Certificate No. : TC-5389

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E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT

SHEET NO.: 1 OF 9

NAME & ADDRESS OF CUSTOMER **M/s. Epoxy Terminal & Equipment Pvt. Ltd.** Plot No : 6B, Phase –III APIIC, IDA, Pashamylaram, Medak, Telangana India 502 307	**REPORT NO.:** RP-1819-021280 **DATE** : 29/08/2018 **CUSTOMER REF. NO.:** NIL **DATED** : 08/06/2018
	DATE OF SAMPLE RECEIPT: 08/06/2018 **DATE OF TESTING**: 02/07/2018 to 13/08/2018
SAMPLE DESCRIPTION **1.1 kV 5000 A Epoxy Bushing** Rated Voltage : 1.1 kV Rated Current : 5000 A Embossing : ETE Insulator Glaze : Epoxy	**SAMPLE IDENTIFICATION** Serial No. : 02/17052018/A Make : M/s. Epoxy Terminal & Equipment Pvt. Ltd. Year of Mfg.: 2018 ERDA S.C. No.: ERDA-00261845
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 0010 REV 1

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

REMARKS:As per **SHEET NO.:** 3 OF 9, 4 OF 9, 7 OF 9 & 8 OF 9

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

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REPORT NO.: RP-1819-021280 **SHEET NO.:** 2 OF 9
DATE : 29/08/2018

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 Dry lightning impulse voltage withstand test
2.2 Wet Power Frequency 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-1819-021280 **SHEET NO.:** 3 OF 9
DATE : 29/08/2018

Routine Test before type test
Atmospheric condition:
Dry bulb Temperature : 28.0 °C
Wet bulb Temperature : 24.0 °C
Atmospheric Pressure : 741.3 mm of Hg

Sr. No.	Test Conducted (Cl.No. & IS)	Test Requirement	Obtained Results	Remark
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

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REPORT NO.: RP-1819-021280 **SHEET NO.:** 4 OF 9
DATE : 29/08/2018

Atmospheric condition :
Dry bulb Temperature : 28.0 °C
Wet bulb Temperature : 24.0 °C
Atmospheric Pressure : 741.3 mm of Hg

2.1 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 : 12.556 kVp, Wave Shape: 1.455 / 46.579 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.	20.155	20.023
2.	19.495	20.438
3.	19.765	20.017
4.	19.622	19.529
5.	19.588	19.763
6.	20.335	19.954
7.	20.224	20.048
8.	19.802	19.829
9.	20.192	20.282
10.	19.945	19.748
11.	19.848	20.062
12.	19.579	19.824
13.	19.945	19.923
14.	20.209	19.786
15.	20.229	20.048

REMARKS: Conforms.

2.2 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.

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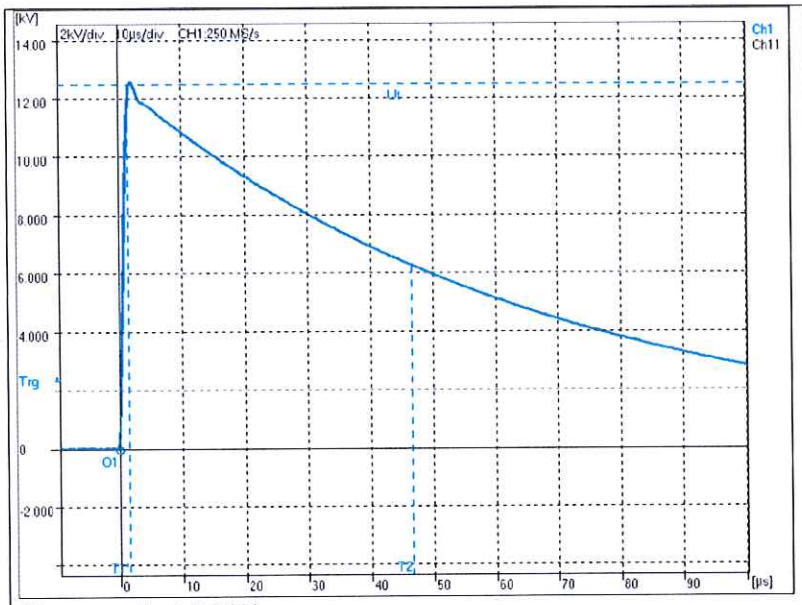
TEST REPORT NO. : RP-1819-021280 **SHEET NO.:** 5 of 9
DATE : 29/08/2018

