केन्द्रीय विद्युत अनुसंधान संस्थान
(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)
क्षेत्रीय परीक्षण प्रयोगशाला
3-ए, इंस्टीटयुशनल एरिया, सैक्टर-62, नोएडा-201309 (उ0प्र0)

CENTRAL POWER RESEARCH INSTITUTE
(A Government of India Society, Ministry of Power)
REGIONAL TESTING LABORATORY
3-A, Institutional Area, Sector - 62, Noida - 201309 (U.P.)
वेबसाईट / Website : http://cpri.res.in

संदर्भ क्रमांक : सीपीआरआई/आरटीएल/एचवी/2024-25/377 दिनाँक (Date) : 23.08.2024

सेवा में/To,

M/s. SK Engineers India Private Limited
Plot No-C21 And 71/2, IID Centre
Industrial Estate, Khordha, Odisha-752057

विषय (Sub): परीक्षण प्रमाणपत्र (Test Report): CPRINOAHVMISC24T0487 Dt.: 22.08.2024

महोदय / Dear sir,

हमारी प्रयोगशाला में आपके सैंपल पर दिनाँक 14.08.2024 और 16.08.2024 तक संचालित परीक्षण के संबंध में निम्नलिखित दस्तावेज संलग्न है।
Please find attached the following documents in respect of the test(s) conducted on your sample on 14.08.2024 & 16.08.2024 at our laboratory.

रिपोर्ट में यदि असंगतियां हो तो इस रिपोर्ट के जारी होने की तारीख से ४५ दिन के अंदर लिखित रूप में हमारे ध्यान में लाई जाय ताकि आवश्यक संसोधन किया जा सके और इसके लिए रिपोर्ट की सभी मूल प्रतियां लौटाई जाय। कृपया नोट करें कि इस तारीख के बाद प्राप्त अनुरोधों पर कोई कार्यवाही नहीं की जायेगी।
Any discrepancies in the test report must be brought to our notice in writing within 45 days of the date of issue of this test report for effecting necessary corrections for which all the original copies of the test report must be returned.
Please note that request received beyond this date will not be entertained.

दस्तावेजो की प्राप्ति की पावती भेजे।
Please acknowledge receipt of the documents.
सधन्यवाद, Thanking you,

संलग्न : उपरोक्त
Encl : As above

भवदीय (Yours sincerely)

ईकाई- प्रमुख
Unit-Head

CPRI

TEST REPORT

CENTRAL POWER RESEARCH INSTITUTE

(A Govt. of India Society)

Regional Testing Laboratory

3A, Institutional Area, Sector - 62

Noida - 201 309

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

CPRI

Test Report Number	:	**CPRINOAHVMISC24T0487** **Date: 22 August 2024**
Name and Address of the Customer	:	M/s. SK Engineers India Private Limited Plot No-C21 And 71/2, IID Centre Indusrial Estate Khordha, Odisha-752057
Name and Address of the Manufacturer	:	M/s. SK Engineers India Private Limited Plot No-C21 And 71/2, IID Centre Indusrial Estate Khordha, Odisha-752057
Particulars of sample tested	:	415 V, 4000 A, 3 Phase, LT Panel
Type	:	Main Distribution Panel
Description of test sample	:	Refer Sheet 2 of 6
Serial Number	:	SKEIPL/02/07/24/2372
Number of samples tested	:	One
Date(s) of Test(s)	:	14 & 16 August 2024
CPRI Sample code Number(s)	:	NOAHVMISC24S0472
Particulars of tests conducted	:	Refer sheet 3 of 6
Test in accordance with Standard/Specification	:	As per customer requirement & procedure followed as per IS/IEC 61439-1: 2020 & IS/IEC 61439-2: 2020
Sampling Plan	:	Nil
Customer's Requirement	:	Maximum temperature rise on busbar & busbar joints shall be ≤ 70K
Deviations if any	:	Nil
Name of the witnessing persons Customers representative	:	Mr. Tapas Das
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

