

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

420 kV CAPACITOR VOLTAGE TRANSFORMER TYPE: CPB-H 420

CLIENT:
(AS APPLICABLE)

Since the supply of terminal connectors is not in the scope of Manufacturer as mentioned in the drawings The EPC contractor shall be instructed to supply the same in line with CT/PT/CVT/Isolator/VT/LA/Breakers, requirement and capability.

END CUSTOMER:
APTRANSCO

Ground clearance of 8000mm shall be maintained from plinth level during erection.

PROJECT:
(AS APPLICABLE)

W.O. NO.:
(AS APPLICABLE)

P.O. NO.:
(AS APPLICABLE)

Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

QTY.:
(AS APPLICABLE)

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Ⓐ New drg. prepared.

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SR. NO.	REFERENCE OF STD DRGS/ DOCUMENTS	REV.	DESCRIPTION
1.	1HYT903320-085	A	GENERAL ARRANGEMENT - 31mm/kV
2.	1HYT903320-086	A	RATING PLATE - 31mm/kV
3.	1HYT903320-087	A	SECONDARY TERMINAL BOX
4.	1HYT903320-088	A	SECTIONAL VIEW
5.	1HYT903320-089	A	INSULATOR- 31mm/kV

Drawing approval subject to valid vendor registration

Prepared: SR	Checked: SNP	Approved: SN
Without Sep. PL.: <input type="checkbox"/>	SamePL.Same No.: <input type="checkbox"/>	Sep. PL.Other No.: <input type="checkbox"/>
Derived by:	Supersedes:	Supersedes by:
A 2022-07-07		

LIST OF DOCUMENTS FOR CPB-H 420 TYPE CVT

	Scale NTS
	T.Sh. 1
	Sheets 1

ABB HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL)

