



**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

<b>Rishabh Instruments Pvt. Ltd.</b> Testing, Trishala unit, Plot No. C-6, M.I.D.C., Satpur, Nashik – 422007. Maharashtra (India)	<b>TEST REPORT NO : RIPL/TST/PT1112/041</b>	
	<b>DATE OF ISSUE : 11<sup>th</sup> March, 2012</b>	<b>PAGE : 1 of 14</b>

**DESCRIPTION OF SAMPLE :**

Name : Digital Panel Meter  
 Model : Rish EINE 96 X 96, Single Phase – 240V LN  
 Specifications : Input 240V LN (Primary Range Programmable : 60V LN to 999KV LN)  
 Auxiliary supply : 80...300VAC  
 Class Index : 1  
 No. of Samples : 01  
 Sample Identification:  
     Base PCB: 20100313 Rev. : B  
     Firmware version : 1.1

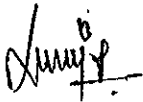


**INSTRUMENTS USED:**

Sr. No.	Instrument	Make / Model	Sr. No.
1	Digital Multimeter	Gossen metrawatt: Metra Hit 28S	M49228082
2	Temperature- humidity chamber	ESPEC: 2L-KPH	14010625
3	HV Tester	Laxtronics: HV-10	1109104
4	Insulation Tester	Rish Insu 5000A	100146
5	AC Voltage Current standard	Yokogawa 2558	11AA03920
6	Vibration Test System	Saraswati Dynamics – SEV010	--
7	3 Phase Power Calibrator & Tester	Calmet –C300	SN21135

**COMPLIANCE SPECIFICATION:** Product datasheet : Revision E 03/2012  
 Operating Manual 15001059 Rev B 03/2012

**REMARKS:**

The Sample has passed the specifications tested to.

<b>PREPARED BY : RDS</b> 	<b>CHECKED BY : PBC</b> 	<b>APPROVED BY : SDC</b> 
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**Table – A: Summary of tests Conducted**

Sr. No	Test procedures	Requirement	Observation	Remark
<b>PERFORMANCE TESTS</b>				
1.	<b>Intrinsic Error Test :</b> The UUT being under reference conditions, The value indicated on the measuring instrument shall be read out at constant intervals at n-test points. Calculate the Error at each test point.	Error should be within specified accuracy limits.	See Table 1	Conforms
2.	<b>Influence Error Resulting from the Supply Voltage :</b> Measurement is to be taken at lower and higher limits of aux supply (80 to 300V AC) & Calculate the Error in each case.	Error should be within specified accuracy limits.	See Table 2	Conforms
3.	<b>Influence Error Resulting from aux Supply frequency.</b> Measurement is to be taken at lower and higher limits of aux supply frequency (45-65Hz) & Calculate the Error in each case.	Error should be within specified accuracy limits.	See table 3	Conforms
4.	<b>Self heating due to Measured Quantity.</b> Keep the Measuring instrument switched on at reference temperature for at least 2hrs without a measured quantity applied. At reference conditions apply 90% input and take reading after 1 <sup>st</sup> min and 30 <sup>th</sup> min. Calculate the variation.	Variation should not exceed specified accuracy limits. Instrument shall comply with the accuracy.	See table 4	Conforms
5.	<b>Influence due to Frequency of input quantity.</b> Measurement of upper and lower limits of input frequency (45 and 65 Hz) is to be carried out. Variation in readings is calculated with respect to readings at ref. frequency 50Hz.	Variation should not exceed specified accuracy limits.	See table 5	Conforms
6.	<b>Influence of Storage temperature.</b> Keep the meter in de-energized condition for 4 hours at -25 °C then keep the meter at reference condition for 2 hours recovery period & take the intrinsic error. Repeat the above procedure for +70°C.	Storage temperature should not cause any damage to instrument. After recovery period it should meet the accuracy requirement	See table 6	Conforms