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

CPRI

Test Report Number: CPRINOAHVMISC24T0487 **Date: 22 August 2024**

DESCRIPTION OF SAMPLE TESTED
(As assigned by the manufacturer)

Sample	:	LT Panel
Rated voltage (Volts)	:	415
Rated current (Amps)	:	4000
Frequency (Hz)	:	50
Insulation level	:	690 V
No. of Phase	:	3 PH+N
Rated Short Time Current	:	70 kA_{rms} for one second with initial peak of 154 kA_{peak}
Pollution Degree	:	3
Material Group	:	IIIa

(Gangeshwar Singh)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

CPRI

Test Report Number: CPRINOAHVMISC24T0487 **Date: 22 August 2024**

SUMMARY OF TESTS CONDUCTED

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

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

4. Oscillogram Numbers : Nil
5. Graph Numbers : Nil
6. Photograph Numbers : CPRINOAHVMISC24T0487P01
7. Test Circuit Diagram Numbers : Nil
8. Drawing Numbers : As given below

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	SKEIPL/HRT/NOIDA/01	1 of 3	00
2	SKEIPL/HRT/NOIDA/01	2 of 3	00
3	SKEIPL/HRT/NOIDA/01	3 of 3	00

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

(Gangeshwar Singh)
Test Engineer

TEST REPORT

CPRI

Test Report Number: CPRINOAHVMISC24T0487 **Date: 22 August 2024**

TEST RESULTS

1). Test conducted: Verification of Temperature Rise

Date of test	:	14.08.2024
Starting time (hrs.)	:	11:00
Shut down time (hrs.)	:	15:00
Test current (A)	:	4000
Size of the conductor used for temporary connection	:	Aluminium busbar size 150 x 10 sqmm x 4 nos./phase
Frequency (Hz)	:	50
Phase	:	3 PH+N
Avg. ambient temperature at shut down	:	33.2 °C

Arrangement of thermocouple locations: As per drawing no: SKEIPL/HRT/NOIDA/01 Sheet: 2 of 3 Rev.: 00

Thermocouples		Maximum Temperature (°C)	Temperature Rise (K)
Locations	Numbers		
Incoming Terminal – R1	T01	65.0	31.8
Incoming Terminal – Y1	T02	71.6	38.4
Incoming Terminal – B1	T03	67.4	34.2
Incoming Terminal – R2	T04	71.1	37.9
Incoming Terminal – Y2	T05	73.8	40.6
Incoming Terminal – B2	T06	63.3	30.1
HBB Joint – R	T07	66.6	33.4
HBB Joint – Y	T08	73.7	40.5
HBB Joint – B	T09	69.0	35.8
VBB Joint – R1	T10	59.0	25.8
VBB Joint – Y1	T11	70.0	36.8
VBB Joint – B1	T12	68.1	34.9
VBB Joint – R2	T13	61.7	28.5
VBB Joint – Y2	T14	59.8	26.6
VBB Joint – B2	T15	57.1	23.9
Outgoing Terminal – R1	T16	57.9	24.7
Outgoing Terminal – Y1	T17	60.2	27.0
Outgoing Terminal – B1	T18	60.2	27.0
Outgoing Terminal – R2	T19	61.7	28.5
Outgoing Terminal – Y2	T20	47.4	14.2
Outgoing Terminal – B2	T21	53.5	20.3
Enclosure Top	T22	41.9	8.7
Enclosure Side	T23	40.8	7.6

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_{rms} for 1 min.

(Gangeshwar Singh)
Test Engineer

TEST REPORT

CPRI

Test Report Number: CPRINOAHVMISC24T0487 **Date: 22 August 2024**

TEST RESULTS

2. Test conducted: Verification of Dielectric Properties

Test Details:

Sl. No.	Voltage applied to	Connected to earth	Voltage applied kV_{rms}	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 are found for clearance was 19.6 mm and for creepage distance was 22.3 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.

