



CPRI

UHV RESEARCH LABORATORY
CENTRAL POWER RESEARCH INSTITUTE
P.B. No. 9, UPPAL P.O., HYDERABAD - WARANGAL HIGHWAY
HYDERABAD - 500 039.
Phone : Direct (040)-27203622, EPABX : (040)-27203112, 27204701
Fax : (040)-27203378, E-mail: uhvac@cprihyderabad.com

April 21, 2009

UHV/PFL/09-10/

M/s. Crompton Greaves Limited,
S6 Division, D-2, MIDC Waluj,
Aurangabad - 431 136

Sub: Test Report on 145 kV Current Transformer
Kind Attn: Mr. Sunil Nannaware

Sirs,

Please find herewith enclosed test reports bearing numbers UHV / T / 016 and UHV / T / 017 dated 20.04.2009 for the tests conducted on your 145 kV Current Transformer. Any anomalies / discrepancies in the test reports issued should be brought to the notice of CPRI within 45 days from the date of issue of test reports.

Kindly acknowledge the receipt.

Thanking you,

Yours faithfully,


(B GUNASEKARAN)
Additional Director



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Certificate No. : T-0098

Sheet 01 of 03

TEST REPORT

Test report number

UHV / T / 016

Dated: 20.04.2009

Name and address of the customer

M/s. Crompton Greaves Limited
S6 Division, D-2, MIDC Waluj,
Aurangabad - 431 136

Name and address of the manufacturer

M/s. Crompton Greaves Limited,
S6 Division, D-2, MIDC Waluj,
Aurangabad - 431 136

Particulars of sample tested

Condition of sample on receipt

Type

Description

Serial number

Number of samples tested

Date(s) of test(s)

CPRI sample code number

New

IOSK: 145 / 275 / 650

145 kV Current Transformer

81541

One

08.04.2009

UHV09S0151

Particulars of test conducted

Corona inception and extinction voltage test

Test method

Standard/specification

As per Technical Specification, Section GTR C/ENGG/SP1
/GTR REV. NO: 08 Pages 47 of 79 and 48 of 79

Sampling plan

Not applicable

Customers requirement

Nil

Deviations if any

Photographs of sample during the test not taken due to fac
limitation. Observations were made with naked eye

Name of the witnessing persons

Customer's representatives

Mr. Sunil Nannaware

Other than customer's representatives

Nil

Test subcontracted with address of the
laboratory

Nil

**Documents constituting this report (in
words)**

Number of sheets

Three

Number of oscillograms

Nil

Number of graphs

Nil

Number of photos

Nil

Number of test circuit diagrams

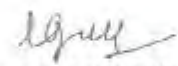
One in sheet 03 of 03

Number of drawings

Three


(K. A. ARAVIND)
Test Engineer


AUTHORIZED SIGNATORIES


(B. GUNASEKARAN)
Additional Director

CPRI

TEST REPORT



**Central Power Research Institute
(A Govt. of India Society)
P.B. No.9, Uppal P.O.,
Hyderabad - Warangal Highway,
HYDERABAD - 500 039 (INDIA)**



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Aurangabad - 431 136

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S6 Division, D-2, MIDC Waluj,
Aurangabad - 431 136

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Condition of sample on receipt

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UHV09S0151

Corona inception and extinction voltage test

Particulars of test conducted

Test method

Standard/specification

Sampling plan

Customers requirement

Deviations if any

As per Technical Specification, Section: GTR C/ENGG/SPEC
/GTR REV. NO. 08 Pages 47 of 79 and 48 of 79

Not applicable

Nil

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limitation. Observations were made with naked eye

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Customer's representatives

Other than customer's representatives

Mr. Sunil Nannaware

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One in sheet 03 of 03

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(K. A. ARAVIND)
Test Engineer



AUTHORIZED SIGNATORIES

(B. GUNASEKARAN)
Additional Director



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Certificate No. : T-0098

Sheet 02 of 03

Test Report Number

: UHV / T /016

Dated: 20.04.2009

MOUNTING ARRANGEMENTS & TEST CONNECTIONS DURING TEST:

Mounting arrangements: CT was placed at outdoor

Reference Drawing Nos: 1) SX2602 CT1 GA
2) SX2602 CT1 RS Rev R1
3) SX2602 CT1 SB

Test connections: HV connected to primary terminal P1 of the current transformer.
All secondary terminals were shorted together and earthed along with CT base.

