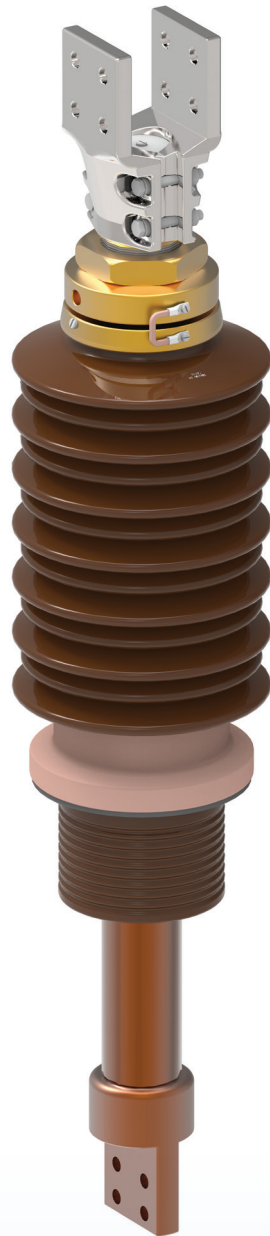


PORCELAIN BUSHINGS HC Series



The CEDASPE brand around the world: Innovative and reliable with a high level of available customizations



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

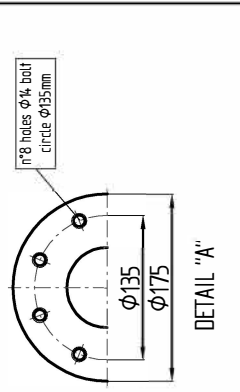
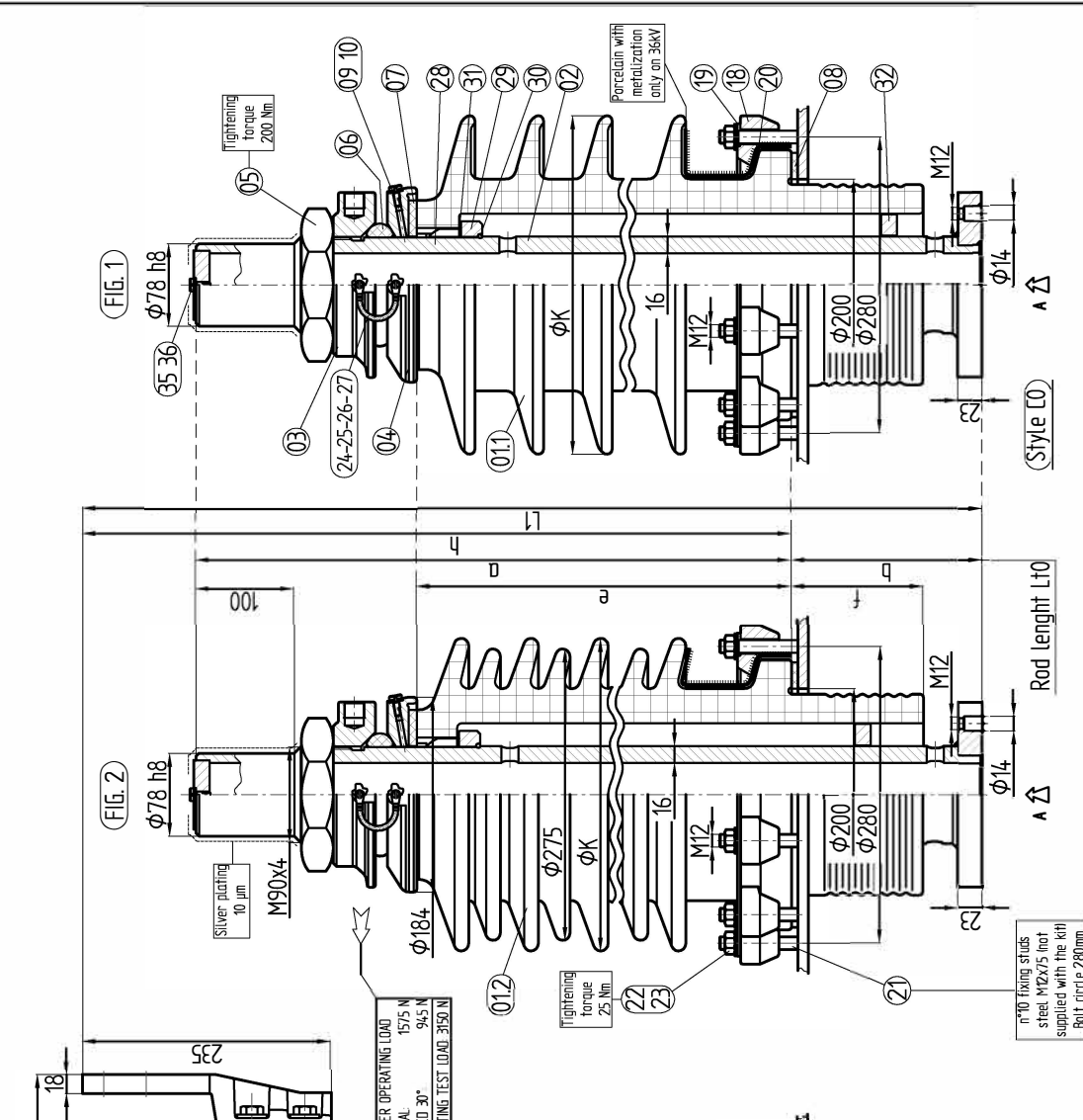
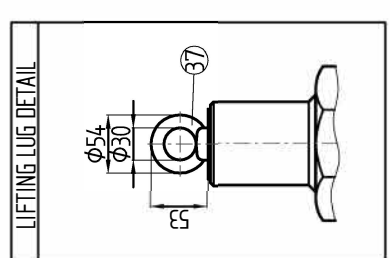
All our bushings HV 1000 to 4500 A are fit by default with a ring to center the conductor in the lower part,
The advantages offered by this solution are a better distribution of the electric field in the fixation area and a better release of the mechanical stress due to the connections under oil

