



Lightning and surge protection for single-family houses

White Paper



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White Paper

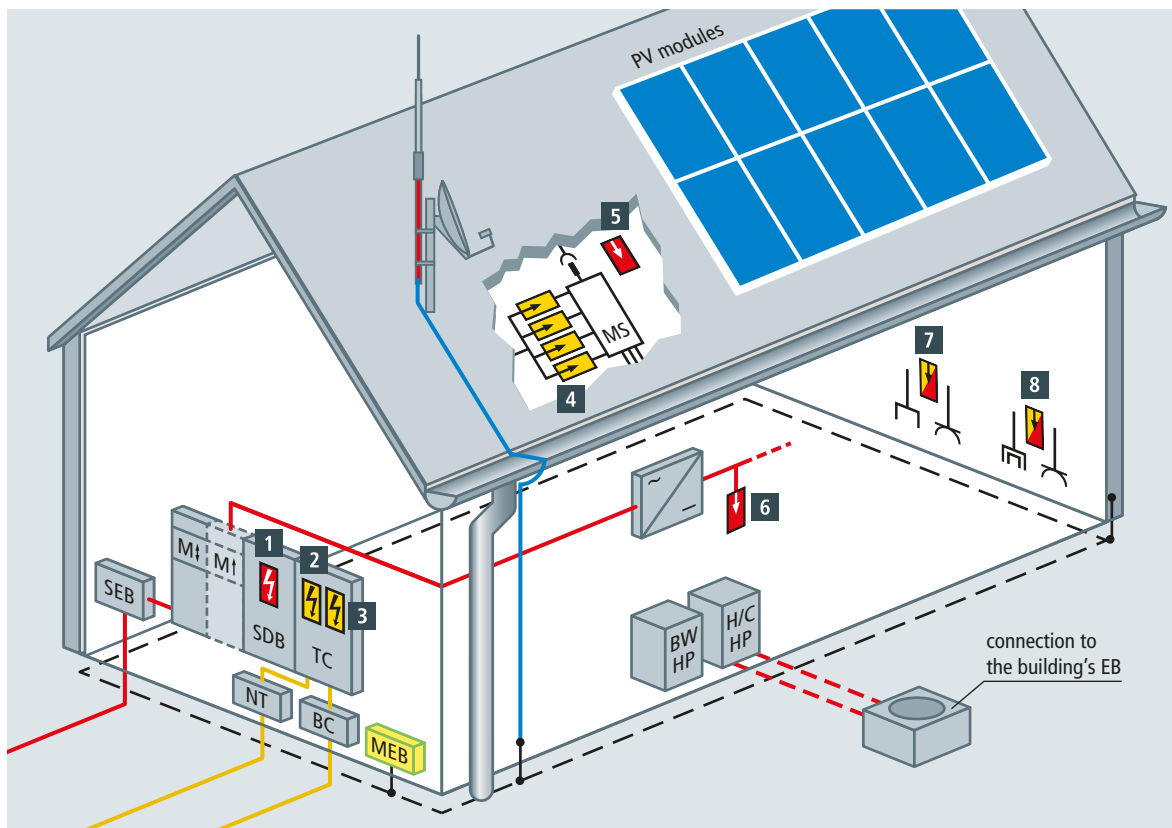
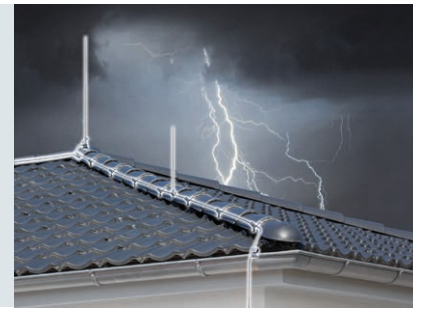


Figure 1 Surge protection for a single-family house with isolated lightning protection system of an antenna

Single-family houses increasingly use renewable sources of energy (sun/wind) for hot water collectors, photovoltaic modules and small wind turbines. While small wind turbines are currently not often installed, solar energy with an insolation of 1100 to 1300 kWh/m²/year already ensures a high yield all over Germany. An increasing share of electricity meanwhile comes from small distributed solar power stations.

