



Surge protection for PROFIBUS FMS, DP and PA

White Paper



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beyond a building with external
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White Paper



PROFIBUS requires high availability since it is used as communication system in process-oriented applications and as instrumentation and control medium between cells and objects. However, PROFIBUS is highly susceptible to surges since high inductive/capacitive coupling may occur due to its large spatial dimensions.

PROFIBUS is a product designation by Siemens for communication products (hardware and software) according to the standardised PROFIBUS standard (ProcessFieldBus). Alternative designations for PROFIBUS FMS and PROFIBUS DP are the Siemens product designations SINEC L2 and SINEC L2-DP. While PROFIBUS FMS is only designed for data transmission rates up to 500 kBit/s, PROFIBUS DP is capable of transmitting data with a transmission rate up to 12 MBit/s. PROFIBUS FMS (SINEC L2) is mainly used to handle large data volumes of

the process and group control level. The fast PROFIBUS DP is designed for applications in the decentralised programmable logic controller I/O.

The latest development in the PROFIBUS segment is the intrinsically safe PROFIBUS PA which can also be used in potentially explosive atmospheres of process plants.

A two-wire bus cable is typically used as a transmission medium. The physical properties of the bus system mainly comply with the RS 485 standard.

The bus devices can be connected as follows:

- ➔ Connection via 9-pin D-Sub miniature plug (typically 3/8 pin assignment)
- ➔ Connection via screw terminals
- ➔ Connection via bus terminals

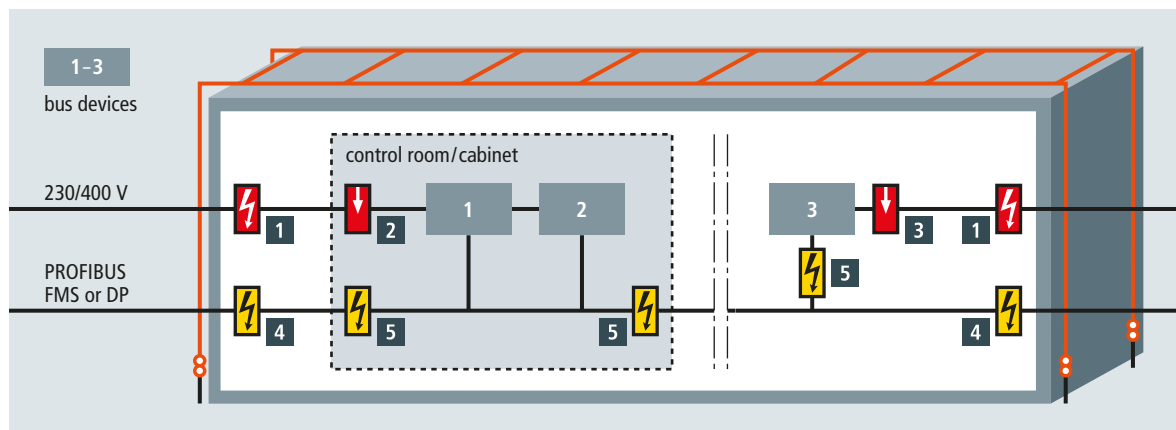


Figure 1 PROFIBUS FMS or DP extending beyond a building with external lightning protection system

