

Installation Instructions for surge arresters



SPB */10 PP **



SPB */AlFe**



SPB */S*



SPB */DT**

SPB */10 PP **

SPB */10 DT **

SPB */10 AlFe **

SPB */10 S **

note.:

PP - on flat busbars

DT - into distribution transformers

AlFe - on bare overhead conductors

S - on insulated overhead conductors

1. USING A SURGE ARRESTER

SPB surge arresters with a nominal discharge current of 10 kA and with a maximum continuous operating voltage of $U_c = 280, 440, 500, 660$ or 900 V are designed to protect low voltage of energy equipment in AC networks with a frequency of 48 to 62 Hz against the destructive effects of lightning and switching

overvoltage.

2. INSTALLING THE SURGE ARRESTERS

After unpacking it is necessary to check whether the technical data on the type label of the arrester corresponds to the project specification.

Installation should be carried out with voltage off or during the normal functioning of the network in accordance with "Live Working" rules.

WARNING!

It is necessary to observe local regulations in every country where the surge arresters are installed.

An arrester with selected accessories should be installed as close to the device protected as possible.

An arrester should be installed in a vertical position. If the project requires a different position (from vertical), it is not permitted to exceed a deviation of 45° from a vertical position.

3. MAINTENANCE

The SPB surge arresters do not require any special maintenance. It is recommended to check the surge arresters visually after heavy thunderstorms with atmospheric discharges. The best way of visual inspection is to use a telescope. Damaged surge arresters with their internal disconnector are indicated by the lifting-off of the red signalling cap, and should be replaced by new ones.

The purpose of using SPB */10 surge arresters in LV networks is:

- to limit atmospheric overvoltage at transfer points of distribution-system installations pursuant to ČSN 33 2000-4-443 ed.3:2016
- to reduce failures of cable lines and AES

- lines to an acceptable level
- to protect LV distribution installations against destruction

Rules for rating the surge arresters in LV networks

In a certain application, a suitable SPB surge arrester is chosen based on the maximum operating voltage U_c .

Rules for positioning and connecting the surge arresters

In TN-C networks, the surge arresters shall be connected between a phase conductor and a PEN conductor at the point of its earthing.

In the event that the surge arresters are positioned at a place where there is no earthed PEN conductor, the earthing shall be carried out through a separate earth electrode. A 1-metre earthing rod or another equivalent earth electrode is considered to be sufficient. The magnitude of resistance of the earthing of the surge arresters is not decisive for their functioning. When designing and carrying out the earthing, the procedure as per PNE 33 0000-1 shall be followed.

In absolutely exceptional and justified cases, surge arresters connected between a phase conductor and PEN conductor are not to be earthed.

The surge arresters in TT networks should be connected between line conductors and an earthing wire.

Positioning the surge arresters in a LV network - Overhead lines

In the case of overhead lines, regardless of whether designed with insulated or bare conductors, the surge arresters shall be positioned:

- On a transformer station (in LV leads or in an LV switchgear and controlgear assembly) or

- on the first support of the line.
- In overhead lines, spaced at 500-metre intervals on condition that no support of the network may be more than 250 metres away from the surge arresters.
- On transitions from overhead lines into an underground cable line (it does not apply to connections shorter than 250 m).

Furthermore, it is recommended that the surge arresters should be installed at places where lightning frequently strikes.

The Declaration of Conformity of the product is available for download on our website www.acervoltage.com

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SPB - Surge Arresters

Description and mounting

TECHNICAL DESCRIPTION

The SPB */10 surge arrester is in accordance with the requirements of ČSN EN 61643-11, August 2007, Class II: "Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems".

Predominantly capacitive current in the order of hundreds of μA passes through the arrester at continuous operating voltage. The active component of the current is negligible. When the terminal voltage of the arrester increases, the arrester changes smoothly to an on-state and limits all types of overvoltage. The response time is very small (in the order of 100 ns) so the surge arrester reliably limits even steep surges of atmospheric overvoltage. Its protective level is independent of the steepness of an overvoltage surge.

The surge arrester consists of a plastic housing with connecting leads, a separately enclosed watertight and electrically isolated varistor in silicon caoutchouk with a thermal disconnecter inside the housing and with a signalling cap in the bottom part of the housing. The plastic of the housing is resistant to UV radiation, weather effects and is flame-retardant – Class V0. The connecting screws and terminals are made of stainless steel. The overvoltage limiter is fitted with a small earthing cable with an end – green-yellow or black in colour as required by the customer, with a length of 0.65 m, 0.8 m or 1.0 m.

