INSTALLATION AND OPERATING MANUAL FOR PROXAR-IIW DC TYPE SURGE ARRESTERS

PROTEKTEL Sp. o.o.
PIŁSUDSKIEGO 92 Str.
06-300 PRZASNYSZ
Tel./Fax. (0)29 752 57 84
www.protektel.pl
protektel@protektel.pl

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1. GENERAL INFORMATION

Dear customer, thank you for choosing our product - the surge arrester type PROXAR-IIW DC. Please read the operating manual before starting the installation. The manufacturer assumes no responsibility for incorrect installation of the product.

This manual does not cover all contingencies relating to the installation and operation manual for the arresters. If problems arise that are not covered in this manual, please contact the manufacturer. The described type of surge arresters are designed to be installed by qualified personnel with the required practice in the field of safety devices of high and medium voltage. These guidelines are drafted for such personnel and are not a substitute for proper training and experience in the safe operation of this type of devices.

WARNING

Any work on the surge arresters should be carried out on disconnected and grounded device. Follow all the rules and principles of international and national safety and health at work.

2. DESCRIPTION OF THE PRODUCT

Surge arresters type PROXAR-IIW DC are single-phase devices, designed to work indoors. The role of surge arresters is protection against over voltage by bringing it to the ground and reducing it. This allows other devices connected to the network are safely protected from the effects of each type of overvoltage.

Generally, arresters are constructed from a stack of variable resistance elements – i.e. zinc oxide (ZnO) resistors, placed in a durable mechanical structure made of an aramid composite terminated with electrodes and completely overmolded with an electrically insulating material, i.e. silicone. Surge arrester PROXAR-IIW DC can be supplied with the following equipment:

Surge arrester PROXAR-IIW DC can be supplied with the following equipment:
- Line terminal
- Ground terminal

3. ELECTRICAL DETAILS

Line discharge class according to EN 50526-1: 2012	DC-A
Line discharge class according to IEC 60099-4: 2009	2
System voltage (Un_{DC})	0.6 – 3 kV
Continuous operating voltage (Uc_{DC})	1 – 4.7 kV
Nominal discharge current In 8/20 μs	10 kA
High current impulse Ihc 4/10 μs	100 kA
Long duration current impulse, 2000 μs	600 A
Energy absorption capability, 2 impulses	5.5 kJ/kV Uc
Short circuit rating	31.5 kA/0.2s
Service conditions:	
- ambient temperature	-40 °C do +40 °C*
- altitude up to	1000 m*
Mechanical strength:	
- SLL specified long-term load	350 Nm
- SSL specified short-term load	560 Nm
- torque	100 Nm
- tensile	1000 N

*) For higher values please contact with manufacturer.

Table 1. **ELECTRICAL DATA**

Type PROXAR IIW DC	Max. continuous operating voltage (DC) Uc	Residual voltage in [kV] peak at a specified impulse current							
		Wave 1/… µs	Wave 8/20 µs				Wave 30/60 µs		
		10kA	2.5kA	5kA	10kA	20kA	125A	250A	500A
	kV	kV	kV	kV	kV	kV	kV	kV	kV
1.0	1.0	3,2	2,3	2,5	2,7	2,9	2,0	2,0	2,1
1.2	1.2	3,8	2,7	2,9	3,2	3,5	2,4	2,4	2,5
1,5	1,5	4,8	3,4	3,7	4,0	4,3	2,9	3,0	3,1
1,8	1,8	5,8	4,1	4,4	4,8	5,2	3,5	3,6	3,7
2.0	2.0	6,4	4,5	4,9	5,3	5,8	3,9	4,0	4,1
2.2	2.2	7,0	5,0	5,4	5,8	6,4	4,3	4,4	4,6
2.5	2.5	8,0	5,6	6,1	6,6	7,2	4,9	5,0	5,2
3.0	3.0	9,6	6,8	7,4	8,0	8,7	5,9	6,0	6,2
3.2	3.2	10,2	7,2	7,8	8,5	9,2	6,3	6,4	6,6
3.6	3.6	11,5	8,1	8,8	9,5	10,4	7,1	7,2	7,5
4.2	4.2	13,4	9,5	10,3	11,1	12,1	8,2	8,4	8,7
4.5	4.5	14,4	10,1	11,0	11,9	13,0	8,8	9,0	9,3
4.7	4.7	15,0	10,6	11,5	12,5	13,6	9,2	9,4	9,7

Attention: There is possibility to make surge arresters PROXAR-IIW DC in different continuous operating voltage.

