

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

Drawing approval subject to valid vendor registration

**Item: 145kV IVT**

**Ratio: 1W**

**Creepage: 31mm/kV**

**Customer: APTransco, Andhra Pradesh**

**List of Standard Drawings/Documents:**

Sl. No.	Description	Drawing/ Doc No.
1	General Arrangement	APTR-07.31.145E1_REV No.02
2	Rating Plate	APTR-07.31.145E2_REV No.02
3	Terminal Box GA	APTR-07.31.145E3_REV No.02
4	Sectional View	APTR-07.31.145E4_REV No.01
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 compatibility.

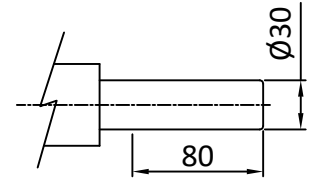
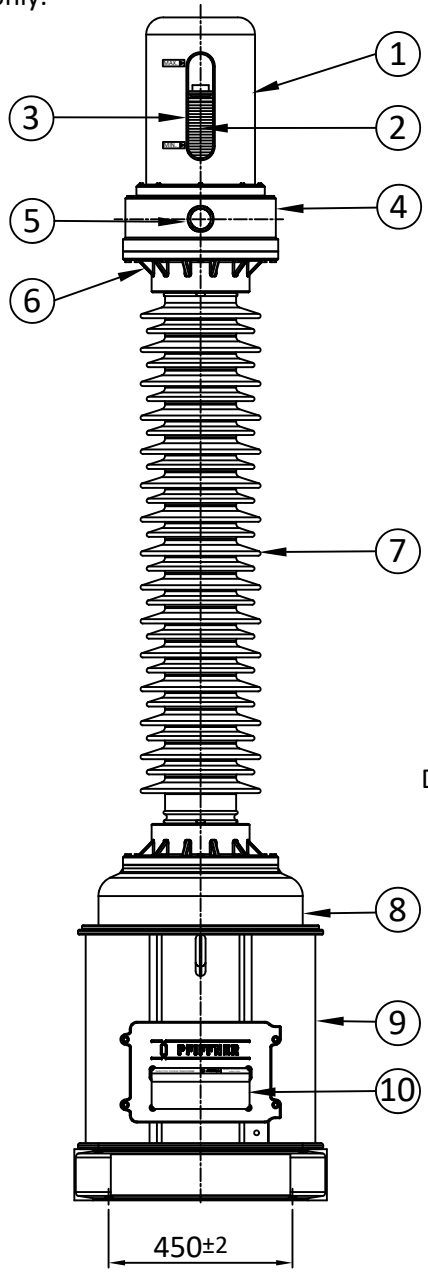
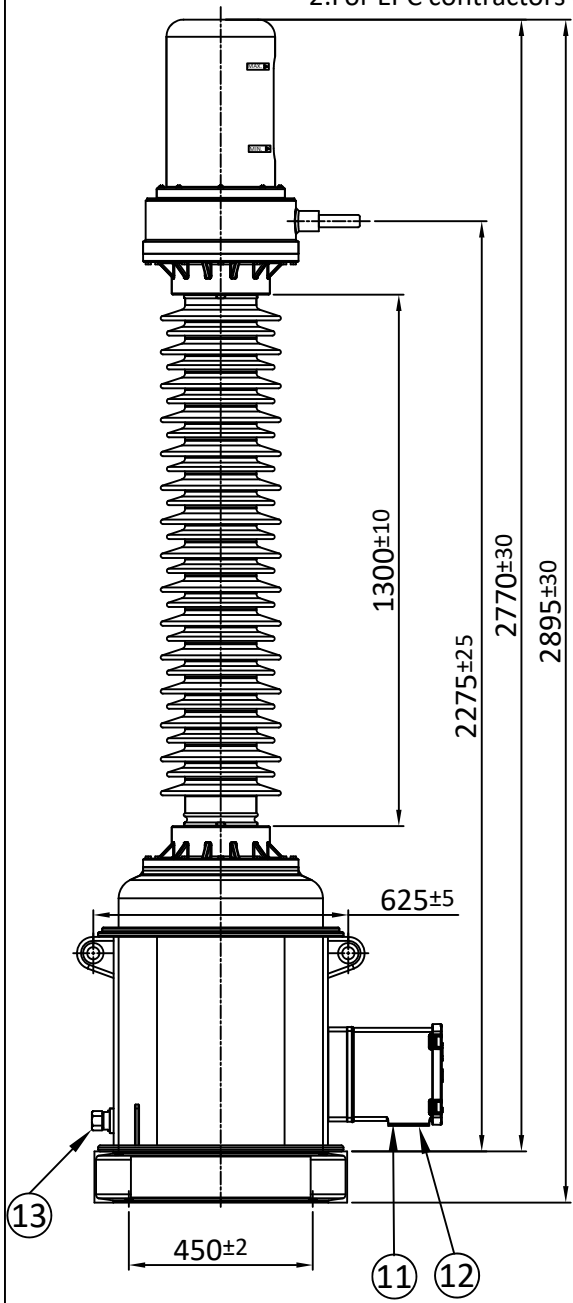
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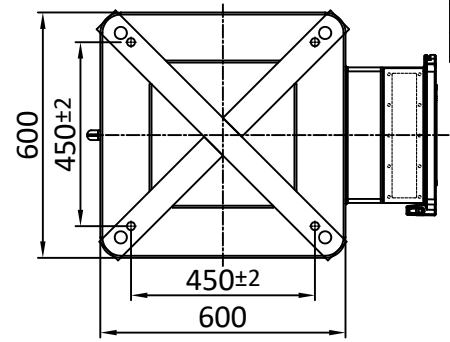
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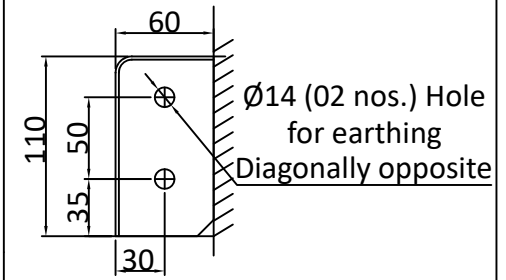