AMBIENT CONDITIONS:

Temperature in Degree Celsius		Atmospheric pressure in mm of Hg
Dry bulb	Wet bulb	
25	22	718

TEST PROCEDURE: As per Technical Specification, Section: GTR C/ENGG/SPEC/GTR REV. NO: 08, Pages 47 of 79 and 48 of 79

Specified RIV test voltage: $1.1 U_m / \sqrt{3} = 92.1 \text{ kV}$

RESULTS & OBSERVATIONS:

Corona inception and extinction voltage test:

The CT was pre-stressed at 120 kV (RMS) for 5 minutes duration.
No corona was visible from any part of the sample during this voltage application and the test was stopped


(K. A. ARAVIND)
Test Engineer



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Certificate No. : T-0098

Sheet 03 of 03

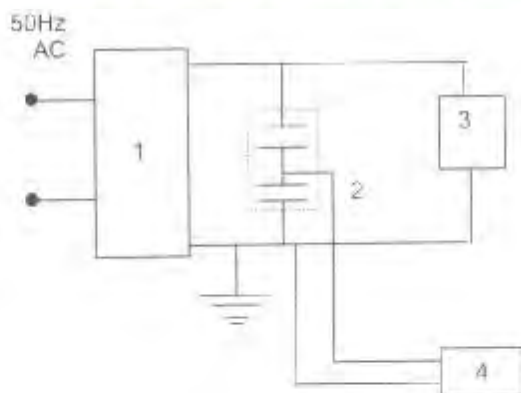
Test Report Number

: UHV / T / 016

Dated: 20.04.2009

TEST CIRCUIT DIAGRAM

Corona Inception and extinction voltage test



Legend:

- 1 AC Transformer
- 2 Voltage Divider
- 3 Test Sample
- 4 RMS voltmeter

NOTE

- a) The test results relates only to the items 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 approval of CPRI
- c) Corrections/ erasing invalidates the test report.
- d) Any anomalies/ discrepancies in the test report should be brought to our notice within 45 days from the date of issue.

K. A. Aravind
(K. A. ARAVIND)
Test Engineer

NO.	QTY.	DESCRIPTION	MATERIAL
1	1	BELLOW LEVE. INDICATOR	ACRYLIC
2	1	HOUSING	ALUMINIUM
3	1	BASE	ALUMINIUM
4	2	NEMA PRIMARY TERMINAL SIZE - 100x100x20mm Thk	ALUMINIUM
5	1	PRIMARY WINDING	ALUMINIUM
6	3	SECONDARY WINDING	COPPER
7	1	PORCELAIN INSULATOR	PORCELAIN
8	1	SECONDARY TERMINAL BOX	BROWN COLOUR
9	1	WATING & SCHEMATIC DIAGRAM	DRG NO. 2002 CT1 RS
10	1	GAIL TYPE SAMPLING VALVE	STEEL PLATED
11	1	BELLOW	STAINLESS STEEL
12	1	EARTHING HOLES-#14	ALUMINIUM

VIEW FROM 'A'

SECTION 'X-X'

EARTHING & LIFTING DETAILS

TECHNICAL SPECIFICATIONS

145 KV CURRENT TRANSFORMER

SPECIFICATION	UNIT	VALUE
DESIGN	145 KV	145
DESIGN SYSTEM VOLTAGE (P-H)	KV	145
DESIGN SYSTEM VOLTAGE (P-E)	KV	145
DESIGN SYSTEM VOLTAGE (P-N)	KV	145
DESIGN SYSTEM VOLTAGE (P-G)	KV	145
DESIGN SYSTEM VOLTAGE (P-L)	KV	145
DESIGN SYSTEM VOLTAGE (P-T)	KV	145
DESIGN SYSTEM VOLTAGE (P-B)	KV	145
DESIGN SYSTEM VOLTAGE (P-C)	KV	145
DESIGN SYSTEM VOLTAGE (P-D)	KV	145
DESIGN SYSTEM VOLTAGE (P-F)	KV	145
DESIGN SYSTEM VOLTAGE (P-H)	KV	145
DESIGN SYSTEM VOLTAGE (P-I)	KV	145
DESIGN SYSTEM VOLTAGE (P-J)	KV	145
DESIGN SYSTEM VOLTAGE (P-K)	KV	145
DESIGN SYSTEM VOLTAGE (P-L)	KV	145
DESIGN SYSTEM VOLTAGE (P-M)	KV	145
DESIGN SYSTEM VOLTAGE (P-N)	KV	145
DESIGN SYSTEM VOLTAGE (P-O)	KV	145
DESIGN SYSTEM VOLTAGE (P-P)	KV	145
DESIGN SYSTEM VOLTAGE (P-Q)	KV	145
DESIGN SYSTEM VOLTAGE (P-R)	KV	145
DESIGN SYSTEM VOLTAGE (P-S)	KV	145
DESIGN SYSTEM VOLTAGE (P-T)	KV	145
DESIGN SYSTEM VOLTAGE (P-U)	KV	145
DESIGN SYSTEM VOLTAGE (P-V)	KV	145
DESIGN SYSTEM VOLTAGE (P-W)	KV	145
DESIGN SYSTEM VOLTAGE (P-X)	KV	145
DESIGN SYSTEM VOLTAGE (P-Y)	KV	145
DESIGN SYSTEM VOLTAGE (P-Z)	KV	145

LIST OF DRAWINGS

NO.	QTY.	DESCRIPTION	MATERIAL
1	1	BELLOW LEVE. INDICATOR	ACRYLIC
2	1	HOUSING	ALUMINIUM
3	1	BASE	ALUMINIUM
4	2	NEMA PRIMARY TERMINAL	ALUMINIUM
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10	1	GAIL TYPE SAMPLING VALVE	STEEL PLATED
11	1	BELLOW	STAINLESS STEEL
12	1	EARTHING HOLES-#14	ALUMINIUM

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

LEVEL SET AT AVERAGE AMBIENT TEMPERATURE

BELLOW LEVEL CALIBRATION

20mm Thk.

