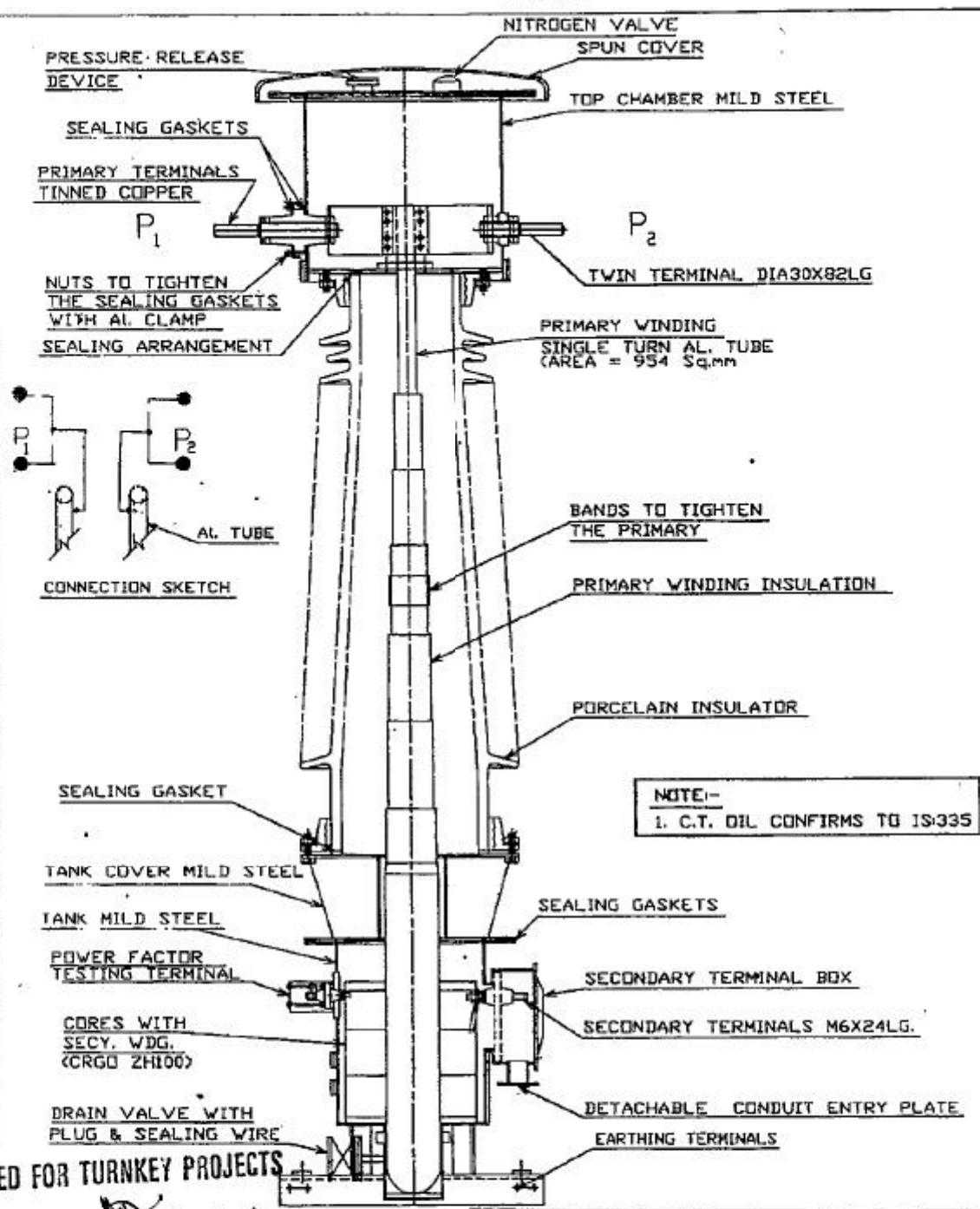


CALL DIMENSIONS ARE IN MM



NOTE:-
1. C.T. OIL CONFIRMS TO IS:335

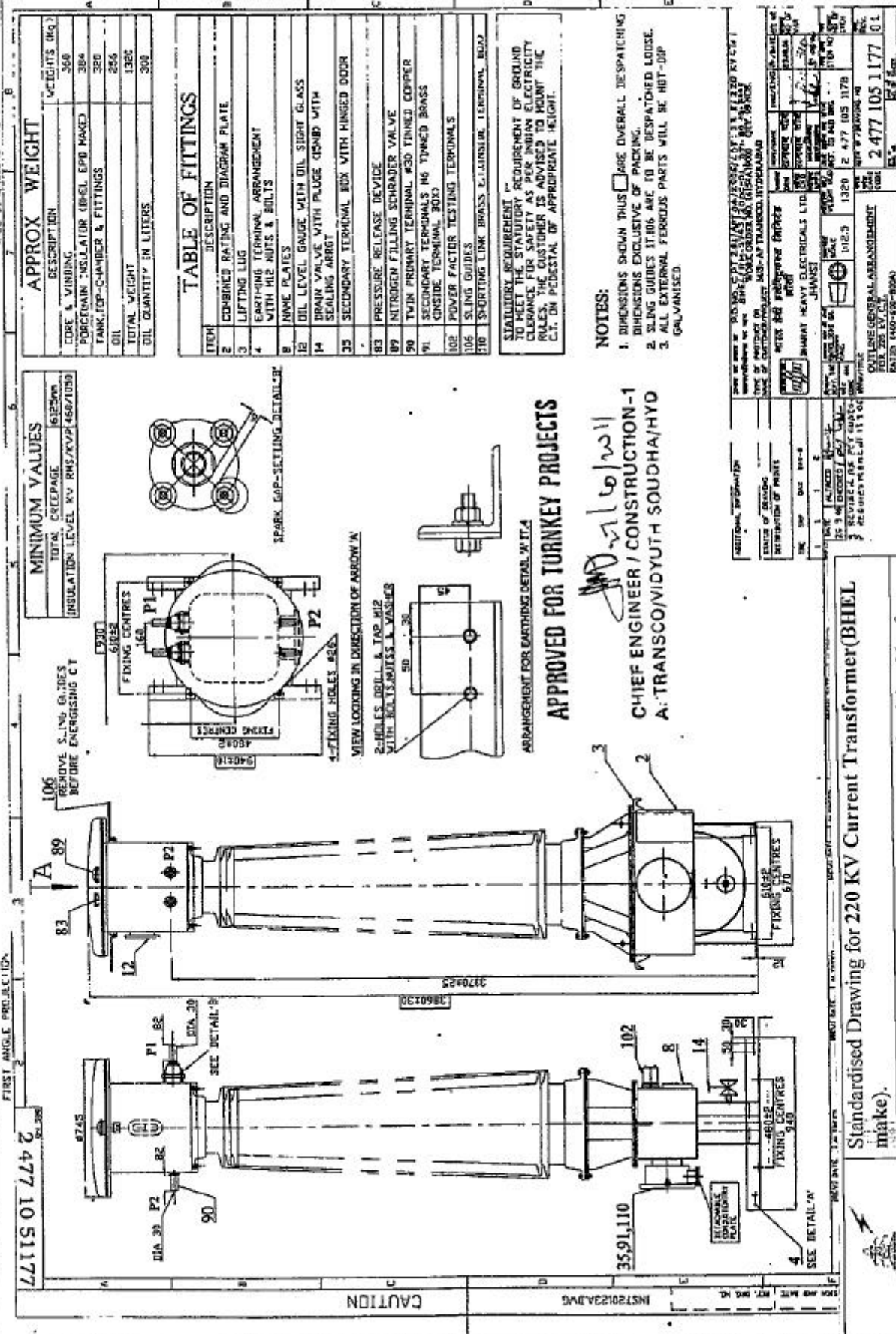
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CHIEF ENGINEER / CONSTRUCTION-1
APTRANSCO/VIDYUTH SOUDHA

