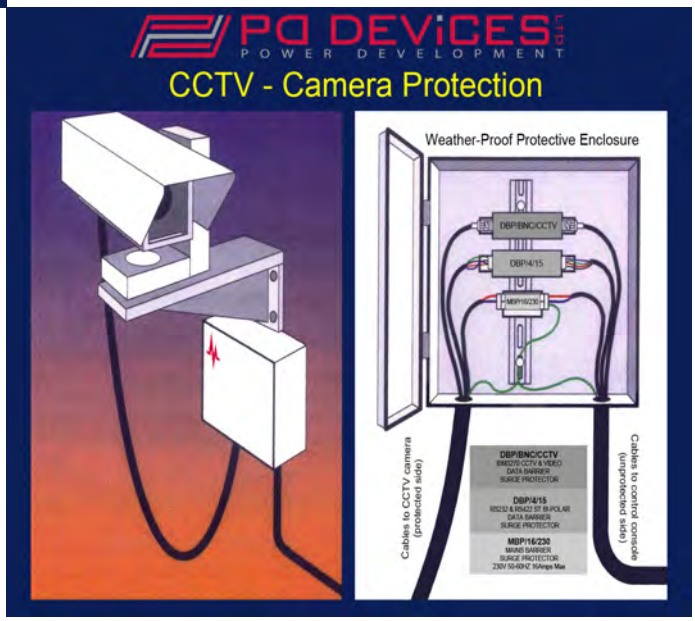
Used with appropriate protectors from our extensive range as illustrated below, the MBP forms an important part of CCTV surge protection systems. Video circuit protection for cabling of CCTV, Consoles, Camera pan and tilt and Control Room Mains should also be installed.







MBP & DBPApplication



*The following are ideal for use with the MBP series for CCTV Video System applications, for our extensive range of DBP please look at our DBP series datasheet.

DBP/4/15

DBP/BNC/CCTV

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DBP Series
Data Barrier Protection

Designed for business and industrial applications, these products provide protection for local area networks, CCTV/ video equipment, computer serial communication interfaces and process control systems against the damaging effects of transient overvoltages caused by lightning, AC power systems and other electrically “noisy” sources.

Low energy and seemingly harmless transients can cause gradual degradation of the sensitive integrated circuits used in network interfaces and CCTV hardware. This will lead to the eventual failure of the equipment.

At the other end of the scale are the high energy surges induced by lightning and direct short-circuit contact with power cables which can result in the immediate destruction of circuitry.

Computer network systems using coaxial or twisted pair cabling are subject to electrical interference pick-up from surges caused by earth potential differences - a particular problem for LANs running between buildings. Low energy transients can be the result of electrostatic discharge and power switching in electrical machinery.

Due to earth potential differences, long-distance cables, such as RS422 and RS485 systems operating over large areas, are particularly susceptible to the effects of lightning strikes even when they are several miles away.

The DBP Series offers low cost and effective surge suppression for applications where cables leave the security of the office and enter electrically harsh environments.

Features

- Exceptionally high surge handling capability meets the 10kA requirements of BS6651:1999 Annex C, to provide long life and low maintenance
- Meets the requirements of BS EN62305-4:2006 (which replaced BS6651:1999 Annex C in August 2008) and BS EN61643 21/22
- BS6651:1999 Annex C location category C
- Rugged construction (grey moulded plastic).
- DIN rail mounting for modular installation.
- DIN rail earthing provided for ease of installation.
- ST models provided with two port push in screw terminal connectors for ease of installation or replacement.
- Panel mounting screw holes for permanent installation.
- Low “let through” voltages.
- Fast response times.
- Negligible effect on normal line operation.
- Additional earth stud provided for installation versatility.
- Many models offer lower line resistance and higher line current capability than most other competitors products.

Instant protection from surges caused by:

- Lightning.
- Nearby power systems.
- Power-cross faults (direct contact with power cables).
- Electrical machinery.
- Electro-static discharge.

Revision: **vPD5, 13/02/18**
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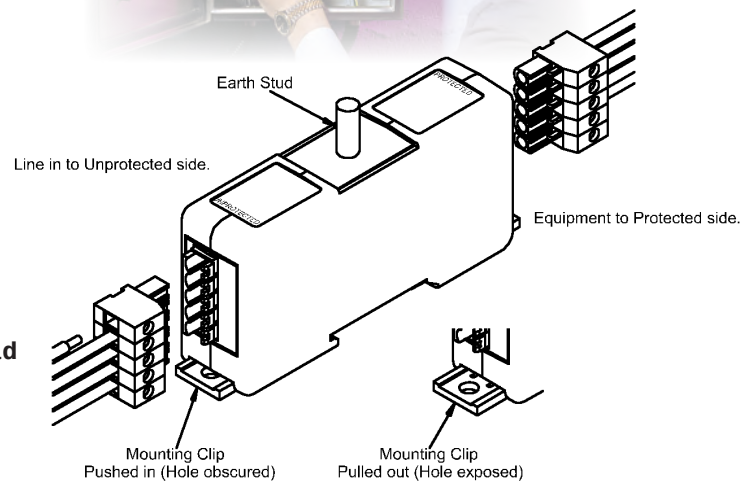
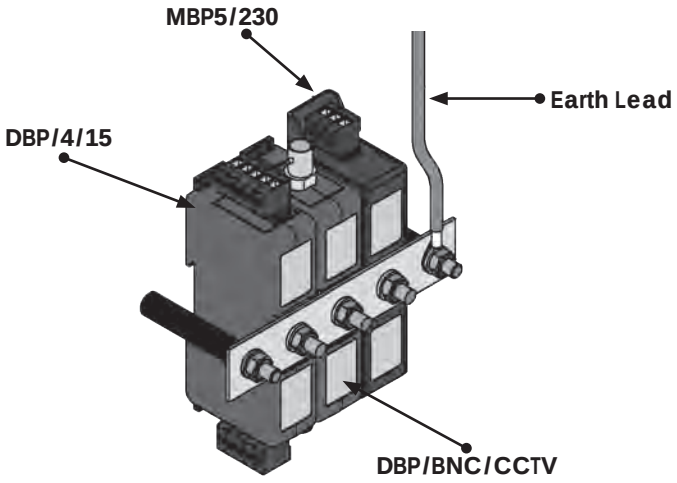
DBP Series
Data Barrier Protection

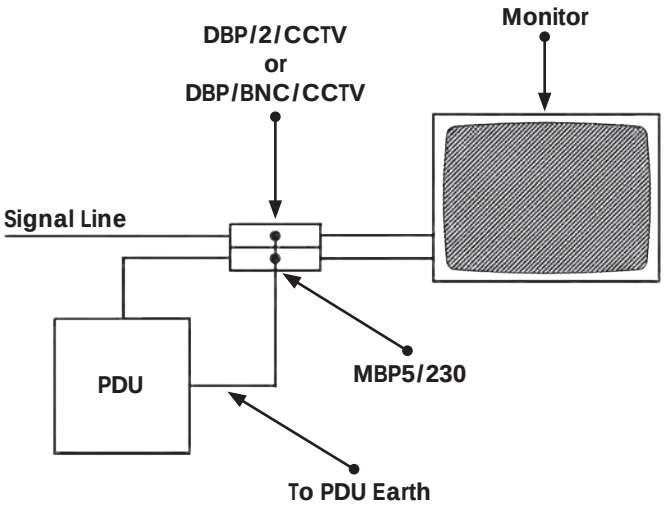
Applications

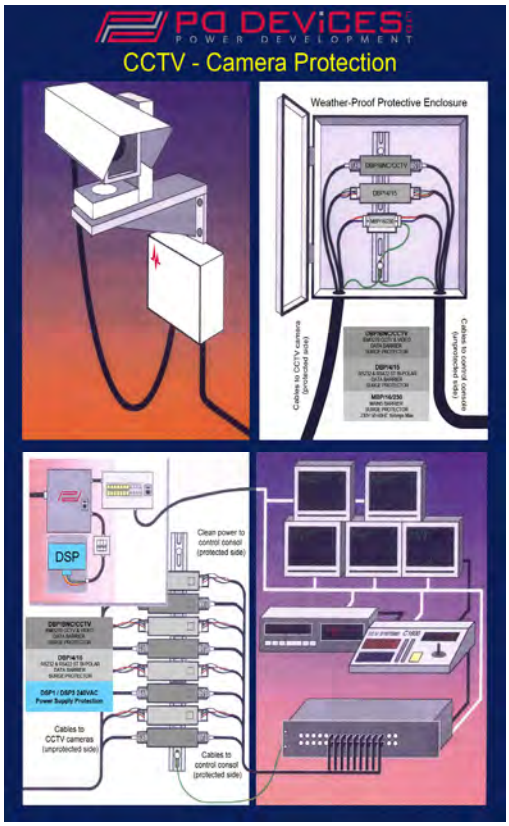
- Building-to-building serial communication.
- Long-range data acquisition and display systems at sports venues.
- Plant and process control systems.
- Signalling and telemetry to remote sites.
- “Intelligent” stage lighting.
- Local area networks (LAN)
- Office computer networks.
- Electronic cash registers (EPOS).
- Ethernet (10Base2, 10Base5 & 10BaseT), Cat 5, RS485, RS232, RS422 and Token Ring
- Closed circuit television (CCTV security).