While solar hot water collectors directly heat the boiler water (BW) via heat exchangers, a photovoltaic system generates electrical energy which can be used in many different ways. For example, this energy can be used to cover the daily energy demand of an air source heat pump (HP) which is supplied by the energy storage system (batteries) of the photovoltaic system or the grid of the distribution network operator during night time. In this case, a separate measuring device for the air source heat pump is not required. It is advisable to install a combined arrester downstream of the measuring device (M) (Figures 1 and 2).

Be it the energy management of a bivalent (heating/cooling (H/P)) air source heat pump or the KNX scene control of the lighting/shutter system while on holiday, a gateway, which is

controlled by the telephone or broadband cable (BC), is always required. The worldwide web which is taken for granted today can only be used if the DSL modem or the DSL router is not destroyed by surges which spread through the telephone or broadband cable. Also in these cases, a combined arrester can avoid destruction (Figures 1 and 2).

However, not only conducted impulse currents, but also lightning strikes can cause surges. If no external lightning protection system is installed on a single-family house and lightning hits the antenna mast, the same physical conditions occur as in case of a single-family house with external lightning protection system. The potential of the earth electrode rises and surges are injected into the single-family house. This cannot be prevented by earthing the antenna mast according to the standard and establishing equipotential bonding for the coaxial shields. Therefore, it is advisable to use DEHNcon-H to protect the satellite system of a single-family house without external lightning protection system from direct lightning strikes (Figure 1).

If the risk for a single-family house without external lightning protection system has been significantly reduced by an appli-

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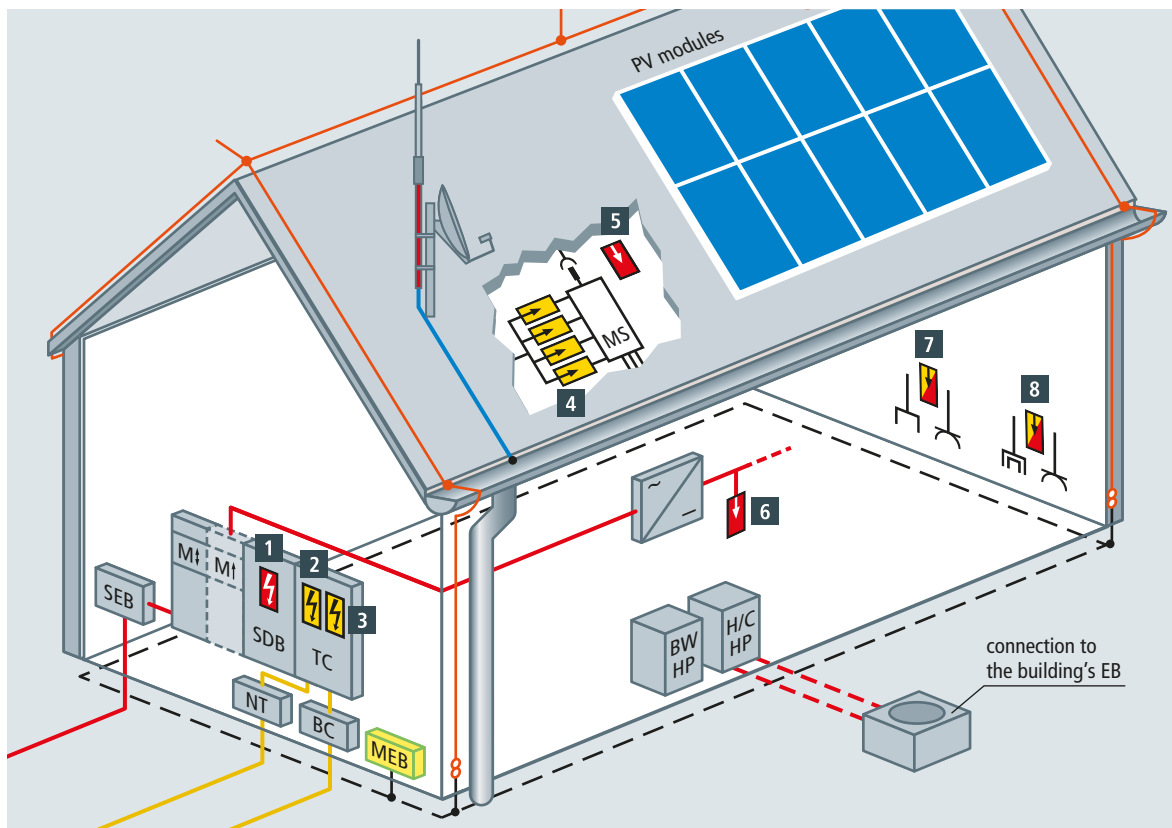
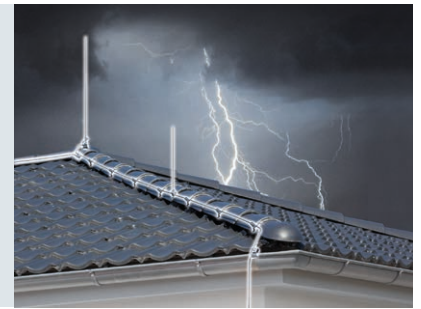


