

DRG.NO: 3-KAD 5493

IF IN DOUBT, ASK

**LIST OF STANDARD DRAWINGS APPLICABLE FOR 245 kV CT (31mm/kV)**

| SR. NO. | DESCRIPTION                 | DRG./DOC.NO.  | APP. CAT. | REMARKS |
|---------|-----------------------------|---------------|-----------|---------|
| 01      | GENERAL ARRANGEMENT         | 3-KAD 5494/R1 |           |         |
| 02      | RATING/SCHEMATIC PLATE      | 3-KAD 5495/R1 |           |         |
| 03      | SECONDARY TERMINAL BOX G.A. | 3-KAD 5496/R1 |           |         |
| 04      | SECTIONAL VIEW              | 3-KAD 5497/R0 |           |         |

**LIST OF VARIABLE DRAWINGS APPLICABLE FOR 245 kV CT**

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


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

**Chief Engineer/Projects  
APTRANSCO/VS/Vijayawada.**

| REMARKS | APPROVAL LETTER NO. |
|---------|---------------------|
|         |                     |
|         |                     |
|         |                     |
|         |                     |

Drawing approval subject to valid vendor registration

1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators/IV/LA/Breakers in the Substation during foundation works to ensure safe live to ground clearance 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 contractor shall be instructed to supply the same in line with CT/PT/CVT/Isolator/IVT/LA/Breakers requirement and compatibility.

|  |  |   |                                |
|--|--|---|--------------------------------|
| CUSTOMER : APTRANSCO   |  |   |                                |
| 4  |  | GEN. TOL.                                     | MATL.:<br>SPEC.:               |
| 3  |  | THIRD ANGLE PROJECTION                        |                                |
| 2  |  | SCALE: NTS                                    | INITIALS NAME                  |
| 1  | CUSTOMER COMMENTS DTD 21.12.2023 ADDED | PBN<br>USS                                    | 23.12.23                       |
|  |  | ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED. | ORG NAC<br>CHD SHB<br>APPD USS |
| NO   | REVISION                               | SIGN  | DATE                           |
|  |  | DATE : 15.07.2023                             |                                |
| TITLE : LIST OF STANDARD DRGS. / DOCUMENTS APPLICABLE ( FOR 245 kV CT - 31mm/kV) (500-800-1600/1-1-1-1 A) (300-500-800-1600/1 A)                                       |  |   | REV<br>1                       |
|  <b>CG Power and Industrial Solutions Limited</b><br>S1 - DIVISION, AMBAD, NASHIK |  |   | DRG.NO: 3-KAD 5493             |

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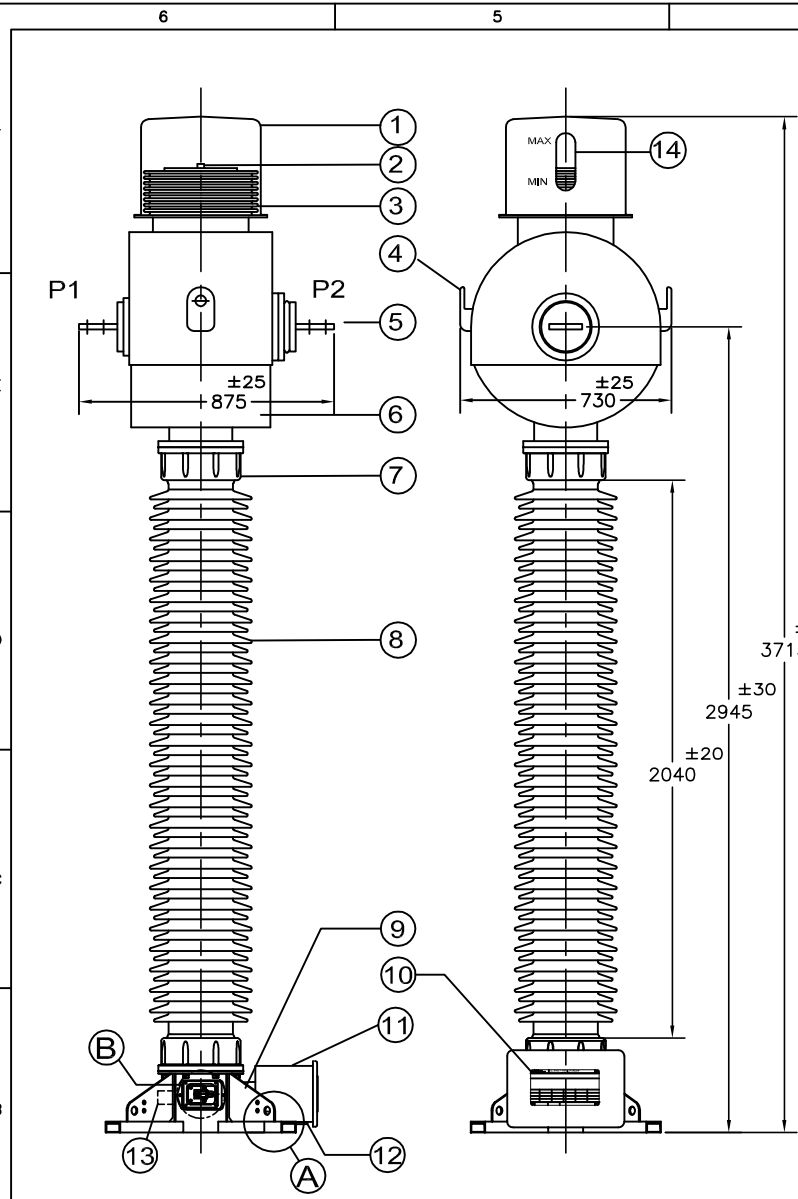
DRG.NO: 3-KAD 5494