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RIPL/TST/PT1112/041

ISSUE DATE: 11/03/2012

Page 3 of 14

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Sr. No	Test procedures	Requirement	Observation	Remark
7.	<b>Influence Error resulting from Changes in Ambient Temperature.</b> Take readings at reference condition 23°C. Then vary the temperature to 0°C and keep UUT energized for 2hrs with 90% input and take readings there after. Repeat the above procedure for 50°C and Calculate the Variation.	variation should not exceed : 0.025% /°C.	For results See table 7	Conforms
8.	<b>Influence Error resulting from Changes in Relative Air Humidity.</b> Take readings at reference conditions. Then vary the RH to 90% and keep UUT energized for 2hrs with 90% input and take readings. Calculate the Variation.	Variation should not exceed specified accuracy limits.	For results See table 8	Conforms
9.	<b>Measurement of Supply Voltage Consumption.</b> Measure the consumption of aux supply at full scale input.	Consumption should be less than 3VA at 240V, 50Hz aux supply.	For results See table 9	Conforms
10.	<b>Measurement of Input Consumption.</b> Measure the input consumption by applying full scale input.	Consumption should be less than 0.3VA.	For results See table 10	Conforms
11.	<b>Influence due to continuous overload</b> Apply overload of 120% of Range for 2 hours then instrument shall be kept in switched on condition for at least 2 hours at reference condition. Take readings.	Error should be within specified accuracy limits. Overload should not cause any damage to the meter.	For results See table 11	Conforms
12.	<b>Influence due to short term overload :</b> a. Apply 2 times rated value for 1 second, repeated 10 times at 10 second intervals. b. Instrument kept in switched-on condition for at least 2 hrs at reference temperature then conducts the intrinsic error test.	Meter should comply with accuracy class after test.	For results See table 12	Conforms
13.	<b>High Voltage test</b> Apply 2.2kV AC for 1 min between 1. All the terminals and housing. 2. Aux terminals and Input terminals.	No breakdown should occur.	No breakdown observed	Conforms

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ISSUE DATE: 11/03/2012

Page 4 of 14

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Sr. No	Test procedures	Requirement	Observation	Remark
14.	<b>Insulation resistance test.</b> Measure the insulation resistance At 500V : Between input + aux and housing	---	Insulation resistance is found >100GΩ.	---
15.	<b>Influence due to vibration</b> Determine intrinsic error. Put UUT for vibration test. Sweep frequency range : 10-55-10Hz, amplitude ±0.15mm.scanning speed 1octave/min.number of scanning cycles : 2 in each direction of the axes (6 in all) after completion of vibration test Check UUT visually and determine intrinsic error	Vibration should not cause any mechanical damage. Instrument shall comply with the accuracy requirements after test.	For results See table 13	Conforms
16.	<b>Influence Error Resulting from External Electromagnetic fields.</b> a. At reference conditions, take readings without application of magnetic field. b. Place the meter in the magnetic field of 0.4kA/m and observe readings. c. Compute variation in two readings.	Variation should not exceed specified accuracy limits.	No any Variation in display observed.	Conforms
17.	<b>Influence due to continuous operation.</b> Keep meter ON with Full scale input for 6 hours and take readings initially and after. Calculate variation.	Variation should not exceed specified accuracy limits. Instrument shall comply with the accuracy requirements.	For results See table 14	Compliance
18.	<b>Verification of features</b>			
18.1	<b>Programmable PT ratio :</b> Check the PT primary values are Programmable.	PT primary shall be set form 60V to 999 kV LN,	Programmable within the range of 60V to 999 kV LN,	Conforms
18.2	<b>True RMS measurement :</b> Take readings with waveforms of 2 <sup>nd</sup> to 15 <sup>th</sup> harmonic with different amplitude. Take readings with individual harmonic and mixed multiple harmonics.	Meter shall show readings with accuracy with input signal up to 15 <sup>th</sup> harmonic.	For results See table 15	Conforms
18.3	<b>Overload indication :</b> Apply input of >125% of PT secondary value and observe the display.	After applying input of >125%, it should indicate overload on display.	It shows "-oL-" on display.	Conforms
18.4	<b>Led Annunciation:</b> Verify the Led annunciation is proper.	Meter shall show the reading with proper Led Annunciation.	"KV" LED glows when Reading is ≥1kV.	Conforms

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**Table 1: Intrinsic Error Test**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error %	Allowed Error %
10	23.96 V	23.89 V	-0.070 V	4.792 V	-0.03	2.00
20	47.92 V	47.82 V	-0.100 V	2.396 V	-0.04	1.00
40	95.84 V	95.96 V	0.120 V	2.396 V	0.05	1.00
60	143.76 V	143.8 V	0.040 V	2.396 V	0.02	1.00
80	191.68 V	191.9 V	0.220 V	2.396 V	0.09	1.00
100	239.60 V	239.9 V	0.300 V	2.396 V	0.13	1.00
120	287.52 V	287.8 V	0.280 V	4.792 V	0.12	2.00

