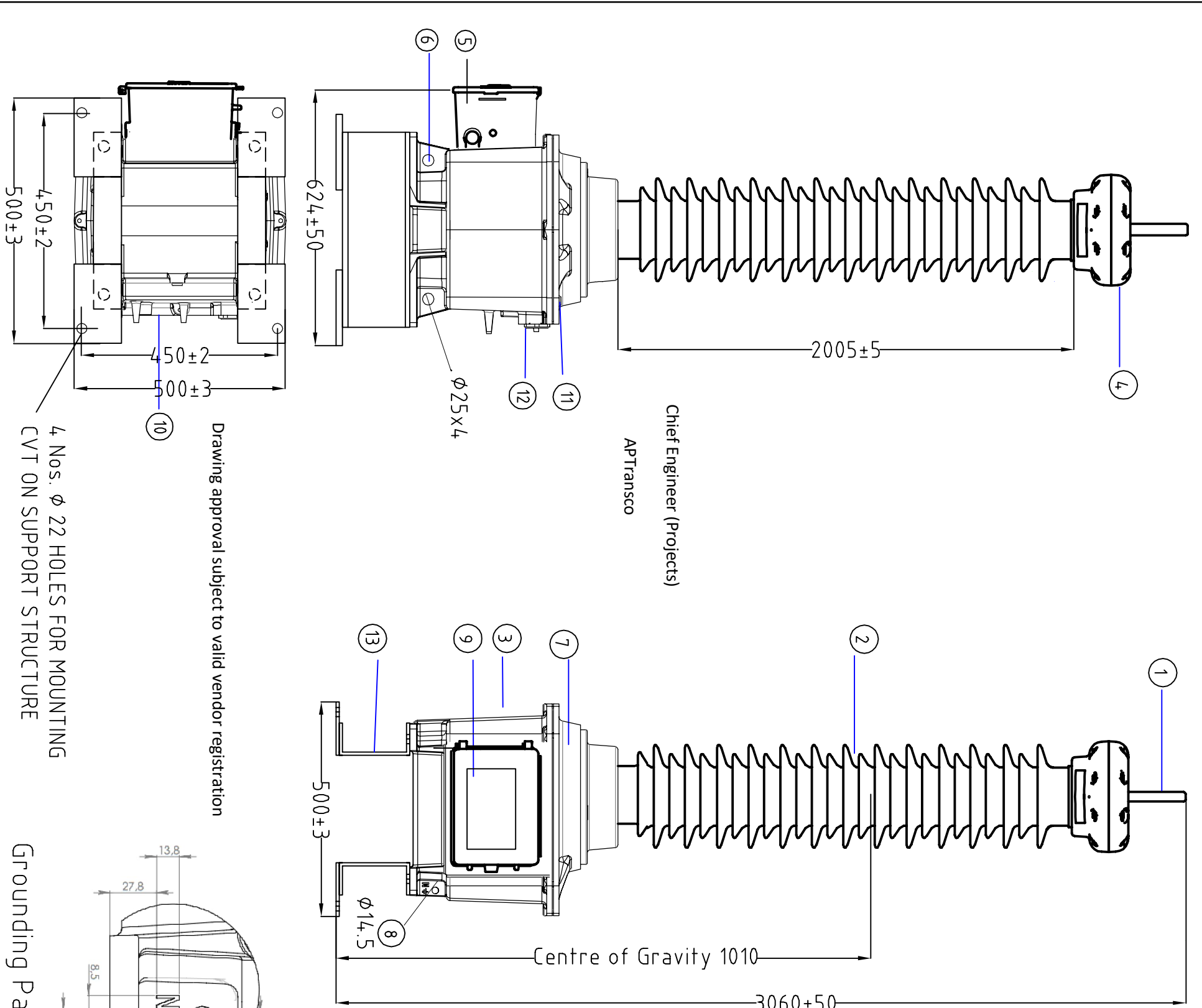




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Chief Engineer (Projects)  
APTransco