Figure 2 Surge protection for a single-family house with external lightning protection system

cation-optimised combined arrester, adequate air-termination systems and down conductors leading to the earth-termination system are required to ensure efficient external lightning

protection. The DEHNcon-H conductor, which is routed up to the earth electrode, is then connected to the metallic gutter (Figure 2).

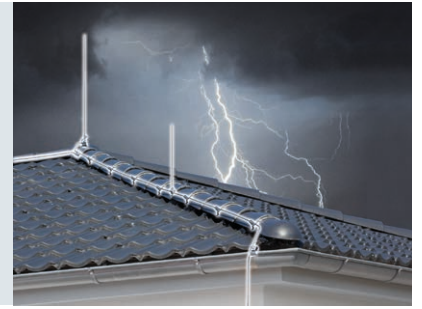
No. in Fig. 1 and 2	Protection for...	Surge protective device	Part No.
1	Power supply system (TN-S system) Power supply system (TT system)	DEHNshield DSH TNS 255 DEHNshield DSH TT 255	941 400 941 310
2	Telephone	DEHNbox DBX TC 180	922 210
3	Broadband cable	DEHNgate DGA GFF TV	909 705
4	Coaxial cable of the multiswitch (MS)	DEHNgate DGA FF TV	909 703
5	Power supply of the multiswitch (MS)	DEHNcord DCOR L 2P 275	900 430
6	d.c. input of the inverter	DEHNcube DCU YPV SCI 1000 1 M	900 910 *
7	Power supply and LAN PC	DEHNprotector DPRO 230 LAN 100	909 321
8	Power supply and coaxial TV cable	DEHNprotector DPRO 230 TV	909 300

* Observe optional accessories

Table 1 Surge protective devices for a single-family house

Lightning and surge protection for single-family houses

White Paper



If additional surge protective devices (**Figures 1 and 2**) are installed, it is assumed that the a.c. connection of the inverter and the heat pumps are located in the protected volume (about 5 m) of the supply-side combined arrester and that

the cables leading to the compressor are shielded. The compressor housing / foundation must be connected to the earth-termination system by means of a lightning current carrying 16 mm² copper conductor.