HV TERMINAL DETAIL



IVT MOUNTING DETAIL

NO.	QTY.	DESCRIPTION	MATERIAL
01	01	BELLOWS COVER	ALUMINIUM
02	01	BELLOWS	STAINLESS STEEL
03	01	BELLOW LEVEL INDICATOR	POLYCARBONATE
04	01	CHAMBER	ALUMINIUM
05	01	HV TERMINAL	COPPER
06	02	INSULATOR FLANGE	ALUMINIUM
07	01	INSULATOR	PORCELAIN
08	01	TOP TANK	ALUMINIUM
09	01	BOTTOM TANK	ALUMINIUM
10	01	RATING & SCHEMATIC PLATE	ALUMINIUM
11	01	TERMINAL BOX	ALUMINIUM
12	01	GLAND PLATE	ALUMINIUM
13	01	OIL SAMPLING VALVE	STEEL GALVANISED



EARTHING DETAIL

Ø14 (02 nos.) Hole for earthing Diagonally opposite

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TOTAL WEIGHT : 500 kg ±10%  
 TOTAL OIL WEIGHT : 110 kg ±10%  
 CREEPAGE DISTANCE : ≥4495 mm

Customer : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.

02	AS PER CUSTOMER COMMENTS.		CHM	25.04.2023
01	AS PER CUSTOMER COMMENTS.		CHM	20.04.2023
REV.NO.	DESCRIPTION		APPV'D	REV. DATE
GEN. TOL : NA		MATERIAL : NA		
WEIGHT : NA		SPEC : NA		
DRAWN	M.D.	09.03.2023	ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED.	
CHK'D	M.C.	09.03.2023	SCALE : N.T.S.	
APPV'D	R.P.	09.03.2023	SHEET SIZE : A3	

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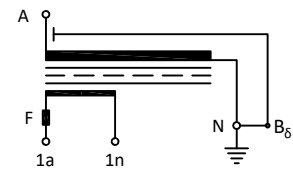
**PIFFNER**  
 Instrument Transformers Pvt.Ltd.  
 NASHIK, INDIA

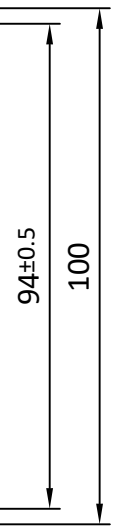
TITLE : GENERAL ARRANGEMENT  
 145kV IVT  
 DWG NO. APTR-07.31.145E1  
 SHEET 1 OF 1 | REV. NO. : 02

