





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 IIE 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.

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

TO BE CHECKED DURING ACCEPTANCE TESTS.

IF IN DOUBT ,ASK

**CG Power & Industrial Solutions Limited**  
**ZINC OXIDE SURGE ARRESTER**

Model No. : ZLA-3E  
 Rated Voltage of Unit : 72 KV  
 Position Of Unit : TOP  
 Year of Mfg. : 2024

Sr.No. : \*\*  
 MCOV : 61.3 KV  
 Qrs : 1.6 C  
 TYPE : SM

105

TOP UNIT

**CG Power & Industrial Solutions Limited**  
**ZINC OXIDE SURGE ARRESTER**

Model No. : ZLA-3E  
 Rated Voltage of Unit : 72 KV  
 Position Of Unit : MID  
 Year of Mfg. : 2024

Sr.No. : \*\*  
 MCOV : 61.3 KV  
 Qrs : 1.6 C  
 TYPE : SM

105

MID UNIT

**CG Power & Industrial Solutions Limited**  
**ZINC OXIDE SURGE ARRESTER**

Model No. : ZLA-3E  
 HSV : 245  
 N.D.C (kAp) : 10  
 Year of Mfg : 2024  
 Designation : SM  
 Qrs (C) : 1.6C

Sr.No. : \*\*\*\*  
 Rated Voltage (K/Vrms) : 216  
 MCOV (K/Vrms) : 184  
 Pr. Rel. Current (kArms) : 40  
 Apr. Wt. (kg) : 170  
 Rated Freq. (Hz) : 50

CREPAGE DISTANCE : 7595MM

105

ARRESTER NAME PLATE

**CG Power & Industrial Solutions Limited**  
**ZINC OXIDE SURGE ARRESTER**

Model No. : ZLA-3E  
 Rated Voltage of Unit : 72 KV  
 Position Of Unit : BOT  
 Year of Mfg. : 2024

Sr.No. : \*\*  
 MCOV : 61.3 KV  
 Qrs : 1.6 C  
 TYPE : SM

105

BOTTOM UNIT

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Chief Engineer  
 Projects

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH		
THIRD ANGLE PROJECTION		TITLE : ARRESTER & UNIT NAME PLATE FOR 216KV, OL-3, SM TYPE, SA		
NO.	REVISION	DATE	INITIALS	NAME
1		07.02.2024		
2				
3				

