



RECEIVED
ON..15/09/15
IN.W. No..430



REGD.A.D / H.D. / COURIER

Our Reference : WO-1516-008716

10489

Date : 26-August-2015

To,

Multiquadrant Industrial Controls (I) Pvt Ltd (C13233)

Kind Attn. :Sanket Sawalkar
206,Nimesh Industrial Estate,
Vidyalaya Marg, Gavanpada,
Mulund (E),
Mumbai-400081
Maharashtra ,India

Kind attn. : Mr. Sanket Sawalkar

Subject : Submission of Test Report & Invoice

Reference : NIL,DT.:18.08.2015

Dear Sir,

With reference to your communication referred above, we are pleased to submit our Test Report No: RP-1516-019542 & Invoice No. SINV-1516-09636 dated 26/08/15 for the testing of samples sent by you.

Please find enclosed herewith Test Report Acknowledgement Form. You are requested to kindly acknowledge the receipt of Test Report and forward the form to the undersigned.

In order to improve our services your feedback in the attached Feedback Form shall be appreciated.

We thank you for the Payment already received in full and there is no outstanding against this invoice.

Please arrange to collect the tested sample(s) personally or through your authorized representative with a letter of authority within 30 days from the date of this letter. Please note that ERDA will not be responsible for its safe custody beyond 30 days. The Sample(s) will be disposed off after that date. No claim, in this regard will be entertained.

In case of any complaint of disagreement regarding the test results, please inform immediately but not later than 30 days.

Thanking you,

Yours faithfully,

Y. I. PATHAN

Head of Section

Email : erdasvl@erda.org

Mobile : +91 9978940916

Encl:

1. Test Report No. : RP-1516-019542
2. Invoice No. : SINV-1516-09636
3. Test Report Acknowledgement Form
4. Feedback Form

Electrical Research & Development Association

Registered Office

Brabourne Stadium,
87, Veer Nariman Road,
Opp. Ambassador Hotel
Mumbai - 400 020, India

Tel. (+91) 022 22820622, 22815376
Fax (+91) 022 22815376
E-mail berda@bom8.vsnl.net.in
Web <http://www.erda.org>

Vadodara Laboratory Complex

ERDA Road, GIDC, Makarpura,
Vadodara - 390 010, India

Tel. (+91) 0265 2642942, 2642964,
2642377, 3043128-3043131
Tele. (+91) 0265 2638382, 3048248
E-mail erda@erda.org
Web <http://www.erda.org>

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382, Web : http://www.erda.org
E-mail : erda@erda.org, dir@erda.org, ene@erda.org, erdasvl@erda.org, ins@erda.org,
mtd@erda.org, phv@erda.org, plv@erda.org, tdc@erda.org



Invoice

To,
Multiquadrant Industrial Controls (I) Pvt Ltd (C13233)
Kind Attn.: Sanket Sawalkar
206, Nimesh Industrial Estate,
Vidyalaya Marg, Gavanpada,
Mulund (E),
Mumbai-400081
Maharashtra, India

No. :	SINV-1516-09636
Date :	26-August-2015

Test Report Ref. :	RP-1516-019542
Your Ref. No. :	NIL, DT.:18.08.2015
Received Date :	21-August-2015

Kind attn. : Mr. Sanket Sawalkar

SPECIMEN : Panel 500 A

Sr. No.	Particulars	No. of Samples	Amount
	Development and Verification Testing	1	51,578.00
	Add : Additional Charges		0.00
	Less : Line Discount		0.00
	Less : Invoice Discount		0.00
	Net Total		51,578.00
	Add : Service Tax		7,220.92
	Add : Education Cess on Service Tax		0.00
	Add : Higher Education Cess on Service Tax		0.00
	Add : Invoice Rounding		0.08
Total Rounded Amount			58,799.00

PAYMENT RECEIVED

NOTE :

E. & O.E.

1. Cheque/Draft may be drawn in favor of "Electrical Research and Development Association".
2. Discrepancy if any, in this invoice, may please be intimated within 15 days from the date of invoice.
3. Please quote Invoice No. while making payment for Electrical Research & development Association

