



DEHNrapid® LSA

Modular lightning and surge protection





Protection thanks to modularity:
The DEHNrapid® modular system



Modular lightning and surge protection

The DEHNrapid® modular system provides ...

DEHNrapid consists of powerful lightning current and surge arresters for protecting information technology and safety systems. The lightning current carrying components have a discharge capacity up to 2.5 kA (10/350 μ s) per core. The DEHNrapid modular system allows the user to select an optimal combination for every application.

... protection thanks to its modularity

The modular design allows to combine the individual elements to form a protection system which meets the requirements on site. The protection elements are harmonised and can be combined, thus ensuring flexible use and an optimal solution – and therefore an excellent protective effect. Comprehensive installation and mounting accessories complete the portfolio.

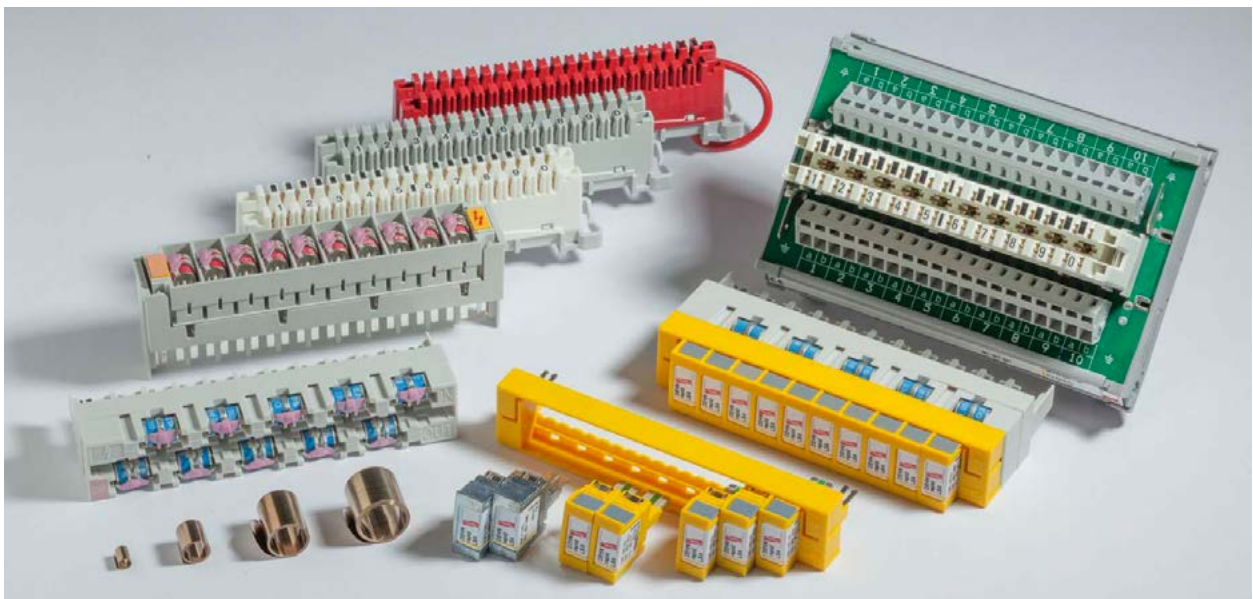
... and tested safety

Tests in the DEHN test laboratory demonstrate that DEHNrapid arresters can handle impulse loads up to 2.5 kA (10/350 μ s) per core. The integrated fail-safe function protects terminal equipment from dangerous interference, even in case of arrester overload.

The VdS* certificate recommends to use DEHNrapid surge protective devices for safety systems and installations requiring high availability.

DEHNrapid® LSA

- protects from the effects of lightning strikes and surges
- offers solutions for different applications
- is capable of protecting terminal equipment
- is ideally suited for telecommunication systems



* VdS Schadensverhütung GmbH (Damage prevention), "Vertrauen durch Sicherheit" ("Creating trust through safety") is a member of the Association of German Insurers, accredited by the German Accreditation Body for Technology as certification body for fire protection and safety systems



Modularity

The DEHnrapiD LSA arrester series is a modular system of lightning current and surge arresters and can be combined to form a single combined arrester. The arresters can be plugged into standard type 2 LSA disconnection blocks. The lightning current carrying plug-in SPD block incorporates gas discharge tubes and disconnection block contacts. This allows testing, disconnecting or patching with plugged-in protection. The additional attachment of surge arresters ensures protection of terminal equipment.

The surge arresters snap into the earthing frame and can be removed as a block, whenever required.