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FRAME:- 382-1 TF-7595-NT-SB

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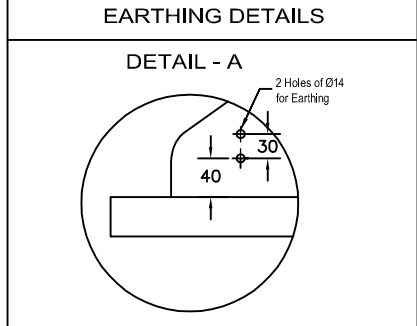
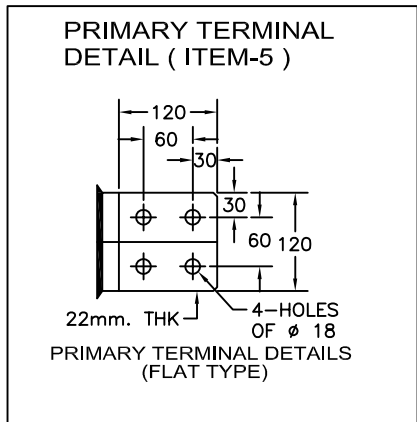
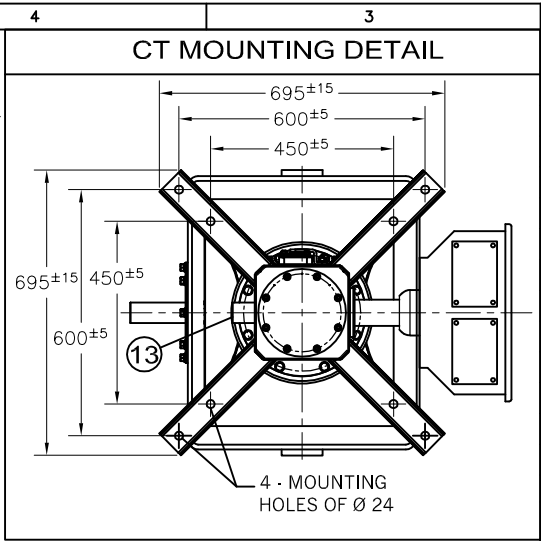