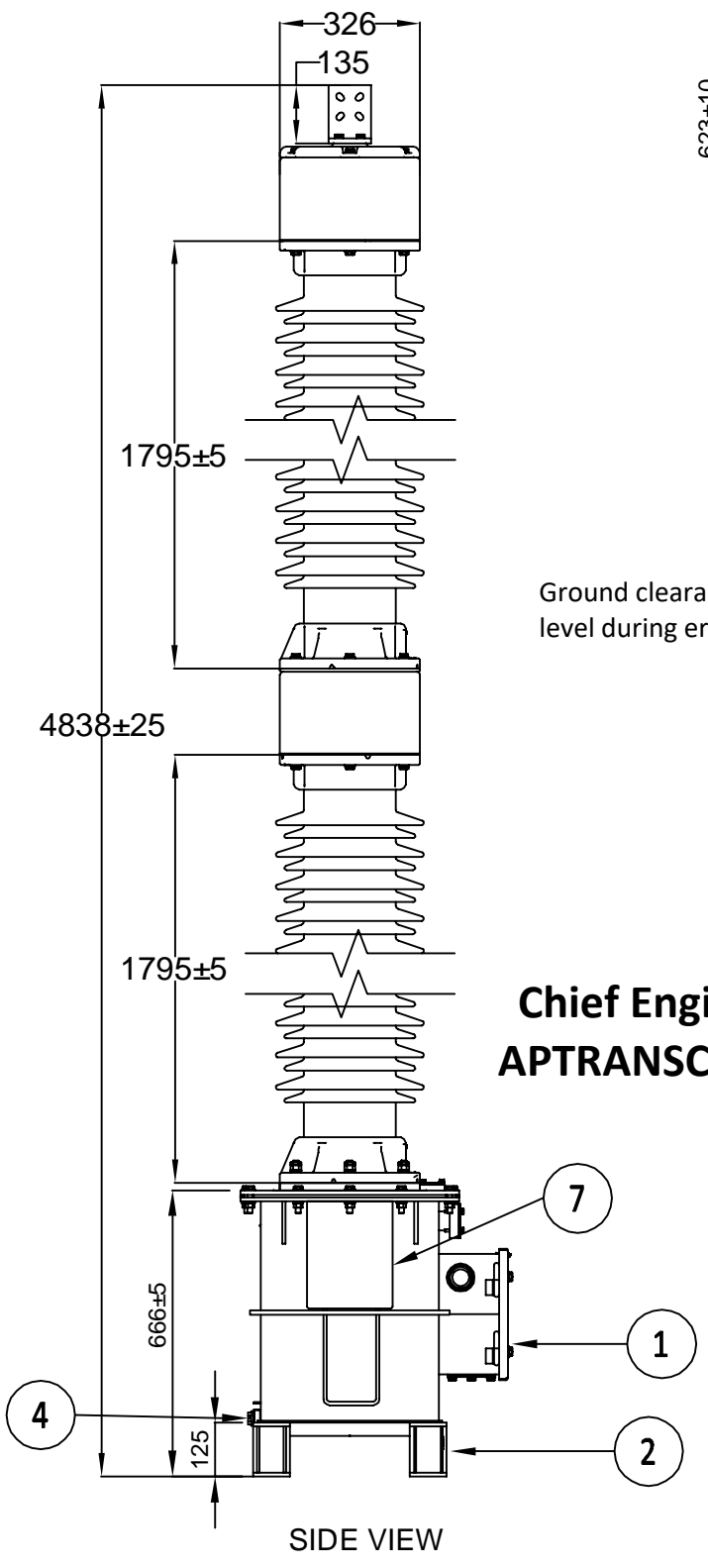
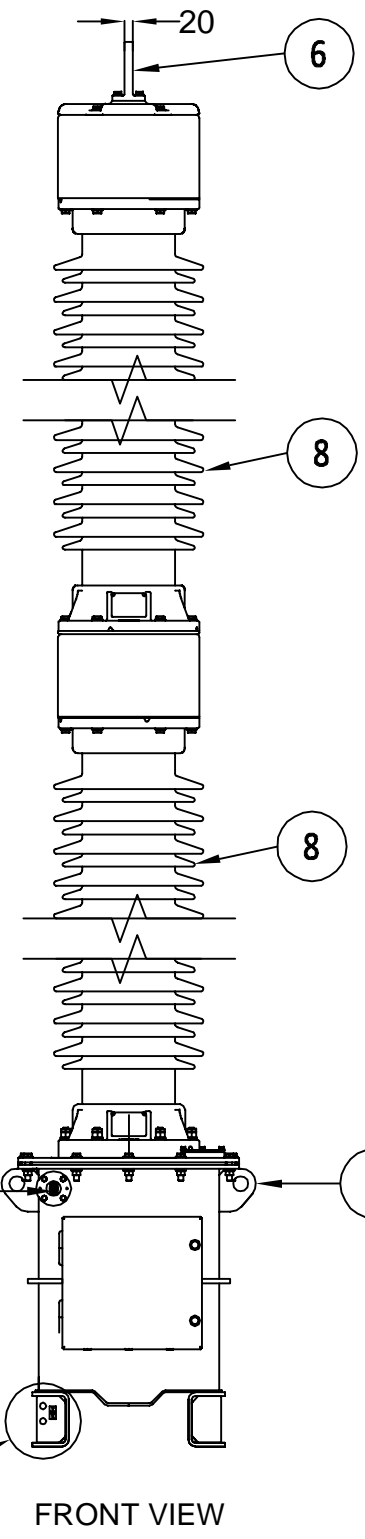
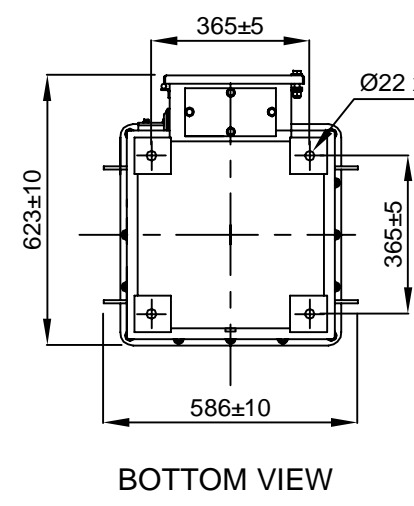
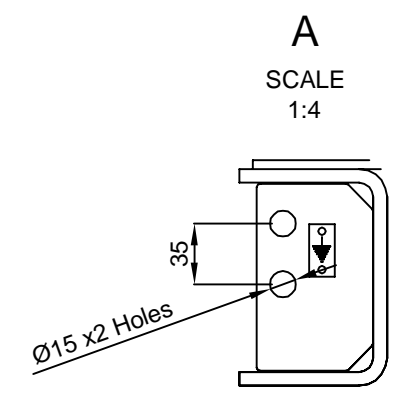
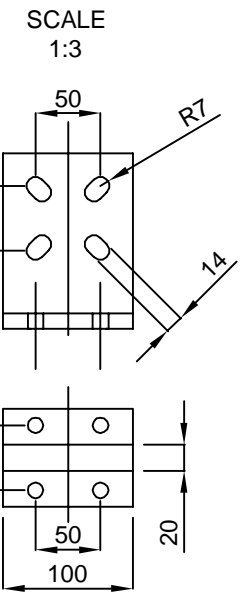
1HYT903320-084