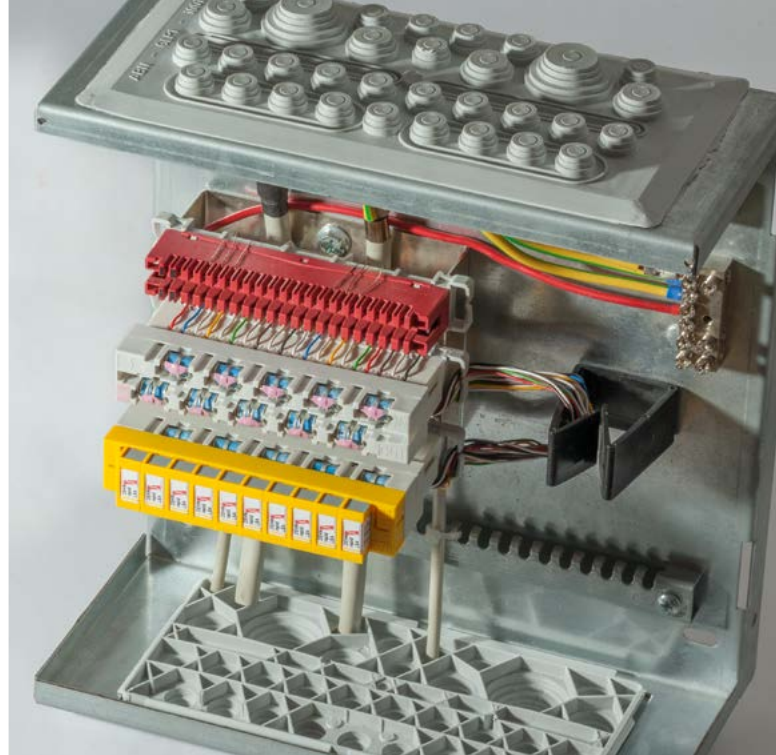
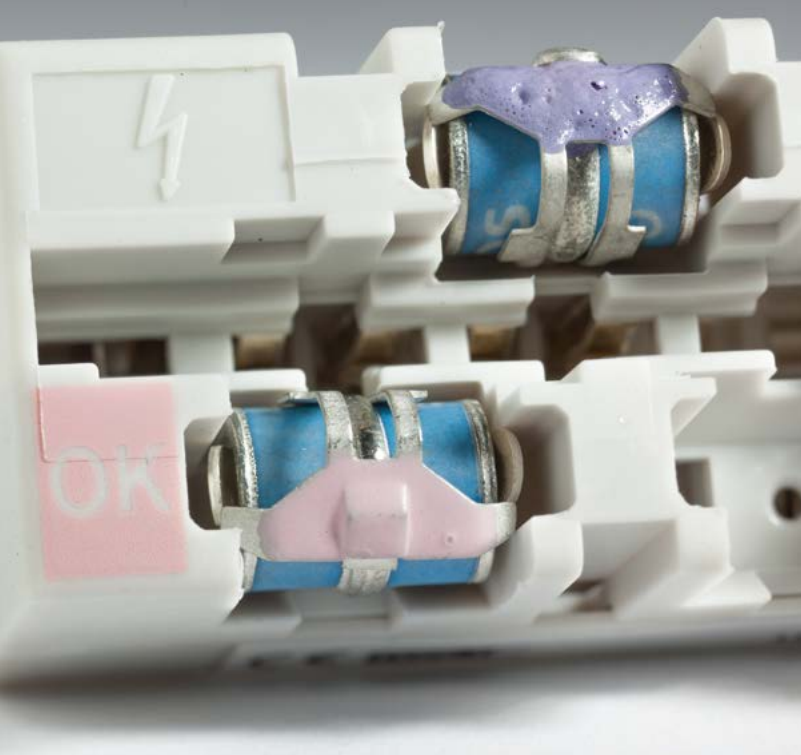
Variable protection

The variable arrester system provides protection for different applications. Powerful plug-in SPD blocks with integrated gas discharge tubes, which protect 10 pairs, ensure a high discharge capacity.

The finely limiting protection modules are available for different signal voltages and provide protection for different interfaces.

The broad portfolio of arresters ensures an ideal protection solution for the relevant application:

- Lightning current carrying type 1 plug-in SPD blocks for use at lightning protection zone O_A to 1 and higher
- Powerful type 2 plug-in SPD blocks for use at lightning protection zone O_B to 1 and higher
- Application-specific type 3 protection modules and earthing frames for variable protection of terminal equipment can be plugged into the LSA disconnection blocks or used for expanding the plug-in SPD blocks into combined arresters
- Combined arrester consisting of a lightning current carrying plug-in SPD block, earthing frame and protective plug.



