



Surge protection for petrol stations

White Paper



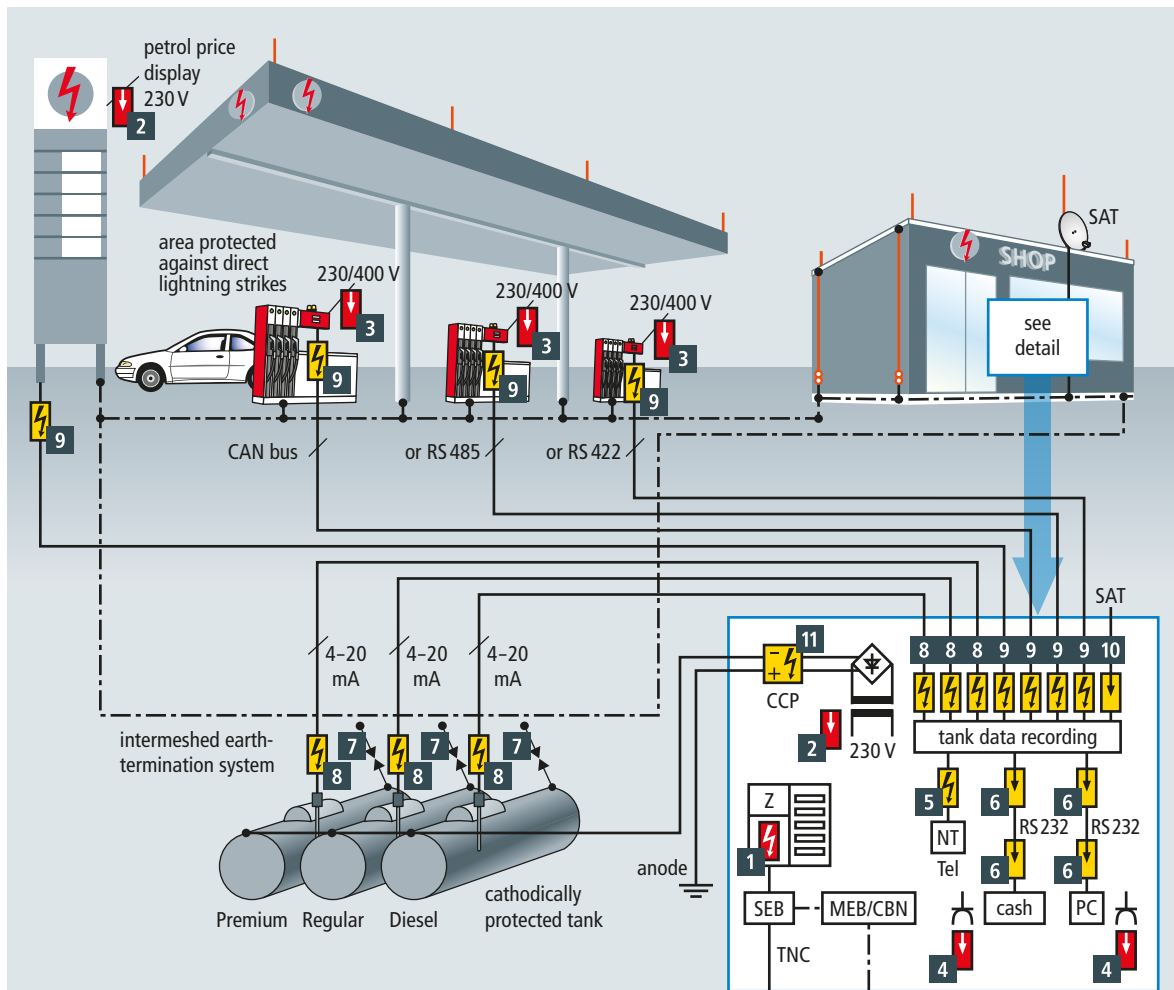
Contents

Petrol station with:

- ➔ lightning protection system
- ➔ intermeshed earth-termination system
- ➔ protective and functional equipotential bonding
- ➔ surge protective devices

