



Lightning and surge protection for golf courses

White Paper



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Golf courses by nature extend over large areas and include many facilities such as club houses, caddy/trolley sheds (frequently with integrated driving range), locker/change rooms, halfway houses, shelters and golf cart parking lots/garages (with battery charging units). Widespread irrigation and sprinkler systems ensure the quality of the greens. Golf courses are often located in areas where low-voltage power supply is not readily available and receive power from the distribution network operator (DNO) as medium voltage (compact station).

In general, it is advisable to assess the risk resulting from a lightning strike for all concern areas of the golf course as per IEC 62305-2 (EN 62305-2) and to plan protection measures based on the results of this risk analysis.

Lightning protection measures are a combination of external lightning protection and lightning equipotential bonding for all service lines entering and leaving the building such as the metal gas and water pipes as well as power supply feeder and control lines.

Equipotential bonding measures in accordance with IEC 62305-3 (EN 62305-3) are e.g.

- ➔ Use of type 1 lightning current arresters (e.g. DEHNventil) for electrical lines
- ➔ Direct equipotential bonding of metal systems.

Protection against transients (resulting from indirect lightning interference or switching operations on the electrical supply system) is achieved by using type 2 surge arresters (e.g. DEHNguard), thus increasing system safety and availability. Normative information is given in IEC 62305-4 (EN 62305-4), IEC 60364-4-44 (HD 60364-4-443) as well as EN 50174-2.

Shelters

Shelters, for example on golf courses, must not only protect golfers from storm and rain, but also from lightning interference.

An external lightning protection system in combination with feasible measures to reduce inadmissibly high step and touch potentials at the entrance and in the shelter are required in case of a lightning strike (**Figure 1**). Shelters should not be installed at exposed locations (on hills, at the edge of a forest, underneath isolated trees). For more detailed information, please refer to chapter 9.28.

Club house

The power supply feeder cable to the main low-voltage distribution board is often located in the basement of the club house together with different sub-distribution boards supplying power to the restaurants, halfway house, offices, shops, and other detached buildings. Regardless of whether an external lightning protection system exists, a type 1 combined arrester should be installed in the main low-voltage distribution board to prevent potentially damaging lightning currents entering via the power

supply feeder cable (**Figure 2**). The sub-distribution boards are equipped with type 2 surge arresters.

Telephone/data lines usually terminate in a dedicated service room of the club house. In the simplest case, several telephone lines and lines for data/internet access (U_{k0} lines) enter the building.

A type 1 combined arrester for IT equipment is installed for the U_{k0} lines near the entrance point into the building.

Office communication and RFID systems for ball machines, access control and renting of golf carts play an important function. Therefore, the network card should be protected by a surge arrester for LAN connections and the power supply by a type 3 surge arrester.

It is equally important to protect the protective circuit for the transmit/receive antenna of the RFID system or for the TV and radio satellite antenna near the entrance point into the building.

Caddy/trolley shed with integrated driving range

Measures to avoid inadmissibly high step and touch voltages in case of lightning interference are imperative. Protection measures are to be taken for highly frequented entrance and shelter areas. To this end, numerous measures can be employed, for example keeping a surface resistance $\geq 100 \text{ k}\Omega$ within a limited protective area of 3 m around the down conductor (e.g. 5 cm asphalt).

As described above, lightning equipotential bonding has to be implemented for the different systems directly at the entrance point into the building and, if necessary (depending on the results of the risk analysis), further surge protection measures upstream of the terminal device have to be provided (**Figure 3**).

The same protection measures as for the club house or the caddy/trolley shed with driving range have to be taken for the golf cart parking garage and the cart shed.

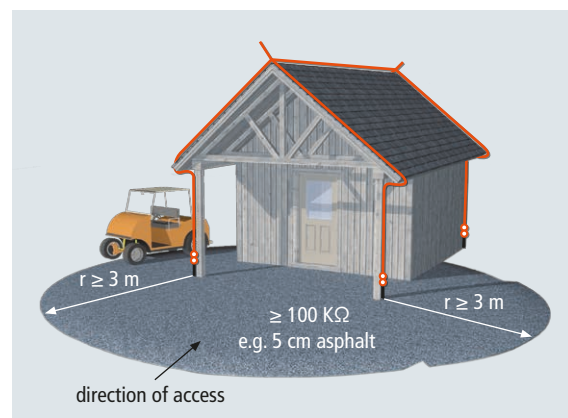
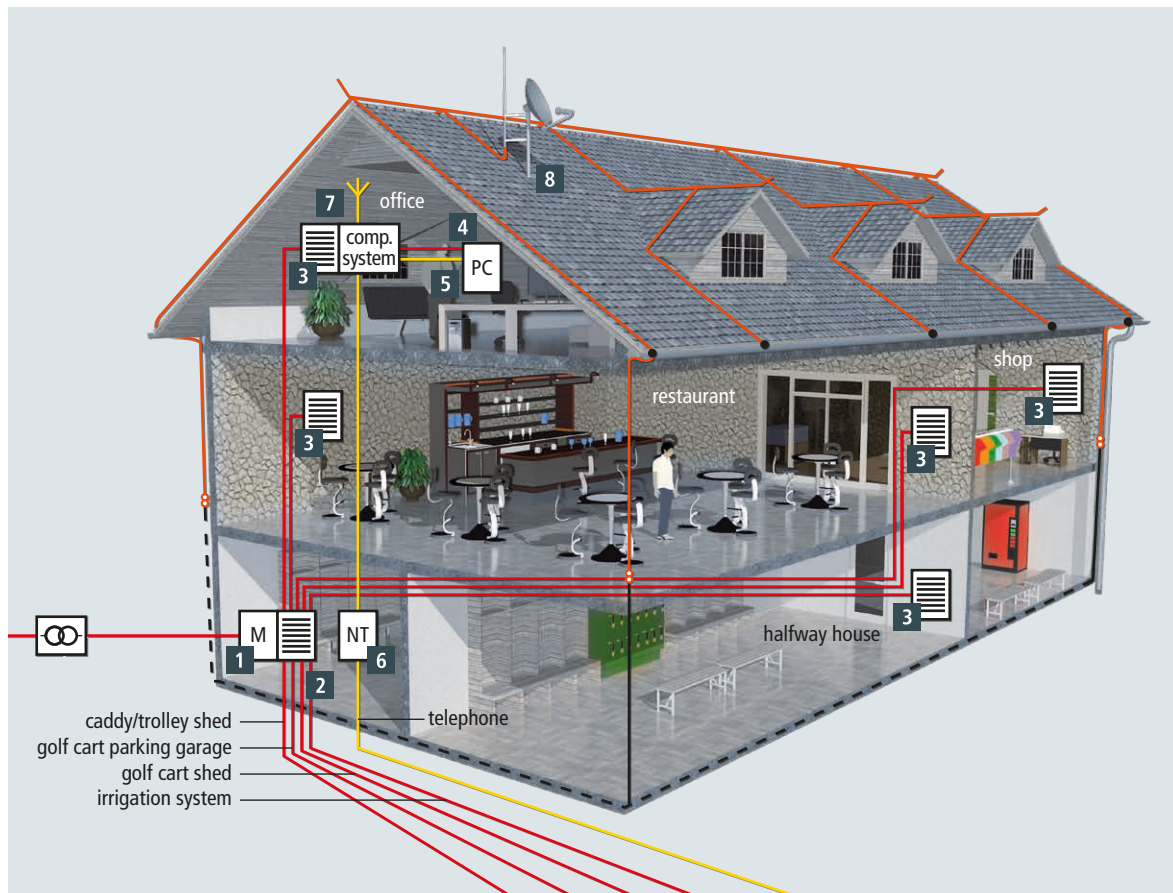


Figure 1 Protection of a shelter with one entrance and defined direction of access against step and touch voltage

