

# DEHNrapid® LSA

Modular lightning and surge protection





Protection thanks to modularity:  
The DEHNrapid® modular system



# Modular lightning and surge protection

## The DEHNrapid® modular system ...

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 µs) per core. The DEHNrapid modular system allows the user to select an optimal combination for every application.

## ... provides protection thanks to its modularity

The modular design allows the individual elements to be combined 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 µs) per core. The integrated fail-safe function protects terminal equipment from dangerous interference, even in case of arrester overload.

DEHNrapid surge protective devices are used in 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





## 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.

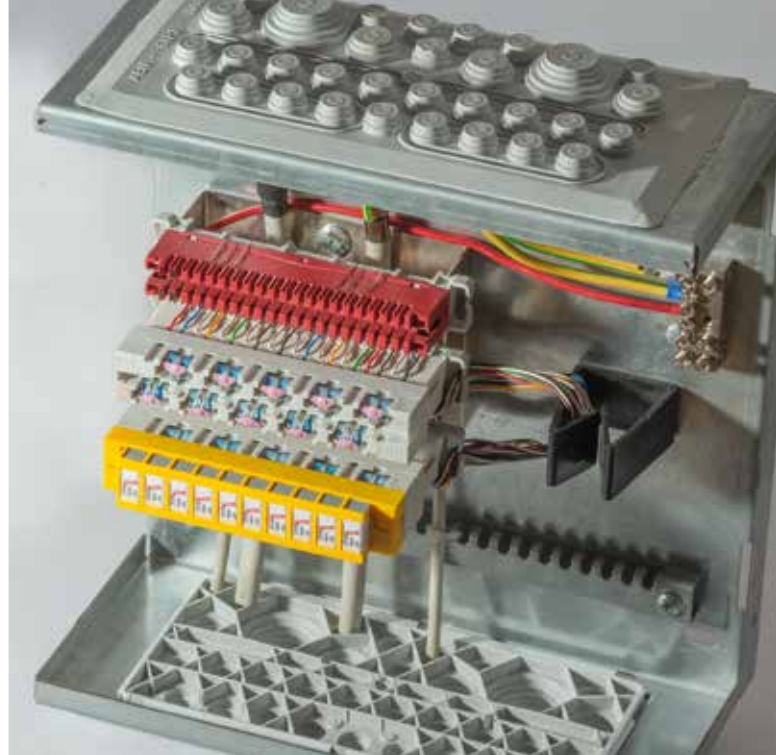
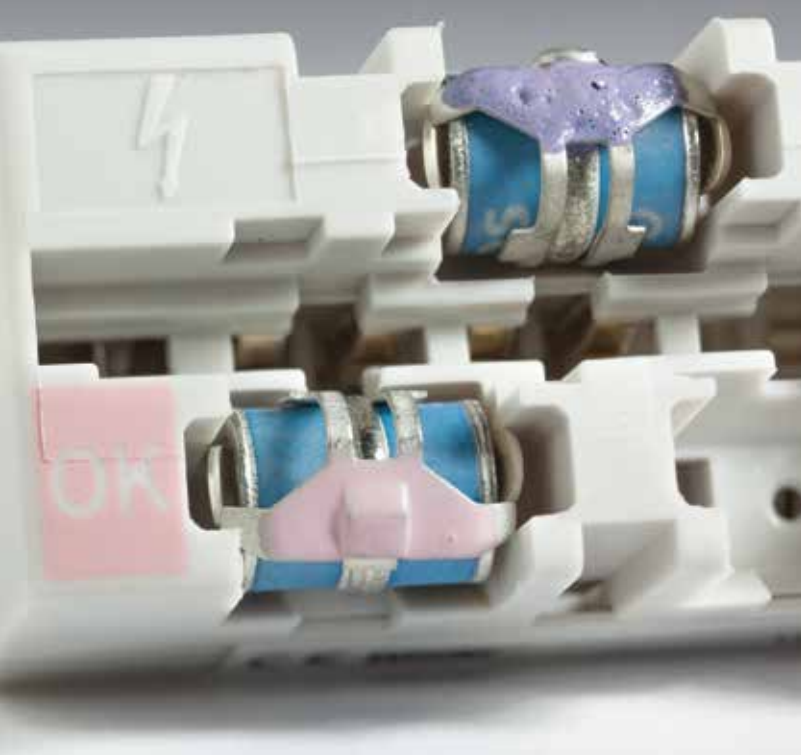
## Variable protection

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.

