



**MEDIUM VOLTAGE  
SURGE ARRESTER  
TYPE PROXAR-IN AC  
IN SILICONE HOUSING**

**CATALOGUE CARD**

**APPLICATION**

Surge arresters type **PROXAR-IN AC** in silicone housing are intended for protection AC power engineering networks against multiple lightning and switching overvoltages in MV substations, cables and transformers. This surge arrester is destined to all special technical requirements as well.

**OPERATING CONDITIONS**

Surge arresters adapted for outdoor and indoor installation, temperate and tropical climate up to 1000 m over the sea level. The possibility for install in any working positions. Working temperature -45 °C do +60 °C.

**ADVANTAGES**

- Low residual voltage
- High energy input capacity
- Stable U-I characteristics even after multiple strokes
- Housing resistant to rough handling
- Explosion and shatter – resistant design
- Pollution resistant and UV
- Ability to install in any position (vertically or horizontally)
- Maintenance free
- Low weight, easy transportation and storage

**ADDITIONAL EQUIPMENT**

The surge arrester can be equipped with additional line and ground accessories. At the customer's request and after agreeing with the manufacturer, any type of accessories can be supplied.

**ELECTRICAL DATA**

Arrester classification according to EN 60099-4: 2014	DH(Distribution High)
Line discharge class according to IEC 60099-4: 2009	1
System voltage (Us)	3.6 – 36 kV
Rated voltage (Ur)	1.2 – 48 kV
Nominal discharge current $I_n$ 8/20 $\mu$ s	10 kA
High current impulse $I_{hc}$ 4/10 $\mu$ s	100 kA
Rated repetitive charge transfer rating Qrs	0.4 C
Rated thermal Energy Qth	1.1 C
Long duration current impulse, 2000 $\mu$ s	325 A
Short circuit rating	31.5 kA/0.2s
Maximal level of partial discharges	$\leq 5$ pC

Service conditions:

- ambient temperature -45 °C do +60 °C\*
- altitude up to 1000 m\*
- frequency 48 – 62 Hz

Mechanical data:

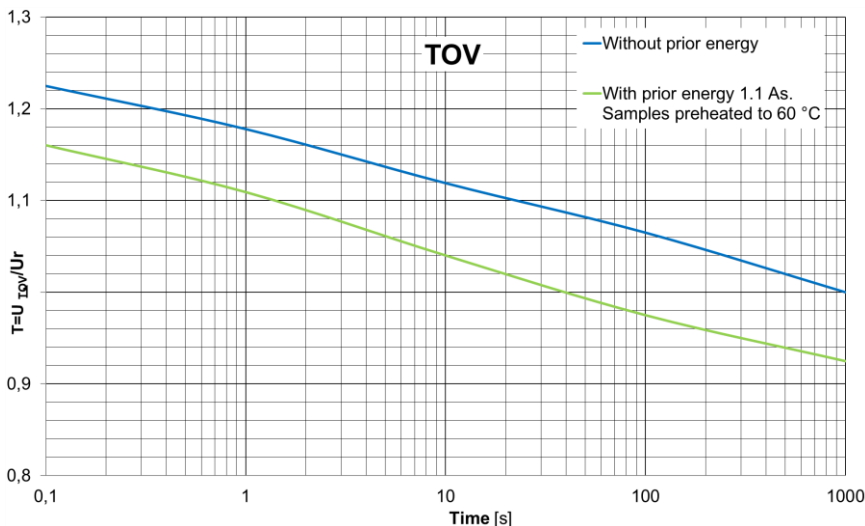
- specified long-term load (SLL) 210 Nm
- specified short-term load (SSL) 336 Nm
- torsional strength 50 Nm

