



Surge protection for petrol stations

White Paper

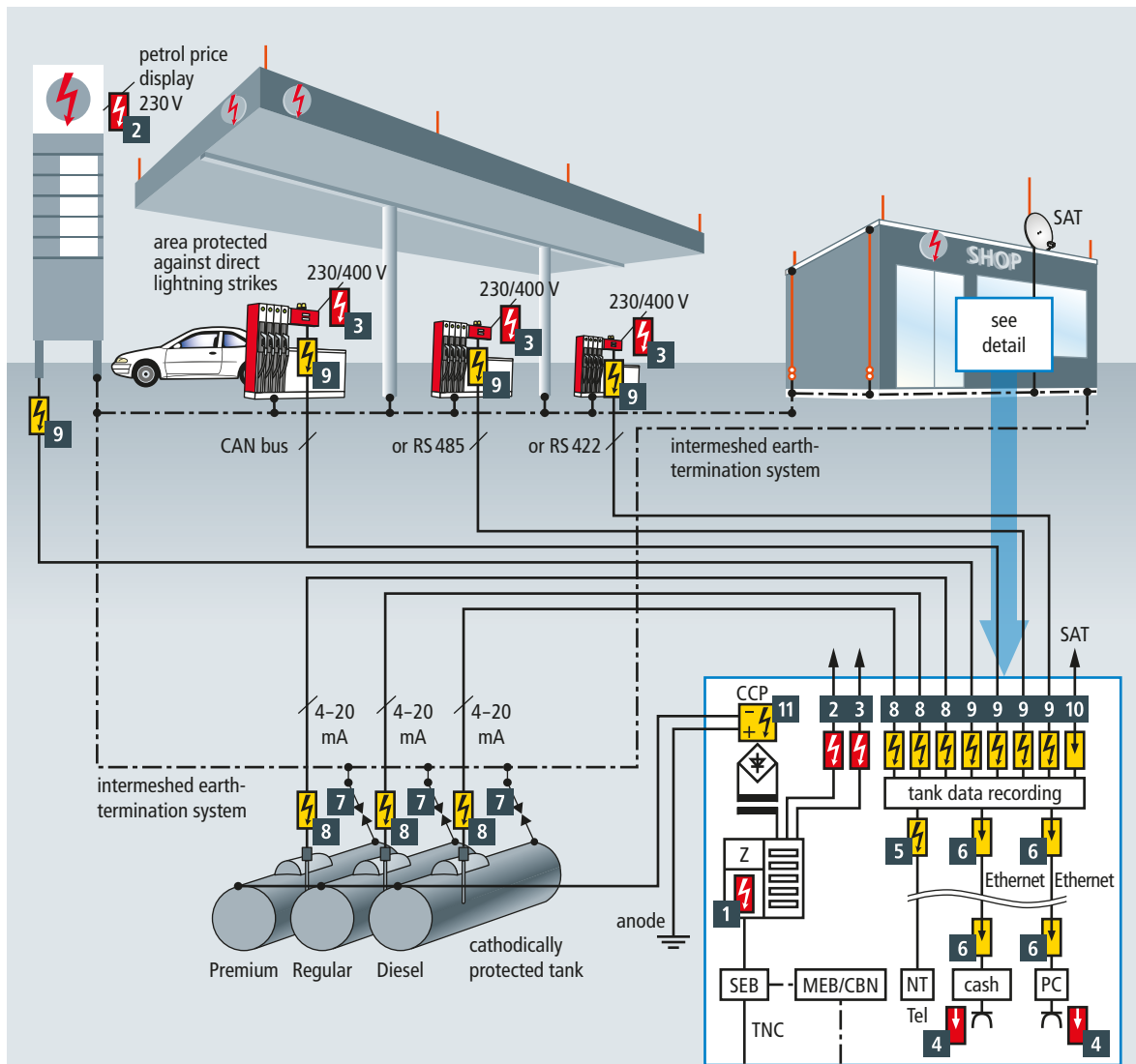


Contents

- Lightning protection system
- Intermeshed earth-termination system
- Protective and functional equipotential bonding
- Surge protective devices

