

6 5 4 3 2 1

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS
2. FOR EPC CONTRACTS ONLY

LIST OF STANDARD DRGS./DOCUMENTS APPLICABLE FOR 420 kV CVT (4400 pF) HIGH CREEPAGE

LIST OF VARIABLE DRGS. APPLICABLE FOR 420 kV CVT (4400 pF) HIGH CREEPAGE

SR. NO.	DESCRIPTION	DRG./DOC.NO.	APP. CAT.	REMARKS
01	GENERAL ARRANGEMENT	3-CAD 10460/R0	--	--
02	RATING/SCHEMATIC PLATE	3-CAD 10461/R0	--	--
03	SECONDARY TERMINAL BOX G.A.	3-CAD 10462/R0	--	--
04	SECTIONAL VIEW	3-CAD 10463/R0	--	--
05	PORCELAIN INSULATOR	3-CAD 10464/R0	--	--
06	GUARANTEED TECHNICAL PARTICULARS	S1/CV/T/660/R0	---	---
07	LIST OF TYPE TEST REPORTS	S1/CV/T/661/R0	---	--

SR. NO.	DESCRIPTION	DRAWING NO.
01	COVER SHEET	AS APPLICABLE
02	RATING/SCHEMATIC PLATE	AS APPLICABLE

CUSTOMER	:	} AS APPLICABLE
LOA NO.	:	
PO. NO.	:	
S.O. NO.	:	
QUANTITY	:	


Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/IVT/CVT requirement and compatibility.

Ground clearance of 8000 mm shall be maintained from Plinth level during erection.

Drawing approval subject to valid vendor registration

**CHIEF ENGINEER
PLANNING & POWER SYSTEMS
APTRANSCO**

2			
1			
NO	REVISION	SIGN	DATE

CUSTOMER : TRANSMISSION CORPORATION OF ANDHRA PRADESH (APTRANSCO)			
GEN. TOL.	MATL.: SPEC.:	TITLE : <u>STANDARD DRAWING</u> LIST OF STANDARD DRGS. / DOCUMENTS APPLICABLE FOR 420 kV CVT (4400 pF) HIGH CREEPAGE	
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	
	CHD	HARI	
	APPD	USS	
DATE : 21.05.2022		 CG Power and Industrial Solutions Limited S1 - DIVISION, AMBAD, NASHIK	
DRG.NO: 3-CAD 10459			REV 0

