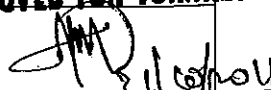




Schedule of General Technical Particular's of 145kV and 245kV Capacitor Voltage Transformer's

Sr. No.	Item Description	145kV			245kV		
		1)	Type of tank / installation	Dead tank, Vertical, Oil filled, Hermetically Sealed.			
2)	Type of mounting	Vertical.					
3)	Manufacturers name, address & country	M/s. Crompton Greaves Ltd, A-3, MIDC Ambad, Nasik 422 010.					
4)	Conforming to standard	IS: 3156(1992) / IEC 186 (1987)					
5)	Type of voltage transformer	CVE: 145/650/50			CVE 245/1050/50		
6)	Type of insulation used	Class A					
7)	Rated primary voltage (kV rms)	132kV/√3.			220 kV /√3		
8)	Rated system voltage (kV rms)	145kV /√3.			245kV /√3		
		Wdg-I	Wdg-II	Wdg-III	Wdg-I	Wdg-II	Wdg-III
9)	Rated secondary voltage (V)	110/√3	110/√3	110-110/√3	110/√3	110/√3	110-110/√3
10)	Rated transformation ratio	220/√3/110/√3	220/√3/10/√3	220/√3/110-110/√3	220/√3/10/√3	220/√3/10/√3	220/√3/10-110/√3
11)	Rated secondary burden(VA)	50	100	50	50	100	50
12)	Rated thermal burden(VA)	350			400		
13)	Accuracy at rated burden	0.2	3P	3P	0.2	0.5	3P
14)	Rated frequency (Hz)	50					
15)	Temp.rise of winding by resistance (Deg.C)	55			55		
16)	Primary winding one minute power frequency withstand voltage kV (rms)	275			460		
17)	Impulse withstand voltage 1.2/50 micro sec. full wave positive and negative impulse withstand voltage kV (Peak)	650			1050		
18)	One minute power frequency withstand voltage of secondary winding kV (rms)	3			4		
19)	Maximum dynamic P.F. over voltage kV (Peak)	Not Applicable for CVT.					
20)	Maximum radio interference voltage at 266kV rms	< 1000					

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APTRANSCO/VIDYUTH SOUDHA/HYD.



	(micro-volts)		
21)	Corona inception and extinction voltage 9kV (rms)	110kV & 92kV	156kV & 136kV
22)	Capacitance (+10% -5%) pF	4400	4400
23)	Total creep age distance of bushing (mm)	3625	6125
24)	Overall height (mm)	2385	3475
25)	Total weight (Kg)	450(+/- 10%)	625(+/- 10%)
26)	Type test reports	Available. Shall be given as per 8800pF	Available.
27)	Min. recommended spacing between voltage transformers	Not in our scope.	
28)	Outline dimension drawing no. giving clearance for installation (Drg. No)	Not in our scope.	
29)	Mounting flange dimensional details	450 X 450	
30)	Rated voltage factor	1.2 for continuous & 1.5 for 30 second	
31)	Partial discharge level at rated voltage for capacitance divider (pC)	< 10	
32)	Seismic acceleration (horizontal) (g)	0.3g	
33)	No. of terminals in terminal box	03	07
34)	Primary & secondary windings made out of (copper only)	Copper and Aluminum	
35)	Tank material & tank coating	Steel & Hot Galvanized	
36)	Hardware exposed to atmosphere	As per attached tender purpose GA drawing	
37)	Bolts, nuts & washers	Stainless and spring steels	
38)	Porcelain housing & its make	IEC/Modern/WSI	
39)	Sealing	Yes. By stainless steel below.	
40)	Whether supply includes terminal connectors	Yes.	

u1) The type tests should have been conducted not earlier than 5 years in standard third party laboratory. The manufacture shall produce the type tests reports at the time of acceptance tests.

u2) Quality of material held applicable standard- B.E.s. The manufacturer shall produce the Valid B.Es certification at the time of acceptance tests.

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[Signature]
CHIEF ENGINEER / CONSTRUCTION-1
A.P. TRANSCO / VIDYUTH SOUTH & HYD.



Standardised Guaranteed Technical Particulars for **245KV Capacitor Voltage Transformer (Crompton Greaves make)**

STD/GTP-DWG/Approval No. **209-7** Revision No. **0**

Prepared & Approved during **October - 2011**

USED ON.

DRG.NO. 3-CAD 10033

IF IN DOUBT ASK

LIST OF STANDARD DRGS./DOCUMENTS APPLICABLE FOR 245 KV CVT.

SR. NO.	DESCRIPTION	DRG./DOC.NO.
01	GENERAL ARRANGEMENT	3-CAD 10034/R0
02	RATING/SCHEMATIC PLATE	3-CAD 10035/R0
03	SECONDARY TERMINAL BOX G.A.	3-CAD 10036/R0

LIST OF VARIABLE DRGS. APPLICABLE FOR 245 KV CVT.

SR. NO.	DESCRIPTION	DRAWING NO.
01	COVER SHEET	AS APPLICABLE
02	RATING/SCHEMATIC PLATE	AS APPLICABLE

S.O. NO.	:	} AS APPLICABLE
QUANTITY	:	
SR. NO.	:	

APPROVED FOR TURNKEY PROJECTS

M D zillohal
 CHIEF ENGINEER / CONSTRUCTION-1
 APTRANSCO/VIDYUTH SOUDHA/HYD.



