

PORCELAIN BUSHINGS

HV Series



Cedaspe core product, with hundreds of available configurations



BUSHINGS: GENERAL INFORMATION

1.0 Electrical characteristics (I_r = rated current; U_r = rated voltage)

1.1 Standard insulation levels (IEC 60137 ed 6.0)

Rated voltage U _r kV (r.m.s.)	One minute power frequency withstand voltage wet (dry) kV (r.m.s.)	Dry lightning impulse withstand voltage dry (1,2/50 ms) kV
1	10	20
3,6	10 (15)	40
12	28 (30)	75
24	50 (55)	125
36	70 (77)	170
52	95 (105)	250

1.2 Standard values of rated thermal short time current (I_{th}) 25 times the rated current (I_r) for 2 s ; for I_r equal or greater than 4000A, I_{th} is always 100kA

1.3 Overload conditions (IEC 354): Bushing selected with I_r not less than 120% of the rated current of the transformers are considered to be able to withstand the overload conditions according to IEC 354.

2.0 Mechanical characteristic

2.1 Cantilever operating load (bushing installed less than 30° from vertical)

U _r kV	I _r			
	800 A	1600 A	2500 A	3150 A
36	500 N	625 N	1000 N	1575 N
52	500 N	625 N	1000 N	1575 N

2.2 Cantilever operating load (bushing installed more than 30° from vertical)

U _r kV	I _r			
	800 A	1600 A	2500 A	3150 A
36	300 N	375 N	600 N	945 N
52	300 N	375 N	600 N	945 N

2.3 Cantilever test load

U _r kV	I _r			
	800 A	1600 A	2500 A	3150 A
36	1000 N	1250 N	2000 N	3150 N
52	1000 N	1250 N	2000 N	3150 N

3.0 Tightening torque (suggested values, +/- 10% depending on the quality of the tank cover surface)

3.1 On the central conductor LV/HV in brass or copper




CEDASPE S.p.a
 S. Giuliano Milanese (ITALY)

- ▶ Closing nut partially tightened for transport / storing
 ATTENTION: complete the tightening before testing / commissioning
- ▶ Die Mutter ist aus Transportgründen Und Lagergründen.
 ACHTUNG: Vor in Betrieb nahme sind alle Teile nochmals anzuziehen.
- ▶ Tuerca parcialmente serrada para transporte y para tenerlo en almacen
 ATENCION: completar el serraje de la tuerca antes de la puesta en marcha
- ▶ ATTENTION: Écrous partiellement vissé pour le transport et stockage.
 Le visser complètement avant essai/mise en service
- ▶ Dado parzialmente serrato per il trasporto / immagazzinamento.
 ATTENZIONE: completare il serraggio prima del collaudo / messa in servizio

Tightening Torque (+/-10%)

Current	Size	Torque
250 A	M12	13 Nm
630 A	M20	30 Nm
1250 A	M30x2	70 Nm
2000 A	M42x3	115 Nm
3150 A	M48x3	150 Nm
4500 A	M55x3	200 Nm
6300 A	M75x3	200 Nm
5000/8000 A	M90x4	200 Nm

3.2 On the steel fixing stud of HV bushings

Size	Torque
M10	15 Nm
M12	25 Nm
M16	40 Nm

3.3 On the locking bolts of the flags

Size	Torque
M10	25 Nm
M12	40 Nm
M16	90 Nm

4.0 Surface treatment of active metallic parts

Standard scope of supply does not include any surface treatment or plating.
Upon request, particularly for use in highly polluted environmental conditions or in tropical climate, all metal parts (in copper or brass) air side can be supplied with 6-8 micron thickness electrolytic tinplating

5.0 Gaskets

During the impregnation of the transformer it is possible to reach the max temperature of 110°C in oil and 120°C in air for 24 hours, without damaging the gaskets.

Unless contrary request, the material normally used for the gaskets is NBR (nitrile rubber) suitable for use with mineral oils with MIN ambient temperature of -30°C and MAX temperature of +120°C (up to 130°C during drying process/vapour phase).

Upon request available cork rubber impregnated gaskets, or in Viton, or in silicon rubber.

NBC (Cork TD1120): Temp. range: -30°C/+120°C (up to 130°C during drying process/vapour phase).

Cork TD7000: Temp. range: -45°C/+120°C (up to 130°C during drying process/vapour phase)

VITON: Temp. range: -20°C/+150°C (recommended when bushing is installed inside a cable box or a cable duct)

Fluoro Silicone: Temp. range: -60°C/+150°C

6.0 Centering ring

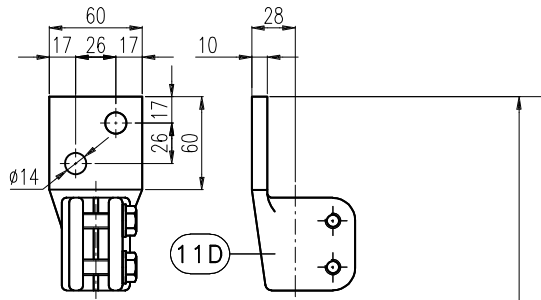
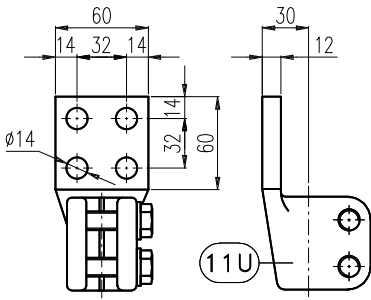
All our bushings HV 1000 to 4500 A are fit by default with a ring to center the conductor in the lower part,
The advantages offered by this solution are a better distribution of the electric field in the fixation area and a better release of the mechanical stress due to the connections under oil

This ring is made by default in nylon PA6; on demand we can supply it in pressboard

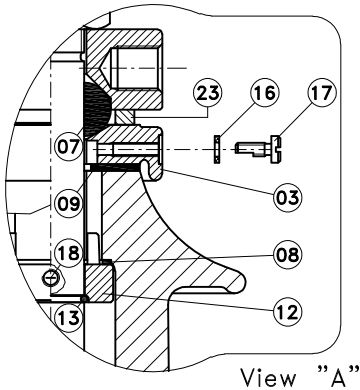
For high current bushings 5 to 12,5kA the ring is always in pressboard

Style VU

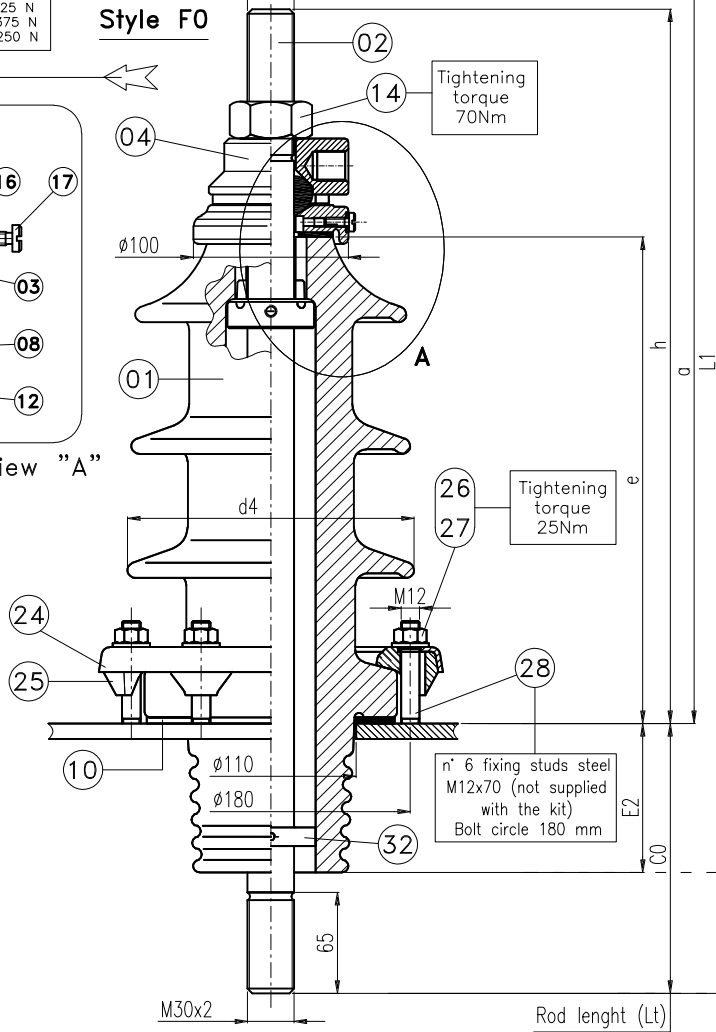
Style VD



CANTILEVER OPERATING LOAD
 - VERTICAL: 625 N
 - INCLINED 30°: 375 N
 - OPERATING TEST LOAD: 1250 N



Style F0



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Gasket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11D	Brass flag Esec. DIN
11U	Brass flag Esec. UNEL
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut M30 DIN 934
16	Fiber gasket
17	Vent/screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Alluminium fixing ring "C" DIN 42538 (AISI304)
25	Alluminium clamping piece "F" DIN 42538
26	Nuts M12 DIN934 (AISI304)
27	Washer 13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut M30 DIN934
30	Brass locknut M30 DIN936
31D-U	Brass flag Esec. DIN or UNEL
32	Center ring

Bushing Acc. to IEC 60137 ed. 7.0

Style C0

Style E1

Style A1

Bushing	Voltage kV	Current A	Creepage distance mm	PF 1' kV	BIL kV	a mm	C0 mm	d4 mm	e mm	E2 mm	h mm	L1 mm	Z n° of sheds	G.W. Kg	Rod LT mm
10F/1000	12	1250	290	30	75	455	158	170	239	86	387	613	2	15	545
20F/1000	24		440	55	125	530	168	185	314	96	462	698	3	18	630
30F/1000	36		640	77	170	635	198	200	419	121	567	833	4	22	765

THE FIGURE SHOWS THE BUSHING 20F/1000 (1:5 SCALE)



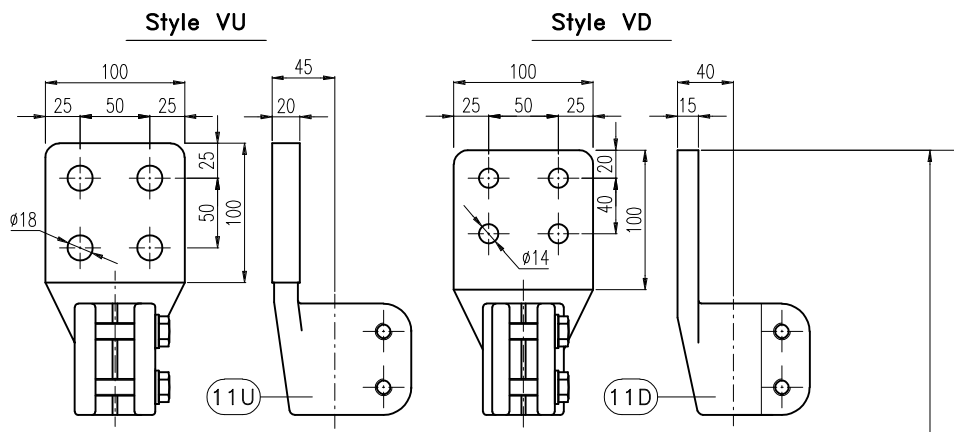
Titolo **OUTDOOR TRANSFORMER BUSHING**
DIN 42533 (UNEL 38174/74)
RATED CURRENT 1250A
VOLTAGE 12 TO 36kV