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	Protection measures	System	Type	Part No.
1	Combined arrester (DIN rail)	TN-C system TN-S system TT system	DEHNventil DV M TNC 255 DEHNventil DV M TNS 255 DEHNventil DV M TT 255	951 300 951 400 951 310
2	$I_{UV} \rightarrow$ building exit < 15 m, lightning current arrester (DIN rail)	TN-S system TT system	4 x DEHNbloc DB M 1 255 3 x DEHNbloc DB M 1 255 + 1 x DEHNgap DGP M 255	961 120 961 120 + 961 101
3	Surge arrester (DIN rail)	TN-S system TT system	DEHNguard DG M TNS 275 DEHNguard DG M TT 275	952 400 952 310
4	Surge arrester (socket outlet)	All system configurations	DEHNflex DFL M 255 STC 230 module for socket outlets SFL Protector SFL PRO 6X	924 396 924 350 909 250
Interface			Type	Part No.
5	LAN data network		DEHNpatch DPA M CAT6 RJ45S 48	929 100
6	Telephone	1 trunk 2 trunks	BLITZDUCTOR BXT ML2 BD 180 + BXT BAS base part BLITZDUCTOR BXT ML4 BD 180 + BXT BAS base part	920 247 + 920 300 920 347 + 920 300
7	WLAN antenna		DEHNgate DGA G BNC + angled fixing plate	929 042 + 106 329
8	Satellite antenna		DEHNgate DGA FF TV	909 703

Figure 2 Surge protection for the low-voltage and IT supply lines of a club house

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	Protection measures	System	Type	Part No.
1	Combined arrester (DIN rail)	TN-S-System TT-System	DEHNventil DV M TNS 255 DEHNventil DV M TT 255	951 400 951 310
2	Surge arrester (socket outlet) Surge arrester (DIN rail)	All system configurations	DEHNflex DFL M 255 DEHNrail DR M 2P 255	924 396 953 200
	Interface		Type	Part No.
3	WLAN antenna		DEHNgate DGA G BNC + angled fixing plate	929 042 + 106 329

Figure 3 Caddy/trolley shed with integrated driving range protected against surges as well as step and touch voltage

Irrigation system

Water is mostly pumped from reservoirs. The necessary pumps are installed in underground ducts and are controlled and monitored from a service station (Figure 4).

The pressurised water pipe runs throughout the entire golf course. Sprinkler systems which are supplied by branch pipes water the individual greens and tees. The water flow is controlled via magnetic valves which are installed either directly at the sprinkler or in ground-level boxes. The magnetic valves which activate the individual sprinklers are controlled by decoders. Data transmission and power supply for the valves (e.g. 35 V/1 Hz, 1.1 A) is provided by a two-wire ring conductor. In some cases, this two-wire cable can be longer than 10 km. Connecting cables to the magnetic valves, however, do not exceed 150 m to limit any excessive voltage drop.

The long two-wire ring conductor and the extremely long conductors to the magnetic valves provide the highest risk in terms of surges. In practice, therefore corresponding surge protective

devices are installed on the two-wire ring conductor at intervals not exceeding 150 m. For locally earthing the surge protective devices, suitable corrosion-resistant earth-termination systems (earth rods or radial earth electrodes) are installed. These should be implemented simultaneously with the installation of the pressurised water reticulation pipe and the two-wire ring conductor.

Service station

Lightning equipotential bonding has to be implemented at the entry point into the service station for the pressurised water pipe, the two-wire ring conductor, the IT and the power supply feeder cable and the pump line.

It depends on the building size whether further surge protection measures are necessary for the internal conductors upstream of the corresponding control systems (Figure 5).

The described practical solutions are just examples. Lightning and surge protection have to be individually adjusted to the natural and structural conditions.

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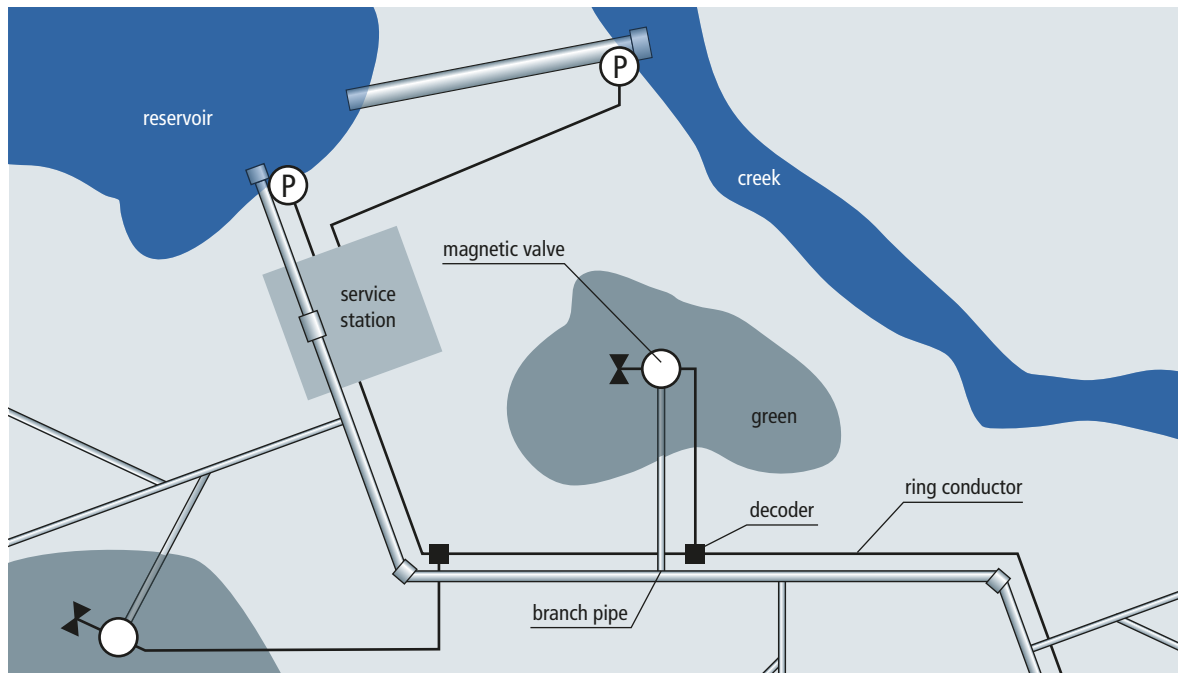


Figure 4 Pressurised pipe with branch pipes, magnetic valves, two-wire ring conductor and decoders

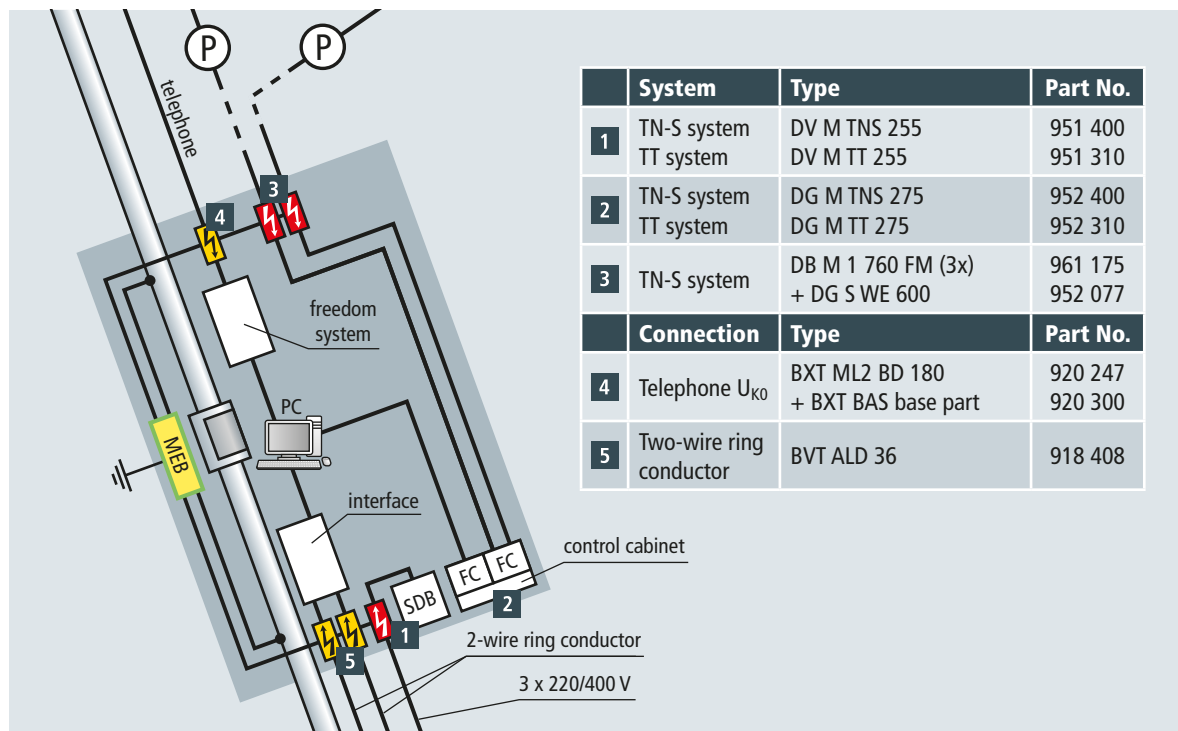


Figure 5 Service station with power distribution board, control cabinet of the irrigation system, PC, interface and data management system

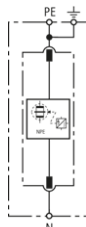
DEHNgap

DGP M 255 (961 101)

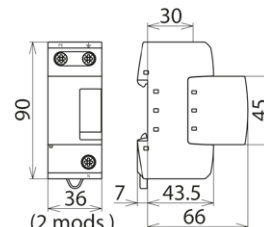
- Discharge capacity up to 100 kA (10/350 μ s)
- Total current arrester specifically designed for installation in "3+1" and "1+1" circuits of TT systems according to IEC 60364-5-53 between neutral conductor N and protective conductor PE
- Creepage discharge spark gap technology



Figure without obligation



Basic circuit diagram DGP M 255



Dimension drawing DGP M 255

Coordinated and modular single-pole N-PE lightning current arrester for $U_c = 255$ V; also available with remote signalling contact for the monitoring system (floating changeover contact).

