CENTRAL POWER RESEARCH INSTITUTE
(Member of STL)

CPRI

TEST REPORT

Test Report Number	: **CPRIBLRSCL23T1479** **Date: 21 November 2023**
Name & Address of the Customer	: M/S SURAKSHA ENTERPRISE THIRD FLOOR, TITHI APARTMENT SOUTH 24 PARGANAS, WEST BENGAL PIN- 700140
Name & Address of the Manufacturer	: M/S SURAKSHA ENTERPRISE THIRD FLOOR, TITHI APARTMENT SOUTH 24 PARGANAS, WEST BENGAL PIN- 700140
Particulars of sample tested	: Low-voltage switchgear and controlgear assembly – 3200A, 415V, LT Panel
Type	: Indoor
Description of test sample	: Refer Sheet 2 of 7
Serial Number	: SE/2023-24/45
Number of samples tested	: One
Date(s) of Test (s)	: 13 November 2023
CPRI Sample code Number(s)	: SCL23S1309
Particulars of tests conducted	: Short-circuit withstand strength on main busbars
Test in accordance with Standard / specification	: Subclause(s) 10.11.5.3.3 & 10.11.5.3.5.1 of IEC 61439-1:2020 & IEC 61439-2:2020
Sampling plan	: Not applicable
Customer's requirement	: 50 kA rms for 1.0 s & 105 kA peak on main phase busbars only
Deviations if any	: Nil
Name of the witnessing persons	
Customer's representative	: Mr. Prasanta Banerjee
Other than customer's representative	: None
Test subcontracted with address of the laboratory	: None
Documents constituting this report (In words)	
Number of Sheet(s)	: Seven
Number of Oscillogram(s)	: Two
Number of Graph(s)	: Nil
Number of Photograph(s)	: Two
Number of Test Circuit Diagram(s)	: Two
Number of Drawing(s)	: Two

(G. Venkatramanaiah)
Test Engineer

(Swaraj Kumar Das)
Head of Division
Reviewed & Authorized by

TEST REPORT

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DESCRIPTION OF SAMPLE TESTED
(As assigned by the manufacturer)

Test sample	: Low-voltage switchgear and controlgear assembly – LT Panel
Type	: Indoor
Serial number	: SE/2023-24/45
Rated voltage	: 415V
Rated insulation voltage	: 660V
Rated current	: 3200A
Rated frequency	: 50 Hz
Number of phases	: Three & Neutral
Rated short-time withstand current & peak withstand current	: 50 kA rms for 1.0 s & 105 kA peak on phase busbars & 30 kA rms for 1.0 s & 63 kA peak on neutral busbar

(G. Venkatramanaiah)
Test Engineer

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SUMMARY OF TESTS CONDUCTED

1. Tests conducted : Short-circuit withstand strength on main busbars

2. Rating for which tested : 50 kA rms for 1.0 s & 105 kA peak on main phase busbars & 30 kA rms for 1.0 s & 63 kA peak on neutral busbar

3. Schedule of tests :

The Clause numbers of the standard IEC 61439-1:2020 pertain to the test(s) conducted are detailed in the following table:

Tests Conducted	Clause numbers	Sheet
Short-circuit withstand strength on main busbars	10.11.5.3.3 & 10.11.5.3.5.1	5 of 7
Power-frequency withstand voltage	10.9.2	6 of 7

4. Oscillogram Numbers : CPRIBLRSCL23T1479S001 & CPRIBLRSCL23T1479S003

5. Photograph Numbers : CPRIBLRSCL23T1479P01 & CPRIBLRSCL23T1479P02

6. Test Circuit Diagram Numbers : CRTL/SC/STC-04A & CRTL/SC/STC-02A

7. Drawing Numbers : Refer Sheet 4 of 7

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LIST OF DRAWINGS

Drawing Numbers

The manufacturer has guaranteed that the sample submitted for the test(s) has been manufactured in accordance with the following drawings.

Sl. No.	Drawing Number	Sheet Number	Revision Number
1	SE/2023-24/45/1	1 OF 2	00
2	SE/2023/24/45/2	2 OF 2	00

It is verified that these drawings adequately represent the sample tested. Verification of this drawing by CPRI is limited to dimensional check only wherever possible.