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<b>PFIFFNER</b> Instrument Transformers Pvt.Ltd. NASHIK, INDIA		<b>INDUCTIVE VOLTAGE TRANSFORMER</b> MADE IN INDIA	
CUSTOMER : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.		PO No. : -----	
YEAR : ----	TYPE : EOF 145 W	SPECIFICATION : IS 16227, IEC 61869	SERIAL NO. : -----
A - N 132000/√3 V	1a - 1n	110/√3 V	
	VA	10	
	CLASS	0.2	
	SIMULTANEOUS BURDEN / ACCURACY CLASS		10 VA / 0.2
H.S.V. 145 kV	FREQUENCY	50 Hz	
INSULATION LEVEL		275 kV / 650 kVp	
VOLTAGE FACTOR		1.2 CONT. / 1.5-30 sec.	
CREEPAGE DISTANCE		≥4495 mm	
TOTAL WEIGHT 500 ±10% kg	OIL WEIGHT	110 ±10% kg	
A - PRIMARY TERMINAL (H.V.) B <sub>δ</sub> - CAPACITANCE TAN DELTA LEADOUT N - NEUTRAL END OF PRIMARY WINDING. F - FUSE (16 A)		 <p>CAUTION : - ENSURE SECONDARY TERMINALS ARE NOT SHORTED IN OPERATION. - ENSURE B<sub>δ</sub> AND N ARE CONNECTED TO EARTH BEFORE CHARGING IVT. - CHECK BELLOWS POSITION.</p>	

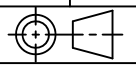



234±0.5  
240

Ø1.7 (04 Nos.)

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.

Customer : TRANSMISSION CORPORATION OF ANDRA PRADESH LTD.

02	AS PER CUSTOMER COMMENTS.			CHM	26.04.2023
01	AS PER CUSTOMER COMMENTS.			CHM	20.04.2023
REV.NO.	DESCRIPTION			APPV'D	REV. DATE
GEN. TOL : NA		MATERIAL :			
WEIGHT : NA		1mm thick Aluminium metal photo			
	NAME	SIGN	DATE	SPEC : NA	ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED.
DRAWN	M.D.		09.03.2023		SCALE : N.T.S.
CHK'D	M.C.		09.03.2023	FINISH : NA	SHEET SIZE : A3
APPV'D	R.P.		09.03.2023		DWG NO.
 Instrument Transformers Pvt.Ltd. NASHIK, INDIA				TITLE : RATING PLATE 145 kV IVT	
				APTR-07.31.145E2	
				SHEET 1 OF 1	REV. NO. : 02

