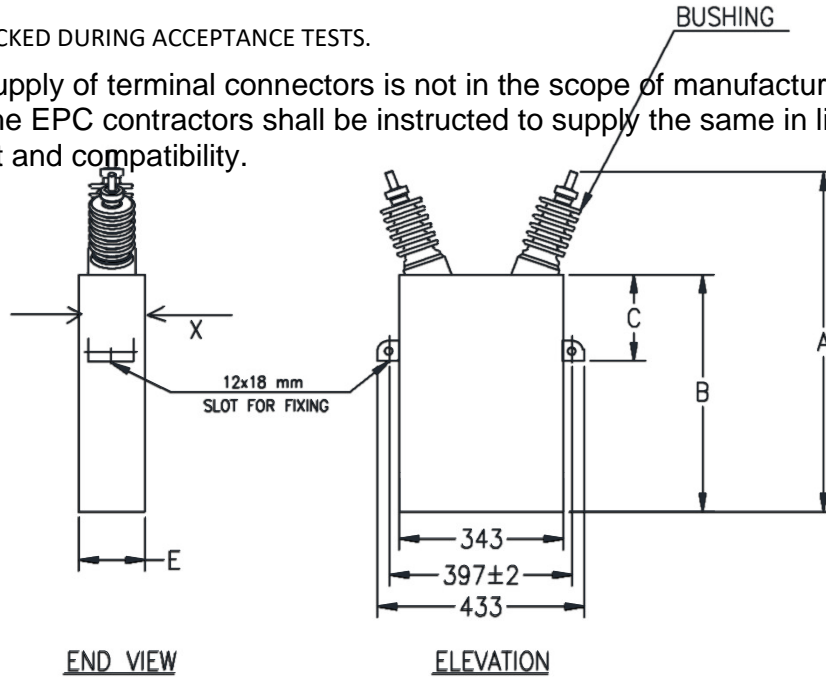


Unit Dimensions in mm				
A (+/-10mm)	B	C	D	E
770	380	150	-	178

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

TO BE CHECKED DURING ACCEPTANCE TESTS.

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/IVT/CVT requirement and compatibility.



NOTES :

- 1) ALL DIMENSIONS ARE IN mm.
- 2) TOLERANCES ARE AS PER IS:2102(PART-1)-1993, UNLESS SPECIFIED VERY COARSE-CLASS OF DEVIATION.
- 3) THIS DRAWING IS FOR 21.94kV, 200kvar, 1PH, 50Hz UNIT
- 4) UNIT IS EXTERNAL FUSED
- 5) UNIT INSULATION LEVEL IS 70/170 kV/kVp
- 6) TIME TO DISCHARGE TO 50 VOLTS WITHIN 600 SECONDS
- 7) REFERENCE STANDARD: IS 13925
- 8) THICKNESS OF CRCA CAN: 2 mm
- 9) PAINT SHADE IS 631 OF IS5
- 10) UNIT WEIGHT IS 35 kg (APPROX)
- 11) TEMPERATURE CATEGORY: +7.5/C

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X: EXPANDABLE UPTO 190mm  
SCALE : NTS

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Sheet	Cont.								
Form No.	Dept	Year	Week	Rev	Revision	Appd	Year	Week	
Design Checked By	Accepted by Q.C.	Accepted for Production. by		Description: UNIT DIMENSION DRAWING					
	Design checked by VK	Drawn By KJ		Customer : APTRANSCO					
	Drawing Checked By SK	Issued by Dept. PGHV-C		Year Week 23 02		Order Ref			
Drawn By	Hitachi Energy		HITACHI		Drg No. YC1H423188-031				Rev 0
6917 5300 - AA (A4) Rev									1 Contd.
									--

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TO BE CHECKED DURING ACCEPTANCE TESTS.

Drawing approval subject to valid vendor registration



BANGALORE, INDIA

**DISCHARGE CAPACITOR  
BEFORE HANDLING**

No.#				FUSES : EXTERNAL			
Type	CHD	C <sub>N</sub>	1.32	uF	@		
IN	9.1	A	f <sub>N</sub>	50	Hz	U <sub>N</sub>	21940 V
Q <sub>N</sub>	200.00	kvar	Ins.level,Ui	70	/170	kV	
Temp.cat.	+7.5/C °C		Discharge Device Internal				
Standard	IS 13925 :2012						
PHASE	1	Wt. *	35	kg	Year	\$\$	
CAPACITOR	PP	Faradol (Non PCB) impregnated					

# UNIT SERIAL No. TO BE ENGRAVED

@ TOLERANCE GROUP TO BE MENTIONED

\* WEIGHT INDICATED IS APPROXIMATE ONLY

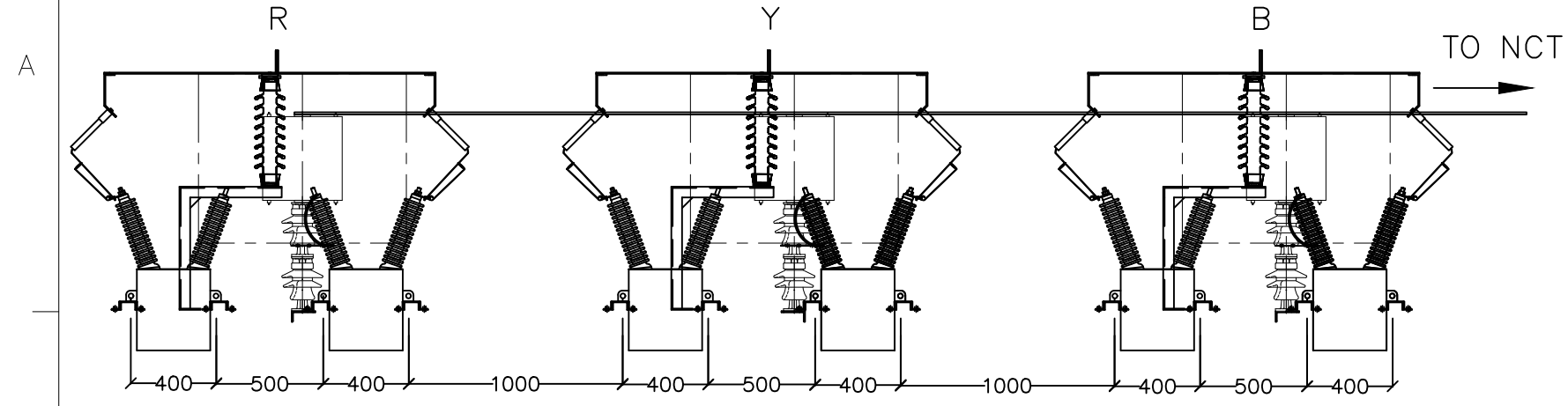
\$\$ CURRENT YEAR TO BE MENTIONED

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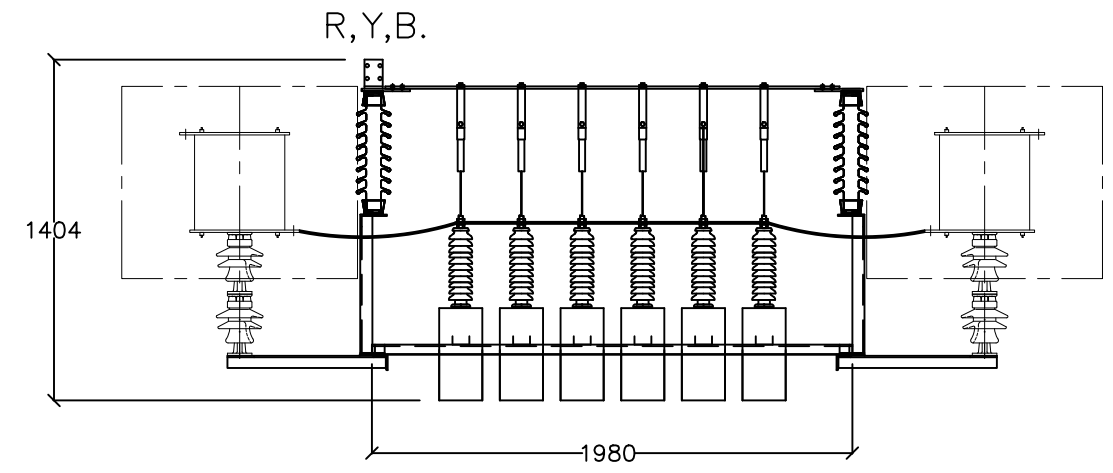
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Accepted by Qual Control		Accepted for Production. by		Description: UNIT RATING PLATE		
Design checked by	Drawn By	Customer :		APTRANSCO		
Drawing Checked By	Issued by Dept.	Year	Week	Order Ref	Rev	Sheet
	PGHV-C	23	02			1
				Urg No.		Contd.
				YC1H423188-030	0	--

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TO BE CHECKED DURING ACCEPTANCE TESTS.

