

**CPRI**

# **TEST REPORT**



**Central Power Research Institute  
(A Govt. of India Society)  
P.B. No.9, Medipally P.O.,  
Uppal - Warangal Highway  
HYDERABAD - 500 098 (INDIA)**

# CENTRAL POWER RESEARCH INSTITUTE



**CPRI**

## TEST REPORT

**Test Report Number** : UHV / T / 377 **Date:** 21.02.2012  
**Name & Address of the Customer** : M/s. Crompton Greaves Ltd.,  
EHV Switchgear Division (S<sub>3</sub>), A-3, MIDC,  
Ambad, Nashik- 422010  
**Name & Address of the Manufacturer** : M/s. Crompton Greaves Ltd.,  
EHV Switchgear Division (S<sub>3</sub>), A-3, MIDC,  
Ambad, Nashik- 422010  
**Particulars of sample tested**  
**Condition of the sample on receipt** : New  
Type : 120-SFM-32B  
Designation : 145 kV, 3150 A, 40 kA, SP-SP, SF<sub>6</sub> Gas Circuit Breaker  
Serial Number : 37649C  
Number of samples tested : One  
Date(s) of test(s) : 18.02.2012  
CPRI Sample Code no(s) : UHV12S0039  
**Particulars of test conducted** : Test 1) Lightning impulse voltage test (Dry)  
Test 2) Power frequency voltage test (Dry)  
Test 3) Power frequency voltage test (Wet)  
Standard/ Specification : IEC: 62271 – 100 / 2008 and customer's request  
Sampling plan : Not applicable  
Customer's requirement : Test voltages indicated by the customer  
Deviations if any : Nil  
**Name of the witnessing persons**  
Customer representatives : 1) Mr. Lalit Mahale  
2) Mr. Santosh Gundap  
Other than customer's representatives : Nil  
**Test subcontracted with address of the Laboratory** : Nil  
**Documents constituting this report (in words)**  
Number of sheets : Five  
Number of oscillogram/s : Twelve in three sheets  
Number of graphs : Nil  
Number of photos : Nil  
Number of test circuit diagrams : Two  
Number of drawings : Four



  
(Dr. PRADEEP M. NIRGUDE) (K. A. ARAVIND)  
**Test Engineers**

  
(Dr. D. DEVENDRANATH)  
**Joint Director**

Sheet 01 of 05

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**CPRI**

Test Report Number : UHV / T / 377

Date: 21.02.2012

## MOUNTING ARRANGEMENTS & TEST CONNECTIONS DURING TEST:

**Mounting arrangements:** The sample was mounted at outdoor as per drawing no: 3949627 R0  
Reference drawing nos. 1) 4,94,9632 R0 2) 2940037 R3 3) 3943042 R1

### Test connections:

Test Connection No.	Status of breaker	HV source connected to	Earth connected to
1	Closed	Aa	Bb, Cc, F
2	Closed	Bb	Aa, Cc, F
3	Open	A	a, B, b, C, c & F
4	Open	a	A, B, b, C, c & F
5	Open	B	A, a, b, C, c & F
6	Open	b	A, a, B, C, c & F

F- Frame of the circuit breaker SF<sub>6</sub> Gas Pressure: 6.2 kg/cm<sup>2</sup> (gauge) @ 28°C

### AMBIENT CONDITIONS:

Name of the test	Test connection No.	Temperature in Degree Celsius		Atmospheric pressure in kPa	Correction factor applied
		Dry bulb	Wet bulb		
Lightning impulse voltage test ( Dry )	1 & 2	28	22	95.86	0.978
	3, 4, 5 & 6	30	25	95.86	0.968
Power frequency voltage test (Dry)	1 & 2	23	19	95.99	0.998
	3, 4, 5 & 6	23	19	95.99	0.996
Power frequency voltage test (Wet)	1 & 2	23	19	95.99	0.991
	3, 4, 5 & 6	23	19	95.99	0.981