3.3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

5

4

NO. REVISION DATE

DATE

CGI. W.O.: APTRANSCO STD 216KV SH 1 OF 1

REV 0

**CG Power and Industrial Solutions Limited**  
 LIGHTNING ARRESTER DIVISION, AMBAD, NARSIK

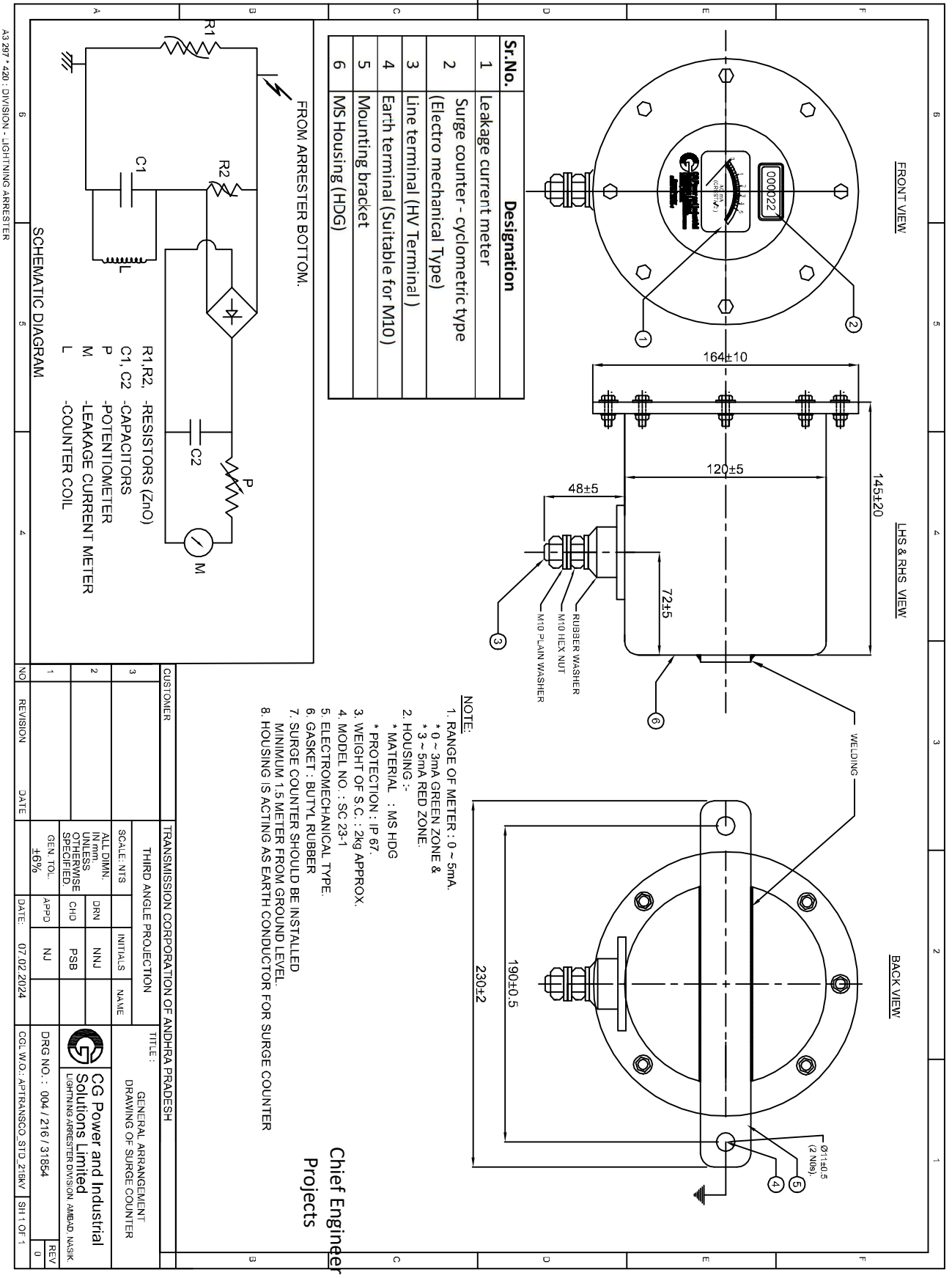
DRG NO. : 003 / 216 / 31854

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

For EPC Contracts Only



Chief Engineer  
Projects

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH	
TITLE		GENERAL ARRANGEMENT DRAWING OF SURGE COUNTER	
SCALE: NTS	THIRD ANGLE PROJECTION	INITIALS	NAME
ALL DIMN. IN mm UNLESS OTHERWISE SPECIFIED	DRN	NNJ	
GEN. TOL. ±6%	APPD	NU	
NO.	REVISION	DATE	DATE
1		07.02.2024	
CGI. W.O. : APTRANGCO STD 218M	SIT 1 OF 1	DRG NO. : 004 / 216 / 37854	CG Power and Industrial Solutions Limited LIGHTNING ARRESTER DIVISION AMBAD NASKI