(Gangeshwar Singh)
Test Engineer

TEST REPORT

CPRI

Test Report Number: CPRINOAHVMISC24T0487 **Date: 22 August 2024**

NOTE

a) CPRI is responsible for the test results relate only to the sample(s) tested.

b) 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.

c) Any Corrections/erasure invalidates the Test Report/Test Certificate

d) 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

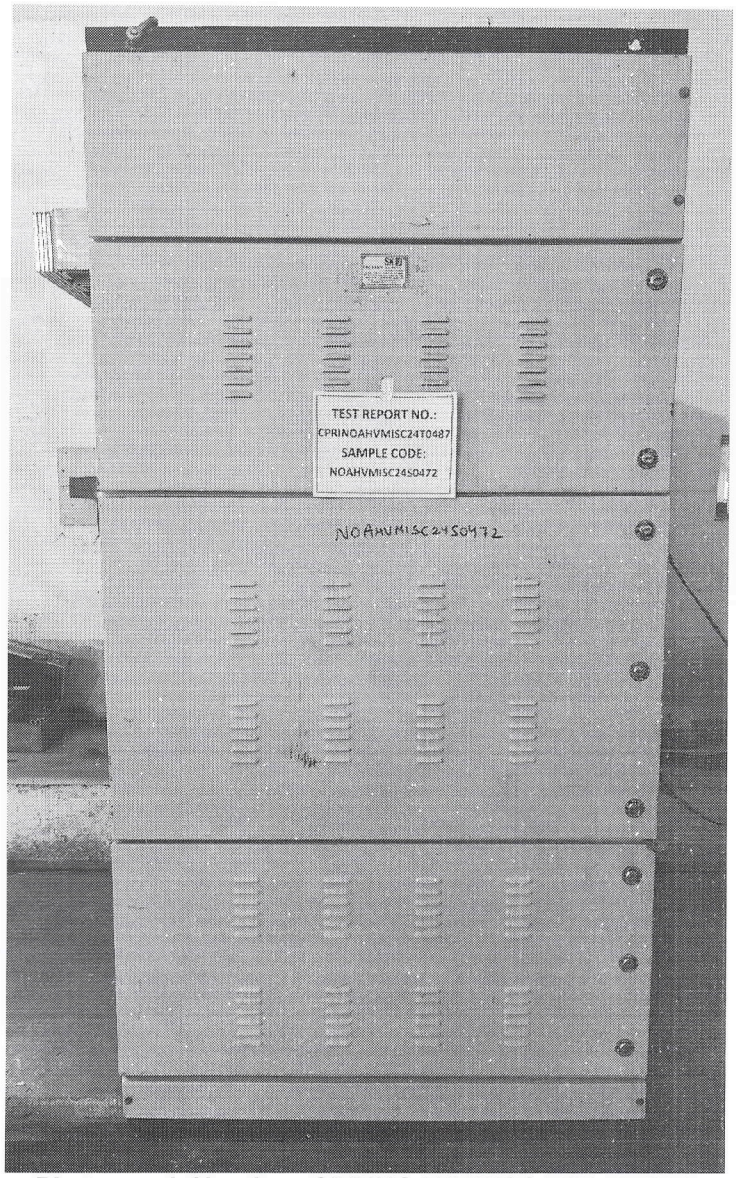
----------End of Test Report----------

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

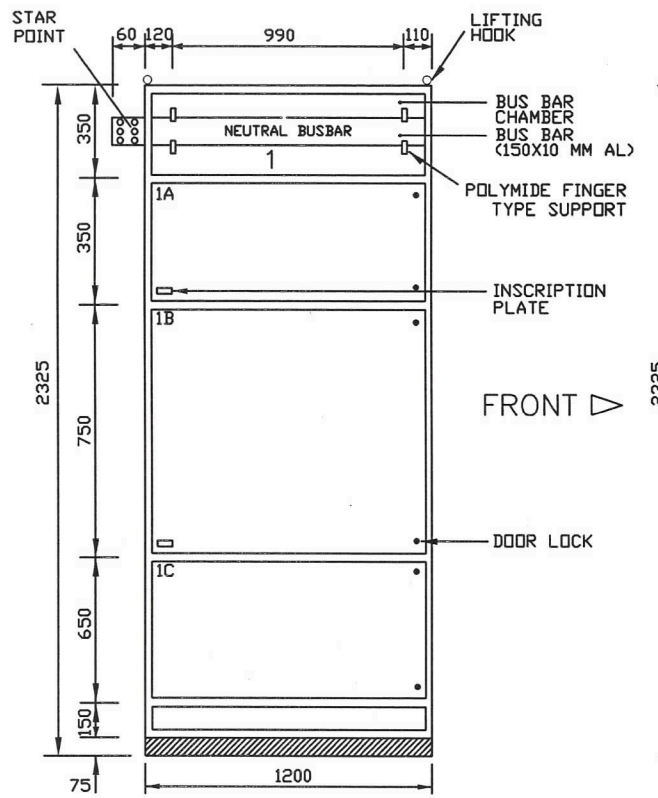
CPRI

Test Report Number: CPRINOAHVMISC24T0487 **Date: 22 August 2024**

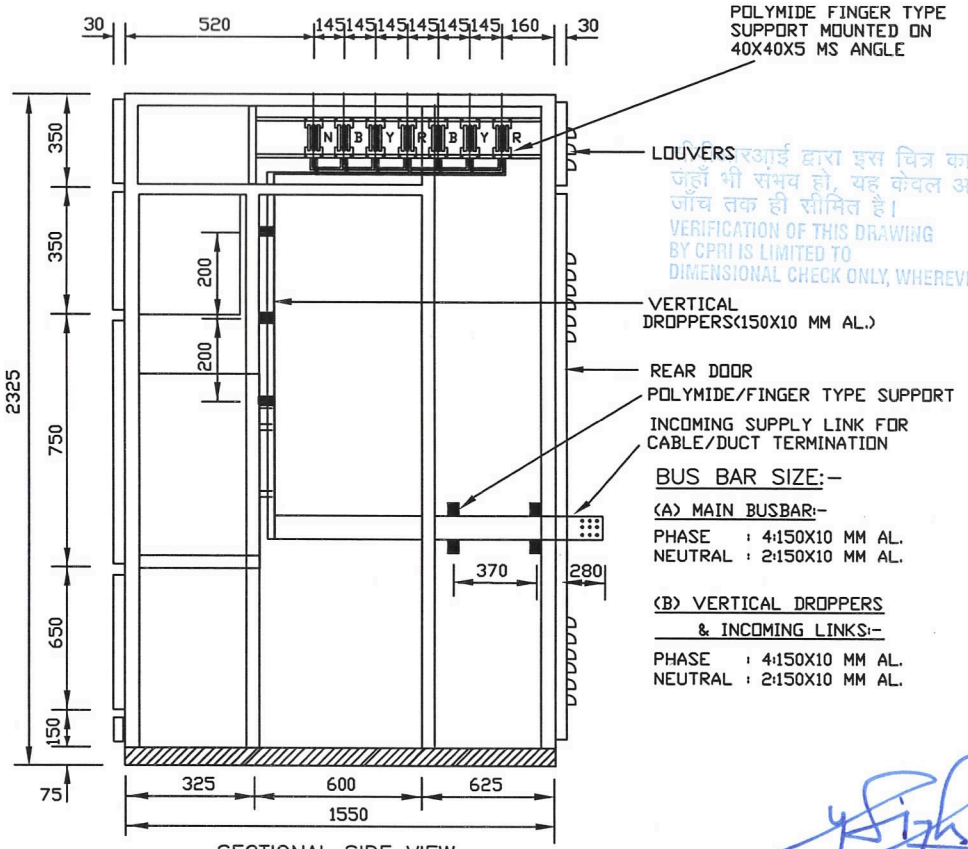