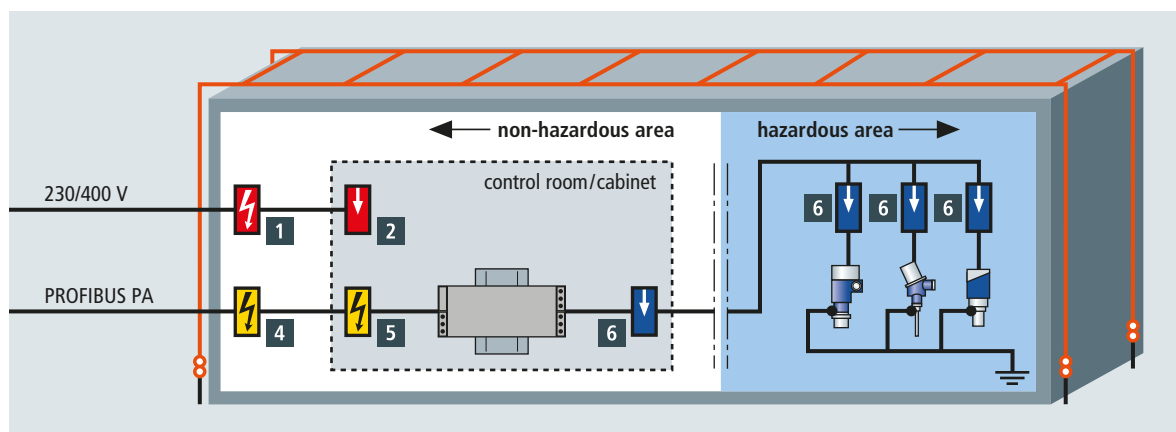


Figure 2 Intrinsically safe PROFIBUS PA in a building with external lightning protection system

Surge protection for PROFIBUS FMS, DP and PA

White Paper



No. in Fig. 1 and 2	Protection for...	Surge protective device	Part No.
1	Three-phase TN-S system	DEHNventil DV M TNS 255	951 400
	Three-phase TT system	DEHNventil DV M TT 255	951 310
2	Three-phase TN-S system	DEHNguard DG M TNS 275	952 400
	Three-phase TT system	DEHNguard DG M TT 275	952 310
3	230 V supply	DEHNrail DR M 2P 255	953 200
	24 V d.c. supply	DEHNrail DR M 2P 30	953 201
4	PROFIBUS	BLITZDUCTOR XT BXT ML2 B 180 + BXT BAS base part	920 211 920 300
5	PROFIBUS	BLITZDUCTOR XT BXT ML2 BE HFS 5 + BXT BAS base part	920 270 920 300
6	PROFIBUS in hazardous area	BLITZDUCTOR XT BXT ML4 BD EX 24 + BXT BAS EX base part or DEHNpipe DPI MD EX 24 M 2	920 381 920 301 929 960

Table 1 Lightning current and surge arresters for intrinsically safe PROFIBUS PA, PROFIBUS FMS and DP

Building with external lightning protection system

If a building is equipped with an external lightning protection system, lightning equipotential bonding is required. To this end, the earth-termination system is connected to pipes, metal installations and earthed parts of the power supply and information technology systems. In addition, all power supply and information technology cables entering and leaving the structure are connected to the earth-termination system via lightning current arresters (**Figures 1 and 2**).

In addition to lightning equipotential bonding, surge protection measures must be taken to protect electrical installations and systems.

If lightning equipotential bonding, surge protection and external lightning protection measures are properly implemented, they reduce failure in case of direct lightning strikes to a minimum.

Building without external lightning protection system

If no external lightning protection system is installed, the bus devices must be protected by surge arresters. In this case, lightning current arresters for power supply and information technology lines do not have to be installed (arresters 1 and 4 are not required).

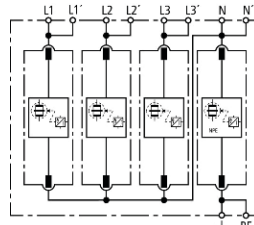
DEHNventil

DV M TT 255 (951 310)

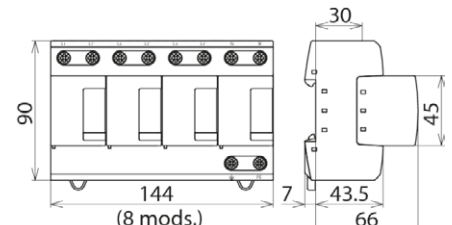
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TT 255



Dimension drawing DV M TT 255

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

Type	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 (≤ 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, $\varnothing$) (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', $\varnothing$) (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	8 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Extended technical data:	Use in switchgear installations with prospective short-circuit currents of more than 50 kA _{rms} (tested by the German VDE)
– Max. prospective short-circuit current	100 kA _{rms} (220 kA _{peak})
– Limitation / Extinction of mains follow currents	up to 100 kA _{rms} (220 kA _{peak})
– Max. backup fuse (L) up to $I_K = 100$ kA _{rms}	315 A gL/gG
Weight	1,27 kg
Customs tariff number	85363030
GTIN	4013364108172
PU	1 pc(s)