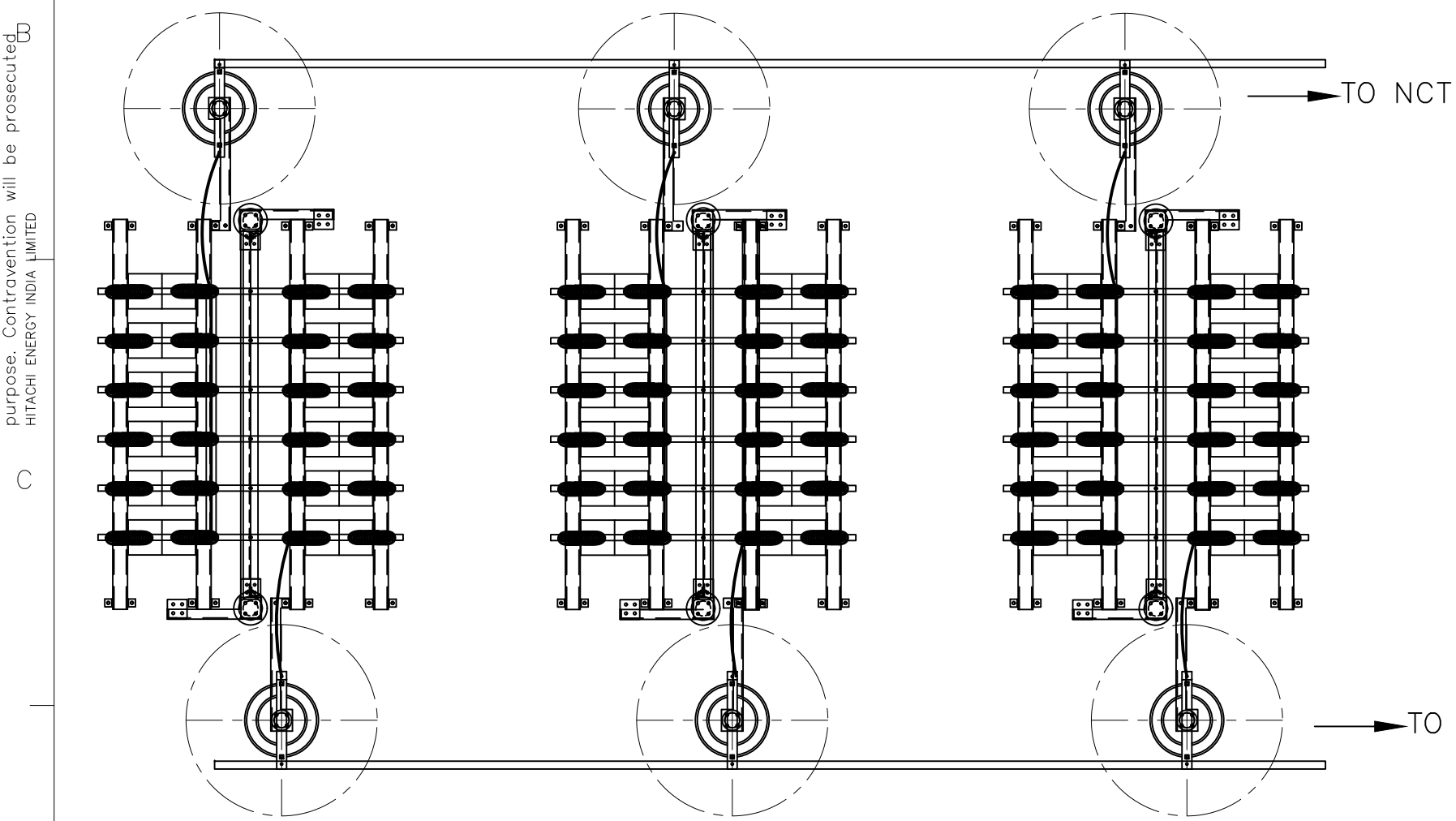


ELEVATION



SIDE VIEW

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PLAN

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Projects

**MATERIAL LIST:**

- 1)CAPACITOR UNIT RATING 21.94 KV, 200 KVAR, 1PH 50 HZ  
EXTERNALLY FUSED PAINTED WITH SHADE 631 AS PER IS: 5
- 2)MS CHANNEL RACK-HOT DIP GALVANIZED.
- 3)36KV SOLID CORE INSULATOR FOR INCOMER SUPPORT.
- 4)75 X 10 AL FLAT FOR INCOMING .
- 5)50 SQ MM TINNED CU CONDUCTOR FOR INTERCONNECTION  
/NEUTRAL SHORTING (1 RUN).
- 6)36KV CLASS, 15AMP, EXPULSION FUSE WITH ASSEMBLY.

**NOTES**

- 1.ALL DIMENSIONS ARE IN mm. EXTERNALLY FUSED PAINTED WITH SHADE 631 AS PER IS: 5
- 2.TOLERANCES ARE AS PER IS: 2102(PART-1)1993.
- 3.MIN CLEARANCES FOLLOWED ARE CORRESPONDING TO THE HIGHEST SYSTEM VOLTAGE 36KV.  
PHASE TO PHASE : 320 MM  
PHASE TO EARTH : 320 MM

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/IVT/CVT requirement and compatibility.

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Rev				Revision				Appd		Year		Week		CUSTOMER : M/s APTRANSCO		Design checked by: VK		GA OF 38 kV, 7.2 MVar		HITACHI ENERGY DRAWING NO.:		Rev		Scale	
																Drawing checked by : SK		3 PH, CAPACITOR BANK		00		NTS		Sheet	
																Drawn by : HKR		PGHV-C 24 01		YC1H423188-001		1 OF 1		Cont.	

1 2 3 4 5 6

A

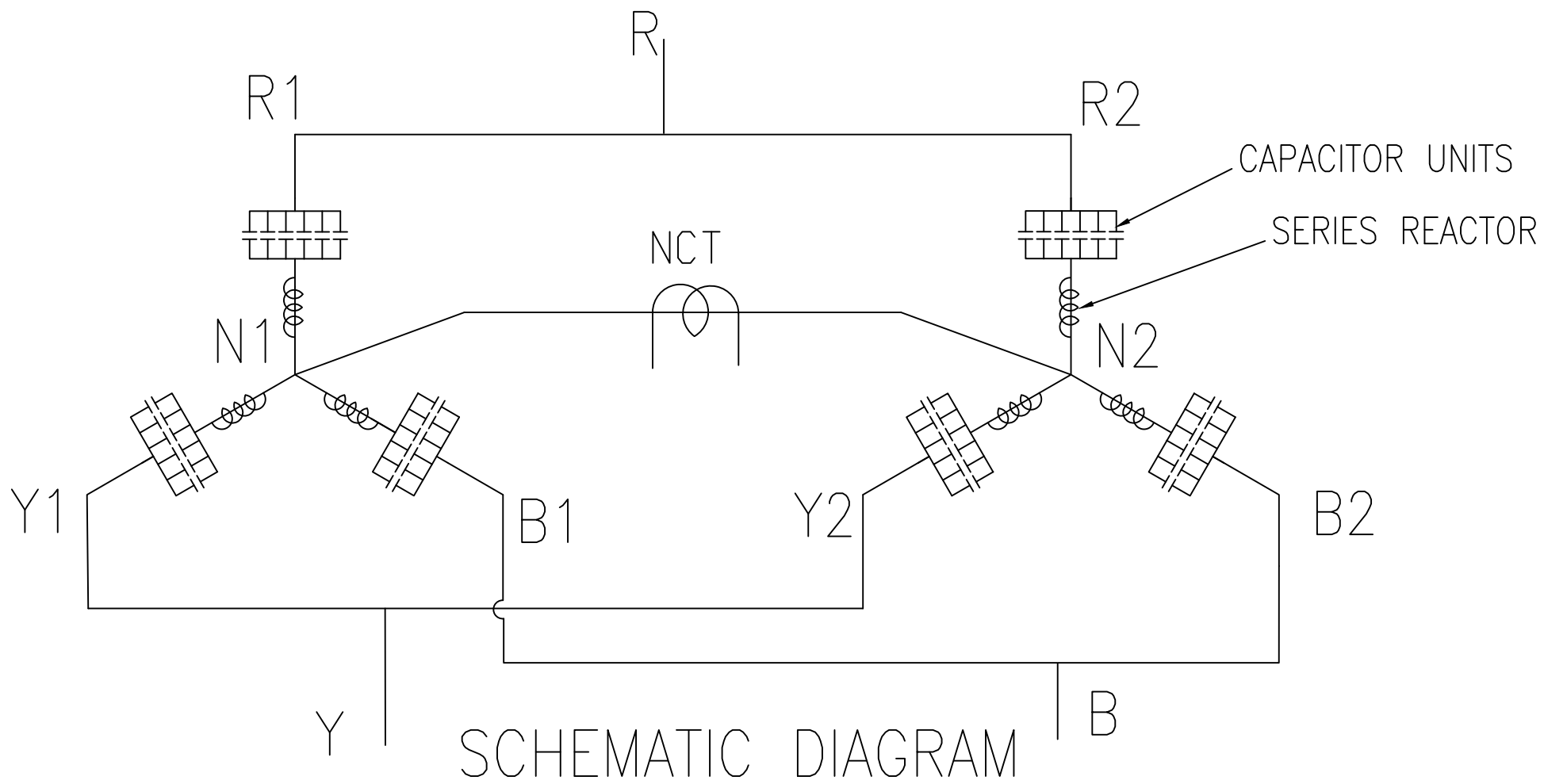
B

C

D

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NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.  
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SCHEMATIC DIAGRAM

CAPACITOR BANK RATING		CAPACITOR UNIT RATING		NO OF UNITS IN PARALLEL PER SERIES GROUP IN FIRST STAR	NO OF UNITS IN PARALLEL PER SERIES GROUP IN SECOND STAR	NO OF SERIES GROUPS PER STAR PER PHASE	TOTAL NO OF UNITS
kV / Mvar		kV / kvar					
38	kV	21.94	kV	6	6	1	36
7.2	MVAR	200	KVAR				
3PH.		1PH.					

