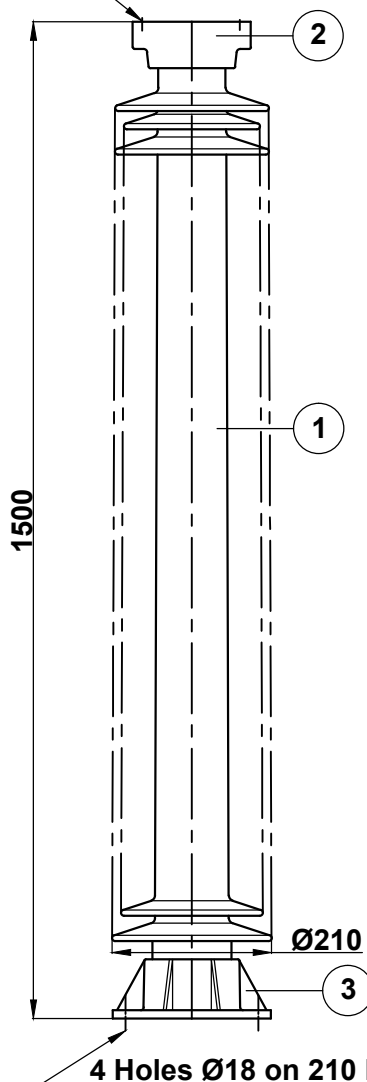


4 Holes M16 X 22 deep
on 127 PCD



TECHNICAL PARTICULARS

MECHANICAL VALUES

Bending strength (Upright)	kN	6
Compression strength	kN	160
Tensile strength	kN	80
Torsional strength	kNm	4.5

ELECTRICAL VALUES

Dry power frequency withstand voltage	kV	375
Wet power frequency withstand voltage	kV	310
Dry power frequency flashover voltage	kV	410
Wet power frequency flash over voltage	kV	340
Lightning impulse withstand voltage	kVp	650
Impulse flashover voltage	kVp	750
Minimum nominal creepage distance	mm	3700
Visible discharge voltage	kV	> 105
Net Weight (approx.)	kgs	63
Shed profile as per IEC : 60815		

NOTE :-

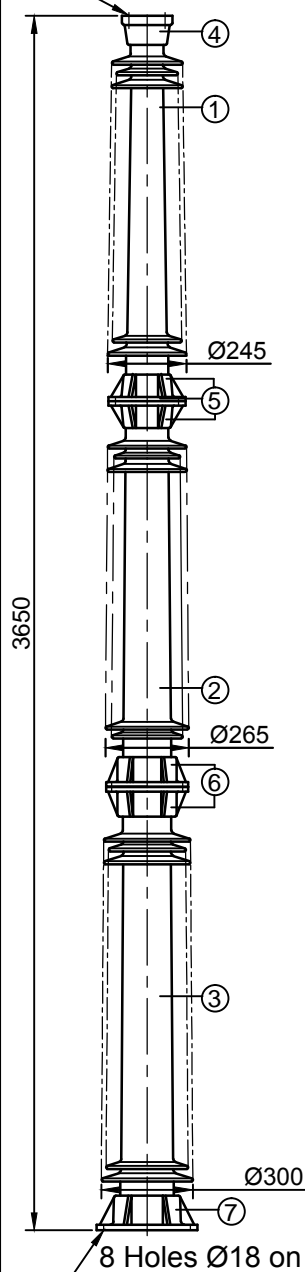
Test & tolerance as per IS : 2544 , 5350 & IEC : 60168 , 273

CUSTOMER:	TAMILNADU TRANSMISSION CORP. LTD.
PROJECT:	400/230-110kV SUBSTATION ANIKADAVU AND 400/110kV SUBSTATION THAPPAGUNDU
MAIN CONTRACTOR:	BHARAT HEAVY ELECTRICALS LTD.

2. & 3	Cap & Flange	MCI / SGI	Hot Dip Galvanized
1.	Insulator body	Porcelain	Brown Glazed
S. No.	DESCRIPTION	MATERIAL	REMARKS
Title		Scale	Matl .
132 kV		N.T.S.	See table
SOLIDCORE POST INSULATOR			
(C6 - 650)			
Ref.		Drawn	K. G. Sharma
		Checked	APN
		Approved	APN
All dimensions are in mm.		Date	14-07-1986
MODERN INSULATORS LIMITED ABU ROAD		Drg. No.	Rev .
		211 - C - 113	5

Rev. 5 On dated 10-08-2004

4 Holes M 16 X22 deep on
127 P.C.D.



TECHNICAL PARTICULARS

MECHANICAL VALUES

Bending strength (Upright)	kN	8
Compression strength	kN	360
Tensile strength	kN	180
Torsional strength	kNm	6

ELECTRICAL VALUES

Dry power frequency withstand voltage	kV	760
Wet power frequency withstand voltage	kV	680
Dry power frequency flashover voltage	kV	890
Wet power frequency flashover voltage	kV	820
Impulse withstand voltage(1.2/50micro sec.)	kVp	1550
Impulse flashover voltage(1.2/50micro sec.)	kVp	1850
Min. nominal creepage distance	mm	10500
Corona extinction voltage	kV	320
Max. radio interference voltage (μ v) for any frequency between 0.5 MHz to 1 MHz at voltage 305 kV (rms) between phase to ground	μ V	500
Switching surge withstand voltage	kVp	1175
Net Weight (approx.)	kgs	299

Shed profile as per IEC:60815
Assy. drg. No. :- 211-C-347/Z (Rev.:- 0)

NOTE :-

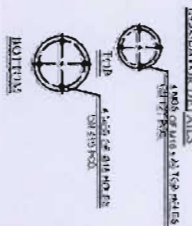
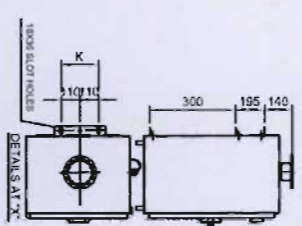
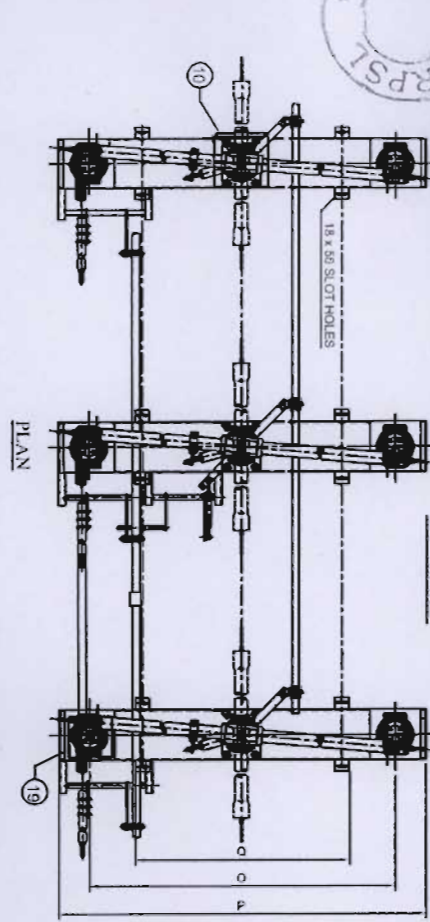
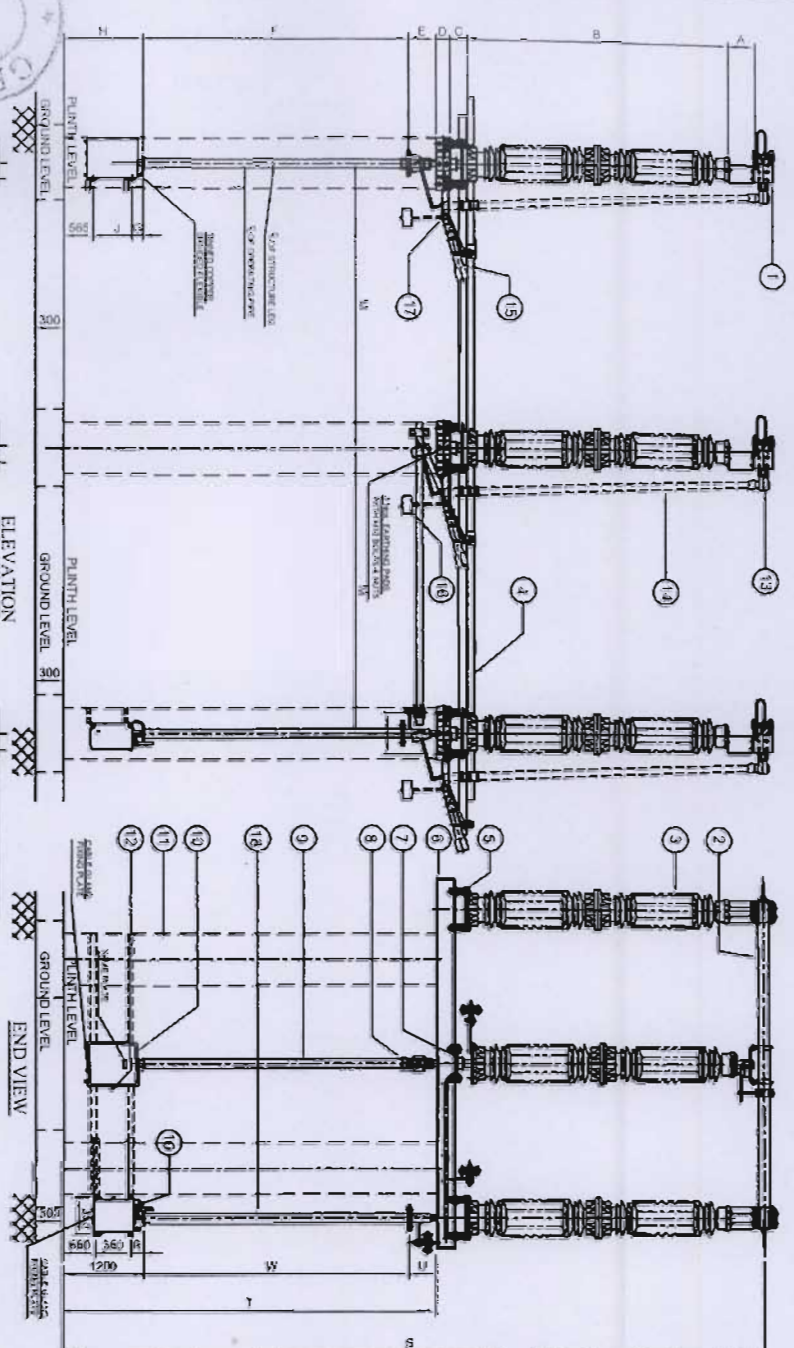
Standard applicable as per IS : 2544 ,5350 &
IEC : 60168 , 273

CUSTOMER:	TAMILNADU TRANSMISSION CORP. LTD.
PROJECT:	400/230-110kV SUBSTATION ANIKADAVU AND 400/110kV SUBSTATION THAPPAGUNDU
MAIN CONTRACTOR:	BHARAT HEAVY ELECTRICALS LTD.

4, 5, 6 & 7	Cap & flanges	MCI / SGI	Hot dip galv .
1, 2 & 3	Insulator body	Porcelain	Brown Glazed
S.No.	DESCRIPTION	MATERIAL	REMARKS

Title 400 kV Solidcore Cylindrical Post Insulator (C8 - 1550)		Scale N.T.S.	Matl. See table
		Drawn	R.K.Malonia
		Checked	K.R.J.C.
		Approved	J.B.A.
All dimension are in mm.		Date	03 - 02 - 1995
MODERN INSULATORS LIMITED ABU ROAD		Drg. No.	Rev.
		211 - C - 347	5

Rev. :-5 On dated - 29-09-2005



- PART LIST**
1. FIXED CONTACT ASSEMBLY
 2. MOVING CONTACT ASSEMBLY
 3. INSULATOR STACK (CONTRACTOR SCOPE OF SUPPLY)
 4. TANDEM PIPE (32 NB. CLASS B7, G.I. PIPE)
 5. ELEVATOR PLATE
 6. BASE CHANNEL (145 x 80 x 4 mm THICK BOX CHANNEL)
 7. ROTATING STOOL BASE WITH LEVER ARM & CLAMP (M.S. HOT DIP GALVANIZED)
 8. UNIVERSAL JOINT ARRANGEMENT
 9. DOWN OPERATING PIPE (50 NB. CLASS B7, G.I. PIPE)
 10. OPERATING MECHANISM FOR M.S. (MOTOR)
 11. SUPPORTING STRUCTURE (CONTRACTOR SCOPE OF SUPPLY)
 12. PROVISION FOR PADLOCK
 13. E.S. FIXED CONTACT ASSEMBLY
 14. E.S. MOVING CONTACT ASSEMBLY
 15. E.S. TANDEM PIPE (32 NB. CLASS B7, G.I. PIPE)
 16. COUNTER WEIGHT
 17. TOP OPERATING MECHANISM FOR E.S.
 18. E.S. DOWN OPERATING PIPE (50 NB. CLASS B7, G.I. PIPE)
 19. OPERATING MECHANISM FOR E.S. (MANUAL)
 20. MECHANICAL INTERLOCK BETWEEN M.S. & E.S.
 21. AUX. TANDEM PIPE (32 NB. CLASS B7, G.I. PIPE)

NOTES:

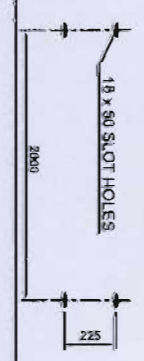
1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (10 TO 13 MICRONS)
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE MANUFACTURING TOLERANCE:
UP TO 50 mm $\pm 0.3\%$, 51 TO 100 mm $\pm 0.4\%$,
101 TO 150 mm $\pm 0.5\%$, ABOVE 150 mm $\pm 0.6\%$.
5. SHORT TIME CURRENT RATING 40 KA. MVA FOR 3 SEC.
6. MIN. CREEPAGE DISTANCE 1425 mm
7. APPROXIMATE STANDOFF (S985) PART TO V

WEIGHT

NET WEIGHT OF THE INSULATOR
ASSEMBLY INCLUDING
1400 NBS (approx.)

DIMENSIONS												
A	B	C	D	E	F	G	H	I	J	K	L	M
175	2300	75	80	250	1420	140	1100		495	220		
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
4000	225	2600	3000	2000	180	5500	2870	175				1495

BASE FIXING DETAILS



FOR TENDER PURPOSE ONLY

TITLE: 245 KV, 2000 A, TRIPLE POLE, HDB
ISOLATOR WITH ONE E.S.

SCALE

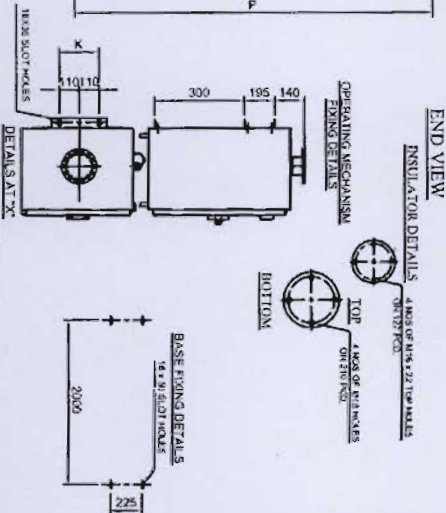
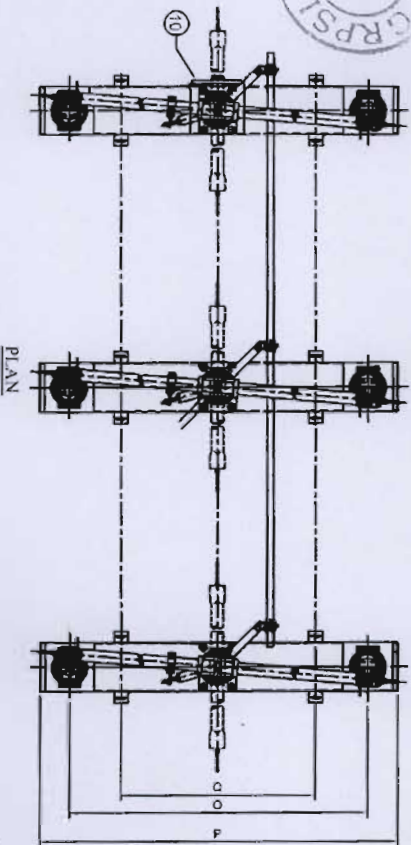
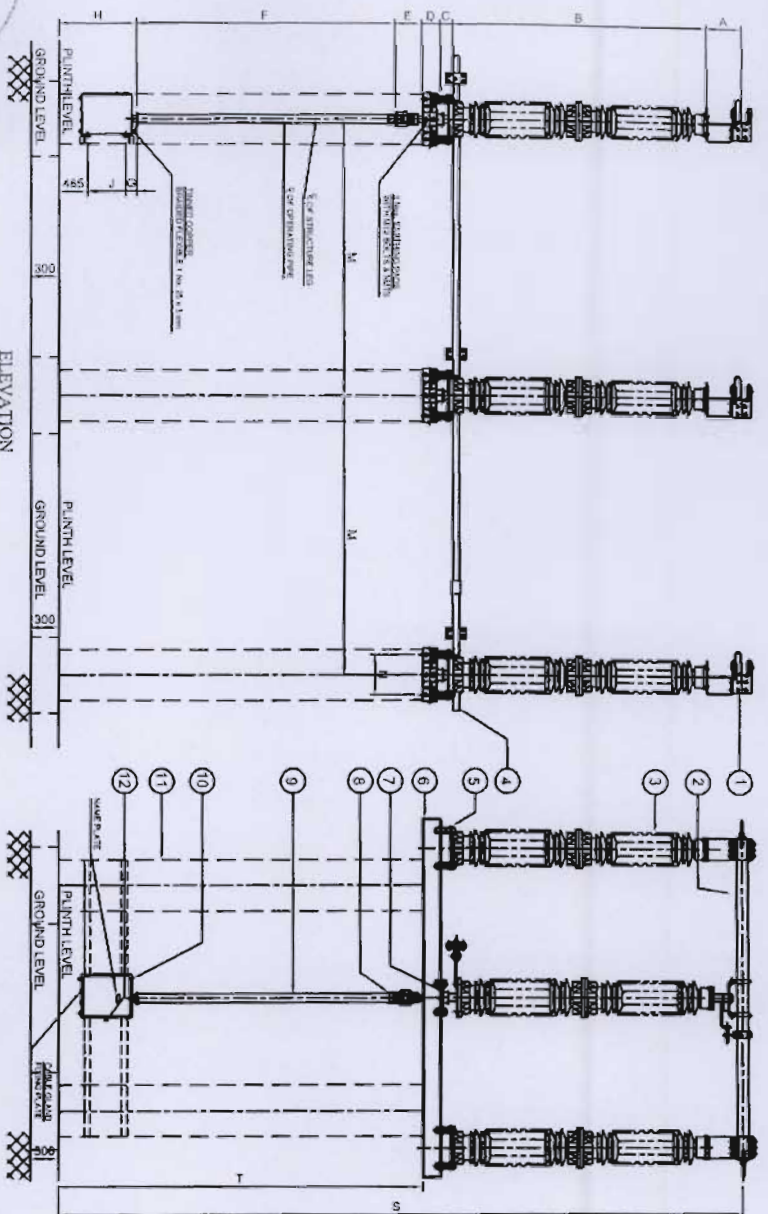
DESIGN	NAME	DATE
DRN		
CHKD		
APPD		
SHEET 1 OF 11		
PRODUCTION		

REV	DESCRIPTION	USNO	DRN	CHKD	APPD
8					
7					
6					
5					
4					
3					
2					
1					

VENDOR:

GR POWER SWITCHGEAR LTD.,
JEEDEMETTA HYDERABAD-500 055 INDIA

CLIENT:
TAMILNADU TRANSMISSION CORPORATION LTD.,
CHENNAI, TAMILNADU, INDIA.



