



# HIGH VOLTAGE SURGE ARRESTER TYPE PROXAR-IIIN AC IN SILICONE HOUSING



## CATALOG CARD

### APPLICATION

Surge arresters type **PROXAR-IIIN AC** in silicone housing are intended for protection AC power engineering networks against multiple lightning and switching overvoltages in HV 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 and temperate and tropical climate up to 1000 m over the sea level. The possibility to install in any working positions.

### 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
- Ability to work in horizontal position

### ADDITIONAL EQUIPMENT

Surge counter type ProCounter and insulating base. Support bases allow to install surge arrester type **PROXAR-IIIN AC** at places of retrofit or service installation.

The special support bases with various dimensions of hole position can be delivered on request.

### ELECTRICAL DATA

Arrester classification according to IEC 60099-4: 2015	SM (Station Medium)
Line discharge class according to IEC 60099-4: 2009	3
System voltage (Us)	3.6 – 245 kV
Rated voltage (Ur)	1.0 – 228 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	2.4 C
Rated thermal Energy Wth	11.0 kJ/kV Ur
Single impulse energy capability (impulse duration 2 ms – 4 ms)	5.9 kJ/kV Ur
Long duration current impulse, 2000 $\mu$ s	1000 A
Short circuit rating	65 kA/0.2s
Service conditions:	
- ambient temperature	-45 °C do +60 °C*
- altitude up to	1000 m*
Mechanical data:	
- specified long-term load (SLL)	2500 Nm
- specified short-term load (SSL)	4000 Nm
- torsional strength	200 Nm
- vertical load	5 kN
Dane mechaniczne <sup>1)</sup> :	
- specified long-term load (SLL)	1800 Nm
- specified short-term load (SSL)	1200 Nm
- torsional strength	200 Nm
- vertical load	5 kN

\*) for other values please contact with the manufacturer;

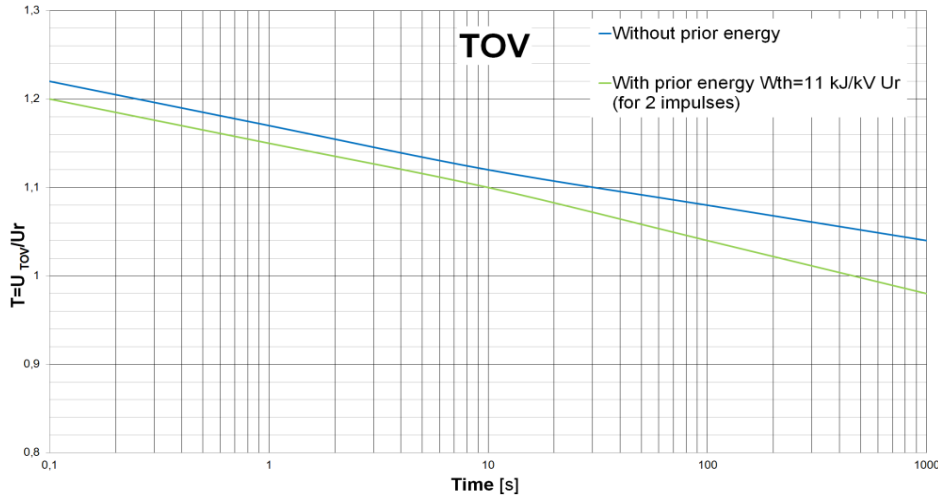
<sup>1)</sup> Only applies to drawing and cover No.1

TYP PROXAR- IIIN AC	Rated voltage	Maximum continous operating voltage Uc	TOV <sup>2)</sup>		Residual voltage in [kV] pk at a specified impulse current							
			1 s	10 s	Wave 1/... μs	Wave 8/20 μs				Wave 30/60 μs		
	Ur kV	1 s kV	10 s kV	10kA kV	2.5kA kV	5kA kV	10kA kV	20kA kV	0.25kA kV	0.5kA kV	1kA kV	
1.0	1.0	0.8	1.2	1.1	4.2	2.2	2.3	2.4	2.6	1.9	2.0	2.0
1.2	1.2	1.0	1.4	1.3	4.7	2.6	2.7	2.9	3.1	2.3	2.3	2.4
1.5	1.5	1.2	1.7	1.7	5.5	3.2	3.4	3.6	3.9	2.8	2.9	3.0
1.7	1.7	1.4	2.0	1.9	6.0	3.7	3.8	4.1	4.4	3.2	3.3	3.5
2.0	2.0	1.6	2.3	2.2	6.8	4.3	4.5	4.8	5.2	3.8	3.9	4.1
2.2	2.2	1.8	2.5	2.4	7.3	4.7	5.0	5.3	5.7	4.2	4.3	4.5
2.5	2.5	2.0	2.9	2.8	8.1	5.4	5.6	6.0	6.5	4.7	4.9	5.1
2.7	2.7	2.2	3.1	3.0	8.6	5.8	6.1	6.5	7.0	5.1	5.3	5.5
3.0	3.0	2.4	3.5	3.3	9.4	6.5	6.8	7.2	7.8	5.7	5.9	6.1
3.2	3.2	2.6	3.7	3.5	9.9	6.9	7.2	7.7	8.3	6.0	6.2	6.5
3.5	3.5	2.8	4.0	3.9	10.6	7.5	7.9	8.4	9.1	6.6	6.8	7.1
3.7	3.7	3.0	4.3	4.1	11.2	8.0	8.3	8.9	9.6	7.0	7.2	7.5
4.0	4.0	3.2	4.6	4.4	11.9	8.6	9.0	9.6	10.4	7.6	7.8	8.1
4.5	4.5	3.6	5.2	5.0	13.2	9.7	10.1	10.8	11.7	8.5	8.8	9.1
5	5	4.0	5.8	5.5	14.5	10.8	11.3	12.0	13.0	9.5	9.8	10.2
6	6	4.8	6.9	6.6	17.1	12.9	13.5	14.4	15.6	11.3	11.7	12.2
7	7	5.6	8.1	7.7	19.6	15.1	15.8	16.8	18.2	13.2	13.7	14.2
8	8	6.4	9.2	8.8	22.2	17.2	18.0	19.2	20.8	15.1	15.6	16.2
9	9	7.2	10.4	9.9	24.8	19.4	20.3	21.6	23.4	17.0	17.6	18.3
10	10	8.0	11.5	11.0	27.4	21.5	22.5	24.0	26.0	18.9	19.5	20.3
11	11	8.8	12.7	12.1	30.6	23.7	24.8	26.4	28.6	20.8	21.5	22.3
12	12	9.6	13.8	13.2	33.2	25.8	27.0	28.8	31.2	22.7	23.4	24.4
13	13	10.4	15.0	14.3	35.8	28.0	29.3	31.2	33.8	24.6	25.4	26.4
14	14	11.2	16.1	15.4	38.3	30.1	31.5	33.6	36.4	26.5	27.3	28.4
15	15	12.0	17.3	16.5	40.9	32.3	33.8	36.0	39.0	28.4	29.3	30.5
16	16	12.8	18.4	17.6	44.0	34.4	36.0	38.4	41.6	30.2	31.2	32.5
17	17	13.6	19.6	18.7	46.6	36.6	38.3	40.8	44.2	32.1	33.2	34.5
18	18	14.4	20.7	19.8	49.2	38.7	40.5	43.2	46.8	34.0	35.1	36.5
19	19	15.2	21.9	20.9	51.7	40.9	42.8	45.6	49.4	35.9	37.1	38.6
20	20	16.0	23.0	22.0	54.3	43.0	45.0	48.0	52.0	37.8	39.0	40.6
21	21	16.8	24.2	23.1	56.9	45.2	47.3	50.4	54.6	39.7	41.0	42.6
22	22	17.6	25.3	24.2	59.5	47.3	49.5	52.8	57.2	41.6	42.9	44.7
23	23	18.4	26.5	25.3	62.6	49.5	51.8	55.2	59.8	43.5	44.9	46.7
24	24	19.2	27.6	26.4	65.2	51.6	54.0	57.6	62.4	45.4	46.8	48.7
25	25	20.0	28.8	27.5	67.7	53.8	56.3	60.0	65.0	47.3	48.8	50.8
26	26	20.8	29.9	28.6	70.3	55.9	58.5	62.4	67.6	49.1	50.7	52.8
27	27	21.6	31.1	29.7	72.9	58.1	60.8	64.8	70.2	51.0	52.7	54.8
28	28	22.4	32.2	30.8	75.4	60.2	63.0	67.2	72.8	52.9	54.6	56.8
29	29	23.2	33.4	31.9	78.0	62.4	65.3	69.6	75.4	54.8	56.6	58.9
30	30	24.0	34.5	33.0	80.6	64.5	67.5	72.0	78.0	56.7	58.5	60.9
33	33	26.4	38.0	36.3	88.8	71.0	74.3	79.2	85.8	62.4	64.4	67.0
36	36	28.8	41.4	39.6	96.6	77.4	81.0	86.4	93.6	68.0	70.2	73.1
39	39	31.2	44.9	42.9	104.8	83.9	87.8	93.6	101.4	73.7	76.1	79.2
42	42	33.6	48.3	46.2	112.5	90.3	94.5	100.8	109.2	79.4	81.9	85.3
45	45	36.0	51.8	49.5	120.2	96.8	101.3	108.0	117.0	85.1	87.8	91.4
48	48	38.4	55.2	52.8	128.5	103.2	108.0	115.2	124.8	90.7	93.6	97.4
51	51	41.0	58.7	56.1	136.2	109.7	114.8	122.4	132.6	96.4	99.5	103.5
54	54	43.0	62.1	59.4	144	116	122	130	140	102	105	110
60	60	48.0	69.0	66.0	160	129	135	144	156	113	117	122
66	66	53.0	75.9	72.6	176	142	149	158	172	125	129	134
72	72	58.0	82.8	79.2	192	155	162	173	187	136	140	146
84	84	67.0	96.6	92.4	224	181	189	202	218	159	164	171
96	96	77.0	110.4	105.6	257	206	216	230	250	181	187	195
102	102	82.0	117.3	112.2	273	219	230	245	265	193	199	207
108	108	86.0	124.2	118.8	288	232	243	259	281	204	211	219
120	120	96.0	138.0	132.0	321	258	270	288	312	227	234	244
132	132	106.0	151.8	145.2	352	284	297	317	343	249	257	268
138	138	111.0	158.7	151.8	367	297	311	331	359	261	269	280
144	144	115.0	165.6	158.4	383	310	324	346	374	272	281	292
150	150	120.0	172.5	165.0	405	323	338	360	390	284	293	305
156	156	125.0	179.4	171.6	420	335	351	374	406	295	304	317
162	162	130.0	186.3	178.2	436	348	365	389	421	306	316	329
168	168	134.0	193.2	184.8	451	361	378	403	437	318	328	341
192	192	154.0	220.8	211.2	515	413	432	461	499	363	374	390
198	198	158.0	227.7	217.8	530	426	446	475	515	374	386	402
204	204	163.0	234.6	224.4	546	439	459	490	530	386	398	414
216	216	173.0	248.4	237.6	577	464	486	518	562	408	421	438
228	228	182.0	262.2	250.8	607	490	513	547	593	431	445	463

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

<sup>2)</sup>With prior energy 11 kJ/kV Ur

## TOV CHARACTERISTIC



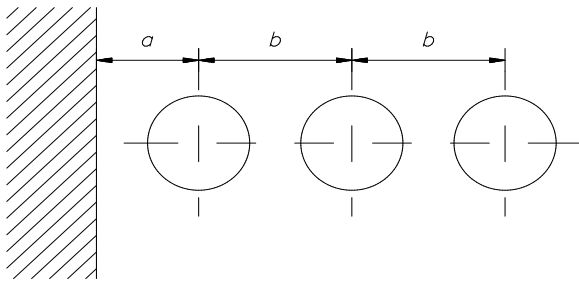
Power frequency voltage versus time characteristic TOV without prior energy

$U_{TOV}$  dla  $t=1$  s  $1.170 U_r = 1.463 U_c$   
 $U_{TOV}$  dla  $t=3$  s  $1.145 U_r = 1.431 U_c$   
 $U_{TOV}$  dla  $t=10$  s  $1.120 U_r = 1.400 U_c$

Power frequency voltage versus time characteristic TOV with prior energy 11 kJ/kV Ur; 13.75 kJ/kV Uc

$U_{TOV}$  dla  $t=1$  s  $1.150 U_r = 1.438 U_c$   
 $U_{TOV}$  dla  $t=3$  s  $1.125 U_r = 1.406 U_c$   
 $U_{TOV}$  dla  $t=10$  s  $1.100 U_r = 1.375 U_c$

TOV characteristic for PROXAR-IIIN AC



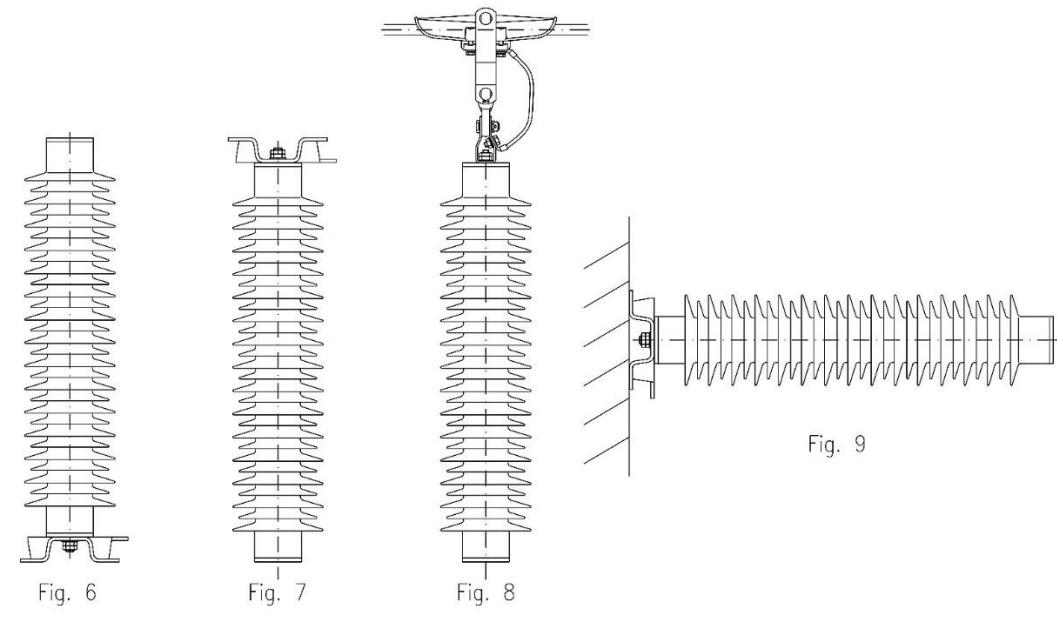
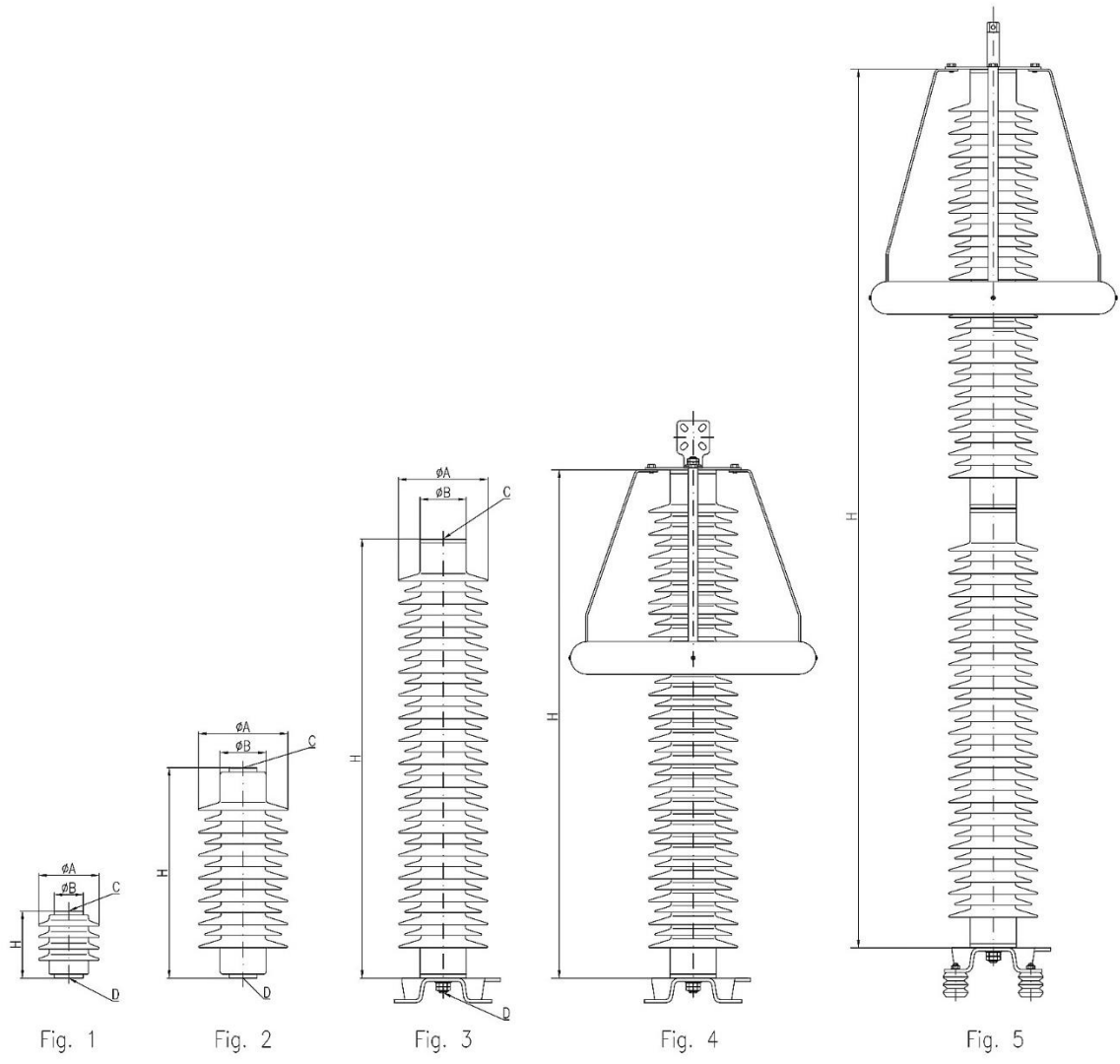
Minimal mounting distances of surge arresters.