DBPApplication







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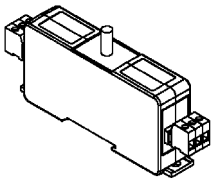
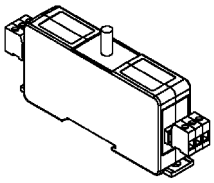
DBP Series
Data Barrier Protection



DBP/2/06

RS485 ST BARRIER

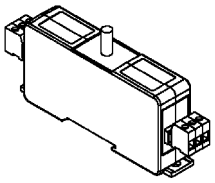
A barrier protector designed for RS485 lines providing screw terminals for secure connection. Intended for hardwired installation on remote computer controlled equipment.



DBP/2/15

RS232 ST BARRIER

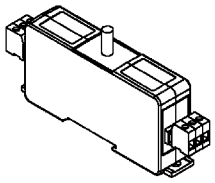
A barrier protector for RS232 serial communications requiring hardwired installation in low-risk situations. Ideal for short building-to-building cable runs and where cables pass through a factory area.



DBP/2/30

4-20mA ST LOOP BARRIER

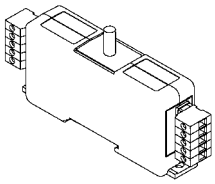
This device provides protection for process control applications using 4-20mA current loop signalling. A pluggable terminal strip allows the unit to be readily disconnected once wired into the circuit.



DBP/2/50

TWISTED PAIR BARRIER

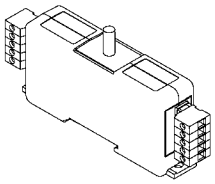
A barrier protector designed for twisted pair data communication signal lines up to 50 volts. Intended for hardwired installation and provided with screw terminals for secure connection.



DBP/4/06

RS485 ST BARRIER

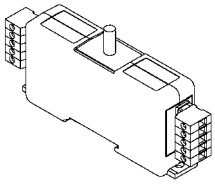
A barrier protector designed for RS485 lines providing screw terminals for secure connection. Intended for hardwired installation on remote computer controlled equipment.



DBP/4/15

RS232 ST BARRIER

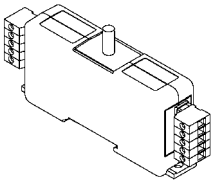
A barrier protector for RS232 serial communications requiring hardwired installation in low-risk situations. Ideal for short building-to-building cable runs and where cables pass through a factory area.



DBP/4/15

RS422 ST BI-POLAR BARRIER

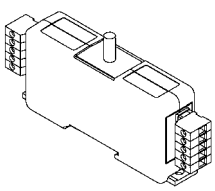
A bi-polar RS422 surge barrier for long distance serial communication lines requiring hardwired installation. Applications include data collection and public display as well as process control



DBP/4/30

4-20mA ST 2-PAIR LOOP BARRIER

A version of the 4-20mA Current Loop Barrier provides dual-pair protection required on systems using bi-directional data transfer or process control signalling.



DBP/4/50

TWISTED PAIR BARRIER

A barrier protector designed for twisted pair data communication signal lines up to 50 volts. Intended for hardwired installation and provided with screw terminals for secure connection.

Revision: **vPD5, 13/02/18**
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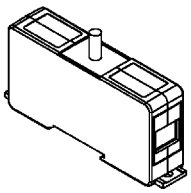
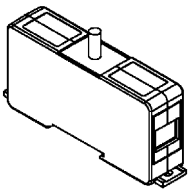
DBP Series
Data Barrier Protection



DBP/RJ45/100BT

CATEGORY 5 BARRIER

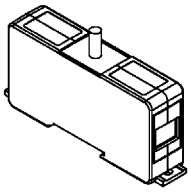
Provides primary level surge protection for category 5 cabling installations using RJ45 modular jack connectors.



DBP/RJ45/100BT

TOKEN RING BARRIER

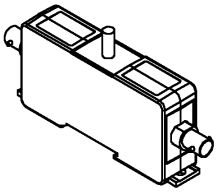
This barrier device provides protection for Token Ring systems using RJ45 modular jack connectors.



DBP/RJ45/100BT

10BASET BARRIER

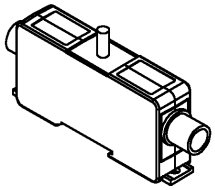
Designed for Ethernet 10BaseT (twisted pair) systems with RJ45 modular jack connectors.



DBP/BNC/10B2

10BASE2 BARRIER

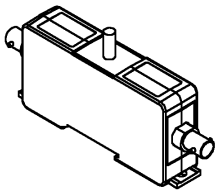
Provides primary level surge protection for Ethernet 10Base2 (ThinNet or CheaperNet) systems with BNC connectors.



DBP/N/10B5

10BASE5 BARRIER

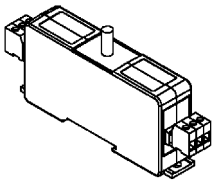
A barrier protector designed for Ethernet 10Base5 (ThickNet) systems with 'N' type connectors where "backbone" cables connect buildings.



DBP/BNC/CCTV

CCTV & VIDEO BARRIER

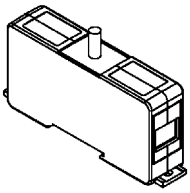
Designed to protect CCTV video systems with coax connectors. Particularly ideal for remotely situated cameras with BNC connectors.



DBP/2/CCTV

CCTV & VIDEO ST BARRIER

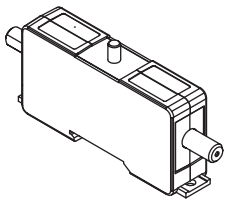
Similar to the CCTV & VIDEO BARRIER, this unit is designed specifically for CCTV video systems requiring hardwired installation. Particularly ideal for systems using twisted pair or with no standard connection in remote areas.



DBP/RJ45/100BT/PoE

10/100BASET BARRIER for Power over Ethernet

RJ45 surge protector for powered ethernet connections.



DBP/CATV

Cable TV / Satellite System Barrier

Provides surge protection for Cable TV and Satellite Systems. Protection is provided against the damaging effects of transient overvoltages caused by lightning, AC power sub systems and other electrically "noisy" sources.

Optional Extras

An extensive range of DIN rail mounting kits and IP rated enclosures are available.

Revision: **vPD5, 13/02/18**
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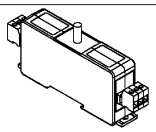
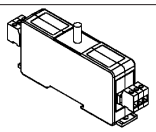
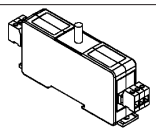
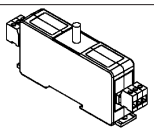
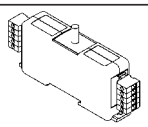
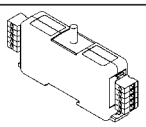
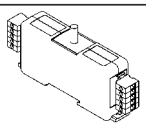
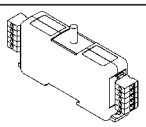
DBP Series
Data Barrier Protection

Specifications				
Part Code	**DBP/2/06**	**DBP/2/15**	**DBP/2/30**	**DBP/2/50**
Description	RS485 ST Barrier	RS232 ST Barrier	4-20mA ST Loop Barrier	Twisted Pair Barrier
Connectors	Screw Terminals 2-Wire	Screw Terminals 2-Wire	Screw Terminals 2-Wire	Screw Terminals 2-Wire
Nominal Working Voltage (DC)	6V	15V	30V	50V
Maximum Working Voltage (DC)	7.5V	6.5V	36.5V	58V
Current Rating (Signal)	1.25A	1.25A	1.25A	1.25A
Clamping Voltage [1]	11V	27V	45V	75V
Maximum Surge Current [2]	10kA	10kA	10kA	10kA
Line Resistance (±10%)	1Ω	1Ω	1Ω	1Ω
Response Time	<10ns	<10ns	<10ns	<10ns
System Exposure Level [3]	High	High	High	High
Operating Temperature	-25° to +70° C	-25° to +70° C	-25° to +70° C	-25° to +70° C
Dimensions (in mm) W	135	135	135	135
D	50	50	50	50
H	25	25	25	25

Specifications				
Part Code	**DBP/4/06**	**DBP/4/15**	**DBP/4/30**	**DBP/4/50**
Description	RS485 ST Barrier	RS232 ST Barrier	4-20 mA ST 2-pair Loop Barrier	Twisted Pair Barrier
Connectors	Screw Terminals 4-Wire	Screw Terminals 4-Wire	Screw Terminals 4-Wire	Screw Terminals 4-Wire
Nominal Working Voltage (DC)	6V	15V	30V	50V
Maximum Working Voltage (DC)	7.5V	16.5V	36.5V	58V
Current Rating (Signal)	1.25A	1.25A	1.25A	1.25A
Clamping Voltage [1]	11V	27V	45V	75V
Maximum Surge Current [2]	10kA	10kA	10kA	10kA
Line Resistance (±10%)	1Ω	1Ω	1Ω	1Ω
Response Time	<10ns	<10ns	<10ns	<10ns
System Exposure Level [3]	High	High	High	High
Operating Temperature	-25° to +70° C	-25° to +70° C	-25° to +70° C	-25° to +70° C
Dimensions (in mm) W	135	135	135	135
D	50	50	50	50
H	25	25	25	25

Revision: **vPD5, 13/02/18**
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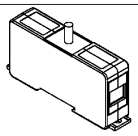
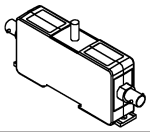
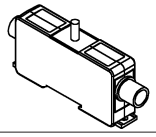
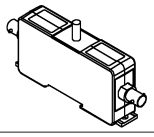
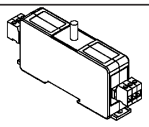
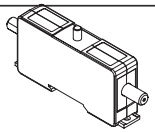
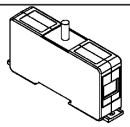
DBP Series
Data Barrier Protection