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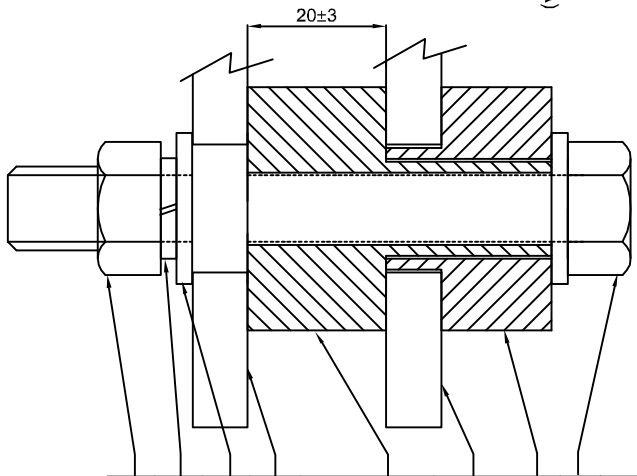
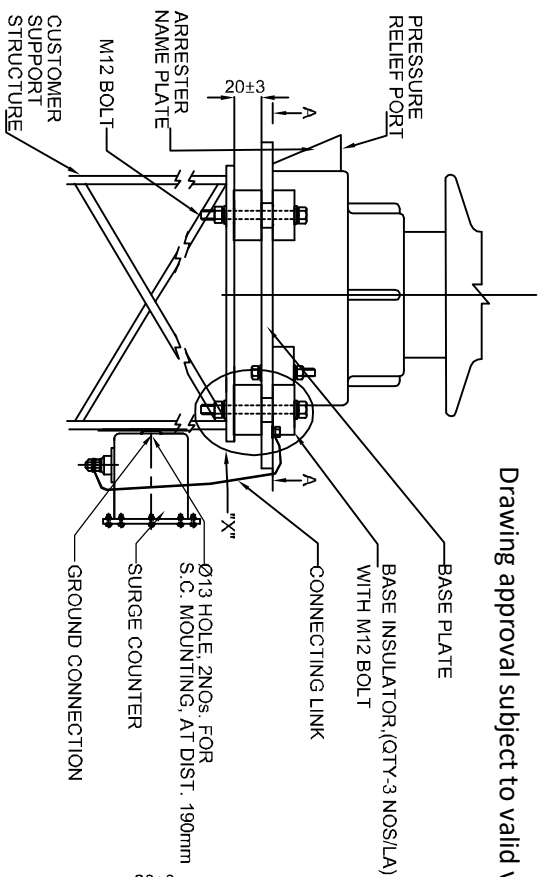
IF IN DOUBT ,ASK

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.

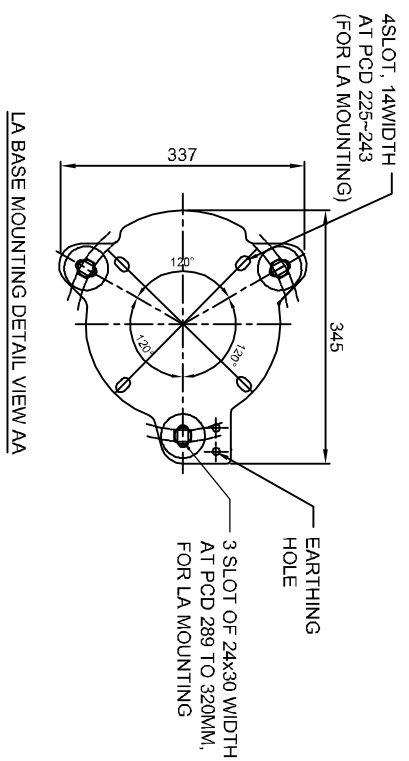
1) Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators in the substation during foundation works to ensure safe live to ground clearances as per IE rules.

