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TEST REPORT

NAME & ADDRESS OF CUSTOMER	REPORT NO.: RP-1819-011069 DATE: 21.06.2018	
RAJASTHAN POWERGEN TRANSFORMER PVT. LTD. Khasra No. 911-914, Karola – Bhinmal Road, Karola, Sanchore, Rajasthan-343041 (India)	**CUSTOMER REF. NO.:** RPTPL/Type Test/ERDA/004	**DATED:** 26.04.2018
	DATE OF SAMPLE RECEIPT:	**DATE OF TESTING:**
	26.04.2018	01.05.2018 to 13.06.2018

SAMPLE DESCRIPTION	SAMPLE IDENTIFICATION
25 kVA Single Phase Distribution Transformer 11000/√3/240 Volts, 3.94/104.17 Amps., Oil filled, **ENERGY EFFICIENCY LEVEL:** 2 Further details as per sheet No. 3 OF 26	**ERDA SAMPLE CODE NO.:** ERDA-00254194 **SERIAL NO.:** RPTPL/25KVA/18-19/001 **YEAR OF MFG.:** 2018

TEST DETAILS	TEST SPECIFICATIONS
As per SHEET 4 OF 26	As per SHEET 4 OF 26

ENCLOSURES: As per SHEET 2 OF 26

REMARKS: 1) The sample **conforms** to the guaranteed requirement as per above mentioned test specification for above mentioned test nos. 1 to 14.
2) The sample **does not conform** to the guaranteed requirement as per above mentioned test specification for above mentioned test no. 15.

PREPARED BY	CHECKED BY	K. B. PATEL APPROVED BY

NOTE:
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2. This report cannot be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from Director, ERDA.
4. Only test asked for by customer have been carried out.
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Enclosures:

Contents	
1. Oscillogram No.	0137/01 to 0137/05
2. Photograph No.	1819-001486/0193
3. Test circuit diagram No.	OLSC/DTC/05
4. Drawing No.	RPTPL/RP/03B Rev.: 00 RPTPL/OGA/03B Rev.: 01 Sheet No. 01 of 01 RPTPL/IC/03B Rev.: 01 Sheet No. 01 of 01

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TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER

1.	Name of manufacturer	: **RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.**
2.	Equipment	: **25 kVA Single Phase Distribution Transformer**
3.	Serial No.	: RPTPL/25KVA/18-19/001
4.	Energy efficiency level	: 2
5.	Type	: Outdoor, Oil cooled, Sealed type, Non Circular Coil
6.	kVA rating	: 25
7.	Rated voltage H.V.(volts)	: 11000/√3
	L.V. (volts)	: 240
8.	Rated current H.V. (Amp.)	: 3.94
	L.V.(Amp.)	: 104.17
9.	Number of phases	: 1
10.	Frequency (Hz.)	: 50
11.	Type of cooling	: ONAN
12.	Temperature rise of oil/winding	: 35°C/40°C
13.	Percentage Impedance	: 4.0% ± 10% Tolerance
14.	Primary winding conductor	: Polysterimide Enamel Class H, Aluminium wire, bare dia. 2.53mm
15.	Secondary winding conductor	: DPC Aluminium strip, bare size (8.5mm x 3.5mm) x 4 Nos. in parallel
16.	Quantity of oil (Litre)	: 57
17.	Weight of oil (kg.)	: 49
18.	Weight of core & winding (kg.)	: 136
19.	Total weight (kg.)	: 228
20.	Polarity	: Subtractive
21.	Vector group	: 1-Phase
22.	Year of manufacture	: 2018
23.	Insulation Level H.V.	: 75 kVp
24.	Insulation Level L.V.	: 03 kVrms
25.	Total losses at 75°C (Watts)	: 110 Max. (at 50 % load)
26.	Total losses at 75°C (Watts)	: 300 Max. (at 100 % load)

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SR. NO.	TEST DETAILS	TEST SPECIFICATIONS
1.	Short-circuit withstand test	Cl. No. (17 & 21.3.c) of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
2.	Lightning Impulse Test	Cl. No. 21.3 a of IS 1180 (Part 1): 2014 [Amendment No.1 & 2] & Test voltage was specified by the customer & Test procedure was followed as per IS: 2026 (Part 3): 2009, Cl. No. 14
3.	Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load.	Cl. No. 21.2.c of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
4.	Measurement of no-load loss and current	Cl. No. 21.2.d of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
5.	Total losses at 50 % load	Cl. No. 8.8 of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
6.	Total losses at 100 % load	Cl. No. 8.8 of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
7.	Temperature-rise test	As per customer's requirement, testing procedure followed as per Cl. No. 21.3.b of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
8.	No-load current at 112.5 percent voltage	Cl. No. 21.4.c of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
9.	Oil leakage test	Cl. No. 21.2.j of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
10.	Pressure test (routine test)	Cl. No. 21.2.h of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
11.	Pressure test (type test)	Cl. No. 21.3.d of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
12.	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 [Amendment No.1 & 2] & Cl. No. 13 of IS 2026 (Part 10): 2009
13.	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
*14.	Paint adhesion test	Test procedure followed as per ASTM D 3359-2017, Cl. No. 8 & Cl. No. 21.4.d of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
*15.	Total dry film paint thickness	Cl. No. 15.5 & Table 12 of IS 1180 (Part 1): 2014 [Amendment No.1 & 2]
* Not covered in our NABL scope		

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1. Short-circuit withstand test
(Cl. No. 17 & 21.3 c)

ROUTINE TEST RESULTS BEFORE SHORT CIRCUIT

a) MEASUREMENT OF WINDING RESISTANCE

Measurement at oil temperature: 38.9°C	
LV Winding resistance (mΩ)	HV Winding resistance (Ω)
2.1-2.2(n)	1.1-1.2(N)
9.356	7.3315

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)		
26.447	26.463	-0.060

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

Oil temperature: 39.0°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
3.935	265.282	50.081	236.960	4.175	264	4.200

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

Oil temperature: 39.0°C

Test current (Amp.)	Impedance voltage (V)	Frequency (Hz.)	Load loss measured (Watts)	Load loss computed at 75°C (Watts)
1.968	132.626	50.094	59.219	66

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e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Oil temperature: 39.0°C

Applied Voltage (V)	Current (Amp.)	Frequency (Hz.)	Losses Measured (Watts)
240.017	0.623	50.068	21

- Total losses at 75°C: 87 Watts (at 50 % load)
- Total losses at 75°C: 285 Watts (at 100% load)

f) MEASUREMENT OF INSULATION RESISTANCE

Oil temperature: 38.9°C, Measured at Voltage: 1000 V DC

	IR value (MΩ)
HV to LV winding	> 2000
HV winding to LV + EARTH	> 2000
LV winding to HV + EARTH	> 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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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.	0137/01	-	3746	1888	0.1	Calibration Shot
2.	0137/02	240	5065	2495	0.5	No Abnormality
3.	0137/03	240	5131	2516	0.5	No Abnormality
4.	0137/04	240	4874	2534	0.5	No Abnormality
5.	0137/05	240	5007	2432	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		4.06	-
2.	After the test no.	2.	4.11	1.23
3.	After the test no.	3.	4.21	3.69
4.	After the test no.	4.	4.23	4.19
5.	After the test no.	5.	4.25	4.68

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ROUTINE TEST RESULTS AFTER SHORT CIRCUIT

a) MEASUREMENT OF WINDING RESISTANCE

Measurement at oil temperature:34.2°C	
LV Winding resistance (mΩ)	HV Winding resistance (Ω)
2.1-2.2(n)	1.1-1.2(N)
9.277	6.8780

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)		
26.450	26.463	-0.049

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

Oil temperature: 33.5°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
3.936	275.450	49.948	233.390	4.347	263	4.374

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

Oil temperature: 33.5°C

Test current (Amp.)	Impedance voltage (V)	Frequency (Hz.)	Load loss measured (Watts)	Load loss computed at 75°C (Watts)
1.970	137.746	49.940	58.338	66

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e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Oil temperature: 33.5°C

Applied Voltage (V)	Current (Amp.)	Frequency (Hz.)	Losses Measured (Watts)
240.264	0.656	50.040	22

- Total losses at 75°C: 88 Watts (at 50 % load)
- Total losses at 75°C: 285 Watts (at 100% load)

f) MEASUREMENT OF INSULATION RESISTANCE

Oil temperature: 34.2°C, Measured at Voltage: 1000 V DC

	IR value (MΩ)
HV to LV winding	> 2000
HV winding to LV + EARTH	> 2000
LV winding to HV + EARTH	> 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.

