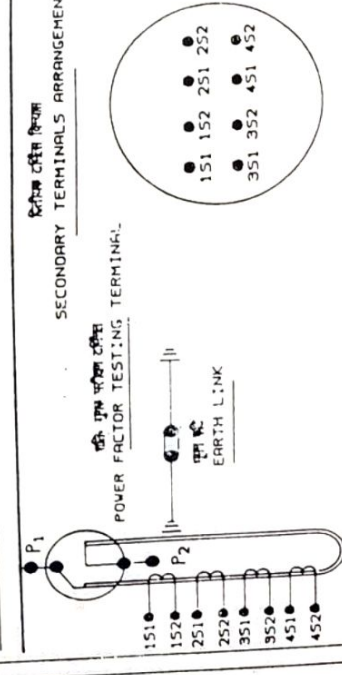


भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LIMITED

STANDARD	151-2763	प्रधान धारा का तार	300
TYPE	145	RATED PRIMARY CURRENT AMPS.	
INSULATION LEVEL K.V.	105/AS/NV	प्रधान धारा का वोल्टेज	1.1
INSULATION LEVEL K.V.	50	TRANSIENT CURRENT RATINGS K.A.	24761050717
SHORT TIME CURRENT A.	1000/15EC	प्रधान धारा ड्राइंग नं.	635024
TOTAL WEIGHT OF C.T. KG.	530	इलेक्ट्रिकल एल.ए. स्पेसि.	श्री. जयसि

CAUTION - SECONDARY TERMINALS MUST BE SHORT CIRCUITED BEFORE THE BURDEN IS DISCONNECTED.



TERMINALS	RATIO	RATING	CLASS	PURPOSE
151-152	1500/1	10	SP5	PROTECTION
251-252	1500/1	10	SP5	PROTECTION
351-352	300/1	10	SP7	METERING
451-452	300/1	10	SP7	METERING

REV. DATE	ALTERED	CHECKED
REV. DATE	ALTERED	CHECKED
REV. DATE	ALTERED	CHECKED

- NOTES TO DIAGRAM PLATE MANUFACTURING -
- DIAGRAM PLATE IS TO BE MANUFACTURED FROM STAINLESS STEEL PLATE.
 - THE FOLLOWING IS TO BE MARKED ON THE BACK OF PLATE WORK ORDER NO. 04259425000 & 04259425000 DGS. NO. 24761050717 REV. NO. 02
 - OVERALL SIZE OF MONOGRAM 25-00 2401121 REV. 21
 - SPACE BETWEEN MONOGRAM ENGLISH TITLE AND BOARD TITLE TO BE LEFT.
 - ALL LETTERS, CHARACTERS, BORDER LINES & FIGURES TO BE MADE BY ETCHING PROCESS AND FILLED BLACK.
 - BLACK GROUND TO BE STAIN SILVER.
 - THE SETTING OF THE DIAGRAM PLATE SHOULD BE DONE AS PER ATTACHED TO DRAWING.

ITEM	DESTINATION	QUANTITY
P1-Z1-T1	CHANDRAPUR	1 NO.
P2-Z1-T1	PAUGH	1 NO.

C.T. RATIO 1500/1 & 300/1

01	REMARKS	ITEM No.	DESCRIPTION	QTY.
		001	STAINLESS STEEL PLATE 2 TK X 200 X 305 LG.	0.76

ADDITIONAL INFORMATION: P.O. No. P/P/EX/001E/BHEL/CP/12003/17.09.93 WORK ORDER NO. 04259425000 QTY. 4 NOS. WORK ORDER NO. 04259425000 QTY. 2 NOS. ISAPRE WORK ORDER NO. 04259425000 PROJECT