NOTE:- REFER INSTRUCTION MANUAL FOR HANDLING & TRANSPORTATION

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

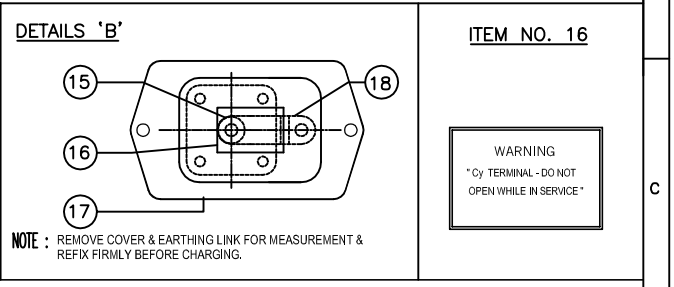
2. FOR EPC CONTRACTS ONLY

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| NO. | QTY. | DESCRIPTION                                     | MATERIAL               |
|-----|------|---|------------------------|
| 1   | 1    | HOOD  | ALUMINIUM              |
| 2   | 1    | OIL PRESENCE INDICATOR                          | POLY CARBONATE         |
| 3   | 1    | BELLOWS   | STAINLESS STEEL        |
| 4   | 2    | LIFTING LUG Ø 40                                | ALUMINIUM              |
| 5   | 2    | PRIMARY TERMINAL                                | ALUMINIUM              |
| 6   | 1    | HOUSING   | ALUMINIUM              |
| 7   | 2    | PORCELAIN FLANGE                                | ALUMINIUM              |
| 8   | 1    | PORCELAIN INSULATOR                             | PORCELAIN              |
| 9   | 1    | BASE  | STEEL HDG              |
| 10  | 1    | RATING PLATE                                    | ALUMINIUM              |
| 11  | 1    | SECONDARY TERMINAL BOX                          | STEEL HDG              |
| 12  | 2    | GLAND PLATE                                     | STEEL HDG              |
| 13  | 1    | OIL FILLING/SAMPLING VALVE                      | STEEL EG               |
| 14  | 1    | BELLOWS LEVEL INDICATOR                         | POLYCARBONATE          |
| 15  | 1    | CAPACITANCE & TAN DELTA MEASUREMENT TERMINAL Cy | BRASS                  |
| 16  | 1    | WARNING STICKER                                 | ALUMINIUM              |
| 17  | 1    | COVER   | ALUMINIUM              |
| 18  | 1    | EARTHING LINK                                   | COPPER (NICKEL PLATED) |

MAKE OF PORCELAIN : MODERN/IEC/CJI/RAVIKIRAN



TOTAL WEIGHT = 800±10% kg.  
 TOTAL OIL WEIGHT = 200±10% kg.  
 CREEPAGE DISTANCE = 7595mm

Chief Engineer/Projects  
**APTRANSCO/Vs/Vijayawada**

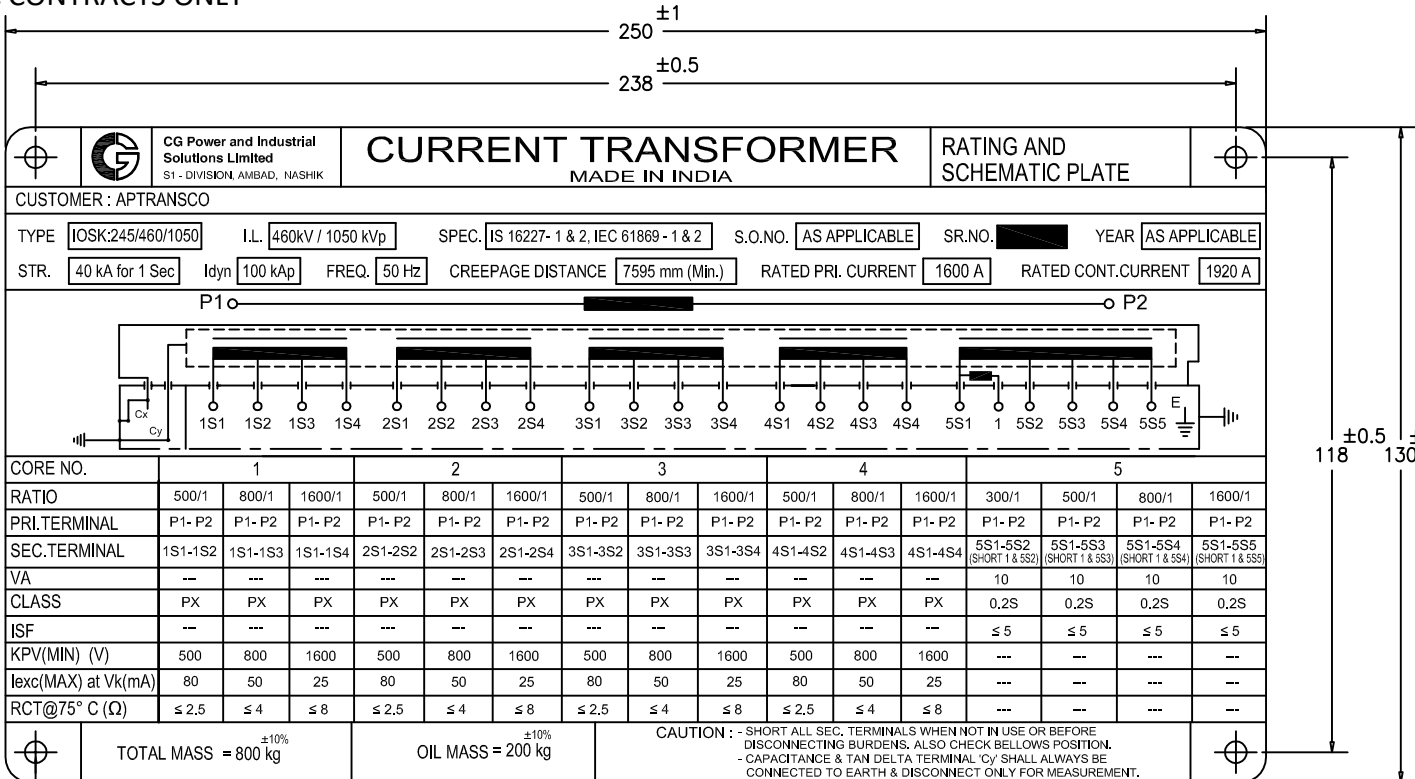
|   |          |   |       |
|---|----------|---|-------|
| CUSTOMER : APTRANSCO                          |          | TITLE : STANDARD DRAWINGS                 |       |
| GEN. TOL.                                     | MATL.:   | GENERAL ARRANGEMENT                       |       |
|   | SPEC.:   | (FOR 245 kV CT-31mm/kV)                   |       |
| THIRD ANGLE PROJECTION                        |          |   |       |
| SCALE: NTS                                    | INITIALS | NAME                                      |       |
| ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED. | DRN      | NAC                                       |       |
|   | CHD      | SHB                                       |       |
|   | APPD     | USS                                       |       |
| DATE : 15.07.2023                             |          | CG Power and Industrial Solutions Limited |       |
| DRG.NO: 3-KAD 5494                            |          | S1 - DIVISION, AMBAD, NASHIK              |       |
| REV 1   |          |   | REV 1 |