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BILL OF MATERIAL	
DESCRIPTION	QTY. NOS./LA
M12 BOLT	3
INSULATING BASE-1	3
BASE PLATE	1
INSULATING BASE-2	3
STRUCTURE TOP PLATE	1
M12 PLAIN WASHER	6
M12 SPRING WASHER	3
M12 NUT	3



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

Chief Engineer  
Projects

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH	
THIRD ANGLE PROJECTION		SCALE: NTS	INITIALS
1	NO.	1	DATE: 07.02.2024
2	REVISION	2	DATE:
3	DATE	3	DATE:

TITLE : INSULATING BASE ASSY. AND SURGE COUNTER MOUNTING DETAILS FOR 218KV, CL-3, SM TYPE SA

CG Power and Industrial Solutions Limited  
LBSHINAPARTNER DIVISION AMBAD NASKI

DRG NO. : 006 / 216 / 31984

REV 0

A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

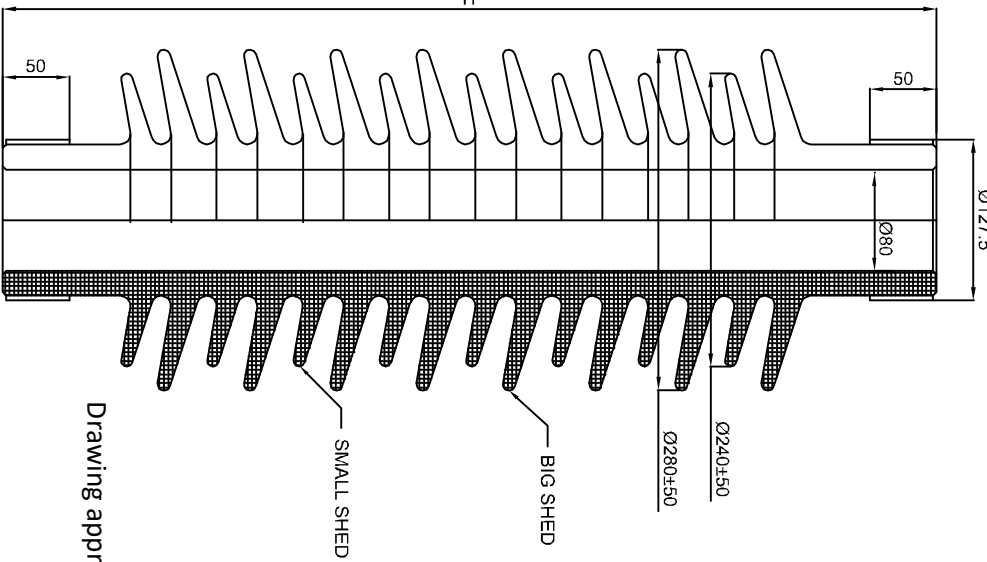


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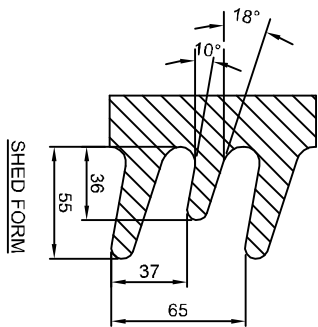
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1) Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators in the substation during foundation works to ensure safe live to ground clearances as per IE rules.



Drawing approval subject to valid vendor registration



For EPC Contracts Only

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

RATED VOLTAGE (kV)	HEIGHT (H) mm	TOTAL CREEPAGE (mm)
21kV	740	7595
72kV-TOP	740	
72kV-MID	740	
72kV-BOT	740	

Chief Engineer  
Projects

- NOTE:
- PORCELAIN COLOUR : GLAZE - BROWN
  - BENDING STRENGTH : 150kg
  - ELECTRICAL TEST AS PER IS : 5621
  - SHED PROFILE AS PER IEC : 815

A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH	
THIRD ANGLE PROJECTION		SCALE: NTS	INITIALS
TITLE: PORCELAIN INSULATOR FOR 21kV/CL-3, SM TYPE SA		ALL DIM. IN mm UNLESS OTHERWISE SPECIFIED	DRN
DRG NO. : 007 / 216 / 31854		GEN. TOL. ±6%	APPD
CGI. W/O. -APTRANSCO STD 21kV		DATE: 07.02.2024	NU
SIT 1 OF 1		DATE:	REV
CG Power and Industrial Solutions Limited		DATE:	0
LAKSHMIPUR, BENTON DIVISION, AMBAD, NARSIP		DATE:	