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DRG.NO: 3-CAD 10459

IF IN DOUBT, ASK

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST

REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS

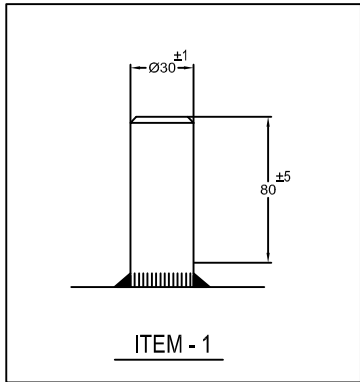
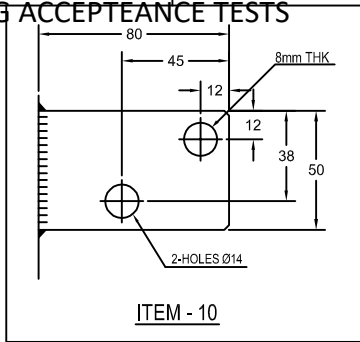
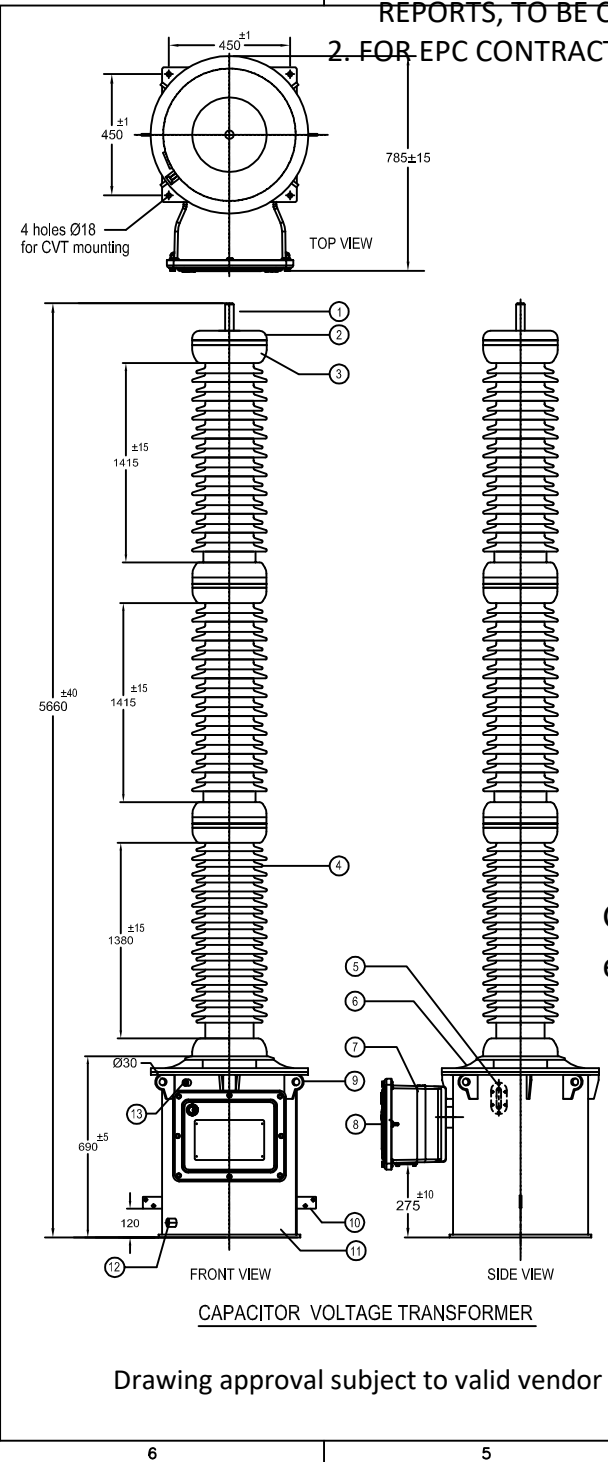
2. FOR EPC CONTRACTS ONLY

DRG.NO: 3-CAD 10460

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CCC15E (MDSO)

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SR.NO	QTY.	DESCRIPTION	MATERIAL
1	1	H.V. TERMINAL Ø30x80 mm LONG	ALUMINIUM
2	1	HOOD	ALUMINIUM
3	6	PORCELAIN FLANGE	ALUMINIUM
4	3	PORCELAIN INSULATOR *	PORCELAIN
5	1	OIL LEVEL INDICATOR ON EMU	POLYCARBONATE
6	1	TANK COVER	ALUMINIUM
7	1	SECONDARY TERMINAL BOX	ALUMINIUM
8	1	RATING/SCHEMATIC PLATE	ALUMINIUM
9	4	LIFTING LUGS	STEEL HDG
10	2	EARTHING PADS (8 mm THK.)	STAINLESS STEEL
11	1	EMU TANK	STEEL HDG
12	1	OIL SAMPLING VALVE (FOR EMU)	STEEL GALVANISED
13	1	OIL FILLING PLUG(FOR EMU)	BRASS NICK.PLATED

* MAKE OF PORCELAIN : IEC / CJI / MODERN / RAVIKIRAN

1. TOTAL MASS	: 775 kg	±10%
2. OIL MASS	: 130 kg	±10%
3. TOTAL CREEPAGE	: 13020 mm (min)	
4. CANTILEVER LOAD FOR CVT	: 500 kgf	


Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/IVT/CVT requirement and compatibility.

Ground clearance of 8000 mm shall be maintained from Plinth level during erection.

