

Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.

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

**Item: 420kV CT**

**Ratio:** 3000-2000-1000-500/1-1-1-1A (5C)

**Creepage:** 25mm/kV

**Customer:** APTransco, Andhra Pradesh

**List of Standard Drawings/Documents:**

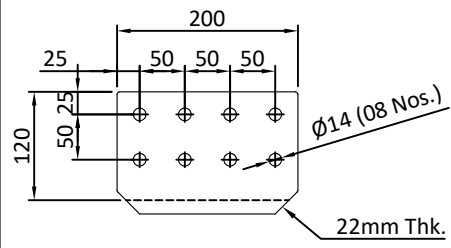
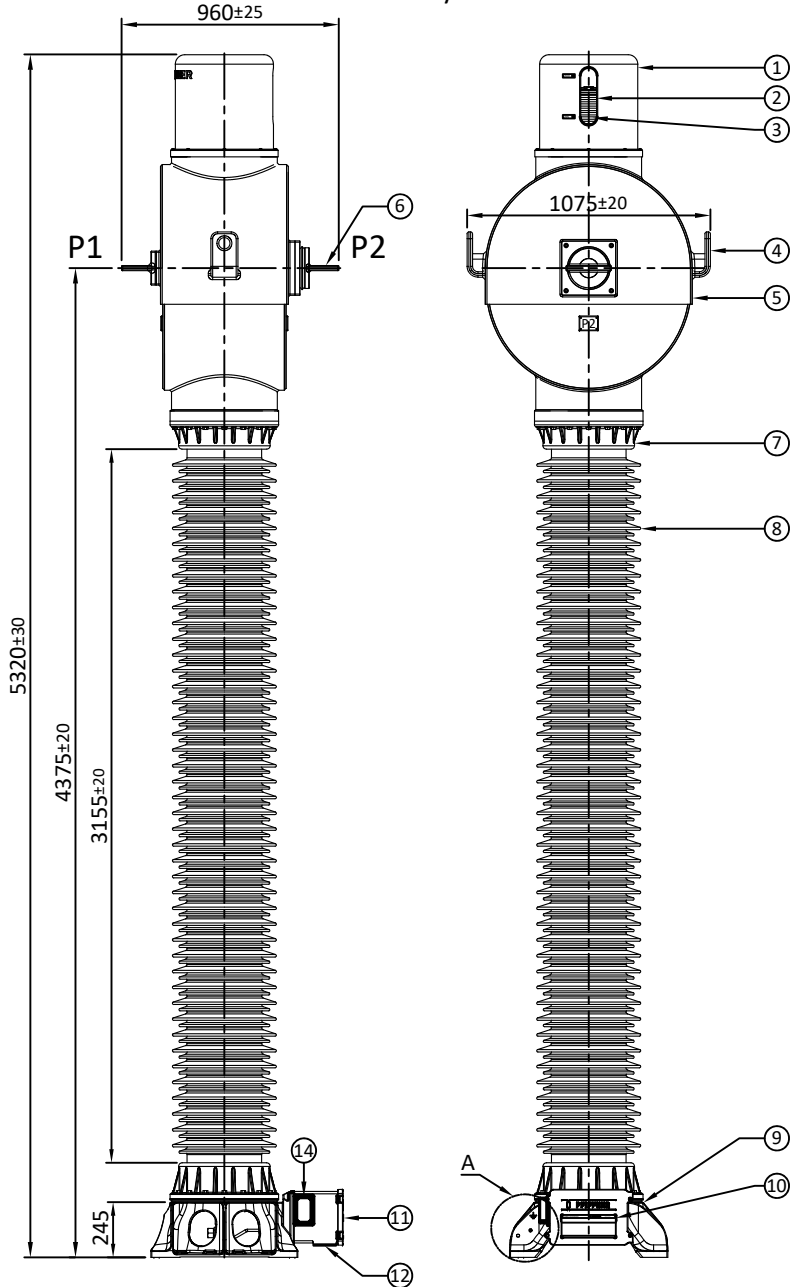
Sl. No.	Description	Drawing/ Doc No.
1	General Arrangement	APTR-01.25.420J1
2	Rating Plate	APTR-01.25.420J2_ REV No.01
3	Terminal Box GA	APTR-01.25.420J3_ REV No.01
4	Sectional View	APTR-01.25.420J4
5	GTP	--

1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/ Isolators/IVT in the substation during foundation works to ensure safe live to ground clearance as per IE rules.
2. Since the supply of terminal connectors is not in the scope of manufacturers as mentioned in the drawings. The EPC contractors shall be instructed to supply the same in line with CT/PT/CVT/Isolator /IVTs requirement and capatibility.