Prepared by : AW

Checked by : Swi

J. M. K. Molate
Sr. Accounts Officer :
11-9-15

Work Order No: WO-1516-008716

Receipt No: _____

Quote No: SQ-1516-008271

Service Category : Scientific & Technical Consultancy 14%

S.T.No: _____

PAN No: AAATE0499H

TAN No: BRDE00131F

ERDA PAN NO. AAATE0499H
ERDA STC NO. AAATE0499H ST001
ERDA SERVICE TAX REGISTRATION NO. : S&TC/VADODARA/01/ERDA/2001



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 Web : http://www.erda.org



TEST REPORT

SHEET 1 OF 4

<p>NAME & ADDRESS OF CUSTOMER</p> <p>Multiquadrant Ind. Controls (I) Pvt. Ltd. 206, Nimesh Indl. Estate, Gavan Pada, Mulund (E), Mumbai-400 081. India.</p>	<p>REPORT NO.: RP-1516-019542 DATE: 28.08.2015</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">CUSTOMER REF.NO: NIL</td> <td style="width: 50%;">DATED: 18.08.2015</td> </tr> <tr> <td style="width: 50%;">DATE OF SAMPLE RECEIPT: 20.08.2015</td> <td style="width: 50%;">DATE OF TESTING: 21.08.2015 to 22.08.2015</td> </tr> </table>	CUSTOMER REF.NO: NIL	DATED: 18.08.2015	DATE OF SAMPLE RECEIPT: 20.08.2015	DATE OF TESTING: 21.08.2015 to 22.08.2015
CUSTOMER REF.NO: NIL	DATED: 18.08.2015				
DATE OF SAMPLE RECEIPT: 20.08.2015	DATE OF TESTING: 21.08.2015 to 22.08.2015				
<p>SAMPLE DESCRIPTION</p> <p>Fixed Type MCC Panel</p> <p>Rated Voltage (Un) : 415 V Rated Current (InA) : 500 A Rated Frequency(fn) : 50 Hz Rated insulation voltage (Ui) : 660 V No. of Phases : TPN</p> <p>Rated short time withstand current & its duration :</p> <ul style="list-style-type: none"> - 50 kArms for 1 sec. with an initial peak of 105 kA between phases - 30 kArms for 1 sec. with an initial peak of 63 kA between nearest phase & Neutral <p>Quantity (Tested): 1 No.</p>	<p>SAMPLE IDENTIFICATION</p> <p>ERDA Sample Code No.: ERDA-00103738</p> <p>TYPE DESIGNATION: Fixed type MCC Panel</p> <p>DRAWING NO.: GA1 REV. R0 SHEET 1 OF 5, GA1 REV. R0 SHEET 2 OF 5, GA1 REV. R0 SHEET 3 OF 5, GA1 REV. R0 SHEET 4 OF 5, GA1 REV. R0 SHEET 5 OF 5.</p>				
<p>TEST DETAILS</p> <p>Short circuit withstand Strength test (Sub Cl. 10.11.5.3.3 & 10.11.5.3.5)</p> <p>ENCLOSURES:</p> <p>NUMBER OF OSCILLOGRAM : Two NUMBER OF PHOTOGRAPH : One NUMBER OF TEST CIRCUIT DIAGRAM : Two NUMBER OF DRAWINGS : Five</p> <p>TEST WITNESSED BY: Mr. S. Ganguly (SO/C, BARC) Mr. Sanket Sawalkar (Asst. Manager-Sales, Multiquadrant Ind. Controls (I) Pvt. Ltd.) Mr. Akhilesh Tiwari (Sales Executive, Multiquadrant Ind. Controls (I) Pvt. Ltd.)</p>	<p>TEST SPECIFICATIONS</p> <p>As per customer's requirement, test procedure followed as per IEC 61439-1:2011 & IEC 61439-2:2011</p>				
<p>NOTE: Only main busbars were tested for short circuit withstand Strength test.</p> <p>REMARKS: The sample conforms to the requirements of verification of the short circuit withstand strength as specified by the customer.</p>					
<p style="text-align: center;"><i>(Signature)</i></p> <p>PREPARED BY</p>	<p style="text-align: center;"><i>(Signature)</i></p> <p>CHECKED BY</p>				
<p style="text-align: center;"><i>(Signature)</i></p> <p>APPROVED BY (YASHINKHAN I. PATHAN)</p>					

Note: 1. This report relates only to the particular sample received for testing in good condition at ERDA.
 2. This report cannot be reproduced in part under any circumstances.
 3. Publication of this report requires prior permission in writing from Director, ERDA.
 4. Only test asked by customer have been carried out.
 5. In case of any dispute, Vadodara will be the exclusive jurisdiction & shall be construed as where the cause has arisen.

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Certificate No. : T-0071

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ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.

EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33

Fax : +91 (0265) 2638382

E-mail : erda@erda.org

Web : <http://www.erda.org>



REPORT NO.: RP-1516-019542

SHEET 2 OF 4

DATE: 28.08.2015

Contents	
Verification of the short-circuit withstand strength	Sheet No. 3 of 4
Test results after Verification of the short-circuit withstand strength	Sheet No. 4 of 4
Oscillogram No.	309/01 to 309/02
Photograph No.	1516-008716-187
Test circuit diagram No.	OLSC/SWG/47 OLSC/SWG/49
Drawing No.	GA1 REV. R0 SHEET 1 OF 5, GA1 REV. R0 SHEET 2 OF 5, GA1 REV. R0 SHEET 3 OF 5, GA1 REV. R0 SHEET 4 OF 5, GA1 REV. R0 SHEET 5 OF 5.



PREPARED BY



CHECKED BY

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REPORT NO.: RP-1516-019542

SHEET 3 OF 4

DATE: 28.08.2015

SHORT-CIRCUIT WITHSTAND STRENGTH TEST

VERIFICATION BY TEST

TESTING OF INCOMING CIRCUIT AND MAIN BUSBAR:

(As per customer's requirement, test procedure followed as per Sub clause 10.11.5.3.3 & 10.11.5.3.5)

The short-circuit withstand strength test was performed on the sample connected to source as per test circuit diagram no.: OLSC/SWG/47 & 49. The test was carried out with the short-circuit current path as per drawing. No. GA1 REV. R0 SHEET 1 OF 5. The sample was connected to earth through fine wire fuse.

Condition of the equipment under test: New

Test Supply position:

- 3-Phase: Bottom incoming terminal of vertical busbars (Left hand side of panel) using copper braided cable of size 1000mm² per phase.
- 1-Phase: Bottom incoming terminal of vertical busbars (Left hand side of panel) (B-Phase & Neutral) using copper braided cable of size 1000mm².

Short circuit position:

- 3-Phase: Bottom outgoing terminal of vertical busbars (Right hand side of panel) using shorting link size of 60 mm x 5 mm copper.
- 1-Phase: Bottom outgoing terminal of vertical busbars (Right hand side of panel) (B-Phase & Neutral) using shorting link size of 60mm x 5mm copper.

Oscillogram No.	Short circuit current (kA)			Duration (sec.)	Observation During test	Remarks
	Peak	Rms	Average			
309/01	108.798 - -	50.849 51.966 50.189	51.001	1.006	No Abnormality	Between phases
309/02	63.857	30.884	-	1.002	No Abnormality	Between B-phase & neutral

Observations after test:

- No abnormality was observed.
- Busbar connections were not loosened.
- No deformation in busbars.
- Busbar supports were intact.
- Fine wire fuse in earth circuit found intact.

