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TEST REPORT

NAME AND ADDRESS OF CUSTOMER:	**REPORT NO.:** RP-1617-049432 **DATE** : 24/01/2017	
Ashida Electronics Pvt. Ltd., Plot No. A-308, Road No.21, Wagle Industrial Estate, Thane-400604 Maharashtra, India.	**CUSTOMER REF. NO.:** Nil **DATED:** 12/01/2017	
	DATE OF SAMPLE RECEIPT	**DATE OF TESTING**
	12/01/2017	21/01/2017
SAMPLE DESCRIPTION: See Annexure-I Sheet No.2 of this report	**SAMPLE IDENTIFICATION:** See Annexure-I Sheet No.2 of this report	

TEST DETAILS	**TEST SPECIFICATION:**
Power frequency magnetic field	As per customer requirements & Procedure Followed as per Cl. No.7.2.10 of IEC 60255-26:2013,

Notes:
1) Only Power frequency magnetic field test has been carried out as per customer requirements.
2) Test was carried out with EUT in X, Y & Z direction of EUT.
3) The sample was tested under 'non-operate' condition as per customer requirements.
4) Operating procedure / conditions during the test & performance/acceptance criteria of the sample under test as specified by the customer are mentioned on sheet no.3, 4, 5 & 6 of this report.
5) The list of the major equipments used during the test is mentioned on sheet no.7 of this report.
6) Test set up block diagram is shown on sheet no.8 of this test report.
7) Photograph of test set up and sample description mention on EUT is shown on sheet no.13 & 14 of this test report.

REMARK: The sample conforms to the requirement as specified by the customer for the above-mentioned test.

WITNESSED BY: Mr. Prashant Patil - Ashida Electronics Pvt. Ltd., Thane.

PREPARED BY	**CHECKED BY**	**Dr. Vinod Gupta** **APPROVED BY**

Notes: 1.This report relates only to the particular sample received for testing in good condition at ERDA, Vadodara.
2. This report can not be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from the Director, ERDA.
4. Only the test asked for by the 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 arised.

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ANNEXURE–I

SAMPLE DESCRIPTION:	SAMPLE IDENTIFICATION:
ASHIDA Feeder Protection Relay CT : 1A / 5A PT : 63.5 VAC Freq.: 50 Hz / 60 Hz Aux Supply = 24 V to 230 V AC/DC	**Sr. No:** 16L245M0001 **Platform:** ADR24xB-M **ERDA Sample Code No.:** ERDA-00177845
Accessories used: • Doble - Model no.:F6150, Sr. No.: 060803068 • Laptop	

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Operating procedure of the sample under test as specified by the customer.

Sample / Equipment under Test (EUT)

EUT: Feeder Protection Relay
EUT Brief Description:
The EUT is a high performance Enhance Aditya M (Modular) protection relay platform, designed for highly electrical noisy substation environment. Following are some of the feature of this platform:

- High performance 32-Bit processor with Floating point Unit operating at 200MHz
- 8 Analogue input having 16 bit simultaneous sampling ADC, design for CT or PT
- 32 Digital Input / Output extended up to 64 Nos.
- RTD and 4-20mA analogue input
- Dual redundant Ethernet ports
- RS485 port
- 16 dual colour LEDs
- Breaker Close / Trip Push buttons
- Graphical Display

Operating Procedure:
Connect the Input supply 110V DC to the power supply terminal of EUT.

Pick up value Test:

- Connect current source at 1A current to input terminal.
- Set current setting value to 100% i.e. 1A, TMS at Minimum (x0.02) value and Curve setting to C1.
- Start current injector & increase current value till relay get pick up and trip.
- The operating value should be within 1 to 1.1 times of set pickup value.

Operating Time Test:

- Set current 2N i.e. 2A and connect trip contact to timer.
- Change the TMS setting at 1.00.
- Start the current injector and measure the operating time. The trip time value should be within ±12.5% of actual value. (Actual time 10.029 Sec.)