Specifications				
Part Code	**DBP/RJ45/100BT**	**DBP/BNC/10B2**	**DBP/N/10B5**	**DBP/BNC/CCTV**
Description	Category 5 Barrier	10Base2 Barrier	10Base5 Barrier	CCTV & Video Barrier
Connectors	Modular RJ45	BNC-Type Coaxial	N-Type Coaxial	BNC-Type Coaxial
Nominal Working Voltage (DC)	≤4.0V	-2.05V	-2.05V	2.0V
Maximum Working Voltage (DC)	4.0V	-4.5V	-4.5V	6.5V
Current Rating (Signal)	330mA	330mA	330mA	330mA
Clamping Voltage (1)	25V/600V	20V/325V	20V/325V	17V
Maximum Surge Current (2)	10kA	10kA	10kA	10kA
Line Resistance (±10%)	1Ω	0.5Ω	0.5Ω	1Ω
Response Time	<10ns	<10ns	<10ns	<10ns
System Exposure Level (3)	High	High	High	High
Operating Temperature	-25° to +70° C	-25° to +70° C	-25° to +70° C	-25° to +70° C
Dimensions (in mm) W	135	135	135	135
D	50	50	50	50
H	25	25	25	25

Specifications			
Part Code	**DBP/2/CCTV**	**DBP/CATV**	**DBP/RJ45/100BT/PoE**
Description	CCTV & Video ST Barrier	Cable TV / Satellite System Barrier	10/100 Power over Ethernet protector
Connectors	Screw Terminals 2-Wire	F Type Coaxial	RJ45
Nominal Working Voltage (DC)	2.0V	50V	57V
Maximum Working Voltage (DC)	6.5V	60V	65V
Current Rating (Signal)	330mA	330mA	600mA
Clamping Voltage (1)	17V	20V	105V
Maximum Surge Current (2)	10kA	10kA	10kA
Line Resistance (±10%)	1Ω	0.5Ω	0.5Ω
Response Time	<10ns	<10ns	<10ns
System Exposure Level (3)	High	High	High
Operating Temperature	-25° to +70° C	-25° to +70° C	-25° to +70° C
Dimensions (in mm) W	135	135	135
D	50	50	50
H	25	25	25

Notes:
(1) 'Let through' voltage when 5kV (10/700µs) @ 125A surge waveform applied
(2) 8/20µs surge current applied without failure of unit
(3) BS6651:1999 Annex C - Category C exposure level capability

Revision: **vPD5, 13/02/18**
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TLP-Series
Telecom Line Protection

The PD Devices TLP series - telecommunication line surge suppressors are designed to provide complete system protection for business PABX and single line applications.

This series of Telecom Line Protectors are designed to the recommendations of BS6651: 1999 (Annex C) for location category C which requires 10kA (8/20µs) surge capacity. These products are primary rated devices for protecting systems connected to dial-up PSTN (or "external") lines or where PABX extensions are routed between buildings.

Conventional telecom surge suppressors such as gas discharge tubes (GDT's) or metal oxide varistors (MOV's) exhibit a higher clamping or "let-through" voltage with respect to fast acting solid state devices. In other words, they are designed to clamp voltages somewhere above the largest expected line signal, i.e. the voice line ringing signal. Consequently, the suppressor allows harmful spikes of up to 500V to attack the equipment.

The PD Devices TLP series uses a combination of GDT's and fast acting solid state devices to seriously enhance the protection provided.

The combination of GDT and fast acting solid state technology offers the benefits of a higher surge withstand capability together with lower clamping level and extremely fast reaction time. This means the TLP series offers much improved equipment protection and reduced component fatigue.

Telecom Line Protection Series

Features:

- Rugged construction
- High surge handling capabilities
- Low "let through" voltages.
- Fast response times.
- High surge handling capabilities.
- Negligible effect on normal line operation.
- Many models offer lower line resistance and higher line current capability than most other competitors' products.

TLP1ALR

TLP1PALR

DIN rail mount models:

- DIN rail mounting for modular installation
- DIN rail earthing provided for ease of installation
- Panel mounting screw holes for permanent installation
- Additional earth stud provided for installation versatility
- TLP/4 provided with two part push in screw terminal connection for ease of installation or replacement

TLP/6/BT

Applications include:

- Private Automatic Branch Exchange systems (PABX)
- Voice lines on the public network (PTSN)
- Fax
- Modem/Router

TLP10

TLP/4

Revision: **vPD2, 18/04/17**
Information subject to change without notice.

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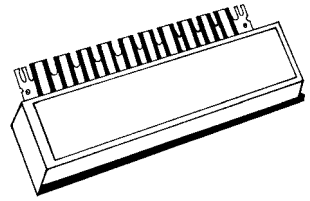
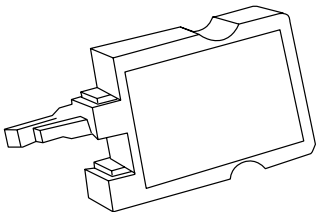
TLP-Series
Telecom Line Protection



TEN PAIR PABX SURGE MODULE – TLP10 / TLP10LR

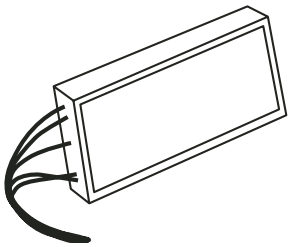
Provides harsh environment, primary level protection for PABX systems against surges on incoming PSTN voice and data lines. The unit fits directly into LSA-Plus[1] type 237A termination strips and provides a maximum surge withstand capability of 10,000 Amps for up to 10 pairs.

[1] "LSA-Plus" is a registered trademark of Krone



SINGLE PAIR PABX SURGE MODULE – TLP1PA / TLP1PALR

Provides harsh environment, primary level protection for PABX systems against surges on incoming PSTN voice and data lines. The unit fits directly into LSA-Plus[1] type 237A termination strips and provides a maximum surge withstand capability of 10,000 Amps for 1 pair.



SINGLE PAIR PABX SURGE MODULE – TLP1A / TLP1ALR

Provides harsh environment, primary level protection for PABX systems against surges on incoming PSTN voice and data lines. The unit is designed for hard-wired applications where durable, shockproof connections are required and provides a maximum surge withstand capability of 10,000 Amps for 1 pair.

Specifications

Module Type	10 Pair PABX		Single Pair PABX		Single Pair Hardwired	
Connector Type	LSA Plus™ Plug-In	LSA Plus™ Plug-In	LSA Plus™ Plug-In	LSA Plus™ Plug-In	Flying Lead	Flying Lead
Circuits	10 x 2 wire	10 x 2 wire	1 x 2 wire	1 x 2 wire	1 x 2 wire	1 x 2 wire
Max. Working Voltage	190V	190V	190V	190V	190V	190V
Current Rating (Signal)	300mA	300mA	300mA	300mA	300mA	300mA
Rated Impulse Discharge, 8/20µs, per line (2 wires)	10kA	10kA	10kA	10kA	10kA	10kA
Minimum DC Breakover	220V	220V	220V	220V	220V	220V
Impulse Voltage Performance 10/700µs (125A Peak)	<247V All Modes	<265V All Modes	<247V All Modes	<265V All Modes	<247V All Modes	<265V All Modes
Typical Loop Resistance (25°C)	50Ω	9.4Ω	50Ω	9.4Ω	50Ω	9.4Ω
Response Time	<10ns	<10ns	<10ns	<10ns	<10ns	<10ns
Maximum Line Capacitance	130pF	130pF	130pF	130pF	130pF	130pF
System Exposure Level (1)	High	High	High	High	High	High
Operating Temperature	-25° to +70°C	-25° to +70°C	-25° to +70°C	-25° to +70°C	-25° to +70°C	-25° to +70°C
Dimensions (in mm):						
W	130	130	9	9	12	12
D	47	47	50	50	40	40
H	20	20	22	22	16	16
Part Code:	**TLP10**	**TLP10LR**	**TLP1PA**	**TLP1PALR**	**TLP1A**	**TLP1ALR**

Revision: **vPD2, 18/04/17**
Information subject to change without notice.

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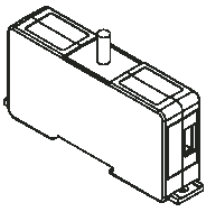
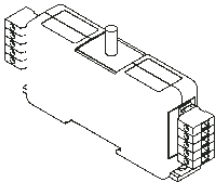
TLP-Series
Telecom Line Protection



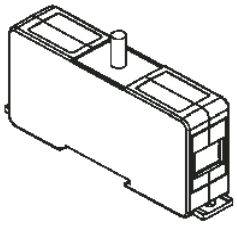
INLINE 6 WIRE BT TYPE PLUG IN MODULE – TLP/6/BT

Provides harsh environment, primary level protection for PABX systems against surges on incoming PSTN voice and data lines. This DIN rail mountable unit is designed for connection to stand alone apparatus such as fax, modem and telephone equipment using the standard BT type plug and socket. This unit provides a maximum surge withstand capability of 10,000 Amps for 1 line (6 wire).



INLINE HARD WIRED 4 WIRE MODULE – TLP/4

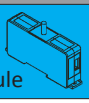
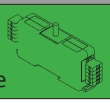
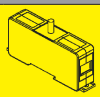
Provides harsh environment, primary level protection for PABX systems against surges on incoming PSTN voice and data lines. This DIN rail mountable unit is designed for similar applications to the above where a hard wired connection is required. This unit provides a maximum surge withstand capability of 10,000 Amps for 1 line (4 wire) or two lines (2 wire).