Data **11/03/13**
 Scala **1:5**
 Dis.
 Visto

Dis. Nr
3804

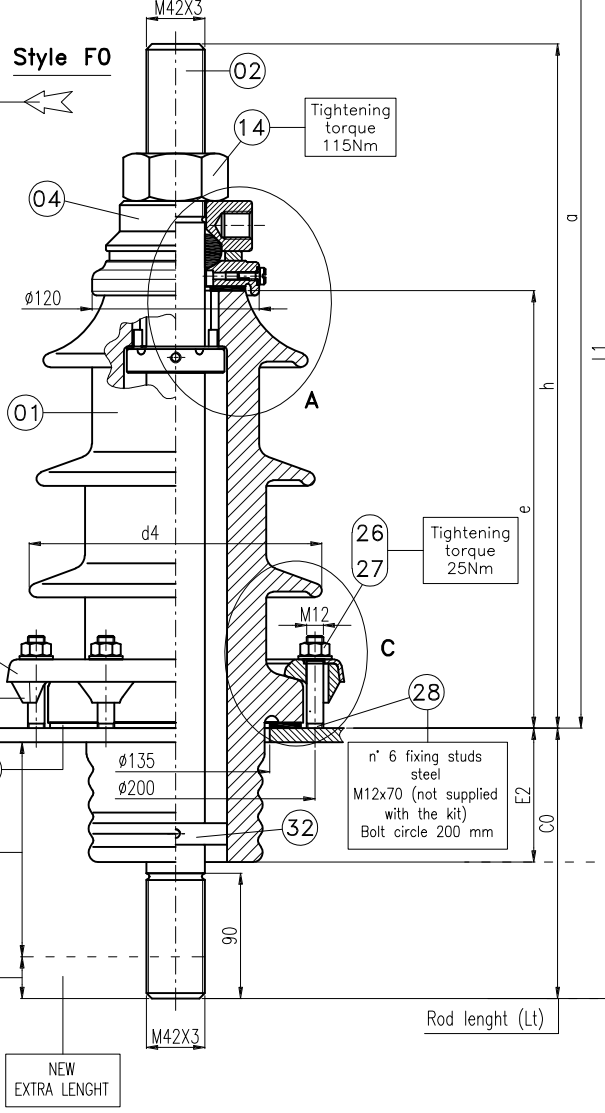
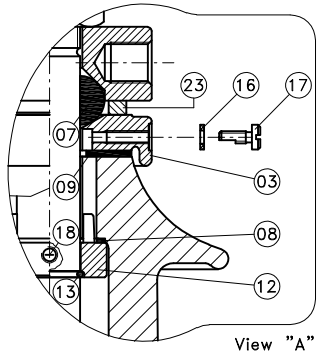
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 REV. 03 DTD 31/01/2020
 La CEDASPE S.p.A. si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

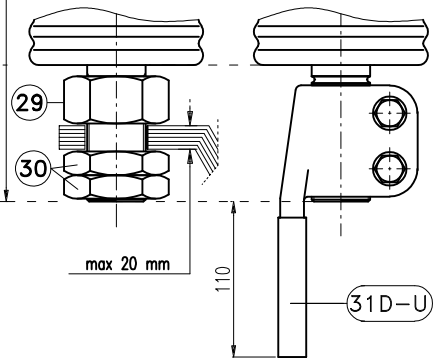


CANTILEVER OPERATING LOAD

- VERTICAL: 1000 N
- INCLINED 30°: 600 N
- OPERATING TEST LOAD: 2000 N



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Gasket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11D	Brass flag Esec. DIN
11U	Brass flag Esec. UNEL
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut M42 DIN 934
16	Fiber gasket
17	Vent/screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Aluminium fixing ring "D" DIN 42538 (AISI304)
25	Alluminium clamping piece "P" DIN 42538
26	Nuts M12 DIN934 (AISI304)
27	Washer ø13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut M42 DIN934
30	Brass locknut M42 DIN936
31D-U	Brass flag Esec. DIN or UNEL
32	Center ring
39	Copper spacer ring

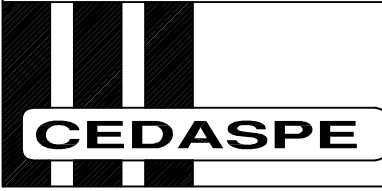


Bushing Acc. to IEC 60137 ed. 7.0

Bushing	Voltage kV	Current A	Creepage distance mm	PF 1' kV	BIL kV	a mm	C0 mm	d4 mm	e mm	E2 mm	h mm	L1 mm	Z n° of sheds	G.W. Kg	Rod LT mm
10F/2000	12	2000	290	30	75	530	188	190	239	86	417	718	2	25	605
20F/2000	24		440	55	125	605	198	210	314	96	492	803	3	29	690
30F/2000	36		680	77	170	710	228	230	419	121	597	938	4	35	825
30F/2000.M			585*												

NOTE *: Reduced CD for porcelain with metalization

THE FIGURE SHOWS THE BUSHING 20F/2000 (1:5 SCALE)

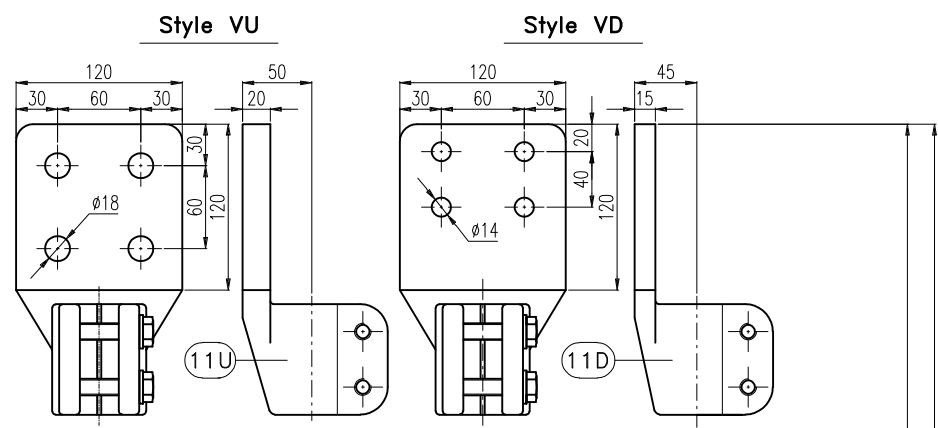


Titolo **OUTDOOR TRANSFORMER BUSHING**
DIN 42533 (UNEL 38174/74)
RATED CURRENT 2000A
VOLTAGE 12 TO 36kV

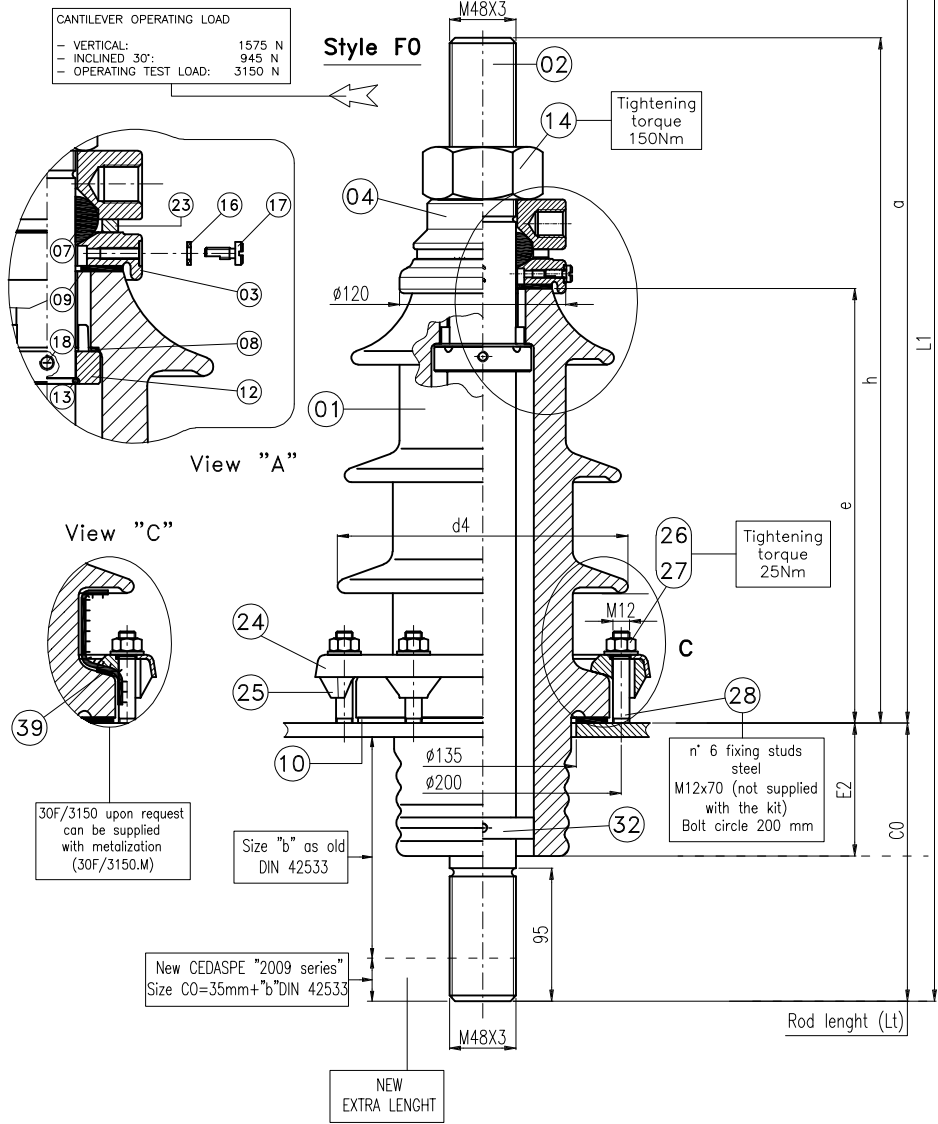
Data **11/03/13**
 Scala **1:5**
 Dis.
 Visto

Dis. Nr
3805
 1 2 3

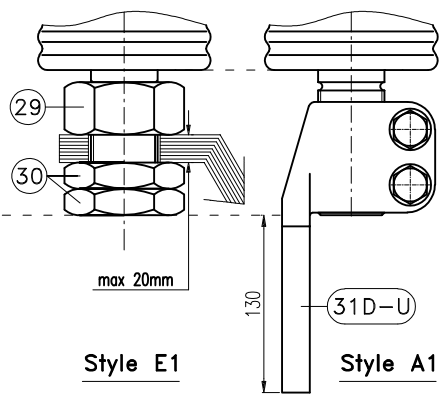
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 REV. 03 DTD 18/07/2014
 La CEDASPE S.p.A. si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.



