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

420 kV CAPACITOR VOLTAGE TRANSFORMER TYPE: CPB-H 420

CLIENT:
(AS APPLICABLE)

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

END CUSTOMER:
APTRANSCO

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.

PROJECT:
(AS APPLICABLE)

W.O. NO.:
(AS APPLICABLE)

PODIUM SURYACHANDRAM

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PLANNING & POWER SYSTEMS
APTRANSCO

P.O. NO.:
(AS APPLICABLE)

QTY.:
(AS APPLICABLE)

SR. NO.	REFERENCE OF STD DRGS/ DOCUMENTS	REV.	DESCRIPTION
1.	1HYT903320-062	B	GENERAL ARRANGEMENT - 25mm/kV
2.	1HYT903320-063	B	RATING PLATE - 25mm/kV
3.	1HYT903320-064	B	SECONDARY TERMINAL BOX
4.	1HYT903320-065	A	SECTIONAL VIEW
5.	1HYT903320-076	A	INSULATOR- 25mm/kV

Drawing approval subject to valid vendor registration

Ⓐ New drg. prepared.

Ⓑ Change in sr no. 1,2 & 3.

This drawing is a COMPUTER ORIGINAL and does not require signature for its authentication

Prepared: SR	Checked: SNP SNP	Approved: SN
Without Sep. PL.: ☐	SamePL.Same No.: ☐	Sep. PL.Other No.: ☐
Derived by:	Supersedes:	Supersedes by:
A 2022-06-09		
B 2022-06-29		

HITACHI ENERGY INDIA LIMITED
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LIST OF DOCUMENTS FOR CPB-H 420 TYPE CVT