P.D.NO. CPT251/APT04/2006/LOT I & II 220KV.CT/ BHEL/ RM-3743/2006-01.DT: 30.08.2006.	
WORK ORDER NO. 16153A19000 QTY.78 NOS. TYPE OF PRODUCT OR WORK ORDER NO. 16154A19000 QTY.99 NOS. NAME OF CUSTOMER/PROJECT M/S:- APTRANSCO, HYDERABAD	डायग्राम के प्रकर पर बलवत्/परिचालन के लिए TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT
STATUS OF DRAWING DISTRIBUTION OF PRINTS TPC TRP OAX DAY-8 1 1 1 2 REV. DATE ORN 01.25.06 CKD Drg Revised as per CUSTOMER REQUIREMENT DT: 13.09.06.	भारत हेवी इलेक्ट्रिकल्स लिमिटेड भारती BHARAT HEAVY ELECTRICALS LTD. BHANSI 1:1 24771051175-7 34771050263 SECTIONAL VIEW FOR 220 KV.C.T. RATIO(500-300A) & (800-600-400)

	Standardised Drawing for 220 KV Current Transformer(BHEL make).
	STD/GTP-DWG/Approval No. 205-2-sheet2 Revision No. 0
	Prepared & Approved during October - 2011
	Customer ref : APTRANSCO
Title:Sectional view for 220KV CT of Ratio(500-300A) & (800-600-400)	

420/99





**TRANSFORMER ENGG. DEPARTMENT
BHARAT HEAVY ELECTRICALS LIMITED JHANSI (UP)**

GUARANTEED TECHNICAL PARTICULAR OF 220KV CT

QE-8547

CUSTOMER:--M/S-APTRANSCO Ltd.

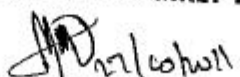
ITEM-No.:2, 220 KV CT (800-600-400A)

QTY. NO.: 2 NOS.

DATE:-13.01.2009

Sl.No.	PERTICULARS	
1.	Type of tank/installation	Dead Tank Type, Out door /
2.	Type of Mounting	Pedestal Mounting /
3.	Manufacturer's Name and address and country of Manufacture	BHEL Jhansi (INDIA)
4.	Conforming the Standard	IS-2705-1992
5. (a)	(i) Primary and Secondary winding made out of (As per Clause 4.12,4.13,4.14)	Confirmed /
	(ii) Primary Windings design Density	<105 A/Sq.mm.Al.
(b).	(i). Area of cross section of primary winding	AL. 950 mm
	(ii). Area of cross section of secondary winding	>1.22 Sq.mm. /
(c).	Material used for providing secondary terminals	Brass Stud (ET)
6.	Rated primary Voltage (KV rms)	220 KV /
7.	Rated highest Voltage (KV rms)	245 KV /
8.	Rated frequency (Hz)	50 HZ /
9..	Rated primary current (A)	800-600-400A /
10.	Rated secondary Current (A)	1, 1, 0.5-1, 0.5-1, 1A /
11.	Ratio taps	Confirmed (From Secondary taps only)
12.	Type of insulation	Class 'A' immersed in oil
13.	Seismic acceleration (g)	0.1 g. /
14.	RIV at 1.1 x Rated voltage (μv)	<500 Micro volt /
15.	Tank material and Tank coating (As per Clause 3.13 & 3.14)	Confirmed (Zink Rich Epoxy Painted with shad 631 of IS 5)
16.	Hardware exposed to atmosphere (As per Clause 3.14)	Confirmed /
17.	Bolts, Nuts and Washers (As per Clause 3.14)	Confirmed
18.	Porcelain housing and it make (Single piece only as per clause 3.12)	BHEL, (EPD) make /
19.	Sealing (Nitrogen gas cushion /Metal	N2 gas cushion provided at the top of

