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TEST REPORT

NAME & ADDRESS OF CUSTOMER	REPORT NO.: RP-1819-010640 DATE: 19.06.2018	
M/s. RAJASTHAN POWERGEN TRANSFORMER PVT.LTD. KHASRA NO.911-914, KAROLA-BHINMAL ROAD, KAROLA,SANCHORE,-343041 RAJASTHAN.	**CUSTOMER REF. NO.** RPTPL/Type Test/ ERDA/001	**DATED:** 26.04.2018
	DATE OF SAMPLE RECEIPT:	**DATE OF TESTING:**
	26.04.2018	02.05.2018 to 25.05.2018

SAMPLE DESCRIPTION	SAMPLE IDENTIFICATION
5 kVA, Single Phase Distribution transformer (Sealed Type) 11000/√3/240 Volts, 0.79/20.83 Amps., Oil filled, **Energy efficiency level : 2** Further details as per sheet No. 3 of 25	**ERDA SAMPLE CODE NO.:** ERDA-00254262 **SERIAL NO.:** RPTPL/5KVA/CU/18-19/001 **YEAR OF MFG.:** 2018

TEST DETAILS
As per sheet 4 OF 25.

TEST SPECIFICATIONS
As per sheet 4 OF 25.

ENCLOSURES: As per sheet 2 OF 25.

REMARKS: On respective sheets from 5 OF 25 to 25 OF 25.

PREPARED BY **CHECKED BY** **APPROVED BY**
Kapil J. Sharma

NOTE:
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TEST REPORT NO : RP-1819-010640
DATE: 19.06.2018

Contents	
1. Oscillogram No.	0143/01 to 0143/05
2. Photograph No.	1819-001542/0194
3. Test circuit diagram No.	OLSC/DTC/05
4. Drawing No.	1) RPTPL/RP/04 Rev.:01 Sheet no.01 2) RPTPL/OGA/04 Rev.:01 Sheet no.01 3) RPTPL/IC/04 Rev.:01 Sheet no.01

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TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER

1.	Name of manufacturer	: **RAJASTHAN POWERGEN TRANSFORMER PVT.LTD.**
2.	Equipment	: **5 kVA Single Phase Distribution Transformer**
3.	Standard No.	: IS 1180 (Part 1): 2014 [Amendment No. 1& 2],IS 2026 (Part 1): 2011 & IS 2026 (Part 10): 2009
4.	Serial No.	: RPTPL/5KVA/CU/18-19/001
5.	Energy efficiency level	: 2
6.	Type	: Outdoor, Oil cooled, Sealed Type
7.	kVA rating	: 5
8.	Rated voltage H.V.(volts)	: 11000/√3
	L.V. (volts)	: 240
9.	Rated current H.V. (Amp.)	: 0.79
	L.V.(Amp.)	: 20.83
10.	Number of phases	: 1
11.	Frequency (Hz.)	: 50 Hz
12.	Type of cooling	: ONAN
13.	Temperature rise of oil/winding	: 35°C/40°C
14.	Percentage Impedance	: 2.5% (+ IS Tolerance)
15.	Primary winding conductor	: Polysterimide enamel (Class-H) Copper wire, Bare dia. 0.83 mm
16.	Secondary winding conductor	: Polysterimide enamel (Class-H) Copper Strip, Bare size (5.0 mm x 2.9 mm)
17.	Quantity of oil (Litre)	: 13
18.	Weight of oil (kg.)	: 11
19.	Weight of core coil assembly (kg.)	: 47
20.	Total weight (kg.)	: 85
21.	Polarity	: Subtractive
22.	Vector group	:1-Phase
23.	Year of manufacture	: 2018
24.	Insulation Level L.V.	: 03 kVrms
25.	Total losses at 75°C (Watts)	: 35 Max. (at 50 % load)
		: 95 Max. (at 100 % load)

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REPORT NO.: RP-1819-010640 **Sheet :** 4 OF 25
DATE : 19.06.2018

	TEST DETAILS	TEST SPECIFICATION
1.	Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load	As per cl.no.21.2.c of IS 1180 (Part 1):2014
2.	Measurement of no-load loss and current	As per cl.no.21.2.d of IS 1180 (Part 1):2014
3.	Total losses at 50 % load	As per cl.no. 8.8 of IS 1180 (Part 1):2014
4.	Total losses at 100 % load	As per cl.no. 8.8 of IS 1180 (Part 1):2014
5.	No load current at 112.5 percent Voltage	As per cl.no.21.4.c of IS: 1180 (PART 1):2014
6.	Temperature-rise test	As per customer's requirement, testing procedure followed as per Cl.no.21.3.b of IS1180(Part 1):2014
7.	Oil leakage test	As per cl.no.21.2.j of IS 1180 (Part 1):2014
8	Pressure test (routine test)	As per cl.no.21.2.h of IS 1180 (Part 1):2014
9.	Pressure test (type test)	As per cl.no.21.3.d of IS 1180 (Part 1):2014
10.	Determinations of sound levels	As per customer's requirement, testing procedure followed as per cl. no. 21.4.a of IS 1180 (Part 1) : 2014 & Cl. No.13 of IS 2026(Part 10): 2009
11.	Measurement of the Harmonics of the No-load current	As per customer`s requirement testing procedure followed as per cl.no.10.6. of IS: 2026 (PART 1)-2011
12.	Lightning impulse test	As per cl.no.21.3.a of IS 1180 (Part 1):2014 And test voltage specified by the customer(Test procedure was followed as per cl.no.14 of IS 2026 (Part 3) : 2009
13.	Short-circuit withstand test	As per cl.no.17 & 21.3 c of IS 1180 (Part 1) :2014
14.	Paint adhesion test	As per cl.no.21.4 d of IS 1180 (Part 1): 2014
15.	Total dry film paint thickness	As per cl.no.15.5 & table 12 of IS 1180 (Part 1) :2014

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REPORT NO.: RP-1819-010640 **Sheet :** 5 OF 25
DATE : 19.06.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
1.	**Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load :** (As per cl.no.21.2.c of IS 1180 (Part 1): 2014)			---
	At 50% load : Tested with **0.3909** Amps (on HV side) Frequency : **50.013** Hz Top oil temperature : **35.6**°C			
	Test current (Amps)		0.3909	
	Impedance voltage (Volts)		74.640	
	Measured load loss (Watts)		14.91	
	Impedance voltage (%) (Computed to 50% load)			
	At 35.6°C		1.185	
	At 75°C	---	1.197	
	Load loss (Watts) (Computed to 50% load)			
	At 35.6°C		15.147	
	At 75°C	---	17.314	
	At 100% load : Tested with **0.7894** Amps (on HV side) Frequency : **50.013** Hz Top oil temperature : **35.9**°C			
	Test current (Amps)		0.7894	
	Impedance voltage (Volts)		150.72	
	Measured load loss (Watts)		60.76	
	Impedance voltage (%) (Computed to 100% load)			
	At 35.9°C		2.375	
	At 75°C	2.5 (±10%)	2.467	**Conforms**
	Load loss (Watts) (Computed to 100% load)			
	At 35.9°C		60.852	
	At 75°C	--	69.475	

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REPORT NO.: RP-1819-010640 **Sheet :** 6 OF 25
DATE : 19.06.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
2.	**Measurement of no-load loss and current :** (As per cl.no.21.2.d of IS 1180 (Part 1): 2014) Tested with average **239.97** Volts (on LV side) Frequency : **50.054** Hz **RMS voltage** (Volts) **No-load current** (Amps) **Measured no-load loss** (Watts) **Corrected no-load loss** (Watts)	-- -- -- --	 240.11 0.08292 15.41 15.401	--
3.	**Total losses at 50 % load (Watts) :** (As per cl.no.8.8 of IS 1180 (Part 1):2014)	Max. 35	32.715	**Conforms**
4.	**Total losses at 100 % load (Watts) :** (As per cl.no.8.8 of IS 1180 (Part 1):2014)	Max. 95	84.876	**Conforms**
5.	**No load current at 112.5 percent Voltage :** (As per cl.no.21.4.c of IS: 1180 PART 1-2014) Test voltage of 112.5 percent of rated voltage at rated frequency was applied to the L.V. winding terminals and H.V. winding terminals were kept open circuited. No load current was recorded. **Test voltage** (Volts) **No load current** (Amps) **No Load Current** (%)	 Max. 6.0	 270.50 0.1107 0.531	**Conforms**

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REPORT NO.: RP-1819-010640 **Sheet :** 7 OF 25
DATE : 19.06.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained value	Remarks
6.	**Temperature-rise test :** (As per customer's requirement, testing procedure followed as per Cl.no.21.3.b of IS1180(Part 1):2014) Before starting test, the dimensions of tank were measured & recorded. Size of tank : H-400 mm, Diameter-285 mm **Specified losses fed for temperature-rise test were 95 Watts.** Specified losses were fed to the transformer (i.e. Supply was connected to HV winding and LV winding kept short-circuited) till steady state temperature-rise was attained. Top oil temperature was recorded hourly. After steady state condition, the losses were brought down in reference to the rated current one hour prior to shut down. At the shutdown, the hot windings resistance were measured and temperature-rise calculated. A) Top oil temperature-Rise : B) Winding Temperature Rise (Resistance method) 1) HV Winding : 2) LV Winding : C) Ambient temperature at shutdown : D)Time of Shutdown(Hrs) :	 Max. 35°C Max. 40°C Max. 40°C	 16.2°C 25.3°C 28.0°C 30.1°C 8:30	**Conforms**

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REPORT NO.: RP-1819-010640 **Sheet :** 8 OF 25
DATE :19.06.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
7.	**Oil leakage test :** (As per cl.no.21.2.j of IS 1180 (Part1: 2014)) The assembled transformer with all fittings including bushings in position was tested at a pressure at the top equivalent to the head that was available at the base of the tank for 6 hours.	There should be no leakage at any point	No leakage observed.	**Conforms**
8.	**Pressure test (routine test) :** (As per cl.no.21.2.h of IS 1180 (Part 1: 2014) The transformer was tested at an air pressure of 35 kPa above atmosphere pressure maintained inside the tank for 10 min.	There should be no leakage at any point.	No leakage observed.	**Conforms**
9.	**Pressure test (Type test) :** (As per cl.no.21.3.d of IS 1180 (Part 1: 2014) The transformer was tested at an air pressure OF 100 kPa above atmosphere pressure maintained inside the tank for 30 min.	There should be no leakage at any point & no deformation of tank	No leakage & No deformation of tank observed.	**Conforms**

