Red/Line Selection Guide
Surge Protection for Power Supply Systems
Power Supply Systems Worldwide

International system configurations* according to IEC 60364-1 (DIN VDE 0100-100)

Further system configurations* used worldwide

- **TN-C system**: 230 / 400 V
- **TN-C-S system**: 230 / 400 V
- **TN-S system**: 230 / 400 V
- **TT system**: 230 / 400 V
- **IT system**: 230 V, 400 V, 500 V, 690 V

* System according to earth connection (according to DIN VDE 0100-100)
**TN system:** Example: Separation of the PEN conductor in the main distribution board

1) Only required, if no fuse of the same or a lower nominal value is provided in the upstream power supply.
TN system: Example: Office building – Separation of the PEN conductor in the sub-distribution board

**SPD Type 3**
(Surge arrester)

1 x NSM PRO EW  Part No. 924 342
1 x DPRO 230 F  Part No. 909 240
1 x DPRO 230  Part No. 909 230
1 x SFL PRO 6X  Part No. 909 250

**SPD Type 2**
(Surge arrester)

1 x DG M TNC 275  Part No. 952 300
with remote signalling contact:
1 x DG M TNC 275 FM  Part No. 952 305

**SPD Type 1**
(Lightning current arrester)

3 x DBH M 1 255  Part No. 961 122
1 x MVS 1 6  Part No. 900 815
alt. 1 x DB 3 255 H  Part No. 900 120
3 x DB M 1 255 FM  Part No. 961 125
1 x MVS 1 6  Part No. 900 815
alt. 3 x DB M 1 255  Part No. 961 120
1 x MVS 1 6  Part No. 900 815
alt. 3 x DV M TNC 255  Part No. 951 305
alt. 1 x DV M TNC 255 FM Part No. 951 305

1) Only required, if no fuse of the same or a lower nominal value is provided in the upstream power supply.
**TN system:** Example: Industrial building – Separation of the PEN conductor in the sub-distribution board
**Central Main and Sub-distribution Board**

**SPD Type 1**
(Combined lightning current and surge arrester)

- **1 x DV ZP TNC 255** Part No. 900 390
- **1 x DV ZP TT 255** Part No. 900 391
  - also available for 5-wire systems

**Note:**
As an alternative, surge arresters can also be used downstream of meter panels (e.g. **DG M TNC 275** Part No. 952 300) if there is no
- lightning protection system
- electrical power supply by the service entry mast
- antenna of the roof
- if none of the conditions mentioned above apply to an adjoining building

**Central Main and Sub-distribution Board**

**TN system:** Example: Single-family house

**SPD Type 1**
(Combined lightning current and surge arrester)

- **1 x DV ZP TNC 255** Part No. 900 390

**Note:**
As an alternative, surge arresters can also be used downstream of meter panels (e.g. **DG M TT 275** Part No. 952 310) if there is no
- lightning protection system
- electrical power supply by the service entry mast
- antenna of the roof
- and if none of the conditions mentioned above apply to an adjoining building.

**Central Main and Sub-distribution Board**

**TT system:** Example: Single-family house

**SPD Type 1**
(Combined lightning current and surge arrester)

- **1 x DV M TT 255** Part No. 951 310

**Note:**
As an alternative, surge arresters can also be used downstream of meter panels (e.g. **DG M TT 275** Part No. 952 310) if there is no
- lightning protection system
- electrical power supply by the service entry mast
- antenna of the roof
- and if none of the conditions mentioned above apply to an adjoining building.

**Socket Outlet**

**SPD Type 3**
(Surge arrester)

- **1 x DFL M 255** Part No. 924 396

**Socket Outlet**

**SPD Type 3**
(Surge arrester)

- **1 x DFL M 255 Part No. 924 396**
for cable ducts for existing socket outlets

Cable length ≥ 5 m

SPD Type 3
(Surge arrester)

SPD Type 3
(Surge arrester)

SPD Type 3
(Surge arrester)

1) Only required, if no fuse of the same or a lower nominal value is provided in the upstream power supply.