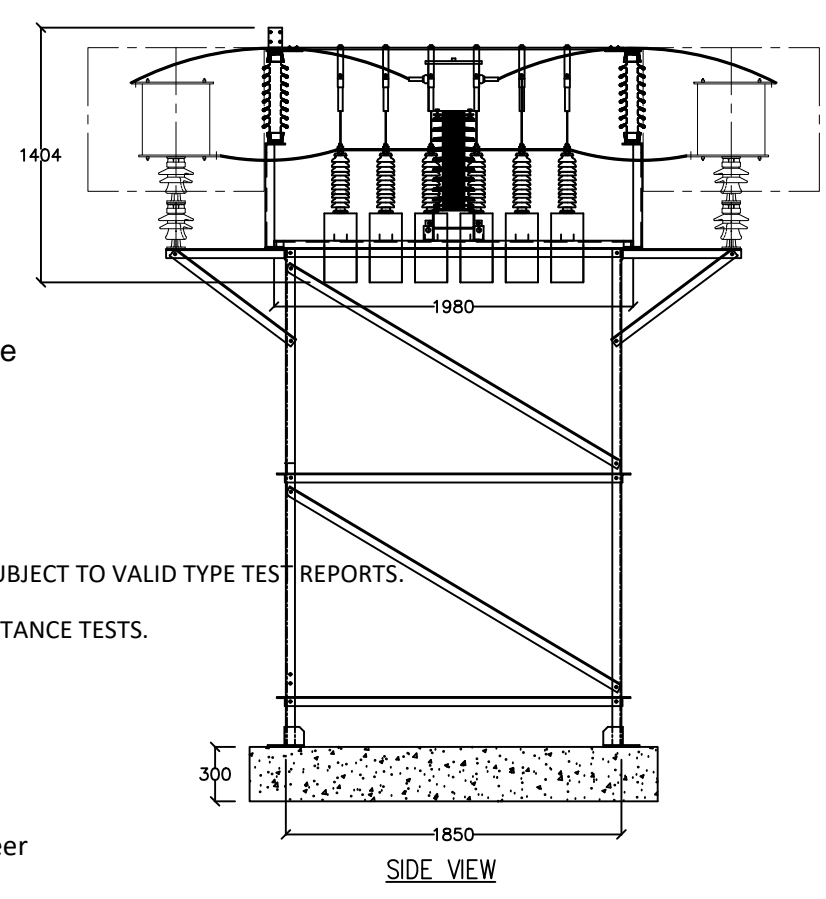
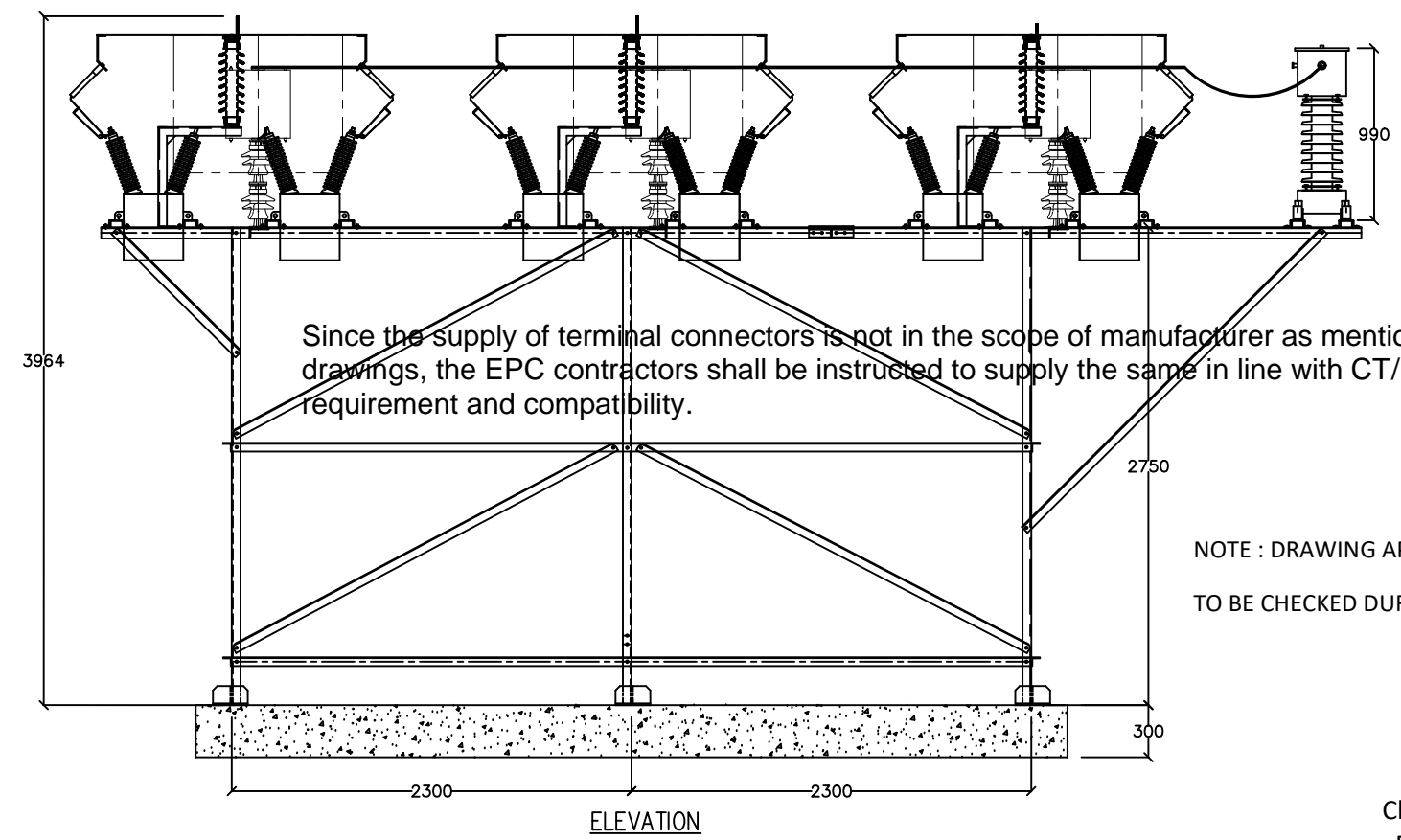
Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/IVT/CVT requirement and compatibility.

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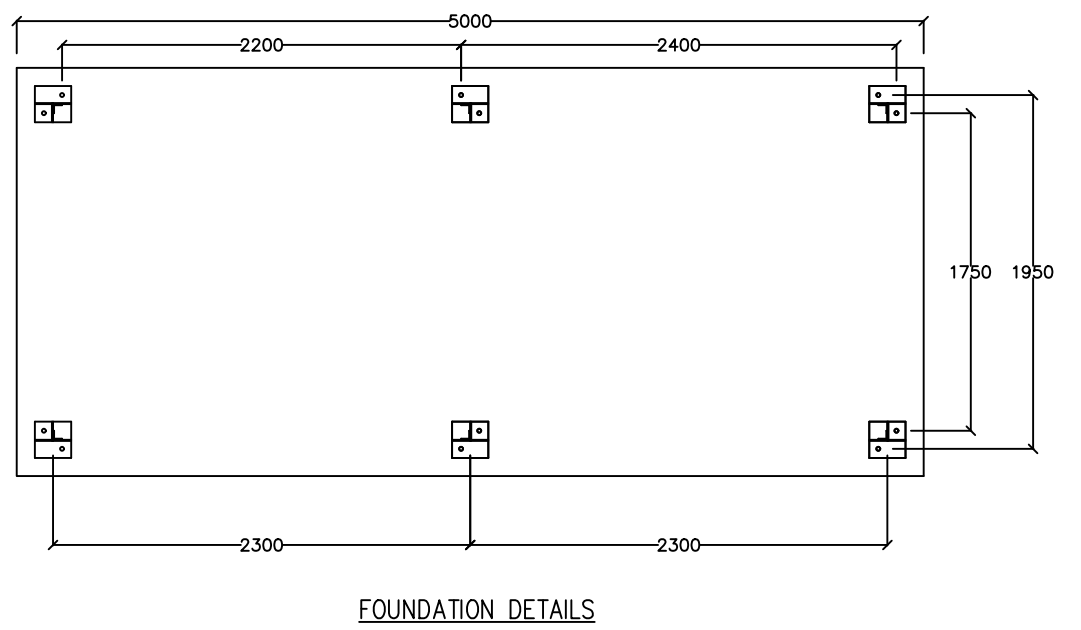
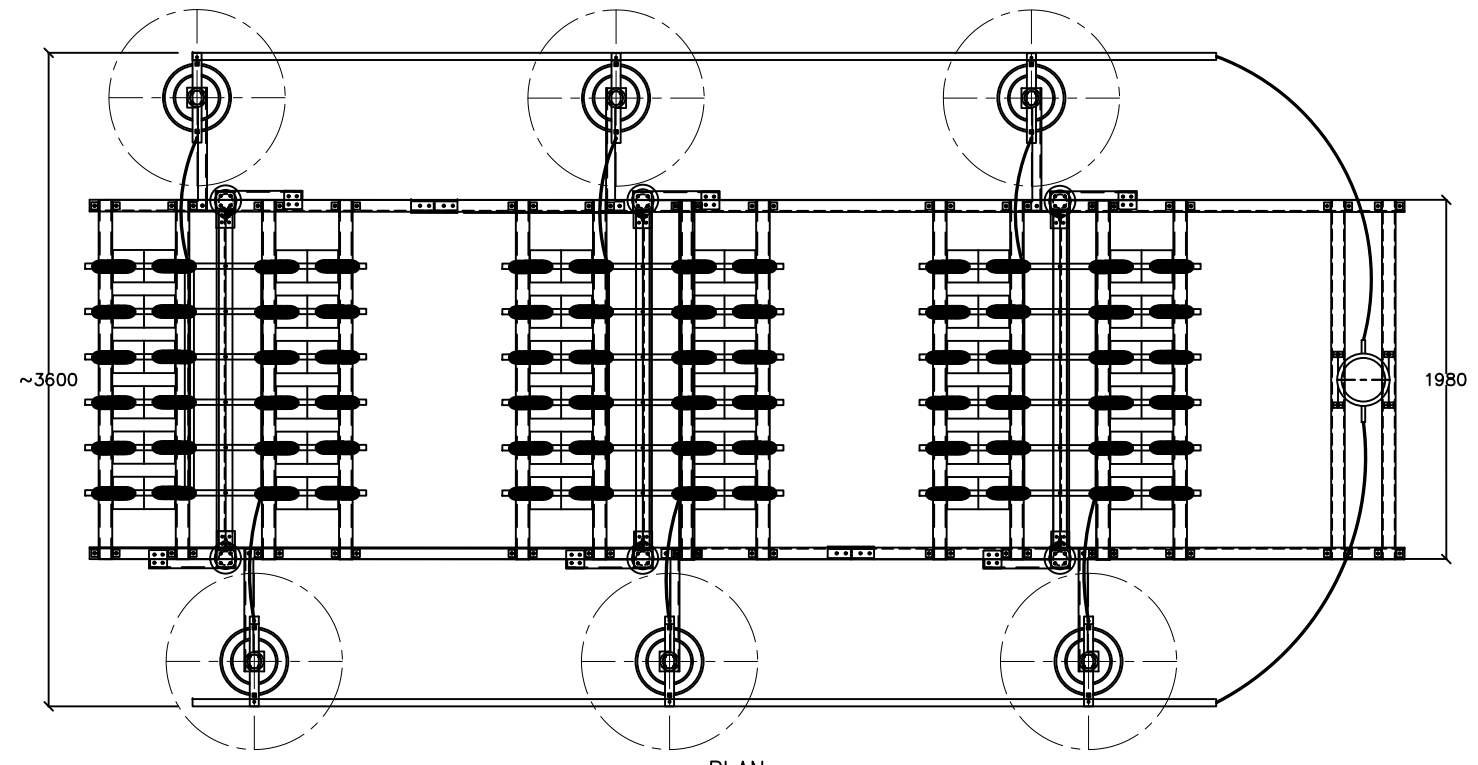
				CUSTOMER : M/s. APTRANSCO	Design checked by	SCHEMATIC DIAGRAM 38 kV, 7.2 MVAR, 3 PH, CAPACITOR BANK	HITACHI ENERGY DRAWING NO.:	Rev	Scale	
					Drawing checked by			YC1H423188-002	0	NTS
					Drawn by				© Hitachi Energy	1
Rev	Revision	Appd	Year Week	Iss by Dept	Year Week	Cont.				