PREPARED BY

CHECKED BY

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REPORT NO.: RP-1516-019542

SHEET 4 OF 4

DATE: 28.08.2015

TEST RESULTS AFTER VERIFICATION OF THE SHORT- CIRCUIT WITHSTAND STRENGTH

a) INSULATION RESISTANCE TEST

Sr. No.	Test	Test voltage (V DC)	I.R. Value (MΩ)	
			Required	Measured
1.	Between all live parts and the interconnected exposed conductive parts of the assembly.	500	> 0.5	> 0.5
2.	Between each pole and all the other poles connected for this test to the interconnected exposed conductive parts of the assembly.	500	> 0.5	> 0.5

b) VERIFICATION OF DIELECTRIC PROPERTIES

Sr. No.	Test	*Applied voltage (kV)	*Duration (sec.)	Remarks
1.	Between all live parts and the interconnected exposed conductive parts of the assembly.	2	60	Withstood
2.	Between each pole and all the other poles connected for this test to the interconnected exposed conductive parts of the assembly.	2	60	Withstood

***NOTE:** The test voltage (2 kV for 60 sec.) was applied as on request of customer.

PREPARED BY

CHECKED BY

TE 1712716





Certificate No. : T-0071

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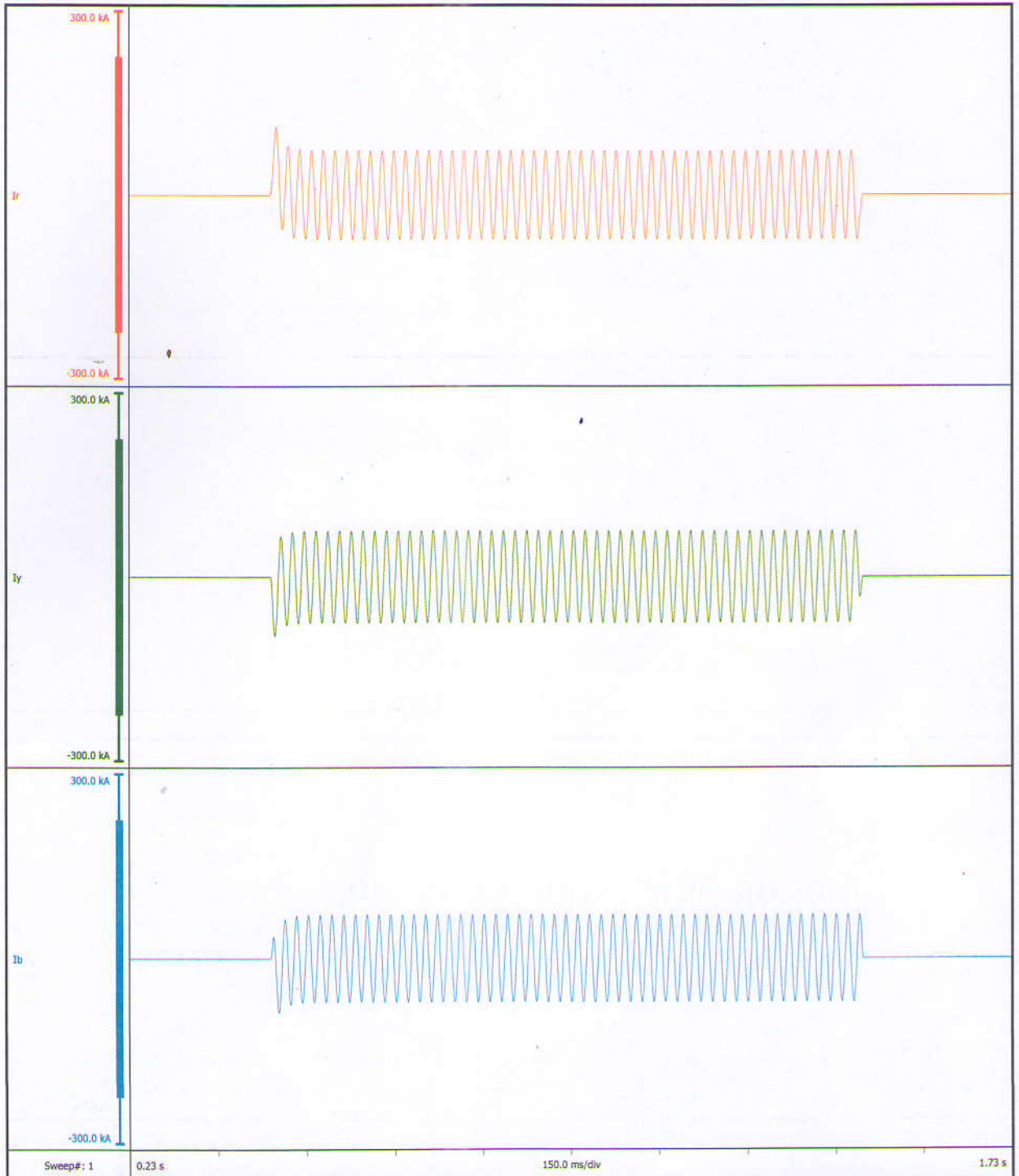
E-mail : erda@erda.org

