



Station Class Surge Arresters

Product Overview

Answers for energy.

SIEMENS

High Voltage – Reliable Protection



Just as the Golden Gate Bridge has successfully defied all winds, weather and earthquakes for decades, our surge arresters in the same environment exhibit all their properties and benefits to ensure they will meet the one target – to protect from lightning and switching overvoltages.



With decades of experience in the design and manufacturing of high voltage power supply components, Siemens also specializes in advanced Silicone Rubber (SR) insulated surge arresters providing the highest levels of mechanical strength, performance and safety even in the most demanding environments, such as in contaminated, industrially polluted, high seismic and vandal prone critical installations.

The product family of our surge arresters offers the right solution to any specific need. They have a proven fit for protecting transmission lines and transformers, as well as complete switch-gear against the hazards of high voltage start-up surges, line transients and lightning. Siemens surge arresters have been successfully tested to the latest ANSI/IEEE Standard C62.11-1999.

As pioneers in the field of Silicone Rubber (SR) insulation and one of the few suppliers with comprehensive inhouse research and development capabilities in this industry, we can also provide surge arresters customized to very special requirements. The cost-effectiveness of our products is underscored by uncompromising quality ensuring the long service life and reliability of each application.

Available off-the-shelf, the 3EL standard series of our SR surge arresters have been designed to meet the requirements of a wide range of common installation environments. For more demanding applications, our high-end 3EQ series will maintain at least 75% of its nominal mechanical strength in the event of a pressure relief, and can thus also be used as a "regular" support (station post) insulator.

Siemens Promise System Reliability



Silicone Rubber (SR) Insulation for Safety

Siemens offers two different types of arresters with SR housing: The 3EL series for standard applications, and the advanced 3EQ series for the highest performance needs. Both are designed using the same glass collared MOV-blocks resulting in the same outstanding electrical performance.

SR has been used as outdoor insulation material for over 25 years, with excellent service experience even under severe climatic and environmental conditions. Today, it is among the most widely used materials for HV outdoor equipment.

Silicone is highly hydrophobic. While there are many polymeric materials with similar initial hydrophobic properties, most of them lose their hydrophobicity after a relatively short period such as EPDM based alloy rubber. Only the true SR is capable of maintaining its hydrophobicity throughout its entire lifetime. This again ensures the long service life of our 3EL and 3EQ arresters.

Further key advantages of SR especially compared to EPDM based alloy rubber include:

- High resistance to tracking erosion
- Excellent resistance to flashover
- Superior UV stability
- Self-extinguishing flame retardancy
- Adaptability to variable design and ease of processing

For additional information call for our publication on Silicone Rubber insulation.

One Goal – 3 Designs

3EL Silicone Rubber (SR) Surge Arresters in Cage Design

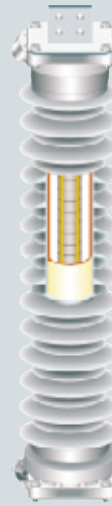
The standard 3EL series is based on a cage of prestressed fiber glass reinforced rods for high mechanical strength. The SR insulation is molded directly onto the MOV-Blocks. The design provides an optimum price/performance ratio for applications up to 362 kV system voltage. The new 3EL1 as intermediate class surge arrester is the enhancement of our product line 3EL.



3EL

3EQ Silicone Rubber (SR) Surge Arresters in Tube Design

The fiber reinforced plastic (FRP) tube material has been chosen to provide the highest possible mechanical strength. Due to its excellent processibility, the SR insulation is molded directly onto the FRP tube. The 3EQ tube design is considered the best choice for applications up to 800 kV system voltage, particularly in locations or installations with demanding environmental or extremely high mechanical/seismic requirements.



3EQ

3EP Porcelain Surge Arresters

The high-quality porcelain housing of the 3EP as well as the special grade sulfur cement bonding of housing and flanges both ensure outstanding mechanical strength, for applications up to 800 kV.



3EP

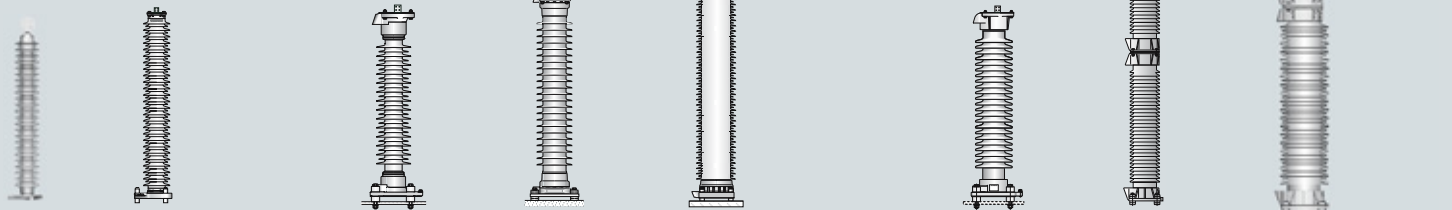
- Total enclosure of all components to avoid partial discharges or moisture ingress
- High mechanical performance for standard applications
- Silicone Rubber shielding provides low-pressure escape of the arc in the event of a short circuit
- Significant weight savings vs. comparable porcelain arresters, facilitating transport and installation of the arresters
- Suitable for use as substation and/or transmission line arresters

- FRP tube design for outstanding mechanical stability (much stronger than porcelain), combined with an excellent sealing system for long-life protection against ingress of moisture and partial discharges
- Highest level of safety in the event of short circuits, no ejection of any internal components
- Retention of at least 75% of initial mechanical strength even after short circuit and thus permits the use of the arrester as a support insulator
- Weight savings vs. comparable porcelain arresters
- Ideal for applications in areas exposed to high seismic activity, heavy wind loads and any other demanding mechanical impact
- Available as single-unit arrester rated up to 300 kV or two-unit arresters for up to 550 kV, minimizing the required number of units
- High reliability over a wide range of temperatures and extreme temperature changes from -67 F to +122 F (-55 °C to +50 °C)

- Reliable technology with a proven history
- Optimized glass collared MOV-block design
- Pressure relief system for very fast venting, providing the highest possible means of safety in areas requiring special protection
- Very high cantilever strength over 360,000 inch lbf
- Highly reliable sealing system and state of the art seal test set-up make Siemens arresters highly reliable

Product Range

For 3EQ and 3EP series we offer 3 models each. They differ mainly in diameter and length of the housings and size of the MOV-blocks to fulfill different customer requirements. At this time, the 3EL series has two models, and its range is being extended.



3EL1

3EL2

3EQ1

3EQ4

3EQ3

3EP4

3EP2

3EP3

Silicone Rubber

Porcelain

Reliable power transmission ...



Application: Fixed series capacitor protected by arrester banks, consisting of multi-column 3EP3 arresters connected in parallel

Key benefits: Improved power transmission quality.

Customer: ENTERGY Services Inc.

Project name: Jacinto

Location: Near Cleveland, Texas

... even in extreme climates ...



