

## Surge arresters SurgeController V 20-C, V 20-C/...+NPE



### Operation and fields of application

SurgeControllers V 20-C are surge arresters of requirement class C to DIN VDE 0675, Part 6 (Draft 02.89) A1, A2. These devices protect low-voltage consumer installations from voltage surges of all kinds. They are available in single-pole to four-pole versions.

Type V 20-C/3+NPE (requirement class C) is a special surge arrester for TN-C-S, TN-S, TT and IT systems. This device was developed for the new requirements of DIN VDE 0100, Part 534/A1, to allow simple, safe installation of the devices.

The voltage-dependent active part of the V 20-C is a high-performance zinc oxide varistor with a highly non-linear characteristic. Among the advantages of this component are an extremely short response time, a low protection level and a high current diversion capacity, combined with long life. A further feature of

these devices is that no follow-up current can be registered after the surge has decayed.

If the surge arrester is damaged by overloading, the integral isolating device breaks the connection to the mains. This is signalled by a red fault indicator.

### Mounting

The V 20-C can easily be installed in any distribution box or switchgear cabinet by snap-fitting to any commercial 35 mm top-hat rail. The poles of multi-pole arresters are connected together by an earthing bridge at the factory, so that there is only one earth (PE) connection to make on site. The NPE arrester element type C 25-B+C/NPE and the matching base are designed so that they cannot be plugged in the wrong way round (coding). This ensures correct installation of the upper parts of the arresters.

## Ordering data

Type	Description	Order no.	Type	Description	Order no.
<b>V 20-C/1</b>	1-pole complete <sup>1)</sup> ; 280 V	<b>5099 42 0</b>	<b>V 20-C/1-385</b>	1-pole complete <sup>1)</sup> ; 385 V	<b>5099 16 1</b>
<b>V 20-C/2</b>	2-pole complete <sup>1)</sup> ; 280 V	<b>5099 43 9</b>	<b>V 20-C/2-385</b>	2-pole complete <sup>1)</sup> ; 385 V	<b>5099 13 7</b>
<b>V 20-C/3</b>	3-pole complete <sup>1)</sup> ; 280 V, TN-C	<b>5099 44 7</b>	<b>V 20-C/3-385</b>	3-pole complete <sup>1)</sup> ; 385 V	<b>5099 19 6</b>
<b>V 20-C/4</b>	4-pole complete <sup>1)</sup> ; 280 V, TN-S	<b>5099 45 5</b>	<b>V 20-C/4-385</b>	4-pole complete <sup>1)</sup> ; 385 V	<b>5099 14 5</b>
<b>V 20-C/1+NPE</b>	1+1-pole complete <sup>1)</sup> ; 280, V	<b>5095 61 1</b>	<b>V 20-C/1+NPE-385</b>	1+1-pole complete <sup>1)</sup> ; 385 V	<b>5095 68 9</b>
<b>V 20-C/3+NPE</b>	3+1-pole complete <sup>1)</sup> ; 280 V, TT+IT	<b>5095 64 6</b>	<b>V 20-C/3+NPE-385</b>	3+1-pole complete <sup>1)</sup> ; 385 V	<b>5095 70 0</b>
<b>V 20-C/0- 75</b>	Upper part; 75 V version	<b>5099 57 9</b>	<b>V 20-C/U-1</b>	1-pole base <sup>2)</sup>	<b>5099 63 3</b>
<b>V 20-C/0-150</b>	Upper part; 150 V version	<b>5096 70 7</b>	<b>V 20-C/U-2</b>	2-pole base <sup>2)</sup>	<b>5099 64 1</b>
<b>V 20-C/0-280</b>	Upper part; 280 V version	<b>5099 60 9</b>	<b>V 20-C/U-3</b>	3-pole base <sup>2)</sup>	<b>5099 66 8</b>
<b>V 20-C/0-335</b>	Upper part; 335 V version	<b>5099 85 0</b>	<b>V 20-C/U-4</b>	4-pole base <sup>2)</sup>	<b>5099 67 6</b>
<b>V 20-C/0-385</b>	Upper part; 385 V version	<b>5099 59 5</b>	<b>V 20-C/U1+NPE</b>	1+1 pole base <sup>2)</sup>	<b>5095 86 7</b>
<b>V 20-C/0-440</b>	Upper part; 440 V version	<b>5099 70 6</b>	<b>V 20-C/U3+NPE</b>	3+1 pole base <sup>2)</sup>	<b>5095 87 5</b>
<b>V 20-C/0-550</b>	Upper part; 550 V version	<b>5099 61 7</b>			
<b>C 25-B+C/NPE</b>	Upper part NPE spark gap	<b>5095 60 3</b>			
<b>V 20-C/3-G</b>	3-pole V 20-C arrester in insulating material housing (IP 65); 280 V version	<b>5099 49 8</b>			
<b>V 20-C/4-G</b>	4-pole V 20-C arrester in insulating material housing (IP 65); 280 V version	<b>5099 52 8</b>			

1) Complete = upper part and base  
2) Suitable for V 25-B+C and V 20-C

The V 20-C/... is also available on request in a 75 V, 150 V, 335 V and a 550 V version.

