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TEST REPORT

NAME AND ADDRESS OF CUSTOMER **M/s. Rajasthan Powergen Transformer Pvt. Ltd.** Khasra No. 911-914 Karola-Bhinmal Road Karola, Sanchore, Rajasthan-343041(India)	**TEST REPORT NO.:** RP-1819-007269 **DATE** : 28/05/2018 **CUSTOMER REF. NO.** / **DATE**: Nil / 28/03/2018 **DATE OF SAMPLE RECEIPT** / **DATE OF TESTING**: 28/03/2018 / 04/04/2018 to 03/05/2018
SAMPLE DESCRIPTION **DISTRIBUTION TRANSFORMER** Rating : 2000 kVA Volts : 11000/433 V Current : 104.97/2666.74 Amps Phases : 3/3 Vector group : Dyn11 Energy efficiency level : 2 Further details as per sheet no.2 of 29	**SAMPLE IDENTIFICATION** ERDA sample code number : ERDA-00249415 Manufacturer serial no.: RPTPL/-001 Year of manufacture : 2018
TEST DETAILS As per sheet 3 of 29.	**TEST SPECIFICATION** As per sheet 3 of 29.
TEST RESULTS : As per sheets from 4 of 29 to 27 of 29.	
ENCLOSED DRAWING NUMBERS : 1) RPTPL-2000KVA-R&D-01 2) RPTPL-2000KVA-GA-02	
REMARKS : 1) The transformer **conforms** to the guaranteed requirement as per above mentioned test specification for above mentioned test nos. 1,3,6,7 & 11 to 18. 2) Criteria limit has not been specified for test nos. 2,5,6,8,9 & 10.	

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3. Publication of this report requires prior permission in writing from Director , E.R.D.A.
4. Only the tests asked for by the customer have been carried out.
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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 2 of 29
DATE : 28/05/2018

TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER

1.	Name of Manufacturer	RAJASTHAN POWERGEN POWERGEN PVT. LTD.
2.	Sr.No.	RPTPL/-001
3.	kVA rating	2000
4.	Rated Voltage H.V.(Volts)	11000
5.	Rated Voltage L.V.(Volts)	433
6.	Rated Current H.V.(Amp.)	104.97
7.	Rated Current L.V.(Amp.)	2666.74
8.	Number of phases	3
9.	Energy Efficiency level	2
10.	Vector Group	Dyn11
11.	BIL H.V. L.V.	28kVrms / 75 kVp 3 kVrms / ---
12.	Winding Material	Copper
13.	Type of Cooling	ONAN
14.	Frequency (Hz)	50
15.	Guaranteed Percentage impedance (%)	6.25
16.	Total losses at 50 % load (Watts)	5050
17.	Total losses at 100 % load (Watts)	15000
18.	Guaranteed temperature rise of oil/Winding	40/45°C
19.	Year of Manufacture	2018
20.	Standard no.	IS 1180 (PART-1) 2014 with amendment no. 1 & 2.

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 3 of 29
DATE : 28/05/2018

SR. NO.	TEST DETAILS	TEST SPECIFICATION [As per IS 1180 (Part 1):2014 with Amendment No.1 & 2]
1.	Lightning impulse test	As per cl. no. 21.3.a & test procedure was followed as per IS 2026 (Part 3): 2009, Cl. No. 14
2.	Measurement of winding resistance.	As per cl.no.21.2.a of IS 1180 (Part 1):2014
3.	Measurement of voltage ratio and check of phase displacement	As per cl.no.21.2.b of IS 1180 (Part 1):2014
4.	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
5.	Measurement of no-load loss and current.	As per cl.no.21.2.d of IS 1180 (Part 1):2014
6.	Total losses at 50 % load	As per cl.no.7.8 of IS 1180 (Part 1):2014
7.	Total losses at 100 % load	As per cl.no.7.8 of IS 1180 (Part 1):2014
8.	Measurement of short-circuit impedance and load loss (At tap no.1)	As per customer's requirement, testing procedure followed as per cl.no.21.2.c of IS 1180 (Part 1):2014
9.	Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load.(At tap no.7)	As per customer's requirement, testing procedure followed as per cl.no.21.2.c of IS 1180 (Part 1):2014
10.	Measurement of insulation resistance.	As per cl.no.21.2.e of IS 1180 (Part 1):2014
11.	Induced overvoltage withstand test.	As per cl.no.21.2.f of IS 1180 (Part 1):2014
12.	Separate-source voltage withstand test	As per cl.no.21.2.g of IS 1180 (Part 1):2014
13.	Temperature rise test	As per cl.no.21.3.b of IS 1180 (Part 1):2014
14.	Magnetic balance test	As per CBIP manual; Publication no.317-2013
15.	No load current at 112.5 percent voltage	As per Cl.no.21.4.c of IS 1180 (Part 1):2014
16.	Oil leakage test	As per cl.no.21.2.j of IS 1180 (Part 1):2014
17.	Pressure test (routine test)	As per cl.no.21.2.h of IS 1180 (Part 1):2014
18.	Pressure test (type test)	As per cl.no.21.3.d of IS 1180 (Part 1):2014

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TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 4 of 29
DATE : 28/05/2018

1.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
1U-PHASE (TAP NO.:3)					
1	LI RW	-42.145	1.348	45.629	
2	100% LI FW	-76.141	1.353	45.655	
3	LI CRW	-51.497	1.326		2.502
4	110% LI CFW	-82.492	1.328		2.912
5	110% LI CFW	-82.025	1.323		2.536
6	100% LI FW	-76.368	1.350	45.649	
7	100% LI FW	-75.611	1.355	45.666	
1V-PHASE (TAP NO.:1)					
8	LI RW	-49.690	1.328	47.796	
9	100% LI FW	-75.308	1.331	47.918	
10	LI CRW	-50.175	1.310		2.409
11	110% LI CFW	-82.672	1.314		3.019
12	110% LI CFW	-83.160	1.311		3.020
13	100% LI FW	-75.533	1.331	47.900	
14	100% LI FW	-75.574	1.330	47.952	
1W-PHASE (TAP NO.:7)					
15	LI RW	-47.826	1.290	42.933	
16	100% LI FW	-75.213	1.290	43.035	
17	LI CRW	-51.265	1.307		2.409
18	110% LI CFW	-81.610	1.315		3.185
19	110% LI CFW	-82.995	1.309		2.876
20	100% LI FW	-75.359	1.290	42.994	
21	100% LI FW	-75.303	1.293	43.011	

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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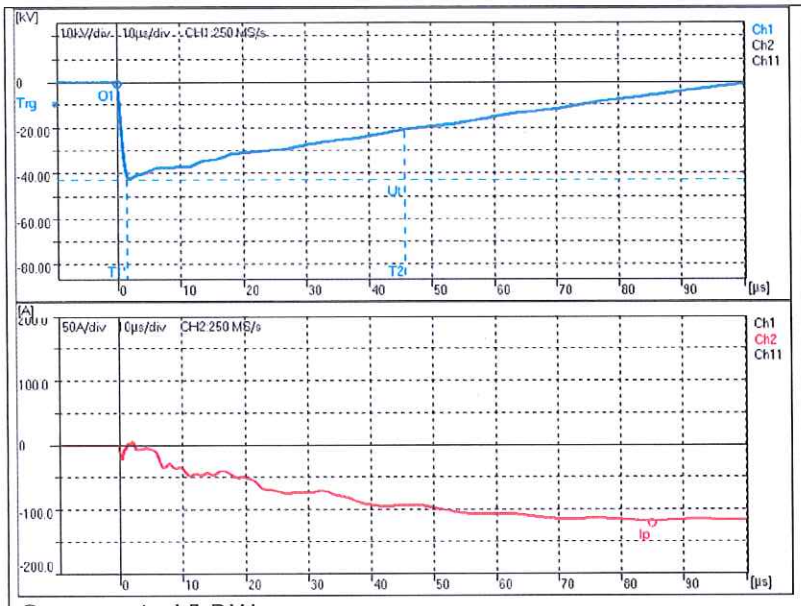
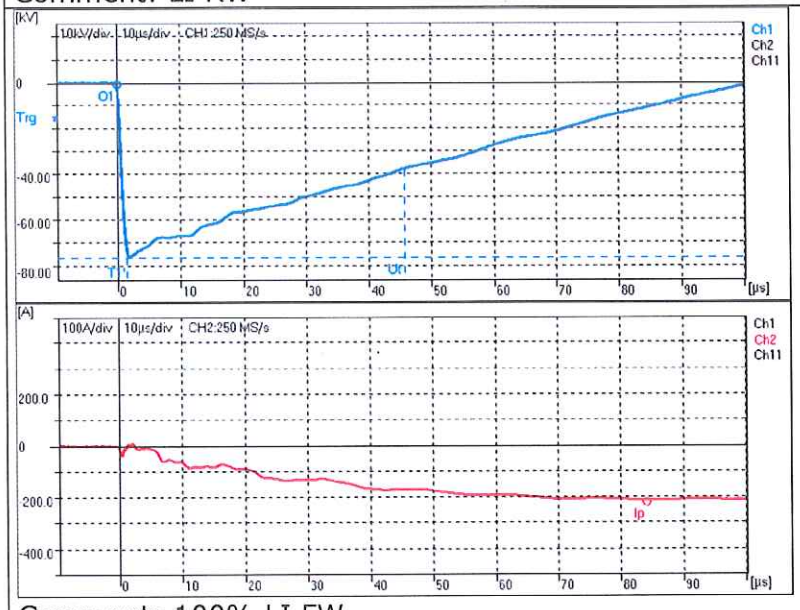
TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 5 of 29
DATE : 28/05/2018