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

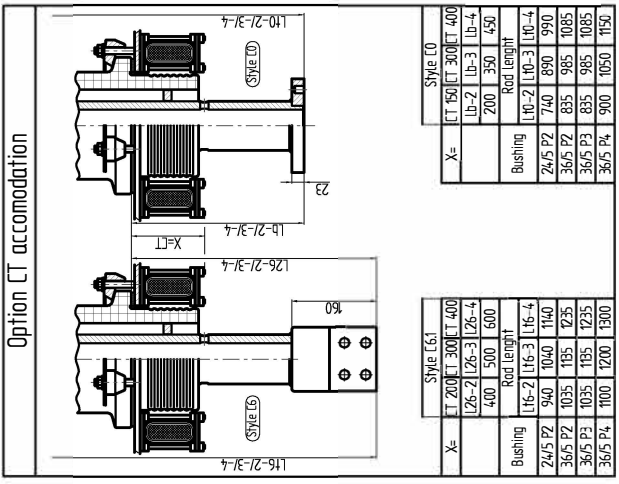
DATE	NAME	DOCUMENT NO.
06/05/22	Curti M.	5156
CHKO	CHANGE NO.	SCALE
STAND	02	1:5

Pos.	Description
11	Porcelain 24&36kV P2
12	Porcelain 36kV P3/4
2	Copper tube
3	Tightening ring
4	Cap disc
5	Brass nut
6	Ring gasket
7	Flat gasket
8	Flange gasket
9/10	M6 Vent/screw & gasket (Cap)
18	Clamping piece
19	Fixing ring
20	Copper spacer ring
21	Fixing stud M12x75 (not supplied)
22/23	Nut & washer M12
24/27	Equipotential link
28/30	Anti-rattling and stopper device
31	Fiber gasket
32	Center ring
35/36	M12 Vent/screw & gasket (Top)
37	Lifting lug



(*) Bushing 24/5-P2 full glazed porcelain without metallization

Fig.	Bushing	Voltage kV	Current A	Freeplay distance mm	PF T	PF kV	n° of spreads	Z	L1	e	f	a	h	b	L10 (mm)	EW Kg		
1	24/5-P2 (1)	24	5000	480*	55	125	3	285	825	320	100	540	675	150	350	890	60	
1	36/5-P2 (24/5-P4)	36	5000	900	744	170	5	320	945	445	125	635	770	175	810	350	985	80
2	36/5-P3	36	5000	900	771	170	5-4	295	945	445	125	635	770	175	810	350	985	80
2	36/5-P4	36	5000	1116	771	200	6-5	304	1033	481	149	701	839	200	300	350	1050	85