Drawing approval subject to valid vendor registration

4 Nos.  $\phi$  22 HOLES FOR MOUNTING  
CVT ON SUPPORT STRUCTURE

Grounding Pad Details

NOS	DESCRIPTION	MATERIAL	QTY
①	H.V. TERMINAL ( $\phi$ 30X100mm)	ALUMINUM ALLOY	01
②	INSULATOR	PORCELAIN	01
③	BASE BOX	ALUMINUM ALLOY	01
④	TOP COVER	ALUMINUM ALLOY	01
⑤	TERMINAL BOX	ALUMINUM ALLOY	01
⑥	LIFTING EYE	ALUMINUM ALLOY	04
⑦	TANK COVER	ALUMINUM ALLOY	01
⑧	ARRANGEMENT FOR GROUND PAD	ALUMINUM ALLOY	01
⑨	RATING PLATE	ALUMINUM ALLOY	01
⑩	MV TAP GROUNDING SWITCH	ALUMINUM ALLOY	01
⑪	OIL SAMPLING PLUG	SS	01
⑫	OIL LEVEL INDICATOR	ALUMINUM ALLOY +GLASS	01
⑬	BASE FRAME	MS+HDG	02

**TECHNICAL DETAILS:**  
 APPLICABLE STANDARD : IEC 61869-1 & 5 & IEC 60358  
 RATED VOLTAGE : 220 kV/sqrt(3)  
 HIGHEST SYSTEM VOLTAGE : 245 kV  
 H.V. TEST VOLTAGE : 460 kV rms for 1 min  
 IMPULSE TEST VOLTAGE : 1050 kVp  
 RATED FREQUENCY : 50 Hz  
 'HF' CAPACITANCE : 4400 pF (+10%, -5%)  
 PRIMARY CAPACITANCE C1 : 4773.7 pF (+10%, -5%)  
 SECONDARY CAPACITANCE C2 : 62058.1 pF (+10%, -5%)  
 TOTAL OUTPUT SIMULTANEOUS : 50 VA/ 0.2 & 150 VA/ 3P

**NOTES**

- TOTAL CREEPAGE DISTANCE : 6125 mm
- OIL QUANTITY : 37 kg (Approx.)
- WEIGHT OF CVT: 265 kg (Approx.)
- WEIGHTS INDICATED ARE APPROXIMATED
- GENERAL TOLERANCE AS PER IS:2102 WILL BE APPLICABLE WHERE TOLERANCE IS NOT INDICATED.
- PORCELAIN MAKE: MODERN/IEC/CJI/ABI.

HO/ESD-Coord/9E 03-90		7257798/2023/EEMRT-ENE51	
Description		Date	22.12.22
Date		Prep.	LB
Prep		CKd.	AR
Norm.		Original/Replaced By :-	LOA No. :-
Customer: Transmission Corporation of Andhra Pradesh Limited.		Siemens Ltd.	
Contractor: -		AURANGABAD	
Project: -		Descr : 245 kV, Outdoor, Oil Cooled hermetically sealed Capacitive Voltage Transformer.	
LOA No. :-		Details : General Arrangement Drawing.	
S.O.No. :-		Quantity :-	
Item No. :-		Drawing No. :- (4)G71AIN-NA203-Z2283-200	
NOT TO SCALE		All dimensions are in mm	
SH 1		SH 1	

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**CAPACITOR VOLTAGE TRANSFORMER**

RATING AND SCHEMATIC PLATE

Made in India.

Customer: Transmission Corporation of Andhra Pradesh Limited.

