

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST
 5987122/2022/FEMRT-ENE51 REPORTS TO BE CHECKED DURING ACCEPTANCE TESTS

EPC works only

2. FOR EPC CONTRACTS ONLY



LIST OF STANDARD TECHNICAL DATA

Rating -216kV , 10kAp, Class 3 , SM Type Porcelain Housed SA

Sr.No	Drawing No	Rev.No	Description
1	31812	R0	GENERAL ARRANGEMENT FOR 216kV, 10kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER(Qrs-1.6C)
2	G-033 / 216 / 31812	R0	ARRESTER AND UNIT NAME PLATE FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)
3	G-075 / 216 / 31812	R0	INSULATING BASE ASSY. AND SURGE COUNTER MOUNTING DETAILS FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)
4	G-056 / 216 / 31812	R0	TOP TERMINAL PLATE FOR FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)
5	G-016 / 216 / 31812	R0	CROSS SECTIONAL VIEW AND PRESSURE RELIEF ARRANGEMENT FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)
6	G-008 / 216 / 31812	R0	PORCELAIN INSULATOR FOR FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)
7	G - 083 / 216/31812	R0	GENERAL ARRANGEMENT DRAWING AND SCHEMATIC DIAGRAM OF SURGE COUNTER
8	G-025 / 216/ 31812	R0	GRADING RING FOR SM TYPE, SA
9	G-057 / 216/31812	R0	V-I & V-T CHARACTERISTICS
10	G - 007 / 216 / 31812	R0	MIN. RECOMMENDED CLEARANCES
11	G-110 / 216/31812	R0	ZnO ELEMENT FOR CLASS 3, SM Type SA
12	S4/GTP/APTRANSCO/216kV-SM/25/POR/003	R0	GUARANTEED TECHNICAL PARTICULARS FOR 216kV SA

Drawing approval subject to valid vendor registration

MANUFACTURER
CG Power and Industrial Solutions Limited
 A-3, MIDC Ambad
 Nashik-422010

CLIENT



Transmission Corporation Of Andhra Pradesh Ltd

Prepared : PSB

Checked: PSB

Approved: NJ

LOA NO :-

AS APPLICABLE

PROJECT

AS APPLICABLE

List of drawing for 216kV ,10kAp , SM
 Type Porcelain Housed Lightning Arrester
 (Class 3)
Title:

Doc No. CGPISL / S4/STD/APTRANSCO/003

DATE 30.05.2022

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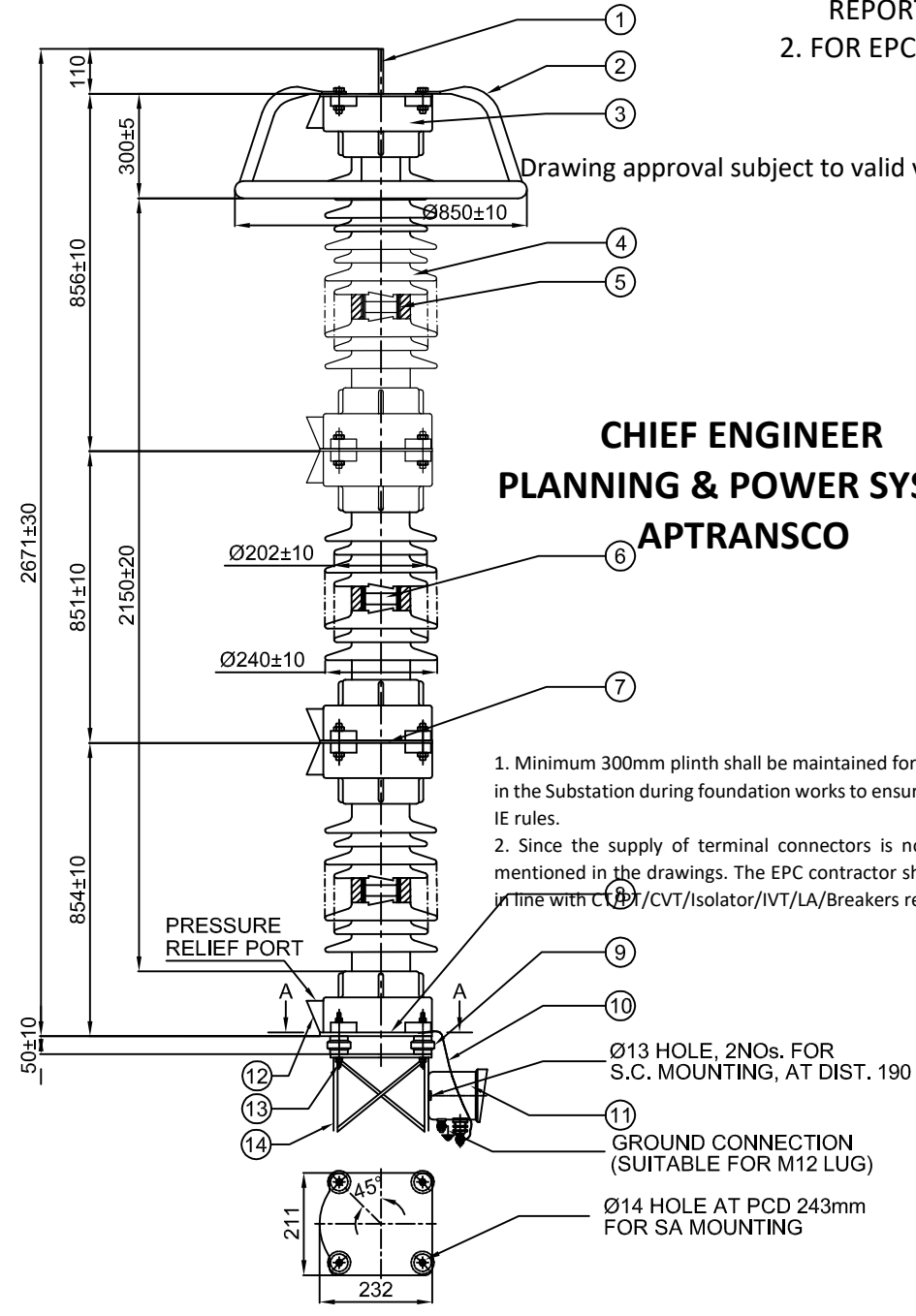
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BILL OF MATERIAL