Application: Three advanced series 3-phase static compensators protected by arrester banks, consisting of multi-column arresters connected in parallel

Key benefits: Enhanced power transmission quality at high reliability under extreme climatic conditions.

All our arresters are capable of withstanding temperature extremes of -67 F to $+122\text{ F}$ ($-55\text{ }^{\circ}\text{C}$ to $+50\text{ }^{\circ}\text{C}$).

Customer: Hydro-Québec

Project name: Montagnais FSC

Location: Montagnais, Quebec, Canada

... and high seismic impact locations



Application: Innovative installation of 3EQ3 surge arresters for protection of hanging thyristor valves in a 500 kV HVDC long-distance power transmission system

Key benefits: Superior resistance to seismic shock for optimum reliability of HVDC transmission. These arresters are capable of withstanding seismic forces up to 1 g.

Customer: Los Angeles Department of Water and Power

Project name: Sylmar East, Valve Reconstruction

Location: Sylmar, California

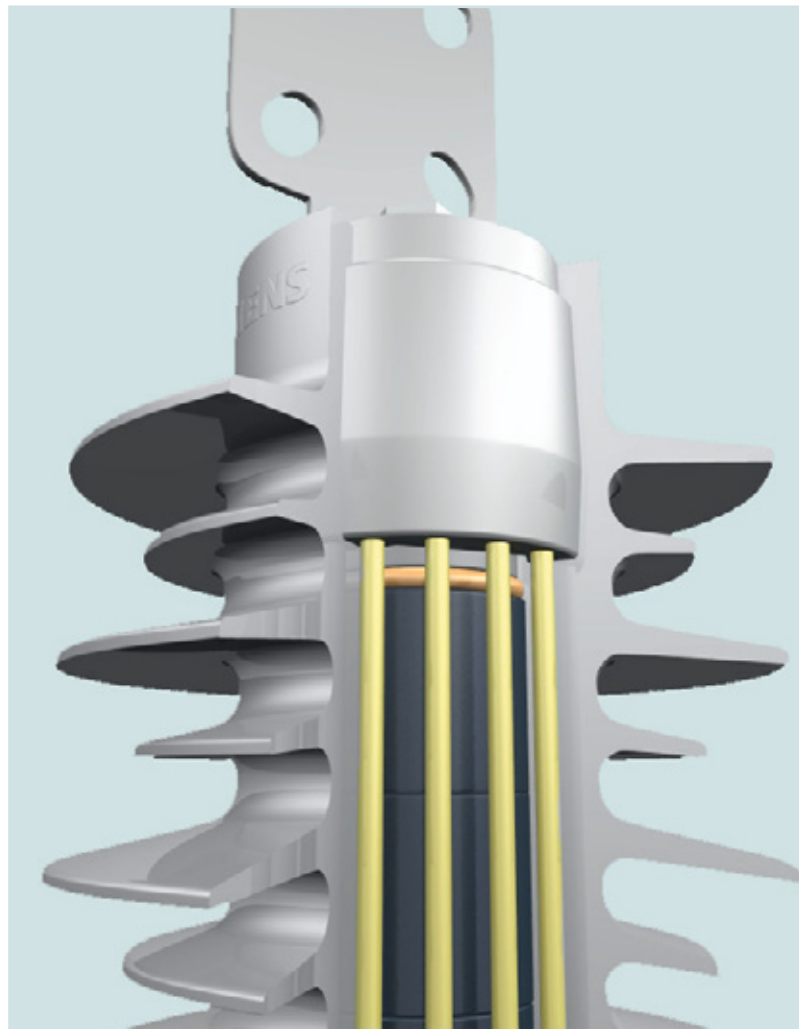
Rating and Specifications

Station Class – Silicone Rubber Housed Surge Arrester, Type 3EL1

Electrical Characteristics												
Duty cycle voltage	MCOV	TOV Capability ¹⁾	Protective level									Arrester order number
			Maximum discharge voltage									
			FOW ²⁾	for 8/20 μs					for 45/90 μs			
[kV]	[kV]	for 0.1 s [kV]	[kV cr]	1.5 kA [kV cr]	3 kA [kV cr]	5 kA [kV cr]	10 kA [kV cr]	20 kA [kV cr]	40 kA [kV cr]	250 A [kV cr]	500 A [kV cr]	
3	2.55	4.0	8.7	6.8	7.1	7.4	8.0	8.9	10.2	6.0	6.1	3EL1 003-1PC21-4YH5
6	5.1	8.0	17.5	13.5	14.2	14.8	15.9	17.8	20.4	11.9	12.2	3EL1 006-1PC21-4YH5
9	7.65	11.9	26.2	20.3	21.2	22.2	23.9	26.7	30.5	17.9	18.4	3EL1 009-1PC21-4YH5
10	8.4	13.1	29.2	22.5	23.6	24.6	26.5	29.7	33.9	19.9	20.4	3EL1 010-1PC21-4YH5
12	10.2	15.9	35.0	27.0	28.3	29.6	31.8	35.6	40.7	23.9	24.5	3EL1 012-1PC21-4YH5
15	12.7	19.8	43.7	33.8	35.4	37.0	39.8	44.5	50.9	29.8	30.6	3EL1 015-1PC21-4YH5
18	15.3	23.9	52.5	40.5	42.5	44.4	47.7	53.4	61.1	35.8	36.7	3EL1 018-1PC21-4YH5
21	17	26.5	61.2	47.3	49.5	51.8	55.7	62.3	71.2	41.7	42.9	3EL1 021-1PE21-4YH5
24	19.5	30.4	70.0	54.1	56.6	59.1	63.6	71.2	81.4	47.7	49.0	3EL1 024-1PE21-4YH5
27	22	34.3	78.7	60.8	63.7	66.5	71.6	80.1	91.6	53.7	55.1	3EL1 027-1PE21-4YH5
30	24.4	38.1	87.5	67.6	70.8	73.9	79.5	89.0	102	59.6	61.2	3EL1 030-1PE21-4YH5
36	29	45.2	105	81.1	84.9	88.7	95.4	107	122	71.6	73.5	3EL1 036-1PE21-4YH5
39	31.5	49.1	114	87.8	92.0	96.1	103	116	132	77.5	79.6	3EL1 039-1PH21-4YH5
45	36.5	56.9	131	101	106	111	119	134	153	89.4	91.8	3EL1 045-1PH21-4YH5
48	39	60.8	140	108	113	118	127	142	163	95.4	97.9	3EL1 048-1PH21-4YH5
54	42	65.5	157	122	127	133	143	160	183	107	110	3EL1 054-1PH21-4YH5
60	48	74.9	175	135	142	148	159	178	204	119	122	3EL1 060-1PH21-4YH5
72	57	88.9	210	162	170	177	191	214	244	143	147	3EL1 072-1PK21-4YH5
90	70	109	262	203	212	222	239	267	305	179	184	3EL1 090-1PK21-4YH5
96	76	119	280	216	226	237	254	285	326	191	196	3EL1 096-1PK21-4YH5
108	84	131	315	243	255	266	286	321	366	215	220	3EL1 108-1PH22-4YH5
120	98	153	350	270	283	296	318	356	407	239	245	3EL1 120-1PH22-4YH5
132	106	165	385	297	311	325	350	392	448	262	269	3EL1 132-1PQ22-4YH5
144	115	179	420	324	340	355	382	427	488	286	294	3EL1 144-1PQ22-4YH5

