

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



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1. GENERAL INFORMATION

Dear customer, thank you for choosing our product - the surge arrester type PROXAR-IIW AC. 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 occupational health and safety.

2. DESCRIPTION OF THE PRODUCT

Surge arresters type PROXAR-IIW AC are single-phase devices, designed to work both outdoors and 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-IIIN AC can be supplied with the following equipment:

Surge arrester PROXAR-IIW AC can be supplied with the following equipment:

- Line terminal
- Earth terminal

3. ELECTRICAL DETAILS

Arrester classification according to EN 60099-4:2014

Line discharge class according to IEC 60099-4:2009

System voltage (Us)

Rated voltage (Ur)

Nominal discharge current I_n 8/20 μ s

High current impulse I_{hc} 4/10 μ s

Rated repetitive charge transfer rating Qrs

Rated thermal Energy Wth

Single impulse energy absorption capability (impulse duration 2 ms – 4 ms)

Long duration current impulse resistance 2 ms (based on Qrs)

Short circuit rating

Service conditions:

- ambient temperature
- altitude up to
- frequency

Mechanical data:

- SLL specified long-term load
- SSL specified short-term load
- torque
- vertical load

*) for higher parameters please contact with manufacturer

SL (Station Low)

2

1 –52 kV

1.3 – 51 kV

10 kA

100 kA

1,6 C

7,0 kJ/kV Ur

3,5 kJ/kV Ur

600 A

31.5 kA/0.2s

-45 °C do +60 °C*

1000 m*

48-62 Hz

350 Nm

560 Nm

100 Nm

1000 N

Table 1. ELECTRICAL DATA

Type PROXAR IIW AC	Rated voltage Ur kV	Max. continuous operating voltage Uc kV	Residual voltage in [kV] peak at a specified impulse current							
			Wave 1/... μ s	Wave 8/20 μ s				Wave 30/60 μ s		
			10kA kV	2.5kA kV	5kA kV	10kA kV	20kA kV	0.25kA kV	0.5kA kV	1kA kV
1.3	1.3	1.0	3.9	3.0	3.1	3.4	3.8	2.6	2.7	2.8
1.7	1.7	1.3	4.7	3.6	3.8	4.1	4.6	3.1	3.2	3.4
2.0	2.0	1.6	6.8	5.2	5.4	5.9	6.5	4.5	4.6	4.8
2.3	2.3	1.8	7.4	5.6	5.9	6.4	7.1	4.9	5.0	5.2
2.5	2.5	2.0	7.5	5.7	5.9	6.5	7.2	4.9	5.1	5.3
3.1	3.1	2.5	9.0	6.9	7.1	7.8	8.7	5.9	6.1	6.4
3.4	3.4	2.75	9.9	7.6	7.9	8.6	9.5	6.5	6.7	7.1
3.8	3.8	3.0	12.1	9.2	9.6	10.5	11.7	8.0	8.2	8.6
4.5	4.5	3.6	13.8	10.6	11.0	12.0	13.3	9.1	9.4	9.8
5.0	5.0	4.0	14.6	11.2	11.6	12.7	14.1	9.7	9.9	10.4
6.0	6.0	4.8	17.7	13.6	14.1	15.4	17.1	11.7	12.0	12.6
6.3	6.3	5.0	18.1	13.8	14.4	15.7	17.4	11.9	12.2	12.9
7.0	7.0	5.6	19.8	15.1	15.7	17.2	19.1	13.1	13.4	14.1
8.0	8.0	6.4	22.6	17.3	18.0	19.7	21.8	14.9	15.3	16.1
9.0	9.0	7.2	25.4	19.5	20.2	22.1	24.5	16.8	17.2	18.1
10.0	10.0	8.0	28.2	21.6	22.5	24.6	27.3	18.7	19.2	20.1
11.0	11.0	8.8	31.1	23.8	24.7	27.0	30.0	20.5	21.1	22.2
11.3	11.3	9.0	31.9	24.4	25.4	27.8	30.8	21.1	21.7	22.8
12.0	12.0	9.6	33.9	25.9	27.0	29.5	32.7	22.4	23.0	24.2
13.0	13.0	10.4	36.7	28.1	29.2	31.9	35.4	24.3	24.9	26.2
14.0	14.0	11.2	39.5	30.3	31.5	34.4	38.2	26.1	26.8	28.2
15.0	15.0	12.0	42.4	32.4	33.7	36.8	40.9	28.0	28.7	30.2
16.0	16.0	12.8	45.2	34.6	36.0	39.3	43.6	29.9	30.7	32.2
17.0	17.0	13.6	48.0	36.7	38.2	41.8	46.4	31.7	32.6	34.2
18.0	18.0	14.4	50.8	38.9	40.5	44.2	49.1	33.6	34.5	36.3
19.0	19.0	15.2	53.7	41.1	42.7	46.7	51.8	35.5	36.4	38.3
20.0	20.0	16.0	56.5	43.2	45.0	49.1	54.5	37.3	38.3	40.3
21.0	21.0	16.8	59.3	45.4	47.2	51.6	57.3	39.2	40.2	42.3
22.0	22.0	17.6	62.1	47.6	49.4	54.0	60.0	41.1	42.2	44.3
23.0	23.0	18.4	65.0	49.7	51.7	56.5	62.7	42.9	44.1	46.3
24.0	24.0	19.2	67.8	51.9	53.9	59.0	65.4	44.8	46.0	48.3
25.0	25.0	20.0	70.6	54.0	56.2	61.4	68.2	46.7	47.9	50.4
26.0	26.0	20.8	73.4	56.2	58.4	63.9	70.9	48.5	49.8	52.4
27.0	27.0	21.6	76.3	58.4	60.7	66.3	73.6	50.4	51.7	54.4
28.0	28.0	22.4	79.1	60.5	62.9	68.8	76.3	52.3	53.6	56.4
29.0	29.0	23.2	81.9	62.7	65.2	71.2	79.1	54.1	55.6	58.4
30.0	30.0	24.0	84.7	64.9	67.4	73.7	81.8	56.0	57.5	60.4
33.0	33.0	26.4	93.2	71.3	74.2	81.1	90.0	61.6	63.2	66.5
36.0	36.0	28.8	101.7	77.8	80.9	88.4	98.2	67.2	69.0	72.5
39.0	39.0	31.2	110.2	84.3	87.7	95.8	106.3	72.8	74.7	78.6
42.0	42.0	33.6	118.6	90.8	94.4	103.2	114.5	78.4	80.5	84.6
45.0	45.0	36.0	127.1	97.3	101.1	110.5	122.7	84.0	86.2	90.6
48.0	48.0	38.4	135.6	103.8	107.9	117.9	130.9	89.6	92.0	96.7
51.0	51.0	40.8	144.1	110.2	114.6	125.3	139.1	95.2	97.7	102.7