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	bellow as per clause 3.17)	CT above the oil.
20.	Instrument security factor (As per clause 4.10)	ISF <5 ✓
21.	Whether test tap provided (As per clause 4.18)	Yes ✓
22.	Acceptable limit of temperature	45 Deg.C ✓
23.	Acceptable partial discharge level at 1.1 times the rated voltage	10 PC at UM & 5PC at 1.2 UM/root 3 ✓
24.	Rated short time withstand current for 1 sec. duration (kA rms)	40KA/1Sec. ✓
25.	Rated Dynamic withstand current (Kap)	100 Kap
26.	Rated continuous thermal current (pu) Where pu= rated current	1.2Pu
27.	1.2/50 micro-second impulse withstand voltage (kVp)	1050 Kap.
28.	One minute power frequency withstand Voltage (kV rms) of primary winding (Dry)	460 kV.
29.	One minute power frequency withstand voltage of secondary winding (kV rms)	3KV.
30.a.	Minimum total creepage distance of insulator bushing (mm)	6125mm.
b.	Protected creepage distance of bushing (mm)	3062mm
31.	Details of Core	
	CORE-I	
	Current ratio	800-600-400/1A
	Output burden (VA)	NA
	Class of accuracy	PS ✓
	Accuracy limit factor	NA
*	Min. Knee point Voltage (kpv)	100I(Rct+20) =2500V, 1875V, 1250V offered at 800/1, 600/1, 400/1A ratio taps.
*	Secondary resistance corrected to 75 deg.C	5 ohm, 3.75 ohm, 2.5 ohm offered at 800/1A, 600/1A, 400/1A.
*	Max. exciting current at 800/1A	
	20% Knee point Voltage	20mA
	50% Knee point Voltage	50mA ✓
	100% Knee point Voltage	100mA
	Application	Protection
	CORE-II	
	Current ratio	800-600-400/1A

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	Output burden (VA)	NA
	Class of accuracy	PS
	Accuracy limit factor	NA
*	Min. Knee point Voltage (kpv)	100I(Rct+20) =2500V, 1875V, 1250V offered at 800/1, 600/1, 400/1A ratio taps.
*	Secondary resistance corrected to 75 deg.C	5 ohm, 3.75 ohm, 2.5 ohm offered at 800/1A, 600/1A, 400/1A.
*	Max. Exciting current at 800/1A	
	20% Knee point Voltage	20mA
	50% Knee point Voltage	50mA
	100% Knee point Voltage	100mA
	Application	Protection
	CORE-III	
	Current ratio	800-600-400/0.5 -1A
	Output burden (VA)	NA
	Class of accuracy	PS
	Accuracy limit factor	NA
*	Min. Knee point Voltage (kpv)	80I(Rct+3)=640V, 480V, 320V, 1280V, 960V, 640V offered at 800/1, 600/1, 400/1, 800/0.5, 600/0.5, 400/0.5 ratio taps.
*	Secondary resistance corrected to 75 deg.C	5 ohm, 3.75 ohm, 2.5 ohm, 10 ohm, 7.5 ohm, 5 ohm offered at 800/1, 600/1, 400/1, 800/0.5, 600/0.5, 400/0.5 ratio taps.
*	Max. exciting current at 800/1A	
	20% Knee point Voltage	6 mA
	50% Knee point Voltage	15 mA
	100% Knee point Voltage	30 mA
	Application	Protection
	CORE-IV	
	Current ratio	800-600-400/0.5-1A
	Output burden (VA)	NA
	Class of accuracy	PS
	Accuracy limit factor	NA
*	Min. Knee point Voltage (kpv)	80I(Rct+3)=640V, 480V, 320V, 1280V, 960V, 640V offered at 800/1, 600/1, 400/1, 800/0.5, 600/0.5, 400/0.5 ratio taps.
*	Secondary resistance corrected to 75 deg.C	5 ohm, 3.75 ohm, 2.5 ohm, 10 ohm, 7.5 ohm, 5 ohm offered at 800/1, 600/1, 400/1, 800/0.5, 600/0.5, 400/0.5 ratio taps.
*	Max. exciting current at 800/1A	
	20% Knee point Voltage	6 mA
	50% Knee point Voltage	15 mA

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	100% Knee point Voltage	30 mA
	Application	Protection
	CORE-V	
	Current ratio	800-600-400/1A
	Output burden (VA)	20VA
	Class of accuracy	0.2, ISF < 5
	Accuracy limit factor	NA
	Min. Knee point Voltage (kpv)	NA
31.8	Application	Metering
32.	Weight of oil	Approximate 286 Kg
33.	Total weight (kg)	as per enclosed OGA.Drg.No-24771051177
34.	Mounting Details	as per enclosed OGA.Drg.No-24771051177
35.	Overall Dimensions	as per enclosed OGA.Drg.No-24771051177
36.	Characteristics	
a.	Ratio and phase angle curves	As per IS-2705-1992
b.	Magnetization Curves	Enclosed for PS-class only
c.	Ratio correction factor Curves	As per IS-2705-1992
37.	CORE	
a.	Area of cross section	Adequate
b.	Flux density at rated primary current and rated burden.	Adequate

38. The type tests should have been conducted not earlier than 5 years in the standard third party laboratory. The manufacturer shall produce the type test reports at the time of acceptance tests.