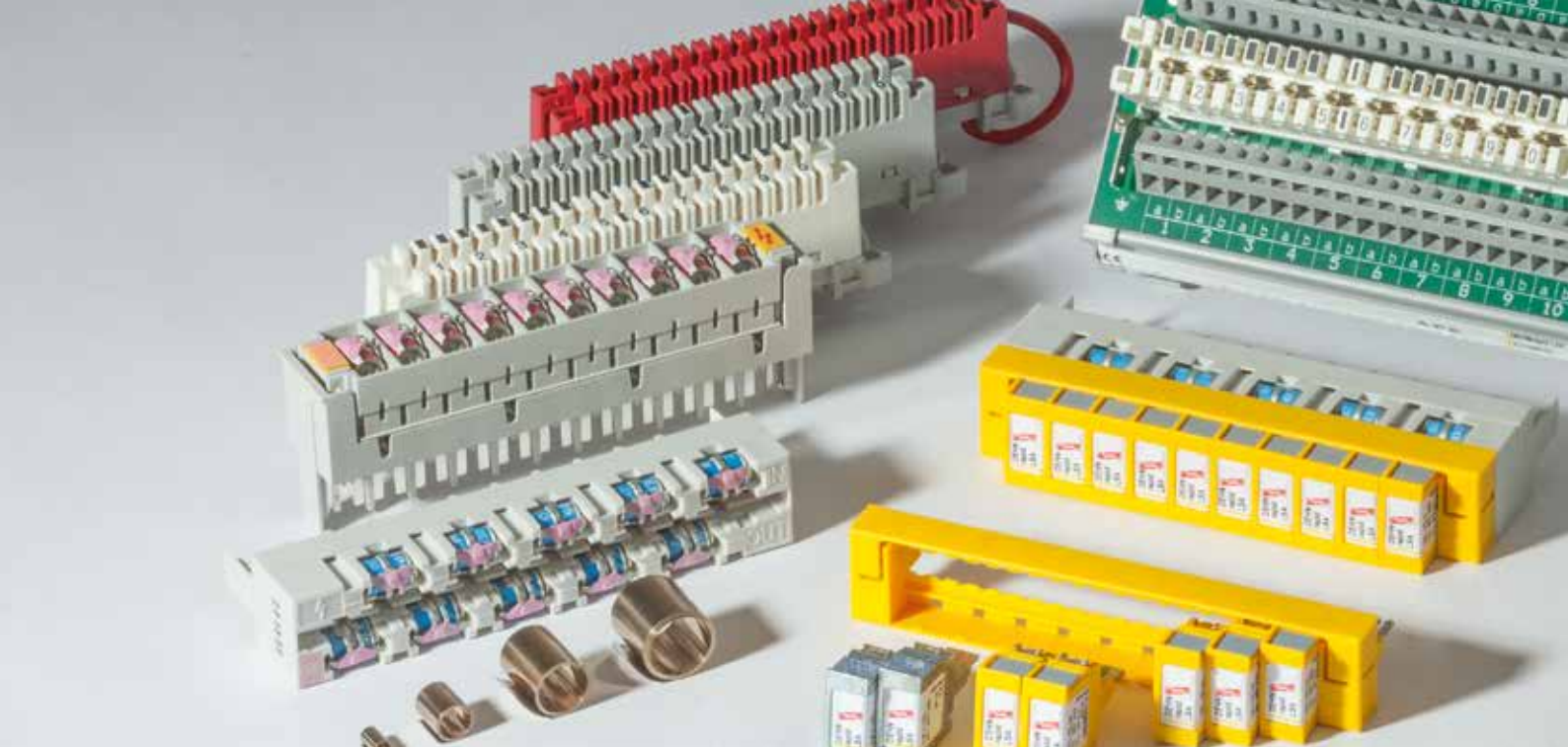
## DEHN equipotential bonding enclosure

The DEHN equipotential bonding enclosure (DPG) is a lockable lightning current carrying metal enclosure for the installation of wiring and protection components. Available in four different sizes, the enclosures provide terminals that allow the integration of surge arresters and cable shields in the equipotential bonding system. The cover can be removed from the wall plate without tools and 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.               | <b>906 100</b>     | <b>906 101</b>     |
| 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.               | <b>906 102</b>     | <b>906 103</b>     |
| 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 |