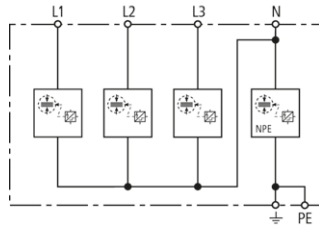
DEHNshield

DSH TT 255 (941 310)

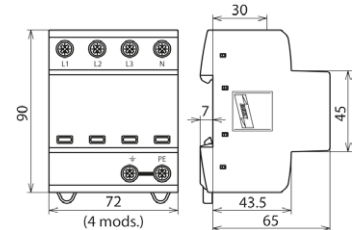
- Application-optimised and prewired spark-gap-based type 1 and type 2 combined lightning current and surge arrester
- Space-saving arrester for compact and simply equipped electrical installations with reduced technical requirements
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DSH TT 255



Dimension drawing DSH TT 255

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

Type Part No.	DSH TT 255 941 310
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 (U_C)	255 V (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L1+L2+L3+N-PE] (I_{total})	50 kA
Specific energy [L1+L2+L3+N-PE] (W/R)	625.00 kJ/ohms
Lightning impulse current (10/350 μ s) [L-N]/[N-PE] (I_{imp})	12.5 / 50 kA
Specific energy [L-N]/[N-PE] (W/R)	39.06 / 625.00 kJ/ohms
Nominal discharge current (8/20 μ s) [L-N]/[N-PE] (I_n)	12.5 / 50 kA
Voltage protection level [L-N]/[N-PE] (U_p)	≤ 1.5 / ≤ 1.5 kV
Follow current extinguishing capability [L-N]/[N-PE] (I_f)	25 kA _{rms} / 100 A _{rms}
Follow current limitation / Selectivity	no tripping of a 32 A gL/gG fuse up to 25 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	160 A gL/gG
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	440 V / 120 min. – withstand
Temporary overvoltage (TOV) [N-PE] (U_T) – Characteristic	1200 V / 200 ms – withstand
Operating temperature range (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L1, L2, L3, N, PE, \ominus) (min.)	1.5 mm ² solid / flexible
Cross-sectional area (L1, L2, L3, N, PE, \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
Weight	480 g
Customs tariff number	85363030
GTIN	4013364131798
PU	1 pc(s)

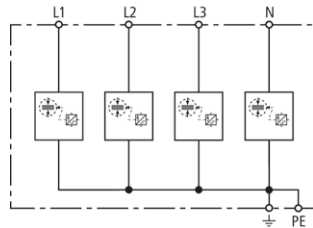
DEHNshield

DSH TNS 255 (941 400)

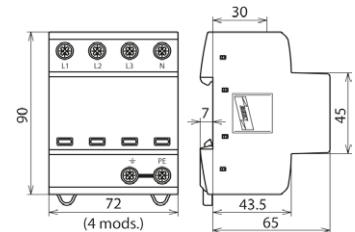
- Application-optimised and prewired type 1 and type 2 spark-gap-based combined lightning current and surge arrester
- Space-saving arrester for compact and simply equipped electrical installations with reduced technical requirements
- Capable of protecting terminal equipment



Figure without obligation



Basic circuit diagram DSH TNS 255



Dimension drawing DSH TNS 255

Application-optimised and prewired combined lightning current and surge arrester for TN-S systems.