Web : <http://www.erda.org>



REPORT NO.: RP-1516-019542

DATE: 28.08.2015



OSCILLOGRAM NO. : 309/01

TE 1712832





Certificate No.: T-0071

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Fax : +91 (0265) 2638382

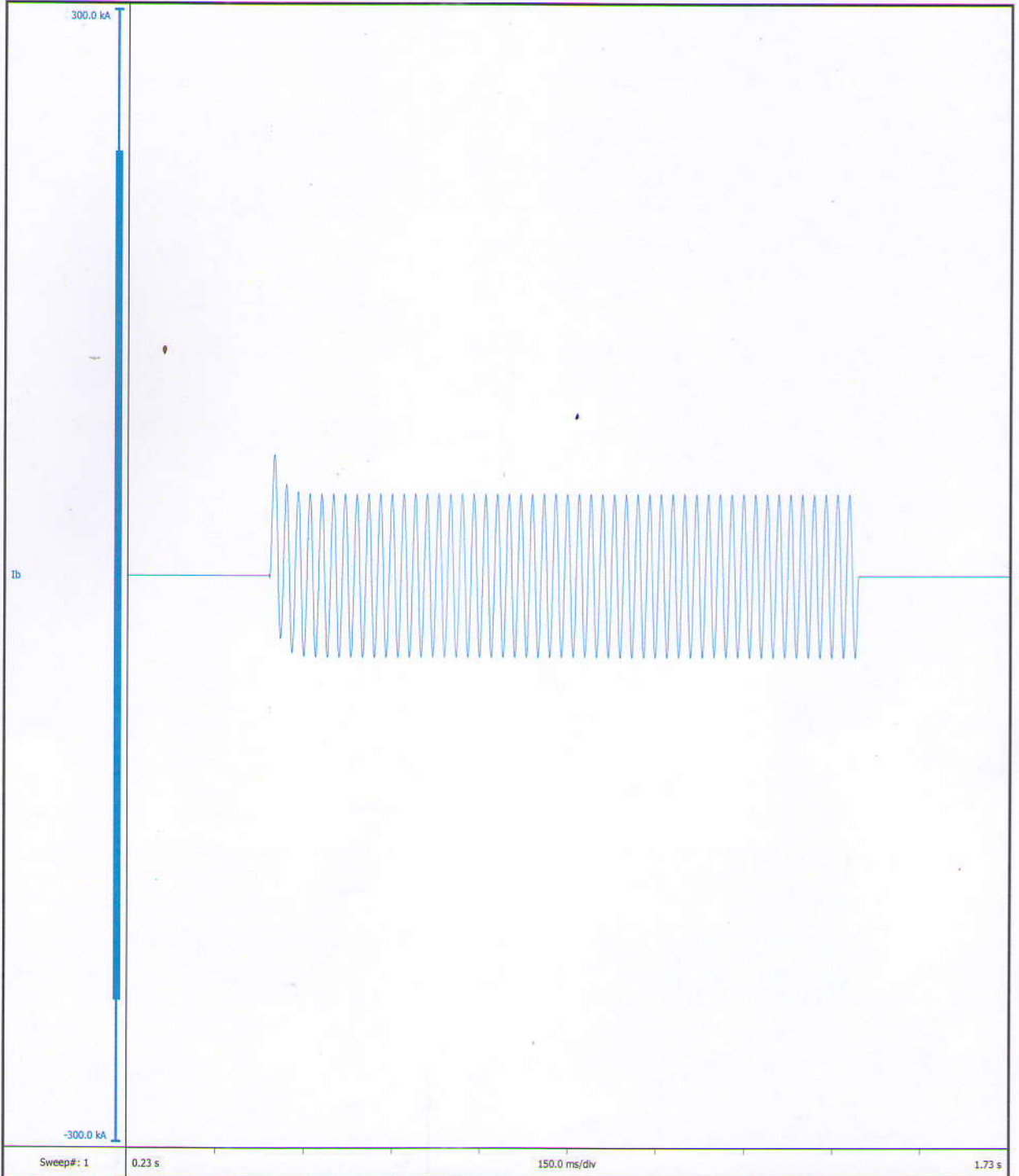
E-mail : erda@erda.org

Web : <http://www.erda.org>



REPORT NO.: RP-1516-019542

DATE: 28.08.2015



OSCILLOGRAM NO. : 309/02

TE 1712833





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Fax : +91 (0265) 2638382

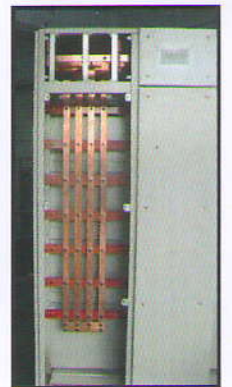
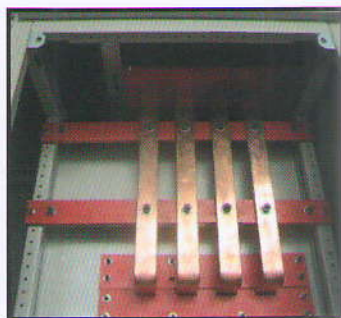
E-mail : erda@erda.org