DRY LIGHTNING IMPULSE VOLTAGE WITHSTAND TEST



Comment: LI RW

CALIBRATION PULSE
U_p = 12.56 kV
T_1 = 1.46 µs
T_2 = 46.58 µs
T_c = µs

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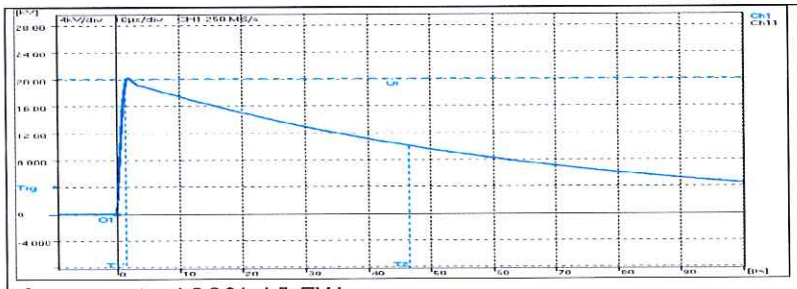
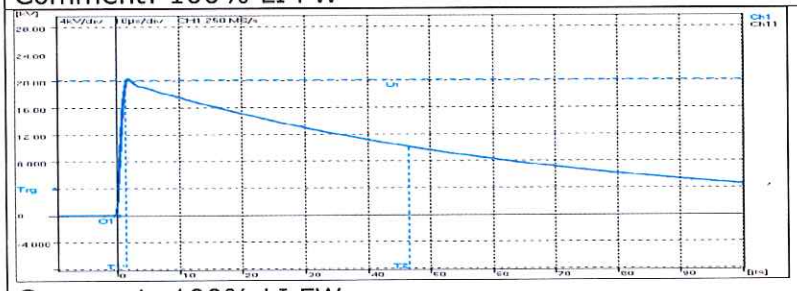
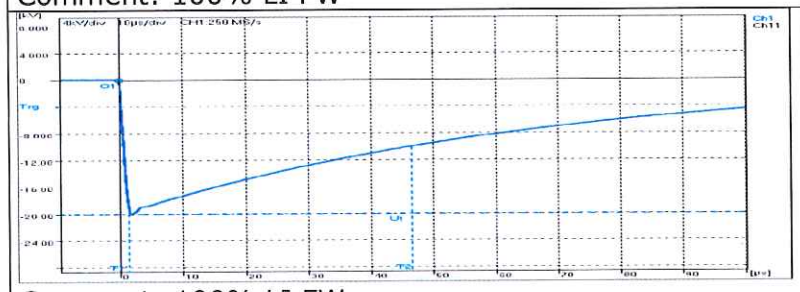
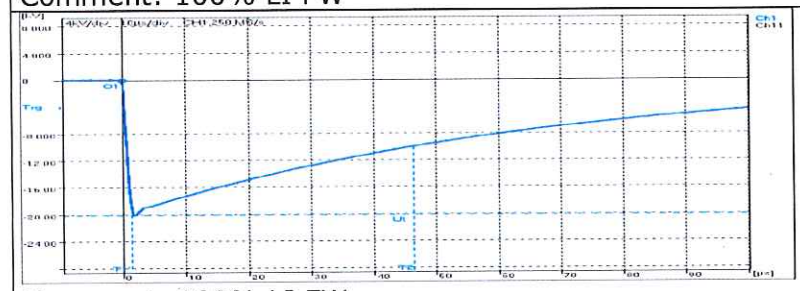
TEST REPORT NO. : RP-1819-021280 **SHEET NO.:** 6 of 9
DATE : 29/08/2018

DRY LIGHTNING IMPULSE VOLTAGE WITHSTAND TEST

 Comment: 100% LI FW	**FIRST SHOT** U_p = 20.15 kV T_1 = 1.44 µs T_2 = 46.60 µs T_c = µs
 Comment: 100% LI FW	**LAST SHOT** U_p = 20.22 kV T_1 = 1.44 µs T_2 = 46.63 µs T_c = µs
 Comment: 100% LI FW	**FIRST SHOT** U_p = -20.02 kV T_1 = 1.44 µs T_2 = 46.67 µs T_c = µs
 Comment: 100% LI FW	**LAST SHOT** U_p = -20.05 kV T_1 = 1.44 µs T_2 = 46.51 µs T_c = µs

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TEST REPORT NO: RP-1819-021280 **SHEET No.** 7 OF 9
DATE : 29/08/2018

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 3150 N* applied perpendicular to the axis of the bushing at the mid-point of the terminal for one minute) ERDA-00261845	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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Mechanical & Insulating Materials Division * Vadodara *

TC 2603335

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Routine Test after type test
Atmospheric condition:
Dry bulb Temperature : 28.0 °C
Wet bulb Temperature : 23.0 °C
Atmospheric Pressure : 742.5 mm of Hg

Sr. No.	Test Conducted (Cl.No. & IS)	Test Requirement	Obtained Results	Remarks
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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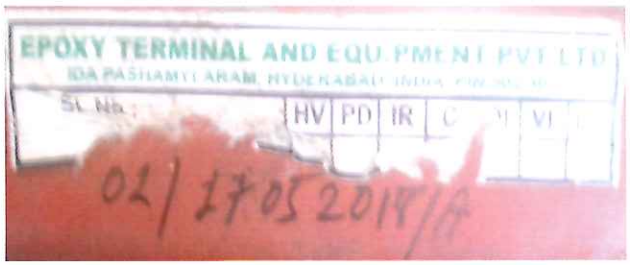
TEST REPORT NO.:RP-1819-021280 **SHEET NO.:** 9 of 9
DATE : 29/08/2018