CHIEF ENGINEER/PROJECTS  
APTRANSCO/VIS/Vijayawada

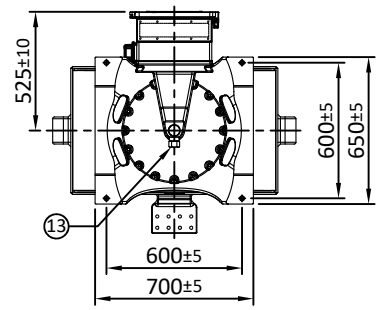
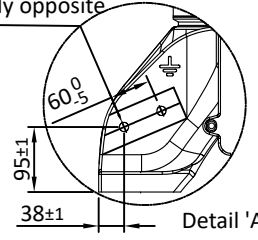
NOTE:-1. Drawings approval subject to valid type test reports, to be checked during acceptance tests.  
2. For EPC contractors only.

IF IN DOUBT ASK



TERMINAL DETAIL

2Nos. of  $\phi 13.5$  Hole for Earthing Diagonally opposite



CT MOUNTING DETAIL

NO.	QTY.	DESCRIPTION	MATERIAL
01	01	BELLOWS COVER	ALUMINIUM
02	01	BELLOWS	STAINLESS STEEL
03	01	BELLOW LEVEL INDICATOR	POLYCARBONATE
04	02	LIFTING LUG	ALUMINIUM
05	01	HOUSING	ALUMINIUM
06	02	PRIMARY TERMINAL	ALUMINIUM
07	02	INSULATOR FLANGE	ALUMINIUM
08	01	INSULATOR	PORCELAIN
09	01	BASE	ALUMINIUM
10	01	RATING PLATE	ALUMINIUM
11	01	TERMINAL BOX	ALUMINIUM
12	01	GLAND PLATE	ALUMINIUM
13	01	OIL SAMPLING VALVE	STEEL GALVANISED
14	01	TAN DELTA MEASUREMENT TERMINAL	BRASS

TOTAL WEIGHT : 1560 kg ±10%  
TOTAL OIL WEIGHT : 380 kg ±10%  
CREEPAGE DISTANCE : ≥10,500 mm

CHIEF ENGINEER/PROJECTS  
APTRANSCO/VS/Vijayawada

Customer : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.

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

Variation of Tan Delta Value from 10KV  $\mu\text{m}/\sqrt{3}$  shall be not exceed 15%.

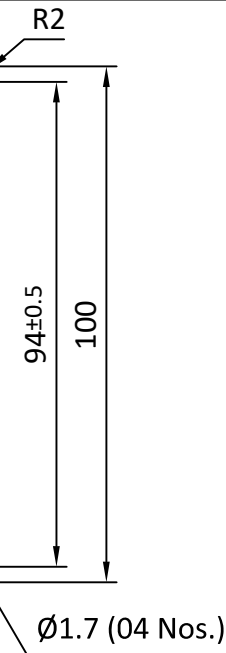
This document must not be copied without our written permission and the content and nor be used for any unauthorised purpose. Contravention will be prosecuted. © PFIFFNER

REV.NO.	DESCRIPTION	APPV'D	REV. DATE
GEN. TOL : NA	MATERIAL : NA		
WEIGHT : AS ABOVE			
NAME	SIGN	DATE	SPEC : NA
DRAWN	M.D.	06.03.2023	FINISH : NA
CHK'D	M.C.	06.03.2023	
APPV'D	R.P.	06.03.2023	
			TITLE : GENERAL ARRANGEMENT 420kV CT
SHEET 1 OF 1		REV. NO. : 00	DWG NO. : APTR_01.25.420J1

Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.