Photograph Number: CPRINOAHVMISC24T0487P01

(Gangeshwar Singh)
Test Engineer



FRONT VIEW



SECTIONAL SIDE VIEW
BUSBAR ARRANGEMENT

BUS BAR SIZE:–

(A) MAIN BUSBAR:–

PHASE : 4:150X10 MM AL.
NEUTRAL : 2:150X10 MM AL.

(B) VERTICAL DROPPERS & INCOMING LINKS:–

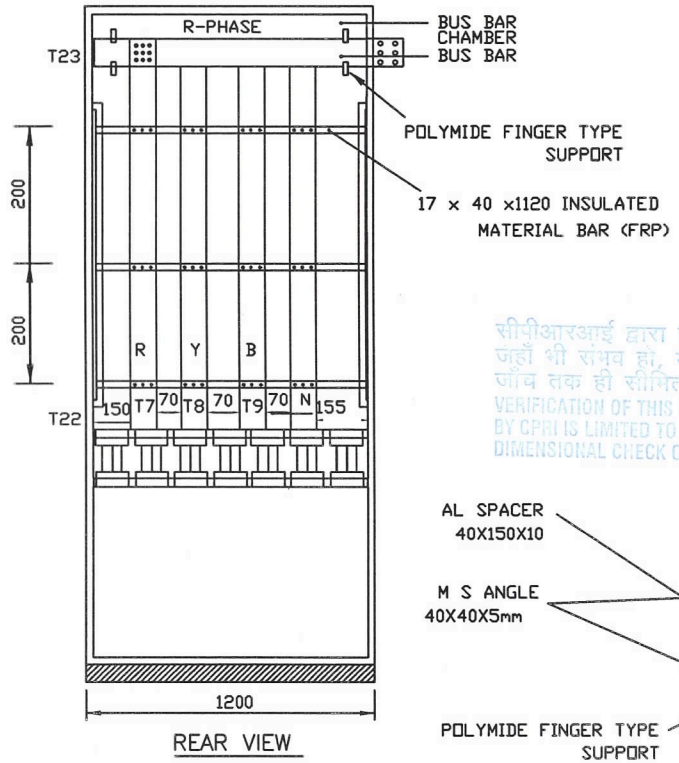
PHASE : 4:150X10 MM AL.
NEUTRAL : 2:150X10 MM AL.