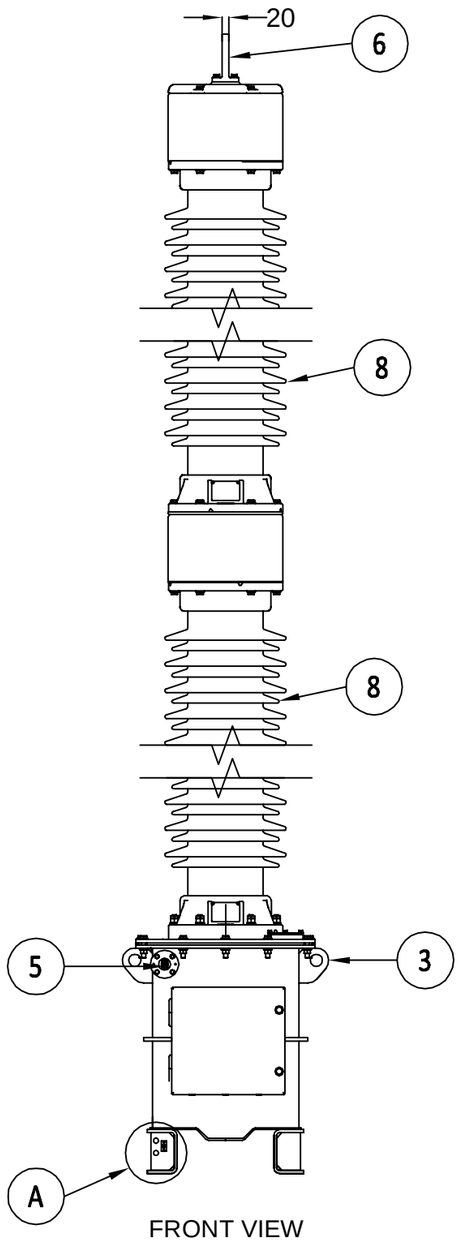
1HYT903320-061

Scale NTS

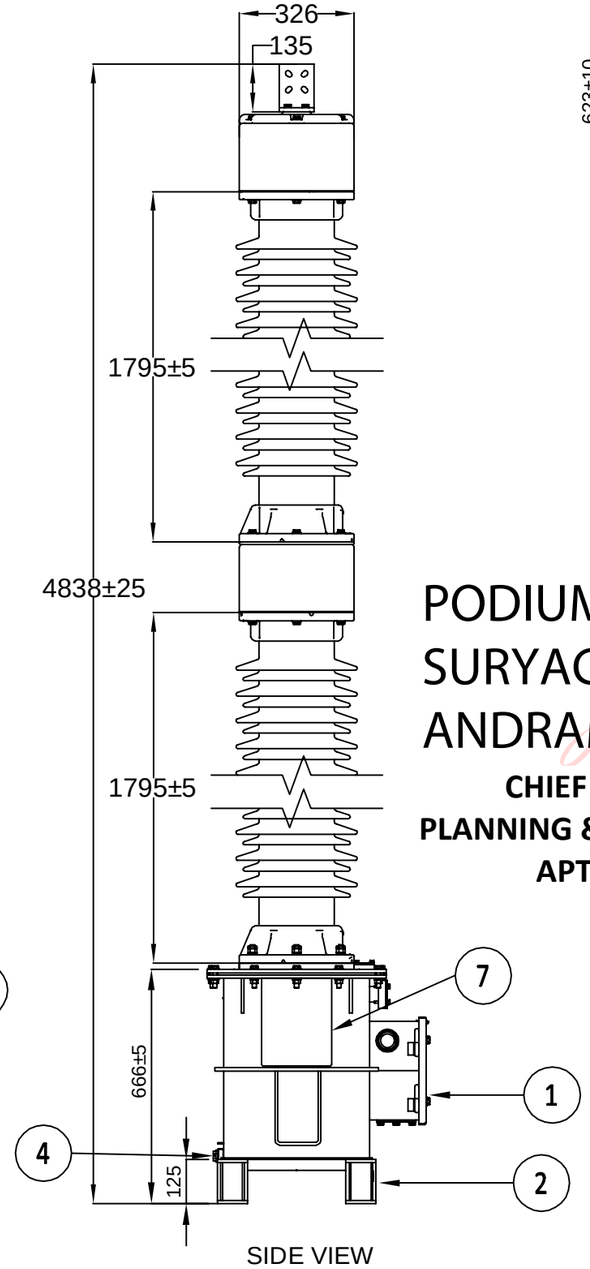
T.Sh. 1

Sheets 1

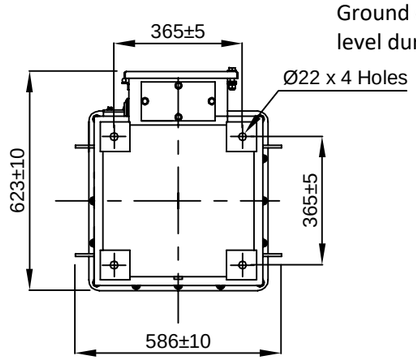
NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTEANCE TESTS
2. FOR EPC CONTRACTS ONLY



FRONT VIEW

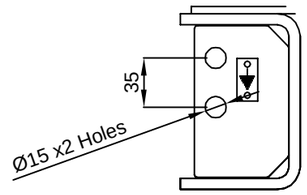


SIDE VIEW

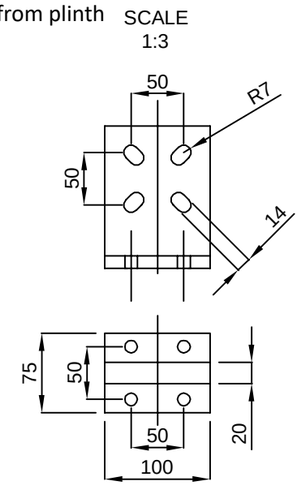


BOTTOM VIEW

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



Earthing Terminal Detail



Primary Terminal Detail

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Sr.No.	DESCRIPTION	MATERIAL	QTY.
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 TERMIANAL BOX	MS HOT DIP GALVANISED	1

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 10500 mm (25 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.

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.

Drawing approval subject to valid vendor registration

Revision Details:
(B) Tank view revised

Revision Details:
(A) New drawing prepared.

