Certificate No. : TC-5389

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
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Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT

NAME & ADDRESS OF CUSTOMER	**REPORT NO.:** RP-1819-017987 **DATE** : 07/08/2018
M/s. Epoxy Terminal & Equipment Pvt. Ltd. Plot No : 6B, Phase –III APIIC, IDA, Pashamylaram, Medak, Telangana India 502 307	**CUSTOMER REF. NO.:** NIL **DATED** : 08/06/2018
	DATE OF SAMPLE RECEIPT: 08/06/2018 **DATE OF TESTING**: 02/07/2018 to 27/07/2018

SAMPLE DESCRIPTION	**SAMPLE IDENTIFICATION**
1.1 kV 630 A L.T Transformer Bushing Rated Voltage : 1.1kV Rated Current : 630 A Embossing : ETE	Serial No. : 11/230518/B Make : M/s. Epoxy Terminal & Equipment Pvt. Ltd. Year of Mfg.: 2018 ERDA S.C. No.: ERDA-00261840

TEST DETAIL
As per **SHEET NO.:** 2 OF 9

TEST SPECIFICATION
As per customer requirement & test procedure followed as per IS: 2099 - 1986

ENCLOSURES:DRG. No.: ETB-0002REV 1

TEST WITNESSED BY: Mr. Ulpesh Parmar - M/s. Epoxy Terminal & Equipment Pvt. Ltd.

REMARKS: As per **SHEET NO.:** 3 OF 9 to 8 OF 9

PREPARED BY **CHECKED BY** **A.S.Khopkar** **APPROVED BY**

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2. This report cannot be reproduced in part under any circumstances.
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TEST DETAIL :

1 Routine Test before type test.

1.1 Dry power-frequency withstand voltage test
1.2 Measurement of partial discharge quantity

2 Type test

2.1 Wet Power Frequency Voltage withstand test
2.2 Dry lightning impulse voltage withstand test
2.3 Cantilever load Withstand Test

3 Routine Test after type test

3.1 Dry power-frequency withstand voltage test
3.2 Measurement of partial discharge quantity

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REPORT NO.: RP-1819-017987 **SHEET NO.:** 3 OF 9
DATE : 07/08/2018

Routine Test before type test

Sr. No.	Test Conducted (Cl.No. & IS)	Test Requirement	Obtained Results	Remark
Atmospheric condition:		Dry bulb Temperature : 29.0 °C Wet bulb Temperature : 24.0 °C Atmospheric Pressure : 741.2 mm of Hg		
1.1	**Dry power frequency withstand voltage test** (As per customer requirement & test procedure followed as per cl. no. 11.13 of IS: 2099 - 1986)	The power frequency voltage of 5 kVrms shall be applied between the H.V. terminal of bushing & earth. The test duration shall be 60s. No flashover or puncture shall be occurred during the test.	The power frequency voltage of 5 kVrms was applied between the H.V. terminal of bushing & earth. The test duration was 60s. No flashover or puncture was occurred during the test.	Conforms
1.2	**Measurement of partial discharge quantity** (As per customer requirement & test procedure followed as per cl. no. 11.14 of IS: 2099 - 1986) Measurement of partial discharge quantity shall be carried out - At 1.5Um/√3 = 0.6 kV - At 1.05Um/√3 = 1.2 kV	 Max. 10 pC Max. 100 pC	 01 pC 01 pC	 Conforms Conforms

S.M

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Atmospheric condition :

Dry bulb Temperature	: 29.0 °C
Wet bulb Temperature	: 24.0 °C
Atmospheric Pressure	: 741.2 mm of Hg

2.1 Wet Power Frequency Voltage withstand test

(As per customer requirement & test procedure followed as per cl. no. 11.3 of IS: 2099 - 1986)

Test requirement:

The test Voltage of 5 kVrms corrected to reference atmospheric condition is applied between the H.V. terminals & earth for one minute duration under artificial rainfall condition.

REMARKS: Conforms.

2.2 Dry lightning impulse voltage withstand test

(As per customer requirement & test procedure followed as per cl. no. 11. 4 of IS: 2099 - 1986)

Test Parameters:

Rated Voltage : 1.1 kV
Test Voltage : 20 kVp ± 3%
No. of Shots to be applied: 15 +ve & 15 –ve Polarity shots

Test Observation:

Calibration Pulse : 12.063 kVp, Wave Shape: 1.256 / 47.805 μs
No. of Shots applied : Calibration pulse, 15 +ve & 15 –ve Polarity shots
No. of Shots recorded : Calibration pulse, First & Last shot (for both polarity)

No. of Shot	Test Voltage Applied in kVp	
	Positive Polarity	Negative Polarity
1.	20.351	20.183
2.	20.393	20.031
3.	19.550	20.076
4.	20.272	19.833
5.	19.768	20.186
6.	19.708	20.385
7.	19.750	19.809
8.	20.475	19.947
9.	19.661	20.025
10.	19.992	20.305
11.	20.258	20.424
12.	19.726	20.145
13.	19.906	20.178
14.	19.942	20.170
15.	20.402	20.134

REMARKS: Conforms.