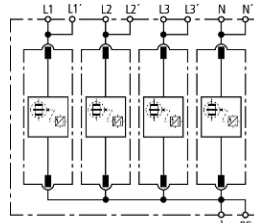
DEHNventil

DV M TNS 255 (951 400)

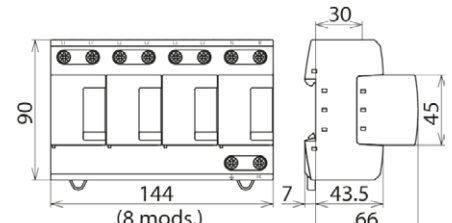
- Prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester consisting of a base part and plug-in protection modules
- Maximum system availability due to RADAX Flow follow current limitation
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DV M TNS 255



Dimension drawing DV M TNS 255

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

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

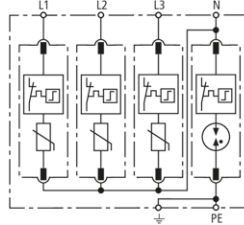
DEHNGuard

DG M TT 275 (952 310)

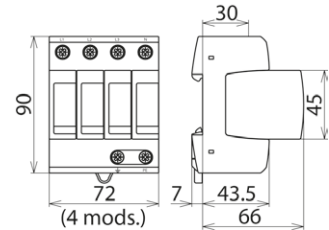
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



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_E)	100 A _{rms}
Response time [L-N] (t_A)	≤ 25 ns
Response time [N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	125 A gG
Short-circuit withstand capability for max. mains-side overcurrent protection (I_{SCCR})	50 kA _{rms}
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	335 V / 5 sec. – withstand
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	440 V / 120 min. – safe failure
Temporary overvoltage (TOV) [N-PE] (U_T) – Characteristic	1200 V / 200 ms – withstand
Operating temperature range (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	1.5 mm ² solid / flexible
Cross-sectional area (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	4 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS
Weight	450 g
Customs tariff number	85363030
GTIN	4013364108479
PU	1 pc(s)

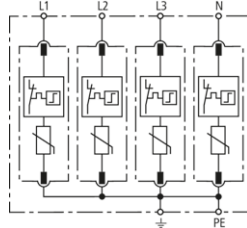
DEHNguard

DG M TNS 275 (952 400)

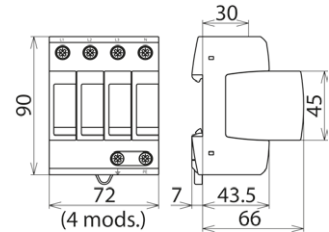
- Prewired complete unit consisting of a base part and plug-in protection modules
- High discharge capacity due to heavy-duty zinc oxide varistors / spark gaps
- High reliability due to "Thermo Dynamic Control" SPD monitoring device



Figure without obligation



Basic circuit diagram DG M TNS 275



Dimension drawing DG M TNS 275

Modular surge arrester for use in TN-S systems.

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

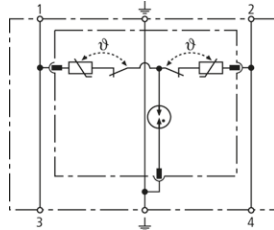
DEHNrail

DR M 2P 255 (953 200)

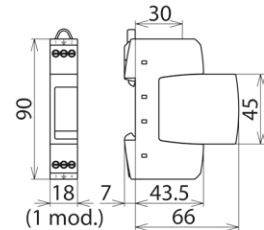
- Two-pole surge arrester consisting of a base element and plug-in protection module
- High discharge capacity due to heavy-duty zinc oxide varistor/spark gap combination
- Energy coordination with other arresters of the Red/Line product family