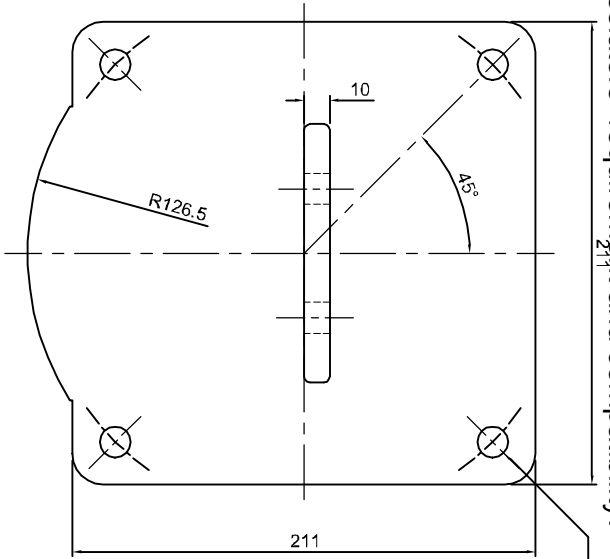
A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

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IF IN DOUBT ,ASK

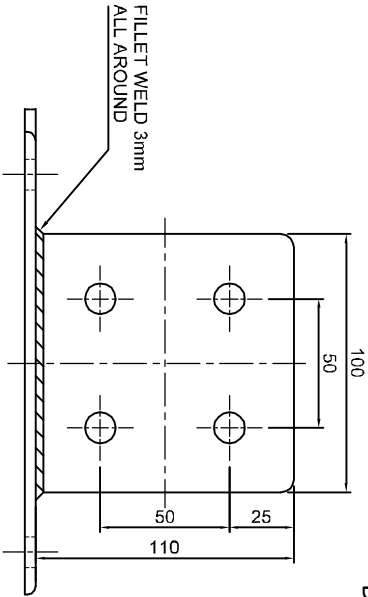
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2) Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/PT/CVT/Isolators requirement and compatibility.



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

Drawing approval subject to valid vendor registration



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

Chief Engineer  
Projects

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CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH			
3		THIRD ANGLE PROJECTION		SCALE: NTS	INITIALS
2		ALL DIM. IN mm UNLESS OTHERWISE SPECIFIED	DRN	NNJ	NAME
1		GEN. TOL. ±0.6%	CHK	PSB	DATE: 07.02.2024
NO.	REVISION	DATE	DATE	DATE	DATE

TITLE : TOP TERMINAL PLATE FOR 10KA SM-TYPE LIGHTNING ARRESTER(Q's-1,6C)

CG Power and Industrial Solutions Limited  
LIGHTNING ARRESTER DIVISION AMBAD NASKI