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TEST REPORT NO: RP-1819-010640
DATE: 19.06.2018

Particulars of Tests & Cl. No.:
10) Determinations of sound levels [A- Weighted Sound Power Level Measurement]
[As per customer's request, testing procedure followed as per as per Cl. No. 21.4.a of IS 1180 (Part 1):2014 & Cl. No. 13 of IS 2026 (Part 10): 2009]

Condition of transformer	Transformer was energized at no load condition & excited at the rated voltage of sinusoidal waveform & rated frequency.
Details of equipment used:	**Name:** Sound level meter **Make:** Lutron **Meter Type:** Type 1 **Serial No.:** I.62852 **Calibration Report No. & Date:** NCQC-M/141117/01, Dt. 27/11/2017

TEST RESULTS:

A-Weighted sound pressure levels of the background noise

Sr. No.	Measurement Locations (Refer Sketch Below)	At the start of test dB(A)	At the end of test dB(A)
1	A	45.9	45.2
2	B	45.7	45.4
3	C	45.6	45.6
4	D	45.7	45.3
5	E	45.1	45.4
6	F	45.4	45.6
7	G	45.7	45.9
8	H	45.6	45.7
9	I	45.5	45.4
10	J	45.1	45.1
	Arithmetic Average $\overline{L_{bgA}}$	**45.5**	**45.5**

A-Weighted sound pressure levels at energized condition L_{pAi}

Sr. No.	Measurement Locations (Refer Sketch Below) dB(A)	L_{pAi} dB(A)
1	A	46.7
2	B	47.1
3	C	45.9
4	D	45.4
5	E	45.6
6	F	45.6
7	G	45.9
8	H	46.1
9	I	46.4
10	J	45.4
	Arithmetic Average $\overline{L_{pA0}}$	**46.1**

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TEST REPORT NO: RP-1819-010640
DATE: 19.06.2018

TEST PARAMETERS:

Measurement distance : 1 m,

Microphone Spacing: 1 m

Measurement made : Half of the height of the transformer tank

Method followed: Sound pressure measurement as per Cl. No. 11, 11.3 & Table 2 of IS 2026 (Part 10): 2009.

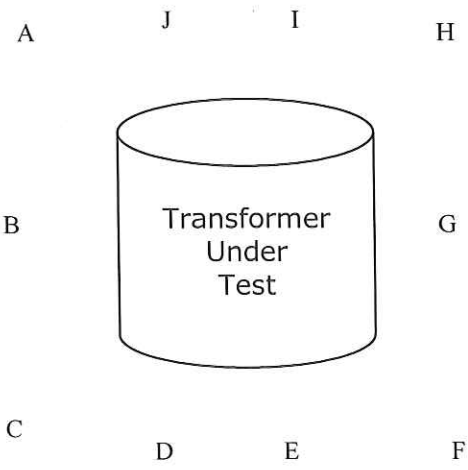
Length of prescribed contour: 9.76 m

Transformer Tank Height: 0.400 m

Person present during sound level measurement: 3

A-Weighted sound pressure level ($\overline{L_{pA0}}$):	46.1 dB(A)
Corrected average A-weighted sound pressure level ($\overline{L_{pA}}$):	37.2 dB(A)
Calculated A- weighted sound power level (L_{WA}) :	44.1 dB(A)

REMARKS: 1) Guaranteed value of sound pressure level is considered as 48 db (A) as mentioned in customer's letter.
2)Transformer conforms to the requirement of guaranteed value of sound pressure level



Sketch showing the locations of sound measurement

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REPORT NO.: RP-1819-010640 Date: 19.06.2018

Sr. No.	Particulars of test and clause no.	Requirement as per specification.	Obtained value	Remarks
11	**Measurement of the Harmonics of the No-load current** (As per customer's request testing procedure followed as per cl. no. 10.6 of IS 2026 (Part 1):2011)	The harmonics of the no-load current shall be measured and magnitude of the harmonics shall be expressed as a percentage of the fundamental component.	Refer table 1 for individual current harmonics components & individual voltage harmonics components measured at LV side at rated voltage i.e. 240 V Current THD: 30.03% Voltage THD: 0.85%	---

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REPORT NO.: RP-1819-010640 Date: 19.06.2018

TABLE-1 : Harmonics in voltage and current (as a percentage of fundamental)

Harmonic order	Current I_R in %	Current I_R in Amps	Voltage V_{RY} in %
1	100.00	0.0754	100.00
2	2.52	0.0019	0.02
3	28.91	0.0218	0.15
4	1.26	0.00095	0.01
5	6.80	0.00513	0.69
6	0.42	0.00032	0.02
7	2.92	0.00220	0.32
8	0.27	0.00020	0.01
9	0.66	0.00050	0.01
10	0.20	0.00015	0.01
11	0.23	0.00017	0.07
12	0.27	0.00020	0.01
13	1.35	0.00102	0.03
14	0.08	0.00006	0.01
15	0.25	0.00019	0.05
16	0.17	0.00013	0.01
17	0.69	0.00052	0.12
18	0.12	0.00009	0.00
19	0.16	0.00012	0.02
20	0.16	0.00012	0.01
21	0.12	0.00009	0.02
22	0.07	0.00005	0.00
23	0.09	0.00007	0.02
24	0.17	0.00013	0.02
25	0.36	0.00027	0.03
THD %	30.03		0.85
Parameter measured	0.08 A		240.11 V

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TEST REPORT NO.: RP-1819-010640 **SHEET NO.:** 13 of 25
DATE : 19/06/2018

12.Lightning Impulse Test (As per Cl. No.21.3.a of IS 1180 (part 1) : 2014 Amendment 1 & 2 & test procedure was followed as per IS : 2026-(part- III), 2009 cl. No. 14

Waveform	Comment	Ut / kVp	T1 / µs	T2 / µs	Tc / µs
1.1 POLE					
1	LI RW	-49.253	1.222	43.944	
2	100% LI FW	-75.194	1.224	44.165	
3	LI CRW	-48.603	1.239		2.927
4	110% LI CFW	-83.710	1.268		2.744
5	110% LI CFW	-81.950	1.262		3.001
6	100% LI FW	-75.929	1.225	44.138	
7	100% LI FW	-75.615	1.226	44.113	

REMARKS: From the observation of enclosed oscillographic records , it is concluded that the transformer **conforms** to the requirements of the above mentioned standard with respect to the test carried out.

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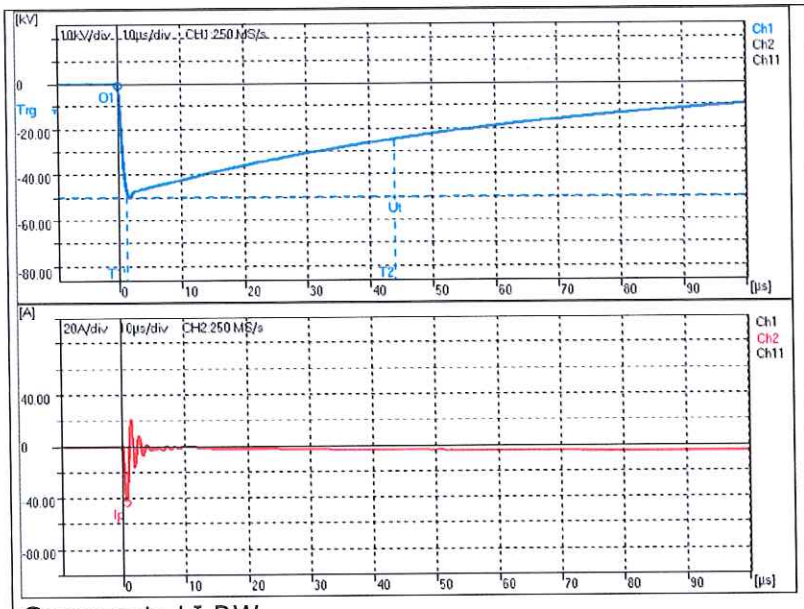
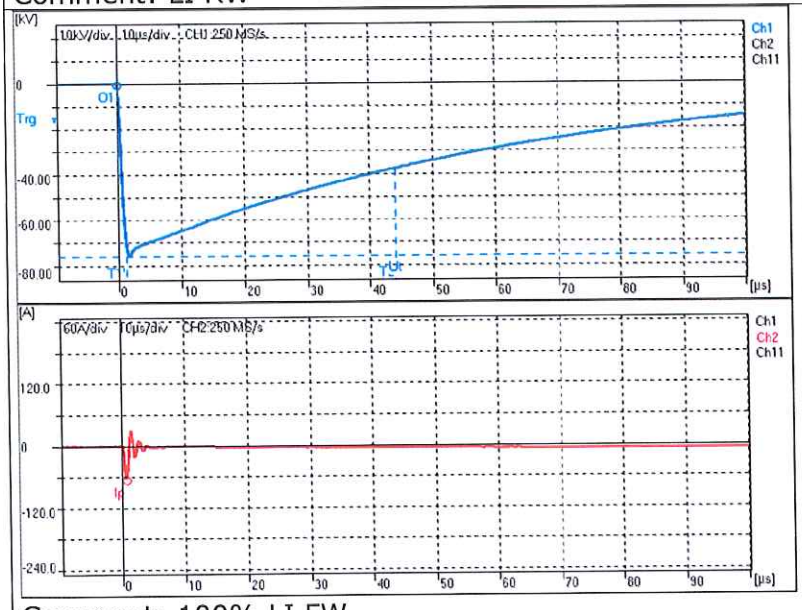
TEST REPORT NO.: RP-1819-010640 **SHEET NO.:** 14 of 25
DATE : 19/06/2018