Standardised Drawing for 245 KV Capacitor
 Voltage Transformer(Crompton Greaves make)
 STD/GTP-DWG/Approval No. 209-8-sheet1 Revision No. 0
 Prepared & Approved during **October - 2011**

Customer ref : APTRANSCO

Title:LIST OF STANDARD DRGS/DOCUMENTS APPLICABLE FOR 245KV CVT

PROJECT : AS APPLICABLE	
LOA NO. : AS APPLICABLE	
CONTRACTOR : AS APPLICABLE	
TITLE : LIST OF STANDARD DRGS. / DOCUMENTS APPLICABLE FOR 245 KV C.V.T.	
DRN.	05.09.11
CHD.	05.09.11
APPD.	05.09.11
SIGN.	DATE
SCALE : N.T.S.	
NO.	REVISION
SIGNDATE	
DRG. NO. : 3-CAD 10033	SHEET NO. 1/4
TOTAL SHTS 4	REV. 00



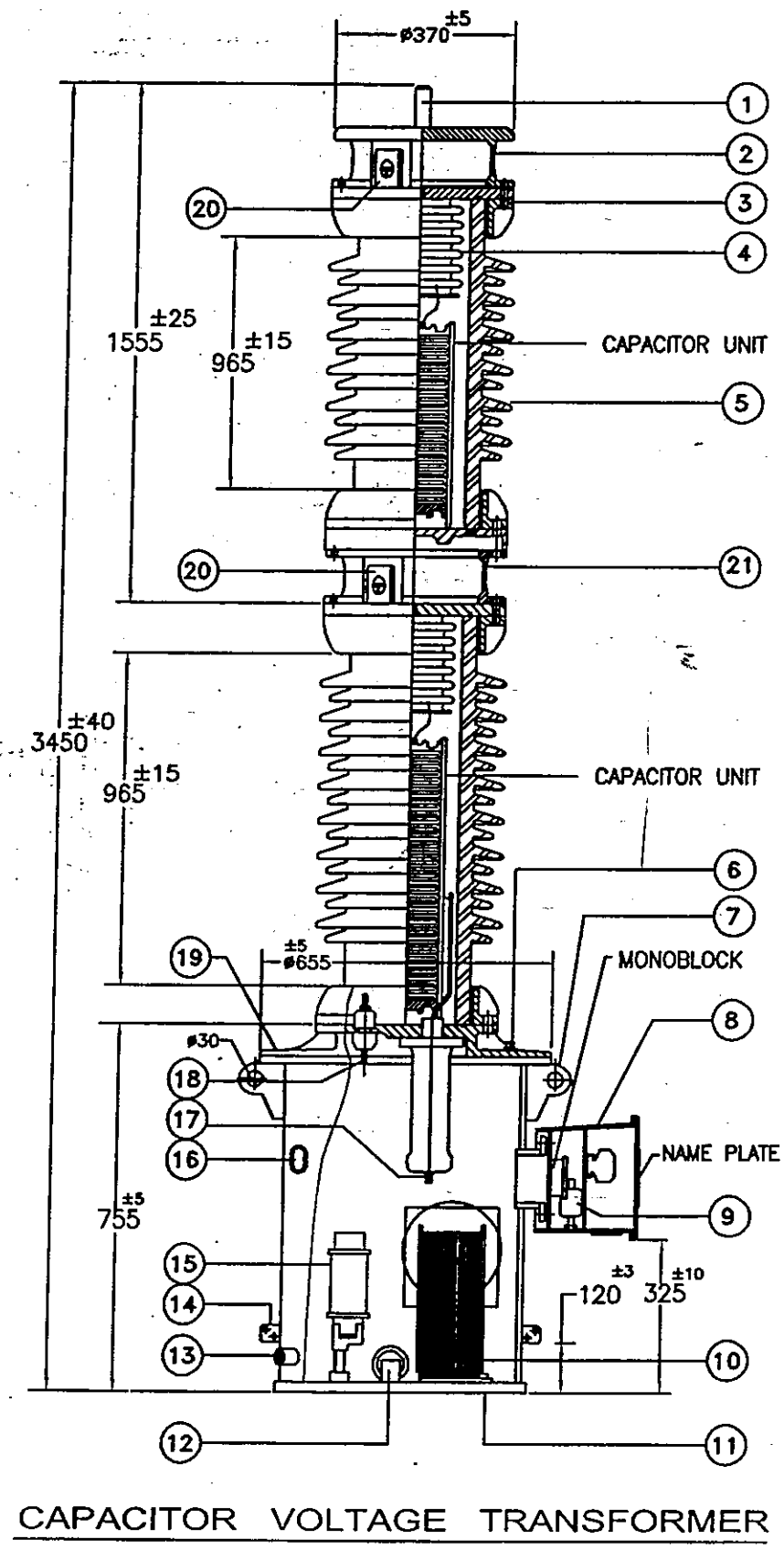
Crompton Greaves Ltd.
 51 - REVISION
 AMRAT, RAJINI

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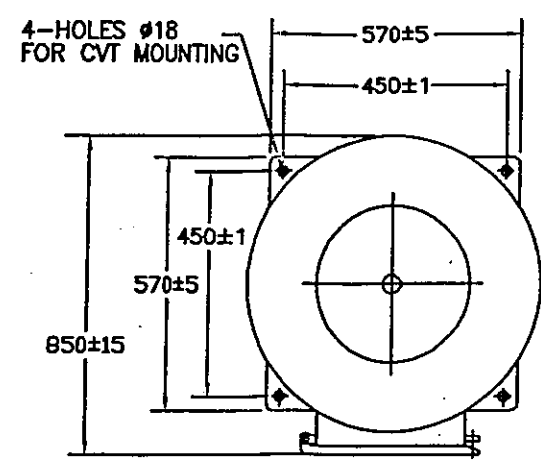
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IF IN DOUBT, ASK