Surge protection for petrol stations

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Type	Info	Part No.	Type	Info	Part No.
1	DV M TT 255 Earthing $\geq 16 \text{ mm}^2 \text{ Cu}$	951 310	7	EXFS 100	923 100
2	DSH TT 2P 255 Earthing $16 \text{ mm}^2 \text{ Cu}$	941 110	8	BXT ML2 BE S 24 + BXT BAS	920 224 + 920 300
3	DSH TT 275 Earthing $\geq 16 \text{ mm}^2 \text{ Cu}$	941 310	9	BXT ML2 BE HFS 5 + BXT BAS	920 270 + 920 300
4	SFL PRO 6X	909 250	10	DGA FF TV	909 703
5	DBX TC 180 Earthing $2.5 \text{ mm}^2 \text{ Cu}$	922 210	11	BVT KKS ALD 75 Earthing $4 \text{ mm}^2 \text{ Cu}$	918 420
6	DPA M CLE RJ45B 48	929 121			

Figure 1 Petrol station with lightning protection system, intermeshed earth-termination system, protective and functional equipotential bonding and surge protective devices

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Petrol stations are highly vulnerable to lightning strikes and surges due to their extremely sensitive control and display systems.

In Germany, the necessity of a lightning protection system for petrol stations must be determined on the basis of a risk analysis according to the German Ordinance on Industrial Safety and Health (BetrSichV), the German technical rules for operating safety (TRBS 2152 Part 3), VDE standards and the fire protection requirements in the applicable building regulations.

The German Ordinance on Industrial Safety and Health (BetrSichV) demands that all sources of ignition are completely ruled out. Some building regulations specify that structures where a lightning strike can easily occur or where it can have serious consequences due to the location, type of construction or use must be equipped with permanently effective lightning protection systems.

The risk analysis described in the IEC 62305-2 (EN 62305-2) lightning protection standard can be used to determine possible risks. The system-specific parameters define the existing risk for a structure. If the risk values determined are higher than the tolerable risks listed in the standard, measures (external lightning protection, surge protection, fire alarm systems, etc.) must be taken to reduce that risk to an acceptable level.

The IEC 60364-1 (HD 60364-1) standard specifies that "property shall be protected against damage as a consequence of overvoltages such as those originating from atmospheric events or from switching".

The surge protective devices recommended here are intended for installation outside ex zones (zones 0, 1 and 2) only. If surge protective devices are located in hazardous zones, adequate measures (e.g. approved enclosures and/or approved surge protective devices) must be taken to avoid ignition.

Electrical equipment located outside the petrol station building is protected by lightning current arresters both on the spot and at the entrance point into the building.

A professional external lightning protection system as per IEC 62305 (EN 62305), consistent lightning equipotential bonding and additional surge protection measures are required to protect petrol stations from direct lightning strikes. The table in **Figure 1** shows which types of surge protective devices can be used to protect the different interfaces and system components.

It is important to interconnect all metal constructions (e.g. pipes, fuel pump housings, tanks) and to connect them to the earth-termination system of the petrol station building (intermeshed earth-termination system). According to IEC 62305-3 (EN 62305-3), the earth-termination system should have an earth resistance of $< 10 \Omega$ (recommendation). Petrol stations with cathodic corrosion protection can only be connected to the earth termination system if one uses special spark gaps for hazardous areas.

The bus systems, sensors and information technology connections listed in **Figure 1** are by no means complete and merely serve as examples. They may only be installed based on the information provided in the detailed planning and the requirements and notes of the acceptance body.

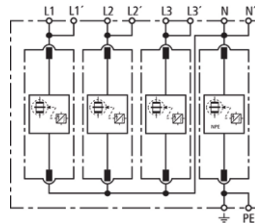
DEHNventil

DV M TT 255 (951 310)

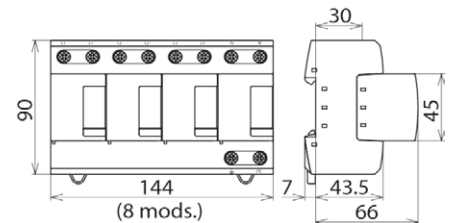
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



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 configuration).

