

CPRI

TEST REPORT



Central Power Research Institute

(A Govt. of India Society,)

P.B. No.8066, Sadashivanagar Post Office

Prof. Sir.C.V. Raman Road,

Bangalore - 560 080(INDIA)



CABLES LABORATORY
DIAGNOSTIC, CABLES & CAPACITORS DIVISION
CENTRAL POWER RESEARCH INSTITUTE
P.B. No.8066, SADASIVANAGAR SUB P.O.
PROF.SIR C.V.RAMAN ROAD , BANGALORE - 560 080, INDIA.
Phone : +91 (0) 80-23604435, Fax : +91 (0) 80 - 23601213

Sheet 1 of 8

CPRI

TEST REPORT

Test Report Number : DCCD-11348 Dated: 26.03.2010

Name & Address of the Customer : M/s Crompton Greaves Ltd.,
D-2, MIDC, Waluj, Aurangabad
India- 431136

Name & Address of the Manufacturer : M/s Crompton Greaves Ltd.,
D-2, MIDC, Waluj, Aurangabad
India- 431136

Particulars of sample tested : 145 kV Live Tank Hermetically Sealed Current transformer

Condition of the sample on receipt : New.
Type : IOSK:145/275/850
Designation : 145 kV Live Tank Hermetically Sealed Current transformer
Ratio: 3000/1 Amps

Serial Number : 83201
Number of Samples tested : One
Date(s) of Test(s) : 10.03.2010
CPRI Sample Code no(s) : DCCDMISC10S0004

Particulars of test conducted : Thermal Stability Test at 4500 Amps

Test in accordance with Standard /Specification : As per Customer Request
Sampling plan : Not applicable
Customer's requirement : Nil
Deviation if any : Nil

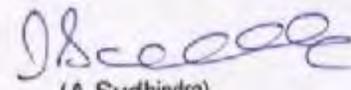
Name of the witnessing persons : Mr.Yogesh P.Sonune
Other than customer's representatives : None.
Test subcontracted with address of the laboratory : Nil

Documents constituting this report (in words) : Nil
Number of sheets : Eight
Number of oscillogram/s : Nil
Number of graphs : Three
Number of photos : One
Number of test circuit diagrams : One
Number of drawings : Three. Drg No. SX2779CT4 GA, SX2779CT4 RS, SX2779CT4 SB


(Thirumurthy)
Test Engineer



AUTHORISED SIGNATORIES


(A.Sudhindra)
Additional Director



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Sheet 2 of 8

TEST REPORT

CPRI Test Report No. : DCCD- 11348

Date: 26.03.2010

TEST RESULTS

1. THERMAL STABILITY TEST

a) Test Procedure:

The primary terminals of the CT under test were short-circuited with high voltage current source (CT). Current source (CT) was energized to circulate 4500 A at 50Hz (i.e 150% of the rated primary current) in the primary winding of the CT under test. An ammeter was connected between terminals S1 and S2 of winding No 2 in series with a resistive burden of 30 Ohm to monitor the secondary induced current, which amounted to 1.5A. Secondary winding No. 1 was connected with a resistive burden of 15 Ohms & Secondary winding No.3 was shorted.

Simultaneously a voltage equal to $1.2 \times 145 / \sqrt{3} = 100.5$ kV, 50 Hz was applied to the primary terminals of the current transformer. During the test Capacitance and Tan delta was measured between HV and terminal Cx and between HV and earth using loss free standard capacitor and automatic C tan delta Bridge.

Every hour, the capacitance and tan delta was measured at 100.5 kV following this voltage was reduced to zero and the ambient temperature (measured at approximately 1.5 meter distance from the current transformer) and the temperature on the bellows, primary terminal P2, tank, porcelain (at 1/3rd of height) base and secondary box was measured by using thermocouple temperature indicator. The voltage was again re-applied to the test object. The test was continued until the temperature rise of all the mentioned locations of current transformers stabilize to a value well within 1°K per hour. The total test duration was eight hours.