CANTILEVER OPERATING LOAD
 - VERTICAL: 1575 N
 - INCLINED 30°: 945 N
 - OPERATING TEST LOAD: 3150 N



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Gasket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11D	Brass flag Esec. DIN
11U	Brass flag Esec. UNEL
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut M48 DIN 934
16	Fiber gasket
17	Vent/screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Alluminium fixing ring "D" DIN 42538 (AISI304)
25	Alluminium clamping piece "T" DIN 42538
26	Nuts M12 DIN934 (AISI304)
27	Washer 13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut M48 DIN934
30	Brass locknut M48 DIN936
31D-U	Brass flag Esec. DIN or UNEL
32	Center ring
39	Copper spacer ring



Style C0
 Bushing Acc. to IEC 60137 ed. 7.0

Bushing	Voltage kV	Current A	Creepage distance mm	PF 1' kV	BIL kV	a mm	C0 mm	d4 mm	e mm	E2 mm	h mm	L1 mm	Z n° of sheds	G.W. Kg	Rod LT mm
10F/3150	12	3150	290	30	75	560	203	190	239	86	422	763	2	29	625
20F/3150	24		440	55	125	635	213	210	314	96	497	848	3	33	710
30F/3150	36		680	77	170	740	243	230	419	121	602	983	4	39	845
30F/3150.M			585*												

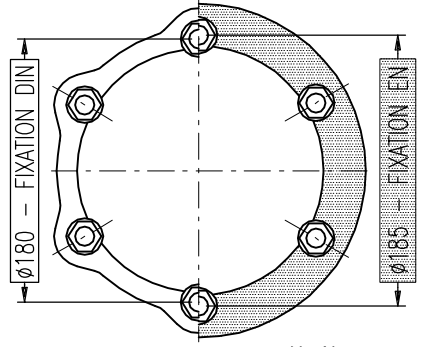
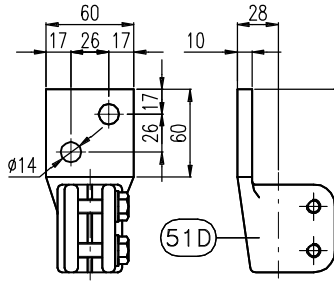
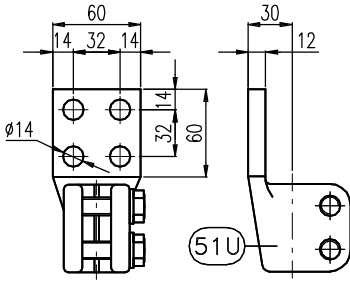
NOTE *: Reduced CD for porcelain with metalization

THE FIGURE SHOWS THE BUSHING 20/3150 (1:5 SCALE)

	Titolo OUTDOOR TRANSFORMER BUSHING		Data 11/03/13	Dis. Nr 3806
	DIN 42533 (UNEL 38174/74)		Scala 1:5	
	RATED CURRENT 3150A		Dis.	
	VOLTAGE 12 TO 36kV		Visto	
			1 2 3	

Style VU

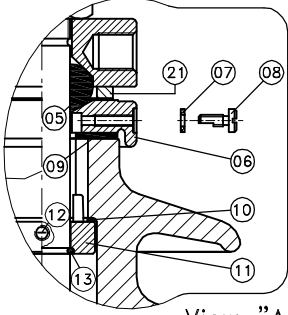
Style VD



Fixing Detail "B"

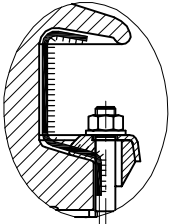
CANTILEVER OPERATING LOAD
 - VERTICAL: 625 N
 - INCLINED 30°: 375 N
 - OPERATING TEST LOAD: 1250 N

Style F0

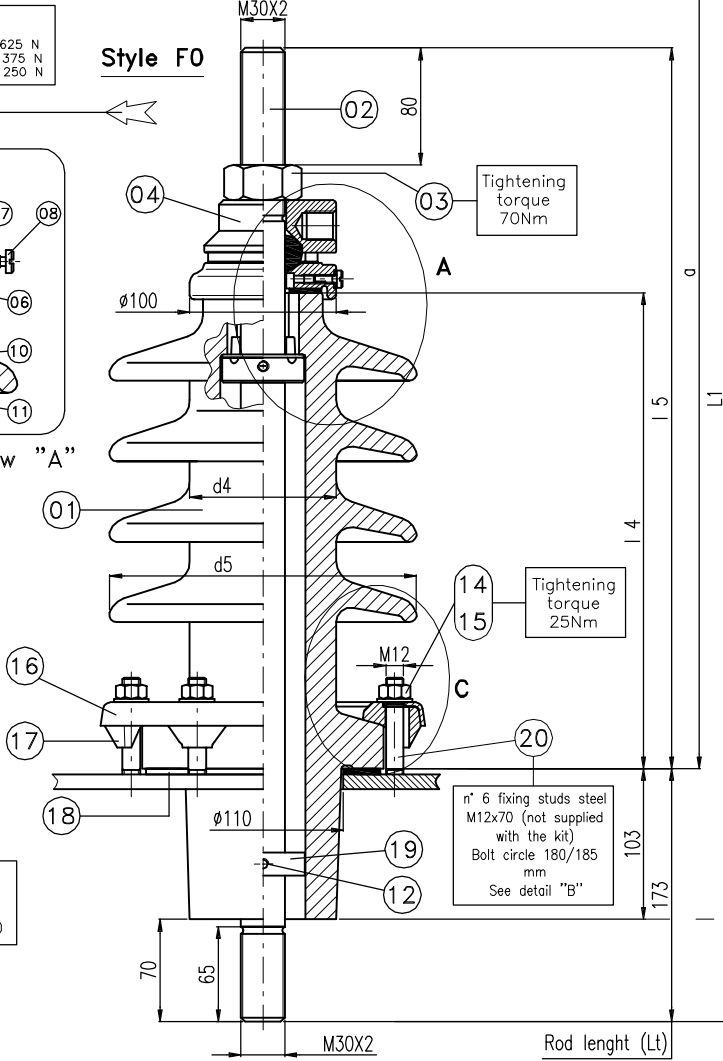


View "A"

View "C"



36/1250-P3/P4 upon request can be supplied with metalization (36/1250-P3.M) (36/1250-P4.M)

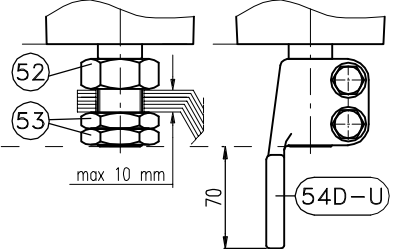


Tightening torque 70Nm

Tightening torque 25Nm

n° 6 fixing studs steel M12x70 (not supplied with the kit) Bolt circle 180/185 mm See detail "B"

Pos.	Description
1	Porcelain
2	Copper rod
3	Brass nut M30 DIN 934
4	Brass top washer "F"
5	NBR ring gasket "J"
6	Brass cap "E"
7	Fiber gasket
8	Vent/screw "R"
9	NBR gasket "M"
10	Fiber spacer "O"
11	Brass ring "P"
12	Locking screw
13	Copper ring "S"
14	Nuts M12 DIN934 (AISI304)
15	Washer 13 (AISI304)
16	Fixing ring "C" DIN 42538 or EN1000 (AISI304)
17	Alluminium clamping piece "T" DIN 42538
18	NBR Flange gasket "N"
19	Center ring
20	Fixing stud M12x70 (not supplied)
21	Bronze contact ring "U"
51D	Flag EP DIN 43675
51U	Flag UNEL SIZE
52	Brass nut M30 DIN 934
53	Brass locknut M30 DIN 936
54D-U	Internal connecting flag



Bushing Acc. to IEC 60137 ed. 6.0

Style C0

Style E1

Style A1

Bushing Type	Voltage kV	Current A	PF 1' kV	BIL kV	Porcelain			14 mm	15 mm	d4 mm	d5 mm	a mm	L1 mm	Z n° of sheds	G.W. Kg	Rod (Lt) mm	Pollution level and min. creep. distance				
					Creepage distance mm	Arcing distance mm	Type										I (b) □	II (c) □	III (d) □	IV (e) □	
12-1250/P4	12	1250	30	75	385	215	21	260	415	100	210	480	653	2	15	595	192	240	300	372	
24-1250/P3	24		55	125	620	280	22	325	480	100	210	545	718	4	18	660	384	480	600	===	
36-1250/P3 (24-1250/P4)	36		77	170**	930	385	23	420	575	100	240	640	813	5	22	755	576	720	900	===	
36-1250/P4					1145	500	24	535	690	100	240	755	928	6	25	870	===	===	===	1116	
36-1250/P3.M (*)					830 (*)	385	23.M	420	575	100	240	640	813	5	22	755	576	720	900	===	===
36-1250/P4.M (*)					1045 (*)	500	24.M	535	690	100	240	755	928	6	25	870	===	===	===	1116	

NOTE:
 * Porcelain with metalization with reduced CD
 ** Tested at 200 kV BIL

NOTE □ : Choice of the bushing as per site pollution severity IEC/TS60815-1/2008

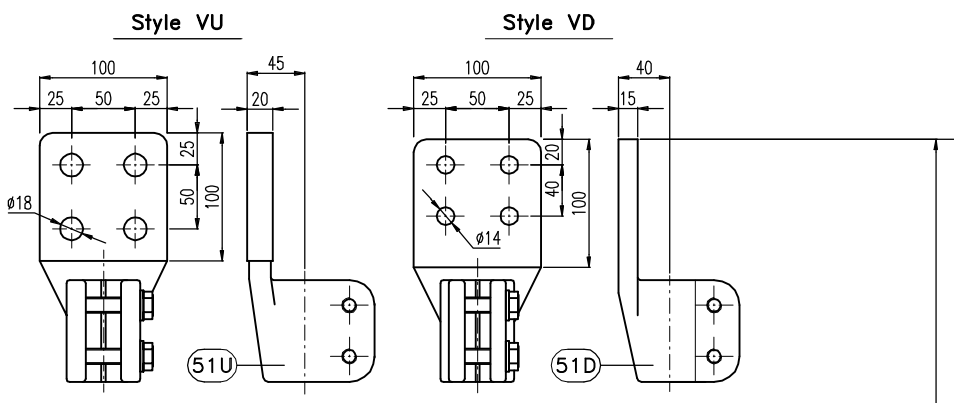
THE FIGURE SHOWS THE BUSHING 24/1250 P3 (1:5 SCALE)



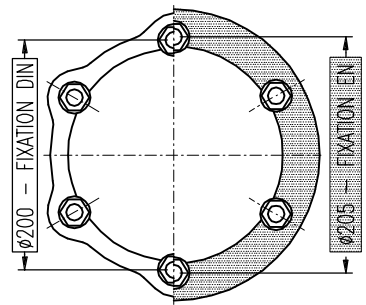
Titolo
**OUTDOOR TRANSFORMER
 BUSHING EN 50180
 RATED CURRENT 1250A
 VOLTAGE 12 TO 36kV**