DRG NO. : 008 / 216 / 31854

A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

5

NO. REVISION DATE

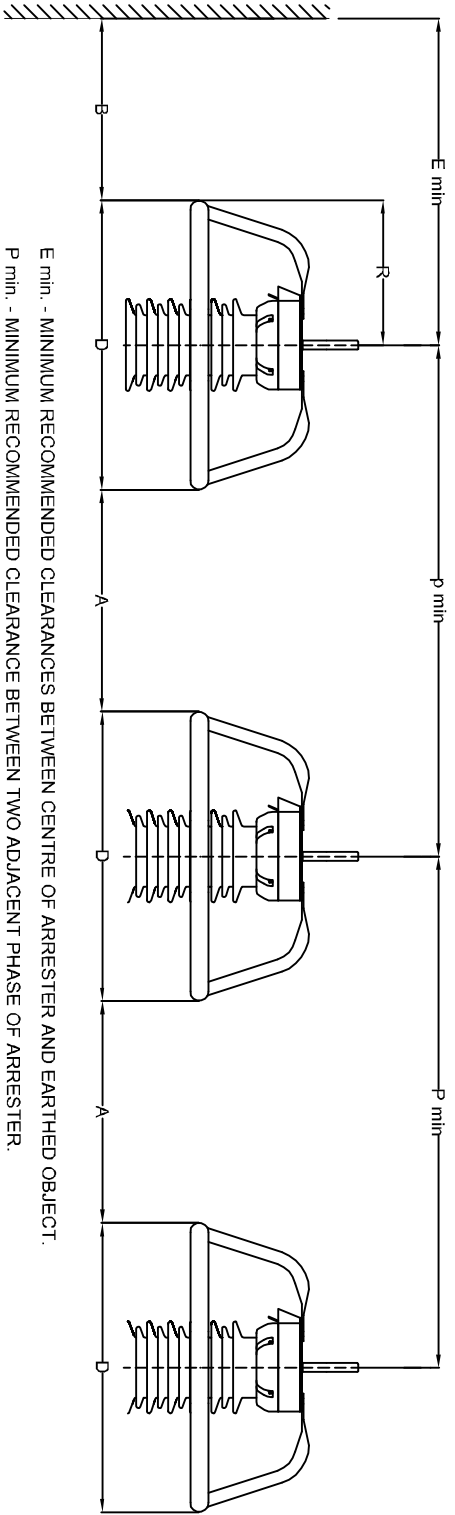
DATE: 07.02.2024

CGI.W.O.-APTRANSCO STD 218W/ SH 1 OF 1

Drawing approval subject to valid vendor registration

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

IF IN DOUBT ,ASK



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(A)	P MIN. (MM)	GRADING RING (R)	PHASE TO EARTH(B)	E MIN. (MM)
1.	216	860	3000	3860	430	2850	3280

DIAMETER OF GRADING RING (D) = 860  
RADIUS OF GRADING RING (R) = 430

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Chief Engineer  
Projects

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CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH	
TITLE :		MIN. RECOMMENDED CLEARANCES	
THIRD ANGLE PROJECTION		SCALE: NTS	
1	NO	REVISION	DATE
1			07.02.2024
2			
3			
ALL DIM. IN mm UNLESS OTHERWISE SPECIFIED.		GEN. TOL. ±0.10	
DRG NO. : 009 / 216 / 31854		CGI. W.O. : APTRANGCO STD 218W/	
CG Power and Industrial Solutions Limited		SIT 1 OF 1	
LIGHTNING ARRESTER DIVISION AMBAD NASKI			
REV			
0			

A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

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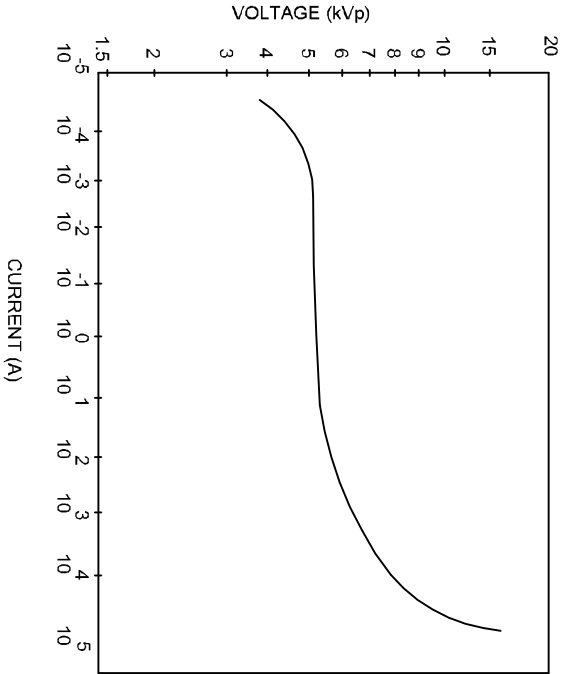
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2) Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/PT/CVT/Isolators requirement and compatibility.