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TEST RESULTS

SHORT-CIRCUIT WITHSTAND STRENGTH TEST ON MAIN BUSBARS

Test conditions

Source	Short-circuit generator
Phase	
Test on phase bus-bars	Three
Test on neutral bus-bar	Single
Frequency	50 Hz
Test sample	
Condition before test	In clean and good condition; end of the Horizontal phase busbars of LT panel connected to source.
Enclosure	2.0 mm thick CRCA sheet; isolated from earth and connected to the source neutral through a fine wire fuse (FWF) of 0.8 mm dia. copper and length 50 mm. in series with 0.1 Ω resistor.
Test details	
Test circuit drawing number	
Test on phase bus-bar	CRTL/SC/STC-04A
Test on neutral bus-bar	CRTL/SC/STC-02A
Short-circuit applied	On the end of the vertical busbars of the LT Panel
Short-circuit point	Grounded

Test on: Horizontal & vertical phase busbars of LT Panel

Ambient Temperature – 27 °C

Oscillogram Number	Current (kA)		Duration (s)	Observations
	Peak	RMS		
CPRIBLRSCL23 T1479S001	107.3 (B-Phase)	R – 49.04 Y – 48.11 B – 49.12 Average:48.76*	1.09	**During test:** No abnormality **After test:** Fine wire fuse intact.

*Equivalent to 50.91 kA rms for 1.0 s

Test on: Neutral busbar of LT Panel with nearest phase busbar as return conductor

Oscillogram Number	Current (kA)		Duration (s)	Observations
	Peak	RMS		
CPRIBLRSCL23 T1479S003	66.13	29.19#	1.08	**During test:** No abnormality **After test:** Fine wire fuse intact.

#Equivalent to 30.33 kA rms for 1.0 s

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POWER-FREQUENCY WITHSTAND VOLTAGE

Condition of the sample: As after the short-circuit withstand strength test

Test procedure	Observations
A power frequency voltage of 1890 V rms for 60 s was applied between: i) All live parts connected together and earthed enclosure ii) Each pole and all other poles connected to earthed enclosure	Withstood. No disruptive discharge was noticed.

Physical Inspection

Bus-bars : No visible damage or deformation
Supports : Intact

Conclusion: The sample tested complies with the requirement of subclause(s) 10.11.5.3.3 & 10.11.5.3.5.1 of IEC 61439-1:2020 & IEC 61439-2:2020 for the tests conducted.

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NOTE

a) The Test results relate only to the sample(s) tested.
b) Publication or reproduction of this Test Report in any form other than by complete set of the whole Test Report and in the language written is not permitted without the written consent of CPRI.
c) Any Corrections / erasure invalidate the Test Report.
d) Any anomaly / discrepancy in the Test report should be brought to notice of CPRI within 45 days from the date of issue.
e) All documents constituting the Test Report are stitched together with a continuous silk thread, the two ends of which have been brought over the front sheet of the Test Report and sealed with a CPRI logo printed paper sticker
f) NABL has accredited this laboratory as per ISO/IEC 17025:2017 vide Certificate no.TC-5452 for the tests carried out.