The DC resistance of secondary windings no. I, II & III were measured by Micro Ohm Meter between S1 and S2 terminals of each winding, before and after Thermal Stability Test.

b) Atmospheric conditions

Ambient temperature 31.0°C
Object temperature 31.0°C

Winding No	Initial resistance (Ω)	Initial Ambient (°C)	Final Resistance (Ω)	Final Ambient (°C)	Rise in Temperature (°C)
Winding No.1, Between 1S1 and 1S2	1.2598	31	1.3127	32	10.1
Winding No.2, Between 2S1 and 2S2	8.2350	31	9.3340	32	34.4
Winding No.3, Between 3S1 and 3S2	7.8045	31	8.8385	32	34.2

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TEST REPORT

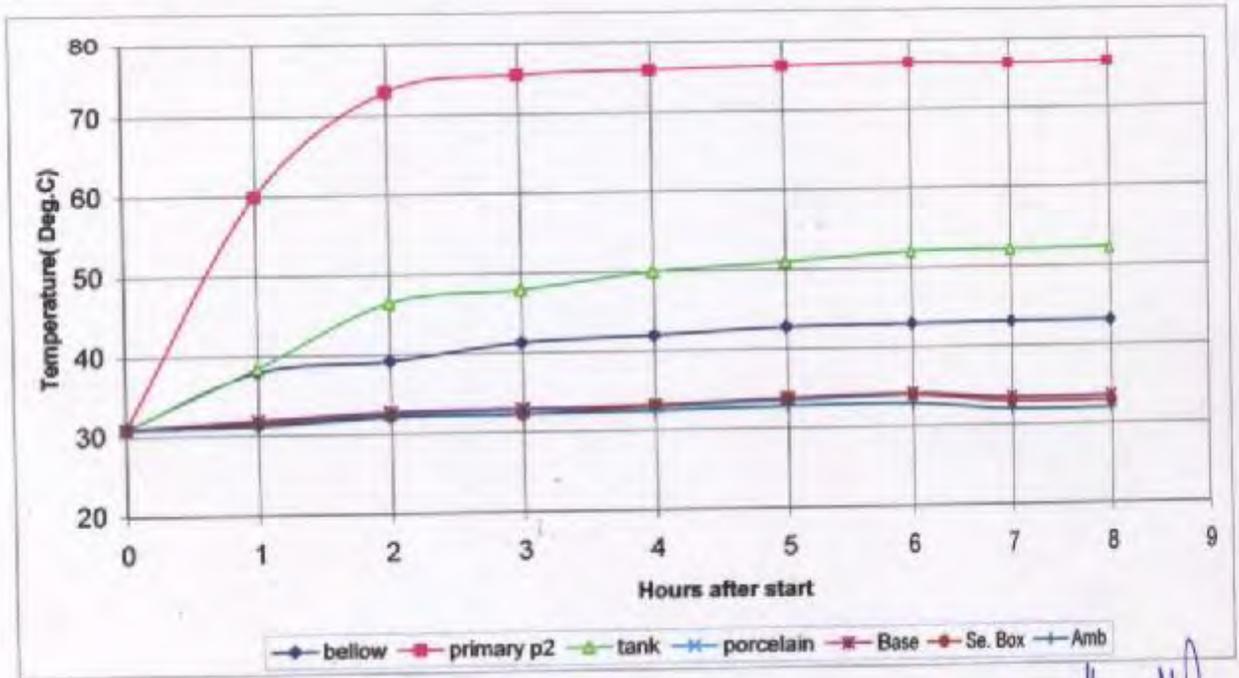
Sheet 3 of 8

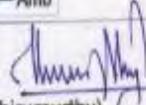
Date: 26.03.2010

TEST RESULTS

c) Temperature measurements on the current transformer during the test

Time after start of test (h)	Bellow temp (°C)	Primary Terminal P2 temp (°C)	Tank temp(°C)	Porcelain temp (°C)	Base temp (°C)	Secondary box temp (°C)	Ambient temp (°C)
0	31.0	31.0	31.0	31.0	31.0	31.0	31.0