INLINE 2,4,6 WIRE RJ11 TYPE PLUG IN MODULE – TLP/2/RJ11, TLP/4/RJ11, TLP/6/RJ11

Provides harsh environment, primary level protection for PABX systems against surges on incomingPSTN voice and data lines. This DIN rail mountable unit is designed for connection to stand alone apparatus such as fax, modem and telephone equipment using RJ11 connections. This unit provides a maximum surge withstand capability of 10,000 Amps for 1 line (2 wire), (4 wire) or (6 wire).

Specifications

Module Type	Inline 6 Wire BT Type Plug-In Module 	Inline Hard Wired 4 Wire Module 	Inline 2,4,6 Wire RJ11 Type Plug-In Module 		
Connector Type	BT Line jack Plug-In	Screw Terminals	RJ11 Plug-In	RJ11 Plug-In	RJ11 Plug-In
Mounting	DIN Rail	DIN Rail	DIN Rail	DIN Rail	DIN Rail
Circuits	1 x 6 wire	2 x 2 wire 1 x 4 wire	1 x 2 wire	1 x 4 wire	1 x 6 wire
Max. Working Voltage	190V	190V	190V	190V	190V
Current Rating (Signal)	300mA	300mA	300mA	300mA	300mA
Rated Impulse Discharge, 8/20µs, per line (2 wires)	10kA	10kA	10kA	10kA	10kA
Minimum DC Breakover	200V	220V	220V	220V	220V
Impulse Voltage Performance 10/700µs (125A Peak)	<265V All Modes	<265V All Modes	<265V All Modes	<265V All Modes	<265V All Modes
Typical Loop Resistance (25°C)	9.4Ω	9.4Ω	9.4Ω	9.4Ω	9.4Ω
Response Time	<10ns	<10ns	<10ns	<10ns	<10ns
Maximum Line Capacitance	200pF	200pF	200pF	200pF	200pF
System Exposure Level [1]	High	High	High	High	High
Operating Temperature	-25° to +70°C	-25° to +70°C	-25° to +70°C	-25° to +70°C	-25° to +70°C
Dimensions (in mm):					
W	100	100	100	100	100
D	23	23	23	23	23
H	50	50	50	50	50
Part Code:	**TLP/6/BT**	**TLP/4**	**TLP/2/RJ11**	**TLP/4/RJ11**	**TLP/6/RJ11**

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FA-Series

BS1363 Surge & RFI Protected Adaptors

Type 3 Class III Surge Arrester

PD Devices BS1363 Surge & RFI protected adaptors are an ideal solution for home, office and industrial use, also fitted with a red status indicator to show mains power / fuse OK.

The internal surge suppressors are tested against 'worst case' conditions, as defined in International Standards.

Meets the requirements of BS EN62305-4 complemented by BS EN61643-11/12, where Type 1, 2 and 3 Surge Protective Devices (SPD's) are used.

FA3

Features

- Protection from voltage transients that can occur between L-N, L-E and N-E
- Flame retardant ABS housing
- Thermal overload protection
- BS EN61643-11/12 – Type 3, Class III
- Tested to ANSI C62.41 1991

Specifications	
Voltage Rating (Nominal)	230V rms
Maximum Current Rating	3A / 7A / 13A
Power Consumption	Negligible
Surge Handling (8/20µs) [Per Element]	19.5kA [6.5kA]
Average Attenuation, Symmetric 1-30MHz (dB)	-55 (3A) -50 (7A) -45 (13A)
Voltage Protection Level (Up) 8/20µs	900V@3kA 8/20µs
Response Time	<10ns
Type 3 Class III (BS EN61643-11/12)	3/ III
Part Code	FA3 (3A) FA7 (7A) FA13 (13A)

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FP-Series

BS1363 Surge & RFI Protected Plugs

Type 3 Class III Surge Arrester

PD Devices BS1363 Surge & RFI protected plugs are and ideal solution for home, office and industrial use.

The “hard wired” plug configuration ensures that surge protector remains with the intended equipment also fitted with a red status indicator to show mains power / fuse OK.

The internal surge suppressors are tested against ‘worst case’ conditions, as defined in International Standards.

Meets the requirements of BS EN62305-4 complemented by BS EN61643-11/12, where Type 1, 2 and 3 Surge Protective Devices (SPD’s) are used.

FP3

Features

- Protection from voltage transients that can occur between L-N, L-E and N-E
- Flame retardant ABS housing
- Thermal overload protection
- BS EN61643-11/12 – Type 3, Class III
- Tested to ANSI C62.41 1991

Specifications	
Voltage Rating (Nominal)	230V rms
Maximum Current Rating	3A / 7A / 13A
Power Consumption	Negligible
Surge Handling (8/20µs) [Per Element]	19.5kA [6.5kA]
Average Attenuation, Symmetric 1-30MHz (dB)	-55 (3A) -50 (7A) -45 (13A)
Voltage Protection Level (Up) 8/20µs	900V@3kA 8/20µs
Response Time	<10ns
Type 3 Class III (BS EN61643-11/12)	3/ III
Part Code	FP3 (3A) FP7 (7A) FP13 (13A)

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BS1363 TRANQ

Type 3 Class III Surge Arrester

PD Devices BS1363 Surge Protected plug range is an ideal solution for home, office and industrial use.

The “hard wired” plug configuration ensures that surge protector remains with the intended equipment, also fitted with a red status indicator to show mains power/fuse OK.

The internal surge suppressors are tested against ‘worst case’ conditions, as defined in International Standards.

Meets the requirements of BS EN62305-4
(which replaced BS6651:1999 Annex C in August 2008)
complemented by BS EN61643-11/12, where Type I, II and III Surge Protective Devices (SPD’s) are used.

- Protection from voltage transients that can occur between L-N, L-E and N-E
- Flame retardant ABS housing
- Thermal overload protection
- BS EN61643-11/12 – Type 3, Class III
- Tested to ANSI C62.41 1991
- BS6651:1999 Annex C location category B
- Approved to EN60950

Specifications	
Voltage Rating (Nominal)	230V rms
Maximum Current Rating	10A
Power Consumption	Negligible
Surge Handling (8/20µs) [Per Element]	13.5kA [4.5kA]
Voltage Protection Level (Up) 8/20µs	900V@3kA 8/20µs
Response Time	<10ns
Type & Class (BS EN61643-11/12)	3/III
Part Codes	TRANQ/3/A (**3A**)
	TRANQ/5/A (**5A**)
	TRANQ/10/A (**10**)

Standard Features

• Red status indicator to show mains power/fuse OK.

Options

• Supplied with 3, 5 or 10A fuse fitted.
• Various pre-fitted lead options.

This Product is available with a lead option
(See table below for options and example*)

Lead Options Available	Leaded Part Codes
No Lead Included	**/A**
2m IEC C13 Commonly used on PCs, Audio equipment, Projectors and Test equipment.	**/B**
5m IEC C13 Commonly used on PCs, Audio equipment and Test equipment.	**/C**
7m IEC C13 Commonly used on PCs, Audio equipment and Test equipment.	**/D**
2m IEC C5 (**3A only**) Commonly used on Laptop power supplies and Projectors.	**/E**
5m IEC C5 (**3A only**) Commonly used on Laptop power supplies and Projectors.	**/H**
2m IEC C7 (**3A only**) Commonly used on Audio equipment.	**/I**
5m IEC C7 (**3A only**) Commonly used on Audio equipment.	**/J**
***Example** – Surge protected plug supplied with a 5A fuse and 2m IEC C13 lead – Part Code: TRANQ/5**/B**	

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FusionPro 4WS

4 Way Surge & RFI Protected Socket Strip

Designed and Manufactured in the UK
Over 50 years experience in over voltage transient suppression and the management of troublesome power conditions

Superior Protection Against Electrical Surges
Prevents damage to equipment caused by power spikes

Reduce Electrical Interference
Combats interference from nearby electrical devices such as computers, cordless phones, dimmer switches, refrigeration equipment

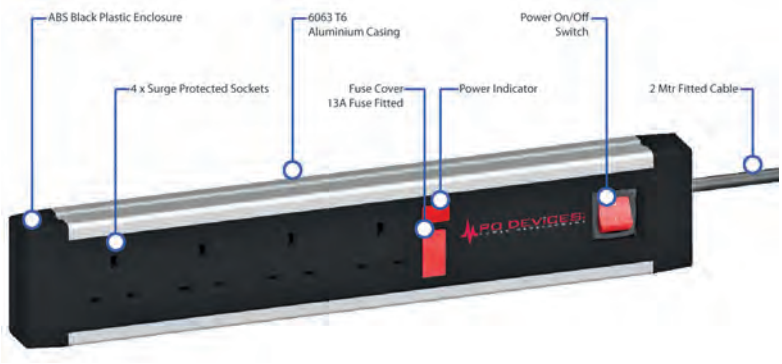
Significantly Reduce Popping or Cracking Sounds
Filters both EMI (Electromagnetic Interference) and RFI (Radio Frequency Interference)

Tough, Robust 6063 T6 Aluminium Casing
Withstands the rigours of a musician's life on the road

Improve Overall Sound Performance
Eliminates ground loops and thus reducing hiss on speakers

Protective Cover
Keeps your FusionPro 4WS clean and dust free when not in use

FusionPro 4WS Characteristics	
Voltage Rating (Nominal)	230V rms
Maximum Current Rating	13A
Power Consumption	Negligible
Lead Length	2m
Surge Handling (8/20µs)	19.5kA
Average Attenuation, Symmetric 1-30MHz (dB)	-50
Voltage Protection Level (U_p) 8/20µs	900V@3kA 8/20µs
Response Time	<10ns
Part Code	FusionPro 4WS



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D30W/1-Series

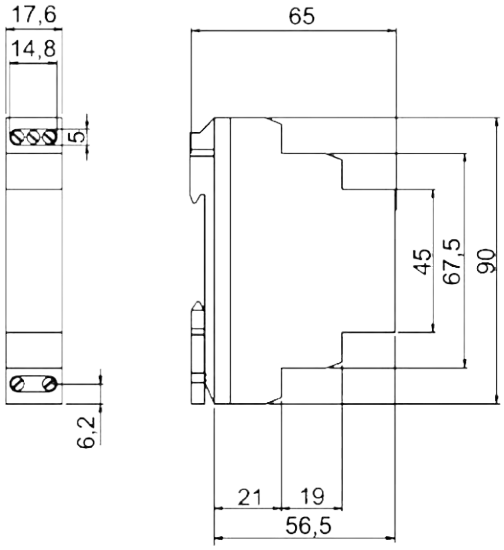
30V, 1 Pair Data Line Protector

The D30W/1 series is designed to protect 1 data, communication, control or monitoring circuit (pair) operating at up to 30v, 0.5A.