Project : --

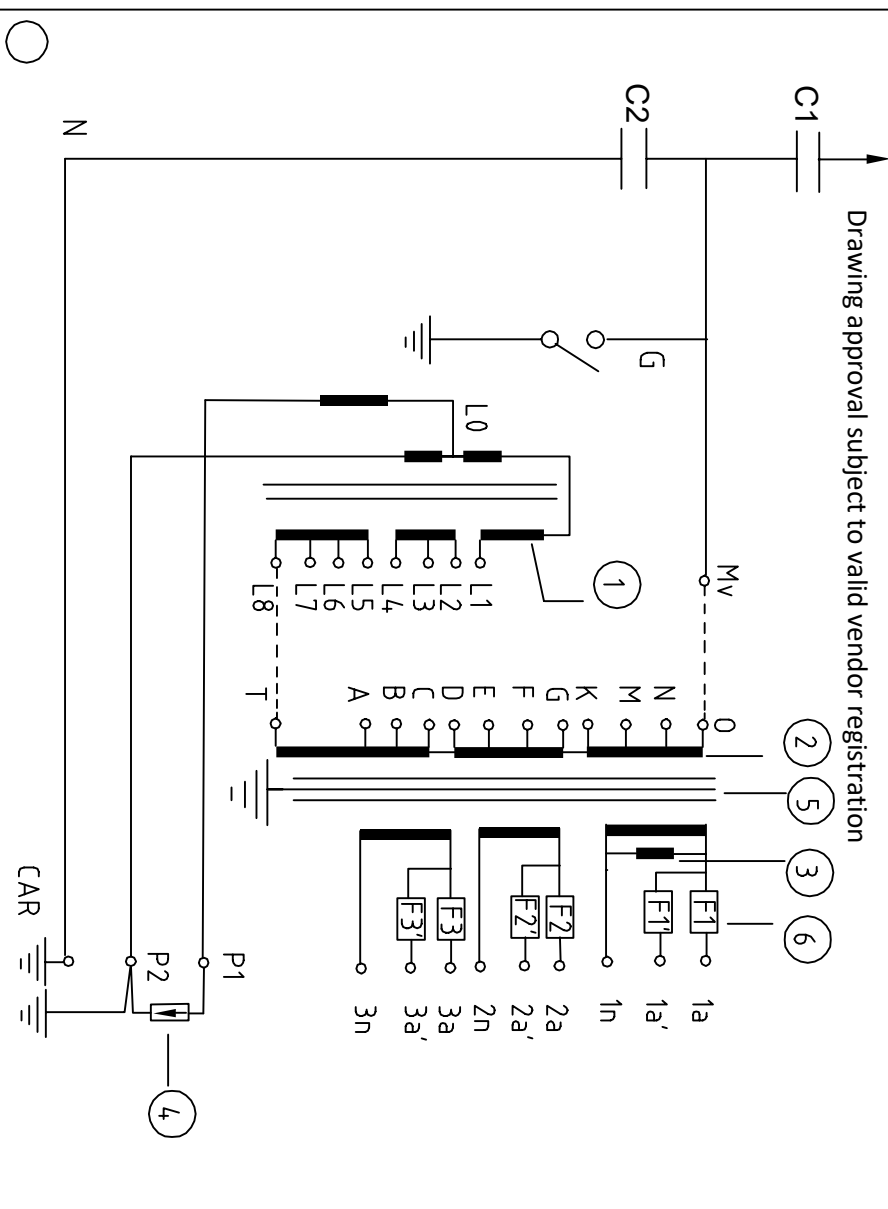
Contractor : --

LOA No. : --

Type **TCVT 245** Insulation level **460 kV/ 1050 kV<sub>p</sub>** Standard **IEC 61869-5** Capacitance **4400 pF (+10%, -5%)** Total Weight **265 kg** S.O. No. **--**

Highest System Voltage **245 kV** Voltage Factor **1.2 Continuous/ 1.5 - 30 sec** Frequency **50 Hz** Simultaneous Burden **50 VA/ 0.2 & 150 VA/ 3P** Oil Weight **37 kg** Sr. No.  Year

**TO HV POWER CIRCUIT(H)**



VOLTS	H-N	1a - 1n	2a - 2n	3a - 3n
		$220000/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$
VA BURDEN		50	50	50
ACCURACY CLASS		3P	3P	0.2

**Notes 1:**

- Series Reactor
- Intermediate Transformer
- Filter
- Protective gap
- Faraday Shield
- Fuse

**H :** HV Terminal  
**N :** HF Terminal  
**C1 :** Primary Capacitance  
**C2 :** Secondary Capacitance  
**G :** MV tap grounding switch  
**Mv:** Intermediate Voltage tap

**Caution :**

- Short circuit the Capacitor units when erecting or dismantling the CVT and remove the short circuit before pre-test or commissioning.
- Under no condition should the Load / Burden values mentioned on the Rating Plate be exceeded.
- When terminal N is not used for HF transmission It must be connected to Earth, when Supplied N is connected to Earth.

**Notes 2:**

- Connection between L1--L8 & A,D--0 are made in factory as required.
- Suitable for Hot line Washing.

**RATING PLATE DETAILS :**

MATERIAL : ALUMINUM ALLOY  
 SIZE : 250 x 150 x 1 mm THICK.  
 COLOUR : LETTERS PRINTED IN BLACK OVER ALUMINUM NATURAL BACKGROUND.