39. Quality of material & applicable standard - BIS. The manufacturer shall produce the valid BIS Certification at the time of acceptance tests.

	Standardised Guaranteed Technical Particulars for 220KV Current Transformer (BHEL make)
	STD/GTP-DWG/Approval No. 205-1 Revision No. 0
	Prepared & Approved during October - 2011

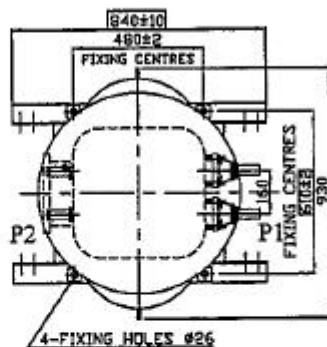
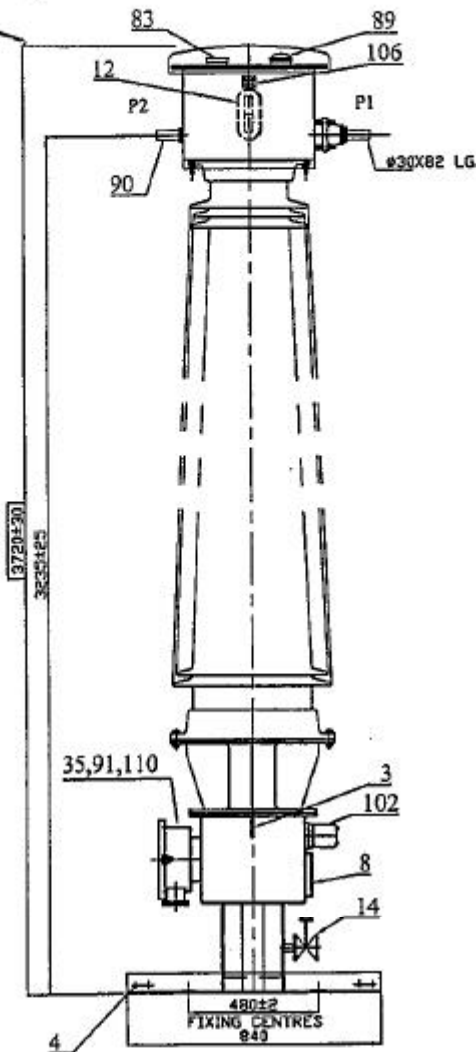
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CHIEF ENGINEER / CONSTRUCTION-1
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FIRST ANGLE PROJECTION

(ALL DIMENSIONS ARE IN mm)

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IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



APPROX WEIGHT	
DESCRIPTION	WEIGHTS (Kg.)
TOTAL WEIGHT	1280
OIL QUANTITY IN LITERS	310

MINIMUM VALUES	
TOTAL CREEPAGE	6125mm
INSULATION LEVEL KV RMS/KVP	460/1050

APPROX WEIGHT	
ITEM	DESCRIPTION
2	COMBINED RATING AND DIAGRAM PLATE
3	LIFTING LUG
4	EARTHING TERMINAL ARRANGEMENT WITH M12 NUTS & BOLTS
8	NAME PLATES
12	OIL LEVEL GAUGE WITH OIL SIGHT GLASS
14	DRAIN VALVE WITH PLUG (15NB) WITH SEALING ARRG.
35	SECONDARY TERMINAL BOX
83	PRESSURE RELEASE DEVICE
89	NITROGEN FILLING SCHRADER VALVE
90	TWIN PRIMARY TERMINAL Ø30 TINNED CU.
91	SECONDARY TERMINALS M6 TINNED BRASS (INSIDE TERMINAL BOX)
102	POWER FACTOR TESTING TERMINALS
106	SLING GUIDES
110	SHORTING LINK BRASS E.T. (INSIDE TERMINAL BOX)

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CHIEF ENGINEER / CONSTRUCTION-1
APTRANSCO/VIDYUTH SOUDHA/HYD.