\*) for higher parameters please contact with manufacturer

TYPE PROXAR-IN AC	Rated voltage Ur kV	Maximum operating voltage Uc kV	Residual voltage in [kV] pk 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
1.2	1.2	1.0	3,55	2.8	2.9	3.2	3.5	2.3	2.3	2.4
2.2	2.2	1.8	6,49	5.0	5.4	5.9	6.5	4.2	4.3	4.5
2.5	2.5	2.0	7,38	5.7	6.1	6.8	7.4	4.7	4.9	5.1
3.0	3	2.4	8,85	6.9	7.4	8.1	8.8	5.7	5.9	6.1
4.0	4	3.2	11,68	9.2	9.8	10.8	11.8	7.6	7.8	8.2
5.0	5	4.0	14,60	11.5	12.3	13.5	14.7	9.5	9.8	10.2
6.0	6	4.8	17,52	13.8	14.7	16.2	17.7	11.4	11.7	12.2
7.0	7	5.6	20,44	16.1	17.2	18.9	20.6	13.3	13.7	14.3
8.0	8	6.4	23,29	18.4	19.7	21.6	23.5	15.2	15.7	16.3
9.0	9	7.2	26,20	20.7	22.1	24.3	26.5	17.1	17.6	18.3
10.0	10	8.0	29,11	23.0	24.6	27.0	29.4	19.0	19.6	20.4
11.0	11	8.8	32,02	25.2	27.0	29.7	32.4	20.8	21.5	22.4
12.0	12	9.6	34,93	27.5	29.5	32.4	35.3	22.7	23.5	24.5
13.0	13	10.4	37,84	29.8	31.9	35.1	38.3	24.6	25.4	26.5
14.0	14	11.2	40,75	32.1	34.4	37.8	41.2	26.5	27.4	28.5
15.0	15	12.0	43,67	34.4	36.9	40.5	44.1	28.4	29.4	30.6
16.0	16	12.8	46,58	36.7	39.3	43.2	47.1	30.3	31.3	32.6
17.0	17	13.6	49,49	39.0	41.8	45.9	50.0	32.2	33.3	34.7
18.0	18	14.4	52,40	41.3	44.2	48.6	53.0	34.1	35.2	36.7
19.0	19	15.2	55,31	43.6	46.7	51.3	55.9	36.0	37.2	38.7
20.0	20	16.0	58,22	45.9	49.1	54.0	58.9	37.9	39.2	40.8
21.0	21	16.8	61,13	48.2	51.6	56.7	61.8	39.8	41.1	42.8
22.0	22	17.6	64,04	50.5	54.1	59.4	64.7	41.7	43.1	44.8
23.0	23	18.4	66,95	52.8	56.5	62.1	67.7	43.6	45.0	46.9
24.0	24	19.2	69,86	55.1	59.0	64.8	70.6	45.5	47.0	48.9
25.0	25	20.0	72,78	57.4	61.4	67.5	73.6	47.4	48.9	51.0
26.0	26	20.8	75,69	59.7	63.9	70.2	76.5	49.3	50.9	53.0
27.0	27	21.6	78,60	62.0	66.3	72.9	79.5	51.2	52.9	55.0
28.0	28	22.4	81,51	64.3	68.8	75.6	82.4	53.1	54.8	57.1
29.0	29	23.2	84,42	66.6	71.3	78.3	85.3	55.0	56.8	59.1
30.0	30	24.0	87,33	68.9	73.7	81.0	88.3	56.9	58.7	61.2
33.0	33	26.4	96,06	75.7	81.1	89.1	97.1	62.5	64.6	67.3
36.0	36	28.8	104,80	82.6	88.5	97.2	105.9	68.2	70.5	73.4
39.0	39	31.2	113,53	89.5	95.8	105.3	114.8	73.9	76.3	79.5
42.0	42	33.6	122,26	96.4	103.2	113.4	123.6	79.6	82.2	85.6
44.0	44	35.2	128,10	101.0	108,1	118.8	129.4	83.4	86.1	89.7
45.0	45	36.0	131,00	103.3	110.6	121.5	132.4	85.3	88.1	91.7
48.0	48	38.4	139,73	110.2	117.9	129.6	141.2	91.0	94.0	97.8

There is a possibility of manufacturing surge arresters for different voltages that are not listed in the table.