REMARKS: The sample **conforms** to the requirements of standard for Short-circuit withstand test.

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TEST REPORT NO. : RP-1819-011069
DATE : 21/06/2018

2.Lightning Impulse Test (As per Cl. No.21.3.a of IS 1180 (part 1) : 2014 Amendment No. 1 & 2 & Test voltage was specified by the customer & 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	-50.656	1.270	48.563	
2	100% LI FW	-76.721	1.277	48.861	
3	LI CRW	-49.542	1.312		2.854
4	110% LI CFW	-82.315	1.298		2.856
5	110% LI CFW	-82.257	1.293		2.471
6	100% LI FW	-75.483	1.269	48.881	
7	100% LI FW	-75.650	1.272	48.800	

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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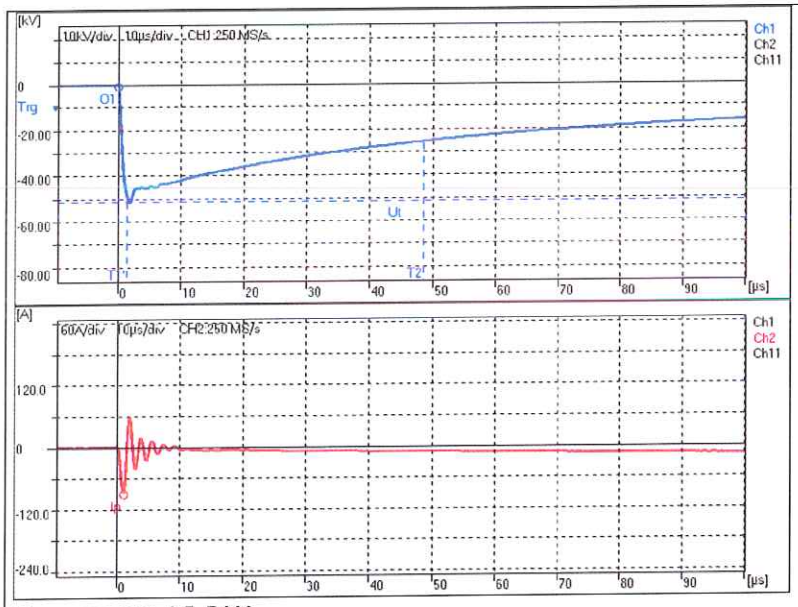
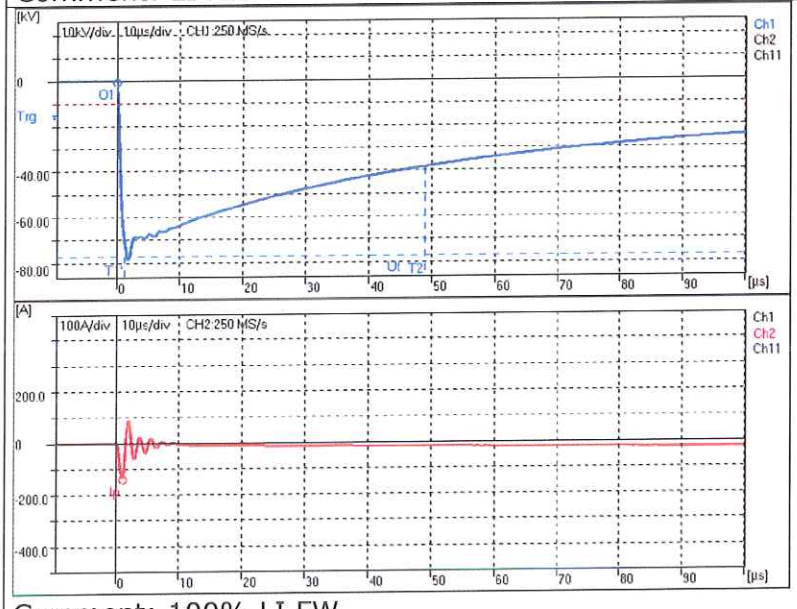


Comment: LI RW

Fig.: 1
U_p = -50.66 kV
T_1 = 1.27 µs
T_2 = 48.56 µs
T_c = µs



Comment: 100% LI FW

Fig.: 2
U_p = -76.72 kV
T_1 = 1.28 µs
T_2 = 48.86 µs
T_c = µs

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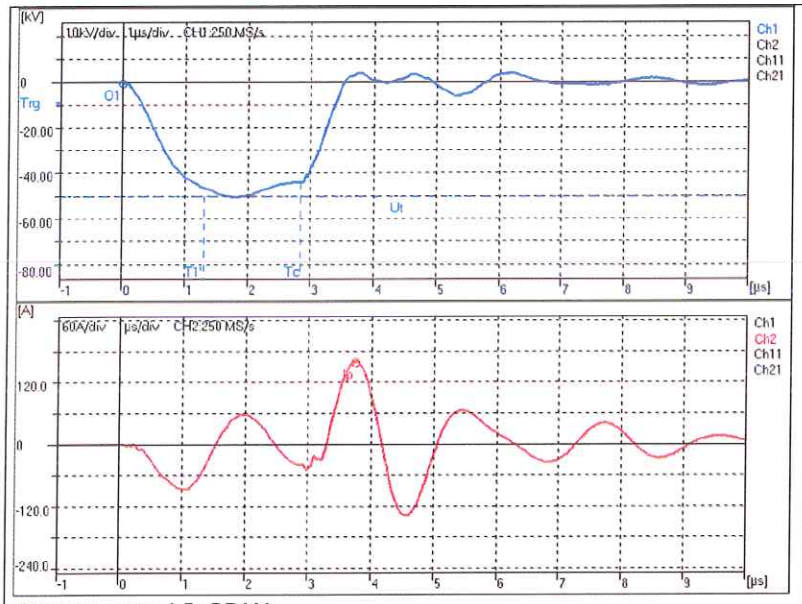
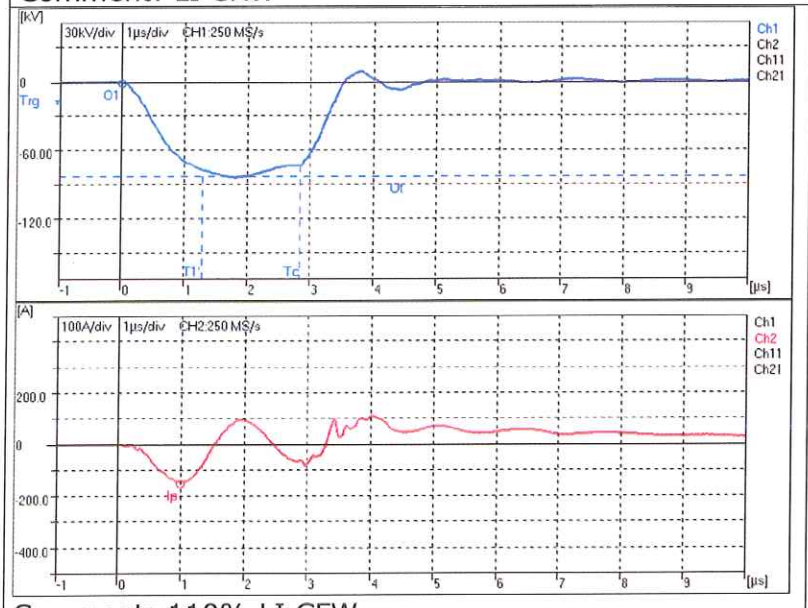
TEST REPORT NO. : RP-1819-011069 **SHEET NO.:** 13 of 26
DATE : 21/06/2018



Comment: LI CRW

Fig.: 3
U_p = -49.54 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 2.85 µs