Comment: LI RW

Fig.: 1
U_p = -49.25 kV
T_1 = 1.22 µs
T_2 = 43.94 µs
T_c = µs



Comment: 100% LI FW

Fig.: 2
U_p = -75.19 kV
T_1 = 1.22 µs
T_2 = 44.17 µs
T_c = µs

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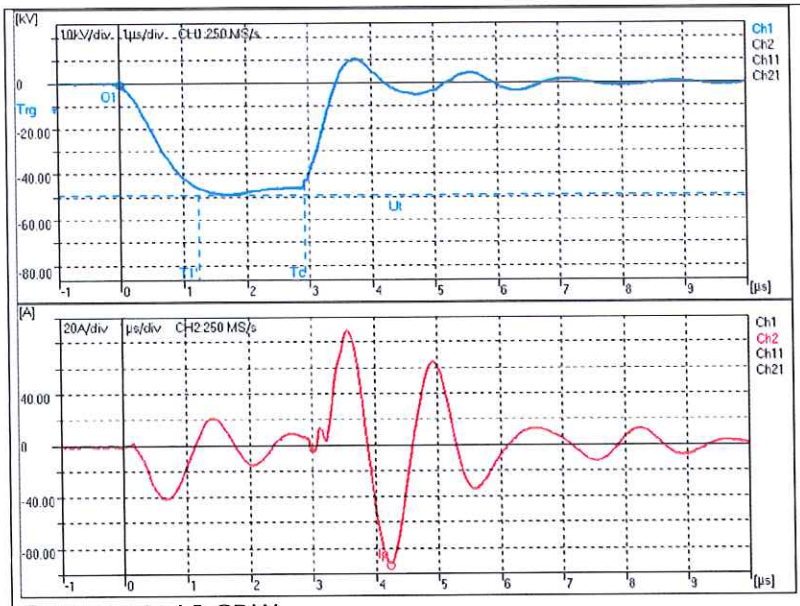
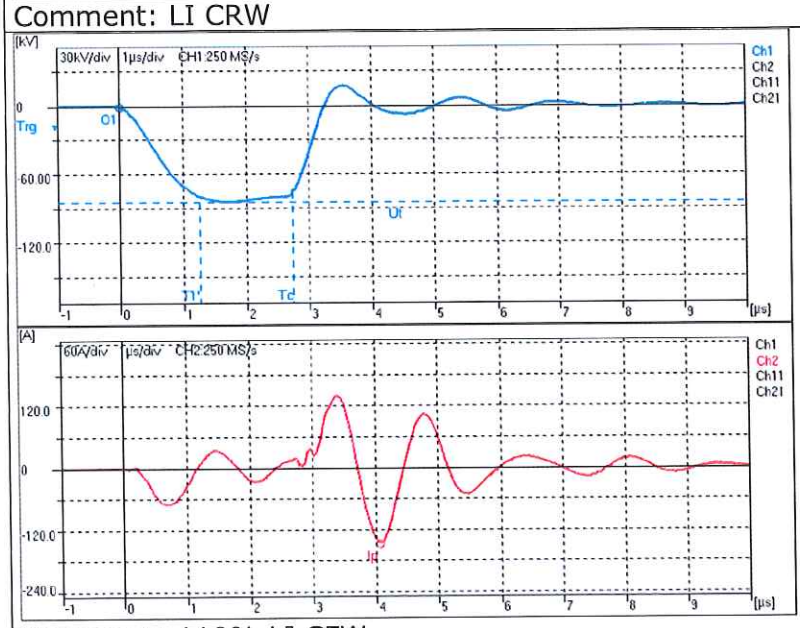
TEST REPORT NO.: RP-1819-010640 **SHEET NO.:** 15 of 25
DATE : 19/06/2018



Comment: LI CRW

Fig.: 3
U_p = -48.60 kV
T_1 = 1.24 µs
T_2 = µs
T_c = 2.93 µs



Comment: 110% LI CFW

Fig.: 4
U_p = -83.71 kV
T_1 = 1.27 µs
T_2 = µs
T_c = 2.74 µs

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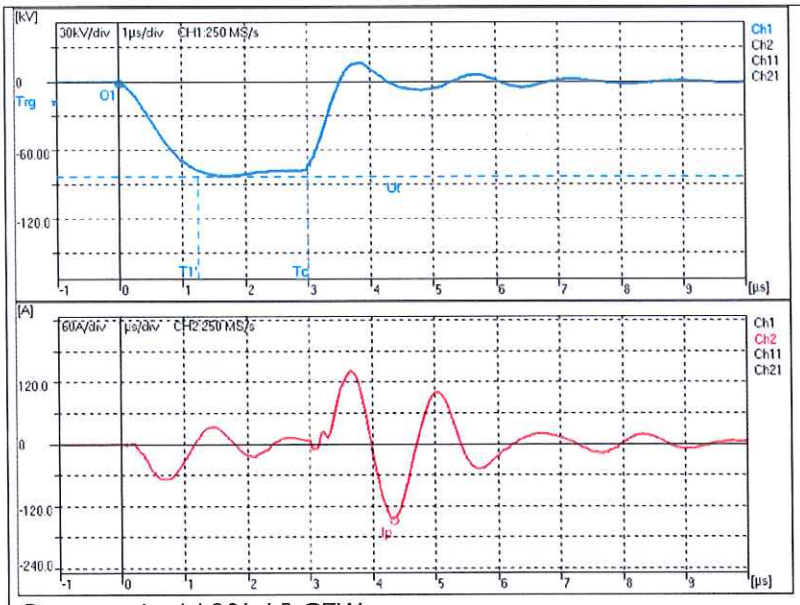
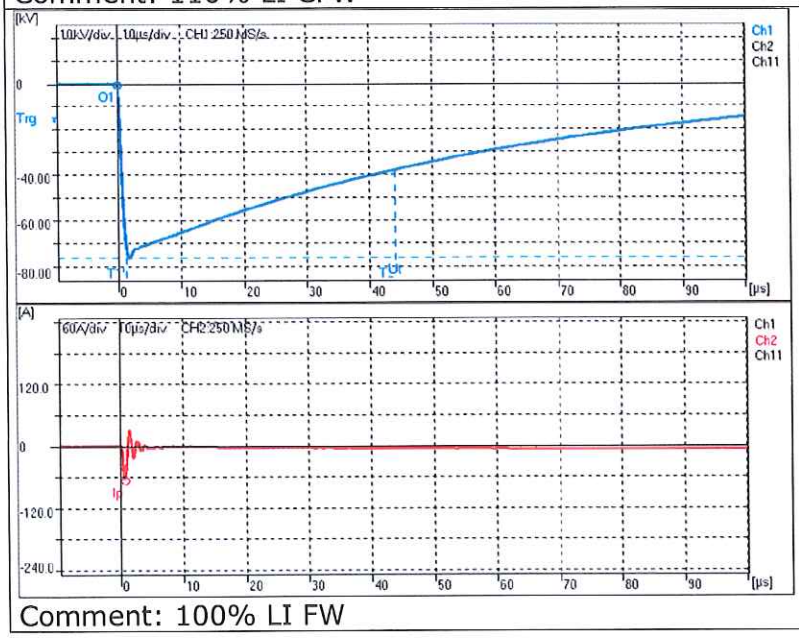
DATE : 19/06/2018



Comment: 110% LI CFW

Fig.: 5
U_p = -81.95 kV
T_1 = 1.26 µs
T_2 = µs
T_c = 3.00 µs



Comment: 100% LI FW

Fig.: 6
U_p = -75.93 kV
T_1 = 1.22 µs
T_2 = 44.14 µs
T_c = µs

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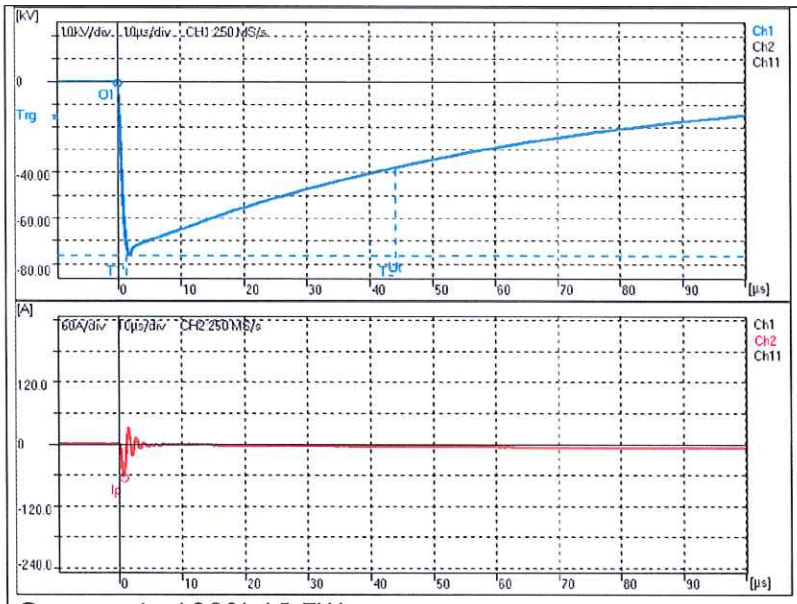

Comment: 100% LI FW

Fig.: 7
U_p = -75.61 kV
T_1 = 1.23 µs
T_2 = 44.11 µs
T_c = µs

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13. Short-circuit withstand test
(As per Cl. No. 17 & 21.3 c of IS 1180 (Part 1): 2014)

ROUTINE TEST RESULTS BEFORE SHORT CIRCUIT

a) MEASUREMENT OF WINDING RESISTANCE

Measurement at oil temperature: 35.5°C	
LV Winding resistance (mΩ)	HV Winding resistance (Ω)
2.1-2.2(n)	1.1-1.2(N)
61.530	51.890