### TOV CHARACTERISTIC



Power frequency voltage versus time characteristic TOV without prior duty

$U_{TOV}$  for  $t=1$  s      1.178  $U_r$  = 1.473  $U_c$   
 $U_{TOV}$  for  $t=3$  s      1.150  $U_r$  = 1.438  $U_c$   
 $U_{TOV}$  for  $t=10$  s     1.119  $U_r$  = 1.399  $U_c$

Power frequency voltage versus time characteristic TOV with prior energy.

$U_{TOV}$  for  $t=1$  s      1.109  $U_r$  = 1.386  $U_c$   
 $U_{TOV}$  for  $t=3$  s      1.078  $U_r$  = 1.348  $U_c$   
 $U_{TOV}$  for  $t=10$  s     1.040  $U_r$  = 1.300  $U_c$

TOV characteristic for PROXAR-INAC

**TECHNICAL DATA FOR HOUSING**

Type PROXAR-IN AC	Insulation withstand voltage of housing		Minimal distances		Height H	Creepage distance	Flash-over distance	Housing number	Weight
	50 Hz wet (60s)	1.2/50 $\mu$ s dry	Distance between arresters „b”	Distance between arrester and the nearest grounded structure „a”					
	kV	kV							
1.2	10	21	105	58	80	127	100	01	0.27
2.2			105	58					0.29
2.5			105	58					0.30
3.0			105	58					0.31
4.0	17	35	105	58	96	143	113	02	0.47
5.0			105	59					0.48
6.0			105	68					0.49
7.0	26	54	105	77	118	242	137	03	0.62
8.0			105	85					0.63
9.0			110	94					0.64
10.0	34	70	119	103	137	338	157	04	0.72
11.0			127	111					0.73
12.0			136	120					0.74
13.0	42	88	145	129	158	436	181	05	0.92
14.0			153	137					0.93
15.0			162	146					0.94
16.0			171	155					1.19
17.0	60	125	179	163	198	555	217	06	1.20
18.0			188	172					1.21
19.0			197	181					1.22
20.0			205	189					1.23
21.0			214	198					1.24
22.0			223	207					1.25
23.0	84	174	231	215	257	767	277	07	1.61
24.0			240	224					1.62
25.0			249	233					1.63
26.0			257	241					1.64
27.0			266	250					1.65
28.0			275	259					1.66
29.0			283	267					1.67
30.0			292	276					1.68
33.0	105	218	318	302	308	972	331	08	2.00
36.0			344	328					2.04
39.0	130	270	370	354	368	1187	391	09	2.47
42.0			396	380					2.50
44.0			413	397					2.52
45.0			422	406					2.53
48.0			448	432					2.56

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

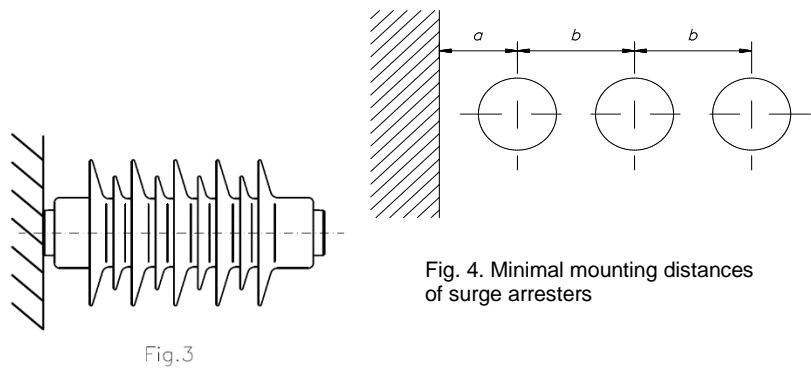
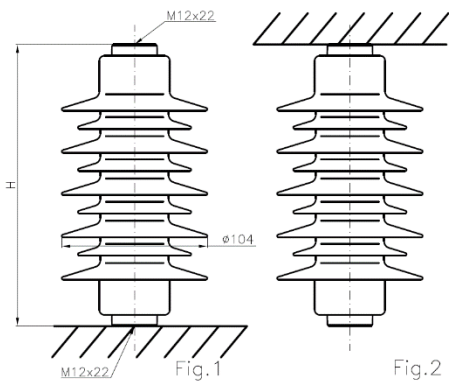


Fig. 4. Minimal mounting distances of surge arresters

Fig. Surge arrester PROXAR-IN AC

The drawings above show the PROXAR-IN AC surge arrester. Surge arrester can work in a vertical position fig.1, inverted position fig.2 and horizontal position fig.3.