Type	DV M TT 255
Part No.	951 310
SPD according to EN 61643-11 / IEC 61643-11	type 1 + type 2 / class I + class II
Energy coordination with terminal equipment (≤ 10 m)	type 1 + type 2 + type 3
Nominal voltage (a.c.) (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating voltage (a.c.) [L-N] (U_C)	264 V (50 / 60 Hz)
Max. continuous operating voltage (a.c.) [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_{fr})	50 kA _{rms} / 100 A _{rms}
Follow current limitation / Selectivity	no tripping of a 20 A 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
Extended technical data:	-----
Voltage protection level [L-PE] (U_p)	2.2 kV
For 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 gG
Weight	1,27 kg
Customs tariff number (Comb. Nomenclature EU)	85363090
GTIN	4013364108172
PU	1 pc(s)

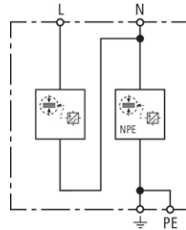
DEHNshield

DSH TT 2P 255 (941 110)

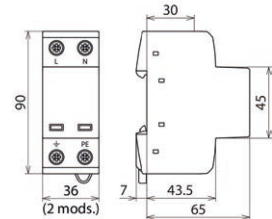
- Application-optimised and prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester
- Compact design due to space-saving spark gap technology with a width of only 1 module / pole
- Allows compact lightning equipotential bonding including protection of terminal equipment



Figure without obligation



Basic circuit diagram DSH TT 2P 255



Dimension drawing DSH TT 2P 255

Application-optimised and prewired combined lightning current and surge arrester for single-phase TT and TN-S systems (1+1 configuration).

Type	DSH TT 2P 255
Part No.	941 110
SPD according to EN 61643-11 / IEC 61643-11	type 1 + type 2 / class I + class II
Energy coordination with terminal equipment (≤ 10 m)	type 1 + type 2 + type 3
Nominal voltage (a.c.) (U_N)	230 V (50 / 60 Hz)
Max. continuous operating voltage (a.c.) (U_C)	255 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L+N-PE] (I_{total})	25 kA
Specific energy [L+N-PE] (W/R)	156.25 kJ/ohms
Lightning impulse current (10/350 μ s) [L-N]/[N-PE] (I_{imp})	12.5 / 25 kA
Specific energy [L-N]/[N-PE] (W/R)	39.06 / 156.25 kJ/ohms
Nominal discharge current (8/20 μ s) [L-N]/[N-PE] (I_n)	12.5 / 25 kA
Voltage protection level [L-N]/[N-PE] (U_p)	≤ 1.5 / ≤ 1.5 kV
Follow current extinguishing capability [L-N]/[N-PE] (I_{fl})	25 kA _{rms} / 100 A _{rms}
Follow current limitation / Selectivity	no tripping of a 32 A gG fuse up to 25 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	160 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 (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L, N, PE, \pm) (min.)	1.5 mm ² solid / flexible
Cross-sectional area (L, N, PE, \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	KEMA, VDE, UL
Extended technical data:	-----
Voltage protection level [L-PE] (U_p)	2.0 kV
Weight	275 g
Customs tariff number (Comb. Nomenclature EU)	85363090
GTIN	4013364137899
PU	1 pc(s)

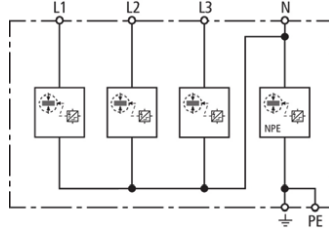
DEHNshield

DSH TT 255 (941 310)

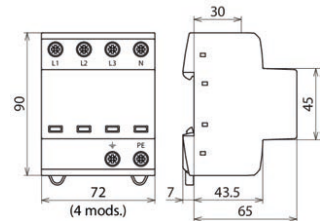
- Application-optimised and prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester
- Compact design due to space-saving spark gap technology with a width of only 1 module / pole
- Allows compact lightning equipotential bonding including protection of terminal equipment



Figure without obligation



Basic circuit diagram DSH TT 255



Dimension drawing DSH TT 255

Application-optimised and prewired combined lightning current and surge arrester for TT and TN-S systems (3+1 configuration).