NOTE : SERIAL NO. IS ENGRAVED ON RATING PLATE

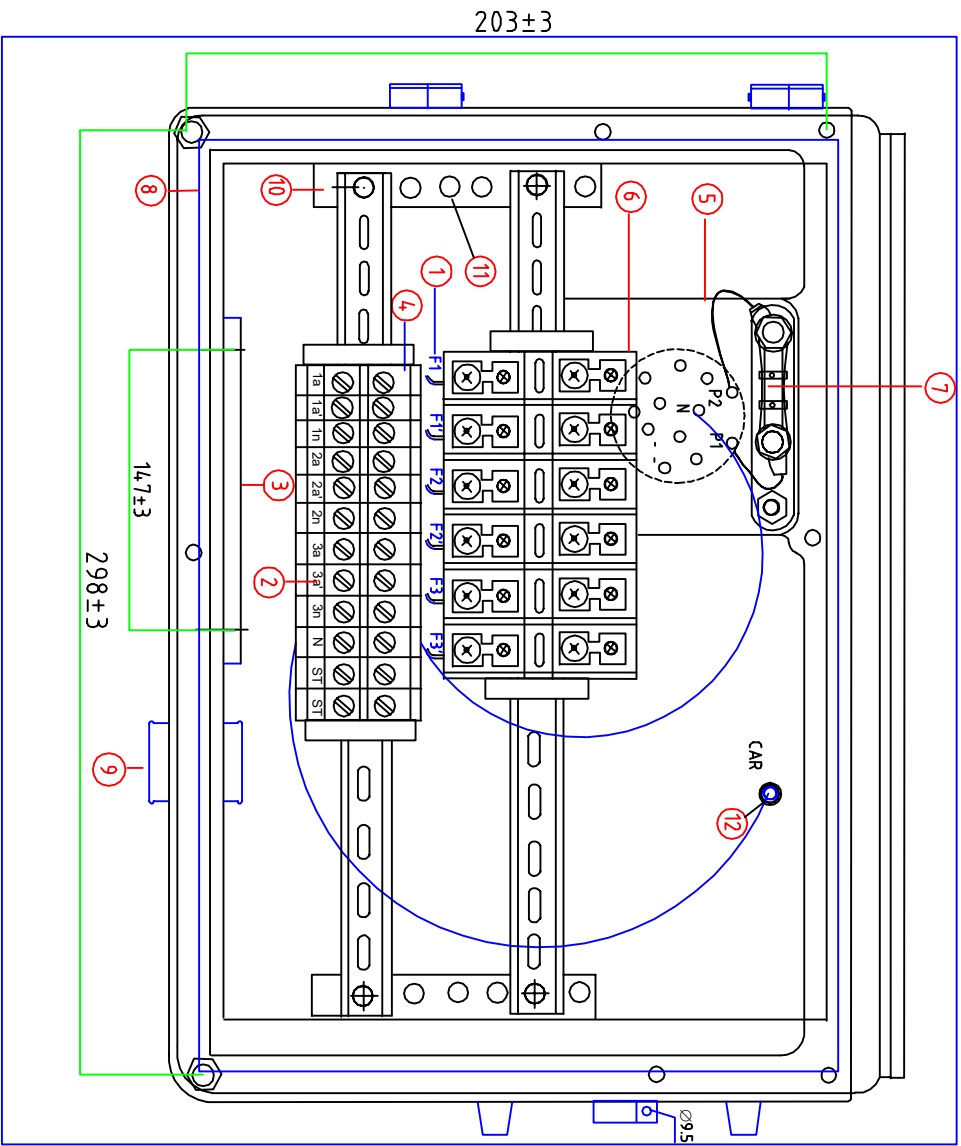
Chief Engineer (Projects)  
 APTransco

Date	22.12.22	Customer: Transmission Corporation of Andhra Pradesh Limited.	Descr :	245 kV, Outdoor, Oil Cooled Hermetically sealed Capacitive Voltage Transformer.	S.O.No. : --	NOT TO SCALE
Prep.	LB	Contractor: --	Details :	Rating Plate Drawing.	Item No. : --	All dimensions are in mm
Ckd.	AR	LOA No.: --			Drawing. No.:(4)G71AIN-NA203-N2283-200	SH 1
Norm.		Original/ Replaced By: --				1 SH

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NOS.	DESCRIPTION
1	TERMINALS - CONNECTED TO 1a, 2a, 3a, 1a', 2a' & 3a' (Not shown for clarity)
2	IDENTIFICATION STRIP
3	GLAND PLATE (122 X 147)
4	TERMINAL BLOCK (STUD TYPE NON DISCONNECTING TYPE)
5	OIL TO AIR SEAL PLATE
6	FUSES, 10 A, HRC TYPE, MAKE SIEMENS
7	SURGE PROTECTOR
8	GASKET
9	RUBBER GORMET
10	ALUMINUM TERMINAL CHANNEL HOLDER
11	EARTHING ARRANGEMENT
12	HF TERMINAL SCREW 'M10'