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF POLARITY

Polarity: Subtractive was verified

Measured turns ratio between Terminals	Rated turns Ratio	Difference (%)
1.1-1.2(N)/2.1-2.2(n)		
26.465	26.463	0.008

c) MEASUREMENT OF SHORT-CIRCUIT IMPEDANCE AND LOAD LOSS **(at 100 % load)**

Oil temperature: 36.0°C

Test current (Amp.)	Impedance voltage (V)	Frequency (Hz.)	Load loss measured (Watts)	Impedance Voltage (%Z) at 50 Hz.	Load loss computed at 75°C (Watts)	%Z at 75°C
0.790	149.724	49.768	60.042	2.368	68	2.458

d) MEASUREMENT OF LOAD LOSS **(at 50 % load)**

Oil temperature: 36.0°C

Test current (Amp.)	Impedance voltage (V)	Frequency (Hz.)	Load loss measured (Watts)	Load loss computed at 75°C (Watts)
0.394	74.638	49.795	14.915	17

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e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Oil temperature: 36.0°C

Applied Voltage (V)	Current (Amp.)	Frequency (Hz.)	Losses Measured (Watts)
240.082	0.083	50.012	15

- Total losses at 75°C: 32 Watts (at 50 % load)
- Total losses at 75°C: 83 Watts (at 100% load)

f) MEASUREMENT OF INSULATION RESISTANCE

Oil temperature: 35.5°C

	Applied DC Voltage (V)	IR value (MΩ)
HV to LV winding	2500	> 2000
HV winding to LV + EARTH	2500	> 2000
LV winding to HV + EARTH	500	> 2000

g) INDUCED OVER-VOLTAGE WITHSTAND TEST

Sr. No.	Test	Applied voltage (V)	Applied Freq. (Hz.)	Duration (sec.)	Remarks
1.	Between LV windings with HV terminal open & neutral terminal earthed.	756	150	40	Withstood

h) SEPARATE-SOURCE VOLTAGE WITHSTAND TEST

Sr. no.	Test	Applied voltage (kV)	Duration (sec.)	Remarks
1.	Between HV winding and LV winding connected to the tank and earth	03	60	Withstood
2.	Between LV winding and HV winding connected to the tank and earth	03	60	Withstood

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TC 2554202

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SHORT-CIRCUIT WITHSTAND TEST:

The verification of short-circuit withstand test was performed on the transformer by connecting the secondary winding to single phase of the source and primary winding short circuited using synchronization switch. The test conducted with short circuiting of primary winding; follow the application of the voltage to the secondary winding of transformer as per schematic circuit diagram No. OLSC/DTC/05.

Condition of the equipment under test: As after routine tests.

Supply Frequency: 50 Hz.

Test No.	Oscillo-gram No.	Applied voltage (Vrms)	Short circuit current on LV (A)		Duration (sec.)	Remarks
			Peak	RMS		
1.	0143/01	-	1163	682	0.1	Calibration Shot
2.	0143/02	240	1438	855	0.5	No Abnormality
3.	0143/03	240	1430	850	0.5	No Abnormality
4.	0143/04	240	1413	856	0.5	No Abnormality
5.	0143/05	240	1386	841	2.0	Thermal shot No Abnormality

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Measurement of the % reactance during the short circuit test

LV winding was short circuited. AC supply was connected to HV winding to pass test current. Before the short circuit test and after each shot, the percentage reactance was measured.

Sr. No.	Measurement performed		Measured value of % reactance at 50 Hz.	%Change in % reactance
1.	Before test		2.04	-
2.	After the test no.	2.	2.07	1.47
3.	After the test no.	3.	2.07	1.47
4.	After the test no.	4.	2.08	1.96
5.	After the test no.	5.	2.08	1.96

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ROUTINE TEST RESULTS AFTER SHORT CIRCUIT

a) MEASUREMENT OF WINDING RESISTANCE

Measurement at oil temperature: 34.5°C	
LV Winding resistance (mΩ)	HV Winding resistance (Ω)
2.1-2.2(n)	1.1-1.2(N)
63.405	51.845

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF POLARITY

Polarity: Subtractive was verified

Measured turns ratio between Terminals	Rated turns Ratio	Difference (%)
1.1-1.2(N)/2.1-2.2(n)		
26.465	26.463	0.008

c) MEASUREMENT OF SHORT-CIRCUIT IMPEDANCE AND LOAD LOSS **(at 100 % load)**

Oil temperature: 34.7°C

Test current (Amp.)	Impedance voltage (V)	Frequency (Hz.)	Load loss measured (Watts)	Impedance Voltage (%Z) at 50 Hz.	Load loss computed at 75°C (Watts)	%Z at 75°C
0.789	152.531	49.917	60.616	2.409	70	2.503

d) MEASUREMENT OF LOAD LOSS **(at 50 % load)**

Oil temperature: 34.7°C

Test current (Amp.)	Impedance voltage (V)	Frequency (Hz.)	Load loss measured (Watts)	Load loss computed at 75°C (Watts)
0.394	76.223	49.904	15.163	17

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e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Oil temperature: 34.7°C

Applied Voltage (V)	Current (Amp.)	Frequency (Hz.)	Losses Measured (Watts)
240.330	0.085	50.006	15

- Total losses at 75°C: 32 Watts (at 50 % load)
- Total losses at 75°C: 85 Watts (at 100% load)

f) MEASUREMENT OF INSULATION RESISTANCE

Oil temperature: 34.5°C

	Applied DC Voltage (V)	IR value (MΩ)
HV to LV winding	2500	> 2000
HV winding to LV + EARTH	2500	> 2000
LV winding to HV + EARTH	500	> 2000

g) INDUCED OVER-VOLTAGE WITHSTAND TEST

Sr. No.	Test	Applied voltage (V)	Applied Freq. (Hz.)	Duration (sec.)	Remarks
1.	Between LV windings with HV terminal open & neutral terminal earthed.	756	150	40	Withstood

h) SEPARATE-SOURCE VOLTAGE WITHSTAND TEST

Sr. no.	Test	Applied voltage (kV)	Duration (sec.)	Remarks
1.	Between HV winding and LV winding connected to the tank and earth	03	60	Withstood
2.	Between LV winding and HV winding connected to the tank and earth	03	60	Withstood

Observation after test: The transformer was untanked and inspected.
1) Condition of conductor, core and clamping:
- No visible damage, deformation or displacement.
2) Condition of oil : Clear

Results: 1) % Change in % reactance is within tolerance limits as per standard.
2) The results of routine tests carried out before and after the short-circuit withstand test found within limits as per standard.

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TEST REPORT No.: RP-1819-010640 DATE: 19-06-2018 SHEET 24 OF 25

Sr. No.	Particular of Tests and Cl. No.	Requirements as per specification	Obtained value	Remarks
14.	Paint Adhesion Test at 37°C & 11 % RH Test Method A – X-cut tape test (Test procedure followed as per ASTM D 3359-2017, Cl. No. 8) Cl. No. 21.4.d of IS 1180 (Part 1): 2014 - Adhesion strength of pressure sensitive tape 6.7 N/cm.	--	Observation 1- 5A – No peeling or removal was observed at the location. Observation 2- 4A – Trace peeling or Removal along incisions or at their intersection between the first coat and second coats. Observation 3- 4A – Trace peeling or Removal along incisions or at their intersection between the first coat and second coats.	--

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REPORT NO.: RP-1819-010640 **Sheet :** 25 of 25
DATE : 19.06.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
15	Total Dry Film Paint Thickness ➢ Cl.no.15.5 & Table 12			
	Inside Tank	35.0 microns [Min.]	25.3 microns#	Does not Conform
	Outside Tank	80.0 microns [Min.]	83.8 microns#	Conforms
	Note:1] Inside Paint Type of Tank: Hot Oil Resistant Paint 01 Coat; Outside Paint Type of Tank: Epoxy (Primer) 01 Coat with Polyurethane (Finish Coat) 02 Coats as mentioned in customer's letter. 2] '#' The result obtained is an average of twelve readings at different locations. 3] Testing was carried out at 40 ± 1°C.			

S.M.Shah
PREPARED BY

Nish
CHECKED BY

Mechanical & Insulating Materials Division * Vadodara *

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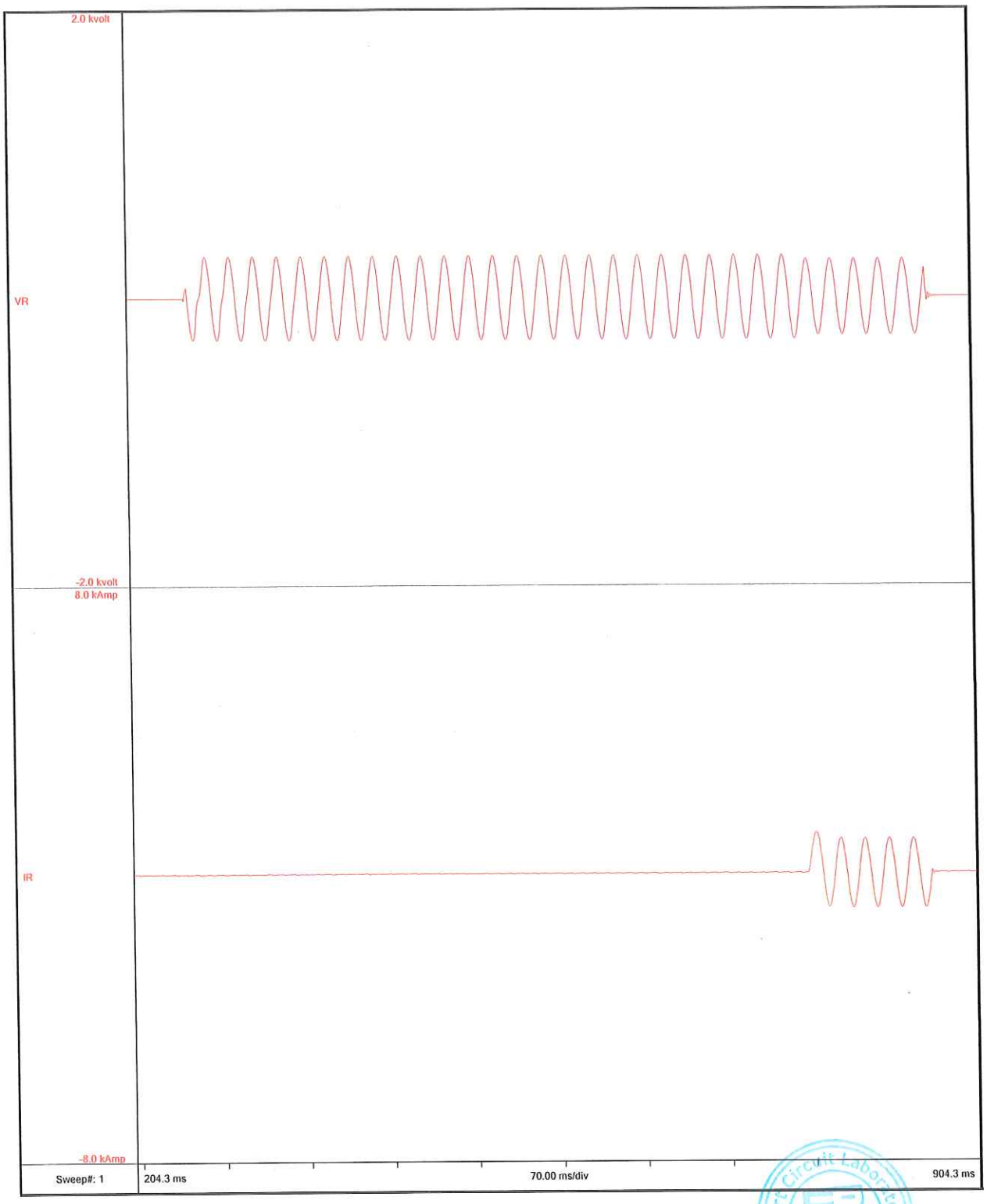