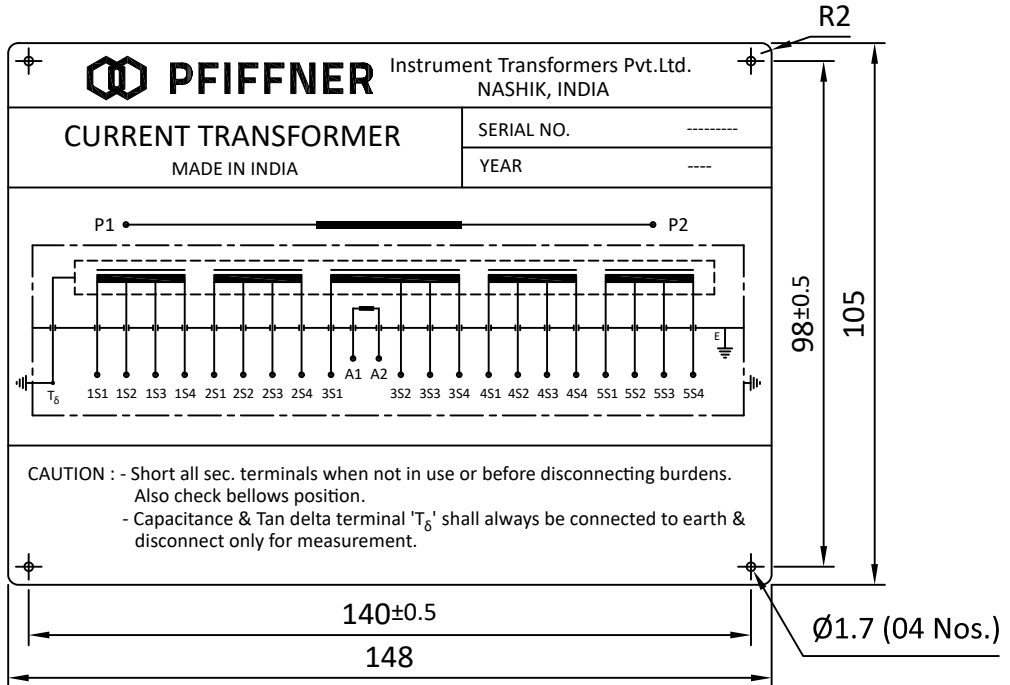
IF IN DOUBT ASK

<b>PFIFFNER</b> Instrument Transformers Pvt.Ltd. NASHIK, INDIA		<b>CURRENT TRANSFORMER</b> MADE IN INDIA																			
CUSTOMER : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.										PO No. : -----											
YEAR	----	SPECIFICATION IS 16227, IEC 61869						H.S.V.				420kv				SERIAL NO.				-----	
TYPE	JOF 420 W	STC. 63 kA for 1S				INSULATION LEVEL 630kv/1425 kVp/1050kVp				RATED PRIMARY CURRENT				3000 A							
FREQUENCY	50 Hz	Idyn 157.5 kAp				TOTAL CREEPAGE DISTANCE				≥ 10500 mm				RATED CONT. THERMAL CURRENT				3600 A			
CORE NO.	1				2				3				4				5				
RATIO	500/1	1000/1	2000/1	3000/1	500/1	1000/1	2000/1	3000/1	500/1	1000/1	2000/1	3000/1	500/1	1000/1	2000/1	3000/1	500/1	1000/1	2000/1	3000/1	
PRI. TERMINAL	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	P1-P2	
SEC. TERMINAL	1S1-1S2	1S3-1S4	1S1-1S3	1S1-1S4	2S1-2S2	2S3-2S4	2S1-2S3	2S1-2S4	3S1-3S2 (SHORT 3S1-A1 3S2-A2)	3S3-3S4 (SHORT 3S3-A1 3S4-A2)	3S1-3S3 (SHORT 3S1-A1 3S3-A2)	3S1-3S4 (SHORT 3S1-A1 3S4-A2)	4S1-4S2	4S3-4S4	4S1-4S3	4S1-4S4	5S1-5S2	5S3-5S4	5S1-5S3	5S1-5S4	
VA	--	--	--	--	--	--	--	--	20	20	20	20	--	--	--	--	--	--	--	--	
CLASS	PX	PX	PX	PX	PX	PX	PX	PX	0.2S	0.2S	0.2S	0.2S	PX	PX	PX	PX	PX	PX	PX	PX	
ISF	--	--	--	--	--	--	--	--	≤5	≤5	≤5	≤5	--	--	--	--	--	--	--	--	
KPV (V) min.	500	1000	2000	3000	500	1000	2000	3000	--	--	--	--	500	1000	2000	3000	500	1000	2000	3000	
max I <sub>exc</sub> at V <sub>k</sub> (mA)	120	60	30	20	120	60	30	20	--	--	--	--	120	60	30	20	120	60	30	20	
R <sub>ct</sub> @75°C (Ω)	≤2.5	≤5	≤10	≤15	≤2.5	≤5	≤10	≤15	--	--	--	--	≤2.5	≤5	≤10	≤15	≤2.5	≤5	≤10	≤15	
TOTAL WEIGHT		1560 ±10% kg				OIL WEIGHT				380 ±10% kg											
										234±0.5											
										240											



CHIEF ENGINEER/PROJECTS  
APTRANSCO/VS/Vijayawada

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



CAUTION : - Short all sec. terminals when not in use or before disconnecting burdens.  
Also check bellows position.  
- Capacitance & Tan delta terminal 'T<sub>δ</sub>' shall always be connected to earth & disconnect only for measurement.