**TEST PROCEDURE:** IEC: 62271 – 100 / 2008 and customer's request

  
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Sheet 02 of 05

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## RESULTS & OBSERVATIONS:

### Test 1) Lightning impulse voltage test (Dry)

Test connection No.	Polarity	No of Impulses applied	Lightning impulse voltage kV peak <sup>@</sup>	Reference Oscillograms No. C:\CPRI2012\02\CGLS3\...DAT	Remarks
1	Negative	15	650	411	Withstood
	Positive	15	650	431	Withstood
2	Positive	15	650	451	Withstood
	Negative	15	650	471	Withstood
3	Positive	15	650	331	Withstood
	Negative	15	650	351	Withstood
4	Negative	15	650	253	Withstood
	Positive	15	650	273	Withstood
5	Positive	15	650	391	Withstood
	Negative	15	650	371	Withstood
6	Positive	15	650	291	Withstood
	Negative	15	650	311	Withstood

@The test voltages were corrected for the atmospheric conditions and corrected voltages were applied.

### Test 2) Power frequency voltage test (Dry)

Test connection No.	Test Voltage kV r.m.s. <sup>@</sup>	Duration	Remarks
1	275	One minute	Withstood
2	275	One minute	Withstood
3	275	One minute	withstood
4	275	One minute	Withstood
5	275	One minute	Withstood
6	275	One minute	withstood

@The test voltages were corrected for the atmospheric conditions and corrected voltages were applied.

*Shalep - S. D. K. A.*  
**Test Engineers**

Sheet 03 of 05

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Test Report Number : UHV / T / 377

Date: 21.02.2012

## Test 3) Power frequency voltage test (Wet)

Test connection No.	Test Voltage kV r.m.s. @	Duration	Remarks
1	275	One minute	Withstood
2	275	One minute	Withstood
3	275	One minute	withstood
4	275	One minute	Withstood
5	275	One minute	Withstood
6	275	One minute	withstood

@The test voltages were corrected for the atmospheric conditions and corrected voltages were applied. Resistivity of the water used for the wet test: 98  $\Omega$ -m.

**Overall Measurement Uncertainty:** The overall expanded measurement uncertainty for test voltage is  $\leq \pm 1.58\%$  of peak value for impulse tests and  $\leq \pm 0.56\%$  for PF tests for 95% confidence level corresponding to coverage factor  $K = 2$ .

## NOTE

- The test results relate only to the item(s) tested.
- Publication or reproduction of the test report /Certificate in any form other than by complete set of the whole test report /Certificate and in the language written is not permitted without the written consent of CPRI.
- Any Corrections/ erasure invalidates the test report /Certificate
- NABL has Accredited this laboratory as per ISO 17025:2005 standard for the tests carried out.
- Any anomaly / discrepancy in the test report /Certificate should be brought to the notice of CPRI within 45 days from the date of issue.

