ब्लू डार्ट/डी एच एल द्वारा
BY BLUE DART / DHL

केन्द्रीय विद्युत अनुसंधान संस्थान

(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)
प्रो सर सी. वी. रामन रोड़, सदाशिवनगर डाक घर, पो. बा. सं. 8066, बेंगलूर - 560 080

CENTRAL POWER RESEARCH INSTITUTE

(A Govt of India Society under Min. of Power)
Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8066, Bangalore - 560 080, India
वेबसाइट/website : http://www.cpri.in

23601442,
23602919
(Extn: 2321)

TELE FAX: 080-23604435
email: hnn@cpri.in

By Speed Post

CAPACITORS DIVISION

No. DCCD/CAP/89/16

Date: 03.11.2016

M/s. Tibrewala Electronics Limited,
B-18, B.H.E.L. Ancillary Industrial Estate,
Ramachandrapuram,
Hyderabad-500037.
(Ph. 040-23027399)

Kind attn.: Mr. P.Ratna Raju, Manager, QA (Design & Development)
Sub : Routine & type tests on 3Ø, 25 kvar, 440 V, 50 Hz, LV shunt capacitor-.

Dear Sir,

Please refer to your Customer Request Form dated 24.06.2016 regarding routine and type test on LV Shunt Capacitor as per IEC 60831-1&2:2014.

As requested, the test has been completed and our test report No.PCD–0057 dated 27.10.2016 is as enclosed.

Any discrepancy in the test report may please be brought to the notice of the undersigned within forty five days from the date of issue.

The receipt of the test report may please be acknowledged.

Thanking you,

Yours faithfully,

(Dr. H.N.Nagamani)
Additional Director

Encl. As above

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)

CENTRAL POWER RESEARCH INSTITUTE

CPRI

TEST REPORT

Test Report Number	: **PCD –0057**	**Dated: 27.10.2016**
Name & Address of the Customer	: M/s. Tibrewala Electronics Limited, 6-56/2/40, Bombay Highway, Balanagar Hyderabad-500037. Ref. No. Customer Request Form dated 24.06.2016	
Name & Address of the Manufacturer	: M/s. Tibrewala Electronics Limited, 6-56/2/40, Bombay Highway, Balanagar Hyderabad-500037.	
Particulars of sample tested	: 25 kvar, 440V, 3Φ, Δ connected, 50Hz Cylindrical Capacitor	
Condition of sample on Receipt	: Good	
Type	: ---	
Description/Name Plate details	: Name Plate Details: Q_N : 25 kvar -5% - +10% U_N : 440 V C_N : 3x137µF I_N :3 x 32.75A No. of phases:3 Connection: Δ F_N: 50Hz Temp. Category: -25/D Date & Serial no.: 17.06.2016/001 Wt: 3.000 kg	Ui : 3/- kV Impregnant: Non- PCB, Discharge Resistor: E SH Overpressure disconnector Ref: IEC: 60831- 1&2 Brand: TIBCON Mfd by: M/s. Tibrewala Electronics Limited, Made in India.
Serial Number	: 001	
Number of samples tested	: One	

(V. VAIDHYANATHAN)
TEST ENGINEER

(Dr.H.N.NAGAMANI)
ADDITIONAL DIRECTOR

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

Date(s) of Test(s) : 18.07.2016 to 21.10.2016

CPRI Sample code No.(s) : DCCDCAPL16S0095

Particulars of test conducted : Routine and Type tests as listed below:

A) Routine tests:

1. Capacitance measurement and output calculation.
2. Measurement of the tangent of the loss angle (tanδ) of the capacitor.
3. Voltage test between terminals.
4. Voltage test between terminals and container.
5. Test of the internal discharge device.
6. Sealing test

B) Type tests:

1. Thermal Stability Test.
2. Measurement of the tangent of the loss angle (tanδ) of the capacitor at elevated temperature
3. Voltage test between terminals.
4. Voltage test between terminals and container.
5. Self-healing Test
6. Discharge test
7. Ageing test
8. Destruction test