1	38.0	60.0	38.5	31.8	31.9	31.5	31.2
2	39.2	73.0	46.5	32.6	32.8	32.3	32.1
3	41.3	75.0	48.0	32.8	33.0	32.3	32.3
4	42.0	75.5	50.0	33.0	33.2	33.1	32.5
5	42.8	75.9	51.0	33.5	33.8	33.8	32.8
6	43.0	76.2	52.1	34.0	34.2	34.0	32.9
7	43.1	76.0	52.2	33.5	33.7	33.2	32.0
8	43.1	76.2	52.3	33.6	33.5	33.0	32.0




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TEST REPORT

Sheet 4 of 8

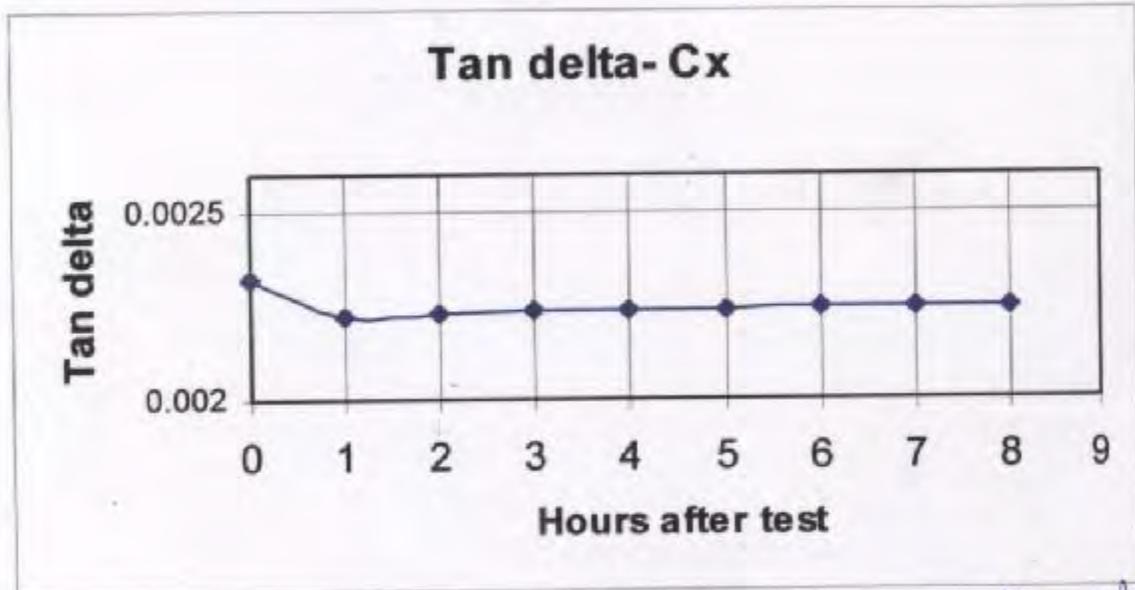
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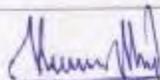
TEST RESULTS

d) Capacitance/tan δ measurements on the current transformer during the test

Time after start of test (h)	Measured total capacitance (pF)	Measured total tan δ	Measured Cx capacitance (pF)	Measured Cx tan δ
0	814.19	0.00168	163.59	0.00232
1	813.33	0.00155	163.61	0.00222
2	813.25	0.00160	163.54	0.00223
3	813.20	0.00161	163.53	0.00224
4	813.15	0.00161	163.53	0.00224
5	813.59	0.00162	163.64	0.00224
6	813.75	0.00163	163.63	0.00225
7	813.74	0.00163	163.64	0.00225
8	813.74	0.00163	163.68	0.00225