Web : http://www.erda.org



REPORT NO.: RP-1516-019542

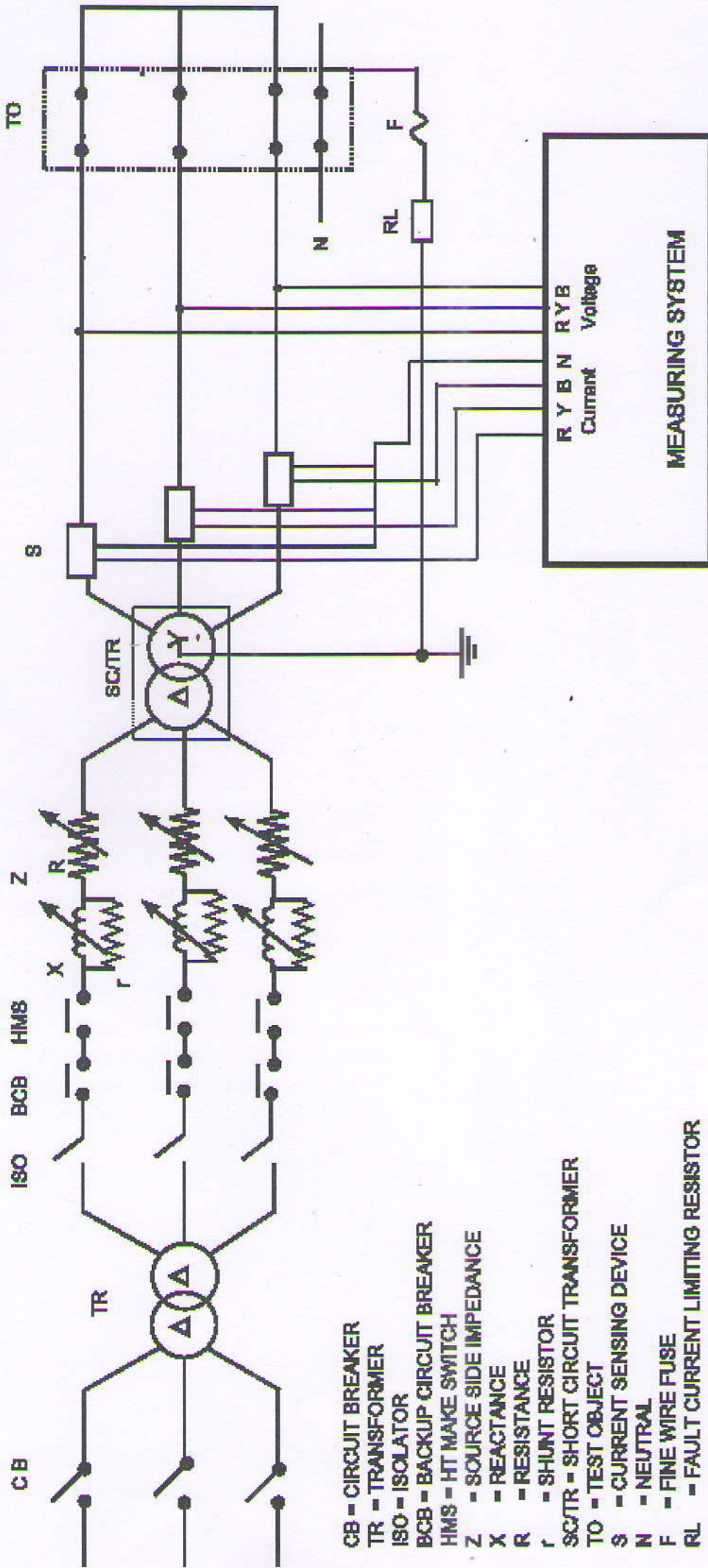
DATE: 28.08.2015



multiquadrant Ind. controls (I) pvt. Ltd. (An ISO 9001 : 2008 Certified Company)	
Rated Current	500A.
Rated Voltage	415V AC.
Short Circuit Rating	50kA for 1 sec.
Ingress Protection	IP-54

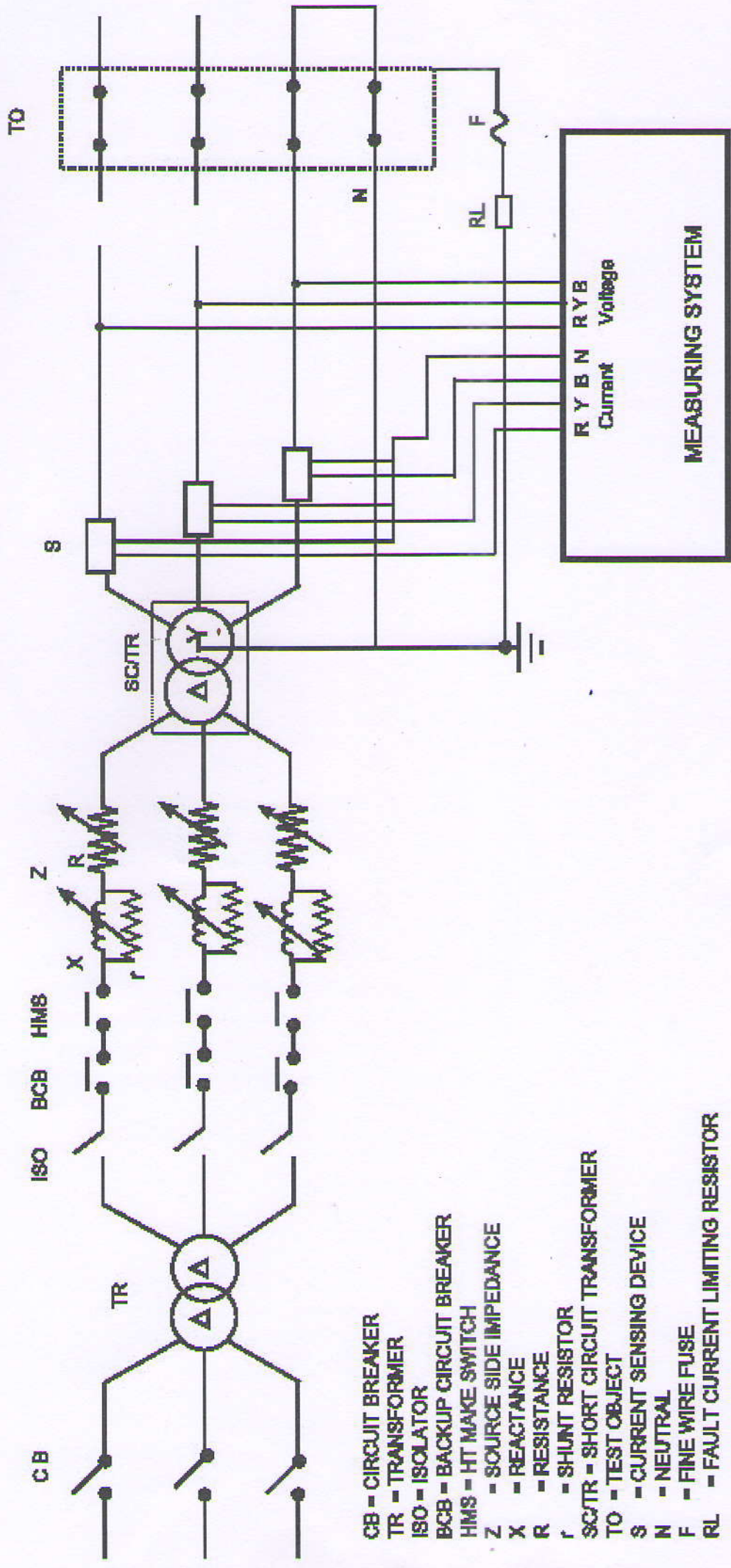
TE 1692697





REPORT NO.: RP-1516-01954D
 DATE: 28/08/2015

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION		DRAWING No. OLSC/SWG/47
SCHEMATIC CIRCUIT DIAGRAM		
DRN H. A. S.	CKD BY M. B. M.	DATE 13/11/2008



ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

SCHEMATIC CIRCUIT DIAGRAM

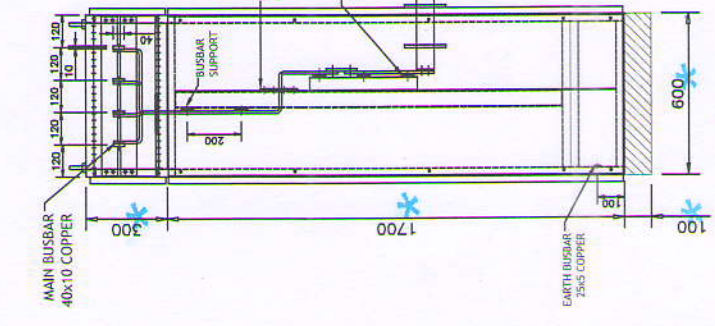
DRN H. A. S.	CKD BY M. B. M.	DATE 13/11/2008	DRAWING No. OLSC/SWG/49
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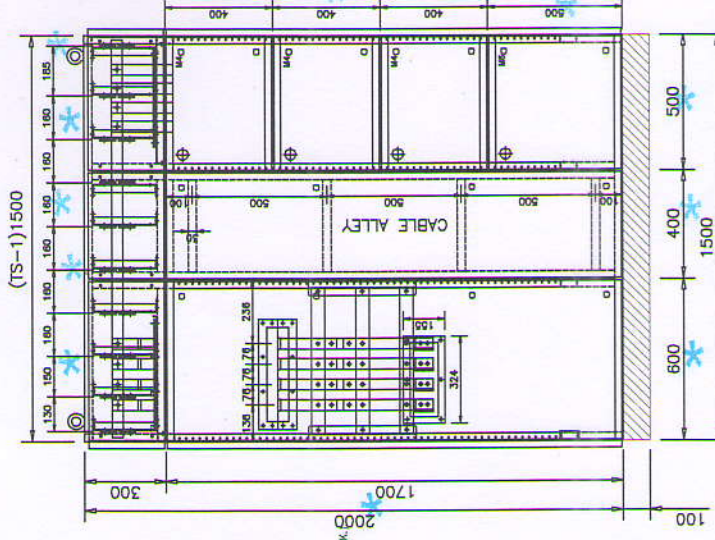
- CB - CIRCUIT BREAKER
- TR - TRANSFORMER
- ISO - ISOLATOR
- BCB - BACKUP CIRCUIT BREAKER
- HMS - HT MAKE SWITCH
- Z - SOURCE SIDE IMPEDANCE
- X - REACTANCE
- R - RESISTANCE
- r - SHUNT RESISTOR
- SC/TR - SHORT CIRCUIT TRANSFORMER
- TO - TEST OBJECT
- S - CURRENT SENSING DEVICE
- N - NEUTRAL
- F - FINE WIRE FUSE
- RL - FAULT CURRENT LIMITING RESISTOR

REPORT NO.: RP-1516-019542
 DATE: 28.08.2015

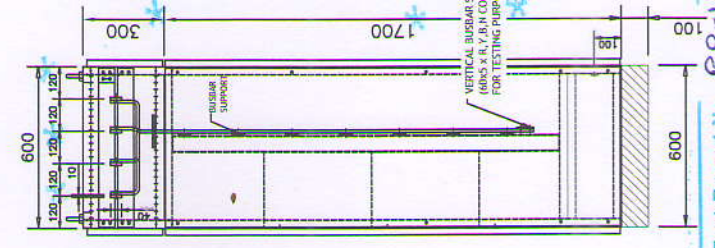
0 1 2 3 4 5 6 7 8 9



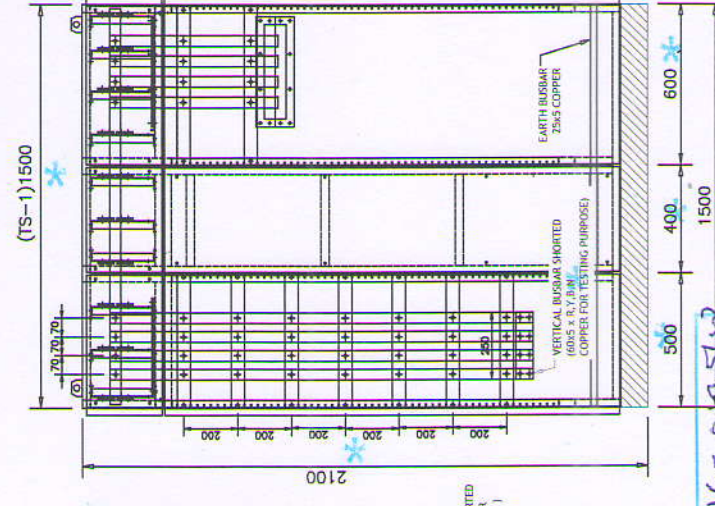
LH SIDE VIEW



FRONT VIEW



RH SIDE VIEW



REAR VIEW

Test Report No. RP-1516-0-19-512
 Date: 28.08.2015
 Product: 500 A Panel
 Verified By: [Signature]
 Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with **.



FIXED TYPE MCC PANEL
SHORT CIRCUIT TEST.
50KA FOR 1 SEC.
AS PER IEC:61439-1&2

Enclosure: 2000H-100Base x1500W x 600D
Description: Fixed Panel
Ingress Protection: IP-54
Panel QTY.: 01 No.
Paint Shade: Internal & External: RAL-7035
Base Frame: Black
CONSTRUCTION:- Frame Work: 2.0mm CRCA Sheet Mounting Plates: 2.0mm CRCA Sheet Tray, Partition: 1.60mm CRCA Sheet Doors & Covers: 1.60mm CRCA Sheet Base Frame: 3.0mm CRCA Sheet Gland Plate: 3.0mm CRCA Sheet

BUSBAR:	PH 1R x 40 x 10mm Cu
MAIN BUS:	N 1R x 40 x 10mm Cu
VER BUS:	PH 1R x 40 x 10mm Cu
EARTH BUS:	N 1R x 40 x 10mm Cu
Tolerance:	±3MM