| NO | REVISION  | SIGN    | DATE     |
|----|---|---------|----------|
| 2  |   |         |          |
| 1  | 450mmX450mm ADDITIONAL MOUNTING GIVEN AS PER CUSTOMER COMMENTS DTD 21.12.23 | PBN USS | 23.12.23 |

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2. FOR EPC CONTRACTS ONLY

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1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators/IV/LA/Breakers in the Substation during foundation works to ensure safe live to ground clearance 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 contractor shall be instructed to supply the same in line with CT/PT/CVT/Isolator/IVT/LA/Breakers requirement and compatibility.

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|    |  |         |          |
|----|--|---------|----------|
| 2  |  |         |          |
| 1  | CREEPAGE DISTANCE ADDED & PS CLASS CHANGED TO PX AS PER CUSTOMER COMMENTS DTD 21.12.23 | PBN USS | 23.12.23 |
| NO | REVISION   | SIGN    | DATE     |

CUSTOMER : APTRANSCO

|   |          |  |
|---|----------|--|
| GEN. TOL.                                     | MATL.:   | TITLE : STANDARD DRAWINGS<br>RATING/SCHEMATIC PLATE<br>(FOR 245 kV CT-31mm/kV)<br>(500-800-1600/1-1-1 A)<br>(300-500-800-1600/1 A) |
|   | SPEC.:   |  |
| THIRD ANGLE PROJECTION                        |          |  |
| SCALE: NTS                                    | INITIALS | NAME   |
| ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED. | ORG      | NAC  |
|   | CHD      | SHB  |
|   | APPD     | USS  |
| DATE : 15.07.2023                             |          | DRG.NO: 3-KAD 5495   |
|   |          | REV 1  |

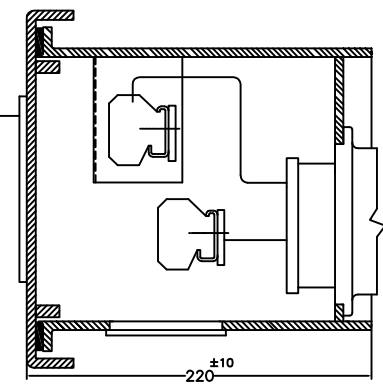
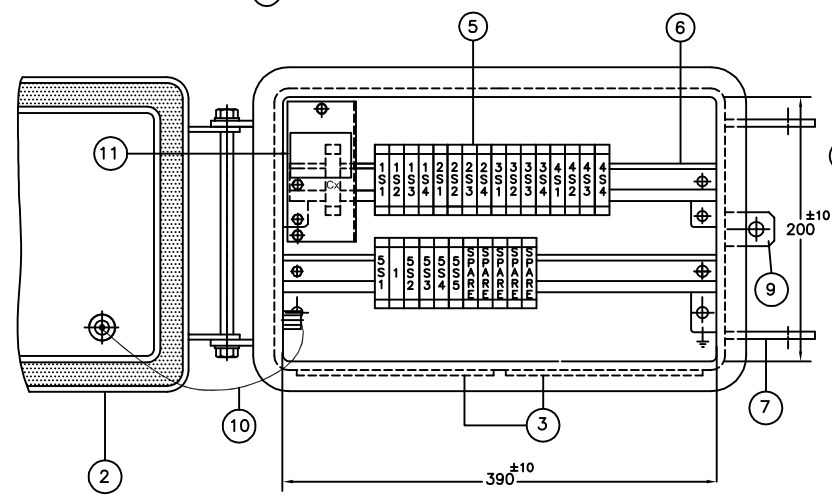
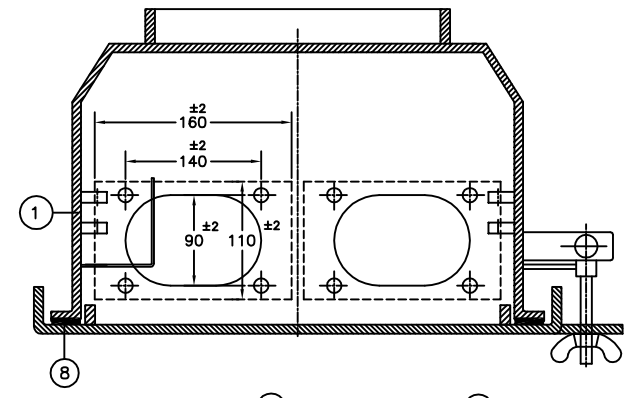
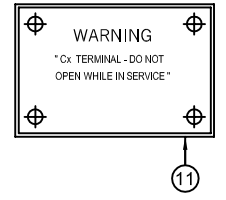
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**2. FOR EPC CONTRACTS ONLY**