NOTE:-1. Drawings approval subject to valid type test reports, to be checked during acceptance tests.  
2. For EPC contractors only.

Customer : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.

01	AS PER CUSTOMER COMMENTS.			CHM	17.04.2023
REV.NO.	DESCRIPTION			APPV'D	REV. DATE
GEN. TOL : NA		MATERIAL : 1mm thick Aluminium metal photo			
WEIGHT : NA		SPEC : NA			
DRAWN	M.D.	06.03.2023	FINISH : NA	ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED.	
CHK'D	M.C.	06.03.2023	SCALE : N.T.S.	SHEET SIZE : A3	
APPV'D	R.P.	06.03.2023	TITLE : RATING PLATE 420 kv CT		DWG NO. APTR_01.25.420J2
			SHEET 1 OF 1		REV. NO. : 01

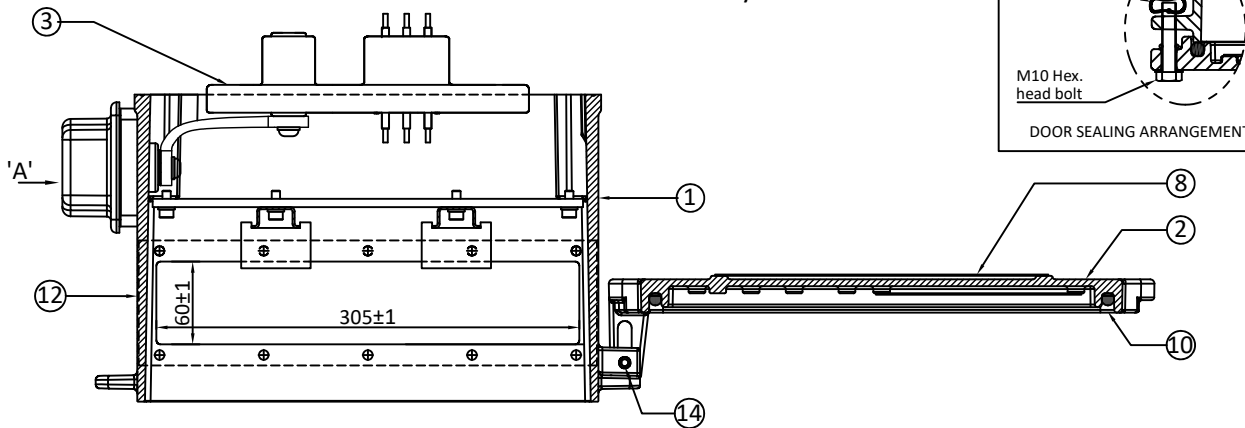
This document must not be copied without our written permission and the content and nor be used for any unauthorised purpose. Contravention will be prosecuted.

NOTE:- 1. Drawings approval subject to valid type test reports,

to be checked during acceptance tests.