Table 1: Station Class – Silicone Rubber Housed Surge Arrester, Type 3EL1

Station class 3EL1	Up to
Maximum continuous operating voltage MCOV	115 kV
Duty cycle voltage	144 kV
Low-current, long-duration	500 A
High current pressure relief	65 kA
Low current pressure relief	600 A
High-current, short-duration	100 kA
Impulse classifying current	10 kA
Maximum design cantilever load-static (MDCL)	7430 lbf in
Energy absorption capability thermal	6.3 kJ/kV _{MCOV}
Energy absorption capability impulse	2.6 kJ / kV _{MCOV}



Mechanical Characteristics

Creep-age distance	Flashover distance	LIWV ²⁾	Height „H“	Weight
[inch]	[inch]	[kV]	[inch]	[lbs]
35.4	12.4	183	18.1	16
35.4	12.4	183	18.1	16
35.4	12.4	183	18.1	17
35.4	12.4	183	18.1	17
35.4	12.4	183	18.1	17
35.4	12.4	183	18.1	17
35.4	12.4	183	18.1	17
55.1	17.9	264	23.6	22
55.1	17.9	264	23.6	22
55.1	17.9	264	23.6	22
55.1	17.9	264	23.6	22
55.1	17.9	264	23.6	22
80.7	24.8	365	30.5	28
80.7	24.8	365	30.5	28
80.7	24.8	365	30.5	28
80.7	24.8	365	30.5	29
80.7	24.8	365	30.5	29
121	35.8	528	41.5	38
121	35.8	528	41.5	39
121	35.8	528	41.5	39
161	49.6	731	55.1	52
161	49.6	731	55.1	52
202	60.6	893	66.1	61
202	60.6	893	66.1	62

- 1) Temporary Overvoltage with no prior duty
- 2) 0.5 μs Front-Of-Wave Protective level: 10 kA for 360 kV Duty Cycle
- 3) Lightning impulse withstand voltage of arrester housing

Rating and Specifications

Station Class – Silicone Rubber Housed Arrester, Type 3EL2

Electrical Characteristics												
Duty cycle voltage	MCOV	TOV Capability ¹⁾	Protective level									Arrester order number
			Maximum discharge voltage									
			FOW ²⁾	for 8/20 μs					for 45/90 μs			
[kV]	[kV]	for 0.1 s [kV]	[kV cr]	1.5 kA [kV cr]	3 kA [kV cr]	5 kA [kV cr]	10 kA [kV cr]	20 kA [kV cr]	40 kA [kV cr]	250 A [kV cr]	500 A [kV cr]	
9	7.65	11.9	24.2	19.0	19.8	20.7	22.0	24.5	27.8	17.2	17.6	3EL2 009-2PC31-4NH5
10	8.4	13.1	26.4	20.7	21.6	22.6	24.0	26.7	30.3	18.8	19.2	3EL2 010-2PC31-4NH5
12	10.2	15.9	31.9	25.0	26.1	27.3	29.0	32.2	36.6	22.7	23.2	3EL2 012-2PC31-4NH5
15	12.7	19.8	39.6	31.0	32.4	33.9	36.0	40.0	45.4	28.1	28.8	3EL2 015-2PC31-4NH5
18	15.3	23.9	47.3	37.0	38.7	40.5	43.0	47.8	54.2	33.6	34.4	3EL2 018-2PC31-4NH5
21	17.0	26.5	55.0	43.0	45.0	47.0	50.0	55.5	63.0	39.0	40.0	3EL2 021-2PC31-4NH5
24	19.5	30.4	63.8	49.9	52.2	54.6	58.0	64.4	73.1	45.3	46.4	3EL2 024-2PC31-4NH5
27	22	34.3	71.5	55.9	58.5	61.1	65.0	72.2	81.9	50.7	52.0	3EL2 027-2PC31-4NH5
30	24.4	38.1	79.2	62.0	64.8	67.7	72.0	80.0	90.8	56.2	57.6	3EL2 030-2PC31-4NH5
36	29.0	45.2	94.6	74.0	77.4	80.9	86.0	95.5	108	67.1	68.8	3EL2 036-2PF31-4NH5
39	31.5	49.1	103	80.9	84.6	88.4	94.0	104	119	73.4	75.2	3EL2 039-2PF31-4NH5
45	36.5	56.9	119	92.9	97.2	102	108	120	136	84.3	86.4	3EL2 045-2PF31-4NH5
48	39	60.8	127	99	104	108	115	128	145	89.7	92.0	3EL2 048-2PF31-4NH5
54	42	65.5	143	112	117	122	130	144	164	101	104	3EL2 054-2PF31-4NH5
60	48	74.9	158	124	130	135	144	160	182	112	115	3EL2 060-2PF31-4NH5
72	57	88.9	190	149	156	163	173	192	218	135	138	3EL2 072-2PJ31-4NH5
90	70	109	238	186	194	203	216	240	272	169	173	3EL2 090-2PJ31-4NH5
96	76	119	253	198	207	216	230	255	290	179	184	3EL2 096-2PJ31-4NH5
108	84	131	285	223	233	244	259	288	326	202	207	3EL2 108-2PM31-4NH5
111	88	137	293	229	239	250	266	295	335	208	213	3EL2 111-2PM31-4NH5
120	98	153	317	248	259	271	288	320	363	225	230	3EL2 120-2PM31-4NH5
132	106	165	349	273	285	298	317	352	400	247	254	3EL2 132-2PQ32-4NH5
144	115	179	381	298	311	325	346	384	436	270	277	3EL2 144-2PQ32-4NH5
168	131	204	443	347	363	379	403	447	508	314	322	3EL2 168-2PJ32-4NH5
172	140	218	454	355	372	388	413	459	520	322	330	3EL2 172-2PJ32-4NH5
180	144	225	475	372	389	406	432	480	544	337	346	3EL2 180-2PJ32-4NH5
192	152	237	507	397	415	433	461	512	581	360	369	3EL2 192-2PJ32-4NH5
228	180	281	602	471	492	514	547	607	689	427	438	3EL2 228-2PW32-4NH5
240	190	296	634	495	518	542	576	639	726	449	461	3EL2 240-2PW32-4NH5
258	209	326	652	516	534	558	593	652	712	469	480	3EL2 258-3PW42-4NH5
264	212	331	668	528	546	571	607	668	728	480	492	3EL2 264-3PW42-4NH5
276	220	343	699	553	572	597	635	699	762	502	514	3EL2 276-3PW42-4NH5
288	230	359	728	576	596	622	662	728	794	523	536	3EL2 288-3PM42-4NH5
294	235	367	744	588	608	636	676	744	811	534	548	3EL2 294-3PM42-4NH5