| NO. | QTY.       | DESCRIPTION                        | MTRL./RATING       |
|-----|------------|------------------------------------|--------------------|
| 1   | 1          | SECONDARY TERMINAL BOX             | M.S HDG            |
| 2   | 1          | SECONDARY TERMINAL BOX COVER       | M.S HDG            |
| 3   | 2          | GLAND PLATE                        | M.S HDG            |
| 4   | 1          | RATING & SCHEMATIC PLATE           | ALUMINIUM          |
| 5   | 23+5 SPARE | STUD TYPE SECONDARY TERMINAL BLOCK | ELMEX MAKE,        |
| 6   | 2          | TERMINAL MOUNTING BRACKET          | M.S POWDER COATED  |
| 7   | 1          | LOCKING ARRANGEMENT                | S.S, BRASS         |
| 8   | 1          | GASKET                             | EPDM SPONGE RUBBER |
| 9   | 1          | BRACKET FOR PAD LOCK               | M.S HDG            |
| 10  | 1          | COPPER CABLE FOR BOX DOOR EARTHING | COPPER             |
| 11  | 1          | WARNING PLATE FOR 'Cx' TERMINAL    | ALUMINIUM          |

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DEGREE OF PROTECTION : IP55

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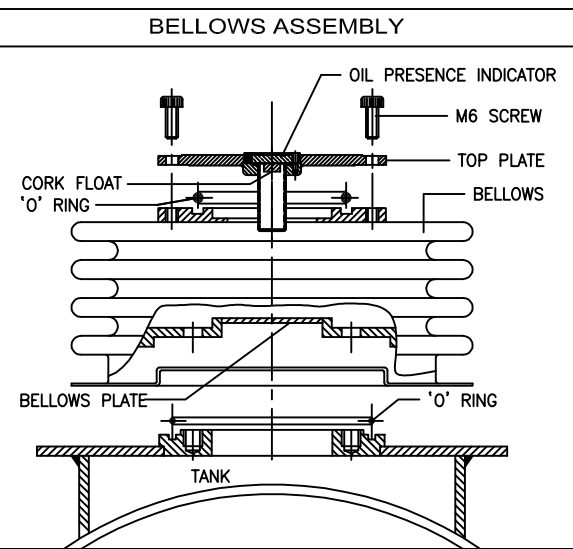
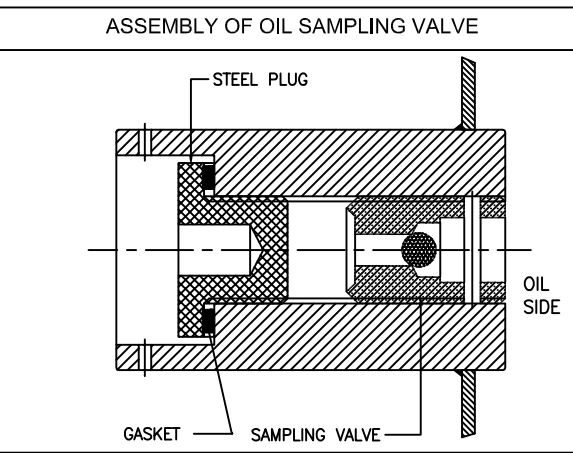
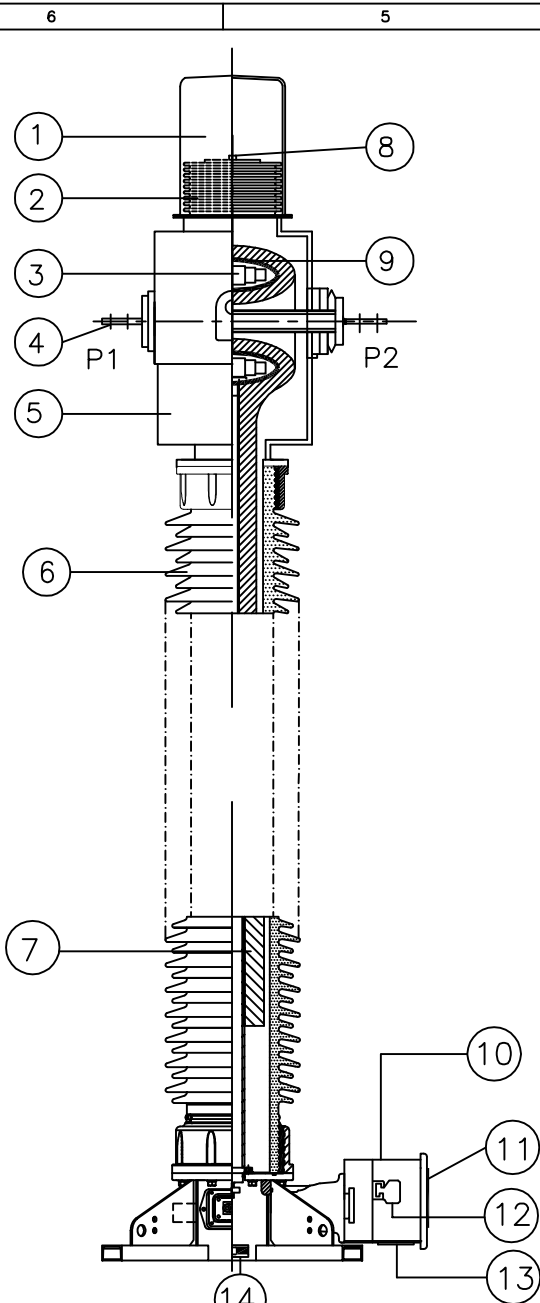
**Chief Engineer/Projects**  
**APTRANSCO/VS/Vijayawada.**