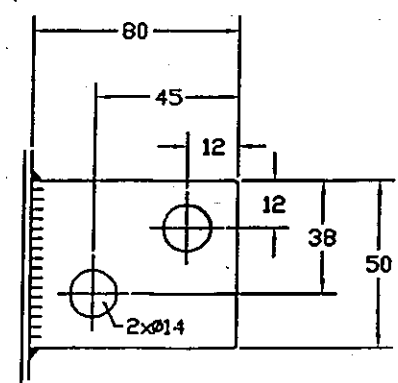
DRG.NO: 3-CAD 10034



CAPACITOR VOLTAGE TRANSFORMER



TOP VIEW



ITEM - 14

SR.NO	QTY.	DESCRIPTION	MATERIAL
1	1	H.V. TERMINAL Ø30x80 mm LONG	ALUMINIUM
2	1	HOOD CHAMBER	ALUMINIUM
3	4	PORCELAIN FLANGE	ALUMINIUM
4	2	BELLOW	STAINLESS STEEL
5	2	PORCELAIN INSULATOR	PORCELAIN
6	1	OIL FILLING PLUG(FOR EMU)	BRASS NICKEL PLATED
7	4	LIFTING LUGS (FOR LOWER UNIT)	STEEL HDG.
8	1	SECONDARY TERMINAL BOX	STEEL HDG.
9	1	SURGE ARRESTOR	-
10	1	INDUCTIVE VOLTAGE TRANSFORMER	-
11	1	EMU TANK	STEEL HDG.
12	1	DAMPING DEVICE	-
13	1	OIL SAMPLING VALVE (FOR EMU)	STEEL GALV.
14	2	EARTHING PADS (8 mm THK.)	STAINLESS STEEL
15	1	COMPENSATING CHOKE	-
16	1	OIL LEVEL INDICATOR ON EMU	POLYCARBONATE
17	1	M.V. TAP TERMINAL	-
18	1	NHF TERMINAL	-
19	1	TANK COVER	ALUMINIUM
20	2	BELLOW LEVEL INDICATOR	POLYCARBONATE
21	1	CHAMBER FOR INDICATOR	ALUMINIUM

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

TOTAL WT.	: 625 kg ±10%
OIL WT.	: 145 kg ±10%
TOTAL CREEPAGE	: 6125 mm

GEN. TOL.	MATL:	TITLE: GENERAL ARRANGEMENT (245 kV CVT) STANDARD DRAWING	
	SPEC:		
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	
	CHD	SPC	
	APPD	SCM	
DATE : 05.09.2011		DRG.NO: 3-CAD 10034	




NO	REVISION	SIGN	DATE
2			
1			

Standardised Drawing for 245 KV Capacitor Voltage Transformer(Crompton Greaves make)
 STD/GTP-DWG/Approval No. 209-8-sheet2 Revision No. 0
 Prepared & Approved during October - 2011
 APTRANSCO
 Customer ref : APTRANSCO
 Title: GENERAL ARRANGEMENT(245KV CVT) STANDARD DRAWING

DRG.NO:3-CAD 10035

IF IN DOUBT, ASK



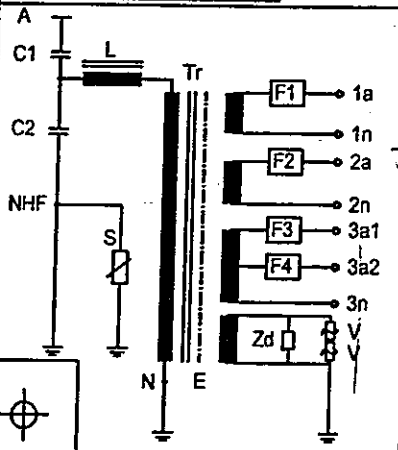
Crompton Greaves Ltd.
S1 - DIVISION AMBAD, NASHIK

CAPACITOR VOLTAGE TRANSFORMER
MADE IN INDIA

RATING AND SCHEMATIC PLATE

CUSTOMER : AS APPLICABLE PROJECT : AS APPLICABLE
LOA NO. : AS APPLICABLE

TYPE	CVE:245 / 1050 / 50	HSV	245 kV	EQUI. CAPACITANCE	4400 +10%, -5% pF	THERMAL OUTPUT	300 VA
STD.	IS:3156-92, IS:9348-98 IEC:186-87, IEC:358-90	FREQ.	50 Hz			CAPACITOR OIL	50 ±10% kg
S.O.	AS APPLICABLE	INSULATION LEVEL	460 kV / 1050 kVp			EMU. OIL	95 ±10% kg
YEAR	2011	VF.	1.2CONT./1.5-30SEC.	TOTAL SIM.BURDEN/CLASS	50 VA / 0.2	TOTAL WT.	625 ±10% kg
SR.NO.							



LEGEND

- A = HV TERMINAL
- C1 = PRI. CAPACITANCE
- C2 = SEC. CAPACITANCE
- NHF = HF TERMINAL
- L = COMPENSATING CHOKE
- N = NEUTRAL
- Tr. = INT. TRANSFORMER
- F1-F4 = HRC FUSE (16 AMP.)
- E = EARTH SCREEN BETWEEN HV & LV
- Zd = DAMPING DEVICE
- V = VARISTOR
- S = SURGE ARRESTOR

	A - NHF	1a - 1n	2a - 2n	3a1 - 3n	3a2 - 3n
VOLTS	$220000/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$	110	$110/\sqrt{3}$
VA	—	50	100	100	100
CLASS	—	0.2	0.5	3P	3P

CAUTION

- 1) SHORT CIRCUIT THE CAPACITOR UNITS WHEN ERECTING OR DISMANTLING THE CVT AND REMOVE THE SHORT CIRCUIT BEFORE PRETEST OR COMMISSIONING.
- 2) UNDER NO CONDITIONS SHOULD THE LOAD/BURDEN VALUES MENTIONED ON THE RATING PLATE BE EXCEEDED.
- 3) WHEN TERMINAL NHF IS NOT USED FOR HF TRANSMISSION IT MUST BE CONNECTED TO EARTH. (AS SUPPLIED NHF IS CONNECTED TO EARTH.)

IMPORTANT

- BEFORE COMMISSIONING IT IS ESSENTIAL TO CHECK THE LOW VOLTAGE RATIO OF CVT. (REFER INSTRUCTION MANUAL)
- DURING SERVICE, PLEASE CLOSE THE TERMINAL BOX COVER FIRMLY WITH WING-NUTS TO ENSURE PROPER SEALING OF BOX.
- PLUG UNUSED HOLES ON THE GLAND PLATE.