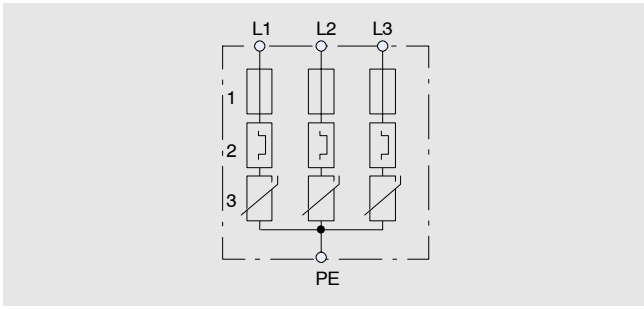
Features at a glance V 20-C	Advantages in use
Metal-oxide varistor	▶ Arresters still work after frequent operation
Plug-in upper part	▶ An arrester module can be changed with the mains voltage on
Pre-wired arrester blocks, 1-4-pole blocks	▶ Simple installation via the marked terminals
Thermal isolating device with optical indication	▶ Permanent check of arrester serviceability
Arrester with NPE spark gap in one module	▶ Certainty in TN-S, TT and IT systems that no voltage can reach the protective earth (PE) conductor
C 25-B+C/NPE with protection against reversed insertion (coding)	▶ Simple, professional installation of the arrester modules

## Technical data

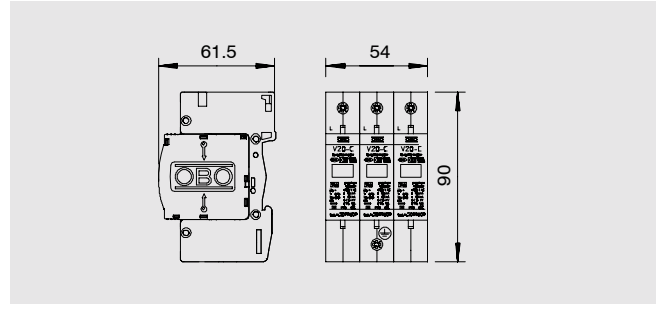
SurgeController surge arrester		V 20-C						
Description		75	150	280	335	385	440	550
Maximum continuous operating voltage (max. permitted operating voltage)	$U_{c AC}$ $U_{c DC}$	75 V~ 100 V-	150 V~ 200 V-	280 V~ 350 V-	335 V~ 420 V-	385 V~ 505 V-	440 V~ 585 V-	550 V~ 745 V-
LPZ		1 → 2						
Requirement class to VDE 0675, Part 6 (Draft 11.89) A1, A2 to IEC 61643-1		C class II						
Tested to		IEC 61643-1, prEN 61643-1, E DIN VDE 0675-6:1989-11 and Part 6/A1						
Nominal discharge current of the upper part	$I_n (8/20)$	15 kA	20 kA					15 kA
Max. discharge current per block	$I_{max} (8/20)$ SurgeController V 20-C/1... SurgeController V 20-C/2... SurgeController V 20-C/3... SurgeController V 20-C/4...	40 kA 75 kA 110 kA 150 kA						
Maximum discharge current of the upper part	$I_{max} (8/20)$	40 kA						
Voltage protection level	at 1 kA (8/20) $U_p$ at 5 kA (8/20) $U_p$ at $I_n U_p$	≤ 300 V ≤ 350 V ≤ 400 V	≤ 500 V ≤ 650 V ≤ 700 V	≤ 900 V ≤ 1.1 kV ≤ 1.4 kV	≤ 1.0 kV ≤ 1.3 kV ≤ 1.6 kV	≤ 1.2 kV ≤ 1.5 kV ≤ 1.8 kV	≤ 1.5 kV ≤ 1.8 kV ≤ 2.2 kV	≤ 1.7 kV ≤ 2.1 kV ≤ 2.5 kV
Response time	$t_A$	<25 ns						
Short-circuit withstand strength 25 kA with max. upstream fuse		125 A gL/gG						
Connection cross-section		2.5-35 mm <sup>2</sup> (single and multi-stranded); 2.5-25 mm <sup>2</sup> (fine-stranded with core end sleeves)						
Mounting		Snap-fitting on 35 mm top-hat rail to DIN EN 50 022						
IP Code		IP 20						
Temperature range	$\vartheta$	-40 °C to +80 °C						

Spark gap CombiController NPE		C 25-B+C/NPE	
Maximum continuous operating voltage	$U_c$	255 V /50-60 Hz	
Insulation resistance at 100 V	$R_{ins}$	> 10 GΩ	
Impulse current	$I_{imp}$	25 kA	
Charge	Q	12.5 As	
Specific energy	W/R	160 kJ/Ω	
Nominal discharge current	$I_n (8/20)$	50 kA	
Voltage protection level		≤ 1.2 kV	
Response time	$t_A$	≤ 100 ns	
Follow current at $U_c$	$I_f$	100 A <sub>rms</sub>	
Temperature range	$\vartheta$	-40 °C to +80 °C	

