

DEHNventil® Combined Arrester VGA 280/4, Art. No. 900 304 and VGA 280/2, Art. No. 900 302

INSTALLATION INSTRUCTIONS

Technical Data

DEHNventil®		VGA 280/2	VGA 280/4
tested to		DIN VDE 0675-6:1989-11	
rated voltage (maximum continuous operating voltage)	U_c	280 V / 50 Hz	
lightning impulse current (8/80)		100 kA	
voltage protection level – residual voltage at i_{sn} – lightn. imp. sparkover volt. 1.2/50	U_p	≤ 2.5 kV ≤ 4 kV	
max. backup fuse (only required if not provided in mains) to		100 A gL/gG	
short-circuit withstand capability with max. backup fuse		25 kA / 50 Hz	
operating temperature range	9	– 40°C ... + 80°C	
conductor cross-sectional areas		L ₁ , L ₂ , L ₃ , N: min. 6 mm ² single-stranded / 4 mm ² fine-stranded (only with connector sleeve) max. 50 mm ² multi-stranded / 35 mm ² fine-stranded ⚡: min. 10 mm ² single-stranded / 10 mm ² fine-stranded (only with connector sleeve) max. 50 mm ² multi-stranded / 35 mm ² fine-stranded FM contacts: max. 2,5 mm ² single-stranded / 1,5 mm ² fine-stranded	
FM contacts:	type of contact	break / normally closed	
	contact rating U_{pN}/I_N	AC: 250 V / 0.5 A DC: 250 V / 0.1 A 125 V / 0.2 A 75 V / 0.5 A	
for mounting on		35 mm DIN rail to EN 50022	
degree of protection		IP 20	
connections		L ₁ , N	L ₁ , L ₂ , L ₃ , N
fault indicator between L ₁ and ⚡	U_{min}	100 V	200 V

1. Application, Design

The combined SPD is used for lightning/overvoltage protection of subsequent electrical installations, also for protection against direct lightning (see also DIN VDE 0185 Parts 1 and 2).

The combined SPD is conceived according to E DIN VDE 0675 Part 6/11.89 in conformity with Classes B and C for lightning protection equipotential bonding according to DIN VDE 0185 Part 1 and protection levels IV and III in accordance with DIN VDE 0110-1 (VDE 0110-1).

The DEHNventil is a two-pole or a four-pole combined arrester with a circuit containing varistors arranged in parallel and lightning-current-proof spark gaps. The varistors alone are able to discharge surge currents in the range of some 10 kA (waveform 8/20). The energy at higher surge currents (direct lightning stroke) is then discharged by the integrated spark gaps. This causes the spark gaps to blow out (quenching chamber openings at the rear of the housing), which means that special installation conditions must be complied with (see Section 7).

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2. Safety Instructions

The combined SPD is only to be installed by a skilled person in accordance with the DIN VDE regulations. Its use is only permitted under the conditions stated and shown in these instructions.

If the SPD is subject to loads exceeding the values stated in the **Technical Data**, its operations can adversely be affected.

The combined SPD is to be checked by the skilled person for signs of external damage prior to installation and is not to be installed if damage or any other defect is detected in this check.

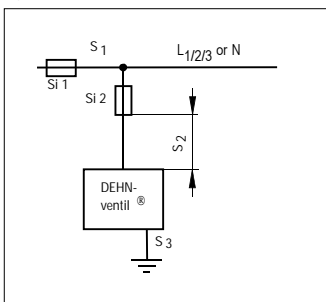
Especially note that opening and otherwise tampering with the equipment is not allowed for safety reasons and invalidates the warranty.



VGA 280/4



Fig. 1: Conductor cross-sectional areas



3. Installation Location

The DEHNventil combined arrester is installed as part of the lightning protection equipotential bonding measures. The electrical installation connected to it is protected when the DEHNventil is installed in the main distribution board or the subsequent distribution board.

4. Connection (see Fig. 1)

4.1 Phase connection

The combined SPD VGA 280/4 is a four-pole device to connect the 3 line conductors L₁, L₂, L₃ and the neutral conductor N in three-phase systems.

The combined SPD VGA 280/2 is a two-pole device to connect the line conductor L₁ and the neutral conductor N in single-phase systems.

Mounting of neutral conductor

TN-C system
In TN-C applications, the neutral conductor N is mounted together with the PE in one PEN-cable. The terminal of the neutral conductor is not connected.

TN-S system

In TN-S applications, the neutral conductor N is connected to the appropriate terminal of the combined SPD.

TT system

The N conductor is connected to the appropriate DEHNventil terminal.