Comment: 110% LI CFW

Fig.: 4
U_p = -82.32 kV
T_1 = 1.30 µs
T_2 = µs
T_c = 2.86 µs

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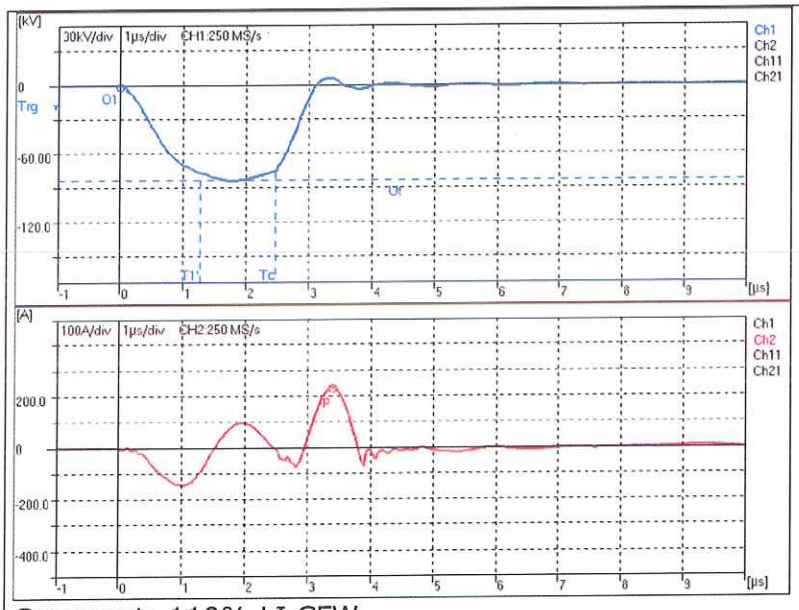
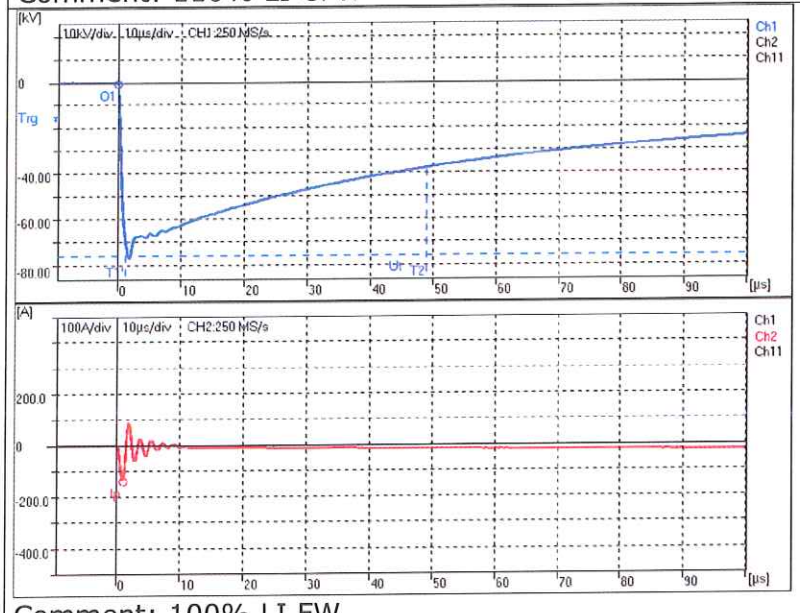


Comment: 110% LI CFW

Fig.: 5
U_p = -82.26 kV
T_1 = 1.29 µs
T_2 = µs
T_c = 2.47 µs



Comment: 100% LI FW

Fig.: 6
U_p = -75.48 kV
T_1 = 1.27 µs
T_2 = 48.88 µs
T_c = µs

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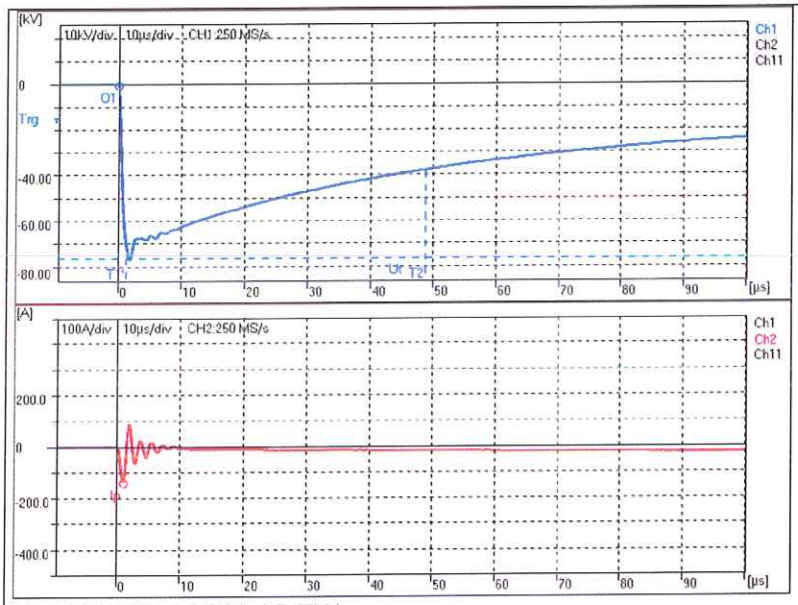

Comment: 100% LI FW

Fig.: 7
U_p = -75.65 kV
T_1 = 1.27 µs
T_2 = 48.80 µs
T_c = µs

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REPORT NO.: RP-1819-011069 **Sheet :** 16 OF 26
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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
3.	**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 **1.9786** Amps (on HV side)			
	Frequency : **49.925** Hz			
	Top oil temperature : **31.6**°C			
	Test current (Amps)		1.9786	
	Impedance voltage (Volts)		137.99	
	Measured load loss (Watts)		57.41	
	Impedance voltage (%)			
	(Computed to 50% load)			
	At 31.6°C		2.16	
	At 75°C	---	2.17	
	Load loss (Watts)			
	(Computed to 50% load)			
	At 31.6°C		56.80	
	At 75°C	---	64.72	
	At 100% load :			
	Tested with **3.9412** Amps (on HV side)			
	Frequency : **49.912** Hz			
	Top oil temperature : **31.6**°C			
	Test current (Amps)		3.9412	
	Impedance voltage (Volts)		275.03	
	Measured load loss (Watts)		228.1	
	Impedance voltage (%)			
	(Computed to 100% load)			
	At 31.6°C		4.33	
	At 75°C	4.0 (±10%)	4.37	**Conforms**
	Load loss (Watts)			
	(Computed to 100% load)			
	At 31.6°C		227.96	
	At 75°C	--	259.61	

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REPORT NO.: RP-1819-011069 **Sheet :** 17 OF 26
DATE : 21.06.2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
4.	**Measurement of no-load loss and current :** (As per cl.no.21.2.d of IS 1180 (Part 1): 2014) Tested with average **240.05** Volts (on LV side) Frequency : **49.965** Hz **RMS voltage** (Volts) **No-load current** (Amps) **Measured no-load loss** (Watts) **Corrected no-load loss** (Watts)	 --	 242.34 0.6303 22.20 21.99	--
5.	**Total losses at 50 % load (Watts) :** (As per cl.no.8.8 of IS 1180 (Part 1):2014)	Max. 110	86.71	**Conforms**
6.	**Total losses at 100 % load (Watts) :** (As per cl.no.8.8 of IS 1180 (Part 1):2014)	Max. 300	281.6	**Conforms**

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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained value	Remarks
7.	**Temperature-rise test :**			**Conforms**
	(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-650 mm, Diameter-470 mm			
	Specified losses fed for temperature-rise test were 300 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 :	Max. 35°C	24.6°C	
	B) Winding Temperature Rise (Resistance method)			
	1) HV Winding :	Max. 40°C	28.1°C	
	2) LV Winding :	Max. 40°C	31.2°C	
	C) Ambient temperature at shutdown :		31.0°C	
	D)Time of Shutdown(Hrs) :		01:30	

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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
8.	**No load current at 112.5 percent voltage :** (As per Cl.no.21.4.c of IS 1180 (Part1: 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	 270.03 1.9001 1.824	**Conforms**
9.	**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**
10.	**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**

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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
11.	**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-1819-011069
DATE: 21.06.2018

Particulars of Tests & Cl. No.:
12) 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	45.6	45.2
2	B	45.7	45.3
3	C	45.9	45.6
4	D	45.7	45.1
5	E	45.1	45.0
6	F	45.4	45.5
7	G	45.7	45.6
8	H	45.5	45.4
9	I	45.6	45.3
10	J	45.1	45.4
	Arithmetic Average $\overline{L_{bgA}}$	**45.5**	**45.3**

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	46.9
2	B	47.2
3	C	47.3
4	D	47.5
5	E	47.1
6	F	47.9
7	G	47.5
8	H	46.9
9	I	47.4
10	J	47.8
	Arithmetic Average $\overline{L_{pA10}}$	**47.4**

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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.