OUTDOOR TRANSFORMER BUSHING EN50243 (ex DIN42541)
RATED CURRENT 5000A VOLTAGE 24 & 36kV

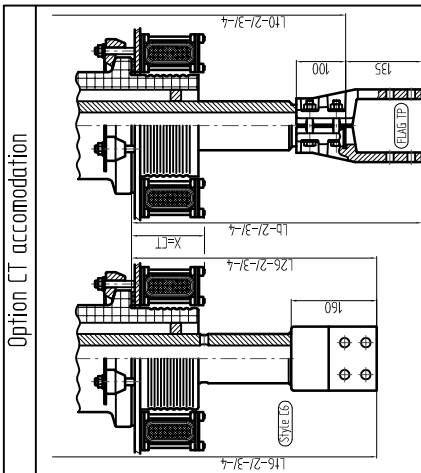
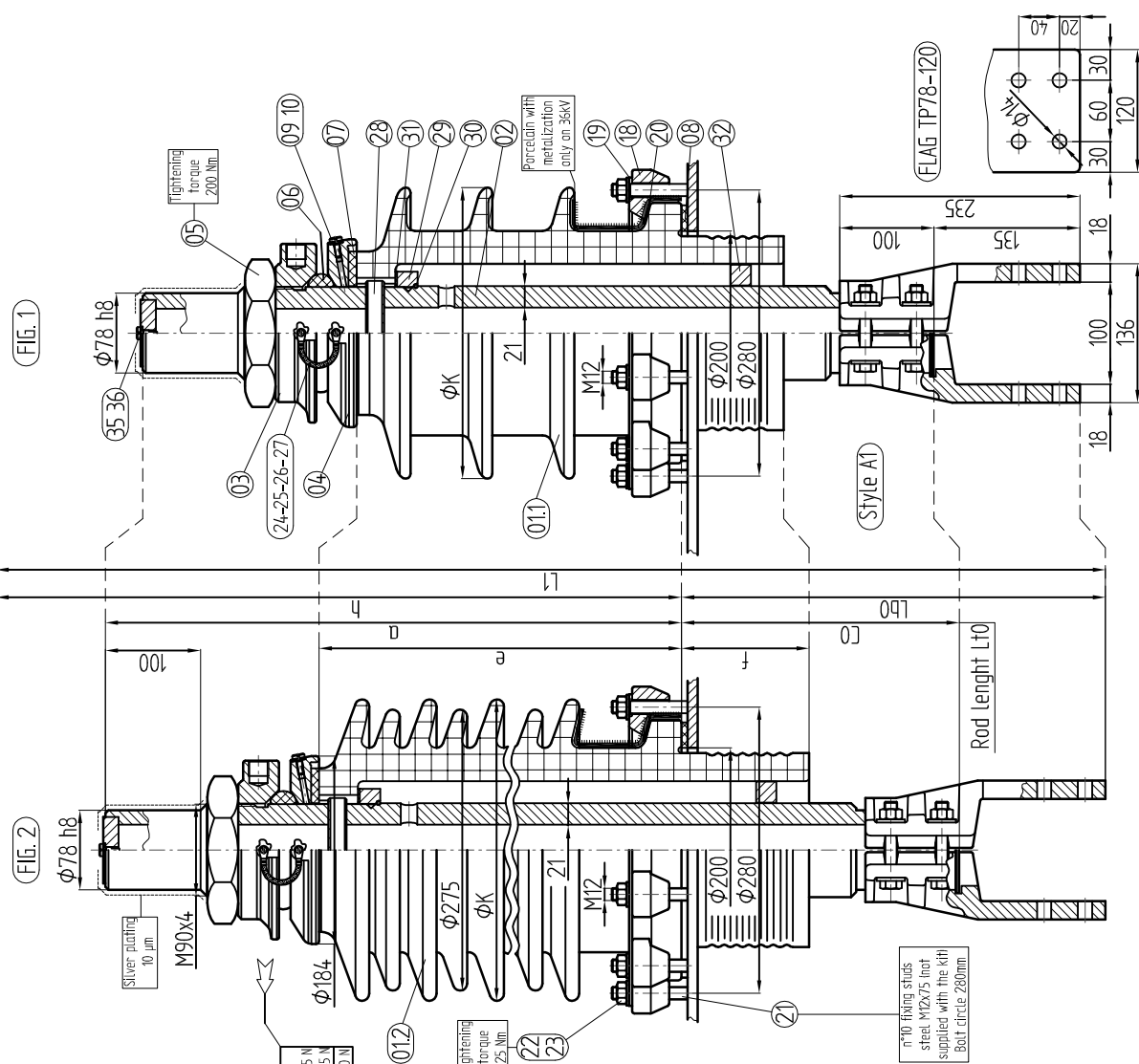
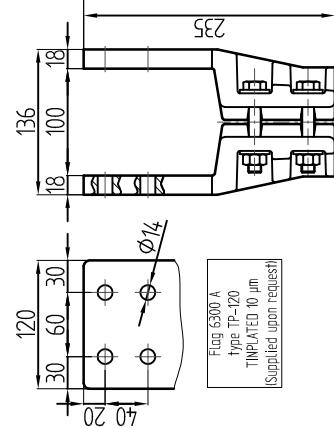
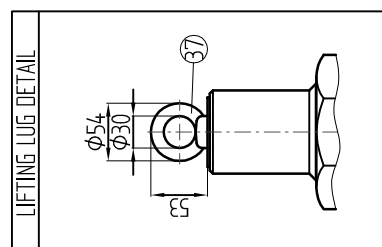
SERIAL NUMBER	SHEET 1/1
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DATE	NAME	DOCUMENT NO.
06/05/22	Curti M.	5158
CHKO.	CHANGE NO.	SCALE
STAND.	01	1:5