Type	DSH TT 255
Part No.	941 310
SPD according to EN 61643-11 / IEC 61643-11	type 1 + type 2 / class I + class II
Energy coordination with terminal equipment (≤ 10 m)	type 1 + type 2 + type 3
Nominal voltage (a.c.) (U_N)	230 / 400 V (50 / 60 Hz)
Max. continuous operating voltage (a.c.) (U_C)	255 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L1+L2+L3+N-PE] (I_{total})	50 kA
Specific energy [L1+L2+L3+N-PE] (W/R)	625.00 kJ/ohms
Lightning impulse current (10/350 μ s) [L-N]/[N-PE] (I_{imp})	12.5 / 50 kA
Specific energy [L-N]/[N-PE] (W/R)	39.06 / 625.00 kJ/ohms
Nominal discharge current (8/20 μ s) [L-N]/[N-PE] (I_n)	12.5 / 50 kA
Voltage protection level [L-N]/[N-PE] (U_p)	≤ 1.5 / ≤ 1.5 kV
Follow current extinguishing capability [L-N]/[N-PE] (I_f)	25 kA _{rms} / 100 A _{rms}
Follow current limitation / Selectivity	no tripping of a 32 A gG fuse up to 25 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	160 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 (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L1, L2, L3, N, PE, \pm) (min.)	1.5 mm ² solid / flexible
Cross-sectional area (L1, L2, L3, N, PE, \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	4 module(s), DIN 43880
Approvals	KEMA, VDE, UL
Extended technical data:	-----
Voltage protection level [L-PE] (U_p)	2.0 kV
Weight	480 g
Customs tariff number (Comb. Nomenclature EU)	85363090
GTIN	4013364131798
PU	1 pc(s)

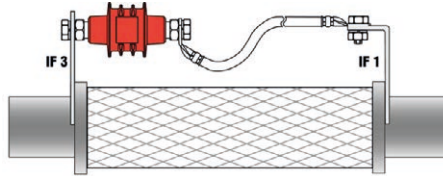
Isolating spark gap EXFS

EXFS 100 (923 100)

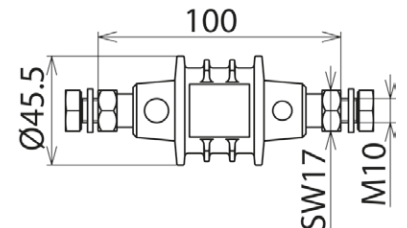
- For indirect connection / earthing of functionally isolated parts of installations under lightning conditions
- Device for lightning equipotential bonding according to IEC 62305 in hazardous areas
- Approval according to ATEX Directive 94/9/EC and IECEx



Figure without obligation



Installation of EXFS 100



Dimension drawing EXFS 100

Isolating spark gap for use in hazardous areas with plastic sheath and M10 threaded screws.

Type	EXFS 100
Part No.	923 100
Isolating spark gap according to EN 62561-3 / IEC 62561-3	yes
Lightning impulse current (10/350 µs) (I_{imp})	100 kA
Class (lightning current carrying capability)	H
Rated power-frequency withstand voltage (50 / 60 Hz) (U_{wAC})	250 V
Rated impulse sparkover voltage ($U_{f,imp}$)	≤ 1.25 kV
Operating temperature range (T_U)	-20 °C ... +60 °C
Degree of protection	IP 67
Approvals	UL
ATEX approvals	DEKRA 11ATEX0178 X
Ex marking according to EN 60079-0 and EN 60079-1: gas	II 2 G Ex db IIC T6 Gb
Ex marking according to EN 60079-0 and EN 60079-31: dust	II 2 D Ex tb IIIC T80 °C Db IP 66/67
IECEx approvals	IECEx KEM 09.0051X
Ex marking according to EN 60079-0 and EN 60079-1: gas	Ex db IIC T6 Gb
Ex marking according to EN 60079-0 and EN 60079-31: dust	Ex tb IIIC T80 °C Db IP 66/67
Inmetro approvals	TÜV 17.0698 X
Ex marking according to EN 60079-0 and EN 60079-1: gas	Ex db IIC T6 Gb
Ex marking according to EN 60079-0 and EN 60079-31: dust	Ex tb IIIC T80 °C Db IP 66/67
Enclosure length	100 mm
Enclosure diameter	45.5 mm
Enclosure material	plastic sheath
Connection of enclosure	M10 threaded bushing, 2x M10x25 mm, 2x spring washer
Extended technical data:	-----
- Rated discharge current (50 / 60 Hz) (I_{max})	500 A / 0.2 sec.
- Nominal discharge current (8/20 µs) (I_n)	100 kA
- Power frequency sparkover voltage (50 / 60 Hz) (U_{sw})	≤ 0.5 kV
Weight	289 g
Customs tariff number (Comb. Nomenclature EU)	85369095
GTIN	4013364108325
PU	1 pc(s)