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Operating procedure/condition of EUT during the test as specified by the customer:

Continued....

Operating condition during the test:

- EUT shall be in "ON" condition during the test.
- Applied 110 VDC to Auxiliary supply input terminal.
- Applied 63.5 VAC to PT input terminals.
- During test, Set Current value less than trip value (<90%). i.e.0.9 A
- All Binary inputs are energized with 110V DC.
- RS485 communication will be in working condition.

Performance Criteria as specified by customer :
Following parameters should be monitored Before, During & After the test.

- 'ENABLE' LED (Green) should be continuously 'ON'.
- Display of EUT should not garbage, reset and hang-up.
- All programmable LEDs (15 Nos. dual color) should remain OFF.

Following parameters of EUT should be checked before & after the test.

	A Ph. Value	B Ph. Value	C Ph. Value	Earth	Tolerance
Pick Up					1-1.1 Amp
Operating Time (2 Amp)					8.77-11.29 Sec

Notes:

- During performance test of EUT, measured value shall be observed on Relay test unit (Doble)/Laptop.

Relay shall be considered to be stable subject to fulfillment of the performance criteria as specified by the customer.

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Acceptance criteria 'A' as per Table 23 of IEC 60255-26:2013 & acceptance criteria 'A' as per Tables 3 item no.3.3 of IEC 60255-26:2013 for 30 A/m		
Function	Conditions for acceptance	As specified by customer
Protection	Normal performance within the specification limits, during and after the test	• The relay should remain stable during the test. • No false indication should be observed on EUT before, during and after the test.
Command and control	Normal performance within the specification limits, during and after the test	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 should not operate, which shall be checked through trip LED. (i.e. LED should be OFF)
Measurement	No degradation during test.	• The operating value should be within 1 to 1.1 times of set pickup value before & after the test. • The trip time value should be within ±12.5% of actual value. (Actual time 10.029 Sec.) before & after the test.
Integral human-machine interface and visual alarms	No degradation or no loss of function during the test. No loss of stored data.	**'Non operate' condition :** • ENABLED LED should be continuously 'ON' & all other LEDs should be 'OFF' before, during and after the test.
Data communication[b]	Possible bit error rate increase but no loss of transmitted data.	Not applicable
Binary input, binary output and output contacts	No unwanted change of status is allowed during the test[a].	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 should not operate, which shall be checked through trip LED. (i.e. LED should be OFF)

a For binary input the manufacture shall state the minimum filtering value for which the test was successful.
b Excluding communication ports for protection or control functionality. For those acceptance criteria see protection or command and control.

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Acceptance criteria 'B' as per Table 23 of IEC 60255-26:2013 & acceptance criteria 'B' as per Tables 3 item no.3.3 of IEC 60255-26:2013 for 300 A/m		
Function	Conditions for acceptance	As specified by customer
Protection	Normal performance within the specification limits, during and after the test	• The relay should remain stable during the test. • No false indication should be observed on EUT before, during and after the test.
Command and control	Normal performance within the specification limits, during and after the test	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 should not operate, which shall be checked through trip LED. (i.e. LED should be OFF)
Measurement	Temporary degradation during the test, with self-recovery at the end of the test. No loss of store data.	• The operating value should be within 1 to 1.1 times of set pickup value before & after the test. • The trip time value should be within ±12.5% of actual value. (Actual time 10.029 Sec.) before & after the test.
Integral human-machine interface and visual alarms	Temporary degradation or loss of function during the test, with self-recovery at the end of the test. No loss of store data.	**'Non operate' condition :** • ENABLED LED should be continuously 'ON' & all other LEDs should be 'OFF' before, during and after the test.
Data communication[b]	Possible bit error rate increase but no loss of transmitted data.	Not applicable
Binary input, binary output and output contacts	No unwanted change of status is allowed during the test[a].	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 should not operate, which shall be checked through trip LED. (i.e. LED should be OFF)
a For binary input the manufacture shall state the minimum filtering value for which the test was successful. b Excluding communication ports for protection or control functionality. For those acceptance criteria see protection or command and control.		
PREPARED BY T Shukla	**CHECKED BY**	