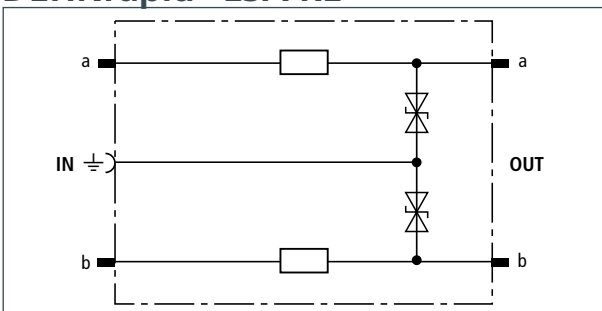


## Surge protection modules

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

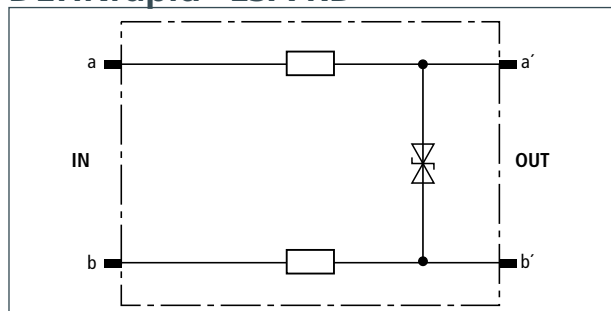
DEHNrapid series are adapted to various interfaces, thus ensuring protection and availability for signal circuits and system components.

### DEHNrapid® LSA RE



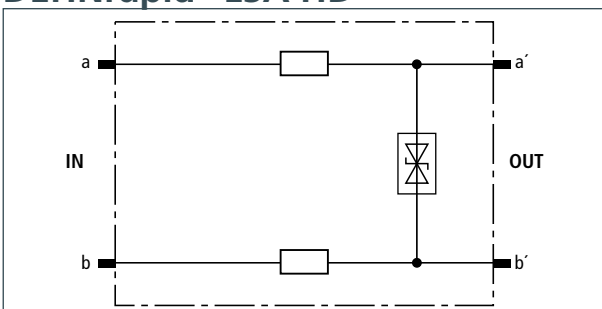
Line-to-earth overvoltage fine limitation for protection against unbalanced interference

### DEHNrapid® LSA RD



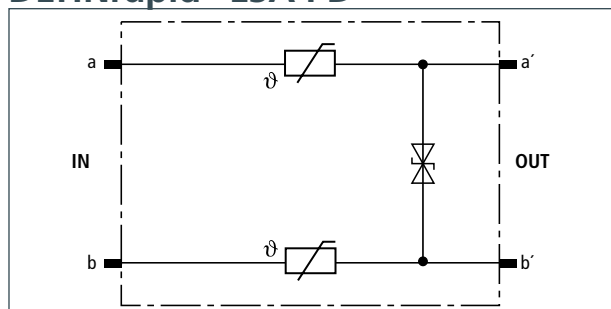
Line-to-core overvoltage fine limitation for protection against balanced interference