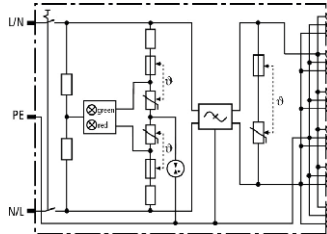
SFL PRO

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 / IEC 61643-11	type 3 / class III
Nominal a.c. voltage (U_N)	230 V (50 / 60 Hz)
Max. continuous operating voltage (a.c.) (U_C)	255 V (50 / 60 Hz)
Nominal load current (a.c.) (I_L)	16 A
Voltage drop in percent for U_C/I_L (ΔU)	$\leq 0.5 \%$
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 wave (U_{OC})	6 kV
Combined wave [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	B 16 A
Short-circuit withstand capability for max. mains-side overcurrent protection (I_{SCCR})	1.5 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) [L/N-PE] (U_T) – Characteristic	335 V / 120 min. – withstand
Temporary overvoltage (TOV) [L/N-PE] (U_T) – Characteristic	440 V / 5 sec. – withstand
Temporary overvoltage (TOV) [L+N-PE] (U_T) – Characteristic	1200 V + U_{REF} / 200 ms – safe failure
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	earthed socket outlets 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 60393-1 (DIN VDE 0565-3)
Attenuation for $f = 1$ MHz, balanced	≥ 32 dB
Attenuation for $f = 1$ MHz, unbalanced	≥ 30 dB
Weight	1,1 kg
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364132566
PU	1 pc(s)

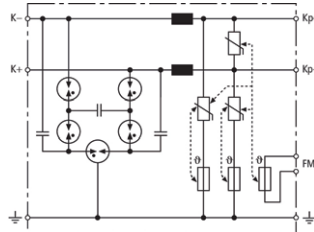
BLITZDUCTOR VT KKS

BVT KKS ALD 75 (918 420)

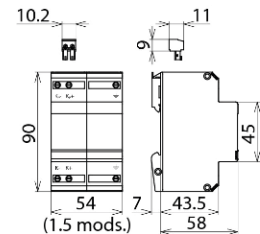
- For protective circuits
- High nominal current
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ and higher



Figure without obligation



Basic circuit diagram BVT KKS ALD 75



Dimension drawing BVT KKS ALD 75

Energy-coordinated combined lightning current and surge arrester for protecting the rectifier in the protective circuit (red colour). Plug-in remote signalling contact (break contact) indicates overload (thermal monitoring of the varistors). Installation into steel-sheet enclosure recommended. A low impulse sparkover voltage is achieved by capacitive control.

Type	BVT KKS ALD 75
Part No.	918 420
SPD class	TYPE 1 P1
Nominal voltage (U_N)	70 V
Max. continuous operating voltage (d.c.) (U_c)	75 V
Nominal current (I_L)	12 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	7 kA
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	3.5 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	40 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	20 kA
Voltage protection level line-line for I_{imp} D1 (U_p)	≤ 400 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 400 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 350 V
Voltage protection level line-PG at 1 kV/ μ s PG (U_p)	≤ 350 V
A2 Total alternating current withstand capability	20 A
Series resistance per line	5 μ H
Cut-off frequency line-line (f_c)	1 MHz
Capacitance line-line (C)	≤ 2 nF
Capacitance line-PG (C)	≤ 2 nF
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 mm ²
Cross-sectional area, flexible	0.5-4 mm ²
Tightening torque (terminal)	0.8 Nm
Earthing via	screw terminal
Enclosure material	thermoplastic, UL 94 V-0
Colour	red
Test standards	IEC 61643-21 / EN 61643-21
Approvals	EAC
Type of remote signalling contact	break contact
Switching capacity (d.c.)	250 V / 0.1 A, 125 V / 0.2 A, 75 V / 0.5 A
Switching capacity (a.c.)	250 V / 0.5 A
Cross-sectional area for remote signalling terminals	max 1.5 mm ²
Weight	212 g
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364094895
PU	1 pc(s)