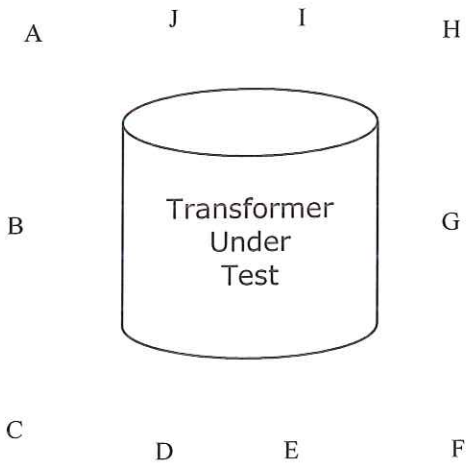
Length of prescribed contour: 10.42 m

Transformer Tank Height: 0.650 m

Person present during sound level measurement: 3

A-Weighted sound pressure level ($\overline{L_{pA0}}$):	47.4 dB(A)
Corrected average A-weighted sound pressure level ($\overline{L_{pA}}$):	43.2 dB(A)
Calculated A- weighted sound power level (L_{WA}) :	52.5 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-1819-011069 Date: 21.06.2018

Sr. No.	Particulars of test and clause no.	Requirement as per specification.	Obtained value	Remarks
13	**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: 27.6% Voltage THD: 2.54%	---

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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	0.60	100.00
2	0.87	0.01	0.07
3	19.59	0.12	1.37
4	1.29	0.01	0.07
5	12.82	0.08	2.10
6	0.42	0.00	0.03
7	14.45	0.09	0.22
8	0.10	0.00	0.02
9	1.44	0.01	0.10
10	0.05	0.00	0.01
11	0.32	0.00	0.20
12	0.02	0.00	0.01
13	0.22	0.00	0.02
14	0.02	0.00	0.03
15	0.10	0.00	0.02
16	0.05	0.00	0.04
17	0.22	0.00	0.12
18	0.03	0.00	0.02
19	0.13	0.00	0.07
20	0.08	0.00	0.05
21	0.05	0.00	0.02
22	0.05	0.00	0.03
23	0.10	0.00	0.03
24	0.03	0.00	0.01
25	0.25	0.00	0.10
THD %	27.60		2.54
Parameter measured	0.62 A		240.16 V

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TEST REPORT No.: RP-1819-011069 DATE: 21-06-2018

Sr. No.	Particular of Tests and Cl. No.	Requirements as per specification	Obtained value	Remarks
14.	Paint Adhesion Test at 37°C & 29 % 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- 5A – No peeling or removal was observed at the location. Observation 3- 5A – No peeling or removal was observed at the location.	--

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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
15	**Total Dry Film Paint Thickness** (As per cl.no.15.5 & Table 12 of IS 1180 (Part 1):2014)			
	Inside Tank	35.0 microns [Min.]	29.7 microns#	**Does not Conform**
	Outside Tank	80.0 microns [Min.]	89.3 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.			

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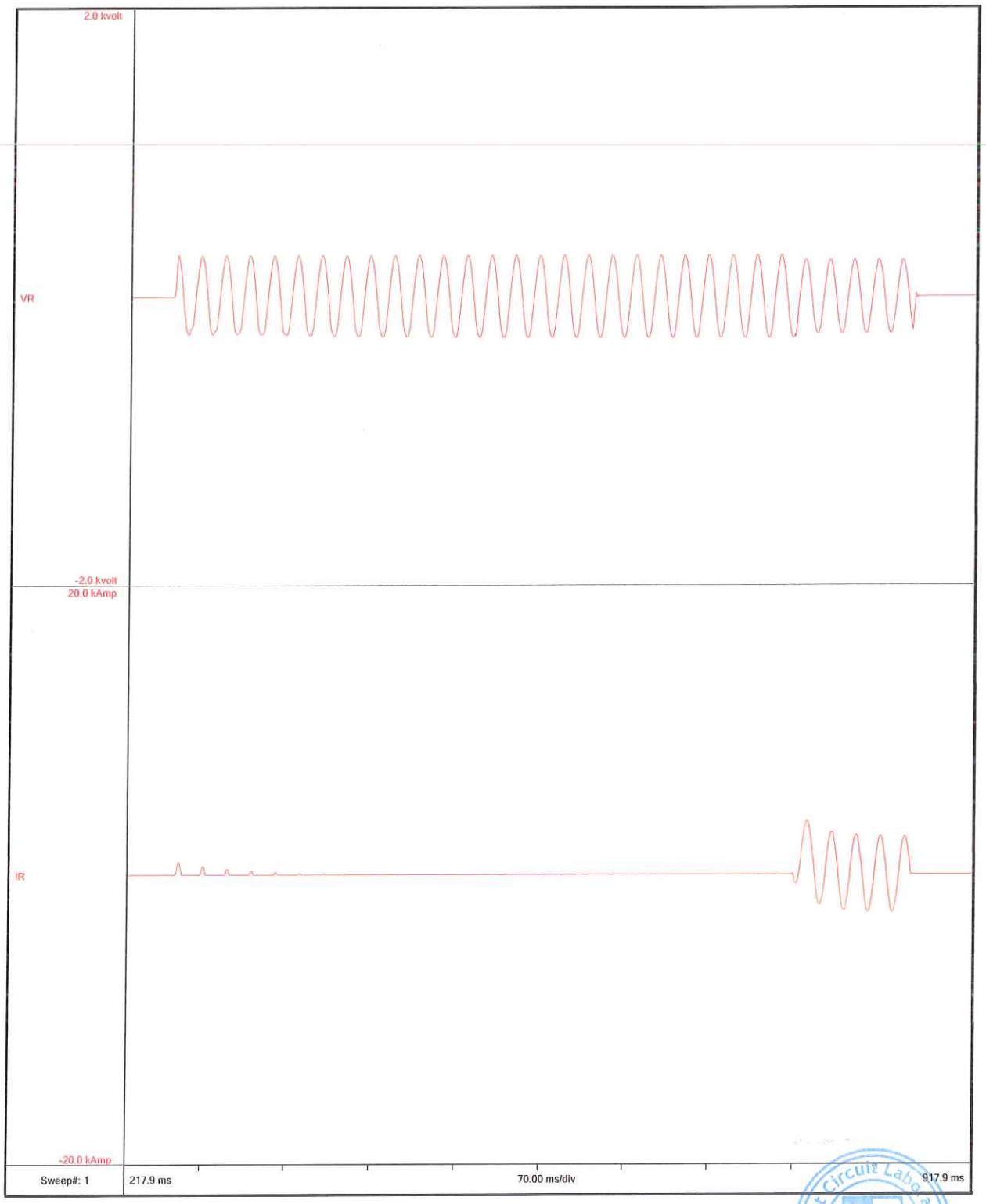

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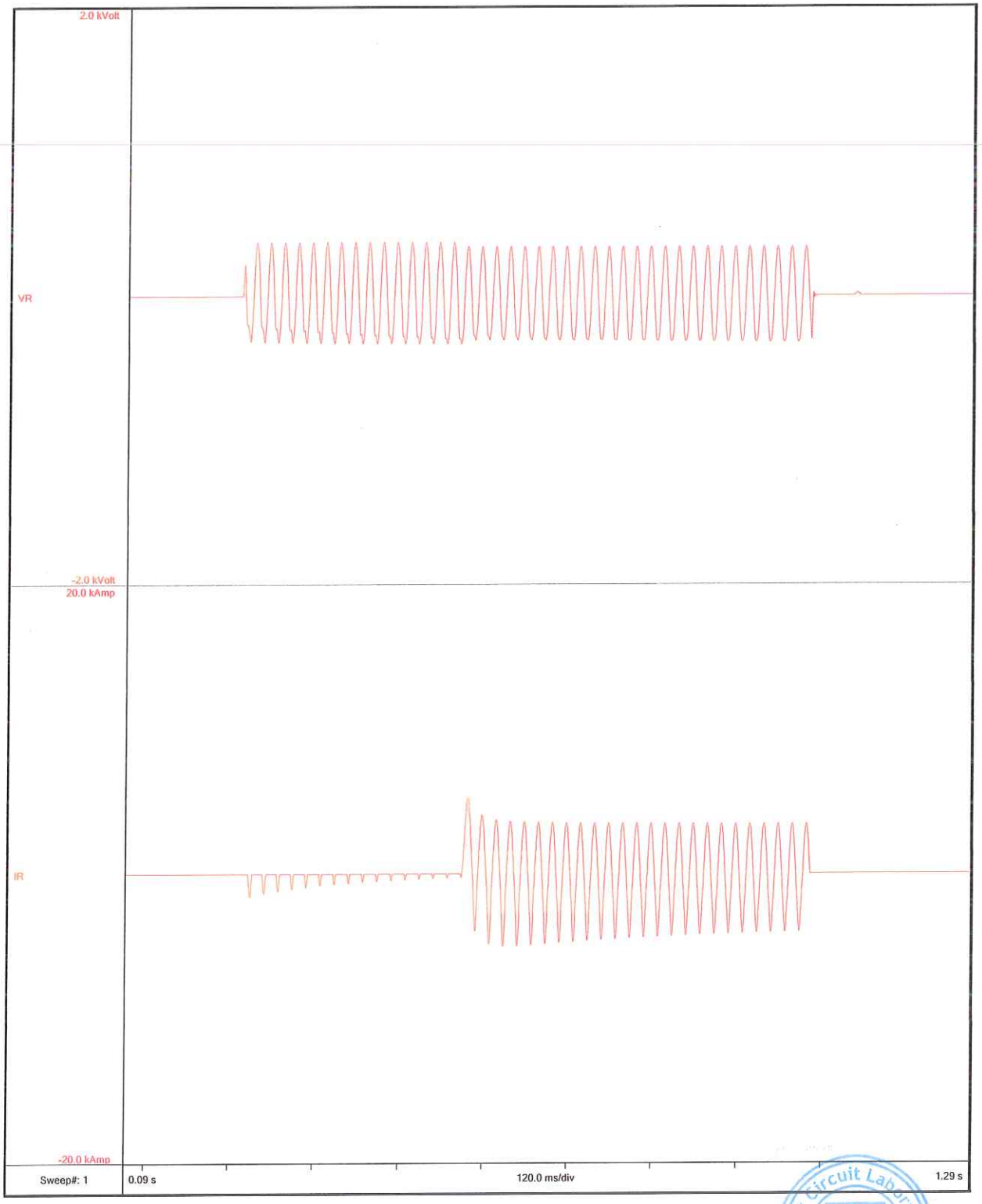