**CHIEF ENGINEER
PLANNING & POWER SYSTEMS**

3	APTRANSCO		
2			
1			
NO	REVISION	SIGN	DATE

CUSTOMER : TRANSMISSION CORPORATION OF ANDHRA PRADESH (APTRANSCO)

GEN. TOL.	MATL. SPEC:	TITLE : <u>STANDARD DRAWING</u> GENERAL ARRANGEMENT FOR 420 kV (4400 pF) CVT HIGH CREEPAGE
THIRD ANGLE PROJECTION		 CG Power and Industrial Solutions Limited S1 - DIVISION, AMBAD, NASHIK
SCALE: NTS	INITIALS NAME	
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	DRN NSB CHD HARI APPD USS	
DATE: 21.05.2022		DRG.NO: 3-CAD 10460
		REV 0

CAPACITOR VOLTAGE TRANSFORMER

Drawing approval subject to valid vendor registration

DRG.NO: 3-CAD 10461

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NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS
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	CG Power and Industrial Solutions Limited <small>S1 - DIVISION, AMBAD, NASHIK</small>	CAPACITOR VOLTAGE TRANSFORMER MADE IN INDIA	RATING AND SCHEMATIC PLATE
CUSTOMER : APTRANSCO		PROJECT : AS APPLICABLE LOA NO. : AS APPLICABLE	
TYPE: <u>CVE:420 / 1425 / 50</u>	HSV: <u>420 kV</u>	EQUI. CAPACITANCE: <u>4400 +10%,-5%pF</u>	THERMAL OUTPUT: <u>750 VA</u>
STD.: <u>IEC 61869 - 1 & 5</u>	FREQ.: <u>50 Hz</u>	TOTAL SIM.BURDEN/CLASS: <u>50VA/0.2 & 150VA/3P</u>	TOTAL MASS: <u>775±10% kg</u>
S.O.: <u>AS APPLICABLE</u>	INSULATION LEVEL: <u>630 kV/1050kVp/1425 kVp</u>	CAPACITOR OIL: <u>65±10% kg</u>	EMU OIL: <u>65±10% kg</u>
YEAR: <u>AS APPLICABLE</u>	VF: <u>1.2CONT./1.5-30SEC.</u>		
SR.NO.: <u> </u>	CREEPAGE DISTANCE: <u>13020 mm</u>		

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">A - NHF</td> <td style="text-align: center;">1a - 1n</td> <td style="text-align: center;">2a - 2n</td> <td style="text-align: center;">3a - 3n</td> </tr> <tr> <td>VOLTS</td> <td style="text-align: center;">$400000/\sqrt{3}$</td> <td style="text-align: center;">$110/\sqrt{3}$</td> <td style="text-align: center;">$110/\sqrt{3}$</td> <td style="text-align: center;">$110/\sqrt{3}$</td> </tr> <tr> <td>VA</td> <td style="text-align: center;">---</td> <td style="text-align: center;">50</td> <td style="text-align: center;">50</td> <td style="text-align: center;">50</td> </tr> <tr> <td>CLASS</td> <td style="text-align: center;">---</td> <td style="text-align: center;">3P</td> <td style="text-align: center;">3P</td> <td style="text-align: center;">0.2</td> </tr> </table> <p>CAUTION</p> <ol style="list-style-type: none"> SHORT CIRCUIT THE CAPACITOR UNITS WHEN ERECTING OR DISMANTLING THE CVT AND REMOVE THE SHORT CIRCUIT BEFORE PRETEST OR COMMISSIONING. UNDER NO CONDITIONS SHOULD THE LOAD/BURDEN VALUES MENTIONED ON THE RATING PLATE BE EXCEEDED. WHEN TERMINAL NHF IS NOT USED FOR HF TRANSMISSION IT MUST BE CONNECTED TO EARTH. (AS SUPPLIED NHF IS CONNECTED TO EARTH.) 		A - NHF	1a - 1n	2a - 2n	3a - 3n	VOLTS	$400000/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$	VA	---	50	50	50	CLASS	---	3P	3P	0.2	<p>4-Holes of ϕ 4</p> <p>±1 250</p> <p>±0,5 238</p> <p>±0,5 118</p> <p>±1 145</p> <p>1 mm Thk. Aluminium</p> <p>15</p>
	A - NHF	1a - 1n	2a - 2n	3a - 3n																		
VOLTS	$400000/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$																		
VA	---	50	50	50																		
CLASS	---	3P	3P	0.2																		

IMPORTANT

- BEFORE COMMISSIONING IT IS ESSENTIAL TO CHECK THE LOW VOLTAGE RATIO OF CVT. (REFER INSTRUCTION MANUAL)
- DURING SERVICE, PLEASE CLOSE THE TERMINAL BOX COVER FIRMLY TO ENSURE PROPER SEALING OF BOX.
- PLUG UNUSED HOLES ON THE GLAND PLATE.