Type Part No.	DGP M 255 961 101
SPD according to EN 61643-11 / IEC 61643-11	type 1 / class I
Max. continuous operating a.c. voltage (U_c)	255 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) (I_{imp})	100 kA
Specific energy (W/R)	2.50 MJ/ohms
Voltage protection level (U_p)	≤ 1.5 kV
Follow current extinguishing capability a.c. (I_n)	100 A _{rms}
Response time (t_A)	≤ 100 ns
Temporary overvoltage (TOV) (U_T) – Characteristic	1200 V / 200 ms – withstand
Operating temperature range (parallel connection) (T_{UP})	-40 °C ... +80 °C
Operating temperature range (series connection) (T_{US})	-40 °C ... +60 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (N, PE, \pm) (min.)	10 mm ² solid / flexible
Cross-sectional area (N, PE) (max.)	50 mm ² stranded / 35 mm ² flexible
Cross-sectional area (\pm) (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	2 module(s), DIN 43880
Approvals	VDE, KEMA, UL
Weight	315 g
Customs tariff number	85363010
GTIN	4013364118676
PU	1 pc(s)

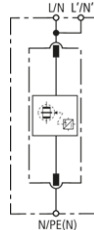
DEHNbloc

DB M 1 255 (961 120)

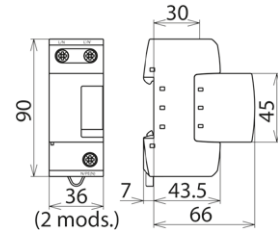
- Coordinated spark-gap-based lightning current arrester consisting of a base part and plug-in protection module
- Maximum system availability due to RADAX Flow follow current limitation
- Directly coordinated with DEHNguard surge protective devices without additional cable length



Figure without obligation



Basic circuit diagram DB M 1 255



Dimension drawing DB M 1 255

Coordinated modular single-pole lightning current arrester with high follow current limitation

Type	DB M 1 255
Part No.	961 120
SPD according to EN 61643-11	Type 1
SPD according to IEC 61643-1/-11	Class I
Max. continuous operating a.c. voltage (U_c)	255 V
Lightning impulse current (10/350 μ s) (I_{imp})	50 kA
Specific energy (W/R)	625.00 kJ/ohms
Nominal discharge current (8/20 μ s) (I_n)	50 kA
Voltage protection level (U_p)	≤ 2.5 kV
Follow current extinguishing capability a.c. (I_{fi})	50 kA _{rms}
Follow current limitation/Selectivity	no tripping of a 32 A gL/gG fuse up to 50 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. backup fuse (L) up to $I_K = 50$ kA _{rms} ($t_a \leq 0.2$ s)	500 A gL/gG
Max. backup fuse (L) up to $I_K = 50$ kA _{rms} ($t_a \leq 5$ s)	315 A gL/gG
Max. backup fuse (L-L')	125 A gL/gG
Temporary overvoltage (TOV) (U_T)	440 V / 5 sec.
TOV characteristic	withstand
Operating temperature range (parallel connection) (T_{UP})	-40°C...+80°C
Operating temperature range (series connection) (T_{US})	-40°C...+60°C
Operating state/fault indication	green / red
Number of ports	1
Cross-sectional area (L/N, L'/N', N/PE (N)) (min.)	10 mm ² solid/flexible
Cross-sectional area (L/N, N/PE(N)) (max.)	50 mm ² stranded/35 mm ² flexible
Cross-sectional area (L'/N') (max.)	35 mm ² stranded/25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	2 module(s), DIN 43880
Approvals	VDE, KEMA, UL
Extended technical data:	Use in installations with prospective short-circuit currents of more than 50 kA _{rms} (tested by VDE)
- Maximum prospective short-circuit current	100 kA _{rms} (220 kA _{peak})
- Limitation/extinction of mains follow currents	up to 100 kA _{rms} (220 kA _{peak})
- Max. backup fuse (L) up to $I_K = 100$ kA _{rms} ($t_a \leq 0.2$ s)	500 A gL/gG
- Max. backup fuse (L) up to $I_K = 100$ kA _{rms} ($t_a \leq 5$ s)	315 A gL/gG
Weight	340 g
Customs tariff number	85363030
GTIN	4013364118614
PU	1 pc(s)

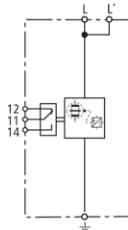
DEHNbloc Maxi

DBM 1 760 FM (961 175)

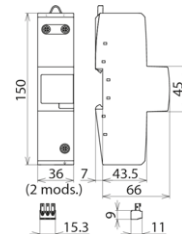
- Encapsulated non-exhausting spark gap
- High follow current extinction and limitation due to RADAX Flow technology
- Directly coordinated with DEHNguard surge protective devices without additional cable length



Figure without obligation



Basic circuit diagram DBM 1 760 FM



Dimension drawing DBM 1 760 FM

Coordinated single-pole lightning current arrester with high follow current limitation for $U_c = 760$ V

Type	DBM 1 760 FM
Part No.	961 175
SPD according to EN 61643-11	Type 1
SPD according to IEC 61643-1/-11	Class I
Max. continuous operating a.c. voltage (U_c)	760 V
Lightning impulse current (10/350 μ s) (I_{imp})	25 kA
Specific energy (W/R)	156.25 kJ/ohms
Nominal discharge current (8/20 μ s) (I_n)	25 kA
Voltage protection level (U_p)	≤ 4 kV
Follow current extinguishing capability a.c. (I_f)	25 kA _{rms}
Follow current limitation / Selectivity	no tripping of a 32 A gL/gG fuse up to 25 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. backup fuse (L) up to $I_K = 25$ kA _{rms} ($t_a \leq 5$ s)	250 A gL/gG
Max. backup fuse (L) up to $I_K > 25$ kA _{rms}	100 A gL/gG
Max. backup fuse (L-L')	125 A gL/gG
Temporary overvoltage (TOV) (U_T)	1000 V / 5 sec.
TOV characteristic	withstand
Operating temperature range (parallel connection) (T_{UP})	-40°C...+80°C
Operating temperature range (series connection) (T_{US})	-40°C...+60°C
Operating state/fault indication	green / red
Number of ports	1
Cross-sectional area (L, L', \pm) (min.)	10 mm ² solid/flexible
Cross-sectional area (L, \pm) (max.)	50 mm ² stranded/35 mm ² flexible
Cross-sectional area (L') (max.)	35 mm ² stranded/25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	2 module(s), DIN 43880
Approvals	UL, CSA
Type of remote signalling contact	changeover contact
a.c. switching capacity	250 V/0.5 A
d.c. switching capacity	250 V/0.1 A; 125 V/0.2 A; 75 V/0.5 A
Cross-sectional area for remote signalling terminals	max. 1.5 mm ² solid/flexible
Weight	508 g
Customs tariff number	85363030
GTIN	4013364116283
PU	1 pc(s)

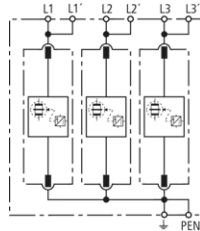
DEHNventil

DV M TNC 255 (951 300)

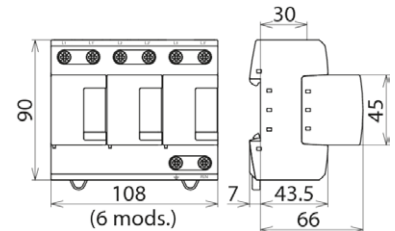
- Prewired combined type 1 and type 2 spark-gap-based lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TNC 255



Dimension drawing DV M TNC 255

Modular combined lightning current and surge arrester for protecting TN-C systems against surges.