ITEM NO.	ITEM	MATERIAL
1	LINE TERMINAL (PAD)	MS. HDG.
2	GRADING RING	ALUMINIUM
3	FLANGE	AL. ALLOY
4	INSULATOR	PORCELAIN (BROWN)
5	FRP TUBE	FIBER REINFORCED PLASTIC
6	ZnO ELEMENT	ZnO & ADDITIVES
7	INTERCONNECTING PLATE	MS H.D.G.
8	BASE PLATE	MS H.D.G.
9	BASE INSULATOR	POLYCRETE / EPOXY
10	CONNECTING LINK (L-2 M)	70 sq.mm Cu CABLE PVC INSULATED
11	SURGE COUNTER	ALUMINIUM
12	ARRESTER NAME PLATE	ALUMINIUM
13	M 12 STUD	S.S.
14	CUSTOMER SUPPORT STRUCTURE	NOT IN CGPISL SCOPE

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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.

NOTE:

1. RATED VOLTAGE : 216kV
2. CREEPAGE (min) : 6125mm
3. WEIGHT (Approx) : 150±10%kg
4. CANTILEVER STRENGTH : 150kg (DEFLECTION LESS THAN 200mm).

SA BASE MOUNTING DETAIL VIEW 'A-A'

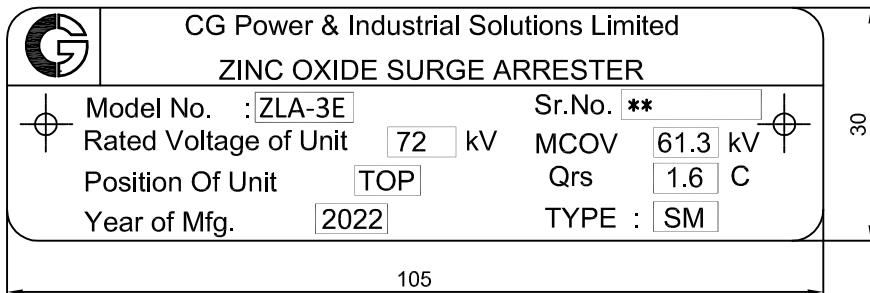
CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			TITLE: GENERAL ARRANGEMENT FOR 216KV, 10KA SM TYPE PORCELAIN HOUSED SURGE ARRESTER(Qrs-1.6C)	
3		THIRD ANGLE PROJECTION			DRN	NNJ
		SCALE: NTS		INITIALS	NAME	
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	CHD		PSB	
1		GEN. TOL. ±6%	APPD		NJ	
NO	REVISION	DATE	DATE: 24.05.2022	DRG NO.: 31812	REV 0	
				CGL W.O.: APTRANSCO_216KV	SH 1 OF 1	

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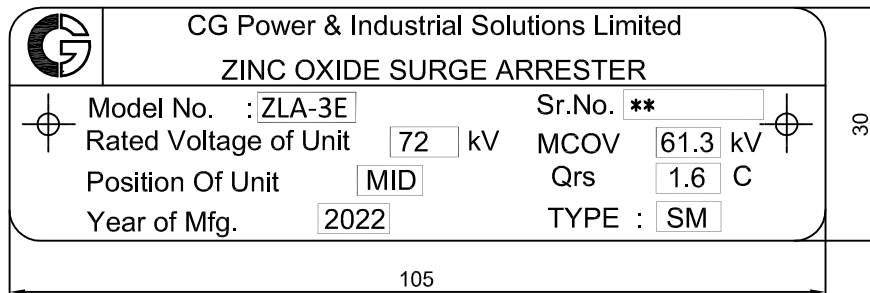
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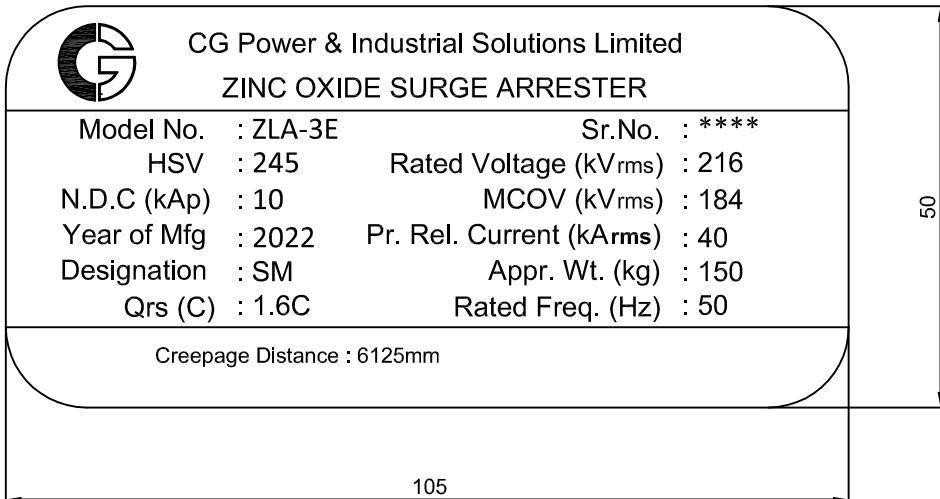
IF IN DOUBT ,ASK