4-Holes of Ø 5.5

±0.5
118 ±1
145

1 mm Thk. Aluminium (Metal Photo)


All letters in this blocks (250X15) will be in RED colour on natural aluminium background.

APPROVED FOR TURNKEY PROJECTS

[Signature]
21/10/2011
CHIEF ENGINEER / CONSTRUCTION-1
APTRANSCO/VIDYUTH SONDHA/HYD

CODE NO. : 870155—

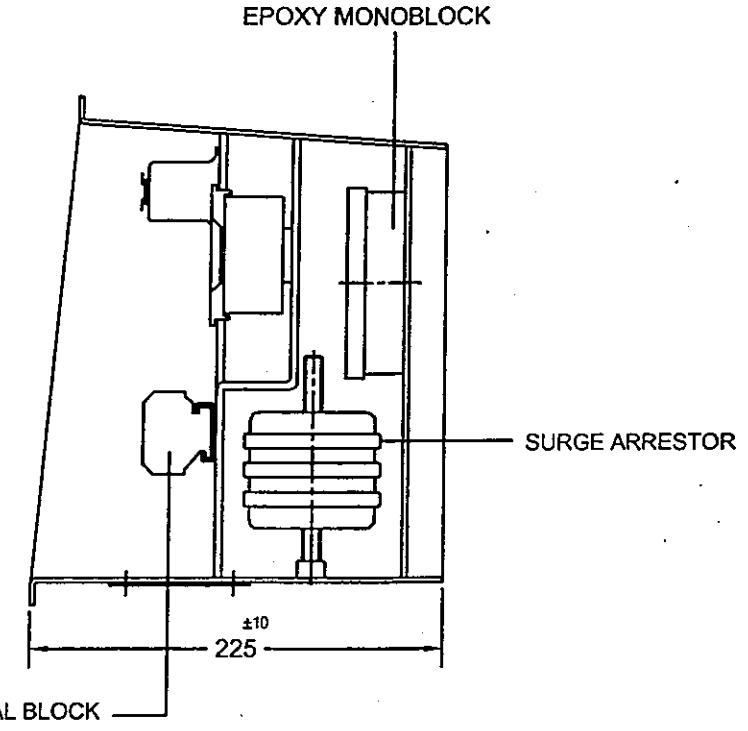
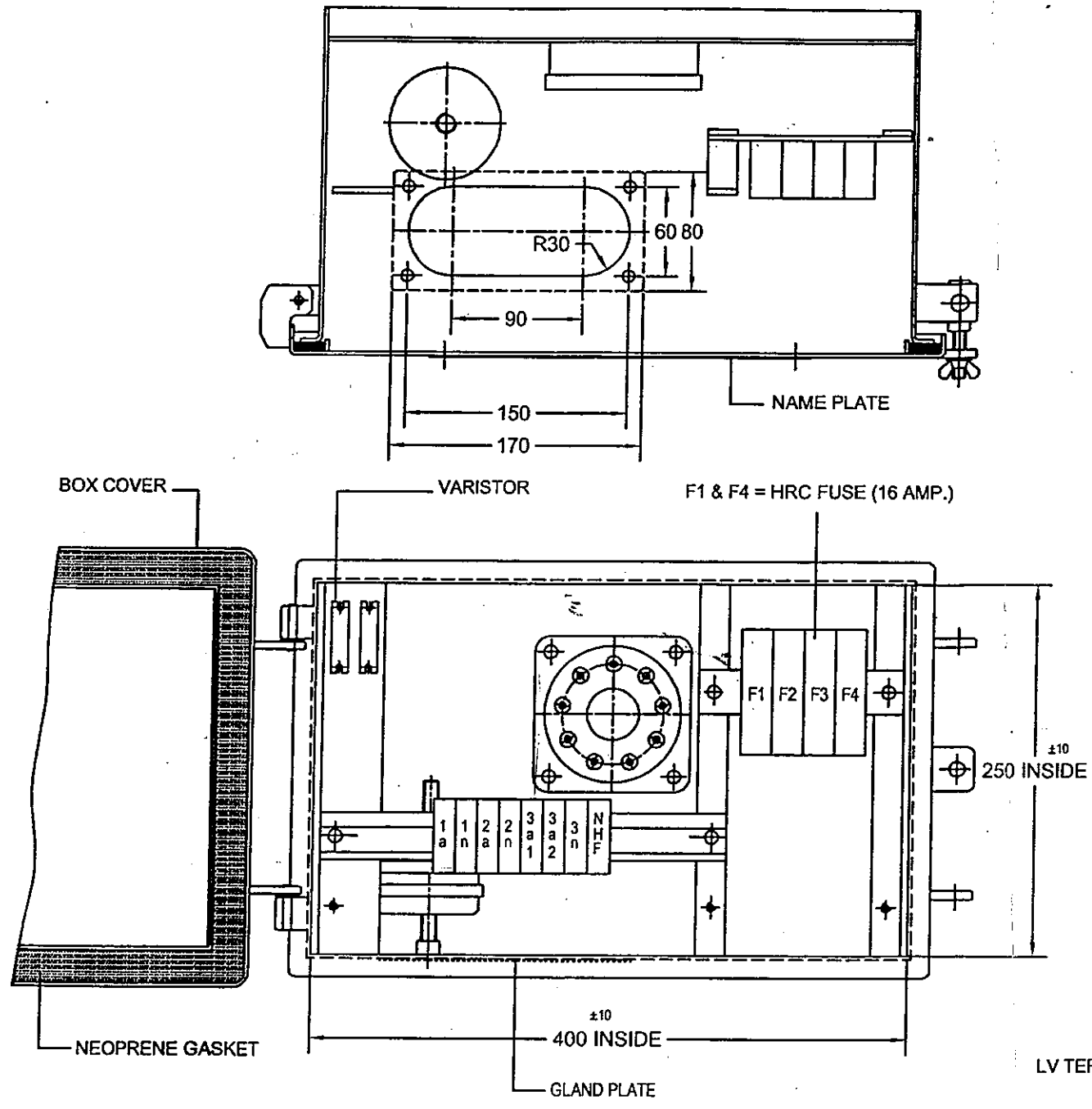
2	
1	
NO	REVISION