e) Graph of measured value for Cx tan delta during the test




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Sheet 5 of 8

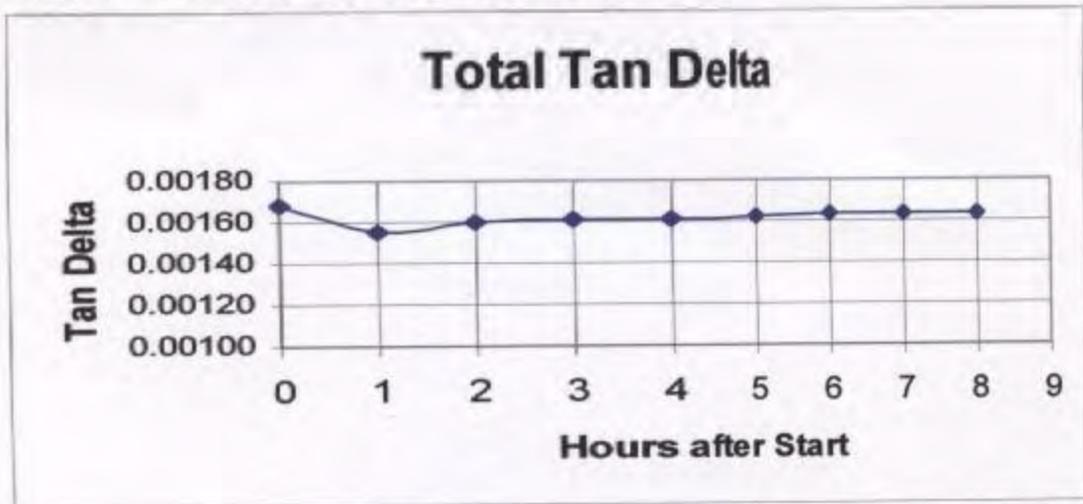
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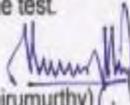
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TEST RESULTS

- f) Graph of measured value for total tan delta during the test



- g) **Conclusion:** The temperature rise observed during thermal stability test on winding and other current transformer components were with in standard limits. The measured Capacitance and tan delta values are also observed to be with in the allowed range through out the test.


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Sheet 6 of 8

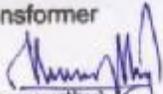
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**TEST REPORT
TEST RESULTS**

Date: 26.03.2010



Photographs of the test set –up during the thermal stability test on the current transformer


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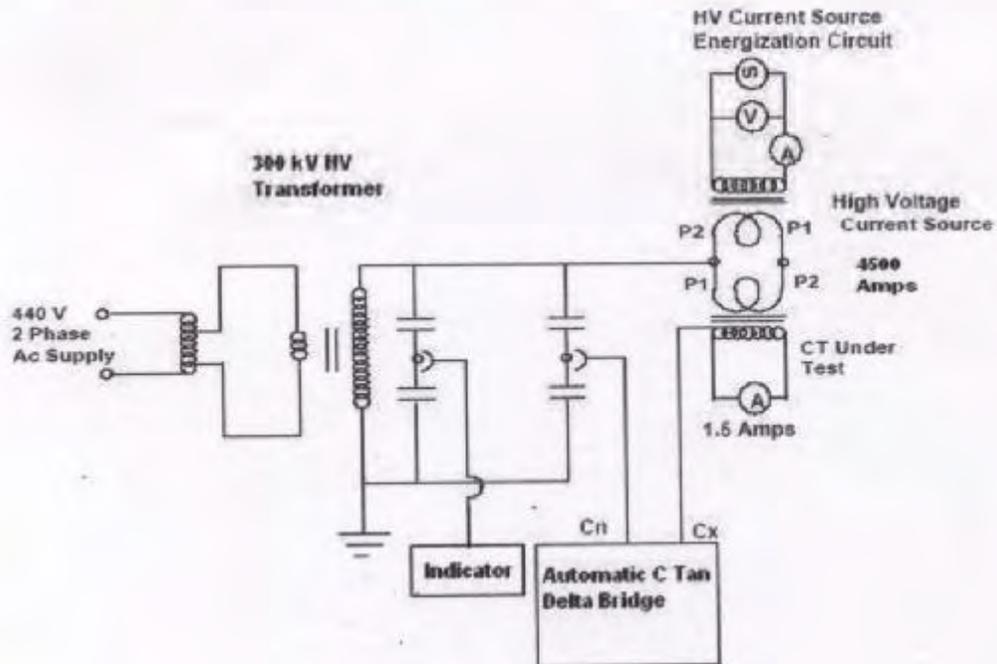
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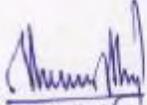
TEST RESULTS