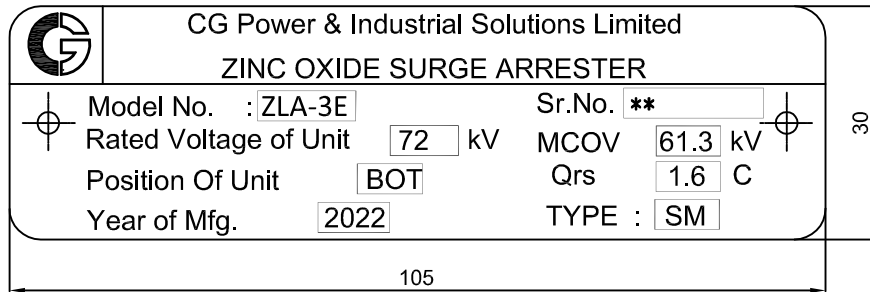
TOP UNIT



MID UNIT



ARRESTER NAME PLATE



BOTTOM UNIT

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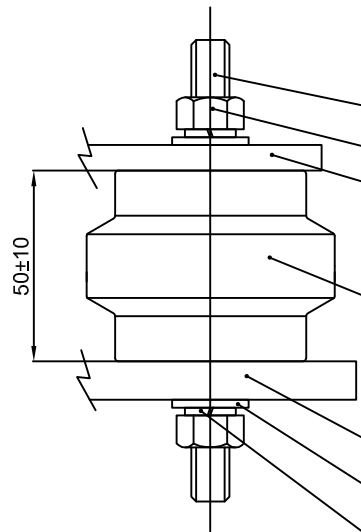
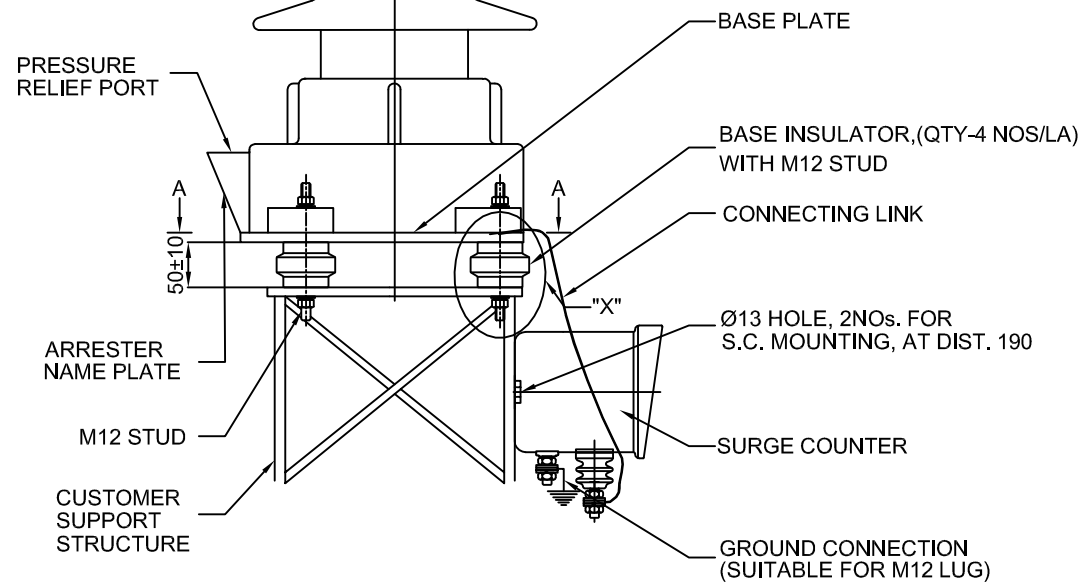
CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH					
3		THIRD ANGLE PROJECTION				TITLE: ARRESTER AND UNIT NAME PLATE FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)	
		SCALE: NTS		INITIALS	NAME		
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ		CG Power and Industrial Solutions Limited LIGHTNING ARRESTER DIVISION, AMBAD, NASIK.
			CHD		PSB		
1		GEN. TOL. ±6%	APPD		NJ	DRG NO.: G-033 / 216 / 31812	REV 0
NO	REVISION	DATE	DATE:	24.05.2022	CGL W.O.:	APTRANSCO_216kV	SH 1 OF 1

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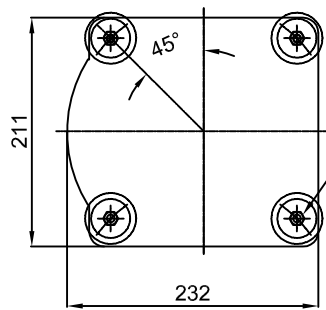
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BILL OF MATERIAL

DESCRIPTION	QTY. NOS./LA
M12 STUD	8
M12 NUT	8
BASE PLATE	1
INSULATOR	4
STRUCTURE TOP PLATE	1
M12 PLAIN WASHER	8
M12 SPRING WASHER	8



Ø14 HOLE AT PCD 243mm FOR SA MOUNTING

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SA BASE MOUNTING DETAIL VIEW 'A-A'