Type	DSH TNS 255
Part No.	941 400
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)	255 (50 / 60 Hz)
Lightning impulse current (10/350 μ s) [L1+L2+L3+N-PE] (I_{total})	50 kA
Specific energy [L1+L2+L3+N-PE] (W/R)	625.00 kJ/ohms
Lightning impulse current (10/350 μ s) [L, N-PE] (I_{imp})	12.5 kA
Specific energy [L,N-PE] (W/R)	39.06 kJ/ohms
Nominal discharge current (8/20 μ s) [L/N-PE]/[L1+L2+L3+N-PE] (I_n)	12.5 / 50 kA
Voltage protection level [L-PE]/[N-PE] (U_P)	≤ 1.5 / ≤ 1.5 kV
Follow current extinguishing capability a.c. (I_{fi})	25 kA _{rms}
Follow current limitation / Selectivity	no tripping of a 32 A gL/gG fuse up to 25 kA _{rms} (prosp.)
Response time (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	160 A gL/gG
Temporary overvoltage (TOV) [L-N] (U_T) – Characteristic	440 V / 120 min. – withstand
Operating temperature range (T_U)	-40 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (L1, L2, L3, N, PE, \pm) (min.)	1.5 mm ² solid / flexible
Cross-sectional area (L1, L2, L3, N, PE, \pm) (max.)	35 mm ² stranded / 25 mm ² flexible
For mounting on	35 mm DIN rails acc. to EN 60715
Enclosure material	thermoplastic, red, UL 94 V-0
Place of installation	indoor installation
Degree of protection	IP 20
Capacity	4 module(s), DIN 43880
Approvals	KEMA, VDE, UL
Weight	525 g
Customs tariff number	85363030
GTIN	4013364133563
PU	1 pc(s)

DEHNcord

DCOR L 2P 275 (900 430)

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

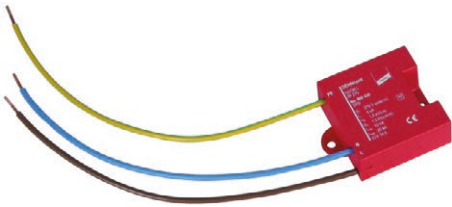
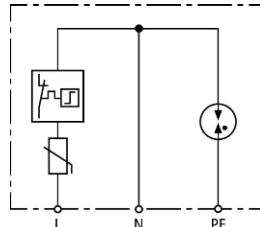
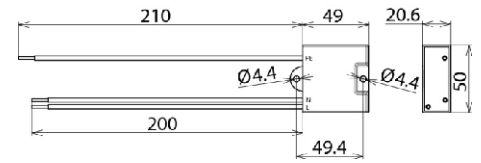


Figure without obligation



Basic circuit diagram DCOR L 2P 275



Dimension drawing DCOR L 2P 275

Surge arrester for all installation systems; compact design.

Type	DCOR L 2P 275
Part No.	900 430
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)	5 kA
Max. discharge current (8/20 μ s) (I_{max})	10 kA
Total discharge current (8/20 μ s) [L+N-PE] (I_{total})	20 kA
Voltage protection level [L-N] (U_p)	≤ 1.5 kV
Voltage protection level [L-N] at 3 kA (U_p)	≤ 1 kV
Voltage protection level [L-N] at 1.5 kA (U_p)	≤ 0.85 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 [L/N-PE] (t_A)	≤ 100 ns
Max. mains-side overcurrent protection	16 A gL/gG
Short-circuit withstand capability for mains-side overcurrent protection (I_{SCCR})	25 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 state / fault indication	green / red
Number of ports	1
Operating temperature range (T_U)	-40 °C ... +80 °C
Connecting wires	1.5 mm ² , length: 200 mm
Enclosure material	thermoplastic, red, UL 94 V-2
Place of installation	indoor installation
Degree of protection of installed device	IP 20
Weight	59 g
Customs tariff number	85363010
GTIN	4013364157286
PU	1 pc(s)

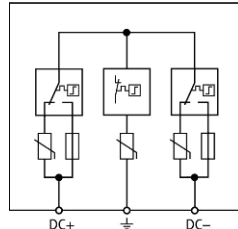
DEHNcube

DCU YPV SCI 1000 1M (900 910)

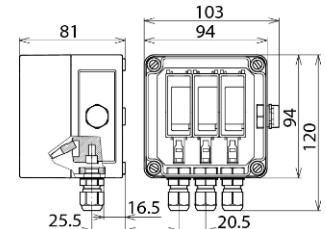
- Prewired multipole surge arrester with IP 65 degree of protection for photovoltaic systems
- Combined disconnection and short-circuiting device with safe electrical isolation in the protection module prevents fire damage caused by d.c. switching arcs (patented SCI principle)
- Easy and fast implementation of surge protection measures since no space is required in a separate insulating enclosure



Figure without obligation



Basic circuit diagram DCU YPV SCI 1000 1M



Dimension drawing DCU YPV SCI 1000 1M

Multipole surge arrester with three-step d.c. switching device for PV inverters with one MPP input.