Fail-safe function

The gas discharge tubes of the DRL 10 180 FSD plug-in SPD block feature a fail-safe function. When the gas discharge tube is overloaded, this function short-circuits the signal lines to earth to protect the arrester from possible burn-off caused by overcurrent. The disconnecting solder between the spring and the arrester melts and the signal lines are short-circuited. The temperature-sensitive colour of the spring changes from pink to purple. This colour change indicates that the gas discharge tube must be replaced.

As soon as the fail-safe function is activated, the signal is no longer available. However, terminal equipment is still protected since surges and lightning currents are discharged to earth. The gas discharge tubes in the plug-in SPD block can be replaced individually. For this purpose, replacement gas discharge tubes of type GDT 230 B3 FSD are available.

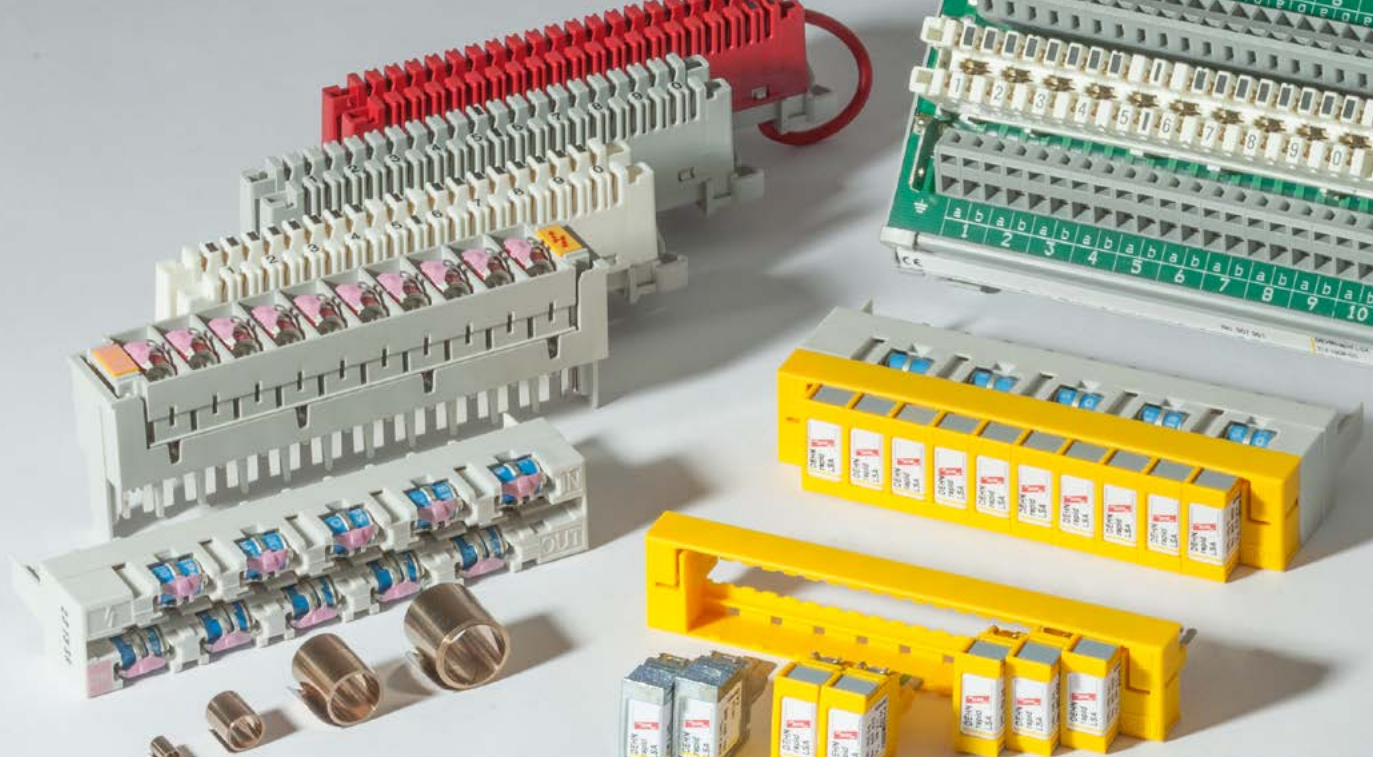
DEHN equipotential bonding enclosure

The DEHN equipotential bonding enclosure (DPG) is a lockable lightning current carrying metal enclosure for installation of wiring and protection components. Available in four different sizes, the enclosures provide terminals that allow to integrate surge arresters and cable shields into the equipotential bonding system. The cover can be removed from the wall plate without tools and can be locked. The C-shaped design of the wall plate allows side and front access, thus facilitating installation work.

The DEHN equipotential bonding enclosure is equipped with terminal or disconnection blocks which can be fitted with surge arresters. Accessories for integrating cable shields or unused signal lines complete the DEHNrapid LSA system.