Table 2: Station Class – Silicone Rubber Housed Arrester, Type 3EL2

Station class 3EL2	Up to
Maximum continuous operating voltage MCOV	235 kV
Duty cycle voltage	294 kV
Low-current, long-duration	1200 A
High current pressure relief	65 kA
Low current pressure relief	600 A
High-current, short-duration	100 kA
Impulse classifying current	10 kA
Maximum design cantilever load-static (MDCL)	24782 lbf in
Energy absorption capability thermal	10 kJ / kV _{MCOV}
Energy absorption capability impulse	3.5 kJ / kV _{MCOV}

Mechanical Characteristics

Creep-age distance	Flashover distance	LIWV ²⁾	Height „H“	Weight
[inch]	[inch]	[kV]	[inch]	[lbs]
59.1	16.0	235	19.0	35
59.1	16.0	235	19.0	36
59.1	16.0	235	19.0	36
59.1	16.0	235	19.0	36
59.1	16.0	235	19.0	37
59.1	16.0	235	19.0	37
59.1	16.0	235	19.0	37
59.1	16.0	235	19.0	37
59.1	16.0	235	19.0	38
59.1	16.0	235	19.0	38
94.4	24.8	365	27.8	47
94.4	24.8	365	27.8	48
94.4	24.8	365	27.8	48
94.4	24.8	365	27.8	49
94.4	24.8	365	27.8	50
94.4	24.8	365	27.8	51
151	38.8	571	41.9	65
151	38.8	571	41.9	68
151	38.8	571	41.9	69
179	45.9	676	48.9	77
179	45.9	676	48.9	77
179	45.9	676	48.9	79
245	54.7	900	69.4	99
245	63.6	900	69.4	108
301	77.6	900	83.5	132
301	77.6	900	83.5	133
301	77.6	900	83.5	134
301	77.6	900	83.5	137
329	84.6	1000	90.5	149
357	91.7	1000	97.5	155
329	84.6	1000	96.7	153
329	84.6	1000	96.7	155
329	84.6	1000	96.7	156
357	91.7	1100	104	165
357	91.7	1100	104	166

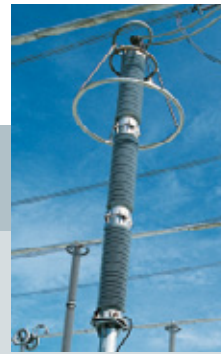


- 1) Temporary Overvoltage with no prior duty
- 2) 0.5 μs Front-Of-Wave Protective level: 10 kA for 360 kV Duty Cycle
- 3) Lightning impulse withstand voltage of arrester housing

Rating and Specifications

Station Class – Silicone Rubber Arrester, Type 3EQ and Porcelain Arrester, Type 3EP

If the offered values of our standard arresters type 3EQ and 3EP do not meet your requirements customized arresters can be provided on special request.



Porcelain type 3EP3
(420 kV)



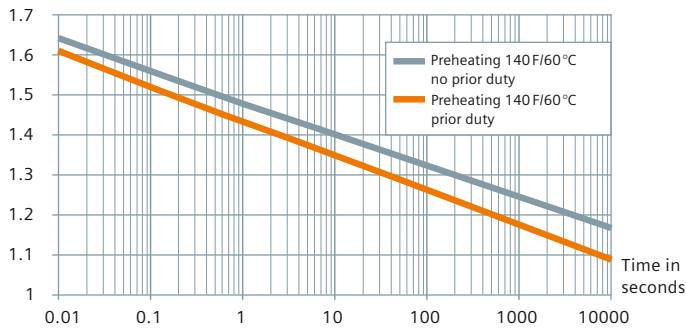
Silicone Rubber type 3EQ4 (550 kV)

Electrical Characteristics for 3EQ & 3EP

Duty cycle voltage	MCOV	TOV capability ²⁾	Protective level											Catalog number
			Maximum discharge voltage											
			for 0.1 s	for 8/20 μs (impulse)							for 45/90 μs (impulse)			
[kV]	[kV]	[kV]	FOW ³⁾	1.5 kA [kV]	3 kA [kV]	5 kA [kV]	10 kA [kV]	15 kA [kV]	20 kA [kV]	40 kA [kV]	500 A [kV]	1 kA [kV]	2 kA [kV]	
30	24.4	38	87.5	67.6	70.8	73.9	79.5	85.1	89.0	102	61.2	63.6	66.8	3EQ1 030-1PB21-4NH5
36	29.0	45	105	81.1	84.9	88.7	95.4	102	107	122	73.5	76.3	80.1	3EQ1 036-1PB21-4NH5
39	31.5	49	113	87.6	91.7	95.8	103	110	115	132	79.3	82.4	86.5	3EQ1 039-1PB21-4NH5
45	36.5	57	119	92.9	97.2	102	108	114	120	136	86.4	88.6	92.9	3EQ1 045-2PB31-4NH5
48	39	61	127	98.9	104	108	115	122	128	145	92.0	94.3	98.9	3EQ1 048-2PB31-4NH5
54	42	66	143	112	117	122	130	138	144	164	104	107	112	3EQ1 054-2PB31-4NH5
60	48	75	158	124	130	135	144	153	160	181	115	118	124	3EQ1 060-2PB31-4NH5
72	57	89	190	149	156	163	173	183	192	218	138	142	149	3EQ1 072-2PB31-4NH5
90	70	109	238	186	194	203	216	229	240	272	173	177	186	3EQ1 090-2PE31-4NH5
96	76	119	253	198	207	216	230	244	255	290	184	189	198	3EQ1 096-2PE31-4NH5
108	84	131	285	223	233	243	259	275	287	326	207	212	223	3EQ1 108-2PJ31-4NH5
111	88	137	293	229	239	250	266	282	295	335	213	218	229	3EQ1 111-2PJ31-4NH5
120	98	153	325	254	266	277	295	313	327	372	236	242	254	3EQ1 120-2PJ31-4NH5
132	106	165	349	273	285	298	317	336	352	399	254	260	273	3EQ1 132-2PP31-4NH5
144	115	179	381	298	311	325	346	367	384	436	277	284	298	3EQ1 144-2PP31-4NH5
168	131	204	443	347	363	379	403	427	447	508	322	330	347	3EQ1 168-2PS31-4NH5
172	140	218	454	355	372	388	413	438	458	520	330	339	355	3EQ1 172-2PJ32-4NH5
180	144	225	475	372	389	406	432	458	480	544	346	378	372	3EQ1 180-2PJ32-4NH5
192	152	237	507	396	415	433	461	489	512	581	369	378	396	3EQ1 192-2PJ32-4NH5
228	180	281	602	470	492	514	547	580	607	689	438	449	470	3EQ1 228-2PJ32-4NH5
240	190	296	634	495	518	541	576	611	639	726	461	472	495	3EQ1 240-2PJ32-4NH5
258	209	326	681	532	557	582	619	656	687	780	495	508	532	3EQ1 258-2PP32-4NH5
264	212	331	697	545	571	596	634	672	704	799	507	520	545	3EQ1 264-2PP32-4NH5
276	220	343	728	569	596	622	662	702	735	834	530	543	569	3EQ1 276-2PP32-4NH5
288	230	359	760	594	622	650	691	732	767	871	553	567	594	3EQ1 288-2PP32-4NH5
294	235	367	777	607	635	664	706	748	784	890	565	579	607	3EQ4 294-2PN32-4NH1
300	245	382	776	613	635	663	705	740	776	846	571	585	613	3EQ4 300-3PN42-4NH1
312	249	388	806	638	660	689	733	770	806	880	594	608	638	3EQ4 312-3PN42-4NH1
336	272	424	869	687	711	743	790	830	869	948	640	656	687	3EQ4 336-3PR42-4NH1
360	291	454	931	736	761	795	846	888	931	1,015	685	702	736	3EQ4 360-3PR42-4NH1
396	318	496	1,075	819	857	884	931	978	1,015	1,108	763	791	819	3EQ4 396-4PV52-4NH1
420	335	523	1,116	850	889	918	966	1,014	1,053	1,150	792	821	850	3EQ4 420-4PV52-4NH1
444	353	551	1,133	881	911	941	990	1,030	1,069	1,168	832	851	881	3EQ4 444-5PV52-4NH1
468	372	580	1,240	929	960	992	1,044	1,086	1,128	1,232	877	898	929	3EQ3 468-5PV52-4NH1
588	470	733	1,557	1,167	1,206	1,245	1,311	1,363	1,416	1,547	1,101	1,127	1,167	3EQ3 588-5PT53-4NH1
612	485	757	1,622	1,215	1,256	1,297	1,365	1,420	1,474	1,611	1,147	1,174	1,215	3EQ3 612-5PU53-4NH1

