SIEMENS energy

STARON

25 – 500 kV

OIP transformer condenser bushings
porcelain and composite insulator

IEEE standard

siemens-energy.com/bushings

1 General information

Siemens Energy released our enhanced STARON portfolio to complete the offer for the IEEE market. Together with STAROIP, which provides the unique feature of stainless steel bellows as oil expansion chamber, these are both designed following the high quality standards of Siemens Energy and provides increased grid performance thanks to the electrical and thermal margins included in the design and type tests performed beyond IEEE standard requirements.

STARON is the enhanced generation of Siemens Energy OIP (Oil Impregnated Paper) condenser bushing, with voltage ratings between 25 kV and 500 kV, specifically designed to meet IEEE market requirements, with an optimized design based on the conventional IEEE standards.

The STARON series complies with world-wide international standards and has been specifically designed and tested according to IEEE C57.19.01-2017 and IEEE C57.19.00-2004. STARON portfolio meets all applicable dimensional requirements of IEEE C57.19.01-2017 standard, allowing interchangeability with your installed base.

Your benefits with STARON bushing

- Air side insulator: porcelain cemented into the flange for increased cantilever withstand capability or composite silicone insulator
- Oil side epoxy insulator providing high impact resistance and reduced size
- Embedded end shield in the epoxy insulator eliminates external shielding in draw lead applications up to 230 kV and provides greater internal clearances
- High electrical and thermal margins
- Horizontal transportation and storage
- Replacement:
  Draw lead adapters to allow replacement of old draw lead bushings without modification of the existing stud/bolt & cable
- Qualified for optional ambient temperature down to -60°C
- Customizable solution for specific operating conditions
- Full portfolio available from 25 kV to 500 kV

STARON	Unit									
Nominal system voltage	kV	25	34,5	69	115	138	161	230	345	500
Max. line-to-ground voltage	kV	16	22	44	88	102	146	146	220	318
Rated lightning impulse withstand voltage (BIL)	kV	150	200	350	550	650	750	900	1175	1675
Power frequency withstand voltage (60 Hz, 1 min, dry)	kV	60	80	160	260	310	365	425	520	750
Max. service current with draw lead cond.	A	1200	1200	1200	1200	1200	1200	1200	800	800
Max. rated current with fixed cond.	A	3000	3000	3000	3000	3000	3000	3000	3000	3000
Arcing distance	mm (in)	235 (9.25)	340 (13.38)	600 (23.62)	1050 (41.34)	1250 (49.21)	1460 (57.48)	2150 (84.65)	2400 (94.50)	3800 (149.60)
Minimum Creepage distance	mm (in)	780 (30.70)	1120 (44.10)	2248 (88.50)	3813 (150.12)	4495 (176.97)	5270 (207.48)	7603 (299.33)	9760 (384.25)	17864 (703.31)
Contamination level per C57.19.100				Extra heavy					Heavy	
Oil-side end acc. to IEEE C57.19.01										
Length for 800/1200 A	mm (in)	749 (29.50)	724 (28.50)	952 (37.50)	1092 (43.00)	1188 (46.75)	1276 (50.25)	1276 (50.25)	1295 (51.00)	1651 (65.00)
Dmax for 800 / 1200 A	mm (in)	79 (3.15)	80 (3.15)	100 (3.94)	130 (5.12)	130 (5.12)	175 (6.89)	200 (7.87)	235 (9.25)	291 (11.45)
Length for 2000 / 3000 A	mm (in)	800 (31.50)	851 (33.50)	1003 (39.50)	1092 (43.00)	1188 (46.75)	1276 (50.25)	1276 (20.25)	1295 (51.00)	1651 (65.00)
Dmax for 2000/ 3000 A	mm (in)	92 / 100 (3.94)	100 (3.94)	130 (5.12)	150 / 190 (6) / (7.5)	150 / 190 (6) / (7.5)	190 (7.48)	220 (8.66)	250 (9.84)	315 (12.40)
CT space	mm (in)	534 (21.00)	534 (21.00)	534 (21.00)	584 (23.00)	584 (23.00)	584 (23.00)	584 (23.00)	584 (23.00)	584 (23.00)
Connecting dimensions for draw lead bolt and removable conductor										
Top terminal dimension	in	1.5-12UNF-2A x 2.13			1.5-12UNF-2A x 2.00					
DL Tube inner diameter	mm (in)	35.7 (1.4)	35.7 (1.4)	35.7 (1.4)	41 (1.6)	41 (1.6)	41 (1.6)	55 (2.2)	55 (2.2)	58 (2.3)
Bottom terminal removable conductor					acc. to IEEE C57.19.01-2017					
Connecting dimensions for solid conductor										
Top terminal dimension	in	For 2000A: 1.50-12UNF-2A x 2.50						For 3000A: 2.00-12UNF-2A x 3.00		
Bottom terminal					acc. to IEEE C57.19.01-2017					
Flange dimensions										
Imax: 800 / 1200 / 2000 A										
Bolt circle diameter	mm (in)	184 (7.25)	184 (7.25)	235 (9.25)	337 (13.25)	362 (14.25)	400 (15.75)	533.4 (21.00)	533.4 (21.00)	635 (25.00)
Number of holes		4	4	6	6	6	8	12	12	12
Hole size	mm (in)	24 (0.94)*	24 (0.94)*	23 (0.88)	32 (1.25)	32 (1.25)	32 (1.25)	32 (1.25)	32 (1.25)	32 (1.25)
Imax: 3000 A										**2000A: 23 (0.88)*
Bolt circle diameter	mm (in)	209.6 (8.25)	235 (9.25)	260.4 (10.25)	337 (13.25)	362 (14.25)	400 (15.75)	533.4 (21.00)	533.4 (21.00)	635 (25.00)
Number of holes		4	6	6	6	6	8	12	12	12
Hole size	mm (in)	23 (0.88)	23 (0.88)	23 (0.88)	32 (1.25)	32 (1.25)	32 (1.25)	32 (1.25)	32 (1.25)	32 (1.25)

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