Type Part No.	DV M TNC 255 951 300
SPD according to EN 61643-11 / IEC 61643-11	type 1 + type 2 / class I + class II
Energy coordination with terminal equipment (≤ 5 m)	type 1 + type 2 + type 3
Nominal a.c. voltage (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating a.c. voltage (U_c)	264 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L1+L2+L3-PEN] (I_{total})	75 kA
Specific energy [L1+L2+L3-PEN] (W/R)	1.40 MJ/ohms
Lightning impulse current (10/350 μ s) [L-PEN] (I_{imp})	25 kA
Specific energy [L-PEN] (W/R)	156.25 kJ/ohms
Nominal discharge current (8/20 μ s) [L-PEN]/[L1+L2+L3-PEN] (I_n)	25 / 75 kA
Voltage protection level (U_p)	≤ 1.5 kV
Follow current extinguishing capability a.c. (I_n)	50 kA _{rms}
Follow current limitation / Selectivity	no tripping of a 20 A gL/gG fuse up to 50 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. backup fuse (L) up to $I_K = 50$ kA _{rms}	315 A gG
Max. backup fuse (L-L')	125 A gG
Temporary overvoltage (TOV) (U_T) – Characteristic	440 V / 120 min. – withstand
Operating temperature range [parallel] / [series] (T_U)	-40 °C ... +80 °C / -40 °C ... +60 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L1, L1', L2, L2', L3, L3', PEN, \pm) (min.)	10 mm ² solid / flexible
Cross-sectional area (L1, L2, L3, PEN) (max.)	50 mm ² stranded / 35 mm ² flexible
Cross-sectional area (L1', L2', L3', \pm) (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	6 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Extended technical data:	Use in switchgear installations with prospective short-circuit currents of more than 50 kA _{rms} (tested by the German VDE)
– Max. prospective short-circuit current	100 kA _{rms} (220 kA _{peak})
– Limitation / Extinction of mains follow currents	up to 100 kA _{rms} (220 kA _{peak})
– Max. backup fuse (L) up to $I_K = 100$ kA _{rms}	315 A gL/gG
Weight	970 g
Customs tariff number	85363030
GTIN	4013364108134
PU	1 pc(s)

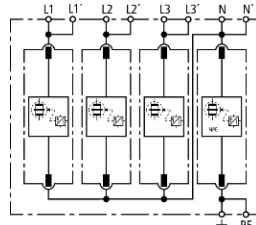
DEHNventil

DV M TT 255 (951 310)

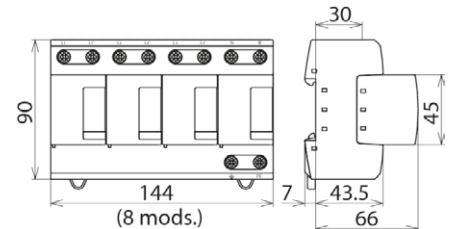
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TT 255



Dimension drawing DV M TT 255

Modular combined lightning current and surge arrester for TT and TN-S systems ("3+1" circuit).

Type Part No.	DV M TT 255 951 310
SPD according to EN 61643-11 / IEC 61643-11	type 1 + type 2 / class I + class II
Energy coordination with terminal equipment (≤ 5 m)	type 1 + type 2 + type 3
Nominal a.c. voltage (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating a.c. voltage [L-N] (U_C)	264 V (50 / 60 Hz)
Max. continuous operating a.c. voltage [N-PE] ($U_{C(N-PE)}$)	255 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L1+L2+L3+N-PE] (I_{total})	100 kA
Specific energy [L1+L2+L3+N-PE] (W/R)	2.50 MJ/ohms
Lightning impulse current (10/350 μ s) [L-N]/[N-PE] (I_{imp})	25 / 100 kA
Specific energy [L-N]/[N-PE] (W/R)	156.25 kJ/ohms / 2.50 MJ/ohms
Nominal discharge current (8/20 μ s) [L-N]/[N-PE] (I_n)	25 / 100 kA
Voltage protection level [L-N]/[N-PE] (U_p)	≤ 1.5 / ≤ 1.5 kV
Follow current extinguishing capability [L-N]/[N-PE] (I_a)	50 kA _{rms} / 100 A _{rms}
Follow current limitation / Selectivity	no tripping of a 20 A gL/gG fuse up to 50 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. backup fuse (L) up to $I_k = 50$ kA _{rms}	315 A gG
Max. backup fuse (L-L')	125 A gG
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	440 V / 120 min. – withstand
Temporary overvoltage (TOV) [N-PE] (U_T) – Characteristic	1200 V / 200 ms – withstand
Operating temperature range [parallel] / [series] (T_U)	-40 °C ... +80 °C / -40 °C ... +60 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L1, L1', L2, L2', L3, L3', N, N', PE, \perp) (min.)	10 mm ² solid / flexible
Cross-sectional area (L1, L2, L3, N, PE) (max.)	50 mm ² stranded / 35 mm ² flexible
Cross-sectional area (L1', L2', L3', N', \perp) (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	8 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Extended technical data:	Use in switchgear installations with prospective short-circuit currents of more than 50 kA _{rms} (tested by the German VDE)
– Max. prospective short-circuit current	100 kA _{rms} (220 kA _{peak})
– Limitation / Extinction of mains follow currents	up to 100 kA _{rms} (220 kA _{peak})
– Max. backup fuse (L) up to $I_k = 100$ kA _{rms}	315 A gL/gG
Weight	1,27 kg
Customs tariff number	85363030
GTIN	4013364108172
PU	1 pc(s)

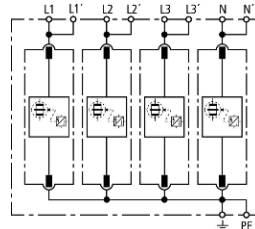
DEHNventil

DV M TNS 255 (951 400)

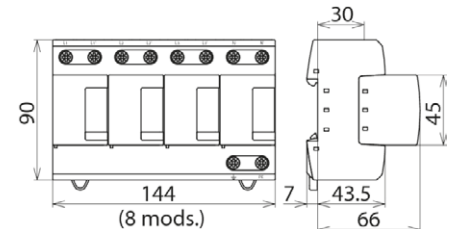
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TNS 255



Dimension drawing DV M TNS 255

Modular combined lightning current and surge arrester for TN-S systems.

Type Part No.	DV M TNS 255 951 400
SPD according to EN 61643-11 / IEC 61643-11	type 1 + type 2 / class I + class II
Energy coordination with terminal equipment (≤ 5 m)	type 1 + type 2 + type 3
Nominal a.c. voltage (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating a.c. voltage (U_c)	264 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L1+L2+L3+N-PE] (I_{total})	100 kA
Specific energy [L1+L2+L3+N-PE] (W/R)	2.50 MJ/ohms
Lightning impulse current (10/350 μ s) [L, N-PE] (I_{imp})	25 kA
Specific energy [L,N-PE] (W/R)	156.25 kJ/ohms
Nominal discharge current (8/20 μ s) [L/N-PE]/[L1+L2+L3+N-PE] (I_n)	25 / 100 kA
Voltage protection level [L-PE]/[N-PE] (U_p)	≤ 1.5 / ≤ 1.5 kV
Follow current extinguishing capability a.c. (I_{fi})	50 kA _{rms}
Follow current limitation / Selectivity	no tripping of a 20 A gL/gG fuse up to 50 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. backup fuse (L) up to $I_k = 50$ kA _{rms}	315 A gG
Max. backup fuse (L-L')	125 A gG
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	440 V / 120 min. – withstand
Operating temperature range [parallel] / [series] (T_U)	-40 °C ... +80 °C / -40 °C ... +60 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L1, L1', L2, L2', L3, L3', N, N', PE, \pm) (min.)	10 mm ² solid / flexible
Cross-sectional area (L1, L2, L3, N, PE) (max.)	50 mm ² stranded / 35 mm ² flexible
Cross-sectional area (L1', L2', L3', N', \pm) (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	8 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Extended technical data:	Use in switchgear installations with prospective short-circuit currents of more than 50 kA _{rms} (tested by the German VDE)
– Max. prospective short-circuit current	100 kA _{rms} (220 kA _{peak})
– Limitation / Extinction of mains follow currents	up to 100 kA _{rms} (220 kA _{peak})
– Max. backup fuse (L) up to $I_k = 100$ kA _{rms}	315 A gL/gG
Weight	1,35 kg
Customs tariff number	85363030
GTIN	4013364108158
PU	1 pc(s)

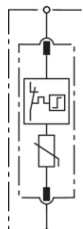
DEHNguard S

DG S WE 600 (952 077)

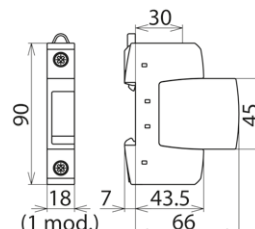
- Multi-purpose surge arrester consisting of a base element and plug-in protection module
- High discharge capacity due to heavy-duty zinc oxide varistor
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



Figure without obligation



Basic circuit diagram DG S WE 600



Dimension drawing DG S WE 600

Pluggable single-pole surge arrester with a rated varistor voltage $U_{mov} = 750$ V a.c., consisting of base part and plug-in protection module; FM version with floating remote signalling contact.