OSCILLOGRAM NO. : 0143/01

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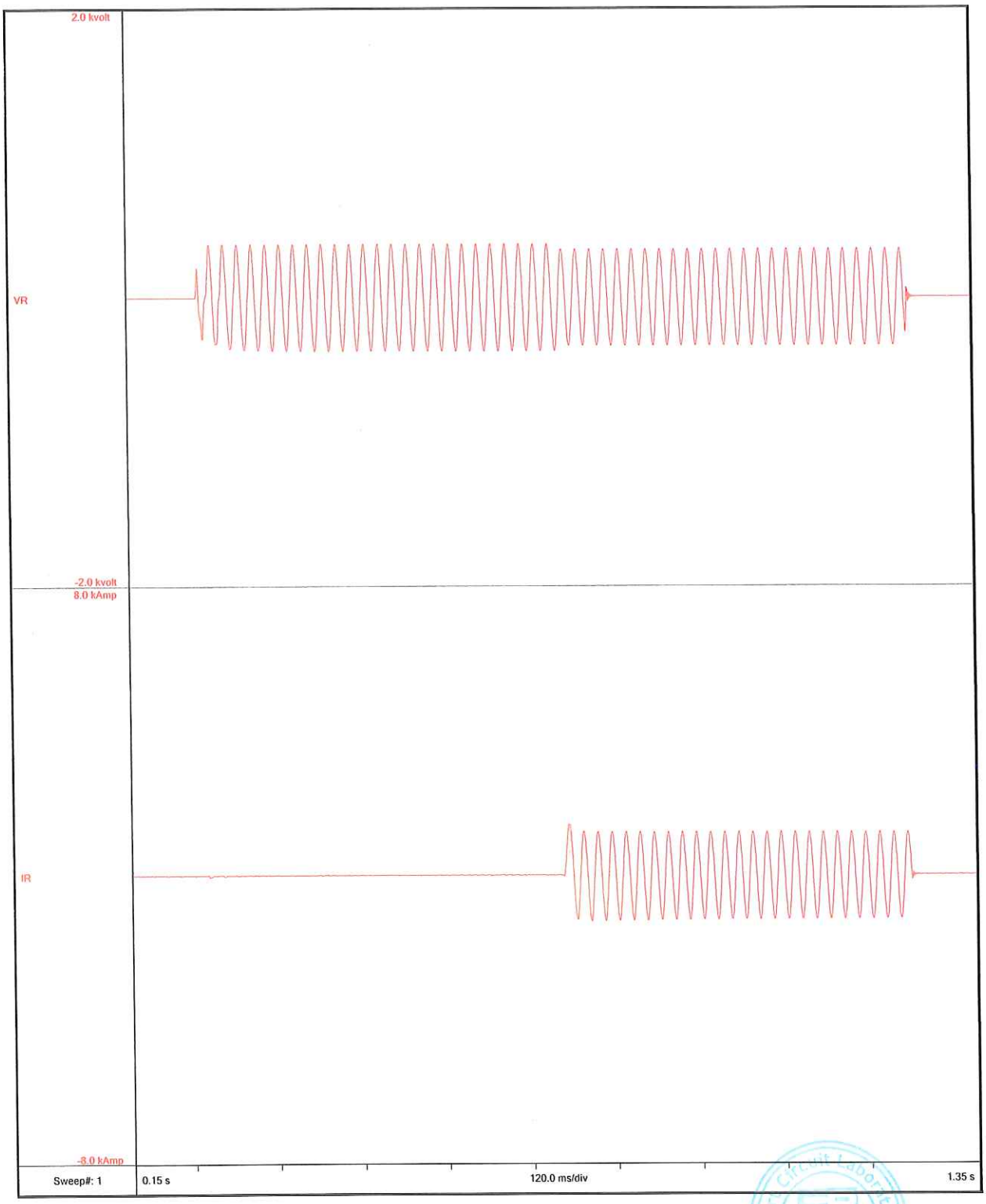

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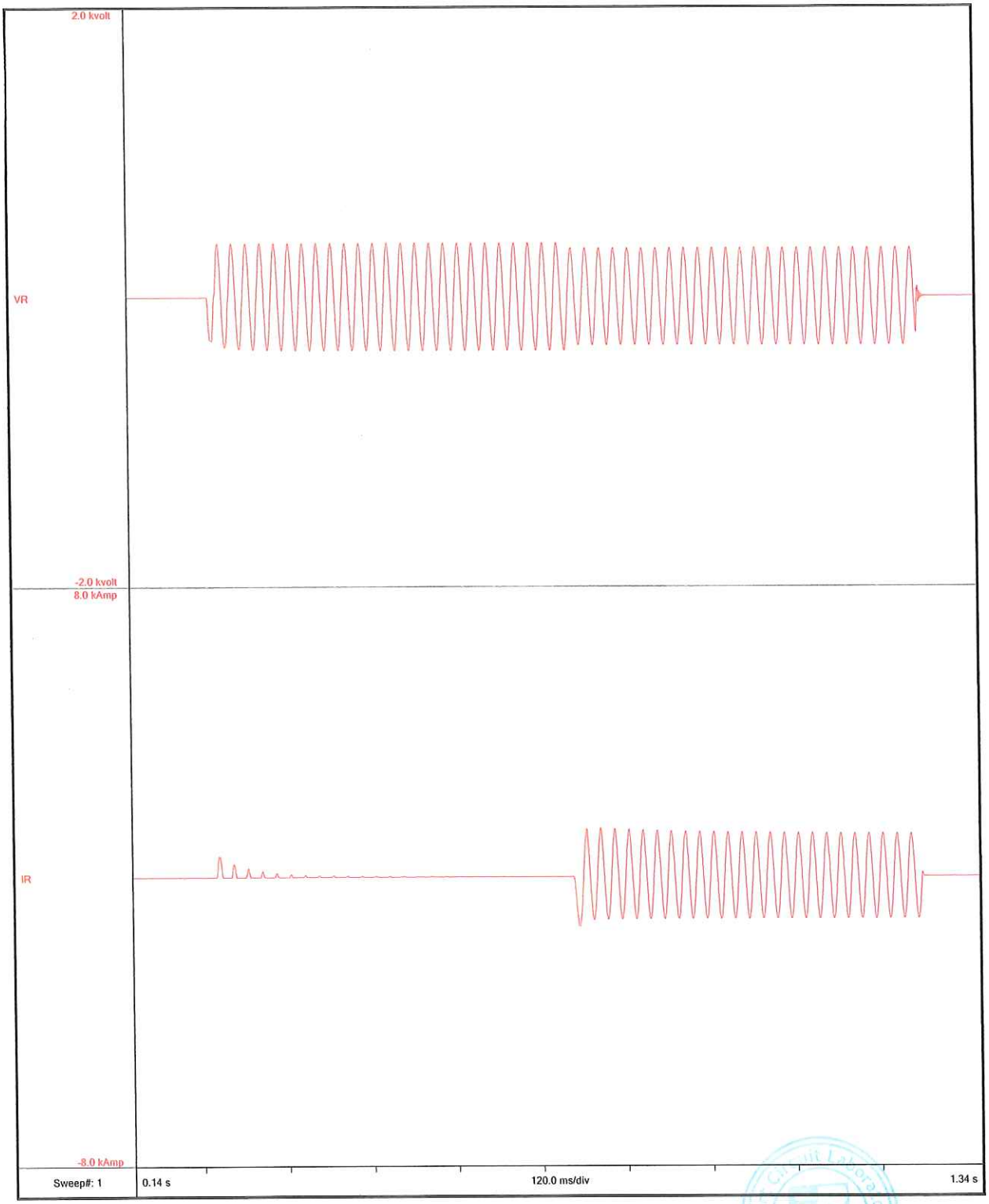