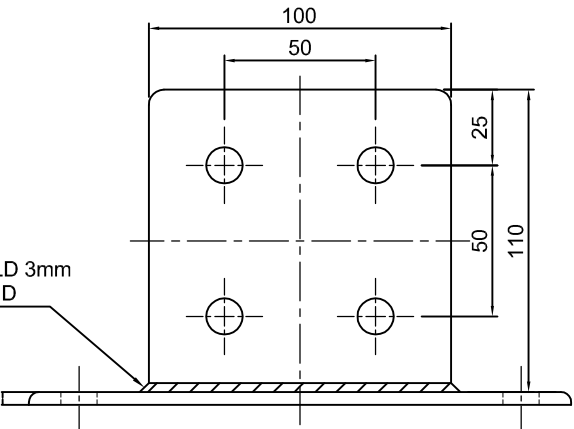
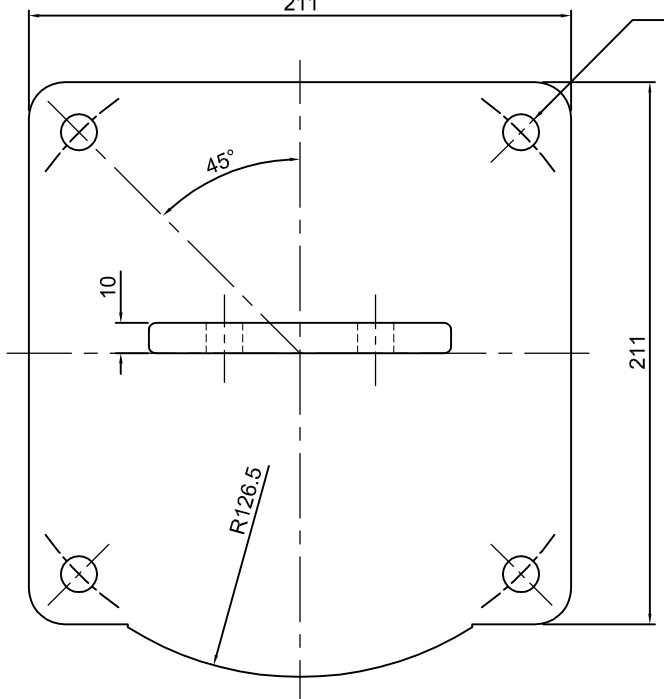
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CUSTOMER AND COMPANY			MISSION CORPORATION OF ANDHRA PRADESH			
3			THIRD ANGLE PROJECTION			TITLE: INSULATING BASE ASSY. AND SURGE COUNTER MOUNTING DETAILS FOR 216kV, SM TYPE SA
			SCALE: NTS		INITIALS	
2			ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
				CHD		PSB
1			GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE:	24.05.2022	DRG NO. : G-075 / 216 / 31812	REV 0
			CGL W.O.: APTRANSCO_216KV			SH 1 OF 1

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FILLET WELD 3mm ALL AROUND

NOTE:-

- 1. FINISH : HDG
- 2. HDG 85 MICRONS MIN. THK.

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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.

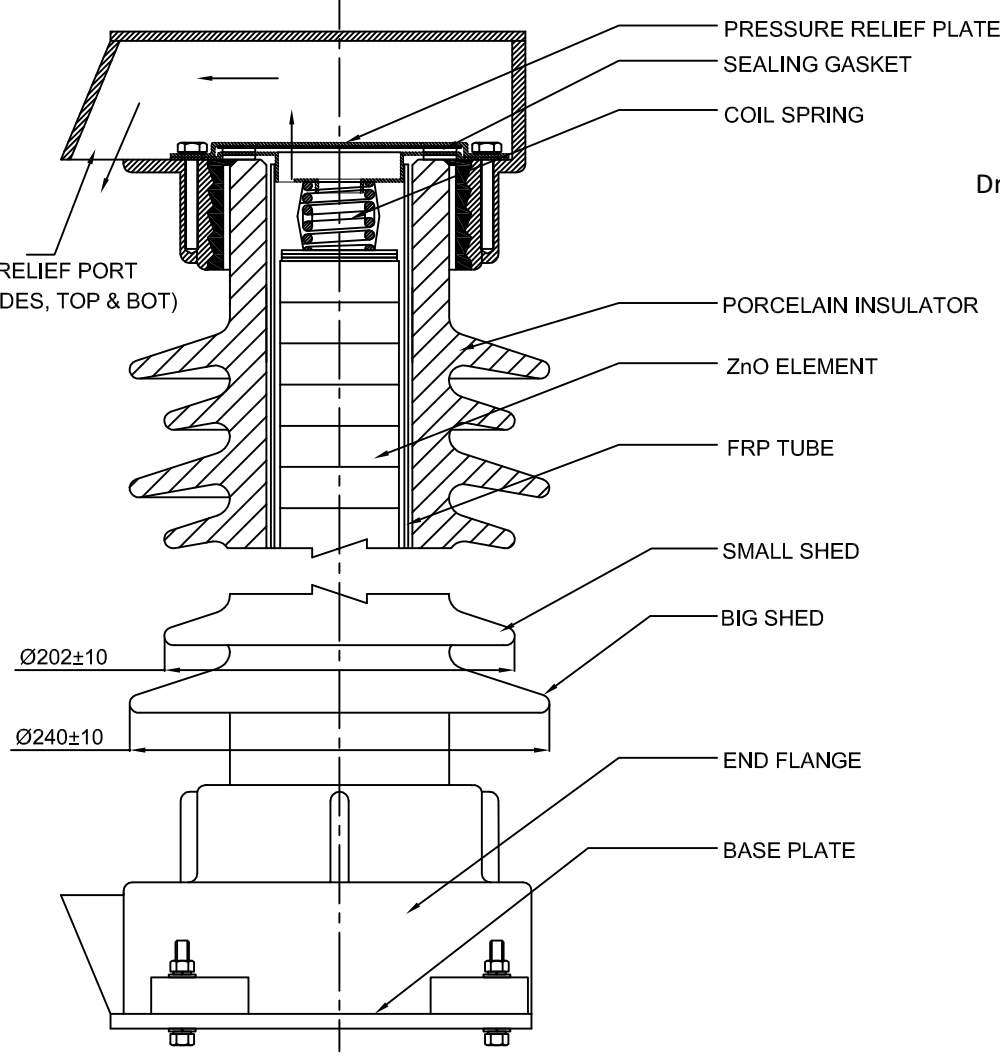
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CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION			TITLE: TOP TERMINAL PLATE FOR 10kA, SM-TYPE, SURGE ARRESTER (Qrs-1.6C)
		SCALE: NTS		INITIALS	
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
			CHD		PSB
1		GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE:	24.05.2022	DRG NO. : G-056 / ZN0288
				CGL W.O.:	APTRANSCO_216kV
					SH 1 OF 1