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LIST OF THE MAJOR EQUIPMENTS USED DURING THE TEST

Sr. No	Details of equipments used	Specifications	Traceability
1.	EMC Compact Generator (Magnetic field part) with Magnetic Field Coil MF-1000-3-1510 MF-1000-1-1522 • ERDA Sr. No: 17066, 17071 & 17072 • Validity of Calibration till date: 18/12/2018	1mx1m for magnetic fields test AC magnetic fields (50/60Hz) 0.3 up to 1kA/m Continuous:max.500 A/m Short time 3s: max. 1050 A/m Antenna factor H/A:0.87	Calibration results are traceable to NPL, New Delhi.
2	Relay Test Unit (provided by customer) ▪ Sr. No. 060803068 ▪ Make: Doble ▪ Validity of calibration till date: 03.03.2017	AC Amplitude Accuracy at 50/60 Hz Voltage & Current Sources: Accuracy: Typically 0.02% of Rdg Timers and Triggers Accuracy: ± 0.0005% of Rdg, ± 50µsec.	Calibration results are traceable to National Standards

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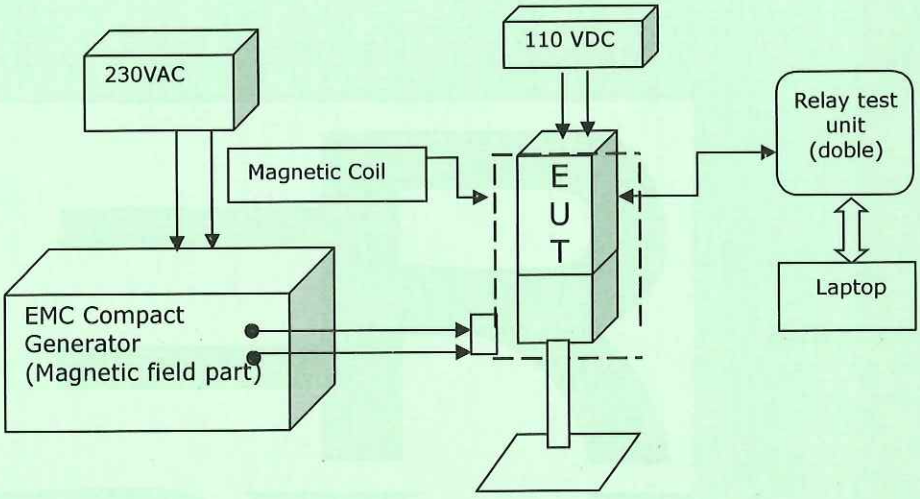

Test set up block diagram for Power frequency magnetic field immunity test.

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Sr. No.	Particular of test and Cl. No.	Requirement as per customer specifications	Obtained value	Remarks
	Power frequency magnetic field test as per customer requirement & test procedure followed as per Cl. No.7.2.10 of IEC 60255-26: 2013	The test procedure shall be followed as per clause 7.2.10 of IEC 60255-26: 2013 & IEC 61000-4-8: 2009. Test Specifications as per item 3.3 of table no. 3 of IEC 60255-26:2013 are mentioned below. Magnetic field strength: 30A/m Duration of the test for each axis: 60 Sec. Magnetic field strength: 300A/m Duration of the test for each axis: 3 Sec. The test shall be carried out on EUT to the field with different orientations. The performance test shall be carried out on EUT before and after test. Test voltage shall be applied under 'non-operate' condition of EUT. Performance criteria and acceptance criteria as specified by customer are mentioned on sheet no. 4, 5 & 6 of this report.	The EUT was energized & operated as specified on sheet no. 3 & 4 of this report. The EUT was tested under 'non-operate' condition. 110VDC was applied to Auxiliary power supply of the EUT through power supply. Performance test was carried out on EUT before & after test. The obtained values are mentioned on Annexure-III of this report. The observed parameters before, during & after test are mentioned on sheet no.10 & 11 of this report.	Conforms