OSCILLOGRAM NO. : 0143/03

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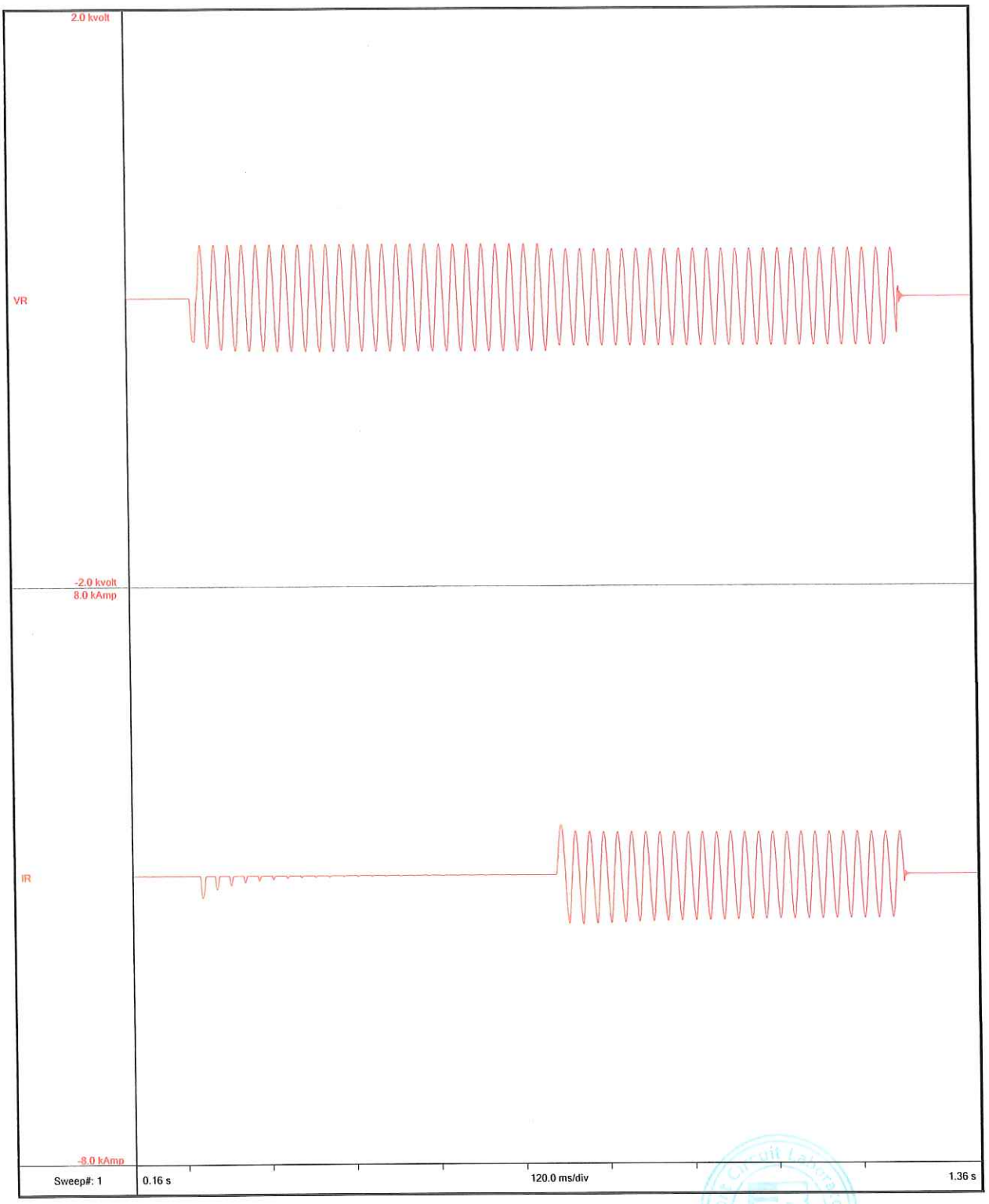

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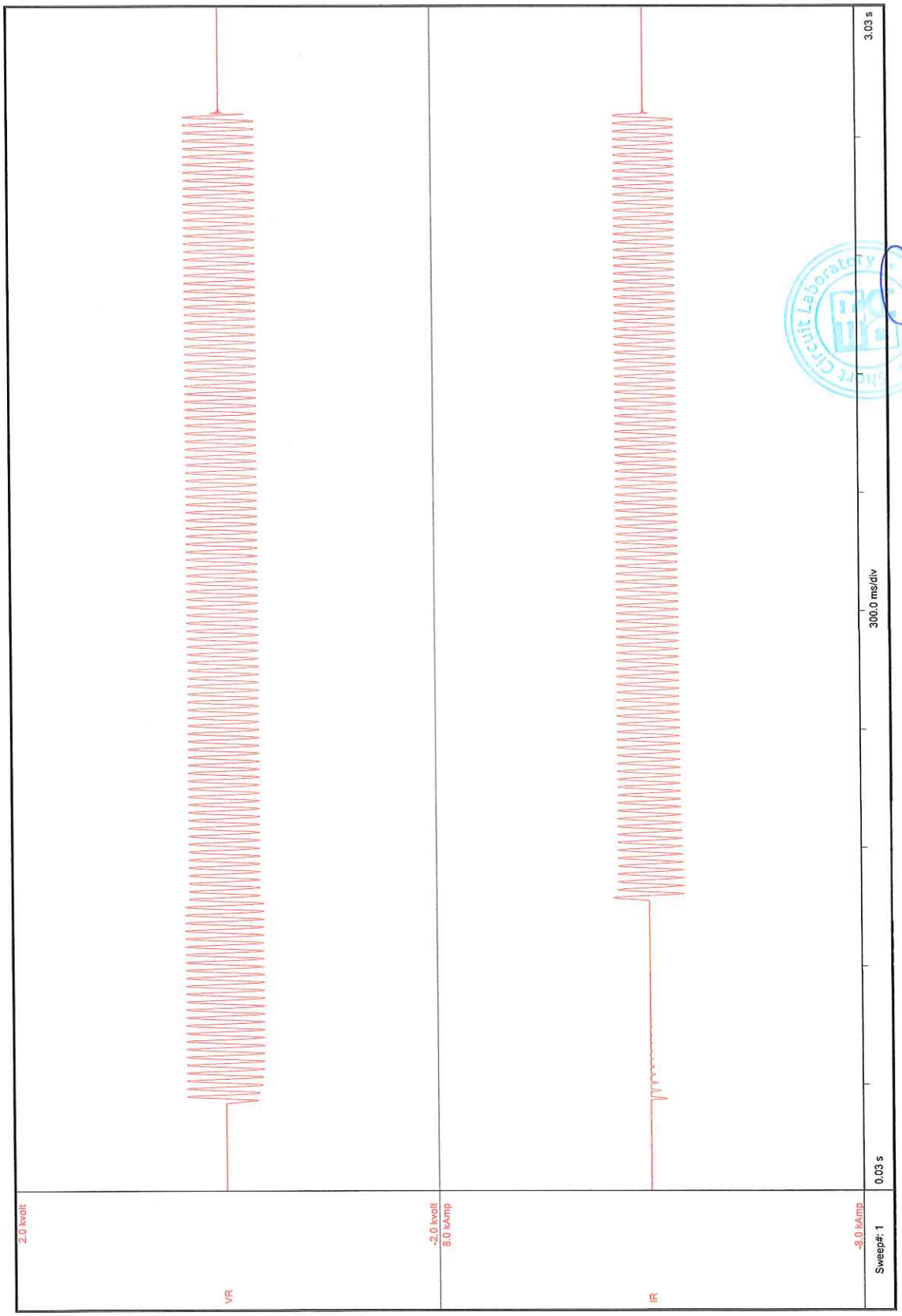