PART LIST:

1. FIXED CONTACT ASSEMBLY
2. MOVING CONTACT ASSEMBLY
3. INSULATOR STACK (CONTRACTOR SCOPE OF SUPPLY)
4. TANDEM PIPE (32 NB, CLASS B, G.I. PIPE)
5. ELEVATOR PLATE
6. BASE CHANNEL (145 x 80 x 4 mm THICK BOX CHANNEL)
7. ROTATING STOOL BASE WITH LEVER ARM & CLAMP
8. UNIVERSAL JOINT ARRANGEMENT (M.S. HOT DIP GALVANIZED)
9. DOWN OPERATING PIPE (50 NB, CLASS B, G.I. PIPE)
10. OPERATING MECHANISM FOR M.S. (MOTOR)
11. SUPPORTING STRUCTURE (CONTRACTOR SCOPE OF SUPPLY)
12. PROVISION FOR PADLOCK

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (10 TO 15 MICRONS)
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE MANUFACTURING TOLERANCE:
UP TO 50 mm $\pm 0.5\%$, 51 TO 100 mm $\pm 0.2\%$,
101 TO 300 mm $\pm 0.1\%$, ABOVE 300 mm $\pm 0.5\%$.
5. SHORT TIME CURRENT RATING 40 KA rms FOR 3 Sec.
6. MIN. CREEPAGE DISTANCE 8125 mm
7. APPLICABLE STANDARD: IS 9921 PART I TO V

WEIGHT:

NET WEIGHT OF THE ISOLATOR EXCLUDING INSULATOR: 1250 KGS. (Approx.)

DIMENSIONS

A	B	C	D	E	F	G	H	J	K
175	2300	75	80	250	1420	140	1100	495	220
M	N	O	P	Q	R	S	T		
4000	225	2600	3000	2000	120	5500	2870		

FOR TENDER PURPOSE ONLY

TITLE:

245 KV, 2000 A, TRIPLE POLE, HDB ISOLATOR WITH OUT E/S

SCALE

DSGN	NAME	DATE
DRWN		
CHKD		
APRD		

DRAWING NO.

RELEASED FOR

☐ PRELIMINARY

☐ TENDER

☐ INFORMATION

☐ APPROVAL

☐ DECONSTRUCTION

SHEET 2 OF 11

PROJECTION

REV.

VENDOR:

GR POWER SWITCHGEAR LTD.,

JEEDEMETTA HYDERABAD-500 055 INDIA

CLIENT:

TAMILNADU TRANSMISSION CORPORATION LTD.,
CHENNAI, TAMILNADU, INDIA.

REV. 8

OSND

DRWN

CHKD

APRD

6

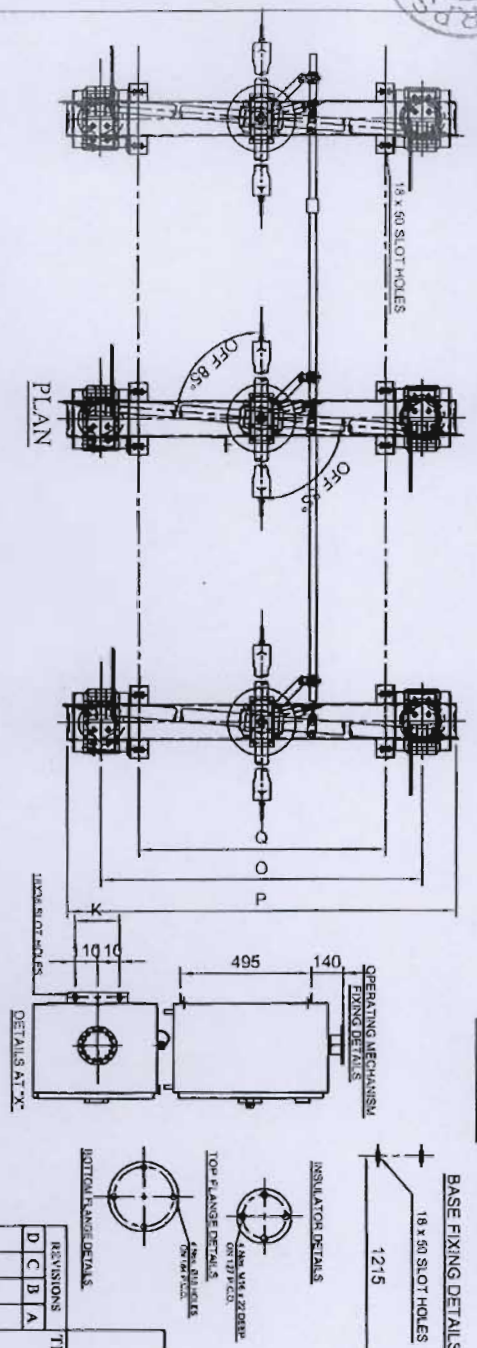
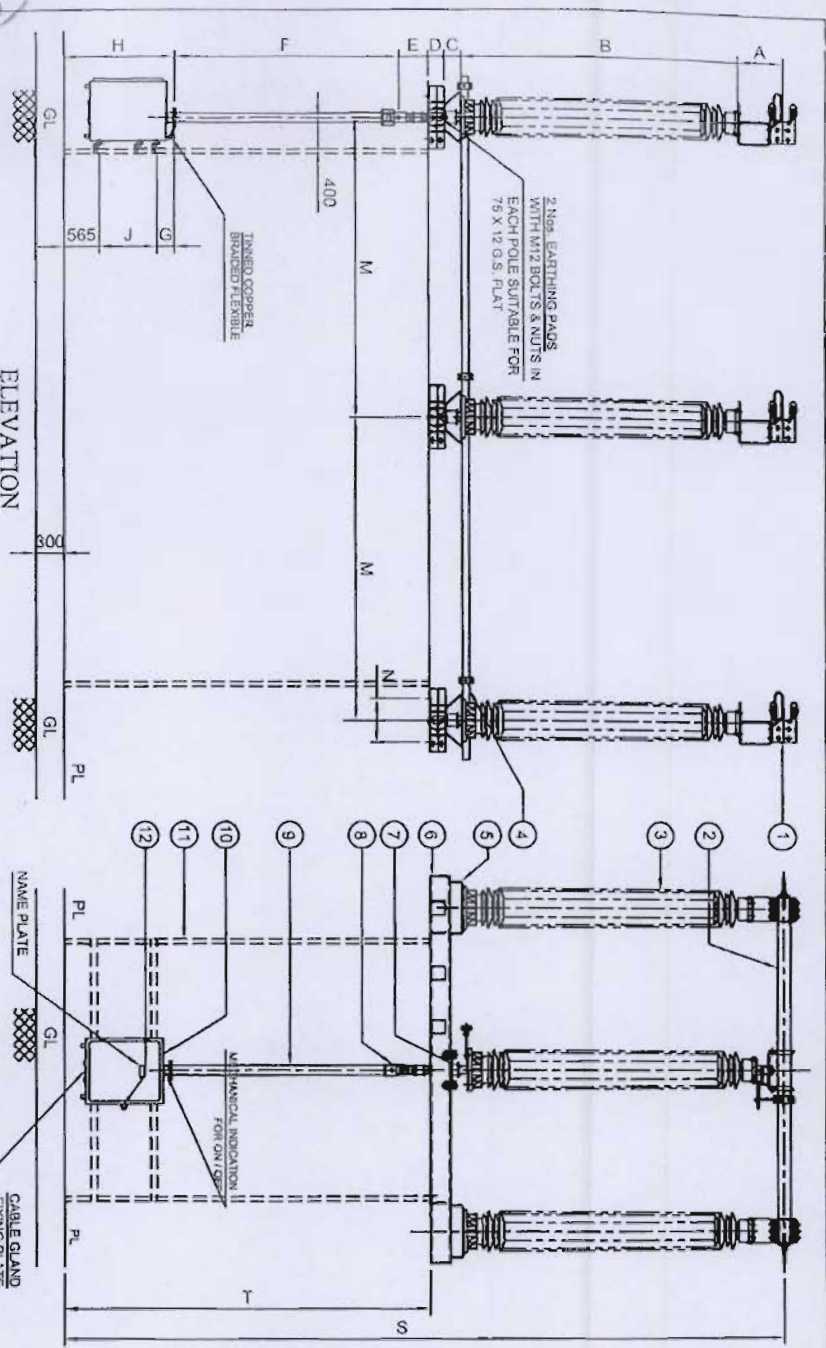
5

4

3

2

1



PART LIST:

1. FIXED CONTACT ASSEMBLY
2. MOVING CONTACT ASSEMBLY
3. INSULATOR STACK (NOT IN OUR SCOPE OF SUPPLY)
4. TANDEM PIPE (32 NB, G.I. PIPE)
5. ELEVATOR CHANNEL (250 x 75 mm FORMED CHANNEL)
6. BASE CHANNEL (145 x 80 x 4 mm THICK FORMED CHANNEL)
7. ROTATING SHAFT WITH LEVER ARM & CLAMP (M.S. HDG)
8. UNIVERSAL JOINT ARRANGEMENT
9. DOWN OPERATING PIPE (50 NB, G.I. PIPE)
10. OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)
11. SUPPORTING STRUCTURE (NOT IN OUR SCOPE OF SUPPLY)
12. PROVISION FOR PADLOCK

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (10 TO 15 MICRONS)
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE MANUFACTURING TOLERANCE.
5. UP TO 50 mm - ±2%; 51 TO 100 mm - ±3%; 101 TO 200 mm - ±1%; ABOVE 200 mm - ±0.5%.
6. MIN. CREEPAGE DISTANCE: 3025 mm
7. APPLICABLE STANDARD: IS 9521 PART 1 TO V
8. MAIN ROTATING POST HAVING 2 Nos. BALL BEARINGS OF ADEQUATE SIZE

WEIGHT:

NET WEIGHT OF THE ISOLATOR
EXCLUDING INSULATOR: 550 kg (Approx.)

FOR TENDER PURPOSE ONLY

G.A. OF 145 kV, 2000 AMPS,
TP, HDB, RT, ISOLATOR WITH OUT E.S.

GR POWER SWITCHGEAR LTD.,
JEEDINETLA HYDERABAD-500 055 INDIA

A	B	C	D	E	F	G	H	J	K	M	N	O	P	Q	S	T
175	1500	75	80	180	1690	140	1200	495	220	3000	190	1525	1800	1215	4900	3070

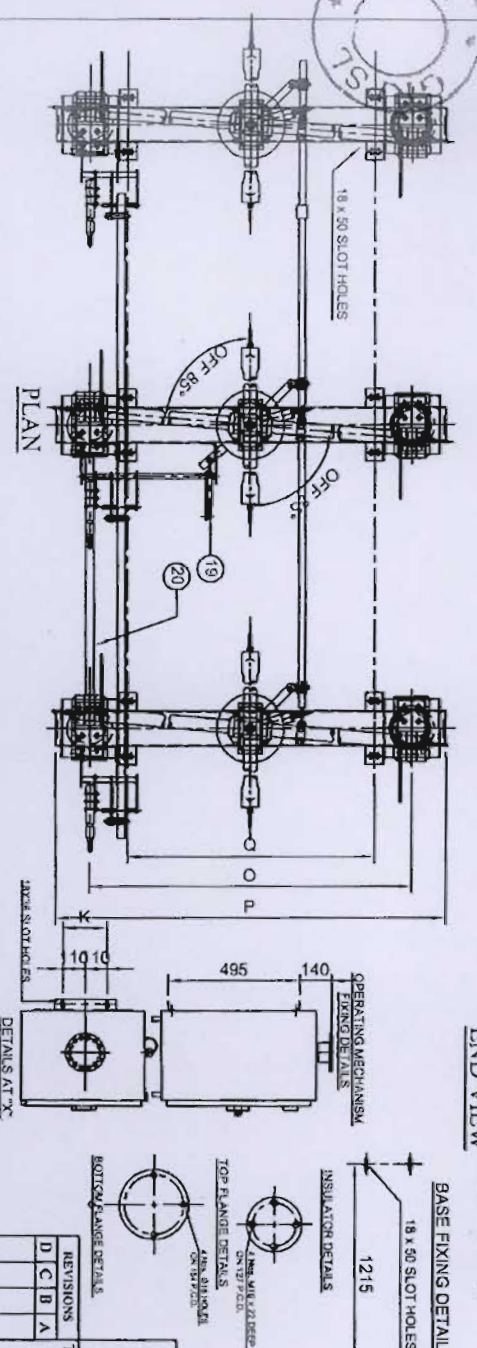
DIMENSIONS

REVISIONS	D	C	B	A

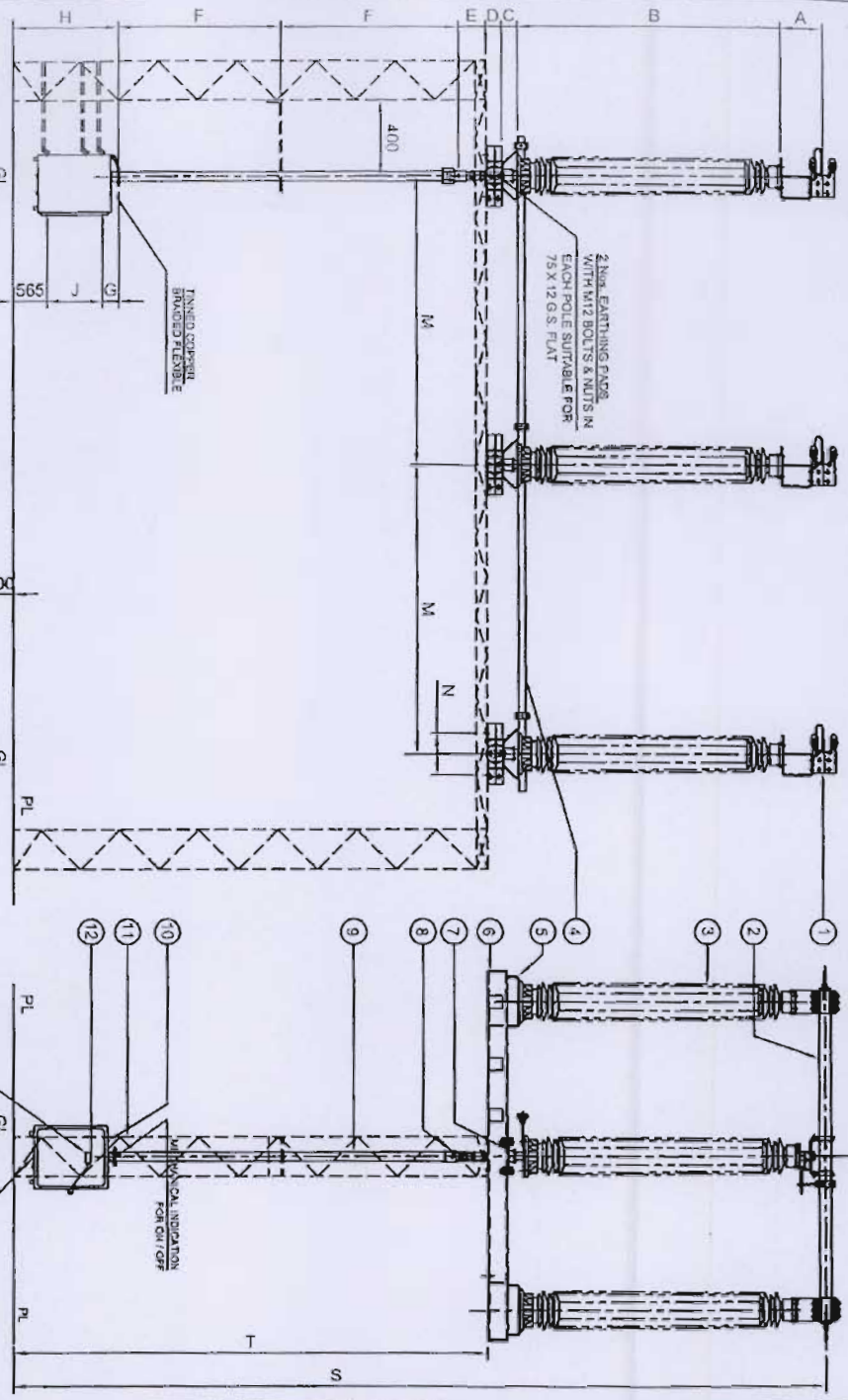
TITLE:

SCALE: 1:5	DATE
	01-08-2013
DRAWN	CHECKED
APPROVED	DRG. NO.

REV	3. PR 2013 01



- PART LAST.
1. FIXED CONTACT ASSEMBLY
2. MOVING CONTACT ASSEMBLY
3. INSULATOR STACK (NOT IN OUR SCOPE OF SUPPLY)
4. TANDEM PIPE (32 NB, G.I. PIPE)
5. ELEVATOR CHANNEL (250 x 75 mm FORMED CHANNEL)
6. BASE CHANNEL (145 x 80 x 4 mm THICK FORMED CHANNEL)
7. ROTATING SHAFT WITH LEVER ARM & CLAMP (M.S. HDG)
8. UNIVERSAL JOINT ARRANGEMENT
9. DOWN OPERATING PIPE (6C NB, G.I. PIPE)
10. OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)
11. SUPPORTING STRUCTURE (NOT IN OUR SCOPE OF SUPPLY)
12. PROVISION FOR PADLOCK
13. E.S., FIXED CONTACT ASSEMBLY
14. E.S., MOVING CONTACT ASSEMBLY
15. E.S., TANDEM PIPE (32 NB, G.I. PIPE)
16. TOP OPERATING MECHANISM FOR E.S.
17. E.S. DOWN OPERATING PIPE (50 NB, G.I. PIPE)
18. OPERATING MECHANISM FOR E.S. (MANUAL)
19. MECHANICAL INTERLOCK BETWEEN V.S. & E.S.
20. AUX. TANDEM PIPE (32 NB, G.I. PIPE)
21. COUNTER WEIGHT



PART LIST:

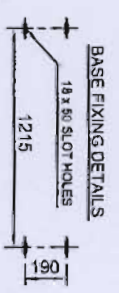
1. FIXED CONTACT ASSEMBLY
2. MOVING CONTACT ASSEMBLY
3. INSULATOR STACK (NOT IN OUR SCOPE OF SUPPLY)
4. TANDEN PIPE (32 NB, G.I. PIPE)
5. ELEVATOR CHANNEL (250 x 75 mm FORMED CHANNEL)
6. BASE CHANNEL (145 x 80 x 4 mm THICK FORMED CHANNEL)
7. ROTATING SHAFT WITH LEVER ARM & CLAMP (M.S. HDG)
8. UNIVERSAL JOINT ARRANGEMENT
9. DOWN OPERATING PIPE (50 NB, G.I. PIPE)
10. OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)
11. SUPPORTING STRUCTURE (NOT IN OUR SCOPE OF SUPPLY)
12. PROVISION FOR PADLOCK

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FABRICIOUS PARTS ARE HOT DIP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (10 TO 15 MICRONS)
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE MANUFACTURING TOLERANCE:
UP TO 50 mm $\pm 0.5\%$, 51 TO 100 mm $\pm 0.75\%$,
101 TO 200 mm $\pm 1.1\%$, ABOVE 200 mm $\pm 2.0\%$
5. SHORT TIME CURRENT RATING 40 KA FOR 3 SEC.
6. AIR CREEPAGE DISTANCE : 3025 mm
7. APPLICABLE STANDARD : IS 9211 PART 1 TO V
8. MAIN ROTATING POST HAVING 2 NO. BALL BEARINGS OF ADEQUATE SIZE

WEIGHT:

NET WEIGHT OF THE ISOLATOR
EXCLUDING INSULATOR : 550 Kg (Approx.)