All letters in this blocks (250X15) will be in RED colour on natural aluminium background.

Drawing approval subject to valid vendor registration

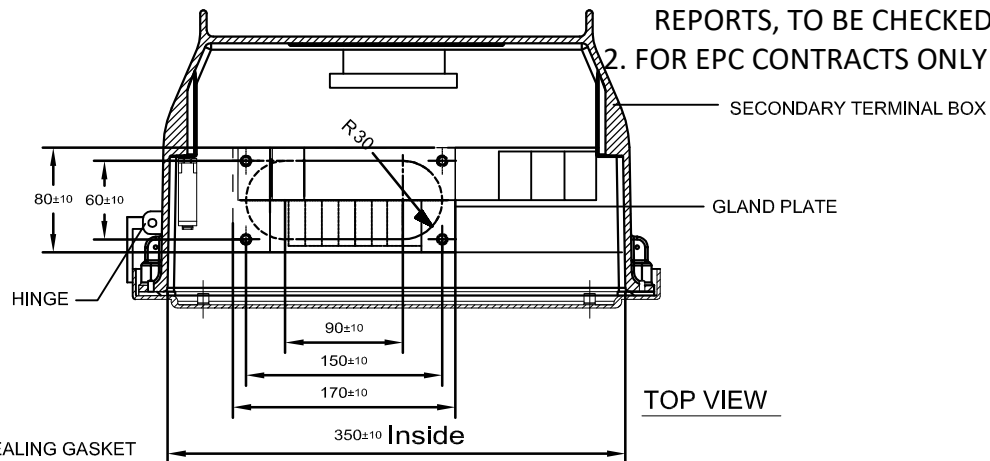
CHIEF ENGINEER
PLANNING & POWER SYSTEMS
APTRANSCO

CUSTOMER : TRANSMISSION CORPORATION OF ANDHRA PRADESH (APTRANSCO)			
GEN. TOL.	MATL.:	TITLE : STANDARD DRAWING RATING / SCHEMATIC PLATE 420 kV CVT (4400 pF) HIGH CREEPAGE	
	SPEC.:		
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	
	CHD	HARI	
	APPD	USS	
		CG Power and Industrial Solutions Limited <small>S1 - DIVISION, AMBAD, NASHIK</small>	
DRG.NO: 3-CAD 10461			REV 0

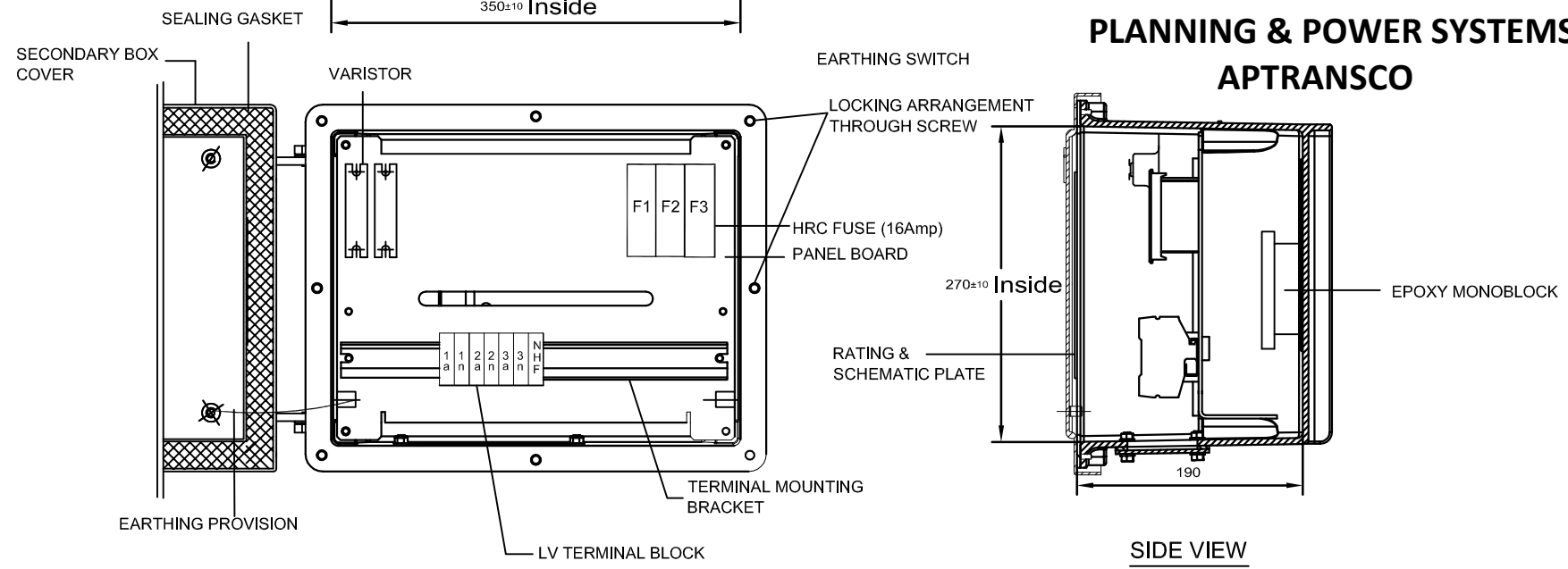
NO	REVISION	SIGN	DATE
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NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS
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FRONT VIEW