Sheet 7 of 8

Date: 26.03.2010



Test Circuit Diagram for Thermal Stability Test


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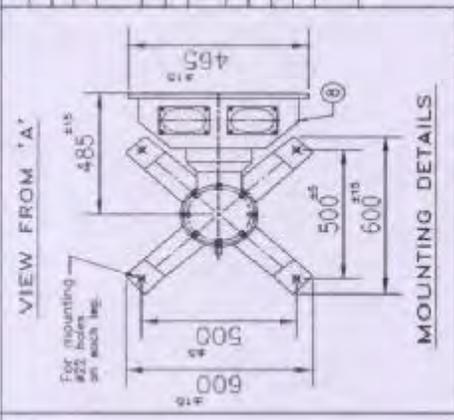
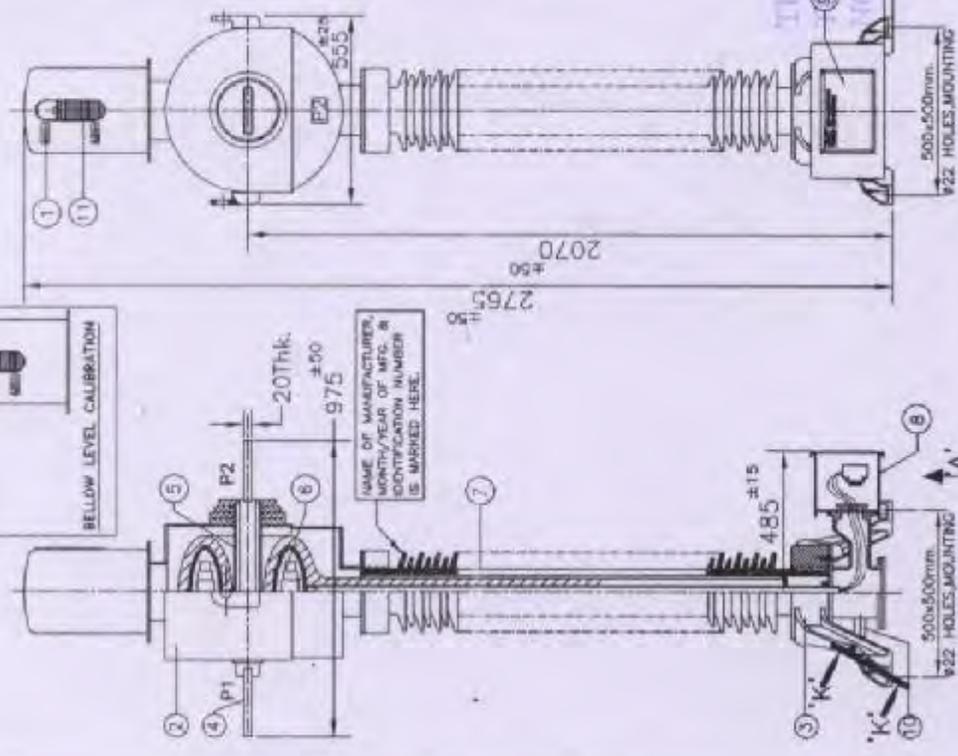
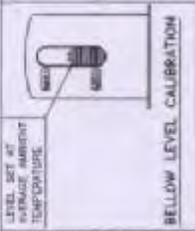
NOTE

- a) The Test results relate only to the item(s) tested.
- b) Publication or reproduction of this report in any form other than by complete set of the whole report and in the language written, is not permitted without the written consent of CPRI.
- c) Any Corrections/erasure invalidates this test report.
- d) Any anomaly/discrepancy in this test report should be brought to our notice within 45 days from the date of issue.