Type / Version	DPG LSA 30 P	DPG LSA 60 P
Part No.	906 100	906 101
LSA mounting frame for	1 x 3 blocks	1 x 6 blocks
Dimensions W x H x D	240 x 260 x 130 mm	240 x 350 x 130 mm

Type / Version	DPG LSA 120 P	DPG LSA 220 P
Part No.	906 102	906 103
LSA mounting frame for	2 x 6 blocks	2 x 11 blocks
Dimensions W x H x D	330 x 350 x 130 mm	330 x 500 x 130 mm

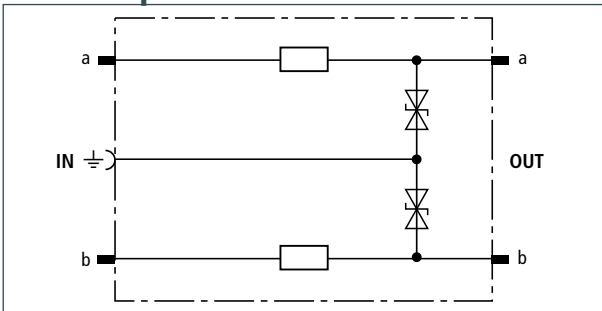


Surge protection modules

In data networks and measuring and control systems, there are many interfaces with different requirements on the performance of the protection components. The arresters must protect from lightning strikes and surges and must transmit the system-relevant signal parameters. The modules of the

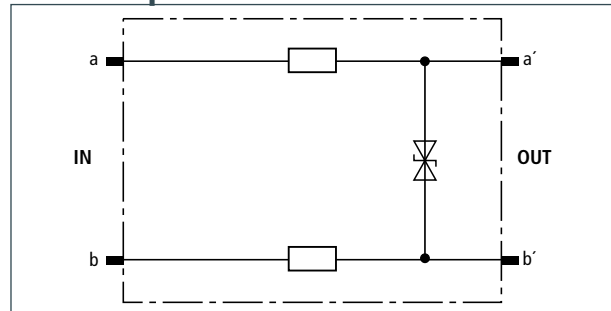
DEHNrapid series are adapted to various interfaces, thus ensuring protection and availability for signal circuits and system components.

DEHNrapid® LSA RE



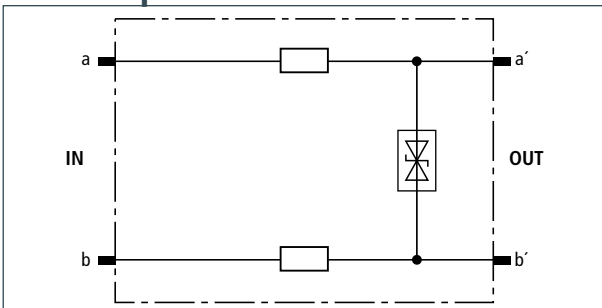
Line-to-earth overvoltage fine limitation for protection against unbalanced interference

DEHNrapid® LSA RD



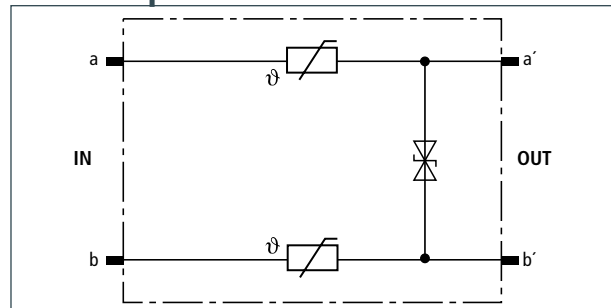
Line-to-core overvoltage fine limitation for protection against balanced interference