- NOTES :
1. DOOR REMOVED FOR CLARITY
  2. TERMINAL BOX SHALL CONFIRM AS PER IP55.
  3. 20 % SPARE TERMINALS SHALL BE PROVIDED.
  4. SHEET THICKNESS : 5 MM
  5. SECONDARY TERMINAL BLOCKS ARE OF STUD TYPE & PHOENIX/ CONNECT WELL MAKE (4/1 A RATING)
  6. TERMINAL BOX IS MADE UP OF ALUMINIUM

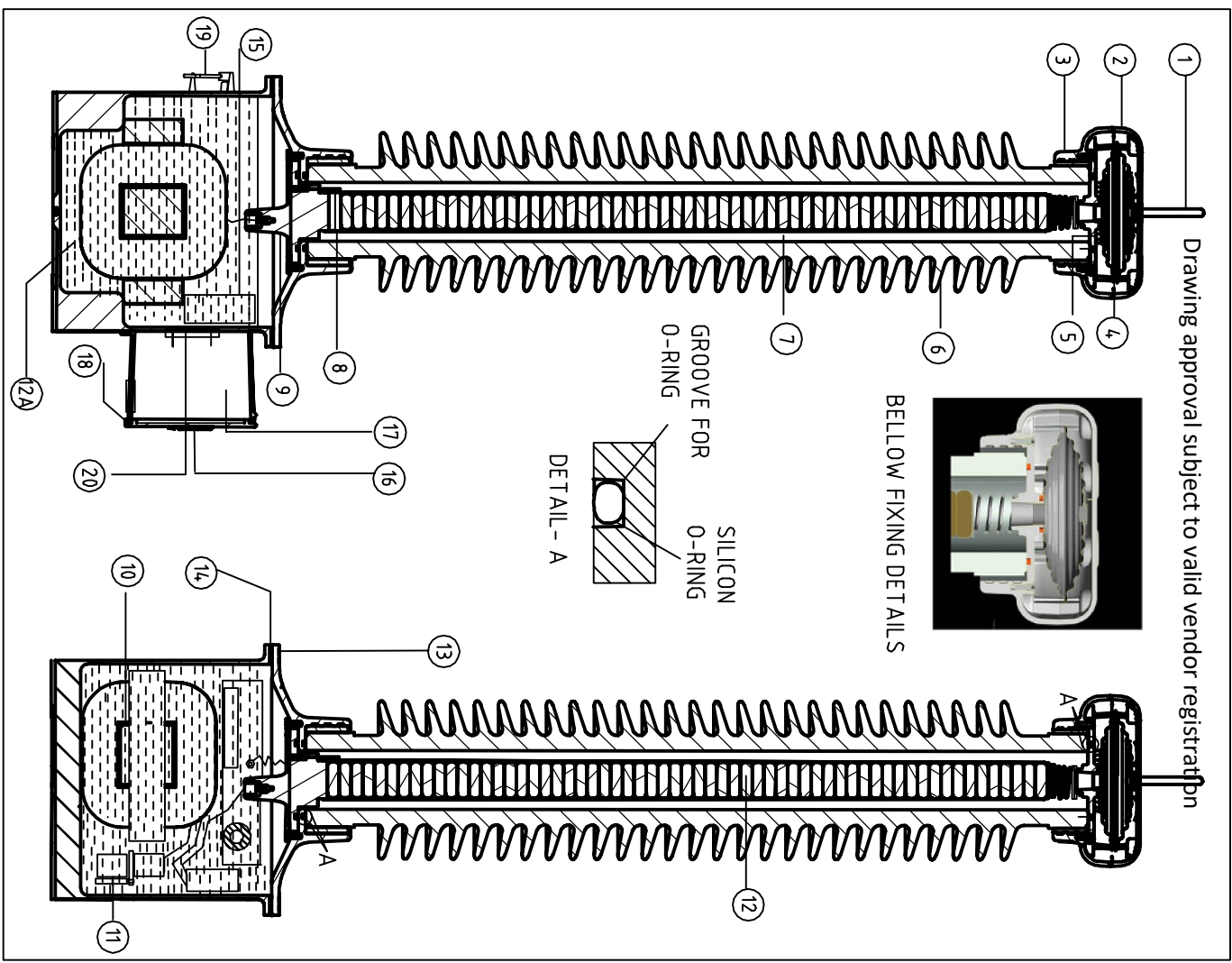
Chief Engineer (Projects)