The DEHNventil combined arrester is to be connected on the load side of the (main) residual current circuit breaker.

IT system

No connection as the N conductor is not provided.

Note:

The continuous operating voltage of 280 V/50 Hz must not be exceeded even in the case of a fault.

4.2 Earthing cable

The combined arrester is to be earthed via the earthing terminal (⚡) by the shortest possible path - connection via earthing cable to the earthing busbar/equipotential bonding system/equipotential bonding bar (Section 6).

5. Backup Fuse

The rating of the upstream fuse Si 1 of the SPD is not to exceed 100 A gL/gG. When the upstream fuse is rated higher, an additional backup fuse with a rating of up to 100 A gL/gG is to be connected before the DEHNventil. Another type of fuse device with the same or faster tripping characteristic can be used instead of this backup fuse.

6. Conductor Cross-sectional Areas

The minimum cross-sectional areas of S₂ and S₃ comply with the requirements according to DIN VDE 0100 Part 430 and DIN VDE 0185 Part 1 (see Table 1).

For the minimum cross-sectional area of S₃ (earthing cable), DIN VDE 0100 Parts 410/540 - main equipotential bonding - is observed.

It is 0.5 x cross-section of the main earthing conductor of the installation, subject to a minimum of 10 mm² copper and a maximum of 25 mm² copper.

7. Special Installation Conditions

In the event of direct lightning, the spark gaps blow out with a corresponding pressure wave in the quenching chamber area to the rear of the enclosure (see Fig. 2). It is therefore recommended to install the SPD in the lightning-current-proof housing (Art. No. 900 305) designed for this purpose. If the combined SPD is installed in distribution boards, it must not be mounted in direct vicinity of combustible materials (see DIN VDE 0100 Part 430). The following installation condition must be complied with in order to ensure that a short-circuit to adjacent bare and live conductors/parts cannot occur on "blow-out".

7.1 All the bare live parts within 150 mm of the blow-out area (see Fig. 2) are to be covered with insulation or electrically isolating obstacles.

8. Fault Indicator

The combined SPD is supervised by an integrated thermodynamic control device for automatic disconnection of the varistors in case of an overload. This is externally indicated by a lamp. The protection of the subsequent installation is not fully provided by the spark gaps. The DEHNventil must be replaced to restore full protection.

9. Functional Test

The function of the supervisory device can be tested with the test button "T": lamp lights on pressing the button "T" when the combined SPD is in order.

Note:

The lamp is electrically connected between terminals L₁ and earth (⚡) and can only light at a voltage between these terminals of at least 100 V (VGA 280/2) or 200 V (VGA 280/4).

10. Installation Instructions

Application of fault indicator/remote indicator

The disconnection of the varistors, i.e. limited protection of the subsequent electrical installation (see Section 8), can also be remotely indicated via the terminals a and b at the SPD (see "Technical Data").

On disconnection of the varistors by the supervisory device, an integrated floating changeover contact is activated between terminals a and b (see Technical Data).

The following conditions must be complied with for connecting the remote indicator:

- The terminals must be connected as shown in Fig. 3. Additional surge protective devices (e.g. BLITZDUCTOR CT or overvoltage arrester DEHNgard in conformity with the system data of the remote control system) are to be installed at both ends of the remote control line.

This measure is necessary to provide adequate protection against overvoltage for the remote control line and the equipment connected to it.

- The remote control line must have a screening braid and the minimum cross-sectional area.
- The screening braid is to be earthed at least every 20 m (as distance "L" in Fig. 3). The requirements of DIN VDE 0800 must be complied with.

Table 1

Upstream fuse Si 1	Separate backup fuse Si 2	Conductor cross-sectional area S ₂	Conductor cross-sectional area S ₃
≤ 100 A gL/gG	—	as S ₁	see Section 6 minimum 10 mm ² Cu maximum 25 mm ² Cu
> 100 A gL/gG	100 A gL/gG	35 mm ² Cu	

Fig. 2

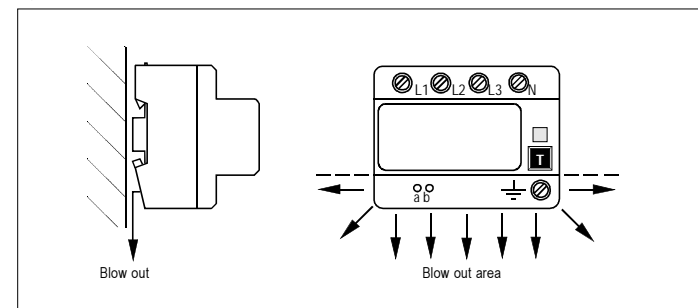


Fig. 3