DEHNrapid® LSA HD

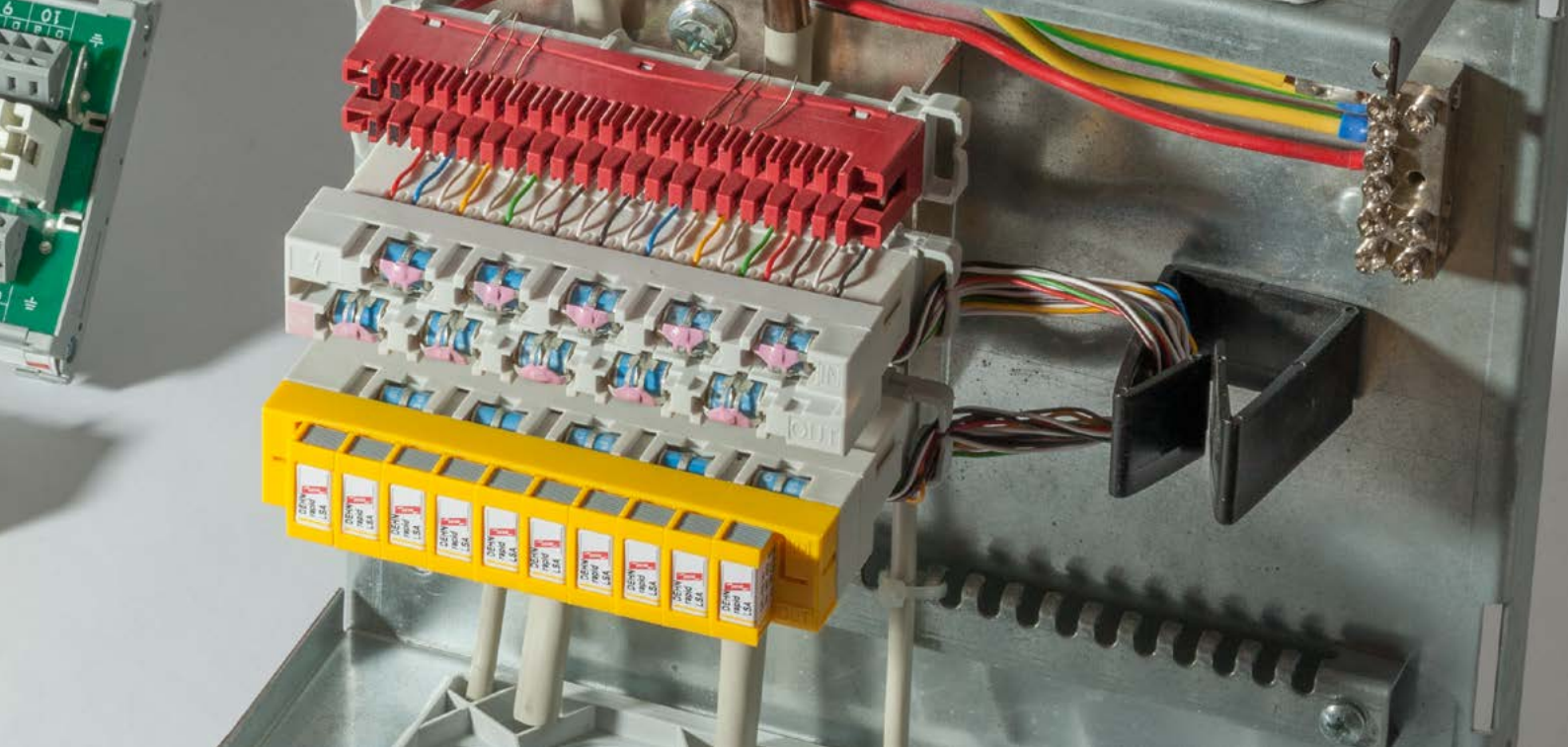


Line-to-core overvoltage fine limitation for interfaces with high transmission rates

DEHNrapid® LSA PD



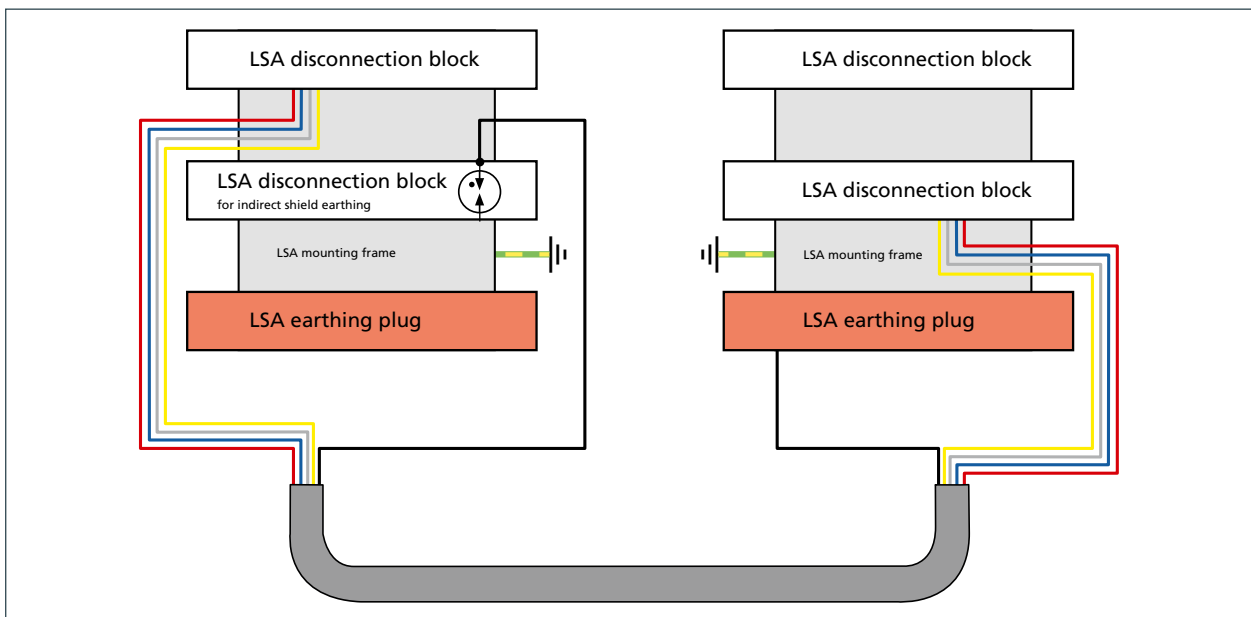
Line-to-core overvoltage fine limitation with additional over-current protection