FOR TENDER PURPOSE ONLY

REVISIONS

REV	DESCRIPTION
A	INITIAL DESIGN
B	REVISED DESIGN
C	REVISED DESIGN
D	REVISED DESIGN

TITLE:

G.A. OF 145 kV, 2000 AMPS,
TP, HDB, RT, ISOLATOR WITH OUT E.S.
(GANTRY MOUNTED : 8 Mtrs)

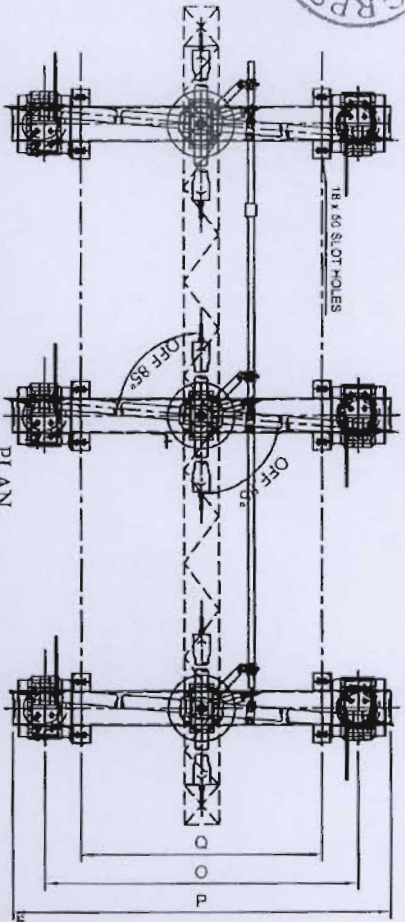
GR POWER SWITCHGEAR LTD.,
JEEDEMETLA HYDERABAD-500 055 INDIA

3. FR 2013 03

A	B	C	D	E	F	G	H	J	K	M	N	O	P	Q	S	T
175	1500	75	80	180	3310	140	1200	495	220	3000	190	1525	1800	1215	9630	8000

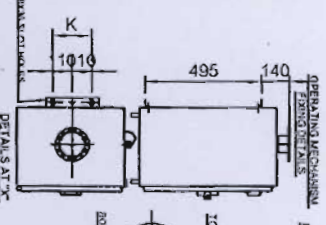
DIMENSIONS

PLAN



ELEVATION

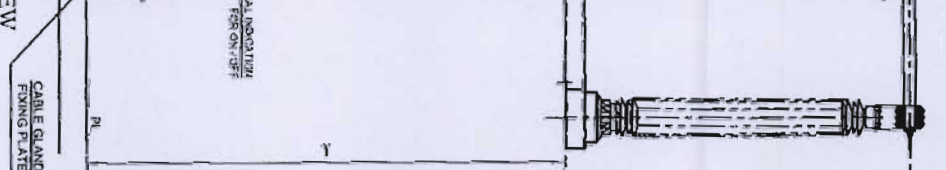
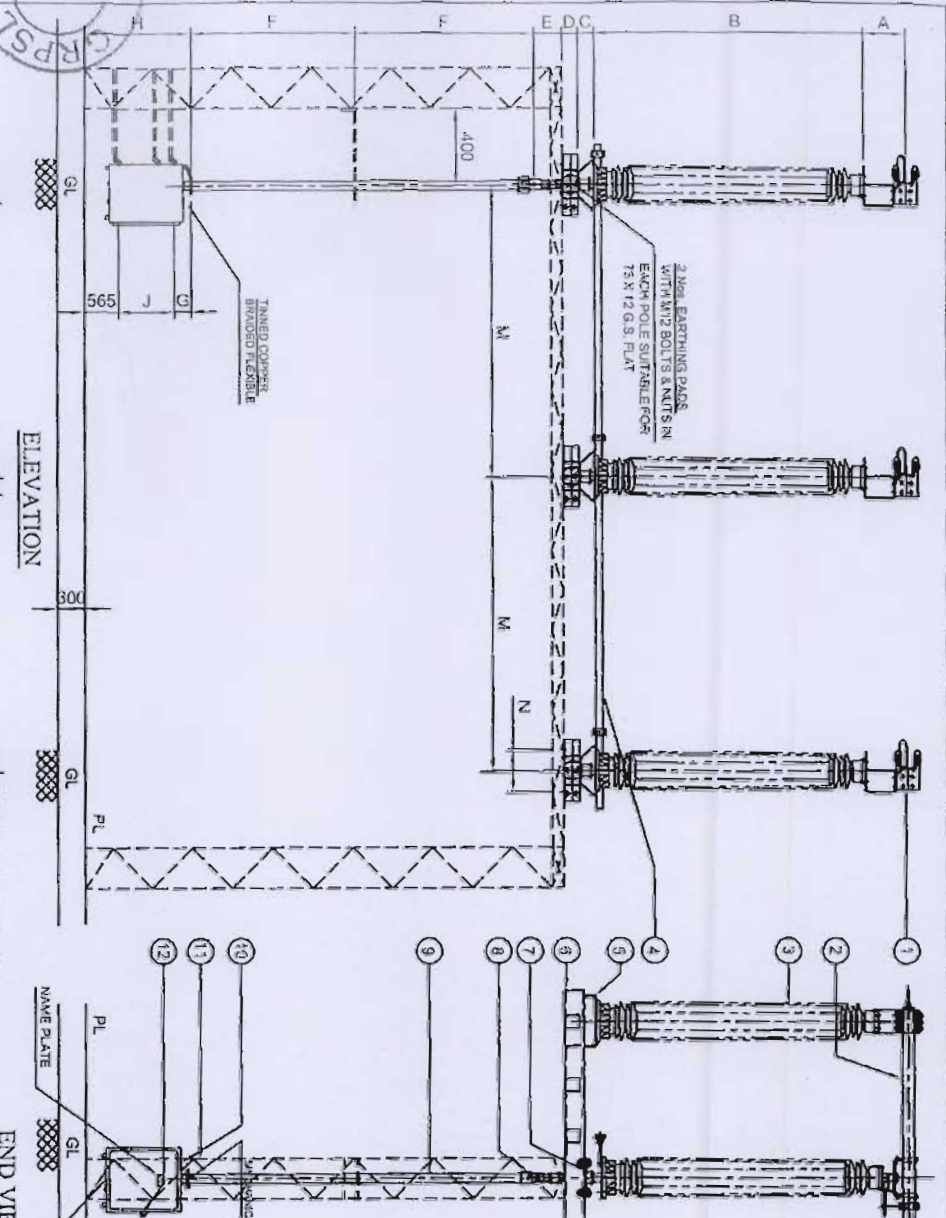
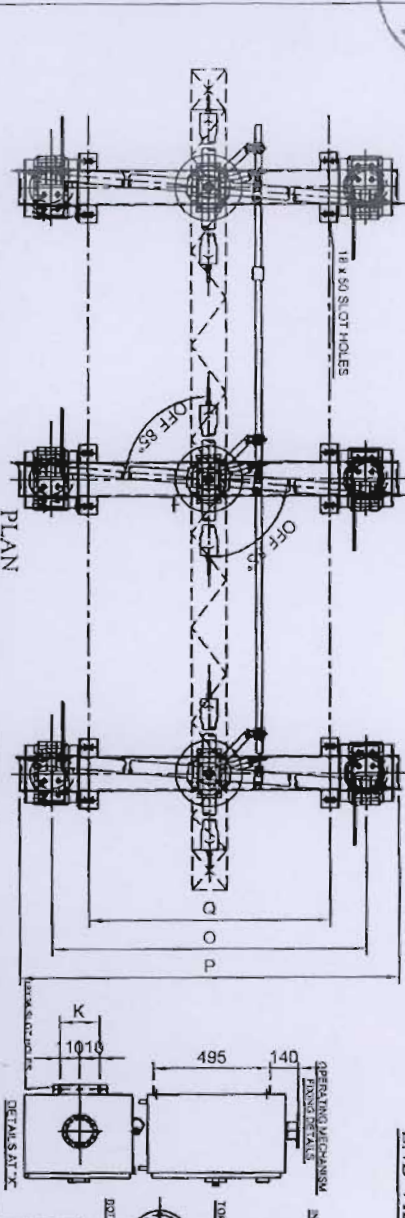
END VIEW





A	B	C	D	E	F	G	H	J	K	M	N	O	P	Q	S	T
175	1500	75	80	180	4310	140	1200	495	220	3000	190	1525	1800	1215	11830	10000

DIMENSIONS



REVISIONS	D	C	B	A
TITLE	G.A. OF 145 KV, 2000 AMPS. TP, HDB, RT, ISOLATOR WITH OUT E.S. (CANTY MOUNTED : 10 Mtrs)			
DATE	01.08.2013			
DRAWN	JEDINMETLA HYDERABAD-500 055 INDIA			
CHECKED	3. FR 2013 04			
APPROVED	KEY			

FOR TENDER PURPOSE ONLY

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FERROUS PARTS ARE NOT OUP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (10 TO 15 MICRONS)
4. THE INDICATED DIMENSIONS ARE SUBJECTED TO THE MANUFACTURING TOLERANCE:
UP TO 50 mm - ±0.5%
51 TO 100 mm - ±0.5%
101 TO 300 mm - ±1%
301 TO 500 mm - ±1.5%
501 TO 1000 mm - ±2%
1001 TO 3000 mm - ±3%
3001 TO 5000 mm - ±4%
5001 TO 10000 mm - ±5%
5. SIGHT TIE CURRENT RATING 40 kVA mm FOR 3 SW.
6. MIN. OPERATING DISTANCE : 3025 mm
7. APPLICABLE STANDARD : IS 9921 PART 1 TO V
8. MAIN ROTATING POST HAVING 2 mm BALL BEARINGS OF ADEQUATE SIZE

WEIGHT:

NET WEIGHT OF THE ISOLATOR
EXCLUDING INSULATOR : 550 Kg (Approx.)

BASE FIXING DETAILS

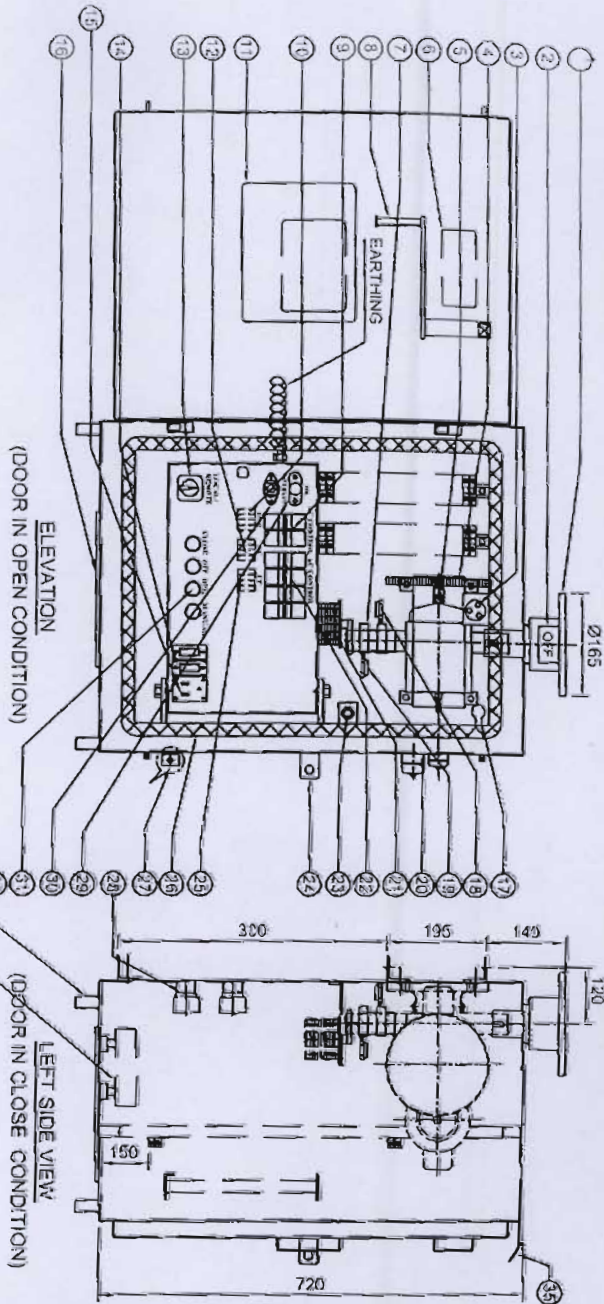
18 x 50 SLOTH HOLES

1215

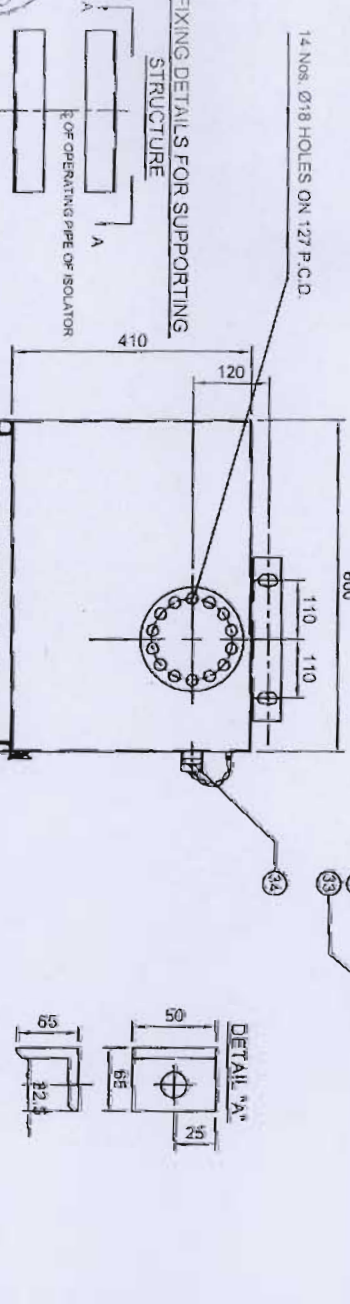
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PART LIST

1. FIXED CONTACT ASSEMBLY
2. MOVING CONTACT ASSEMBLY
3. INSULATOR STACK (NOT IN OUR SCOPE OF SUPPLY)
4. TANDEN PIPE (32 NB, G.I. PIPE)
5. ELEVATOR CHANNEL (250 x 75 mm FORMED CHANNEL)
6. BASE CHANNEL (145 x 80 x 4 mm THICK FORMED CHANNEL)
7. ROTATING SHAFT WITH LEVER ARM & CLAMP (M.S. HDG)
8. UNIVERSAL JOINT ARRANGEMENT
9. DOWN OPERATING PIPE (50 NB, G.I. PIPE)
10. OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)
11. SUPPORTING STRUCTURE (NOT IN OUR SCOPE OF SUPPLY)
12. PROVISION FOR PADLOCK



- PART LIST**
- | QTY | DESCRIPTION |
|-------|---|
| 01 No | 1. OUTPUT FLANGE (12 mm THICK 14 HOLES) |
| 01 No | 2. ON/OFF INDICATOR |
| 01 No | 3. THERMOSTAT (80 TO 85°C RECOMMENDED SETTING 40°) |
| 01 No | 4. GEAR BOX (SPUR / WORM & WORM SHAFT, RATIO 1:1.650) |
| 01 No | 5. MOTOR (23, 415 WATT, 1.5 HP MOTOR) |
| 01 No | 6. CAUTION NAME PLATE |
| 01 No | 7. LIMIT SWITCH OPERATING CAM |
| 01 No | 8. OPERATING HANDLE FIXED TO DOOR |
| 01 No | 9. DC CONTROL SWITCH (2 POLE ACSR) |
| 01 No | 10. OVER LOAD RELAY (LIM SINGLE PHASE PREVENTOR (OLR)) |
| 01 No | 11. SCHEMATIC DIAGRAM PLATE |
| 01 No | 12. OPENING CONTACTOR (OC) |
| 01 No | 13. LOCAL REMOTE SELECTOR SWITCH (LS) |
| 01 No | 14. HEATER / POWER SOCKET SWITCHES (HS, PSS) |
| 01 No | 15. POWER SOCKET (PS) |
| 01 No | 16. DETACHABLE CABLE GLANDS FIXING PLATE (WITH GUT GLANDS) |
| 01 No | 17. CUSCILE LAMP HOLDER |
| 01 No | 18. LIMIT SWITCH (LSO) |
| 01 No | 19. LIMIT SWITCH (LSC) |
| 01 No | 20. CUSCILE WITH DOOR (2 mm THICK MS. SHEET) |
| 01 No | 21. ALX SWITCH (23 NC + 23 NC + 2 MBB) |
| 01 No | 22. AC CONTROL SWITCH (4 POLE MCB) |
| 01 No | 23. DOOR OPERATED LIGHT SWITCH (LS) |
| 01 No | 24. PROVISION FOR PAD LOCK |
| 01 No | 25. CLOSING CONTACTOR (CC) |
| 01 No | 26. RUBBER GASKET (EPDM) |
| 01 No | 27. EARTHING TERMINAL (2 NOS. 75 x 12 GS PLAT (WELDING TO BOX) WITH M12 x 50 BOLT WITH CHECK NOT AND WASHERS) |
| 01 No | 28. TERMINAL BLOCK (STD TYPE OF ELMECH OR ITS EQUIVALENT) |
| 01 No | 29. PUSH CAP (FOR HIL) |
| 01 No | 30. HANDLE INTERLOCK (HIL) |
| 01 No | 31. OPEN / CLOSE / MANUAL / OFF PUSH BUTTON (PBO / PBC / PBM / EPR) |
| 01 No | 32. SUPPORTING CLEAT |
| 01 No | 33. HEATER, 80 WATTS, 240 V |
| 01 No | 34. MANUAL OPERATING CAP / COVER (NYLON) |
| 01 No | 35. RAIN SHADE |



- DETAIL "A"**
-



- NOTE:**
1. ALL DIMENSIONS ARE IN MILLIMETERS
 2. GASKET WILL BE POWDER COATED WITH LIGHT GRAY SHADE NO. 1897 OF IS: 5
 3. DEGREE OF PROTECTION IP: 55 AS PER IS: 13847 FOR INSIDE AND OUTSIDE
 4. 20% SPARE TERMINALS WILL BE PROVIDED
 5. WIRING WILL BE DONE WITH 1100 V GRADE
 6. FOR POWER CIRCUIT (AC SUPPLY): 2.5 Sqmm Cu. STRANDED
 7. FOR AUXILIARY CIRCUIT (DC SUPPLY): 1.5 Sqmm Cu. STRANDED
 8. WEIGHT OF THE BOX: 100 Kg (Approx.)

VIEW AT 'A-A'

4 Nos. 18x26 SLOT HOLES

FIXING DETAILS FOR SUPPORTING STRUCTURE

14 Nos. Ø18 HOLES ON 127 P.C.D.

1/2 OF OPERATING PIPE OF ISOLATOR

PLAN

GASKET DETAILS

DETAIL "A"

LEFT SIDE VIEW

(DOOR IN OPEN CONDITION)

(DOOR IN CLOSE CONDITION)

FIXING DETAILS FOR SUPPORTING STRUCTURE

14 Nos. Ø18 HOLES ON 127 P.C.D.

1/2 OF OPERATING PIPE OF ISOLATOR

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14 Nos. Ø18 HOLES ON 127 P.C.D.