NOTES:–

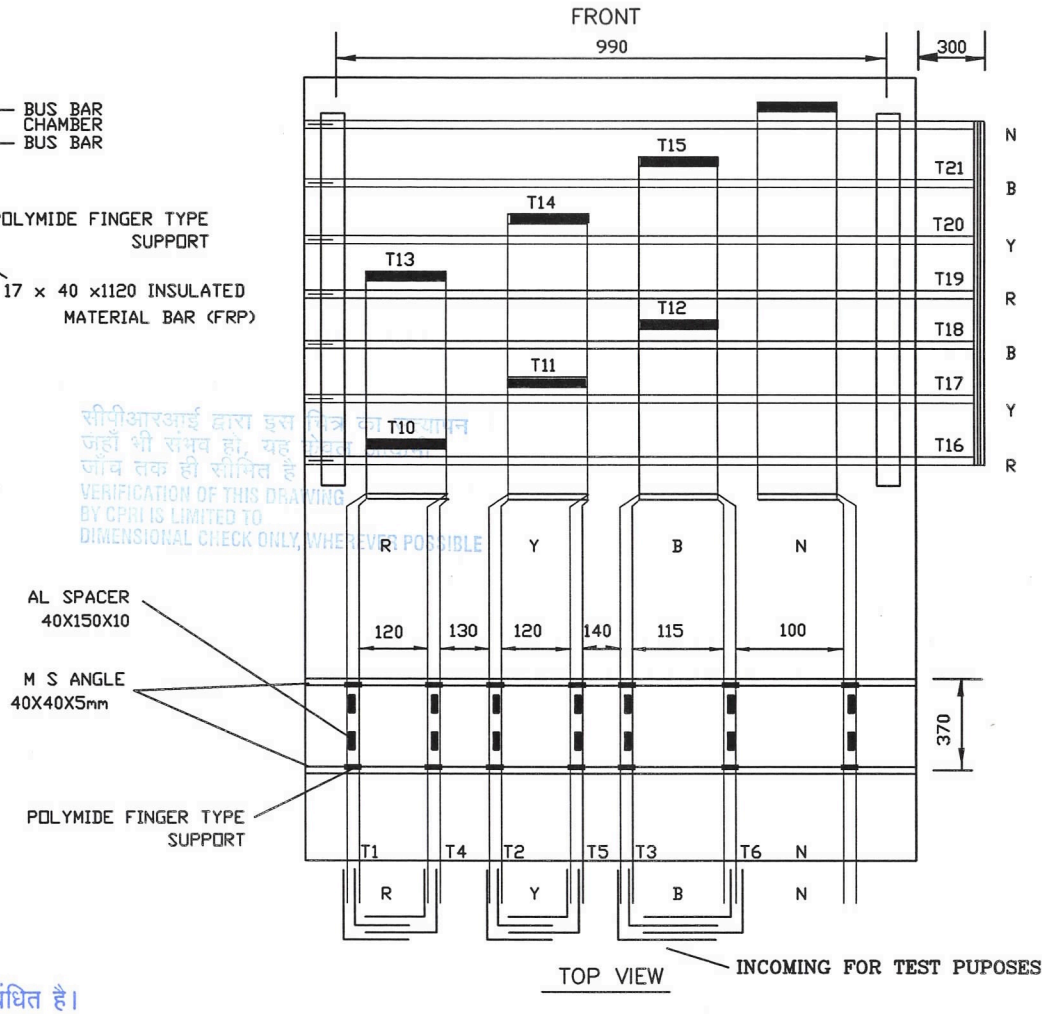
1. PAINT SHADE ENCL.:– SIEMENS GREY (RAL 7032.)
2. SHEET ENCL. :– 2MM THICK CRCA SHEET.
3. CABLE ENTRY :– TOP AND BOTTOM

Tolerance - 3 %.
All Dimensions in mm

MANUFACTURED BY; Engineers India Pvt Ltd. Plot no - C/21 and 71/2, IID Center, Industrial Estate,Khorda, Odisha-752057.	TEST DETAILS	RATED VOLTAGE : 415 VAC.	SCALE	SHEET	DATE	DRAWN	Mr. PRAKASH
	TEMPERATURE RISE TETING for LT PANEL 4000A	CURRENT : 4000 A	NTS	1 OF 3	12-08-2024	APPROVED	Mr.Tapas. Das
		TYPE : MAIN DISTRUBUTION PANEL			REV	SR. NO	SKEIPL/02/07/24/2372
		DESIGNATION : PCC CUM MCC CONTROL CENTRE			00.	DRG.NO	SKEIPL/HRT/NOIDA/01.



REAR VIEW



TOP VIEW

THERMOCOUPLES
T1 - R1 INCOMING
T2 - Y1 INCOMING
T3 - B1 INCOMING
T4 - R2 INCOMING
T5 - Y2 INCOMING
T6 - B2 INCOMING
T7 - R HBB JOINT
T8 - Y HBB JOINT
T9 - B HBB JOINT
T10 - R1 VBB JOINT
T11 - Y1 VBB JOINT
T12 - B1 VBB JOINT
T13 - R2 VBB JOINT
T14 - Y2 VBB JOINT
T15 - B2 VBB JOINT
T16 - R1 OUTGOING
T17 - Y1 OUTGOING
T18 - B1 OUTGOING
T19 - R2 OUTGOING
T20 - Y2 OUTGOING
T21 - B2 OUTGOING
T22 - BODY 1
T23 - BODY 2