Shield earthing

To ensure maximum protection from EMC interference*, both ends of cable shields must be connected to the equipotential bonding system. If systems with a different earth potential, for example two buildings with insufficient equipotential bonding, are connected via the cable, a significant equalising current may flow through the cable shield, thus interfering with the data signal to be transmitted. Therefore, cable shields are earthed directly on one end and indirectly on the other end by means of a gas discharge tube which is connected to earth potential. This indirect shield earthing prevents equalising currents during normal operation.

Indirect shield earthing by means of DEHNrapid arresters can be implemented as follows: On the one end, the cable shield is connected to an earthing plug and is thus directly earthed. On the other end, the cable shield is connected to a disconnection block with integrated gas discharge tube, thus preventing equalising currents. In case of lightning strikes or surges, the gas discharge tube establishes a direct connection to the earth potential and prevents that the connected devices are interfered with.



Indirect and direct shield earthing

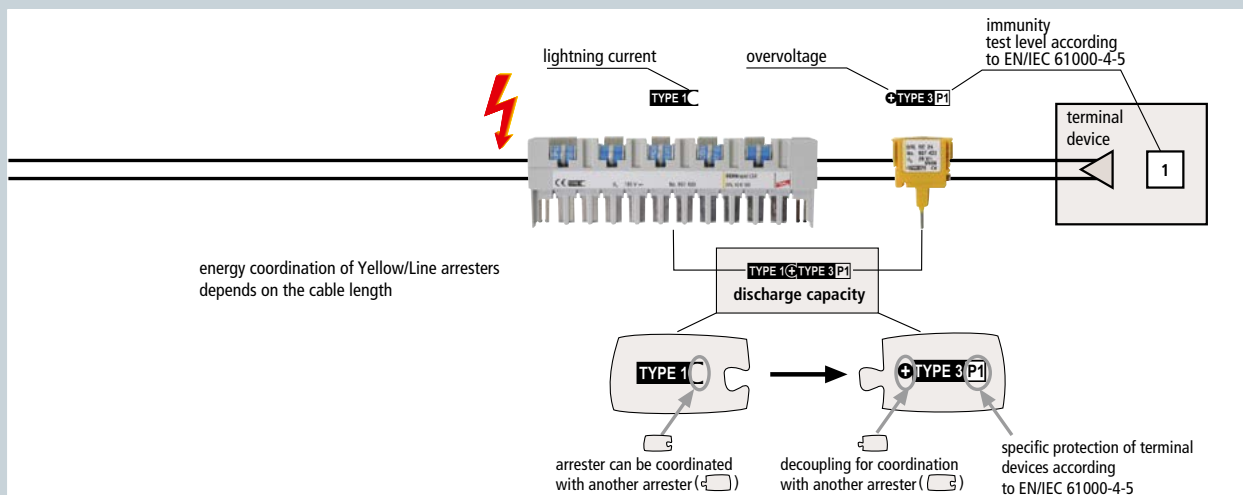
* EMC: Electromagnetic compatibility

DEHNrapid® LSA Modules and approvals

Type	Part. No.	Max. continuous operating voltage U_c	Nominal current	SPD class	Approval
DRL 10 B 180	907 400	180 V	0.4 A	TYPE 1 C	VdS, GOST
DRL 10 B 180 FSD	907 401	180 V	0.4 A	TYPE 1 C	VdS, GOST
DRL RE 5	907 420	5 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RE 12	907 421	12 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RE 24	907 422	24 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RE 48	907 423	48 V	0,4 A	TYPE 3 P1	VdS, GOST
DRL RE 60	907 424	60 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RE 180	907 425	180 V	0.1 A	TYPE 3 P1	VdS, GOST
DRL RD 5	907 440	5 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RD 12	907 441	12 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RD 24	907 442	24 V	0,4 A	TYPE 3 P1	VdS, GOST