1 2 3 4 5 6 7 8

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APTRANSCO/VS/Vijayawada.**

9	EMU TANK	MS HOT DIP GALVANISED	1
8	INSULATOR	PORCELAIN	2
7	RATING PLATE	ALUMINUM	1
6	PRIMARY TERMINAL	ALUMINUM	1
5	OIL LEVEL INDICATOR	TOUGHENED GLASS	1
4	OIL DRAIN PLUG	MS HOT DIP GALVANISED	1
3	LIFTING LUG	MS HOT DIP GALVANISED	4
2	MOUNTING PAD	MS HOT DIP GALVANISED	4
1	SECONDARY TERMINAL BOX	MS HOT DIP GALVANISED	1
Sr.No.	DESCRIPTION	MATERIAL	QTY.

- Notes:-
1. All exposed ferrous parts including tank are hot dip galvanized.
 2. Connect the HF Terminal to Earth when carrier coupling device is not used.
 3. Nominal Creepage Distance is 13020 mm (31 mm/kV)
 4. All Dimensions are in mm. General Tolerance as per ISO:2768-C.
 5. Porcelain insulators with maximum one joint
 6. CVD bellow material: Stainless Steel
 7. Two nos. earthing provisions provided on mounting pad diagonally.

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Revision Details:
A New drawing prepared.

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Revision				DRAWN: SR	CHECKED: SNP	APPRD.: SN	file: - 3320-085	TOTAL SH. 1
A	2022-07-07						1HYT903320-085	Sh. NO. 1

1 2 3 4 5 6 7 8

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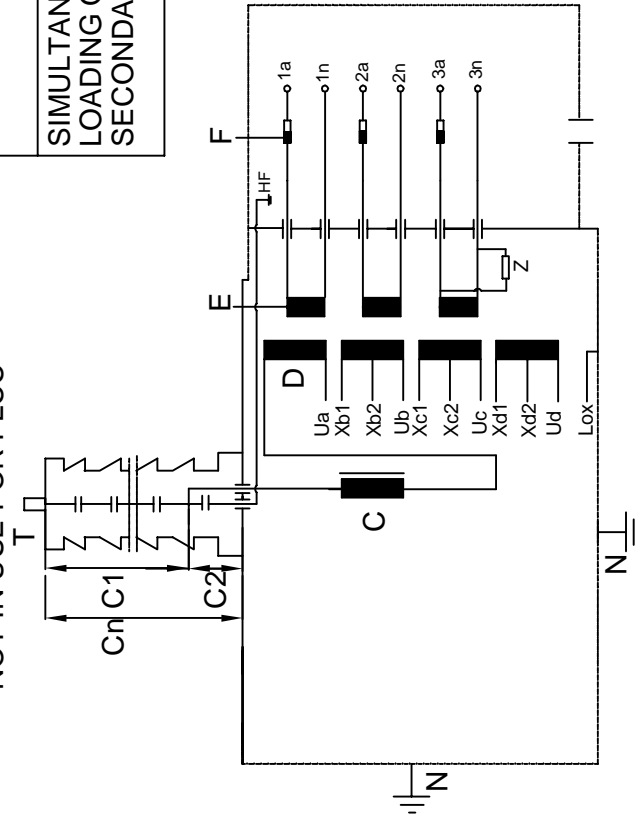
Ground clearance of 8000mm shall be maintained from plinth level during erection.

200±1

ABB		HEIL		Made in India	
1Ph. Capacitor voltage transformer	420	Type	CBP-H 420	Serial No.	xxxxxxx
Highest system volt.kV	630/1050/1425	Rated voltage	kV	400/√3	
Rated Insulation level kV	50	Total creepage minimum	mm	13020	
Rated frequency Hz	IEC: 61869-5	Weight of oil	kg	121	
Standard	4619	Total weight	kg	700	
H.V.(PRI) Cap: C1 pF	92631	Equ.Cap.(Cn)For PLCC pF	4400 ^{+10%} _{-5%}	19/√3	
Int. V(SEC) Cap: C2 pF	-5 to +50 °C	Nominal Intermediate volt kV	MM/YYYY		
Temperature category °C	750 VA	Date of mfg.	YES		
Total thermal burden VA	'A'	Suitable for hot line washing			
Class of Insulation		G.A. drg. No.	1HYT903320-085		

Rated sec. voltage (V)	110/√3	Terminal markings	1a - 1n	Rated burden (VA)	50	Accuracy class	3P
	110/√3		2a - 2n		50		3P
	110/√3		3a - 3n		50		0.2
SIMULTANEOUS LOADING OF SECONDARIES							

EARTH HF TERMINAL WHEN NOT IN USE FOR PLCC



T - H.V. Terminal
 C - Compensating reactor
 D - Primary Winding
 E - Secondary Winding
 F - FUSE
 HF- H.F. Terminal(PLCC)
 N - Earthing
 Z - F.R. Circuit
 Ud-Xd } Compensating windings
 Uc-Xc }
 Ub-Xb }
 Ua-Lead connecting C,D.
 Lox-Earth Terminal

END CUSTOMER: APTRANSCO
 HEIL WORKS ORDER NO : (AS APPLICABLE)
 CLIENT WORK ORDER NO: (AS APPLICABLE)

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 Manufactured by/for a Hitachi Energy company.