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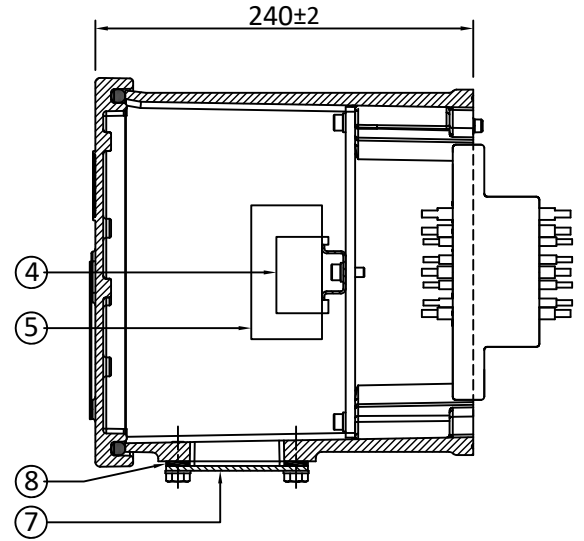
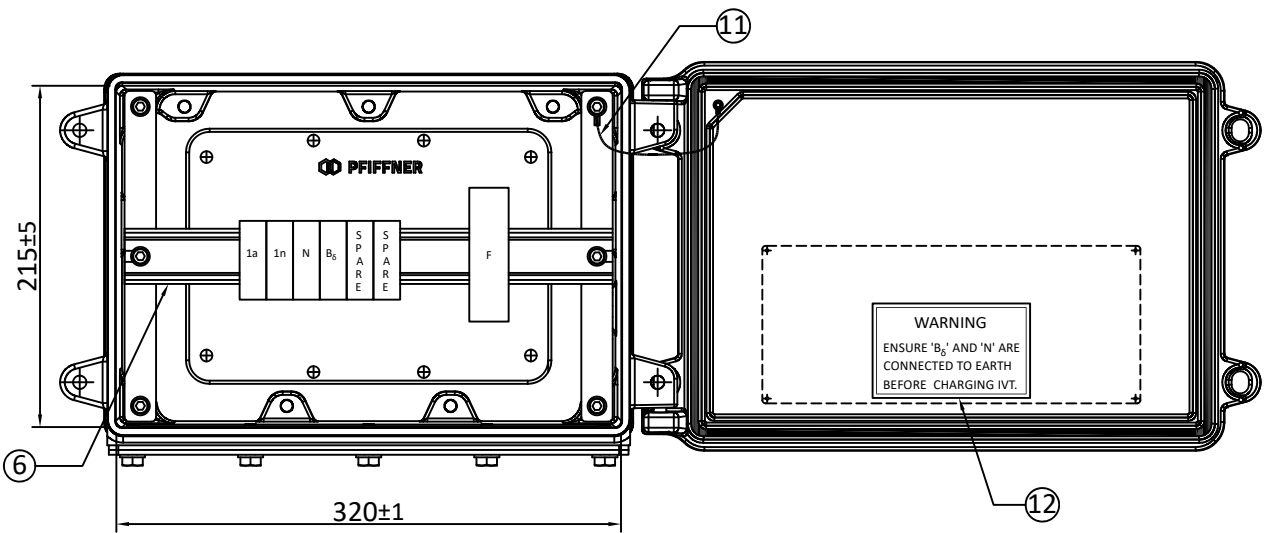
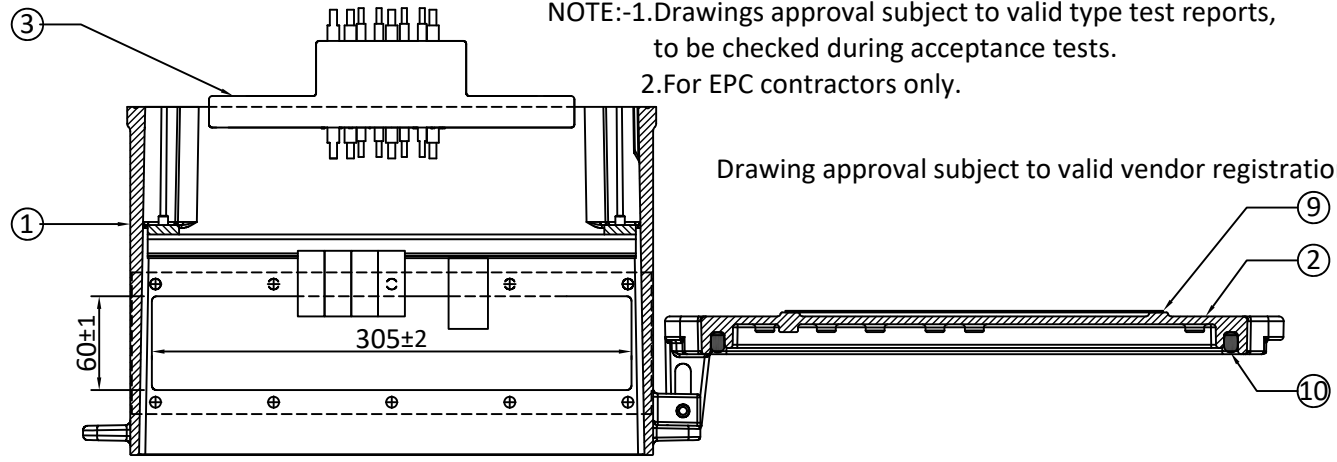
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SR.NO.	DESCRIPTION	QTY.	MATERIAL
1	TERMINAL BOX	1	ALUMINIUM
2	TERMINAL BOX COVER	1	ALUMINIUM
3	EPOXY MONOBLOCK	1	EPOXY
4	STUD TYPE TERMINAL BLOCK	4+2 SPARE	ELMEX OR EQUI.
5	FUSE - HRC (16 A)	1	GE / C&S
6	TERMINAL CARRIER RAIL	1	STEEL
7	GLAND PLATE ( 330x90x4 mm thk. )	1	ALUMINIUM
8	GLAND PLATE GASKET	1	RUBBER
9	RATING & SCHEMATIC PLATE	1	ALUMINIUM
10	DOOR GASKET	1	RUBBER
11	DOOR EARTHING CABLE	1	COPPER
12	WARNING STICKER	1	ALUMINIUM