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Observed parameters

Performance test was carried out on the EUT in 'Non-operate' condition. Following parameters were checked before, during and after the test on EUT for 30 A/m

Function	Conditions for acceptance	As specified by customer
Protection	Normal performance within the specification limits, during and after the test	• The relay remained stable during the test. • No false indication was observed on EUT before, during and after the test.
Command and control	Normal performance within the specification limits, during and after the test	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 did not operate, which was checked through trip LED. (i.e. LED was OFF)
Measurement	No degradation during test.	• The operating value was within 1 to 1.1 times of set pickup value before & after the test. • The trip time value was within ±12.5% of actual value. (Actual time 10.029 Sec.) before & after the test.
Integral human-machine interface and visual alarms	No degradation or no loss of function during the test. No loss of stored data.	**'Non operate' condition :** • ENABLED LED was continuously 'ON' & all other LEDs was remained 'OFF' before, during and after the test.
Data communication[b]	Possible bit error rate increase but no loss of transmitted data.	Not applicable
Binary input, binary output and output contacts	No unwanted change of status is allowed during the test[a].	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 did not operate, which was checked through trip LED. (i.e. LED was OFF)

a For binary input the manufacture shall state the minimum filtering value for which the test was successful.
b Excluding communication ports for protection or control functionality. For those acceptance criteria see protection or command and control.

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Observed parameters

Performance test was carried out on the EUT in 'Non-operate' condition. Following parameters were checked before, during and after the test on EUT for 300 A/m

Function	Conditions for acceptance	As specified by customer
Protection	Normal performance within the specification limits, during and after the test	• The relay remained stable during the test. • No false indication was observed on EUT before, during and after the test.
Command and control	Normal performance within the specification limits, during and after the test	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 did not operate, which was checked through trip LED. (i.e. LED was OFF)
Measurement	Temporary degradation during the test, with self-recovery at the end of the test. No loss of store data.	• The operating value was within 1 to 1.1 times of set pickup value before & after the test. • The trip time value was within ±12.5% of actual value. (Actual time 10.029 Sec.) before & after the test.
Integral human-machine interface and visual alarms	Temporary degradation or loss of function during the test, with self-recovery at the end of the test. No loss of store data.	**'Non operate' condition :** • ENABLED LED was continuously 'ON' & all other LEDs was remained 'OFF' before, during and after the test.
Data communication[b]	Possible bit error rate increase but no loss of transmitted data.	Not applicable
Binary input, binary output and output contacts	No unwanted change of status is allowed during the test[a].	**'Non-operate' condition:** • Before, during and after the test, assigned general pick up contact output 3 did not operate, which was checked through trip LED. (i.e. LED was OFF)

a For binary input the manufacture shall state the minimum filtering value for which the test was successful.
b Excluding communication ports for protection or control functionality. For those acceptance criteria see protection or command and control.

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Annexure-III
Obtained values

Before Test:

	A Ph. Value	B Ph. Value	C Ph. Value	Earth	Tolerance
Pick Up	1.05 A	1.06 A	1.05 A	1.06 A	1-1.1 Amp
Operating Time (2 Amp)	10.06 sec	10.07 sec	10.09 sec	10.06 sec	8.77-11.29 Sec

After Test:

	A Ph. Value	B Ph. Value	C Ph. Value	Earth	Tolerance
Pick Up	1.05 A	1.05 A	1.06 A	1.06 A	1-1.1 Amp
Operating Time (2 Amp)	10.05 sec	10.06 sec	10.08 sec	10.06 sec	8.77-11.29 Sec

Note: During performance test of sample, measured values were observed on Relay test unit (Doble)/Laptop.