ilac-MRA

TC-5452

(G. Venkatramanaiah)
Test Engineer

----------**End of Test Report**----------

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CPRIBLRSCL23T1479S001

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TEST REPORT

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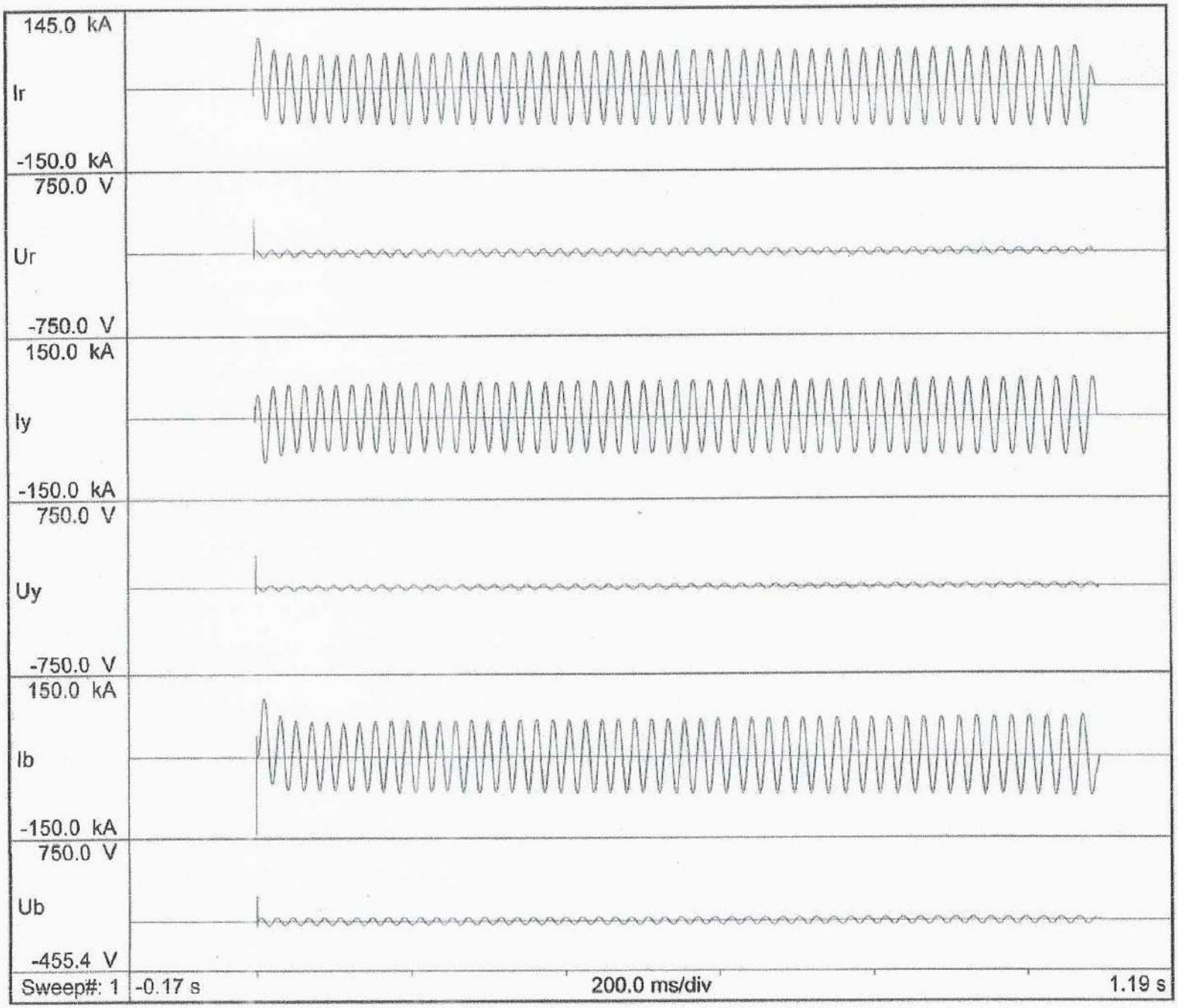