## TECHNICAL DATA FOR HOUSING

Typ PROXAR IIIN AC	Insulation withstand voltage of housing		Minimal distances		Dimensions					Variant of drawing	Operating position	No of housing	Weight	
	50 Hz wet (60s)	1.2/50µs dry	Distance between Arresters „b”	Distance between arrester and the nearest grounded structure „a”	Creepage distance	Strike distance	H	A	B					C, D
1.0	28	75	150	75	318	165	165	148	96	M12	1	6, 7, 9	01	2.4
1.2			150	75										2.5
1.5			150	75										2.6
1.7			150	75										2.6
2.0			150	75										2.7
2.2			150	75										2.7
2.5			150	75										2.8
2.7			150	75										2.8
3.0			150	75										2.9
3.2			150	75										2.9
3.5			150	75										3.0
3.7			150	75										3.1
4.0			150	75										3.2
4.5			150	75										3.3
5.0			150	85										3.5
6.0			150	95										3.7
7.0			150	95										3.9
8.0	150	100	4.1											
9.0	150	110	4.3											
10.0	150	115	4.5											
11	81	152	220	165	528	247	235	219	113	M12	2	6, 7, 9	02	12.4
12			230	170										12.5
13			240	180										12.6
14			240	185										12.7
15			250	195										12.8