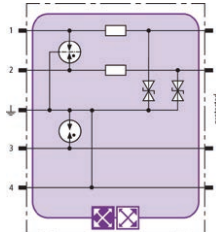
BLITZDUCTOR XT

BXT ML2 BE S 24 (920 224)

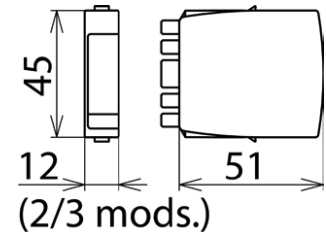
- LifeCheck SPD monitoring function
- Optimal protection of two single lines and the cable shield
- For use in conformity with the lightning protection zone concept at the boundaries from $0_A -2$ and higher



Figure without obligation



Basic circuit diagram BXT ML2 BE S 24



Dimension drawing BXT ML2 BE S 24

Space-saving combined lightning current and surge arrester module with LifeCheck feature for protecting two single lines sharing a common reference potential as well as unbalanced interfaces, with direct or indirect shield earthing. 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 BE S 24
Part No.	920 224
SPD monitoring system	LifeCheck
SPD class	TYPE 1 PI
Nominal voltage (U_N)	24 V
Max. continuous operating voltage (d.c.) (U_c)	33 V
Max. continuous operating voltage (a.c.) (U_c)	23.3 V
Nominal current at 45 °C (I_L)	0.75 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	9 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)	≤ 102 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 66 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 90 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 45 V
Series resistance per line	1.8 ohm(s)
Cut-off frequency line-PG (f_c)	6.8 MHz
Capacitance line-line (C)	≤ 0.5 nF
Capacitance line-PG (C)	≤ 1.0 nF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection (with plugged-in protection module)	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
Approvals	CSA, EAC, ATEX, IECEx, CSA & USA Hazloc, SIL
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
Weight	37 g
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364117785
PU	1 pc(s)

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

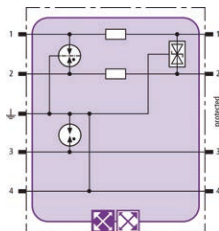
BLITZDUCTOR XT

BXT ML2 BE HFS 5 (920 270)

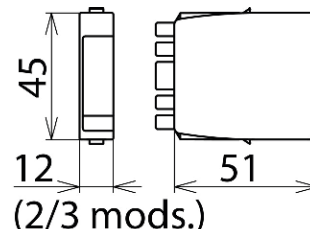
- LifeCheck SPD monitoring function
- Optimal protection of one pair and shield
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A -2$ and higher



Figure without obligation



Basic circuit diagram BXT ML2 BE HFS



Dimension drawing BXT ML2 BE HFS

Space-saving combined lightning current and surge arrester module with LifeCheck feature for protecting one pair of high-frequency transmissions without galvanic isolation, with direct or indirect shield earthing. 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 BE HFS 5
Part No.	920 270
SPD monitoring system	LifeCheck
SPD class	TYPE 1 PI
Nominal voltage (U_N)	5 V
Max. continuous operating voltage (d.c.) (U_c)	6.0 V
Max. continuous operating voltage (a.c.) (U_c)	4.2 V
Nominal current at 45 °C (I_L)	1.0 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	9 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)	≤ 26 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 40 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 11 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 11 V
Series resistance per line	1.0 ohm(s)
Cut-off frequency line-PG (f_c)	100.0 MHz
Capacitance line-line (C)	≤ 20 pF
Capacitance line-PG (C)	≤ 30 pF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection (with plugged-in protection module)	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
Approvals	CSA, UL, EAC, ATEX, IECEx, CSA & USA Hazloc, SIL
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
Weight	22 g
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364117549
PU	1 pc(s)