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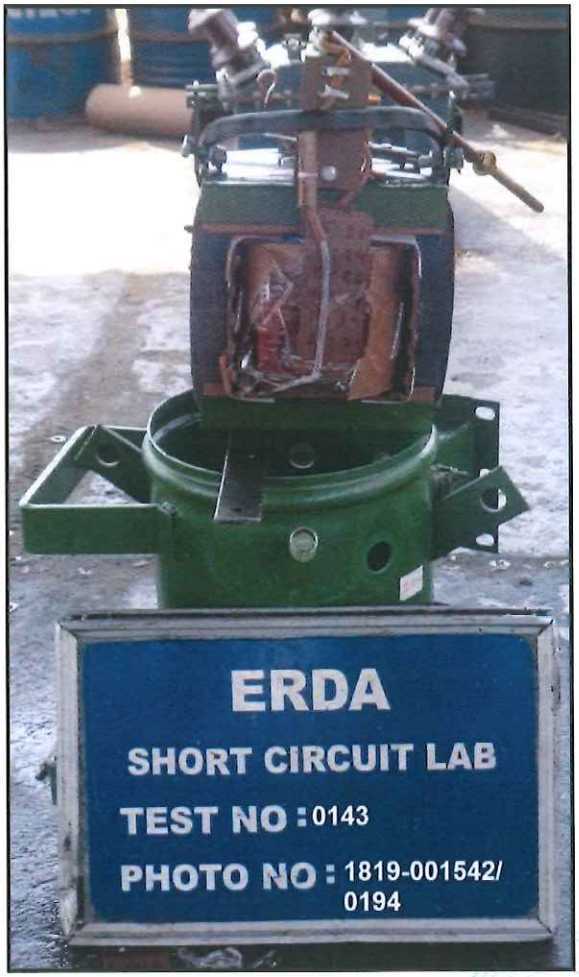
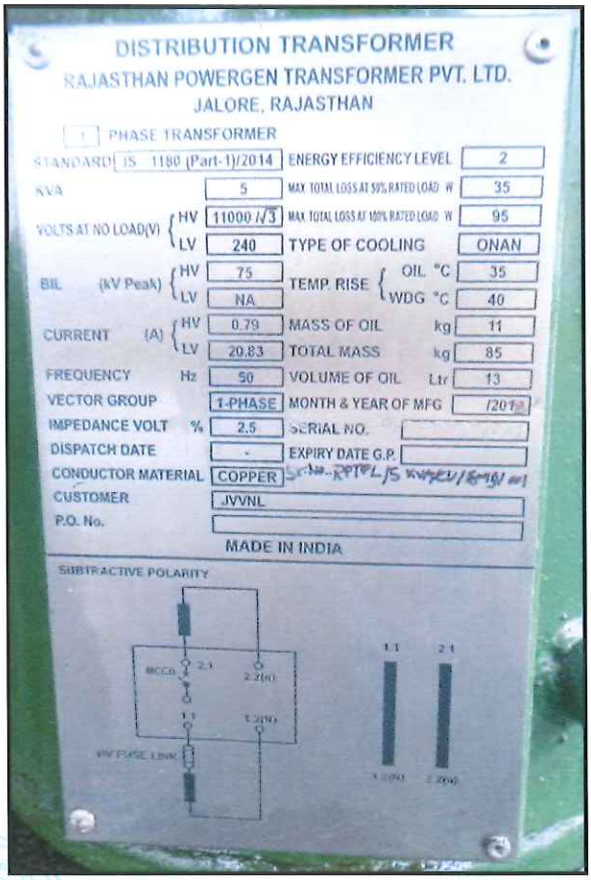
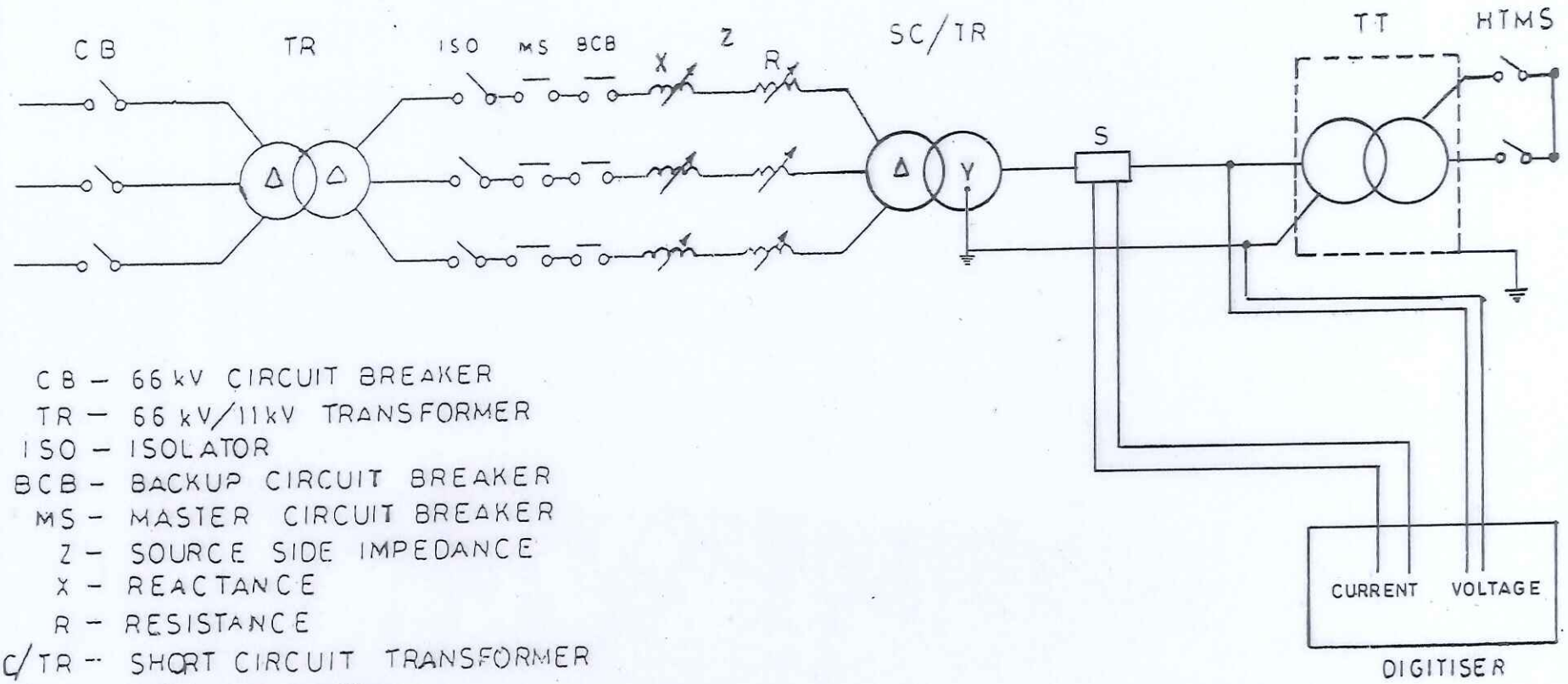




TC 2546899



CB – 66 kV CIRCUIT BREAKER
TR – 66 kV/11kV TRANSFORMER
ISO – ISOLATOR
BCB – BACKUP CIRCUIT BREAKER
MS – MASTER CIRCUIT BREAKER
Z – SOURCE SIDE IMPEDANCE
X – REACTANCE
R – RESISTANCE
SC/TR – SHORT CIRCUIT TRANSFORMER
HTMS – H.T. MAKE SWITCH
T.T. – TEST TRANSFORMER
S – CURRENT MEASURING DEVICE

REPORT NO.: RP-1819-010640
DATE : 19.06.2018

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

SCHEMATIC CIRCUIT DIAGRAM

DRN. BY	CKD.	DATE	DRG. NO.
S.B.S.	A.V.S.	30.9.01	OLSC/DTC/05.

4 HOLES
of Ø3.6mm

DISTRIBUTION TRANSFORMER

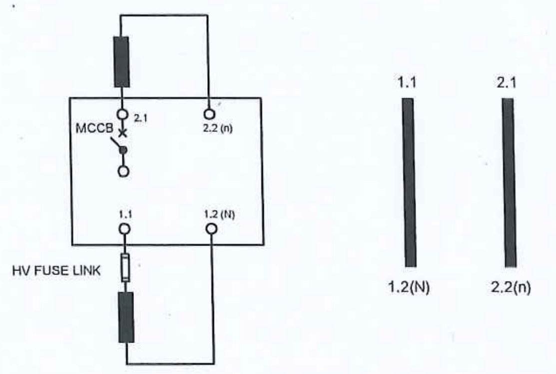
RAJASTHAN POWERGEN TRANSFORMER PVT LTD
JALORE, RAJASTHAN

1 PHASE TRANSFORMER

STANDARD	IS : 1180 (Part-1)/2014	ENERGY EFFICIENCY LEVEL	2
KVA	5	MAX. TOTAL LOSS AT 50% RATED LOAD W	35
VOLTS AT NO LOAD (V) HV	11000 /√3	MAX. TOTAL LOSS AT 100% RATED LOAD W	95
VOLTS AT NO LOAD (V) LV	240	TYPE OF COOLING	ONAN
BIL (kV Peak) HV	75	TEMP. RISE OIL °C	35
BIL (kV Peak) LV	NA	TEMP. RISE WDG °C	40
CURRENT (A) HV	0.79	MASS OF OIL kg	11
CURRENT (A) LV	20.83	TOTAL MASS kg	85
FREQUENCY Hz	50	VOLUME OF OIL Ltr	13
VECTOR GROUP	1-PHASE	MONTH & YEAR OF MFG.	/2018
IMPEDANCE VOLT %	2.5	SERIAL NO.	RPTPL/5 KVA/CU/18-19/001 *
DISPATCH DATE	-	EXPIRY DATE G.P.	-
CONDUCTOR MATERIAL	COPPER		
CUSTOMER	JVVNL		
P.O. No.	-		

MADE IN INDIA

SUBTRACTIVE POLARITY



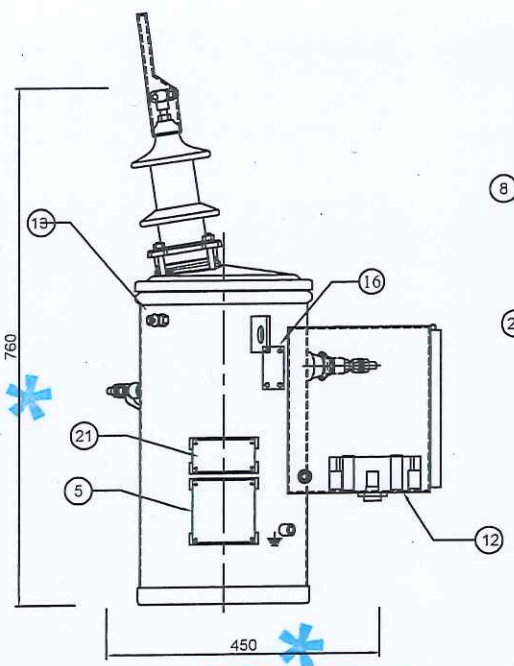
Dimensions: 165, 175, 105, 70, 95, 105

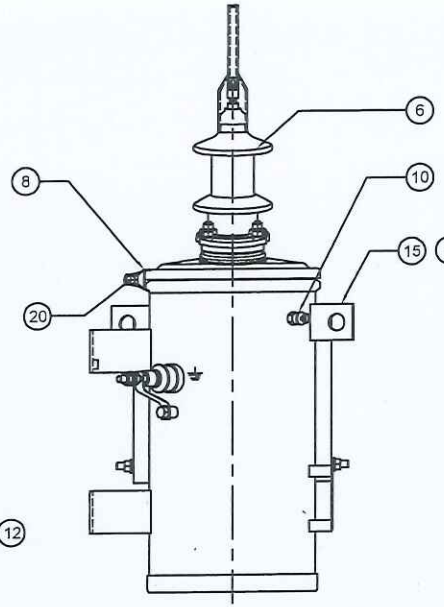
Report No.: RP-1819-010660
19-6-18
5 kVA

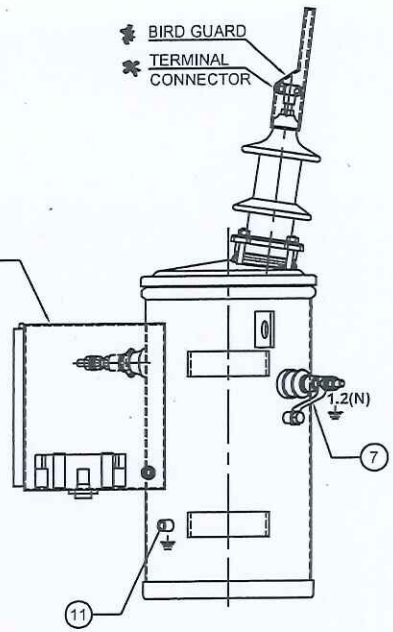
NOTES :-
1- ' * ' MARKED ITEMS SHOULD BE PUNCHED AT THE TIME OF DISPATCH.
2- ALL LETTERS, FIGURES ETC. TO BE ENGRAVED & POLISHED BLACK.
3- MATERIAL - STAINLESS STEEL 0.9 WITH TOLERANCE ± 0.1 MM. THICK.
4- ALL DIMENSIONS ARE IN MM.