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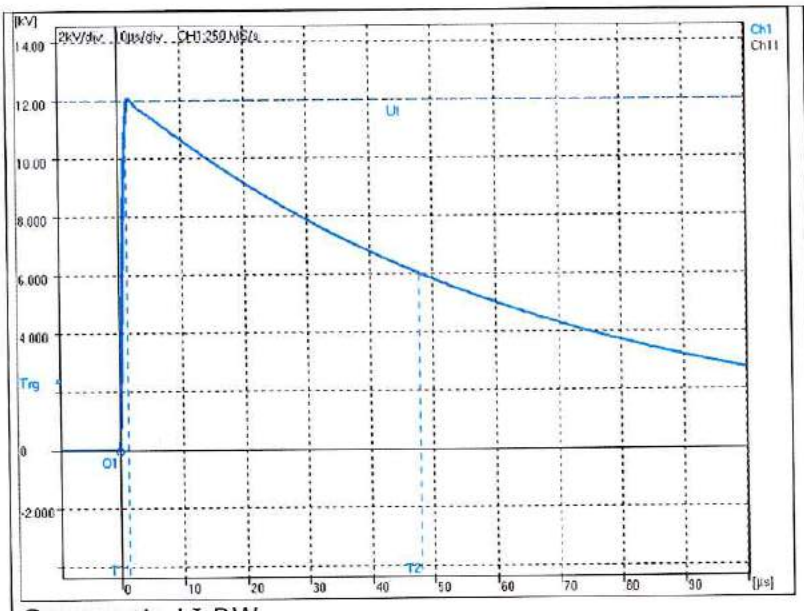
TEST REPORT NO. : RP-1819-017987 **SHEET NO.:** 5 of 9
DATE : 07/08/2018

DRY LIGHTNING IMPULSE VOLTAGE WITHSTAND TEST



Comment: LI RW

CALIBRATION PULSE
U_p = 12.06 kV
T_1 = 1.26 µs
T_2 = 47.80 µs
T_c = µs

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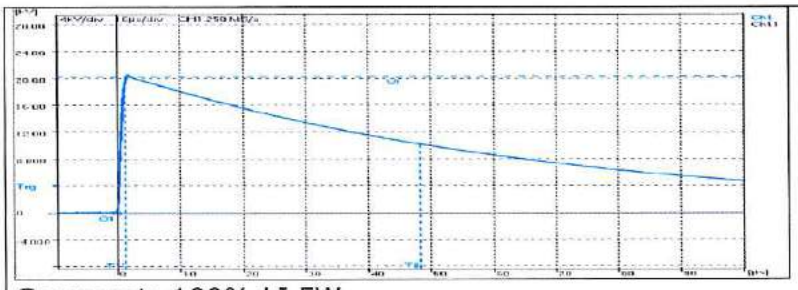
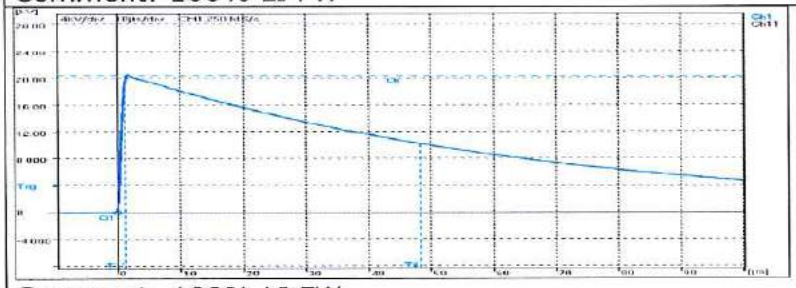
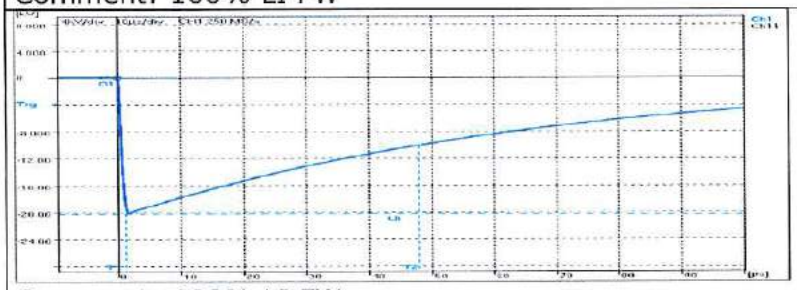
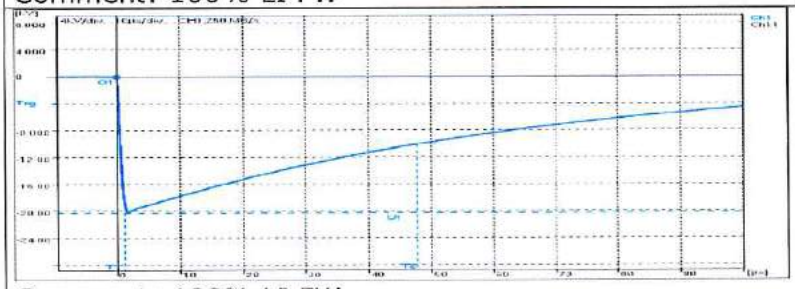
TEST REPORT NO. : RP-1819-017987 **SHEET NO.:** 6 of 9
DATE : 07/08/2018