Comment: LI RW

Fig.: 1
U_p = -42.15 kV
T_1 = 1.35 µs
T_2 = 45.63 µs
T_c = µs



Comment: 100% LI FW

Fig.: 2
U_p = -76.14 kV
T_1 = 1.35 µs
T_2 = 45.66 µs
T_c = µs

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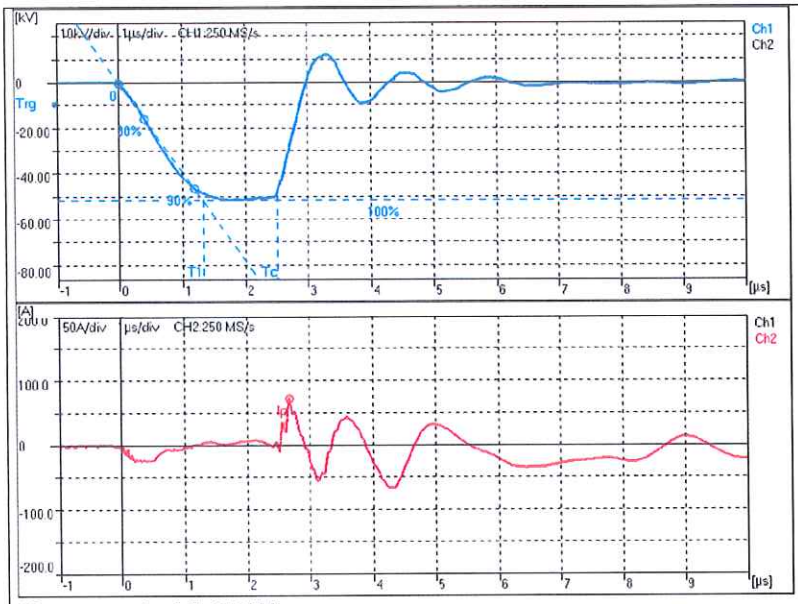
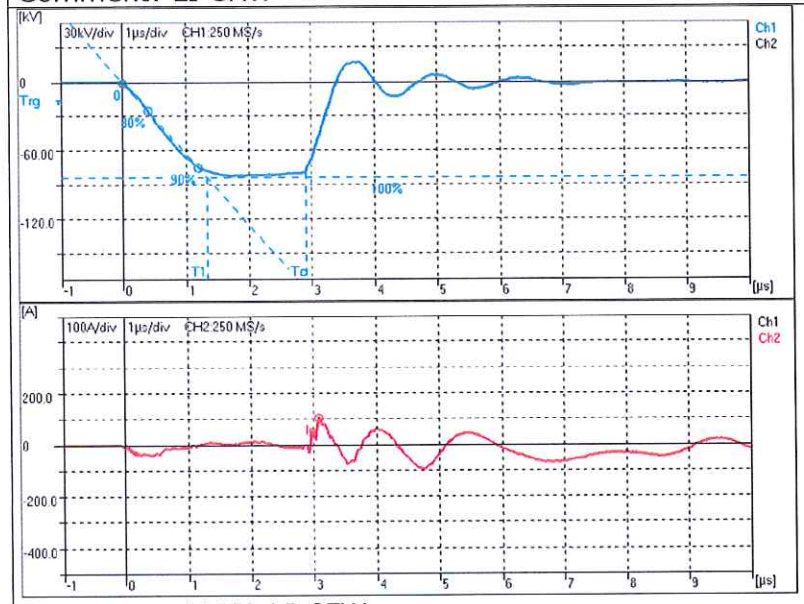
TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 6 of 29
DATE : 28/05/2018



Comment: LI CRW

Fig.: 3
U_p = -51.50 kV
T_1 = 1.33 µs
T_2 = µs
T_c = 2.50 µs



Comment: 110% LI CFW

Fig.: 4
U_p = -82.49 kV
T_1 = 1.33 µs
T_2 = µs
T_c = 2.91 µs

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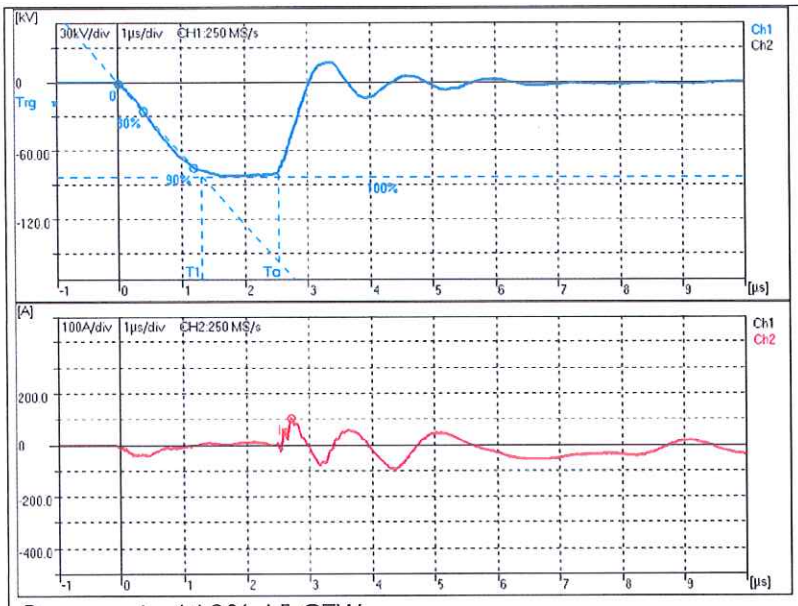
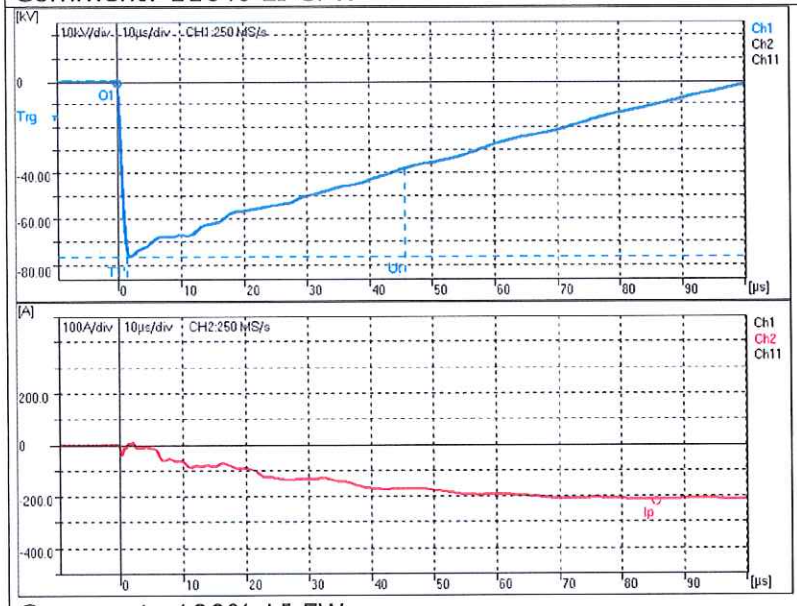
TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 7 of 29
DATE : 28/05/2018