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

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1	Rating and Diagram Plate	1	ALUMINUM	Sh. 2mm thk.
QTY	DESCRIPTION	P	MATERIAL /CODE NO	WT LOWER DRG NO.
DRAWN: SR		CHECKED: SNP		APPRD.: SN
file :3320-086		TOTAL SH. 1		
ABB HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL)		1HYT903320-086		
		Sh. NO. 1		

Rating Plate:
 1HYP000428P3

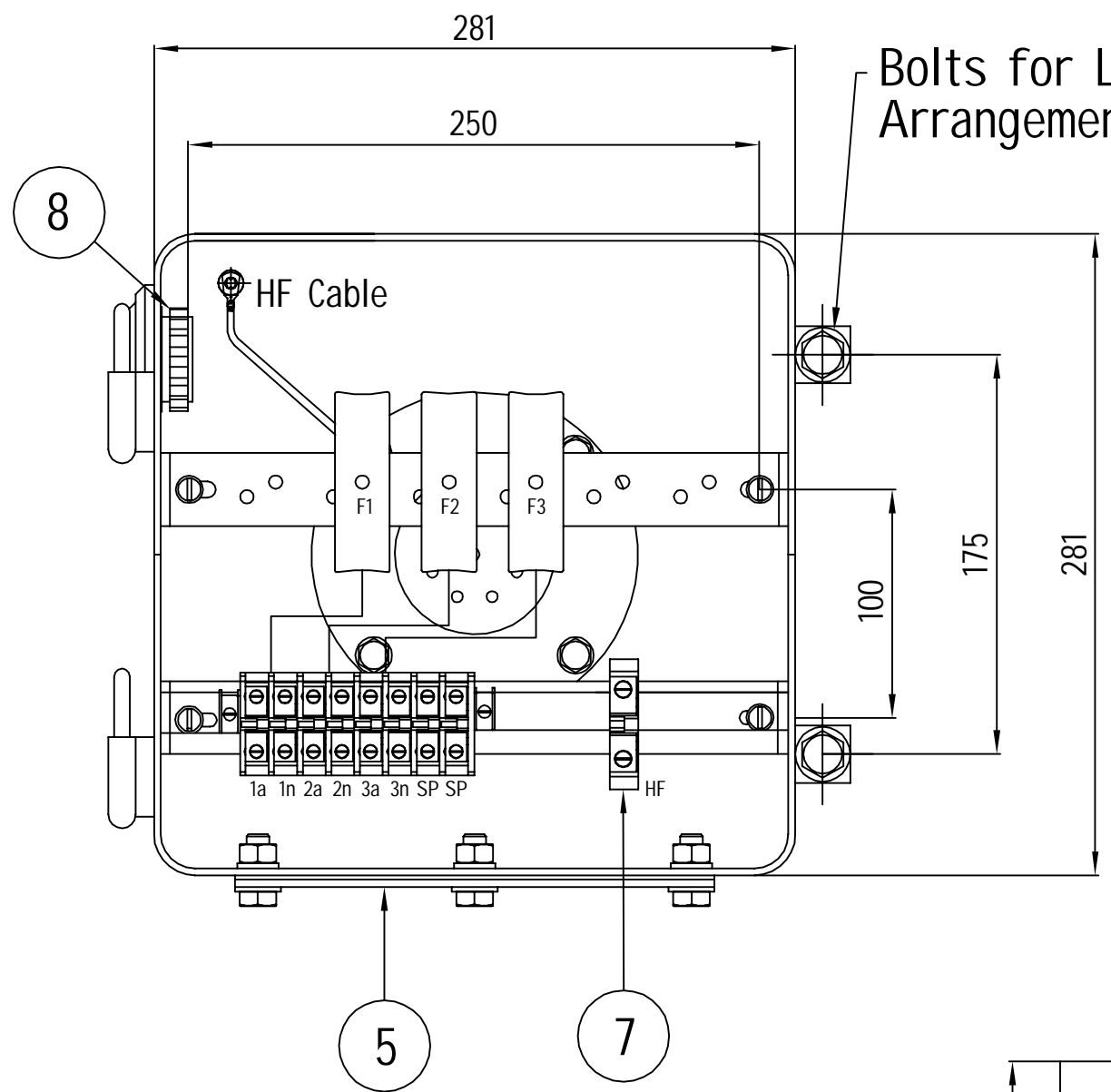
Rating & Diagram Plate for
 420kV Capacitor Voltage
 Transformer