DRL RD 48	907 443	48 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RD 60	907 444	60 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL RD 110	907 445	110 V	0.4 A	TYPE 3 P1	VdS, GOST
DRL PD 180	907 430	180 V	0.1 A	TYPE 3 P1	VdS, GOST
DRL HD 5	907 465	5 V	0.4 A	TYPE 3 P1	GOST
DRL HD 24	907 470	24 V	0.4 A	TYPE 3 P1	VdS, GOST
DPL 10 G3 110	907 214	110 V	0.4 A	TYPE 2	–
DPL 10 G3 110 FSD	907 216	110 V	0.4 A	TYPE 2	–

VdS Vertrauen durch Sicherheit/Germany GOST Gossudarstwenny Standart/Russia

Characteristic	Symbol	Description
Discharge capacity of an arrester (according to the categories of EN/IEC 61643-21)	TYPE 1	D1 impulse (10/350 μ s), lightning impulse current ≥ 2.5 kA / core or ≥ 5 kA / total • Exceeds the discharge capacity of TYPE 2 – TYPE 4
	TYPE 2	C2 impulse (8/20 μ s), increased impulse load ≥ 2.5 kA / core or ≥ 5 kA / total • Exceeds the discharge capacity of TYPE 3 – TYPE 4
	TYPE 3	C1 impulse (8/20 μ s), impulse load ≥ 0.25 kA / core or ≥ 0.5 kA / total • Exceeds the discharge capacity of TYPE 4
	TYPE 4	Load < TYPE 3
Protective effect of an arrester (limitation below the test levels according to EN/IEC 61000-4-5)	P1	Test level required for the terminal device: 1 or higher
	P2	Test level required for the terminal device: 2 or higher
	P3	Test level required for the terminal device: 3 or higher
	P4	Test level required for the terminal device: 4 or higher
Energy coordination (with another Yellow/Line arrester)	+	Arrester has a decoupling impedance and is suitable for coordination with an arrester marked with \curvearrowright
	\curvearrowright	Arrester is suitable for coordination with an arrester with decoupling impedance +



DEHNrapid® LSA selection chart

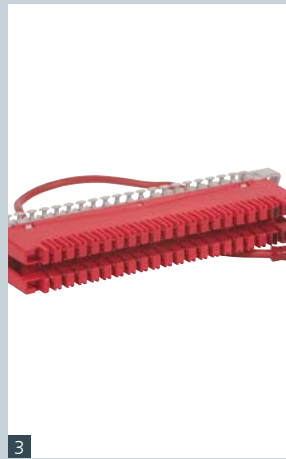
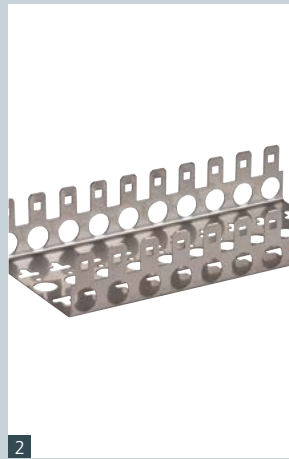
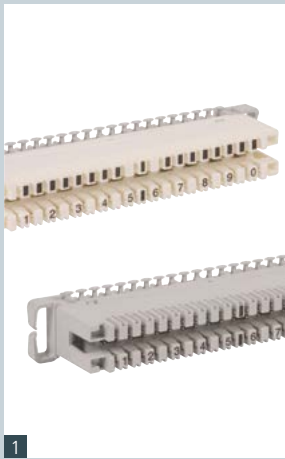


Selection guide
Yellow/Line

The right arrester for every interface and signal:

Use our selection guide to find the right arrester for the applications and signal circuits to be protected.