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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.

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.

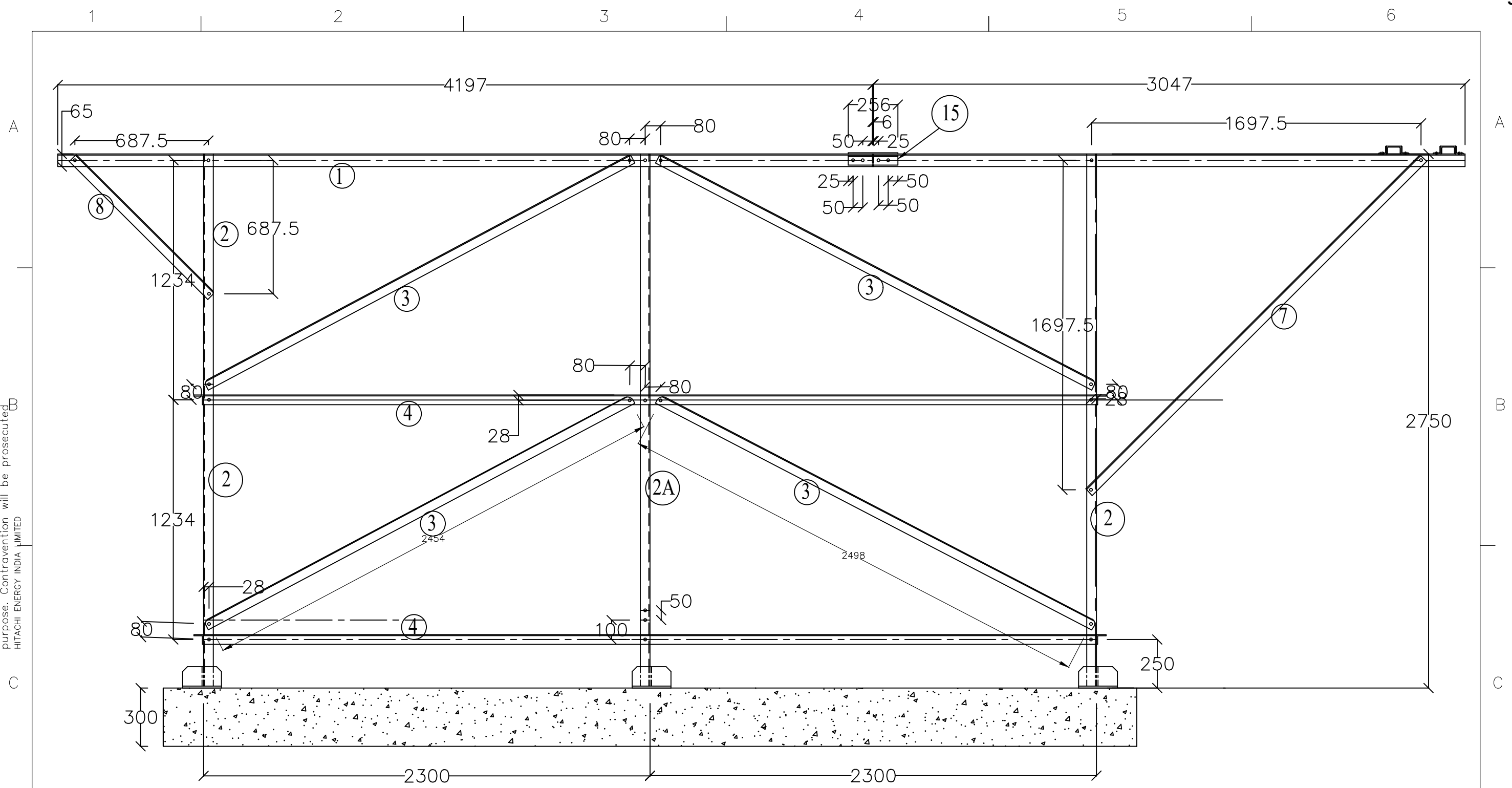
Rev	Revision	Appd	Year	Week

Design checked by: VK	LAYOUT DRAWING OF 38 kV, 7.2 MVAR, 3 PH, CAPACITOR BANK	HITACHI ENERGY DRAWING NO.: YC1H423188-050
Drawing checked by: SK		
Drawn by: HKR		

Iss by Dept	Year Week
PGHV-C	24 01

Rev	Scale
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	1 OF 1
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### ELEVATION

- 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.

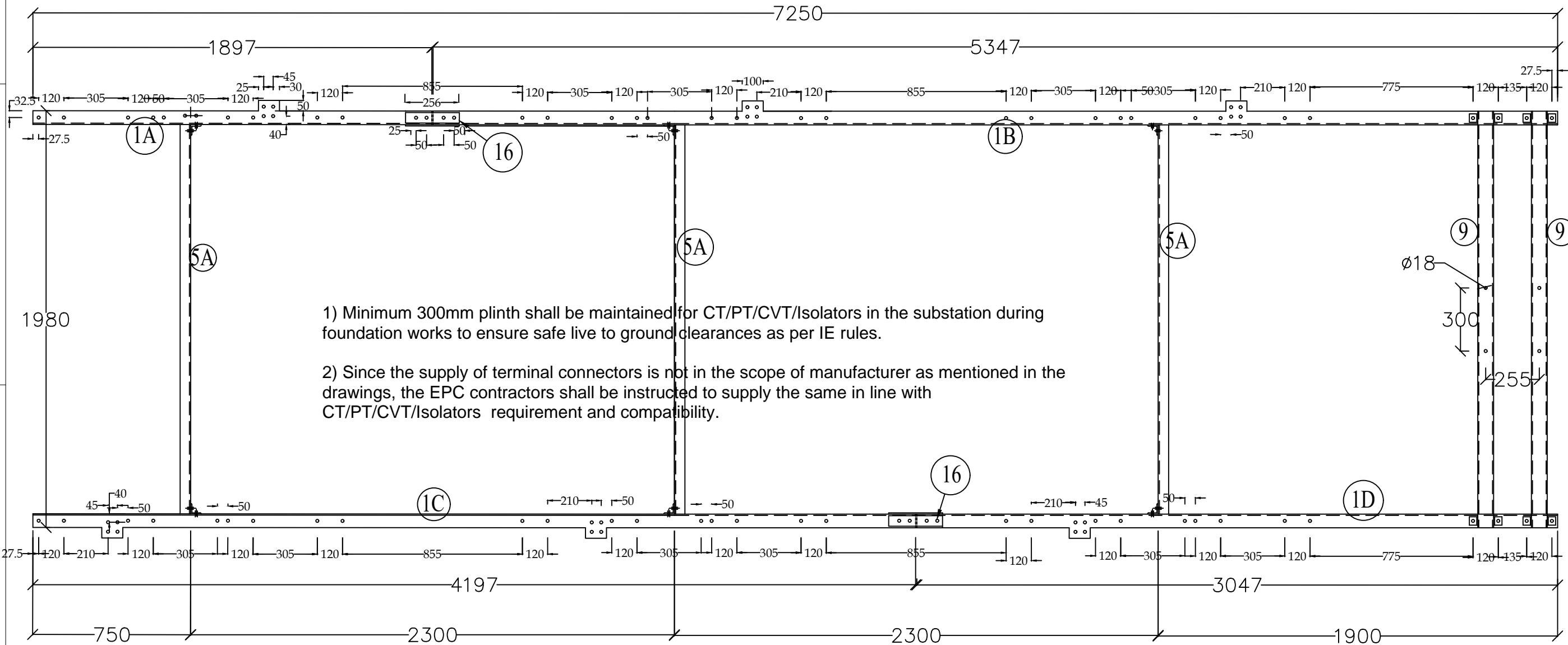
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		CUSTOMER : M/s APTRANSCO	Design checked by: VK	SUPPORT STRUCTURE FOR 38 kV, 7.2 MVAR	HITACHI ENERGY DRAWING NO.:	Rev	Scale
			Drawing checked by : SK	3 PH, CAPACITOR BANK & NCT.		00	NTS
			Drawn by : HKR		Iss by Dept PGHV-C		Sheet
					Year Week 24 06		1 OF 4
Rev	Revision	Appd	Year	Week	YC1H423188-080		Cont.
							2 OF 4

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# PLAN

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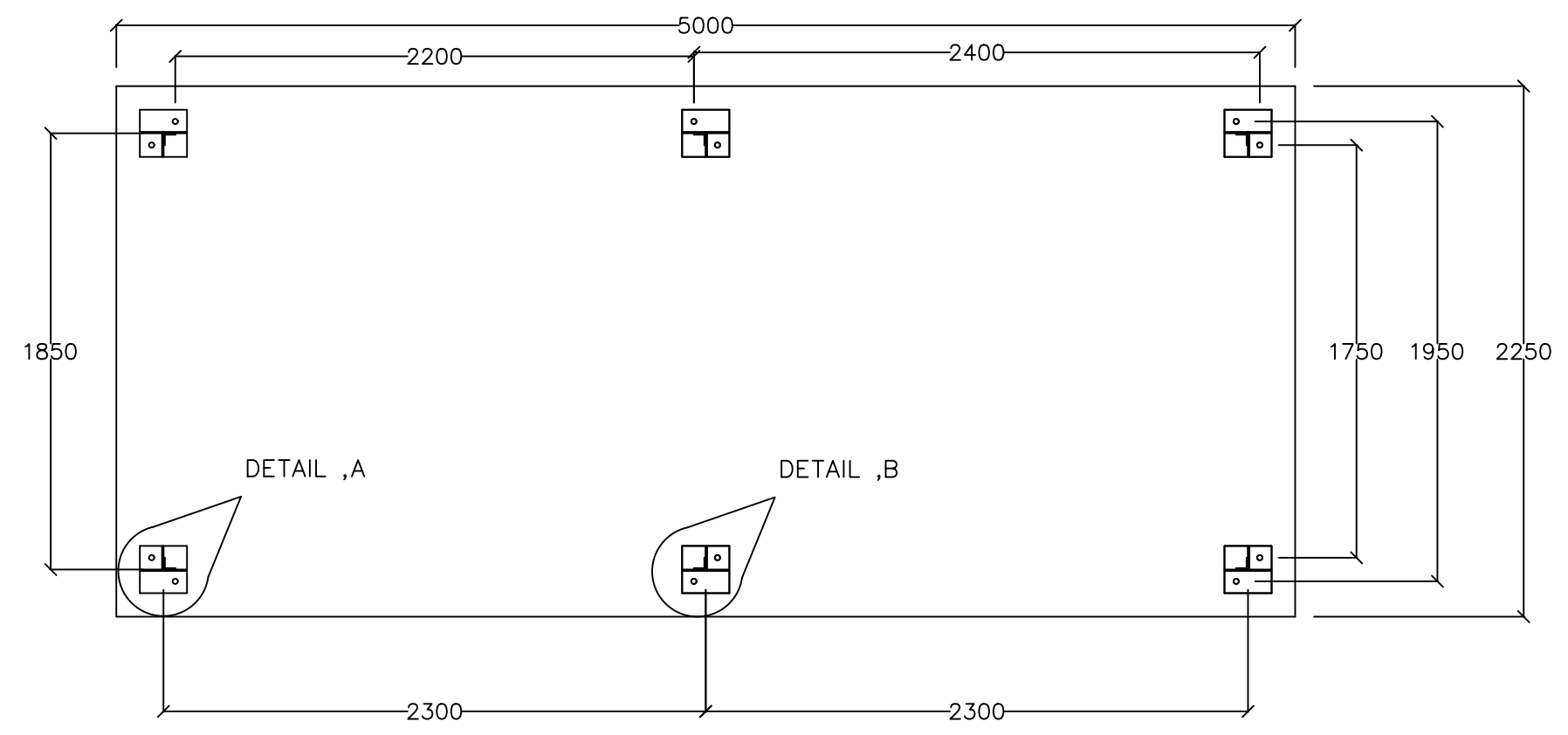
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																Drawing checked by : SK		3 PH, CAPACITOR BANK & NCT.		00		NTS		Sheet	
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																Hitachi Energy		Iss by Dept		Year Week		3 OF 4			
																		PGHV-C		24 06		YC1H423188-080			



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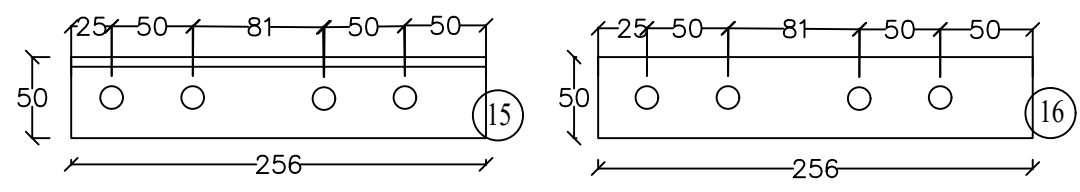
HEIGHT OF THE CAPACITOR	:1404mm
HEIGHT OF THE NCT	:990
HEIGHT OF STRUCTURE	:2750mm
HEIGHT OF PLINTH	:300mm
QUANTITY/BANK	:1No
WEIGHT OF STRUCTURE	:489Kgs.(APPROX)



**BILL OF MATERIAL**

Part no.	DESCRIPTION	LENGTH	QTY.
1A	L 65 x 65 x 6	1897	1 Nos.
1B	L 65 x 65 x 6	5347	1 Nos.
1C	L 65 x 65 x 6	4197	1 Nos.
1D	L 65 x 65 x 6	3047	1 Nos.
2	L 50 x 50 x 6	2740	3 Nos.
2A	L 50 x 50 x 6	2740	3 Nos.
3	L 50 x 50 x 5	2491	8 Nos.
4	L 50 X 50 X 5	4600	4 Nos.
5	L 50 x 50 x 5	1850	5 Nos.
5A	L 50 x 50 x 6	1850	3 Nos.
6	L 50 X 50 X 5	2131	4 Nos.
7	L 50 X 50 X 5	2434	2 Nos.
8	L 50 X 50 X 5	687.5	2 Nos.
9	ISMC 75 x 40	1950	2 Nos.
10	PLATE 200 x 10	200	6 Nos.
11	PLATE 100 x 6	200	6 Nos.
12	PLATE 100 x 6	100	6 Nos.
13	PLATE 50 x 6	100	6 Nos.
14	40 x 40 x 5	40	8 Nos.
15	50 x 50 x 6	256	2 Nos.
16	PLATE 50 x 6	256	4 Nos.
17	BOLT 8 X 2		16 Nos.
18	M-20 ANCHOR BOLTS	650	12 Sets.
19	M-12 HARDWARE	40	104 Sets

**FOUNDATION DETAILS**



**NOTE**  
 1. ALL STRUCTURAL MS SHALL CONFIRM TO IS: 2062 2006.  
 2. UNLESS SPECIFIED ALL HOLES ARE OF 14# FOR M-12 BOLTS.  
 3. ALL WELDINGS ARE 6mm. FILLET WELDS.  
 4. 3mm SPRING WASHER SHALL BE SUPPLIED WITH EVERY BOLT.  
 5. ALL BOLTS SHOULD CONFIRM TO IS:6639-2005  
 6. TOLERANCE FOR HOLE DISTANCE(CENTRE TO CENTRE) ±5mm.  
 7. THE ELEVATING STRUCTURES ARE HOT DIP GALVANISED.  
 8. THE ZINC COATING AT ANY POINT ON THE STR. WILL BE 910gms/Mt.sq.  
 9. THE ZINC COATING SHALL WITHSTAND MIN. FOUR DIPS IN CU. SULPHATE SOLUTION, EACH DIP LASTING FOR ONE MINUTE AS PER IS: 2629-1990.  
 10. ALL FABRICATION SHALL BE AS PER IS:802(PART II)-1992.  
 11. ALL CROSS-ANGLE DIMENSIONS ARE APPROXIMATE.  
 12. ALL DIMENSIONS ARE IN MM. UNLESS OTHERWISE SPECIFIED.  
 13. REFERENCE DRG.No YC1H420920-001.

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

TO BE CHECKED DURING ACCEPTANCE TESTS.

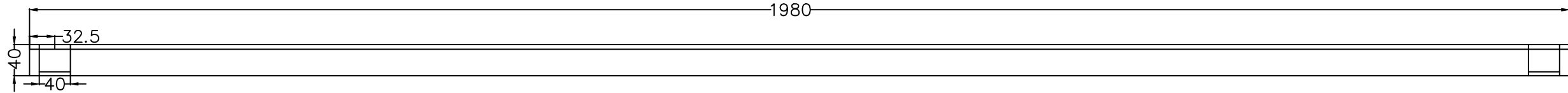
Chief Engineer  
Projects

6917 5339 - AA (A3) Rev 1			CUSTOMER : M/s APTRANSCO		Design checked by: VK	SUPPORT STRUCTURE FOR 38 kV, 7.2 MVAR	HITACHI ENERGY DRAWING NO.:	Rev	Scale
					Drawing checked by : SK	3 PH, CAPACITOR BANK & NCT.		00	NTS
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							YC1H423188-080		Cont. ---

1 2 3 4 5 6

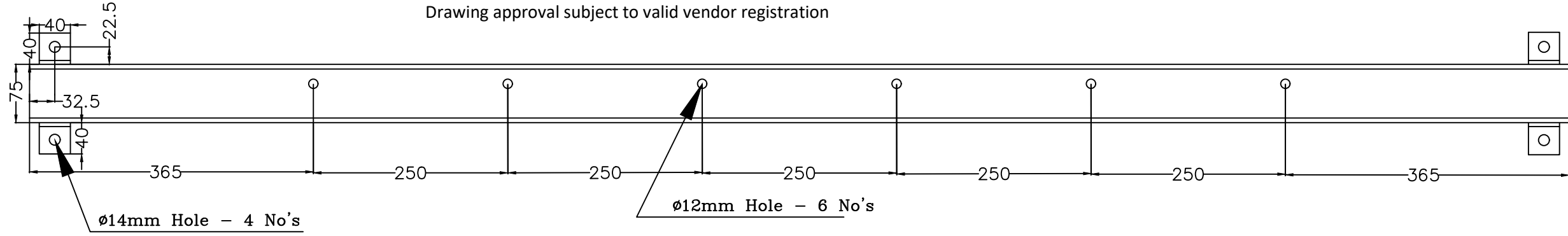
Drawing approval subject to valid vendor registration

- 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.

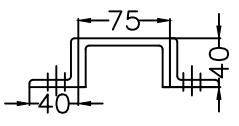


FRONT VIEW

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TOP VIEW



SIDE VIEW

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

- NOTE:
- 1. WEIGHT/PIECE : 14.4KG (APPROX)
  - 2. QTY/BANK : 12NOS
  - 3. MATERIAL : ISMC 75 MM CHANNEL & 40 X 40 X 6 MM MS ANGLE.
  - 4. ALL DIAMENSION ARE IN mm..
  - 5. TOLERANCES ARE AS PER IS:2102(PART-1) -1993  
VERY COARSE - CLASS OF DEVIATION.