|   |             |  |                  |
|---|-------------|--|------------------|
| CUSTOMER APTRANSCO                            |             |  |                  |
| GEN. TOL.                                     | MATL. SPEC. | TITLE : STANDARD DRAWINGS SECONDARY BOX G.A. (FOR 245 kV CT-31mm/kV) (500-800-1600/1-1-1-1 A) (300-500-800-1600/1 A) |                  |
| THIRD ANGLE PROJECTION                        |             |  |                  |
| SCALE: NTS                                    | INITIALS    | NAME   |                  |
| ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED. | ORG         | NAC  |                  |
|   | CHD         | SHB  |                  |
|   | APPD        | USS  |                  |
| NO. 1   |             | 20% SPARE TERMINALS ADDED AS PER CUSTOMER COMMENTS DTD 21.12.23  | PBN USS 23.12.23 |
| NO. REVISION                                  |             | SIGN   | DATE             |
| DATE : 15.07.2023                             |             | <b>CG Power and Industrial Solutions Limited</b><br>S1 - DIVISION, AMBAD, NASHIK                                     |                  |
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| SR.NO. | DESCRIPTION                 | MATERIAL          |
|--------|-----------------------------|-------------------|
| 1      | HOOD                        | ALUMINIUM         |
| 2      | BELLOWS                     | STAINLESS STEEL   |
| 3      | CORE WITH SECONDARY WINDING | *                 |
| 4      | PRIMARY TERMINAL            | ALUMINIUM         |
| 5      | HOUSING                     | ALUMINIUM         |
| 6      | INSULATOR                   | PORCELAIN         |
| 7      | CONDENSER BUSHING           | KRAFT PAPER (OIP) |
| 8      | OIL PRESENCE INDICATOR      | POLY CARBONATE    |
| 9      | SHELL                       | ALUMINIUM         |
| 10     | SECONDARY TERMINAL BOX      | M.S. HDG.         |
| 11     | RATING/SCHEMATIC PLATE      | ALUMINIUM         |
| 12     | SECONDARY TERMINALS         | STUD TYPE         |
| 13     | GLAND PLATE                 | M.S. HDG.         |
| 14     | AUXILIARY CORE              | NANO-CRYSTALLINE  |

NOTE.....  
 INSULATING OIL SHALL BE EHV GRADE AS PER IS 335, IEC 296  
 \* CORE - CRGO Si-Fe/EQUIVALENT HIGH PERMEABILITY MATERIAL, MU-METAL, NANO-CRYSTALLINE  
 \* SEC. WINDING - ENAMELLED COPPER