SIDE VIEW

Drawing approval subject to valid vendor registration

DEGREE OF PROTECTION : IP55

CUSTOMER : TRANSMISSION CORPORATION OF ANDHRA PRADESH (APTRANSCO)			
GEN. TOL.	MATL.:	TITLE : <u>STANDARD DRAWING</u>	
	SPEC.:	SECONDARY BOX GA	
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	
	CHD	HARI	
	APPD	USS	
DATE : 21.05.2022		DRG.NO: 3-CAD 10462	
		REV 0	

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NO	REVISION	SIGN	DATE	



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S1 - DIVISION, AMBAD, NASHIK

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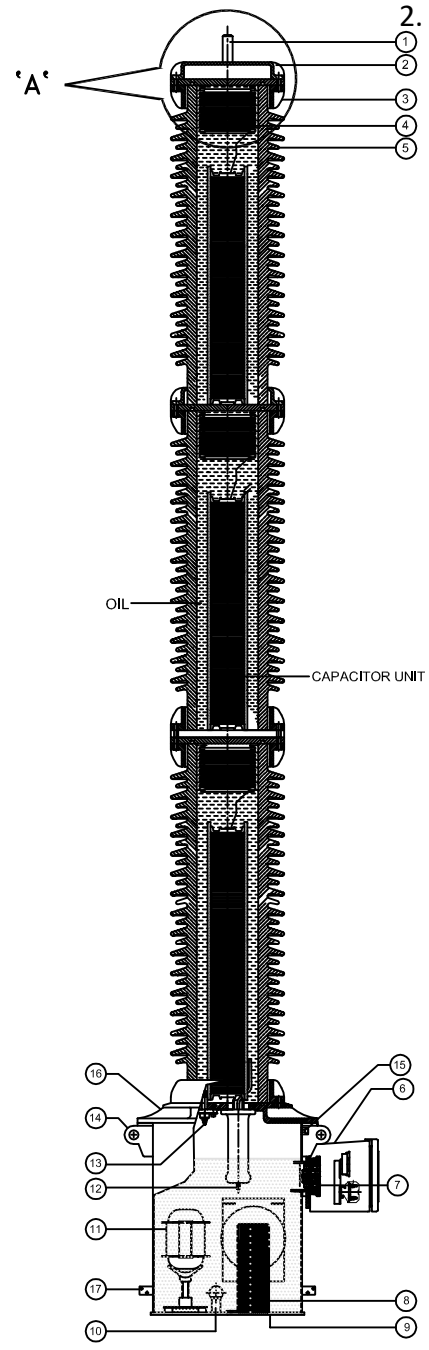
DRG.NO: 3-CAD 10463

