

AC Surge Protection Devices

These are Surge Protection Devices (SPD) that prevent transitional impulsive overvoltage, conducted via the mains power supply, the earth network or signal networks, from damaging electronic command and control systems and electronic appliances in general. Series BY7 protection devices limit dangerous overvoltage to standard levels tolerated by the appliances intended for use in Overvoltage Category II or greater (impulsive overvoltage max. 2.5kV) in zone protected from overvoltage B and C (Zones 1 and 2) if the plant does not have a lightning arrester, in protection zone C (Zone 2) if the plant has a lightning arrester, and are SPD in Test Class II as required by standards IEC1024, IEC1312-1, EN50083-1 in force (see figure 1 the following pages)

Where and how to use them

In accordance with current standards, series BY7 surge protection devices must be installed on incoming power lines to electrical distribution and control and command boards for automation, in order to guarantee immunity to the transistors of the equipment contained, such as PLC, industrial PCs, power supplies, inverters, etc.. For command and control boards, generally in Overvoltage Category II according to IEC EN 644-1 to be compliant with EMC standards, maximum impulsive overvoltage applied to equipment must be below 2.5kV, as indeed is also required by EN61000-4-4, 4-5. If SPDs with residual overvoltage of less than 2.5kV, which can be withstood by equipment, are not installed on command and control boards, overvoltage may cause plant or machine failure or breakdown, with costs that certainly exceed the cost of the SPDs. Installation of SDPs is also required, in any case, in order to comply with EMC standards and CE marking of the board.

Performance

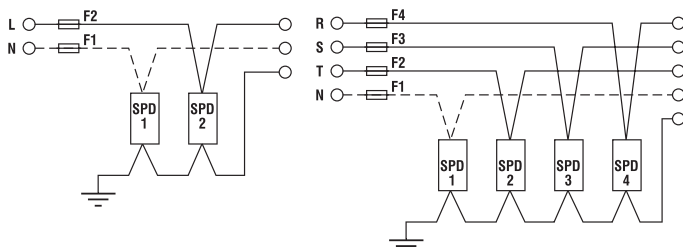
They consist of a wiring socket that can be assembled onto a DIN rail and a removable protection module that contains the discharge, making it easy to disconnect the SPD during insulation tests or for quick replacement at the end of its working life. They are able to withstand ten 20kA impulses of I_{sc} discharge current with impulse 8/20 and a single 40kA impulse, which is statistically very rare. As required by the product regulations on the SPDs, the BY7 series is equipped with an automatic thermal cut-off device able to disconnect the line transformer in the event of failure, providing an indication of the failure discharge visible on the front of the unit and via a clean contact. When, after numerous discharges and years of service the module has deteriorated, it can be rapidly replaced by removing it from its base socket and replacing it with another, identical one, without disconnecting the power supply.

Fuses and protection devices

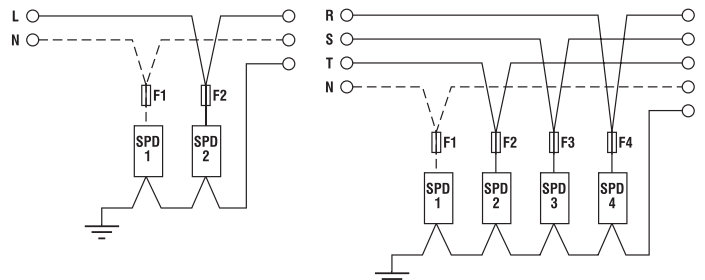
BY7 series overvoltage dischargers have an incorporated device that disconnects the transformer at the end of its working life (close to short circuit or short circuited). They must, however, be fitted with protection against short circuit current upstream and differential protection against indirect contact (generally already included in the installation). If installed downstream of highly sensitive differential protection devices, we recommend using the configuration with gas discharger (see layouts on the following pages). The diagrams below illustrate an example protection connection according to priority type.