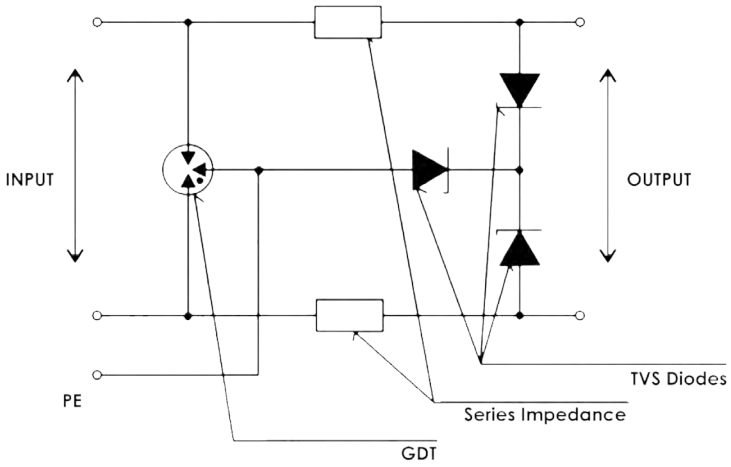
Suitable for use at $LPZ0_{a(b)}$ to 1 according to EN 62305. Protects connected equipment from the effects of common and differential mode surges, according to IEC 61643-21.

Specifications		
Connector Type	Screw Terminal	
Number of Protected Pairs	1	
Nominal Voltage	U_N	30V
Max. Continuous Operating Voltage	U_C	36V
Nominal Current	I_N	0.5A
D1 Total Lightning Impulse Current (10/350µs)	I_{imp}	5kA
D1 Lightning Impulse Current (10/350µs) L-PE	I_{imp}	2.5kA
C2 Max. Discharge Current (8/20µs) - See Below	I_{max}	10kA/20kA
Nominal Discharge Current (8/20µs)	I_n	1kA
Voltage Protection Level at I_n	U_P	75V
Voltage Protection Level at 1kV/µs	U_P	54V
Response Time	t_A	<30ns
Data Rate	1 Mbit/s	
Series Impedance, Per Line	4.7µH	
Parasitic Capatacence	C	1.5nF
Operating Temperature Range	ϑ	-40 to +80°C
Reccomended Cable Cross Section	0.25 - 1.5mm²	
Category Tested According to IEC 61643:21-2000	A2, B2, C2, C3, D1	
Part Code (10kA I_{max})	**D30W/1/0.5/10**	
Part Code (20kA I_{max})	**D30W/1/0.5/20**	

Dimensions



Circuit Diagram



Revision: **vPD3, 21/04/17**
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D30W/2-Series

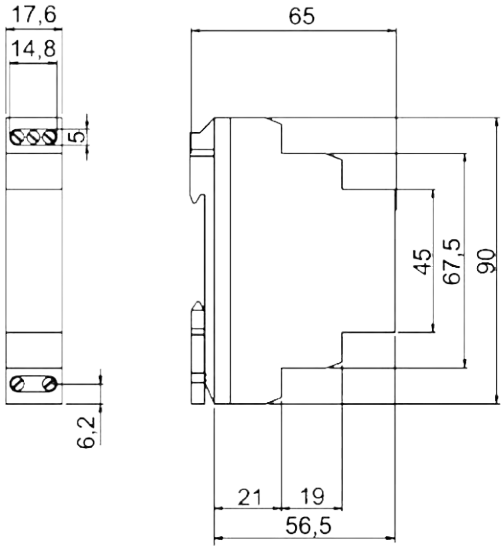
30V, 2 Pair Data Line Protector

The D30W/2 series is designed to protect 2 data, communication, control or monitoring circuit (pair) operating at up to 30v, 0.5A.

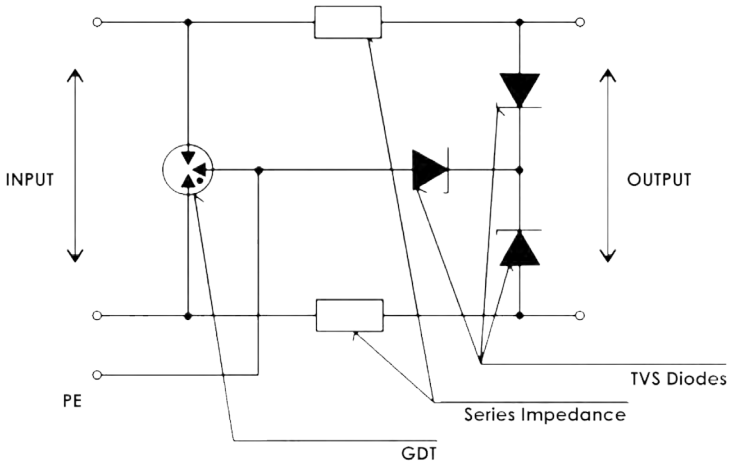
Suitable for use at $LPZ0_{a(b)}$ to 1 according to EN 62305. Protects connected equipment from the effects of common and differential mode surges, according to IEC 61643-21.

Specifications		
Connector Type	Screw Terminal	
Number of Protected Pairs	2	
Nominal Voltage	U_N	30V
Max. Continuous Operating Voltage	U_C	36V
Nominal Current	I_N	0.5A
D1 Total Lightning Impulse Current (10/350µs)	I_{imp}	5kA
D1 Lightning Impulse Current (10/350µs) L-PE	I_{imp}	2.5kA
C2 Max. Discharge Current (8/20µs) - See Below	I_{max}	10kA/20kA
Nominal Discharge Current (8/20µs)	I_n	1kA
Voltage Protection Level at I_n	U_P	75V
Voltage Protection Level at 1kV/µs	U_P	54V
Response Time	t_A	<30ns
Data Rate	1 Mbit/s	
Series Impedance, Per Line	4.7µH	
Parasitic Capatacence	C	1.5nF
Operating Temperature Range	ϑ	-40 to +80°C
Reccomended Cable Cross Section	0.25 - 1.5mm²	
Category Tested According to IEC 61643:21-2000	A2, B2, C2, C3, D1	
Part Code (10kA I_{max})	**D30W/2/0.5/10**	
Part Code (20kA I_{max})	**D30W/2/0.5/20**	

Dimensions



Circuit Diagram



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DBP/F/72

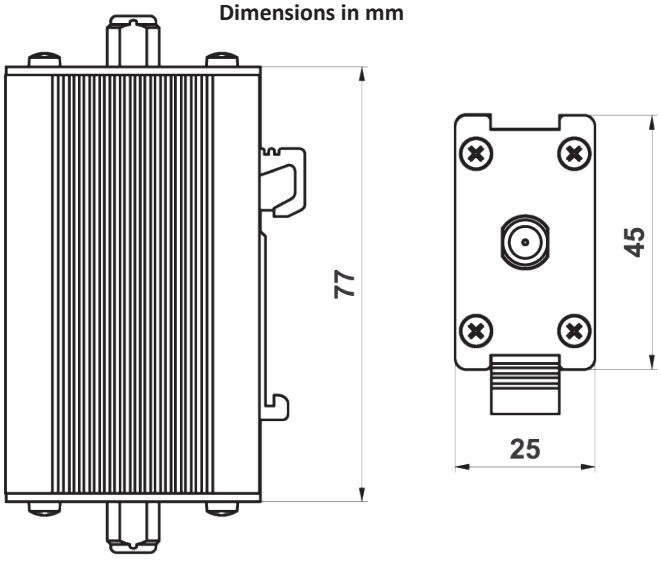
75Ω, 50W Type F
Satellite Protector

The **DBP/F/72** is designed to protect satellite equipment. Casing of this protector is made out of light alloy, which ensures high mechanical and thermal resistance.