### DEHNrapid® LSA HD

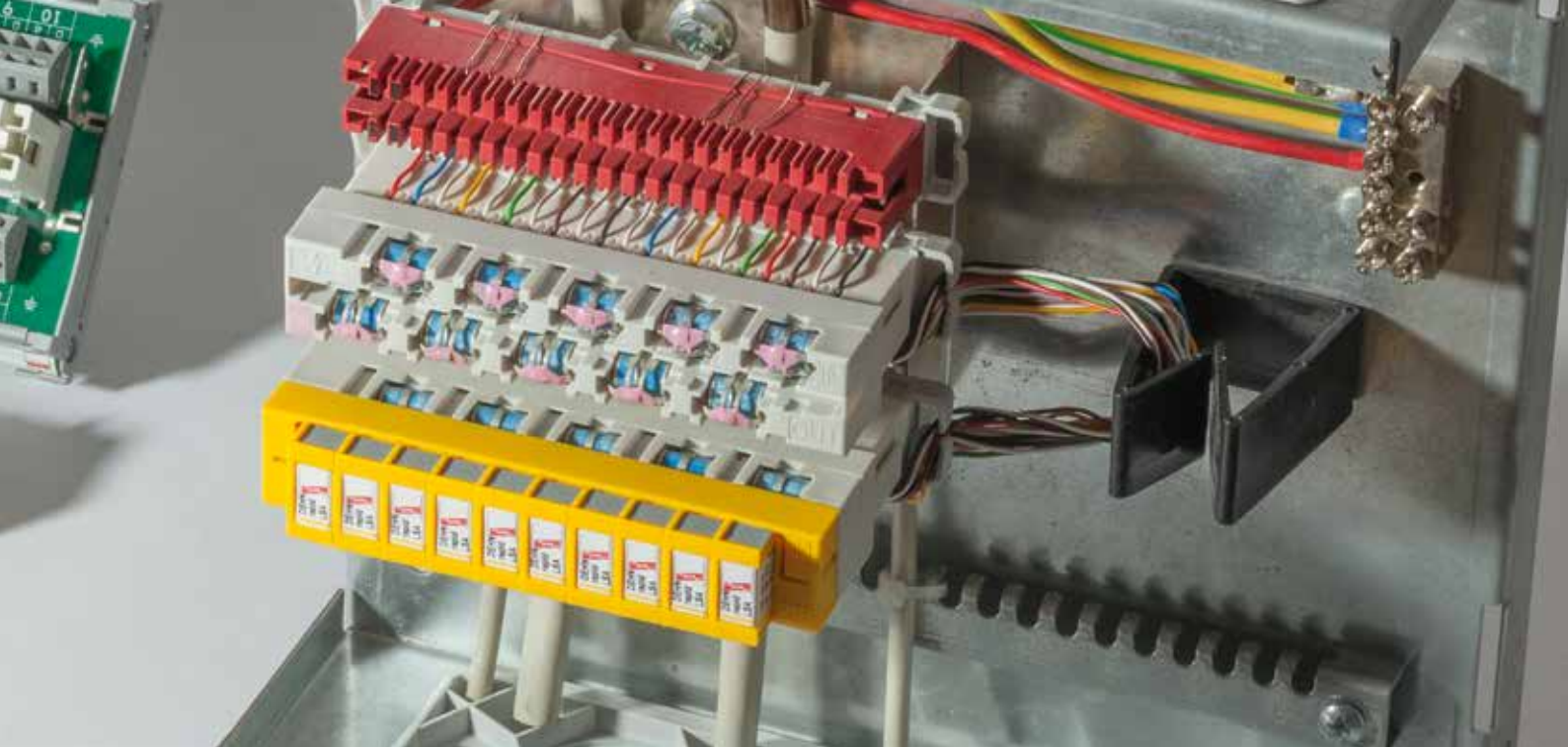


Line-to-core overvoltage fine limitation for interfaces with high transmission rates