Figure without obligation



Basic circuit diagram DR M 2P 255



Dimension drawing DR M 2P 255

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

Type	DR M 2P 255
Part No.	953 200
SPD according to EN 61643-11	Type 3
SPD according to IEC 61643-1/-11	Class III
Nominal a.c. voltage (U_N)	230 V
Max. continuous operating a.c. voltage (U_C)	255 V
Max. continuous operating d.c. voltage (U_C)	255 V
Nominal load current a.c. (I_L)	25 A
Nominal discharge current (8/20 μ s) (I_n)	3 kA
Total discharge current (8/20 μ s) [L+N-PE] (I_{total})	5 kA
Combined impulse (U_{OC})	6 kV
Combined impulse [L+N-PE] ($U_{OC, total}$)	10 kV
Voltage protection level [L-N] (U_P)	≤ 1250 V
Voltage protection level [L/N-PE] (U_P)	≤ 1500 V
Response time [L-N] (t_A)	≤ 25 ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	25 A gL/gG or B 25 A
Short-circuit withstand capability for mains-side overcurrent protection with 25 A gL/gG	6 kA _{rms}
Temporary overvoltage (TOV) [L-N] (U_T)	335 V / 5 sec.
Temporary overvoltage (TOV) [L/N-PE] (U_T)	400 V / 5 sec.
Temporary overvoltage (TOV) [L+N-PE] (U_T)	1200 V + U_{CS} / 200 ms
TOV characteristic [L-N]	withstand
TOV characteristic [L/N-PE]	withstand
TOV characteristic [L+N-PE]	withstand
Operating temperature range (T_U)	-40°C...+80°C
Operating state/fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	0.5 mm ² solid/flexible
Cross-sectional area (max.)	4 mm ² solid/2.5 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	1 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS, CSA
Weight	81 g
Customs tariff number	85363030
GTIN	4013364108301
PU	1 pc(s)

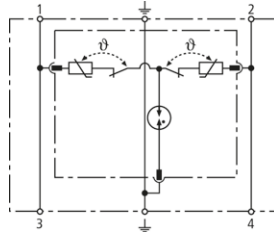
DEHNrail

DR M 2P 30 (953 201)

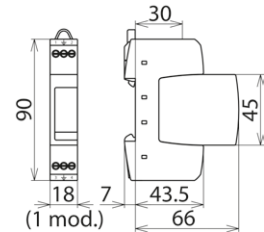
- Two-pole surge arrester consisting of a base element and plug-in protection module
- High discharge capacity due to heavy-duty zinc oxide varistor/spark gap combination
- Energy coordination with other arresters of the Red/Line product family



Figure without obligation



Basic circuit diagram DR M 2P 30



Dimension drawing DR M 2P 30

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

Type	DR M 2P 30
Part No.	953 201
SPD according to EN 61643-11	Type 3
SPD according to IEC 61643-1/-11	Class III
Nominal a.c. voltage (U_N)	24 V
Max. continuous operating a.c. voltage (U_C)	30 V
Max. continuous operating d.c. voltage (U_C)	30 V
Nominal load current a.c. (I_L)	25 A
Nominal discharge current (8/20 μ s) (I_n)	1 kA
Total discharge current (8/20 μ s) [L+N-PE] (I_{total})	2 kA
Combined impulse (U_{OC})	2 kV
Combined impulse [L+N-PE] ($U_{OC total}$)	4 kV
Voltage protection level [L-N] (U_P)	≤ 180 V
Voltage protection level [L/N-PE] (U_P)	≤ 630 V
Response time [L-N] (t_A)	≤ 25 ns
Response time [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	25 A gL/gG or B 25 A
Short-circuit withstand capability for mains-side overcurrent protection with 25 A gL/gG	6 kA _{rms}
Operating temperature range (T_U)	-40°C...+80°C
Operating state/fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	0.5 mm ² solid/flexible
Cross-sectional area (max.)	4 mm ² solid/2.5 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	1 module(s), DIN 43880
Approvals	KEMA, VDE, UL, VdS, CSA
Weight	80 g
Customs tariff number	85363030
GTIN	4013364109674
PU	1 pc(s)

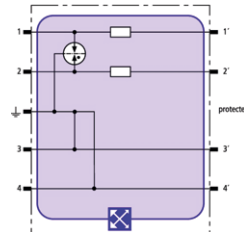
BLITZDUCTOR XT

BXT ML2 B 180 (920 211)

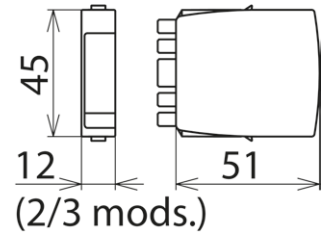
- LifeCheck SPD monitoring function
- Two-pole lightning equipotential bonding with four terminals for shield and/or functional earthing
- For installation in conformity with the lightning protection zone concept at the boundaries from 0_A – 1 and higher