**Table 2: Influence Error Resulting from the Supply Voltage**

**2.1 Readings at Lower aux 80V 50Hz**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error %	Allowed Error %
10	23.96 V	23.85 V	-0.110 V	4.792 V	-0.05	2.00
20	47.92 V	47.87 V	-0.050 V	2.396 V	-0.02	1.00
40	95.84 V	95.75 V	-0.090 V	2.396 V	-0.04	1.00
60	143.76 V	143.7 V	-0.060 V	2.396 V	-0.03	1.00
80	191.68 V	191.5 V	-0.180 V	2.396 V	-0.08	1.00
100	239.60 V	239.4 V	-0.200 V	2.396 V	-0.08	1.00
120	287.52 V	287.2 V	-0.320 V	4.792 V	-0.13	2.00

**2.2 Readings at higher Aux 300V 50Hz**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error %	Allowed Error %
10	23.96 V	23.87 V	-0.090 V	4.792 V	-0.04	2.00
20	47.92 V	47.77 V	-0.150 V	2.396 V	-0.06	1.00
40	95.84 V	95.71 V	-0.130 V	2.396 V	-0.05	1.00
60	143.76 V	143.6 V	-0.160 V	2.396 V	-0.07	1.00
80	191.68 V	191.5 V	-0.180 V	2.396 V	-0.08	1.00
100	239.60 V	239.2 V	-0.400 V	2.396 V	-0.17	1.00
120	287.52 V	287.3 V	-0.220 V	4.792 V	-0.09	2.00

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**Table 3: Influence Error Resulting From Aux Supply Frequency.**

**3.1 Readings at 220V, 45Hz**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error %	Allowed Error %
10	23.96 V	23.86 V	-0.100 V	4.792 V	-0.04	2.00
20	47.92 V	47.89 V	-0.030 V	2.396 V	-0.01	1.00
40	95.84 V	95.90 V	0.060 V	2.396 V	0.03	1.00
60	143.76 V	143.9 V	0.140 V	2.396 V	0.06	1.00
80	191.68 V	191.9 V	0.220 V	2.396 V	0.09	1.00
100	239.60 V	240.0 V	0.400 V	2.396 V	0.17	1.00
120	287.52 V	287.9 V	0.380 V	4.792 V	0.16	2.00

**3.2 Readings at 220V, 50Hz**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error %	Allowed Error %
10	23.96 V	23.92 V	-0.040 V	4.792 V	-0.02	2.00
20	47.92 V	47.89 V	-0.030 V	2.396 V	-0.01	1.00
40	95.84 V	95.90 V	0.060 V	2.396 V	0.03	1.00
60	143.76 V	143.8 V	0.040 V	2.396 V	0.02	1.00
80	191.68 V	191.9 V	0.220 V	2.396 V	0.09	1.00
100	239.60 V	239.9 V	0.300 V	2.396 V	0.13	1.00
120	287.52 V	287.7 V	0.180 V	4.792 V	0.08	2.00

**3.3 Readings at 220V, 65Hz**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error %	Allowed Error %
10	23.96 V	23.86 V	-0.100 V	4.792 V	-0.04	2.00
20	47.92 V	47.84 V	-0.080 V	2.396 V	-0.03	1.00
40	95.84 V	95.84 V	0.000 V	2.396 V	0.00	1.00
60	143.76 V	143.7 V	-0.060 V	2.396 V	-0.03	1.00
80	191.68 V	191.6 V	-0.080 V	2.396 V	-0.03	1.00
100	239.60 V	239.6 V	0.000 V	2.396 V	0.00	1.00
120	287.52 V	287.5 V	-0.020 V	4.792 V	-0.01	2.00

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RIPL/TST/PT1112/041

ISSUE DATE: 11/03/2012

Page 7 of 14

**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

**Table 4 : Self heating due to Measured Quantity**

Test Point (V)	Readings at 1st min.	Readings at 30th min.	Observed Variation	Allowed Variation	Observed Variation (%)	Allowed Variation (%)
215.6V	215.5 V	215.7 V	0.200 V	2.396 V	0.08	1.00
239.6V	239.5 V	239.8 V	0.300 V	2.396 V	0.13	1.00