IF IN DOUBT, ASK

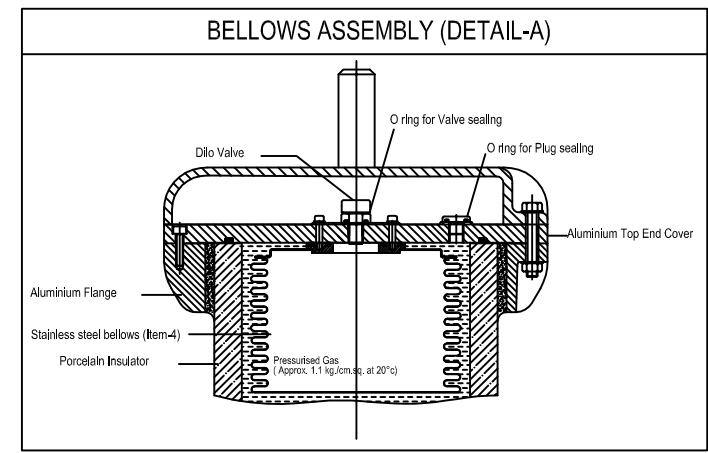
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NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS

2. FOR EPC CONTRACTS ONLY



SR.NO	QTY.	DESCRIPTION
1	1	H.V. TERMINAL Ø30x80 mm LONG
2	1	HOOD
3	6	PORCELAIN FLANGE
4	3	S.S BELLOWS
5	3	PORCELAIN INSULATOR
6	1	SECONDARY TERMINAL BOX
7	1	MONOBLOCK
8	1	INDUCTIVE VOLTAGE TRANSFORMER
9	1	EMU TANK
10	1	DAMPING DEVICE
11	1	COMPENSATING CHOKE
12	1	M.V. TAP TERMINAL
13	1	NHF TERMINAL
14	4	LIFTING LUGS
15	1	OIL FILLING PLUG(FOR EMU)
16	1	TANK COVER
17	2	EARTHING PADS (8mm. THK)



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2			
1			
NO	REVISION	SIGN	DATE

CUSTOMER : TRANSMISSION CORPORATION OF ANDHRA PRADESH (APTRANSCO)			
GEN. TOL.	MATL. SPEC.	TITLE : STANDARD DRAWING SECTIONAL VIEW FOR 420 kV CVT (4400pF) HIGH CREEPAGE	
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	
	CHD	HARI	
	APPD	USS	
DATE: 21.05.2022			REV 0



CG Power and Industrial Solutions Limited
S1 - DIVISION, AMBAD, NASHIK

DRG.NO: 3-CAD 10463

NOTE: 01. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST

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REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS
2. FOR EPC CONTRACTS ONLY

NOTE

- * ∇ INDICATE UNGLAZED SURFACE GROUND SMOOTH, PERPENDICULAR TO THE AXIS AND PARALLEL TO EACH OTHER.
- * SHALL BE HIGH VOLTAGE ELECTRICAL PORCELAIN CONFORMING TO IS 5621:80 (OR IEC 62155:2003) UN SPECIFIED TOLERANCES AS PER IS 5621:80
- * INSIDE AND OUTSIDE SHALL BE BROWN GLAZED.
- * SHED FORM CONFORMS TO IEC 60815:2008 REQUIREMENTS.
- * TOTAL CREEPAGE DISTANCE = 4495 mm.
- * CANTILEVER LOAD OF PORCELAIN = 500 kgf
- * QTY = 3 NOS/CVT