1 x DSA 230 LA
Part No. 924 370
for cable ducts

1 x DFL M 255
Part No. 924 396
for flush-mounted systems

1 x STC 230
Part No. 924 350
for existing socket outlets

DEHNguard®
DG MOD 275

SPD Type 2
(Surge arrester)

SPD Type 2
(Surge arrester)

Cable length ≥ 15 m

SPD Type 1
(Lightning current arrester)

SPD Type 1
(Coordinated lightning current arrester)

SPD Type 1
(Combined lightning current and surge arrester)

1 x DG M TT 275
Part No. 952 310
with remote signalling contact:
1 x DG M TT 275 FM
Part No. 952 315

1 x DGP M 255 Part No. 961 101
1 x MVS 1 8 Part No. 900 611
1 x DV M TT 255 FM Part No. 951 315
alt. 1 x DV M TT 255 Part No. 951 310

1315 A

L1 L2 L3 N

Socket Outlet

Main Distribution Board

Sub-distribution Board

1125 A

TT system: Example: Office building
SPD Type 3 (Surge arrester)

SPD Type 2 (Surge arrester)

Cable length ≥ 15 m

SPD Type 1 (Lightning current arrester)

DEHNbloc® M
Coordinated with DEHNguard® without additional cable length.

DEHNventil®
Directly coordinated with RedLine SPDs Type 2 and 3 without additional cable length.

For serial connection please see also page 6

1) Only required, if no fuse of the same or a lower nominal value is provided in the upstream power supply.

**TT system:** Example: Industrial building
**TT system**: Industrial building TN-C 400/690 V

**IT system**: Industrial building IT 690 V, without integrated neutral conductor
1) Only required, if no fuse of the same or a lower nominal value is provided in the upstream power supply.
2) Without separate backup fuse in case of earth-fault and short-circuit-proof installation.

**SPD Type 1**
(Dehnblock® M)
Coordinated with DehnGuard®
without additional cable length.

**SPD Type 2**
(Surge arrester)
with remote signalling contact:
1 x DG M TNS CI 275 FM Part No. 952 406

**SPD Type 3**
(Surge arrester)
1 x DFL M 255
for flush-mounted systems

**Main Distribution Board**

**Sub-distribution Board**

**Socket Outlet**

Cable length ≥ 5 m

**Cable length**

**SPD Type 1**
(Coordinated lightning current arrester)

**SPD Type 2**
(Surge arrester)

**SPD Type 3**
(Surge arrester)

**TN system**

**TT system**
**TN system:** Use of type 1 and 2 arresters with integrated backup fuse in an industrial building.
Roof-mounted Photovoltaic Systems
Place of installation of the surge protective devices

Equipotential bonding
For lightning and surge protection reasons, it is strongly recommended to connect the PV frame as follows to the equipotential bonding system:
- Defined connection with at least 6 mm² copper at the PV frame (a + b).
- Defined connection with at least 16 mm² copper at the PV frame (c).
- Electrically conductive connection of the PV frames has to be ensured.
- The earth conductor is connected to the main earthing busbar of the building on ground level.
- The earth conductor has to be installed in parallel and in close proximity to the d.c. and a.c. cables / lines and accessory.
**Type 1 combined lightning current and surge arrester DEHNlimit PV 1000 V2 FM**

Multipole, spark-gap-based combined lightning current and surge arrester for PV generator circuits with wave breaker function.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
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<tbody>
<tr>
<td>DLM PV 1000 V2 FM*</td>
<td>900 345</td>
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**Type 2 arrester DEHNguard® M YPV SCI**

Multipole, modular surge arrester for PV systems. The patented SCI technology prevents fire damage caused by d.c. switching arcs.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DG M YPV SCI 600 FM*</td>
<td>952 516</td>
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<tr>
<td>DG M YPV SCI 1000 FM*</td>
<td>952 515</td>
</tr>
<tr>
<td>DG M YPV SCI 1200 FM*</td>
<td>952 517</td>
</tr>
<tr>
<td>DG ME YPV SCI 1500 FM*</td>
<td>952 525</td>
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</tbody>
</table>