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Test set up photograph for Power frequency magnetic field

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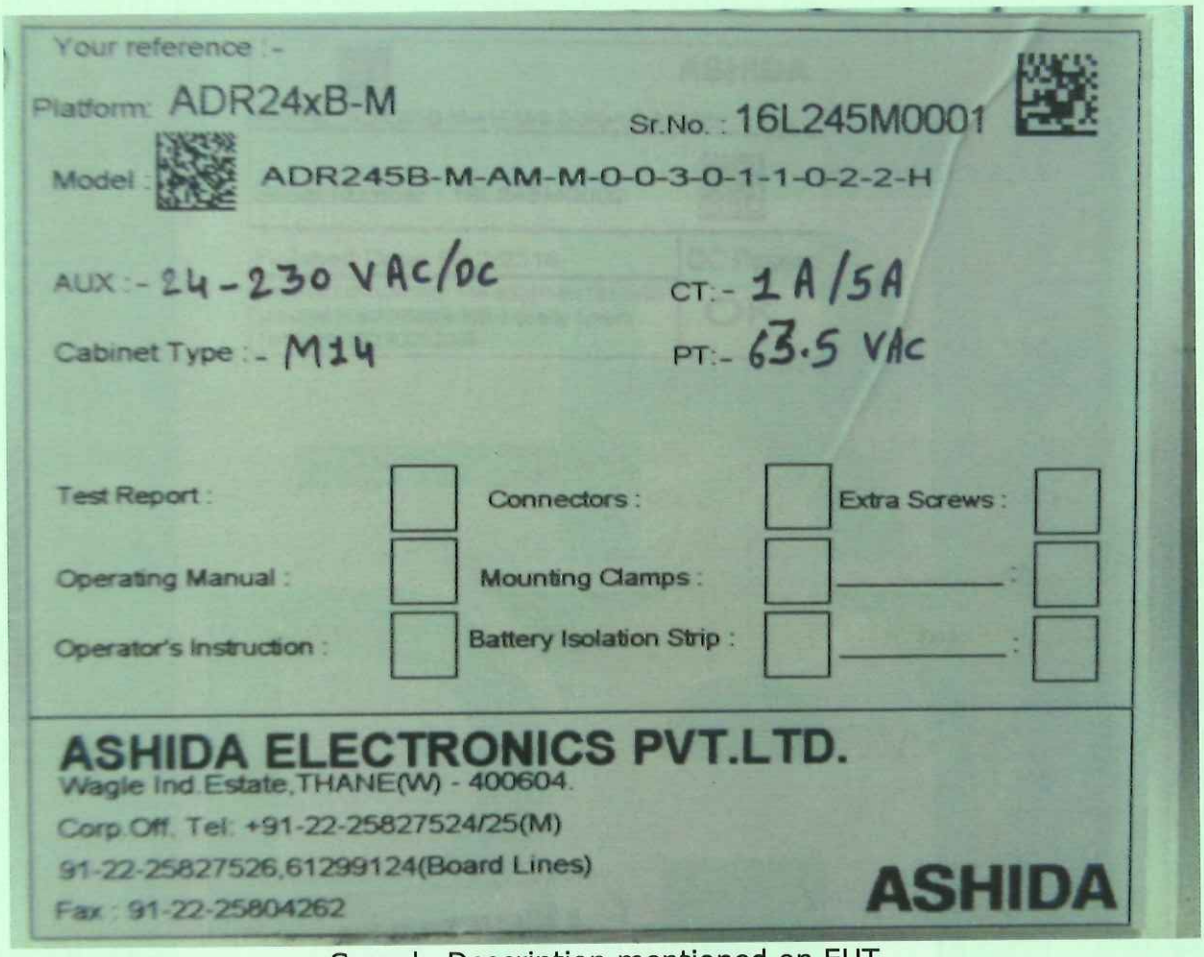

Sample Description mentioned on EUT

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