1/2 OF OPERATING PIPE OF ISOLATOR

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GASKET DETAILS

DETAIL "A"

LEFT SIDE VIEW

(DOOR IN OPEN CONDITION)

(DOOR IN CLOSE CONDITION)

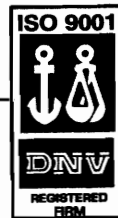
FIXING DETAILS FOR SUPPORTING STRUCTURE

GRID | **ALSTOM**



OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED

A-16 & 17, Assisted Private Industrial Estate, Balanagar, Hyderabad - 500 037. A.P. (INDIA)
 Grams : OBLUM, Phone : 23771880, 23774184, 23772708, Fax : 0091 (040) 23771106
 E-MAIL : oblumelectricals@gmail.com, oblumelectricals@yahoo.co.in, oblumexports@gmail.com
 oblumelectricals@hotmail.com



Surge Arresters

Ref. No.

Date :

GUARANTEED TECHNICAL PARTICULARS OF 96kV 10kA CLASS-III METAL OXIDE GAPLESS SURGE ARRESTER

SL. No.	DESCRIPTION	96 kV 10kA Class-III
01.	Maker's Name and place of manufacturer	M/s. Oblum Electrical industries pvt.Ltd. A-16&17, A.P.I.E, Balanagar, Hyd-37.
02.	a) Type of construction	Gapless construction.
	b) Type of Mounting	Pedestal mounting.
	c) Model	ZAQ
03.	a) Rated Voltage kV(RMS)	96 kV.
	b) Reference Voltage kV(RMS)	Greater than rated voltage of the arrester at 3mA reference current
04.	Maximum continuous operating voltage (kV)	81 kVrms
05.	Nominal Discharge Current (8/20 μ sec.wave)	10 kA.
06.	Min. Discharge Capability	8kJ/kV (OD TEST).
07.	Rated Frequency	50 Hz.
08.	a) Ir at MCOV	Less than 400 μ Amps.
	b) Ic at MCOV	About 1400 μ Amps.
09.	a)Reference current (mA)	3 mA.
	b)Reference Voltage at reference Current	Greater than rated voltage of the arrester.
10.	Max. residual voltage in kVp 8/20 μ sec. wave	
	a) at 5000 Amps	256 kVp.
	b) at 10000 Amps	272 kVp.
	c) at 20000 Amps	304 kVp.
	d) Max. partial discharge (pC)	Less than 10 pC.
11.	Max. Switching Impulse Residual Voltage at 1kA	217 kVp
12.	Max. Steep Current Impulse RDV (kVp)	304 kVp.
13.	Impulse High Current Short duration discharge Amps. (4/10 μ sec. wave)kA	100 kAp.
14.	Temporary Over Voltage (kVp)	
	a) 0.1 sec.	169kVp.
	b) 1.0 sec.	162kVp.
	c) 10.0 secs.	156 kVp.
	d) 100.0 secs.	149 kVp.
15.	Insulation withstand	
	a) Lightning Impulse (Dry) (kVp)	550 kVp.
	b) Power frequency with voltage kV (rms) Dry/Wet	230 kVrms.
	c) Switching Impulse Wet (kVp)	As per IEC Applicable for rated voltages of 200 kV & above only.
16.	Pressure Relief Class	Class-'A'
17.	PR Relief Class (kArms)	40 kA.
18.	Long Duration Current Impulse Test	
	a) Current Peak Amps.	600 Amps.
	b) Virtual Duration μ Sec.	2400 μ sec.
19	a) Leakage Current at normal voltage	Less than 3mA
	b) Leakage Current at max. Operating voltage	Ir: Less than 400 μ Amps. Ic: About 1400 μ Amps



OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED

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oblumelectricals@hotmail.com



Surge Arresters

Ref. No.

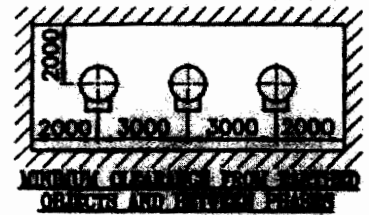
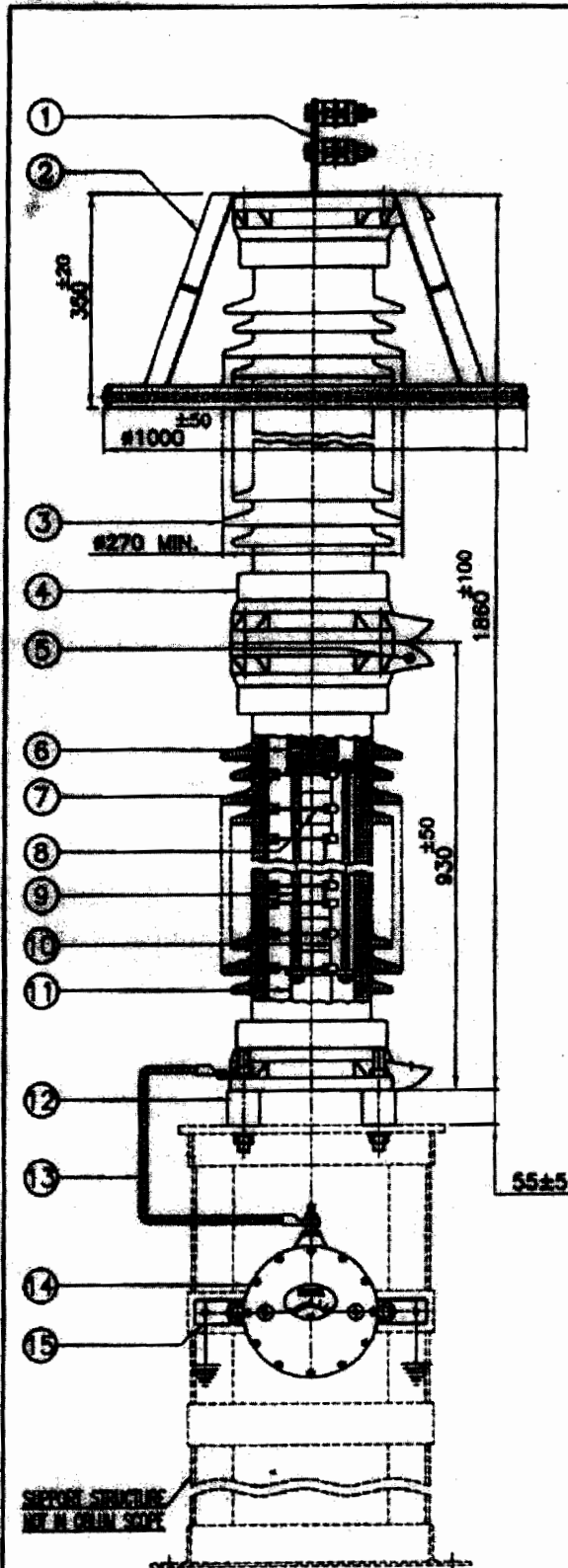
Date :

20.	Arrester percentage rating	80%
21.	Dimensions of the arrester	
	a) Max. dia of porcelain	Bigger: 270 mm(min) , Smaller: 240 mm.(min)
	b) Max. Height of porcelain	1860mm±100
22.	a) Material of Valve	Metal Oxide.
	b) Details of sealing	Dumbbell ring placed against ground porcelain surface and seated against hot tinned copper diaphragm which is placed in a pressure release plate. The pressure release plate is screwed on Arrester end flanges such that the dumbbell ring is compressed to 70% of the initial height.
	c) Description of pressure Relief Systems	
	d) No. of units per arrester	Two units of 48kV.
23.	Creepage Distance (mm)	25mm/kV
24.	Minimum Clearance	
	a) Between phases (mm)	3000mm.
	b) Between phase to earth (mm)	2000 mm.
25.	Size of grounding terminal	As per Drawing Enclosed
26.	Size of the line terminal	As per drawing enclosed
27.	Diameter of the grading ring	Ø1000±50
28.	Min.Space required for 3-phase installation	3000mm
29.	Max. Cantilever strength of the arrester kGM.	500 kGM.
30.	Overall weight of one single-phase stack (Approx.) kGS.	130kGS±10%.
31.	Weight of complete arrester (Approx.) kGS. (With Accessories)	140 kGS±10%
32.	Net Weight of each arrester (Approx.) (kGS.)	140 kGS±10%

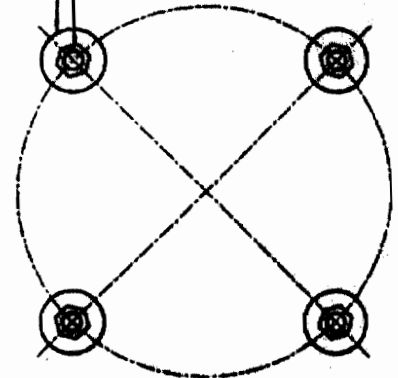
For OBLUM ELECTRICAL INDUSTRIES PVT. LTD.

AKELLA S.S SARMA
VICE PRESIDENT(Operations)

STANDARD DRAWINGS



4-INSULATORS ON PCD 295 ± 6
4-HOLES $\phi 17$ ON PCD 295 ± 6
FOR STRUCTURE BASE PLATE



ARRESTER BASE MOUNTING DETAILS

ARRESTER MODEL	ARRESTER RATING KV	DISCHARGE CURRENT kA
ZAQ	96	10

15. EARTH & FIXING TERMINAL
 14. SURGE MONITOR
 13. CONNECTING LEAD (35 Sq mm INSULATED AL CABLE 1.5M LENGTH)
 12. INSULATING BASE
 11. SPACER
 10. ZnO. ELEMENT
 9. INSULATING TIE ROD
 8. CONTACT ELECTRODE
 7. BUMPER
 6. COMPRESSION SPRING
 5. PRESSURE RELEASE PORT
 4. END CASTING
 3. ARRESTER HOUSING
 2. GRADING RING
 1. TERMINAL CLAMP

TITLE:

96kV-10kA METAL OXIDE SURGE ARRESTER

MAT: ALL M.S. PARTS ARE HOT DIP GALVANISED

REV. No.: 0

DATE: 03/04/2012

DRG. No.: ZAQ-06136HC-SM

DRN. BY: *[Signature]*

OBUM ELECTRICAL INDUSTRIES PRIVATE LIMITED

A-16&17 ASSISTED PRIVATE INDUSTRIAL ESTATE

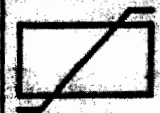
BALANAGAR

HYDERABAD - 37 A.P. (INDIA)

SCALE: N.T.S.

APPRD. BY: *[Signature]*

ALL DIMENSIONS ARE IN m.m.

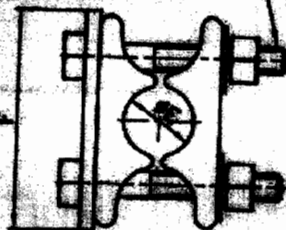


STANDARD DRAWING

SELECTION TABLE

NAME	CLAMP DIMENSIONS					
	A	B	C	D	E	F
WOLF	58	96	35	45	20.80	100
LYNX	58	96	35	45	19.50	100
SPIDER	58	96	35	45	20.80	100
PANTHER	58	96	35	45	21.20	100
HAWK	58	96	35	45	21.80	100
KUNDAH	58	96	35	53	26.80	100
DRAKE	58	96	35	53	28.50	100
ZEBRA	58	96	35	55	29.50	100
MOOSE	58	96	35	55	31.50	100

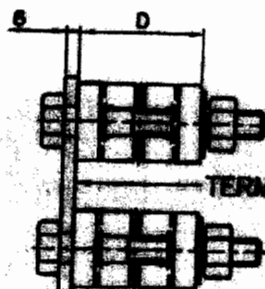
M12-G.I. BOLTS



PLAN

NOTE:

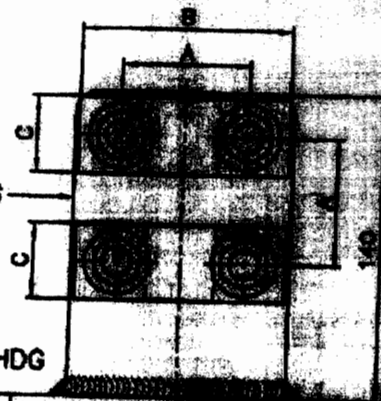
1. SELECT THE TERMINAL CLAMP REQUIRED BY AREA ENGINEER AND APPROVE THE Dwg.
2. APPLICABLE STANDARDS FOR CLAMP DIMENSIONS AND (RATED CURRENT) ARE NOT APPLICABLE ARE NOT APPLICABLE OF A.C.S.R. CABLES.
3. TERMINAL CLAMP IS TO BE HORIZONTAL.



TERMINAL PAD MS HDG

GRADING RING BRACKET MS HDG

ELEVATION



SIDE VIEW

TITLE: **TERMINAL CLAMPS**
(ROUTED TYPE)

MATL: ALUMINIUM ALLOY GRADE 6350 OF IS-733-80

REV. No.: 0

DATE: 05/04/20

DRG. No.: TD-1000

DRN. BY: *20/04/20*

SCALE: N.T.S.

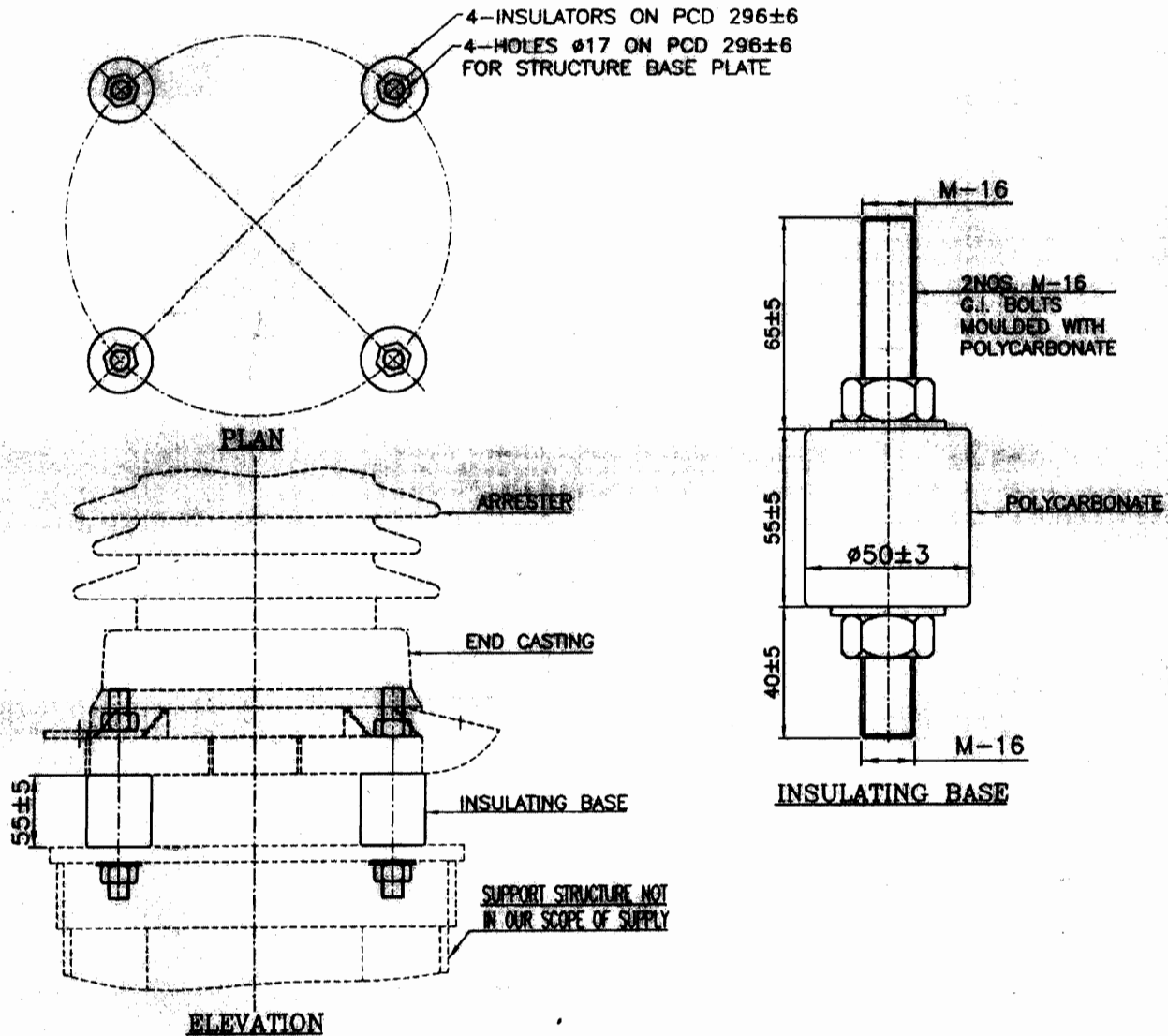
APPRD. BY: *OM*


ALL DIMENSIONS ARE IN MM. WITH A TOLERANCE OF $\pm 5\%$

OBUM ELECTRICAL INDUSTRIES PVT. LTD.
A-16217 ASSIED PRATE INDUSTRIAL ESTATE
BALANAGAR
HYDERABAD - 57 A.P. (INDIA)



STANDARD DRAWINGS



TITLE: INSULATING BASE FIXING DETAILS		MATL.: POLYCARBONATE	
DRG. NO.: ZAQ-IB-60135		REV. No.: 0	DATE: 31/12/2012
DRN. BY: <i>Dr. Kumar</i>		OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED, A-16 & 17 ASSISTED PRIVATE INDUSTRIAL ESTATE, BALANAGAR	
SCALE: N.T.S.		APPRD. BY: <i>JS</i>	
ALL DIMENSIONS ARE IN m.m.		HYDERABAD - 37. A.P. (INDIA)	

STANDARD DRAWINGS

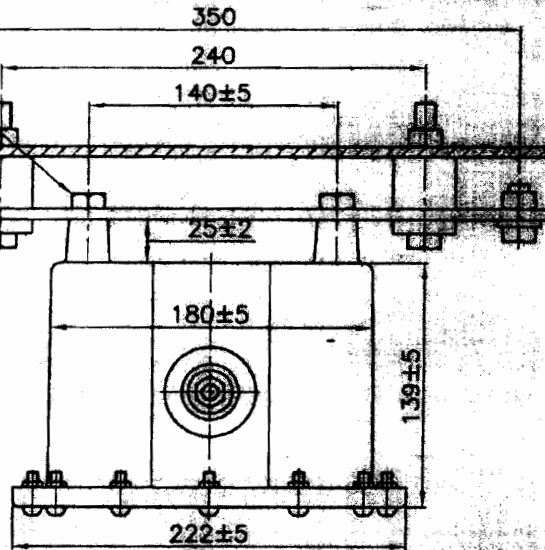
2-NOs. M-10 BOLTS FOR SURGE MONITOR TO EARTH TERMINAL

INSULATION FOR SURGE MONITOR AND ALSO FIXING TO SUPPORT STRUCTURE WITH M-12 BOLTS

SUPPORT STRUCTURE ANGLE OR FLAT

TWO EARTHING CONNECTIONS

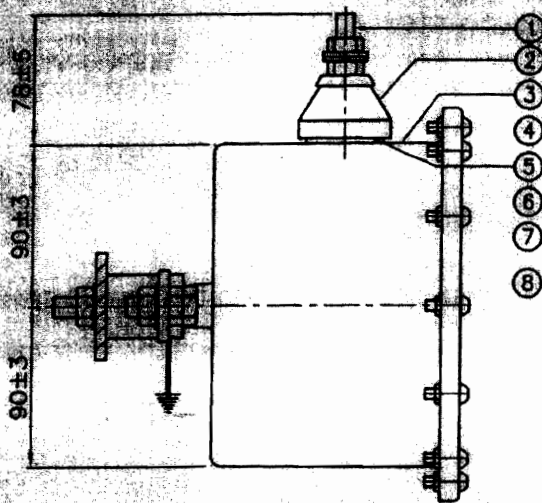
EARTHING & FIXING TERMINAL



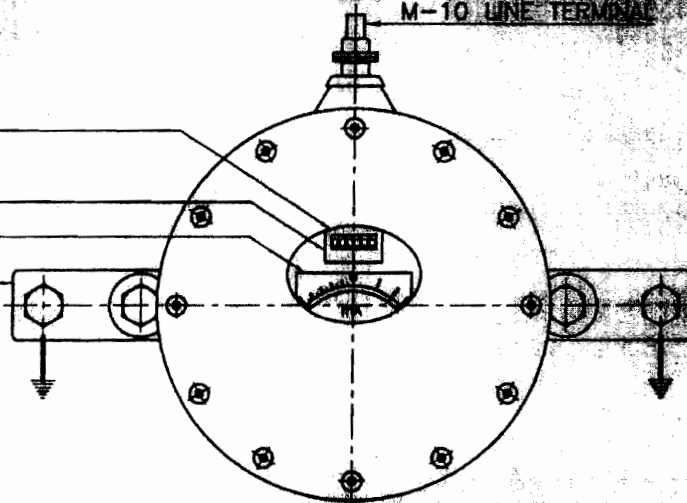
PLAN

M-10 LINE TERMINAL

- NOTE : 1. DO NOT OPEN THE SEALED UNIT
2. GREEN BAND : 0 TO 2mA - RED BAND : 2 TO 5mA
3. DEGREE OF PROTECTION : IP-67



SIDE VIEW



ELEVATION

- 8. FIXING & EARTHING TERMINAL
- 7. MILLI AMMETER 0 - 5mA
- 6. ELECTROMAGNETIC COUNTER
- 5. SEALING GASKET
- 4. VIEWING WINDOW
- 3. AL. SHELL
- 2. INSULATOR
- 1. LINE TERMINAL

TITLE:

SURGE MONITOR

MATL: -----

REV. No.: 0

DATE: 29/12/2012

DRG. No.: **SM-TZB-3R**

DRN. BY: *DVhuman*

SCALE: N.T.S.