IF IN DOUBT ASK



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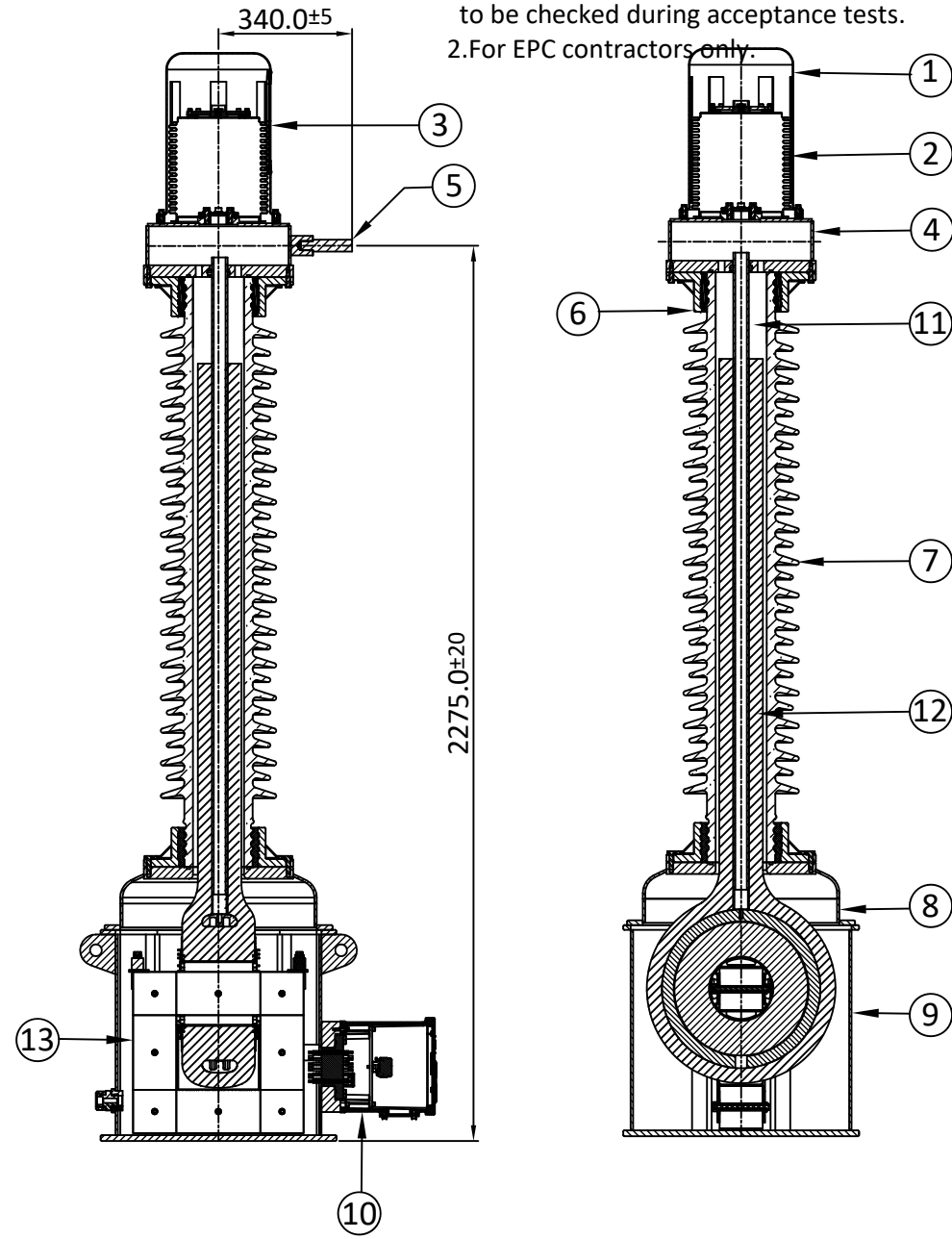
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01	AS PER CUSTOMER COMMENTS.	CHM	20.04.2023
REV.NO.	DESCRIPTION	APPV'D	REV. DATE
GEN. TOL : NA		MATERIAL : NA	
WEIGHT : NA			
DRAWN M.D. 09.03.2023			
CHK'D M.C. 09.03.2023		FINISH : NA	
APPV'D R.P. 09.03.2023		TITLE : TERMINAL BOX GA 145kv IVT	
 Instrument Transformers Pvt.Ltd. NASHIK, INDIA		ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED. SCALE : N.T.S. SHEET SIZE : A3 DWG NO. APTR-07.31.145E3 SHEET 1 OF 1   REV. NO. : 02	