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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.
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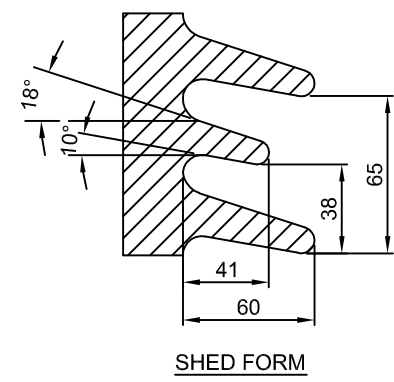
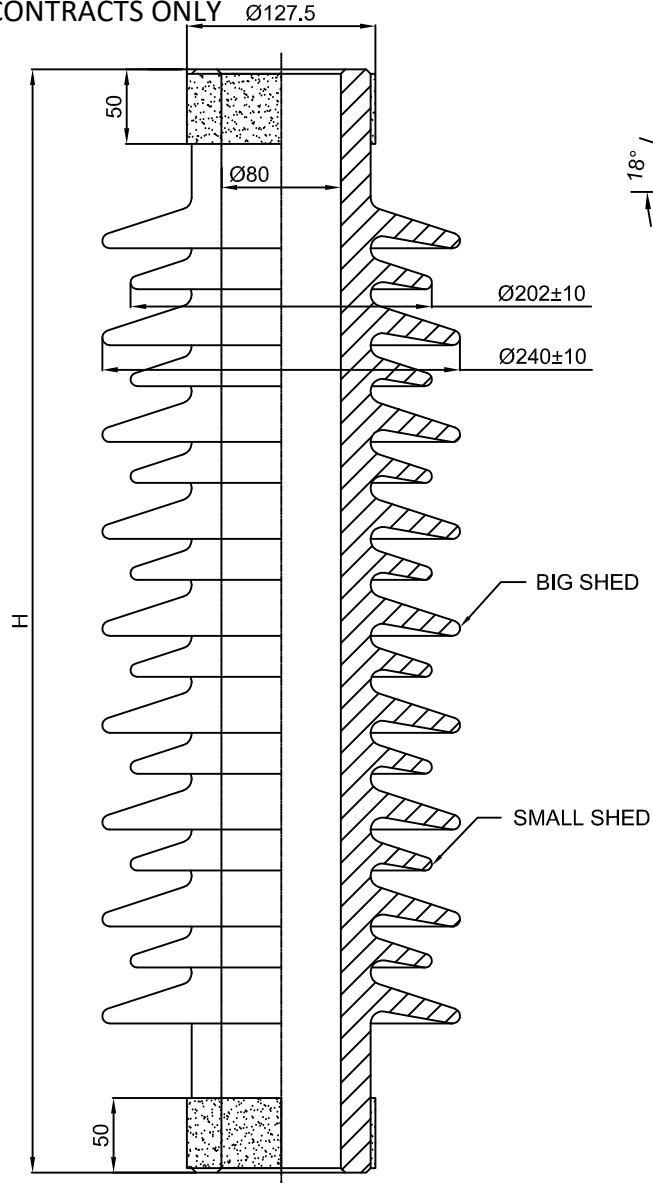
NOTE:
 1. BURSTING PRESSURE OF ARRESTER : 3kg/cm^2 (Max.)
 2. APPLICABLE FOR 3 UNITS.

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION			TITLE: CROSS SECTIONAL VIEW AND PRESSURE RELIEF ARRANGEMENT FOR 216kV, 10kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)
		SCALE: NTS		INITIALS	
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
			CHD		PSB
1		GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE:	24.05.2022	DRG NO. : G-016 / 216 / 31812
				CGL W.O.:	APTRANSCO_216KV SH 1 OF 1

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RATED VOLTAGE (kV)	HEIGHT (H) mm	TOTAL CREEPAGE (mm)
216kV (TOP, MID & BOT 72kV EACH)	740	6125

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.

NOTE (A):
 ROUTINE & ACCEPTANCE TEST AS PER IS 3070 P-III, IS 15086 P-I, IEC-99-4.