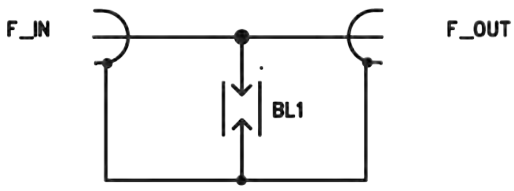
Specification		
Connector type		F
Max. continous operating voltage	U_C	72 V
Rated load current	I_N	0.5A
D1 Max. lightning impulse current (10/350)	I_{imp}	2 kA
C2 Max. discharge current (8/20)	I_{max}	10 kA
C2 Nominal discharge current (8/20)	I_n	5 kA
Voltage protection level at 1kV/ms	U_p	500 V
Frequency range		0 to 2GHz
Max. transmission power capacity		50 W
Insertion loss		< 0.5 dB
Return loss		> 20 dB
Characteristic impedance		75 Ω
Category tested acc. to IEC 61643:21-2000		A2, B2, C2, C3, D1
Part Code		**DBP/F/72**

DBP/F/72

Dimensions in mm



IMPEDANCE 75ohm



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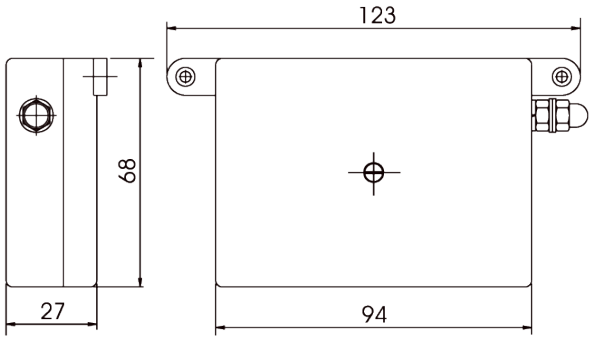
DBP/RJ45/ADSL
2 Pair Data Protection
Surge Arrester

The DBP/RJ45/ADSL is a complex surge protection device designed for protection of data, communication, measuring and control lines against surge effects.

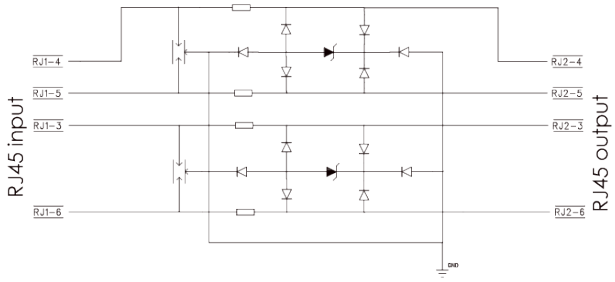
This surge protection device is recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ $0_{A(B)}$ - 1 according to EN 62305. They provide effective protection of connected equipment against common mode and differential mode surge effects according to IEC 61643-21. The nominal current of individual protected lines IN < 0,1A.

This device consist of gas discharge tubes, series impedance and transils, offering 2 pair protection. Produced for a nominal voltage of 170V, designed for the protection of equipment using DSL technology. The connection of protected lines is carried out by by RJ45 connectors

Dimensions in mm



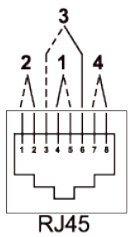
Specifications		
No: of protected pairs	2	
Nominal Voltage	U_N	170V
Max. continuous operating voltage	U_C	204V
Nominal current	I_N	100mA
C2 Max. discharge current (8/20)	I_{max}	2kA
C2 Nominal discharge current (8/20)	I_n	1kA
C3 Voltage protection level at 1kV /µs	U_p	520V
Response time	t_A	<30ns
Data rate	10 MBit/s	
Series impedance per line	1.5 - 10 Ω	
Parasitic capacitance	C	1,5 nF
Operating temperature rangeDR	-40°C - +80°C	
Recommended cable cross-section	0.3mm²	
Catergory tested acc. to IEC 61643:21-2000	A2, B2, C2,C3, D1	
Part Code	**DBP/RJ45/ADSL**	



Connection of RJ45 pins
acc.to EIA/TIA 568, type B

- 1 whiteorange
- 2 orange
- 3 whitegreen
- 4 blue
- 5 whiteblue
- 6 green
- 7 whitebrown
- 8 brown

1 - blue pair
2 - orange pair
3 - green pair
4 - brown pair



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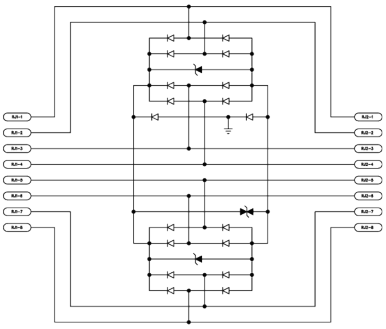
DSP-CAT-5E Series
6v, 12v, 48v

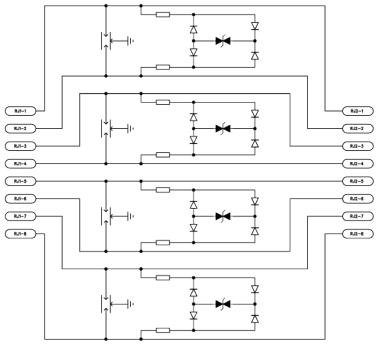
The DSP-CAT-5E series is designed to protect data and communications lines in accordance to EN50173-1 edition 3, Class E. All protected lines are equipped with Transient Voltage Suppressor Diode which eliminates common mode and differential mode surge effects during computer networks operations.

The DSP-CAT-5E series consists of a plastic box and patch cords which are terminated with RJ45 connectors. Required length of the patch cords (a,b) is to be specified by the customer.

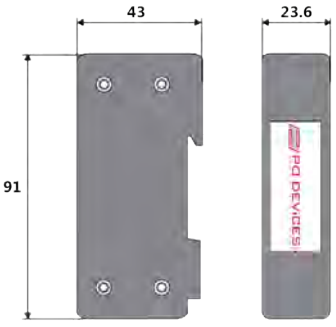
Specification		**DSP-CAT-5E/6-6**	**DSP-CAT-5E/6-12**	**DSP-CAT-5E/6-48**
Number of protected pairs		4	4	4
Nominal voltage	U_n	6V	12V	48V
Max. continous operating voltage	U_c	7.2v	14.4V	57.6V
Nominal current	I_L	200mA	200mA	200mA
Mode of protection		line-line, line-G(PE)	line-line, line-G(PE)	line-line, line-G(PE)
Bandwitch line-line	f_g	250MHz	250MHz	250MHz
C2 Nominal discharge current (8/20) line/line	I_n	20A	150A	150A
C3 Voltage potection level at I_n line/G(PE) at 1 kV/µs	U_p	<15V	<40V	<150V
Insertion loss for 250 MHz		<3dB	<3dB	<3dB
Parasitic capacitance line/line	c	max. 5 pF	max. 160 pF	max. 160 pF
Mounting on		DIN rail 35 mm		
Input/Output, pinning		RJ45/RJ45, 1/2, 3/6, 4/5, 7/8		
Length of patch cords		Customers specification, a+b < 3 m		
Grounding method		trough DIN rail 35 mm by special metal clip on the back side of box		
Housing material		POLYAMID PA6		
Colour		Grey		
Category tested acc. to		IEC 61643-21		
Approvals and Certifications		Cat. 6, ISO/IEC 11801		
Part Code		**DSP-CAT-5E/6-6**	**DSP-CAT-5E/6-12**	**DSP-CAT-5E/6-48**



DSP-CAT-5E/6-6



DSP-CAT-5E/6-12 & DSP-CAT-5E/6-48



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RF7-16/350/10FM

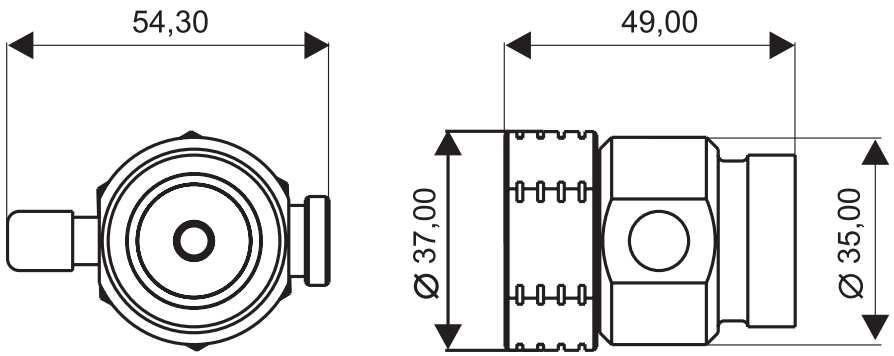
7/16” Coaxial Surge Arrester

The RF7-16/350/10FM is a coaxial high-frequency protection device designed for protection of equipment connected to an aerial system by means of coaxial cables. Gas discharge tubes with maximum discharge current Imax (8/20) = 10 kA ensure reliable protection of receiving and transmitting systems even against a proximity lightning strike.

This range is produced with 7/16” connector type, enabling usage in many applications. They are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0A(B) -1 and higher according to EN 62305.