2. For EPC contractors only.

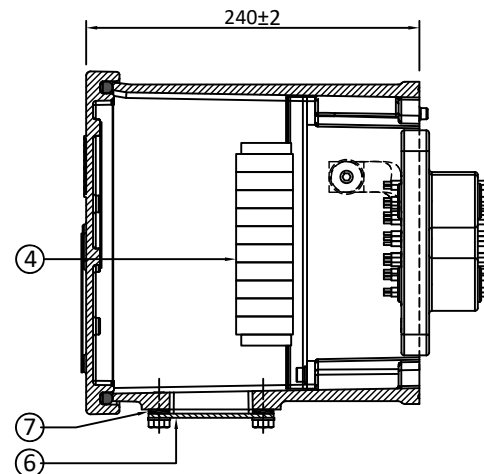
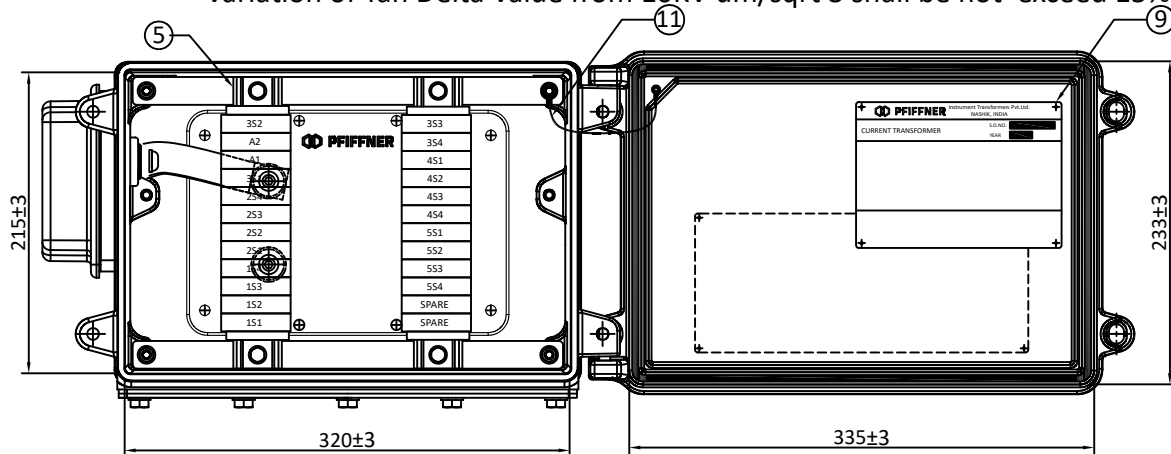
IF IN DOUBT ASK



SR.NO.	DESCRIPTION	QTY.	MATERIAL
1	TERMINAL BOX	1	ALUMINIUM
2	TERMINAL BOX DOOR	1	ALUMINIUM
3	SECONDARY LEAD OUT	1	EPOXY
4	STUD TYPE TERMINAL BLOCK (KBT M4 )	22+2 SPARE	MAKE - ELMEX
5	TERMINAL CARRIER RAIL	2	STEEL
6	GLAND PLATE	1	ALUMINIUM
7	GLAND PLATE GASKET	1	NEOPRENE RUBBER
8	RATING PLATE	1	ALUMINIUM
9	SCHEMATIC DIAGRAM PLATE	1	ALUMINIUM
10	DOOR GASKET	1	EPDM RUBBER
11	DOOR EARTHING CABLE	1	PVC INSULATED COPPER CABLE
12	WARNING STICKER	1	ALUMINIUM
13	TAN DELTA (T <sub>δ</sub> ) MEASUREMENT TERMINAL	1	BRASS
14	HINGES	2	S.S. TENSION PIN
15	TAN DELTA EARTH LINK	1	COPPER (NICKEL PLATED)

DEGREE OF PROTECTION : IP 55

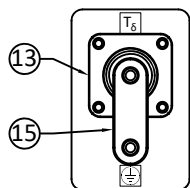
Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.



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

Customer : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.

This document must not be copied without our written permission and the content and nor be used for any unauthorised purpose. Contravention will be prosecuted. PFIFFNER



Detail 'A'