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Projects

CUSTOMER : M/s APTRANSCO				Design checked by: VK	CAPACITOR MOUNTING CHANNEL		HITACHI ENERGY DRAWING NO.:	Rev	Scale
				Drawing checked by : SK				00	NTS
				Drawn by : HKR			Iss by Dept Year Week PGHV-C 24 06		Sheet 1 OF 1
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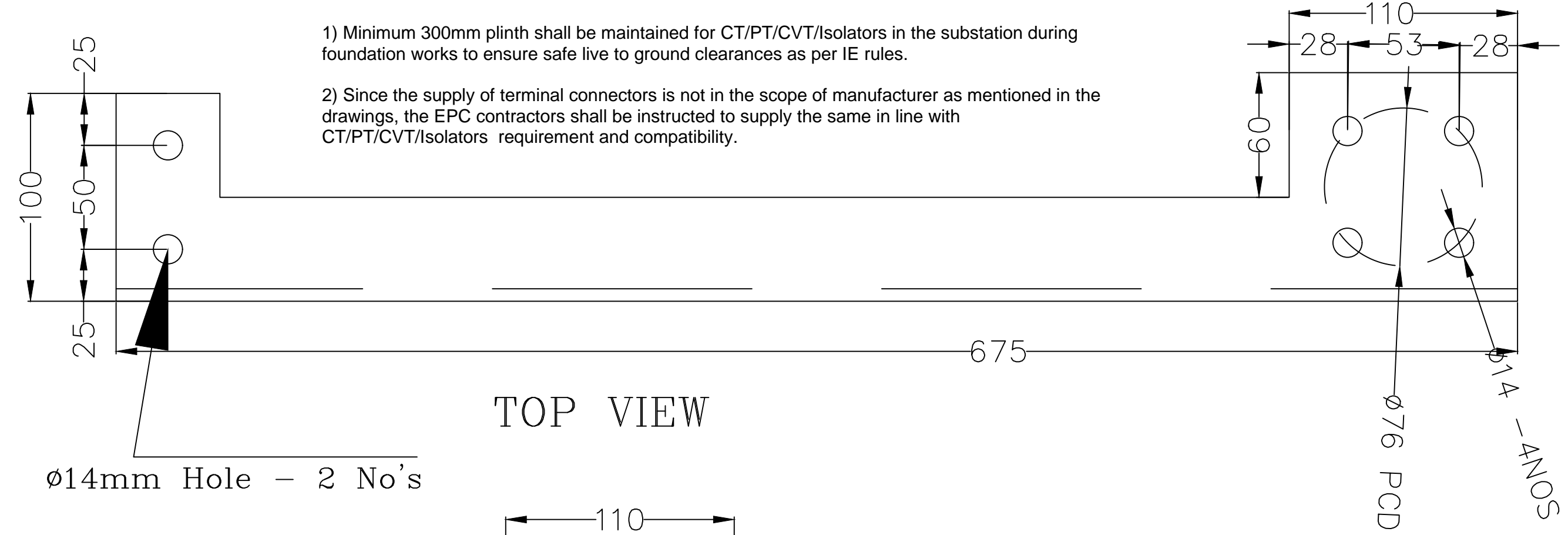
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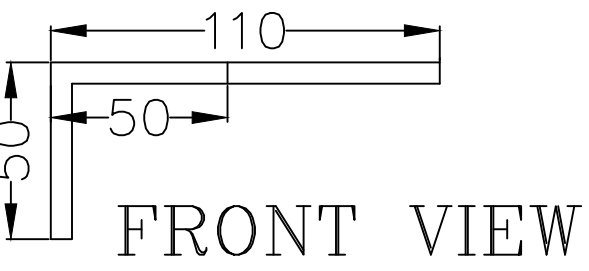
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- 1) Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators in the substation during foundation works to ensure safe live to ground clearances as per IE rules.
- 2) Since the supply of terminal connectors is not in the scope of manufacturer 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.



Ø14mm Hole - 2 No's



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

- NOTE:
- 1. WEIGHT/PIECE : 2.6KG (APPROX)
  - 2. QTY/BANK: 4NOS
  - 3. MATERIAL : 50 X 50 X 6MM MS ANGLE, 50 X 50 X 6 MM MS PLATE & 60 X 110 X 6MM.
  - 4. ALL DIAMENSION ARE IN mm..
  - 5. TOLERANCES ARE AS PER IS:2102(PART-1) -1993 VERY COARSE - CLASS OF DEVIATION.

Chief Engineer  
Projects

CUSTOMER : M/s APTRANSCO			Design checked by: VK	RECATOR SUPPORT ANGEL RIGHT SIDE	HITACHI ENERGY DRAWING NO.:	Rev	Scale
			Drawing checked by : SK			00	NTS
			Drawn by : HKR	Hitachi Energy	Iss by Dept Year Week PGHV-C 24 06		Sheet 1 OF 1
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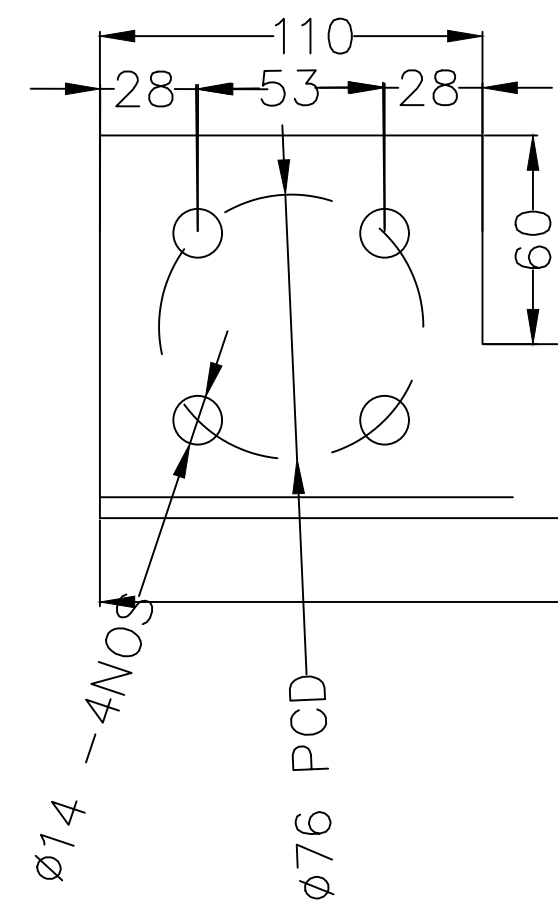
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C

D

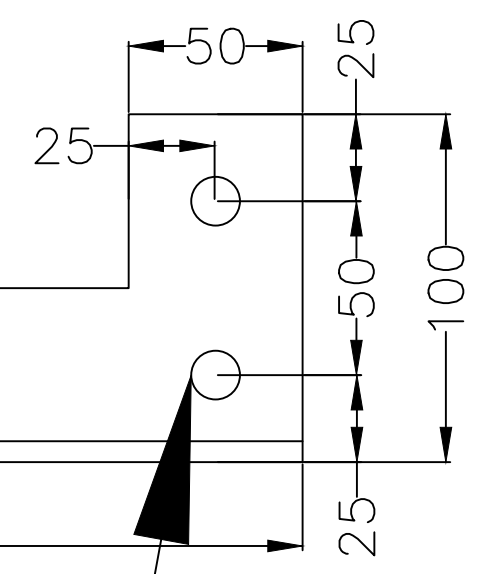
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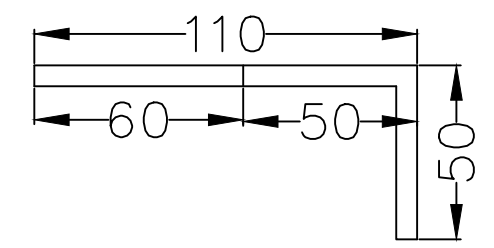


- 1) Minimum 300mm plinth shall be maintained for CT/PT/CVT/Isolators in the substation during foundation works to ensure safe live to ground clearances as per IE rules.
- 2) Since the supply of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/PT/CVT/Isolators requirement and compatibility.

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TOP VIEW



FRONT VIEW

Ø14mm Hole - 2 No's

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

- NOTE:
1. WEIGHT/PIECE : 2.6KG (APPROX)
  2. QTY/BANK: 2NOS
  3. MATERIAL : 50 X 50 X 6MM MS ANGLE, 50 X 50 X 6 MM MS PLATE & 60 X 110 X 6MM.
  4. ALL DIAMENSION ARE IN mm..
  5. TOLERANCES ARE AS PER IS:2102(PART-1) -1993 VERY COARSE - CLASS OF DEVIATION.

Chief Engineer  
Projects

Rev		Revision		Appd		Year		Week		CUSTOMER : M/s APTRANSCO	Design checked by: VK	RECATOR SUPPORT ANGEL LEFT SIDE		HITACHI ENERGY DRAWING NO.:		Rev	Scale	
											Drawing checked by : SK			YC1H423188-084		00	NTS	
											Drawn by : HKR	Hitachi Energy		Iss by Dept	Year Week	1 OF 1		Cont.
											PGHV-C		23 06				---	



TECHNICAL DOCUMENT  
 HV Capacitor Division  
 Customer: - APTRANSCO  
 Unbalance Details

Ref: YC1H423188-201  
 Date: 2023-01-10  
 Revision: 00  
 Page: 1 of 4

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2	EXTERNAL FUSE CAPACITOR	2
3.1	DESIGN REQUIREMENT	2-3
3.2	DECISIVE CASE AND RELAY SETTING	4
4.	UNBALANCE SETTINGS	4

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**Prepared By: KJ**  
**Approved by: VK**



TECHNICAL DOCUMENT  
HV Capacitor Division  
Customer: - APTRANSCO  
Unbalance Details

Ref: YC1H423188-201  
Date: 2023-01-10  
Revision: 00  
Page: 2 of 4

## 1. GENERAL

The aim of this report is to coordinate the design and operation of external fuse capacitor faulty element with the settings of the unbalance protection.

## 2. EXTERNAL CAPACITOR

A Capacitor unit comprises of several capacitor elements connected in series and parallel.