STATUS OF DRAWING: NAME OF CUSTOMER: M.S. H.S.E. BILVAOCT PROJECT DATE: 1.11.95

DISTRICTION OF PRINTS: NAME OF CUSTOMER: M.S. H.S.E. BILVAOCT PROJECT DATE: 1.11.95

REV. DATE ALTERED CHECKED

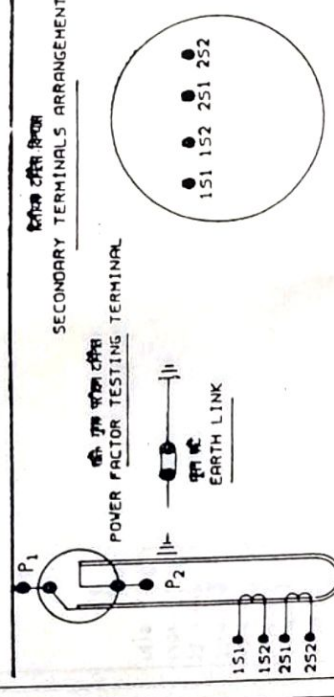
COMBINED RATING & DIAGRAM PLATE FOR 132 KV C.T. (FOR 25KV DC FILTERS ETC.)

24761050717

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LIMITED

STANDARD	IS: 2705	200
INSULATION LEVEL k.V.	145	0.6
INSULATION LEVEL k.V.	105/450V6	24761050710
FREQUENCY Hz	50	635626
SHORT TIME CURRENT A.	1000/15EC.	श्री जमिनी
TOTAL WEIGHT OF C.T. KG (INCLUDING OIL)	530	

सावधान - यह सिस्टम अपने से एक इन्सुलेशन टर्मिनस को जोड़ने से तुरन्त ही तुरन्त बंद
 CAUTION - SECONDARY TERMINALS MUST BE SHORT CIRCUITED BEFORE THE BURDEN IS DISCONNECTED.



TERMINALS RATIO	PRIMARY RATING	वोल्टेज व. करंट का अनुपात 75°C पर	उद्देश्य
151-152	10	15P/110	मेट्रिंग के लिये
251-252	10	15P/110	मेट्रिंग के लिये

V.O. No. 04260P05000/04250R05000
 V.O. No. 04263F05000/04301R05000
 EQUIPMENT SPECIFICATION NO. ES-CP-076
 MAINTENANCE SPECIFICATION NO. D-CP-076
 MADE IN INDIA

- NOTES TO DIAGRAM PLATE MANUFACTURING :-
- DIAGRAM PLATE IS TO BE MANUFACTURED FROM STAINLESS STEEL PLATE.
 - THE FOLLOWING IS TO BE MARKED ON THE BACK OF PLATE.
 WORK ORDER NO. 04260P05000, 04263F05000, 04250R05000, 04301R05000
 DRG. NO. 24761050717 REV. NO. 01
 - OVERALL SIZE OF MONOGRAM 25-RR 2401121 REV. 01.
 - SPACE BETWEEN HINDI, ENGLISH TITLE AND BELOW HINDI TITLE TO BE LEFT.
 - ALL LETTERS, DIVIDING LINES, BORDER LINES & FIGURES ETC. TO BE LEFT. ETCHING PROCESS AND FILLED BLACK.
 - BLACK GROUND TO BE STAIN SILVER.
 - THE SETTING OF THE DIAGRAM PLATE SHOULD BE DONE AS NEAR AS POSSIBLE TO DRAWING.

ITEM DESIGNATION	QUANTITY	CHANDRAPUR	PROGHE
P1-Z1-T2	1 NO.	1 NO.	1 NO.
P2-Z1-T2	1 NO.	1 NO.	1 NO.
P1-Z2-T2	1 NO.	1 NO.	1 NO.
P2-Z2-T2	1 NO.	1 NO.	1 NO.