Specifications		
Connector Type		7/16”
Maximum Continuous Operating Voltage	U_C	350V
Nominal Current	I_N	5A
D1 Max. lightning impulse current (10/350µs)	I_{imp}	2kA
C2 Max discharge current (8/20µs)	I_{max}	10kA
C2 Nominal discharge current (8/20µs)	I_n	5kA
C3 Voltage protection level at 1kV/µs	U_p	850V
Frequency range		0-2.6GHz
Max transmission power		400W
Insertion loss		<0.5dB
Return loss		>15dB
Characteristic impedance		50Ω
Category tested to IEC 61643:21-2000		A2, B2, C2, C3, D1
Part Code	**RF7-16/350/10FM**	

Dimensions in mm



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RF7-16/600/20FM

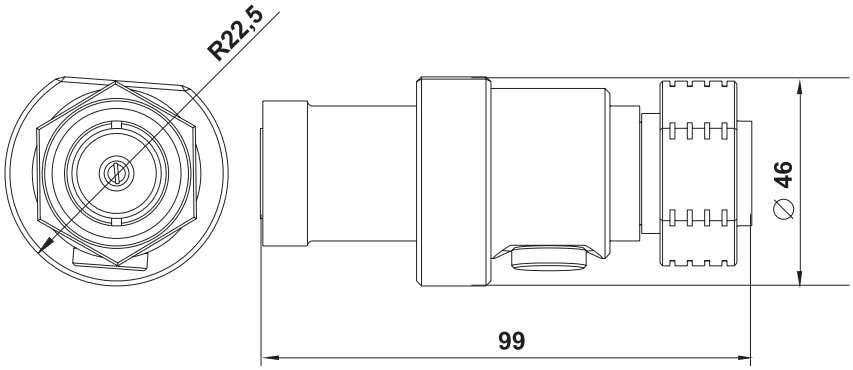
7/16” Coaxial Surge Arrester

RF7-16/600/20FM is a coaxial high-frequency protection device designed for protection of equipment connected to an aerial system by means of coaxial cables. Gas discharge tubes with maximum discharge current Imax (8/20) = 20 kA ensure reliable protection of receiving and transmitting systems even against a proximity lightning strike.

This range is produced with 7/16” connector type, enabling usage in many applications. They are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0A(B) -1 and higher according to EN 62305.

Specifications		
Connector Type		7/16”
Maximum Continuous Operating Voltage	U_C	600V
Nominal Current	I_N	12A
D1 Max. lightning impulse current (10/350µs)	I_{imp}	3kA
C2 Max discharge current (8/20µs)	I_{max}	20kA
C2 Nominal discharge current (8/20µs)	I_n	10kA
C3 Voltage protection level at 1kV/µs	U_p	950V
Frequency range		0-2.6GHz
Max transmission power		900W
Insertion loss		<0.2dB
Return loss		>20dB
Characteristic impedance		50Ω
Category tested to IEC 61643:21-2000		A2, B2, C2, C3, D1
Part Code	**RF7-16/600/20FM**	

Dimensions in mm



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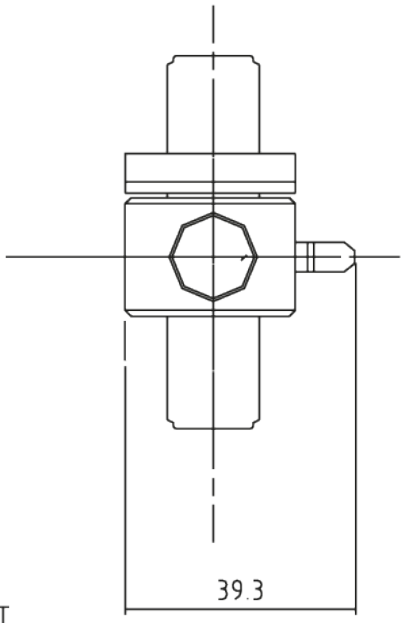
RFN72/10FF & 10FM
N Type
Coaxial Surge Arrester

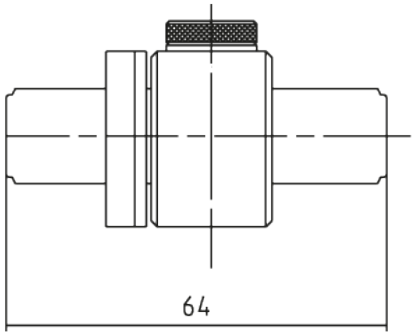
The RFN72/10FF & RFN72/10FF is an innovated coaxial high-frequency protection range designed for equipment connected to an aerial system by means of coaxial cables. Special gas discharge tubes with maximum discharge current (I_{max}) of 10kA (8/20µs) ensure reliable protection of receiving and transmitting systems even against a lightning stroke nearby.

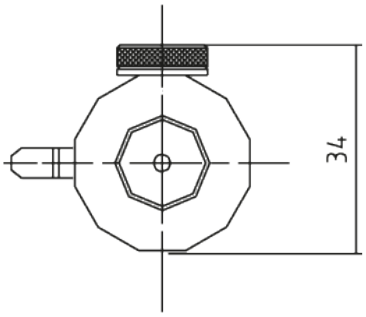
PD Devices offer a wide range of coaxial protectors for various connector types and transmission power grades enabling use in many applications. These coaxial protectors are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0A(B) -1 and higher according to EN 62305.

Specification		
Connector Type		N
Maximum Continuous Operating Voltage	U_C	90V
Nominal Current	I_N	5A
D1 Max. lightning impulse current (10/350µs)	I_{imp}	2kA
C2 Max discharge current (8/20µs)	I_{max}	10kA
C2 Nominal discharge current (8/20µs)	I_n	5kA
C3 Voltage protection level at 1kV/µs	U_p	200V
Frequency range		0-3GHz
Max transmission power		50W
Insertion loss		<1.5dB
Return loss		>20dB
Characteristic impedance		50Ω
Category tested to IEC 61643:21-2000		A2, B2, C2, C3, D1
Part Code (F-F)	**RFN72/10FF**	
Part Code (F-M)	**RFN72/10FM**	

Dimensions in mm







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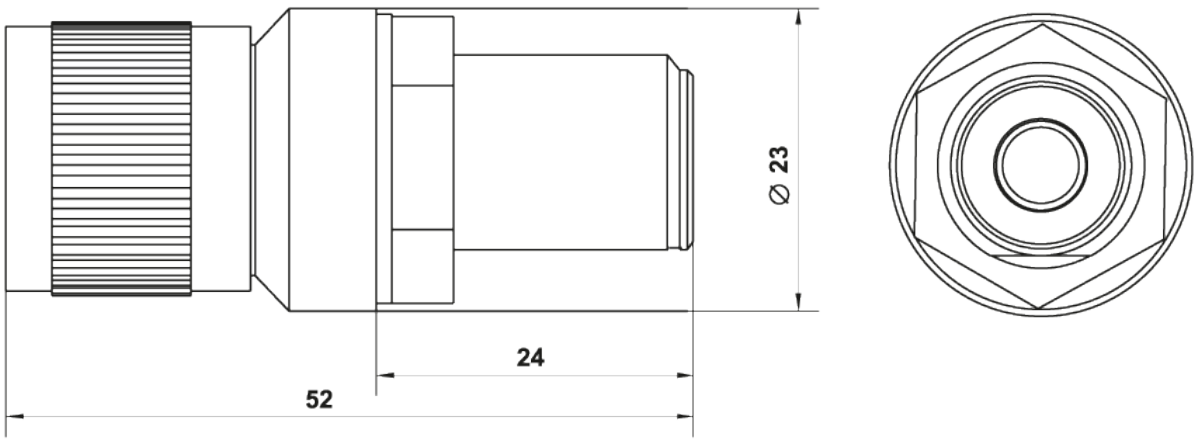
RFN135/10FM
N Type
Coaxial Surge Arrester

The RFN135/10FM is an innovated coaxial high-frequency protection range designed for equipment connected to an aerial system by means of coaxial cables. Special gas discharge tubes with maximum discharge current (I_{max}) of 10kA (8/20µs) ensure reliable protection of receiving and transmitting systems even against a lightning stroke nearby.

PD Devices offer a wide range of coaxial protectors for various connector types and transmission power grades enabling use in many applications. These coaxial protectors are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0A(B) -1 and higher according to EN 62305.

Specifications		
Connector Type		N
Maximum Continuous Operating Voltage	U_C	135V
Nominal Current	I_N	5A
D1 Max. lightning impulse current (10/350µs)	I_{imp}	1kA
C2 Max discharge current (8/20µs)	I_{max}	10kA
C2 Nominal discharge current (8/20µs)	I_n	5kA
C3 Voltage protection level at 1kV/µs	U_p	<500V
Frequency range		0-5.8GHz
Max transmission power		50W
Insertion loss		<0.2dB
Return loss		>20dB
Characteristic impedance		50Ω
Category tested to IEC 61643:21-2000		A2, B2, C2, C3, D1
Part Code (F-F)	**RFN135/10FM**	

Dimensions in mm



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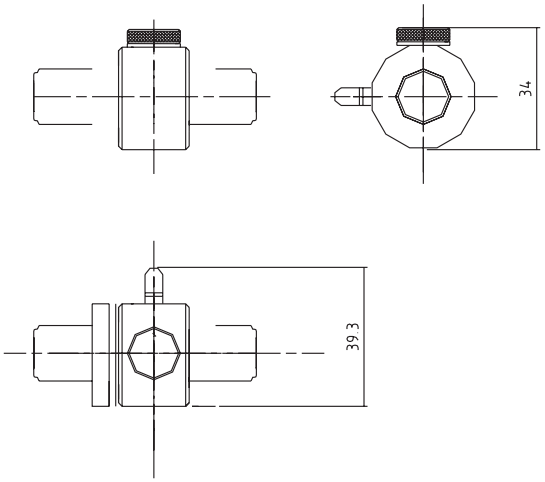
RFN200/10FF & 10FM
N Type
Coaxial Surge Arrester

High-frequency protection range designed for equipment connected to an aerial system by means of coaxial cables. Special gas discharge tubes with maximum discharge current (Imax) of 10kA (8/20µs) ensure reliable protection of receiving and transmitting systems even against a lightning stroke nearby.