Typ PROXAR IIIN AC	Insulation withstand voltage of housing		Minimal distances		Dimensions						Variant of drawing	Operating position	No of housing	Weight
	50 Hz wet (60s)	1.2/50µs dry	Distance between Arresters „b”	Distance between arrester and the nearest grounded structure „a”	Creepage distance	Strike distance	H	A	B	C. D				
16	98	184	270	210	760	303	291	219	113	M20	2	6, 7, 9	03	13.6
17			280	215										13.7
18			280	225										13.8
19			290	235										13.9
20			300	240										14.0
21			310	250										14.1
22			310	255										14.2
23	116	216	330	275	992	359	347	219	113	M20	2	6, 7, 9	04	15.0
24			340	280										15.1
25			350	290										15.2
26			360	295										15.3
27			360	305										15.4
28			370	310										15.5
29			380	320										15.6
30			390	325										15.7
33	133	248	430	370	1225	415	403	219	113	M20	2	6, 7, 9	05	16.4
36			450	395										16.6
39	150	281	470	415	1457	471	459	219	113	M20	2	6, 7, 9	06	17.1
42			500	440										17.4
45			520	460										17.7
48	168	313	550	495	1689	527	515	219	113	M20	2	6, 7, 9	07	18.0
51			570	515										18.5
54	185	345	620	555	1741	583	571	219	113	M20	3	6, 7, 8, 9	08	20.0
60			660	600										20.5
66	219	410	740	680	2208	695	683	219	113	M20	3	6, 7, 8, 9	09	21.5
72			790	725										22.0
84	271	506	920	865	2905	837	851	219	113	M20	3	6, 7, 8, 9	10	23.0
96	306	571	1050	995	3369	975	963	219	113	M20	3	6, 7, 8, 9	11	25.5
102			1100	1040										26.0
108			1140	1085										26.5
96	340	635	1050	995	3834	1087	1075	219	113	M20	3	6, 7, 8, 9	12	27.5
102			1100	1040										29.5
108			1140	1085										30.0
120			1270	1215										30.5
132			1360	1305										31.5
138			1410	1350										32.0
120	392	732	1270	1215	4530	1255	1243	219	113	M20	3	6, 7, 8, 9	13	32.5
132			1360	1305										35.0
138			1410	1350										36.0
144			1450	1395										36.5
138	392	732	1940	1635	4530	751	1243	219	113	M20	4	6, 7, 9	14	43.5
144			1980	1680										44.0
150	491	916	2030	1725	5110	1034	1534	219	113	M20	5	6, 7, 9	14	44.5
156			2070	1770										45.0
162			2120	1820										45.5
168			2170	1865										46.0
138			525	981										1940
144	1980	1680			45.5									
150	2030	1725			46.0									
156	2070	1770			46.5									
162	2120	1820			47.0									
168	2170	1865			47.5									
192	612	1142	2270	1970	6738	1326	1926	219	113	M20	5	6, 7, 9	16	54.5
198			2320	2015										55.5
204			2360	2060										56.5
216			2460	2155										57.5
228			2550	2245										59.5
192	680	1270	2270	1970	7668	1550	2150	219	113	M20	5	6, 7, 9	17	62.5
198			2320	2015										63.5
204			2360	2060										64.5
216			2460	2155										65.5
228			2550	2245										67.5

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



In the above figures show the configuration of the surge arresters housing (fig. 1; 2, 3, 4, 5). The drawings No 6 – 9 presents different system of assembling surge arresters. Drawings No 6 presents vertical system of assembling. Drawings No 7 presents reverse system of assembling surge arrester. Drawing No 8 presents suspension system of assembly line surge arrester. Drawings No 9 presents horizontal system of assembling. Below the figures are presenting different options line and earth accessories available for use in surge arrester type PROXAR-IIIN AC. For horizontal working configuration of surge arresters is this same option like for vertical working.