Revision		
A	2022-07-07	

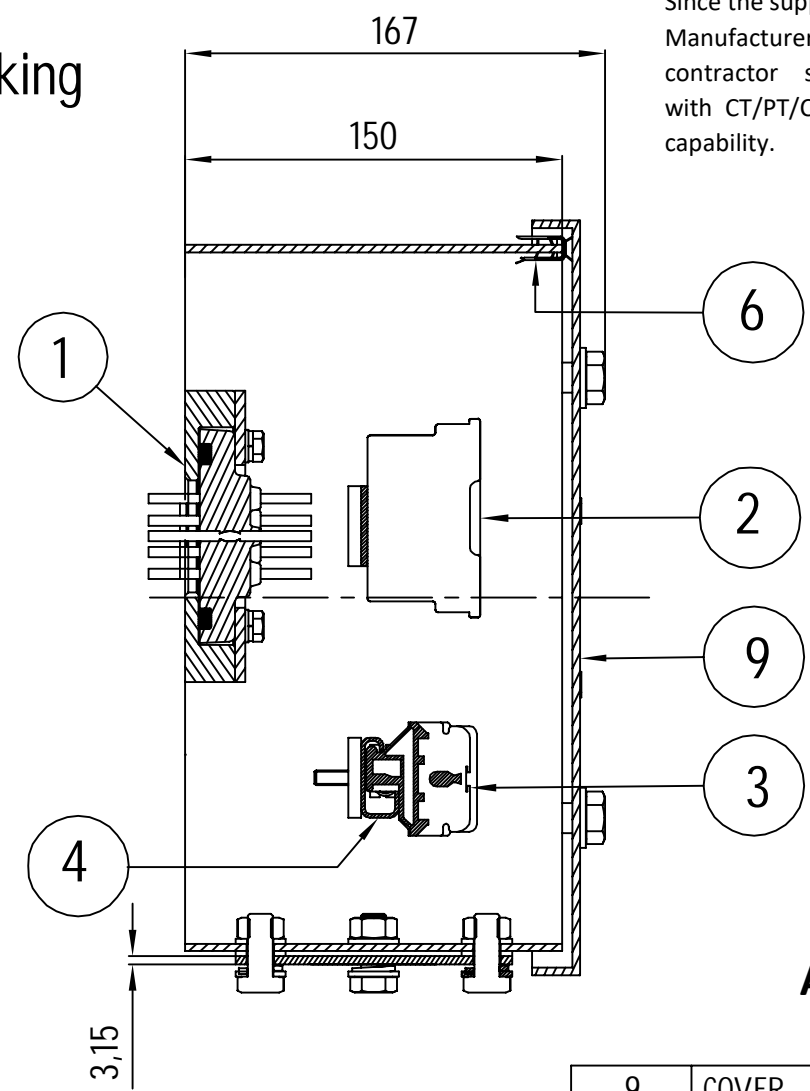
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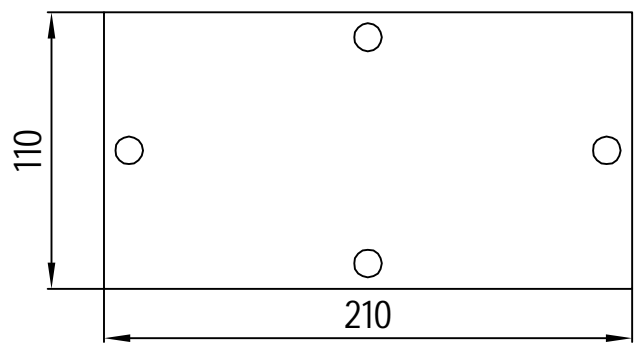
Bolts for Locking Arrangement



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APTRANSCO/VS/Vijayawada.**

9	COVER
8	BREATHER
7	HF TERMINAL CONNECTION - OAT 25
6	EPDM GASKET
5	REMOVABLE UNDRILLED CABLE GLAND PLATE
4	TERMINAL MOUNTING CHANNEL
3	TERMINALS ELMEX MAKE CAT M4
2	HRC. FUSES (16AMP)
1	SECONDARY WINDING TERMINALS & HF BUSHING
Sr. No.	Item Description



5. REMOVABLE UNDRILLED CABLE GLAND PLATE

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- NOTES:
- 1) DEGREE OF PROTECTION IP-55.
 - 2) ALL FERROUS PARTS ARE HOT DIP GALVANIZED.
 - 3) STEEL SHEET 3.15mm THICK HOT ROLLED.
 - 4) ALL DIMENSIONS ARE IN mm.