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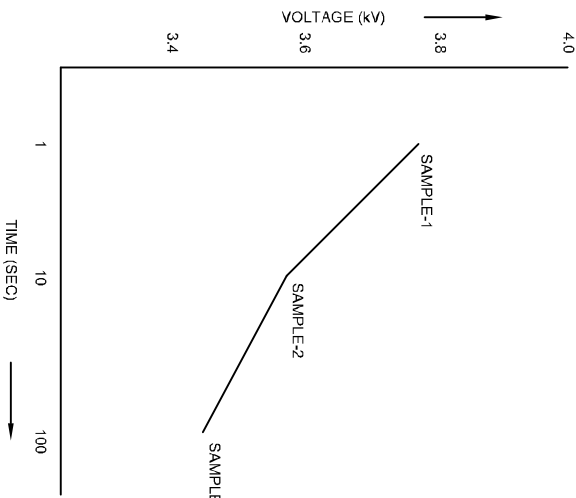
POWER FREQUENCY VOLTAGE VS CURRENT CHARACTERISTICS



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- NOTE :
- Ur = 3kV
  - Uc = 2.8kV
  - NDC = 10kA<sub>p</sub>
  - FOLLOWING GRAPH REPRESENTS ONLY FOR SINGLE ZNO BLOCK FOR OFFERED RATING.

POWER FREQUENCY VOLTAGE VS TIME CHARACTERISTICS



Chief Engineer  
Projects

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH	
NO	REVISION	DATE	DATE
1		07.02.2024	
2			
3			
THIRD ANGLE PROJECTION		SCALE: NTS	TITLE: V - I & V-T CHARACTERISTICS
ALL DIM. IN mm UNLESS OTHERWISE SPECIFIED	DRN	INITIALS	NAME
GEN. TOL. ±0.10	CHD		
	PSB		
	NU		
DRG NO. : 010 / 216 / 31654	APPD		
CGI W/O. APTRANGCO STD 218M	REV		
SIT 1 OF 1	0		



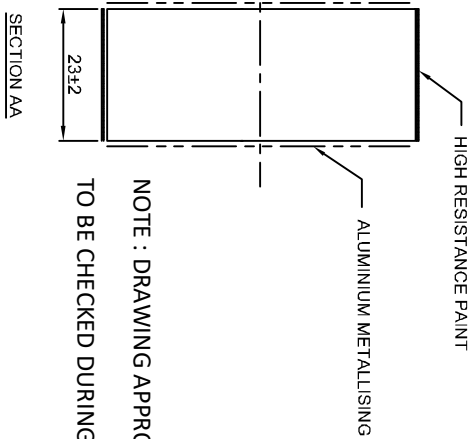
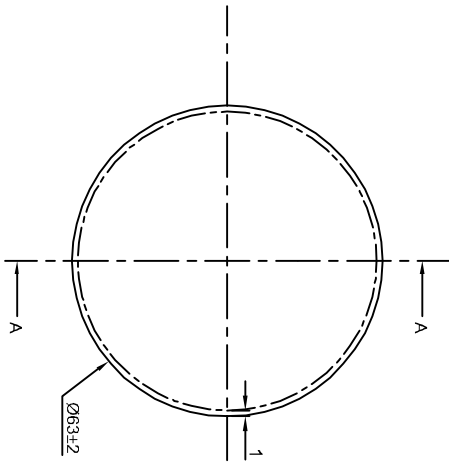
CG Power and Industrial Solutions Limited  
LIGHTNING ARRESTER DIVISION AMBAD NASKI

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IF IN DOUBT ,ASK

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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.  
ZNO ELEMENT TYPE D6