**Table 5: Influence due to Frequency of input Quantity**

**5.1 Variation at 45Hz**

Test Point (V)	Readings at 50 HZ	Readings at 45 Hz	Observed Variation	Allowed Variation	Observed Variation (%)	Allowed Variation (%)
23.96	23.89 V	23.85 V	-0.040 V	2.396 V	-0.02	1.00
47.92	47.82 V	47.82 V	0.000 V	2.396 V	0.00	1.00
95.84	95.96 V	95.74 V	-0.220 V	2.396 V	-0.09	1.00
143.76	143.8 V	143.6 V	-0.200 V	2.396 V	-0.08	1.00
191.68	191.9 V	191.5 V	-0.400 V	2.396 V	-0.17	1.00
239.60	239.9 V	239.4 V	-0.500 V	2.396 V	-0.21	1.00
287.52	287.8 V	287.4 V	-0.400 V	2.396 V	-0.17	1.00

**5.2 Variation at 65Hz**

Test Point (V)	Readings at 50 HZ	Readings at 65 Hz	Observed Variation	Allowed Variation	Observed Variation (%)	Allowed Variation (%)
23.96	23.89 V	23.79 V	-0.100 V	2.396 V	-0.04	1.00
47.92	47.82 V	47.83 V	0.010 V	2.396 V	0.00	1.00
95.84	95.96 V	95.75 V	-0.210 V	2.396 V	-0.09	1.00
143.76	143.8 V	143.6 V	-0.200 V	2.396 V	-0.08	1.00
191.68	191.9 V	191.6 V	-0.300 V	2.396 V	-0.13	1.00
239.60	239.9 V	239.3 V	-0.600 V	2.396 V	-0.25	1.00
287.52	287.8 V	287.1 V	-0.700 V	2.396 V	-0.29	1.00

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RIPL/TST/PT1112/041

ISSUE DATE: 11/03/2012

Page 8 of 14

**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

**Table 6: Influence of Storage temperature**

**6.1 Readings after storage of -25°C**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error (%)	Allowed Error (%)
10	23.96 V	23.84 V	-0.120 V	4.792 V	-0.05	2.00
20	47.92 V	47.85 V	-0.070 V	2.396 V	-0.03	1.00
40	95.84 V	95.76 V	-0.080 V	2.396 V	-0.03	1.00
60	143.76 V	143.8 V	0.040 V	2.396 V	0.02	1.00
80	191.68 V	191.7 V	0.020 V	2.396 V	0.01	1.00
100	239.60 V	239.8 V	0.200 V	2.396 V	0.08	1.00
120	287.52 V	287.8 V	0.280 V	4.792 V	0.12	2.00

**6.2 Readings after storage of 70°C**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error (%)	Allowed Error (%)
10	23.96 V	23.81 V	-0.150 V	4.792 V	-0.06	2.00
20	47.92 V	47.85 V	-0.070 V	2.396 V	-0.03	1.00
40	95.84 V	95.74 V	-0.100 V	2.396 V	-0.04	1.00
60	143.76 V	143.6 V	-0.160 V	2.396 V	-0.07	1.00
80	191.68 V	191.6 V	-0.080 V	2.396 V	-0.03	1.00
100	239.60 V	239.4 V	-0.200 V	2.396 V	-0.08	1.00
120	287.52 V	287.7 V	0.180 V	4.792 V	0.08	2.00

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RIPL/TST/PT1112/041

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Page 9 of 14

**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

**Table 7: Influence Error resulting from Changes in Ambient Temperature**

**7.1 Influence at 0°C**

Test Point (V)	Readings at 23 °C	Readings at 0 °C	Observed Variation	Allowed Variation	Observed Variation (%)	Allowed Variation (%)
23.96	23.93 V	23.90 V	-0.030 V	1.378 V	-0.01	0.575
47.92	47.90 V	47.92 V	0.020 V	1.378 V	0.01	0.575
95.84	95.89 V	96.01 V	0.120 V	1.378 V	0.05	0.575
143.76	143.7 V	143.9 V	0.200 V	1.378 V	0.08	0.575
191.68	191.6 V	192.0 V	0.400 V	1.378 V	0.17	0.575
239.60	239.7 V	240.0 V	0.300 V	1.378 V	0.13	0.575
287.52	287.7 V	288.0 V	0.300 V	1.378 V	0.13	0.575