Revision			
A	2022-06-09		
B	2022-06-29		

420 Kv Capacitor Voltage Transformer Type: CPB-H 420

General Arrangement Drawing

DRAWN:	CHECKED:	APPRD.:	file: - 3320-062	TOTAL SH.
SR	SNP	SN		1

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1HYT903320-062 | Sh. NO. 1

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

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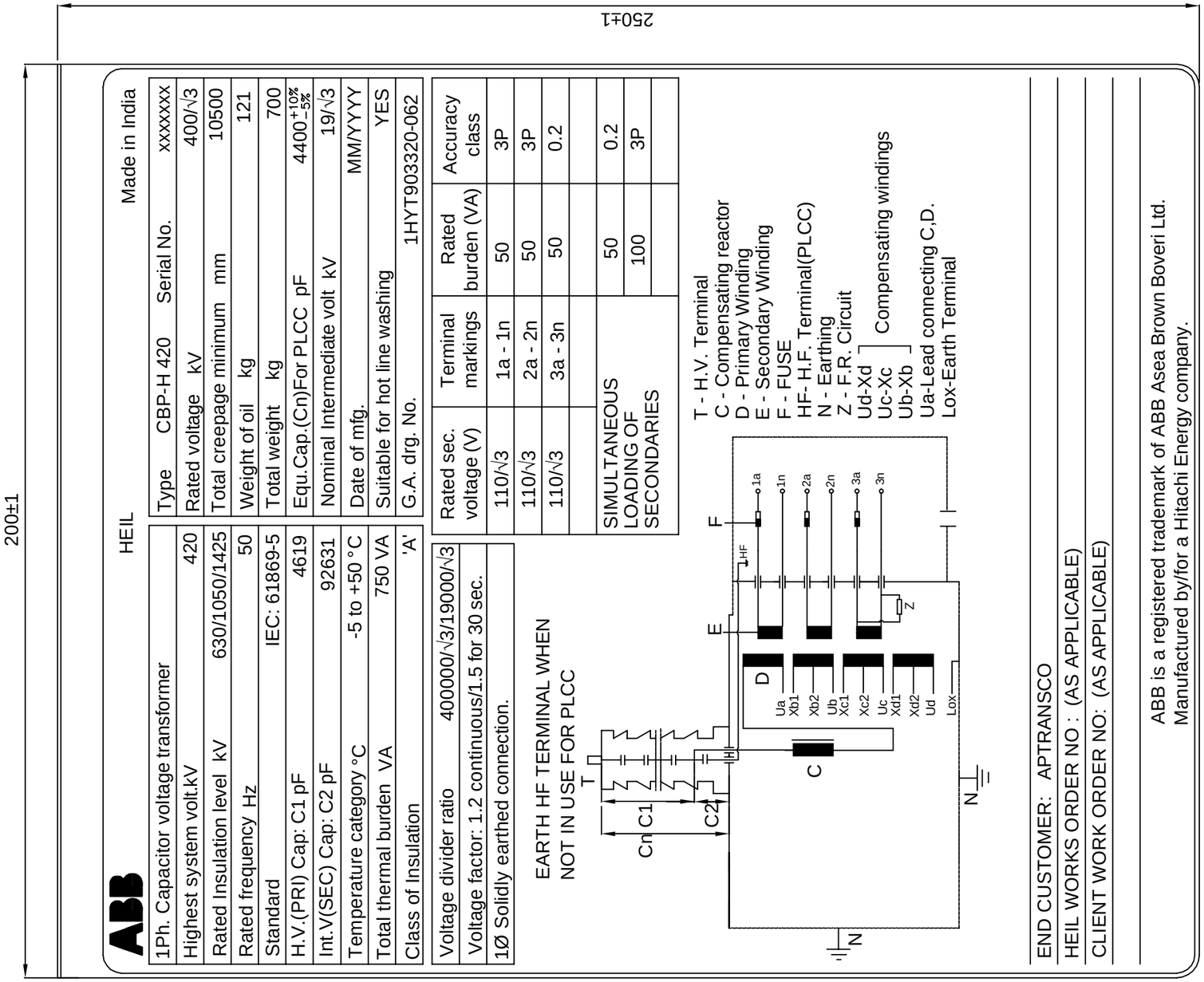
Since the supply of terminal connectors is not in the scope of Manufacturer as mentioned in the drawings The EPC contractor shall be instructed to supply the same in line with CT/PT/CVT/Isolator/VT/LA/Breakers, requirement and capability.