GEN. TOL.	MATL. SPEC.	TITLE : RATING/SCHEMATIC PLATE (245 KV CVT)
		
<p>Standardised Drawing for 245 KV Capacitor Voltage Transformer (Crompton Greaves make)</p> <p>STD/GTP-DWG/Approval No. <u>209-8-sheet3</u> Revision No. <u>0</u></p> <p>Prepared & Approved during October - 2011</p>		
Customer ref : APTRANSCO		
Title: RATING/SCHEMATIC PLATE (245KV CVT) STANDARD DRAWING		

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DRG.NO: 3-CAD 10036

IF IN DOUBT, ASK



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[Signature]
 CHIEF ENGINEER / CONSTRUCTION-1
 APTRANSCO/VIDYUT SANGRAHA/HYD

2	
1	
NO	REVISION

GEN. TOL.	MATL.:	TITLE: SECONDARY BOX G.A. (245 kV CVT) STANDARD DRAWING
	SPEC.:	

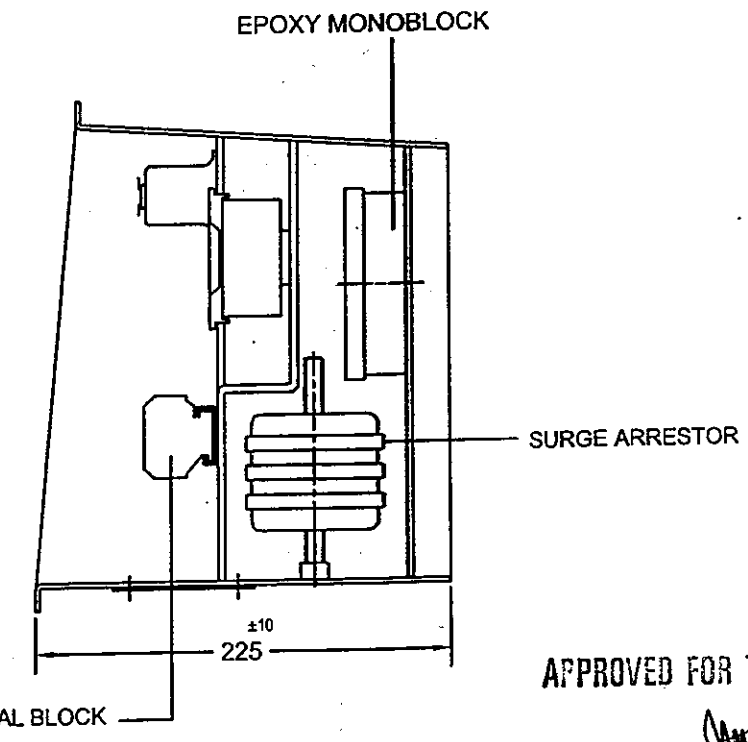
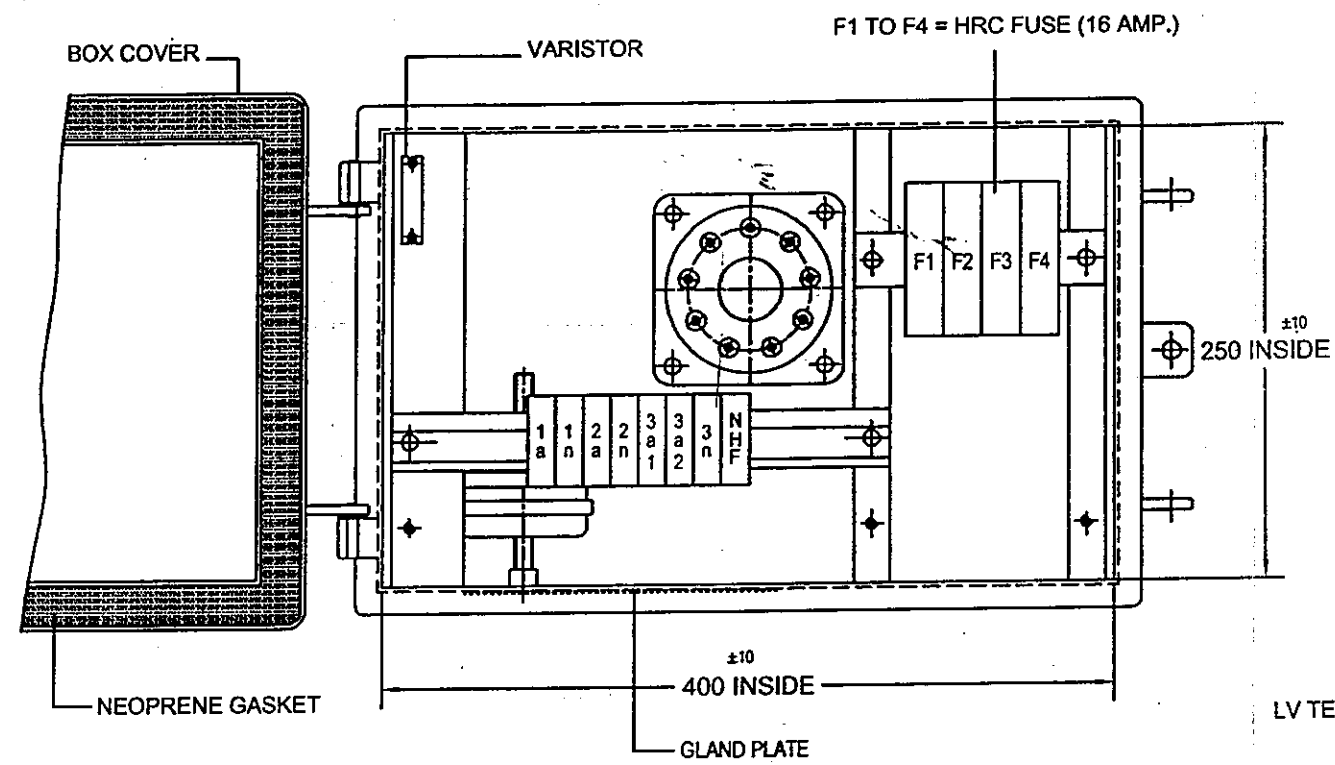
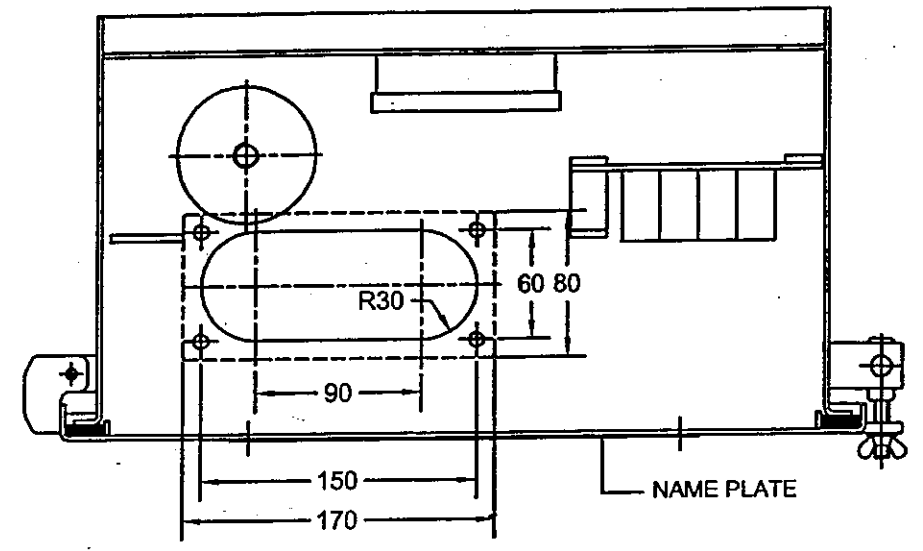