**7.2 Influence at 50°C**

Test Point (V)	Readings at 23 °C	Readings at 50 °C	Observed Variation	Allowed Variation	Observed Variation (%)	Allowed Variation (%)
23.96	23.93 V	23.90 V	-0.030 V	1.617 V	-0.01	0.675
47.92	47.90 V	47.85 V	-0.050 V	1.617 V	-0.02	0.675
95.84	95.89 V	95.74 V	-0.150 V	1.617 V	-0.06	0.675
143.76	143.7 V	143.8 V	0.100 V	1.617 V	0.04	0.675
191.68	191.6 V	191.5 V	-0.100 V	1.617 V	-0.04	0.675
239.60	239.7 V	239.8 V	0.100 V	1.617 V	0.04	0.675
287.52	287.7 V	287.4 V	-0.300 V	1.617 V	-0.13	0.675

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**Table 8: Influence Error resulting from Changes in Relative Air Humidity**


Test Point (V)	Readings at 50% RH	Readings at 90% RH	Observed Variation	Allowed Variation	Observed Variation (%)	Allowed Variation (%)
23.96	23.93 V	23.86 V	-0.070 V	2.396 V	-0.03	1.000
47.92	47.90 V	47.88 V	-0.020 V	2.396 V	-0.01	1.000
95.84	95.89 V	95.92 V	0.030 V	2.396 V	0.01	1.000
143.76	143.7 V	143.8 V	0.100 V	2.396 V	0.04	1.000
191.68	191.6 V	191.7 V	0.100 V	2.396 V	0.04	1.000
239.60	239.7 V	239.8 V	0.100 V	2.396 V	0.04	1.000
287.52	287.7 V	288.0 V	0.300 V	2.396 V	0.13	1.000


**Table 9: Measurement of Supply Voltage Consumption**

Aux Voltage (V), 50Hz	Current (mA)	Observed (VA)	Specified VA
315	14.652	4.615	--
300	13.885	4.166	--
240	11.008	2.642	3.0
200	9.015	1.803	--
110	5.329	0.586	--
80	2.910	0.233	--

**Table 10: Measurement of Input Consumption**

Input Voltage (V)	Current (uA)	Observed (VA)	Allowed VA
240.00	127.31	0.031	<0.3
287.50	152.35	0.044	<0.3

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ISSUE DATE: 11/03/2012

Page 11 of 14

**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

**Table 11: Influence due to continuous overload**

**Readings after test**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error (%)	Allowed Error (%)
10	23.96 V	23.90 V	-0.060 V	4.792 V	-0.03	2.00
20	47.92 V	47.88 V	-0.040 V	2.396 V	-0.02	1.00
40	95.84 V	95.80 V	-0.040 V	2.396 V	-0.02	1.00
60	143.76 V	143.9 V	0.140 V	2.396 V	0.06	1.00
80	191.68 V	191.8 V	0.120 V	2.396 V	0.05	1.00
100	239.60 V	239.6 V	0.000 V	2.396 V	0.00	1.00
120	287.52 V	287.8 V	0.280 V	4.792 V	0.12	2.00

**Table 12: Influence of short term overload**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error (%)	Allowed Error (%)
10	23.96 V	23.85 V	-0.110 V	4.792 V	-0.05	2.00
20	47.92 V	47.86 V	-0.060 V	2.396 V	-0.03	1.00
40	95.84 V	95.89 V	0.050 V	2.396 V	0.02	1.00
60	143.76 V	143.7 V	-0.060 V	2.396 V	-0.03	1.00
80	191.68 V	191.7 V	0.020 V	2.396 V	0.01	1.00
100	239.60 V	239.8 V	0.200 V	2.396 V	0.08	1.00
120	287.52 V	287.7 V	0.180 V	4.792 V	0.08	2.00

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**Table 13: Influence due to vibration**

**Readings after test**

Test Point % of range	Test Point	UUT Reading	Observed Error	Allowed Error	Observed Error (%)	Allowed Error (%)
10	23.96 V	23.86 V	-0.100 V	4.792 V	-0.04	2.00
20	47.92 V	47.86 V	-0.060 V	2.396 V	-0.03	1.00
40	95.84 V	95.91 V	0.070 V	2.396 V	0.03	1.00
60	143.76 V	143.7 V	-0.060 V	2.396 V	-0.03	1.00
80	191.68 V	191.7 V	0.020 V	2.396 V	0.01	1.00
100	239.60 V	239.8 V	0.200 V	2.396 V	0.08	1.00
120	287.52 V	287.7 V	0.180 V	4.792 V	0.08	2.00