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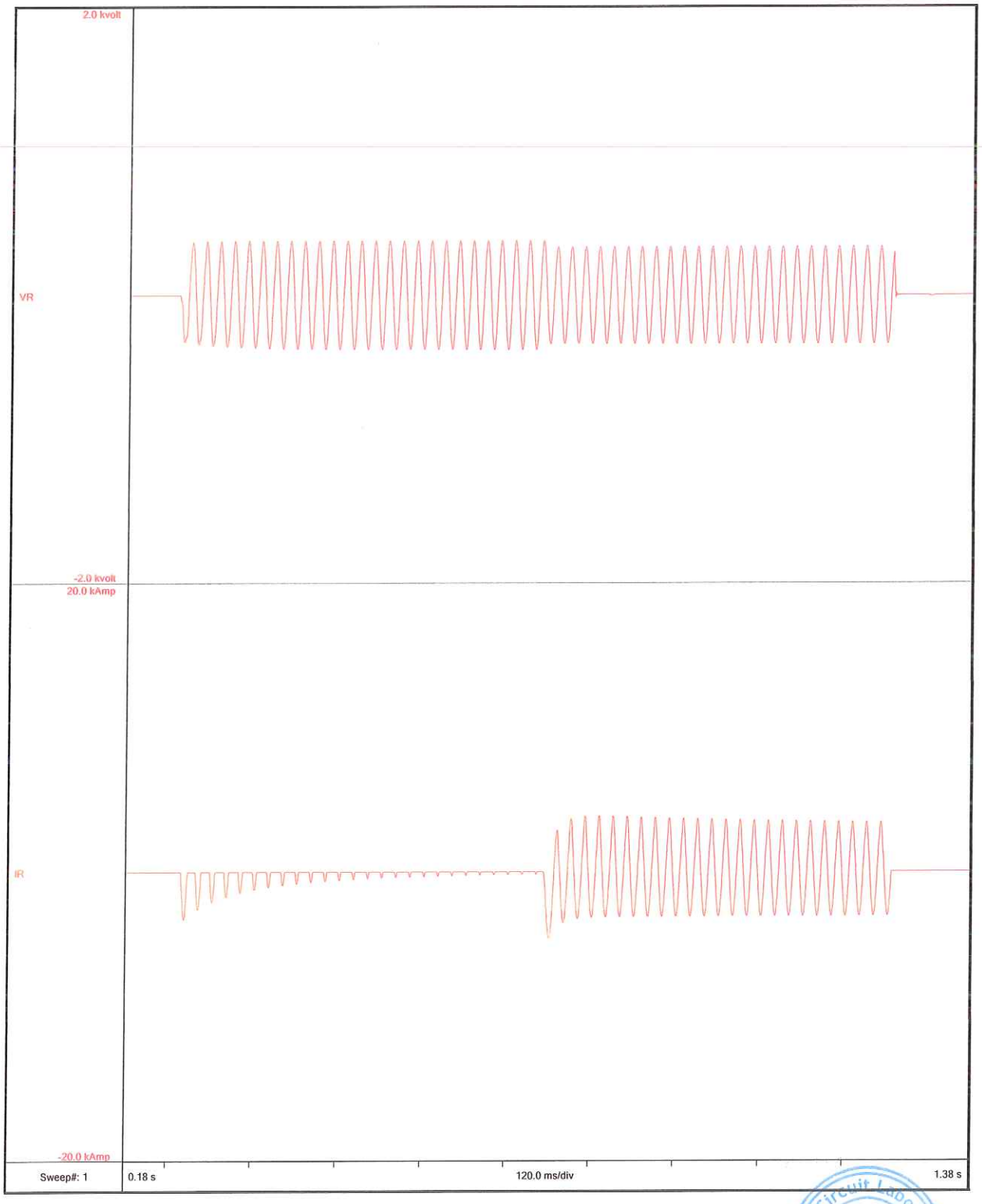

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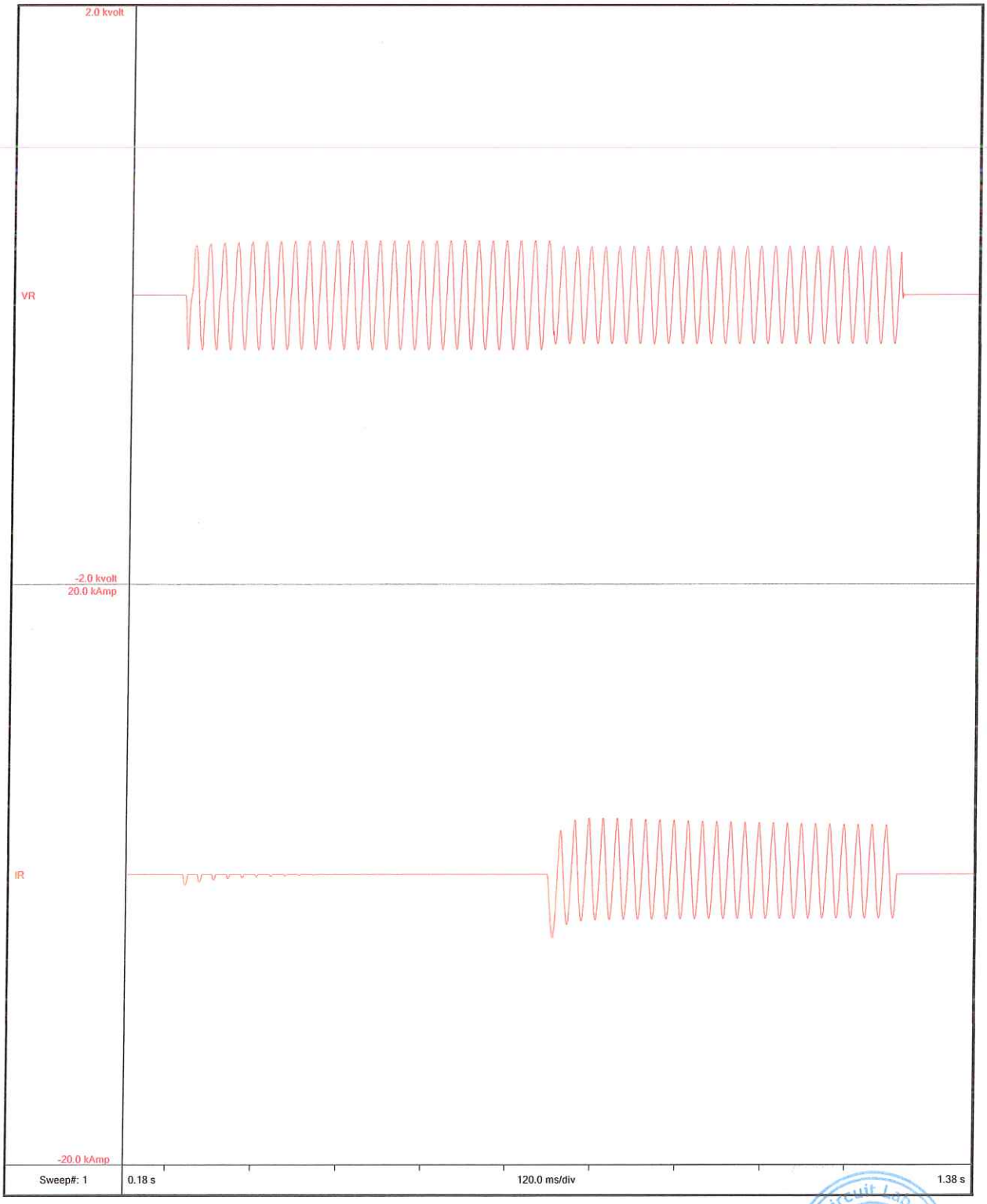