PHOTOGRAPH OF TEST SAMPLE

PHOTOGRAPH OF NAME PLATE



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Impulse Laboratory H.V. Division Vadodara

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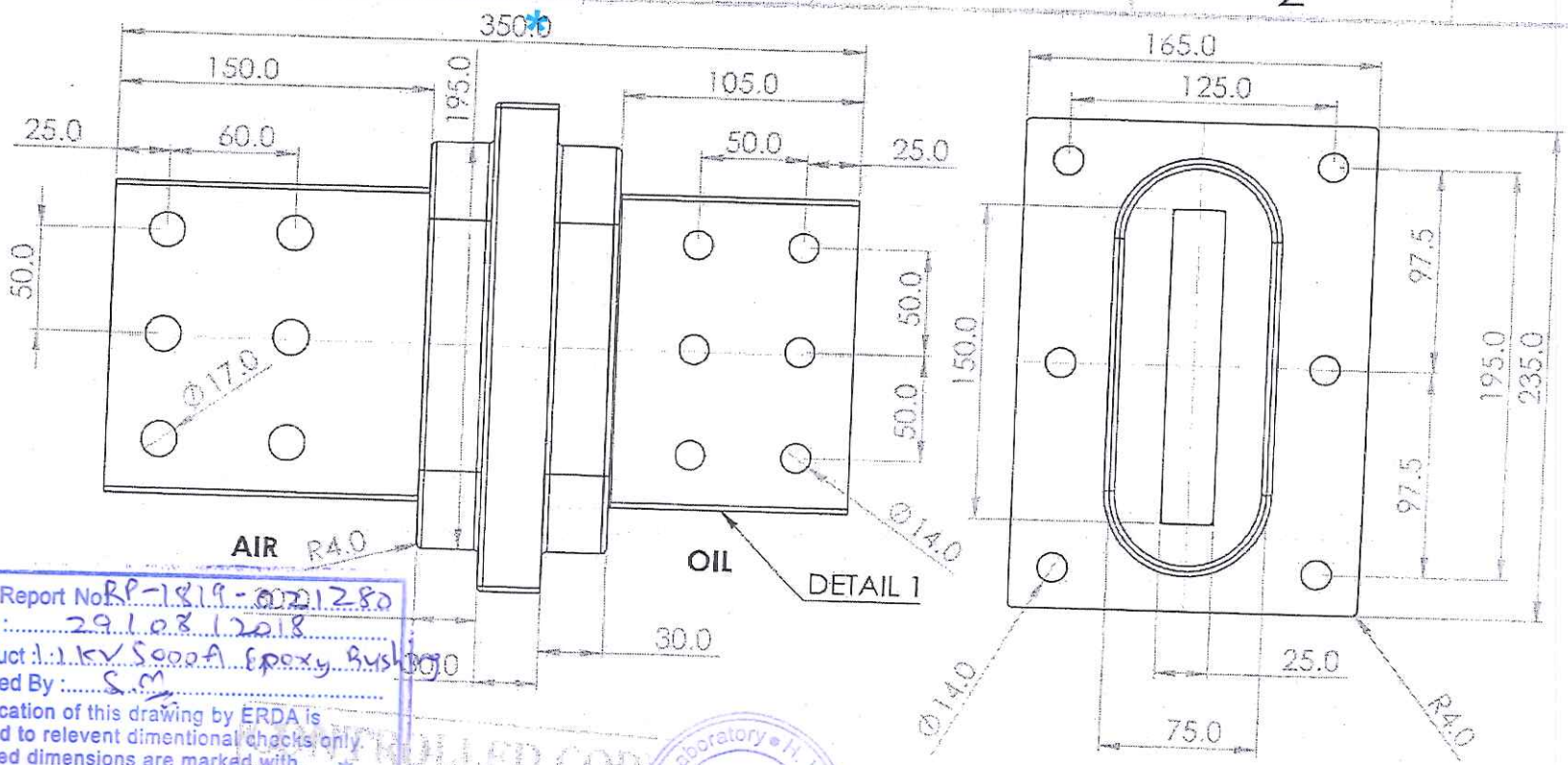
TC 2599604



Test Report No: RP-1819-0021280
Date: 29.08.2018
Product: 1.1 KV 5000A Epoxy Bush
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	-
3	CREEPAGE DISTANCE	40 mm (min)
4	MAX CURRENT	5000A
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	QTY.
1	ETB-0010 -1	1

EPOXY TERMINAL AND EQUIPMENT PVT. LTD.
PLOT 6B ,PHASE III , IDA PASHAMAILARAM, PATANCHERU, SANGAREDDY, TELANGANA - 502 307.

Date :	09/02/2018
Drawn by:	PANKAJ
Checked by	RK
Approved by	RAGHU
REV - 0	09/12/2013

NOTE: All Dimensions Are in mm

TITLE: EPOXY BUSHING ASSEMBLY (1.1K.V, 5000A)

DWG NO. ETB-0010

REV 1