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

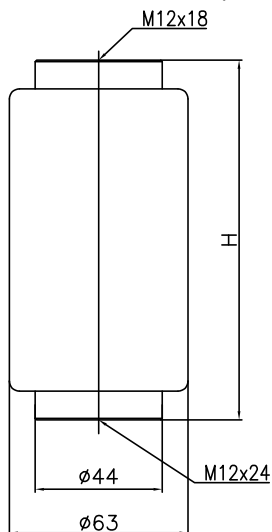


Fig. 1

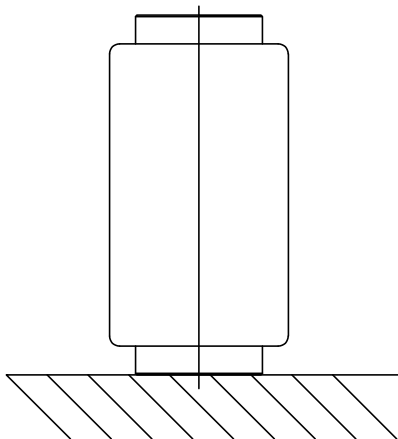


Fig. 2

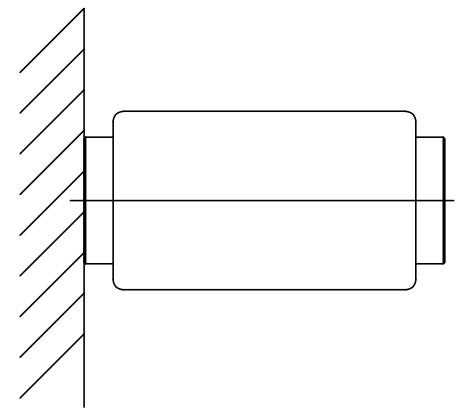


Fig. 3

The figure shows the installation of surge arresters type PROXAR-IIW AC. The drawings No 2 – 3 presents different system of assembling surge arresters. 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 AC. For horizontal working configuration of surge arresters is this same option like for vertical working.

Table 2. TECHNICAL DATA FOR HOUSING.