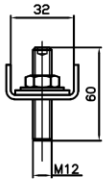
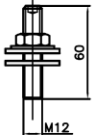
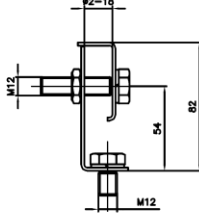
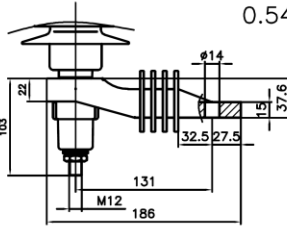
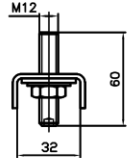
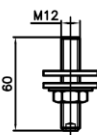
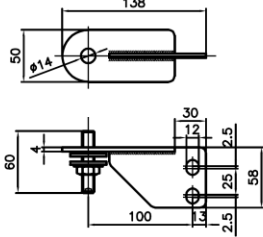
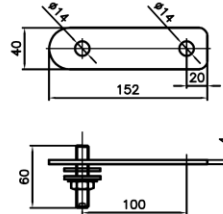
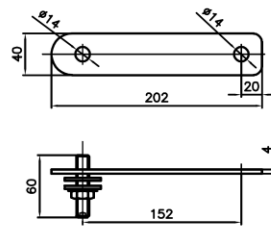
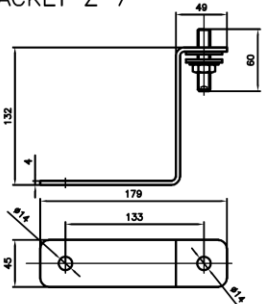
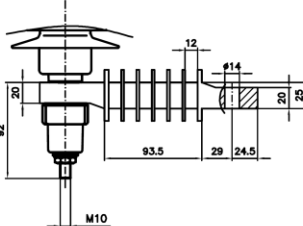
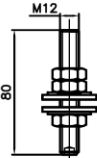
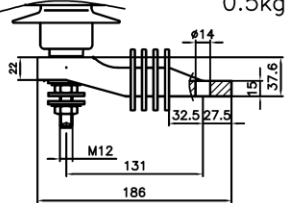
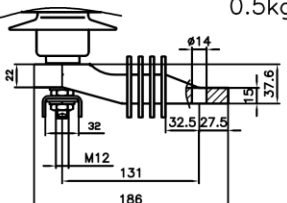
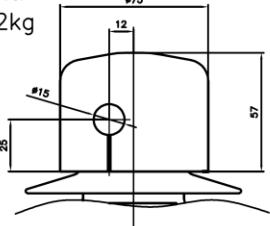
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">LINE ACCESSORIES</p> <p style="text-align: center;">LINE TERMINAL 1</p> <p style="text-align: right;">Weight: 0.093kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="text-align: center;">LINE TERMINAL 2</p> <p style="text-align: right;">Weight: 0.063kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="text-align: center;">LINE TERMINAL 3</p> <p style="text-align: right;">Weight: 0.15kg</p>  <p style="text-align: center;">Stainless steel</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">EARTH ACCESSORIES</p> <p style="text-align: center;">INSULATING BRACKET WITH DISCONNECTOR 1 (<math>U_r \leq 30kV</math>)</p> <p style="text-align: right;">Weight: 0.54kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="text-align: center;">EARTH TERMINAL 2</p> <p style="text-align: right;">Weight: 0.093kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="text-align: center;">EARTH TERMINAL 3</p> <p style="text-align: right;">Weight: 0.063kg</p>  <p style="text-align: center;">Stainless steel</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">EARTH ACCESSORIES</p> <p style="text-align: center;">VERTICAL SUPPORT 4</p> <p style="text-align: right;">Weight: 0.51kg</p>  <p style="text-align: center;">Hot-dip galvanized</p>	<p style="text-align: center;">HORIZONTAL SUPPORT 5</p> <p style="text-align: right;">Weight: 0.21kg</p>  <p style="text-align: center;">Hot-dip galvanized</p>	<p style="text-align: center;">HORIZONTAL SUPPORT 6</p> <p style="text-align: right;">Weight: 0.27kg</p>  <p style="text-align: center;">Hot-dip galvanized</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">EARTH ACCESSORIES</p> <p style="text-align: center;">BRACKET Z 7</p> <p style="text-align: right;">Weight: 0.48kg</p>  <p style="text-align: center;">Hot-dip galvanized</p>	<p style="text-align: center;">INSULATING BRACKET WITH DISCONNECTOR 8 (<math>U_r &gt; 30kV</math>)</p> <p style="text-align: right;">Weight: 0.48kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="text-align: center;">EARTH TERMINAL 9</p> <p style="text-align: right;">Weight: 0.1kg</p>  <p style="text-align: center;">Stainless steel</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">EARTH ACCESSORIES</p> <p style="text-align: center;">INSULATING BRACKET A (<math>U_r \leq 30kV</math>)</p> <p style="text-align: right;">Weight: 0.5kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="text-align: center;">INSULATING BRACKET B (<math>U_r \leq 30kV</math>)</p> <p style="text-align: right;">Weight: 0.5kg</p>  <p style="text-align: center;">Stainless steel</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">ACCESSORIES</p> <p style="text-align: center;">ANTI-BIRD CAP 1</p> <p style="text-align: right;">Weight: 0.032kg</p>  <p style="text-align: center;">Stainless steel</p>