DRY LIGHTNING IMPULSE VOLTAGE WITHSTAND TEST

 Comment: 100% LI FW	**FIRST SHOT** U_p = 20.35 kV T_1 = 1.25 µs T_2 = 48.38 µs T_c = µs
 Comment: 100% LI FW	**LAST SHOT** U_p = 20.40 kV T_1 = 1.25 µs T_2 = 48.38 µs T_c = µs
 Comment: 100% LI FW	**FIRST SHOT** U_p = -20.18 kV T_1 = 1.25 µs T_2 = 47.93 µs T_c = µs
 Comment: 100% LI FW	**LAST SHOT** U_p = -20.13 kV T_1 = 1.25 µs T_2 = 47.88 µs T_c = µs

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TEST REPORT NO: RP-1819-017987 **SHEET No.** 7 OF 9
DATE : 07/08/2018

Sr. No.	Particular of Tests & Cl. No.	Requirement as per Specification	Obtained Value/ Observation	Remarks
2.3	**Cantilever load withstand test** [Cl. No. 11.10 of IS 2099 & as per customer's requirement] (The load of 1000 N* applied perpendicular to the axis of the bushing at the mid-point of the terminal for one minute) ERDA-00261840	The bushing shall be considered to have passed the test if there is no evidence of damage (deformation or rupture) and if it has withstood a repetition of routine tests without significant change from previous results.	No evidence of damage was observed in bushing and bushing withstood repetition of routine tests (Dry power frequency withstand voltage test and Measurement of partial discharge quantity) without any significant change from previous results.	Conforms

Note: "*" As specified by customer.

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REPORT NO.: RP-1819-017987 **SHEET NO.:** 8 OF 9
DATE : 07/08/2018

Routine Test after type test

Sr. No.	Test Conducted (Cl. No. & IS)	Test Requirement	Obtained Results	Remarks
Atmospheric condition:		Dry bulb Temperature : 29.0 °C Wet bulb Temperature : 25.0 °C Atmospheric Pressure : 743.2 mm of Hg		
3.1	**Dry power frequency withstand voltage test** (As per customer requirement & test procedure followed as per cl. no. 11.13 of IS: 2099 - 1986)	The power frequency voltage of 5 kVrms shall be applied between the H.V. terminal of bushing & earth. The test duration shall be 60s. No flashover or puncture shall be occurred during the test.	The power frequency voltage of 5 kVrms was applied between the H.V. terminal of bushing & earth. The test duration was 60s. No flashover or puncture was occurred during the test.	Conforms
3.2	**Measurement of partial discharge quantity** (As per customer requirement & test procedure followed as per cl. no. 11.14 of IS: 2099 - 1986) Measurement of partial discharge quantity shall be carried out - At 1.5Um/√3 = 0.6 kV - At 1.05Um/√3 = 1.2 kV	 Max. 10 pC Max. 100 pC	 01 pC 01 pC	 Conforms Conforms
	Change in measurement of partial discharge quantity Change in partial discharge quantity - At 1.5Um/√3 = 0.6 kV - At 1.05Um/√3 = 1.2 kV	 ≤ 05 pC# ≤ 05 pC#	 0 pC 0 pC	 Conforms Conforms

Note: "#" Requirement of change in measurement of partial discharge quantity was specified by customer.