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NO.	QTY.	DESCRIPTION	MATERIAL
01	01	BELLOWS COVER	ALUMINIUM
02	01	BELLOWS	STAINLESS STEEL
03	01	BELLOWS LEVEL INDICATOR	POLYCARBONATE
04	01	CHAMBER	ALUMINIUM
05	01	HV TERMINAL	COPPER
06	02	INSULATOR FLANGE	ALUMINIUM
07	01	INSULATOR	PORCELAIN
08	01	TOP TANK	ALUMINIUM
09	01	BOTTOM TANK	ALUMINIUM
10	01	TERMINAL BOX	ALUMINIUM
11	-	INSULATING OIL	EHV Grade - MINERAL OIL
12	01	ACTIVE PART	OIL IMPREGNATED PAPER
13	01	CRGO CORE ASSEMBLY	CRGO (M4)

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- Notes:
- Insulating oil shall be EHV Grade as per IS 335, IEC 296
  - Core : CRGO M4 / Equivalent high permeability material
  - Secondary winding - Enamelled copper

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01	AS PER CUSTOMER COMMENTS.			CHM	25.04.2023
REV.NO.	DESCRIPTION			APPV'D	REV. DATE
GEN. TOL. : NA		MATERIAL : NA			
WEIGHT : NA		SPEC : NA			
DRAWN	M.D.	09.03.2023	FINISH : NA	ALL DIMENSION ARE IN MM. UNLESS OTHRWISE SPECIFIED.	
CHK'D	M.C.	09.03.2023	SCALE : N.T.S.	SHEET SIZE : A3	
APPV'D	R.P.	09.03.2023	TITLE :	DRG NO.	
<b>PFIFFNER</b> Instrument Transformers Pvt.Ltd. NASHIK, INDIA			SECTIONAL VIEW 145KV IVT	APTR-07.31.145E4	
				SHEET 1 OF 1	REV. NO. : 01

**Annexure**  
**GUARANTEED TECHNICAL PARTICULARS FOR PTs**

EOF 145 W OUTDOOR INDUCTIVE VOLTAGE TRANSFORMERS  
 (145kV, 1 Windings 31mm Creepage)

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Sl.No	Particulars	Description
1	Type	Dead Tank, Single Phase, Oil Filled, Outdoor type
2	Manufacturer's type /Designation	EOF 145 W, / Pedestal Mounting
3	Manufacturer's Name and address and Country of Manufacture	PFIFFNER Instrument Transformers Pvt Limited, Gat No. 176, 178/2, Sarul, Nashik 422010, Maharashtra, INDIA
4	Mounting of tank (Bottom)	Bottom
5	Conforming to Standard	Yes, IEC 61869-1&3
6	Rated primary voltage (kV rms)	132 kV
7	Rated highest voltage (kV rms)	145 kV
8	Rated frequency (Hz)	50 Hz
9	Secondary winding details	
	a) No. of secondary windings	Winding – I
	b) Rated secondary voltage(v)	110/v3
	c) Rated burden (VA)	10
	d) Class of accuracy	0.2
10	Temperature rise at 1.2 times rated voltage with rated burden (deg.C)	As per IEC61869
11	Rated voltage factor and time	1.2 Continuous and 1.5 for 30seconds
12	Impulse withstand test voltage (KV) peak.	650
13	One minute power frequency withstand test voltage on primary (KV rms)	275
14	One minute power frequency withstand test voltage on secondary (KV rms)	3
15	Porcelain Bushing (make)	IEC / Modern / Ravikiran
16	Total creepage distance of the bushing (mm)	≥ 4495 mm
17	Protected creepage distance of the bushing (mm)	Not Applicable
18	Quantity of insulating oil (Litres)	120 ± 10% (approx.)
19	Weight of oil (Kg.)	110 ± 10% (approx.)
20	Total Weight (Kg.)	500 ± 10% (approx.)
21	Mounting details	450 x 450 (please refer GA drawing)
22	Live parts to ground clearance	
23	Whether V.T. is sealed construction with nitrogen at top	YES, IVT is hermetically sealed with SS bellows.
24	Overall dimensions	Please Refer Attached GA Drawing
25	Grade of oil	IS 335
26	Voltage Transformers shall carry 25% above the rated burden continuously without injury in respect of voltage Transformers	YES
27	RIV at 1.1 x Um/Root3m(Micro Volts)	<1000 uV
28	Partial Discharge	<10 pC @ Um <5 pC@1.2 @ Um/v3
29	Tan Delta	< 0.5%
30	Total thermal limiting output (VA)	100
31	Simultaneous burden and accuracy class	10VA / 0.2

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