Comment: 110% LI CFW

Fig.: 5
U_p = -82.03 kV
T_1 = 1.32 µs
T_2 = µs
T_c = 2.54 µs



Comment: 100% LI FW

Fig.: 6
U_p = -76.37 kV
T_1 = 1.35 µs
T_2 = 45.65 µs
T_c = µs

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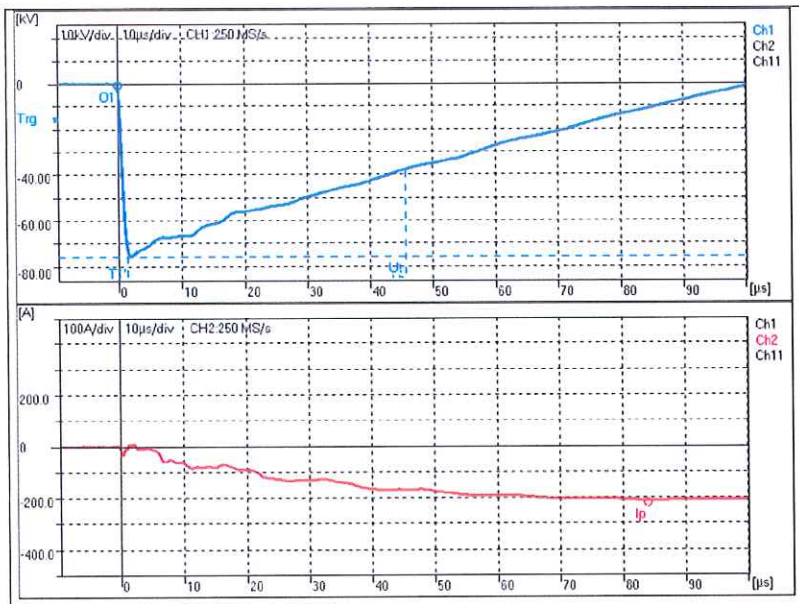
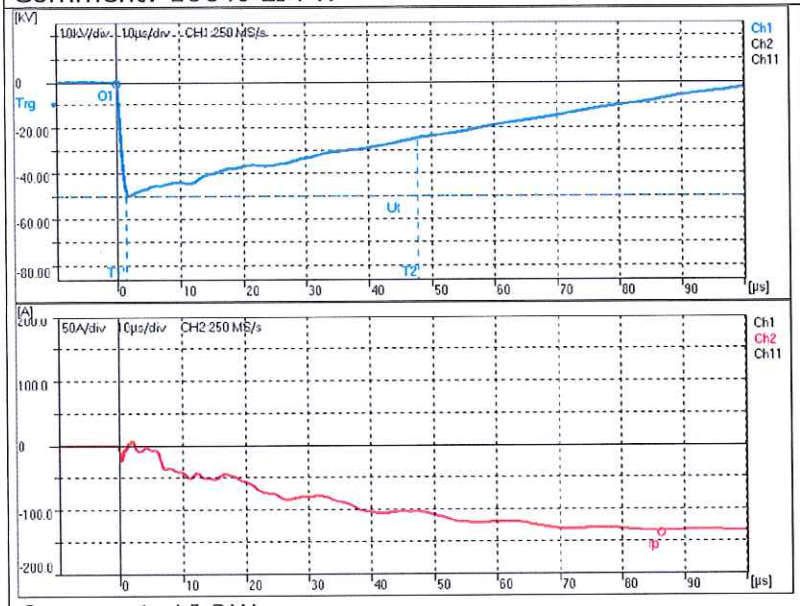
TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 8 of 29
DATE : 28/05/2018



Comment: 100% LI FW

Fig.: 7
U_p = -75.61 kV
T_1 = 1.35 µs
T_2 = 45.67 µs
T_c = µs



Comment: LI RW

Fig.: 8
U_p = -49.69 kV
T_1 = 1.33 µs
T_2 = 47.80 µs
T_c = µs

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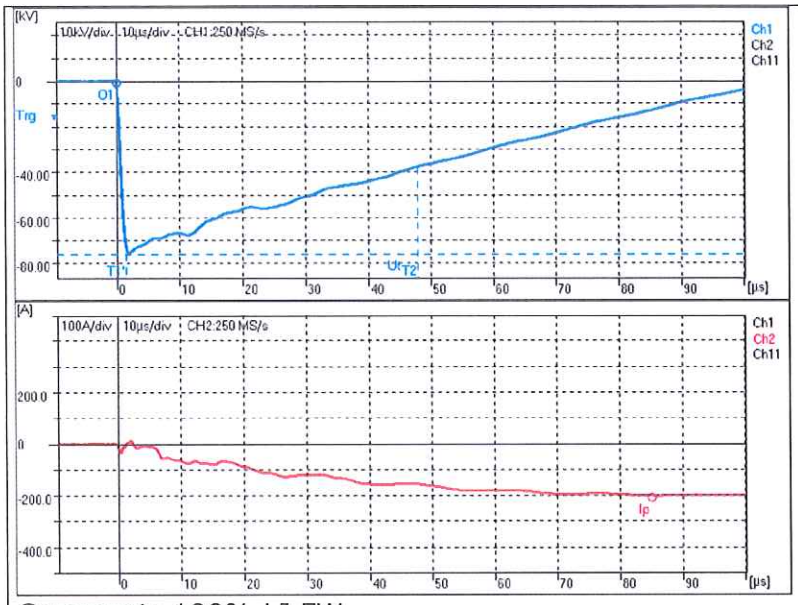
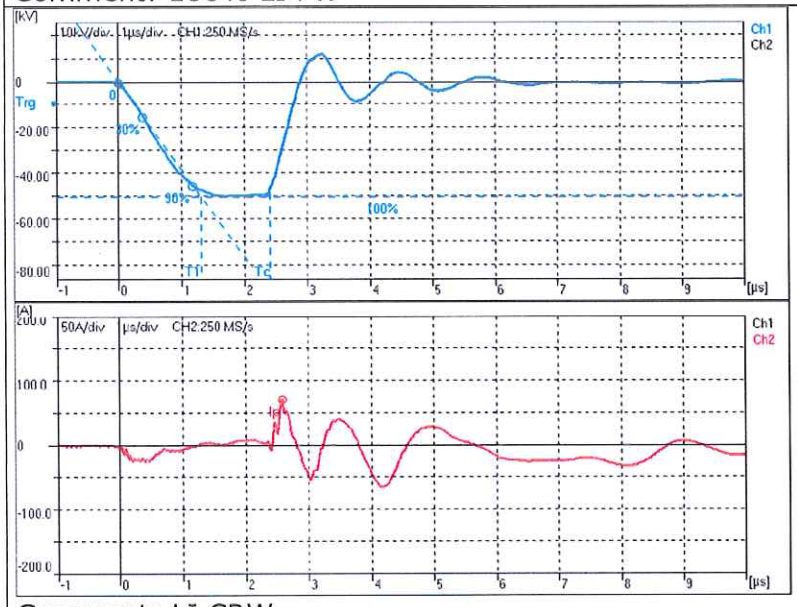


Comment: 100% LI FW

Fig.: 9
U_p = -75.31 kV
T_1 = 1.33 µs
T_2 = 47.92 µs
T_c = µs



Comment: LI CRW

Fig.: 10
U_p = -50.18 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 2.41 µs