A built-in disconnecter is used to disconnect the limiter from the mains in the event of its overloading, which may occur owing to the limit parameters of the varistor being exceeded (absorption of greater energy, e.g. due to a long-term increase in the operating voltage above UC, or due to great voltage induced by a lightning strike in the immediate

vicinity). Disconnection is signalled in such a way that the red cap of the surge arrester in the bottom part of the housing is lifted off. It requires no maintenance, only checking the conduction – destruction of the limiter due to great overloading is indicated by the lifting-off of the red cap.

In the event of varistor breakdown (e.g. when the maximum current is exceeded owing to a steep pulse), the enclosed varistor may be carried up from the housing by short-circuit current without the outer shell of the limiter being damaged or destroyed. This will ensure that the surge arrester is disconnected from the mains without potential damage to surrounding objects (except the bottom part) or a flashover between busbars in the switchgear. The disconnection is again indicated by the lifting off of the cap.

When an insulated terminal is used, all the live parts remain sufficiently insulated and protected against accidental contact.

USE, MOUNTING AND MAINTENANCE

The SPB */10 surge arrester protects – in low-voltage overhead power distribution systems – electrical equipment, instruments, switchgear of distribution transformers and reduces the risk of damage to in-house networks and their equipment by atmospheric and switching overvoltage.

It is used in places where direct contact needs to be prevented e.g. by a position or barrier. It is mounted on bare lines (conductor) by means of a stainless clip; the small earthing cables from all three phases are joined into a common terminal of the earth wire. It is mounted on the line in a vertical position with a permissible deviation of $\pm 30^\circ$.

Considering the fact that the arrester is not destroyed in the event of its excessive overloading above guaranteed limits and subsequent thermal breakdown, this arrester can be mounted into switchboards directly on the buses of the power circuit-breaker. An SPB can be connected to all types of overhead conductor lines, including insulated lines to where it is supplied with an insulated piercing

terminal. The connection with an insulated terminal makes it possible to connect a branch line to the protected structure and to mount and dismount the live arrester without the risk of contact with live parts under voltage. The SPBs are supplied in three basic modifications according to the method of mounting:

SPB */10 PP ** - on flat busbars in switchboards with a serrated lock washer and nut

SPB */10 DT ** - version with insulated FeZn holder intended for installation in distribution transformers.

SPB */10 ALFE ** - on a bare AlFe conductor with a stainless clip and nut

SPB */10 S ** - on an insulated line with an insulated terminal

GENERAL PRINCIPLES FOR POSITIONING AND CONNECTING THE ARRESTERS IN LV NETWORKS

The surge arresters in TN-C networks shall be connected between a phase conductor and a PEN conductor (in star) at the place of its earthing.

In the event that the surge arresters are positioned at a place where there is no earthed PEN conductor, the earthing shall be carried out through a separate earth electrode. A 1-metre earthing rod or another equivalent earth electrode is considered to be sufficient. The magnitude of resistance of the earthing of the surge arresters is not decisive for their functioning. When designing and earthing, the procedure as per PNE 33 0000-1 shall be followed.

In absolutely exceptional and justified cases, surge arresters connected between a phase conductor and PEN conductor are not to be earthed.

The surge arresters in TT networks shall be connected between line conductors and the main protective PE conductor, from which discharge current is diverted to the ground via a test clip, earthing wire and earth electrode.

TRANSPORT, HANDLING AND STORAGE REQUIREMENTS

The arresters shall be packed individually in a polyethylene bag and transported in non-returnable cardboard boxes. Other packaging is possible by agreement with the customer.

The arresters shall be stored in cartons in indoor closed stores at a temperature from $- 30^\circ\text{C}$ to $+ 30^\circ\text{C}$. Foam or water may be used as extinguishing agents.

During transport it is necessary to handle the product with care so as not to damage the carton packaging.

RECYCLABILITY AND EFFECT ON THE ENVIRONMENT

SPB XX/10 products meet RoHS directives.

There is no risk of a negative influence on the environment during the transport, handling, storage and use of an SPB arrester.

1. It fulfils the requirements imposed by Act No. 185/2001 Coll., on Waste;
2. It fulfils the requirements of EU Directive 2002/95/EC and EU Directive 2002/96/EC;
3. It supplies products including accessories that do not contain toluene and trichlorobenzene.

The disposal of damaged products shall be carried out by taking them to a waste dump. The waste catalogue number is 07 02 99.



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