WORK ORDER NO. 04260P05000 QTY. 4 NOS.
 WORK ORDER NO. 04263F05000 QTY. 4 NOS.
 WORK ORDER NO. 04250R05000 QTY. 2 NOS. (SPARE)
 WORK ORDER NO. 04301R05000 QTY. 2 NOS. (SPARE)
 C.T. RATIO - 200/1A

ITEM No.	DESCRIPTION	DRAWING NO.	UNIT WT.	QTY.
01	STAINLESS STEEL PLATE 214 X 200 X 305 LG.		0.76	5

P.O. No. PP/ENV/601/E/BHEL (SUPPLY/31205 DT-17.08.93)

NAME OF CUSTOMER: M/S. H.S.E.D. (HVDC) PROJECT
 NAME: CHAUBEY
 SIGN: [Signature]
 DATE: 21.10.95

DRG. NO.: 24761050717
 REV. NO.: 01

SCALE: 1:1
 DEPT. CODE: 200
 C/M/H/F: [Blank]

COMBINED RATING & DIAGRAM PLATE FOR 132 KV C.T. (FOR 25KV DC FILTER EXT.)

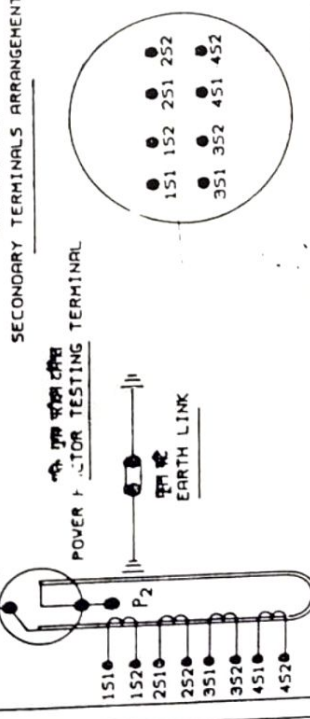
REV DATE	ALTERED	CHECKED	REV DATE	ALTERED	CHECKED

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
BHARAT HEAVY ELECTRICALS LIMITED

कार्या परिचयिका	
STANDARD	15/2795
वोल्टेज परीक्षण के लिए उच्चतम वोल्टेज	145
वोल्टेज परीक्षण के लिए उच्चतम वोल्टेज	185/450kVp
वोल्टेज परीक्षण के लिए उच्चतम वोल्टेज	50
वोल्टेज परीक्षण के लिए उच्चतम वोल्टेज	1000/15EC
वोल्टेज परीक्षण के लिए उच्चतम वोल्टेज	530

CURRENT TRANSFORMER
 RATED PRIMARY CURRENT AMPS. 100
 TRANSIENT CURRENT RATING k.A. 55
 DRAWING NO. 24761850719
 ELEC. SPEC. 635620
 SERIAL NO. श्री जेम्स
 DIVISION श्री जेम्स
 MFG. YEAR

TOTAL WEIGHT OF C.T. KG. (INCLUDING OIL)
 CAUTION - SECONDARY TERMINALS MUST BE SHORT CIRCUITED BEFORE THE BURDEN IS DISCONNECTED.



टर्मिनल नं.	टर्मिनल रेटिंग	टर्मिनल रेटिंग	टर्मिनल रेटिंग	टर्मिनल रेटिंग
TERMINALS	RATIO AMPS.	K.V.A.	CLASS	PURPOSE OF SECY.
151-152	1500/1	10	SPS	PROTECTION
251-252	1500/1	10	SPS	PROTECTION
351-352	100/1	10	SPS	METERING
451-452	100/1	10	SPS	METERING

EQUIPMENT SPECIFICATION NO. ES-CP-076
 MAINTENANCE SPECIFICATION NO. D-CP-076
 MADE IN INDIA V.O. NO. 04261P05000A04299P45020