Table 3: Station Class – Silicone Rubber Arrester, Type 3EQ and Porcelain Arrester, Type 3EP

Voltage per unit MCOV



TOV characteristics – valid for all surge arresters in this catalogue

Station class 3EP and 3EQ	Up to
Maximum continuous operating voltage MCOV	485 kV
Duty cycle voltage	612 kV
Low-current, long-duration	2100 A
High current pressure relief	65 kA
Low current pressure relief	600 A
High-current, short-duration	100 kA
Impulse classifying current	20 kA
Maximum design cantilever load-static (MDCL)	361110 lbf in
Energy absorption capability thermal	22.5 kJ / kV _{MCOV}
Energy absorption capability impulse	14 kJ / kV _{MCOV}

Mechanical Characteristics for 3EQ (Silicone)

Mechanical Characteristics for 3EP (Porcelain)

Short circuit current	Creep-age distance	Weight	Height	Grading ring diameter	Canti-lever	Flash-over distance	LIWV ⁴⁾	Catalog number	Short circuit current	Creep-age distance	Weight	Height	Grading ring diameter	Canti-lever	Flash-over distance	BIL
0.2 s									0.2 s							
[kA]	[in]	[lbs]	[in]	[in]	[inch-lbf]	[in]	[kV]		[kA]	[in]	[lbs]	[in]	[in]	[inch-lbf]	[in]	[kV]
50	81.6	46	34.8	–	37.173	23.6	348	3EP4 030-1PC21-3NH5	65	38.5	53	21.9	–	47.794	13.9	206
50	81.6	46	34.8	–	37.173	23.6	348	3EP4 036-1PC21-3NH5	65	38.5	53	21.9	–	47.794	13.9	206
50	81.6	46	34.8	–	37.173	23.6	348	3EP4 039-1PC21-3NH5	65	38.5	53	21.9	–	47.794	13.9	206
50	81.6	53	34.8	–	37.173	23.6	348	3EP4 045-2PD31-3NH5	65	98.0	99	41.3	–	47.794	32.8	484
50	81.6	53	34.8	–	37.173	23.6	348	3EP4 048-2PD31-3NH5	65	98.0	99	41.3	–	47.794	32.8	484
50	81.6	55	34.8	–	37.173	23.6	348	3EP4 054-2PD31-3NH5	65	98.0	101	41.3	–	47.794	32.8	484
50	81.6	57	34.8	–	37.173	23.6	348	3EP4 060-2PD31-3NH5	65	98.0	104	41.3	–	47.794	32.8	484
50	81.6	60	34.8	–	37.173	23.6	348	3EP4 072-2PD31-3NH5	65	98.0	106	41.3	–	47.794	32.8	484
40	103.7	68	40.7	–	37.173	29.5	435	3EP4 090-2PD31-3NH5	65	98.0	110	41.3	–	47.794	32.8	484
40	103.7	71	40.7	–	37.173	29.5	435	3EP4 096-2PD31-3NH5	65	98.0	112	41.3	–	47.794	32.8	484
40	133.4	79	48.6	–	37.173	37.4	551	3EP4 108-2PE31-3NH5	65	134.0	143	51.8	–	47.794	44.6	658
40	133.4	79	48.6	–	37.173	37.4	551	3EP4 111-2PE31-3NH5	65	134.0	143	51.8	–	47.794	44.6	658
40	133.4	84	48.6	–	37.173	37.4	551	3EP4 120-2PE31-3NH5	65	134.0	146	51.8	–	47.794	44.6	658
40	170.4	93	58.5	–	37.173	47.2	696	3EP4 132-2PE31-3NH5	65	134.0	150	51.8	–	47.794	44.6	658
40	170.4	95	58.5	–	37.173	47.2	696	3EP4 144-2PF31-3NH5	50	150.9	163	57.5	–	47.794	49.0	722
40	192.7	108	64.4	31.5	37.173	53.1	783	3EP4 168-2PD32-3NH5	65	196.0	231	82.7	31.5	47.794	65.7	750
40	266.9	152	97.2	31.5	37.173	72.8	900	3EP4 172-2PD32-3NH5	65	196.0	234	82.7	31.5	47.794	65.7	750
40	266.9	152	97.2	31.5	37.173	72.8	900	3EP4 180-2PD32-3NH5	65	196.0	234	82.7	31.5	47.794	65.7	750
40	266.9	154	97.2	31.5	37.173	72.8	900	3EP4 192-2PD32-3NH5	65	196.0	238	82.7	31.5	47.794	65.7	750
40	266.9	168	97.2	31.5	37.173	72.8	900	3EP4 228-2PD32-4NH5	65	268.1	302	103.5	31.5	47.794	80.5	950
40	266.9	170	97.2	31.5	37.173	72.8	900	3EP2 240-2PF32-3NH1	65	251.1	437	115.4	39.4	132.761	83.6	1,050
40	340.9	198	116.9	39.4	37.173	85.0	1,050	3EP2 258-2PG32-3NH1	65	283.8	478	127.6	39.4	132.761	95.6	1,200
40	340.9	198	116.9	39.4	37.173	85.0	1,050	3EP2 264-2PG32-3NH1	65	283.8	478	127.6	39.4	132.761	95.6	1,200
40	340.9	201	116.9	39.4	37.173	85.0	1,050	3EP2 276-2PG32-3NH1	65	283.8	481	127.6	39.4	132.761	95.6	1,200
40	340.9	205	116.9	39.4	37.173	85.0	1,050	3EP2 288-2PG32-4NH1	65	317.7	602	127.6	39.4	132.761	95.6	1,200
65	400.3	392	138.6	47.2	130.106	100	1,300	3EP2 294-2PG32-4NH1	65	317.7	606	127.6	39.4	132.761	95.6	1,200
65	400.3	430	138.6	47.2	130.106	100	1,300	3EP2 300-3PG42-4NH1	65	317.7	644	127.6	39.4	132.761	95.6	1,200
65	400.3	434	138.6	47.2	130.106	100	1,300	3EP2 312-3PG42-4NH1	65	317.7	648	127.6	39.4	132.761	95.6	1,200
65	400.3	467	138.6	70.9	130.106	100	1,300	3EP2 336-3PD43-4NH1	65	346.6	752	145.9	47.2	132.761	110	1,300
65	400.3	476	138.6	70.9	130.106	100	1,300	3EP2 360-3PF43-3NH1	65	376.6	675	173.0	47.2	132.761	123	1,700
65	400.3	553	138.6	70.9	130.106	100	1,300	3EP2 396-4PF53-4NH1	65	414.5	899	173.0	70.9	132.761	123	1,700
65	607.4	564	193.7	70.9	130.106	134	1,850	3EP2 420-4PD54-4NH1	65	462.2	1010	194.5	70.9	132.761	137	1,800
65	607.4	721	193.7	70.9	130.106	134	1,850	3EP3 444-5PH53-4NH1	65	552.1	1770	193.7	70.9	361.110	142	1,750
65	651.9	928	204.7	70.9	260.212	144	1,800	3EP3 468-5PH53-4NH1	65	552.1	1784	193.7	70.9	361.110	142	1,750
65	889.3	1259	283.5	86.6	260.212	200	2,400	3EP3 588-5PK54-4NH1	65	868.5	2630	294.5	86.6	361.110	211	2,500
65	925.5	1305	295.3	86.6	260.212	212	2,500	3EP3 612-5PK54-4NH1	65	868.5	2648	294.5	86.6	361.110	211	2,500