Data 11/03/13
 Scala 1:5
 Dis.
 Visto

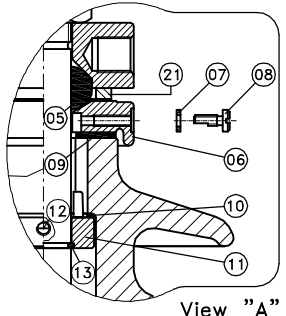
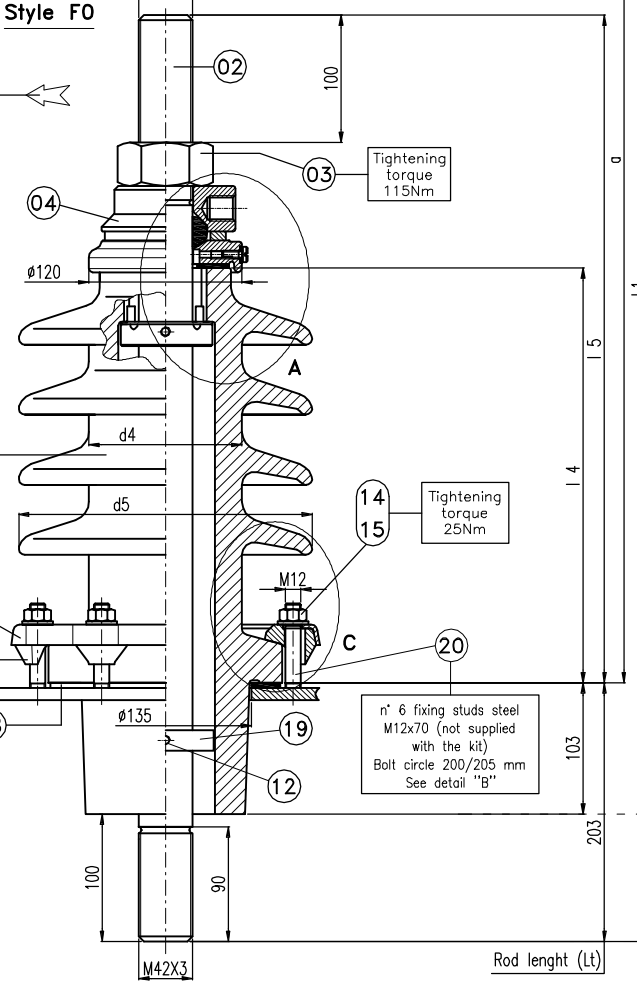
Dis. Nr
3800
 1 2



CANTILEVER OPERATING LOAD
 - VERTICAL: 1000 N
 - INCLINED 30°: 600 N
 - OPERATING TEST LOAD: 2000 N

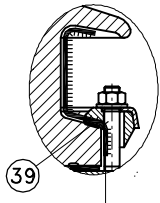


Fixing Detail "B"



View "A"

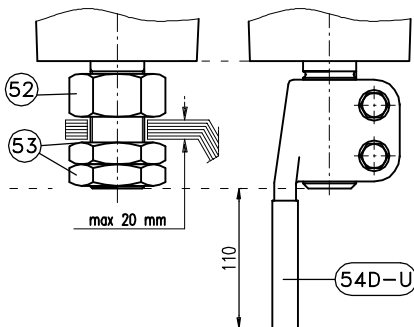
View "C"



36/2000-P3/P4 upon request can be supplied with metalization (36/2000-P3.M) (36/2000-P4.M)

n° 6 fixing studs steel M12x70 (not supplied with the kit)
 Bolt circle 200/205 mm
 See detail "B"

Pos.	Description
1	Porcelain
2	Copper rod
3	Brass nut M42 DIN 934
4	Brass top washer "F"
5	NBR ring gasket "J"
6	Brass cap "E"
7	Fiber gasket
8	Vent/screw "R"
9	NBR gasket "M"
10	Fiber spacer "O"
11	Brass ring "P"
12	Locking screw
13	Copper ring "S"
14	Nuts M12 DIN934 (AISI304)
15	Washer 13 (AISI304)
16	Fixing ring "D" DIN 42538 or EN3150 (AISI304)
17	Alluminium clamping piece "F" DIN 42538
18	NBR Flange gasket "N"
19	Center ring
20	Fixing stud M12x70 (not supplied)
21	Bronze contact ring "U"
39	Copper spacer ring
51D	Flag PP DIN 43675
51U	Flag UNEL SIZE
52	Brass nut M42 DIN 934
53	Brass locknut M42 DIN 936
54D-U	Internal connecting flag



Style E1

Style A1

Bushing Acc. to IEC 60137 ed. 6.0

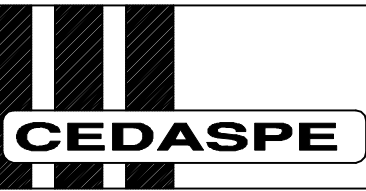
Style C0

Bushing Type	Voltage kV	Current A	PF 1' kV	BIL kV	Porcelain		Type	14 mm	15 mm	d4 mm	d5 mm	a mm	L1 mm	Z n° of sheds	G.W. Kg	Rod (Lt) mm	Pollution level and min. creep. distance			
					Creepage distance mm	Arcing distance mm											I (b) □	II (c) □	III (d) □	IV (e) □
12-2000/P4	12		30	75	385	210	25	260	450	120	230	563	766	2	25	653	192	240	300	372
24-2000/P3	24		55	125	620	275	26	325	515	120	230	628	831	4	29	718	384	480	600	===
36-2000/P3 (24-2000/P4)	36	2000	77	170**	920	385	27	420	610	125	260	723	926	5	35	813	576	720	900	===
36-2000/P4					1135	500	28	535	725	125	260	838	1041	6	40	928	===	===	===	1116
36-2000/P3.M (*)					830 (*)	385	27.M	420	610	125	260	723	926	5	35	813	576	720	900	===
36-2000/P4.M (*)					1045 (*)	500	28.M	535	725	125	260	838	1041	6	40	928	===	===	===	1116

NOTE:
 * Porcelain with metalization with reduced CD
 ** Tested at 200 kV BIL

THE FIGURE SHOWS THE BUSHING 24/2000 P3 (1:5 SCALE)

NOTE □ Choice of the bushing as per site pollution severity IEC/TS60815-1/2008

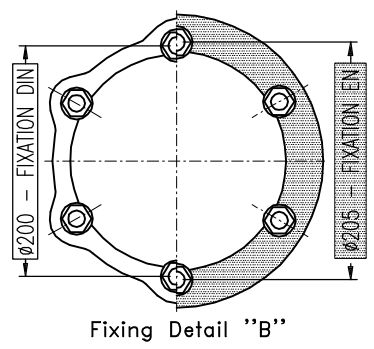
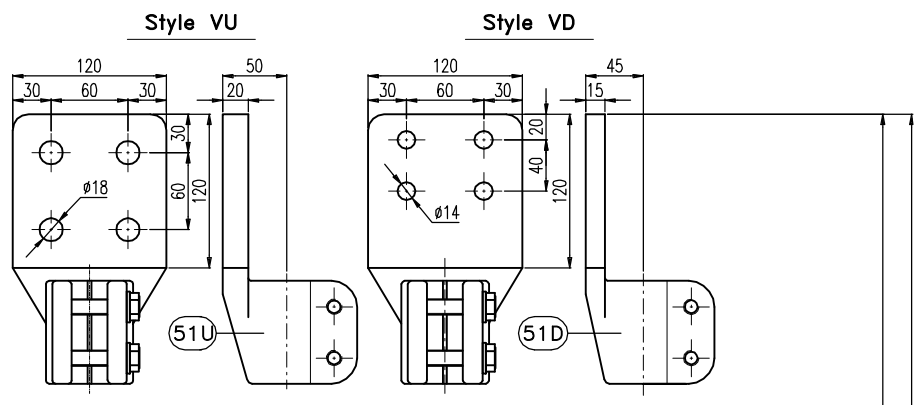


Titolo
**OUTDOOR TRANSFORMER
 BUSHING EN 50180
 RATED CURRENT 2000 A
 VOLTAGE 12 TO 36kV**

Data 11/03/13
 Scala 1:6
 Dis.
 Visto

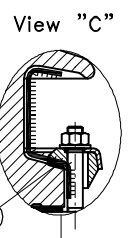
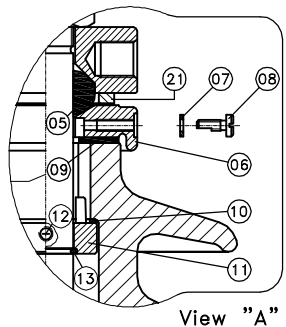
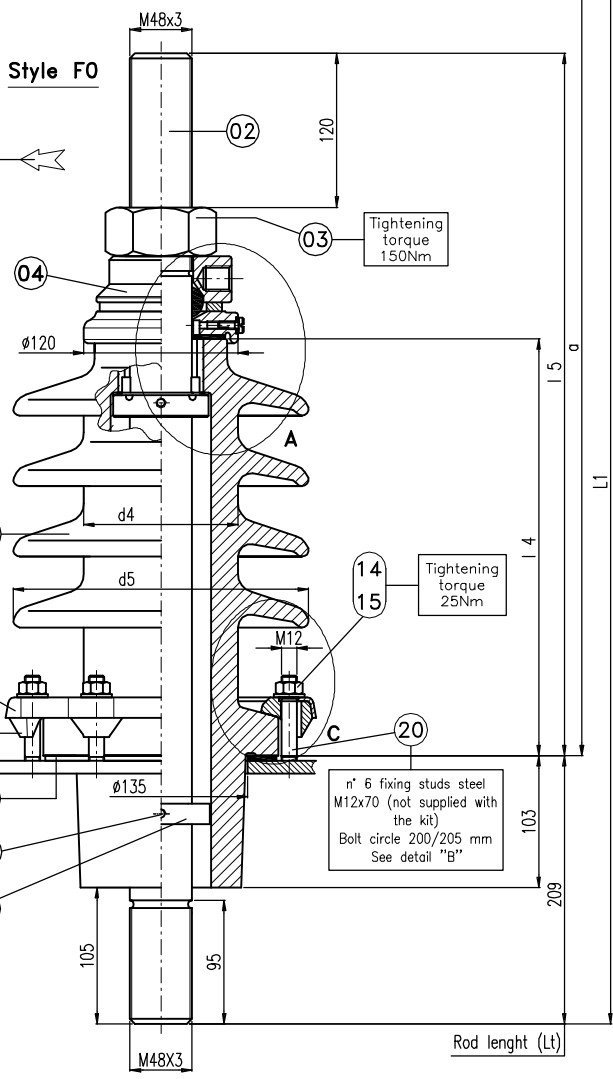
Dis. Nr
3801
 1 2

FILE = 3802 .DWG
 LMT [(0,0) (196,266)] A4 (210x297)
 REV. 02 DTD 30/06/14
 La CEDASPE S.p.A. si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

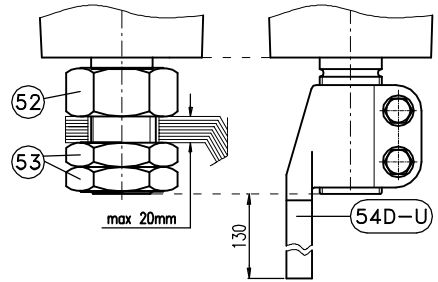


CANTILEVER OPERATING LOAD

- VERTICAL: 1575 N
- INCLINED 30°: 945 N
- OPERATING TEST LOAD: 3150 N



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass nut M48 DIN 934
4	Brass top washer "P"
5	NBR ring gasket "J"
6	Brass cap "E"
7	Fiber gasket
8	Vent/screw "R"
9	NBR gasket "M"
10	Fiber spacer "O"
11	Brass ring "P"
12	Locking screw
13	Copper ring "S"
14	Nuts M12 DIN934 (AISI304)
15	Washer 13 (AISI304)
16	Fixing ring "D" DIN 42538 or EN3150 (AISI304)
17	Alluminium clamping piece "F" DIN 42538
18	NBR Flange gasket "N"
19	Center ring
20	Fixing stud M12x70 (not supplied)
21	Bronze contact ring "U"
39	Copper spacer ring
51D	Flag FP DIN 43675
51U	Flag UNEL SIZE
52	Brass nut M48 DIN 934
53	Brass locknut M48 DIN 936
54D-U	Internal connecting flag