Figure without obligation



Basic circuit diagram BXT ML2 B 180



Dimension drawing BXT ML2 B 180

Space-saving two-pole lightning current arrester module with LifeCheck feature and shield earthing for almost all applications. For use in conjunction with downstream **TYPE 2 P1** surge arresters or combined lightning current and surge arresters with a lower or equal voltage level. 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 ML2 B 180 920 211
SPD monitoring system	LifeCheck
SPD class	TYPE 1
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 _N)	1.2 A
D1 Total lightning impulse current (10/350 µs) (I _{imp})	10 kA
D1 Lightning impulse current (10/350 µs) per line (I _{imp})	2.5 kA
C2 Total nominal discharge current (8/20 µs) (I _n)	20 kA
C2 Nominal discharge current (8/20 µs) per line (I _n)	10 kA
Voltage protection level line-line for I _{imp} D1 (U _p)	≤ 600 V
Voltage protection level line-PG for I _{imp} D1 (U _p)	≤ 550 V
Voltage protection level line-line at 1 kV/µs C3 (U _p)	≤ 650 V
Voltage protection level line-PG at 1 kV/µs C3 (U _p)	≤ 550 V
Series resistance per line	0.4 ohm(s)
Capacitance line-line (C)	≤ 16 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	23 g
Customs tariff number	85363010
GTIN	4013364120570
PU	1 pc(s)

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

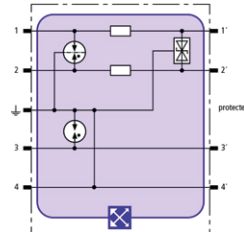
BLITZDUCTOR XT

BXT ML2 BE HFS 5 (920 270)

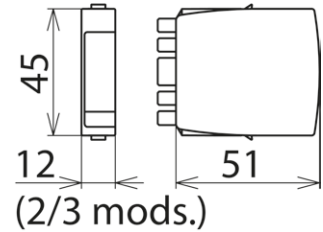
- LifeCheck SPD monitoring function
- Optimal protection of one pair and shield
- For installation in conformity with the lightning protection zone concept at the boundaries from 0_A –2 and higher



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 1P
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 _N)	1.0 A
D1 Total lightning impulse current (10/350 µs) (I _{imp})	9 kA
D1 Lightning impulse current (10/350 µs) per line (I _{imp})	2.5 kA
C2 Total nominal discharge current (8/20 µs) (I _n)	20 kA
C2 Nominal discharge current (8/20 µs) 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/µs C3 (U _p)	≤ 11 V
Voltage protection level line-PG at 1 kV/µs 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.

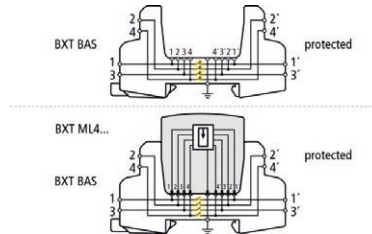
BLITZDUCTOR XT

BXT BAS (920 300)

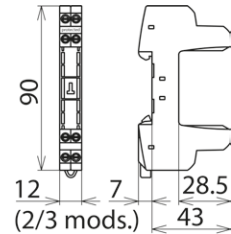
- Four-pole version for universal use with all types of BSP and BXT / BXTU protection modules
- No signal interruption if the protection module is removed
- Universal design without protection elements



Figure without obligation



Basic circuit diagram with and without plugged-in module



Dimension drawing BXT BAS

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

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

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

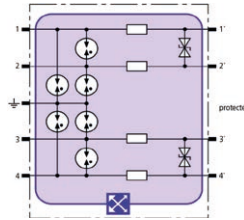
BLITZDUCTOR XT

BXT ML4 BD EX 24 (920 381)

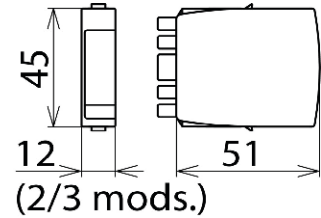
- For universal use, with LifeCheck monitoring function
- Self-capacitance and self-inductance negligibly small
- For installation in conformity with the lightning protection zone concept at the boundaries from 0_B-2 and higher



Figure without obligation



Basic circuit diagram BXT ML4 BD EX 24



Dimension drawing BXT ML4 BD EX 24

Space-saving surge arrester module with LifeCheck feature for protecting two pairs of intrinsically safe measuring circuits and bus systems, meets FISCO requirements. ATEX. Insulation strength > 500 V line-earth.