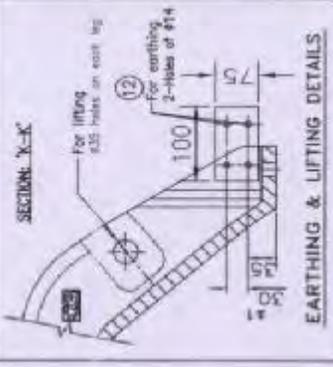
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L02-SHELL

IF IN DOUBT ASK



MOUNTING DETAILS



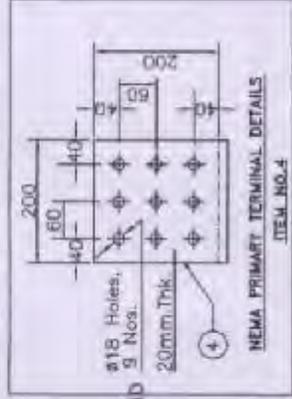
SECTION X-X

EARTHING & LIFTING DETAILS

NO.	QTY.	DESCRIPTION	MATERIAL
1	1	BELLOW LEVEL INDICATOR	ACRYLIC
2	1	HOUSING	ALUMINIUM
3	1	BASE	ALUMINIUM
4	2	PRIMARY TERMINAL-TYPE NEMA SIZE-200x200x20mm Thk.	ALUMINIUM
5	1	PRIMARY WINDING	ALUMINIUM
6	3	SECONDARY WINDING	COPPER
7	1	PORCELAIN INSULATOR	PORCELAIN-DARK BROWN COLOUR
8	1	SECONDARY TERMINAL BOX	DRG NO. SX2779 C14 SB
9	1	RATING & SCHEMATIC DIAGRAM	DRG NO. SX2779 C14 WB
10	1	BALL TYPE SAMPLING VALVE	STEEL PLATED
11	1	BELLOW	STAINLESS STEEL
12	1	EARTHING PAD-100x75x12Thk. #14 Holes, 2M.O's.	COPPER

TECHNICAL SPECIFICATIONS
132 KV CURRENT TRANSFORMER

SPECIFICATION	UNIT	RATING
HIGHEST SYSTEM VOLTAGE (PH-PH)	Kilo Volts	145
HIGHEST SYSTEM VOLTAGE (PH-E)	Kilo Volts	145/√3
POWER FREQUENCY WITHSTAND VOLTAGE FOR 1 MIN. (DRY & WET)	Kilo Volts	275
LIGHTNING IMPULSE WITHSTAND VOLTAGE	Kilo Volts/Peak	850
FREQUENCY	Hz	50
TOTAL CREEPAGE DISTANCE (MINIMUM)	mm	3685
TOTAL WEIGHT (±10%)	Kilogram	450
OIL VOLUME (±10%)	Litre	120
APPLICABLE STANDARDS	-	EC-80044.1-2003