(V. VAIDHYANATHAN)
TEST ENGINEER

(Dr.H.N.NAGAMANI)
ADDITIONAL DIRECTOR

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

CENTRAL POWER RESEARCH INSTITUTE

CPRI

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

Test in accordance with Standard/specification	:	IEC 60831-1:2014.
Sampling Plan	:	Not applicable
Customer's requirement	:	Routine and type test as per IEC 60831-1:2014
Deviations if any	:	Nil
Name of the witnessing persons Customer's representatives	:	None
Other than customer's representatives	:	None
Test subcontracted with address of the laboratory	:	None
Document consisting this report (in words)		
Number of Sheets	:	Sixteen
Number of oscillogram/s	:	Nil
Number of graphs	:	Nil
Number of photos	:	One
Number of test circuit diagrams	:	Nil
Number of drawings	:	Nil

(V. VAIDHYANATHAN)
TEST ENGINEER

(Dr.H.N.NAGAMANI)
ADDITIONAL DIRECTOR

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

CENTRAL POWER RESEARCH INSTITUTE

CPRI

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016.**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

ROUTINE AND TYPE TESTS AS PER IEC 60831-1 & 2 :2014

A. ROUTINE TESTS

A1(a).Capacitance measurements and Output calculation (as per Cl.7)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Capacitance (μF)	Calculated Output
440 V ac	Between terminals 1 & 2	209.41	25.48 kvar
	Between terminals 2 & 3	209.46	
	Between terminals 3 & 1	209.41	

A1(b). Tolerances (Cl.7.2)

	Specified	Observed
Capacitor Output	- 5 to +10%	+1.90%
Ratio of maximum to minimum value of capacitance	1.08	1.00

Test result: Output and capacitance tolerances are within the specified limits.

A2. Measurement of the tangent of the loss angle (tanδ) of the capacitor (as per Cl.8)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Tan δ (Absolute)
440 V ac	Between terminals 1 & 2	0.00046
	Between terminals 2 & 3	0.00043
	Between terminals 3 & 1	0.00048

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

A3. Voltage test between terminals (as per Cl. 9.1)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (Ut = 2.15 U_N ac)	Voltage application	Duration (Minimum)	Observation
946 V ac	Between terminals 1 & 2 (3 open)	2 seconds	No permanent puncture or flash over occurred
	Between terminals 2 & 3 (1 open)	2 seconds	
	Between terminals 3 & 1 (2 open)	2 seconds	

Test result: Withstood

A4. Voltage test between terminals and container (as per Cl. 10.1)

AC voltage was applied between all terminals (connected together) and grounded container.

Ambient temperature: 27°C Frequency: 50Hz

Voltage Applied	Duration	Observation
3.0 kV ac	10 Seconds	No puncture or flash over occurred

Test result: Withstood

(V. VAIDHYANATHAN)
TEST ENGINEER

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

A5. Test of internal Discharge Device (as per Cl.11)

The discharge time of the capacitor was measured by charging the capacitor to a voltage of √2 times U_N dc and measuring the time taken by the capacitor to discharge to 75V dc.

Discharge time measured is given below:

Voltage Applied √2 U_N dc	Between Terminals	Discharge time Measured	Specified time (Max)
623V dc	1 & 2 (3 open)	51 seconds	3 Minutes
	2 & 3 (1 open)	51 seconds	
	3 & 1 (2 open)	51 seconds	

A6. Sealing Test (Cl.12)

Test conditions:

(a)Test temperature : 75°C
(b)Test duration : 2 Hours
(c)Test Result : No leakage of the impregnant was observed at the end of the test period.

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B) TYPE TESTS

B1(a). Thermal Stability Test (as per Cl. 13)

Test arrangement: The test capacitor was placed between two dummy capacitors supplied by the capacitor manufacturer. All the three capacitors were energised to the test voltage of 523 V ac using a three-phase voltage source.