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

- 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. Q/S(C) ≥1.6C

Chief Engineer  
Projects

For EPC Contracts Only

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH		
		THIRD ANGLE PROJECTION		TITLE :
3		SCALE: NTS	INITIALS	NAME
2		ALL DIM. IN mm UNLESS OTHERWISE SPECIFIED	DRN	NNJ
1		GEN. TOL. ±6%	CHD	PSB
			APPD	NU
NO.	REVISION	DATE	DATE	DATE
			07.02.2024	
		DRG NO. : 011 / 216 / 31854		CGI. W/O. -APTRANSCO STD ZIBAV/ SHT 1 OF 1
		CG Power and Industrial Solutions Limited		CG Power and Industrial Solutions Limited
		LIGHTNING ARRESTER DIVISION AMBAD NASKI		REVISION
				0

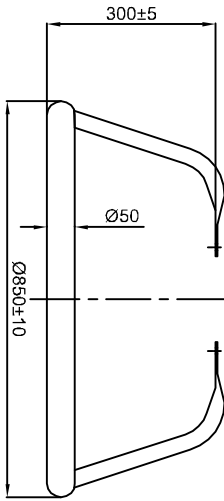
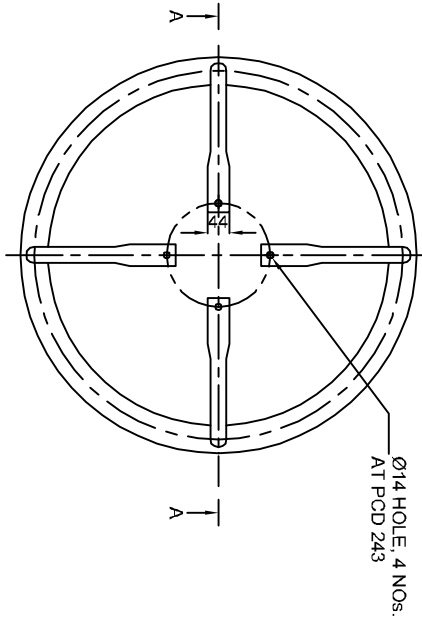
A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

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



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Chief Engineer  
Projects

NOTE:  
FINISHING SMOOTH FREE FROM CAVITIES & PIN HOLES.  
MATERIAL : ALUMINIUM

CUSTOMER		TRANSMISSION CORPORATION OF ANDHRA PRADESH	
TITLE :		GRADING RING FOR 210KV, SM TYPE, SA	
SCALE: NTS		THIRD ANGLE PROJECTION	
1	NO.	REVISION	DATE
1			07.02.2024
2			
3			
ALL DIM. IN mm. UNLESS OTHERWISE SPECIFIED		DRN	NNJ
GEN. TOL. ±6%		CHD	PSB
		APPD	NJ
CGI W.O. : APTRANGCO STD 210KV/ SHT 1 OF 1		CG Power and Industrial Solutions Limited LIGHTNING ARRESTER DIVISION, AMBAD, NASKIK	
DRG NO. : 012 / 216 / 31854		REV 0	

A3 297 \* 420 : DIVISION - LIGHTNING ARRESTER

**S4/GTP/APTRANSCO/216kV-SM/31/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

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.

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For EPC Contracts Only

## S4/GTP/APTRANSCO/216kV-SM/31/POR/003

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)	7595 (31mm/kV)
21	Leakage current (mA)	<= 3 mAp
22	Total weight of Arrester (kg)	170kG approx
23	Maximum cantilever strength of Surge Arrester (Including wind load)	150kG with deflection less than 20mm
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

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 time with CT/PT/CVT/Isolators requirement and compatibility.

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.

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

TO BE CHECKED DURING ACCEPTANCE TESTS.

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T: +91 22 2423 7777 F: +91 22 2423 7733 W: www.cgglobal.com  
Corporate Identity Number: L99999MH1937PLC002641

Chief Engineer  
Projects