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH				TITLE: PORCELAIN INSULATOR FOR 216kV 10 kA SM TYPE PORCELAIN HOUSED SURGE ARRESTER (Qrs-1.6C)	
3		THIRD ANGLE PROJECTION			SCALE: NTS	INITIALS	NAME
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ	 CG Power and Industrial Solutions Limited LIGHTNING ARRESTER DIVISION, AMBAD, NASIK.	
1			CHD		PSB		
		GEN. TOL. ±6%	APPD		NJ	DRG NO. : G-008 / 216 / 31812	REV 0
NO	REVISION	DATE	DATE:	24.05.2022	CGL W.O.:	APTRANSCO_216kV	SH 1 OF 1

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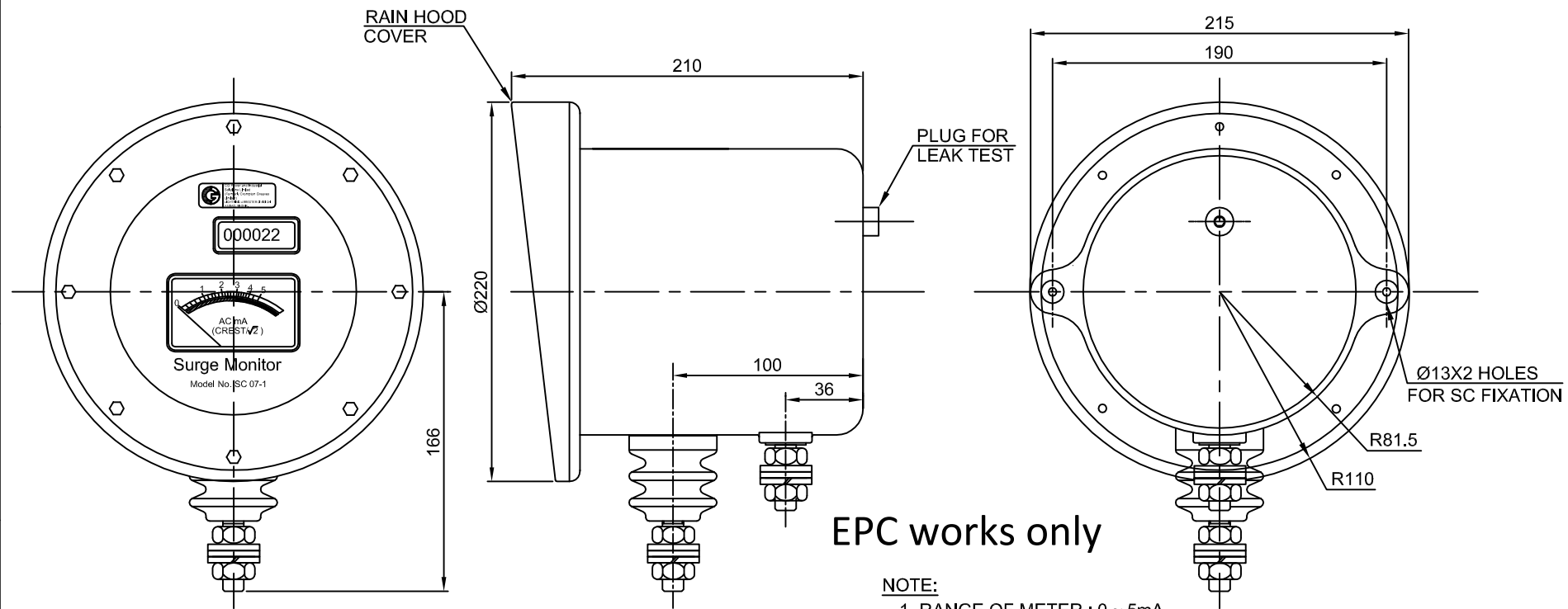
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REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS

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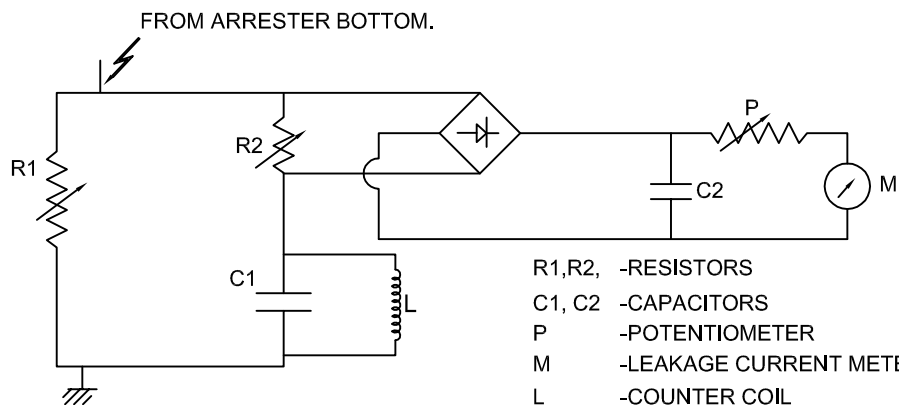
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- NOTE:**
- RANGE OF METER : 0 ~ 5mA.
 - * 0 ~ 3mA GREEN ZONE &
 - * 3 ~ 5mA RED ZONE.
 - HOUSING :-
 - * MATERIAL : AL. ALLOY.
 - * PROTECTION : IP 67.
 - WEIGHT OF S.C. : 4kg APPROX.
 - MODEL NO. : SC 07-1
 - ELECTROMECHANICAL TYPE.