*[Handwritten Signature]*  
Test Engineers

Sheet 04 of 05

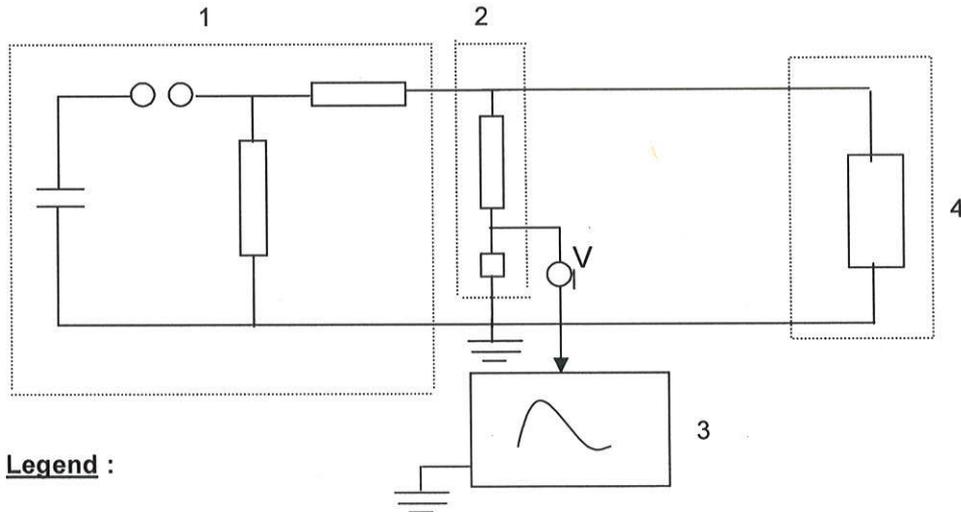


Test Report Number : UHV / T / 377

Date: 21.02.2012

### TEST CIRCUIT DIAGRAMS

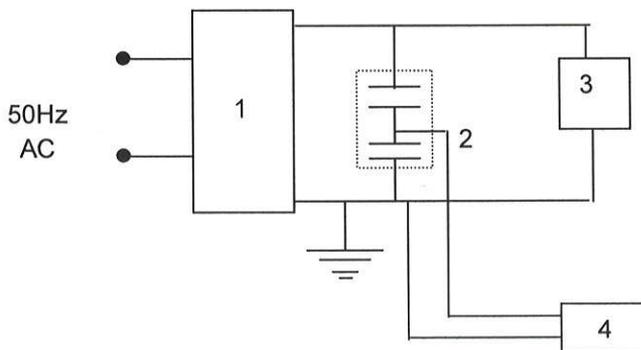
Test 1:



**Legend :**

- 1. Impulse voltage generator
- 2. Impulse voltage divider
- 3. Digital recorder for measurement of voltage
- 4. Test object
- V. Voltage

Tests 2 & 3:



**Legend:**

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

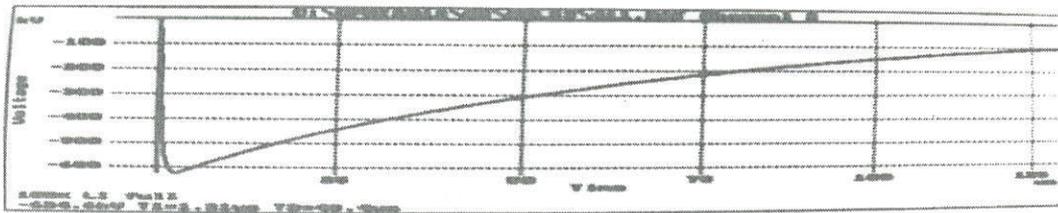
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**Test Engineers**