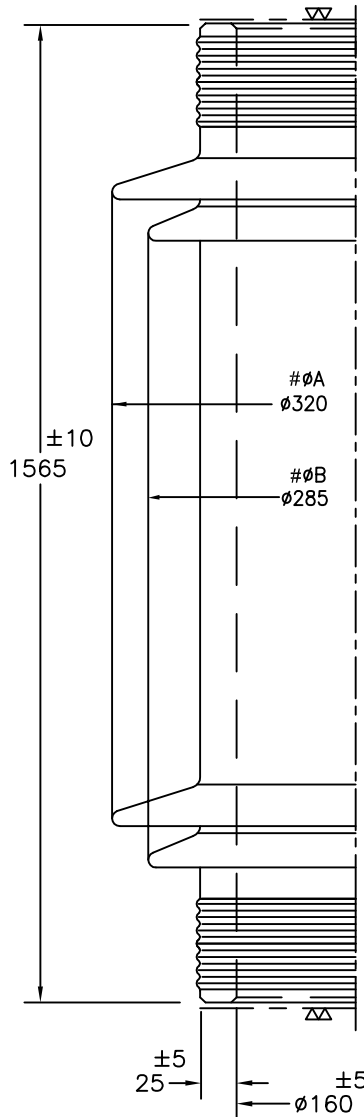
NOTE:
TOLERANCES ON $\varnothing A$, $\varnothing B$ ARE AS PER IS 5621:1980 AND THE SAME ARE $\pm(0.025xd+6)$ mm. WHERE d IS $\varnothing A$ OR $\varnothing B$

Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/IVT/CVT requirement and compatibility.


Ground clearance of 8000 mm shall be maintained from Plinth level during erection.

Drawing approval subject to valid vendor registration

**CHIEF ENGINEER
PLANNING & POWER SYSTEMS
APTRANSCO**



NO	REVISION	SIGN	DATE
2			
1			

CUSTOMER : TRANSMISSION CORPORATION OF ANDHRA PRADESH (APTRANSCO)			
GEN. TOL.	MATL:	TITLE : <u>STANDARD DRAWING</u>	
	SPEC.:	LOWER / MIDDLE / UPPER PORCELAIN INSULATOR	
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	 CG Power and Industrial Solutions Limited S1 - DIVISION, AMBAD, NASHIK
	CHD	HARI	
	APPD	USS	
DATE: 21.05.2022			DRG.NO: 3-CAD 10464 REV 0

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DRG.NO: 3-CAD 10464

6063020/2022/EEMRT-ENE51 FOR EPC CONTRACTS ONLY

CG Power and Industrial Solutions Limited S1 Division, A-3, MIDC, Ambad, Nashik	Guaranteed Technical Particulars For high Creepage (31mm/kV) 400kV SINGLE PHASE CAPACITOR VOLTAGE TRANSFORMER	Document No. S1/CV/T/660/R0
		Date 25/05/2022
		Page 1 of 3

Sr. No	Description		400kV
1	Manufacturers/suppliers name and country of manufacture.		M/s. CG Power and Industrial Solutions Limited, A-3, MIDC, Ambad, Nasik, Maharashtra-India
2	Governing standard		IEC-61869-1&5 & IEC 60358
3	Rated voltage	(kVrms)	
a)	Nominal		400
b)	Maximum		420
4	Rated frequency	(Hz)	50
5	No of Phases		Single
6	Maximum temperature rise over 50 deg.C	°C	55
7	Reference range of frequency	(kHz)	40 to 500
8	Reference range of temperature	°C	-5°C to + 55 °C
9	Simultaneous burden / Accuracy Class	VA	50/0.2 150/3P
10 a)	Rated primary voltage	(kVrms)	400/√3
b)	Rated secondary voltage	(V)	110/√3; 110/√3; 110/√3
c)	Rated secondary burden	(VA)	50; 50 ; 50
d)	Accuracy class		3P; 3P; 0.2
11	Rated voltage factor		1.2 for continuous, 1.5 for 30 seconds
12	Rated intermediate voltage	(kVrms)	13
13	Total capacitance	(pF)	4400pF (+10% -5%)
14	High frequency capacitance for entire carrier frequency range	(pF)	4400pF (+10% -5%)
15	Equivalent series resistance over the entire carrier frequency range	(ohms)	< 40 ohms
16	Stray capacitance and strap conductance of the LT Terminal over entire carrier frequency range	(pF & μS)	As per IEC
17	Rated insulation levels 1.2/50 μsec lightning impulse withstand voltage	(kV peak)	1425
18	250/2500 μsec switching surge withstand voltage	(kV peak)	1050