±50

850

NAME OF MANUFACTURER
MONTH/YEAR OF MFG.
IDENTIFICATION NUMBER
IS MARKED HERE.

1280 Min.

2125

2880

500-500mm

1280 HOLES MOUNTING

25 FROM GROUND LEVEL

485

±15

8

11

12

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TEST ENGINEER

Central Power Research Institute

HYDRA-2002

UNV/7/016

2004.07

1000 MC

2004.07

ITEM NO. 4

MAIN PRIMARY TERMINAL DETAILS

ITEM NO.	NAME	SIGN
1	DRN	STJ
2	CHD	DSJ
3	APPD	USS

REVISION

NO.	REVISION	SIGN	DATE	NO.
R1				
R2				
R3				
R4				

DATE: 11.09.2008

SCALE: N.T.S.

ALL DIMENSIONS ARE IN mm

DRG NO. - SX2602 CT1 GA

- 3.5 The metering instruments shall be as per CISPR recommendation or equivalent device so long as it has been used by other testing authorities.
- 3.6 The RIV measurement may be made with a noise meter. A calibration procedure of the frequency to which noise meter shall be tuned shall establish the ratio of voltage at the high voltage terminal to voltage read by noise meter.

4. Test Methods for Visible Corona

The purpose of this test is to determine the corona extinction voltage of apparatus, connectors etc. The test shall be carried out in the same manner as RIV test described above with the exception that RIV measurements are not required during test and a search technique shall be used near the onset and extinction voltage, when the test voltage is raised and lowered to determine their precise values. The test voltage shall be raised to 130% of RIV test voltage and maintained there for five minutes. In case corona inception does not take place at 130 %, test shall be stopped, otherwise test shall be continued and the voltage will then be decreased slowly until all visible corona disappears. The procedure shall be repeated at least 4 times with corona inception and extinction voltage recorded each time. The corona extinction voltage for purposes of determining compliance with the specification shall be the lowest of the four values at which visible corona (negative or positive polarity) disappears. Photographs with laboratory in complete darkness shall be taken under test conditions, at all voltage steps i.e. 85%, 100%, 115% and 130%. Additional photographs shall be taken at corona inception and extinction voltages. At least two views shall be photographed in each case using Panchromatic film with an ASA daylight rating of 400 with an exposure of two minutes at a lens aperture of f/5.6 or equivalent. The photographic process shall be such that prints are available for inspection and comparison with conditions as determined from direct observation. Photographs shall be taken from above and below the level of connector so as to show corona on bushing, insulators and all parts of energised connectors. The photographs shall be framed such that test object essentially, fills the frame with no cut-off.

- 4.1 The test shall be recorded on each photograph. Additional photograph shall be taken from each camera position with lights on to show the relative position of test object to facilitate precise corona location from the photographic evidence.

- 4.2 In addition to photographs of the test object preferably four photographs shall be taken of the complete test assembly showing relative positions of all the test equipment and test objects. These four photographs shall be taken from four points equally spaced around the test arrangement to show its features from all sides. Drawings of the laboratory and test set up locations shall be provided to indicate camera positions and angles. The precise location of camera shall be approved by Purchaser's inspector, after determining the best camera locations by trial energisation of test object at a voltage which results in corona.
- 4.3 The test to determine the visible corona extinction voltage need not be carried out simultaneously with test to determine RIV levels.
- 4.4 However, both test shall be carried out with the same test set up and as little time duration between tests as possible. No modification on treatment of the sample between tests will be allowed. Simultaneous RIV and visible corona extinction voltage testing may be permitted at the discretion of Purchaser's inspector if, in his opinion, it will not prejudice other test.

5. Test Records:

In addition to the information previously mentioned and the requirements specified as per CISPR or NEMA 107-1964 the following data shall be included in test report:

- a) Background noise before and after test.
- b) Detailed procedure of application of test voltage.
- c) Measurements of RIV levels expressed in micro volts at each level.
- d) Results and observations with regard to location and type of interference sources detected at each step.
- e) Test voltage shall be recorded when measured RIV passes through 100 microvolts in each direction.
- f) Onset and extinction of visual corona for each of the four tests required shall be recorded.