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

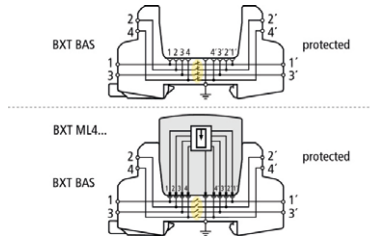
BLITZDUCTOR XT

BXT BAS (920 300)

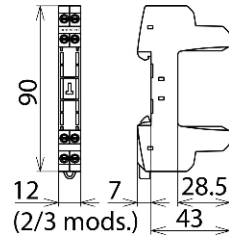
- Four-pole version for universal use with all types of BSP and BXT / BXTU protection modules
- No signal interruption if the protection module is removed
- Universal design without protection elements



Figure without obligation



Basic circuit diagram with and without plugged-in module



Dimension drawing BXT BAS

The BLITZDUCTOR XT base part is an extremely space-saving and universal four-pole feed-through terminal for the insertion of a protection module without signal disconnection 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, maintenance is only required for the protection modules.

Type Part No.	BXT BAS 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, UL, EAC, ATEX, IECEX ^{*)}
Weight	34 g
Customs tariff number (Comb. Nomenclature EU)	85369010
GTIN	4013364109179
PU	1 pc(s)

^{*)} only in connection with an approved protection module

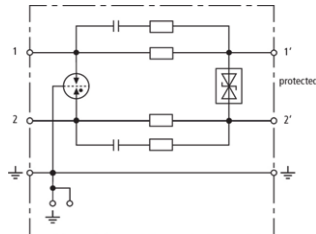
DEHNbox

DBX TC 180 (922 210)

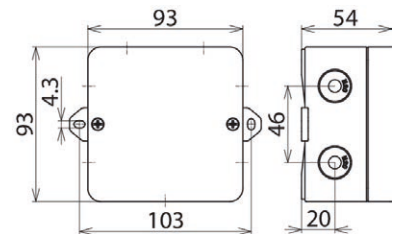
- Powerful protection for telecommunication interfaces
- Suitable for wall mounting, IP 65
- Installation in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ and higher



Figure without obligation



Basic circuit diagram DBX TC 180



Dimension drawing DBX TC 180

Compact combined arrester in a surface-mounted plastic enclosure for protecting information technology interfaces, particularly telecommunication connections and devices such as analogue telephones, ISDN and xDSL (VDSL2-tested). Fast connection of one pair without tools and integrated strain relief for the connecting cable. Cut-off frequency up to 250 MHz ensures maximum transmission performance in case of high-frequency signal parts.

Type	DBX TC 180
Part No.	922 210
SPD class	TYPE 1P2
Nominal voltage (U_N)	180 V
Max. continuous operating voltage (d.c.) (U_C)	180 V
Max. continuous operating voltage (a.c.) (U_C)	127 V
Nominal current at 45°C (I_N)	0.75 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	7.5 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)	15 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	7.5 kA
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
Voltage protection level line-line for I_{imp} D1 (U_p)	≤ 300 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 550 V
Series resistance per line	1.8 ohms
Bandwidth line-line (100 ohms) (f_c)	250 MHz
Capacitance line-line (C)	≤ 20 pF
Capacitance line-PG (C)	≤ 10 pF
Operating temperature range (T_U)	-25 °C ... +40 °C
Degree of protection	IP 65
Cross-sectional area of the signal lines, solid	0.2-1.5 mm ²
Cross-sectional area of the signal lines, flexible	0.25-1.5 mm ²
Cross-sectional area of the earth terminal	0.25-2.5 mm ²
Dimensions (L x W x H)	93 x 93 x 55 mm
Enclosure material	polycarbonate
Colour	grey
Test standards	IEC 61643-21 / EN 61643-21
Weight	138 g
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364158214
PU	1 pc(s)

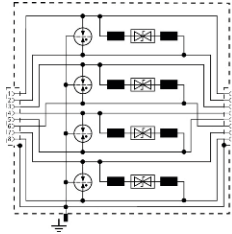
DEHNpatch

DPA M CLE RJ45B 48 (929 121)