NEMA PRIMARY TERMINAL DETAILS

THIS DRAWING PERTAINS TO CPRI TEST REPORT NO. DCCD-11348 Dated 26-3-10

25 FROM GROUND LEVEL

NOTE : PLEASE REFER INSTRUCTION MANUAL FOR HANDLING & TRANSPORTATION OF CT. TEST ENGINEER

NO.	REVISION	SIGN/DATE	NO.	REVISION	SIGN/DATE	NO.	SIGN	NAME
R6			R2				DRN	
R5			R1				CHD	
							APPR	
							USS	

GENERAL DRAWING/TEST DRAWING FOR 132 KV CURRENT TRANSFORMER TYPE-J03K145/275/050

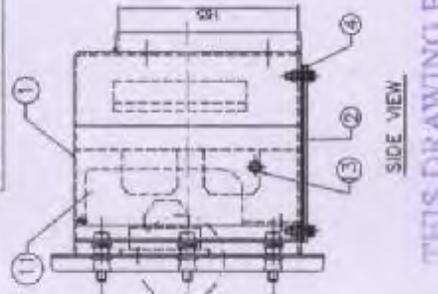
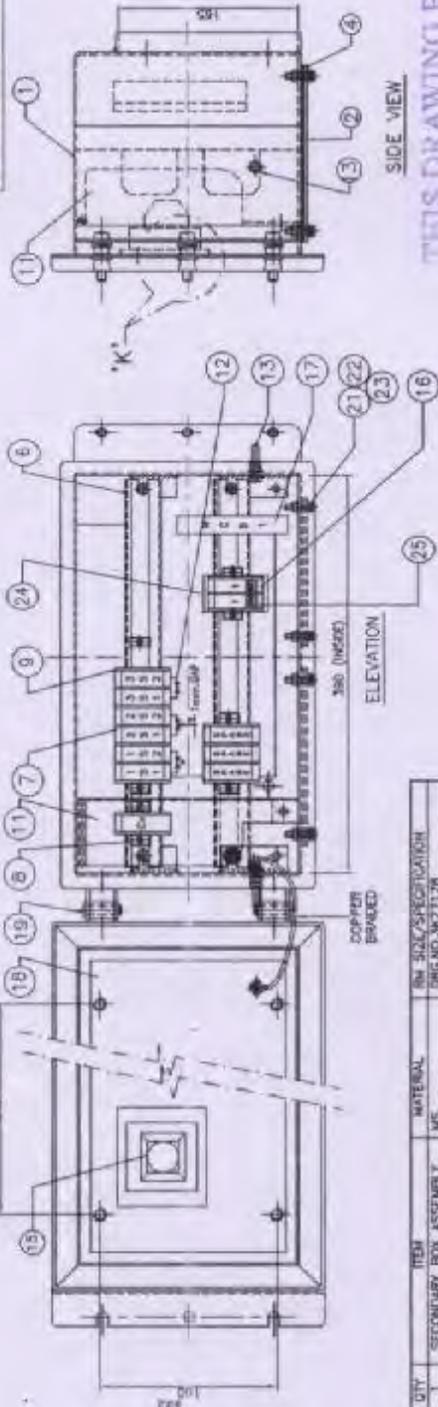
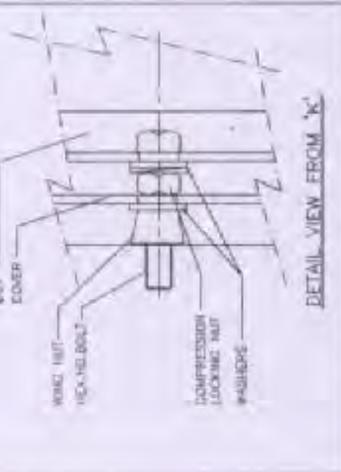
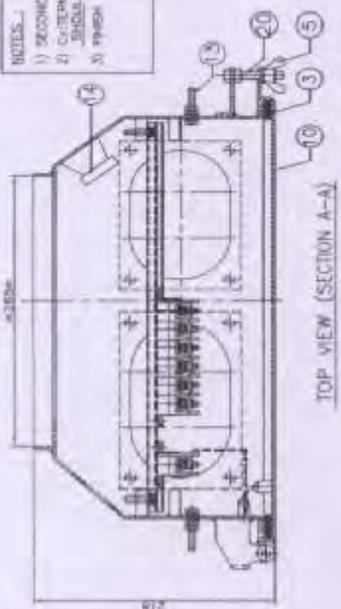
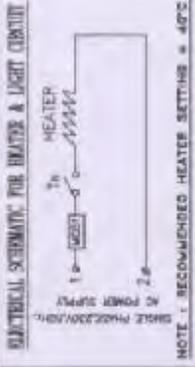
DATE : 26.03.2009 ALL DIMENSIONS ARE IN mm

DRG NO. - SX2779 C14 GA

Crompton Greaves EVERYDAY SOLUTIONS 26, DRN, ALURABARD.