Prepared By
Parimal S Borse

Checked By
Hari Baskhar.S

Approved By
Uday Sanvatsarkar

6063020/2022/EEMRT-ENE51

FOR EPC CONTRACTS ONLY

CG Power and Industrial Solutions Limited S1 Division, A-3, MIDC, Ambad, Nashik	Guaranteed Technical Particulars For high Creepage (31mm/kV) 400kV SINGLE PHASE CAPACITOR VOLTAGE TRANSFORMER	Document No. S1/CV/T/660/R0
		Date 25/05/2022
		Page 2 of 3

19	1 minute dry power frequency withstand test voltage	(kV rms)	630
20	Creepage distance (min) (with tolerance positive side)	(mm)	13020 (min.)
21	Radio interference voltage	μ V	Less than 1000 microvolt
22	Corona extinction voltage	kV rms	267
23	Rated total thermal burden	VA	750
24	Capacitance	CHIEF ENGINEER PLANNING & POWER SYSTEMS APTRANSCO	
a)	Primary capacitance	(pF)	4650 Nominal
b)	Secondary capacitance	(pF)	82070 Nominal
c)	Equivalent capacitance	(pF)	4400 (+10% -5%)
25	If CVT suitable for carrier coupling. If so, the range of carrier frequency (KHz)	(kHz)	40-500
26	Natural frequency of coupling capacity	(kHz)	More than 600kHz
27	Number of secondary windings	Nos.	03
28	Temperature rise at 1.2 times rated voltage and rated burden after steady state conditions at normal rated voltage and burden.	$^{\circ}$ C	55
29	Temperature rise at 1.5 times rated voltage for 30 sec.	$^{\circ}$ C	55
30	One minute power frequency withstand voltage on secondary's	(kV rms)	
	Winding No. I		3
	Winding No. II		3
	Winding No. III		3
31	Partial discharge level at 1. U_m ; 2. $1.2*U_m/\sqrt{3}$	pC	<10pC <5pC
32	Over all dimensions	(mm)	
a)	Length X Width X Height (Lower)		1040 X 910 X 2700
b)	Length X Width X Height (Middle)		625 X 625 X 2070
c)	Length X Width X Height (Upper)		625 X 625 X 2070
d)	Gross Weight	kg	775 \pm 10%
33	Value of pressure for sealing test	(kg/cm ²)	1.1
34	Weight of oil and the standard to which it conforms		

Prepared By
Parimal S BorseChecked By
Hari Baskhar.SApproved By
Uday Sanvatsarkar

CG Power and Industrial Solutions Limited S1 Division, A-3, MIDC, Ambad, Nashik	Guaranteed Technical Particulars For high Creepage (31mm/kV) 400kV SINGLE PHASE CAPACITOR VOLTAGE TRANSFORMER	Document No. S1/CV/T/660/R0
		Date 25/05/2022
		Page 3 of 3

a)	In capacitor unit	kg	Oil Mass: 65 ± 10% IEC 60867
b)	In measuring unit	kg	Oil Mass: 65 ± 10% IEC 60296 & IS 335
35	Total weight	kg	Total Mass: 775 ± 10% Total Oil Mass : 130 ± 10%
36	Minimum centre to centre recommended spacing between CVT's.	(mm)	Not In our scope.
37	Clearance required from grounded equipment at various heights of CVT's	(mm)	Not In our scope
38	Mounting flange dimensional details	(mm)	Ø 18 Hole, 4 Nos. 450 X 450 hole to hole
39	Do the CVT's contain built in compensating reactor, HF choke coil, voltage arresters and damping devices in P.T. Portions?		Yes.
40	Transportation Details [vertical/Horizontal].		Vertical
41	Type of Insulation		Class A
42	Degree of Protection		Secondary Box IP 55
43	One minute power frequency test voltage of secondary winding (kV rms)	kVrms	3
44	One minute power frequency test voltage of H.F. terminal	kVrms	4
45	Range of frequency for which accuracy are valid for 1. Metering 2. Protection		99% to 101% 96% to 102%
46	Tan delta of capacitor unit	Tan δ	< 0.002
47	Seismic Acceleration (Horizontal + Vertical)	g	0.3

Tan delta of CVT < 0.005

Drawing approval subject to valid vendor registration

**CHIEF ENGINEER
PLANNING & POWER SYSTEMS
APTRANSCO**

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Uday Sanvatsarkar