PD Devices offer a wide range of coaxial protectors for various connector types and transmission power grades enabling use in many applications. These coaxial protectors are recommended for use in the Lightning Protection Zones Concept at the boundaries of LPZ 0A(B) -1 and higher according to EN 62305.

Specifications		
Connector Type		N
Maximum Continuous Operating Voltage	U_C	200V
Nominal Current	I_N	5A
D1 Max. lightning impulse current (10/350µs)	I_{imp}	2kA
C2 Max discharge current (8/20µs)	I_{max}	10kA
C2 Nominal discharge current (8/20µs)	I_n	5kA
C3 Voltage protection level at 1kV/µs	U_p	600V
Frequency range		0-3GHz
Max transmission power		400W
Insertion loss		<1.5dB
Return loss		>20dB
Characteristic impedance		50Ω
Category tested to IEC 61643:21-2000		A2, B2, C2, C3, D1
Part Code (F-F)	**RFN200/10FF**	
Part Code (F-F)	**RFN200/10FM**	

Dimensions in mm



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T1SP3/IT/12.5/400R

Type 1/2 Class I/II Surge Arrester

The T1SP3/IT/12.5/400R lightning surge arrester type 1 + 2 designed for the IT network 3 x AC 400 V without neutral conductor.

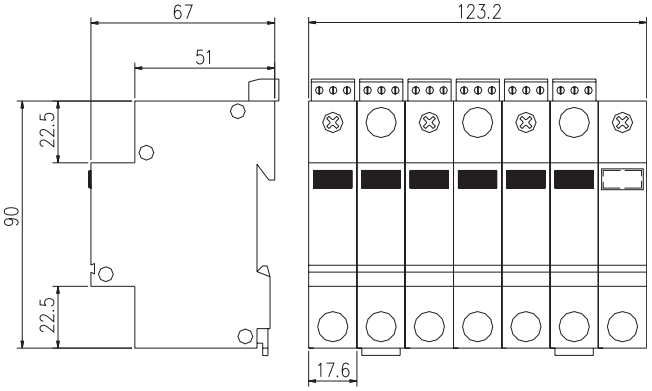
The recommended use for the T1SP3/IT/12.5/400R is in heavy industry, rolling mills, machinery, etc. The unit can be installed horizontal, vertical, rotated 90 and 180 degrees, and this does not affect the function of the T1SP3/IT/12.5/400R mentioned parameters.

Double terminals devices allow connection “V” at the maximum current carrying capacity of 63 A.

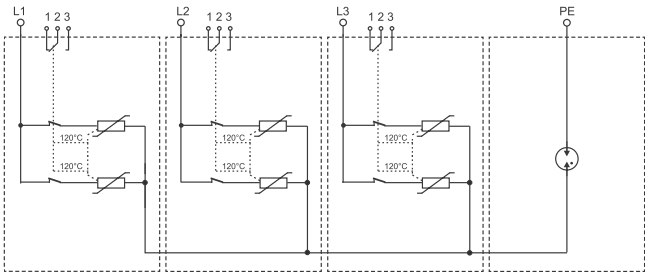
The T1SP3/IT/12.5/400R comes with remote signaling.

Specification		
Classification according to EN 61643-11 and IEC 61643-11	Type 1/2 Class I/II	
Earth system	IT	
Nominal operating voltage	U_N	3 x 400 V AC
Maximum continuous operating voltage	U_C	3 x 480 V AC
Impulse discharge current test, Class I (10/350)	I_{imp}	12.5 kA
Charge (L/N)	Q	6 As
Specific energy	W/R	36 kJ/Ω
Total discharge current (10/350) L1 + L2 + L3-> PEN	I_{total}	50kA
Rated discharge current , Class II (8/20)	I_n	50kA
Maximum discharge current (8/20)	I_{max}	90kA
Total discharge current (8/20) L1 + L2 + L3-> PEN	I_{total}	100kA
Voltage protection level	U_p	<1.6 kV
Response time	t_A	<25 ns
Maximum overcurrent protection	160A GL / gG	
Maximum overcurrent protection ("V" connection)	63A gL / gG	
Short-circuit withstand at 160 A gL / gG	I_p	80 kA_{rms}
Lightning protection zone	LPZ	0 - 1
Housing material	Polyamide PA6, UL94 V-0	
IP Rating	20	
Operating Temperature	-40 to +70°C	
Main Terminal Torque	4 Nm	
Maximum conductor size (Main terminals)	35 mm^2 (solid) 25 mm^2 (stranded)	
Mass	872g	
Maximum conductor size (remote terminals)	1 mm^2	
Maximum remote terminal rating	AC 250 V / 0.5 A DC 250 V / 0.1 A	
Part Code	**T1SP3/IT/12.5/400R**	

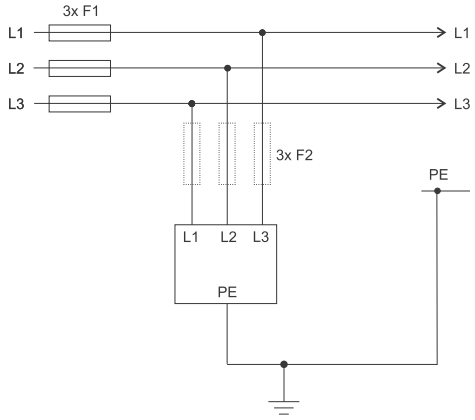
Dimensions in mm



Block Diagram



Wiring Diagram



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T1SP3/IT/12.5/500R

Type 1/2 Class I/II Surge Arrester

The T1SP3/IT/12.5/500R lightning surge arrester type 1 + 2 designed for the IT network 3 x AC 500 V without neutral conductor.

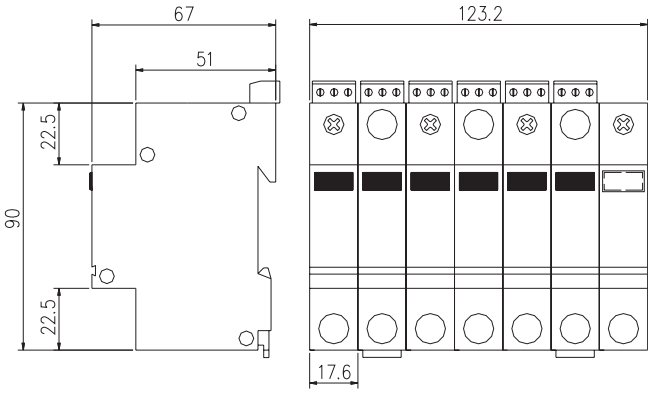
The recommended use for the T1SP3/IT/12.5/500R is in heavy industry, rolling mills, machinery, etc. The unit can be installed horizontal, vertical, rotated 90 and 180 degrees, and this does not affect the function of the T1SP3/IT/12.5/500R mentioned parameters.

Double terminals devices allow connection “V” at the maximum current carrying capacity of 63 A.

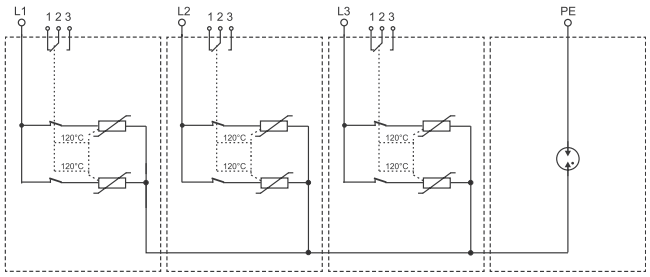
The T1SP3/IT/12.5/500R comes with remote signaling.

Specification		
Classification according to EN 61643-11 and IEC 61643-11	Type 1/2 Class I/II	
Earth system	IT	
Nominal operating voltage	U_N	3 x 500 V AC
Maximum continuous operating voltage	U_c	3 x 600 V AC
Impulse discharge current test, (10/350), MOV	I_{imp}	12.5 kA
- Charge	Q	6 As
- Specific energy	W/R	36 kJ/Ω
Maximum discharge current (8/20), MOV	I_{max}	90kA
Rated discharge current (8/20), MOV	I_n	50kA
Voltage protection level at I_{imp}, MOV	U_p	<2.1kV
Response time		
- MOV	t_A	<25ns
- GDT	t_A	<100ns
Maximum overcurrent protection	315A gL/gG	
Maximum overcurrent protection, V connected	63A gL/gG	
Short-circuit withstand with 315 A gL / gG	I_p	80kA rms
Main Terminal Torque	4 Nm	
Maximum conductor size (Main terminals)	50 mm² (solid) 35 mm² (stranded)	
IP Rating	20	
Operating Temperature	-40 to +70°C	
Housing material	Polyamide PA6, UL94 V-0	
Maximum conductor size (remote terminals)	1 mm²	
Maximum remote terminal rating	AC 250 V / 0.5 A DC 250 V / 0.1 A	
Mass	880g	
Part Code	**T1SP3/IT/12.5/500R**	

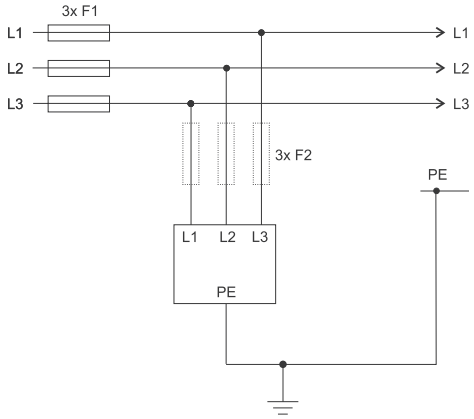
Dimensions in mm



Block Diagram



Wiring Diagram



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