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Test Engineer

13-11-2023

CPRIBLRSCL23T1479S003

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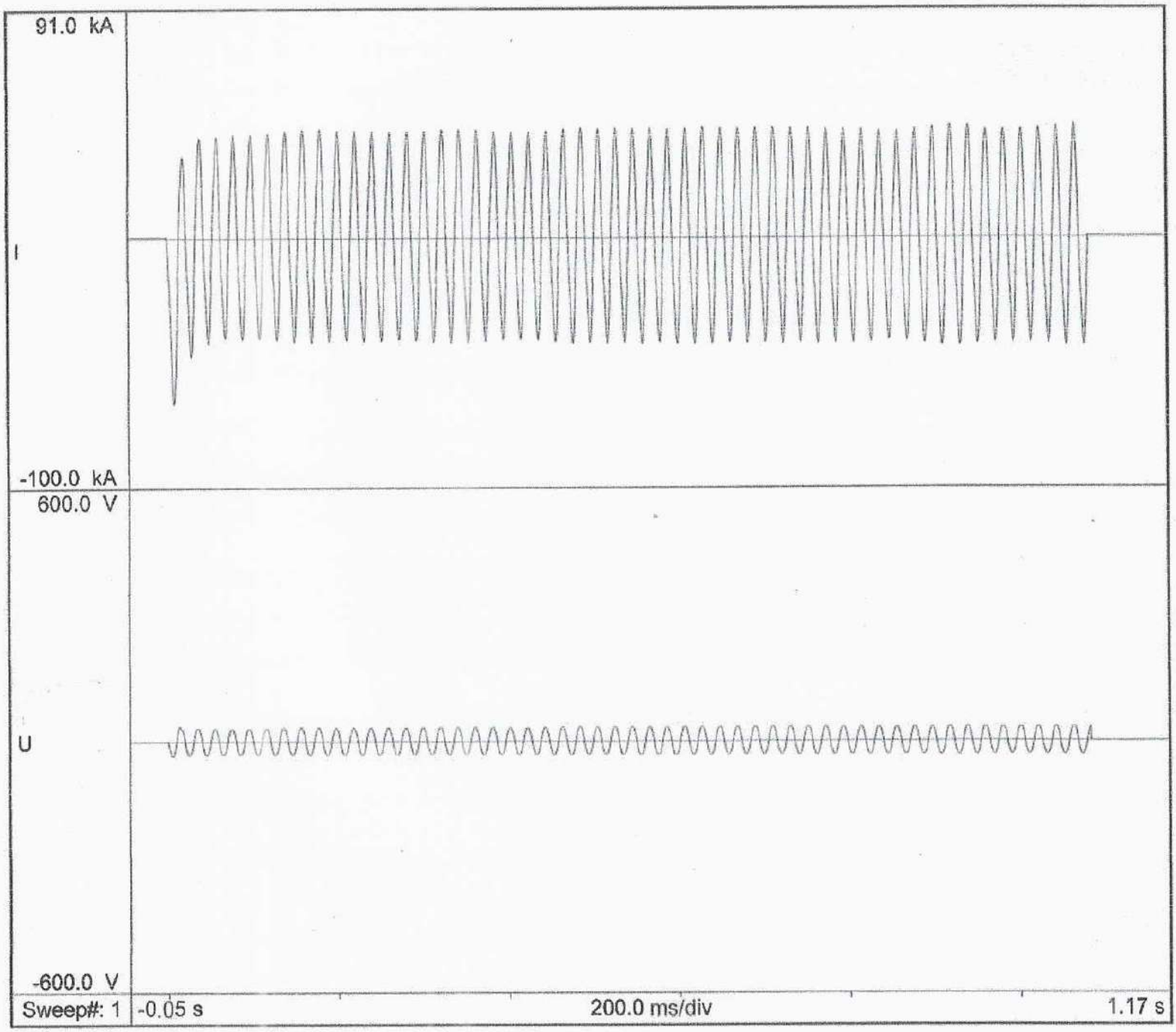
TEST REPORT

Test Report Number: CPRIBLRSCL23T1479 **Date: 21 November 2023**



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Test Engineer

13-11-2023

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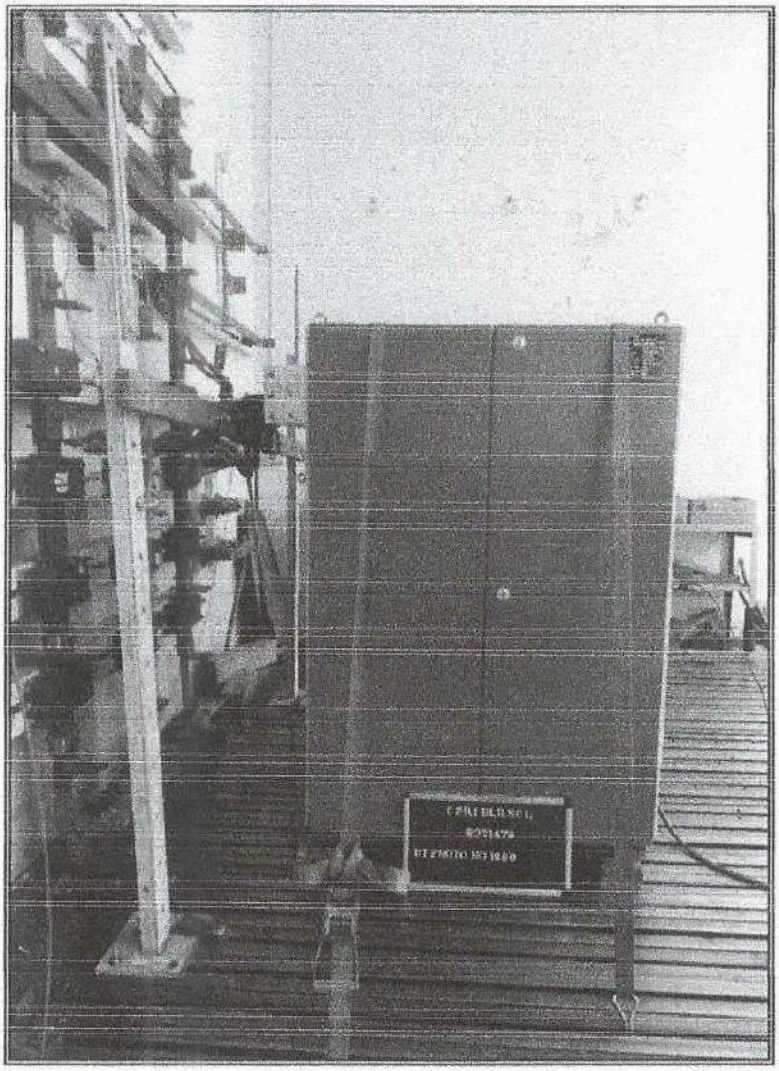