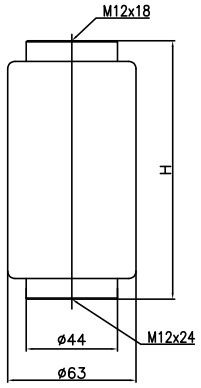

Fig.1

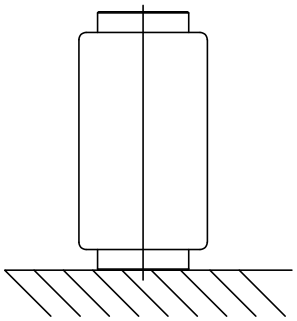
Fig.2

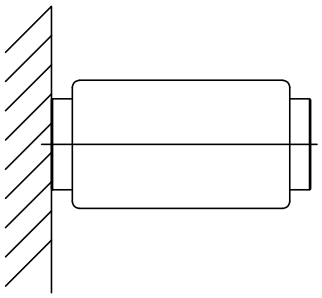
Fig.3

The above drawings show the configuration of the surge arresters in operation. Drawings No 2 presents vertical system of assembling. Drawings No 3 presents horizontal system of assembling. Below the figures are presenting different options line and earth accessories available for use in surge arrester type PROXAR-IIW DC For horizontal working configuration of surge arresters is this same option like for vertical working.

Table 2. **TECHNICAL DATA FOR HOUSING**

Type PROXAR IIW DC	External insulation		Minimal distances	H	Creepage distance	Flash-over distance	Housing number	Weight
	50 Hz (60s)	1.2/50 µs dry	Distance between arrester and the nearest return path structure „a”					
kV	kV	kV	mm	mm	mm	mm	No	kg
1.0	29	63	38	125	120	120	02	0.90
1.2			40					0.90
1,5			46					0.90
1,8			48					0.90
2.0			48					0.95
2.2			52					0.95
2.5			55					0.95
3.0			61					0.95
3.2			63					0.95
3.6			68					0.95
4.2			77					1.00
4.5			78					1.00
4.7			83					1.00