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TEST REPORT NO. : RP-1819-017987 **SHEET NO.:** 9 of 9
DATE : 07/08/2018

PHOTOGRAPH OF TEST SAMPLE

PHOTOGRAPH OF NAME PLATE

PREPARED BY

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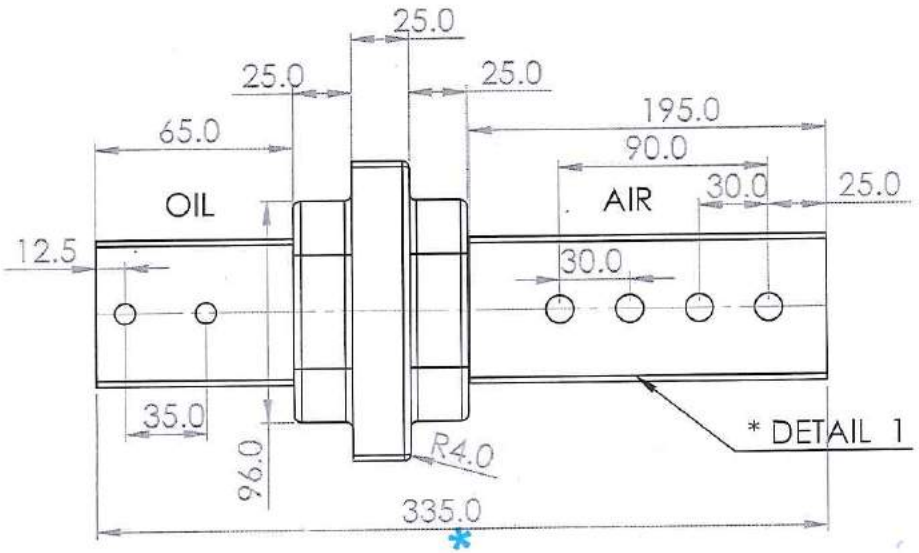
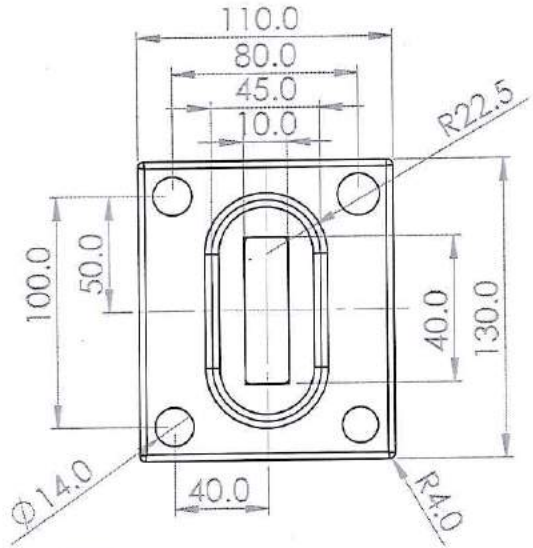
TC 2576037





Test Report No. RI-1819-017987
Date : 07/08/2018
Product : 1.1 kV 630A L-T X'mer Bushing
Verified By : S.M
Verification of this drawing by ERDA is limited to relevent dimentional checks only. Verified dimensions are marked with. *

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S.NO	Description	value
1	RATED VOLTAGE	1.1 Kv
2	one min.DRY FREQUENCY WITH STAND VOLTAGE	5.0 Kv
3	CREEPAGE DISTANCE	*50 mm
4	MAX CURRENT	630A
5	COPPER FLAT DIMENSION TOLARANCE	IS 613-2008
6	COPPER AND EPOXY DIMENSION TOLARANCE	IS 2102-1993
7	ELECTRICAL SPECIFICATION	IS 2099-1986
8	ELECTRO TIN PLATING	12 - 15 µ
9	COLOUR CODE	RAL 2001
10	COPPER FLAT GRADE	CuETP ,HB CONFORMING toIS:191-2007

NOTE:
1) KNURLING /SHOT BLASTING /ANY SUITABLE SURFACE TREATMENT TO ENSUURE LEAK PROOF JOINT BETWEEN COPPER FLAT AND EPOXY.
2) EPOXY CAST ASSEMBLY SHOULD NOT LEAK AT 90°C In transformer oil to IS:335-1983 AT 1 KG /SQ.MM.
3) GLASS TRANSITION TEMPERATURE SHELL BE : 105-120°C.
4) PRODUCT MUST BE FREE FROM SURFACE DEFECT .

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
detail 1	ETB 0002-1		1

EPOXY TERMINAL AND EQUIPMENT PVT. LTD.

PLOT 68 ,PHASE III , IDA PASHAMAILARAM, PATANCHERU, SANGAREDDY, TELANGANA - 502 307.

Date :	09/02/2018	TITLE: TRANSFORMER LT BUSHING (1.1KV 630AMPS)	
Drawn by:	PANKAJ		
Checked by	RK		
Approved by	RAGHU		
REV - 0	09/12/2013	DWG NO. ETB- 0002	REV 1
NOTE: All Dimensions Are in mm			