### DEHNrapid® LSA PD



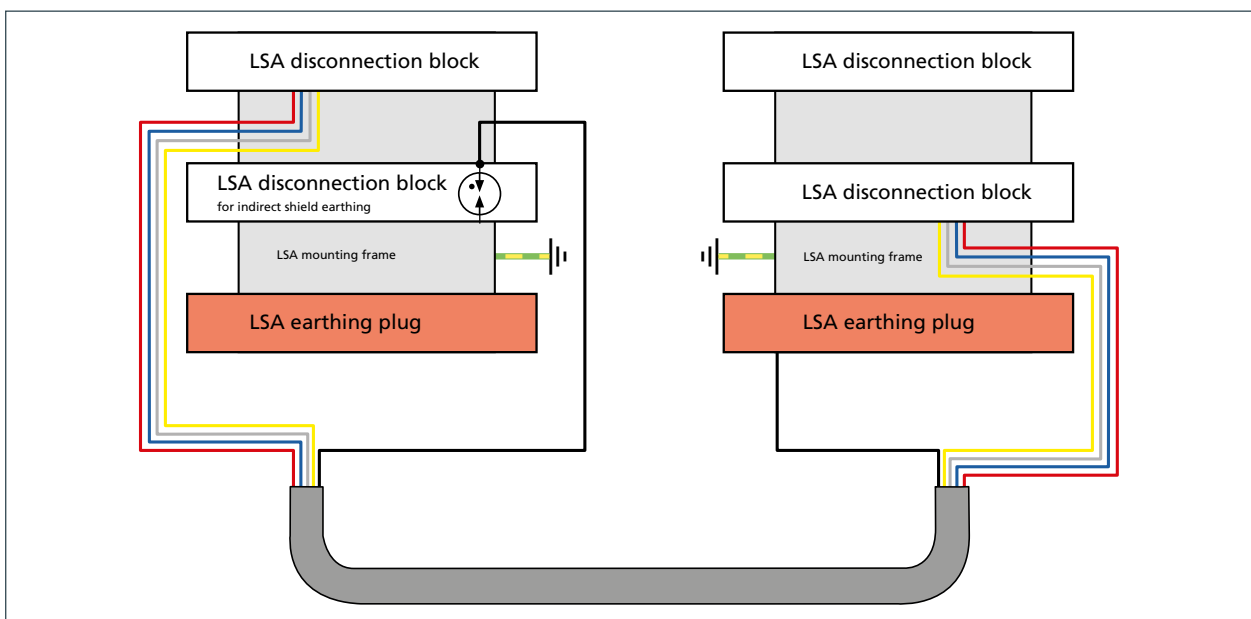
Line-to-core overvoltage fine limitation with additional overcurrent protection



## Shield earthing

To ensure maximum protection from EMC interference\*, both ends of the 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 at one end and indirectly at 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 one side, the cable shield is connected to an earthing plug and is thus directly earthed. On the other side, 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 protects the connected devices from interference.