Type	DCU YPV SCI 1000 1M
Part No.	900 910
SPD according to EN 50539-11	type 2
Max. PV voltage (U_{CPV})	≤ 1000 V
Short-circuit withstand capability (I_{SCP})	1000 A
Total discharge current (8/20 μ s) (I_{total})	40 kA
Nominal discharge current (8/20 μ s) [(DC+/DC-) --> PE] (I_n)	12.5 kA
Max. discharge current (8/20 μ s) [(DC+/DC-) --> PE] (I_{max})	25 kA
Voltage protection level (U_p)	≤ 4 kV
Voltage protection level at 5 kA (U_p)	≤ 3.5 kV
Response time (t_A)	≤ 25 ns
Operating temperature range (T_U)	-35 °C ... +80 °C
Operating state / fault indication	green / red
Number of ports	1
Cross-sectional area (min.)	2.5 mm ² solid / flexible
Cross-sectional area (max.)	6 mm ² solid / flexible
Place of installation	outdoor
Degree of protection	IP 65
Type	with pressure compensating element
Cover	transparent cover with product label
Colour of enclosure	grey
Number of cable entries	3x \varnothing 3-7 mm
Enclosure dimensions (w x h x d)	94 x 94 x 81 mm
Approvals	KEMA
Weight	426 g
Customs tariff number	85363030
GTIN	4013364155046
PU	1 pc(s)

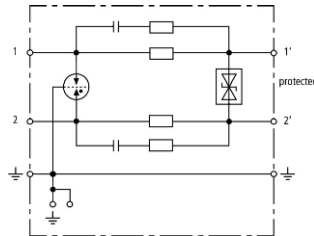
DEHNbox

DBX TC 180 (922 210)

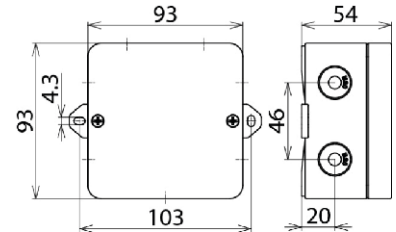
- Powerful protection for telecommunication interfaces
- Suitable for wall mounting, IP 65
- Installation in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ and higher



Figure without obligation



Basic circuit diagram DBX TC 180



Dimension drawing DBX TC 180

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

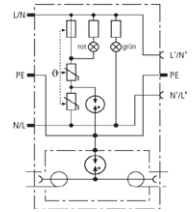
Type Part No.	DBX TC 180 922 210
SPD class	TYPE I P2
Nominal voltage (U_N)	180 V
Max. continuous operating d.c. voltage (U_C)	180 V
Max. continuous operating a.c. voltage (U_C)	127 V
Nominal current at 45°C (I_L)	0.75 A
D1 Total lightning impulse current (10/350 μ s) (I_{imp})	7.5 kA
D1 Lightning impulse current (10/350 μ s) per line (I_{imp})	2.5 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	15 kA
C2 Nominal discharge current (8/20 μ s) per line (I_n)	7.5 kA
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	≤ 250 V
Voltage protection level line-PG at 1 kV/ μ s C3 (U_p)	≤ 550 V
Voltage protection level line-line for I_{imp} D1 (U_p)	≤ 300 V
Voltage protection level line-PG for I_{imp} D1 (U_p)	≤ 550 V
Series resistance per line	1.8 ohms
Bandwidth line-line (100 ohms) (f_c)	250 MHz
Capacitance line-line (C)	≤ 20 pF
Capacitance line-PG (C)	≤ 10 pF
Operating temperature range (T_U)	-25 °C ... +40 °C
Degree of protection	IP 65
Cross-sectional area of the signal lines, solid	0.2-1.5 mm ²
Cross-sectional area of the signal lines, flexible	0.25-1.5 mm ²
Cross-sectional area of the earth terminal	0.25-2.5 mm ²
Dimensions (L x W x H)	93 x 93 x 55 mm
Enclosure material	polycarbonate
Colour	grey
Test standards	IEC 61643-21 / EN 61643-21
Weight	138 g
Customs tariff number	85363010
GTIN	4013364158214
PU	1 pc(s)