**Type 2 arrester DEHNguard® M ... 275 FM**

Multipole, modular surge arrester: High reliability due to “Thermo Dynamic Control” monitoring device.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
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</thead>
<tbody>
<tr>
<td>DG M TNC 275 FM*</td>
<td>952 305</td>
</tr>
<tr>
<td>DG M TNS 275 FM*</td>
<td>952 405</td>
</tr>
<tr>
<td>DG M TT 275 FM*</td>
<td>952 315</td>
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</tbody>
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**Type 1 combined lighting current and surge arrester DEHNventil® M ZP**

Lightning current carrying spark-gap-based combined arrester with wave breaker function. Easy installation on 40 mm busbar systems. Capable of protecting terminal equipment.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
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</thead>
<tbody>
<tr>
<td>DV M TNC 255 FM*</td>
<td>941 300</td>
</tr>
<tr>
<td>DV M TNS 255 FM*</td>
<td>941 400</td>
</tr>
<tr>
<td>DV M TT 255 FM*</td>
<td>941 310</td>
</tr>
</tbody>
</table>

**Type 1 combined arrester DEHNventil® 2P**

Lightning current carrying spark-gap-based combined arrester with wave breaker function. Easy installation on 40 mm busbar systems. Capable of protecting terminal equipment.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
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</thead>
<tbody>
<tr>
<td>DV ZP TNC 255</td>
<td>900 390</td>
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<tr>
<td>DV ZP TT 255</td>
<td>900 391</td>
</tr>
</tbody>
</table>

**Type 1 application-optimised combined lightning current and surge arrester DEHNshield® ... 255**

Multipole, spark-gap-based combined lighting current and surge arrester with impulse current parameters which are sufficient for this place of installation.

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
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<tbody>
<tr>
<td>DSH TNC 255</td>
<td>941 300</td>
</tr>
<tr>
<td>DSH TNS 255</td>
<td>941 400</td>
</tr>
<tr>
<td>DSH TT 255</td>
<td>941 310</td>
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**Data interface**

DIN rail mounted combined lightning current and surge arrester with actiVsense and LifeCheck technology for protecting two pairs of balanced interfaces (for example RS485) (BXT BAS base part required, Part No. 920 300)

<table>
<thead>
<tr>
<th>Type</th>
<th>Part No.</th>
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<tr>
<td>BXTU ML4 BD 0-180</td>
<td>920 349</td>
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Our promise
DEHN protects

Our key objective is to protect material assets and workers. It was our pioneering spirit and innovative ideas that have defined our company for more than 100 years and made us a market leader with more than 1,500 employees. Our products and developments reflect our market feasibility, commitment and ideas.

As early as in 1923 our founder Hans Dehn started production of external lightning protection and earthing components to optimise the protection of buildings and installations. In 1954, we launched the first series of surge protective devices. Constant further development of these devices ensures safe operation and permanent availability of electrical and electronic installations. Also in the 1950s, our third sector, safety equipment, was added to our portfolio. The Bavarian town of Neumarkt is the heart of our activities where product managers and developers advance our protection technologies. Here we manufacture our high-quality safety products.

We offer the best solution

Our concern is to be a reliable and fair partner for our industrial, commercial and technical customers all over the world. To this end, we always focus on the best solution to protection problems. Our sales teams in Germany and our global network of 11 subsidiaries as well as more than 70 international sales partners are committed to competent and customer-oriented distribution of our products. Proximity and close contact with our customers is of utmost importance to us, be it on-site support by our experienced field staff team, our telephone hotline or personal contact at trade fairs.

In hundreds of seminars, workshops and conferences held every year throughout the world we impart practical knowledge on products and solutions. Our specialised book “Lightning Protection Guide” and our brochures will broaden your practical knowledge. Or visit us at www.dehn.de for information around the clock.