Standardised Drawing for 245 KV Capacitor Voltage Transformer(Crompton Greaves make)
 STD/GTP-DWG/Approval No. 209-8-sheet4 Revision No. 0
 Prepared & Approved during **October - 2011**

Customer ref : APTRANSCO
 Title:SECONDARY BOX G.A (245KV CVT) STANDARD DRAWING

DRG.NO: 3-CAD10032

IF IN DOUBT, ASK



APPROVED FOR TURNKEY PROJECTS

Signature 31/10/2011
 CHIEF ENGINEER / CONSTRUCTION-1
 APTRANSCO/VIDYUTH SODHA/HYD.

	Standardised Drawing for 145KV Capacitor Voltage Transformer (Crompton Greaves Ltd).
	STD/GTP-DWG/Approval No. 209-9-sheet4 Revision No. 0
	Prepared & Approved during October - 2011
Customer ref : APTRANSCO	
Title: Secondary Box G.A for 145KV CVT	

GEN. TOL.	MATL. SPEC.
THIRD ANGLE PROJECTION	
SCALE: NTS	INITIALS NAME
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG NSB
	CHD SPC
	APPD SCIA

TITLE: SECONDARY BOX G.A. (145 kV CVT) STANDARD DRAWING	
	Crompton Greaves Ltd. 51 - DIVISION AMBAD, NASHIK
	DRG.NO: 3-CAD10032
REV 0	DATE : 05.09.2011

NO	REVISION	SIGN	DATE
2			
1			

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USED ON.

DRG.NO. 3-CAD 10029

IF IN DOUBT ASK

LIST OF STANDARD DRGS./DOCUMENTS APPLICABLE FOR 145 KV CVT.

SR. NO.	DESCRIPTION	DRG./DOC.NO.
01	GENERAL ARRANGEMENT	3-CAD 10030/R0
02	RATING/SCHEMATIC PLATE	3-CAD 10031/R0
03	SECONDARY TERMINAL BOX G.A.	3-CAD 10032/R0


LIST OF VARIABLE DRGS. APPLICABLE FOR 145 KV CVT.

SR. NO.	DESCRIPTION	DRAWING NO.
01	COVER SHEET	AS APPLICABLE
02	RATING/SCHEMATIC PLATE	AS APPLICABLE

S.O. NO.	:	} AS APPLICABLE
QUANTITY	:	
SR. NO.	:	

APPROVED FOR TURNKEY PROJECTS

[Signature] 21/10/2011
 CHIEF ENGINEER / CONSTRUCTION-1
 APTRANSCO, VIDYUTH SOUDHA/HYD.

	Standardised Drawing for 145KV Capacitor Voltage Transformer (Crompton Greaves Ltd)
	STD/GTP-DWG/Approval No. <u>209-9-sheet1</u> Revision No. <u>0</u>
	Prepared & Approved during October - 2011
Customer ref : APTRANSCO	
Title: List of standard drawings/documents applicable for 145KV CVT	

		PROJECT : AS APPLICABLE	
		LOA NO. : AS APPLICABLE	
		DRN.	05.09.11
		CHD.	05.09.11
		APPD.	05.09.11
		SIGN.	DATE
NO.	REVISION	SIGNATURE	SCALE : N.T.S.
		CONTRACTOR : AS APPLICABLE	
		TITLE : LIST OF STANDARD DRGS. / DOCUMENTS APPLICABLE FOR 145KV CVT	
		DRG. NO. :	3-CAD 10029
		SHEET NO.	1/4
		TOTAL SHTS	4
		REV.	00