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Use	Type	Part No.	Use	Type	Part No.
1 T... system, 3~	DV M T... 255	951...	7 Zone 1 or 2	EXFS 100	923 100
2 TN system, 1~ TT system, 1~	DG M TN 275 DG M TT 2P 275	952 200 952 110	8 4-20 mA: 2 single cores 4-20 mA: 4 single cores	BXT ML2 BE S 24 BXT ML4 BE 24 + BXT BAS	920 224 920 324 920 300
3 TN-S system, 3~ TT system, 3~	DG M TNS 275 DG M TT 275	952 400 952 310	9 CAN, RS 485, RS 422: 2 single cores CAN, RS 485, RS 422: 2 single cores	BXT ML2 BE HFS 5 BXT ML4 BE HF 5 + BXT BAS	920 270 920 370 920 300
4 1~	DPRO 230	909 230	10 Satellite antenna	DGA FF TV	909 703
5 Telephone	BXT ML2 BD 180 + BXT BAS	920 247 920 300	11 Protective circuit	BVT KKS ALD 75	918 420
6 25-pin D-Sub	FS 25E HS 12	924 018			

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 amongst others based on 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 fire protection requirements of the relevant building regulations. The German Ordinance on Industrial Safety and Health (BetrSichV) requires to avoid all sources of ignition. Some building regulations specify that structures where a lightning strike can easily occur or can have serious consequences due to their 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 of 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 which reduce the inadmissibly high risks 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 in this standard must not be installed in Ex zones (zone 0, 1 and 2), if any. 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.

Equipment located in the forecourt (e.g. petrol price display) and the incoming utility line are vulnerable to direct lightning strikes. Therefore, lightning current arresters are installed at the entrance point into the building.

The fuel dispensers are located underneath a projecting metal roof and are thus protected against direct lightning strikes. For this reason and due to the intermeshed earth-termination system (**Figure 1**), surge arresters are installed at the entrance point of the lines into the petrol station building and at the entrance point of the lines into the fuel dispenser to protect the lines leading to the fuel dispenser electronics.

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 dispenser enclosures, tanks) and to connect them to the earth-termination system of the petrol station building. According to IEC 62305-3 (EN 62305-3), the earth-termination system should have an earth resistance of $< 10 \Omega$ (recommendation). Spark gaps for use in hazardous areas must be used to connect petrol stations with cathodic corrosion protection to the earth-termination system.

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.

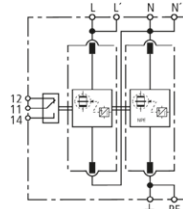
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DV M TT 2P 255 FM (951 115)

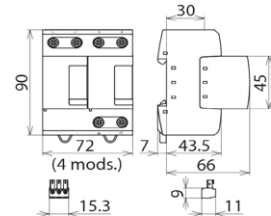
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TT 2P 255 FM



Dimension drawing DV M TT 2P 255 FM

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

Type Part No.	DV M TT 2P 255 FM 951 115
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 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) [L+N-PE] (I_{total})	50 kA
Specific energy [L+N-PE] (W/R)	625.00 kJ/ohms
Lightning impulse current (10/350 μ s) [L-N]/[N-PE] (I_{imp})	25 / 50 kA
Specific energy [L-N]/[N-PE] (W/R)	156.25 / 625.00 kJ/ohms
Nominal discharge current (8/20 μ s) [L-N]/[N-PE] (I_n)	25 / 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_n)	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 (L, L', N, N', PE, \ominus) (min.)	10 mm ² solid / flexible
Cross-sectional area (L, N, PE) (max.)	50 mm ² stranded / 35 mm ² flexible
Cross-sectional area (L', N', \ominus) (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
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
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 / Exinction 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	664 g
Customs tariff number	85363030
GTIN	4013364108127
PU	1 pc(s)

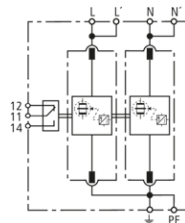
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DV M TN 255 FM (951 205)