Specified test conditions: (a) Ambient Air Temperature set for the oven: 55°C
(b) Test voltage : 523 V ac
(c) Test duration : 48 Hours

The temperature of the container near the top was measured during the last 10 hours of thermal stability test. Measured values are as follows:

Measurement at the end of	Temperature of the capacitor container	Increase in temperature rise	
		Observed	Specified (Max.)
43 rd hour	65°C	Nil	≤1 K
44 th hour	65°C		
45 nd hour	65°C		
46 th hour	65°C		
47 th hour	65°C		
48 th hour	65°C		

B1(b). Difference between capacitor case temperature and cooling air temperature measured at the end of the thermal stability test : 10°C

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

CENTRAL POWER RESEARCH INSTITUTE

CPRI

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B1(c). Change in capacitance before & after thermal stability test (as per Cl.13)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Measured values of Capacitance (in µF)		Change in capacitance	
		Before Thermal stability	After Thermal stability	Observed	Specified (Max)
440 Vac	Between terminals 1&2	209.34	209.52	+0.09%	2 %
	Between terminals 2&3	209.39	209.58	+0.09%	
	Between terminals 3&1	209.34	209.52	+0.09%	

B1(d). Change in Capacitor loss tangent (Tanδ) before & after thermal stability test (as per Cl.13)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Measured values of tangent of loss angle (tanδ) of the capacitor (Abs.)		Change in tanδ Absolute	
		Before Thermal stability	After Thermal stability	Observed	Specified (Max)
440 Vac	Between terminals 1&2	0.00048	0.00047	-0.1×10^{-4}	2×10^{-4}
	Between terminals 2&3	0.00046	0.00048	0.2×10^{-4}	
	Between terminals 3&1	0.00050	0.00049	-0.1×10^{-4}	

B2. Capacitor loss tangent (TAN δ) measurement at elevated temperature (as per Cl. 14)

Capacitor loss tangent (TAN δ) value measured at the end of thermal stability test at elevated temperature of 55°C is as follows:

Frequency: 50Hz

Voltage Applied	Measuring connection	Tan δ (Absolute)
523 V ac	Between terminals 1 & 2	0.00039
	Between terminals 2 & 3	0.00037
	Between terminals 3 & 1	0.00042

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B3. AC Voltage test between terminals (as per Cl.9.2)

Ambient temperature: 27°C Frequency: 50Hz

Voltage Applied (Ut = 2.15 U_N ac)	Voltage application	Duration	Observation
946V ac	Between terminals 1 & 2 (3 open)	10 seconds	No permanent puncture or flash over occurred
	Between terminals 2 & 3 (1 open)	10 seconds	
	Between terminals 3 & 1 (2 open)	10 seconds	

Test result: Withstood

B4. AC Voltage test between terminals and container (as per Cl. 10.2)

AC voltage was applied between all terminals (connected together) and grounded container.

Ambient temperature: 27°C Frequency: 50Hz

Voltage Applied	Duration	Observation
3.0 kV ac	1 Minute	No puncture nor flash over occurred

Test result: Withstood

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

CENTRAL POWER RESEARCH INSTITUTE

CPRI

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B5(a) Self-healing Test (as per Cl.18)

A test voltage of 946 volts ac (2.15 U_{Nac}) was applied between the terminals and maintained for a period of 10 seconds. Number of self-healing breakdowns were counted. Since more than five breakdowns occurred the test voltage was reduced to zero and the capacitance was measured at the rated voltage (1.0U_N = 440V ac) and ambient temperature.

B5(b). Change in capacitance before & after self- healing test (as per Cl.18)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Measured values of Capacitance (in µF)		Change in capacitance	
		Before self healing test	After self-healing test	Observed	Specified (Max)
440 Vac	Between terminals 1&2	209.52	209.46	- 0.03%	0.5 %
	Between terminals 2&3	209.58	209.54	- 0.02%	
	Between terminals 3&1	209.52	209.47	- 0.02%	

B5(c). Change in Capacitor loss tangent (Tanδ) before & after self- healing test (as per Cl.18)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Tangent of loss angle of the capacitor before self healing test ($tan\delta_0$-Abs.)	Tangent of loss angle (tanδ) of the capacitor after self healing test.	
			Measured (tanδ-Abs.)	Specified (Max) (tanδ -Abs.)
440 Vac	Between terminals 1&2	0.00047	0.00046	0.00061
	Between terminals 2&3	0.00048	0.00046	0.00062
	Between terminals 3&1	0.00049	0.00049	0.00064

B6(a). Discharge test (as per Cl. 16)

Capacitor was charged to 880Volts dc (2 U_N) between terminals 3 and (1 & 2) connected together and discharged through a sphere gap. This constitutes one cycle. Five such charging and discharging operations were performed within 10 minutes.