Type	DG S WE 600
Part No.	952 077
SPD according to EN 61643-11 / IEC 61643-11	type 2 / class II
Nominal a.c. voltage (U_N)	480 V (50 / 60 Hz)
Max. continuous operating a.c. voltage (U_C)	600V (50 / 60 Hz)
Rated varistor voltage a.c. (U_{mov})	750 V
Nominal discharge current (8/20 μ s) (I_n)	15 kA
Max. discharge current (8/20 μ s) (I_{max})	25 kA
Voltage protection level (U_p)	≤ 3 kV
Voltage protection level at 5 kA (U_p)	≤ 2.5 kV
Response time (t_A)	≤ 25 ns
Max. mains-side overcurrent protection	100 A gG
Short-circuit withstand capability for max. mains-side overcurrent protection (I_{SCCR})	25 kA _{rms}
Temporary overvoltage (TOV) (U_T) – Characteristic	900 V / 5 sec. – withstand
Temporary overvoltage (TOV) (U_T) – Characteristic	915 V / 120 min. – safe failure
Operating temperature range (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	1.5 mm ² solid / flexible
Cross-sectional area (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	1 module(s), DIN 43880
Approvals	KEMA, UL, CSA, VdS
Weight	137 g
Customs tariff number	85363030
GTIN	4013364119680
PU	1 pc(s)

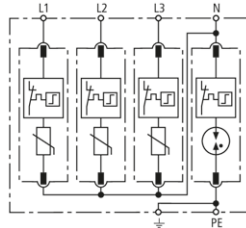
DEHNguard

DG M TT 275 (952 310)

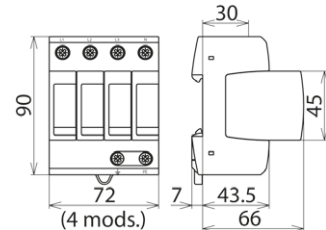
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



Figure without obligation



Basic circuit diagram DG M TT 275



Dimension drawing DG M TT 275

Modular surge arrester for use in TT and TN-S systems ("3+1" circuit).

Type	DG M TT 275
Part No.	952 310
SPD according to EN 61643-11 / IEC 61643-11	type 2 / class II
Nominal a.c. voltage (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating a.c. voltage [L-N] (U_C)	275 V (50 / 60 Hz)
Max. continuous operating a.c. voltage [N-PE] (U_C)	255 V (50 / 60 Hz)
Nominal discharge current (8/20 μ s) (I_n)	20 kA
Max. discharge current (8/20 μ s) (I_{max})	40 kA
Lightning impulse current (10/350 μ s) [N-PE] (I_{imp})	12 kA
Voltage protection level [L-N] (U_P)	≤ 1.5 kV
Voltage protection level [L-N] at 5 kA (U_P)	≤ 1 kV
Voltage protection level [N-PE] (U_P)	≤ 1.5 kV
Follow current extinguishing capability [N-PE] (I_n)	100 A _{rms}
Response time [L-N] (t_A)	≤ 25 ns
Response time [N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	125 A gG
Short-circuit withstand capability for max. mains-side overcurrent protection (I_{SCCR})	50 kA _{rms}
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	335 V / 5 sec. – withstand
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	440 V / 120 min. – safe failure
Temporary overvoltage (TOV) [N-PE] (U_T) – Characteristic	1200 V / 200 ms – withstand
Operating temperature range (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	1.5 mm ² solid / flexible
Cross-sectional area (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	4 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Weight	450 g
Customs tariff number	85363030
GTIN	4013364108479
PU	1 pc(s)

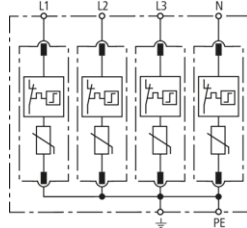
DEHNguard

DG M TNS 275 (952 400)

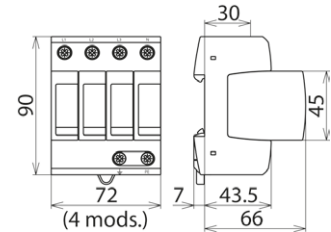
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



Figure without obligation



Basic circuit diagram DG M TNS 275



Dimension drawing DG M TNS 275

Modular surge arrester for use in TN-S systems.

Type	DG M TNS 275
Part No.	952 400
SPD according to EN 61643-11 / IEC 61643-11	type 2 / class II
Nominal a.c. voltage (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating a.c. voltage (U_C)	275 V (50 / 60 Hz)
Nominal discharge current (8/20 μ s) (I_n)	20 kA
Max. discharge current (8/20 μ s) (I_{max})	40 kA
Voltage protection level (U_P)	≤ 1.5 kV
Voltage protection level at 5 kA (U_P)	≤ 1 kV
Response time (t_A)	≤ 25 ns
Max. mains-side overcurrent protection	125 A gG
Short-circuit withstand capability for max. mains-side overcurrent protection (I_{SCCR})	50 kA _{rms}
Temporary overvoltage (TOV) (U_T) – Characteristic	335 V / 5 sec. – withstand
Temporary overvoltage (TOV) (U_T) – Characteristic	440 V / 120 min. – safe failure
Operating temperature range (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	1.5 mm ² solid / flexible
Cross-sectional area (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	4 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Weight	443 g
Customs tariff number	85363030
GTIN	4013364108455
PU	1 pc(s)

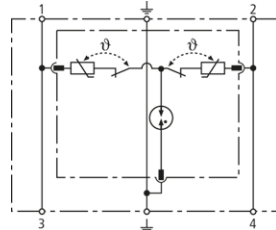
DEHNrail

DR M 2P 255 (953 200)

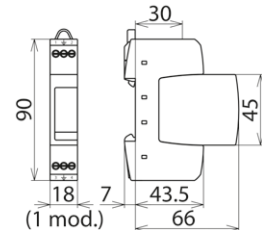
- Two-pole surge arrester consisting of a base element and plug-in protection module
- High discharge capacity due to heavy-duty zinc oxide varistor/spark gap combination
- Energy coordination with other arresters of the Red/Line product family



Figure without obligation



Basic circuit diagram DR M 2P 255



Dimension drawing DR M 2P 255

Two-pole surge arrester consisting of a base part and plug-in protection module

Type	DR M 2P 255
Part No.	953 200
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)	255 V
Max. continuous operating d.c. voltage (U_C)	255 V
Nominal load current a.c. (I_L)	25 A
Nominal discharge current (8/20 μ s) (I_n)	3 kA
Total discharge current (8/20 μ s) [L+N-PE] (I_{total})	5 kA
Combined impulse (U_{OC})	6 kV
Combined impulse [L+N-PE] ($U_{OC total}$)	10 kV
Voltage protection level [L-N] (U_P)	≤ 1250 V
Voltage protection level [L/N-PE] (U_P)	≤ 1500 V
Response time [L-N] (t_A)	≤ 25 ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	25 A gL/gG or B 25 A
Short-circuit withstand capability for mains-side overcurrent protection with 25 A gL/gG	6 kA _{rms}
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
TOV characteristic [L-N]	withstand
TOV characteristic [L/N-PE]	withstand
TOV characteristic [L+N-PE]	withstand
Operating temperature range (T_U)	-40°C...+80°C
Operating state/fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	0.5 mm ² solid/flexible
Cross-sectional area (max.)	4 mm ² solid/2.5 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	1 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS, CSA
Weight	81 g
Customs tariff number	85363030
GTIN	4013364108301
PU	1 pc(s)