Bushing Acc. to IEC 60137 ed. 6.0

Bushing Type	Voltage kV	Current A	PF I' kV	BIL kV	Porcelain Creepage distance mm	Porcelain Arcing distance mm	Type	14	15	d4	d5	a	L1	Z	G.W. Kg	Rod (Lt) mm	Pollution level and min. creep. distance			
								mm	mm	mm	mm	mm	n° of sheds	I (b)□			II (c)□	III (d)□	IV (e)□	
12-3150/P4	12	3150	30	75	385	210	25	260	474	120	230	607	816	2	29	683	192	240	300	372
24-3150/P3	24		55	125	620	275	26	325	539	120	230	672	881	4	33	748	384	480	600	===
36-3150/P3 (24-3150/P4)	36		77	170**	920	385	27	420	634	125	260	767	976	5	39	843	576	720	900	===
36-3150/P4					1135	500	28	535	749	125	260	882	1091	6	43	958	===	===	===	1116
36-3150/P3.M (*)					830 (*)	385	27.M	420	634	125	260	767	976	5	39	843	576	720	900	===
36-3150/P4.M (*)					1045 (*)	500	28.M	535	749	125	260	882	1091	6	43	958	===	===	===	1116

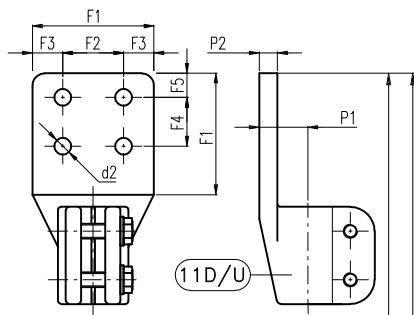
NOTE:
 * Porcelain with metalization with reduced CD
 ** Tested at 200 kV BIL

NOTE □ Choice of the bushing as per site pollution severity IEC/TS60815-1/2008

THE FIGURE SHOWS THE BUSHING 24/3150 P3 (1:5 SCALE)

	Titolo OUTDOOR TRANSFORMER BUSHING EN 50180 RATED CURRENT 3150A VOLTAGE 12 TO 36kV	Data 11/03/13	Dis. Nr 3802
	Scala 1:6	1 2	
	Dis.		
	Visto		

CANTILEVER OPERATING LOAD		
250A - 630A		
- VERTICAL:		500 N
- INCLINED 30°:		300 N
- OPERATING TEST LOAD:		1000 N
1250A		
- VERTICAL:		625 N
- INCLINED 30°:		375 N
- OPERATING TEST LOAD:		1250 N
2000A		
- VERTICAL:		1000 N
- INCLINED 30°:		600 N
- OPERATING TEST LOAD:		2000 N
3150A		
- VERTICAL:		1575 N
- INCLINED 30°:		945 N
- OPERATING TEST LOAD:		3150 N

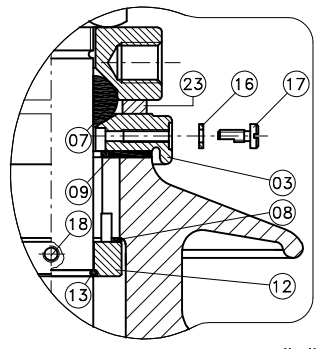
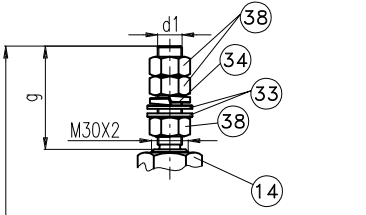


3.6.A-EN

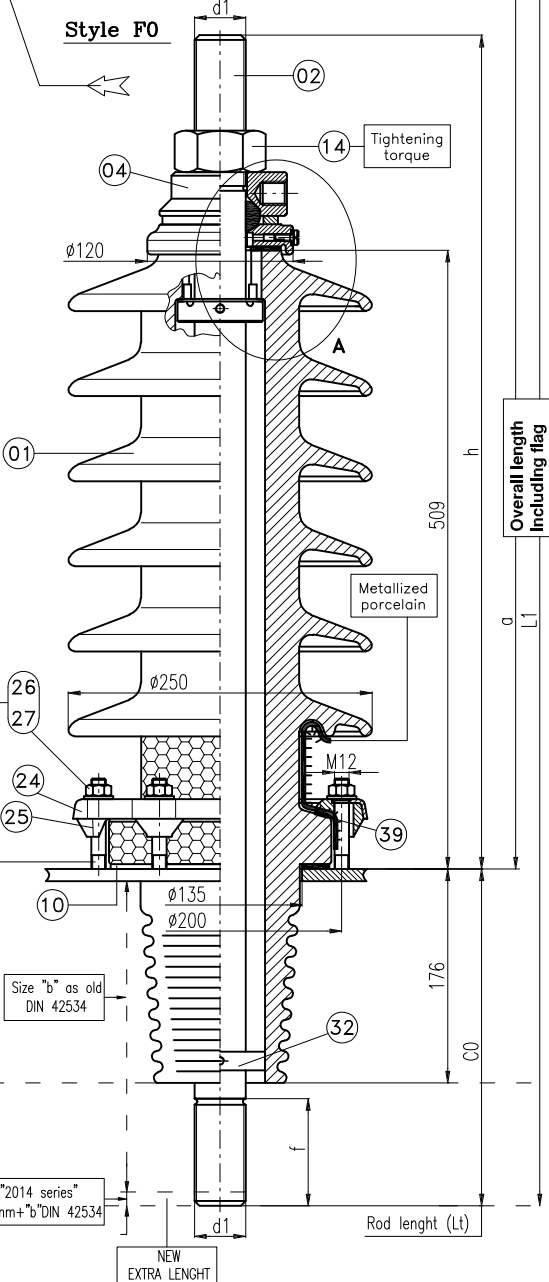
Style VD/VU

Style VD	F1	F2	F3	F4	F5	P1	P2	d2	N° Fori N° holes
52/1000	60	26	17	26	17	28	10	14	2
52/2000	100	50	25	40	20	40	15	14	4
52/3150	120	60	30	40	20	45	15	14	4

Style VU	F1	F2	F3	F4	F5	P1	P2	d2	N° Fori N° holes
52/1000	60	32	14	32	14	30	12	14	4
52/2000	100	50	25	50	25	45	20	18	4
52/3150	120	60	30	60	30	50	20	18	4



Style F0



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Gasket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11D	Flag Esec. DIN
11U	Flag Esec. UNEL
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut DIN 934
16	Fiber gasket
17	Vent/screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Aluminium fixing ring "D" DIN 42538 (AISI304)
25	Aluminium clamping piece "F" DIN 42538
26	Nuts M12 DIN934 (AISI304)
27	Washer ø13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut DIN934
30	Brass locknut DIN936
31D-U	Flag Esec. DIN or UNEL
32	Center ring
33	Brass washer
34	Spring washer
35	Brass nut DIN 936
36	Bakelite insulating tube
37	Copper rod
38	Brass nut DIN 934
39	Copper spacer ring

Style E1 (250/630 A)

Style C0 (1250/2000/3150 A)

Style E1

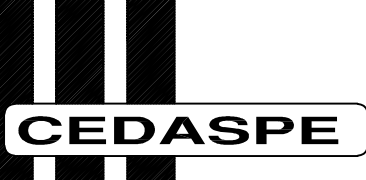
Style A1

Bushing	Current A	Creepage distance mm	PF 1' kV	BIL kV	d1	Tightening torque	a mm	C0 mm	f mm	g mm	h mm	L1 mm	G.W. Kg	Rod LT mm
52/250-P1	250	950 *	105	250	M12	70 Nm	248	60	662	910	35	910		
52/630-P1	630				M20		273	85	687	960				
52/1250-P1	1250				M30x2	725	253	65	657	985				
52/2000-P1	2000				M42x3	800	285	90	687	1085	45	972		
52/3150-P1	3150				M48x3	830	290	95	692	1120	50	982		

NOTE *: CD 1080 on demand, only with porcelain full glaze without flange metallization

Bushing Acc. to IEC 60137 ed. 7.0

THE FIGURE SHOWS THE BUSHING 52/2000-P1 (1:5 SCALE)