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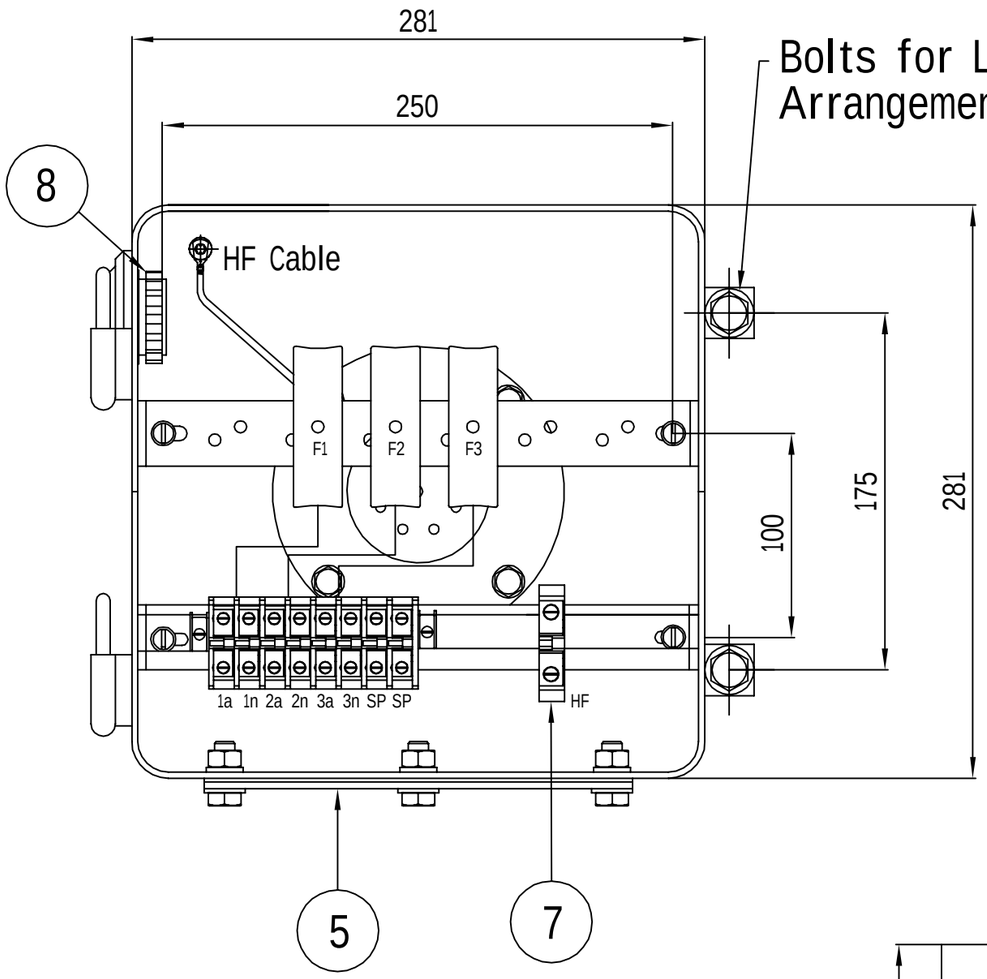
1	Rating and Diagram Plate	1	ALUMINUM		Sh. 2mm thk.
QTY	DESCRIPTION	P	MATERIAL /CODE NO		WT LOWER DRG NO.