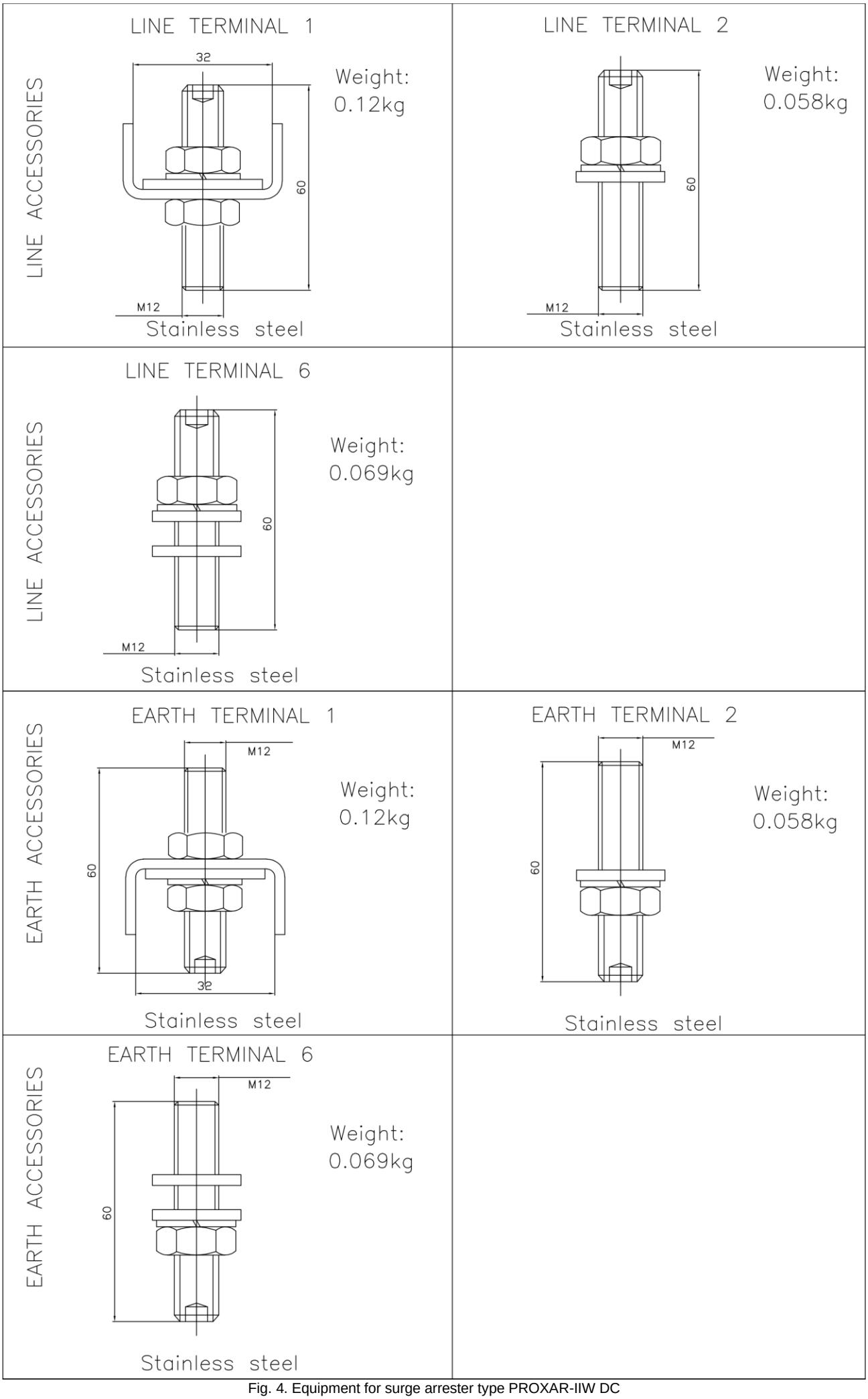

Fig. 4. Equipment for surge arrester type PROXAR-IIW DC

4. TRANSPORTATION, RECEIVING AND STORAGE

Surge arresters are supplied in cardboard packages or packed in cartons on a pallet. Terminals or other accessories are packed separately. Equipment is shown in Figure "line and earth accessories", which is always attached to each batch of surge arresters.
Upon receipt, check number and completeness arresters. Must be stored in a dry and ventilated place, free from corrosive agents. Please observe the instructions on the cartons. Cartons can be bunk on top of another to a maximum of 3 layers.

5. INSTALATION

If damage was found during unloading or unpacking please do not hesitate to contact with the manufacturer.
Before final installation, check that the product is correct (type designation, Ur - rated voltage, Uc - continuous operating voltage, type of voltage system DC – direct current, In – nominal discharge current, etc.). If in doubt about the appropriate model, please consult with the manufacturer's technical department (+48 29 752 57 84).
The method of assembling and tightening torques of screw connections are shown in Figure "Figure mounting surge arresters type PROXAR-IIW DC", which is always attached to each batch of surge arresters. For screw connections used to be typical assembly tools in the form of keys and sockets using the torque wrench.
Tightening torques of screw connections:
M12 – 25/50 Nm lower value is for grub screw with hexagonal socket.

Table 2 and Figure No 5 show the recommended minimum distances that should be maintained during installation of arresters. These are the minimum distance between the surge arrester and nearest return path structure.
In the upper part of the surge arrester is located line terminal (please see line accessories), to connect the linear conductor Cu or Al. Arrester can be fitted with earth terminal (please see earth accessories). In the case of return path wire, the minimum cross-sections are the same as in the case of linear conductors.

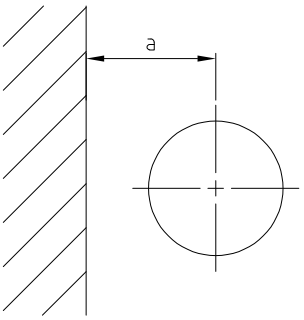

Fig.5 Minimal distances for surge arresters

6. ELECTRICAL CONNECTIONS

It is recommended to install arresters as close as possible in relation to the protected equipment, moreover, observe the rules for the shortest possible cable connections and ground connectors for better protection of surge arresters. Connections not need be insulated unless the infrastructure requires the use of insulation. See Table 2, where they are given the minimum distance surge arrester from the return path structure.
First of all, make sure to perform a reliable return path connection/ and then connect the surge arrester to the line. It is required that all installation works were carried out in a non-voltage protected system. The minimum section of the line conductor should be: Cu – 25 mm^2; Al – 35 mm^2.
Surge arrester PROXAR–IIW DC is a “symmetrical” apparatus. According it, there is possibility that we can change pole’s “+” and “-“ to terminals without effecting the quality and reliability of surge arrester.