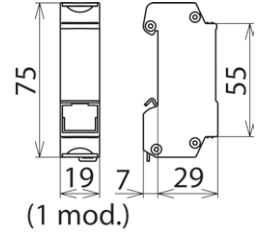
- Ideally suited for retrofitting, protection of all lines
- Cat. 6 in the channel (class E)
- Power over Ethernet IEEE 802.3 compliant (up to PoE++ / 4PPoE)
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_B -2$ and higher



Figure without obligation



Basic circuit diagram DPA M CLE RJ45B 48



Dimension drawing DPA M CLE RJ45B 48

Universal arrester for Industrial Ethernet, Power over Ethernet (IEEE 802.3 compliant up to PoE++ / 4PPoE) and similar applications in structured cabling systems according to class E up to 250 MHz. Protection of all pairs by means of powerful gas discharge tubes and one adapted filter matrix per pair. Fully shielded type with sockets for DIN rail mounting (up to 1 Gbit Ethernet).

Type	DPA M CLE RJ45B 48
Part No.	929 121
SPD class	TYPE 2 Pt
Nominal voltage (U_N)	48 V
Max. continuous operating voltage (d.c.) (U_c)	48 V
Max. continuous operating voltage (a.c.) (U_c)	34 V
Max. continuous operating voltage (d.c.) pair-pair (PoE) (U_c)	57 V
Nominal current (I_N)	1 A
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	0.5 kA
C2 Nominal discharge current (8/20 μ s) line-line (I_n)	150 A
C2 Nominal discharge current (8/20 μ s) line-PG (I_n)	2.5 kA
C2 Nominal discharge current (8/20 μ s) total (I_n)	10 kA
C2 Nominal discharge current (8/20 μ s) pair-pair (PoE) (I_n)	150 A
Voltage protection level line-line for I_n C2 (U_p)	≤ 180 V
Voltage protection level line-PG for I_n C2 (U_p)	≤ 500 V
Voltage protection level line-line for I_n C2 (PoE) (U_p)	≤ 600 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 180 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 500 V
Voltage protection level pair-pair at 1 kV/ μ s C3 (PoE) (U_p)	≤ 600 V
Cut-off frequency (f_c)	250 MHz
Insertion loss at 250 MHz	≤ 3 dB
Capacitance line-line (C)	≤ 30 pF
Capacitance line-PG (C)	≤ 25 pF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection	IP 10
For mounting on	35 mm DIN rails acc. to EN 60715
Connection (input / output)	RJ45 socket / RJ45 socket
Pinning	1/2, 3/6, 4/5, 7/8
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 / UL 497B
Approvals	CSA, UL, GHMT, EAC
External accessories	fixing material
Weight	109 g
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364118935
PU	1 pc(s)

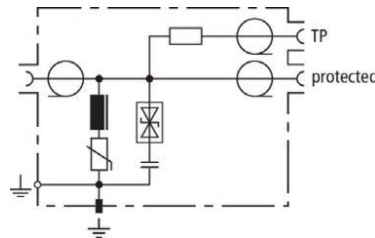
DEHNgate

DGA FF TV (909 703)

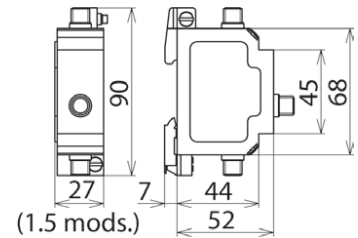
- Frequency range for analogue and digital TV, also suitable for reverse LAN channels
- Arresters of type FF and GFF with integrated measuring output
- Three types for adapted use in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ (combined lightning current and 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 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, allowing the system to be easily tested.

Type	DGA FF TV
Part No.	909 703
SPD class	TYPE 3 P1
Max. continuous operating voltage (d.c.) (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	EAC
Accessories	2x F plugs
Weight	233 g
Customs tariff number (Comb. Nomenclature EU)	85363010
GTIN	4013364085664
PU	1 pc(s)

Surge Protection
Lightning Protection
Safety Equipment
DEHN protects.

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