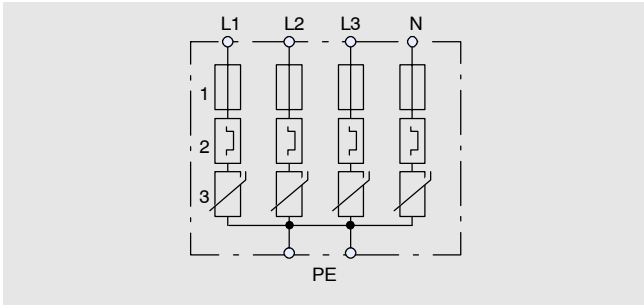
Subject to technical alterations



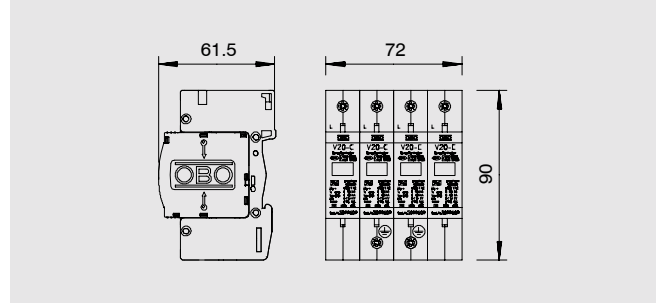
Block diagram of V 20-C/3



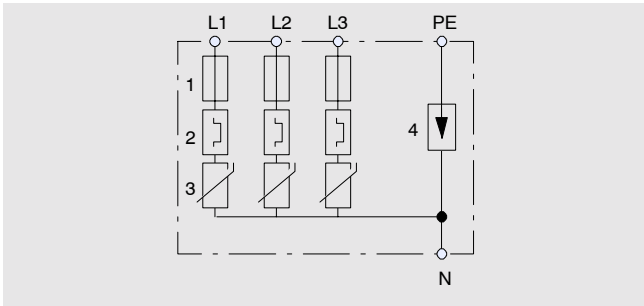
Dimension drawing



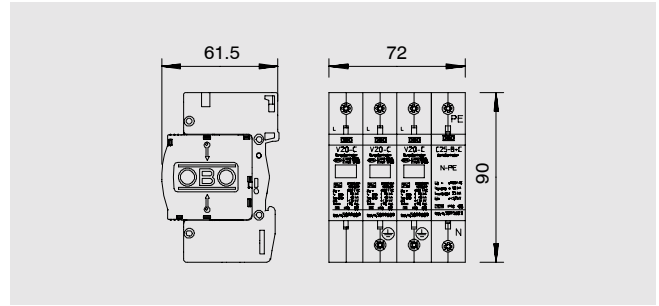
Block diagram of V 20-C/4



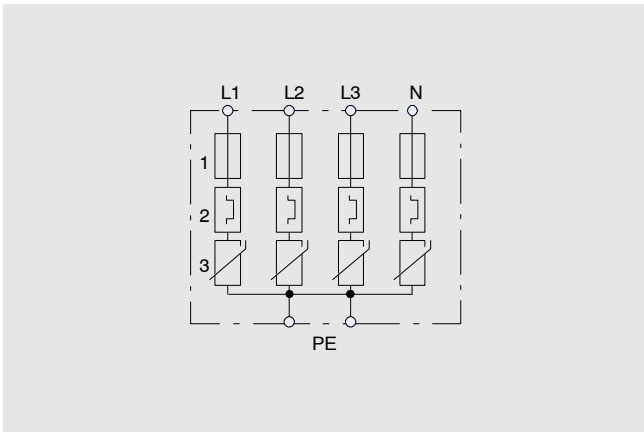
Dimension drawing



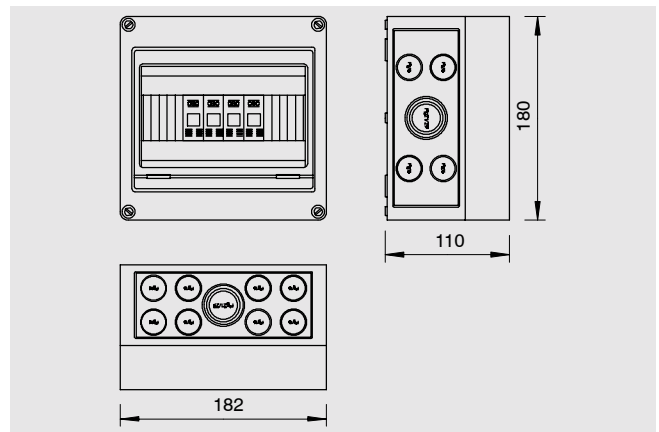
Block diagram of V 20-C/3+NPE



Dimension drawing



Block diagram of V 20-C/4-G



Dimension drawing

Key

- 1) Dynamic isolating device
- 2) Thermal isolating device
- 3) Metal-oxide varistor
- 4) NPE sum current spark gap