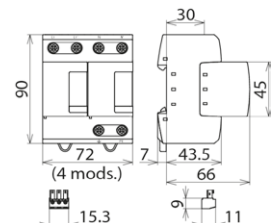
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TN 255 FM



Dimension drawing DV M TN 255 FM

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

Type Part No.	DV M TN 255 FM 951 205
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 V (50 / 60 Hz)
Max. continuous operating a.c. voltage (U_C)	264 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L+N-PE] (I_{total})	50 kA
Specific energy [L+N-PE] (W/R)	625.00 kJ/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]/[L+N-PE] (I_n)	25 / 50 kA
Voltage protection level [L-PE]/[N-PE] (U_P)	≤ 1.5 / ≤ 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) [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 (L, L', N, N', PE, \pm) (min.)	10 mm ² solid / flexible
Cross-sectional area (L, N, PE) (max.)	50 mm ² stranded / 35 mm ² flexible
Cross-sectional area (L', 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	4 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
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
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	668 g
Customs tariff number	85363030
GTIN	4013364108103
PU	1 pc(s)

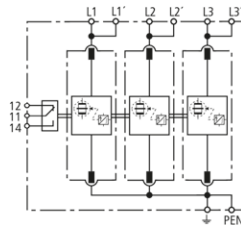
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DV M TNC 255 FM (951 305)

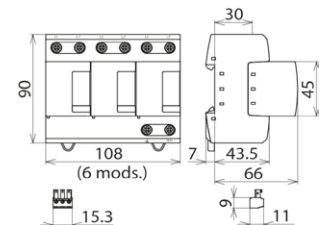
- Prewired combined type 1 and type 2 spark-gap-based lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TNC 255 FM



Dimension drawing DV M TNC 255 FM

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

Type Part No.	DV M TNC 255 FM 951 305
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
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
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	962 g
Customs tariff number	85363030
GTIN	4013364108141
PU	1 pc(s)

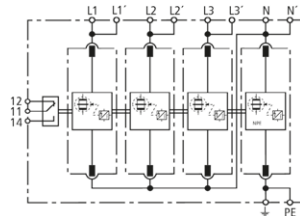
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DV M TT 255 FM (951 315)

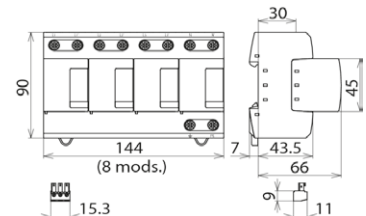
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TT 255 FM



Dimension drawing DV M TT 255 FM

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

Type Part No.	DV M TT 255 FM 951 315
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_n)	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, $\frac{1}{2}$) (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', $\frac{1}{2}$) (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
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
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	1,28 kg
Customs tariff number	85363030
GTIN	4013364108189
PU	1 pc(s)

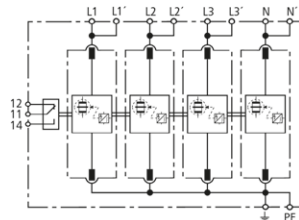
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DV M TNS 255 FM (951 405)

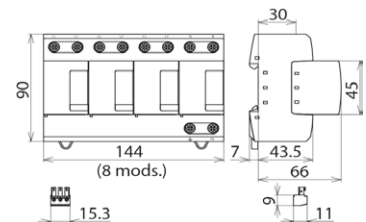
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TNS 255 FM



Dimension drawing DV M TNS 255 FM

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

Type	DV M TNS 255 FM
Part No.	951 405
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_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) [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
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
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	1,36 kg
Customs tariff number	85363030
GTIN	4013364108165
PU	1 pc(s)

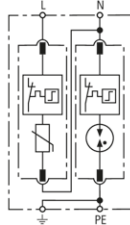
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DG M TT 2P 275 (952 110)

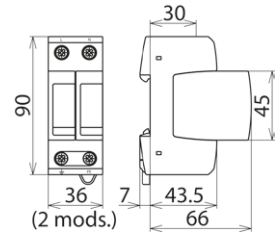
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