Mounting arrangement (Before test)

CPRIBLRSCL23T1479P01

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CPRI

Mounting arrangement (After test)

CPRIBLRSCL23T1479P02

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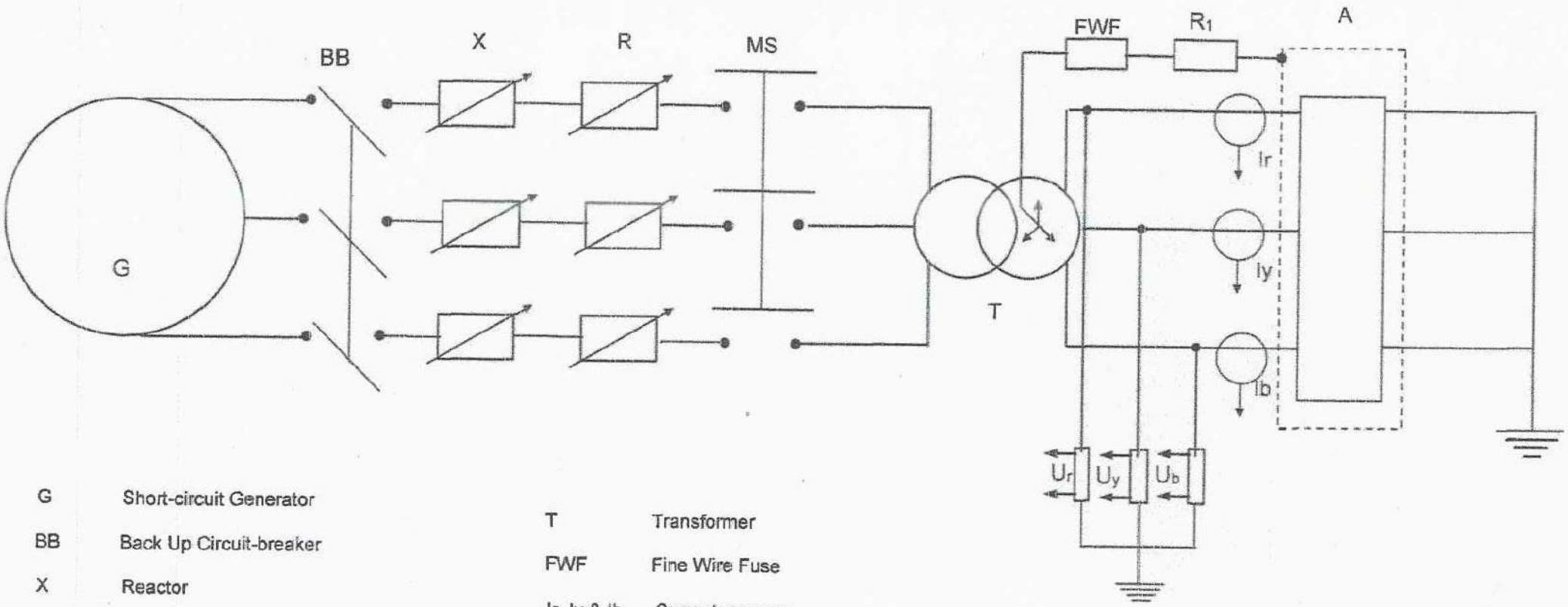
Schematic of main & measurement circuits - Three phase test