If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by DEHNrecord LC / SCM / MCM.

Type	BXT ML4 BD EX 24
Part No.	920 381
SPD class	TYPE2+P
SPD monitoring	LifeCheck
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 V
Max. input voltage acc. to EN 60079-11 (U _i)	30 V
Max. input current acc. to EN 60079-11 (I _i)	0.5 A
D1 Total lightning impulse current (10/350 µs) (I _{imp})	4 kA
D1 Lightning impulse current (10/350 µs) per line (I _{imp})	1 kA
C2 Total nominal discharge current (8/20 µs) (I _n)	20 kA
C2 Nominal discharge current (8/20 µs) per line (I _n)	5 kA
Voltage protection level line-line for I _{imp} D1 (U _p)	≤ 50 V
Voltage protection level line-PG for I _{imp} D1 (U _p)	≤ 1300 V
Voltage protection level line-line for I _n C2 (U _p)	≤ 52 V
Voltage protection level line-PG for I _n C2 (U _p)	≤ 1400 V
Voltage protection level line-line at 1 kV/µs C3 (U _p)	≤ 45 V
Voltage protection level line-PG at 1 kV/µs C3 (U _p)	≤ 1100 V
Series resistance per line	1.0 ohm
Cut-off frequency line-line (f _c)	7.7 MHz
Capacitance line-line (C)	≤ 0.8 nF
Capacitance line-PG (C)	≤ 16 pF
Operating temperature range (T _U)	-40 °C ... +80 °C
Degree of protection (plugged-in)	IP 20
Plugs into	base part
Earthing via	base part
Enclosure material	polyamide PA 6.6
Colour	blue
Test standards	IEC 61643-21 / EN 61643-21, UL 497B
SIL classification	up to SIL3 ^{*)}
ATEX approvals (1)	KEMA 06ATEX0274 X: II 2 (1) G Ex ia [ia Ga] IIC T4 ... T6 Gb
ATEX approvals (2)	KEMA 06ATEX0274 X: II 2 G Ex ib IIC T4 ... T6 Gb
IECEx approvals (1)	DEK 11.0078X: Ex ia [ia Ga] IIC T4 ... T6 Gb
IECEx approvals (2)	DEK 11.0078X: Ex ib IIC T4 ... T6 Gb
CSA & USA Hazloc approvals (1)	70000011: Class I Div. 1; Class I Zone 1
CSA & USA Hazloc approvals (2)	70000011: Ex ia [ia] IIC T4 ... T6
Approvals	CSA, GOST
Weight	23 g
Customs tariff number	85363010
GTIN	4013364109025
PU	1 pc(s)

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

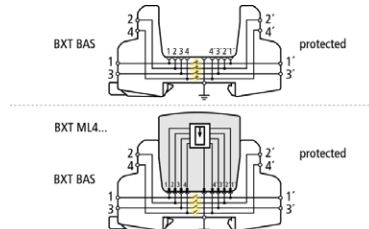
BLITZDUCTOR XT

BXT BAS EX (920 301)

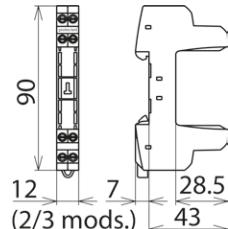
- Four-pole and universal base part for all types of intrinsically safe protection modules
- No signal interruption if the protection module is removed
- Universal design without protection elements