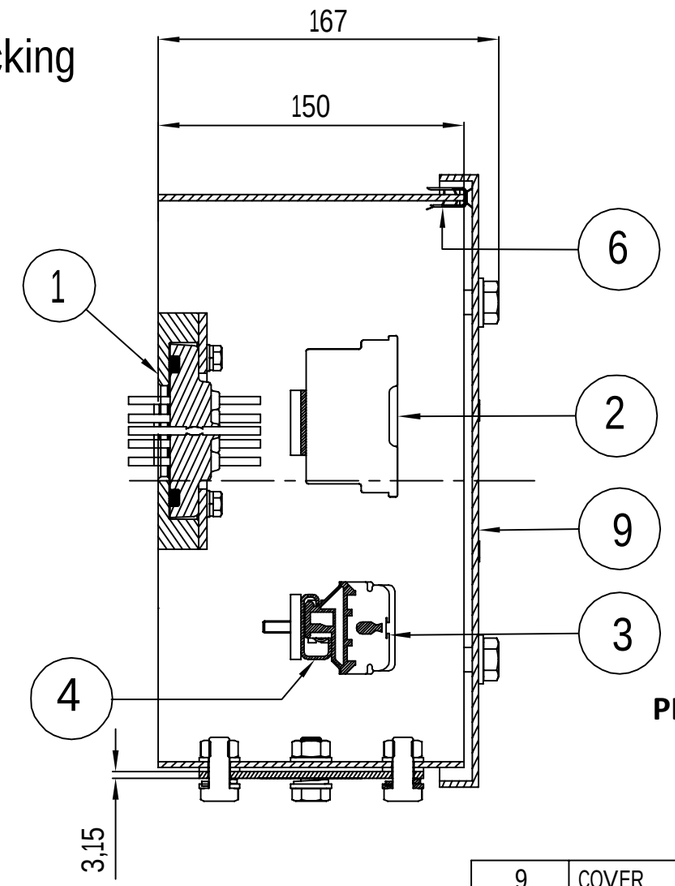
Revision						
A	2022-06-09			Rating Plate: 1HYP000428P3	Rating & Diagram Plate for 420kV Capacitor Voltage Transformer	DRAWN: SR / CHECKED: SNP / APPRD.: SN / file :3320-063 / TOTAL SH. 1
B	2022-06-29					HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL) / 1HYT903320-063 / Sh. NO. 1

Revision Details: (A) New drg. prepared.
Revision Details: (B) Rated insulation level revised

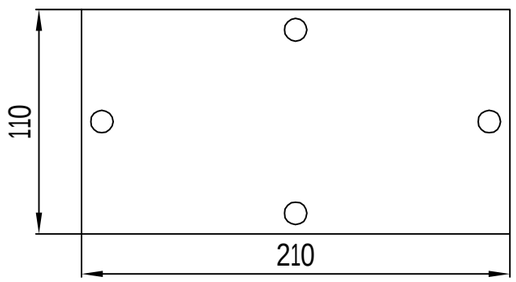
NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTEANCE TESTS
2. FOR EPC CONTRACTS ONLY

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





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.



5. REMOVABLE UNDRILLED CABLE GLAND PLATE

Sr. No.	Item Description
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

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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.

Drawing approval subject to valid vendor registration

This drawing is a COMPUTER ORIGINAL and does not require signatures for its authentication

Revision Details: (B) Gland plate size added

Revision Details: (A) New drg. prepared.