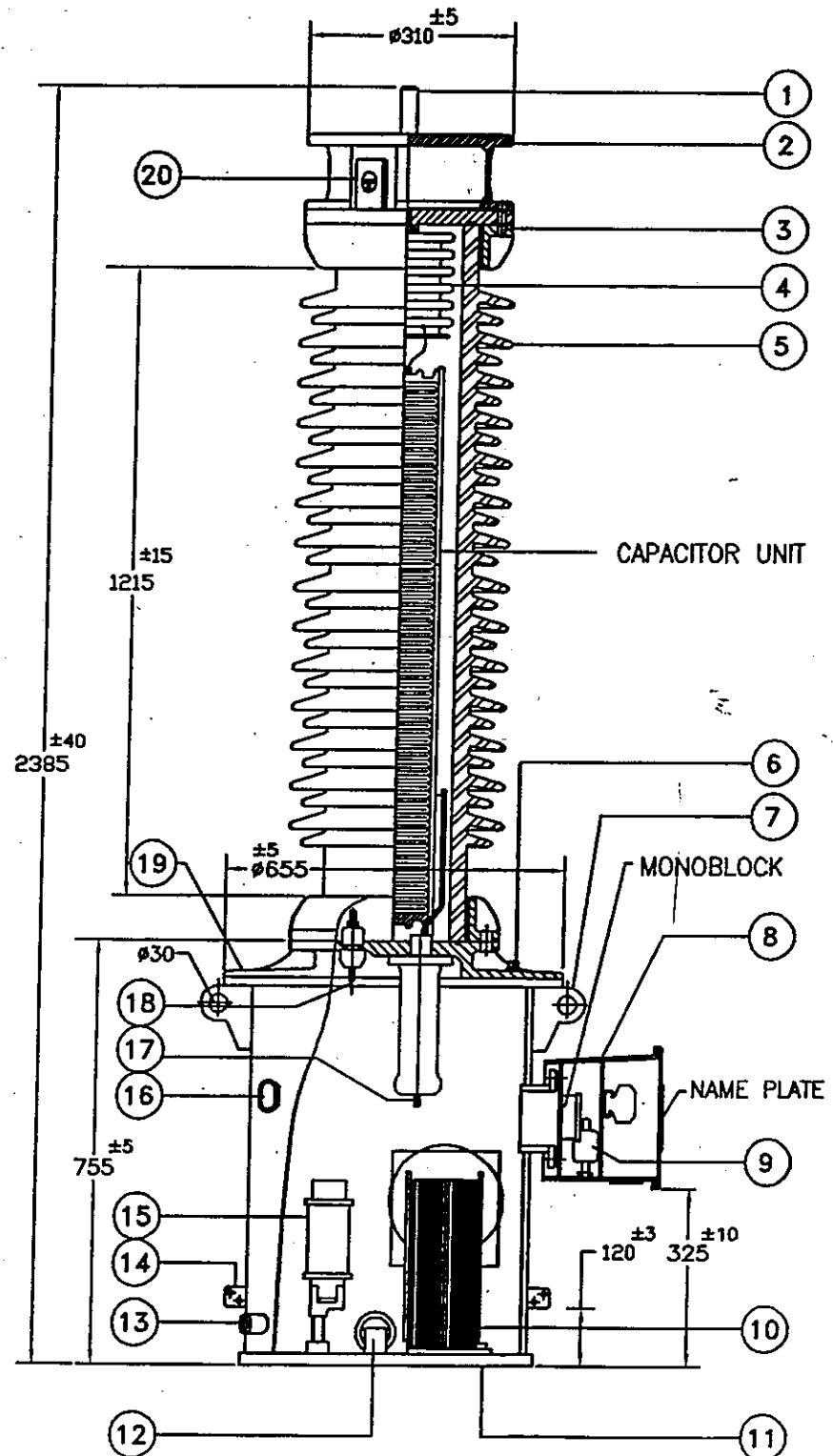
Crompton Greaves Ltd.
 51 - DIVISION
 ANRAD, RASHIK

DRG.NO: 3-CAD10030

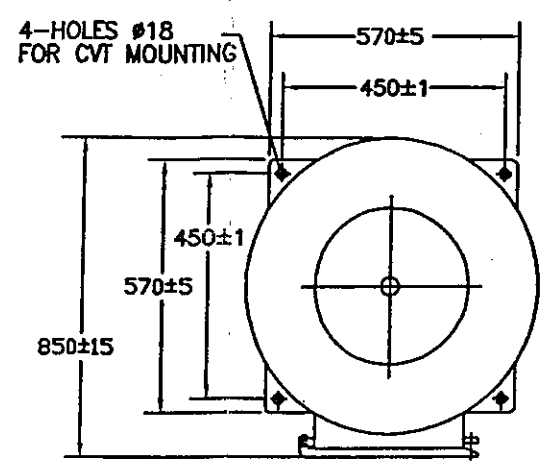
IF IN DOUBT, ASK

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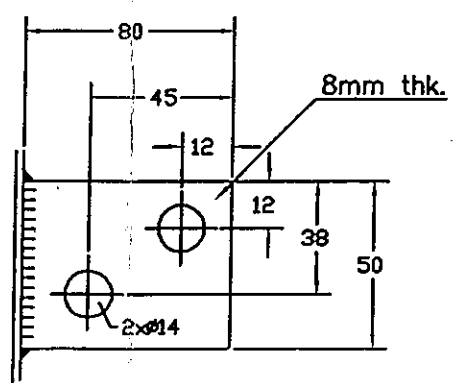
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CAPACITOR VOLTAGE TRANSFORMER