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SCHMATIC DIAGRAM

- R1,R2, -RESISTORS
- C1, C2 -CAPACITORS
- P -POTENTIOMETER
- M -LEAKAGE CURRENT METER
- L -COUNTER COIL

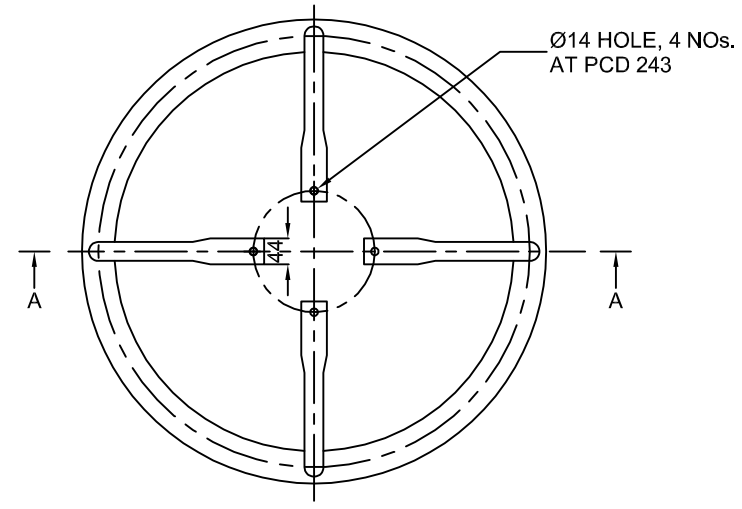
CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION			TITLE: GENERAL ARRANGEMENT DRAWING AND SCHEMATIC DIAGRAM OF SURGE COUNTER
		SCALE: NTS		INITIALS	
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
			CHD		PSB
1		GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE: 24.05.2022	DRG NO.: G - 083 / 216/31812	REV 0
			CGL W.O.: APTRANSCO_216KV	SH 1 OF 1	

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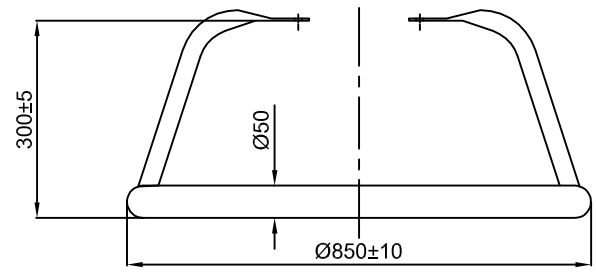
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1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators/IV/LA/Breakers in the Substation during foundation works to ensure safe live to ground clearance as per IE rules.
2. Since the supply of terminal connectors is not in the scope of 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.



VIEW A-A

NOTE:
MATERIAL : AL. ALLOY

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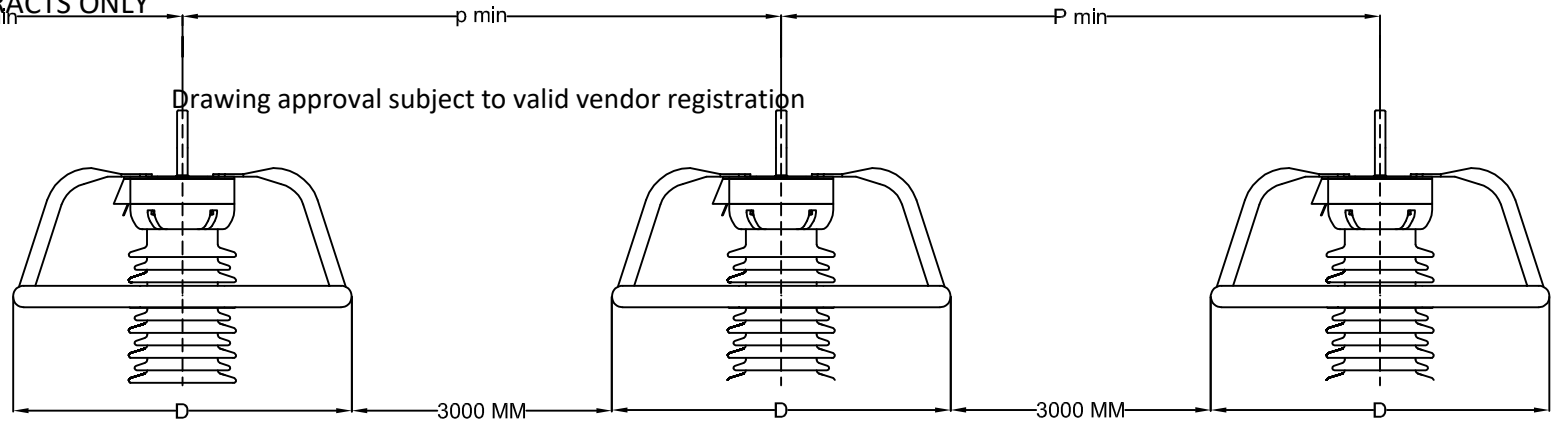
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CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION			TITLE : GRADING RING FOR SM TYPE, SA
		SCALE: NTS		INITIALS	
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
			CHD		PSB
1		GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE: 24.05.2022	DRG NO. : G-025 / 216/ 31812	REV 0
			CGL W.O.: APTRANSCO_216KV	SH 1 OF 1	

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST⁴

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E min. - MINIMUM RECOMMENDED CLEARANCES BETWEEN CENTRE OF ARRESTER AND EARTHED OBJECT.

P min. - MINIMUM RECOMMENDED CLEARANCE BETWEEN TWO ADJACENT PHASE OF ARRESTER.

TABLE

SR.NO.	LA RATED VOLTAGE (kV)	GRADING RING (D)	PHASE TO PHASE	P MIN. (MM)
1.	216	860	3000	3860

SR.NO.	LA RATED VOLTAGE (kV)	GRADING RING (R)	PHASE TO EARTH	E MIN. (MM)
1.	216	430	2850	3280

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.