APPRD. BY: *38*

ALL DIMENSIONS ARE IN m.m. WITH A TOLERANCE OF ±5%

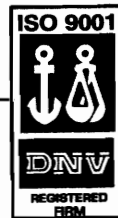
OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED
A-16&17 ASSISTED PRIVATE INDUSTRIAL ESTATE
BALANAGAR
HYDERABAD - 37 A.P. (INDIA)





OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED

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 oblumelectricals@hotmail.com



Surge Arresters

Ref. No.

Date :

GUARANTEED TECHNICAL PARTICULARS OF 96kV 10kA CLASS-III METAL OXIDE GAPLESS SURGE ARRESTER

SL. No.	DESCRIPTION	96 kV 10kA Class-III
01.	Maker's Name and place of manufacturer	M/s. Oblum Electrical industries pvt.Ltd. A-16&17, A.P.I.E, Balanagar, Hyd-37.
02.	a) Type of construction	Gapless construction.
	b) Type of Mounting	Pedestal mounting.
	c) Model	ZAQ
03.	a) Rated Voltage kV(RMS)	96 kV.
	b) Reference Voltage kV(RMS)	Greater than rated voltage of the arrester at 3mA reference current
04.	Maximum continuous operating voltage (kV)	81 kVrms
05.	Nominal Discharge Current (8/20 μ sec.wave)	10 kA.
06.	Min. Discharge Capability	8kJ/kV (OD TEST).
07.	Rated Frequency	50 Hz.
08.	a) Ir at MCOV	Less than 400 μ Amps.
	b) Ic at MCOV	About 1400 μ Amps.
09.	a)Reference current (mA)	3 mA.
	b)Reference Voltage at reference Current	Greater than rated voltage of the arrester.
10.	Max. residual voltage in kVp 8/20 μ sec. wave	
	a) at 5000 Amps	256 kVp.
	b) at 10000 Amps	272 kVp.
	c) at 20000 Amps	304 kVp.
	d) Max. partial discharge (pC)	Less than 10 pC.
11.	Max. Switching Impulse Residual Voltage at 1kA	217 kVp
12.	Max. Steep Current Impulse RDV (kVp)	304 kVp.
13.	Impulse High Current Short duration discharge Amps. (4/10 μ sec. wave)kA	100 kAp.
14.	Temporary Over Voltage (kVp)	
	a) 0.1 sec.	169kVp.
	b) 1.0 sec.	162kVp.
	c) 10.0 secs.	156 kVp.
	d) 100.0 secs.	149 kVp.
15.	Insulation withstand	
	a) Lightning Impulse (Dry) (kVp)	550 kVp.
	b) Power frequency with voltage kV (rms) Dry/Wet	230 kVrms.
	c) Switching Impulse Wet (kVp)	As per IEC Applicable for rated voltages of 200 kV & above only.
16.	Pressure Relief Class	Class-'A'
17.	PR Relief Class (kArms)	40 kA.
18.	Long Duration Current Impulse Test	
	a) Current Peak Amps.	600 Amps.
	b) Virtual Duration μ Sec.	2400 μ sec.
19	a) Leakage Current at normal voltage	Less than 3mA
	b) Leakage Current at max. Operating voltage	Ir: Less than 400 μ Amps. Ic: About 1400 μ Amps



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Surge Arresters

Ref. No.

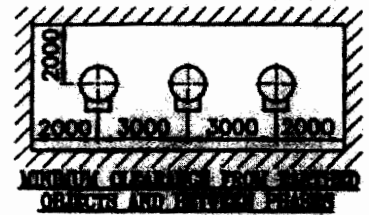
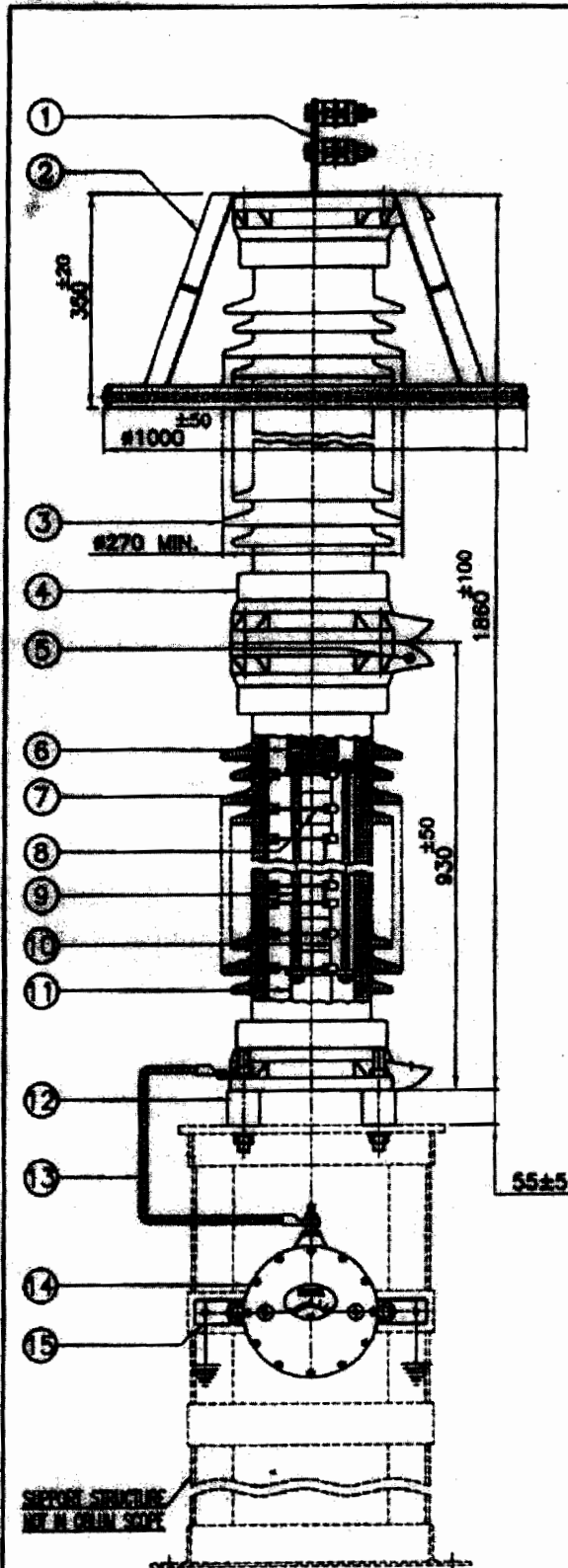
Date :

20.	Arrester percentage rating	80%
21.	Dimensions of the arrester	
	a) Max. dia of porcelain	Bigger: 270 mm(min) , Smaller: 240 mm.(min)
	b) Max. Height of porcelain	1860mm±100
22.	a) Material of Valve	Metal Oxide.
	b) Details of sealing	Dumbbell ring placed against ground porcelain surface and seated against hot tinned copper diaphragm which is placed in a pressure release plate. The pressure release plate is screwed on Arrester end flanges such that the dumbbell ring is compressed to 70% of the initial height.
	c) Description of pressure Relief Systems	
	d) No. of units per arrester	Two units of 48kV.
23.	Creepage Distance (mm)	25mm/kV
24.	Minimum Clearance	
	a) Between phases (mm)	3000mm.
	b) Between phase to earth (mm)	2000 mm.
25.	Size of grounding terminal	As per Drawing Enclosed
26.	Size of the line terminal	As per drawing enclosed
27.	Diameter of the grading ring	Ø1000±50
28.	Min.Space required for 3-phase installation	3000mm
29.	Max. Cantilever strength of the arrester kGM.	500 kGM.
30.	Overall weight of one single-phase stack (Approx.) kGS.	130kGS±10%.
31.	Weight of complete arrester (Approx.) kGS. (With Accessories)	140 kGS±10%
32.	Net Weight of each arrester (Approx.) (kGS.)	140 kGS±10%

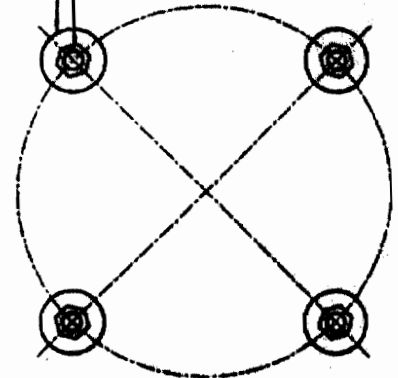
For OBLUM ELECTRICAL INDUSTRIES PVT. LTD.

AKELLA S.S SARMA
VICE PRESIDENT(Operations)

STANDARD DRAWINGS



4-INSULATORS ON PCD 295 ± 6
4-HOLES $\phi 17$ ON PCD 295 ± 6
FOR STRUCTURE BASE PLATE



ARRESTER BASE MOUNTING DETAILS

ARRESTER MODEL	ARRESTER RATING KV	DISCHARGE CURRENT KA
ZAQ	96	10

15. EARTH & FIXING TERMINAL
 14. SURGE MONITOR
 13. CONNECTING LEAD (35 Sq mm INSULATED AL CABLE 1.5M LENGTH)
 12. INSULATING BASE
 11. SPACER
 10. ZnO. ELEMENT
 9. INSULATING TIE ROD
 8. CONTACT ELECTRODE
 7. BUMPER
 6. COMPRESSION SPRING
 5. PRESSURE RELEASE PORT
 4. END CASTING
 3. ARRESTER HOUSING
 2. GRADING RING
 1. TERMINAL CLAMP

TITLE:

96kV-10kA METAL OXIDE SURGE ARRESTER

MAT: ALL M.S. PARTS ARE HOT DIP GALVANISED

REV. No.: 0

DATE: 03/04/2012

DRG. No.: ZAQ-06136HC-SM

DRN. BY: *[Signature]*

OBUM ELECTRICAL INDUSTRIES PRIVATE LIMITED

A-16&17 ASSISTED PRIVATE INDUSTRIAL ESTATE

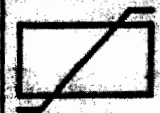
BALANAGAR

HYDERABAD - 37 A.P. (INDIA)

SCALE: N.T.S.

APPRD. BY: *[Signature]*

ALL DIMENSIONS ARE IN m.m.

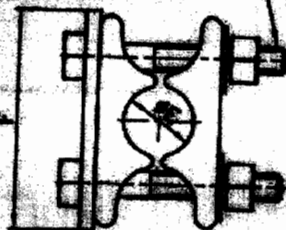


STANDARD DRAWING

SELECTION TABLE

NAME	CLAMP DIMENSIONS					
	A	B	C	D	E	F
WOLF	58	96	35	45	20.80	100
LYNX	58	96	35	45	21.25	100
SPIDER	58	96	35	45	21.25	100
PANTHER	58	96	35	45	21.25	100
HAWK	58	96	35	45	21.25	100
KUNDAH	58	96	35	53	26.25	100
DRAKE	58	96	35	53	26.25	100
ZEBRA	58	96	35	53	26.25	100
MOOSE	58	96	35	53	26.25	100

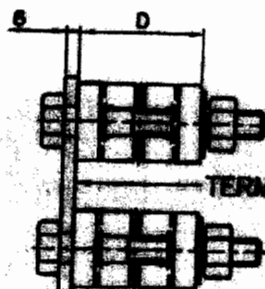
M12-G.I. BOLTS



PLAN

NOTE:

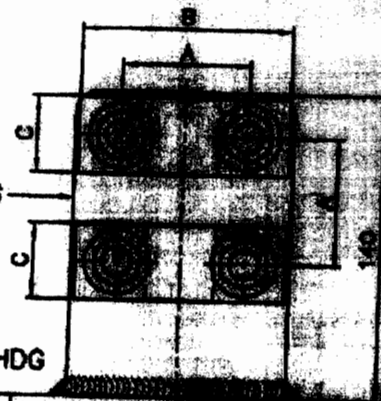
1. SELECT THE TERMINAL CLAMP REQUIRED BY THE DESIGNER AND APPROVE THE Dwg.
2. APPLICABLE STANDARDS FOR CLAMP DIMENSIONS ARE (RATED DIMENSIONS) ARE NOT TO BE USED OF A.C.S.R. CABLES.
3. TERMINAL CLAMP IS TO BE USED FOR HORIZONTAL CABLES.



TERMINAL PAD MS HDG

GRADING RING BRACKET MS HDG

ELEVATION



SIDE VIEW

TITLE: **TERMINAL CLAMPS**
(ROUTED TYPE)

MATL: ALUMINIUM ALLOY GRADE 6350 OF IS-733-80

REV. No.: 0

DATE: 05/04/20

DRG. No.: TD-1000

DRN. BY: *20/04/20*

SCALE: N.T.S.

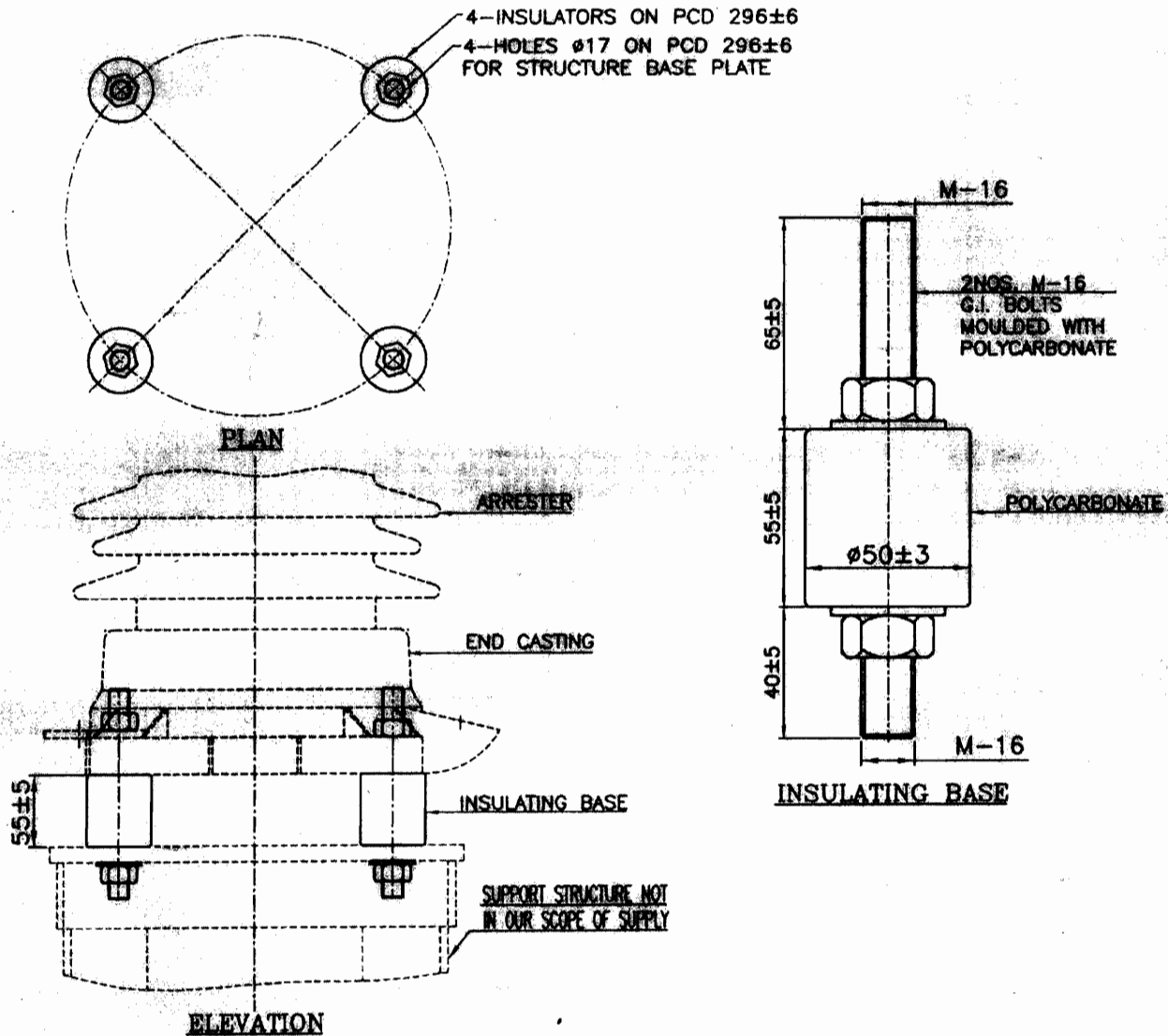
APPRD. BY: *OM*


ALL DIMENSIONS ARE IN MM. WITH A TOLERANCE OF $\pm 5\%$

OBUM ELECTRICAL INDUSTRIES PVT. LTD.
A-16217 ASSIED PRATE INDUSTRIAL ESTATE
BALANAGAR
HYDERABAD - 57 A.P. (INDIA)



STANDARD DRAWINGS



TITLE: INSULATING BASE FIXING DETAILS		MATL.: POLYCARBONATE	
DRG. NO.: ZAQ-IB-60135		REV. No.: 0	DATE: 31/12/2012
DRN. BY: <i>Dr. Kumar</i>		OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED, A-16 & 17 ASSISTED PRIVATE INDUSTRIAL ESTATE, BALANAGAR HYDERABAD - 37. A.P. (INDIA)	
SCALE: N.T.S.			
APPRD. BY: <i>JS</i>			
ALL DIMENSIONS ARE IN m.m.			