DEHNprotector

DPRO 230 TV (909 300)

- Surge protective device for TV, radio or SAT applications with a modern design
- F socket to IEC plug adapter included
- For installation in conformity with the lightning protection zone concept at the boundaries from 2 – 3 :

Figure without obligation



Surge protective device for the power and antenna side of TV, radio or SAT receivers. With visual operating state and fault indication and integrated child lock.

Protection of the data side

Type Part No.	DPRO 230 TV 909 300
SPD class	TYPE2
Max. continuous operating d.c. voltage (U_c)	60 V
C2 Nominal discharge current (8/20 μ s) line-shield (PE) (I_n)	5 kA
Voltage protection level line-shield (PE) at 1 kV/ μ s C3 (U_p)	≤ 600 V
Insertion loss 0-2400 MHz	≤ 1.5 dB
Operating temperature range (T_U)	-25 °C ... +40 °C
Degree of protection	IP 20
Connection (input / output)	F socket / F socket
Earthing via	protective conductor connection
Enclosure material	thermoplastic, UL 94 V-2
Colour	pure white
Test standards	IEC 61643-21 / EN 61643-21

Protection of the power side

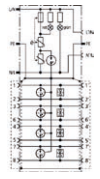
Type Part No.	DPRO 230 TV 909 300
SPD according to EN 61643-11 / IEC 61643-11	type 3 / class III
Nominal a.c. voltage (U_N)	230 V (50 / 60 Hz)
Max. continuous operating a.c. voltage (U_c)	255 V (50 / 60 Hz)
Nominal load current a.c. (I_L)	16 A
Nominal discharge current (8/20 μ s) (I_n)	3 kA
Total discharge 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	16 A gL/gG or B 16 A
Short-circuit withstand capability for 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 indicator light
Operating state indication	green indicator light
Number of ports	1
For mounting on	earthed socket outlets according to DIN 49440/DIN 49441
Test standards	EN 61643-11
Weight	234 g
Customs tariff number	85363010
GTIN	4013364117723
PU	1 pc(s)

DEHNprotector

DPRO 230 LAN100 (909 321)

- Surge protective device for Ethernet components (1000 BASE-T) with an elegant design
- Shielded Cat 5e patch cable (1.5 m) included
- For installation in conformity with the lightning protection zone concept at the boundaries from 2 – 3 and high

Figure without obligation



Combined surge protection for the power side and data input for protecting LAN components. Protection of all pairs for Ethernet pin assignment. It meets the requirements for channel class D in accordance with EN 50173 and is thus suitable for 1000 Base-T (Gigabit Ethernet). With visual operating state and fault indication and integrated child lock.