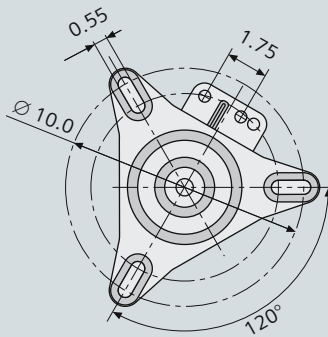
1) Cantilever strength: MDCL-static acc. to IEEE Std C62.11-1999
 2) Temporary overvoltage with no prior duty
 3) 0.5 μs front-of-wave protective level: 10 kA for 240 kV duty cycle, 15 kA for 396–444 kV duty cycle, 20 kA for 468–612 kV duty cycle
 4) Lightning impulse withstand voltage of arrester housing

Typical Station Class Arresters Assigned to Respective Voltages

Max system L-L voltage	Max system voltage L-G	Station class surge arrester	Station class surge arrester			
[kV]	[kV]	3EL1	3EL2	3EQ	3EP	
4.37	2.52	3EL1 003-1PC21-4YH5				
8.73	5.04	3EL1 006-1PC21-4YH5				
13.1	7.56	3EL1 009-1PC21-4YH5	3EL2 009-2PF31-4NH5			
		3EL1 010-1PC21-4YH5	3EL2 010-2PF31-4NH5			
		3EL1 012-1PC21-4YH5	3EL2 012-2PF31-4NH5			
13.86	8.00	3EL1 010-1PC21-4YH5	3EL2 010-2PF31-4NH5			
		3EL1 012-1PC21-4YH5	3EL2 012-2PF31-4NH5			
		3EL1 015-1PC21-4YH5	3EL2 015-2PF31-4NH5			
14.5	8.37	3EL1 010-1PC21-4YH5	3EL2 010-2PF31-4NH5			
		3EL1 012-1PC21-4YH5	3EL2 012-2PF31-4NH5			
		3EL1 015-1PC21-4YH5	3EL2 015-2PF31-4NH5			
26.2	15.1	3EL1 018-1PC21-4YH5	3EL2 018-2PF31-4NH5			
		3EL1 021-1PE21-4YH5	3EL2 021-2PF31-4NH5			
		3EL1 024-1PE21-4YH5	3EL2 024-2PF31-4NH5			
36.2	20.9	3EL1 027-1PE21-4YH5	3EL2 027-2PF31-4NH5			
		3EL1 030-1PE21-4YH5	3EL2 030-2PF31-4NH5	3EQ1 030-1PB21-4NH5	3EP4 030-1PC21-3NH5	
		3EL1 036-1PE21-4YH5	3EL2 036-2PF31-4NH5	3EQ1 036-1PB21-4NH5	3EP4 036-1PC21-3NH5	
48.3	27.8	3EL1 036-1PE21-4YH5	3EL2 036-2PF31-4NH5	3EQ1 036-1PB21-4NH5	3EP4 036-1PC21-3NH5	
		3EL1 039-1PH21-4YH5	3EL2 039-2PF31-4NH5	3EQ1 039-1PB21-4NH5	3EP4 039-1PC21-3NH5	
		3EL1 045-1PH21-4YH5	3EL2 045-2PF31-4NH5	3EQ1 045-2PB31-4NH5	3EP4 045-2PD31-3NH5	
72.5	41.8	3EL1 048-1PH21-4YH5	3EL2 048-2PF31-4NH5	3EQ1 048-2PB31-4NH5	3EP4 048-2PD31-3NH5	
		3EL1 054-1PH21-4YH5	3EL2 054-2PF31-4NH5	3EQ1 054-2PB31-4NH5	3EP4 054-2PD31-3NH5	
		3EL1 060-1PH21-4YH5	3EL2 060-2PF31-4NH5	3EQ1 060-2PB31-4NH5	3EP4 060-2PD31-3NH5	
121	69.8	3EL1 072-1PK21-4YH5	3EL2 072-2PJ31-4NH5	3EQ1 072-2PB31-4NH5	3EP4 072-2PD31-3NH5	
		3EL1 090-1PK21-4YH5	3EL2 090-2PJ31-4NH5	3EQ1 090-2PE31-4NH5	3EP4 090-2PD31-3NH5	
		3EL1 096-1PK21-4YH5	3EL2 096-2PJ31-4NH5	3EQ1 096-2PE31-4NH5	3EP4 096-2PD31-3NH5	
145	83.7	3EL1 108-1PH22-4YH5	3EL2 108-2PM31-4NH5	3EQ1 108-2PJ31-4NH5	3EP4 108-2PE31-3NH5	
		3EL1 120-1PH22-4YH5	3EL2 120-2PM31-4NH5	3EQ1 120-2PJ31-4NH5	3EP4 120-2PE31-3NH5	
		3EL1 108-1PH22-4YH5	3EL2 108-2PM31-4NH5	3EQ1 108-2PJ31-4NH5	3EP4 108-2PE31-3NH5	
169	97.5	3EL1 120-1PH22-4YH5	3EL2 120-2PM31-4NH5	3EQ1 120-2PJ31-4NH5	3EP4 120-2PE31-3NH5	
		3EL1 132-1PQ22-4YH5	3EL2 132-2PQ32-4NH5	3EQ1 132-2PP31-4NH5	3EP4 132-2PE31-3NH5	
		3EL1 144-1PQ22-4YH5	3EL2 144-2PQ32-4NH5	3EQ1 144-2PP31-4NH5	3EP4 144-2PF31-3NH5	
242	139		3EL2 120-2PM31-4NH5	3EQ1 120-2PJ31-4NH5	3EP4 120-2PE31-3NH5	
			3EL2 132-2PQ32-4NH5	3EQ1 132-2PP31-4NH5	3EP4 132-2PE31-3NH5	
			3EL2 144-2PQ32-4NH5	3EQ1 144-2PP31-4NH5	3EP4 144-2PF31-3NH5	
362	209		3EL2 168-2PJ32-4NH5	3EQ1 168-2PS31-4NH5	3EP4 168-2PD32-3NH5	
			3EL2 172-2PJ32-4NH5	3EQ1 172-2PJ32-4NH5	3EP4 172-2PD32-3NH5	
			3EL2 172-2PJ32-4NH5	3EQ1 172-2PJ32-4NH5	3EP4 172-2PD32-3NH5	
550	317		3EL2 180-2PJ32-4NH5	3EQ1 180-2PJ32-4NH5	3EP4 180-2PD32-3NH5	
			3EL2 192-2PJ32-4NH5	3EQ1 192-2PJ32-4NH5	3EP4 192-2PD32-3NH5	
			3EL2 228-2PW32-4NH5	3EQ1 228-2PJ32-4NH5	3EP4 228-2PD32-4NH5	
800	461		3EL2 240-2PW32-4NH5	3EQ1 240-2PJ32-4NH5	3EP2 240-2PF32-3NH1	
			3EL2 258-3PW42-4NH5	3EQ1 258-2PP32-4NH5	3EP2 258-2PG32-3NH1	
			3EL2 264-3PW42-4NH5	3EQ1 264-2PP32-4NH5	3EP2 264-2PG32-3NH1	
		3EL2 276-3PW42-4NH5	3EQ1 276-2PP32-4NH5	3EP2 276-2PG32-3NH1		
		3EL2 288-3PM42-4NH5	3EQ1 288-2PP32-4NH5	3EP2 288-2PG32-4NH1		
		3EL2 294-3PM42-4NH5	3EQ4 294-2PN32-4NH1	3EP2 294-2PG32-4NH1		
			3EQ4 300-3PN42-4NH1	3EP2 300-3PG42-4NH1		
			3EQ4 312-3PN42-4NH1	3EP2 312-3PG42-4NH1		
			3EQ4 396-4PV52-4NH1	3EP2 396-4PF53-4NH1		
			3EQ4 420-4PV52-4NH1	3EP2 420-4PD54-4NH1		
			3EQ4 444-5PV52-4NH1	3EP3 444-5PH53-4NH1		
			3EQ3 468-5PV52-4NH1	3EP3 468-5PH53-4NH1		
			3EQ3 588-5PT53-4NH1	3EP3 588-5PK54-4NH1		
			3EQ3 612-5PU53-4NH1	3EP3 612-5PK54-4NH1		