STANDARD DRAWINGS

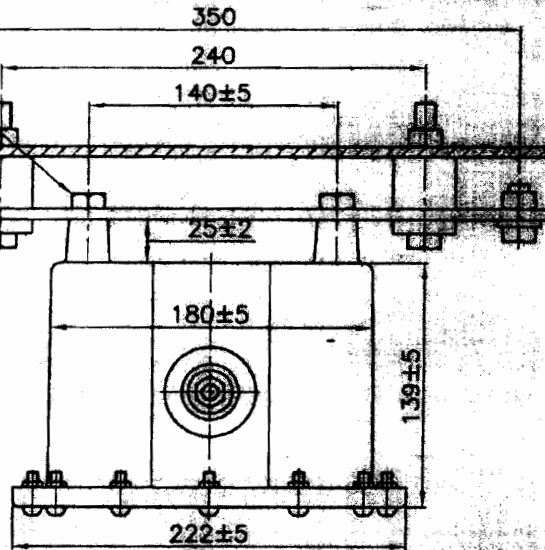
2-NoS. M-10 BOLTS FOR SURGE MONITOR TO EARTH TERMINAL

INSULATION FOR SURGE MONITOR AND ALSO FIXING TO SUPPORT STRUCTURE WITH M-12 BOLTS

SUPPORT STRUCTURE ANGLE OR FLAT

TWO EARTHING CONNECTIONS

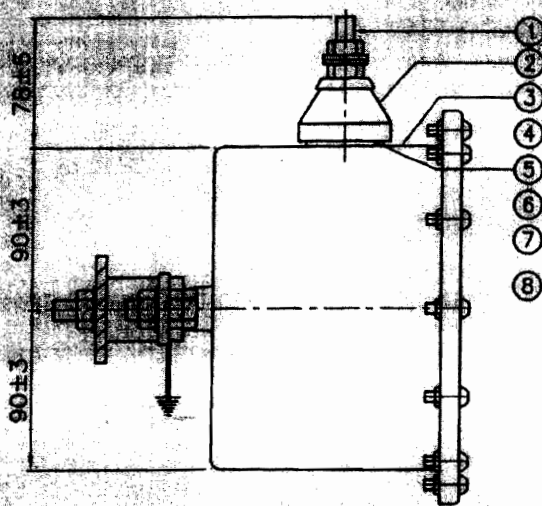
EARTHING & FIXING TERMINAL



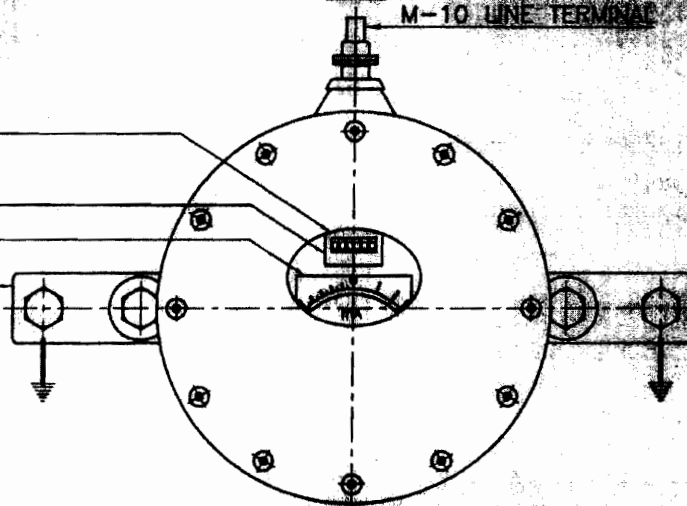
PLAN

M-10 LINE TERMINAL

- NOTE : 1. DO NOT OPEN THE SEALED UNIT
2. GREEN BAND : 0 TO 2mA - RED BAND : 2 TO 5mA
3. DEGREE OF PROTECTION : IP-67



SIDE VIEW



ELEVATION

- 8. FIXING & EARTHING TERMINAL
- 7. MILLI AMMETER 0 - 5mA
- 6. ELECTROMAGNETIC COUNTER
- 5. SEALING GASKET
- 4. VIEWING WINDOW
- 3. AL. SHELL
- 2. INSULATOR
- 1. LINE TERMINAL

TITLE:

SURGE MONITOR

MATL: -----

REV. No.: 0

DATE: 29/12/2012

DRG. No.: **SM-TZB-3R**

DRN. BY: *DVhuman*

SCALE: N.T.S.

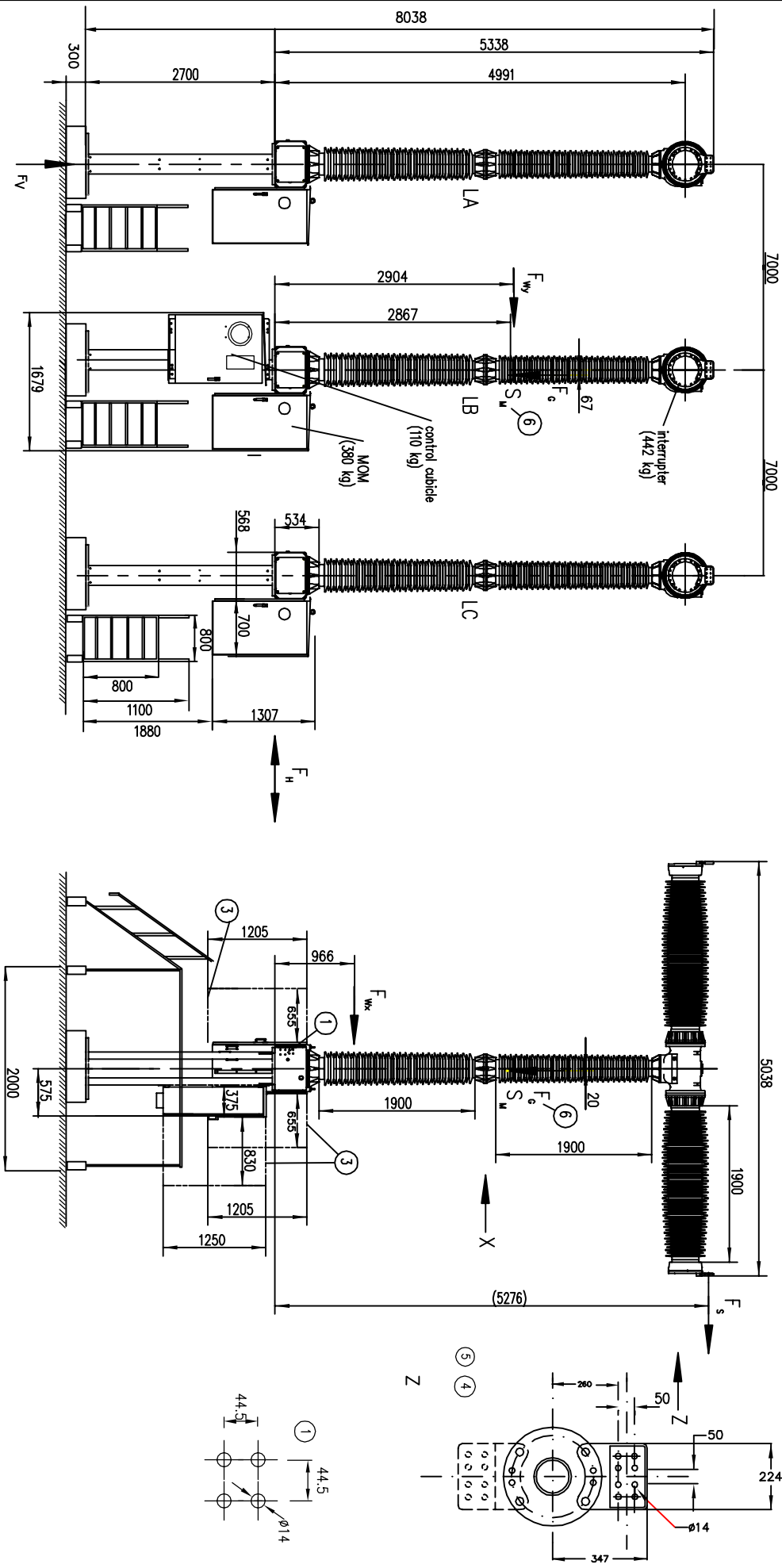
APPRD. BY: *38*

ALL DIMENSIONS ARE IN m.m. WITH A TOLERANCE OF ±5%

OBLUM ELECTRICAL INDUSTRIES PRIVATE LIMITED
A-16&17 ASSISTED PRIVATE INDUSTRIAL ESTATE
BALANAGAR
HYDERABAD - 37 A.P. (INDIA)



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operating loads per pillar
vertical F_v :
+ 20.0 kN (up)
- 34.0 kN (down)

horizontal F_h :
 ± 9.0 kN

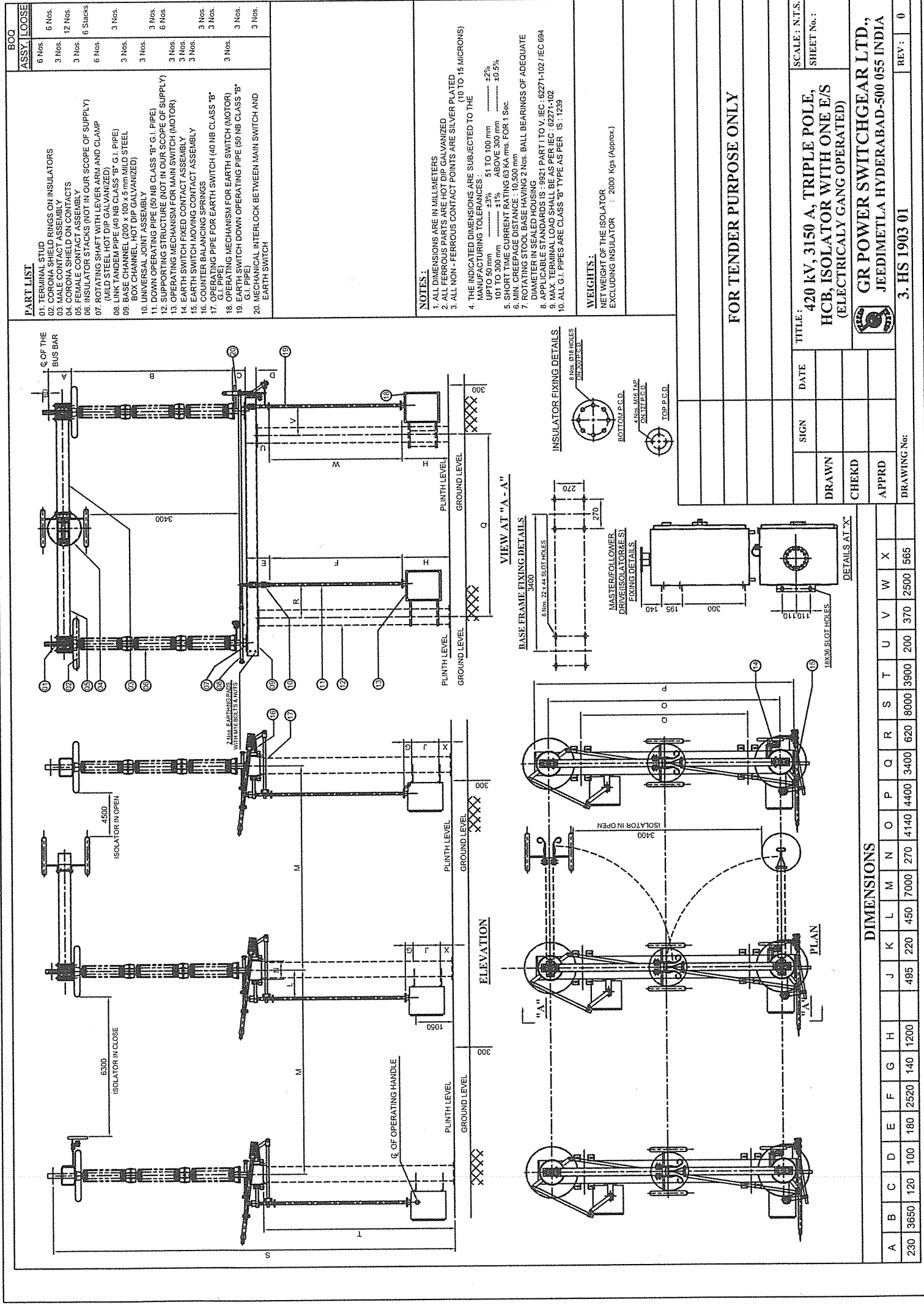
loads per pole (LB)				
F G	F Wx	F Wy	F stat.	F stat+dyn
weight loads	wind loads, at a wind speed of 50m/s		tensile load at terminal	
total	18.8 kN		4.8 kN	
	6.4 kN		2.0 kN	
	5.0 kN			

BILL OF MATERIAL

- 1) Poles – 3nos.
- 2) Spring operating mechanism with control panel – 3nos.
- 3) Marshalling Box fixed with Y pole – 1no.
- 4) Support Structure – 3nos.
- 5) Foundation Bolts – 12nos. (4nos./Pole)
- 6) Interpole cable – Armoured, 1.5sq.mm x nos. of required cores

Minor Deviation from the dimensions and data stated are permissible

Date		Date		Date	
05.02.14		05.02.14		05.02.14	
CONTRACTOR : BHIL - TRANSMISSION BUSINESS GROUP		CLIENT : TAMIL NADU TRANSMISSION CORPORATION LTD.		Sales Ref. : 3003773795	
PROJECT : 400/110KV SUBSTATION AT THAPPAGUNDU		PO No : 143P14, DT : 28.01.2014		Qty. : (8nos – WOPIR)	
Original/Replacement for/Replaced by :-		AURANGABAD		All dimensions are in MM	
Details : STANDARD GA DRAWING		G4		Sh. 1	
G5		G6		Sh. 3	
G7					



BOQ	ASSY	LOOSE
6 Nos.	01. TERMINAL STUD	
3 Nos.	02. CORONA SHIELD RINGS ON INSULATORS	
12 Nos.	03. MALE CONTACT ASSEMBLY	
3 Nos.	04. CORONA SHIELD ON CONTACTS	
6 Nos.	05. FEMALE CONTACT ASSEMBLY	
3 Nos.	06. INSULATOR STACKS (NOT IN OUR SCOPE OF SUPPLY)	
3 Nos.	07. ROTATING SHAFT WITH LEVER ARM AND CLAMP (MILD STEEL HOT DIP GALVANIZED)	
3 Nos.	08. LINK TANDEM PIPE (40 NB CLASS "B" G.I. PIPE)	
3 Nos.	09. BASE CHANNEL (200 x 100 x 5 mm MILD STEEL BOX CHANNEL, HOT DIP GALVANIZED)	
3 Nos.	10. UNIVERSAL JOINT ASSEMBLY	
3 Nos.	11. DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	
3 Nos.	12. SUPPORTING STRUCTURE (NOT IN OUR SCOPE OF SUPPLY)	
3 Nos.	13. OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)	
3 Nos.	14. EARTH SWITCH FIXED CONTACT ASSEMBLY	
3 Nos.	15. EARTH SWITCH MOVING CONTACT ASSEMBLY	
3 Nos.	16. COUNTER BALANCING SPRINGS	
3 Nos.	17. OPERATING PIPE FOR EARTH SWITCH (40 NB CLASS "B" G.I. PIPE)	
3 Nos.	18. OPERATING MECHANISM FOR EARTH SWITCH (MOTOR)	
3 Nos.	19. EARTH SWITCH DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	
3 Nos.	20. MECHANICAL INTERLOCK BETWEEN MAIN SWITCH AND EARTH SWITCH	

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE MANUFACTURING TOLERANCES:

- UPTO 50 mm $\pm 1\%$
- 51 TO 100 mm $\pm 2\%$
- 101 TO 300 mm $\pm 3\%$
- ABOVE 300 mm $\pm 0.5\%$
- 5. SHORT TIME CURRENT RATING 63 KA ms. FOR 1 Sec.
- 6. MIN. CREEPAGE DISTANCE : 10,500 mm
- 7. ROTATING STOOL BASE HAVING 2 Nos. BALL BEARINGS OF ADEQUATE DIAMETER IN SEALED HOUSING
- 8. APPLICABLE STANDARDS IS : 9921 PART I TO V, IEC : 62271-102 / IEC 694
- 9. MAX. TERMINAL LOAD SHALL BE AS IEC : 62271-102
- 10. ALL G.I. PIPES ARE CLASS "B" TYPE AS PER IS : 1239

WEIGHTS:

NET WEIGHT OF THE ISOLATOR
EXCLUDING INSULATOR : 2000 Kgs (Approx.)

FOR TENDER PURPOSE ONLY

TITLE:	DATE	SIGN	DRAWN	CHECKD	APPRD
420 kV, 3150 A, TRIPLE POLE, HCB, ISOLATOR WITH ONE E/S (ELECTRICALLY GANG OPERATED)					
SCALE : N.T.S.					
SHEET No. :					

GR POWER SWITCHGEAR LTD., JEEDIMETLA HYDERABAD-500 055 INDIA	3. HS 1903 01	REV : 0
--	---------------	---------

DIMENSIONS

A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
230	3650	120	100	180	2520	140	1200	495	220	450	7000	270	4140	4400	3400	620	8000	3900	200	370	2500	565

PART LIST		BOQ
01. TERMINAL STUD	6 Nos.	ASSY. LOOSE
02. CORONA SHIELD RINGS ON INSULATORS	6 Nos.	
03. MALE CONTACT ASSEMBLY	3 Nos.	
04. CORONA SHIELD ON CONTACTS	12 Nos.	
05. FEMALE CONTACT ASSEMBLY	3 Nos.	
06. INSULATOR STACKS (NOT IN OUR SCOPE OF SUPPLY)	6 Nos.	
07. ROTATING SHAFT WITH LEVER ARM AND CLAMP (MILD STEEL HOT DIP GALVANIZED)	3 Nos.	
08. LINK TANDEM PIPE (40 NB CLASS "B" G.I. PIPE)	3 Nos.	
09. BASE CHANNEL (200 x 100 x 5 mm MILD STEEL BOX CHANNEL, HOT DIP GALVANIZED)	3 Nos.	
10. UNIVERSAL JOINT ASSEMBLY	3 Nos.	
11. DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	3 Nos.	
12. SUPPORTING STRUCTURE (NOT IN OUR SCOPE OF SUPPLY)	3 Nos.	
13. OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)	6 Nos.	
14. EARTH SWITCH FIXED CONTACT ASSEMBLY	6 Nos.	
15. EARTH SWITCH MOVING CONTACT ASSEMBLY	6 Nos.	
16. COUNTER BALANCING SPRINGS	6 Nos.	
17. OPERATING PIPE FOR EARTH SWITCH (40 NB CLASS "B" G.I. PIPE)	6 Nos.	
18. EARTH SWITCH DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	6 Nos.	
19. MECHANICAL INTERLOCK BETWEEN MAIN SWITCH AND EARTH SWITCH	6 Nos.	