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TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 10 of 29
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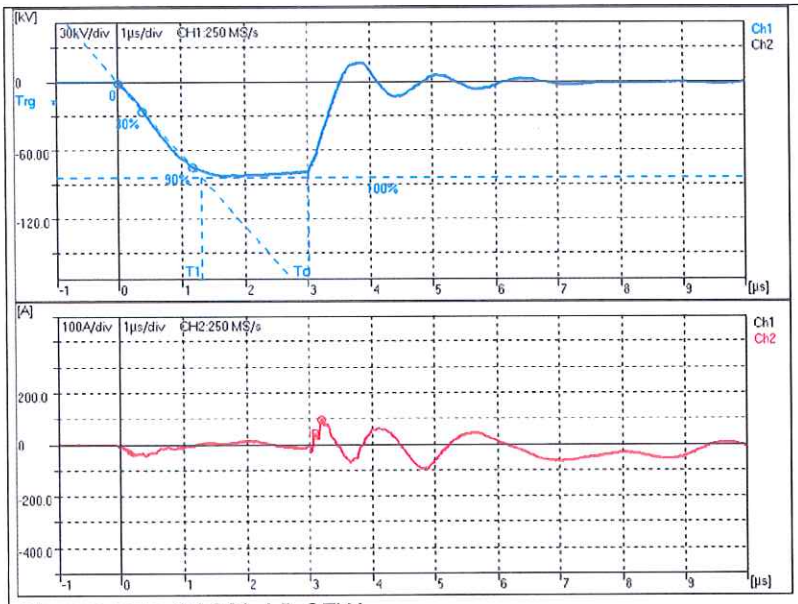
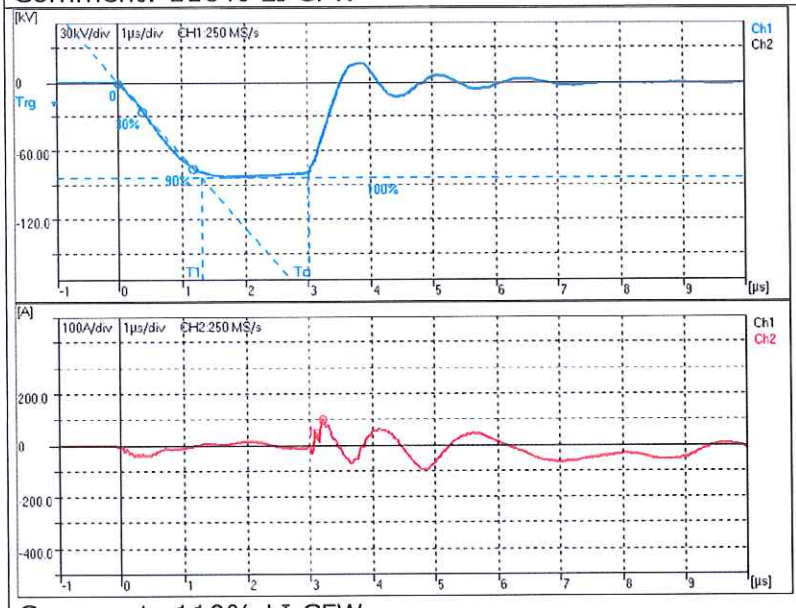


Comment: 110% LI CFW

Fig.: 11
U_p = -82.67 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 3.02 µs



Comment: 110% LI CFW

Fig.: 12
U_p = -83.16 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 3.02 µs

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TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 11 of 29
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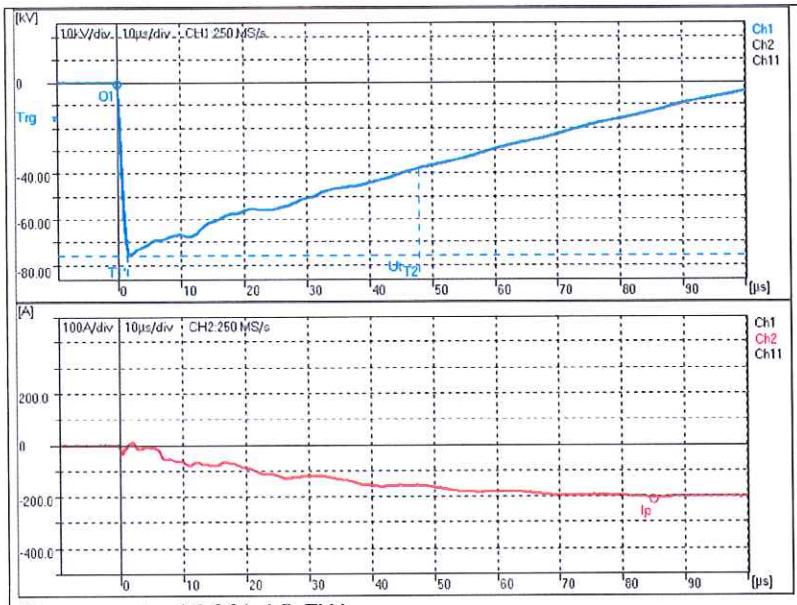
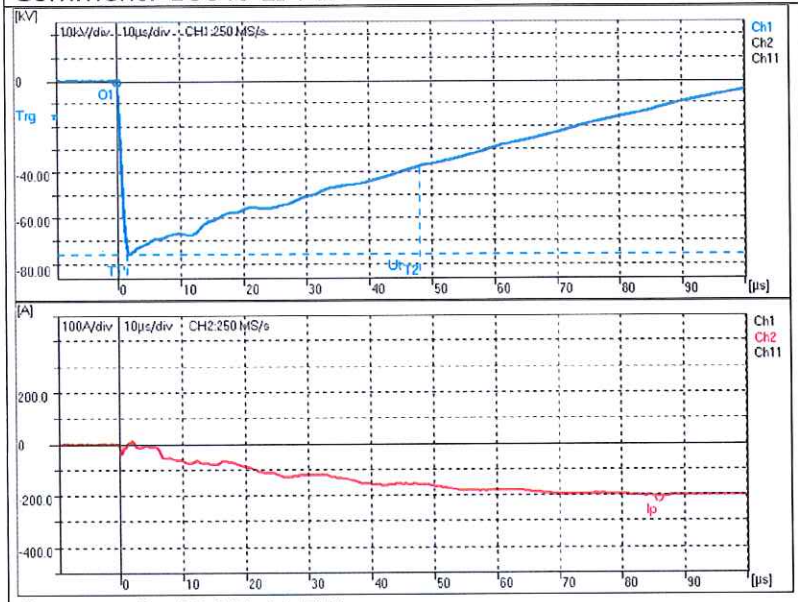


Comment: 100% LI FW

Fig.: 13
U_p = -75.53 kV
T_1 = 1.33 µs
T_2 = 47.90 µs
T_c = µs



Comment: 100% LI FW

Fig.: 14
U_p = -75.57 kV
T_1 = 1.33 µs
T_2 = 47.95 µs
T_c = µs

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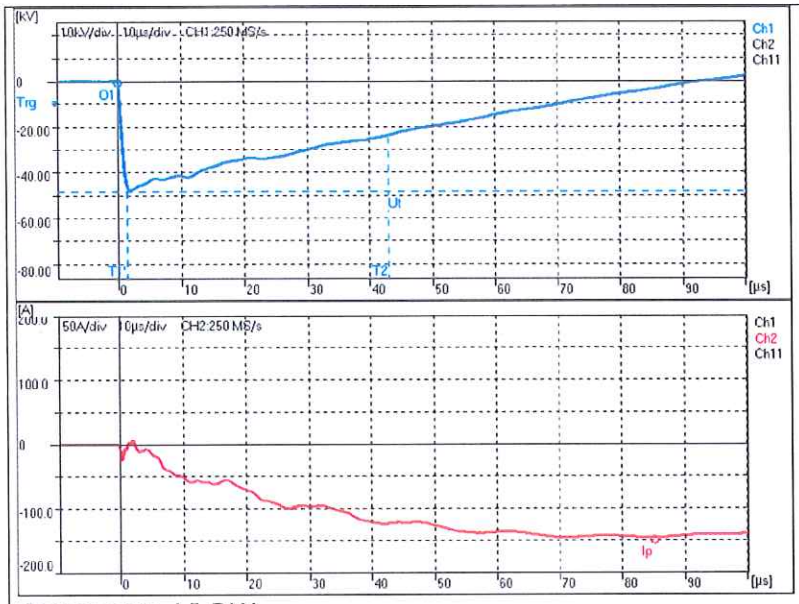
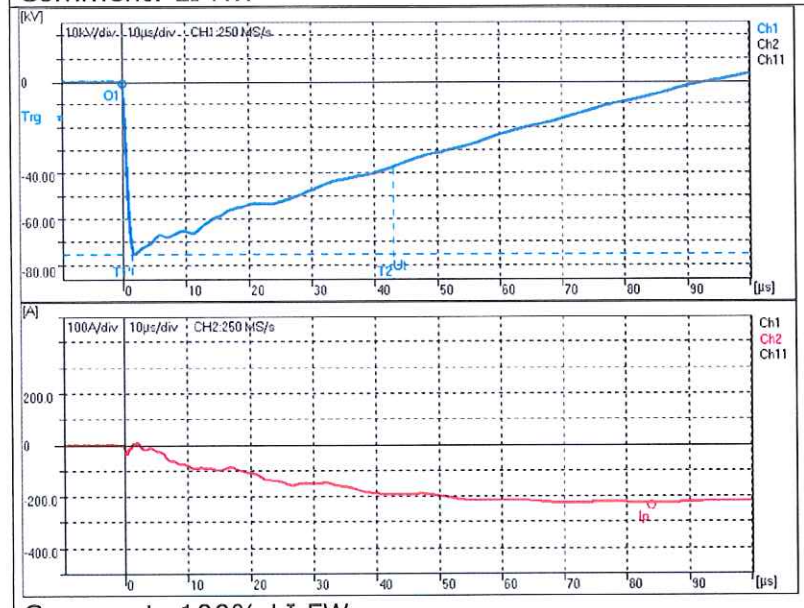