3EL1 Base, Line Terminal and Standard Terminal Connector Assembly

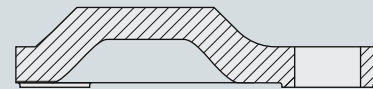
3EL1



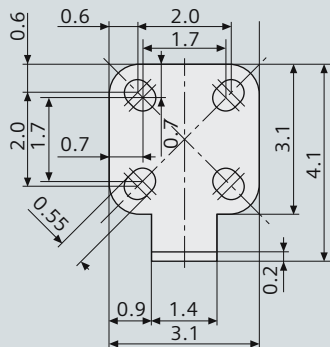
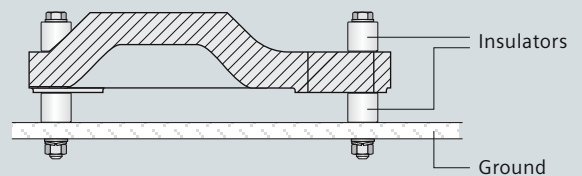
3EL1

3EL1

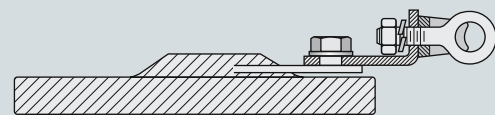
grounded



isolated



Flat terminal 3EL1



Standard Connector Terminal 3EL1

Control Devices for Surge Arresters

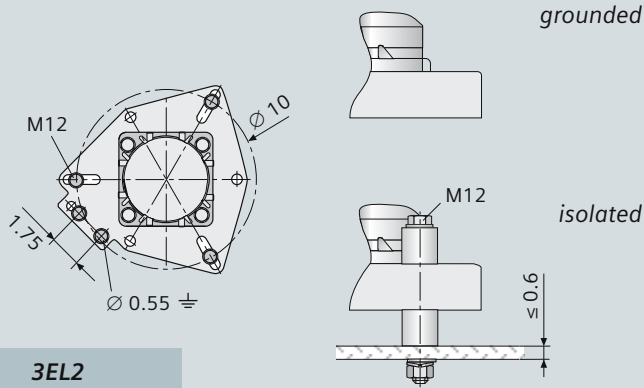


Control spark gap 3EX6040

To estimate the current that flows through the surge arrester in case of an overvoltage depending on the size of burning marks and to count the surges

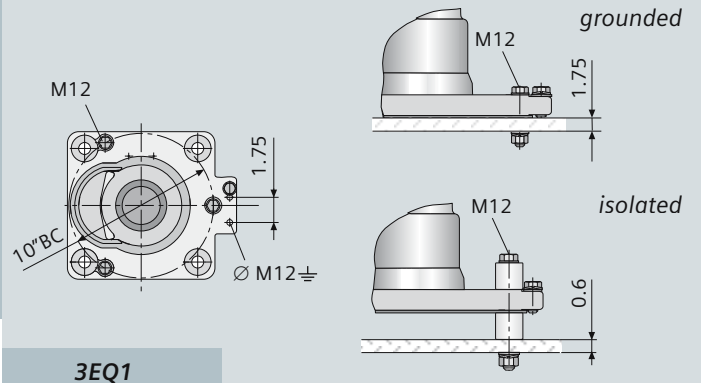
Adapter Plates for Varying Mounting Requirements