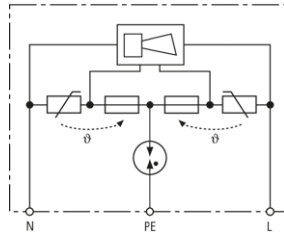
STC module

STC 230 (924 350)

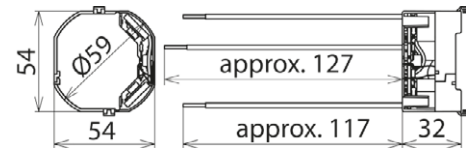
- Acoustic fault indication
- For installation in standard earthed socket outlets
- Independent of the the socket outlet design



Figure without obligation



Basic circuit diagram STC 230



Dimension drawing STC 230

Two-pole surge arrester to be snapped on earthed socket outlets

Type	STC 230
Part No.	924 350
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)	255 V
Nominal discharge current (8/20 μ s) (I_n)	3 kA
Total discharge current (8/20 μ s) [L+N-PE] (I_{total})	5 kA
Combined impulse (U_{OC})	6 kV
Combined impulse [L+N-PE] ($U_{OC total}$)	10 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)	≤ 25 ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	16 A gL/gG or B 16 A
Short circuit withstand capability for mains-side overcurrent protection with 16 A gL/gG	6 kA _{rms}
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
TOV characteristic [L-N]	withstand
TOV characteristic [L/N-PE]	withstand
TOV characteristic [L+N-PE]	safe
Operating temperature range (T_U)	-25°C...+40°C
Fault indication	acoustic signal on
Number of ports	1
Terminal wires	1 mm ² , 120 mm long
For mounting on	standard earthed socket outlets
Enclosure material	thermoplastic, red, UL 94 V-2
Place of installation	indoor installation
Degree of protection of installed device	IP 20
Dimensions	54 x 54 x 32 mm
Indication of disconnecter	acoustic signal on
Weight	34 g
Customs tariff number	85363010
GTIN	4013364076709
PU	1 pc(s)

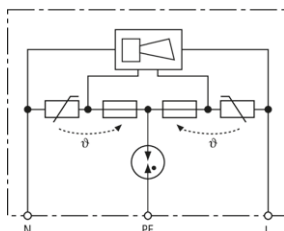
DEHNflex

DFL M 255 (924 396)

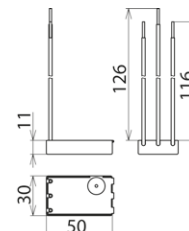
- Acoustic fault indication
- Compact design
- For use in flush-mounted systems, cable ducts and flush-type boxes



Figure without obligation



Basic circuit diagram DFL M 255



Dimension drawing DFL M 255

Surge arrester for use in all types of installation systems for terminal equipment; compact dimensions

Type Part No.	DFL M 255 924 396
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)	255 V
Nominal discharge current (8/20 μ s) (I_n)	1.5 kA
Total discharge current (8/20 μ s) [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)	≤ 25 ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	32 A gL/gG or B/C 32 A
Short-circuit withstand capability for mains-side overcurrent protection with 32 A gL/gG	6 kA _{rms}
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
TOV characteristic [L-N]	withstand
TOV characteristic [L/N-PE]	withstand
TOV characteristic [L+N-PE]	safe
Fault indication	acoustic signal on
Number of ports	1
Operating temperature range (T_U)	-25°C...+40°C
Terminal wires	1 mm ² , 120 mm long
Enclosure material	thermoplastic, red, UL 94 V-2
Place of installation	indoor installation
Degree of protection of installed device	IP 20
Dimensions	30 x 50 x 11 mm
Weight	32 g
Customs tariff number	85363010
GTIN	4013364091016
PU	1 pc(s)

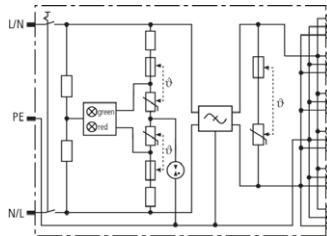
SFL protector

SFL PRO 6X (909 250)

- Surge protection with monitoring device and disconnecter
- Interference suppressor filter
- Visual operating state (green) and fault indication (red)



Figure without obligation



Basic circuit diagram SFL PRO 6X



Dimension drawing SFL PRO 6X

Surge protective multiple socket outlet with mains filter

Type	SFL PRO 6X
Part No.	909 250
SPD according to EN 61643-11	Type 3
SPD according to 61643-1/-11	Class III
Nominal a.c. voltage (U_N)	230 V
Max. continuous operating a.c. voltage (U_C)	255 V
Nominal load current a.c. (I_L)	16 A
Nominal discharge current (8/20 μ s) (I_n)	3 kA
Total discharge current (8/20 μ s) [L+N-PE] (I_{total})	5 kA
Combined impulse (U_{OC})	6 kV
Combined impulse [L+N-PE] ($U_{OC total}$)	10 kV
Voltage protection level (U_P)	≤ 1.5 kV
Response time [L-N] (t_A)	≤ 25 ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	16 A gL/gG or B 16 A
Short-circuit withstand capability for mains-side overcurrent protection with 16 A gL/gG	1.5 kA _{rms}
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
TOV characteristic [L-N]	withstand
TOV characteristic [L/N-PE]	withstand
TOV characteristic [L+N-PE]	safe
Fault indication	red light
Operating state indication	green light
Number of ports	2
Operating temperature range (T_U)	-20°C...+40°C
Connecting cable	approx. 2000 mm
Number of socket outlets	6
For mounting on	plug-in systems with earth contact according to DIN 49440 / DIN 49441
Enclosure material	thermoplastic, black/silver, UL 94 V-1
Place of installation	indoor installation
Degree of protection	IP 20
Dimensions	571 x 72 x 43 mm
Mains filter	acc. to EN 60939-1
Attenuation for f = 1 MHz, balanced	≥ 32 dB
Attenuation for f = 1 MHz, unbalanced	≥ 30 dB
Weight	1,1 kg
Customs tariff number	85369010
GTIN	4013364132566
PU	1 pc(s)

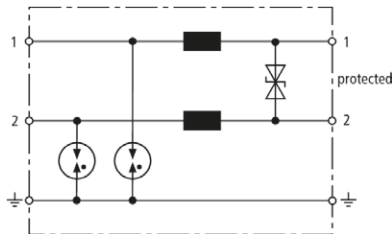
BLITZDUCTOR VT

BVT ALD 36 (918 408)

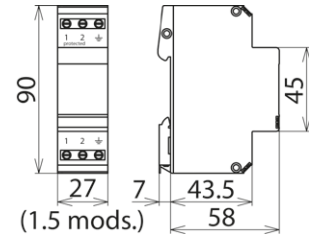
- For d.c. supply systems up to nominal currents of 7 A
- Low voltage protection level
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A -2$ and higher



Figure without obligation



Basic circuit diagram BVT ALD 36



Dimension drawing BVT ALD 36

Energy-coordinated, DIN rail mounted combined lightning current and surge arrester for protecting unearthed d.c. power supply systems.

Type	BVT ALD 36
Part No.	918 408
SPD class	TYPE 1 Pt
Nominal d.c. voltage (U_N)	36 V
Max. continuous operating d.c. voltage (U_C)	45 V
Nominal current at 80 °C (I_L)	4 A
Nominal current at 45 °C (I_L)	7 A
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	2.5 kA
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	5 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	10 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	20 kA
Voltage protection line-line for I_n C2 (U_p)	≤ 80 V
Voltage protection level line-PG for I_n C2 (U_p)	≤ 1000 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 60 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 650 V
Series resistance per line	22 μ H
Capacitance line-line (C)	≤ 1.5 pF
Capacitance line-PG (C)	≤ 100 pF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection	IP 20
For mounting on	35 mm DIN rails acc. to EN 60715
Connection (input / output)	screw / screw
Cross-sectional area, solid	0.5-6.0 mm ²
Cross-sectional area, flexible	0.5-4.0 mm ²
Tightening torque (terminals)	0.8 Nm
Earthing via	screw terminal
Enclosure material	thermoplastic, UL 94 V-0
Colour	yellow
Test standards	IEC 61643-21 / EN 61643-21
Approvals	GOST
Weight	110 g
Customs tariff number	85363010
GTIN	4013364125292
PU	1 pc(s)

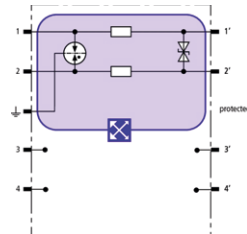
BLITZDUCTOR XT

BXT ML2 BD 180 (920 247)

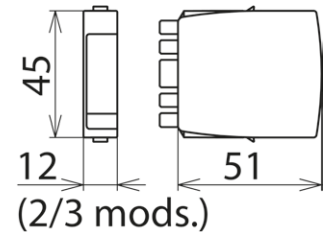
- LifeCheck SPD monitoring function
- Optimal protection of one pair
- For installation in conformity with the lightning protection zone concept at the boundaries from 0_A-2 and higher



Figure without obligation



Basic circuit diagram BXT ML2 BD 180



Dimension drawing BXT ML2 BD 180

Space-saving combined lightning current and surge arrester module with LifeCheck feature for protecting one pair of unearthed balanced interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.