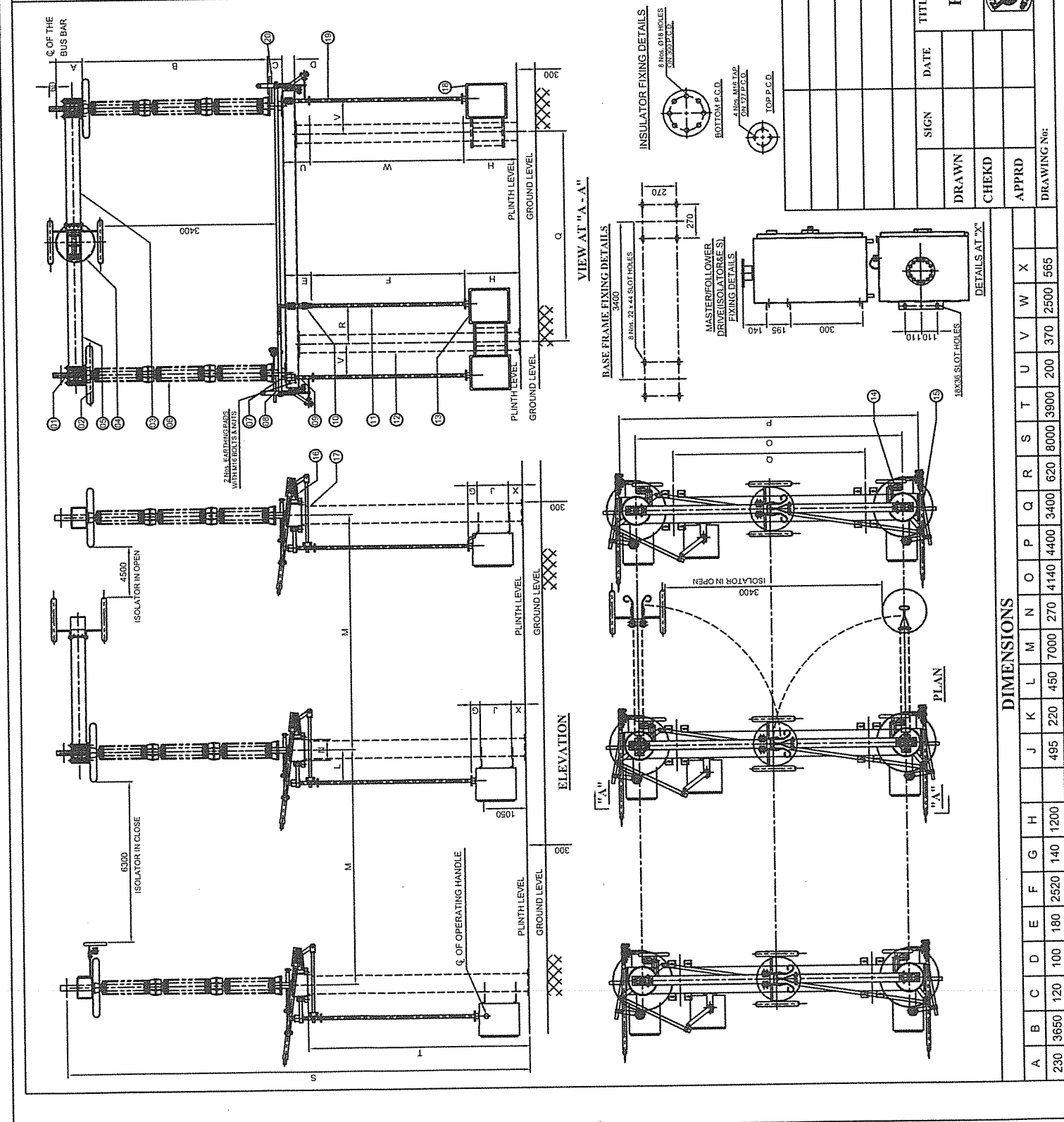
NOTES:

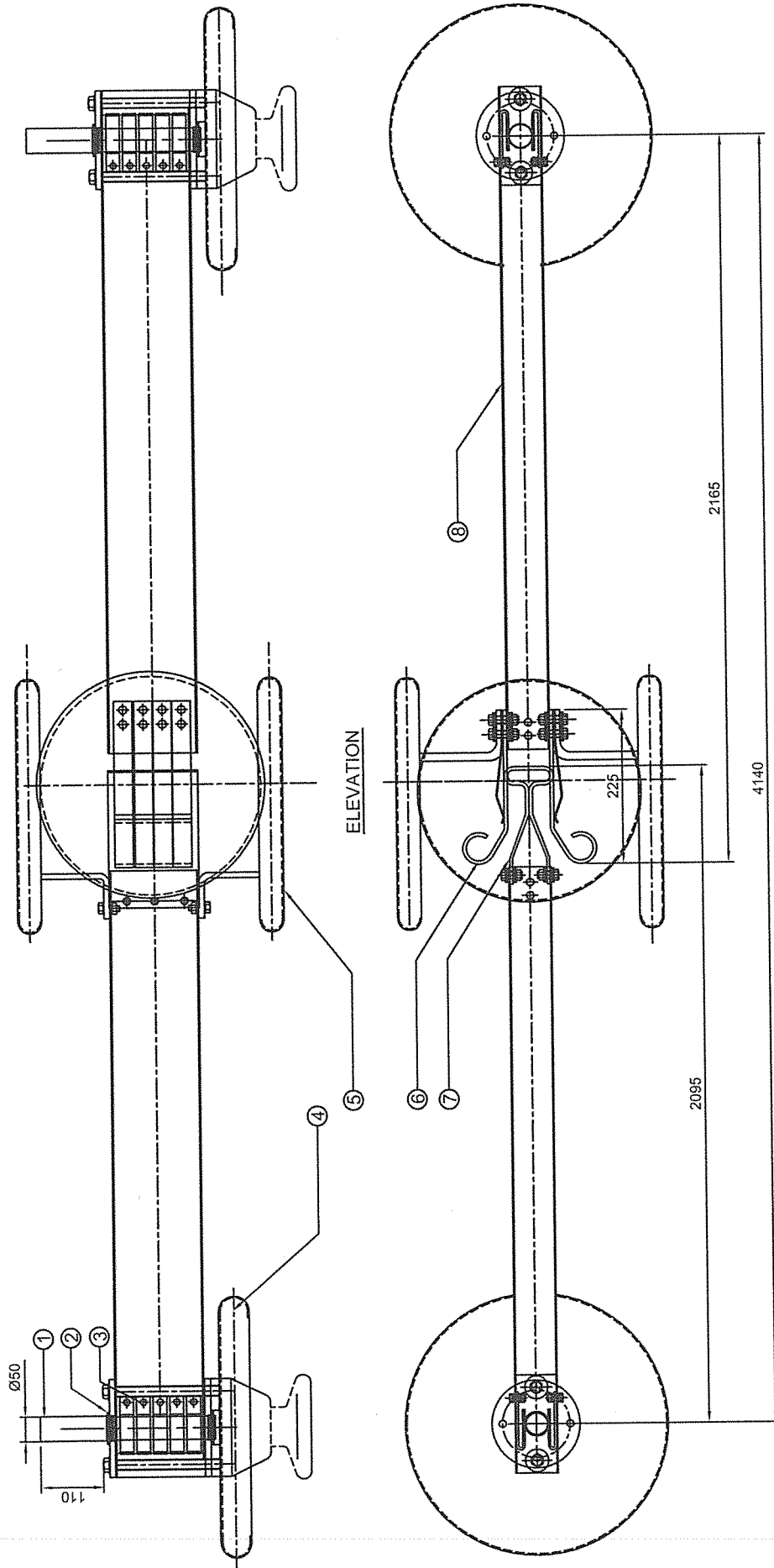
1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
3. ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (10 TO 15 MICRONS)
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE FOLLOWING TOLERANCES:
 - 101 TO 300 mm: $\pm 1\%$
 - 300 TO 500 mm: $\pm 1.5\%$
 - 500 TO 1000 mm: $\pm 2\%$
 - 1000 TO 1500 mm: $\pm 2.5\%$
 - 1500 TO 2000 mm: $\pm 3\%$
 - 2000 TO 2500 mm: $\pm 3.5\%$
 - 2500 TO 3000 mm: $\pm 4\%$
 - 3000 TO 3500 mm: $\pm 4.5\%$
 - 3500 TO 4000 mm: $\pm 5\%$
 - 4000 TO 4500 mm: $\pm 5.5\%$
 - 4500 TO 5000 mm: $\pm 6\%$
 - 5000 TO 5500 mm: $\pm 6.5\%$
 - 5500 TO 6000 mm: $\pm 7\%$
 - 6000 TO 6500 mm: $\pm 7.5\%$
 - 6500 TO 7000 mm: $\pm 8\%$
 - 7000 TO 7500 mm: $\pm 8.5\%$
 - 7500 TO 8000 mm: $\pm 9\%$
 - 8000 TO 8500 mm: $\pm 9.5\%$
 - 8500 TO 9000 mm: $\pm 10\%$
 - 9000 TO 9500 mm: $\pm 10.5\%$
 - 9500 TO 10000 mm: $\pm 11\%$
5. SHORT TIME CURRENT RATING 63 KA ms. FOR 1 Sec.
6. MIN. CREEPAGE DISTANCE: 10,500 mm
7. ROTATING STOOL BASE HAVING 2 Nos. BALL BEARINGS OF ADEQUATE DIAMETER IN SEALED HOUSING
8. APPLICABLE STANDARDS IS: 9921 PART 1 TO V, IEC: 62271-102 / IEC 694
9. MAX. TERMINAL LOAD SHALL BE AS PER IEC: 62271-102
10. ALL G.I. PIPES ARE CLASS "B" TYPE AS PER IS: 1239

WEIGHTS:
NET WEIGHT OF THE ISOLATOR : 2400 Kgs (Approx.)
EXCLUDING INSULATOR

FOR TENDER PURPOSE ONLY

TITLE: 420 kV, 3150 A, TRIPLE POLE, HCB, ISOLATOR WITH TWO E/S (ELECTRICALLY GANG OPERATED)		SCALE: N.T.S.
SIGN	DATE	SHEET No.:
DRAWN	CHECKD	
APPRD		
DRAWING No.:		
GR POWER SWITCHGEAR LTD., JEEDEMETLA HYDERABAD-500 055 INDIA		
3. HS 1903 02		REV: 0





ELEVATION

PLAN

FOR TENDER PURPOSE ONLY

NOTE :

BOQ/SET

PART LIST :

1. TERMINAL CONTACT (50 OD Cu. ROD)	06 Nos.
2. BUSH (NYLON)	12 Nos.
3. TERMINAL CONTACT (5 PAIRS 25 x 4 HDECu FLAT)	60 Nos.
4. CORONA SHIELD ON INSULATORS (ALUMINUM)	06 Nos.
5. CORONA SHIELD ON CONTACTS (ALUMINUM)	12 Nos.
6. FEMALE CONTACT FINGER (32 x 5 mm Cu. FLAT, 4 PAIRS SILVER PLATED)	24 Nos.
7. MALE CONTACT (150 x 6 Cu. FLAT, 2 Nos. SILVER PLATED)	06 Nos.
8. CONTACT ARM (140 x 80 x 4 mm THICK ALUMINUM DRAWN SECTION BOX TYPE)	06 Nos.

- ALL DIMENSIONS ARE IN MILLIMETERS
- ALL NON FERROUS CONTACT POINTS ARE SILVER PLATED (25 Microns)
- REMAINING CONTACT AREA TIN PLATED GALVANIZED
- ALL FERROUS PARTS ARE HOT DIP GALVANIZED
- THE INDICATED DIMENSIONS ARE SUBJECTED TO THE MANUFACTURING TOLERANCES :

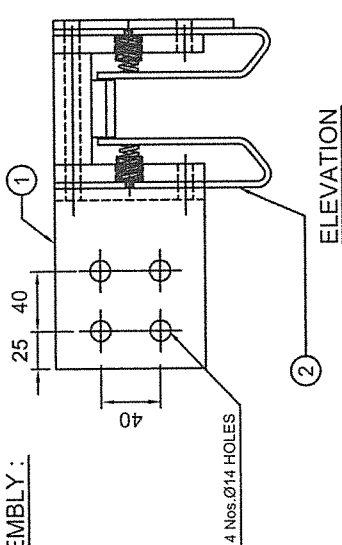
UPTO 50 mm	±3%
101 TO 300 mm	±1%
51 TO 100 mm	±2%
ABOVE 300 mm	±0.5%

5. CORONA SHIELD REF DRG No: 4, O 1906 15

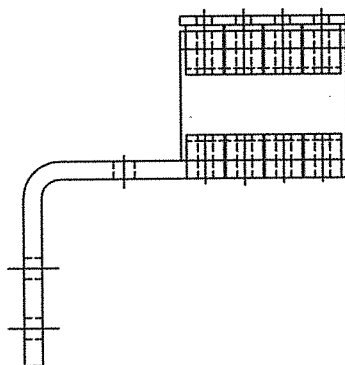
REVISIONS	TITLE:	SCALE: T.S
D C B A	MAIN CONTACT ASSEMBLY (420 KV, 3150A)	DATE 31-07-2013
		DRAWN
		CHECKED
		APPROVED
		DRG.NO:
		REV
		4. HSM 1903 03

GR POWER SWITCHGEAR LTD.,
JEEEDIMETLA HYDERABAD-500 055 INDIA

FIXED CONTACT ASSEMBLY :

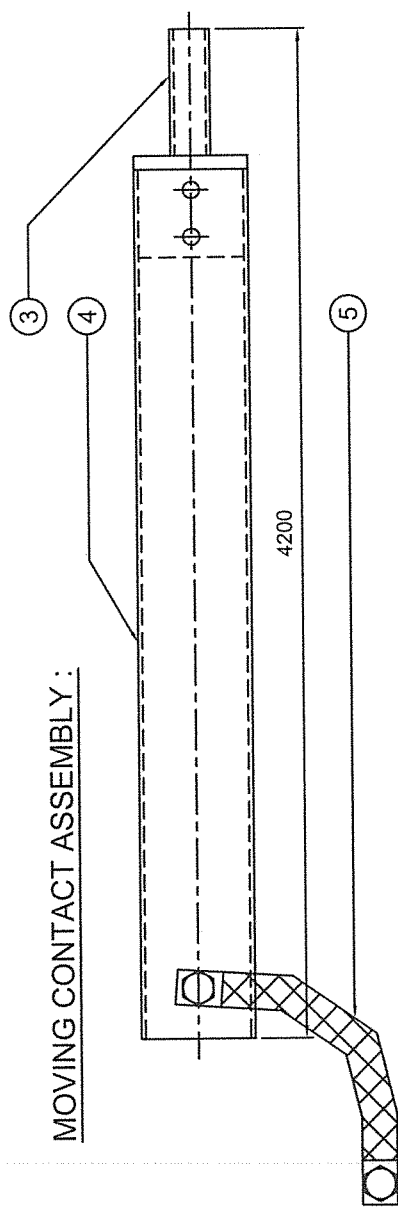


ELEVATION



PLAN

MOVING CONTACT ASSEMBLY :



PART LIST

1. CONTACT HOLDER (100 x 12 Alu. FLAT)
2. CONTACT FINGER (25 x 4 Cu. FLAT 4 PAIRS, SILVER PLATED)
3. MOVING CONTACT (40 OD 29 ID Cu. PIPE SILVER PLATED)
4. CONTACT ARM (101 OD x 3 Thk Alu. TUBE)
5. TINNED COPPER BRAIDED FLEXIBLE (25 x 3 mm, 4 NOS.)

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL COPPER CONTACT POINTS ARE SILVER PLATED
REMAINING AREA TIN PLATED
3. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE
MANUFACTURING TOLERANCES :
UPTO 50 mm ----- ±3% 51 TO 100 mm ----- ±2%
101 TO 300 mm ----- ±1% ABOVE 300 mm ----- ±0.5%

VENDOR : **GR POWER SWITCHGEAR LTD.,**
JEEDEMETLA HYDERABAD-500 055 INDIA
CLIENT : **TAMILNADU TRANSMISSION CORPORATION LTD.,**
CHENNAI, TAMILNADU, INDIA.

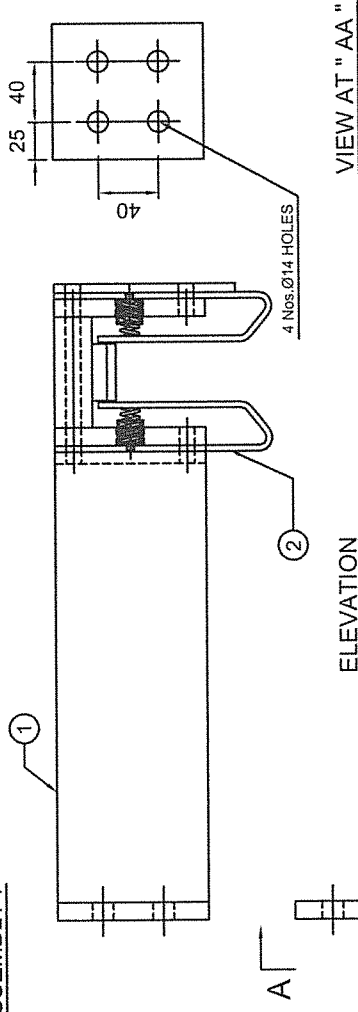
FOR TENDER PURPOSE ONLY
TITLE : EARTH SWITCH CONTACT ASSEMBLY
FOR 400 KV

REV	DESCRIPTION	DATE	NAME	DATE
A	CUSTOMER COMMENTS ON 17/03/14		DSGN	
			DRWN	
			CHKD	
			APPD	
			SHEET	5 OF 18
			PROJECTION	

REV	DESCRIPTION	DATE	NAME	DATE
A	CUSTOMER COMMENTS ON 17/03/14		DSGN	
			DRWN	
			CHKD	
			APPD	
			SHEET	5 OF 18
			PROJECTION	

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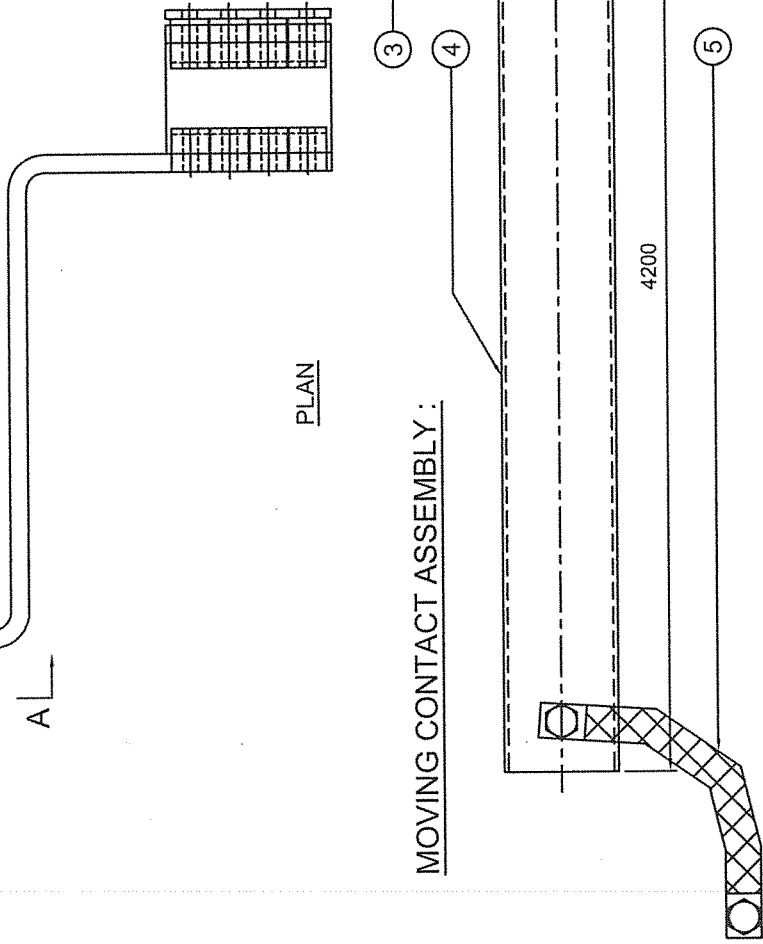
FIXED CONTACT ASSEMBLY :



ELEVATION

VIEW AT "AA"

PLAN



MOVING CONTACT ASSEMBLY :

PART LIST

1. CONTACT HOLDER (100 x 12 Alu. FLAT)
2. CONTACT FINGER (25 x 4 Cu. FLAT 4 PAIRS, SILVER PLATED)
3. MOVING CONTACT (40 OD 29 ID Cu. PIPE SILVER PLATED)
4. CONTACT ARM (101 OD x 3 Thk Alu. TUBE)
5. TINNED COPPER BRAIDED FLEXIBLE (25 x 3 mm, 4 NOs.)

NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETERS
2. ALL COPPER CONTACT POINTS ARE SILVER PLATED
REMAINING AREA TIN PLATED
3. ALL FERROUS PARTS ARE HOT DIP GALVANIZED
4. THE INDICATED DIMENSIONS ARE SUBJECT TO THE
MANUFACTURING TOLERANCES :
UP TO 50 mm ----- ±3% 51 TO 100 mm ----- ±2%
101 TO 300 mm ----- ±1% ABOVE 300 mm ----- ±0.5%

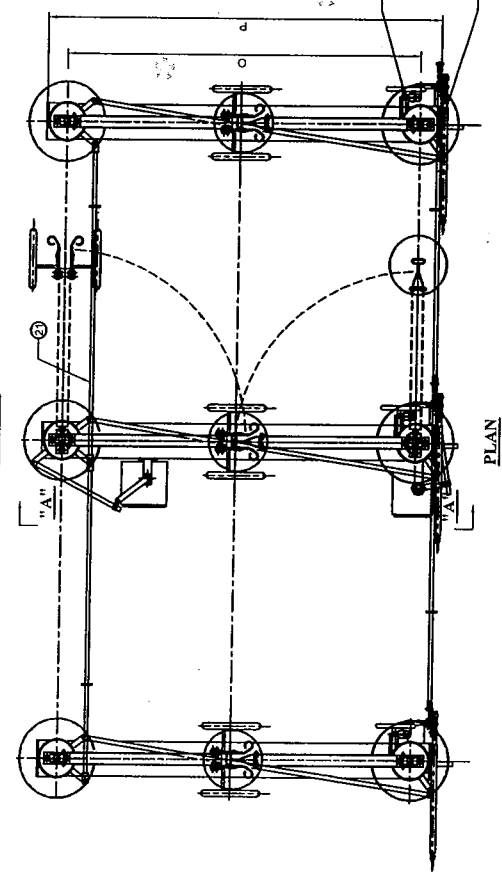
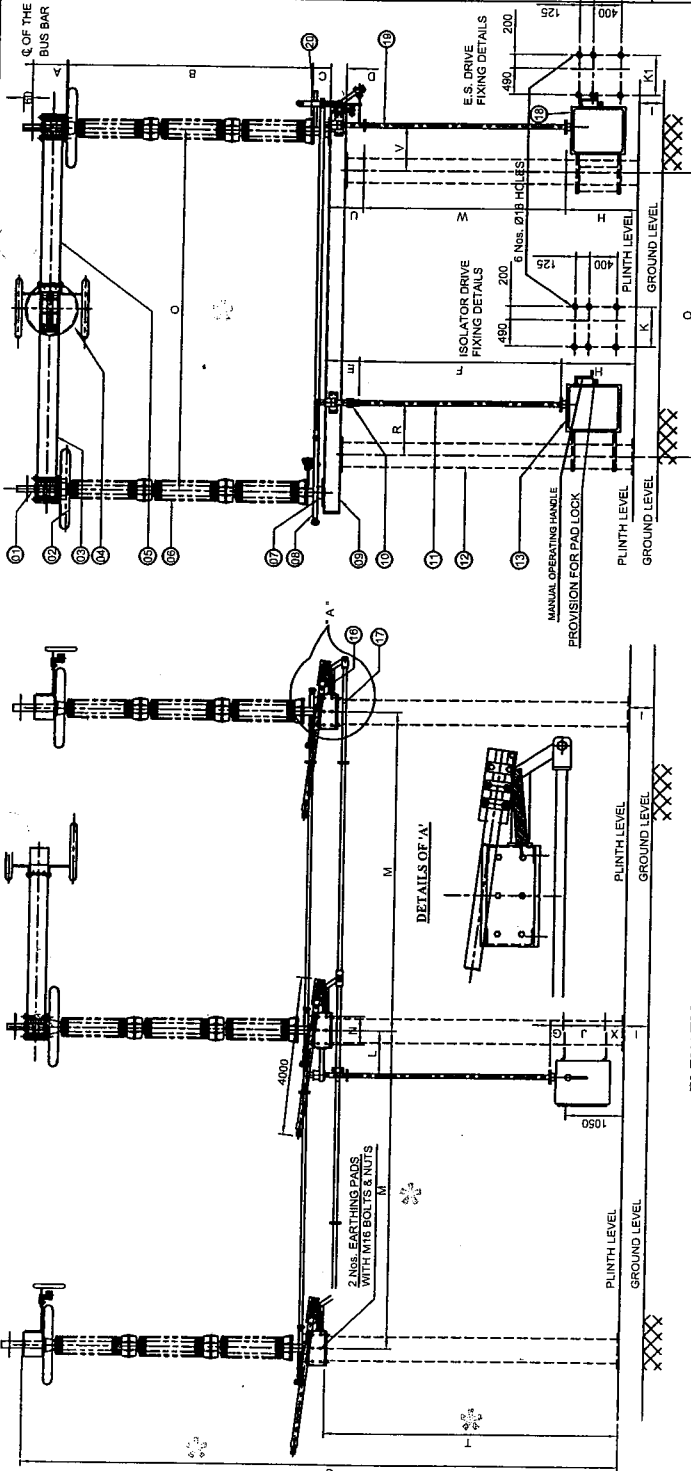
VENDOR : GR POWER SWITCHGEAR LTD.,
JEEDEMETLA HYDERABAD-500 055 INDIA
CLIENT : TAMILNADU TRANSMISSION CORPORATION LTD.,
CHENNAI, TAMILNADU, INDIA.

FOR TENDER PURPOSE ONLY

TITLE: BUS BAR EARTH SWITCH CONTACT ASSEMBLY (FOR 420 KV)
SCALE: _____
DRAWING No. _____
RELEASED FOR: ☐ PRELIMINARY ☐ TENDER ☐ INFORMATION ☐ APPROVAL ☐ EXCONSTRUCTION

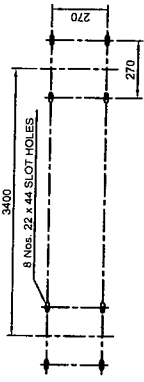
NAME	DATE
DSGN	
DRWN	
CHKD	
APPD	
SHEET 6 OF 18	REV.
PROJECTION	

REV	DESCRIPTION
A	CUSTOMER COMMENTS ON 17/03/14

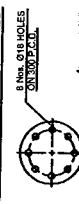


VIEW AT "A-A"

BASE FRAME FIXING DETAILS



INSULATOR FIXING DETAILS



Test Report No. 14.195 HCB 1201896
42000 HCB 1201896
13 Nov 2018

PART LIST

QTY	DESCRIPTION	UNIT	QTY	DESCRIPTION	UNIT
1	TERMINAL STUD (50 OD Cu ROD)	Nos.	1	TERMINAL STUD (50 OD Cu ROD)	Nos.
2	CORONA SHIELD RINGS ON INSULATORS (ALUMINIUM)	Nos.	2	CORONA SHIELD RINGS ON INSULATORS (ALUMINIUM)	Nos.
3	MALE CONTACT ASSEMBLY (150 x 6 Cu FLAT, 2 NOS)	Nos.	3	MALE CONTACT ASSEMBLY (150 x 6 Cu FLAT, 2 NOS)	Nos.
4	CORONA SHIELD ON CONTACTS (100 x 6 ALUMINIUM)	Nos.	4	CORONA SHIELD ON CONTACTS (100 x 6 ALUMINIUM)	Nos.
5	FEMALE CONTACT ASSEMBLY (150 x 6 Cu FLAT, 2 NOS)	Nos.	5	FEMALE CONTACT ASSEMBLY (150 x 6 Cu FLAT, 2 NOS)	Nos.
6	INSULATOR STACKS (EMCO SCOPE OF SUPPLY)	Nos.	6	INSULATOR STACKS (EMCO SCOPE OF SUPPLY)	Nos.
7	ROTATING SHAFT WITH LEVER ARM AND CLAMP	Nos.	7	ROTATING SHAFT WITH LEVER ARM AND CLAMP	Nos.
8	WILD STEEL HOT DIP GALVANIZED (40 NB CLASS "B" G.I. PIPE)	Nos.	8	WILD STEEL HOT DIP GALVANIZED (40 NB CLASS "B" G.I. PIPE)	Nos.
9	BASE CHAMFER (40 NB CLASS "B" G.I. PIPE)	Nos.	9	BASE CHAMFER (40 NB CLASS "B" G.I. PIPE)	Nos.
10	UNIVERSAL JOINT ASSEMBLY (MS HOG)	Nos.	10	UNIVERSAL JOINT ASSEMBLY (MS HOG)	Nos.
11	DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	Nos.	11	DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	Nos.
12	SUPPORTING STRUCTURE (EMCO SCOPE OF SUPPLY)	Nos.	12	SUPPORTING STRUCTURE (EMCO SCOPE OF SUPPLY)	Nos.
13	OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)	Nos.	13	OPERATING MECHANISM FOR MAIN SWITCH (MOTOR)	Nos.
14	EARTH SWITCH FIXED CONTACT ASSEMBLY (3 PAIRS 25x4 Cu FLAT)	Nos.	14	EARTH SWITCH FIXED CONTACT ASSEMBLY (3 PAIRS 25x4 Cu FLAT)	Nos.
15	EARTH SWITCH MOVING CONTACT ASSEMBLY (3 PAIRS 25x4 Cu FLAT)	Nos.	15	EARTH SWITCH MOVING CONTACT ASSEMBLY (3 PAIRS 25x4 Cu FLAT)	Nos.
16	COUNTER BALANCING SPRINGS (S) (60 OD 50 ID ALU. TUBE)	Nos.	16	COUNTER BALANCING SPRINGS (S) (60 OD 50 ID ALU. TUBE)	Nos.
17	OPERATING PIPE FOR EARTH SWITCH (40 NB CLASS "B" G.I. PIPE)	Nos.	17	OPERATING PIPE FOR EARTH SWITCH (40 NB CLASS "B" G.I. PIPE)	Nos.
18	OPERATING MECHANISM FOR EARTH SWITCH (MOTOR)	Nos.	18	OPERATING MECHANISM FOR EARTH SWITCH (MOTOR)	Nos.
19	EARTH SWITCH DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	Nos.	19	EARTH SWITCH DOWN OPERATING PIPE (50 NB CLASS "B" G.I. PIPE)	Nos.
20	MECHANICAL INTERLOCK BETWEEN MAIN SWITCH AND EARTH SWITCH (MS HOG)	Nos.	20	MECHANICAL INTERLOCK BETWEEN MAIN SWITCH AND EARTH SWITCH (MS HOG)	Nos.
21	TANDER OPERATING PIPE FOR ISOLATOR (40 NB CLASS "B" G.I. PIPE)	Nos.	21	TANDER OPERATING PIPE FOR ISOLATOR (40 NB CLASS "B" G.I. PIPE)	Nos.

REFERENCE DRAWINGS

- FOR MAIN CONTACT ASSEMBLY (2000 A) ----- 3. SM 868 04
- FOR EARTH SWITCH CONTACT ASSEMBLY ----- 3. SE 868 05
- FOR OPERATING MECHANISM FOR ISOLATOR ----- 3. MS 868 06
- FOR SCHEMATIC DIAGRAM DETAILS (ISOLATOR) ----- 3. MS 868 07
- FOR OPERATING MECHANISM FOR EARTH SWITCH ----- 3. ES 868 08
- FOR SCHEMATIC DIAGRAM DETAILS (EARTH SWITCH) ----- 3. ES 868 08
- FOR COUNTER WEIGHT SPRING DETAILS ----- 4. S 2009
- FOR INSULATOR DETAILS ----- 5. 780.00

NOTES:

- ALL DIMENSIONS ARE IN MILLIMETERS
- ALL FERROUS PARTS ARE HOT DIP GALVANIZED
- ALL NON-FERROUS CONTACT POINTS ARE SILVER PLATED (25 MICRONS MINIMUM)
- THE INDICATED DIMENSIONS ARE SUBJECT TO THE MANUFACTURING TOLERANCES:
 - UP TO 50 mm ----- ±1%
 - 51 TO 100 mm ----- ±1%
 - 101 TO 300 mm ----- ±1%
 - ABOVE 300 mm ----- ±0.5%
- SHORT TIME CURRENT RATING 40 KA rms. FOR 3 Sec.
- PERMITTED TO BE USED FOR 10,000 cycles
- ROTATING STOPS BASED ON 2 Nos. BALL BEARINGS OF ADEQUATE DIAMETER IN SEALED HOUSING
- APPLICABLE STANDARDS FOR ISOLATOR IS: 9921 PART I TO V. IEC: 62271-102 / IEC 694
- MAX. TERMINAL LOAD SHALL BE AS PER IEC: 62271-102
- ALL G.I. PIPES ARE CLASS "B" TYPE AS PER IS: 1239
- EARTH SWITCHES ARE SUITABLE FOR FIXING BOTH SIDES OF ISOLATOR
- INDUCED CURRENT SWITCHING DUTY CLASS "B" FOR EARTH SWITCH
- APPLICABLE STANDARD FOR INSULATOR IS: 2544, IEC: 60168.

WEIGHTS:

NET WEIGHT OF THE ISOLATOR
EXCLUDING INSULATOR
2300 Kgs (Approx.)

QUANTITY:

62121

SCALE: 1:1		DATE: 22.07.2008		DRAWN: 22		CHECKED: 22		APPROVED: 22		REV: 22	
420 KV, 2000A, T.P. HCB MAIN ISOLATOR AND ONE EARTH SWITCH ARE MECHANICALLY GANG MOTOR OPERATED AND ALSO OPERATED BY MANUAL.											
DRG. NO: 3. HS 868 03											
GR POWER SWITCHGEAR LTD., JEEDIMETLA HYDERABAD-500 055 INDIA											

DIMENSIONS

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	K1	G1	J1	X1
230	3650	120	200	180	2420	150	1200	300	525	680	450	7000	270	4140	4470	3400	620	8000	3800	200	370	2400	225	690	150	525	225

(ALL DIMENSIONS ARE IN mm)

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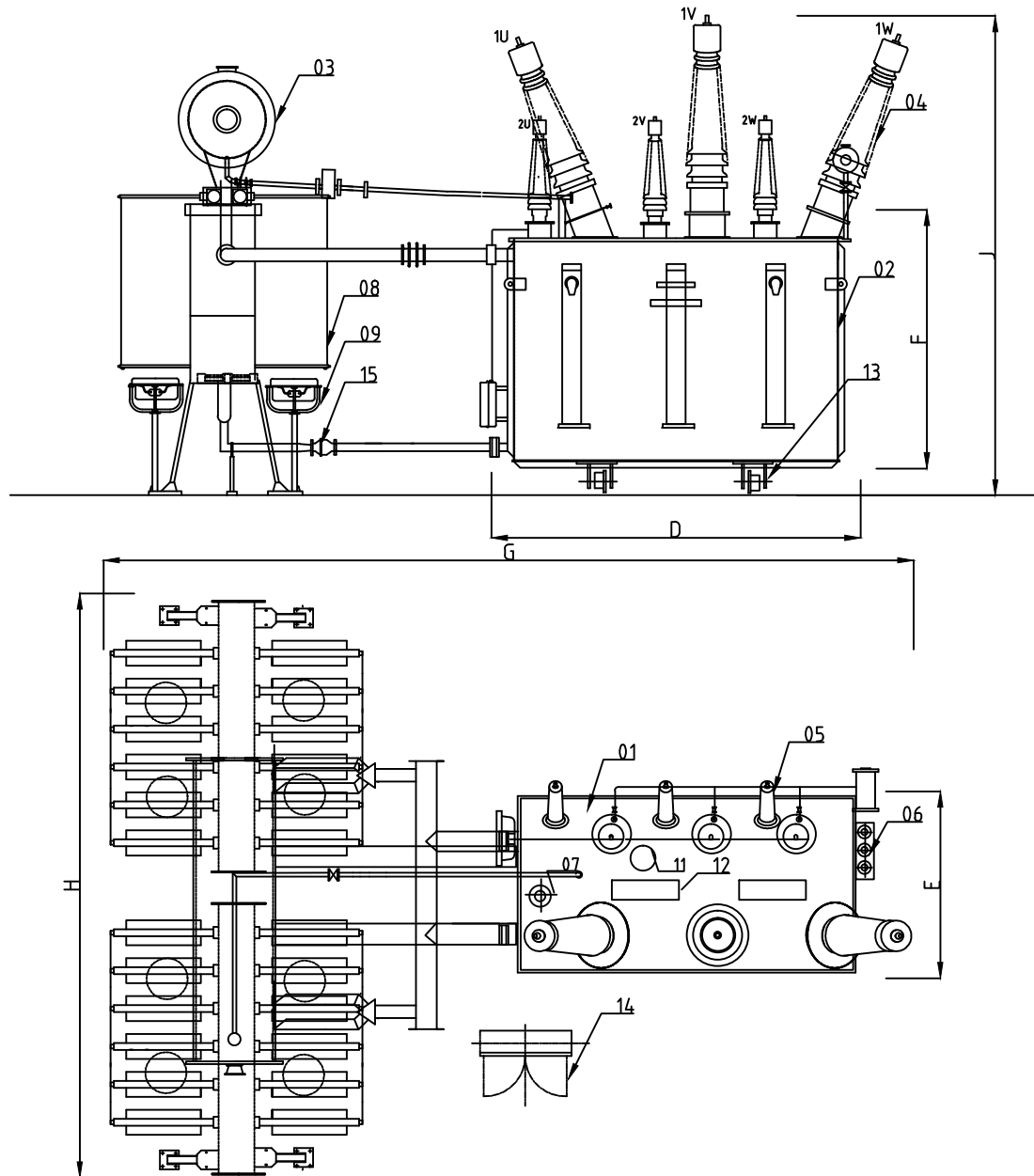


TABLE OF DIMENSION

SHIPPING	D	10800
	E	4000
	F	4600
OVERALL	G	18000
	H	12000
	J	9600

TABLE OF FITTINGS

01	TANK COVER
02	TANK
03	CONSERVATOR
04	HV TERMINAL BUSHING
05	IV TERMINAL BUSHING
06	TERTIARY BUSHING
07	NEUTRAL BUSHING
08	2 x 50% RADIATOR BANK
09	FAN
11	PRESSURE RELIEF VALVE
12	INSPECTION COVER
13	BI-DIRECTIONAL ROLLER
14	MARSHALLING BOX
15	OIL PUMP

NOTES

1. THIS DRG IS FOR TENDERING PURPOSE ONLY
2. THE DIMENSIONS ARE APPROXIMATE AND IN mm.
3. THE DETAILS AND DIMENSIONS SHOULD NOT BE WORKED TO UNLESS CONFIRMED
4. THE POSITION OF FITTINGS SHOWN IS TENTATIVE. FINAL TERMINAL ARRANGEMENT SHALL BE AS PER CUSTOMER SPEC. AND LOCATION OF COOLER BANK SHALL BE FINALISED DURING DETAIL ENGG.

EQUIPMENT : 200 MVA, 400/110/33 KV, 3 PHASE ONAN/
ONAF/OFAF COOLED AUTO TRFR. WITH OLTC

CUSTOMER : M/S TANTRANSCO



BHARAT HEAVY ELECTRICALS LTD.
BHOPAL

TENDER ENQ. NO.
12-E-3104

OUTLINE GENERAL ARRGT.

DRAWING NO.
TRE/12E3104/200ICT