APTransco

Rev	Description	Date	Prep	Norm	Date	Prep	Norm	Customer: Transmission Corporation of Andhra Pradesh Limited	Contractor: --	Project: --	LOA No.: --	Original/Replaced By: --	Siemens Ltd AURANGABAD	Descr : 245 KV Outdoor, Oil Cooled hermetically sealed Capacitive Voltage Transformer.	Details : Secondary Box GA Drawing	S.O No. : --	Item No. : --	Quantity : --	Drawing No. : (4)G71AIN-NA203-W2283-200	NOT TO SCALE	All dimensions are in mm	SH 1
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NOS.	DESCRIPTION	MATERIAL	QTY
1	H.V. TERMINAL ROD (φ 30 X 100)	ALUMINIUM ALLOY	01
2	TOP CAP	ALUMINIUM ALLOY	01
3	UPPER FLANGE	ALUMINIUM ALLOY	01
4	BELLOW	STAINLESS STEEL	01
5	GASKET FOR PORCELAIN TO PLATE	SILICON	01
6	PORCELAIN INSULATOR	PORCELAIN	01
7	CAPACITOR STACK ASSEMBLY	-	01
8	BOTTOM PLATE FOR STACK ASSEMBLY	ALUMINIUM ALLOY	01
9	L.V. BUSHING	EPOXY	01
10	TRANSFORMER ASSEMBLY	-	01
11	REACTOR ASSEMBLY	-	01
12/20A	OIL (NON PCB BASED)	SYNTHETIC OIL / MINERAL OIL	13 / 24 kg
13	TANK COVER PLATE	ALUMINIUM ALLOY	01
14	GASKET FOR TANK	NBR	01
15	HARMONIC SUPPRESSION FILTER	-	01
16	RATING PLATE	ALUMINIUM ALLOY	01
17	SECONDARY TERMINAL BOX	ALUMINIUM ALLOY	01
18	GASKET FOR SECONDARY TERMINAL BOX	EPDM	01
19	SWITCH HANDLE	ALUMINIUM ALLOY	01
20	SEALING FOR OIL TO AIR SEAL PLATE	SILICON	01

NOTE :

- HERMETICALLY SEALED ARRANGEMENT IS ACHIEVED BY USING SS BELLOW FOR VOLUMETRIC COMPENSATION.
- SILICON O-RING & EPDM GASKET USED AT ALL JOINTS. (DETAILS SHOWN IN ABOVE TABLE) ENSURES COMPLETE SEALING OF CVT.

Chief Engineer (Projects)


APTransco

Rev	Description	Date	Prep	Norm	Original/Replaced By:-
G					
G1					
G2					
G3					
G4					
G5					
G6					
G7					

Date	22.12.22	Customer	Transmission Corporation of Andhra Pradesh Limited.
Prep	LB	Contractor	-
Ckd	AR	Project	--
Original/Replaced By:-		LOA No.:-	--

Deser	245 KV Outdoor Oil Cooled hermetically sealed Capacitive Voltage Transformer.	Siemens Ltd.	
Details	Cross Sectional View of CVT	AURAN GABAD	
S.O.No.	:-	Item No.	:-
Quantity	:-	All dimensions are in mm	
Drawing No.	:- (4)G71AIN-NA203-E2283-200	SH	1
		SH	1




DOCUMENT: GTP_245 kV 4400 pF CVT		Page 1/2	
Customer: Transmission Corporation of Andhra Pradesh Limited. Contractor: -- Project:-- LOA No: --		Rev.00	
DOC. NO : 245 kV CVT/GTP/ APTRANSCO	Prepared By LB	Approved By AR	Date 22.12.2022