Protection of the data side

Type	DPRO 230 LAN100
Part No.	909 321
SPD class	TYPE 2 [P]
Max. continuous operating d.c. voltage (U_c)	58 V
Lightning impulse current (10/350 μ s) per line D1 (I_{imp})	1 kA
C2 Nominal discharge current (8/20 μ s) line-line (I_n)	30 A
C2 Nominal discharge current (8/20 μ s) line-PE (I_n)	2.5 kA
C2 Total nominal discharge current (8/20 μ s) (I_n)	10 kA
Voltage protection level line-line for I_n C2 (U_p)	≤ 100 V
Voltage protection level line-PE for I_n C2 (U_p)	≤ 500 V
Voltage protection level line-line at 1 kV/ μ s C3 (U_p)	90 V
Voltage protection level line-PE at 1 kV/ μ s C3 (U_p)	≤ 500 V
Cut-off frequency (f_c)	120 MHz
Operating temperature range (T_u)	-25 °C ... +40 °C
Degree of protection	IP 20
Connection (input / output)	shielded RJ45 socket / shielded RJ45 socket
Pinning	1/2, 3/6, 4/5, 7/8
Earthing via	protective conductor connection
Enclosure material	thermoplastic, UL 94 V-2
Colour	pure white
Test standards	IEC 61643-21 / EN 61643-21

Protection of the power side

Type	DPRO 230 LAN100
Part No.	909 321
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 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 indicator light
Operating state indication	green indicator light
Number of ports	1
For mounting on	earthed socket outlets according to DIN 49440/DIN 49441
Test standards	EN 61643-11
Weight	222 g
Customs tariff number	85363010
GTIN	4013364126152
PU	1 pc(s)

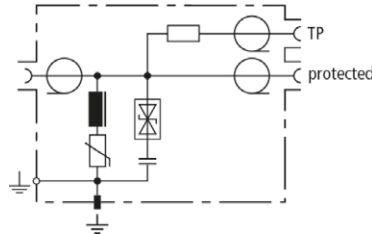
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DGA FF TV (909 703)

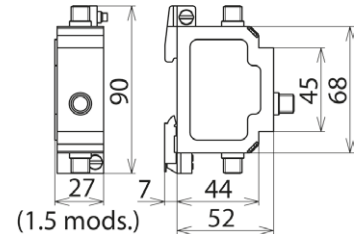
- Frequency range for analogue and digital TV, also suitable for reverse LAN channels
- Arresters of type FF and GFF with integrated measuring output
- Three types for adapted use in conformity with the lightning protection zone concept at the boundaries from $0_A - 2$ (combined lightning current and 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 Part No.	DGA FF TV 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)

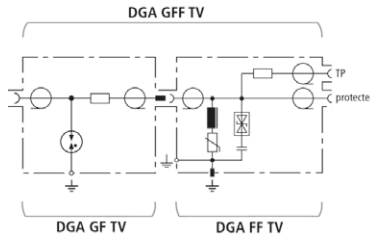
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DGA GFF TV (909 705)

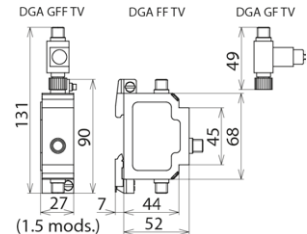
- Frequency range for analogue and digital TV, also suitable for reverse LAN channels
- Arresters of type FF and GFF with integrated measuring output
- Three types for adapted use in conformity with the lightning protection zone concept at the boundaries from 0_A -2 (combined lightning current and surge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



Dimension drawing DGA GFF TV – consisting of DGA GF TV and 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 GFF TV
Part No.	909 705
SPD class	TYPE 1 <input type="checkbox"/> TYPE 3 Pt <input checked="" type="checkbox"/>
Max. continuous operating d.c. voltage (U _c)	24 V
Nominal current (I _n)	2 A
D1 Lightning impulse current (10/350 μs) (I _{imp})	2.5 kA
C2 Nominal discharge current (8/20 μs) (I _n)	10 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/μs C3 (U _p)	≤ 60 V
Frequency range	d.c. / 5-2400 MHz
Insertion loss 5-862 MHz typ.	1.7 dB
Insertion loss 862-2400 MHz typ.	1.9 dB
Return loss (5-8 MHz)	≥ 10 dB
Return loss (8-47 MHz)	≥ 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 _o)	-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 plug
Weight	283 g
Customs tariff number	85363090
GTIN	4013364105706
PU	1 pc(s)

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Lightning Protection
Safety Equipment
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GmbH + Co.KG.

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