**Table 14: Influence due to continuous operation**

Test Point (V)	Reading Before Test	Readings After 6 Hours	Observed Variation (%)	Allowed Variation (%)	(%) Error after 6 hr.	Allowed Error (%)
23.96	23.93 V	23.97 V	0.02	1.000	0.00	2.00
47.92	47.90 V	47.95 V	0.02	1.000	0.01	1.00
95.84	95.89 V	96.07 V	0.08	1.000	0.10	1.00
143.76	143.7 V	143.8 V	0.04	1.000	0.02	1.00
191.68	191.6 V	191.8 V	0.08	1.000	0.05	1.00
239.60	239.7 V	240.0 V	0.13	1.000	0.17	1.00
287.52	287.7 V	288.1 V	0.17	1.000	0.24	2.00

Prepared by:

Checked by:



**RISHABH**  
**INSTRUMENTS**

Measure, Control & Record with a Difference

TESTING, TRISHALA UNIT  
C-6, MIDC, Satpur,  
Nasik-422007,  
Ph: 0253-2202316

REPORT NO.:  
RIPL/TST/PT1112/041

ISSUE DATE: 11/03/2012

Page 13 of 14

**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

**Table 15: Verification of True RMS measurement**

**15.1 AT 50Hz Frequency**

Harmonic No	Amplitude (%)	Crest Factor	Rish master Reading (V)	Rish Eine Reading (V)	Observed Error (%)	Allowed Error (%)
1	-	1.41	239.4	239.3	-0.04	1.00
2	20	1.48	239.3	239.8	0.21	1.00
3	20	1.21	256.4	256.6	0.08	1.00
4	20	1.58	239.4	239.3	-0.04	1.00
5	20	1.66	239.4	239.7	0.13	1.00
6	20	1.62	239.3	239.6	0.13	1.00
7	20	1.54	239.4	239.7	0.13	1.00
8	20	1.64	239.6	239.7	0.04	1.00
9	20	1.66	239.2	239.7	0.21	1.00
10	20	1.65	239.3	239.4	0.04	1.00
11	20	1.61	239.3	239.4	0.04	1.00
12	20	1.65	239.4	239.8	0.17	1.00
13	20	1.66	239.4	239.7	0.13	1.00
14	20	1.66	239.3	239.7	0.17	1.00
15	20	1.63	239.2	239.3	0.04	1.00
3,5,7,15	20	1.44	239.4	239.5	0.04	1.00
2 to 15	10	1.67	239.4	239.7	0.13	1.00
2 to 15	15	2.24	239.4	239.6	0.08	1.00
2 to 15	20	2.68	237.7	239.1	0.58	1.00
2 to 15	20	2.68	237.9	239.9	0.83	1.00

Prepared by:

Checked by:



**RISHABH**  
**INSTRUMENTS**

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TESTING, TRISHALA UNIT  
C-6, MIDC, Satpur,  
Nasik-422007,  
Ph. 0253-2202316

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Page 14 of 14

**TEST REPORT – Rish Eine (1 Phase – 240V LN)**

**15.2 AT 60Hz Frequency**

Harmonic No	Amplitude (%)	Crest Factor	Rish master Reading (V)	Rish Eine Reading (V)	Observed Error (%)	Allowed Error (%)
1	-	1.41	239.6	239.7	0.04	1.00
2	20	1.48	239.6	239.5	-0.04	1.00
3	20	1.21	256.8	256.8	0.00	1.00
4	20	1.58	239.5	239.4	-0.04	1.00
5	20	1.66	239.5	239.4	-0.04	1.00
6	20	1.62	239.4	239.4	0.00	1.00
7	20	1.54	239.5	239.4	-0.04	1.00
8	20	1.64	239.6	239.4	-0.08	1.00
9	20	1.66	239.4	239.7	0.13	1.00
10	20	1.65	239.6	239.4	-0.08	1.00
11	20	1.61	239.5	239.3	-0.08	1.00
12	20	1.65	239.5	239.6	0.04	1.00
13	20	1.66	239.5	239.3	-0.08	1.00
14	20	1.66	239.5	239.7	0.08	1.00
15	20	1.63	239.6	239.7	0.04	1.00
3,5,7,15	20	1.44	239.2	239.7	0.21	1.00
2 to 15	10	1.67	239.4	239.7	0.13	1.00
2 to 15	15	2.24	239.3	239.4	0.04	1.00
2 to 15	20	2.68	238.4	239.8	0.58	1.00
2 to 15	20	2.68	238.6	239.4	0.33	1.00

Prepared by:

Checked by: