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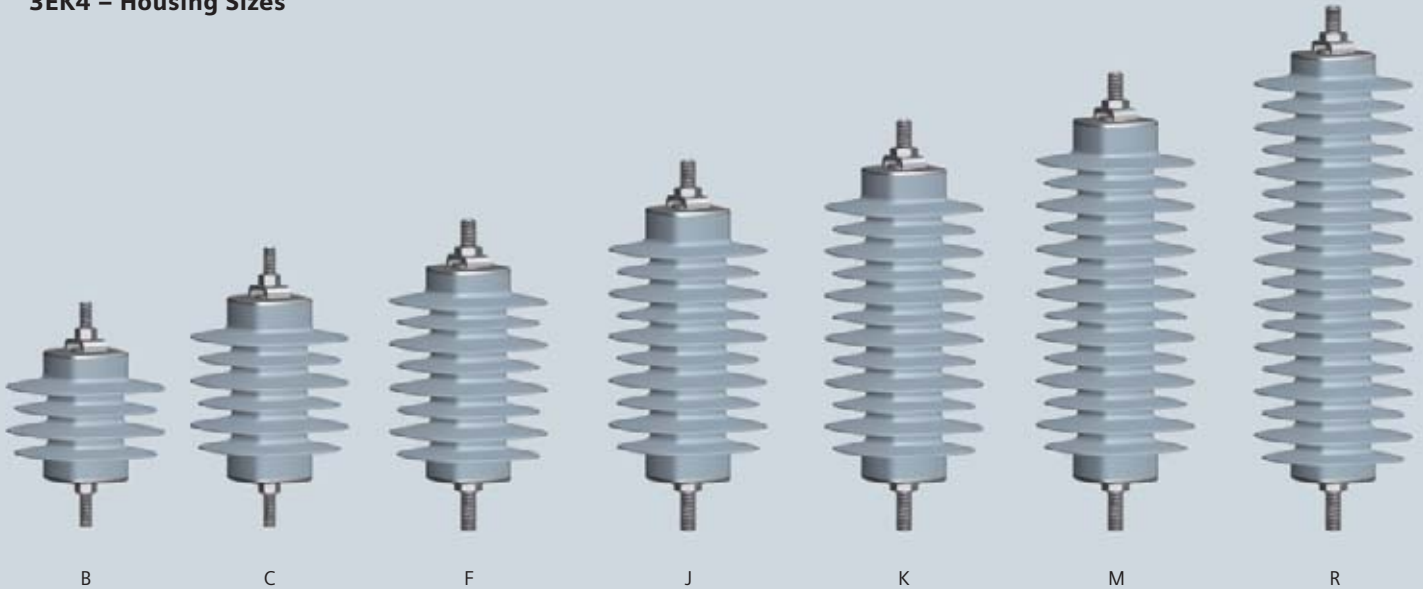
## 3EK4 Medium Voltage Silicone Housed Surge Arresters

[www.siemens.com/energy/arrester](http://www.siemens.com/energy/arrester)

Answers for energy.

# 3EK4 Optimum Performance thanks to the unique Cage Design™

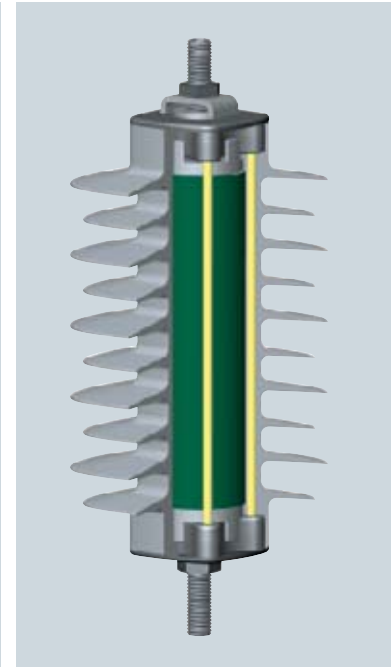
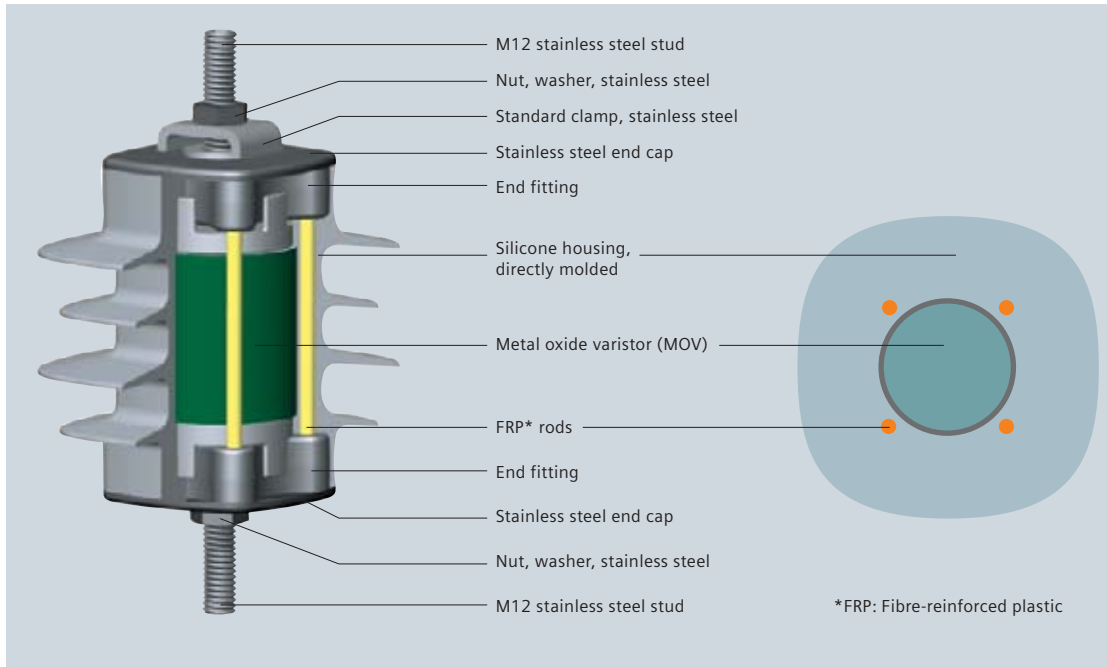
## 3EK4 – Housing Sizes



### Your benefits at a glance

- **Superior**  
The 3EK4's superior electrical and mechanical performance-to-weight ratio is setting entirely new standards
- **Safe**  
The 3EK4's proven cage design provides outstanding performance in safety issues
- **Long-lasting**  
With its high-quality directly molded silicone housing, the 3EK4 surge arrester features prevention of partial discharges and ultimate protection against moisture ingress for a long service life

# 3EK4 Cage Design



## ■ Best Protection Choice

The 3EK4 surge arresters from Siemens offer the best choice for the protection against power surges in medium-voltage distribution systems. Its ratings are suitable for system voltages ( $U_m$ ) up to 40.5 kV.