Interface Signal	Type
Measuring and control systems	
0-20 mA, 4-20 mA	DRL 10 B 180 FSD + EF 10 DRL + DRL RE 24
4-20 mA	DRL 10 B 180 FSD + EF 10 DRL + DRL RD 24
BACnet MS/TP	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5
Binary signals	DRL 10 B 180 FSD + EF 10 DRL + DRL RE 24
CAN bus (data line only)	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5
EIB	DRL 10 B 180 FSD
Electroacoustic system	DRL 10 B 180 FSD + EF 10 DRL + DRL RD 110
Fieldbus Foundation	DRL 10 B 180 FSD + EF 10 DRL + DRL RD 24
Industrial Ethernet	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
KNX	DRL 10 B 180 FSD
LON – TP/FTT10 and TP/LPT10 (up to 0.4 A)	DRL 10 B 180 FSD + EF 10 DRL + DRL RD 48
M bus	DRL 10 B 180 FSD + EF 10 DRL + DRL RD 48
MODBUS	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5
PROFIBUS-DP/FMS	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5
PROFIBUS-PA	DRL 10 B 180 FSD + EF 10 DRL + DRL RD 24
RS 485	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5
RS422,V11	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5
SDLS	DRL 10 B 180 FSD + EF 10 DRL + DRL RE 48
SIGMASYS (Siemens fire alarm system)	DRL 10 B 180 FSD + EF 10 DRL + DRL RE 48
Telecommunication systems	
a/b cores	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180
ADSL	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180
ADSL 2+	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180
E1	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
G.703 / G.704	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
HDSL	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
ISDN S0	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
ISDN S2m / U2m	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180
SDSL	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
SHDSL	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
System telephony (e.g. Siemens, HICOM, Alcatel)	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180 DRL 10 B 180 FSD + EF 10 DRL + DRL RD 110
T-DSL	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180
Telecommunication systems	DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180
Universal lightning equipotential bonding	DRL 10 B 180 FSD
VDSL	DRL 10 B 180 FSD
Data systems	
Ethernet 10/100/1000	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
Industrial Ethernet	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
Token Ring	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24
V 24 (RS232 C)	DRL 10 B 180 FSD + EF 10 DRL + DRL RE 12
Transceivers, video	
Video (two-wire)	DRL 10 B 180 FSD + EF 10 DRL + DRL HD 5



Accessories for DEHNrapid® LSA

1 Disconnection and terminal block

Type 2 disconnection and terminal block for LSA technology allows connection of 10 pairs each on the cable and routing side.

- Disconnection block, white enclosure: Protection is provided between the disconnection contacts as soon as DRL components are plugged in.
- Terminal block, grey enclosure: Only DPL 10 G3 arresters can be inserted.

Disconnection and terminal block	Part No.
TL2 10DA LSA	907 996
AL2 10DA LSA	907 997

2 Mounting frame

Mounting frame for 10 LSA blocks of 2/10 type such as disconnection blocks, terminal blocks and earthing plugs

Mounting frame	Part No.
MB2 10 LSA	907 995

3 Earthing plug

Type 2 earthing plug for LSA technology allows connection of 38 earth wires or shields. Red colour.

Earthing plug	Part No.
EL2 38EA LSA	907 993

4 Earthing module

Plugged into the EF 10 DRL earthing frame, the earthing module connects a pair connected to an LSA disconnection block with the equipotential bonding system. It directly earths unused cable cores which are already connected to the LSA disconnection block. The earthing module cannot be used in connection with the DRL 10 B... plug-in SPD block.

Earthing module	Part No.
EM 2 DRL	907 496



5



6



7



8

5 Routing module

The DIN rail mounted routing module for disconnection blocks is equipped with LSA disconnection block of 2/10 type as well as spring-loaded terminals for variable wire connection. DPL plug-in SPD blocks and DEHNrapid LSA arresters can be plugged into the routing module.

Routing module	Part No.
TL2 10 DACC	907 991

7 Label holder

The universal label holder made of stainless steel ensures clear identification of LSA connections and can be snapped onto DEHNrapid LSA plug-in SPD blocks, earthing frames with protective plugs or mounting frames with LSA blocks of 2/10 type.

Label holder	Part No.
SR DRL	907 497

6 Constant force spring

The shields of the incoming information and measuring and control lines can be contacted by means of SA KRF constant force springs in a space-saving and lightning current carrying way. As, in the course of time, the conductor materials are subject to a yield, this yield is compensated by a spring element. To ensure permanent corrosion protection, the clamping point is wrapped with a self-bonding SKB rubber tape.

Constant force spring	Part No.
SA KRF 10 V2A	919 031
SA KRF 15 V2A	919 032
SA KRF 22 V2A	919 033
SA KRF 29 V2A	919 034
SA KRF 37 V2A	919 035
SA KRF 50 V2A	919 036
SA KRF 70 V2A	910 037
SA KRF 94 V2A	919 038
Rubber tape	Part No.
SKB 19 9 M SW	919 030

8 Insertion tool

The insertion tool with fold-out extraction hook and blade allows to connect the wires and to simultaneously cut them to the required length.

Insertion tool	Part No.
AW2 LSA	907 994



Surge Protection
Lightning Protection
Safety Equipment
DEHN protects.

DEHN + SÖHNE
GmbH + Co.KG.

Hans-Dehn-Str. 1
Postfach 1640
92306 Neumarkt
Germany

Tel. +49 9181 906-0
Fax +49 9181 906-1100
info@dehn.de
www.dehn-international.com

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