REV DATE	ALTERED	CHECKED
REV DATE	ALTERED	CHECKED
REV DATE	ALTERED	CHECKED

- NOTES TO DIAGRAM PLATE MANUFACTURING :-**
- DIAGRAM PLATE IS TO BE MANUFACTURED FROM STAINLESS STEEL PLATE.
 - THE FOLLOWING IS TO BE MARKED ON THE BACK OF PLATE WORK ORDER NO. 04261P05000 & 04299R05000 DRG. NO. 24761050719 REV. NO. 00
 - OVERALL SIZE OF MONOGRAM 25-RA 0401121 REV. 01.
 - SPACE BETWEEN HINDI, ENGLISH TITLE AND BELOW HINDI TITLE TO BE LEFT.
 - ALL LETTERS, DIVIDING LINES, BORDER LINES & FIGURES ETC. TO BE MADE BY ETCHING PROCESS AND FILLED BLACK.
 - BLACK GROUND TO BE STAIN SILVER.
 - THE SETTING OF THE DIAGRAM PLATE SHOULD BE DONE AS NEAR AS POSSIBLE TO DRAWING.

ITEM	DESIGNATION	QUANTITY
P1-21.13	CHANDRAPUR	1 NO.
P2-21.13	PRAGHE	1 NO.

C.T. ratio : 1500/1A & 100/1A

01	REMARKS	ITEM No.	DESCRIPTION	DRAWING NO.	UNIT WT.	QTY.
001			STAINLESS STEEL PLATE 2TK X 200 X 305 LG.		0.76	1

ADDITIONAL INFORMATION
 P.O. NO. P/ENV/0111/01/31205 DT. 17.08.93
 WORK ORDER NO. 04261P05000 DT. 4 NOS.
 WORK ORDER NO. 04299R05000 DT. 2 NOS. (SPARE)
 NAME OF CUSTOMER M/S. H.S.E.A. (INDCO) PROJECT
 NAME CHAUBEY
 SIGN DATE
 1.11.95

STATUS OF DRAWING
 NAME OF CUSTOMER M/S. BHARAT HEAVY ELECTRICALS (INDCO)
 NAME CHAUBEY
 SIGN DATE
 1.11.95

DISTRIBUTION OF PRINTS
 NAME OF CUSTOMER M/S. BHARAT HEAVY ELECTRICALS (INDCO)
 NAME CHAUBEY
 SIGN DATE
 1.11.95

REV DATE ALTERED CHECKED

COMBINED RATING & DIAGRAM PLATE FOR 132 KV C.T. (FOR 25KV DC FILTER Ckt.)

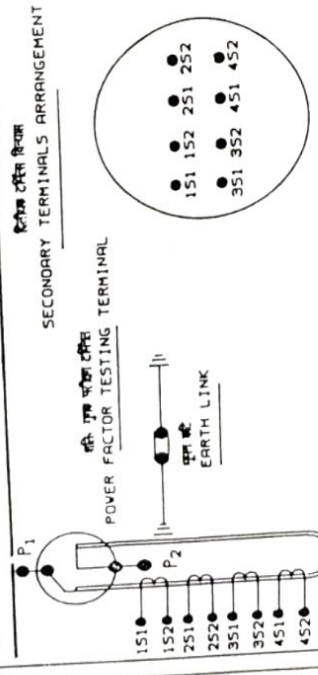
24761050719 00

BHARAT HEAVY ELECTRICALS LIMITED

CURRENT TRANSFORMER

STANDARD	15-2705	200
RATED PRIMARY CURRENT AMPS.		
HIGHEST SYSTEM VOLTAGE K.V.	145	7-9
TRANSIENT CURRENT RATING K.A.		
INSULATION LEVEL K.V.	185/450kVp	24761050720
INSULATION LEVEL K.V.	50	635629
FREQUENCY HZ	50	श्री जयन्ती
SHORT TIME CURRENT A.	1000/1SEC	
TOTAL WEIGHT OF C.T. KG. (INCLUDING OIL)	532	

CAUTION - SECONDARY TERMINALS MUST BE SHORT CIRCUITED BEFORE THE BURDEN IS DISCONNECTED.



