

# CENTRAL POWER RESEARCH INSTITUTE

## TEST REPORT



Test Report Number : CPRINOAHVMISC24T0183 Date: 26 March 2024

Name and Address of the Customer : M/s. Powercon Switchgears LLP  
Plot No-W379, MIDC Industrial Area  
Rabale, Navi Mumbai-400701

Name and Address of the Manufacturer : M/s. Powercon Switchgears LLP  
Plot No-W379, MIDC Industrial Area  
Rabale, Navi Mumbai-400701

Particulars of sample tested : 415 V, 4000 A L.T. Panel  
Type : Main Distribution Panel  
Description of test sample : Refer sheet 2 of 6  
Serial Number : PS/24/CPRI/RTL/02  
Number of samples tested : One  
Date(s) of Test(s) : 22 March 2024  
CPRI Sample code Number(s). : NOAHVMISC24S0173  
Particulars of tests conducted : Refer sheet 3 of 6  
Test in accordance with Standard/Specification : As per customer requirement & procedure generally followed as per IS/IEC 61439-1: 2011 & IS/IEC 61439-2: 2011  
Sampling Plan : Nil  
Customer's Requirement : Maximum temperature rise on busbar & busbar joints shall be  $\leq 70$  K  
Deviations if any : Nil

Name of the witnessing persons  
Customers representative : Mr. Abu Bakkar  
Other than customer's representatives : Nil


Test subcontracted with address of the laboratory : Nil

Documents constituting this report (in words)

Number of Sheets : Six  
Number of Oscillogram(s) : Nil  
Number of Graph(s) : Nil  
Number of Photograph(s) : One  
Number of Test Circuit Diagram(s) : Nil  
Number of Drawing(s) : Three

  
(Gangeshwar Singh)  
Test Engineer



  
(M.K. Jaiswal)  
Head of Division  
Reviewed and Authorized by

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### DESCRIPTION OF SAMPLE TESTED

(As assigned by the manufacturer)

Sample	:	L.T. Panel
Rated voltage (Volts)	:	415
Rated current (Amps)	:	4000
Frequency (Hz)	:	50
No. of Phase	:	3Ph + N
Insulation Level (Volts)	:	690
Rated Short Time Current	:	70 kA <sub>rms</sub> for one seconds with initial peak of 154 kA <sub>peak</sub>

  
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### SUMMARY OF TESTS CONDUCTED

1. Tests conducted : 1. Verification of Temperature Rise  
2. Verification Di-electric Property  
3. Verification of Clearance & Creepage Distance
2. Rating for which tested : 1. 4000 Amps, 50Hz 2. 1.89kV<sub>rms</sub>  
3. As per customer requirement
3. Schedule of tests

Tests Conducted	Clause Numbers	Sheet
Verification of Temperature Rise	As per customer requirement	4 & 5 of 6
Verification of Di-electric Property	As per customer requirement	5 of 6
Verification of Clearance & Creepage Distances	As per customer requirement	5 of 6


4. Oscillogram Numbers : Nil
5. Graph Numbers : Nil
6. Photograph Numbers : CPRINOAHVMISC24T0183P01
7. Test Circuit Diagram Numbers. : Nil
8. Drawing Numbers : As given bellow

### Drawing Numbers

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

SI. No.	Drawing Numbers	Sheet Number	Revision Number
1	PS/24/CPRI/RTL/02	1 of 3	--
2	PS/24/CPRI/RTL/02	2 of 3	--
3.	PS/24/CPRI/RTL/02	3 of 3	--

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

#### 1). Test conducted

: Verification of Temperature Rise

Starting time (Hrs) : 10:00  
Shut down time (Hrs) : 15:00  
Test current (A) : 4000  
Size of the conductor used for temporary connection : Al busbar size 150x10 sqmm x 4nos./phase connection  
Frequency (Hz) : 50  
Phase : 3Ph+N  
Avg. ambient temperature at shut down : 29.0°C  
Arrangement of thermocouple locations: As per drawing no: PS/24/CPRI/RTL/02, Sheet 2 of 3

Thermocouples		Maximum Temperature (°C)	Temperature Rise (K)
Locations	Numbers		
Incoming Terminal-R1	T01	70.1	41.1
Incoming Terminal-Y1	T02	69.0	40.0
Incoming Terminal-B1	T03	79.0	50.0
Incoming Terminal-R2	T04	74.3	45.3
Incoming Terminal-Y2	T05	72.0	43.0
Incoming Terminal-B2	T06	66.0	37.0
HBB+VBB Joint -R1	T07	59.0	30.0
HBB+VBB Joint -Y1	T08	66.8	37.8
HBB+VBB Joint -B1	T09	80.7	51.7
HBB+VBB Joint -R2	T10	77.0	48.0
HBB+VBB Joint -Y2	T11	71.2	42.2
HBB+VBB Joint -B2	T12	61.2	32.2
VBB+HBB Joint -R1	T13	59.3	30.3
VBB+HBB Joint -Y1	T14	68.8	39.8
VBB+HBB Joint -B1	T15	72.8	43.8
VBB+ HBB Joint -R2	T16	77.0	48.0
VBB+ HBB Joint -Y2	T17	76.1	47.1
VBB+ HBB Joint -B2	T18	64.7	35.7
HBB Joint -R1	T19	59.6	30.6
HBB Joint -Y1	T20	68.3	39.3
HBB Joint -B1	T21	78.0	49.0
HBB Joint -R2	T22	76.0	47.0
HBB Joint -Y2	T23	71.2	42.2

  
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### TEST RESULTS

HBB Joint-B2	T24	63.1	34.1
O/G Terminal -R1	T25	56.4	27.4
O/G Terminal -Y1	T26	63.8	34.8
O/G Terminal -B1	T27	72.2	43.2
O/G Terminal -R2	T28	71.4	42.4
O/G Terminal -Y2	T29	67.3	38.3
O/G Terminal -B2	T30	66.4	37.4
Enclosure Top	T31	39.0	10.0
Enclosure Side	T32	36.0	7.0

**Observation:** The maximum temperature rise obtained was within the limits as per the requirements of the customer. After temperature rise test, sample subjected to the HV test to check the effect of temperature rise on adjacent parts of sample. The sample withstood 1.89 kV<sub>rms</sub> for 1 Min.

### 2. Test conducted : Verification of Dielectric Properties

#### Test Details:

Sl.No.	Voltage applied to	Connected to earth	Voltage applied kV <sub>rms</sub>	Remarks
1	R	Y,B,N & Frame	1.89	Withstood for 60 sec.
2	Y	R,B,N & Frame	1.89	Withstood for 60 sec
3	B	R,Y,N & Frame	1.89	Withstood for 60 sec
4	N	R,Y,B & Frame	1.89	Withstood for 60 sec
5	R,Y,B & N	Frame	1.89	Withstood for 60 sec

### 3. Test conducted: Verification of Clearance & Creepage Distance:

Clearance & Creepage Distances were measured as per standard and the value found for clearance was 21 mm and for creepage distance was 24 mm which are within the limits as specified in standard for pollution degree-3 and material group-IIIa.

**Conclusion:** The sample tested complies with the requirements of the customer for the tests conducted.

  
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### NOTE

- CPRI is responsible for the test results relate only to the sample(s) tested.
- Publication or reproduction of this Test Report /Test Certificate in any form other than by complete set of the whole Test Report /Test Certificate and in the language written is not permitted without the written consent of CPRI.
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- Any anomaly/discrepancy in the Test Report / Test Certificate should be brought to the notice of CPRI within 45 days from the date of issue.

(Gangeshwar Singh)  
Test Engineer

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