Comment: LI RW

Fig.: 15
U_p = -47.83 kV
T_1 = 1.29 µs
T_2 = 42.93 µs
T_c = µs



Comment: 100% LI FW

Fig.: 16
U_p = -75.21 kV
T_1 = 1.29 µs
T_2 = 43.03 µs
T_c = µs

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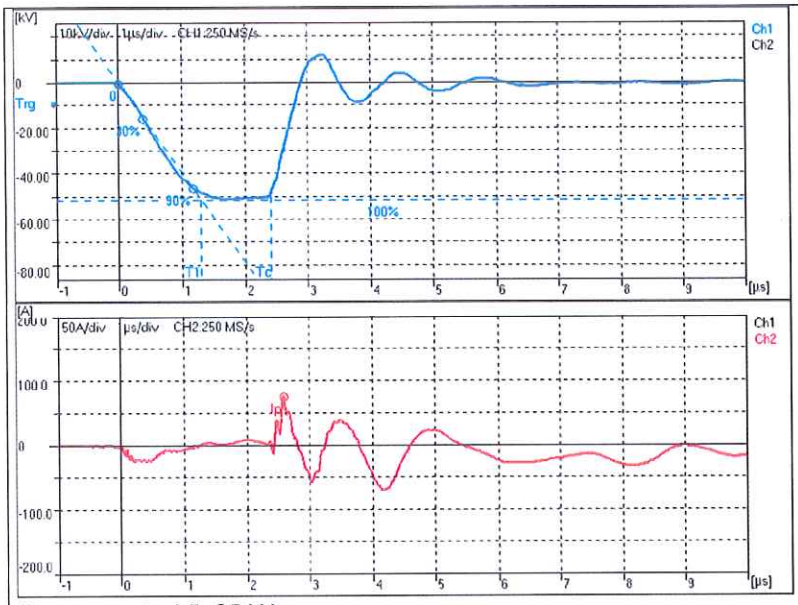
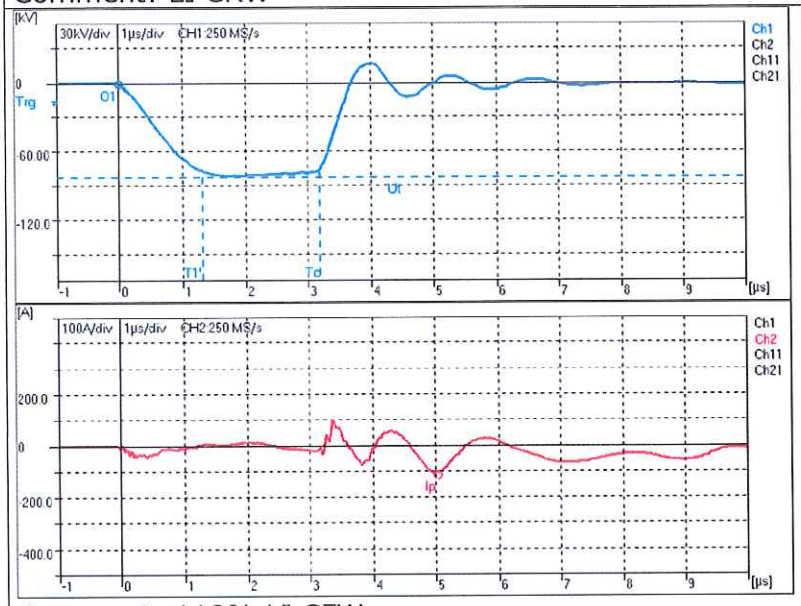


Comment: LI CRW

Fig.: 17
U_p = -51.27 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 2.41 µs



Comment: 110% LI CFW

Fig.: 18
U_p = -81.61 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 3.19 µs

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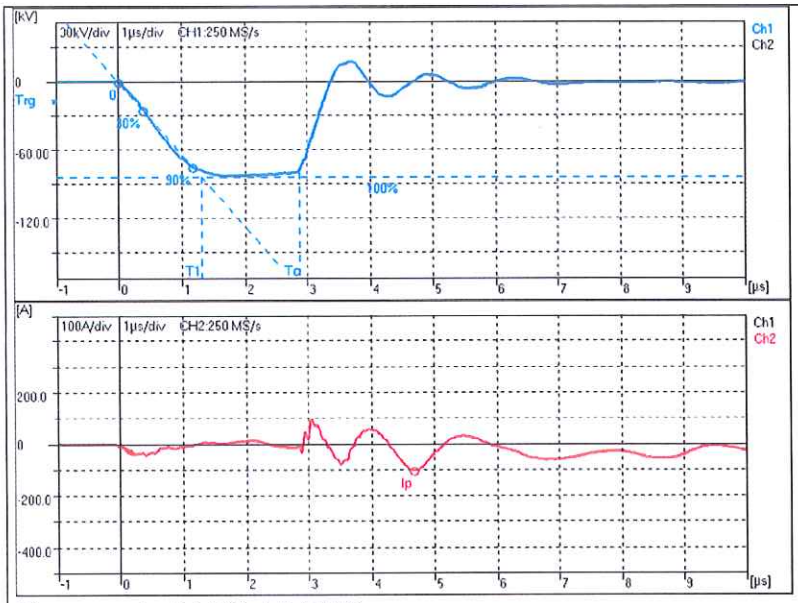
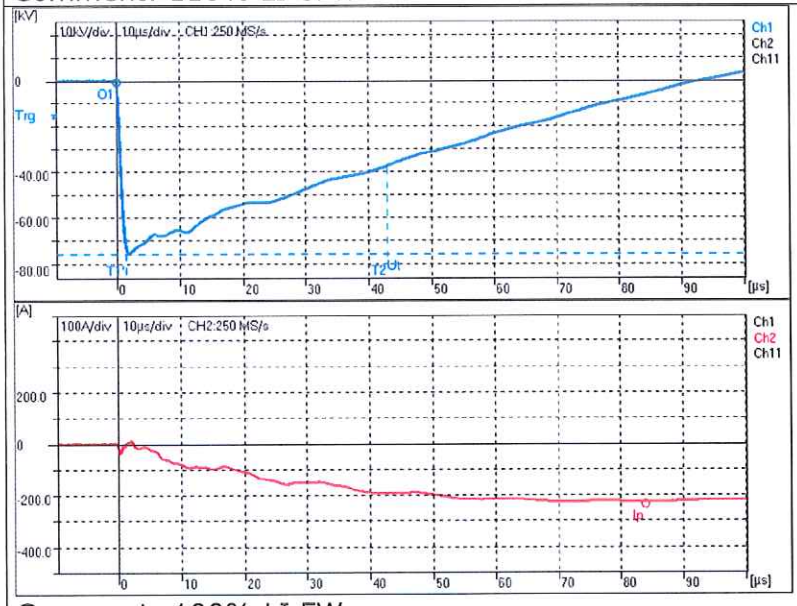