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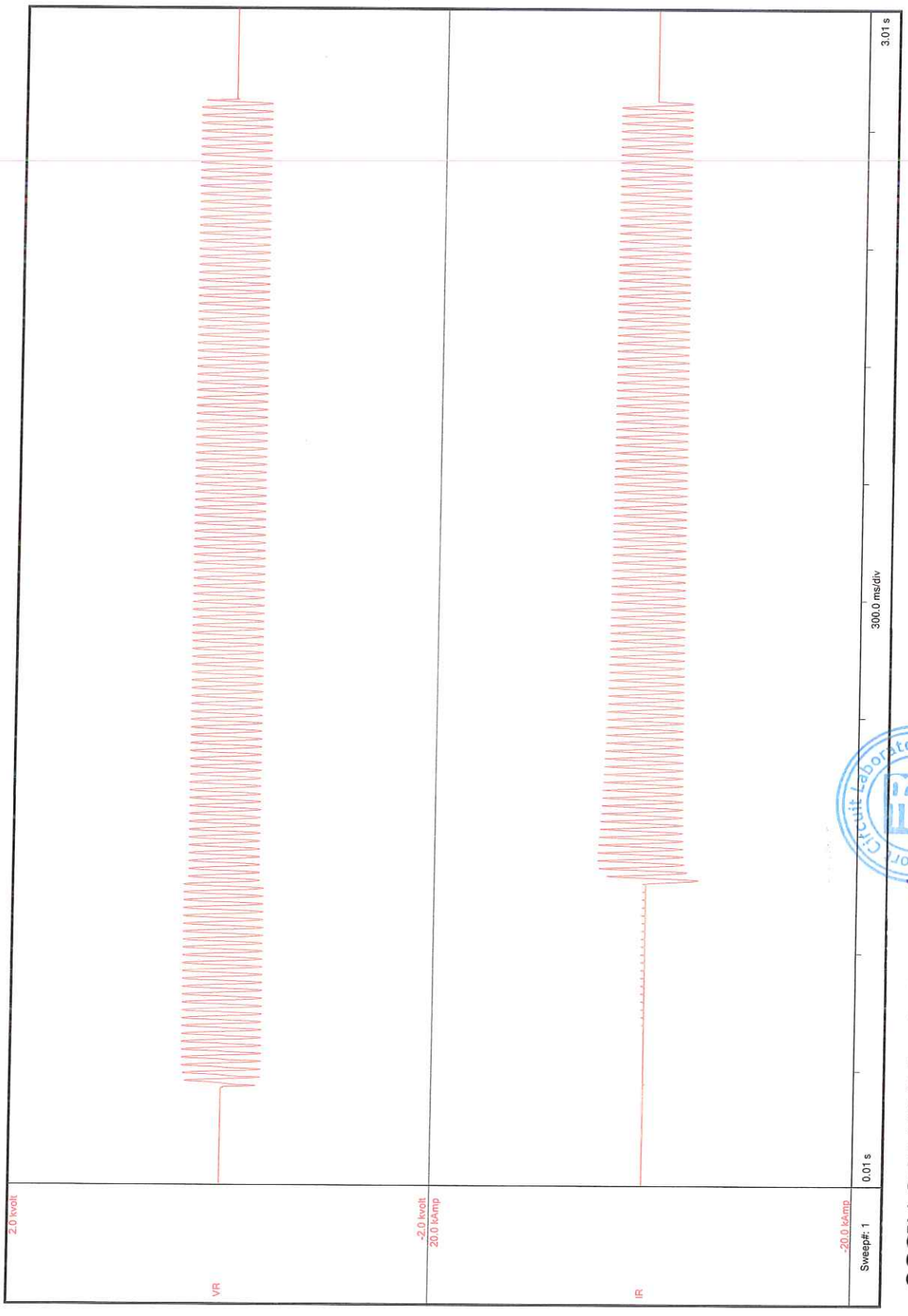

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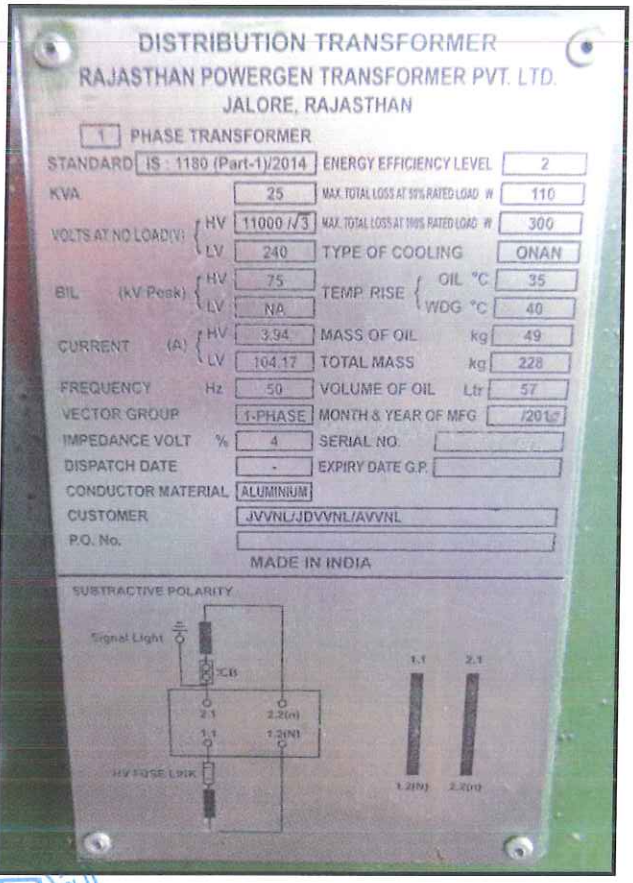

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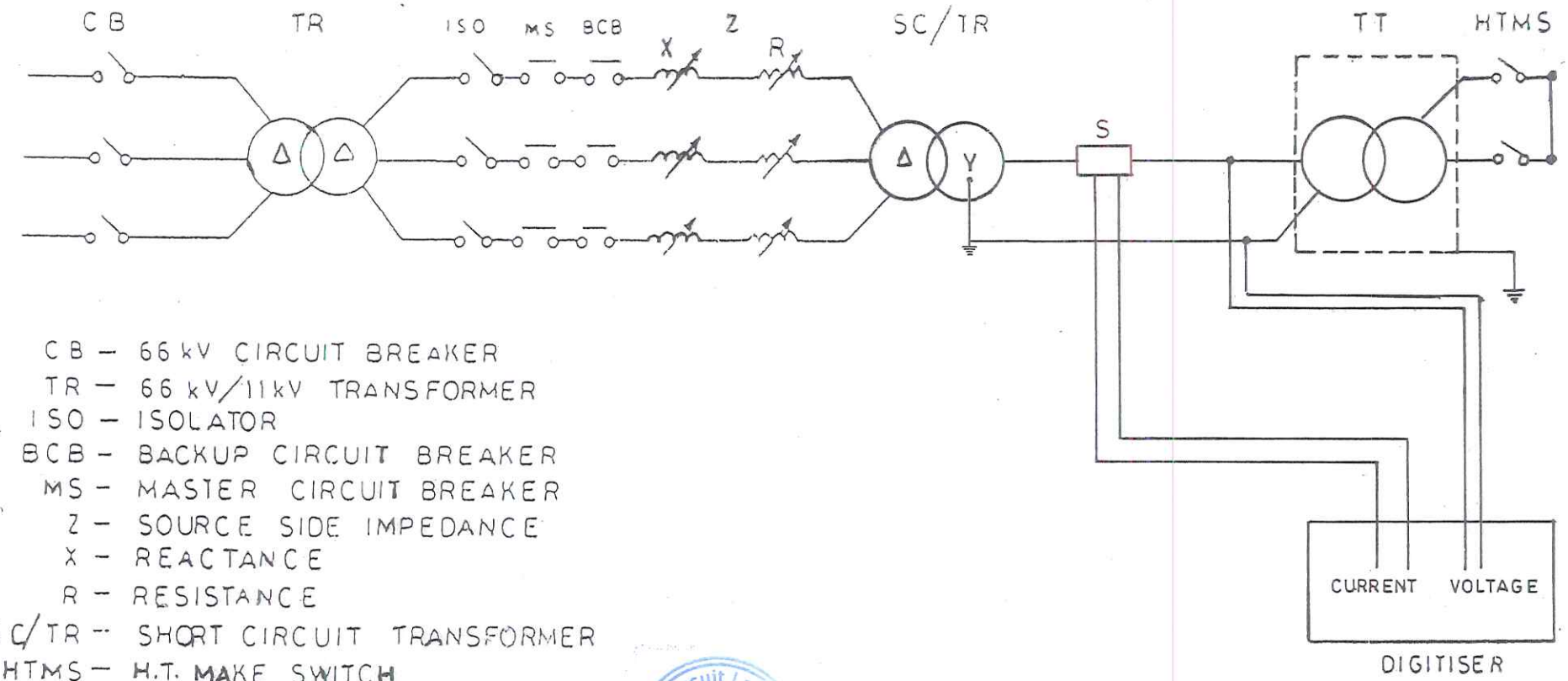