Sheet 05 of 05

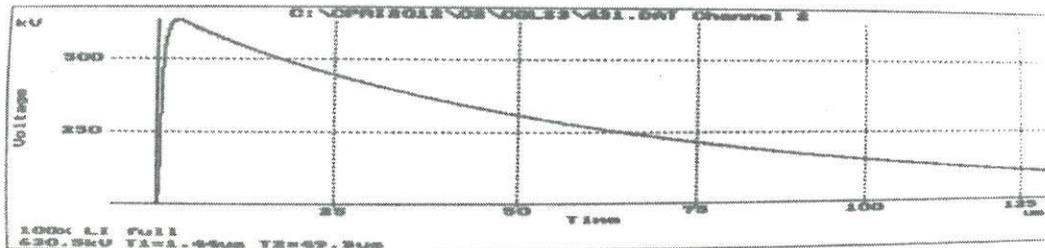
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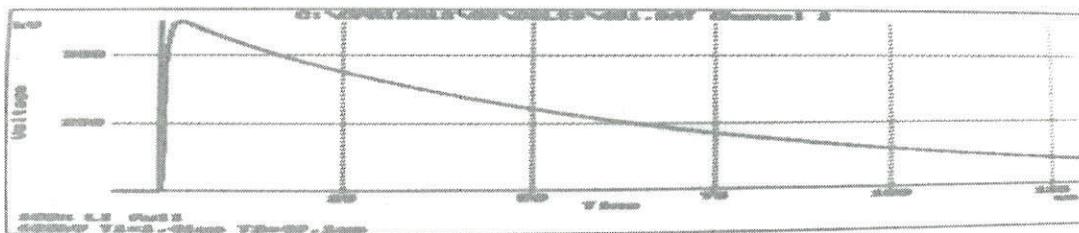
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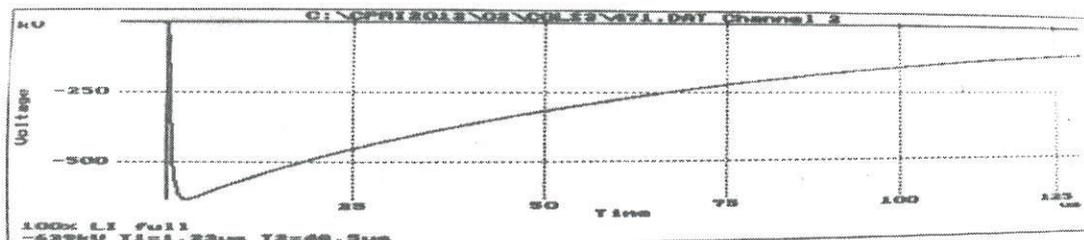
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Test Report Number: UHV/T/377

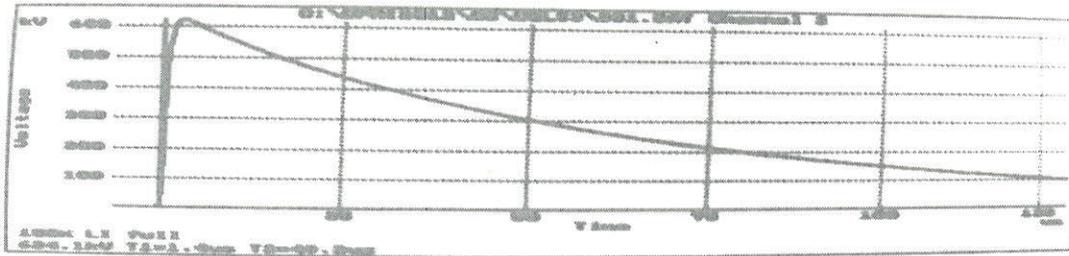
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*Shahy*  
Test Engineer