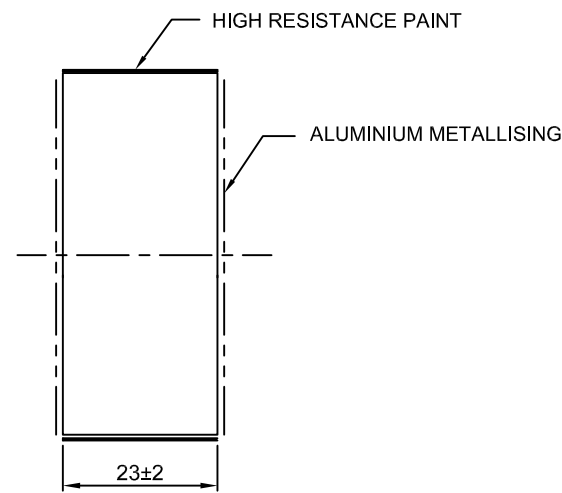
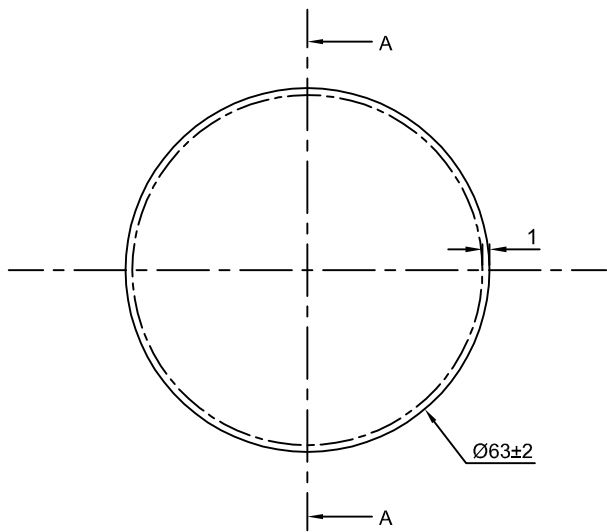
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CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION			TITLE:
		SCALE: NTS		INITIALS	NAME
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
			CHD		PSB
1		GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE:	24.05.2022	DRG NO.: G - 007 / 31816
				CGL W.O.: APTRANSCO_216kV	SH 1 OF 1

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ZnO ELEMENT TYPE D6
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- NOTE :
1. Ur = 3kV
 2. Uc = 2.8kV
 3. NDC = 10kAp
 4. Station SM Type
 5. Line Discharge Class = Class 3 (As per IEC 60099-4 (2009))
 6. Qrs(C) ≥ 1.6C

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CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION			TITLE: ZnO ELEMENT FOR SM TYPE, PORCELAIN SA
		SCALE: NTS		INITIALS	
2		ALL DIMN. IN mm. UNLESS OTHERWISE SPECIFIED.	DRN		NNJ
			CHD		PSB
1		GEN. TOL. ±6%	APPD		NJ
NO	REVISION	DATE	DATE:	24.05.2022	DRG NO. : G-110 / 216/31812
				CGL W.O.:	APTRANSCO_216KV
				SH 1 OF 1	REV 0

S4/GTP/APTRANSCO/216kV-SM/25/POR/003

Sr. No	Description	216kV
1	Name of Manufacturer	CG Power and Industrial Solutions Limited
2	Arrester Class & Type	Station Class, Gapless type
3	Applicable Standard	IEC 99-4
4	Rated Arrester Voltage (kV)	216
5	Maximum continuous operating Voltage (kV)	184
6	Nominal Discharge current (kA) with 8/20 micro-sec wave	10
7	Designation of Arrester	Station Class, Gapless type, SM Type
8	a. Thermal Energy Rating Wth in kJ/kV of Ur b. Repetitive charge transfer rating (Qrs) in coulomb c. Line Discharge Class	≥ 7 kJ/kV; Qrs - 1.6C; Class 3 [As per IEC 60099-4 (2009)]
9	Maximum Switching current impulse residual voltage at	
	i) 1000Amps	494
	ii) 500Amps	480
	iii) 250Amps	465
10	Maximum residual voltage with 1 micro second current wave at 10kA (kVp)	654
11	Maximum residual voltage with 8/20 micro-sec wave (kVp)	
	i) 5 kA	567
	ii) 10kA	602
	III) 20kA	668
12	Safe Fault current (kArms)	40
13	Lightning Impulse withstand voltage of Arrester Housing with 1.2/50 micro-second wave (kVp)	1050
14	One minute power frequency withstand voltage of housing (Dry/Wet) - kVrms	460

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CHIEF ENGINEER

PLANNING & POWER SYSTEMS

APTRANSCO



MS Srugappa



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

S4/GTP/APTRANSCO/216kV-SM/25/POR/003 FOR EPC CONTRACTS ONLY

15	High current short duration impulse withstand level with 4/10 micro-sec wave (kA) Peak	100
16	Pressure Relief Class	A
17	Over-voltage withstand Capability kVp	
	a) 10seconds	367
	b) 1 second	385
	c) 0.1 second	397
18	a) Reference Voltage (kV)	>= 216kV
	b) Reference current (mA)	5 mAp
19	Number of units per phase and rating of each unit.	3 (each of 72kV)
20	Minimum total Creepage distance (mm)	6125 (25mm/kV)
21	Leakage current (mA)	<= 3 mAp
22	Total weight of Arrester (kg)	150kG approx
23	Maximum cantilever strength of Surge Arrester (Including wind load)	150kG with deflection less than 200mm
24	Overall Height of Surge Arresters (mm)	Ref GA Drg.
25	Maximum distance recommended from equipment to be protected by Surge Arrester (mm)	As per IE rules
26	Minimum distance between grounded object	As per IE rules
27	Minimum distance between arrester phase legs	As per IE rules
28	Any other particulars	No
29	Seismic Acceleration (Horizontal + Vertical)	0.3g
30	Partial Discharge level 1.05COV	Less than 10pC
31	RIV level at 156kV	Less than 2500μV

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