Pos.	Description
11	Porcelain 24kV P2
12	Porcelain 36kV P3/4
2	Copper tube
3	Tightening ring
4	Cap disc
5	Brass nut
6	Ring gasket
7	Earl gasket
8	Flange gasket
9/10	M6 Vent/screw & gasket (Cap)
18	Clamping piece
19	Fixing ring
20	Copper spacer ring
21	Fixing stud M12x75 (not supplied)
22/23	Nut & washer M12
24/27	Equipotential link
28/30	Anti-rattling and stopper device
31	Fiber gasket
32	Center ring
35/36	M12 Vent/screw & gasket (Top)
37	Lifting lug



Style L6	Style A1
126-21-31-4	116-21-31-4
226-21-31-4	116-21-31-4
400	475
500	575
800	675
1100	975
1200	1040
1300	1140
1400	1240

Fig.	Bushing	Voltage kV	Current A	Creepage distance mm	PF	Bill n° of sheets	Z	n° of sheets	ΦK	L1	e	f	a	h	CO	Lb0	Lt0	Co.1	Lt6	G.W.
1	24/6.3-P2 (1)	24	6300	480*	55	125	3	285	1057	320	100	540	675	247	382	787	350	890	60	60
2	36/6.3-P3	36	6300	1116	77	200	6-5	304	1268	481	149	701	836	297	432	998	350	1058	85	85

* Bushing 24/6.3-P2 full glazed porcelain without metallization



OUTDOOR TRANSFORMER BUSHING (in deviation of EN50243) RATED CURRENT 6300A VOLTAGE 24 & 36kV

SERIAL NUMBER	
MATERIAL NUMBER	SHEET 1/1

DATE	NAME	DOCUMENT NO.
06/05/22	Curti M.	5157
CHKO.	CHANGE NO.	SCALE
STAND.	02	1:5

Pos.	Description
11	Porcelain 24/8-36kV P2
12	Porcelain 36kV P3/4
2	Copper tube
3	Tightening ring
4	Cap disc
5	Brass nut
6	Ring gasket
7	Flat gasket
8	Flange gasket
9/10	M6 Vent/screw & gasket (Cap)
18	Clamping piece
19	Fixing ring
20	Copper spacer ring
21	Fixing stud M12x75 (not supplied)
22/23	Nut & washer M12
24/27	Equipotential link
28/30	Antirattling and stopper device
31	Fiber gasket
32	Center ring
35/36	M12 Vent/screw & gasket (Top)
37	Lifting lug

DIMENSION IN mm EXCEPT AS NOTED



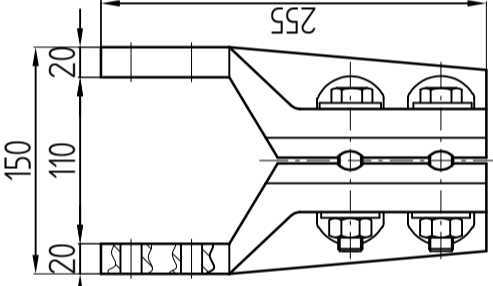
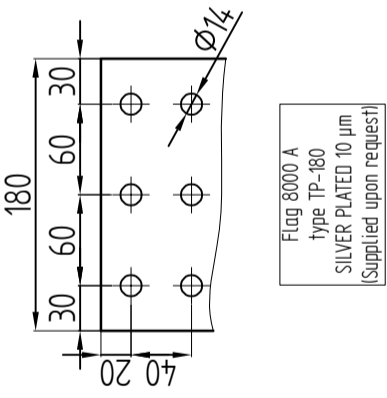
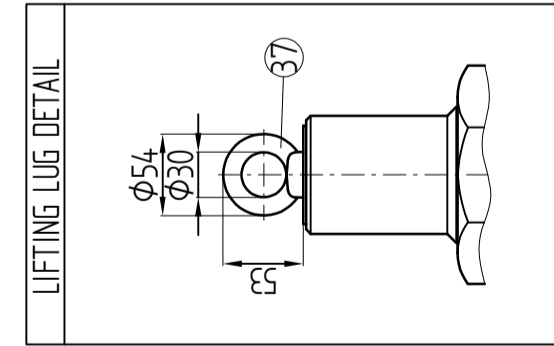
OUTDOOR TRANSFORMER BUSHING EN50243 (ex DIN42541) RATED CURRENT 8000A VOLTAGE 24 & 36kV