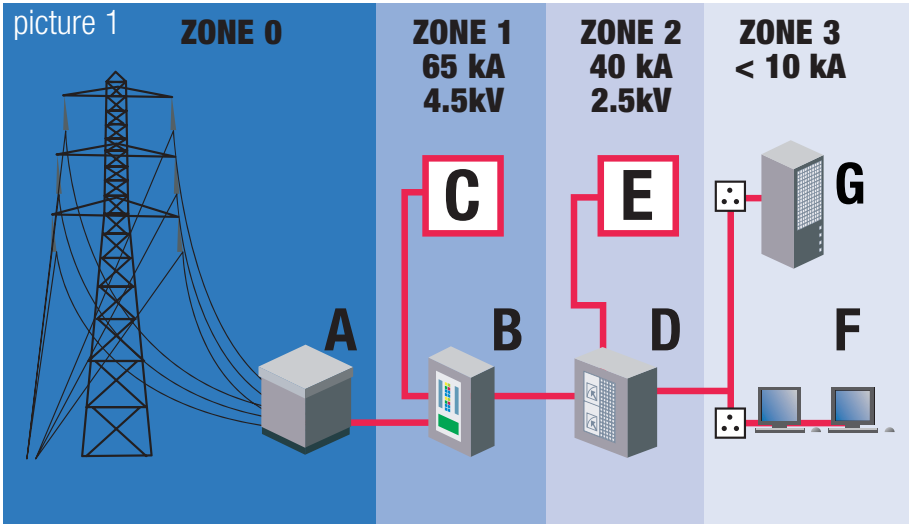
Protection takes priority



Continuity of services takes priority



Surge Protection Devices



Lightning protection zones

Zone 0 - Zone where items are subject to direct lightning strikes or where an unattenuated electromagnetic field occurs as a result of the strike.

Zone 1 - Zone where items are subject to low level direct lightning strikes. The conducted impulse lightning currents and/or switching surges are reduced compared with Zone 0.

Zone 2 - Remnants of lightning impulse currents and/or switching surges are reduced compared with Zone 1.

Zone 3 - Surges, caused by oscillation effects, magnetic field couplings and internal switching surges are reduced compared with Zone 2

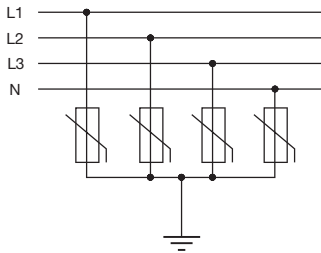
Example of connection for different networks