Comment: 110% LI CFW

Fig.: 19
U_p = -82.99 kV
T_1 = 1.31 µs
T_2 = µs
T_c = 2.88 µs



Comment: 100% LI FW

Fig.: 20
U_p = -75.36 kV
T_1 = 1.29 µs
T_2 = 42.99 µs
T_c = µs

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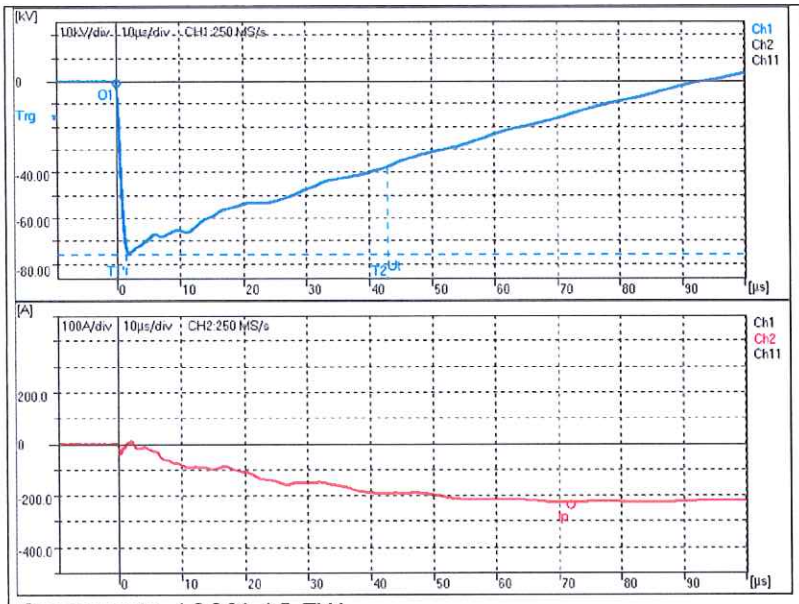

Comment: 100% LI FW

Fig.: 21
U_p = -75.30 kV
T_1 = 1.29 µs
T_2 = 43.01 µs
T_c = µs

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 16 of 29
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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
2.	**Measurement of winding resistance :** (As per cl.no.21.2.a of IS 1180 (Part 1) : 2014) Average oil temperature: 32.6°C			---
	HV Winding			
	Tap number:1			
	1U – 1V:	--	219.94 mΩ	
	1V – 1W:	--	219.76 mΩ	
	1U – 1W:	--	220.38 mΩ	
	Average:	--	220.03 mΩ	
	Tap number:2			
	1U – 1V:	--	215.02 mΩ	
	1V – 1W:	--	214.76 mΩ	
	1U – 1W:	--	215.32 mΩ	
	Average:	--	215.03 mΩ	
	Tap number:3			
	1U – 1V:	--	209.88 mΩ	
	1V – 1W:	--	209.66 mΩ	
	1U – 1W:	--	210.28 mΩ	
	Average:	--	209.94 mΩ	
	Tap number:4			
	1U – 1V:	--	204.74 mΩ	
	1V – 1W:	--	204.46 mΩ	
	1U – 1W:	--	205.20 mΩ	
	Average:	--	204.80 mΩ	
	Tap number:5			
	1U – 1V:	--	199.63 mΩ	
	1V – 1W:	--	199.38 mΩ	
	1U – 1W:	--	200.12 mΩ	
	Average:	--	199.71 mΩ	

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DATE : 28/05/2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
	Tap number:6			
	1U – 1V:	--	194.55 mΩ	
	1V – 1W:	--	194.29 mΩ	
	1U – 1W:	--	194.97 mΩ	
	Average:	--	194.60 mΩ	
	Tap number:7			
	1U – 1V:	--	189.51 mΩ	
	1V – 1W:	--	189.27 mΩ	
	1U – 1W:	--	189.91 mΩ	
	Average:	--	189.56 mΩ	
	LV Winding			
	2u – 2v:	--	564.1 µΩ	
	2v – 2w:	--	553.7 µΩ	
	2u – 2w:	--	574.8 µΩ	
	Average:	--	564.2 µΩ	

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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
3.	**Measurement of voltage ratio and check of phase displacement :** (As per cl.no.21.2.b of IS 1180 (Part 1) : 2014)			Conforms
	Measurement of voltage ratio			
	Tap number:1			
	1U-1V and 2u-2n:	46.200 (±0.5%)	46.184	
	1V-1W and 2v-2n:	46.200 (±0.5%)	46.181	
	1W-1U and 2w-2n:	46.200 (±0.5%)	46.180	
	Tap number:2			
	1U-1V and 2u-2n:	45.100 (±0.5%)	45.102	
	1V-1W and 2v-2n:	45.100 (±0.5%)	45.101	
	1W-1U and 2w-2n:	45.100 (±0.5%)	45.099	
	Tap number:3			
	1U-1V and 2u-2n:	44.000 (±0.5%)	44.015	
	1V-1W and 2v-2n:	44.000 (±0.5%)	44.014	
	1W-1U and 2w-2n:	44.000 (±0.5%)	44.013	
	Tap number:4			
	1U-1V and 2u-2n:	42.900 (±0.5%)	42.930	
	1V-1W and 2v-2n:	42.900 (±0.5%)	42.930	
	1W-1U and 2w-2n:	42.900 (±0.5%)	42.930	
	Tap number:5			
	1U-1V and 2u-2n:	41.800 (±0.5%)	41.846	
	1V-1W and 2v-2n:	41.800 (±0.5%)	41.846	
	1W-1U and 2w-2n:	41.800 (±0.5%)	41.844	
	Tap number:6			
	1U-1V and 2u-2n:	40.700 (±0.5%)	40.766	
	1V-1W and 2v-2n:	40.700 (±0.5%)	40.766	
	1W-1U and 2w-2n:	40.700 (±0.5%)	40.766	
	Tap number:7			
	1U-1V and 2u-2n:	39.600 (±0.5%)	39.681	
	1V-1W and 2v-2n:	39.600 (±0.5%)	39.683	
	1W-1U and 2w-2n:	39.600 (±0.5%)	39.681	
	Vector Group :	Dyn11	Dyn11	

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 19 of 29
DATE : 28/05/2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
4.	**Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load :** **(At tap number : 3)** (As per cl.no.21.2.c of IS 1180 (Part 1) : 2014)			---
	At 50% load : Tested with **52.3433** Amps (on HV side) Frequency : **50.023** Hz Average oil temperature : **29.8** °C			
	Test current (Amps)		52.3433	
	Impedance voltage (Volts)		322.80	
	Measured load loss (Watts)		2992.90	
	Impedance voltage (%) (Computed to 50% load)			
	At 29.8°C		2.94	
	At 75°C	---	2.94	
	Load loss (Watts) (Computed to 50% load)			
	At 29.8°C		3009.47	
	At 75°C	---	3324.92	
	At 100% load : Tested with **104.7224** Amps (on HV side) Frequency : **49.995** Hz Average oil temperature : **29.8**°C			
	Test current (Amps)		104.7224	
	Impedance voltage (Volts)		645.80	
	Measured load loss (Watts)		12074.40	
	Impedance voltage (%) (Computed to 100% load)			
	At 29.8°C		5.89	
	At 75°C	6.25 (±10%)	5.90	**Conforms**
	Load loss (Watts) (Computed to 100% load)			
	At 29.8°C		12133.88	
	At 75°C	---	13381.76	---

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TEST REPORT NO.: RP-1819-007269
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Sr. No	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
5.	**Measurement of no-load loss and current :** (As per cl.no.21.2.d of IS 1180 (Part 1) : 2014) Tested with average **432.71** volts (on LV side) Frequency : **49.964** Hz **RMS voltage** (Volts) **No-load current** (Amps) **Measured no-load loss** (Watts) **Corrected no-load loss** (Watts)	---	 433.38 3.7937 1608.5 1606.09	---
6.	**Total losses at 50 % load (Watts) :** (As per cl.no.7.8 of IS 1180 (Part 1): 2014)	Max. 5050	4931.01	**Conforms**
7.	**Total losses at 100 % load (Watts) :** (As per cl.no.7.8 of IS 1180 (Part 1): 2014)	Max. 15000	14987.85	**Conforms**