TERMINALS	RATIO AMPS.	PROT. RATING K.V./EX.AMPS./SECT.DMS AT 75°C	PURPOSE OF SECT.
151-152	1500/1	10 SPS	PROTECTION
251-252	1500/1	10 SPS	PROTECTION
351-352	200/1	10 0.2 10/2.18	METERING
451-452	200/1	10 15/1.18	METERING

EQUIPMENT SPECIFICATION NO. ES-CP-076
 MAINTENANCE SPECIFICATION NO. D-CP-076
 MADE IN INDIA V.O. No. 04262P05000/04300R05000

REV DATE ALTERED	CHECKED	REV DATE ALTERED	CHECKED
REV DATE ALTERED	CHECKED	REV DATE ALTERED	CHECKED

- NOTES TO DIAGRAM PLATE MANUFACTURING :-
- DIAGRAM PLATE IS TO BE MANUFACTURED FROM STAINLESS STEEL PLATE.
- THE FOLLOWING IS TO BE MARKED ON THE BACK OF PLATE
 WORK ORDER NO. 04262P05000 & 04300R05000
 DRG. NO. 24761050719 REV. NO. 00
- OVERALL SIZE OF MONOGRAM 25-AR 0401121 REV.01.
- SPACE BETWEEN HINDI, ENGLISH TITLE AND BELOW HINDI TITLE TO BE LEFT.
- ALL LETTERS, DIVIDING LINES, BORDER LINES & FIGURES ETC. TO BE MADE BY ETCHING PROCESS AND FILLED BLACK.
- BLACK GROUND TO BE STAIN SILVER.
- THE SETTING OF THE DIAGRAM PLATE SHOULD BE DONE AS NEAR AS POSSIBLE TO PAPER.

ITEM DESIGNATION	QUANTITY	CHANDRAPUR	PROGHE
#P1-22.T1	1 NO.	1 NO.	1 NO.
#P2-22.T1	1 NO.	1 NO.	1 NO.

C.T. RA:10 : 1500/1A & 200/1A

ITEM NO.	REMARKS	DESCRIPTION	DRWG. NO.	VAR	MATL. SPECN.	UNIT WT.	QTY.
001		STAINLESS STEEL PLATE 2TK X 200 X 205 LG.				0.76	10

P.O. No. PP/EHV/001/EI/04HEL (SUPPLY)/31205 DT. 17.08.93
 WORK ORDER NO. 04262P05000 QTY. 4 NOS.
 WORK ORDER NO. 04300R05000 QTY. 2 NOS. (SPARE)
 M/S. M.S.E.B. (M.V.D.C.) PROJECT

NAME OF CUSTOMER: BHARAT HEAVY ELECTRICALS LTD.
 SIGN: CHAUBEY
 DATE: 2-11-11

SCALE: NET WT. 24761050704
 DRG. NO. 24761050720

COMBINED RATING & DIAGRAM
 PLATE FOR 132 kV C.T.
 (FOR 25kV DC FILER CKT)