3EL2

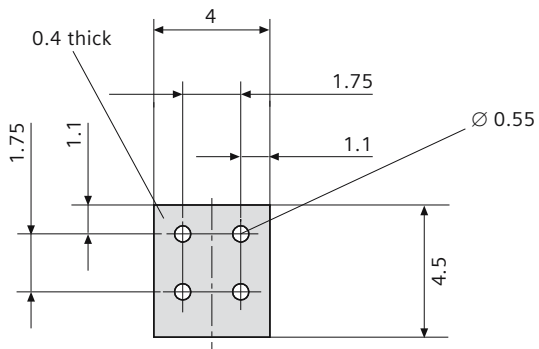


3EL2

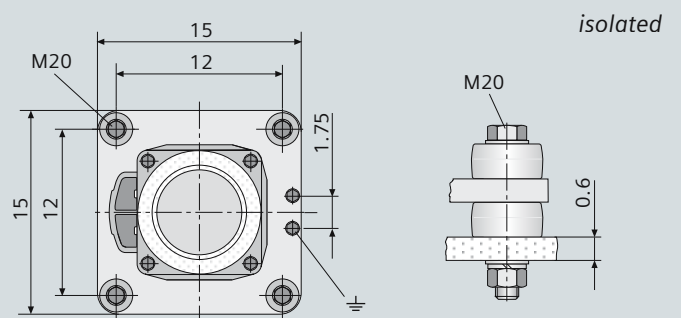
3EQ



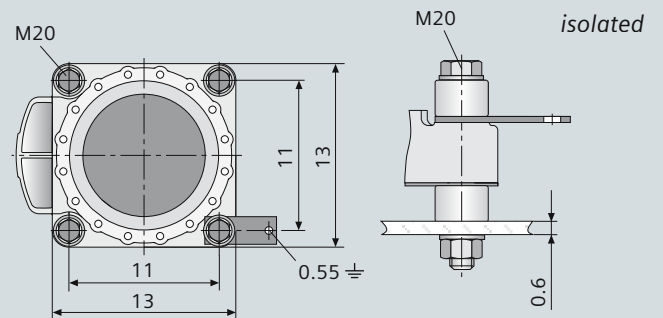
3EQ1



All types are equipped with NEMA 4-hole HV-terminal:



3EQ4



3EQ3



Surge counter
3EX5030



Surge counter 3EX5050
with leakage current meter



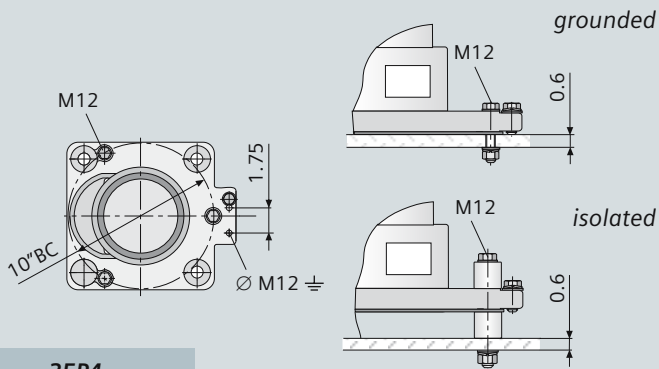
Sensor 3EX5060



Display unit 3EX5062

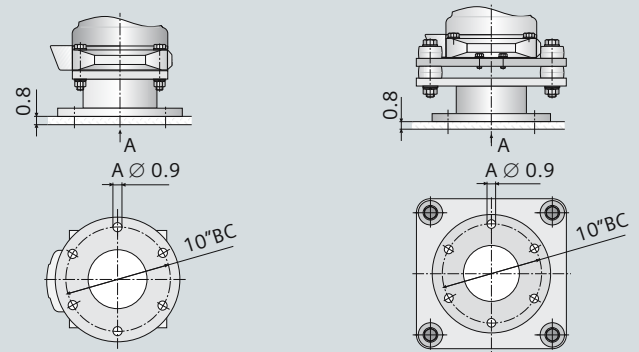
Surge counter with leakage current meter for using the display unit far away from the surge arrester up to distances of max. 220 yards

3EP



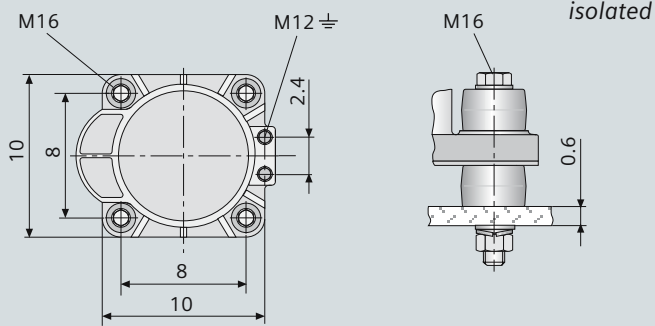
3EP4

Option on request

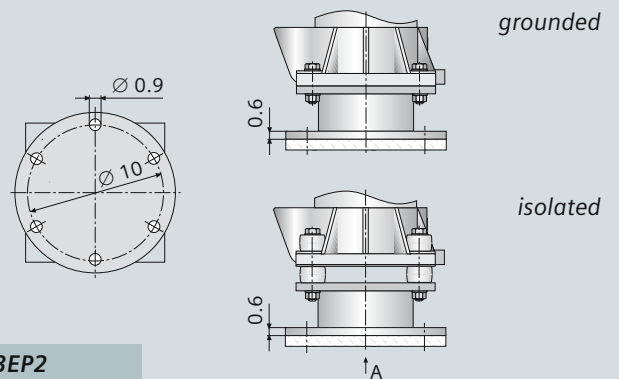


3EQ4 grounded

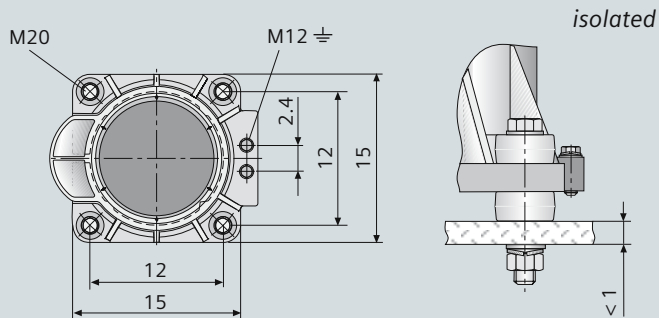
3EQ4 isolated



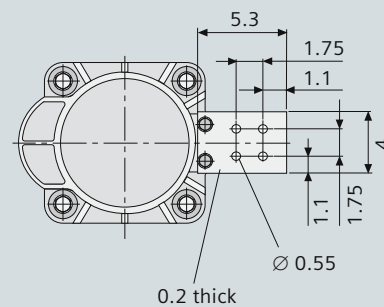
3EP2



3EP2



3EP3



NEMA-ground terminal for 3EQ4, 3EQ3, 3EP2, 3EP3

All dimensions in inches

Siemens Power Transmission
and Distribution Inc.
Arrester Products
444 Highway 49 S.
Richland, MS 39218
Phone 601-932-9800
Fax 601-932-9911

www.usa.siemens.com/energy
www.siemens.com/arrester-download

Order No. E50001-U113-A298-V4-US00
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TH 263-080160 103132 PA 04081.0

The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases.
The required features should therefore be specified in each individual case at the time of closing the contract.