SERIAL NUMBER

MATERIAL NUMBER

SHEET

1/1



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

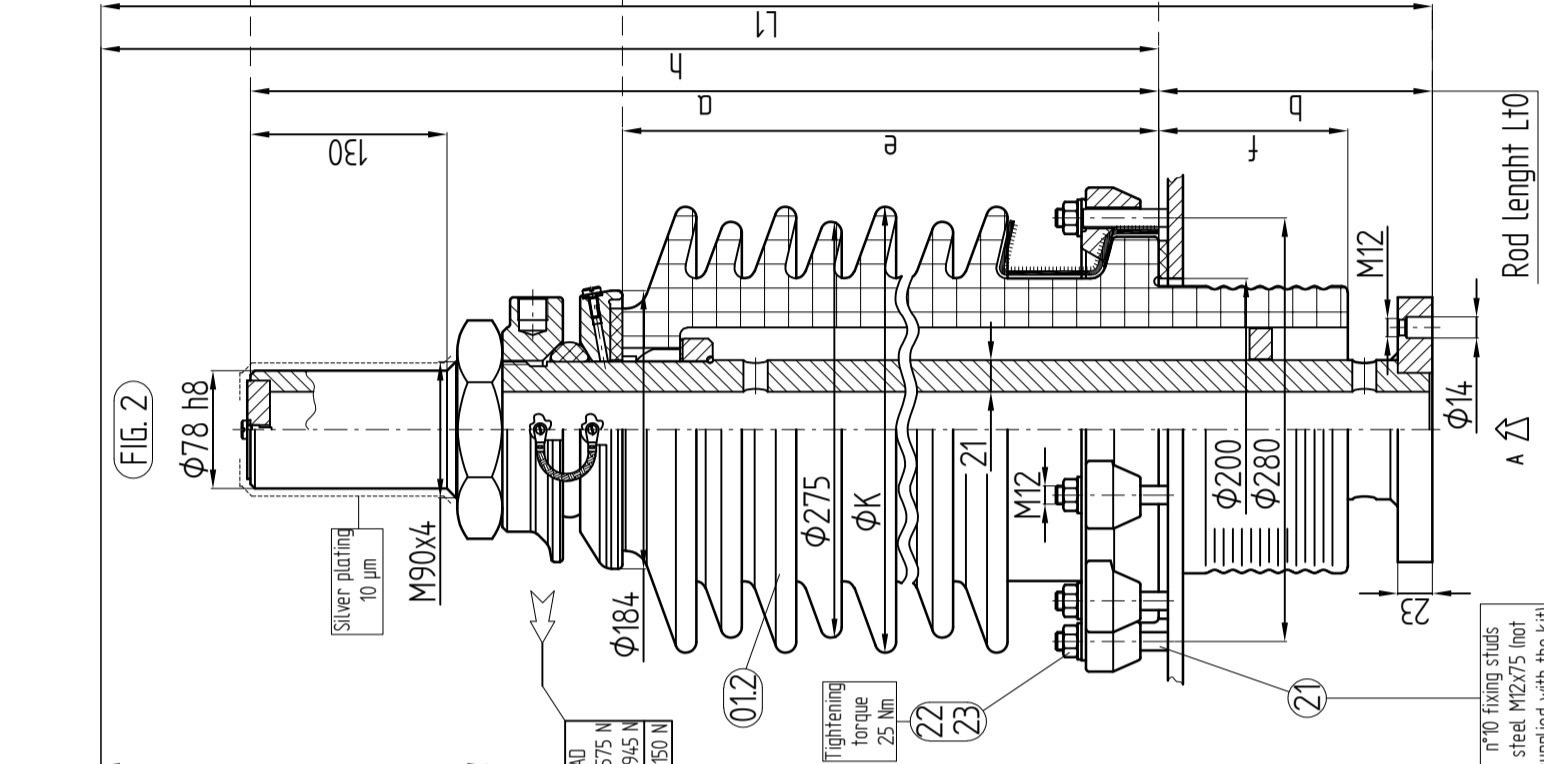
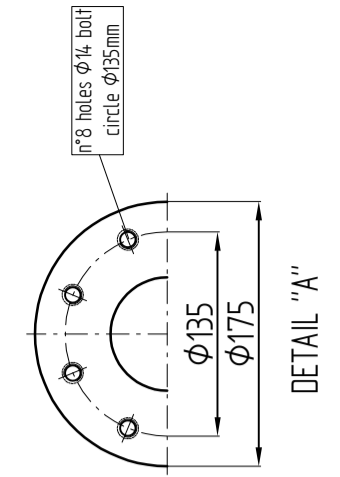
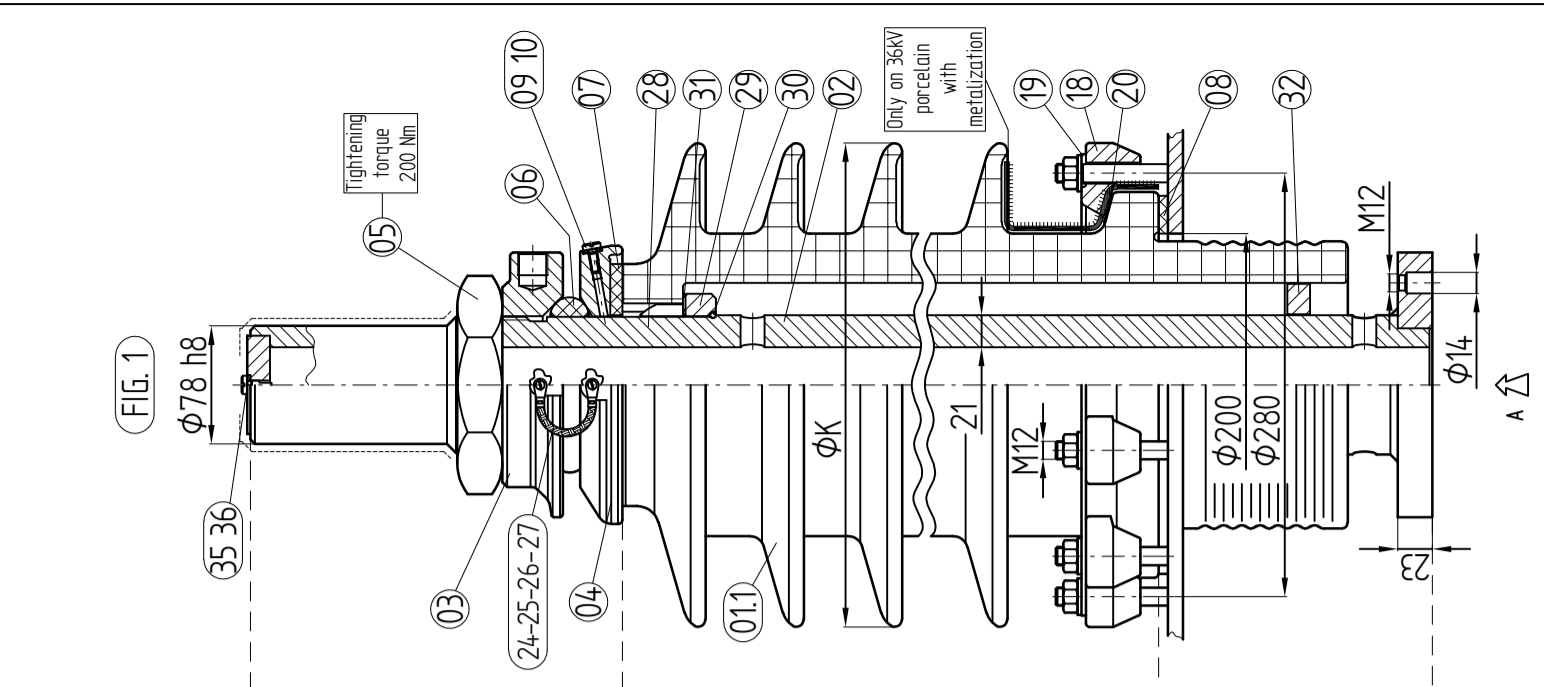