Test result: Withstood

Within 5 minutes after this test the unit was subjected to a voltage test between terminals.

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B6(b). Voltage test between terminals after Short circuit discharge test (as per Cl. 16)

Ambient Temperature: 27°C Frequency: 50Hz

Voltage Applied (Ut = 2.15 U_N ac)	Voltage application	Duration (Minimum)	Observation
946 V ac	Between terminals 1 & 2 (3 open)	2 seconds	No permanent breakdown or flash over occurred
	Between terminals 2 & 3 (1 open)	2 seconds	
	Between terminals 3 & 1 (2 open)	2 seconds	

Test result: Withstood

B6(c).Change in capacitance before & after Short circuit discharge test (as per Cl. 16.1.2)

Ambient temperature: 26°C Frequency: 50Hz

Voltage Applied (U_N)	Measuring connection	Change in Capacitance	
		Measured	Specified (Max)
440V ac	Between terminals 1 & 2	Nil	2 %
	Between terminals 2 & 3	0.01%	
	Between terminals 3 & 1	0.01%	

(V. VAIDHYANATHAN)
TEST ENGINEER

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B7. AGEING TEST (as per Cl.17)

B7(i). Initial 750 hours of Ageing Test (Cl.17.2 (a) of IEC: 60831-2-2014)

Ageing test was performed by placing the test capacitor inside a hot air oven. The test conditions were as follows:

a) Test Temperature : 55ºC
For ageing test, case temperature of the capacitor was maintained at 55ºC+2ºC which is the highest mean temperature in 24 hours, (as per Table 1 of IEC60831-Part-1-2014) plus 10ºC, which is the difference between the capacitor case temperature and the cooling air temperature recorded at the end of thermal stability test (refer to test at No.B1(b) under Type tests)

b) Temperature tolerance : ± 2ºC

c) Test voltage : 550 Volts ac (1.25 U_N)
All the three phases of the capacitor sample were energized with the help of 3 phase voltage source. Test voltage of 550 volts ac was applied after the container of the capacitor reached the test temperature of 55ºC.

d) Test duration : 750 hours(1st phase)

B7(ii). Charge discharge Cycle test (as per Cl.17.2 (b) of IEC: 60831-2-2014)

After completing the ageing test on the sample for 750 hours, a test voltage of 880Vdc (2 U_N dc) was applied between terminals 1 & 3 (terminal 2 left unconnected) for 10 seconds and then discharged through an inductance of value 4.2 µH within 20 seconds. This constituted one cycle. The sample was subjected to 1000 such charge - discharge cycles. Through out the test, the temperature of the capacitor case was maintained at 55ºC ± 2ºC as per Cl.17.1.1 of IEC: 60831-2-2014. After 1000 charge - discharge cycles the sample was subjected to repeat ageing test.

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B7(iii). Repeat Ageing Test (as per Cl.17.2(c) of IEC: 60831-2-2014)

The ageing test was repeated as in test at Sl. No. B7(i) after 1000 charge discharge cycles.
Test conditions:

i) Test voltage : 550 Volts ac (1.25 U_N)
ii) Test temperature : 55°C ± 2°C
iii) Test duration : 750 hours

Test Result: 1) Withstood
2) No permanent breakdown occurred.
3) No interruption or flashover occurred.