TOP VIEW



ITEM - 14

SR.NO	QTY.	DESCRIPTION	MATERIAL
1	1	H.V. TERMINAL Ø30x80 mm LONG	ALUMINIUM
2	1	HOOD CHAMBER	ALUMINIUM
3	2	PORCELAIN FLANGE	ALUMINIUM
4	1	BELLOW	STAINLESS STEEL
5	1	PORCELAIN INSULATOR	PORCELAIN
6	1	OIL FILLING PLUG(FOR EMU)	BRASS NICK.PLATED
7	4	LIFTING LUGS	STEEL HDG
8	1	SECONDARY TERMINAL BOX	STEEL HDG
9	1	SURGE ARRESTOR	-
10	1	INDUCTIVE VOLTAGE TRANSFORMER	-
11	1	EMU TANK	STEEL HDG
12	1	DAMPING DEVICE	-
13	1	OIL SAMPLING VALVE (FOR EMU)	STEEL GALVANISED
14	2	EARTHING PADS (8 mm THK.)	STAINLESS STEEL
15	1	COMPENSATING CHOKE	-
16	1	OIL LEVEL INDICATOR ON EMU	POLYCARBONATE
17	1	M.V. TAP TERMINAL	-
18	1	NHF TERMINAL	-
19	1	TANK COVER	ALUMINIUM
20	1	BELLOW LEVEL INDICATOR	POLYCARBONATE

TOTAL WT.	: 410 kg ±10%
OIL WT.	: 120 kg ±10%
TOTAL CREEPAGE	: 3625 mm

APPROVED FOR TURNKEY PROJECTS

MD 31/10/2011
 CHIEF ENGINEER / CONSTRUCTION-J1
 APTRANSCO/VIDYUTH SOUDHA/HYD.

GEN. TOL.	MATL:	TITLE: GENERAL ARRANGEMENT (145 KV CVT) STANDARD DRAWING	
	SPEC:		
THIRD ANGLE PROJECTION			
SCALE: NTS	INITIALS	NAME	
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	NSB	Crompton Greaves Ltd. S1 - DIVISION AMBAD, NASHIK
	CHD	SPC	
	APPD	SCM	
DRG.NO: 3-CAD10030			REV 0
DATE : 05.09.2011			

2			
1			
NO	REVISION	SIGN	DATE

A3 297 * 420

Standardised Drawing for 145KV Capacitor Voltage Transformer (Crompton Greaves Ltd).
 STD/GTP-DWG/Approval No. 209-9-sheet2 Revision No. 0

DRG.NO: 3-CAD10031

IF IN DOUBT, ASK

Crompton Greaves Ltd.
S1 - DIVISION AMBAD, NASHIK

CAPACITOR VOLTAGE TRANSFORMER
MADE IN INDIA

RATING AND SCHEMATIC PLATE

CUSTOMER : AS APPLICABLE PROJECT : AS APPLICABLE
LOA NO. : AS APPLICABLE

TYPE: CVE:145/650/50	HSV: 145 kV	EQUI. CAPACITANCE: 4400 +10%,-5%pF	THERMAL OUTPUT: 300 VA
STD: IS:3156-92, IS:9348-98 IEC:186-87, IEC:358-90	FREQ.: 50 Hz	TOTAL SIM. BURDEN CLASS: 50 VA / 0.2	CAPACITOR OIL: 25 ±10% kg
S.O.: AS APPLICABLE	INSULATION LEVEL: 275 kV / 650 kVp	EMU. OIL: 95 ±10% kg	TOTAL WT.: 410 ±10% kg
YEAR: 2011	VF: 1.2CONT./1.5-30SEC.		
SR.NO.:			

	A - NHF	1a - 1n	2a - 2n	3a1 - 3n	3a2 - 3n
VOLTS	$132000/\sqrt{3}$	$110/\sqrt{3}$	$110/\sqrt{3}$	110	$110/\sqrt{3}$
VA	—	50	100	100	100
CLASS	—	0.2	0.5	3P	3P

CAUTION

- SHORT CIRCUIT THE CAPACITOR UNITS WHEN ERECTING OR DISMANTLING THE CVT AND REMOVE THE SHORT CIRCUIT BEFORE PRETEST OR COMMISSIONING.
- UNDER NO CONDITIONS SHOULD THE LOAD/BURDEN VALUES MENTIONED ON THE RATING PLATE BE EXCEEDED.
- WHEN TERMINAL NHF IS NOT USED FOR HF TRANSMISSION IT MUST BE CONNECTED TO EARTH. (AS SUPPLIED NHF IS CONNECTED TO EARTH.)

IMPORTANT

- BEFORE COMMISSIONING IT IS ESSENTIAL TO CHECK THE LOW VOLTAGE RATIO OF CVT. (REFER INSTRUCTION MANUAL)
- DURING SERVICE, PLEASE CLOSE THE TERMINAL BOX COVER FIRMLY WITH WING-NUTS TO ENSURE PROPER SEALING OF BOX.
- PLUG UNUSED HOLES ON THE GLAND PLATE.

4-Holes of Ø 5.5

±0.5
118
±1
145

1 mm Thk. Aluminium (Metal Photo)

All letters in this blocks (250X15) will be in RED colour on natural aluminium background.

APPROVED FOR TURNKEY PROJECTS

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

Standardised Drawing for 145KV Capacitor Voltage Transformer (Crompton Greaves Ltd).

STD/GTP-DWG/Approval No. **209-9-sheet3** Revision No. 0

Prepared & Approved during **October - 2011**

Customer ref : APTRANSCO

Title: **Rating/Schematic plate for 145KV CVT**

CODE NO. : 870155

2					
1					
NO	REVISION	SIGN	DATE		

GEN. TOL.	MATL. SPEC.	TITLE : RATING/SCHEMATIC PLATE (145 KV CVT) STANDARD DRAWING		
THIRD ANGLE PROJECTION		SCALE: NTS	INITIALS	NAME
ALL DIMNS. IN MM. UNLESS OTHERWISE SPECIFIED.	ORG	CHD	APPD	NSB SPC SCM
DATE : 05.09.2011				REV 0

Crompton Greaves Ltd.
S1 - DIVISION
AMBAD, NASHIK

DRG.NO: 3-CAD10031

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