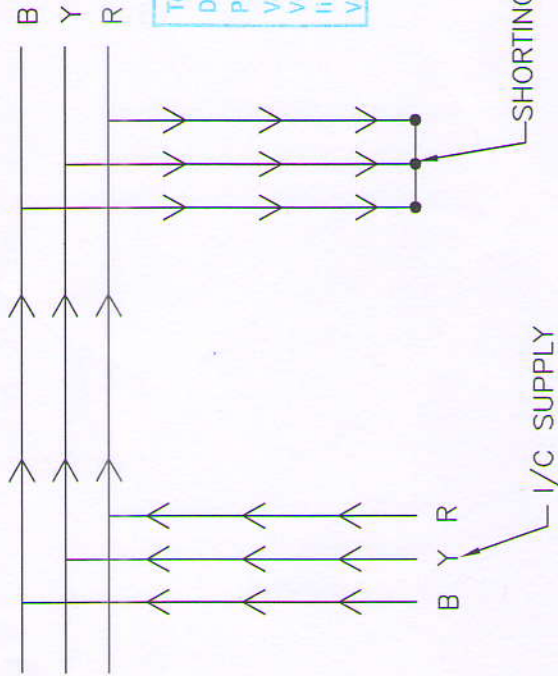
SHEET :-	1 OF 5
DRG.NO.:-	GA1
DRG.CODE :-	GA
REV.	RO

multiquadrant ind. controls (i) pvt.ltd.

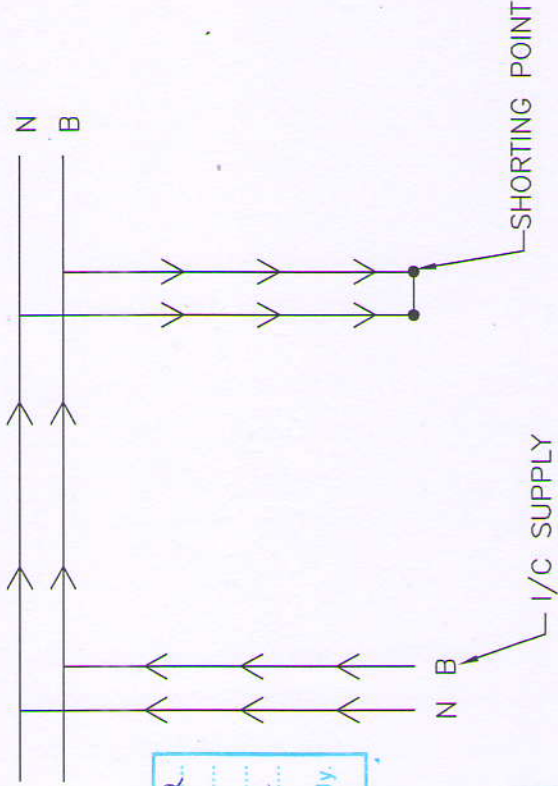
TITLE	GENERAL APPEARANCE DRAWING
CLIENT	M/S.
NAME	SACAR
DATE	13.03.15
DRN	TRD
CHK	APD
APD	

REVISION DETAILS	NAME	DATE	NAME	DATE	CLIENT
R4					M/S.
R3					M/S.
R2					M/S.
R1					M/S.

STC. 3 PHASE 50kA 1 SEC.



STC. SINGLE PHASE & NEUTRAL 30kA 1 SEC.

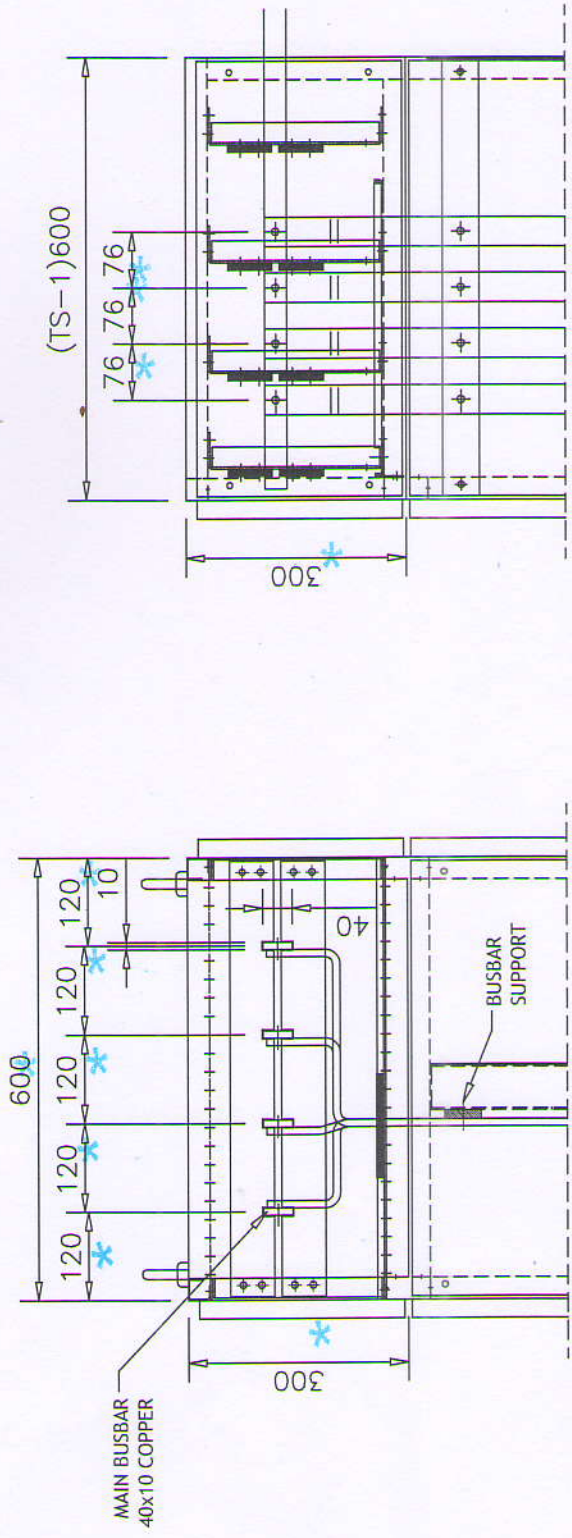


Test Report No. RP-1516-e-1954-d
 Date : 28.08.2015
 Product : 500 A Panel
 Verified By : *[Signature]*
 Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with 'x'.