Fig.5. Equipment for surge arrester type PROXAR-IN AC

Order configurator\*\*:

\*\*\*) Empty fields to fill

I. Type of product

**PROXAR-IN**

II. Rated voltage Ur

See table – TECHNICAL DATA

**Ur**

III. Voltage tyoe

Alternating voltage (48 – 62 Hz)

**AC**

IV. Assembly (according Fig. 1; 2; 3)

- Vertical
- Reversed
- Horizontal

**1**  
**2**  
**3**

V. Line accessories (according fig. 5)

- without line terminal
- line terminal 1
- line terminal 2
- line termianl 3

**0**  
**1**  
**2**  
**3**

VI. Earth accessories (according fig. 5)

- without earth terminal
- insulating bracket with disconnecter 1 ( $U_r \leq 30kV$ )
- earth terminal 2
- earth terminal 3
- vertical bracket 4
- horizontal bracket 5
- horizontal bracket 6
- bracket Z 7
- insulating bracket with disconnecter 8 ( $U_r > 30kV$ )
- earth terminal 9
- insulating bracket A
- insulating bracket B

**0**  
**1**  
**2**  
**3**  
**4**  
**5**  
**6**  
**7**  
**8**  
**9**  
**A**  
**B**

VII. Accessories (according fig. 5)

- without anti-bird cap
- With anti-bird cap 1

**0**  
**1**

VIII. Housing number

See table – TECHNICAL DATA FOR HOUSING

**Housing number**

I	II	III	IV	V	VI	VII	VIII
<b>PROXAR-IN</b>		<b>AC</b>					

Order example:

I	II	III	IV	V	VI	VII	VIII
<b>PROXAR-IN</b>	<b>22</b>	<b>AC</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0 6</b>

**PROXAR-IN 22 AC 110106** – 3 pcs.

Description: Surge arrester type **PROXAR-IN** of rated voltage  $U_r=22kV$  for **AC** system in vertical mounting version -1, line terminal - 1, without earth terminal - 0, with bird cap 1, housing number – **06**,

**PROTEKTEL Sp. z o.o.**

**Piłsudskiego 92 str.;**

**PL 06-300 Przasnysz**

**Poland**

**Tel./Fax +48 029 7525784**

**E-mail: protektel@protektel.pl**

**www.protektel.pl**

ATTENTION

The manufacturer reserves the right to change technical data or designee without prior notice.

**PROXAR®** is a registered trademark newest family of surge arresters produced by Protektel