**WARNING**  
"T<sub>δ</sub>" TERMINAL - DO NOT OPEN WHEN IN SERVICE

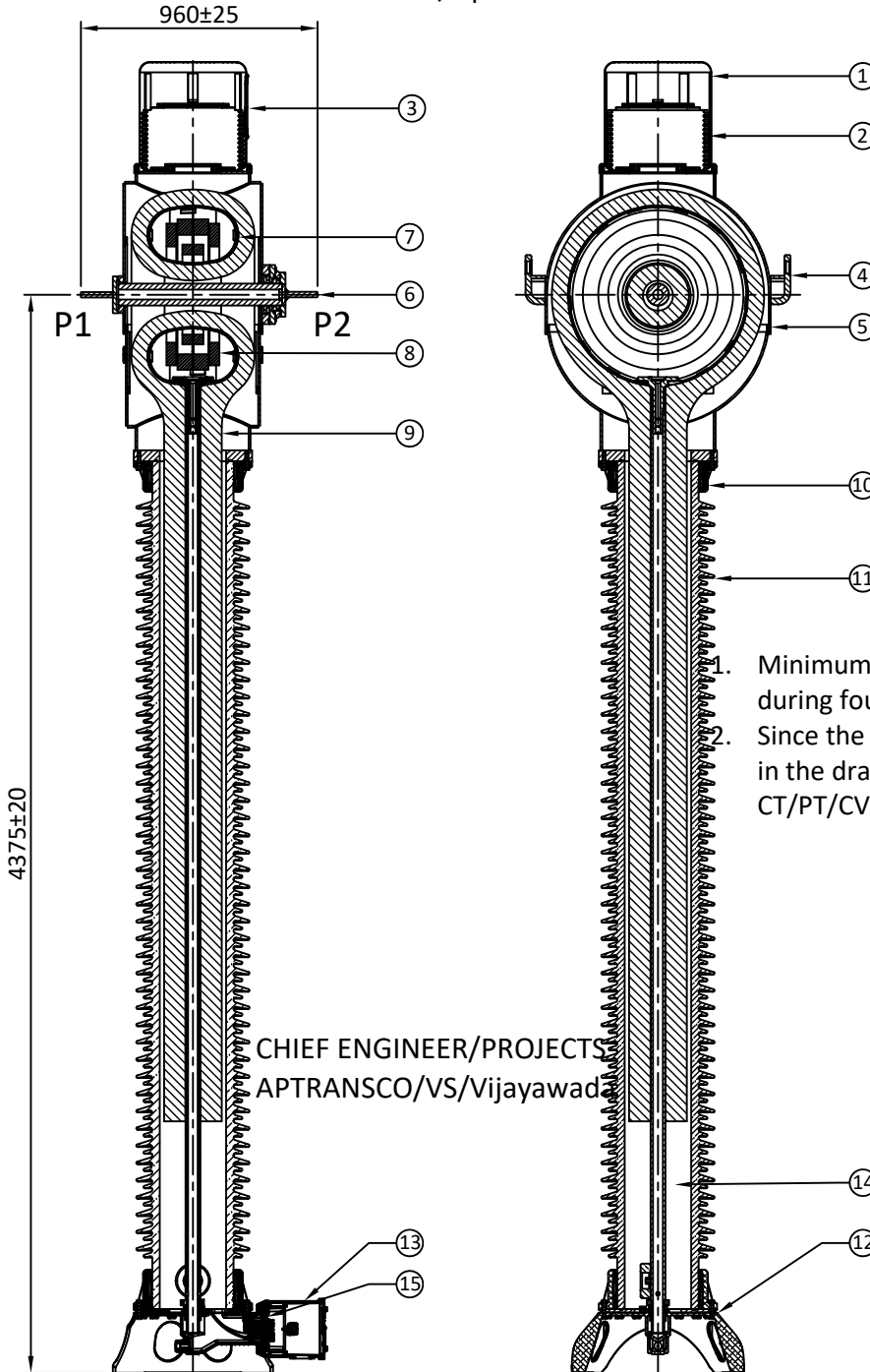
Item : 12

CHIEF ENGINEER/PROJECTS  
APTRANSCO/VS/Vijayawada

01	AS PER CUSTOMER COMMENTS.			CHM	17.04.2023
REV.NO.	DESCRIPTION			APPV'D	REV. DATE
GEN. TOL : NA		MATERIAL : NA			
WEIGHT : NA		SPEC : NA			
DRAWN	M.D.	06.03.2023	FINISH : NA	ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED.	
CHK'D	M.C.	06.03.2023	SCALE : N.T.S.	SHEET SIZE : A3	
APPV'D	R.P.	06.03.2023	TITLE :	DWG NO.	
<b>PFIFFNER</b> Instrument Transformers Pvt.Ltd. NASHIK, INDIA			TERMINAL BOX GA 420KV CT	APTR-01.25.420J3	
				SHEET 1 OF 1	REV. NO. : 01

Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.

IF IN DOUBT ASK



NO.	QTY.	DESCRIPTION	MATERIAL
01	01	BELLOWS COVER	ALUMINIUM
02	01	BELLOWS	STAINLESS STEEL
03	01	BELLOW LEVEL INDICATOR	POLYCARBONATE
04	02	LIFTING LUG	ALUMINIUM
05	01	HOUSING	ALUMINIUM
06	02	PRIMARY TERMINAL	ALUMINIUM
07	01	CORE BOX	ALUMINIUM
08	01	SECONDARY CORES	CRGO & NANO
09	01	ACTIVE PART	OIL IMPREGNATED PAPER
10	02	INSULATOR FLANGE	ALUMINIUM
11	01	INSULATOR	PORCELAIN
12	01	BASE	ALUMINIUM
13	01	TERMINAL BOX	ALUMINIUM
14	--	INSULATING OIL	EHV Grade - MINERAL OIL
15	01	SECONDARY LEADOUT	EPOXY

Notes:

- Insulating oil shall be EHV Grade as per IS 335, IEC 296
- Core : CRGO Si-Fe/ Equivalent high permeability material, MU- Metal, NANO - crystalline
- Secondary winding - Enamelled copper

1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/ Isolators/IVT in the substation during foundation works to ensure safe live to ground clearance as per IE rules.
2. Since the supply of terminal connectors is not in the scope of manufacturers as mentioned in the drawings. The EPC contractors shall be instructed to supply the same in line with CT/PT/CVT/Isolator /IVTs requirement and capatibility.