Indirect and direct shield earthing

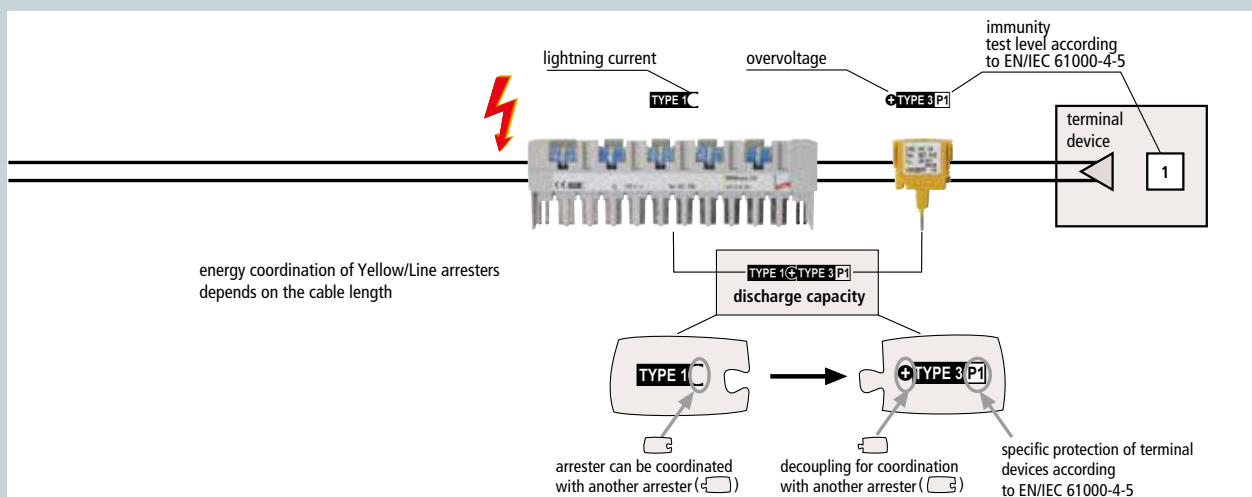
\* EMC: Electromagnetic compatibility

## 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  | EAC <sup>1)</sup> |
| DRL 10 B 180 FSD  | 907 401  | 180 V                                   | 0.4 A           | TYPE 1 C  | EAC <sup>1)</sup> |
| DRL RE 12         | 907 421  | 12 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RE 24         | 907 422  | 24 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RE 48         | 907 423  | 48 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RE 60         | 907 424  | 60 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RE 180        | 907 425  | 180 V                                   | 0.1 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RD 12         | 907 441  | 12 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RD 24         | 907 442  | 24 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RD 48         | 907 443  | 48 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RD 60         | 907 444  | 60 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL RD 110        | 907 445  | 110 V                                   | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL PD 180        | 907 430  | 180 V                                   | 0.1 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| DRL HD 24         | 907 470  | 24 V                                    | 0.4 A           | TYPE 3 P1 | EAC <sup>1)</sup> |
| 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    | –                 |

<sup>1)</sup> EAC European Accreditation of Certification

| Characteristic  | Symbol    | Description   |
|---|-----------|---|
| <b>Discharge capacity of an arrester</b><br>(according to the categories of EN/IEC 61643-21)                | TYPE 1    | D1 impulse (10/350 $\mu$ s), lightning impulse current $\geq 2.5$ kA / core or $\geq 5$ kA / total<br>• Exceeds the discharge capacity of TYPE 2 – TYPE 4 |
|   | TYPE 2    | C2 impulse (8/20 $\mu$ s), increased impulse load $\geq 2.5$ kA / core or $\geq 5$ kA / total<br>• Exceeds the discharge capacity of TYPE 3 – TYPE 4      |
|   | TYPE 3    | C1 impulse (8/20 $\mu$ s), impulse load $\geq 0.25$ kA / core or $\geq 0.5$ kA / total<br>• Exceeds the discharge capacity of TYPE 4                      |
|   | TYPE 4    | Load < TYPE 3   |
| <b>Protective effect of an arrester</b><br>(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  |
| <b>Energy coordination</b><br>(with another Yellow/Line arrester)   | +         | Arrester has a decoupling impedance and is suitable for coordination with an arrester marked with $\square$   |
|   | $\square$ | Arrester is suitable for coordination with an arrester with decoupling impedance +  |





## DEHNrapid® LSA selection chart

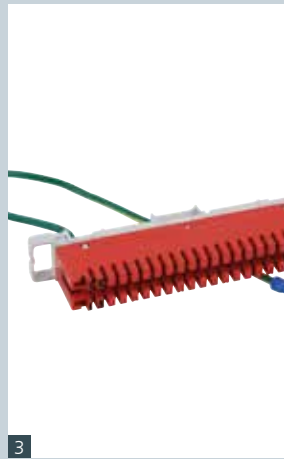
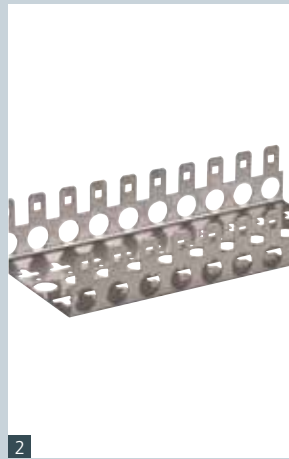


Selection guide  
Yellow/Line

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<br>Signal                                | Type   |
|--|--|
| <b>Measuring and control systems</b>               |  |
| 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 24   |
| 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 24   |
| 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 24   |
| PROFIBUS-DP/FMS                                    | DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24   |
| 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 24   |
| RS422,V11  | DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24   |
| 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   |
| <b>Telecommunication systems</b>                   |  |
| 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<br>(e.g. Siemens, HICOM, Alcatel) | DRL 10 B 180 FSD + EF 10 DRL + DRL PD 180<br>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   |
| <b>Data systems</b>                                |  |
| 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   |
| <b>Transceivers, video</b>                         |  |
| Video (two-wire)                                   | DRL 10 B 180 FSD + EF 10 DRL + DRL HD 24   |



## 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 in 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 is used to connect the wires and simultaneously cut them to the required length.

| Insertion tool | Part No. |
|----------------|----------|
| AW2 LSA        | 907 994  |

[www.dehn-international.com/partners](http://www.dehn-international.com/partners)



**Surge Protection  
Lightning Protection  
Safety Equipment  
DEHN protects.®**

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