FIG. 2

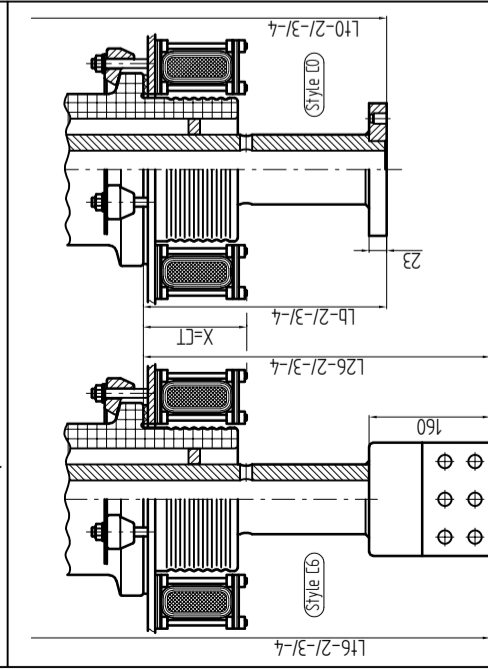
FIG. 1



(*) Bushing 24/8-P2 full glazed porcelain without metalization

Fig.	Bushing	Voltage kV	Current A	Creepage distance mm	PF	BIL n° of kV	Z n° of sheds	ΦK	l1	e	f	a	h	b	Lt0	CG1 Lt0	G.W. Kg	
1	24/8-P2 (*)	24	8000	480	55	125	3	285	845	320	100	570	695	150	720	350	920	70
1	36/8-P2 (24/8-P4)	36	8000	744	77	170	5	320	965	415	125	665	790	175	840	350	1015	90
2	36/8-P3	36	8000	900	77	170	5+4	295	965	415	125	665	790	175	840	350	1015	90
2	36/8-P4	36	8000	1116	77	200	6+5	304	1059	481	149	731	859	200	930	350	1080	95

Option CT accommodation



X=	Style L6				Style L0			
	CT 200	L26-2	L26-3	L26-4	CT 150	Lb-2	Lb-3	Lb-4
	400	500	600	600	200	350	450	450
	Rod length				Rod length			
	L16-2	L16-3	L16-4	L16-4	L10-2	L10-3	L10-4	L10-4
Bushing	24/8 P2	970	1070	1170	770	920	1020	1020
	36/8 P2	1065	1165	1265	865	1015	1115	1115
	36/8 P3	1065	1165	1265	865	1015	1115	1115
	36/8 P4	1130	1230	1330	930	1080	1180	1180

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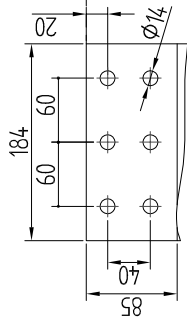
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DATE	NAME	DOCUMENT NO.
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CHD.	-	CHANGE NO.
STAND.	-	5
		SCALE
		1:5

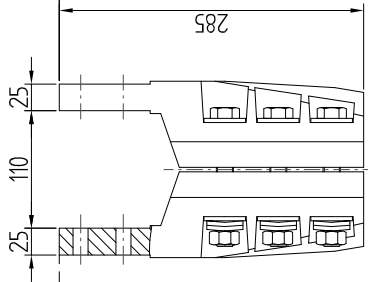
DIMENSION
IN mm
EXCEPT AS
NOTED



BUSHING 36kV 12500 A DIN 42537-1983

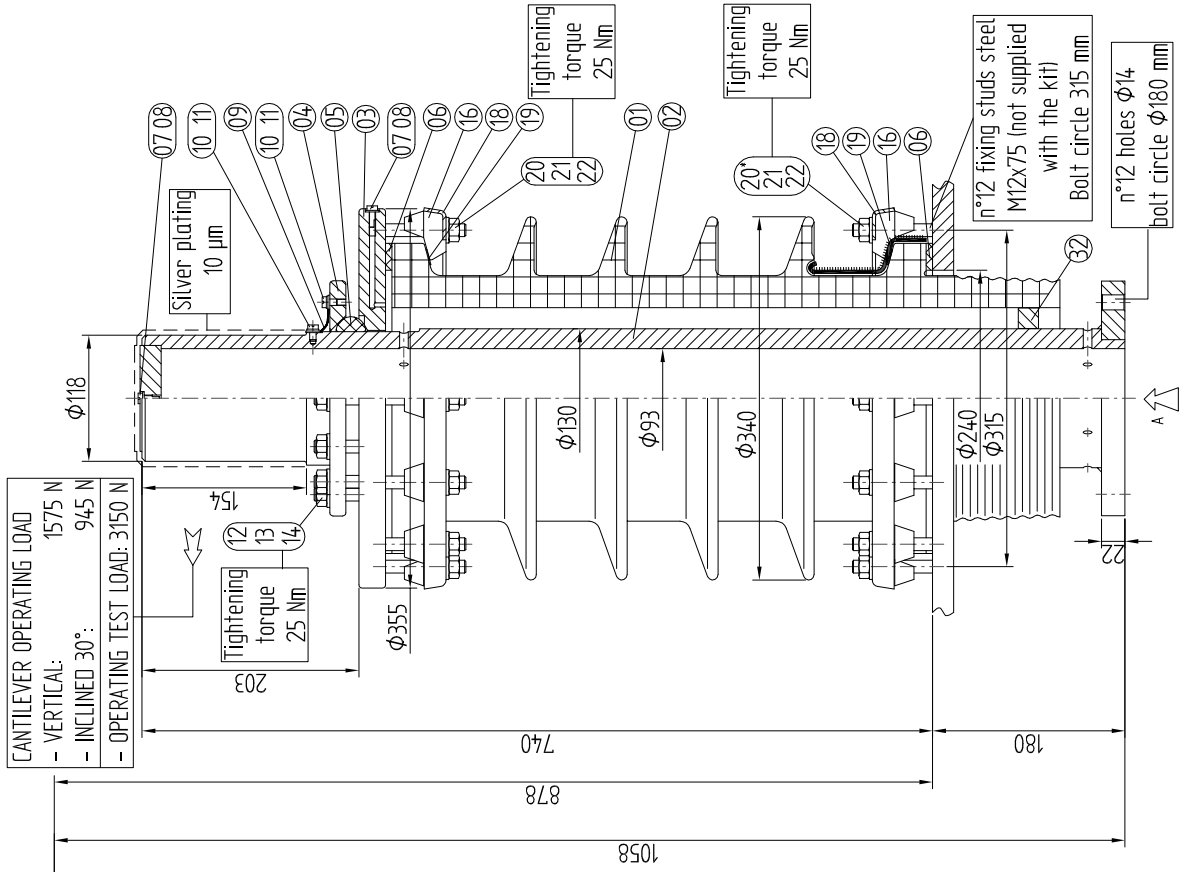
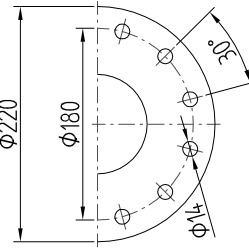