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Revision Details:
A New drg. prepared.

Revision		420 KV Capacitor Voltage Transformer Type: CPB-H 420	SECONDARY TERMINAL BOX	DRAWN: SR	CHECKED: SNP	APPRD.: SN	file: 3320-087	TOTAL SH. 1
A	2022-07-07			HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL)			1HYT903320-087	Sh. NO. 1

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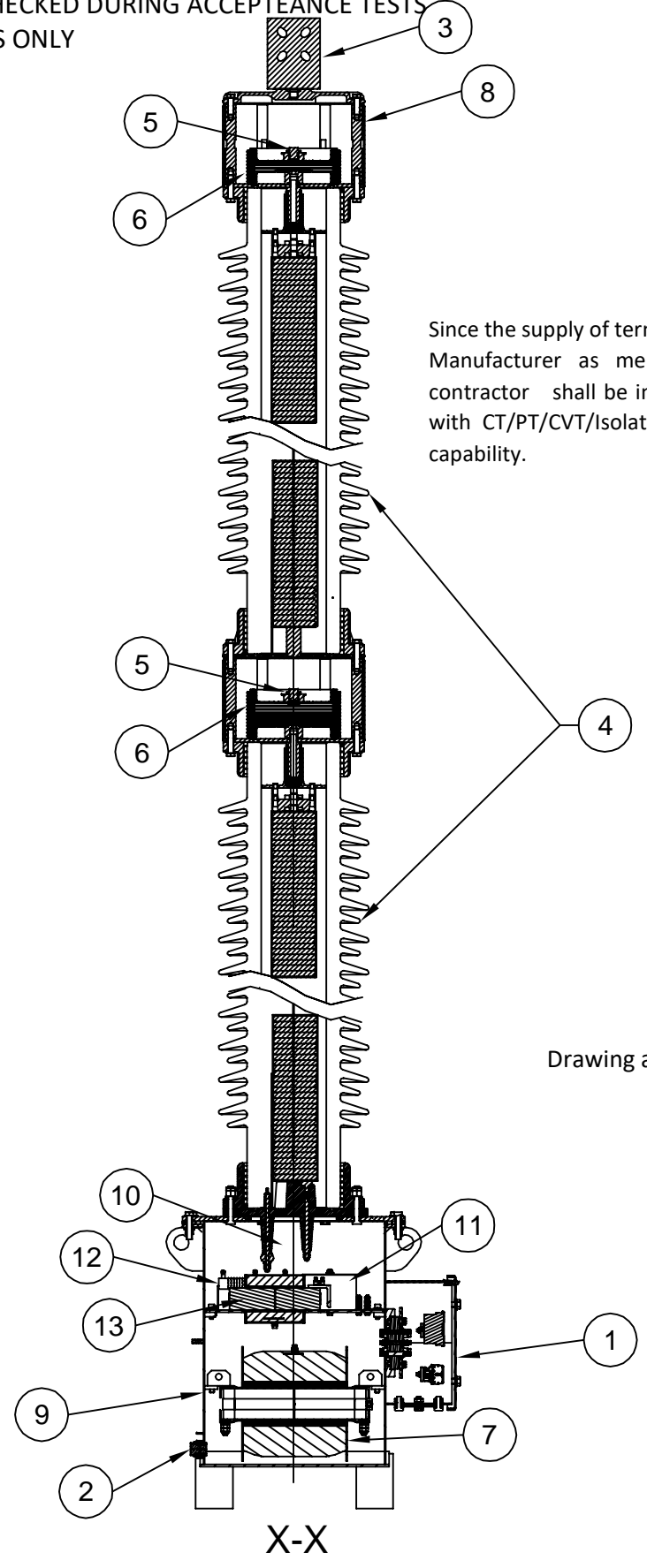
Notes:

1. All exposed ferrous parts including tank are hot dip galvanized.
2. Connect the HF Terminal to Earth when carrier coupling device is not used.
3. All Dimensions are in mm. General Tolerance as per ISO:2768-C.
4. Porcelain insulators with maximum one joint.
5. CVD bellow material: Stainless Steel