Figure without obligation



Basic circuit diagram DG M TT 2P 275



Dimension drawing DG M TT 2P 275

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

Type	DG M TT 2P 275
Part No.	952 110
SPD according to EN 61643-11 / IEC 61643-11	type 2 / class II
Nominal a.c. voltage (U_N)	230 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	2 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Weight	242 g
Customs tariff number	85363030
GTIN	4013364108417
PU	1 pc(s)

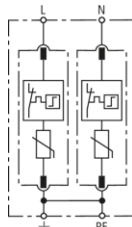
DEHNguard

DG M TN 275 (952 200)

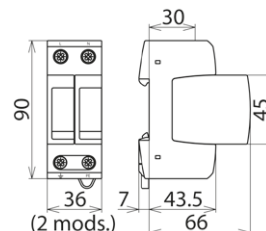
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



Figure without obligation



Basic circuit diagram DG M TN 275



Dimension drawing DG M TN 275

Modular surge arrester for use in single-phase TN systems.

Type	DG M TN 275
Part No.	952 200
SPD according to EN 61643-11 / IEC 61643-11	type 2 / class II
Nominal a.c. voltage (U_N)	230 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	2 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Weight	229 g
Customs tariff number	85363030
GTIN	4013364108394
PU	1 pc(s)

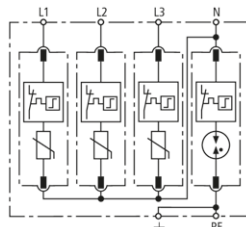
DEHNguard

DG M TT 275 (952 310)

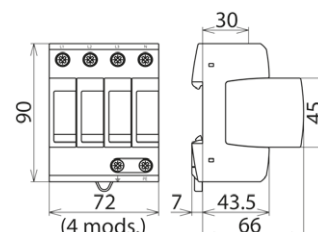
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



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)

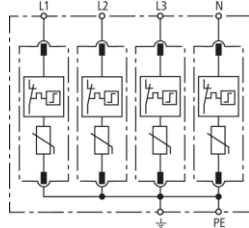
DEHNguard

DG M TNS 275 (952 400)

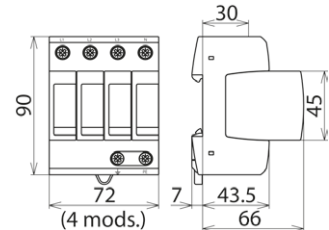
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



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)

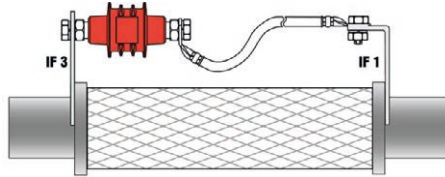
Isolating spark gap EXFS

EXFS 100 (923 100)

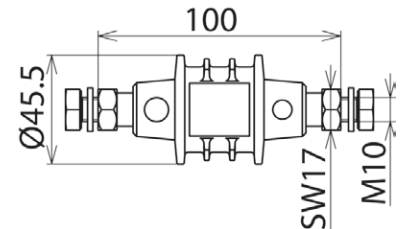
- For indirect connection / earthing of functionally isolated parts of installations under lightning conditions
- Device for lightning equipotential bonding according to IEC 62305 in hazardous areas
- Approval according to ATEX Directive 94/9/EC and IECEx



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 ($U_{r,imp}$)	≤ 1.25 kV
Operating temperature range (T_U)	-20 °C ... +60 °C
Degree of protection	IP 67
ATEX approvals	DEKRA 11ATEX0178 X
Ex marking according to EN 60079-0 and EN 60079-1: gas	II 2 G Ex d 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 d 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.
- Noimnal 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	85369085
GTIN	4013364108325
PU	1 pc(s)

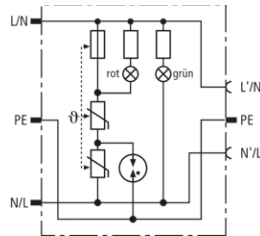
DEHNprotector

DPRO 230 (909 230)

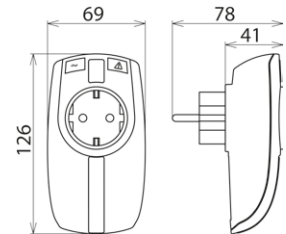
- Surge protection with monitoring device and disconnecter
- Visual operating state (green) and fault indication (red)
- Enhanced safety due to fault-proof Y protective circuit



Figure without obligation



Basic circuit diagram DPRO 230



Dimension drawing DPRO 230

Surge protective adapter with integrated child lock.