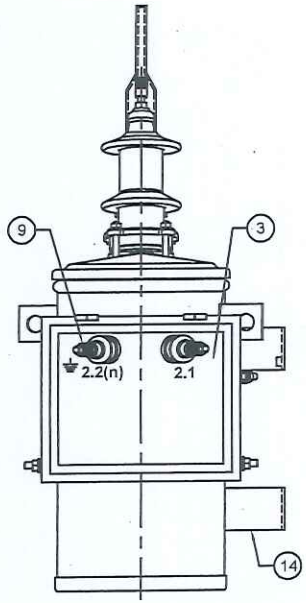
Rev	Date	Draw	Checked	Approved	Description
01	28.05.18				
00	20.12.17				ORIGINAL ISSUE.

R POWER	Title : RATING & DIAGRAM PLATE		Work Order : ----	
	Rating : 5 KVA, 11/√3/0.240 KV, 1Ø, 50 Hz, TRF.	Drawing No. : RPTPL/RP/04 — Rev. : 01	Sheet No. : 01	Total Sheets: 01
RAJASTHAN POWERGEN TRANSFORMER P. LTD. Karola – Bhinmal Road, Karola, Sanchore – 343041 Dist – Jalore, Rajasthan (India)		All dimensions are in millimeters unless otherwise stated. If in doubt - Please Ask !		Scale : NTS









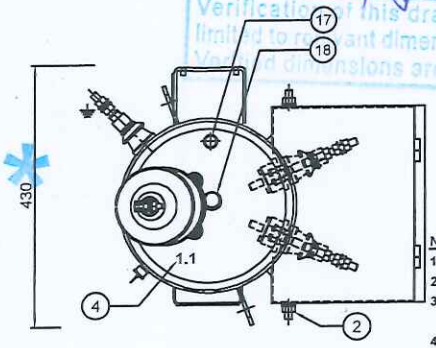
Test Report No RP-1819-010640
Date 19.06.2018
Product 5 KVA M
Verified by
Verification of this drawing by ERDA is limited to ... dimensional checks only. ... dimensions are marked with ***

Tank diameter (mm)	285
Tank height (mm)	400

WEIGHTS / QTY.		
TRANSFORMER OIL	Ltrs.	13
TOTAL TRANSFORMER	Kg.	85
TRANSFORMER OIL	Kg.	11
TANK & FITTINGS	Kg.	27
CORE COIL ASSY	Kg.	47

Locking height (mm)	260
LV hole height (mm)	320
Oil level indicator (mm)	335
Breaker handle height (mm)	NA

AIR CLEARANCES (MM)		
VOLTAGE	H.V.	L.V. (enclosed)
PHASE TO PHASE	NA	NA
PHASE TO EARTH	140	20



Notes :-
1- All dimensions are in mm. Tolerance ±5%
2- This drawing shows only general disposition of fittings.
3- Tank side plate - 2.0 mm. Thk.M.S.
Top & bottom - 2.5 mm. Thk.M.S.
4- Paint Shade : Olive Green Color conforming to No. 220 of IS : 5 / 1961
* Not provided at the time of Type Testing

S. No.	Description	Qty.
21	TECHNICAL PLATE*	1
20	TOP COVER ANTI THEFT BOLT	1
19	-	-
18	OIL FILLING HOLE WITH WELDED COVER AND WITH EXTENDED PIPE as per IS 1 1/4"	1
17	THERMOMETER POCKET WITH CAP	1
16	OIL LEVEL GUAGE	1
15	Lifting lugs for complete unit	2
14	Pole mounting bracket (as per spec)	2
13	Signal light*	1
12	MCCB*	1

S. No.	Description	Qty.
11	Tank Earthing terminal	2
10	Pressure relief device	1
9	L.V. Bushing	2
8	Top cover rim	-
7	H.V. Neutral bushing.	1
6	H.V. Bushing	1
5	Rating & terminal marking plate	1
4	H.V. Terminal marking	1 set
3	L.V. Terminal marking	1 set
2	Earthing terminal (LV box)	2
1	LV MCCB box*	1

Rev	Date	Draw	Checked	Approved	Description
01	26.05.2018				
00	20.12.2017				ORIGINAL ISSUE.

Title : OUTLINE GENERAL ARRANGEMENT

Work Order : ---

Rating : 5 KVA, 11/√3/0.240 KV, 1Ø, 50 Hz, TRF.

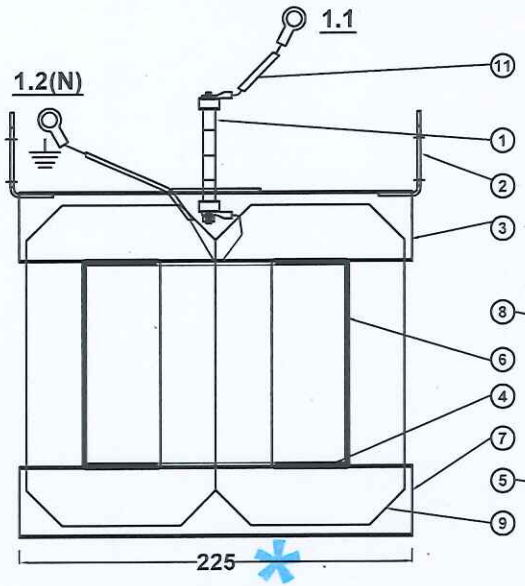
Drawing No. : RPTPL/OGA/04 Rev. : 01

Sheet No. : 01 Total Sheets: 01

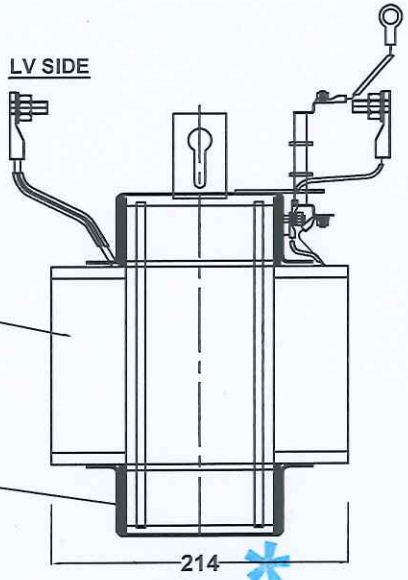
RAJASTHAN POWERGEN TRANSFORMER P. LTD.
Karola – Bhinmal Road, Karola, Sanchore – 343041 Dist – Jalore, Rajasthan (India)

All dimensions are in millimeters unless otherwise stated. If in doubt - Please Ask !

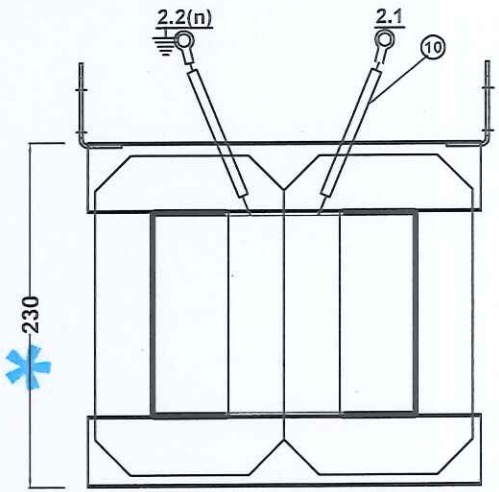
Scale : N.T.S



H.V. SIDE VIEW



SIDE VIEW



L.V. SIDE VIEW

Test Report No. RP-IPV-010640
Date 19.06.2018
Product S ICWA 127
Verified by
Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with ***

CONDUCTOR SIZE		
	LV	HV
Bare	[illegible] 2.9	0.83 Dia
Covered	5.1 x 3.0	0.91 Dia
Copper	Polyesterimide enamel (Class H)	Polyesterimide enamel (Class H)
Conductor Configuration	1W x 1D	-

CORE SIZE	
Core Window Height	147 mm
Core build up	2 x 34 mm
Core Sheet width	130 mm

COIL DIMENSIONS		
	LV	HV
ID	74 x 136	107 x 169
OD	99 x 161	152 x 214
AXIAL HT.	137	

SL.No.	LIST OF FITTINGS	Qty.
11	HV LEAD	-
10	LV LEAD	-
9	CORE (CRGO CORE)	2 set
8	LV & HV COIL (COPPER)	1 set
7	BOTTOM CORE CLAMP	1
6	COIL SEPARATOR	1 set
5	CHANNEL SEPARATOR	1 set
4	END INSULATION	1 set
3	TOP CORE CLAMP	1
2	LOCKING CUM LIFTING LUG	2
1	HV FUSE LINK*	1

Short Circuit Laboratory Jaipur

Notes :-

1- All dimensions are in mm. Tolerance ±5%

2- This drawing shows only general disposition of fittings.

* Not provided at the time of Type Testing

Rev	Date	Draw	Checked	Approved	Description
01	28.05.2018				
00	20.12.2017				ORIGINAL ISSUE.

Title : INTERNAL CONSTRUCTIONAL DETAIL DRAWING

Work Order : ---

Rating : 5 KVA, 11/√3/0.240 KV, 1Ø, 50 Hz, TRF.

Drawing No. : RPTPL/IC/04 Rev. : 01

Sheet No. : 01 Total Sheets: 01

RAJASTHAN POWERGEN TRANSFORMER P. LTD.
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Scale : N.T.S