Type	BXT ML2 BD 180
Part No.	920 247
SPD monitoring system	LifeCheck
SPD class	TYPE 1P2
Nominal voltage (U_N)	180 V
Max. continuous operating d.c. voltage (U_c)	180 V
Max. continuous operating a.c. voltage (U_c)	127 V
Nominal current at 45 °C (I_L)	0.75 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	5 kA
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	2.5 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	20 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	10 kA
Voltage protection level line-line for I_{imp} D1 (U_p)	≤ 270 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 550 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 250 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 550 V
Series resistance per line	1.8 ohm(s)
Cut-off frequency line-line (f_c)	25.0 MHz
Capacitance line-line (C)	≤ 240 pF
Capacitance line-PG (C)	≤ 16 pF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection (plugged-in)	IP 20
Pluggable into	BXT BAS / BSP BAS 4 base part
Earthing via	BXT BAS / BSP BAS 4 base part
Enclosure material	polyamide PA 6.6
Colour	yellow
Test standards	IEC 61643-21 / EN 61643-21, UL 497B
SIL classification	up to SIL3 ^{*)}
ATEX approvals	DEKRA 11ATEX0089 X: II 3 G Ex nA IIC T4 Gc
IECEx approvals	DEK 11.0032X: Ex nA IIC T4 Gc
CSA & USA Hazloc approvals (1)	2516389: Class I Div. 2 GP A, B, C, D T4
CSA & USA Hazloc approvals (2)	2516389: Class I Zone 2, AEx nA IIC T4
Approvals	CSA, GOST, VdS
Weight	43 g
Customs tariff number	85363010
GTIN	4013364116078
PU	1 pc(s)

^{*)} For more detailed information, please visit www.dehn-international.com.

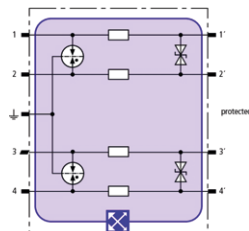
BLITZDUCTOR XT

BXT ML4 BD 180 (920 347)

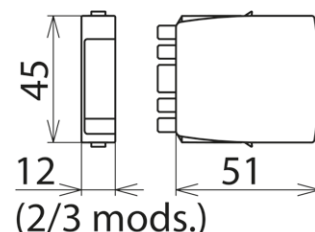
- LifeCheck SPD monitoring function
- Optimal protection of two pairs
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A -2$ and higher



Figure without obligation



Basic circuit diagram BXT ML4 BD 180



Dimension drawing BXT ML4 BD 180

Space-saving combined lightning current and surge arrester module with LifeCheck feature for protecting two pairs of unearthed balanced interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.

Type	BXT ML4 BD 180
Part No.	920 347
SPD monitoring system	LifeCheck
SPD class	TYPE 1P2
Nominal voltage (U_N)	180 V
Max. continuous operating d.c. voltage (U_C)	180 V
Max. continuous operating a.c. voltage (U_C)	127 V
Nominal current at 45 °C (I_L)	0.75 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	10 kA
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	2.5 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	20 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	10 kA
Voltage protection level line-line for I_{imp} D1 (U_p)	≤ 270 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 550 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 250 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 550 V
Series resistance per line	1.8 ohm(s)
Cut-off frequency line-line (f_c)	25.0 MHz
Capacitance line-line (C)	≤ 240 pF
Capacitance line-PG (C)	≤ 16 pF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection (plugged-in)	IP 20
Pluggable into	BXT BAS / BSP BAS 4 base part
Earthing via	BXT BAS / BSP BAS 4 base part
Enclosure material	polyamide PA 6.6
Colour	yellow
Test standards	IEC 61643-21 / EN 61643-21, UL 497B
SIL classification	up to SIL3 ^{*)}
ATEX approvals	DEKRA 11ATEX0089 X: II 3 G Ex nA IIC T4 Gc
IECEx approvals	DEK 11.0032X: Ex nA IIC T4 Gc
CSA & USA Hazloc approvals (1)	2516389: Class I Div. 2 GP A, B, C, D T4
CSA & USA Hazloc approvals (2)	2516389: Class I Zone 2, AEx nA IIC T4
Approvals	CSA, VdS, UL, GOST
Weight	24 g
Customs tariff number	85363010
GTIN	4013364109018
PU	1 pc(s)

^{*)}For more detailed information, please visit www.dehn-international.com.

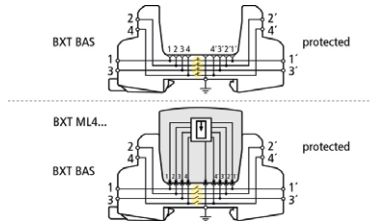
BLITZDUCTOR

BXT BAS (920 300)

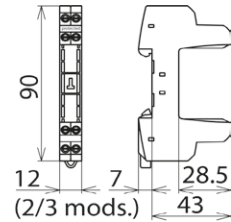
- Four-pole version for universal use with all types of BSP and BXT / BXTU protection modules
- No signal interruption if the protection module is removed
- Universal design without protection elements



Figure without obligation



Basic circuit diagram with and without plugged-in module



Dimension drawing BXT BAS

The BLITZDUCTOR XT base part is a very space-saving and universal four-pole feed-through terminal for the insertion of a protection module without signal interruption if the protection module is removed. The snap-in mechanism at the supporting foot of the base part allows the protection module to be safely earthed via the DIN rail. Since no components of the protective circuit are situated in the base part, only the protection modules must be maintained.

Type	BXT BAS
Part No.	920 300
Operating temperature range (T _u)	-40 °C ... +80 °C
Degree of protection	IP 20
For mounting on	35 mm DIN rails acc. to EN 60715
Connection (input / output)	screw / screw
Signal disconnection	no
Cross-sectional area, solid	0.08-4 mm ²
Cross-sectional area, flexible	0.08-2.5 mm ²
Tightening torque (terminals)	0.4 Nm
Earthing via	35 mm DIN rails acc. to EN 60715
Enclosure material	polyamide PA 6.6
Colour	yellow
ATEX approvals	DEKRA 11ATEX0089 X: II 3 G Ex nA IIC T4 Gc *)
IECEx approvals	DEK 11.0032X: Ex nA IIC T4 Gc *)
Approvals	CSA, VdS, UL, GOST
Weight	34 g
Customs tariff number	85369010
GTIN	4013364109179
PU	1 pc(s)

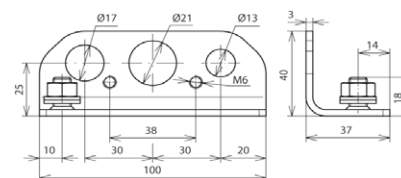
*) only in connection with an approved protection module

DEHNgate

BW90 B17 21 16 V2A (106 329)



Figure without obligation



With three mounting boreholes for three different sizes of DEHNgate arresters, e.g. 1x 929 042 + 1x 929 057 + 1x (929 043, 929 044, 929 045 or 929 059).

Type	BW90 B17 21 16 V2A
Part No.	106 329
Material	stainless steel
Weight	143 g
Customs tariff number	85389099
GTIN	4013364107182
PU	1 pc(s)

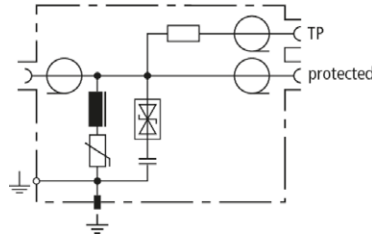
DEHNgate

DGA FF TV (909 703)

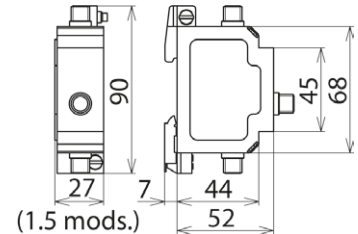
- Frequency range for analogue and digital TV, also suitable for reverse LAN channels
- Arresters of type FF and GFF with integrated measuring output
- Three types for adapted use in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ (combined lightning current and surge arresters of type GFF), $0_A - 1$ (lightning current arresters of type GF) and $1 - 2$ (surge arresters of type FF)



Figure without obligation



Basic circuit diagram DGA FF TV



Dimension drawing DGA FF TV

DGA ... TV are arresters with F connection for remote supply protect 75 ohm satellite and broadband cable systems and fulfil the high shielding requirements of class A according to EN 50083-2. They allow space-saving installation in all common TV and satellite applications and are available as lightning current arresters, surge arresters as well as combined lightning current and surge arresters with integrated measuring output for testing installations.

Type	DGA FF TV
Part No.	909 703
SPD class	TYPE 3 P1
Max. continuous operating d.c. voltage (U_c)	24 V
Nominal current (I_n)	2 A
D1 Lightning impulse current (10/350 μ s) (I_{imp})	0.2 kA
C2 Nominal discharge current (8/20 μ s) (I_n)	1.5 kA
Voltage protection level for I_{imp} D1 (U_p)	≤ 230 V
Voltage protection level for I_n C2 (U_p)	≤ 300 V
Voltage protection level at 1 kV/ μ s C3 (U_p)	≤ 60 V
Frequency range	d.c. / 5-3000 MHz
Insertion loss 5-862 MHz typ.	1.2 dB
Insertion loss 862-2400 MHz typ.	1.4 dB
Insertion loss 2400-3000 MHz typ.	2 dB
Return loss	≥ 14 dB
Return loss (47-2400 MHz)	≥ 18 dB (-1.5 dB/octave)
Return loss test socket (5-47 MHz)	≥ 18 dB
Test socket connection loss	20 dB
Shield attenuation 5-300 MHz	≥ 85 dB
Shield attenuation 300-470 MHz	≥ 80 dB
Shield attenuation 470-1000 MHz	≥ 75 dB
Shield attenuation 1000-2400 MHz	≥ 55 dB
Characteristic impedance (Z)	75 ohms
Operating temperature range (T_u)	-40 °C ... +80 °C
Degree of protection (if lines are connected)	IP 30
For mounting on	35 mm DIN rails acc. to EN 60715 or wall mounting
Connection (input / output)	F socket / F socket
Earthing via	DIN rail or screw connection
Enclosure material	metal
Colour	bare surface
Test standards	IEC 61643-21 / EN 61643-21
Approvals	GOST
Accessories	2x F plugs
Weight	233 g
Customs tariff number	85363090
GTIN	4013364085664
PU	1 pc(s)

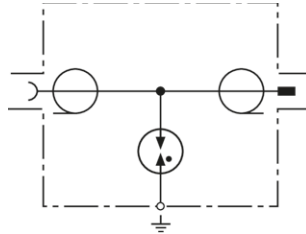
DEHNgate

DGA G BNC (929 042)

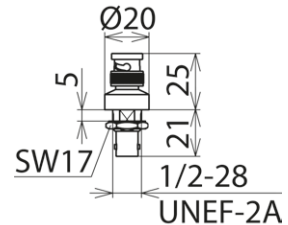
- Compact dimensions
- Extremely wide transmission range
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_B - 1$ and higher



Figure without obligation



Basic circuit diagram DGA G BNC



Dimension drawing DGA G BNC

Surge arrester for remote power supply with integrated gas discharge tube. Ideally suited for wireless applications for the coaxial interfaces of devices and antennas.

Available with SMA, BNC or N connection for bushing installation.

Type Part No.	DGA G BNC 929 042
SPD class	TYPE 2
Max. continuous operating d.c. voltage (U_c)	135 V
Nominal current (I_n)	3.5 A
Max. transmission capacity	25 W
D1 Lightning impulse current (10/350 μ s) (I_{imp})	1 kA
C2 Nominal discharge current (8/20 μ s) (I_n)	5 kA
Voltage protection level for I_n , C2 (U_p)	≤ 650 V
Frequency range	0-4 GHz
Insertion loss	≤ 0.2 dB
Return loss (d.c. - 3 GHz)	≥ 20 dB
Return loss (3 GHz-4 GHz)	≥ 20 dB
Characteristic impedance (Z)	50 ohms
Operating temperature range (T_u)	-40 °C ... +85 °C
Degree of protection (if lines are connected)	IP 20
Connection	BNC socket / BNC plug
Earthing via	bushing ($\varnothing 12.9$ mm)
Enclosure material	brass, gold-plated
Colour	gold
Test standards	IEC 61643-21 / EN 61643-21
Approvals	GOST
Weight	39 g
Customs tariff number	85366910
GTIN	4013364091030
PU	1 pc(s)

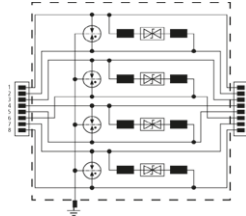
DEHNpatch

DPA M CAT6 RJ45S 48 (929 100)

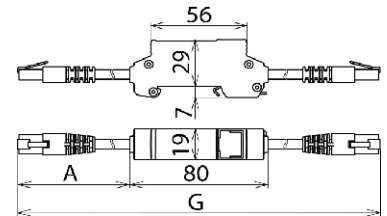
- Ideally suited for retrofitting, protection of all lines
- CAT 6A in the channel according to ANSI/TIA/EIA-568
- Power over Ethernet (PoE+ according to IEEE 802.3at)
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_B -2$ and higher



Figure without obligation



Basic circuit diagram DPA M CAT6 RJ45S 48



Dimension drawing DPA M CAT6 RJ45S 48

Universal arrester for Industrial Ethernet, Power over Ethernet (PoE+ according to IEEE 802.3at up to 57 V) and similar applications in structured cabling systems according to Cat. 6 and class E_A up to 500 MHz. Fully shielded type for DIN rail mounting.

Accessories: Earthing bracket with flat connector sleeve

Type	DPA M CAT6 RJ45S 48
Part No.	929 100
SPD class	TYPE 2 P₁
Nominal voltage (U _N)	48 V
Max. continuous operating d.c. voltage (U _c)	48 V
Max. continuous operating a.c. voltage (U _e)	34 V
Max. continuous operating d.c. voltage pair-pair (PoE) (U _c)	57 V
Nominal current (I _N)	1 A
D1 Lightning impulse current (10/350 μs) per line (I _{imp})	1 kA
C2 Nominal discharge current (8/20 μs) line-line (I _n)	150 A
C2 Nominal discharge current (8/20 μs) line-PG (I _n)	2.5 kA
C2 Total nominal discharge current (8/20 μs) line-PG (I _n)	10 kA
C2 Nominal discharge current (8/20 μs) pair-pair (PoE) (I _n)	150 A
Voltage protection level line-line for I _n C2 (U _p)	≤ 190 V
Voltage protection level line-PG for I _n C2 (U _p)	≤ 600 V
Voltage protection level line-line for I _n C2 (PoE) (U _p)	≤ 600 V
Voltage protection level line-line at 1 kV/μs C3 (U _p)	≤ 145 V
Voltage protection level line-PG at 1 kV/μs C3 (U _p)	≤ 500 V
Voltage protection level pair-pair at 1 kV/μs C3 (PoE) (U _p)	≤ 600 V
Insertion loss at 250 MHz	≤ 2 dB
Capacitance line-line (C)	≤ 165 pF
Capacitance line-PG (C)	≤ 255 pF
Operating temperature range (T _u)	-20 °C ... +60 °C
Degree of protection	IP 20
For mounting on	35 mm DIN rails acc. to EN 60715
Connection (input / output)	RJ45 connecting line / RJ45 connecting line
Pinning	1/2, 3/6, 4/5, 7/8
Connecting line	A = approx. 0.5 m, G = approx. 3 m ¹⁾
Connector	Stewart 39 series
Earthing via	35 mm DIN rail acc. to EN 60715
Enclosure material	zinc die-casting
Colour	bare surface
Test standards	IEC 61643-21 / EN 61643-21
Transmission class according to ISO/IEC 11801	Cat. 6
Transmission class according to EN 50173-1	Class E _A
Transmission class according to ANSI/TIA/EIA-568	cat. 6A in the channel
Approvals	GHMT, GOST
Accessories	fixing material
Weight	244 g
Customs tariff number	85363010
GTIN	4013364102170
PU	1 pc(s)

¹⁾ Special lengths on request

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DEHN protects.**

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