Type	DPRO 230
Part No.	909 230
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 a.c. voltage (U_C)	255 V (50 / 60 Hz)
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
Combination wave (U_{OC})	6 kV
Combination wave [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	B 16 A
Short-circuit withstand capability for max. mains-side overcurrent protection (I_{SCCR})	1 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	1
Operating temperature range (T_U)	-25 °C ... +40 °C
For mounting on	earthed socket outlets according to DIN 49440/DIN 49441
Enclosure material	thermoplastic, pure white, UL 94 V-2
Place of installation	indoor installation
Degree of protection	IP 20
Dimensions	126 x 69 x 41 mm
Weight	190 g
Customs tariff number	85363010
GTIN	4013364117686
PU	1 pc(s)

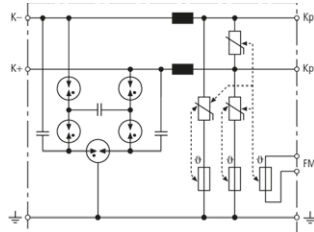
BLITZDUCTOR VT KKS

BVT KKS ALD 75 (918 420)

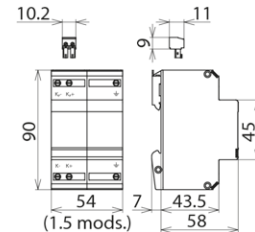
- For protective circuits
- High nominal current
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ and higher



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 Part No.	BVT KKS ALD 75 918 420
SPD class	TYPE 1 P1
Nominal voltage (U_N)	70 V
Max. continuous operating d.c. voltage (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	GOST
Type of remote signalling contacts	break contact
d.c. switching capacity	250 V / 0.1 A, 125 V / 0.2 A, 75 V / 0.5 A
a.c. switching capacity	250 V / 0.5 A
Cross-sectional area for remote signalling terminals	max 1.5 mm ²
Weight	212 g
Customs tariff number	85363010
GTIN	4013364094895
PU	1 pc(s)

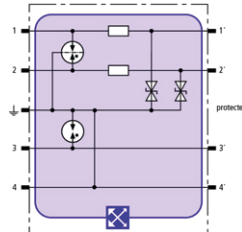
BLITZDUCTOR XT

BXT ML2 BE S 24 (920 224)

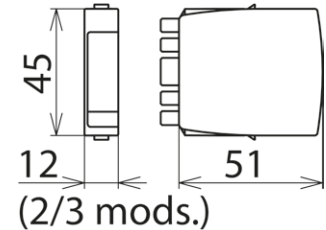
- LifeCheck SPD monitoring function
- Optimal protection of two single lines and the cable shield
- For use in conformity with the lightning protection zone concept at the boundaries from $0_A -2$ and higher



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 d.c. voltage (U_c)	33 V
Max. continuous operating a.c. voltage (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 (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	37 g
Customs tariff number	85363010
GTIN	4013364117785
PU	1 pc(s)

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

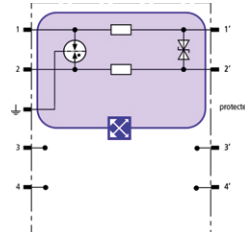
BLITZDUCTOR XT

BXT ML2 BD 180 (920 247)

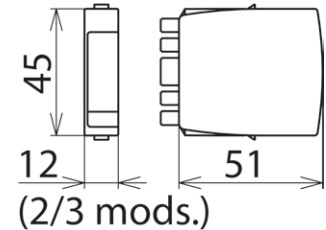
- LifeCheck SPD monitoring function
- Optimal protection of one pair
- For installation in conformity with the lightning protection zone concept at the boundaries from 0_A-2 and higher



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.

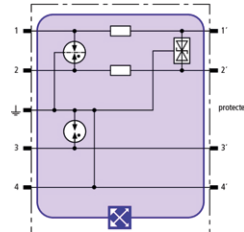
BLITZDUCTOR XT

BXT ML2 BE HFS 5 (920 270)

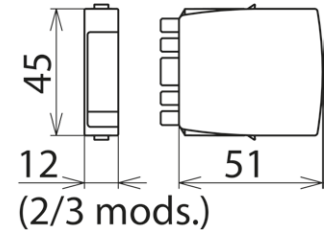
- LifeCheck SPD monitoring function
- Optimal protection of one pair and shield
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A -2$ and higher



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 transmission systems without electrical 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 PE
Nominal voltage (U_N)	5 V
Max. continuous operating d.c. voltage (U_C)	6.0 V
Max. continuous operating a.c. voltage (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 (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, UL, GOST, VdS
Weight	22 g
Customs tariff number	85363010
GTIN	4013364117549
PU	1 pc(s)

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

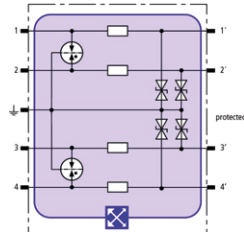
BLITZDUCTOR XT

BXT ML4 BE 24 (920 324)

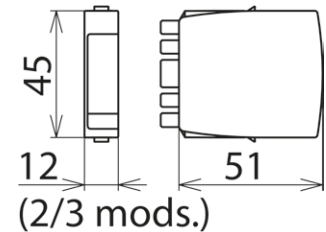
- LifeCheck SPD monitoring function
- Optimal protection of four single lines
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ and higher



Figure without obligation



Basic circuit diagram BXT ML4 BE 24



Dimension drawing BXT ML4 BE 24

Space-saving combined lightning current and surge arrester module with LifeCheck feature for protecting four single lines sharing a common reference potential as well as unbalanced 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 Part No.	BXT ML4 BE 24 920 324
SPD monitoring system	LifeCheck
SPD class	TYPE 1 P_A
Nominal voltage (U_N)	24 V
Max. continuous operating d.c. voltage (U_C)	33 V
Max. continuous operating a.c. voltage (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})	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)	≤ 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 (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	38 g
Customs tariff number	85363010
GTIN	4013364109056
PU	1 pc(s)

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

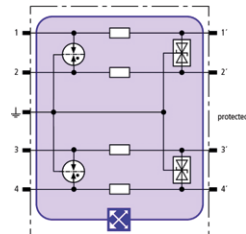
BLITZDUCTOR XT

BXT ML4 BE HF 5 (920 370)

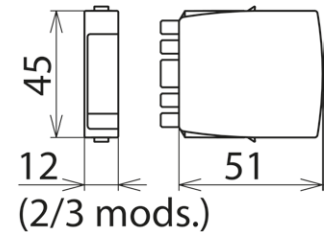
- LifeCheck SPD monitoring function
- Optimal protection of four single lines
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ and higher



Figure without obligation



Basic circuit diagram BXT ML4 BE HF 5



Dimension drawing BXT ML4 BE HF 5

Space-saving combined lightning current and surge arrester module with LifeCheck feature for protecting four single lines sharing a common reference potential as well as high-frequency transmission systems without electrical isolation. 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 BE HF 5
Part No.	920 370
SPD monitoring system	LifeCheck
SPD class	TYPE 1 PE
Nominal voltage (U_N)	5 V
Max. continuous operating d.c. voltage (U_c)	6.0 V
Max. continuous operating a.c. voltage (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})	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)	≤ 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)	≤ 25 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	4013364109117
PU	1 pc(s)

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

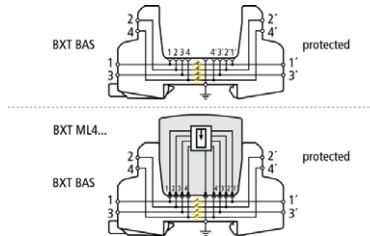
BLITZDUCTOR XT

BXT BAS (920 300)

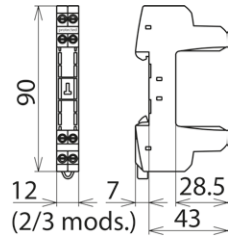
- Four-pole version for universal use with all types of BSP and BXT / BXTU protection modules
- No signal interruption if the protection module is removed
- Universal design without protection elements



Figure without obligation



Basic circuit diagram with and without plugged-in module



Dimension drawing BXT BAS

The BLITZDUCTOR XT base part is 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 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, VdS, UL, GOST
Weight	34 g
Customs tariff number	85369010
GTIN	4013364109179
PU	1 pc(s)

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

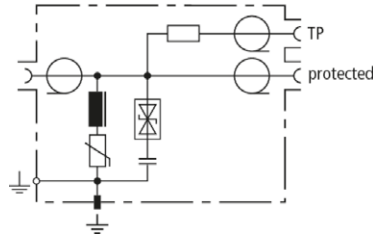
DEHNgate

DGA FF TV (909 703)

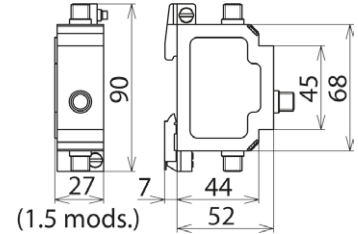
- Frequency range for analogue and digital TV, also suitable for reverse LAN channels
- Arresters of type FF and GFF with integrated measuring output
- Three types for adapted use in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ (combined lightning current and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

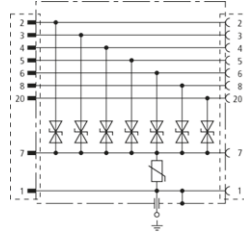
FS/USD

FS 25E HS 12 (924 018)

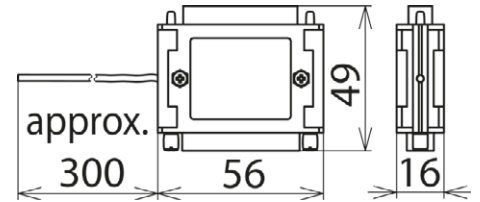
- All lines interconnected
- Low voltage protection level
- For installation in conformity with the lightning protection zone concept at the boundaries from 1 – 2 and higher



Figure without obligation



Basic circuit diagram FS 25E HS 12



Dimension drawing FS 25E HS 12

Surge arrester for V.24 interfaces with handshake. 25-pin SUB-D version.

Type	FS 25E HS 12
Part No.	924 018
SPD class	TYPE 4 [PI]
Nominal voltage (U_N)	12 V
Max. continuous operating d.c. voltage (U_c)	15 V
C1 Nominal discharge current (8/20 μ s) line-SG (I_n)	0.1 kA
C1 Nominal discharge current (8/20 μ s) SG-PG (I_n)	0.1 kA
Voltage protection level line-SG for I_n C1 (U_p)	≤ 24 V
Voltage protection level SG-PG for I_n C1 (U_p)	≤ 200 V
Voltage protection level line-SG at 1 kV/ μ s C3 (U_p)	≤ 21 V
Voltage protection level SG-PG at 1 kV/ μ s C3 (U_p)	≤ 130 V
Cut-off frequency (f_c)	10 MHz
Capacitance line-SG (C)	700 pF
Capacitance SG-PG (C)	350 pF
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection	IP 40
For mounting on	SUB-D (2 threaded screws 4/40 UNC)
Connection (input / output)	SUB-D 25 plug / SUB-D 25 socket
Pinning	line: 2/3/4/5/6/8/20, SG: 7, other lines are unprotected
Earthing via	outgoing earthing conductor (0.75 mm ²)
Length of the connecting line	300 mm (PG)
Enclosure material	plastic, metallised
Colour	silver
Test standards	IEC 61643-21 / EN 61643-21
Approvals	GOST
Weight	53 g
Customs tariff number	85363010
GTIN	4013364048942
PU	1 pc(s)

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**Surge Protection
Lightning Protection
Safety Equipment
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