ITEM NO.4

NOTES:
 1) SECONDARY BOX ASSEMBLY TO CONFORM IECSS AS PER IS:15197-1993
 2) CATERING FOR CAPACITANCE & TMA DELTA MEASUREMENT ONLY.
 SHOULD BE HEPT EARTHED WHEN NOT IN USE.
 3) FINISH : SHOT BLASTED + HOT DIP GALVANIZED + POLYPAINTED.
 BOX INSIDE - EPOXY PAINT - SHADE-GLOSSY WHITE.
 BOX OUTSIDE - POLYURETHANE PAINT SHADE IRAL T032-SIEMENS GREY.



SL. NO.	QTY	ITEM	MATERIAL	RM SIZE/SPECIFICATION
1	1	SECONDARY BOX ASSEMBLY	MS	DRG NO. SK 271.26
2	2	GIAND PLATE	MS	100x110x2mm THK.
3	1	GASKET	NEOPRENE	
4	2	GASKET	NEOPRENE	
5	2	WING NUT	S STEEL	S70-M6
6	2	DIAPHRAGM	STEEL	STD.
7	10	SECONDARY TERMINAL BLOCK WITH MARKER	MELAMINE	MAKE/CONNECTWELL/ELDEX TYPE-CRITS.-28V. 20AMP SUITABLE FOR 45sqmm.CABLE
8	6	END CLAMP	STEEL	MAKE/CONNECTWELL/ELDEX
9	3	END PLATE	MELAMINE	TYPE-CRITS.-28V. 20AMP SUITABLE FOR 45sqmm.CABLE
10	1	BATTERY & SCHEMATIC DIAGRAM	STAINLESS STEEL	MAKE/CONNECTWELL/ELDEX
11	1	BOX IN BOX ARRANGEMENT	MS	MAKE/CONNECTWELL/ELDEX
12	3	SPRING CAP	BRASS PLATED	
13	2	COVER TERMINAL	MS-BRASS	
14	1	TERMINAL	(NEUTER CIRCUIT)	40W.230V. INSULATED CO. MAKE RANGE 230V-400.
15	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
16	2	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
17	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
18	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
19	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
20	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
21	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
22	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
23	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
24	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE
25	1	TERMINAL FOR HEATER CIRCUIT	NYLON	REPUTED CO. MAKE

SL. NO.	QTY	ITEM	MATERIAL	RM SIZE/SPECIFICATION
1	2	IMAGE ARRANGMENT		
18	2	HELIOS/TAIT & WATSON	STAINLESS STEEL	MAGNOLIA
20	3	SET	STAINLESS STEEL	MS STD.
21	6	SW-40-5055N	STAINLESS STEEL	MS STD.
22	6	HEATUT	STAINLESS STEEL	MS STD.
23	6	PLUM WIGHER	STAINLESS STEEL	MS STD.
24	1	TERMINAL PROTECTION COVER	ABS/PLC	
25	1	'SUNGLER' STORAGE COVER	PHOTO METALIC	

THIS DRAWING PERTAINS TO CPRI TEST REPORT NO. DCCD-11348 Dated 26.3.2010

Shammy M
 TEST ENGINEER

CT SR NO. : 83199 TO 83201
 CODE NO. : 970048542

REV	DATE	BY	CHKD	REVISION	REASON	STANDARD	DRG NO.	CTA
R-4								
R-3								
R-2								
R-1								

CS GROUP
 SECONDARY BOX ASSEMBLY FOR IECSS CURRENT TRANSFORMER
 TYPE: 8050145/270/450
 DR: EVAL JAYARAMAN.
 DRG NO.: 332778 CTA 58