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 21 of 29
DATE : 28/05/2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
8.	**Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load :** **(At tap number : 1)** (As per customer's requirement, testing procedure followed as per cl.no.21.2.c of IS 1180 (Part 1) : 2014)			---
	At 50% load : Tested with **49.9877** Amps (on HV side) Frequency : **49.948** Hz Average oil temperature : **29.8** °C			
	Test current (Amps)		49.9877	
	Impedance voltage (Volts)		335.95	
	Measured load loss (Watts)		2983.50	
	Impedance voltage (%) (Computed to 50% load)			
	At 29.8°C		2.91	
	At 75°C	---	2.91	
	Load loss (Watts) (Computed to 50% load)			
	At 29.8°C		2983.66	
	At 75°C	---	3289.26	
	At 100% load : Tested with **99.9594** Amps (on HV side) Frequency : **49.971** Hz Average oil temperature : **29.8**°C			
	Test current (Amps)		99.9594	
	Impedance voltage (Volts)		672.25	
	Measured load loss (Watts)		11954.80	
	Impedance voltage (%) (Computed to 100% load)			
	At 29.8°C		5.82	
	At 75°C	---	5.83	---
	Load loss (Watts) (Computed to 100% load)			
	At 29.8°C		11959.73	
	At 75°C	---	13178.50	---

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 22 of 29
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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
9.	**Measurement of short-circuit impedance and load loss at 50 percent and 100 percent load :**			---
	(At tap number : 7)			
	(As per customer's requirement, testing procedure followed as per cl.no.21.2.c of IS 1180 (Part 1) : 2014)			
	At 50% load :			
	Tested with **58.2712** Amps (on HV side)			
	Frequency : **49.963** Hz			
	Average oil temperature : **29.8** °C			
	Test current (Amps)		58.2712	
	Impedance voltage (Volts)		314.69	
	Measured load loss (Watts)		3328.60	
	Impedance voltage (%)			
	(Computed to 50% load)			
	At 29.8°C		3.18	
	At 75°C	---	3.19	
	Load loss (Watts)			
	(Computed to 50% load)			
	At 29.8°C		3334.18	
	At 75°C	---	3633.93	
	At 100% load :			
	Tested with **116.5960** Amps (on HV side)			
	Frequency : **49.973** Hz			
	Average oil temperature : **29.8**°C			
	Test current (Amps)		116.5960	
	Impedance voltage (Volts)		630.06	
	Measured load loss (Watts)		13274.80	
	Impedance voltage (%)			
	(Computed to 100% load)			
	At 29.8°C		6.37	
	At 75°C	---	6.38	---
	Load loss (Watts)			
	(Computed to 100% load)			
	At 29.8°C		13284.82	
	At 75°C	---	14491.37	---

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DATE : 28/05/2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
10.	**Measurement of insulation resistance :** (As per cl.no.21.2.e of IS 1180 (Part 1) : 2014) Average oil temperature : 29.8°C **IR value measured between** HV winding --- Earth at 2500 V DC LV winding --- Earth at 500 V DC HV winding --- LV winding at 2500 V DC	 -- -- --	 23.27 GΩ 19.14 GΩ 26.79 GΩ	---
11.	**Induced overvoltage withstand test :** (As per cl.no.21.2.f of IS 1180 (Part 1) : 2014) The test voltage of 866 Volts, 3 – phase was applied to the LV winding of the transformer. The supply frequency was maintained at 150 Hz. The test voltage was applied for 40 seconds.	Transformer shall withstand 866 volts at 150 Hz frequency for 40 seconds.	Withstood	**Conforms**
12.	**Separate-source voltage withstand Test :** (As per cl.no.21.2.g of IS 1180 (Part 1) : 2014) ➢ **on HV winding:** The test voltage of 28 kV ac, rms was applied between the HV winding and earth. The tank and LV winding were shorted together and earthed. The test voltage was applied for 60 seconds. ➢ **on LV winding:** The test voltage of 3 kV ac, rms was applied between the LV winding and earth. The tank and HV winding were shorted together and earthed. The test voltage was applied for 60 seconds.	Transformer shall withstand power frequency voltage of 28 kV for 60 seconds. Transformer shall withstand power frequency voltage of 3 kV for 60 seconds.	Withstood Withstood	**Conforms**

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 24 of 29
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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained value	Remarks
13.	**Temperature-rise test :** (As per customers 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 : L-1780 mm,W-760 mm,H1-1715mm,H2-1725mm Size of fins: L-1300 mm,W-520 mm No. of fins per radiator-02(HC Side),02(LV Side) No. of fins per radiator-14(HV Side),18(LV Side) **Total losses fed for temperature-rise test were 16097.46 Watts.** (Measured no- load loss : 1606.09 Watts & load loss at 75°C at tap no. 7: 14491.37 Watts) Measured 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.			Conforms
	A) Top oil temperature-Rise :	Max. 40°C	34.6°C	
	B) Winding Temperature Rise (Resistance method)			
	1) HV Winding :	Max. 45°C	38.6°C	
	2) LV Winding :	Max. 45°C	41.2°C	
	C) Ambient temperature at shutdown :		34.2°C	
	D)Time of Shutdown(HRS) :		22:30	

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TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 25 of 29
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Sr. No.	Particulars of test and Cl. No.			Requirement as per specification	Obtained Value	Remarks
14.	**Magnetic balance test :** (As per CBIP manual; Publication no.317 - 2013)					Conforms
	Voltage Applied Between	**Applied Voltage** (Volts)	**Measured Voltage Between**			
	2u & 2n	100.14	2v & 2n	50 to 90 V	77.88	
			2w & 2n		22.24	
	2v & 2n	100.07	2u & 2n	30 to 70 V	50.26	
			2w & 2n	30 to 70 V	48.80	
	2w & 2n	100.09	2u & 2n		23.73	
			2v & 2n	50 to 90 V	76.25	
15.	**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.					Conforms
	Test voltage(Volts)				487.11	
	No load current (Amps)				5.393	
	No load current(%)			Max. 5.0	0.2	

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Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
16.	**Oil leakage test :** (As per cl.no.21.2.j of IS 1180 (Part 1): 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 8 hours.	There should be no leakage at any point.	No leakage observed.	**Conforms**
17.	**Pressure test (routine test) :** (As per cl.no.21.2.h of IS 1180 (Part 1) : 2014) The transformer tank with bolted cover 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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(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
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Web : http://www.erda.org

TEST REPORT NO.: RP-1819-007269 **SHEET NO.:** 27 of 29
DATE : 28/05/2018

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
18.	**Pressure test (type test) :** (As per cl.no.21.3.d of IS 1180 (Part 1): 2014)			**Conforms**
	➢ The transformer tank was subjected to air pressure of 80 kPa for 30 minutes. The permanent deflection of flat plates were recorded, after pressure has been released.			
	Deflection Measured at / **Length of plate (mm)**			
	HV side 1780	Max.9.0 mm	1.3 mm	
	LV side 1780	Max. 9.0 mm	0.8 mm	
	Side A 760	Max. 6.5 mm	0.2 mm	
	Side B 760	Max. 6.5 mm	0.1 mm	
	➢ The transformer tank was subjected to vacuum of 500 mm of Mercury for 30 minutes. The permanent deflection of flat plates were recorded, after vacuum has been released.			
	Deflection Measured at / **Length of plate (mm)**			
	HV side 1780	Max. 9.0 mm	0.8 mm	
	LV side 1780	Max. 9.0 mm	0.5 mm	
	Side A 760	Max. 6.5 mm	0.0 mm	
	Side B 760	Max. 6.5 mm	0.0 mm	
	HV SIDE / SIDE A / SIDE B / LV SIDE	There should be no air leakage at any point.	No air leakage observed.	