Titolo
**OUTDOOR TRANSFORMER
 BUSHING EN 50180 (DIN 42534)
 RATED VOLTAGE 52 kV-P1
 CURRENT 250 TO 3150 A**

Data 11/03/13
 Scala 1:6
 Dis.
 Visto

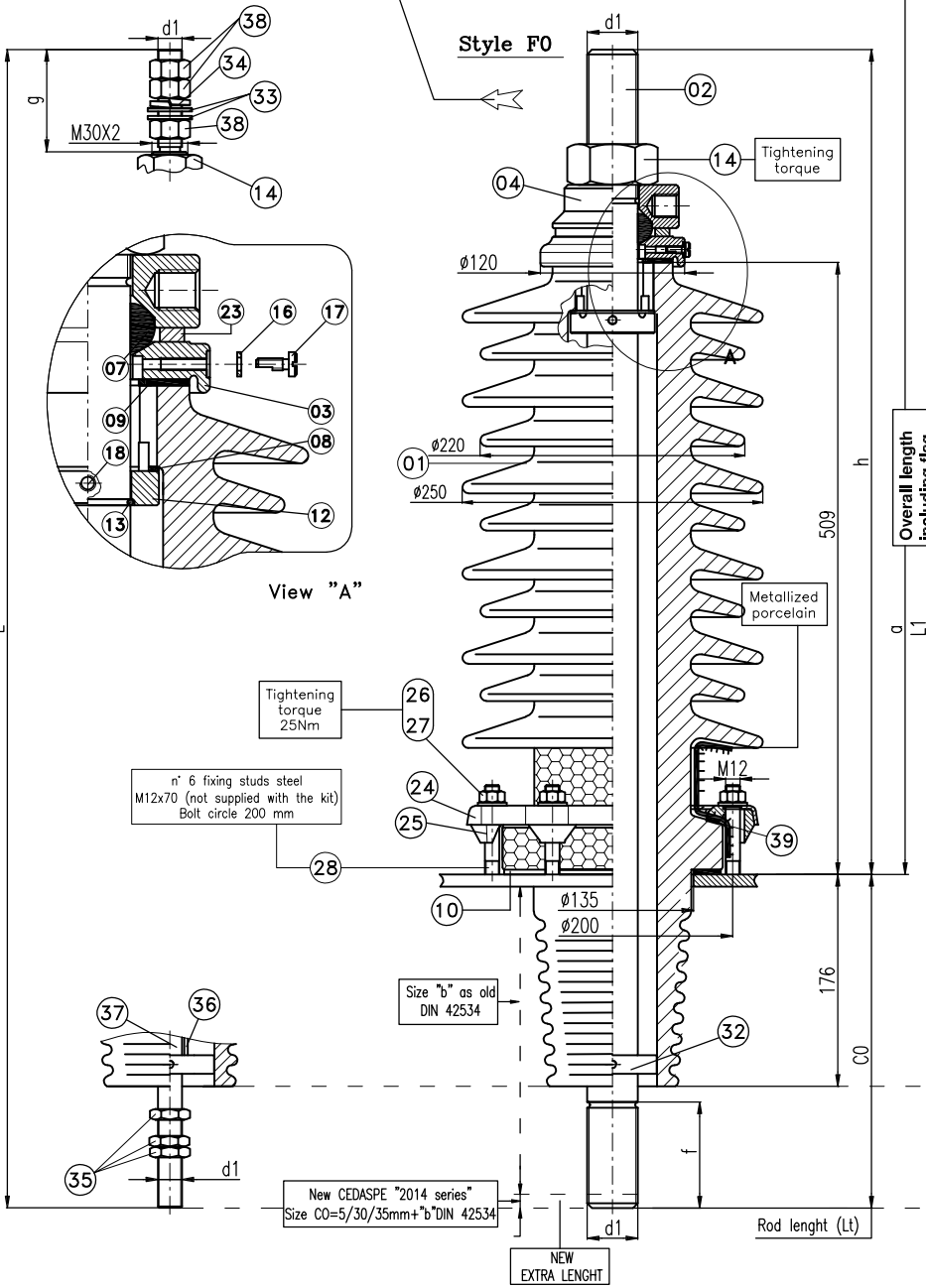
Dis. Nr
3807
 6

Style VD/VU

Style VD	F1	F2	F3	F4	F5	P1	P2	d2	N° Fori N° holes
52/1000	60	26	17	26	17	28	10	14	2
52/2000	100	50	25	40	20	40	15	14	4
52/3150	120	60	30	40	20	45	15	14	4
Style VU	F1	F2	F3	F4	F5	P1	P2	d2	N° Fori N° holes
52/1000	60	32	14	32	14	30	12	14	4
52/2000	100	50	25	50	25	45	20	18	4
52/3150	120	60	30	60	30	50	20	18	4

Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Gasket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11D	Flag Esec. DIN
11U	Flag Esec. UNEL
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut DIN 934
16	Fiber gasket
17	Vent/screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Aluminium fixing ring "D" DIN 42538 (AISI304)
25	Aluminium clamping piece "T" DIN 42538
26	Nuts M12 DIN934 (AISI304)
27	Washer ø13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut DIN934
30	Brass locknut DIN936
31D-U	Flag Esec. DIN or UNEL
32	Center ring
33	Brass washer
34	Spring washer
35	Brass nut DIN 936
36	Bakelite insulating tube
37	Copper rod
38	Brass nut DIN 934
39	Copper spacer ring

CANTILEVER OPERATING LOAD	
250A - 630A	
- VERTICAL:	500 N
- INCLINED 30°:	300 N
- OPERATING TEST LOAD:	1000 N
1250A	
- VERTICAL:	625 N
- INCLINED 30°:	375 N
- OPERATING TEST LOAD:	1250 N
2000A	
- VERTICAL:	1000 N
- INCLINED 30°:	600 N
- OPERATING TEST LOAD:	2000 N
3150A	
- VERTICAL:	1575 N
- INCLINED 30°:	945 N
- OPERATING TEST LOAD:	3150 N



Style E1 (250/630 A)

Style C0 (1250/2000/3150 A)

Style E1

Style A1

Bushing	Current A	Creepage distance mm	PF 1' kV	BIL kV	d1	Tightening torque	a mm	C0 mm	f mm	g mm	h mm	L1 mm	G.W. Kg	Rod LT mm
52/250-P3	250	1350 *	105	250	M12	70 Nm	248	60	662	910	35	910		
52/630-P3	630				M20		273	85	687	960	36	960		
52/1250-P3	1250				M30x2	725	253	65	657	985	45	972		
52/2000-P3	2000				M42x3	800	285	90	687	1085	50	982		
52/3150-P3	3150				M48x3	830	290	95	692	1120	50	982		

NOTE *: CD 1435 on demand, only with porcelain full glaze without flange metallization

Bushing Acc. to IEC 60137 ed. 7.0

THE FIGURE SHOWS THE BUSHING 52/2000-P3 (1:5 SCALE)

CEDASPE

Titolo
**OUTDOOR TRANSFORMER
BUSHING EN 50180 (DIN 42534)
RATED VOLTAGE 52 kV-P3
CURRENT 250 TO 3150 A**

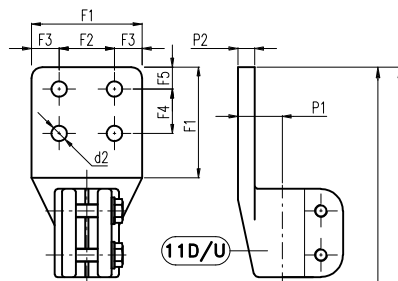
Data **11/03/13**
Scala **1:6**
Dis.
Visto

Dis. Nr
3808

6 7 8

FILE = 3808.DWG
 REV. 08 DTD 31/01/2020
 LMT (0,0) (196,286) A4 (210x297)
 C- La CEDASPE S.p.A. si riserva o termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

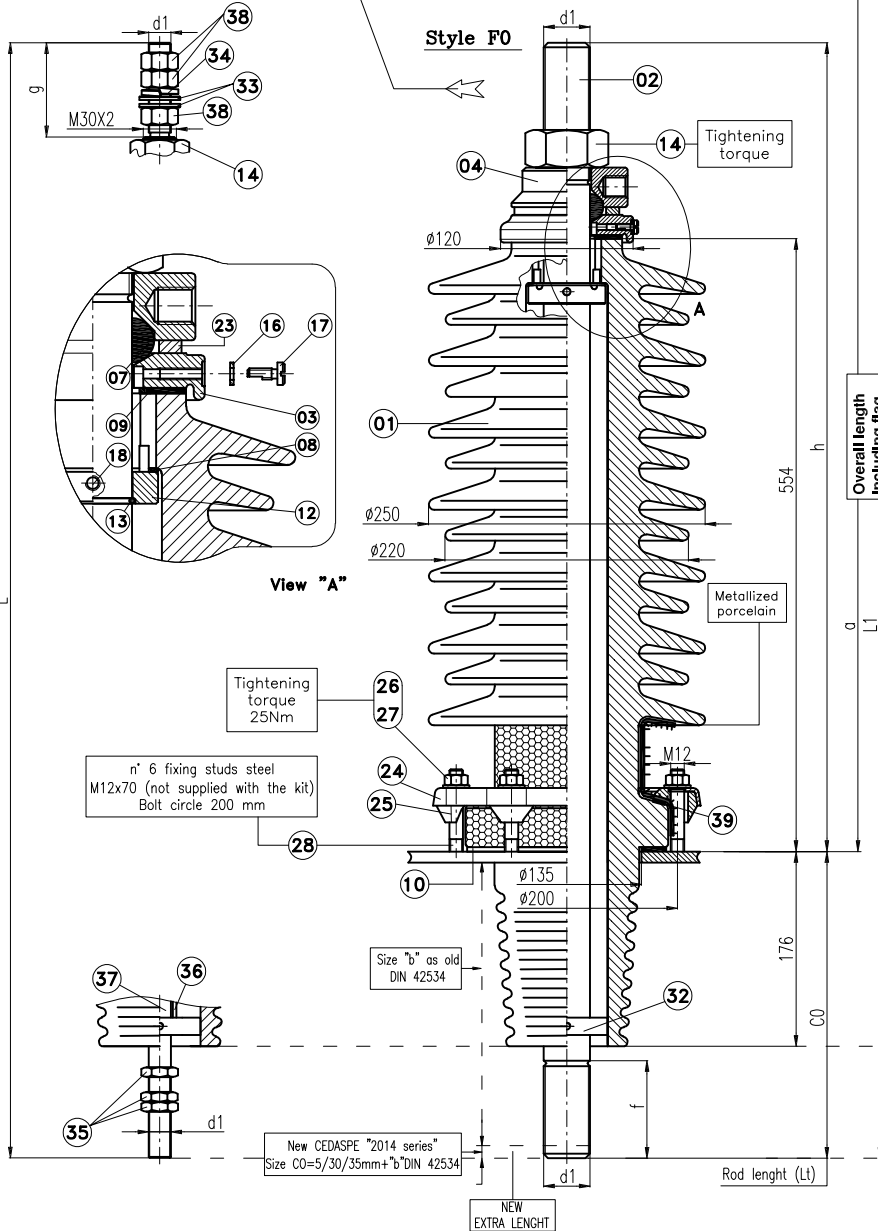
CANTILEVER OPERATING LOAD	
250A - 630A	
- VERTICAL:	500 N
- INCLINED 30°:	300 N
- OPERATING TEST LOAD:	1000 N
1250A	
- VERTICAL:	625 N
- INCLINED 30°:	375 N
- OPERATING TEST LOAD:	1250 N
2000A	
- VERTICAL:	1000 N
- INCLINED 30°:	600 N
- OPERATING TEST LOAD:	2000 N
3150A	
- VERTICAL:	1575 N
- INCLINED 30°:	945 N
- OPERATING TEST LOAD:	3150 N



Style VD/VU

Style VD	F1	F2	F3	F4	F5	P1	P2	d2	N° Fori holes
52/1000	60	26	17	26	17	28	10	14	2
52/2000	100	50	25	40	20	40	15	14	4
52/3150	120	60	30	40	20	45	15	14	4

Style VU	F1	F2	F3	F4	F5	P1	P2	d2	N° Fori holes
52/1000	60	32	14	32	14	30	12	14	4
52/2000	100	50	25	50	25	45	20	18	4
52/3150	120	60	30	60	30	50	20	18	4



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Gasket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11D	Flag Esec. DIN
11U	Flag Esec. UNEL
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut DIN 934
16	Fiber gasket
17	Vent./screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Aluminium fixing ring "D" DIN 42538 (AISI304)
25	Aluminium clamping piece "F" DIN 42538
26	Nuts M12 DIN934 (AISI304)
27	Washer ø13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut DIN934
30	Brass locknut DIN936
31D-U	Flag Esec. DIN or UNEL
32	Center ring
33	Brass washer
34	Spring washer
35	Brass nut DIN 936
36	Bakelite insulating tube
37	Copper rod
38	Brass nut DIN 934
39	Copper spacer ring

Style E1 (250/630 A)

Style C0 (1250/2000/3150 A)

Style E1

Style A1

Bushing	Current A	Creepage distance mm	PF 1' kV	BIL kV	d1	Tightening torque	a mm	C0 mm	f mm	g mm	h mm	L1 mm	G.W. Kg	(Lt) mm
52/250-P4	250	1655	105	250	M12	70 Nm	248	60	707	955	38	955		
52/630-P4	630				M20		273	85	732	1005	40	1005		
52/1250-P4	1250				M30x2	770	253	65	702	1023	40	955		
52/2000-P4	2000				M42x3	845	285	90	732	1130	50	1017		
52/3150-P4	3150				M48x3	875	290	95	737	1165	55	1027		