Us	Type PROXAR-IIW AC	Insulation withstand voltage		Minimal distances		H	Creepage distance	Flash-over distance	Housing number	Weight
		50 Hz (60s)	1.2/50 μ s dry	Distance between arresters „b”	Distance between arrester and the nearest grounded structure „a”					
kV	kV	kV	kV	mm	mm	mm	mm	mm	Nr	kg
	1.3	22	48	64	42	96	97	91	01	0.81
	1.7			66	44					0.82
	2.0			68	46					0.84
	2.3			70	48					0.86
	2.5			72	50					0.88
	3.1			74	52					0.90
	3.4			76	54					0.92
	3.8			98	76					0.94
	4.5			100	78					0.96
3.6	5.0	29	63	102	80	125	120	120	02	0.98
	6.0			109	87					1.00
	1.3			64	42					0.90
	1.7			66	44					0.92
	2.0			68	46					0.94
	2.3			70	48					0.96
	2.5			72	50					0.98
	3.1			74	52					1.00
	3.4			76	54					1.01
	3.8			98	76					1.02
3.6	4.5	31	69	100	78	137	132	132	03	1.03
	5.0			102	80					1.04
	6.0			109	87					1.05
	6.3			114	92					1.06
	7.0			124	102					1.10
	8.0			129	107					1.15
	9.0			134	112					1.20
	10.0			139	117					1.25
	11.0			141	119					1.30
	12.0			143	121					1.35
	7.0	36	79	124	102	155	150	150	04	1.25
	8.0			129	107					1.30
	9.0			134	112					1.35
	10.0			139	117					1.40
	11.0			141	119					1.65
	12.0			143	121					1.70
	13.0			145	123					1.75
	14.0			147	125					1.80
	15.0			149	127					1.85
	16.0	45	99	169	147	195	190	190	05	1.90
	17.0			174	152					2.00
	18.0			184	162					2.10
	19.0			189	167					2.20
	20.0			194	172					2.30
	21.0			199	177					2.40
	22.0			204	182					2.50
	16.0	55	121	169	147	240	235	235	06	1.90
	17.0			174	152					2.00
	18.0			184	162					2.10
	19.0			189	167					2.20
	20.0			194	172					2.30
	21.0			199	177					2.40
	22.0			204	182					2.50
	16.0	65	142	169	147	280	275	275	07	2.00
	17.0			174	152					2.10
	18.0			184	162					2.20
	19.0			189	167					2.30
	20.0			194	172					2.40
	21.0			199	177					2.50
	22.0			204	182					2.60
	23.0	80	175	210	188	345	340	340	08	2.75
	24.0			229	207					2.80
	25.0			239	217					2.85
	26.0			244	222					2.90
	27.0			249	227					3.00
	28.0			254	232					3.10
	29.0			259	237					3.20
	30.0			264	242					3.30
	33.0	89	195	309	287	386	381	381	09	3.45
	36.0			316	294					3.60
	39.0			334	312					4.50
	42.0			349	327					4.65
	45.0			360	338					4.80
	48.0			379	357					5.00
	51.0			394	372					5.15
40.5		126	276			546	541	541	11	

Note: It is possible to make a surge arrester in a different housing than the catalog version.

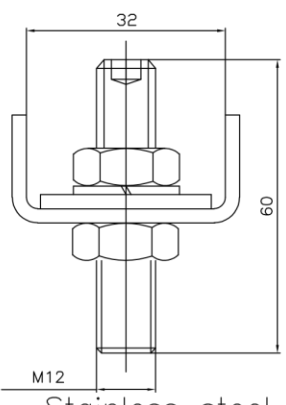
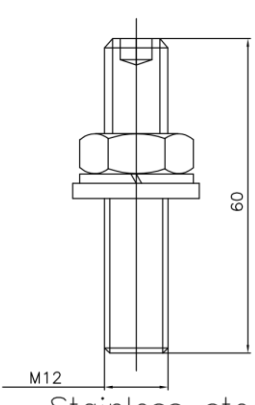
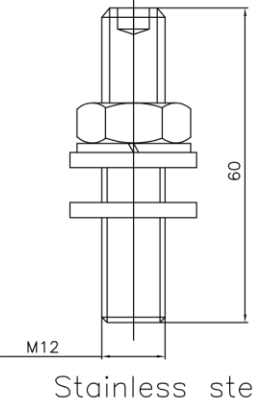
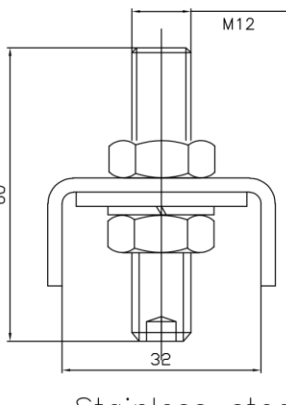
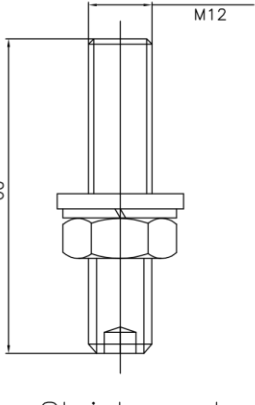
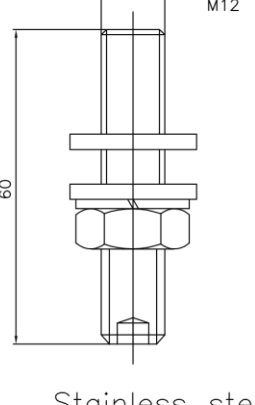
<p>LINE ACCESSORIES</p>	<p>LINE TERMINAL 1</p>  <p>Weight: 0.12kg</p> <p>M12</p> <p>Stainless steel</p>
<p>LINE ACCESSORIES</p>	<p>LINE TERMINAL 2</p>  <p>Weight: 0.058kg</p> <p>M12</p> <p>Stainless steel</p>
<p>EARTH ACCESSORIES</p>	<p>LINE TERMINAL 6</p>  <p>Weight: 0.069kg</p> <p>M12</p> <p>Stainless steel</p>
<p>EARTH ACCESSORIES</p>	<p>EARTH TERMINAL 1</p>  <p>Weight: 0.12kg</p> <p>M12</p> <p>Stainless steel</p>
<p>EARTH ACCESSORIES</p>	<p>EARTH TERMINAL 2</p>  <p>Weight: 0.058kg</p> <p>M12</p> <p>Stainless steel</p>
<p>EARTH ACCESSORIES</p>	<p>EARTH TERMINAL 6</p>  <p>Weight: 0.069kg</p> <p>M12</p> <p>Stainless steel</p>