In the case when the arrester is installed under tension, must be strictly followed safety guidelines for this type of work.

NOTE: Improper installation will void the warranty on the product.

7. DISASSEMBLY

When dismantling the arrester, make sure that the voltage supplied to the arrester terminal has been effectively disconnected. The line terminal must be disconnected from the line cable first. It is required that all dismantling work is performed in a voltage-free state of the protected system. During dismantling, the same safety rules as when installing the arrester must be observed.

8. OPERATION

Surge arresters type PROXAR-IIW DC does not require any particular maintenance. Sufficient periodic inspection, under the inspection of other devices operating in the installation of arresters.
PROXAR surge arresters do not require cleaning of the external surface of the insulating housing during the entire period of operation. The insulating surface may appear dirty, but this does not affect the operation of the surge arrester. However, if the surge arrester were to be washed, then in addition to the usual precautions, the following should be taken into account:

- due to the soft structure of silicone insulation, do not use high-pressure water, which may damage the surface of the insulator
- use "soft" clean water without added detergents

9. IDENTIFICATION OF THE RATING PLATE

The nameplate is shown below in Figure 6. Description of the symbols (description made by the micro point method):

1. Year of production
2. Serial number
3. The manufacturer's name
4. Product name
5. Basic rated parameters
6. Rated voltage Ur and the continuous operating voltage Uc in [kV]

A – nominal voltage for example **1.2**
B – continuous operating voltage for example **1.2**
C – intended for DC system **DC**

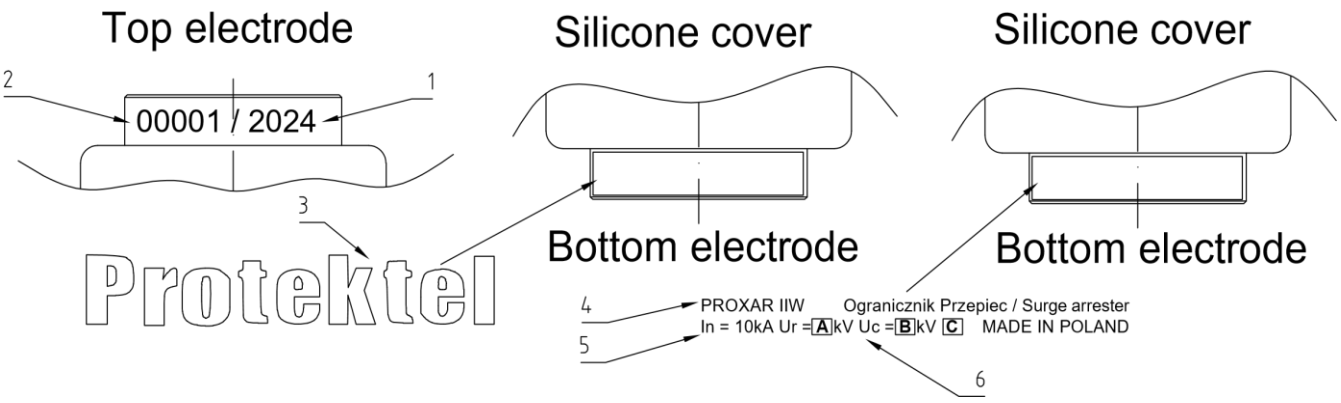

Fig.6. Nameplate for surge arrester type PROXAR-IIW DC

10. DISPOSAL OF WASTE PRODUCT - SCRAPPING

Surge arrester type PROXAR-IIW DC are environmentally friendly, but must be disposed of in accordance with local requirements in an environmentally friendly manner. Materials as far as possible should be recycled.
List of materials included in the arrester:

1. Silicone rubber
2. Aluminum
3. Ceramics - varistors based on zinc oxide
4. Aramide composite
5. Steel

The materials used for the production of the surge arresters does not pose a threat to human life and health.

11. AFTER-SALES SERVICE

In case the product is not delivered in good condition or would cause problems with the installation or during operation, please contact:

Protektel sp. z o.o.
Piłsudskiego 92 Str.
06-300 Przasnysz
Tel.: +48 29 752 57 84
Fax.: +48 29 752 57 84
www.protektel.pl
protektel@protektel.pl
POLAND

Proxar

Check out our MV DC surge arresters

ATTENTION
Note: The manufacturer reserves the right to change technical data or designee without prior notice.
PROXAR® is a registered trademark of the latest family of surge arresters made by Protektel