CB – 66 kV CIRCUIT BREAKER
TR – 66 kV/11kV TRANSFORMER
ISO – ISOLATOR
BCB – BACKUP CIRCUIT BREAKER
MS – MASTER CIRCUIT BREAKER
Z – SOURCE SIDE IMPEDANCE
X – REACTANCE
R – RESISTANCE
SC/TR – SHORT CIRCUIT TRANSFORMER
HTMS – H.T. MAKE SWITCH
T.T. – TEST TRANSFORMER
S – CURRENT MEASURING DEVICE

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REPORT NO.: RP-1419-011069
DATE : 21.06.2018

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

SCHEMATIC CIRCUIT DIAGRAM

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S.B.S.	A.V.P.	30.9.01	OLSC/DTC/05

4 HOLES
of Ø3.6mm

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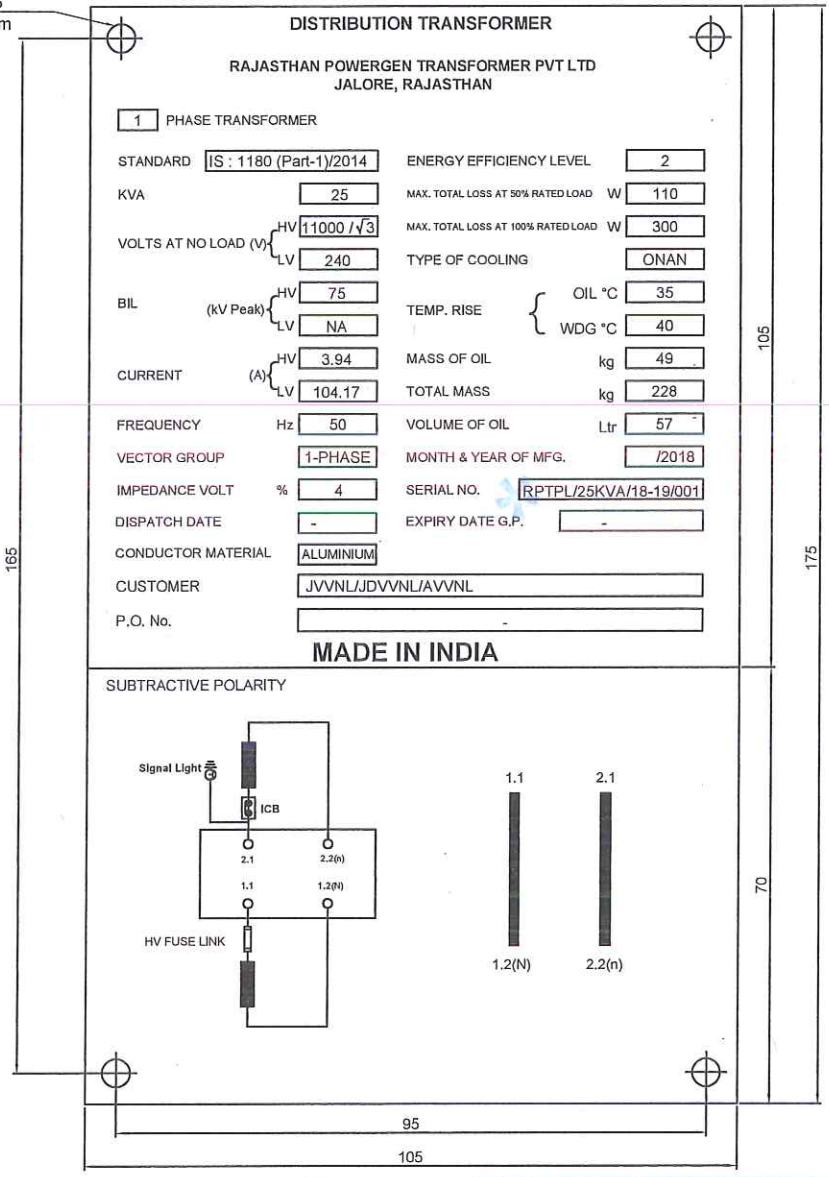
JALORE, RAJASTHAN

1 PHASE TRANSFORMER

STANDARD	IS : 1180 (Part-1)/2014	ENERGY EFFICIENCY LEVEL	2
KVA	25	MAX. TOTAL LOSS AT 50% RATED LOAD W	110
VOLTS AT NO LOAD (V) HV	11000 / √3	MAX. TOTAL LOSS AT 100% RATED LOAD W	300
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	3.94	MASS OF OIL kg	49
CURRENT (A) LV	104.17	TOTAL MASS kg	228
FREQUENCY Hz	50	VOLUME OF OIL Ltr	57
VECTOR GROUP	1-PHASE	MONTH & YEAR OF MFG.	/2018
IMPEDANCE VOLT %	4	SERIAL NO.	RPTPL/25KVA/18-19/001
DISPATCH DATE	-	EXPIRY DATE G.P.	-
CONDUCTOR MATERIAL	ALUMINIUM		
CUSTOMER	JVVNL/JDVVNL/AVVNL		
P.O. No.	-		

MADE IN INDIA

SUBTRACTIVE POLARITY



Short Circuit Laboratory
ERDA
Vadodara

Test Report No. RP-18B-01106
Date 21.06.2018
Product 25 kVA D.T
Verified by
Verification of this drawing by ERDA is limited to relevant dimensional checks only.
Verified dimensions are marked with ***

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
00	23.08.17				ORIGINAL ISSUE.

Title : RATING & DIAGRAM PLATE

Work Order : ----

Rating : 25 KVA, 11/√3/0.240 KV, 1Ø, 50 Hz, TRF.