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

4. TRANSPORT, 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 AC – alternate 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 AC", 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 axes of surge arrester and between the nearest grounded structure.

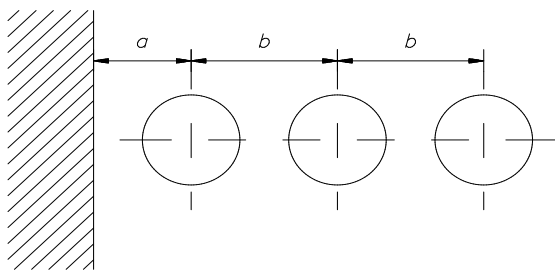


Fig.5 Minimal distances of surge arresters

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 ground wire, the minimum cross-sections are the same as in the case of linear conductors. After that, you can apply metal banding tape. It is recommended to use the cables in isolation. Metal banding tape must be properly labeled according to the applicable regulations at the installation site.

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 grounded structure and distance between surge arresters. First of all, make sure to perform a reliable grounding 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 – 35 mm²; Al – 50 mm².

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 AC 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 (The designation of the rated data of the surge arrester is made using the micro-dot print method on the bottom electrode):

1. Year of production
2. Serial number

3. The manufacturer's name
4. Product name
5. Basic rated parameters
6. Rated voltage U_r and the continuous operating voltage U_c in [kV]
A – nominal voltage for example 9.0
B – continuous operating voltage for example 7.2
C – intended for AC system AC

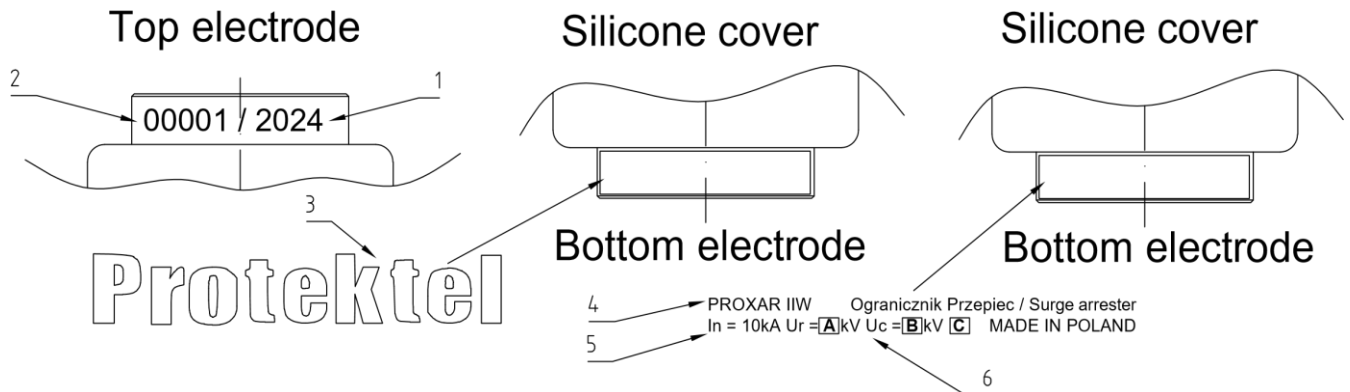


Fig.6. Nameplate for surge arrester type PROXAR-IIW AC

10. DISPOSAL OF WASTE PRODUCT - SCRAPPING

Surge arrester type PROXAR-IIW AC 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



Check out our [medium voltage 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.