NOTE:-1. Drawings approval subject to valid type test reports, to be checked during acceptance tests.  
2. For EPC contractors only.

Customer : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.

This document must not be copied without our written permission and the content and nor be used for any unauthorised purpose. Contravention will be prosecuted. © PFIFFNER

CHIEF ENGINEER/PROJECTS  
APTRANSCO/VS/Vijayawada

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

REV.NO.	DESCRIPTION				APPV'D	REV. DATE
GEN. TOL : NA		MATERIAL : NA				
WEIGHT : NA		SPEC : NA				
NAME	SIGN	DATE	SPEC : NA	ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED.		
DRAWN	M.D.	06.03.2023	FINISH : NA	SCALE : N.T.S.		
CHK'D	M.C.	06.03.2023	FINISH : NA	SHEET SIZE : A3		
APPV'D	R.P.	06.03.2023	FINISH : NA	DRG NO.		
<b>PFIFFNER</b> Instrument Transformers Pvt.Ltd. NASHIK, INDIA				TITLE :		APTR-01.25.420J4
				SECTIONAL VIEW 420KV CT		SHEET 1 OF 1
						REV. NO. : 00

**Annexure-A**  
**GUARANTEED TECHNICAL PARTICULARS FOR CURRENT TRANSFORMERS**

JOF 420 W OUTDOOR CURRENT TRANSFORMERS  
(420kV 3000A CT, 5 Core 25mm Creepage)

Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.

Sl.No	Particulars	Description
1	Type of tank/Installation Dead/Live Tank Type	Live Tank, Single Phase, Oil Filled, Outdoor Type
2	Type of mounting	Pedestal Mounting
3	Manufacturer's Name and address and Country of Manufacture	PIFFNER Instrument Transformers Pvt Limited, Gat No. 176, 178/2, Sarul, Nashik 422010, Maharashtra, INDIA
4	Whether Conforming to IEC 61869 Standard	Yes, IEC 61869-1&2
5 a)	Primary and Secondary winding made out of	Primary - Aluminium alloy Secondary - Copper alloy
i)	Primary windings -Design density for short circuit current -Conductivity of metal used -	Aluminium - 12.7 Amp/mm <sup>2</sup> (Approx.) - As per IEC
b)	i) Area of cross section of primary winding	4964 mm <sup>2</sup> (Approx.)
	ii) Area of cross section of secondary winding	1.588 mm <sup>2</sup> (Minimum)
c)	Material used for providing Primary Terminals	Aluminium
d)	Material used for providing secondary Terminals	Copper Alloy
e)	Whether Primary is Rigid Bar type in case of live tank	Yes, Rigid Bar type
6	Rated primary voltage (kV rms)	400 kV
7	Rated highest voltage (kV rms)	420 kV
8	Rated frequency (Hz)	50 Hz
9	Rated primary current (A)	3000A
10	Rated secondary current (A)	1A
11	Ratio taps (on secondary side only)	On Secondary Only
12	Type of insulation	Class A
13	Seismic acceleration (g)	0.3g
14	RIV at 1.1 x Rated voltage (mv)	< 1000 Micro Volts
15	Tank material and Tank coating	Aluminium Tank with Natural Finish
16	Hardware exposed to atmosphere	Stainless Steel
17	Bolts, Nuts and Washers	Stainless Steel
18	Porcelain housing and it make (Single piece only)	IEC/Modern/Ravikiran
19	Sealing (Nitrogen gas cushion/Metal Bellow)	Stainless Steel Bellows
20	Instrument security factor	≤ 5 (For Metering core )