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13	Compensating reactor	1
12	Damping resistor.	1
11	Damping reactor	1
10	Mono Bushing	1
9	EMU tank	1
8	Top cover	1
7	Intermediate Voltage transformer	1
6	Bellow	2
5	Oil Filling Plug (Not to be Opened as hermetically sealed)	2
4	Insulator	2
3	Primary Terminal	1
2	Oil Drain Plug	1
1	Secondary Terminal Box	1
Sr. No.	Description	Quantity

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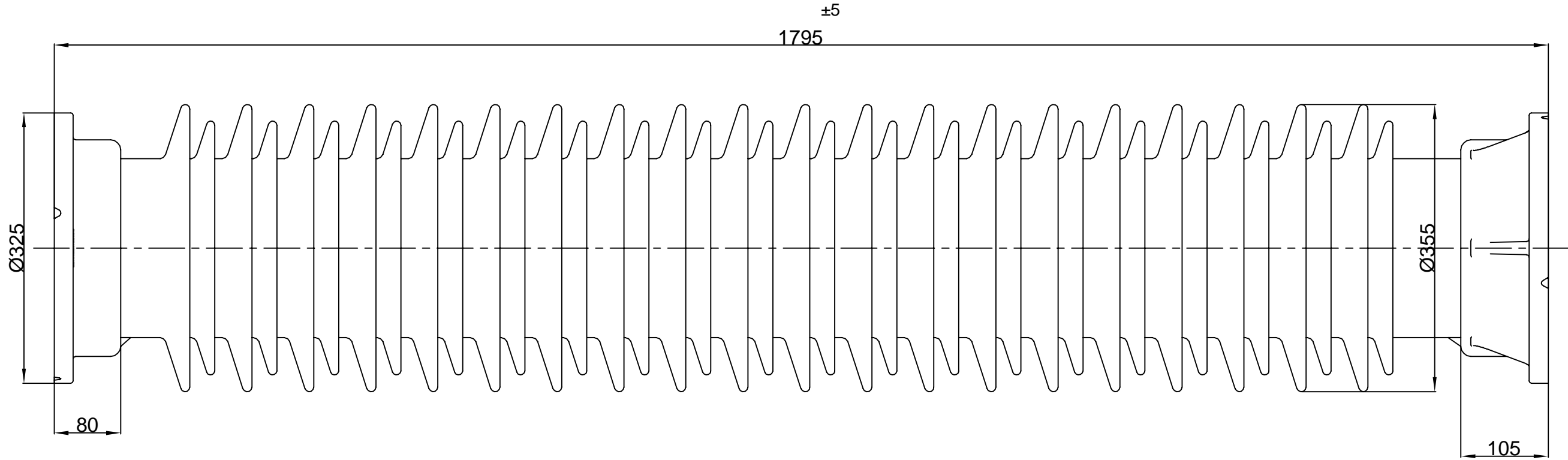
Revision Details:
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Revision		420 KV Capacitor Voltage Transformer Type: CPB-H 420	SECTIONAL VIEW	DRAWN: SR	CHECKED: SNP	APPRD.: SN	file: 3320-088	TOTAL SH. 1
A	2022-07-07			HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL)			1HYT903320-088	Sh. NO. 1

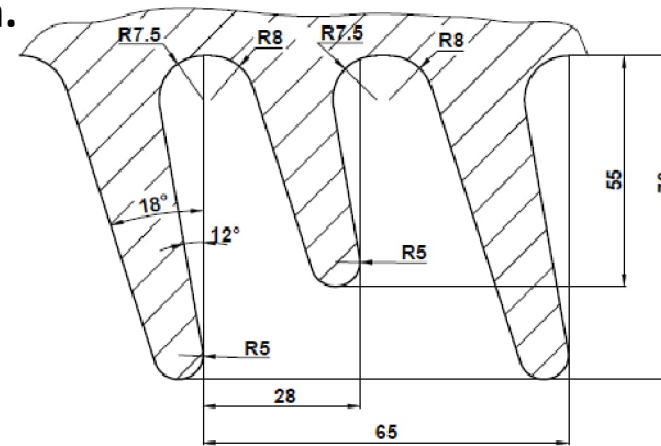
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- A) CEMENT COMPOUND SHOULD NOT STICK ON INSULATOR END
OUTER CHAMFER AS WELL AS SEALING SURFACE
- B) THE OUTER SURFACE OF FLANGES SHALL BE WITH COLOURLESS ANODIZING OF 5 µm THICKNESS MIN.
THE ANODIZING SHALL NOT BE DONE ON SURFACE MARKED WITH CHAIN DOTTED LINE (i.e., ALONG SEALING SURFACE)
- C) CANTILEVER STRENGTH OF INSULATOR - 500 kg.
- D) PLEASE REFER SH.2 FOR SHED PROFILE AND ITS DETAIL
- E) THE TOTAL CREEPAGE DISTANCE SHALL BE 6510 mm MIN.
- F) THIS INSULATOR WILL BE USED FOR THE BOTTOM & TOP STACK OF THE 400 kV CVT



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⊗ New drawing prepared.