Revision			
A	2022-06-09		
B	2022-06-29		

420 KV Capacitor Voltage Transformer Type: CPB-H 420

SECONDARY TERMINAL BOX

DRAWN:	CHECKED:	APPRD.:	file: 3320-064	TOTAL SH.
SR	SNP	SN		1

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1HYT903320-064

Sh. NO. 1

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST
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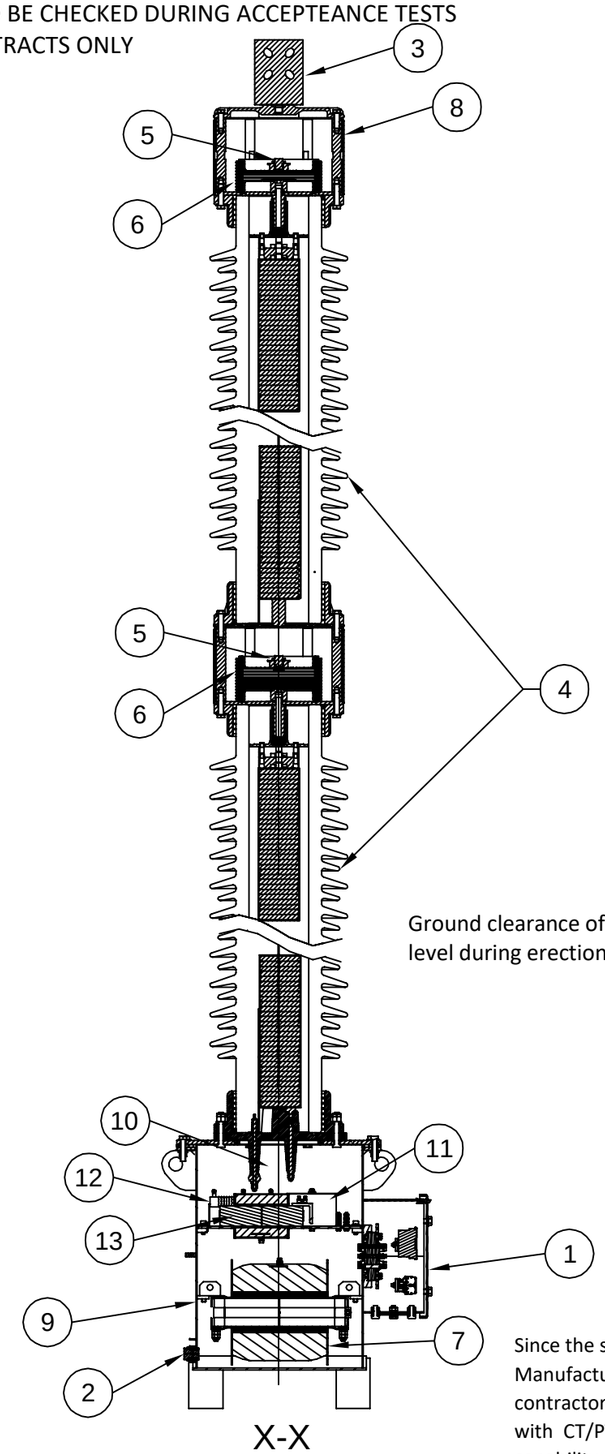
2. FOR EPC CONTRACTS ONLY



X-X

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

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.

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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Sr. No.	Description	Quantity
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

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Revision Details:
A) New drg. prepared.