Drawing No. : RPTPL/RP/03B Rev. : 00

Sheet No. : 00

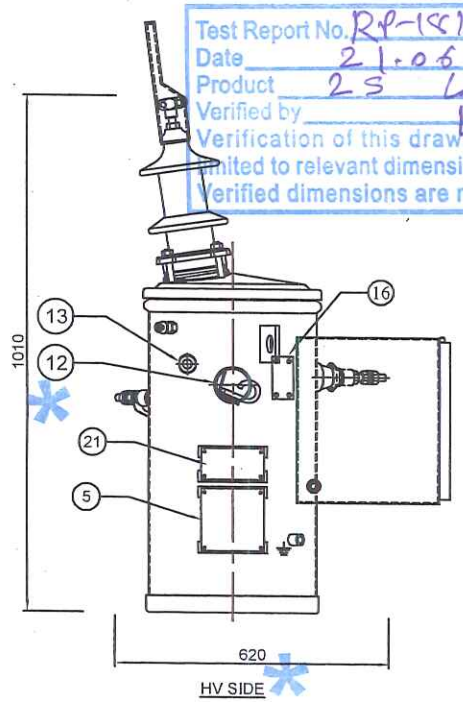
Total Sheets: 00

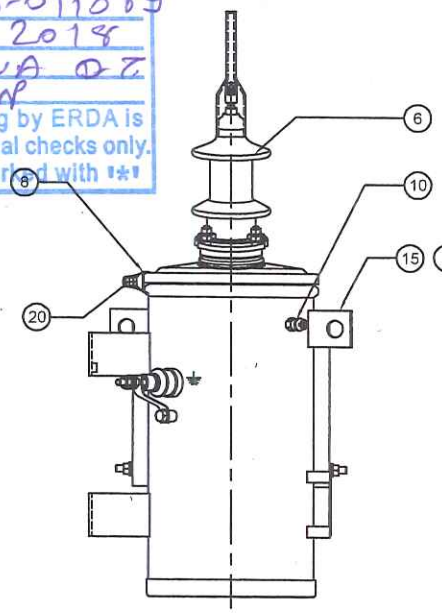
Scale : NTS

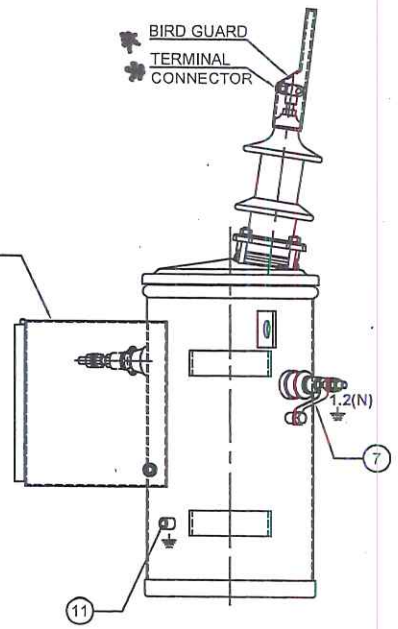
All dimensions are in millimeters unless otherwise stated. If in doubt - Please Ask !

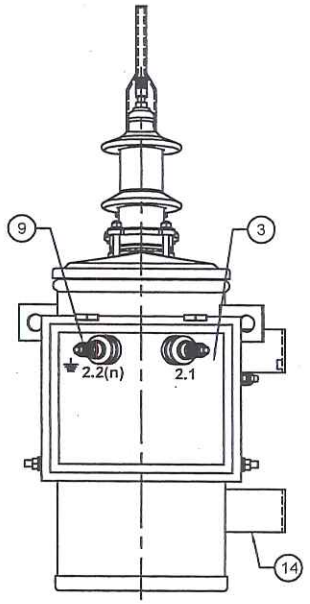
RAJASTHAN POWERGEN TRANSFORMER P. LTD.
Karola – Bhinmal Road, Karola, Sanchore – 343041 Dist – Jalore, Rajasthan (India)

Test Report No. RP-1819-011063
Date 21.05.2018
Product 25 KVA DT
Verified by MP
Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'







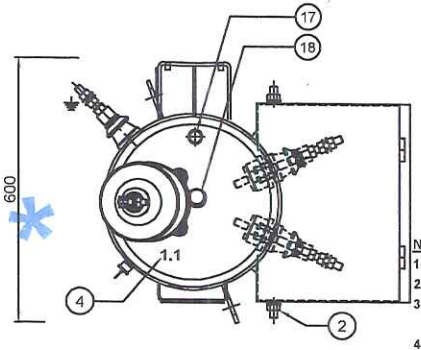


Tank diameter	470 mm
Tank height	650 mm

Locking height (mm)	395
LV hole height (mm)	455
Oil level indicator (mm)	550
Breaker handle height (mm)	NA

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

WEIGHTS / QTY.		
TRANSFORMER OIL	Ltrs.	57
TOTAL TRANSFORMER	Kg.	228
TRANSFORMER OIL	Kg.	49
TANK & FITTINGS	Kg.	43
CORE COIL ASSY	Kg.	136



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	-
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	Internal Circuit Breaker handle*	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 cable box*	1

Rev	Date	Draw	Checked	Approved	Description
01	28.05.2018				
00	23.08.2017				ORIGINAL ISSUE.

Title : OUTLINE GENERAL ARRANGEMENT
Work Order : ---
Rating : 25 KVA, 11/√3/0.240 KV, 1Ø, 50 Hz, TRF.
Drawing No. : RPTPL/OGA/03B
Rev. : 01
Sheet No. : 01
Total Sheets: 01
Scale : N.T.S

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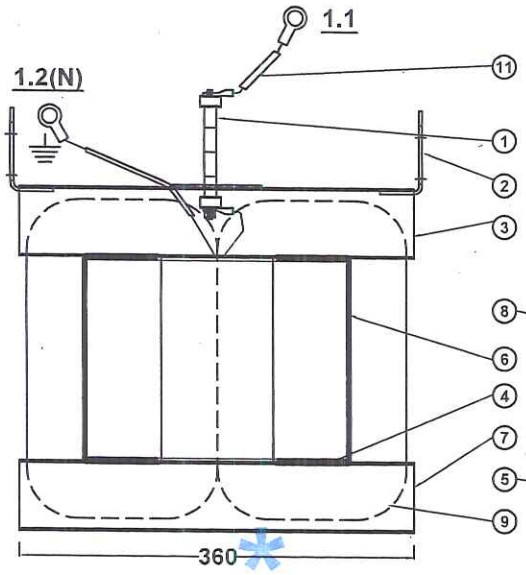
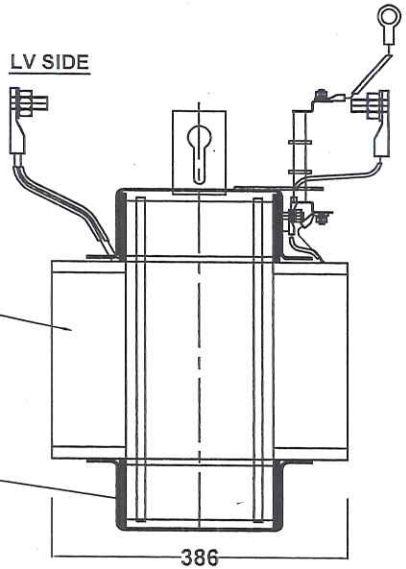
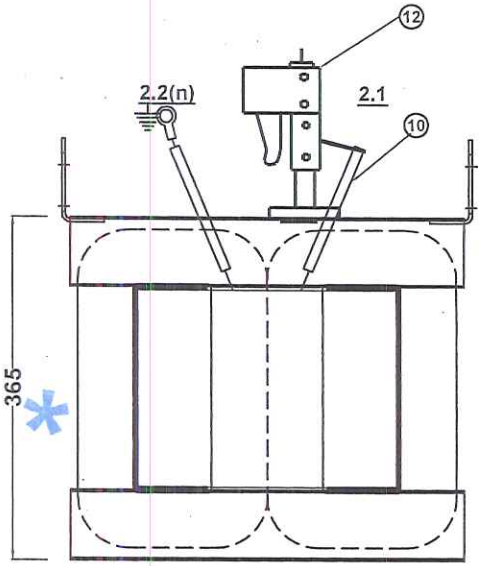


H.V. SIDE VIEW



SIDE VIEW



L.V. SIDE VIEW

Short Circuit Laboratory
ERDA
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CONDUCTOR SIZE		
	LV	HV
Bare	8.5 x 3.5	2.53 Dia
Covered	8.9 x 3.9	2.63 Dia
Aluminium	DPC	Polyesterimide enamel (Class H)
Conductor Configuration	2W x 2D	-

CORE SIZE	
Core Window Height	245 mm
Core build up	2 x 46.5 mm
Core Sheet width	213 mm

COIL DIMENSIONS		
	LV	HV
ID	100 x 221	175 x 296
OD	167 x 288	265 x 386
AXIAL HT.	232*	

Test Report No. RP-1819-011089
Date 21.05.2018
Product 25 kVA DT
Verified by VNP
Verification of this drawing by ERDA is limited to relevant dimensional checks only.
Verified dimensions are marked with '*'

SL.No.	LIST OF FITTINGS	Qty.
12	INTERNAL CIRCUIT BREAKER*	1
11	HV LEAD	-
10	LV LEAD	-
9	CORE (AMORPHOUS CORE)	2 set
8	LV & HV COIL (ALUMINIUM)	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

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	23.08.2017				ORIGINAL ISSUE.

Title : INTERNAL CONSTRUCTIONAL DETAIL DRAWING

Work Order : ---

Rating : 25 KVA, 11/√3/0.240 KV, 1Ø, 50 Hz, TRF.

Drawing No. : RPTPL/IC/03B Rev. : 01

Sheet No. : 01 Total Sheets: 01

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Scale : N.T.S