B7(iv). Change in capacitance before and after Ageing Test (as per Cl.17.3 of IEC: 60831-2-2014)

Measured change in capacitance before and after ageing test is as follows:

Ambient temperature: 26°C Frequency: 50Hz

Voltage (U_N)	Between Terminals	Change in Capacitance	
		Measured	Specified (Max)
440 Vac	1 & 2 (3 open)	0.01%	5%
	2 & 3 (1 open)	-0.15%	
	3 & 1 (2 open)	-0.03%	
	Average	-0.06%	3%

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

B7(v). AC Voltage test between terminals and container (as per Cl.17.3 of IEC: 60831-2-2014 & Cl.10.1 of IEC: 60831-1-2014)

AC voltage was applied between terminals (connected together) and container

Ambient temperature: 29°C Frequency: 50Hz

Voltage Applied	Duration	Result	Observations
3.0 kV ac	10 seconds	Withstood	No puncture nor flash over occurred

Test Result: Withstood

B8(i). Destruction Test (as per Cl. 19 of IEC: 60831-1-2014 & Cl.19 of IEC: 60831-2-2014)

The capacitor sample was mounted in a circulating air oven maintained at a temperature of 55ºC without energizing. After all the parts of the capacitor attained the test temperature, the destruction test was performed between terminals 3 and 1 & 2 (joined together) as per Cl.19.1 of IEC 60831-2 Edition 3.0: 2014-02.

The d.c source was set to 4.40 kV ($10U_N$) and the variable resistor was adjusted to give a short-circuit of 300mA.

The destruction test was carried out as per the test procedure at Cl.19.1 (a), (c) and (d) of IEC 60831-2 Edition 3.0 : 2014-02.

STEP 1: a.c voltage of 572V ($1.3U_N$) was applied to the test capacitor and noted the capacitor current. Measured capacitor current at 572Vac: 52.1 A (Initial current)
STEP 2: d.c voltage of 4.40kV ($10\ U_N$) was applied and maintained until the voltmeter indicated approximately zero for 3 seconds.
STEP 3: a.c voltage of 572 Vac was applied for 3 minutes and the capacitor current was noted.

(V. VAIDHYANATHAN)
TEST ENGINEER

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

TEST RESULTS

Sl. No. of the sample: 001 **Capacity: 25 kvar**

Measured capacitor current at 572Vac : 0.3A ,which was lower than 66% of the initial current at 1.3 U_N ac. Therefore the test procedure was interrupted and the capacitor was cooled to ambient temperature.

Test Result: 1) Sample withstood the test
2) No escaping liquid material observed on the surface of the capacitor
3) Capacitor container has not broken
4) No flame or fiery particles observed

Subsequently, dielectric test between terminals and container was carried out.

B8 (ii). Voltage test between terminals and container (Cl.19.2 (d) of IEC: 60831-2-2014)

AC voltage was applied between terminals (connected together) and container.

Ambient temperature: 28°C Frequency: 50Hz

Voltage Applied	Duration	Observation
1.5 kV ac	10 seconds	No puncture nor flash over occurred

Test result: Withstood

A view of the test sample after destruction test is as shown in photograph no.1.

Note : 1) Capacitor loss tangent (TAN δ) measurements carried out are inclusive of discharge device of the capacitor.
2) C & Tan δ measurements carried out with cable length of 340mm and cross section 16 sq.mm copper wire connected to the terminals of capacitor.

Test summary: The capacitor sample complies with the requirements of IEC 60831-1-2014 & IEC: 60831-2-2014 for Routine test and Type Tests.

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

TEST REPORT

Test Report No. PCD –0057 **Date: 27.10.2016**

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 correction/erasure invalidates the test report.

d) NABL has Accredited this laboratory as per ISO 17025-2005 standard, vide certificate no.T-0010 for the tests carried out.

e) Any anomaly/discrepancy in the test report should be brought to our notice within 45 days from the date of issue.

(V. VAIDHYANATHAN)
TEST ENGINEER

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435

CENTRAL POWER RESEARCH INSTITUTE

CPRI

Test Report Number: PCD-0057 **Date: 27.10.2016.**

Photograph- 1: A view of the test capacitor on completion of destruction test

(V.VAIDHYANATHAN)
Test Engineer

CAPACITORS DIVISION
P.B.NO.8066, SADASHIVANAGAR P.O
PROF.SIR.C.V.RAMAN ROAD,BANGALORE - 560 080, INDIA
Tele/Fax: +91 (0) 80-2360 4435