TN 3-phase system

No. 4 ISPD14440 +
No. 1 screw jumper 9000394



BLOCK DIAGRAM

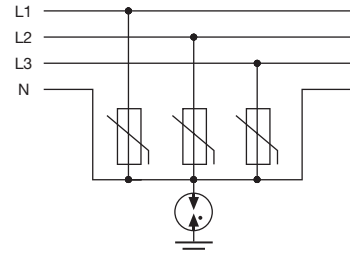


TT 3-phase system

No. 3 ISPD14440 +
No. 1 ISPD1444G +
No. 1 screw jumper 9000394



BLOCK DIAGRAM

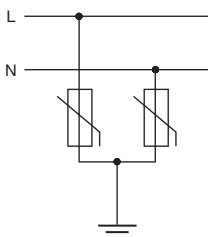


TN single phase system

No. 2 ISPD14275 +
No. 1 screw jumper 9000392



BLOCK DIAGRAM

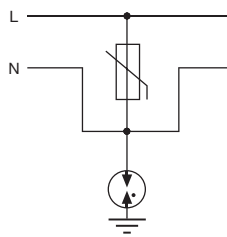


TT single phase system

No. 1 ISPD14275 +
No. 1 ISPD1425G +
No. 1 screw jumper 9000392



BLOCK DIAGRAM

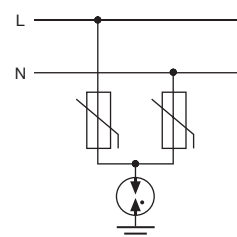


TT single phase system

No. 2 ISPD14275 +
No. 1 ISPD1425G +
No. 1 screw jumper 9000393

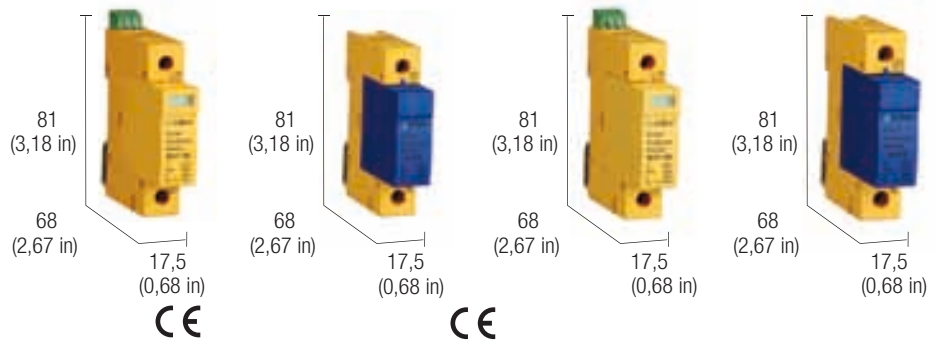


BLOCK DIAGRAM



Surge protection devices

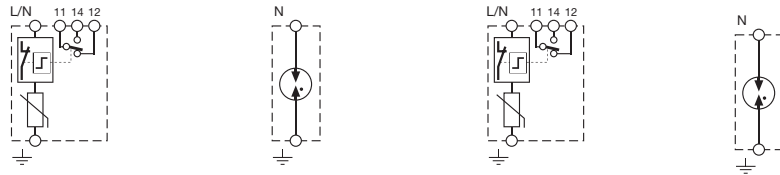
- Rugged contacts
- Pluggable protection
- Efficiency status indicator on front panel
- Available screw jumpers for parallel connection



NOTES

(1) When the terminal protection disconnects the SPD, the contacts 11-14 open and contacts 11-12 close

BLOCK DIAGRAM



VERSIONS

Cod. ISPD14275

Cod. ISPD1425G

Cod. ISPD14440

Cod. ISPD1444G

BY7-40/1-275

BY7-NPE/40-275

BY7-40/1-440

BY7-NPE/40-440

ELECTRICAL TECHNICAL DATA

Category	II	II	II	II
Type of network systems	TN-S; TN-C; TT; IT	TN-S; TN-C; TT; IT	TN-S; TN-C; TT; IT	TN-S; TN-C; TT; IT
Technology	MOV (Metal Oxide Varistor)	GDT (Gas Discharge T)	MOV (Metal Oxide Varistor)	GDT (Gas Discharge Tube)
Rated voltage	Un 230 Vac	Un 230 Vac	Un 400 Vac	Un 400 Vac
Maximum continuous voltage	Uc 275 Vac	Uc 255 Vac	Uc 440 Vac	Uc 440 Vac
Voltage protection level	Up ≤ 1.200 V	Up ≤ 1.800 V	Up ≤ 2.000 V	Up ≤ 1.800 V
Normal discharge current (8/20)	In 20 kA	In 30 kA	In 20 kA	In 30 kA
Maximum discharge surge current (8/20)	I _{max} 40 kA	I _{max} 40 kA	I _{max} 40 kA	I _{max} 40 kA

GENERAL TECHNICAL DATA

Connection terminal	4 ... 25 mm ² fixed screw type			
Response time	t _a < 25 nS			
Operating temperature range	-40°C < T < 80°C			
Status display	Green OK / Red FAILURE	No	Green OK / Red FAILURE	No
Remote signal	SPDT 1 A/230 Vac (1)	No	SPDT 1 A/230 Vac (1)	No
Remote signal connection	1,5 mm ² pluggable 6 A - 120 V	No	1,5 mm ² pluggable 6 A - 120 V	No
Housing material	UL94V0	UL94V1	UL94V2	UL94V3
Protection degree	IP20	IP21	IP22	IP23
Colour	Yellow	Blue	Yellow	Blue
Packaging quantity	1	1	2	3
Approx. Weight	135 g	95 g	135 g	95 g
Mounting information	vertical on rail, without spacing between adjacent components			

MOUNTING ACCESSORIES

Mounting rail type according to IEC60715/TH35-7.5	PR/3/AC, PR/3/AC/ZB, PR/3/AS, PR/3/AS/ZB			
Replacement varistor				
Screw type jumper	2 poles		Cod. 9000392 (BP2)	
	3 poles		Cod. 9000393 (BP3)	
	4 poles		Cod. 9000394 (BP4)	