## ■ Superior Design

The 3EK4's most innovative feature is the Siemens cage design: Preloaded fibre-reinforced plastic rods are used for high mechanical strength and optimized performance-to-weight ratios.

The cage design also features a directly molded silicone rubber housing. The silicone is vulcanized directly onto the metal oxide varistor (MOV) blocks by using high-temperature and high-pressure injection molding; this effectively eliminates partial discharges and moisture ingress.

## ■ Superior Quality

The high-quality UV-resistant silicone rubber is hydrophobic and repels water and any pollution. It is resistant to ozone, all common organic and inorganic solvents and cleaning agents. This results in excellent pollution handling characteristics without any ageing effects. It makes the 3EK4 perfect for applications in any environment including industrial, coastal or desert areas. The MOV blocks used provide excellent residual voltage values for lightning and switching impulses to protect distribution transformers. Additionally they also do not suffer from ageing effects. This makes the 3EK4 surge arrester a long-lasting asset with lowest life-cycle costs.



## ■ Superior Safety

Siemens believes that safety is paramount. This is why a silicone rubber housing is used which is flame-retardant and self-extinguishing. Further the content of combustible material in the fibreglass structure has been minimized so that any fire hazard is reduced to an absolute minimum. The 3EK4 surge arrester has also been extensively type tested. Notably it has passed the short circuit type test according to Edition 2.2 of IEC 60099-4. In this test the surge arrester has successfully demonstrated its safe behavior under realistic fault conditions using the so called pre-failing method (no use of fuse wires). The 3EK4 ensures the safety of personnel, the public and the network.

# 3EK4 Surge Arresters According to IEC 60099-4

Nominal discharge current $I_n$	8/20 $\mu$ s	10 kA
Line discharge class (LDC)		1
Maximum continuous operating voltage $U_c$		28.8 kV
Rated voltage $U_r$		36 kV
Long duration current impulse	2 ms	325 A
High current pressure relief		20 kA
Low current pressure relief		600 A
High-current impulse	4/10 $\mu$ s	100 kA
Specified long-term load SLL ( $M_{stat}$ )		175 Nm
Specified short-term load SSL ( $M_{dyn}$ )		250 Nm
Energy absorption capability (thermal)		3.5 kJ/kV <sub>r</sub>

**Table 1:** 3EK4 surge arrester general technical data

Highest voltage for equipment $U_m$	Rated lightning impulse withstand voltage	Solidly earthed neutral system	Isolated neutral system	Impedance earthed neutral system	Resonant earthed neutral system
[kV]	[kV]				
2.75	30; 45; 60	3EK4 030-.C..	3EK4 050-.C..	3EK4 030-.C..	3EK4 050-.C..
3.6	20; 40	3EK4 030-.C..	3EK4 050-.C..	3EK4 030-.C..	3EK4 050-.C..
5.5	45; 60; 75	3EK4 050-.C..	3EK4 090-.C..	3EK4 050-.C..	3EK4 090-.C..
7.2	40; 60	3EK4 060-.C..	3EK4 090-.C..	3EK4 090-.C..	3EK4 090-.C..
8.25	60; 75; 95	3EK4 090-.C..	3EK4 120-.C..	3EK4 090-.C..	3EK4 120-.C..
12	60; 75; 95	3EK4 090-.C..	3EK4 150-.C..	3EK4 120-.C..	3EK4 150-.C..
15.5	85; 110	3EK4 120-.C..	3EK4 210-.C..	3EK4 150-.C..	3EK4 210-.C..
17.5	95	3EK4 150-.C..	3EK4 220-.C..	3EK4 150-.C..	3EK4 220-.C..
24	125; 145	3EK4 180-.C..	3EK4 300-.C..	3EK4 210-.C..	3EK4 300-.C..
25	125; 145	3EK4 210-.C..	3EK4 330-.C..	3EK4 220-.C..	3EK4 330-.C..
27	150	3EK4 210-.C..	3EK4 360-.C..	3EK4 240-.C..	3EK4 360-.C..
30	160	3EK4 240-.C..	–	3EK4 270-.C..	–
36	170	3EK4 270-.C..	–	3EK4 330-.C..	–
38	125; 150; 200	3EK4 300-.C..	–	3EK4 330-.C..	–
40.5	190	3EK4 330-.C..	–	3EK4 360-.C..	–

**Table 2:** Typical 3EK4 surge arresters for system voltages according to IEC 60099-4

Voltage per Unit [V/U<sub>r</sub>]