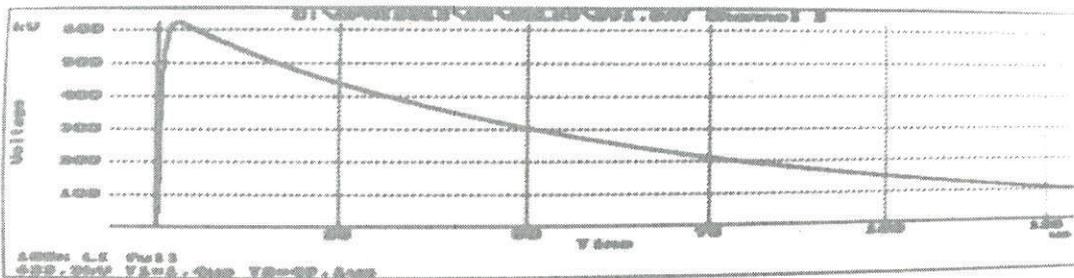
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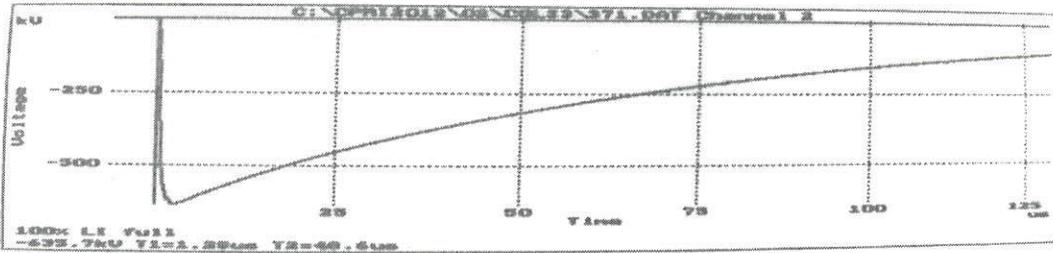
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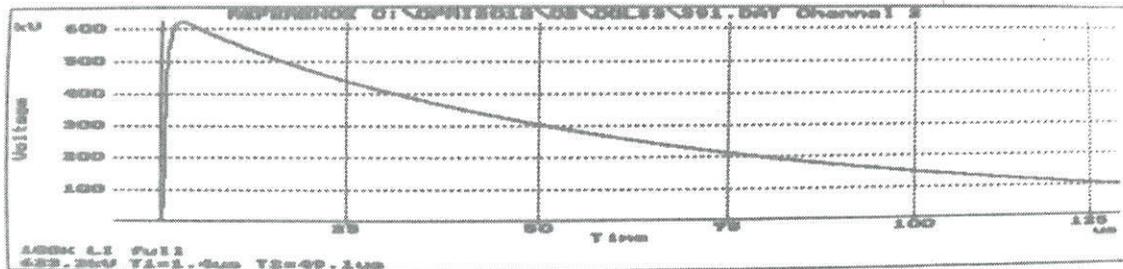
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Test Report Number : UHV/T/377

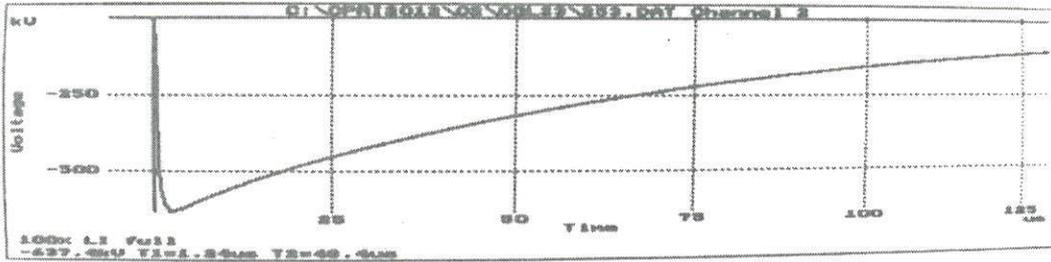
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*Shaleef*  
Test Engineer