Circuit Number: CRTL/SC/STC-04A



G	Short-circuit Generator
BB	Back Up Circuit-breaker
X	Reactor
R	Resistor
MS	Make Switch

T	Transformer
FWF	Fine Wire Fuse
Ir, Iy & Ib	Current sensors
Ur, Uy & Ub	Voltage Sensors
R_1	Current Limiting Resistor
A	Sample under test

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TEST ENGINEER

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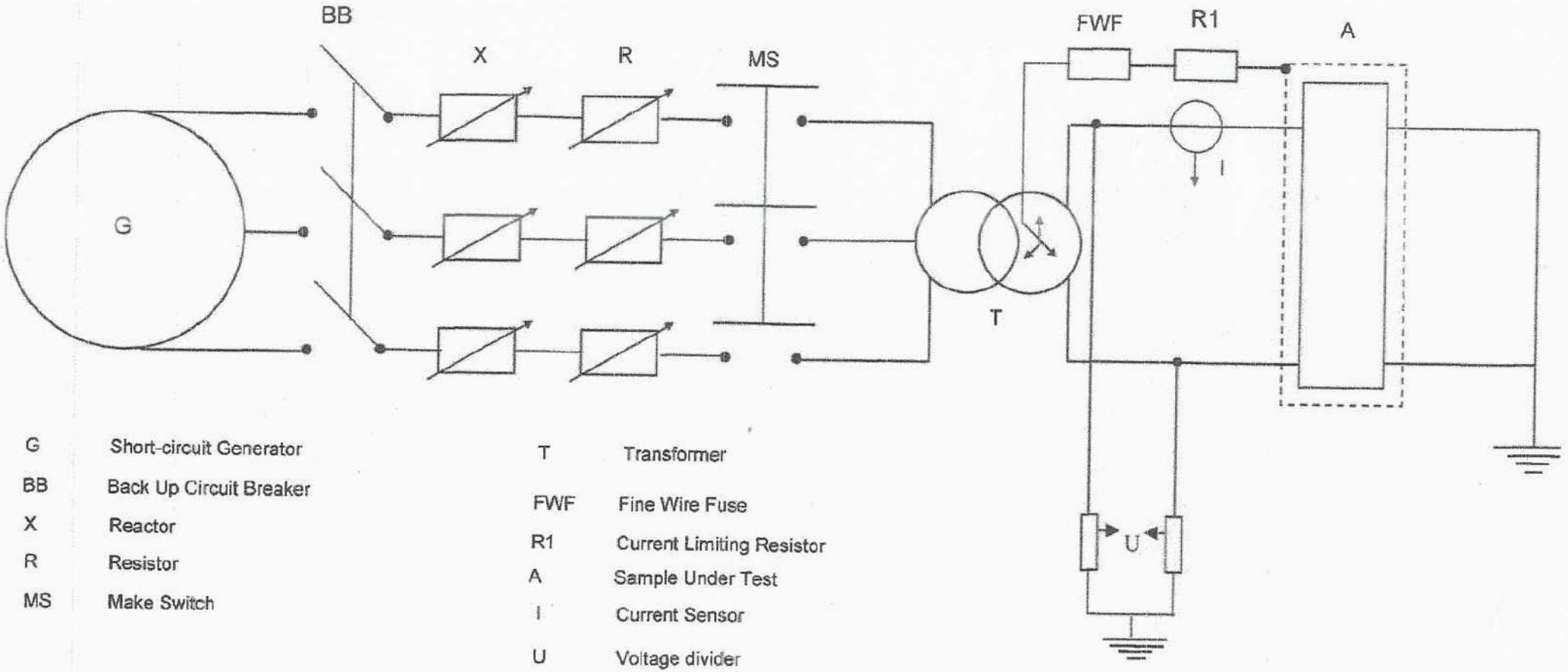
TEST REPORT

Test Report Number: CPRIBLRSCL23T1479

Date: 21 November 2023

Schematic of main & measurement circuits - Single phase test

Circuit Number: CRTL/SC/STC-02A



G	Short-circuit Generator
BB	Back Up Circuit Breaker
X	Reactor
R	Resistor
MS	Make Switch
T	Transformer
FWF	Fine Wire Fuse
R1	Current Limiting Resistor
A	Sample Under Test
I	Current Sensor
U	Voltage divider

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