Sl.No	Particulars	Description
21	Whether Tan Delta test tap provided	Yes
22	Whether secondary terminal plate is of moulded epoxy resin type	Yes (Epoxy Monoblock)
23	Whether primary terminal bushings are of molded Epoxy cast resin/Glass fiber reinforced Polymer	Not Applicable
24	Whether all seals are of "O" ring type	Yes, "O" Rings
25	Whether all "O" Rings are fixed in machined grooves with adequate space for compression'	Yes
26	Whether the main hollow insulator has the flanges cemented at both ends	Yes
27	Whether "O" Rings are of Nitrile butyl rubber or Viton	Yes (Viton)
28	Whether the Short circuit Ampere turns of the CT being supplied is same as type tested CTs	Yes CHIEF ENGINEER/PROJECTS APTRANSCO/VIS/Vijayawada
29	Tan Delta	< 0.5%
30	Whether ratio selection is achieved only in secondary	Yes
31	Whether ratio selection is achieved only in secondary	Yes
32	Whether Non return drain valve for oil sampling is arranged for 132kV and above CT/IVT	Yes
33	Acceptable limit of temperature	As per IS/IEC
34	Partial Discharge Level	< 5pC at 1.2 x Um /√3, < 10pC at Um (where Um is highest system voltage)
35	Rated short time withstand current for 1 sec. duration (kA rms)	63 kA
36	Rated dynamic withstand current (kAp)	157.5
37	Rated continuous thermal current (pu) where pu = rated current	Rated Extended Primary Current 120% for 3000/1A Tap  180% for 2000/1A Tap  200% for 1000/1A and 500/1A Tap
38	1.2/50 micro second impulse withstand voltage (kVp)	1425 kVp
39	One minute power frequency withstand voltage (kV rms) of primary winding (Dry)	630 kV rms
40	One minute power frequency withstand voltage of secondary	5 kV

Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.

PFIFFNER INSTRUMENT TRANSFORMERS PRIVATE LIMITED | CIN: U31909MH2018FTC318024

G.NO.176, 178/2, SARUL, NASHIK- 422010, MH, INDIA | +912532978227 | [contact@pfiffner.in](mailto:contact@pfiffner.in) | [www.pfiffner.in](http://www.pfiffner.in)

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

Sl.No	Particulars	Description				
	winding (kV rms)					
41 a)	Minimum total Creepage distance of insulator bushing (mm)	25mm/kV Porcelain Insulator / 10,500 mm				
b)	Protected Creepage of distance of bushing (mm)	Not Applicable				
42	Details of Cores	Core 1	Core 2	Core 3	Core4	Core 5
i)	Current Ratios A/A	3000-2000-1000-500/1-1-1-1-1A				
ii)	Output burden (VA)	NA	NA	5	NA	NA
iii)	Class of accuracy	PX	PX	0.2S	PX	PX
iv)	ISF	NA	NA	5	NA	NA
v)	Min. knee point voltage (kpv) in volts	3000 2000 1000 500	3000 2000 1000 500	NA	3000 2000 1000 500	3000 2000 1000 500
vi)	Secondary resistance corrected to 75 deg.C in ohms	15-10- 5-2.5	15-10- 5-2.5	NA	15-10-5- 2.5	15-10-5- 2.5
vii)	Max. Exciting current (mA) at V <sub>k</sub> - 100% of knee point voltage	20 30 60 120	20 30 60 120	NA	20 30 60 120	20 30 60 120
43	Weight of oil (Kg.)	380kg ± 10% (approx.)				
44	Approximate weight of Copper used (Kg)	65kg				
45	Approximate weight of Steel used (Kg)	180kg				
46	Total Weight (Kg.)	1560 ± 10% (approx.)				
47	Mounting details	600mm x 600mm (Refer GA Drawing)				
48	Overall dimensions	Please Refer Attached GA Drawing				
49	Characteristics (whether graphs enclosed):	No				
a)	Ratio and phase angle curves	No				
b)	Magnetization curves	No				
c)	Ratio correction factor curves	No				
50	Core					
a)	Area of cross section (sq.cm.)	As per Standard Design Practice				
b)	Flux density at rated primary current and rated burden	As Per Standard Design Practice				
c)	Grade	Nano-crystalline core for Metering CRGO steel or other equivalent alloys for Protection Cores				
50	Cantilever strength (kG)	500 KG				

Variation of Tan Delta Value from 10KV um/sqrt 3 shall be not exceed 15%.

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

CHIEF ENGINEER/PROJECTS  
APTRANSCO/VS/Vijayawada

1. Minimum 300mm plinth shall be maintained for CT/PT/CVT/ Isolators/IVT in the substation during foundation works to ensure safe live to ground clearance as per IE rules.  
2. Since the supply of terminal connectors is not in the scope of manufacturers as mentioned in the drawings. The EPC contractors shall be instructed to supply the same in line with CT/PT/CVT/Isolator /IVTs requirement and capability.