ELECTRICAL DATA FOR DC FILTER CURRENT TRANSFORMERS

Item Designation		145 =P1-Z1.T1 =P2-Z1.T1	145 =P1-Z1.T2 =P2-Z1.T2	145 =P1-Z1.T3 =P2-Z1.T3
ITEM 1				
Location		BP 2/6 filter	BP 2/6 filter	BP 2/6 filter
1. Rated frequency	Hz	50	50	50
2. Maximum direct voltage on the bus	kV _{dc}	25	25	25
3. Maximum continuous current	A _{rms}	133	41	N.A.
major harmonics, order/current	n/A _{rms}	2/132 3/4.2 4/9.8 6/8.4	2/41	N.A.
4. Short-time currents				
4.1 Rated short-time current, 5s	A _{rms}	219	73	N.A.
major harmonics, order/current	n/A _{rms}	2/217 3/4.0 4/24.9 6/10.6	2/73	N.A.
4.2 Rated short-time current, 1.0s	A _{rms}	282	128	167
major harmonics, order/current	n/A _{rms}	2/277 6/46	2/63 6/106	2/135 6/88
5. Maximum continuous direct current	mA _{dc}	< 15	< 15	< 15
6. Transient current Time to crest	kA _{crest} µs	1.6 1000	0.6 1000	55 17
7. Power frequency withstand test (60 sec) Primary winding Secondary winding	kV _{rms} kV _{rms}	185 3	185 3	185 3
8. Lightning impulse withstand level of the primary winding	kV _{crest}	450 > 72kV	450 > 72kV	450 > 72kV
9. Internal partial discharge test	kV _{rms}	78	78	78
10. Minimum nominal creepage distance	mm	2500	2500	2500

2 Pages 2, 3, 4, 5 and 6 revised *la* *BB SA* 95 46
 1 Item 1, 4.2 and sheets 2, 3, 4,5 VFL 95 23

Rev ind	Revision	Appd	Year	Week
Accepted by QA control	Accepted for prod by LC/Lescale/VFL	CHANDRAPUR-PADGHE HVDC BIPOLE PROJECT		
Design checked by LSF/Bergdahl/BB	Drawn by LSS/Bringeskog/RB	Technical Provisions DC Filter Current Transformers		
Drawing checked by LKC/Lindbäck/BL	Iss. by Dept SEPOW/LS	Year 94	Week 45	Lang E
ABB Power Systems				Sheet 1/6
Chandrapur and Padghe Converter Stations L3598.1003 XNL 610 045-076				Rev Ind 2
				Cont

not be repaired to a third party for use in an unauthorized purpose. Contravention will be prosecuted. ABB Power Systems



not be reported to a third party nor be used for any unauthorized purpose. Contravention will be prosecuted.
 ABB Power Systems A

11.	Rated primary current	A_{rms}	300	200	100
12.	Rated secondary current	A_{rms}	1	1	1
13.	Core data				
13.1	Protection cores				
	Number of cores		2	None	2
	Ratio		1500:1		1500:1
	Rated burden	VA	10		10
	Accuracy class		5p5		5p5
13.2	Measuring cores				
	Number of cores		2	2	2
	Ratio		300:1	200:1	100:1
	Rated burden	VA	10	10	10
	Accuracy class		0.2	0.2	0.2
	Instrument security factor		10	10	10
14	RI test voltage	kV_{rms}	N.A.	N.A.	N.A.
15	Equivalent phase-to-ground voltage for thermal coefficient test	kV_{rms}	71.0	71.0	71.0

2 Cl. 15 added *L B Ste* 95 46
 1 Antiremanence gap requirem. deleted CGS/VFL 95 23

Rev ind	Revision	Appd	Year	Week		
Accepted by QA control		Accepted for prod by		CHANDRAPUR-PADGHE HVDC BIPOLE PROJECT		
		LC/Lescale/VFL		Technical Provisions		
Design checked by		Drawn by		DC Filter Current Transformers		
LSF/Bergdahl/BB		LSS/Bringeskog/RB				
Drawing checked by		Iss. by Dept	Year	Week	Lang	Sheet
LKC/Lindbäck/BL		SEPOW/LS	94	45	E	2/6
ABB Power Systems				Chandrapur and Padghe Converter Stations	Rev Ind	Cont
				L3598.1003	2	
				XNL 610 045-076		



not be imparted to a third party nor be used for unauthorized purpose. Contravention will be prosecuted. ABB Power Systems.