The internal design of external fuse capacitors (many elements in series) combined with the method by which the banks are connected (many "strings" of capacitor units in series), account for this design's excellent performance.

A failed element will cause voltage changes within the capacitor unit itself and other Capacitor units.

The elements are connected in parallel strings which have the benefits of less capacitance deviation at element failure, limitation of parallel energy inside the unit and normal bank connection can be used.

### 2.1 Design requirements

#### (i) Voltage stresses within the faulty capacitor unit

The increased voltage across healthy elements in series with faulty elements must not exceed 1.50-1.70 pu rated voltage, according to the capacitor unit manufacturer, see figure 3.1



TECHNICAL DOCUMENT  
 HV Capacitor Division  
 Customer: - APTRANSCO  
 Unbalance Details

Ref: YC1H423188-201  
 Date: 2023-01-10  
 Revision: 00  
 Page: 3 of 4

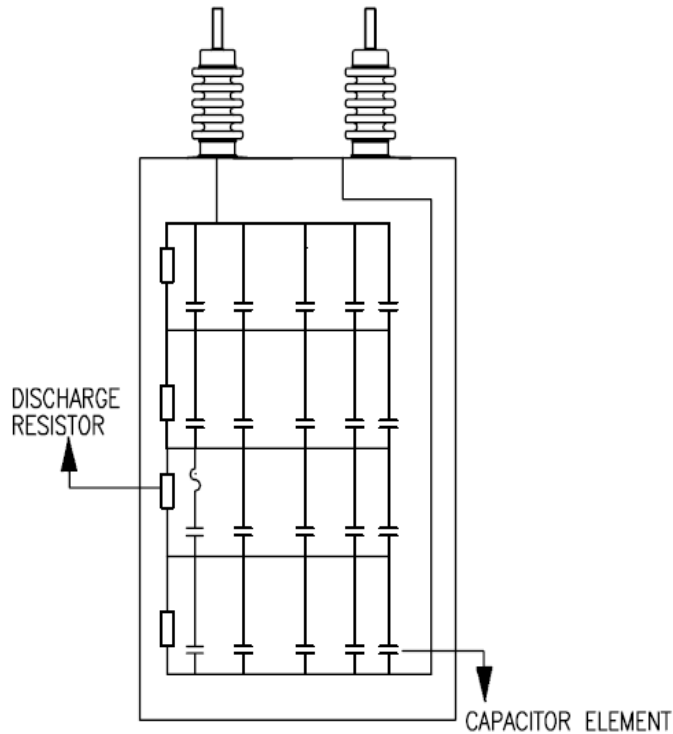


Fig 3.1 Circuit diagram of high voltage capacitor with discharge resistors

1. Discharge resistor
2. Capacitor elements, connection  $s_i \times p_i$

Where

$S_i$  = Number of elements in series

$P_i$  = Number of elements in parallel

## (ii) Voltage stresses within the capacitor segment

The increased voltage across healthy units in parallel with a faulty unit must not exceed 1.1 pu rated voltage

## 2.2 Decisive case and relay settings

If either of the condition (i) and (ii) is exceeded, the unbalance protection shall initiate bypassing of the segment. An alarm signal shall be initiated at a level that is lower than the bypass level.

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Prepared By: KJ  
 Approved by: VK

TECHNICAL DOCUMENT  
 HV Capacitor Division  
 Customer: - APTRANSCO  
 Unbalance Details

Ref: YC1H423188-201  
 Date: 2023-01-10  
 Revision: 00  
 Page: 4 of 4

The level of unbalance (corresponding to the level of voltage stress) is determined by means of measurement of magnitude of the unbalance current in flowing in the unbalance branch of the capacitor segment.

### 3. UNBALANCE SETTINGS:

- ❖ **Bank details :38 kV, 7.2 MVAR, 3PH, YY connected capacitor bank.**  
**Unit Rating: 21.94 kV, 200 kVAR, 1PH, Externally fused, 50 Hz Unit**  
**S=1, P1=6, P2=6**

Table 3.1 Capacitor Unbalance protection setting

Level	Unbalance current (A)	T delay(s)
ALARM	1.531	1 second
- TRIP	2.457	0.1 second

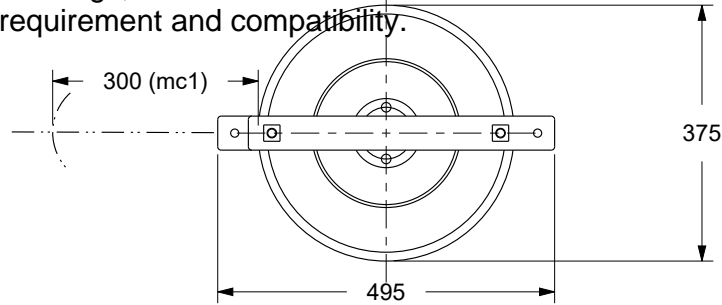
Chief Engineer  
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NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

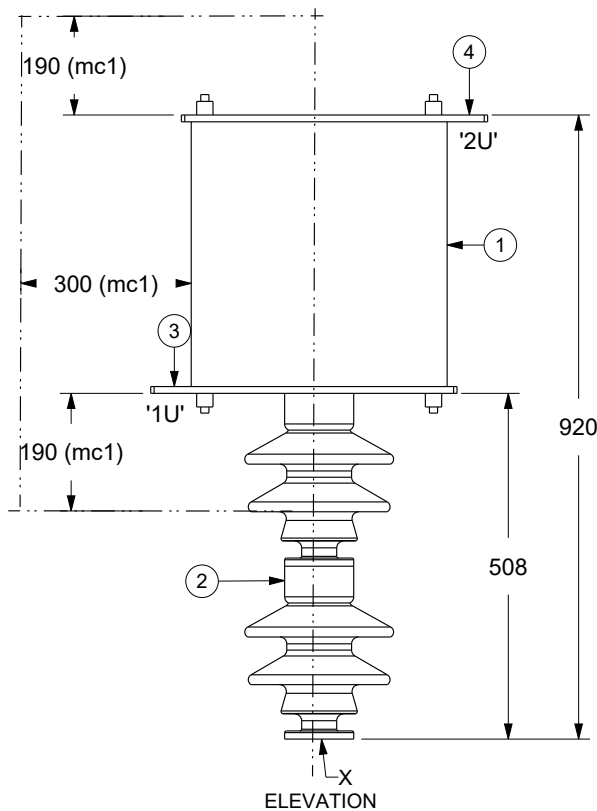
TO BE CHECKED DURING ACCEPTANCE TESTS.

8534178/2024 SHEET ENDS  
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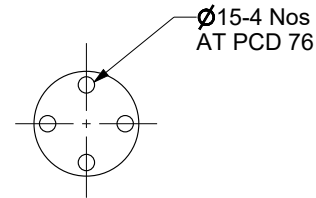
of terminal connectors is not in the scope of manufacturer as mentioned in the drawings, the EPC contractors shall be instructed to supply the same in line with CT/IVT/CVT requirement and compatibility.



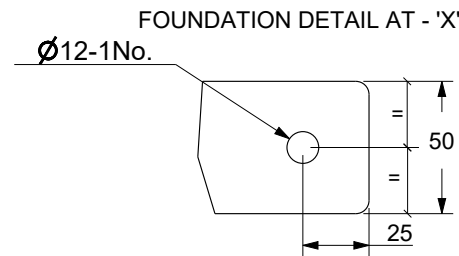
PLAN



ELEVATION



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INCOMING & OUTGOING  
AL. TERMINAL 1U, 2U

No	DESCRIPTION	QTY/COIL
1	ALUMINIUM WOUND COIL	1
2	22 kV POST INSULATOR	2
3	INCOMING TERMINAL '1U'	-
4	OUTGOING TERMINAL '2U'	-

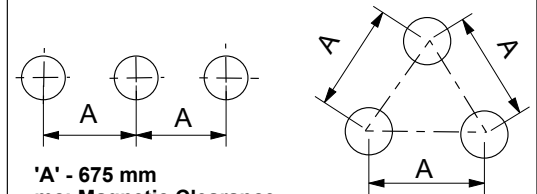
TYPE OF REACTOR  
AIR CORE, AIR COOLED, ALUMINIUM WOUND, EPOXY RESIN IMPREGNATED, DRY TYPE, OUTDOOR SERIES REACTOR

REFERENCE STANDARD	IS-5553 PART III - 1990
COOLING	AN
RATED VOLTAGE	33 kV
REACTANCE PER PHASE	0.802 Ω
NO. OF PHASE	ONE
RATED CURRENT	54.7 A
RATED KVAr PER PHASE	2.4
RATED SHORT TIME CURRENT	0.91 kA / 2 Sec.
RATED FREQUENCY	50 Hz
BIL	70 kV / 170 kVp
INSULATION CLASS	F(155) °C
AVERAGE TEMP. RISE IN WINDING OVER AMBIENT BY RESISTANCE METHOD	90° C
TOTAL WEIGHT WITH INSULATORS	23 kgs App.

NOTE:-

- 1) ALL DIMENSIONS ARE mm
- 2) OVERALL DIMENSIONS AND WEIGHT TOLERANCE +/-10%
- 3) DRAWING NOT TO SCALE

**MINIMUM CENTER DISTANCE BETWEEN TWO COILS**



'A' - 675 mm  
mc: Magnetic Clearance

Air core reactors cause magnetic fields which induces thermal and electromagnetic stresses in the vicinity. The recommended minimum magnetic contour 1 (mc1) is shown in the drawing where magnetic or metallic materials should not be placed. The magnetic contour 2 (mc2) is twice mc1 for metallic forming closed loops. Special care should be undertaken for electronic equipments placed in the vicinity of the reactor.

**QUALITY POWER**  
ELECTRICAL EQUIPMENTS PVT. LTD.,  
L-61 M.I.D.C. Kupwad, Sangli. INDIA  
www.qualitypower.com

TITLE :- GENERAL ASSEMBLY DRAWING OF 33kV, 54.7A, 0.802 Ω SERIES REACTOR

CUSTOMER :- ABB INDIA LTD.