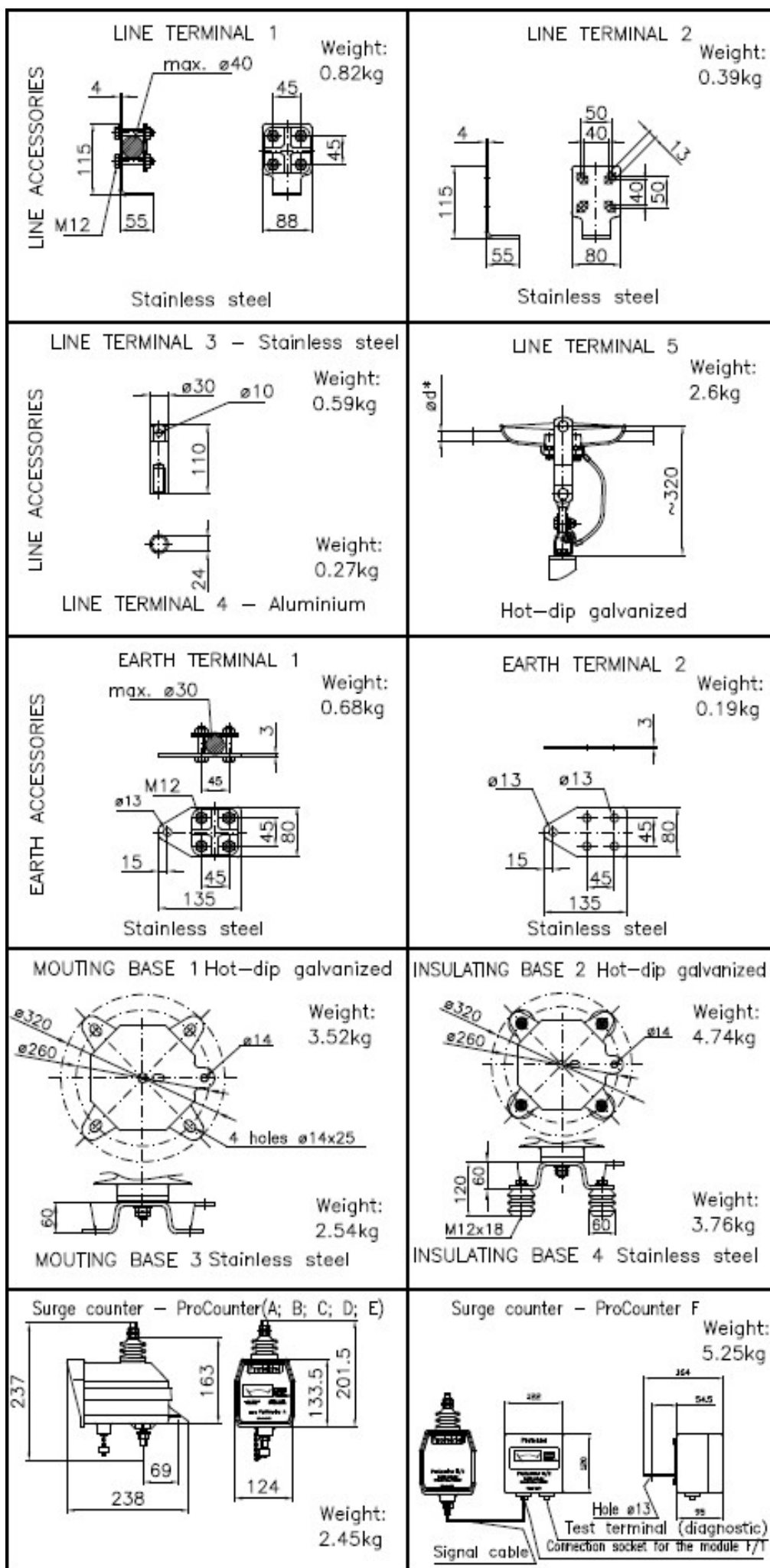


Fig.10. Equipment for surge arrester type PROXAR-IIIN AC

Order configurator\*\*:

I	II	III	IV	V	VI	VII	VIII	IX
PROXAR-IIIN		AC						

\*\*\*) Empty fields to fill.

I. Type of product

PROXAR-IIIN

II. Rated voltage Ur

See table – ELECTRICAL DATA

Ur

III. Voltage type

Alternating voltage (48 – 62 Hz)

AC

IV. Assembly (according fig. 6, 7, 8, 9)

– Vertical (fig.6)

1

– Reversed (fig.7)

2

– Suspension (fig.8)

3

– Horizontal (fig.9)

4

V. Base (according fig. 10)

– Without base

0

– Mounting base1 (Hot-dip galvanized)

1

– Insulating base 2 (Hot-dip galvanized)

2

– Mounting base 3 (Stainless steel)

3

– Insulating base 4 (Stainless steel)

4

VI. Line terminal (according fig. 10)

– without line terminal

0

– line terminal 1

1

– line terminal 2

2

– line terminal 3

3

– line terminal 4

4

– line terminal 5

5

VII. Earth terminal (according fig. 10)

– without earth terminal

0

– earth terminal 1

1

– earth terminal 2

2

VIII. Housing number

See table – TECHNICAL DATA FOR HOUSING

Housing number

IX. Surge counter (please see catalog of surge counter type ProCounter)

– without surge counter

0

– surge counter with electromagnetic counter, indicator of the leakage current and with the measuring socket

A

– surge counter with electromagnetic counter and with the measuring socket

B

– surge counter with electromagnetic counter

C

– surge counter with electromagnetic counter, indicator of the leakage current

D

– surge counter with electromagnetic counter, indicator of the leakage current, socket for transmission via signal line amounts of surges

E

– surge counter with two modules F/1 and F/2 connected to each shielded cable to signal transmission for distance 30 m., by hermetic sockets/plugs (IP67). F/1 – transmitter module, F/2 – receiver module with electromagnetic counter, indicator of the leakage current and with the measuring socket, relay output

F

Order example:

I	II	III	IV	V	VI	VII	VIII	IX
PROXAR-IIIN	96	AC	1	2	3	1	1 2	A

PROXAR-IIIN 96 AC 123112A – 3 pcs.

Description: Surge arrester type **PROXAR-IIIN** of rated voltage  $U_r=96kV$  for **AC** system in vertical mounting version - **1** with insulating base 2 (hot-dip galvanized) - **2**, line terminal - **3**, earth terminal - **1**, housing number - **12**, surge counter type ProCounter **A**.

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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