Figure without obligation



Basic circuit diagram with and without module



Dimension drawing BXT BAS EX

BLITZDUCTOR XT base part for use as an extremely space-saving and universal four-pole feed-through terminal for intrinsically safe circuits for the insertion of the protection module, no signal disconnection if the protection module is removed. The snap-in mechanism at the supporting foot of the base part allows the device 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 EX 920 301
Operating temperature range	-40 °C ... +80 °C
Degree of protection	IP 20
For mounting on	35 mm DINs rails acc. to EN 60715
Connection (input / output)	screw / screw
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	blue
ATEX approvals (1)	KEMA 06ATEX0274 X: II 2 (1) G Ex ia [ia Ga] IIC T4 ... T6 Gb *)
ATEX approvals (2)	KEMA 06ATEX0274 X: II 2 G Ex ib IIC T4 ... T6, Gb *)
IECEx approvals (1)	DEK 11.0078X: Ex ia [ia Ga] IIC T4 ... T6 Gb *)
IECEx approvals (2)	DEK 11.0078X: Ex ib IIC T4 ... T6 Gb *)
CSA & USA Hazloc approvals (1)	70000011: Class I Div. 1; Class I Zone 1
CSA & USA Hazloc approvals (2)	70000011: Ex ia [ia] IIC T4 ... T6
Approvals	UL, CSA, GOST
Weight	53 g
Customs tariff number	85369010
GTIN	4013364109186
PU	1 pc(s)

*) only in connection with an approved protection module

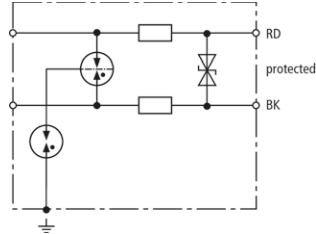
DEHNpipe

DPI MD EX 24 M 2 (929 960)

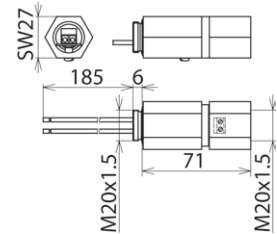
- Easy to mount due to two-part design
- Self-capacitance and self-inductance negligibly small
- For installation in conformity with the lightning protection zone concept at the boundaries from $0_B - 2$ and higher



Figure without obligation



Basic circuit diagram DPI MD EX 24 M 2



Dimension drawing DPI MD EX 24 M 2

Energy-coordinated two-stage surge arrester with low-capacitance protective circuit for protecting intrinsically safe measuring circuits and bus systems, meets FISCO requirements. Insulation strength > 500 V to earth. Cable glands must be ordered separately.

Technical data

Type	DPI MD EX 24 M 2
Part No.	929 960
SPD class	TYPE 2 Pt
Nominal voltage (U_N)	24 V
Max. continuous operating d.c. voltage (U_C)	34.8 V
Max. continuous operating a.c. voltage (U_C)	24.5 V
Max. input voltage acc. to EN 60079-11 (U_i)	30 V
Max. input current acc. to EN 60079-11 (I_i)	0.5 A
Nominal current (I_N)	0.5 A
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	1 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	10 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	5 kA
Voltage protection level line-line for I_n C2 (U_p)	≤ 55 V
Voltage protection level line-PG for I_n C2 (U_p)	≤ 1100 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 49 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 1000 V
Cut-off frequency line-line (f_G)	7 MHz
Capacitance line-line (C)	≤ 850 pF
Capacitance line-PG (C)	≤ 15 pF
Series resistance per line	1.8 ohms
Operating temperature range (T_U)	-40 °C ... +80 °C
Degree of protection	IP 67
For mounting on (field / device side)	M20 x 1.5 female thread / M20 x 1.5 male thread
Connection (input / output)	screw / connecting lines (1.5 mm ²)
Length of the connecting lead	200 mm
Cross-sectional area, solid	0.08-2.5 mm ²
Cross-sectional area, flexible	0.08-1.5 mm ²
Earthing via	enclosure
Enclosure material	StSt (V2A)
Colour	bare surface
Test standards	IEC 61643-21 / EN 61643-21
ATEX approvals	DEKRA 11ATEX0076 X: II 2 (1) G Ex ia [ia Ga] IIC T4 ... T6 Gb
IECEx approvals	DEK 11.0025X: Ex ia [ia Ga] IIC T4 ... T6 Gb
SIL classification	up to SIL3 ^{*)}
Approvals	GOST
Weight	172 g
Customs tariff number	85363010
GTIN	4013364098145
PU	1 pc(s)

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