Bushing Acc. to IEC 60137 ed. 7.0

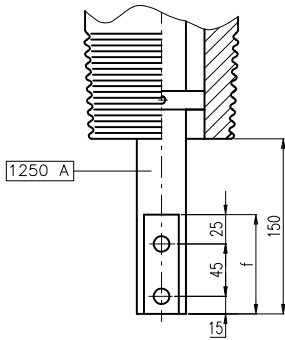
THE FIGURE SHOWS THE BUSHING 52/2000-P4

	Style	VD	F1	F2	F3	F4	F5	P1	P2	d2	N° fori	N° holes
DIN	1250	A	60	26	17	26	17	28	10	14	2	2
	2000	A	100	50	25	40	20	40	15	14	4	4
	3150	A	120	60	30	40	20	45	15	14	4	4
NEMA	1250	A	100	44.5	27.7	44.5	27.7	30	12	14	4	4
	2000	A	100	44.5	27.7	44.5	27.7	40	15	14	4	4
	3150	A	120	44.5	37.7	44.5	37.7	40	15	14	4	4

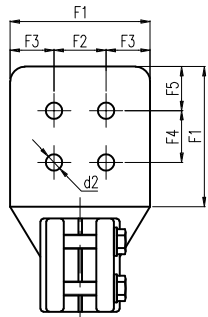
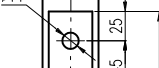
CANTILEVER OPERATING LOAD	
1250A	
- VERTICAL:	625 N
- INCLINED 30°:	375 N
- OPERATING TEST LOAD:	1250 N
2000A	
- VERTICAL:	1000 N
- INCLINED 30°:	600 N
- OPERATING TEST LOAD:	2000 N
3150A	
- VERTICAL:	1575 N
- INCLINED 30°:	945 N
- OPERATING TEST LOAD:	3150 N

Tightening torque 25Nm

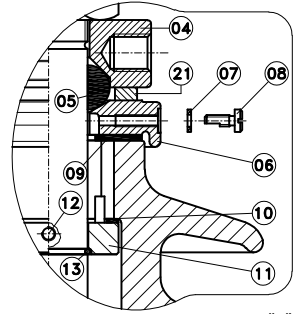
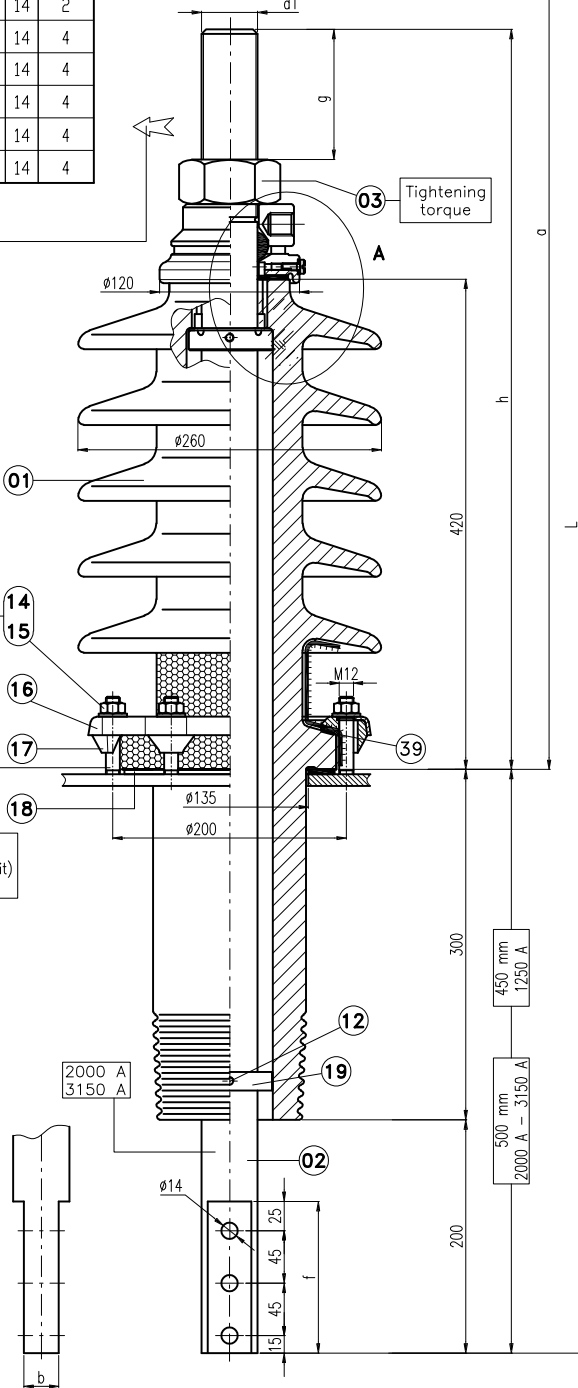
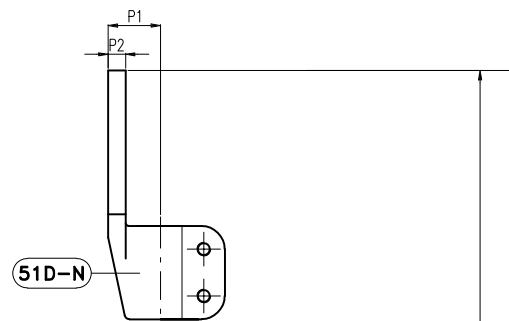
n° 6 fixing studs steel M12x70 (not supplied with the kit) Bolt circle 200 mm



2000 A
3150 A



51D-N



View "A"

Pos.	Description
1	Porcelain
2	Copper rod
3	Brass nut M48 DIN 934
4	Brass top washer "F"
5	Viton ring gasket "J"
6	Brass cap "B"
7	Fiber gasket
8	Vent/ Brass screw "R"
9	Viton gasket "M"
10	Fiber spacer "O"
11	Brass ring "P"
12	Locking screw (Steel)
13	Copper ring "S"
14	Nuts M12 DIN934 (AISI304)
15	Washer ø13 (AISI304)
16	Fixing ring "D" DIN 42538 (Alu)
17	Alluminium clamping piece "F" DIN 42538
18	Viton Flange gasket "N"
19	Center ring (Nylon)
20	Fixing stud M12x70 (Steel not supplied)
21	Bronze contact ring "U"
39	Copper spacer ring
51D	Brass Flag FP DIN42533
51N	Brass Flag FP NEMA

THE FIGURE SHOWS THE BUSHING 30/3150-P3 OL300 (1:5 SCALE)

Isolatore Bushing	Tensione Voltage kV	Corrente Current A	Real Creepage distance mm	PF kV	BIL kV	d1	Tightening torque	b mm	a mm	f mm	g mm	h mm	L mm	G.W. Kg	Note
36/1250-P3 OL300	36	1250	850	77	200	M30x2	70 Nm	22	640	85	80	575	1090	35	
36/2000-P3 OL300		2000				M42x3	115 Nm	30	720	100	610	1220	42		
36/3150-P3 OL300		3150				M48x3	150 Nm	767	130	120	634	1267	46		

Bushing Acc. to IEC 60137 ed. 7.0

EX DIS P2509

CEDASPE

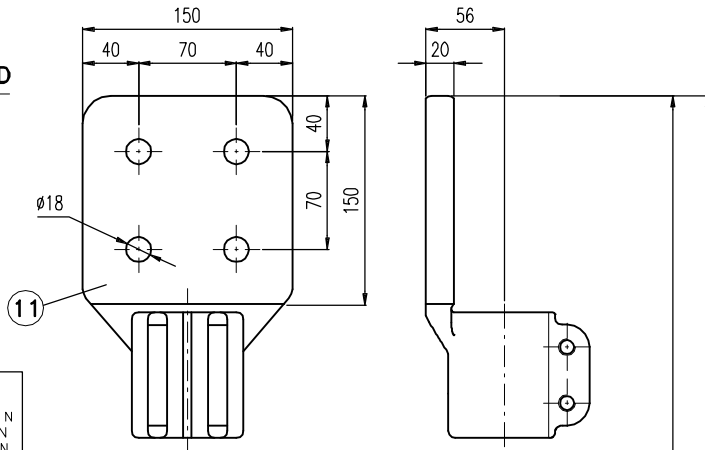
Titolo **SPECIAL BUSHING**
36/1250-2000-3150-P3 OL300
 with metallization and porcelain tail 300 mm

Data 11/03/09
 Scala =====
 Dis.
 Visto

Dis. Nr
3129

1	2	3	4
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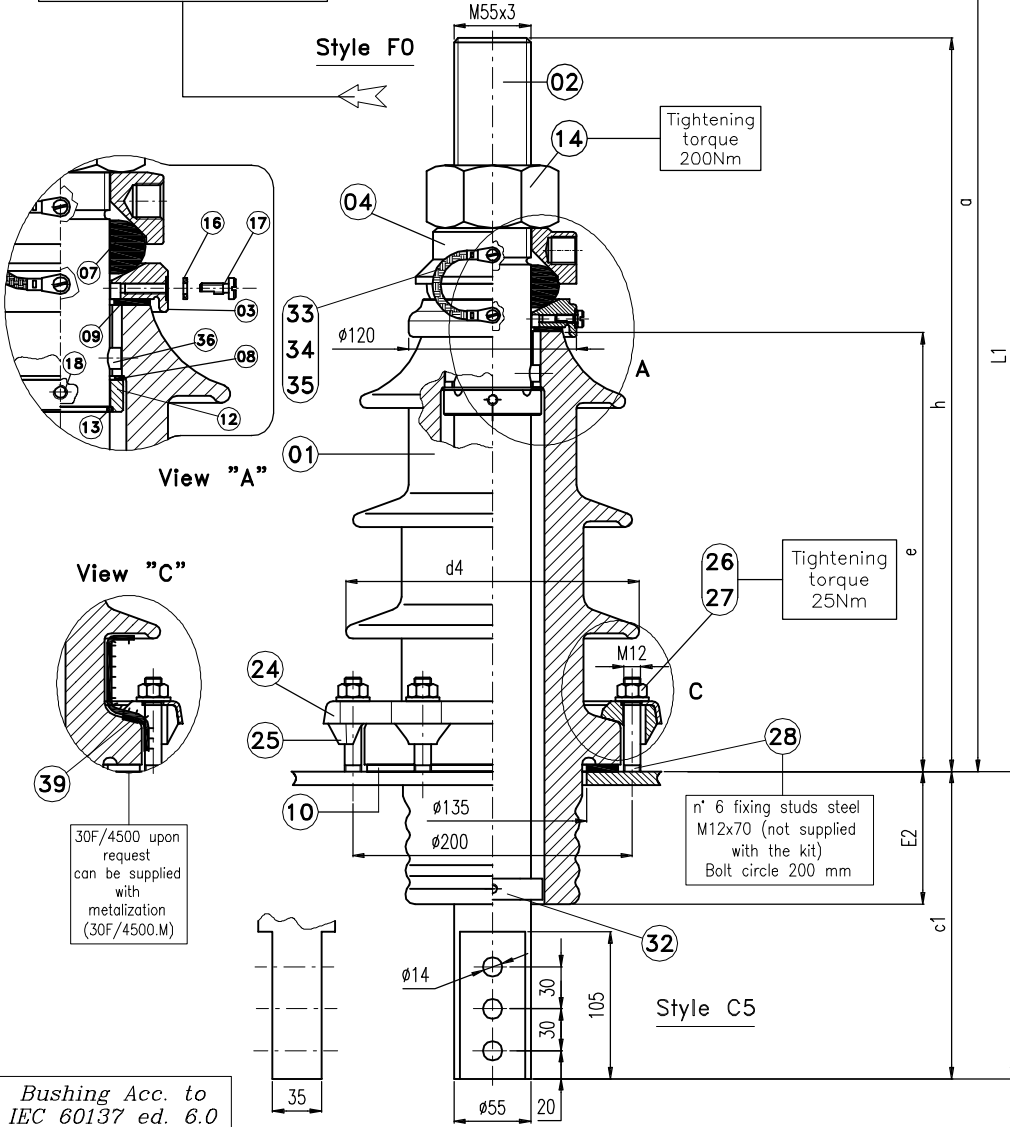
Style VD