GEN TOLERANCE ± 2%

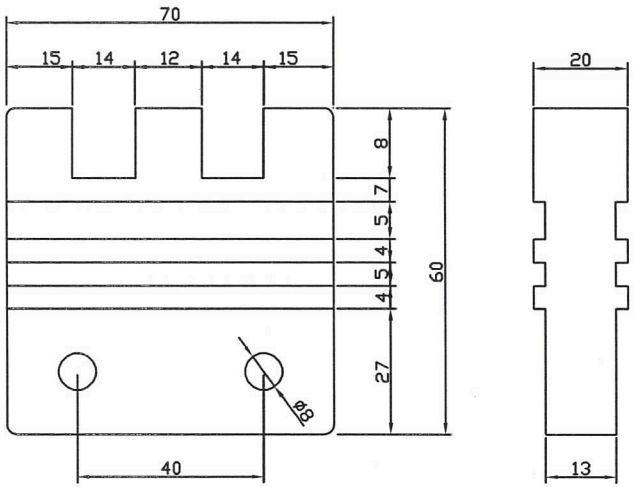
ALL DIMENSIONS ARE IN MM

यह चित्र सीपीआरआई से संबंधित है।
This drawing pertains to CPRI
परीक्षण रिपोर्ट सं./Test Report No. CPRINOAHVMICC24 TO 4197
दिनांक/Date..... 22 August 2024

परीक्षण अभियंता
आरटीएल, सीपीआरआई नोएडा
TEST ENGINEER
RTL, CPRI, NOIDA

MANUFACTURED BY;
Engineers India Pvt Ltd
Plot no - C/21 and 71/2, IID Center,
Industrial Estate,Khorda, Odisha-752057.

TEST DETAILS	RATED VOLTAGE : 415 VAC.	SCALE	SHEET	DATE	DRAWN	Mr. Prakash
TEMPERATURE RISE TETING for LT PANEL 4000A	CURRENT : 4000 A	NTS	2 OF 3	12-08-2024	APPROVED	Mr.Tapas. Das
	TYPE : MAIN DISTRUBUTION PANEL			REV	SR. NO	SKEIPL/02/07/24/2372
	DESIGNATION : PCC CUM MCC CONTROL CENTRE			00.	DRG.NO	SKEIPL/HRT/NOIDA/01.



SUPPORT FOR PH & N
MATERIAL : POLYMIDE
TOLERANCE = ±1MM
MAKE : POWERMAT

यह चित्र सीपीआरआई से संबंधित है।
This drawing pertains to CPRI
परीक्षण रिपोर्ट सं./Test Report No...CPRINOAHVMISC24TO487
दिनांक/Date.....22.....August.....2024

परीक्षण अभियंता
आरटीएल, सीपीआरआई नोएडा
TEST ENGINEER
RTL, CPRI, NOIDA

MANUFACTURED BY;
Engineers India Pvt Ltd
Commitment for our concern...
An ISO 9001:2015 Certified Company
Plot no - C/21 and 71/2, IID Center,
Industrial Estate,Khorda, Odisha-752057.

TEST DETAILS	RATED VOLTAGE : 415 VAC.	SCALE	SHEET	DATE	DRAWN	Mr. Prakash
TEMPERATURE RISE TETING for LT PANEL 4000A	CURRENT : 4000 A	NTS	3 OF 3	12-08-2024	APPROVED	Mr.Tapas. Das
	TYPE : MAIN DISTRUBUTION PANEL			REV	SR. NO	SKEIPL/02/07/24/2372
	DESIGNATION : PCC CUM MCC CONTROL CENTRE			00.	DRG.NO	SKEIPL/HRT/NOIDA/01.