REVISION DETAILS		NAME		DATE		NAME		DATE		CLIENT		TITLE	
R4						DRN	SACAR	13.03.15	M/S.	GENERAL APPEARANCE DRAWING		multiquadrant ind. controls (i) pvt.ltd.	
R3						TRD						SHEET :- 2 OF 5	
R2						CHK						DRG.NO.:- CA1	
R1						APD						DRG.CODE :- GA	
												REV. RO	

0 1 2 3 4 5 6 7 8 9



SIDE VIEW FRONT VIEW

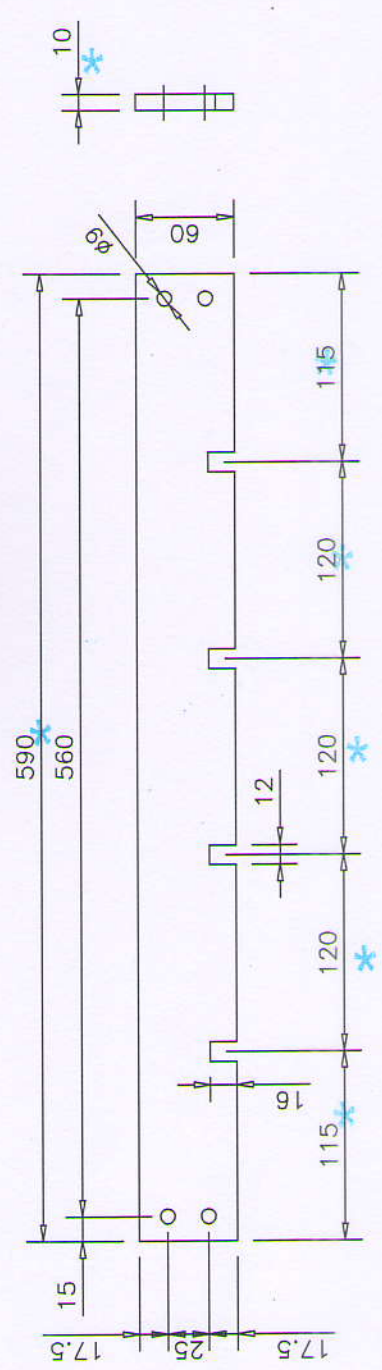
Test Report No RP-1516-019542
 Date : 25.05.2015
 Product : 500 A Panel
 Verified By : [Signature]
 Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'

VERTICAL & MAIN BUS CONNECTION

MATERIAL OF BUSBAR : COPPER
 SIZE : 40 X 10MM



REVISION DETAILS		NAME		DATE		NAME		DATE		CLIENT		TITLE	
R4						DRN	SACAR	13.03.15	M/S.	GENERAL APPEARANCE DRAWING		multiquadrant ind.	
R3						TRD						controls (i) pvt.ltd.	
R2						CHK						DRG.NO.: - GA	
R1						APD						DRG.CODE : - GA	
										SHEET : - 3 OF 5		REV. RO	



MAIN BUSBAR SUPPORT
MAT: FRP THK 10MM ±0.5MM

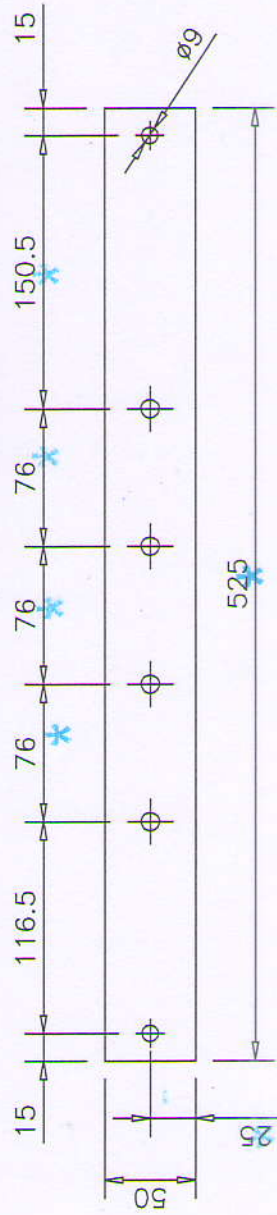
Test Report No RP-1516-019542
 Date : 28.08.2015
 Product : 500 A Panel
 Verified By : *[Signature]*
 Verification of this drawing by ERDA is limited to relevant dimensional checks only.
 Verified dimensions are marked with '*'



REVISION DETAILS	NAME	DATE	DRN	NAME	DATE	CLIENT	TITLE
R4				SAGAR	13.03.15	M/S.	GENERAL APPEARANCE DRAWING
R3			TRD				
R2			CHK				
R1			APD			M/S.	

SHEET :- 4 OF 5	
DRG.NO. :- CA1	
DRG.CODE :- CA	REV. RO

multiquadrant ind. controls (i) pvt.ltd.



VER. BUSBAR SUPPORT
MAT: FRP THK 10MM \pm 0.5MM



Test Report No. RP-1516-009542
 Date: 28/08/15
 Product: 500 A Panel
 Verified By: [Signature]
 Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'

REVISION DETAILS		CLIENT		TITLE	
R4	NAME	DRN	DATE	GENERAL APPEARANCE DRAWING	
R3	SAGAR	TRD	13.03.16		
R2	CHK	APD			
R1					

multiquadrant ind.
controls (i) pvt.ltd.

SHEET :- 5 OF 5
 DRG.NO. :- GA1
 DRG.CODE :- GA
 REV. RO