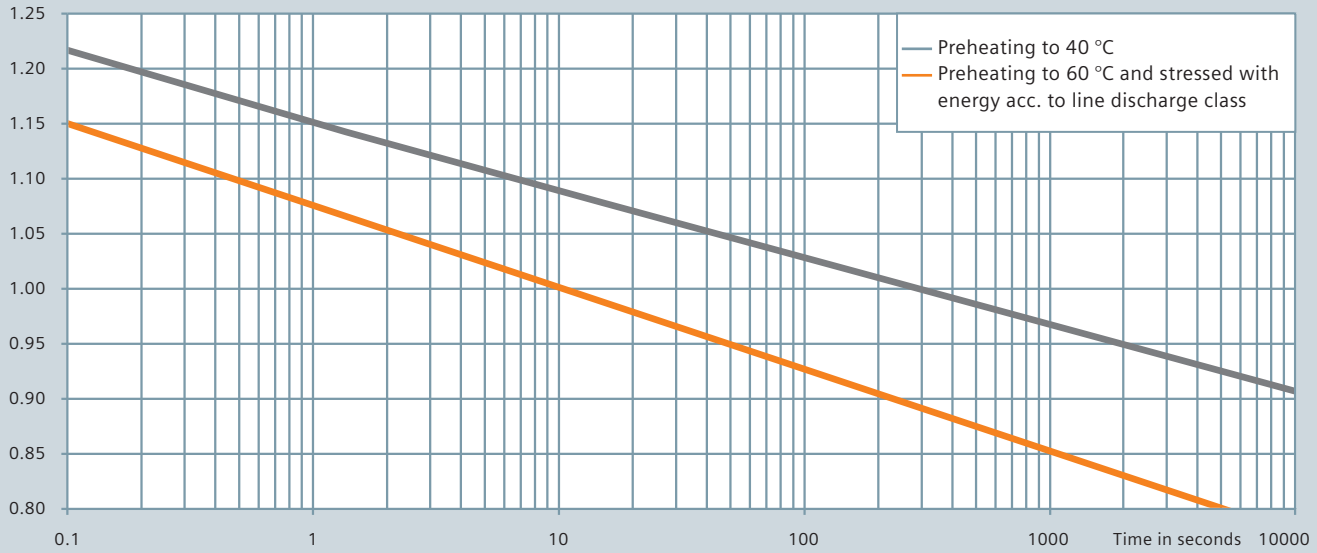
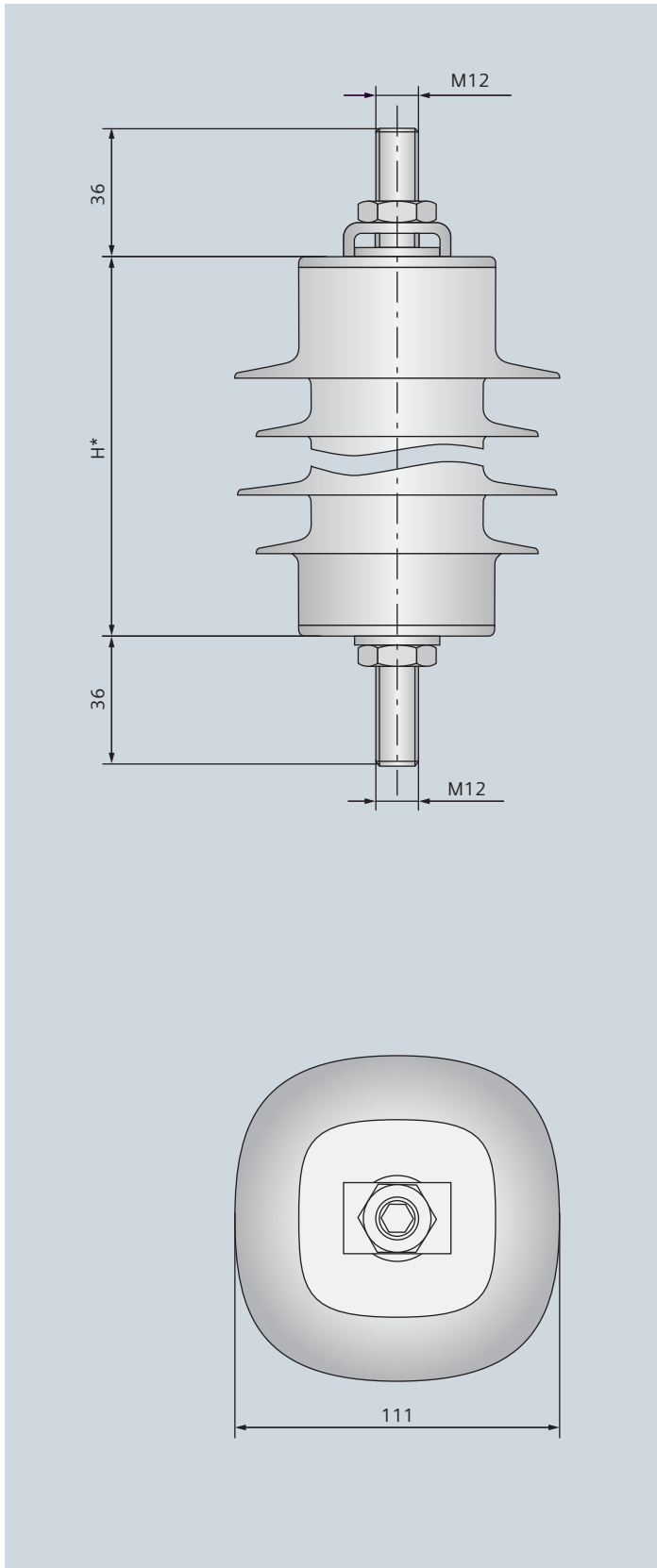