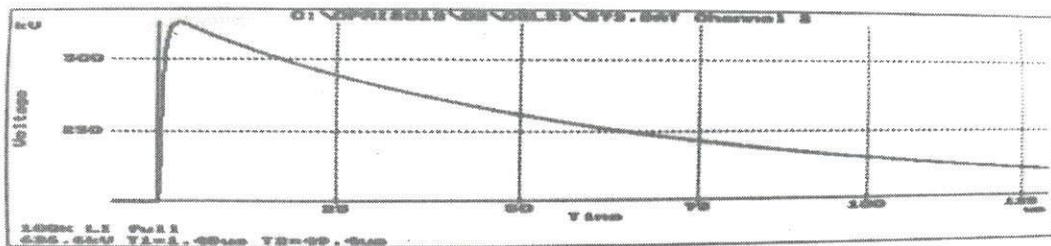
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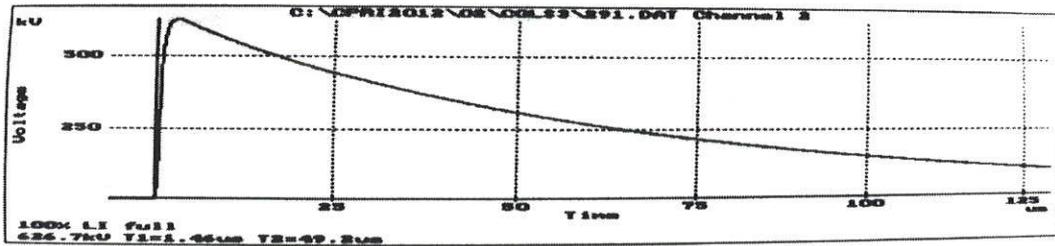
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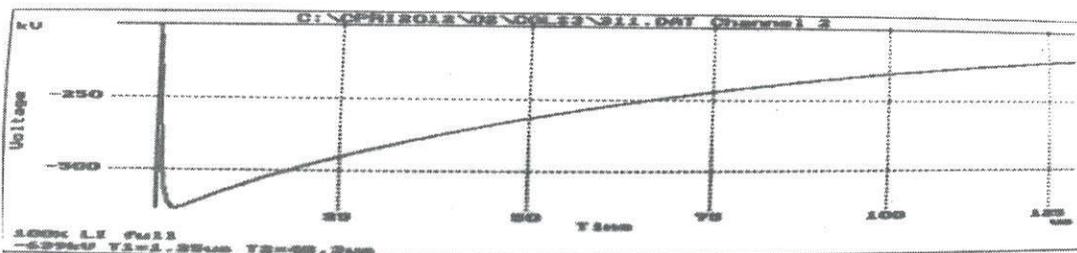
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Oscillogram No.C:\CPRI2012\02\CGLS3\291.DAT



Oscillogram No.C:\CPRI2012\02\CGLS3\311.DAT

Test Report Number : UHV/T/377

Dated: 21-02-2012

*[Signature]*  
Test Engineer





**Crompton Greaves Ltd.**  
**SWITCHGEAR DIVISION S3**  
**AMBAD, NASHIK.**

# GAS CIRCUIT BREAKER

TYPE 120-SFM-32B	SR. NO. : [REDACTED]	YEAR 2011
RATED VOLTAGE 145 KV	RATED FREQUENCY 50 Hz	
RATED NORMAL CURRENT 3150 A	RATED MAKING CAPACITY 100 KAp	
RATED SHORT CIRCUIT BREAKING CURRENT 40 KA	RATED SHORT TIME CURRENT 40 KA FOR 3 SECONDS	
RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE 650 KVP	FIRST POLE TO CLEAR FACTOR 1.5	
RATED GAS PRESSURE 7 kg/cm <sup>2</sup> -(AT 20°C)	RAT.OPR.SEQ. 0-0.3SEC-CO-3MIN-CO	
RATED COIL VOLTAGE - CLOSING 110 V DC , TRIPPING 110 V DC	GAS WT 6 Kg TOTAL WT. 2450 Kg	
MOTOR VOLTAGE 230 V AC/DC	AUX CIRCUIT VOLTAGE 1Ø,230V AC,50/60 Hz.	
REF.STD.IEC-62271-100		

*Mohney*

**TEST ENGINEER**

**Central Materials Stainless Steel 0.5THK  
 HYDERABAD**

इस चित्र परीक्षण दस्तवर्ज सं. से संबंधित है

This drawing pertains to Test report No. UHV/T/377 of 24.02.2012

इस चित्र का साक्ष्योक्त बिमा की जांच लर ही सीमित है

Restation of drawing is limited to the checking of dimensions only

SIGN		NAME		RATING PLATE DETAILS	
4	DRN		H CJ	FOR 145 KV-40KA SP-SFR	
3	CHD		SSS	GCB-TYPE-120-SFM-32B	
	APPD		SSS		
2	DATE	30.03.11			
1	SCALE	NTS			
	THIRD ANGLE	PROJECTION			
NO	REVISION			SIGN DATE ALL DIMENSIONS ARE IN mm DRG. NO.: 4,94,9632 R0	



**Crompton Greaves Ltd.**  
 SWITCHGEAR DIVISION S3  
 AMBAD, NASHIK.