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Revision		420 kV Capacitor Voltage Transformer Type: CPB-H 420	INSULATOR DRAWING (31 mm/kV)	DRAWN: SR	CHECKED: PDS	APPRD.: SN	file: - 3320-089	TOTAL SH. 1
A	2022-07-07			HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL)			1HYT903320-089	

GUARANTEED TECHNICAL PARTICULARS

FOR 400 kV CAPACITOR VOLTAGE TRANSFORMERS
NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST

REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS

FOR EPC CONTRACTS ONLY		
1	Name of the Manufacturer	Hitachi Energy India Limited
2	Type Designation	CPB-H 420
3	Type of CVT	Outdoor, Oil filled, Hermetically sealed
4	Rated Primary Voltage (kV)	400 $\sqrt{3}$
5	Highest Service Voltage (kV)	420
6	Rated Voltage factor	1.2 Continuous & 1.5 for 30 Sec.
7	Rated Frequency (Hz)	50
8	Number of Phases	Single
9	Power frequency voltage withstand for 1 minute (kV rms)	630
10	Lightning Impulse voltage withstand for 1.2/50 μ s (kV peak)	1425
11	Switching Impulse voltage withstand for 250/2500 μ s (kV peak)	1050
12	Power frequency voltage withstand of secondary winding	3 kV for 1 Minute
13	Power frequency voltage withstand of H.F. Terminal	4 kV for 1 Min. (for Enclosed Type)
14	Equivalent series resistance over entire carrier frequency range (Ohm)	<40
15	Standards Applicable	IEC: 61869-5
16	Temperature rise over ambient temperature at 50 °C	According to IEC: 61869-5 /IEC:186 / IS:3156
17	Radio interference voltage at 1 MHz at 1.1Um/ $\sqrt{3}$ (μ V)	<1000
18	Whether CVTs are suitable for Carrier Communication, Carrier Teleprinting services, Metering, Relaying, Protection, Synchronizing and Interlocking purposes ?	Yes
19	Capacitance values (pF)	4400 (+10% -5%)
20	Natural frequency of coupling / Self Tuning frequency (kHz)	\geq 500
21	Band width (kHz)	40 to 500
22	Values of stray capacitance and stray conductance in the carrier frequency range of 40 to 500 kHz	300 + 0.05C _n (pF) and 50 μ S (As per IEC:60358)
23	Capacitance Temp coefficient (% per kelvin)	0.07 %
24	Rated intermediate voltage of CVT (kV)	19/ $\sqrt{3}$
25	Rated primary voltage of EMU (kV)	19/ $\sqrt{3}$
26	Tan Delta value of CVT	<0.005
27	Type of Insulator	Porcelain
28	Mounting details (mm)	365x365
29	Over all height (mm)	4838 \pm 25
30	Standard range of frequencies for which accuracy are valid	As per IEC 61869-5 (96% to 102% for protection) (99 % to 101% for metering)
31	Min. creepage distance (mm/kV)	31
32	Total Weight (kg)	700 approx.
33	Quantity of oil (kg)	121 approx.
34	Surface finish of all ferrous parts	Mild Steel – Hot Dip Galvanized
35	Type & Material of terminal pad	Flat type, Aluminum
36	Provision made for accepting the change in oil volume?	Metal Bellows
37	Partial Discharge (pC)	<10 at Um, <5 at 1.2 Um/ $\sqrt{3}$
38	EMU oil	Mineral oil (As per IEC:60296)
39	CVD oil	Synthetic oil (As per IEC:60867)
40	Seismic acceleration	0.3g
41	Type of insulation	A

Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

6185523/2022/EEMRO-JENE51 **GUARANTEED TECHNICAL PARTICULARS**
FOR 400 kV CAPACITOR VOLTAGE TRANSFORMERS

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Winding Details

Sr.No.	Parameter	Wdg I	Wdg II	Wdg III
1	Rated Secondary Voltage (v)	110/ $\sqrt{3}$	110/ $\sqrt{3}$	110/ $\sqrt{3}$
2	Accuracy Class	3P	3P	0.2
3	Rated Burden	50 VA	50 VA	50 VA
4	Simultaneous Burden	50 VA for 0.2 & 100VA for 3P		
5	Rated Thermal Burden	750 VA		

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