NOTES:-

1. THIS DRAWING IS FOR TENDRING PURPOSE ONLY. DIMENSIONS AND DETAILS ARE SUBJECT TO REVISION AND SHOULD NOT BE FINALLY WORKED TO UNLESS CONFIRMED.

INS40091.DWG
REF. DRG. No.

SIGN & DATE



भारत हेवी इलेक्ट्रिकल्स लिमिटेड, झांसी
BHARAT HEAVY ELECTRICALS LTD, JHANSI

DEPT. TRE
CODE 406



SCALE 1:10

WEIGHT (kg.) 1280

REF. TO ASSY. DRG.

ITEM NO.

NAME	SIGN	DATE
श्री. अ. अ. अ. अ.		
श्री. अ. अ. अ. अ.		

REV
00

No. OF SHEET 01

SIZE A4



Standardised Drawing for 220 KV Current Transformer(BHEL make).

STD/GTP-DWG/Approval No. 205-4-sheet2 Revision No. 0

Prepared & Approved during October- 2011

Customer ref : APTRANSCO

Title:out line General Arrangement for 220KV CT



TRANSFORMER ENGINEERING DEPARTMENT

BHARAT HEAVY ELECTRICALS LIMITED JHANSI (UP)

GUARANTEED TECHNICAL PARTICULARS FOR 220KV CURRENT TRANSFORMER

QE.: 9034

M/S : APTRANSCO

ITEM-No. : 1,

Qty: 6 Nos.

Date: 19.05.2010

SL.N o.	Particulars	
1.	Type of tank/Installation	1Ph ,Out Door, Oil filled,hermetically sealed,220 KV CT (Dead Tank Type.)
2.	Type of mounting	Pedestal type
3.	Manufacturers name and address and country of manufacture	BHEL,Jhansi(INDIA)
4.	Conforming to standard	IS-2705
5.a)	i)Primary and secondary winding made out of	Primary-copper, Secondary-Copper
	ii)Primary windings-Design density for short circuit current	As per IS-2705
b)	i)Area of cross section of primary winding	coppertube-735 sqmm
	ii)Area of cross section of secondary winding	>=1.22 sqmm copper
c)	Materials used for providing secondary terminals	Brass
6.	Rated primary voltage(KVrms)	220
7.	Rated highest	245

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	voltage(KVrms)	
8.	Rated frequency(Hz)	50
9.	Rated primary current(A)	500-300
10.	Rated secondary current(A)	1,0.83,0.625,0.5,0.375
11.	Ratio taps(on secondary side only)	yes
12.	Type of insulation	CLASS-A
13.	Seismic acceleration(g)	<0.3g
14.	RIV at 1.1x Rated voltage(mV)	<500
15.	Tank material and Tank coating	Mild steel, epoxy painted
16.	Hardware exposed to atmosphere	Hot Dip galvanized
17.	Bolts,Nuts and washers	Hot Dip galvanized
18.	Porcelain housing and its make	Hollow Porcelain,EPD bangalore make
19.	Sealing(Nitrogen gas cushion/Metal bellow)	Yes nitrogen gas filled
20.	Instrument security factor	<5 for metering core,(core-V)
21.	Whether test tap provided	yes
22.	Acceptable limit of temperature	As per IS-2705
23.	Acceptable partial discharge level at 1.1 times the rated voltage	<10 PC
24.	Rated short time withstand current for 1 sec.duration(KArms)	40KA/1sec
25.	Rated dynamic withstand current(KAp)	100 KAp
26.	Rated continuous thermal current(pu) where pu =rated current	1.2 times the rated primary current
27.	1.2/50 micro seconds impulse withstand voltage(KVp)	1050,KVp
28.	One minute power	460 KVrms

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[Signature]
 CHIEF ENGINEER / CONSTRUCTION-1
 APTRANSCO/VIDYUTH SOUDHA/HYD.