**DATA SHEET FOR 245 kV CAPACITOR VOLTAGE TRANSFORMER**

1.	Name and Address of Manufacture	Siemens Limited, India. E-76, MIDC Waluj, Aurangabad.
2.	Manufacturer's type designation	TCVT 245
3.	Type of mounting	Pedestal mounting
4.	Type of Insulation used	Mixed Dielectric (Paper, Oil)
5.	Standards Applicable	IEC 61869-5 / IS 3156 (1992)
6.	Rated Primary Voltage	220 kV/ $\sqrt{3}$ rms
7.	Rated Secondary Voltage	WINDING I : 110 V/ $\sqrt{3}$ WINDING II : 110 V/ $\sqrt{3}$ WINDING III : 110 V/ $\sqrt{3}$
8.	Number of Secondary	3
9.	Rated frequency	50 Hz
10.	Rated output of each secondary winding	WINDING I: 50 VA WINDING II: 50 VA WINDING III: 50 VA
11.	Total simultaneous burden	50 VA/ 0.2 & 150 VA/ 3P
12.	Rated total thermal burden	300 VA
13.	Highest system voltage	245 kV rms (line to line)
14.	Rated voltage factor and corresponding rated time	
	i) Continuous	1.2
	ii) 30 seconds	1.5
15.	Accuracy class of each Secondary winding	WINDING I: 3P WINDING II: 3P WINDING III: 0.2
16.	Capacitance	4400 pF (+10 %, -5 %)
17.	Carrier frequency coupling (pF)	4400 pF (+10 %, -5 %)
18.	Natural frequency of coupling	More than 600 kHz
19.	Self tuning frequency of CVT	More than 600 kHz
20.	Band width (kHz)	40 kHz to 500 kHz
21.	One minute Power frequency test Voltage of secondary winding (kV rms)	3 kV rms
22.	One minute Power frequency test Voltage of H.F. terminal	4 kV rms
23.	One minute power frequency test voltage of capacitor (kV rms) (dry & wet)	460 kVrms
24.	1.2 / 50 micro second impulse withstand test Voltage of Capacitor (kV <sub>p</sub> )	1050 kV peak
25.	250/ 2500 micro switching surge withstand Voltage of Capacitor (Dry & wet) (kV <sub>p</sub> )	Not Applicable
26.	Corona extinction Voltage	156 kV rms Chief Engineer (Projects)
27.	Max. Radio interference Voltage at 1.1 Ur/ root 3 at 1.0 MHz	1000 micro Volts APTransco
28.	Total Weight (Approx.)	265 kg

7257798/2023/EEMRT-ENE51

DOCUMENT: GTP_245 kV 4400 pF CVT		Page 2/2	
Customer: Transmission Corporation of Andhra Pradesh Limited. Contractor: -- Project:-- LOA No: --		Rev.00	
DOC. NO : 245 kV CVT/GTP/ APTRANSCO	Prepared By LB	Approved By AR	Date 22.12.2022

29.	Quantity of Oil (Approx.)	37 kg
30.	Overall Height in mm	3060 ± 50
31.	Whether CVTs are hermetically sealed, and how	Yes - 'O' rings and stainless-steel bellow used
32.	No. of terminals in terminal box	12
33.	Material of primary and secondary winding of IVT	Copper
34.	Material of Tank	Aluminum
35.	Type of insulator	Porcelain, (4)G71AIN-NA203-L2283-200
36.	Compliance to technical specification w.r.t.	
	i. Bushing insulator	Yes, (4)G71AIN-NA203-L2283-200
	ii. Marshalling Box Drawing	Not in Siemens Scope of supply
	iii. Terminal Connector	Not in Siemens Scope of supply
37.	Overall GA drawing of CVT enclosed	Yes, (4) G71AIN-NA203-Z2283-200.
38.	Total Minimum Creepage Distance	6125 mm (25 mm/kV)
39.	Temperature rise of winding by resistance	Max 13 deg.
40.	Partial discharge level at rated voltage for Capacitor divider.	As per IEC.
41.	Seismic acceleration (Horizontal & Vertical)	0.3 g horizontal & 0.5 g Vertical.
42.	Hardware exposed to atmosphere (Bolts, Nuts & Washer)	All Exposed hardware is of SS A2 grade.

- Tan Delta of CVT shall be less than 0.5 %.
- Partial Discharge shall be less than 5 PC @ 1.2 Um/v<sup>3</sup> and shall be less than 10 PC @ Um.
- Range of frequency for valid accuracy : 96 % to 102 % for Protection, 99 % to 101 % for Metering.

1) Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators in the substation during foundation works to ensure safe live to ground clearances as per IE rules.

2) 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/PT/CVT/Isolators requirement and compatibility.

Chief Engineer (Projects)

**FOR EPC CONTRACTS ONLY**

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