Item Designation		146 = P1-Z2.T1 = P2-Z2.T1	145 = P1-Z2.T2 = P2-Z2.T2	= P1-Z2.T3 = P2-Z2.T3
ITEM 2				
Location		HP 12/24 filter	HP 12/24 filter	HP 12/24 filter
1. Rated frequency	Hz	50	50	50
2. Maximum direct voltage on the bus	kV _{dc}	25	25	N.A. 24
3. Maximum continuous current major harmonics, order/current	A _{rms} n/A _{rms}	66 2/6.6 3/7.4 4/41.1 6/15.6 12/45.9 24/8.3	91 2/3.6 3/7.6 4/42.7 6/17.1 12/75 24/17.5	N.A. N.A. N.A.
4. Rated short-time current, 5s major harmonics, order/current	A _{rms} n/A _{rms}	139 2/20.5 3/7.0 4/11.5 6/19.6 12/68.2 24/15.3	172 2/11.9 3/7.2 4/120 6/21.5 12/114 24/26.5	N.A. N.A.
5. Maximum continuous direct current	mA _{dc}	< 15	< 15	< 15
6. Transient current Time to crest	kA _{crest} μs	7.9 210	14 650	100 20
7. Power frequency withstand test (60 sec) Primary winding Secondary winding	kV _{rms} kV _{rms}	185 3	185 3	50 3
8. Lightning impulse withstand level of the primary winding	kV _{crest}	450 > 24kV	450 > 71kV	75 > 24kV
9. Internal partial discharge test	kV _{rms}	78	78	11.1
10. Minimum nominal creepage distance	mm	2500	2500	N.A. ..

2 Clause 9 adjusted *h B S* 95 46
1 Item 1 modified CGS/VFL 95 23

Rev ind	Revision	Appd	Year	Week
Accepted by QA control	Accepted for prod by	CHANDRAPUR-PADGHE HVDC BIPOLE PROJECT		
Design checked by	Drawn by	Technical Provisions		
LSF/Bergdahl/BB	LSS/Bringeskog/RB	DC Filter Current Transformers		
Drawing checked by	Iss. by Dept	Year	Week	Lang
LKC/Lindbäck/BL	SEPOW/LS	94	45	E
Chandrapur and Padghe Converter Stations				Sheet
L3598.1003				3/6
XNL 610 045-076				Rev Ind
ABB Power Systems				Cont
				2

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not be imparted to a third party nor be used for any unauthorized purpose. ABB Power Systems A.S. prosecuted

11.	Rated primary current	A_{rms}	200	200	100
12.	Rated secondary current	A_{rms}	1	1	1
13.	Core data				
13.1	Protection cores				
	Number of cores		2	None	2
	Ratio		1500:1		1500:1
	Rated burden	VA	10		10
	Accuracy class		5p5		5p5 ²⁾
13.2	Measuring cores				
	Number of cores		2	2	None
	Ratio		200:1	200:1	
	Rated burden	VA	10	10	
	Accuracy class		0.2	0.2	
	Instrument security factor		10	10	
14	RI test voltage	kV_{rms}	N.A.	N.A.	N.A.
15	Equivalent phase-to-ground voltage for thermal coefficient test	kV_{rms}	71.0	71.0	10.1

²⁾ The accuracy limiting factor (5) is based on 1500 A primary current.

2 Cl. 15 added *CGS/VFL* 95 46
 1 Antiremanence gap requenem. deleted CGS/VFL 95 23

Rev ind	Revision	Appd	Year	Week		
Accepted by QA control		Accepted for prod by		CHANDRAPUR-PADGHE HVDC BIPOLE PROJECT		
		LC/Lescale/VFL		Technical Provisions		
Design checked by		Drawn by		DC Filter Current Transformers		
LSF/Bergdahl/BB		LSS/Bringeskog/RB				
Drawing checked by		Iss. by Dept	Year	Week	Lang	Sheet
LKC/Lindbäck/BL		SEPOW/LS	94	45	E	4/6
ABB Power Systems					Rev Ind	Cont
					2	
					Chandrapur and Padghe Converter Stations	
					L3598.1003	
					XNL 610 045-076	

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