	frequency withstand voltage (KVrms) of primary winding(DRY)					
29.	One minute power frequency withstand voltage (KVrms) of secondary winding	3 KVrms				
30.	a)Minimum total creepage distance of insulator bushing(mm)	6125mm				
	b)Protected creepage of distance of bushing(mm)	3062mm				
31.	Details of cores cores No-	I	II	III	IV	V
31.1	Current ratio A/A	500/1 300/1	500/1,0.66 300/1,0.66	500/1 500/0.375, 0.5,0.625,0 .83 300/1 300/0.375, 0.5,0.625,0 .83	500/1 500/0.375,0.5 0.625,0.83 300/1 300/0.375,0.5 0.625,0.83	500/1 300/1
31.2	Output burden(VA)	20	-	-	-	20
31.3	Class of accuracy	5P	PS	PS	PS	0.2
31.4	Accuracy limit factor	20	-	-	-	-
31.5	Min. Knee point voltage(KPV)		40I(Rct+10) gauranteed at highest ratio tap. KPV=300- 465- 185,280V at 500/1,500/0.6 6,300/1,300/0 .66 ratio taps respt.	80I(Rct+10)) gauranteed at highest ratio tap. KPV=259- 690-517- 414-310- 155-414- 310-248- 187V at 500/1,500/ 0.375,500/ 0.5,500/0.6 25,500/0.8 3,300/1,30 0/0.375,30 0/0.5,300/0 .625,300/0. 83 ratio taps respt.	80I(Rct+10) gauranteed at highest ratio tap. KPV=259- 690-517-414- 310-155-414- 310-248- 187V at 500/1,500/0.3 75,500/0.5,50 0/0.625,500/ .83,300/1,300 /0.375,300/0. 5,300/0.625,3 00/0.83 ratio taps respt	-
31.6	Secondary resistance corrected to 75 deg.C		5Ω at 500/1, 7.5Ω at 500/0.66,	5Ω at 500/1, 13Ω at	5Ω at 500/1, 13Ω at 500/0.375,	-

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			3Ω at 300/1, 4.5Ω at 300/0.66	500/0.375, 10Ω at 500/0.5, 8Ω at 500/0.625, 6Ω at 500/0.83, 3Ω at 300/1, 8Ω at 300/0.375, 6Ω at 300/0.5, 4.5Ω at 300/0.625, 3.5Ω at 300/0.83,	10Ω at 500/0.5, 8Ω at 500/0.625, 6Ω at 500/0.83, 3Ω at 300/1, 8Ω at 300/0.375, 6Ω at 300/0.5, 4.5Ω at 300/0.625, 3.5Ω at 300/0.83,	
31.7	Max. exciting current at		30mA at Knee point voltage at highest ratio taps, i.e 500/0.66	30mA at Knee point voltage at highest ratio taps, i.e 500/ 0.375	30mA at Knee point voltage at highest ratio taps, i.e 500/0.375	-
	20% of knee point voltage	-	6	6	6	-
	50% of knee point voltage	-	15	15	15	-
	100% of knee point voltage	-	30	30	30	-
31.8	Application	Outdoor CT				
32.	Weight of oil(Kg)	As per OGA				
33.	Total weight(Kg)	As per OGA				
34.	Mounting Details	As per OGA				
35.	Overall dimensions	As per OGA				
36.	Characteristic(whether graph enclosed):	Yes enclosed				
37.	Core					
	a) Area of cross section	Adequate as per requirement				
	b) flux density at rated primary current and rated burden	<14500 G for core II, III, IV, V } CRGO Core <900G for core I				
38.	Ferrous part treatment	Epoxy painted as per Shade-631, IS-5				

39. The type tests should have been conducted not earlier than 5 years in the standard third party laboratory. The manufacturer shall produce the type test reports at the time of acceptance tests.

40. Quality of material and applicable standard - BIS - The manufacturer shall produce the valid BIS Certification at the time of acceptance tests.

	Standardised Guaranteed Technical Particulars for 220KV Current Transformer(BHEL make)
	STD/GTP-DWG/Approval No. 205-3 Revision No. 0
	Prepared & Approved during October - 2011

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 CHIEF ENGINEER / CONSTRUCTION-I
 APTRANSCO/VIDYUTH SOUDHA/HYP