Revision			
A	2022-06-09		

420 KV Capacitor Voltage Transformer Type: CPB-H 420

SECTIONAL VIEW

DRAWN:	CHECKED:	APPRD.:	file: 3320-065	TOTAL SH.
SR	SNP	SN		1

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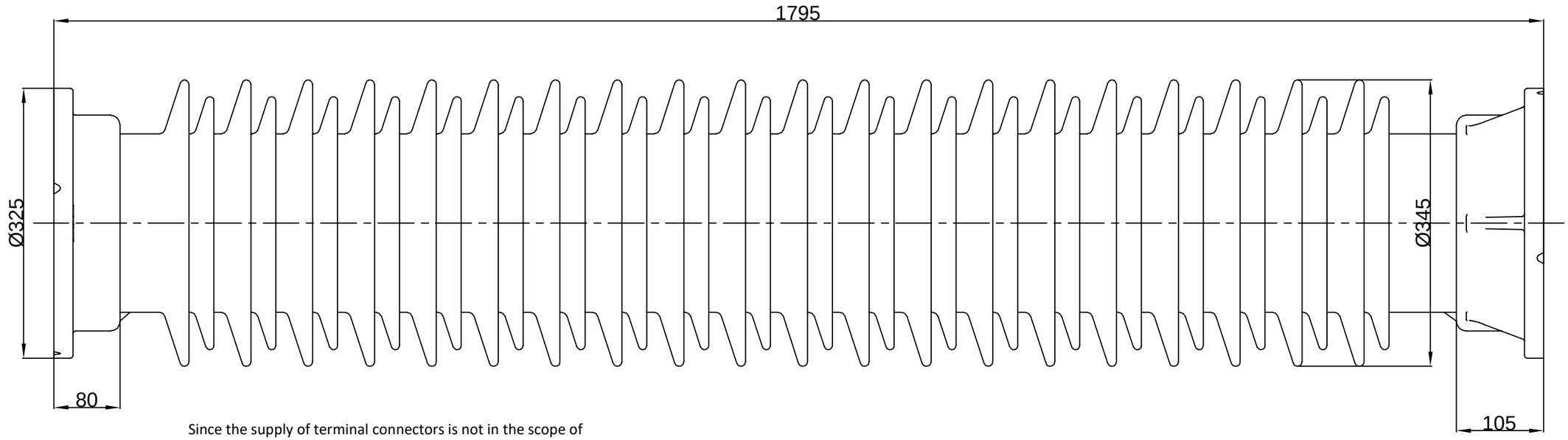
1HYT903320-065 Sh. NO. 1

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

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



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.

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 um 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 5315 mm MIN.

F) THIS INSULATOR WILL BE USED FOR THE BOTTOM & TOP STACK OF THE 400 kV CVT

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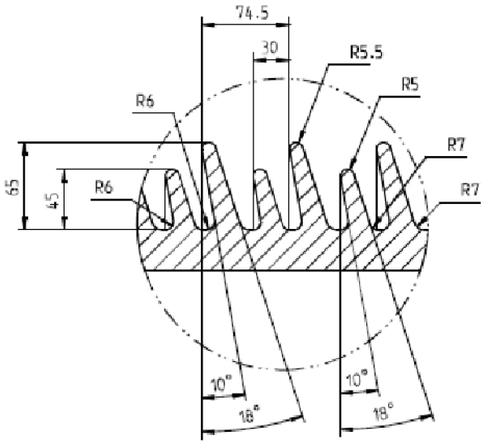

20 long and 20 short sheds

Drawing approval subject to valid vendor registration

Revision Details:
A New drawing prepared.

Revision			
A	2022-06-09		

420 kV Capacitor Voltage Transformer
Type: CPB-H 420

INSULATOR DRAWING (25 mm/kV)

DRAWN:	CHECKED:	APPRD.:	file: - 3320-076	TOTAL SH.
SR	PDS	SN		1

HITACHI ENERGY INDIA LIMITED (FORMERLY KNOWN AS APPSIL)

1HYT903320-076 | Sh. NO. 1

GUARANTED TECHNICAL PARTICULARS
FOR 400 kV CAPACITOR VOLTAGE TRANSFORMERS

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

2. 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√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 μs (kV peak)	1425
11	Switching Impulse voltage withstand for 250/2500 μs (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/√3 (μV)	<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)	≥ 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 μS (As per IEC:60358)
23	Capacitance Temp coefficient (% per kelvin)	0.07 %
24	Rated intermediate voltage of CVT (kV)	19/√3
25	Rated primary voltage of EMU (kV)	19/√3
26	Tan Delta value	<0.005
27	Type of Insulator	Porcelain
28	Mounting details (mm)	365x365
29	Over all height (mm)	4838±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)	25
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/√ 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

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GUARANTED TECHNICAL PARTICULARS
FOR 400 kV CAPACITOR VOLTAGE TRANSFORMERS

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

Winding Details

Sr.No.	Parameter	Wdg I	Wdg II	Wdg III
1	Rated Secondary Voltage (v)	110/√ 3	110/√ 3	110/√ 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		

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

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