Table 3: IEC power-frequency voltage vs. time (U-t) characteristic

Rated voltage U <sub>r</sub> [kV]	Continuous operating voltage U <sub>c</sub> [kV]	Part number	Maximum values of the residual voltages at discharge currents of the following impulses								Housing insulation		Height H (see fig. 1) [mm]	Creepage distance [mm]	Flash-over distance [mm]	Net weight [kg]
			8/20 μs 1 kA [kV]	8/20 μs 3 kA [kV]	8/20 μs 5 kA [kV]	8/20 μs 10 kA [kV]	8/20 μs 20 kA [kV]	30/60 μs 125 kA [kV]	30/60 μs 500 A [kV]	Lightning impulse withstand voltage 1.2/50 μs [kV]	Power frequency withstand voltage 1 min., wet [kV]					
3	2.4	3EK4 030-1CB4	6.4	7.1	7.4	8.0	9.1	5.8	6.1	65	27	96	280	112	0.8	
6	4.8	3EK4 060-1CB4	12.7	14.2	14.8	15.9	18.3	11.6	12.2	65	27	96	280	112	0.9	
9	7.2	3EK4 090-1CC4	19.1	21.2	22.2	23.9	27.4	17.4	18.4	87	36	137	420	150	1.2	
12	9.6	3EK4 120-1CC4	25.4	28.3	29.6	31.8	36.6	23.2	24.5	87	36	137	420	150	1.3	
15	12.0	3EK4 150-1CF4	31.8	35.4	37.0	39.8	45.7	29.0	30.6	99	41	160	550	170	1.6	
18	14.4	3EK4 180-1CJ4	38.2	42.5	44.4	47.7	54.9	34.8	36.7	123	51	204	690	212	2.0	
21	16.8	3EK4 210-1CJ4	44.5	49.5	51.8	55.7	64.0	40.6	42.9	123	51	204	690	212	2.1	
24	19.2	3EK4 240-1CK4	50.9	56.6	59.1	63.6	73.1	46.4	49.0	140	58	234	820	242	2.3	
27	21.6	3EK4 270-1CM4	57.2	63.7	66.5	71.6	82.3	52.2	55.1	161	67	270	960	278	2.7	
30	24.0	3EK4 300-1CM4	63.6	70.8	73.9	79.5	91.4	58.0	61.2	161	67	270	960	278	2.8	
33	26.4	3EK4 330-1CR4	70.0	77.8	81.3	87.5	101	63.8	67.3	191	79	320	1200	330	3.2	
36	28.8	3EK4 360-1CR4	76.3	84.9	88.7	95.4	110	69.6	73.5	191	79	320	1200	330	3.3	

Table 4: 3EK4 part numbers and technical data (other voltages available on request)

# 3EK4 Accessories



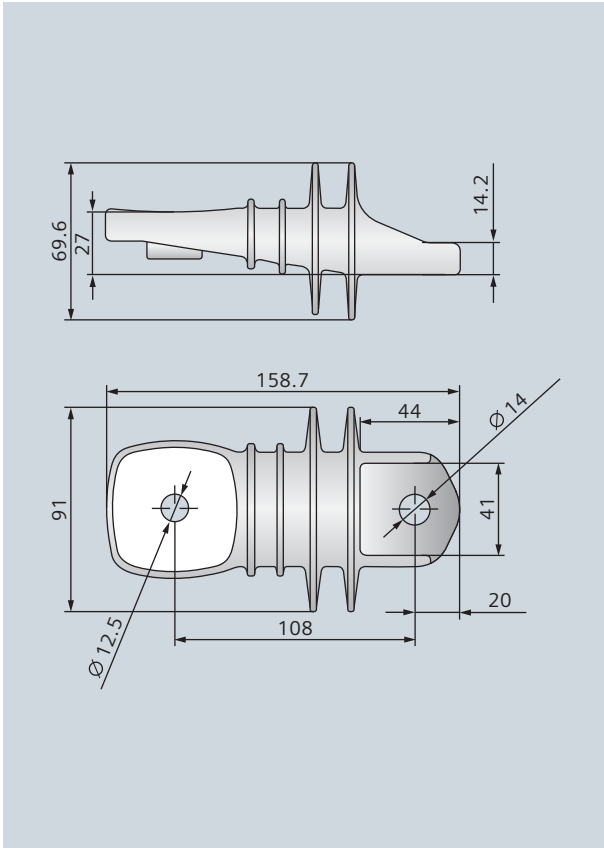
**Figure 1:** 3EK4 surge arrester overall dimensions  
\* please refer to table 4



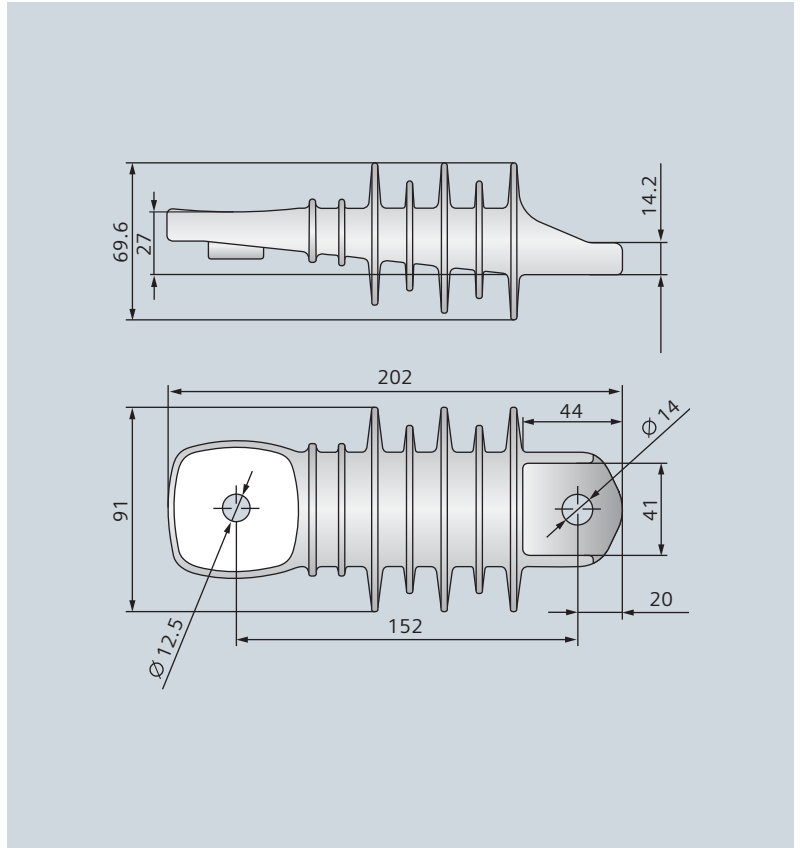
**Figure 2:** 3EK4 surge arrester with accessories P12, P31 and M81



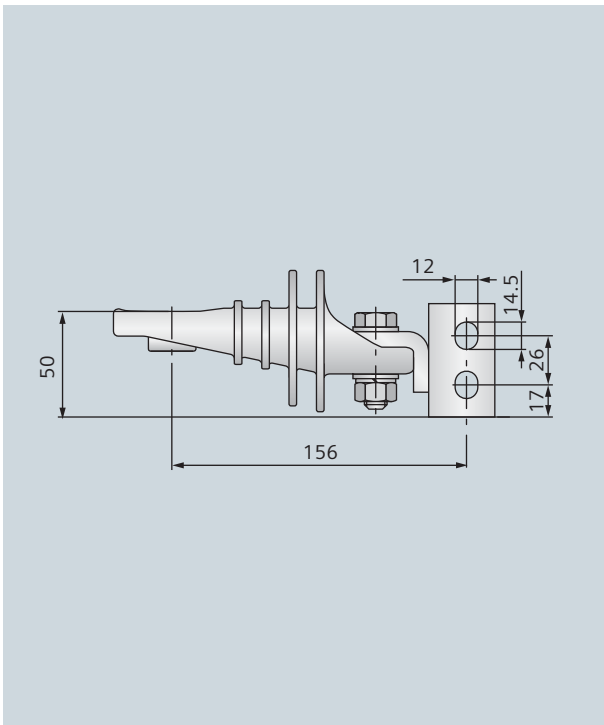
**Figure 3:** 3EK4 surge arrester with accessory P21



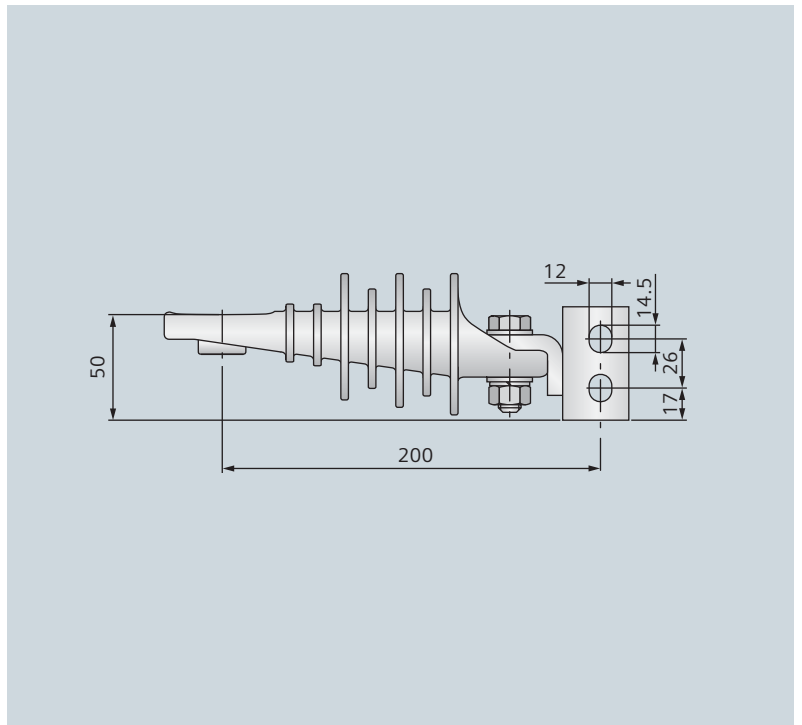
**Figure 4:** NEMA insulating bracket for  $U_r \leq 15$  kV  
Order code P12; 0.25 kg



**Figure 5:** NEMA insulating bracket for  $U_r > 15$  kV  
Order code P12; 0.35 kg

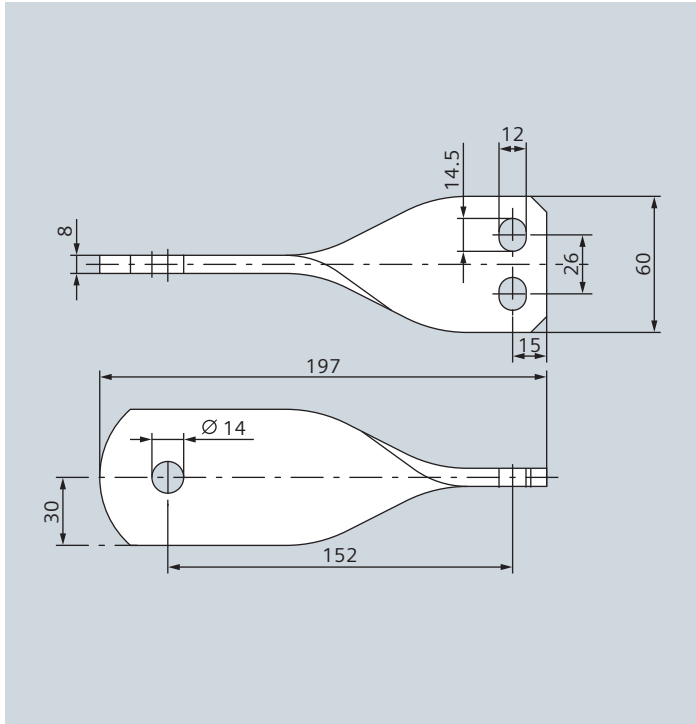


**Figure 6:** DIN insulating bracket for  $U_r \leq 15$  kV  
Order code P22; 0.85 kg

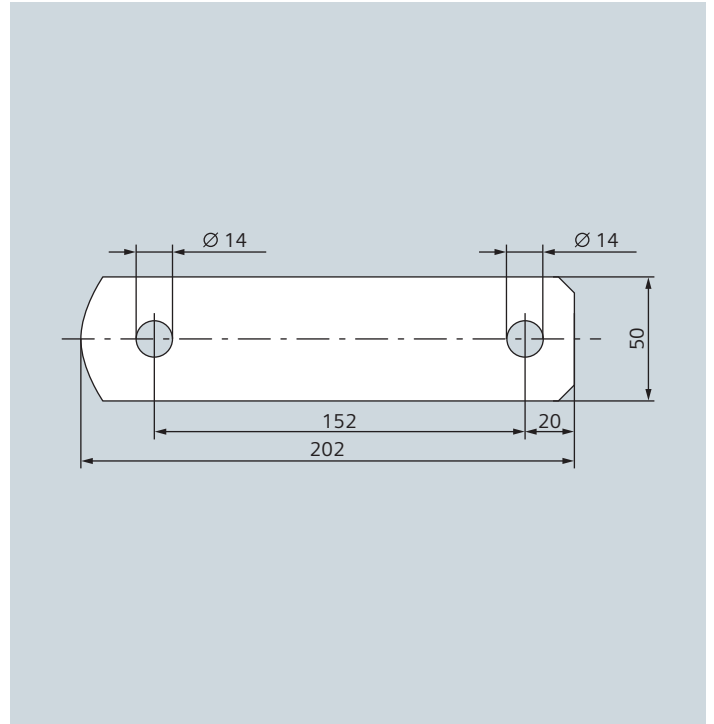


**Figure 7:** DIN insulating bracket for  $U_r > 15$  kV  
Order code P22; 1 kg

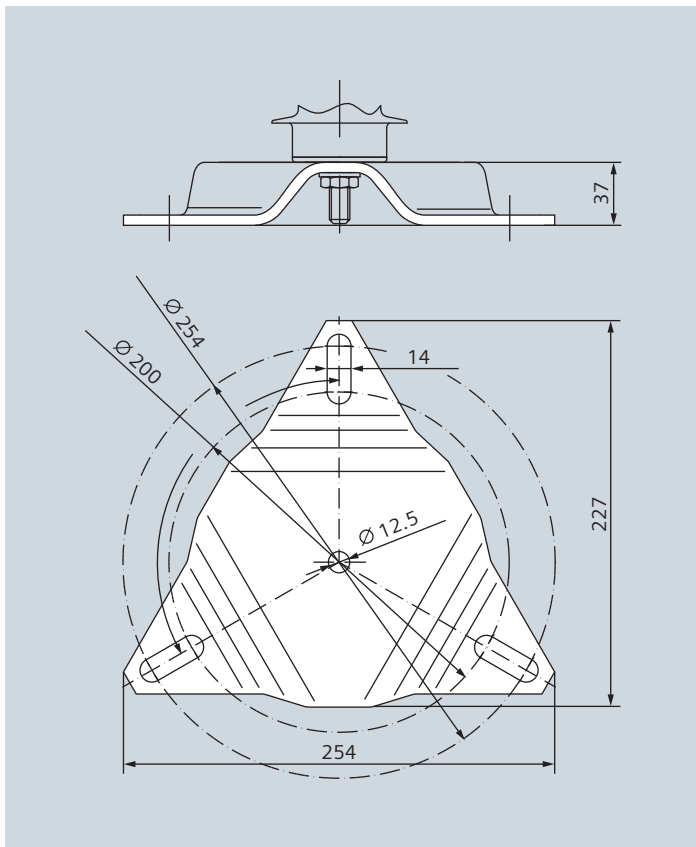
# 3EK4 Accessories



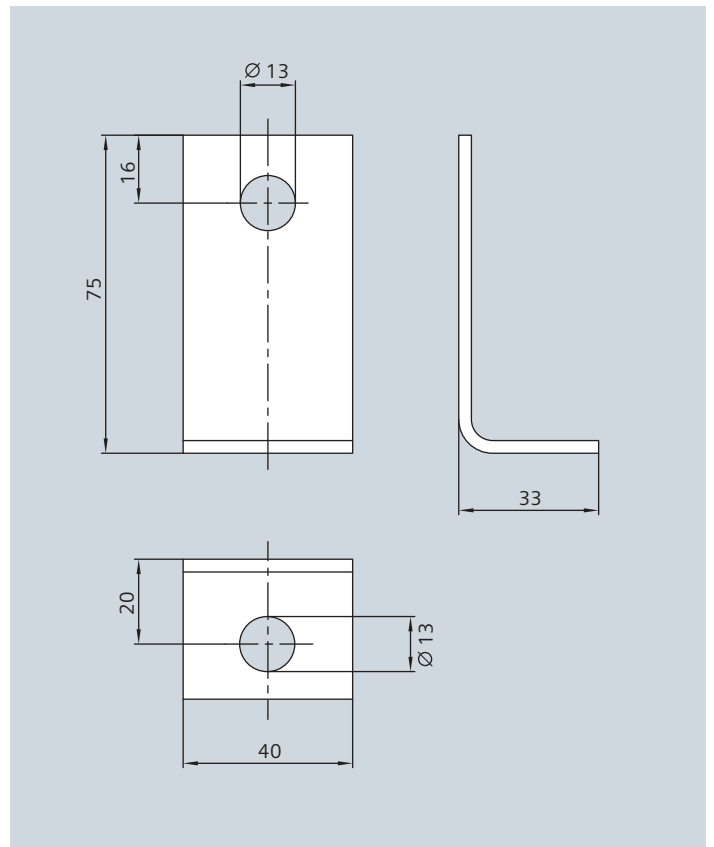
**Figure 8:** DIN metal bracket (hot dip galvanized steel)  
Order code P21; 0.6 kg



**Figure 9:** NEMA metal bracket (hot dip galvanized steel), thickness 8 mm  
Order code P11; 0.6 kg

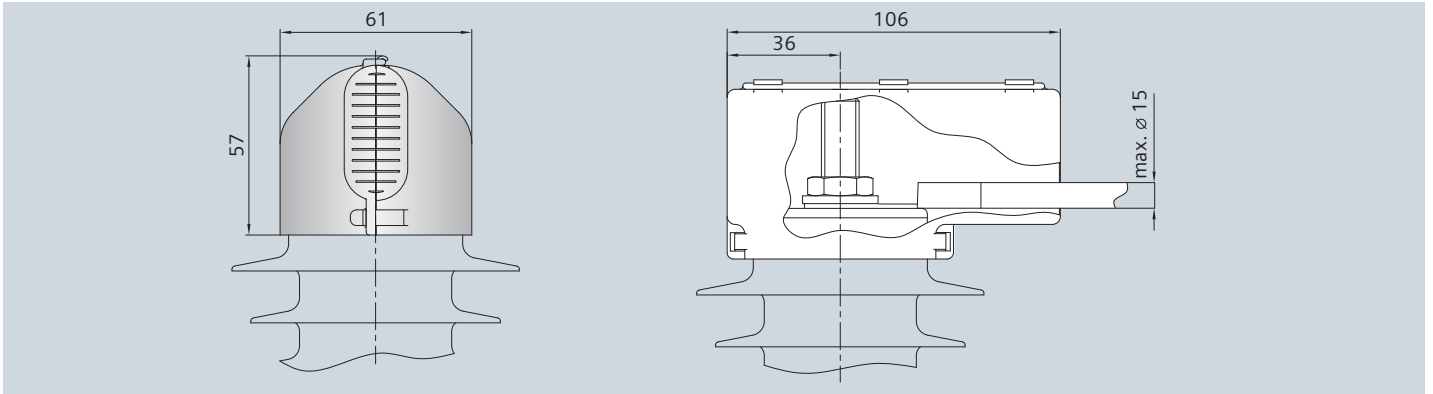


**Figure 10:** Mounting plate  
Order code Q81; 1.6 kg

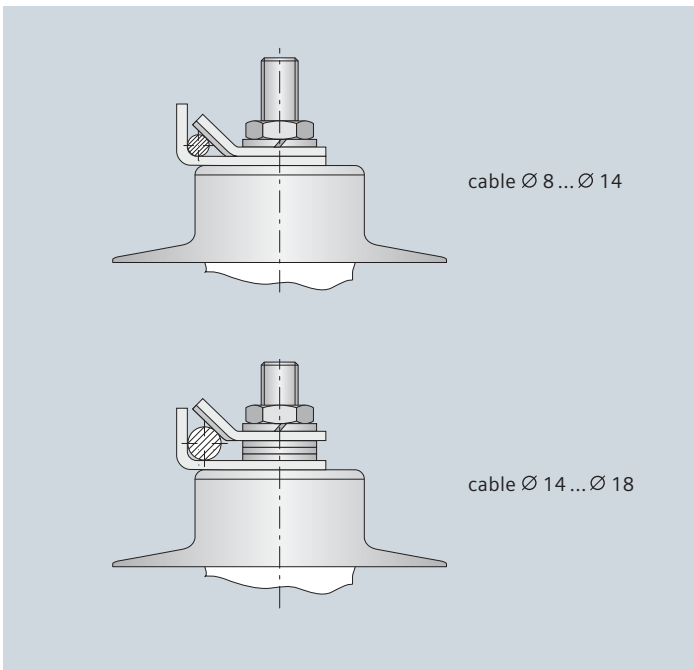


**Figure 11:** L-bracket  
Order code M12; 0.1 kg

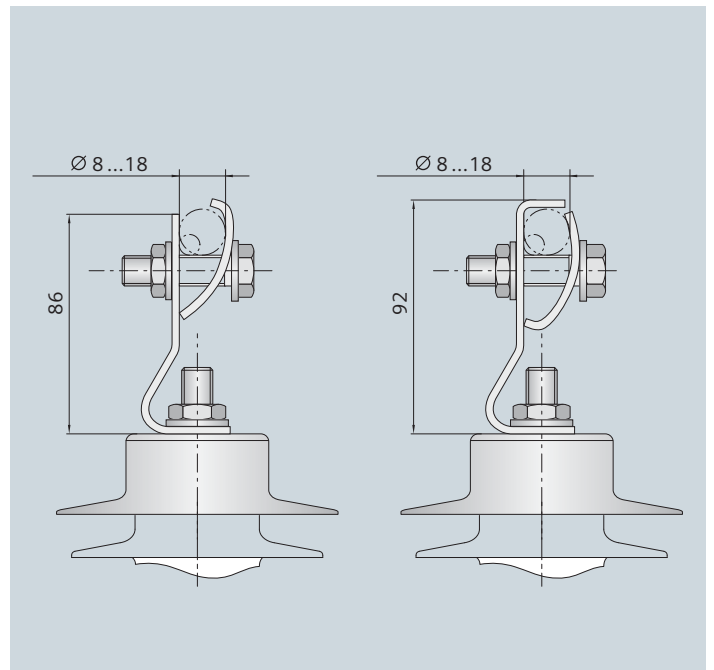




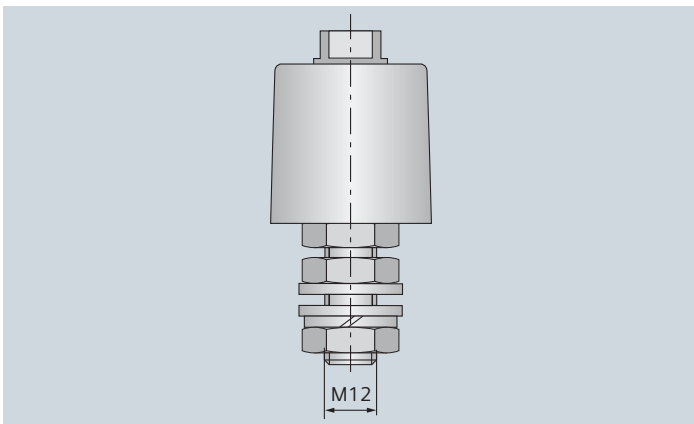
**Figure 12:** Bird protection cap  
Order code M81; 42 g



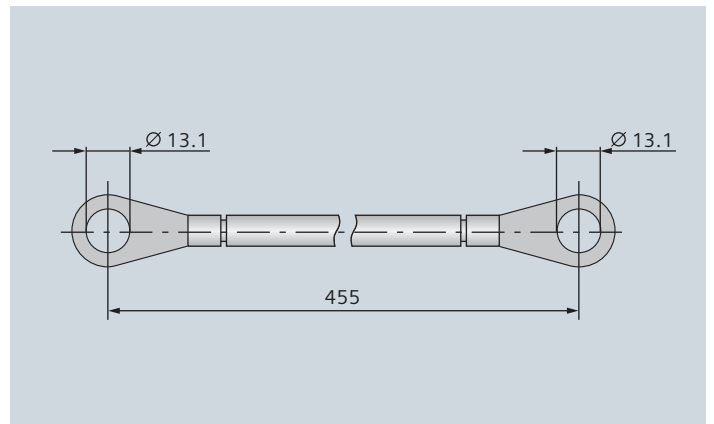
**Figure 13:** Line clamp M11  
Order code M11; 0.1 kg



**Figure 14:** Line clamp M13  
Order code M13; 0.1 kg



**Figure 15:** Disconnecter  
Order code P31; 0.1 kg



**Figure 16:** Insulated line/ground lead  
Order code R51; 0.1 kg, conductor cross-section 16 mm<sup>2</sup>

# Clearances

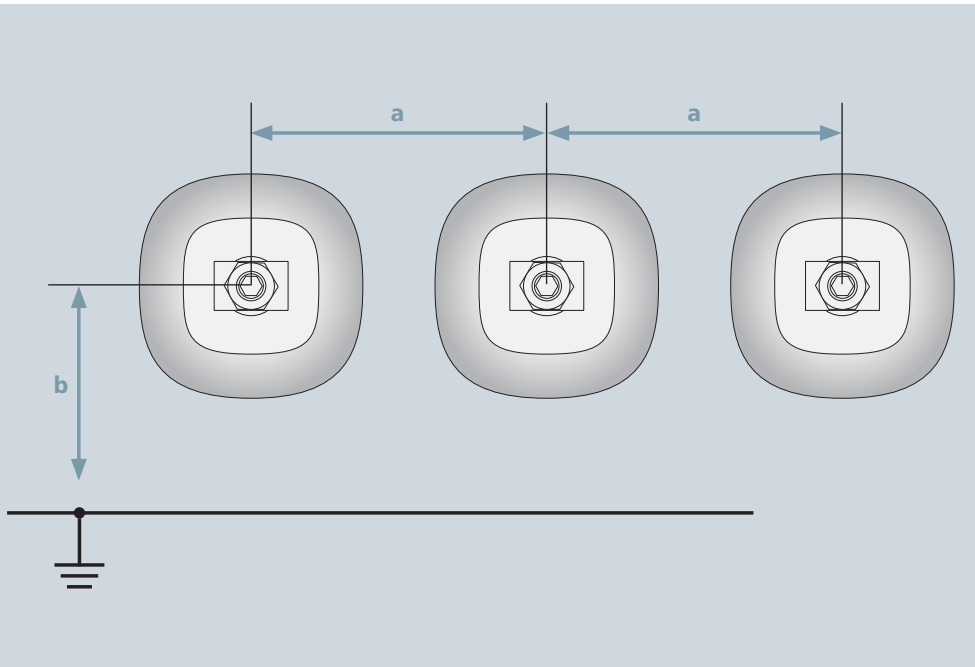


Figure 17: Clearances between surge arrester and earth

$U_r$ kV	a (center-center) mm	b (center-ground) mm
3	140	90
6	140	90
9	170	120
12	170	120
15	210	130
18	220	145
21	240	165
22	250	175
24	270	185
25	280	190
27	290	205
30	320	225
31.5	330	235
33	340	245
36	370	265

Table 5: Minimum recommended clearances

# Ordering information

Part number with accessories	3	E	K	4	120	-	1	C	C	4	-	Z	M81	P12	P31
Medium voltage arresters	3	E	K	4	120	-	1	C	C	4	-	Z	M81	P12	P31
Rated voltage in kV x 10	120					-	1	C	C	4	-	Z	M81	P12	P31
Classification, Nominal discharge current						-	1	C	C	4	-	Z	M81	P12	P31
10 kA						-	1	C	C	4	-	Z	M81	P12	P31
Standard						-	1	C	C	4	-	Z	M81	P12	P31
IEC 60099-4 with metric-thread M12 terminals						-	1	C	C	4	-	Z	M81	P12	P31
Creepage distance						-	1	C	C	4	-	Z	M81	P12	P31
280 mm						-	1	C	B	4	-	Z	M81	P12	P31
420 mm						-	1	C	C	4	-	Z	M81	P12	P31
550 mm						-	1	C	F	4	-	Z	M81	P12	P31
690 mm						-	1	C	J	4	-	Z	M81	P12	P31
820 mm						-	1	C	K	4	-	Z	M81	P12	P31
960 mm						-	1	C	M	4	-	Z	M81	P12	P31
1200 mm						-	1	C	R	4	-	Z	M81	P12	P31
Form of sheds						-	1	C	C	4	-	Z	M81	P12	P31
Alternating sheds						-	1	C	C	4	-	Z	M81	P12	P31
Accessories*						-	1	C	C	4	-	Z	M81	P12	P31
Line terminal						-	1	C	C	4	-	Z	M81	P12	P31
Line clamp M11						-	1	C	C	4	-	Z	M81	P12	P31
L-bracket						-	1	C	C	4	-	Z	M81	P12	P31
Line clamp M13						-	1	C	C	4	-	Z	M81	P12	P31
Line lead, insulated l=455 mm						-	1	C	C	4	-	Z	M81	P12	P31
Bird protection cap						-	1	C	C	4	-	Z	M81	P12	P31
Ground terminal						-	1	C	C	4	-	Z	M81	P12	P31
NEMA metal bracket (hot dip galvanized steel)						-	1	C	C	4	-	Z	M81	P12	P31
NEMA insulating bracket						-	1	C	C	4	-	Z	M81	P12	P31
DIN metal bracket (hot dip galvanized steel)						-	1	C	C	4	-	Z	M81	P12	P31
DIN insulating bracket						-	1	C	C	4	-	Z	M81	P12	P31
Disconnecter						-	1	C	C	4	-	Z	M81	P12	P31
Ground lead, insulated l=455 mm						-	1	C	C	4	-	Z	M81	P12	P31
Mounting plate for 200 – 254 mm bolt circle						-	1	C	C	4	-	Z	M81	P12	P31

\*Other additional parts on request, not all combinations are possible

## Standard accessories at

- Line terminal: M12 stud, standard clamp, washer and nut
- Ground terminal: M12 stud, washer and nut

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Siemens AG  
Energy Sector  
Freyeslebenstraße 1  
91058 Erlangen, Germany

Siemens AG  
Energy Sector  
Power Transmission Division  
High Voltage Products  
Nonnendammallee 104  
13629 Berlin, Germany  
[www.siemens.com/energy/arrester](http://www.siemens.com/energy/arrester)

Please contact us at:  
Phone: +49 30 386 33 222  
Fax: +49 30 386 26 721  
E-mail: [arrester@siemens.de](mailto:arrester@siemens.de)

Power Transmission Division  
Order No. E50001-G630-A135-V1-4A00 | Printed in Germany  
Dispo 30002 | c4bs No. 7457  
TH 263-101197 | BR | 472200 | PA | 03111.5

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