Flag 12500 A
type GPL-180
SILVER PLATED 10 µm
(Supplied upon request)



Pos.	Description
1	Porcelain
2	Copper tube
3	Closing flange
4	Tightening ring
5	Ring gasket
6	Flange gasket
7/8	Vent/screw & gasket
9/11	Equipotential link
12	Stud M12x40
13/14	Nut & washer M12
16	Clamping piece
18	Fixing ring
19	Copper spacer ring
20	Fixing stud M12x75 (not supplied)
21/22	Nut & washer M12
32	Center ring

Detail "A"



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

Tightening torque 25 Nm

Tightening torque 25 Nm

Tightening torque 25 Nm

n°12 fixing studs steel M12x75 (not supplied with the kit)
Bolt circle 315 mm

n°12 holes 14
bolt circle 180 mm

Bushing	Voltage kV	Current A	Creepage distance mm	Arcing distance kV	PF	BIL kV	Z n° of sheds	G.W. Kg
36/12500	36	12500	710	350	77	170	4	165

SERIAL NUMBER

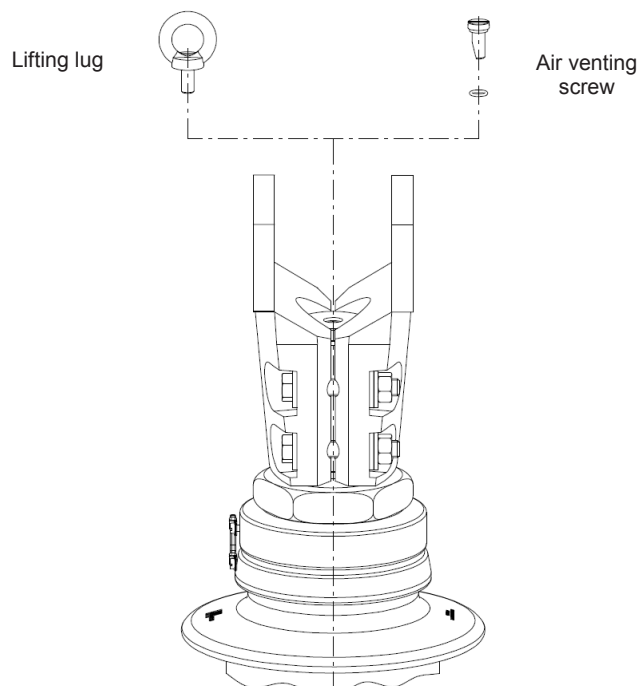
MATERIAL NUMBER

SHEET 1/1

LIFTING LUG USE INFORMATION

Bushings 8000A and 12500A

CEDASPE high current, 8000A and 12500A rated, bushings come equipped with a steel lug, screwed in top of conductor upper end, to help user with lifting and handling operations during installation or dismantling of the bushing off transformer.



CAUTION: Before oil filling operation to dismantle the lug and fit in the air venting screw supplied with the bushing.