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 2. FOR EPC CONTRACTS ONLY

| NO | REVISION | SIGN | DATE |
|----|----------|------|------|
| 1  |          |      |      |

|   |             |  |       |
|---|-------------|--|-------|
| CUSTOMER : APTRANSCO                          |             |  |       |
| GEN. TOL.                                     | MATL. SPEC. | TITLE : STANDARD DRAWINGS SECTIONAL VIEW (FOR 245 kV CT-31mm/kv)<br>(500-800-1600/1-1-1-1 A)<br>(300-500-800-1600/1 A) |       |
| THIRD ANGLE PROJECTION                        |             |  |       |
| SCALE: NTS                                    | INITIALS    | NAME   |       |
| ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED. | DRN         | NAC  |       |
|   | CHD         | SHB  |       |
|   | APPD        | USS  |       |
| DATE : 15.07.2023                             |             |  | REV 0 |



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**Annexure-A**  
**GUARANTEED TECHNICAL PARTICULARS FOR CURRENT TRANSFORMERS**  
**(245kV CT: 1600-800-500/1-1-1-1 A & 1600-800-500-300/1A )**  
**Creepage Distance: 31 mm/kV**

|         |  |  |
|---------|--|--|
| 1       | Type of tank/Installation Dead/Live Tank Type  | Live tank, Single phase, Oil Filled, Outdoor Type                          |
| 2       | Type of mounting   | Pedestal Mounting  |
| 3       | Manufacturer's Name and address and Country of Manufacture                                     | CG Power and Industrial Solutions Limited, A-3 MIDC, Ambad, Nashik , INDIA |
| 4       | Whether Conforming to IEC 61869 standard   | Yes, IEC 61869-1&2 , IS 16227-1&2  |
| 5 a) i) | Primary and Secondary winding made out of  | Primary – Aluminum, Secondary – Copper                                     |
| ii)     | Primary windings<br>-Design density for short circuit current<br>-Conductivity of metal used - | Aluminum<br>- 11.49 Amp/mm <sup>2</sup> (approx.) (<br>- As per IEC        |
| b) i)   | Area of cross section of primary winding   | 3480 mm <sup>2</sup> (approx.) Flat Type Primary- Tube Construction        |
| ii)     | Area of cross section of secondary winding   | 1.167 mm <sup>2</sup> (min.)   |
| c)      | Material used for providing Primary terminals  | Aluminium  |
| d)      | Material used for providing secondary terminals  | Copper Alloy   |
| e)      | Whether Primary is Rigid Bar type in case of live tank   | Yes, Rigid Bar type  |
| 6       | Rated primary voltage (kV rms)   | 220 kV / root3   |
| 7       | Rated highest voltage (kV rms)   | 245 kV   |
| 8       | Rated frequency (Hz)   | 50 Hz  |
| 9       | Rated primary current (A)  | 1600A  |
| 10      | Rated secondary current (A)  | 1  |
| 11      | Ratio taps (on secondary side only)  | On Secondary Side  |
| 12      | Type of insulation   | Class A  |
| 13      | Seismic acceleration (g)   | 0.3 g vertical   |
| 14      | RIV at 1.1 x Rated voltage (mv)  | < 1000 micro volts   |
| 15      | Tank material and Tank coating   | Aluminium Tank with Natural finish   |
| 16      | Hardware exposed to atmosphere   | Stainless Steel  |
| 17      | Bolts, Nuts and Washers  | Stainless Steel.   |
| 18      | Porcelain housing and it make (Single piece only)  | IEC/Modern/ABIL/CJI/RAVIKIRAN or Equivalent Make                           |
| 19      | Sealing (Nitrogen gas cushion/Metal bellow)  | Stainless Steel bellows  |
| 20      | Instrument security factor   | <5 (For Metering core )  |
| 21      | Whether Tan Delta test tap provided  | Yes  |
| 22      | Whether secondary terminal plate is  | Yes ( Epoxy Monoblock)   |

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NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST

**8363152/2024/EEMRT-ENDS1**, TO BE CHECKED DURING ACCEPTANCE TESTS

2. FOR EPC CONTRACTS ONLY

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|       |   |   |
|-------|---|---|
|       | of molded epoxy resin type  |   |
| 23    | Whether primary terminal bushings are of molded Epoxy cast resin/Glass fiber reinforced Polymer | Not applicable  |
| 24    | Whether all seals are of "O" ring type  | Yes "O" ring  |
| 25    | Whether all "O" Rings are fixed in machined grooves with adequate space for compression'        | Yes   |
| 26    | Whether the main hollow insulator has the flanges cemented at both ends                         | Yes   |
| 27    | Whether "O" Rings are of Nitrile butyl rubber or Viton  | Yes (Viton)   |
| 28    | Whether the Short circuit Ampere-turns of the CT being supplied is same as type tested CTs      | Yes   |
| 29    | Tan Delta   | < 0.4 %   |
| 30    | Whether ratio selection is achieved only in secondary   | Yes   |
| 31    | Whether ratio selection is achieved only in secondary   | Yes   |
| 32    | Whether Non return drain valve for oil sampling is arranged for 132kV and above CT/IVT          | Yes   |
| 33    | Acceptable limit of temperature   | As per IS/IEC   |
| 34    | Partial Discharge Level   | < 5pC at 1.2 xUm /√3, < 10pC at Um (where Um is highest system voltage) |
| 35    | Rated short time withstand current for 1 sec. duration (kA rms)                                 | 40 kA   |
| 36    | Rated dynamic withstand current (kAp)   | 100 kA  |
| 37    | Rated continuous thermal current (pu) where pu = rated current                                  | 120% of rated primary current   |
| 38    | 1.2/50 micro second impulse withstand voltage (kVp)   | 1050 kVp  |
| 39    | One minute power frequency withstand voltage (kV rms) of primary winding (Dry)                  | 460 kV rms  |
| 40    | One minute power frequency withstand voltage of secondary winding (kV rms)                      | 3 KV rms  |
| 41 a) | Minimum total Creepage distance of insulator bushing (mm)                                       | 7595 mm / (31mm/kV) Porcelaine Insulator                                |
| b)    | Protected Creepage of distance of bushing (mm)  | < 50 % of total Creepage  |

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**APTRANSCO/VS/Vijayawada.**

8363152/2024/EE MRT-ENE51

|      |   |   |               |                    |                  |                     |
|------|---|---|---------------|--------------------|------------------|---------------------|
| 42   | Details of Cores  | Core 1  | Core 2        | Core 3             | Core 4           | Core 5              |
| 42.1 | Current Ratios A/A  | 1600-800-500/1A   |               |                    |                  | 1600-800-500-300/1A |
| 42.2 | Output burden (VA)  | -   |               |                    |                  | 10                  |
| 42.3 | Class of accuracy   | PX  |               |                    |                  | 0.2S                |
| 42.4 | Accuracy limit factor / ISF   | -   |               |                    |                  | < 5                 |
| 42.5 | Min. knee point voltage (kpv) in volts  | 1600-800-500  |               |                    |                  | NA                  |
| 42.6 | Secondary resistance corrected to 75 deg.C in ohms  | ≤8- ≤4-≤2.5   |               |                    |                  | NA                  |
| 42.7 | Max. Exciting current (mA) at<br>- 20% of knee point voltage<br>- 50% of knee point voltage<br>- 100% of knee point voltage | 25@1600/1A -<br>50 @ 800/1A -<br>80 @ 500/1A at Vk            |               |                    |                  | NA                  |
| 42.8 | Application   | M1 Protection   | M2 Protection | Bus-bar Protection | Spare Protection | Metering            |
| 43   | Weight of oil (Kg.)   | As per GA drawing attached                                    |               |                    |                  |                     |
| 44   | Approximate weight of Copper used (Kgs)   | 27 Kg. (approx.)  |               |                    |                  |                     |
| 45   | Approximate weight of Steel used (Kgs)  | -   |               |                    |                  |                     |
| 46   | Total Weight (Kg.)  | As per GA drawing attached                                    |               |                    |                  |                     |
| 47   | Mounting details  | 450mm x450mm and 600mm x600mm (Please refer GA Drawing)       |               |                    |                  |                     |
| 48   | Overall dimensions  | Please refer GA Drawing                                       |               |                    |                  |                     |
| 49   | Characteristics (whether graphs enclosed):  | Not applicable  |               |                    |                  |                     |
| a)   | Ratio and phase angle curves  | NA  |               |                    |                  |                     |
| b)   | Magnetization curves  | Not applicable  |               |                    |                  |                     |
| c)   | Ratio correction factor curves  | NA  |               |                    |                  |                     |
| 50   | Core  |   |               |                    |                  |                     |
| a)   | Area of cross section (sq.cm.)  | As per Standard design practice                               |               |                    |                  |                     |
| b)   | Flux density at rated primary current and rated burden  | As per Standard design practice                               |               |                    |                  |                     |
| c)   | Grade   | Nano-crystalline for Metering core, CRGO for protection Cores |               |                    |                  |                     |

1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators/IV/LA/Breakers in the Substation during foundation works to ensure safe live to ground clearance 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 contractor shall be instructed to supply the same in line with CT/PT/CVT/Isolator/IVT/LA/Breakers requirement and compatibility.

**Chief Engineer/Projects  
 APTRANSCO/VS/Vijayawada.**