CANTILEVER OPERATING LOAD

- VERTICAL:	1575 N
- INCLINED 30°:	945 N
- OPERATING TEST LOAD:	3150 N

Style FO



Pos.	Description
1	Porcelain
2	Copper rod
3	Brass cap "E"
4	Brass top washer "F"
7	NBR ring gasket "J"
8	Casket "O"
9	NBR gasket "M"
10	NBR Flange gasket "N"
11	Brass flag
12	Brass ring "P"
13	Copper ring "S"
14	Brass nut M55 DIN 934
16	Fiber gasket
17	Vent/screw "R"
18	Locking screw
23	Bronze contact ring "U"
24	Alluminium fixing ring "D"
25	Alluminium clamping piece "P"
26	Nuts M12 DIN934 (AISI304)
27	Washer 13 (AISI304)
28	Fixing stud M12x70 (not supplied)
29	Brass nut M55 DIN934
30	Brass locknut M55 DIN936
32	Center ring
33+35	Equipotential link
39	Copper spacer ring

Bushing Acc. to IEC 60137 ed. 6.0

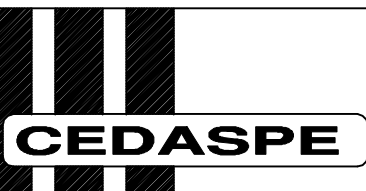
30F/4500 upon request can be supplied with metalization (30F/4500.M)

Bushing	Voltage kV	Current A	Creepage distance mm	PF I' kV	BIL kV	a mm	b1 mm	C1 mm	d4 mm	e mm	E2 mm	h mm	L1 mm	Z n° of sheds	G.W. Kg	Rod E1 mm	Rod C5 mm
10F/4500	12	4500	290	30	75	600	215	210	190	239	86	455	810	2	39	670	665
20F/4500	24	4500	440	55	125	675	225	220	210	314	96	530	895	3	47	755	750
30F/4500	36	4500	680	77	170	780	250	245	230	419	121	635	1025	4	55	885	880
30F/4500.M			575*														
36/4500-P3	36	4500	920	77	170	780	250	245	260	419	103	635	1025	5	55	885	880
36/4500-P3.M			830*														
36/4500-P4	36	4500	1135	77	170	895	250	245	260	535	103	750	1140	6	60	1000	995
36/4500-P4.M			1045*														

*NOTE: Reduced CD for porcelain with metalization

Remark: using porcelain type 36/3150-P3 or P4 with hardware 30/4500

THE FIGURE SHOWS THE BUSHING 20/4500 (1:5 SCALE)



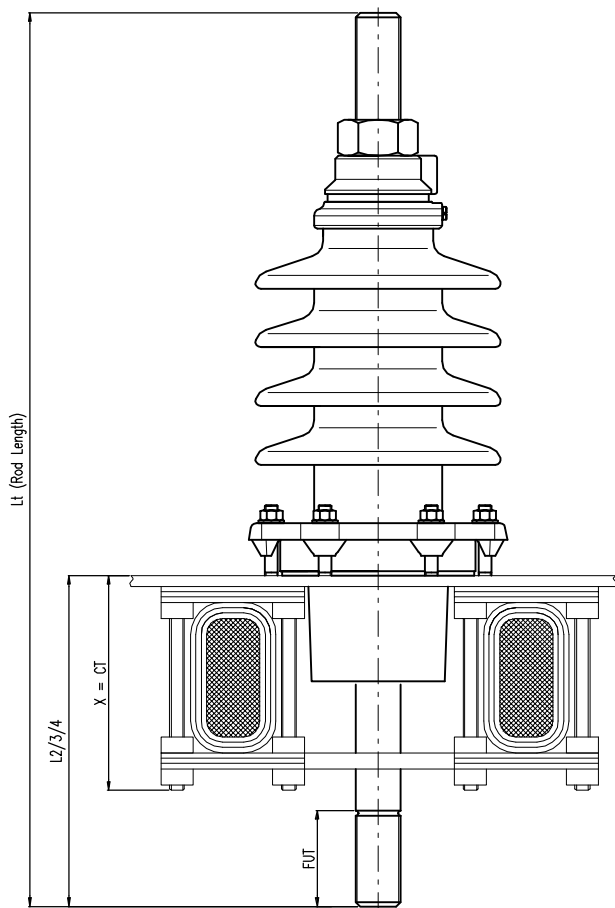
Titolo
**OUTDOOR TRANSFORMER
 BUSHING 12-24-36 kV
 RATED CURRENT 4500A**

Data 11/03/13
 Scala 1:5
 Dis.
 Visto

Dis. Nr
3811
 6 7

Special CT Accomodation

REV. 02 DTD 24/10/14
 FILE = 3928 .DWG
 LMT [(0,0) (196,286)]
 A4 (210x297)

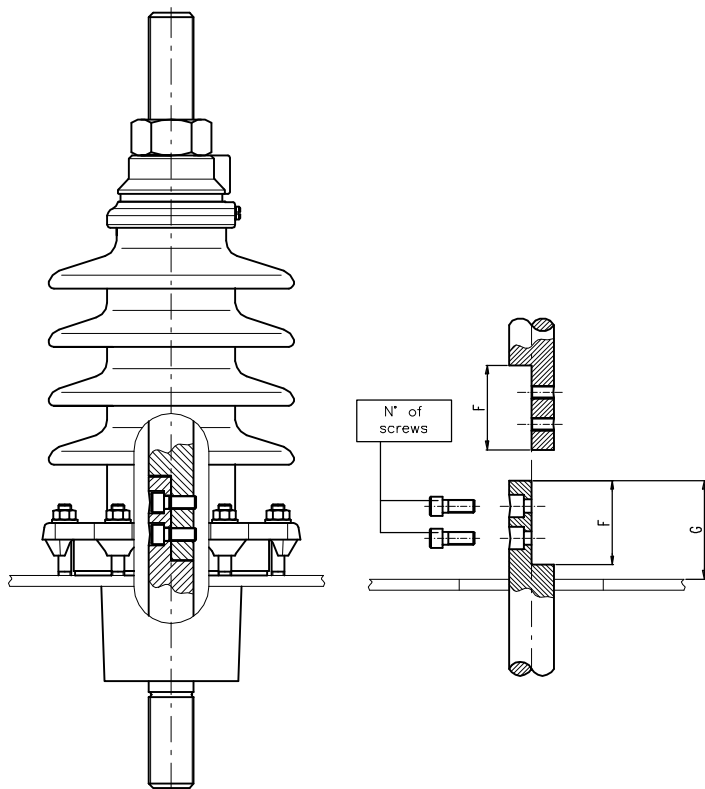


REF	AT1250			
	FUT=65	CT 150	CT 300	CT 500
		L2=300	L3=450	L4=650
4253	Bushing	Lt (Rod Length)		
	10F/1000	687	837	1037
	20F/1000	762	912	1112
EN	30F/1000	867	1017	1217
	12/1250-P4	722	872	1072
	24/1250-P3	787	937	1137
50180	24/1250-P4	882	1032	1232
	36/1250-P3			
	36/1250-P4	997	1147	1347
	52/1250-P1/P3	957	1107	1307
	52/1250-P4	1002	1152	1352

REF	AT2000			
	FUT=90	CT 150	CT 300	CT 500
		L2=350	L3=500	L4=700
4253	Bushing	Lt (Rod Length)		
	10F/2000	767	917	1117
	20F/2000	842	992	1192
EN	30F/2000	947	1097	1297
	12/2000-P4	800	950	1150
	24/2000-P3	865	1015	1215
50180	24/2000-P4	960	1110	1310
	36/2000-P3			
	36/2000-P4	1075	1225	1425
	52/2000-P1/P3	1037	1187	1387
	52/2000-P4	1082	1232	1432

REF	AT3150			
	FUT=95	CT 150	CT 300	CT 500
		L2=350	L3=500	L4=700
4253	Bushing	Lt (Rod Length)		
	10F/3150	772	922	1122
	20F/3150	847	997	1197
EN	30F/3150	952	1102	1302
	12/3150-P4	824	974	1174
	24/3150-P3	889	1039	1239
50180	24/3150-P4	984	1134	1334
	36/3150-P3			
	36/3150-P4	1099	1249	1449
	52/3150-P1/P3	1042	1192	1392
	52/3150-P4	1087	1237	1437

Standard Split Rod



	Bushing	F mm	G mm	N° of screws	Type of screws
EN50180	AT 1250	69	70	2	M10x20
	AT 2000	79	80	2	M12x30
	AT 3150	109	110	3	M12x30
4253	AT 1250	69	70	2	M10x20
	AT 2000	79	80	2	M12x30
	AT 3150	109	110	3	M12x30

THE FIGURE SHOWS THE BUSHING 24/2000 P3



Titolo
**Special Rod
 for HV Bushing**

Data	30/01/14	Dis. Nr 3928
Scala	=====	
Dis.		
Visto		
		1 2

La CEDASPE S.p.A. si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.

ORDER FORM

A4 (210x297)

Type of Bushing:

DIN

EN

LMT [(0,0) (196,286)]

System Rated Voltage (kV):

12

24

36

52
(up to 3150A)

FILE = NR_DIS .DWG

Rated Current (A):

250
(Only for 52kV)

630
(Only for 52kV)

1250

2000

3150

4500

Creepage distance:

..... mm

OR

..... mm/kV

OR

..... Pollution level IEC 60815
(b;c;d;e / 1;2;3;4)

Airside components:

Naked

DIN Flag

UNEL Flag

NEMA Flag

SPECIAL



Oil side components:

Style C0

Style C6

Style E1

Style A1
(Flag)

SPECIAL

REV. 02 DTD 05/12/17

Gasket:

NBR
(-30°C/+120°C)

NBC (Cork TD1120)
(-30°C/+120°C)

Low temp.
(Cork TD7000)
(-45°C/+120°C)

Very Low temp.
(Blue Fl/Sil)
(-60°C/+150°C)

Heavy Duty
(VITON)
(-20°C/+150°C)

Surface finishing:

Tinplated 6/10 µm

Silver plated 6/10 µm

Only Flag (F)

Flag & Cap (F+C)

Flag/Cap/Rod (F+C+R)

CT accomodation:

CT150

CT300

CT500

SPECIAL
CO=.....



Arcing horns:

NO

YES (DIN STYLE)

YES (UNEL STYLE)

Type of Fixation Flange:

DIN

EN

Material of fixation Flange:

Aluminium

Stainless steel

Notes:

.....
.....
.....



La CEDASPE S.p.A. si riserva a termini di legge la proprietà del presente disegno con divieto di riprodurlo o comunicarlo a terzi senza sua autorizzazione.



Titolo

HV Bushing
Order sheet

Data 30/01/14

Scala ==

Dis.

Visto

Dis. Nr

3930

1	2				
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