		SIGN	DATE	DRG.No.	
DRN	SK		04.06.2018	QP-AN-GA-23227-18	
CHD	SN		04.06.2018		
APD	RMK		04.06.2018	REVISION	REF.No.
SHEET : 01 OF 1				0	FO-3256



TO BE CHECKED DURING ACCEPTANCE TESTS.

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.

DATASHEET FOR CAPACITOR BANK									
1	Manufacturer's Name						Hitachi Energy India Ltd		
2	Maker's Type Designation						CHD		
3	Reference Standard						IS-13925		
4	Purpose						Power Factor Improvement		
5	Location						Outdoor		
6	System Specifications								
	a	Bus Voltage		KV		33			
	b	Voltage variation				+15/-25			
	c	Bus Frequency		Hz		50			
	d	Frequency variation				+/- 5			
7	Ambient Temperature:								
	a	Maximum Temperature		°C		50			
	b	Minimum Temperature		°C		7.5			
8	Capacitor Bank(s) rating								
	a	Rated output (Installed)		kV		38			
				MVA		7.2			
	b	No. of Phases		Nos.		3			
	c	Type of Connection				YY			
	d	No. of units per bank		No(s)		36			
	e	Power frequency withstand voltage		kVrms		70			
	f	Impulse withstand voltage		kVpeak		170			
	g	Type of mounting				Structure Mounting			
	h	Terminal arrangement							
	i	Incoming suitable for				Suitable for AL Bus Bar			
	ii	Outgoing suitable for				Suitable for AL Bus Bar			
3					Project		38KV, 7.2 MVAR 3-PH		
2					Customer		CAPACITOR BANK		
1							P CHANDRA REDDY & CO		
Rev.	Rev.	AppdBy	Year	Week					
Article No.				Description					
YC1H423188-110				Datasheet for Capacitor Bank					
Design Checked By				Prepared By		Sale Order No.		Offer Ref.	
SK				NK		4202237450		0	
Dwg. Approved By		Issued By Dept.		Year	Week	Format No.		Rev.	Sheet
VK		PGHV-C		2024	1			0	1
PGHV-Capacitor Division						IHYC449001			Cont.
									2

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Projects

Drawing approval subject to valid vendor registration

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

TO BE CHECKED DURING ACCEPTANCE TESTS.

- 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.

DATASHEET FOR CAPACITOR BANK										
9	Capacitor Unit(s) rating									
	a	Phase(s)		Nos.						1
	b	Type								CHD
	c	Rated Output		kVAR						200
	d	Rated Voltage		kV						21.94
	e	Rated Current		Amps						9.12
	f	No. of Bushings		Nos.						2
	g	Unit Protection		Int/ Ext.						External fuse
	h	Losses (In Capacitor Units only after few hours of energisation)		Watts/kVAR						0.2
	i	Di - electric type								All Poly Propylene
	j	Type of Impregnant								Faradol Non PCB
	k	Power frequency withstand voltage		kVrms						70
	l	Impulse withstand voltage		kVpeak						170
	m	Permissible Load								
		i	Voltage							110% of rated voltage
		ii	Current							130% of rated Current
	iii	Output							143% of rated output	
n	Discharging values								Less than 50 V in 600 Secs	
o	Discharge Resistor		Int/ Ext.						Internal	
p	Unit Container material/ Thickness								2 mm CRCA,	
q	Paint shade								631 As per IS-5	
10	Creepage Distance		mm/Kv						25	
11	Tolerance in Capacitance								0-10%	
12	Clearance									
	a	From phase to phase	mm						320	
	b	From phase to earth	mm							
13	Maximum inrush peak current		IS13925 -2012						Shall not Exceed 100 time rated Current	
14	Capacitor Bank Mounting								Side by Side ( R phase /Y Phase /B phase )	
15	Spare Capacitor								10% of the Bank Capacitor Unit ( 4 No's)	
16	General Arrangement Drawing No.								YC1H423188-110 YC1H423188-031	
3						Project	38KV, 7.2 MVAR 3-PH CAPACITOR BANK			
2						Customer	P CHANDRA REDDY & CO			
1										
Rev.	Rev.	AppdBy	Year	Week						
Article No.			Description							
YC1H423188-110			Datasheet for Capacitor Bank							
Design Checked By			Prepared By			Sale Order No.		Offer Ref.		
SK			NK			4202237450		0		
Dwg. Approved By		Issued By Dept.		Year	Week	Format No.		Rev.	Sheet	
VK		PGHV-C		2024	1			0	2	
PGHV-Capacitor Division						IHYC449001			Cont.	
									-	

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8534178/2024/EEMRT-ENE51

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

TO BE CHECKED DURING ACCEPTANCE TESTS.

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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DATASHEET FOR SERIES REACTOR						
1	Manufacturer's Name				Quality Power	
2	Maker's Type Designation				As per Manufacturer's Standard	
3	Reference Standard				IS-5553, Part-3, 1990	
4	Purpose				Inrush Current Limiting	
5	Location				Outdoor	
6	System Specifications					
	a	Bus Voltage		KV	33	
	b	Voltage variation			+/- 10	
	c	Bus Frequency		Hz	50	
	d	Frequency variation			+/- 5	
	e	Highest system voltage		KV	36	
7	Ambient Temperature:					
	a	Maximum Temperature		°C	50	
	b	Minimum Temperature		°C	7.5	
8	Type of Series Reactor					
	a	Type of Core			Air Core	
	b	Type of Shielding			Non- Magnetically	
	c	No. of Phases			1-Phase	
	d	Connection			Neutral Side	
	e	Type of Mounting			Structure	
9	Rating of Series Reactor					
	a	Rated current		Amps	54.7	
	b	Inductive impedance		Ohms/Ph	0.802	
	c	Rated KVAR		KVAR	2.4	
	d	Max. permissible continuous current		%	130% of Rated Current	
	e	Short time current rating (for 2 sec)				
		i	Winding	kA	16.5 times 130% of rated current for	
		ii	Terminal	kA	2 sec	
3					Project	38KV, 7.2 MVAR 3-PH
2					Customer	CAPACITOR BANK
1						P CHANDRA REDDY & CO
Rev.	Rev.	AppdBy	Year	Week		
Article No.			Description			
YC1H423188-110			Datasheet for Series Reactor			
Design Checked By		Prepared By		Sale Order No.	Offer Ref.	
VU		NK		4202237450	0	
Dwg. Approved By		Issued By Dept.	Year	Week	Format No.	Rev. Sheet
VK		PPHVC	2024	1		1 1
PGHV-Capacitor Division				IHYC449002		Cont.
						2

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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.

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DATASHEET FOR SERIES REACTOR							
10	Class of Insulation			Class F(155°C)			
11	Tolerance in Inductance			As per IS 5553			
12	Insulation level						
	a	Power Frequency withstand voltage	kVrms	70			
b	Impulse withstand voltage	kVpeak	170				
13	Terminal arrangement						
	a	Incoming suitable for	Bus bar				
b	Outgoing suitable for	Bus bar					
14	Winding material			Aluminium.			
20	Quantity	Nos.		6			
21	General Arrangement Drawing No.			QP-AN-GA-23227-18			
3				Project	38KV, 7.2 MVAR 3-PH CAPACITOR		
2				Customer	P CHANDRA REDDY & CO		
1							
Rev.	Rev.	AppdBy	Year	Week			
Article No.			Description				
YC1H423188-110			Datasheet for Series Reactor				
Design Checked By			Prepared By		Sale Order No.	Offer Ref.	
VU			NK		4202237450	0	
Dwg. Approved By		Issued By Dept.	Year	Week	Format No.	Rev.	Sheet
VK		PPHVC	2024	1		1	2
PGHV-Capacitor Division					IHVC449002		Cont.
							-

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Projects

NOTE : DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS.

8534178/2024/EEMRT-ENE51

TO BE CHECKED DURING ACCEPTANCE TESTS.

## DATASHEET FOR NEUTRAL CURRENT TRANSFORMER

1	Manufacturer's Name				Kalpa Electrical Pvt Ltd.		
2	Maker's Type Designation				Outdoor Oil Cooled NCT Live Tank Single Phase		
3	Reference Standard				IS16227-1&2		
4	Purpose				Unbalance Protection		
5	Location				Outdoor		
6	System Specifications						
	a	Bus Voltage		KV	33		
	b	Voltage variation			+/- 10		
	c	Highest System Voltage		KV	36		
	d	Bus Frequency			50		
	e	Frequency variation		KV	+/- 5		
7	Ambient Temperature:						
	a	Maximum Temperature		°C	50		
	b	Minimum Temperature		°C	7.5		
8	Neutral Current Transformer's rating						
	a	Voltage rating		kV	33		
	b	Type			Oil cooled		
	c	Ratio		Amps	10-5/1-1		
	d	No. of Cores		Nos.	2		
	e	Burden		VA	15/15		
	g	Type of installation			Structure		
9	Over Current Factor				100 times the rated Current for 3 Sec		
10	Insulation level						
	a	Power Frequency withstand voltage		kVrms	70		
	b	Impulse withstand voltage		kVpeak	170		
11	Class of accuracy						
	a	Core-I			1		
	b	Core-II			5P20		
12	Terminal arrangement						
	a	Primary			Suitable for AI Busbars		
	b	Secondary			Suitable for LT Control Cables		
13	Min Creepage distance of Porcelain Housing				mm	900	
14	Quantity				No(s)	1	
15	General Arrangement Drawing No.				KE-33OCT-325-375C		
16	Tank Paint Shade				631 As per IS5		
17	P.D @ Um (PD will be done as per IS standard)				<10 p C		
18	P.D @ 1.2 * Um /√3				<5 p C		
3					Project	38KV, 7.2 MVAR 3-PH CAPACITOR BANK	
2					Customer	P CHANDRA REDDY & CO	
1							
Rev.	Rev.	AppdBy	Year	Week			
Article No.				Description			
YC1H423188-110				Datasheet for Capacitor Bank Neutral Current Transformer			
Design Checked By				Prepared By		Sale Order No.	Offer Ref.
SK				NK		4202237450	0
Dwg. Approved By		Issued By Dept.		Year	Week	Format No.	Rev.
VK		PGHVC		2024	1		-
				PGHV-Capacitor Division		IHYC449002	Cont.
							-

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