PREPARED BY **CHECKED BY**

Impulse Laboratory - H. V. Division - Vadodara

TC 2535664

Certificate No. : TC-5389

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TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 28 of 29
DATE : 28/05/2018

PHOTOGRAPH OF TEST SAMPLE

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Certificate No. : TC-5389

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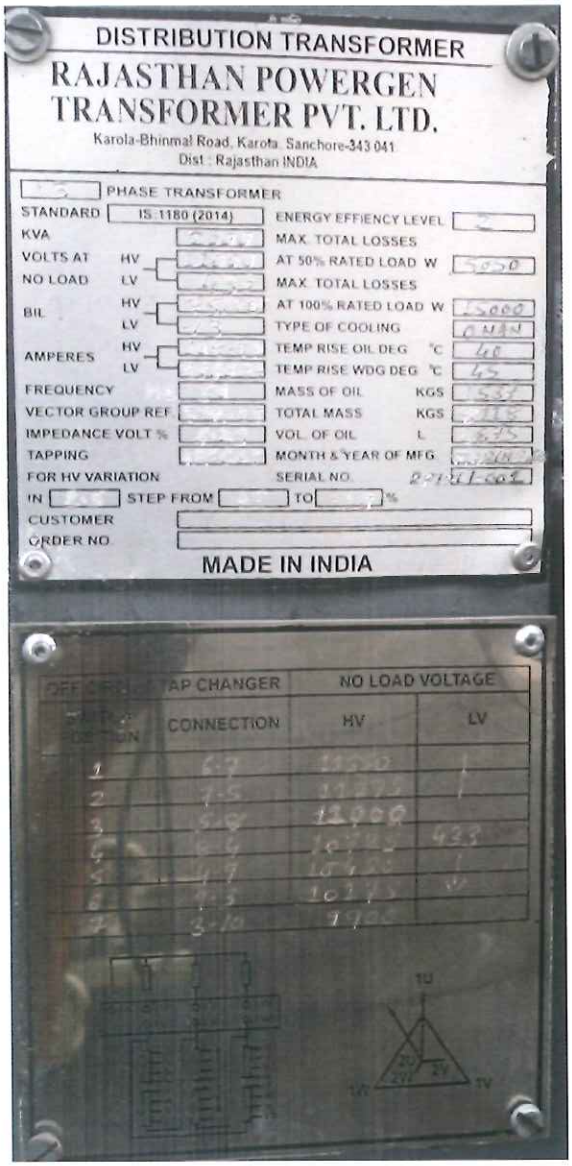
TEST REPORT NO. : RP-1819-007269 **SHEET NO.:** 29 of 29
DATE : 28/05/2018

PHOTOGRAPH OF RATING AND TERMINAL MARKING PLATE



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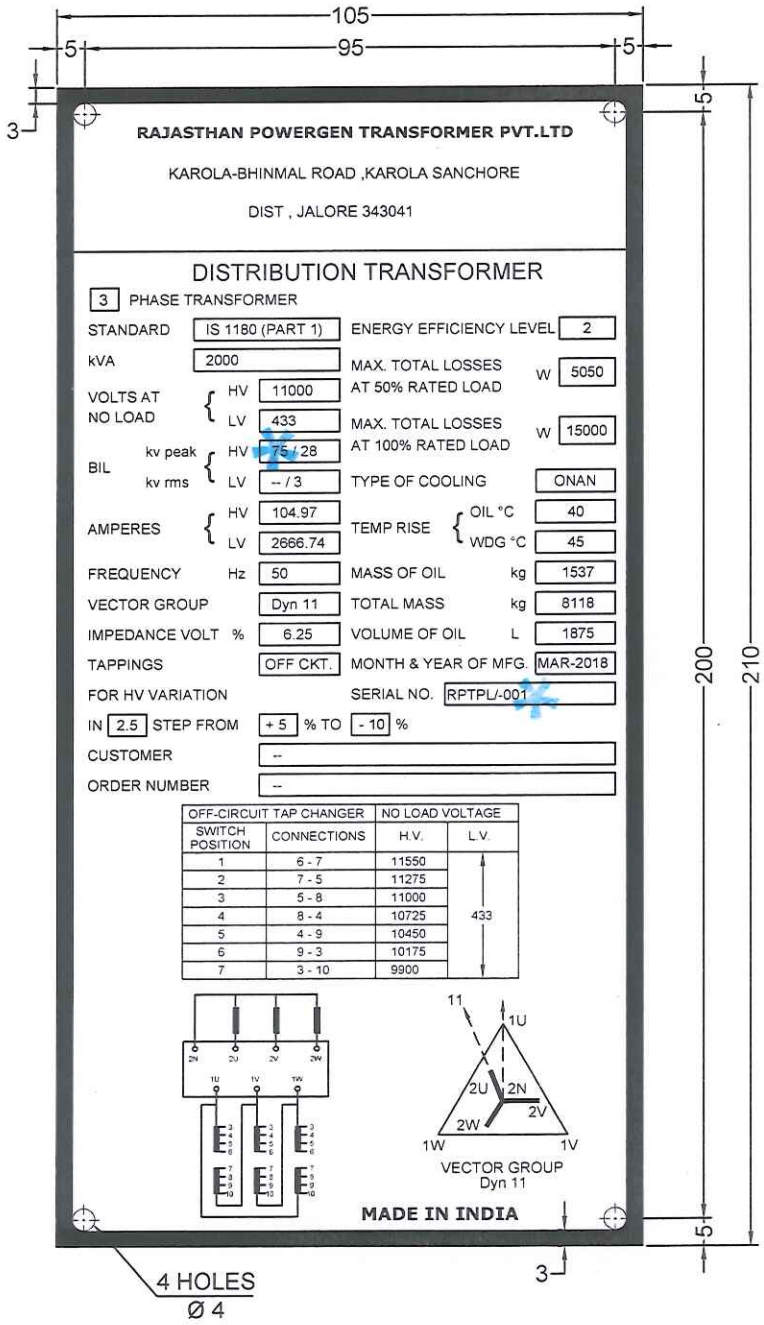
TC 2535678



LEVEL - 2
IS 1180 (PART-1):2014

NOTES:-

(1) ALL DIMENTIONS. ARE IN M.M.

(2) ALL LETTERS AND FIGURES ARE TO BE ETCHED FOR 0.2 TO 0.25 mm & PAINTED WITH NONFADING BLACK PAINT.

(3) ALL LETTERS, FIGURE BLOCK SIZE SHALL BE PROPORTIONAL TO THE ORIGINAL DRAWING.

(4) BACK GROUND OF THE PLATE SHALL BE BUFF FINISHED.

(5) MATERIAL:- 0.8 mm Thk. ALUMINUM PLATE.

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Test Report No. RP-1819-007259
Date : 28/05/2018
Product : 2000 kVA x'mer
Verified By :
Verification of this drawing by ERDA is limited to relevant dimensional checks only.
Verified dimensions are marked with. *

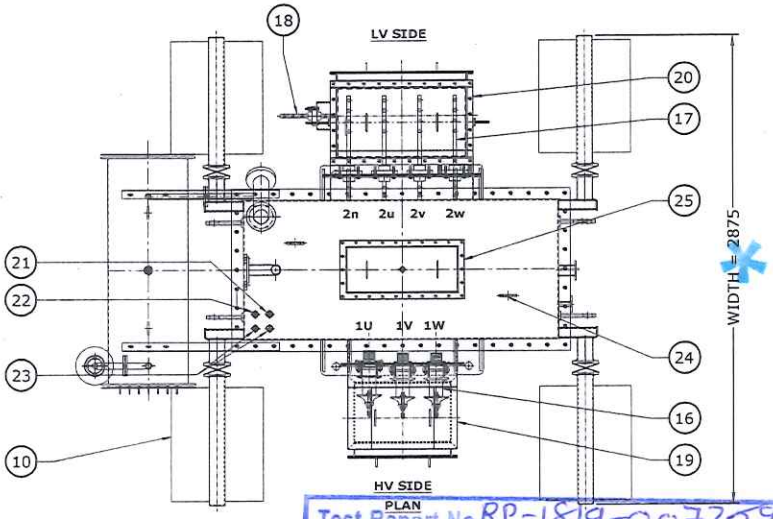
REV NO.	DATE & SIGN	BRIEF RECORD

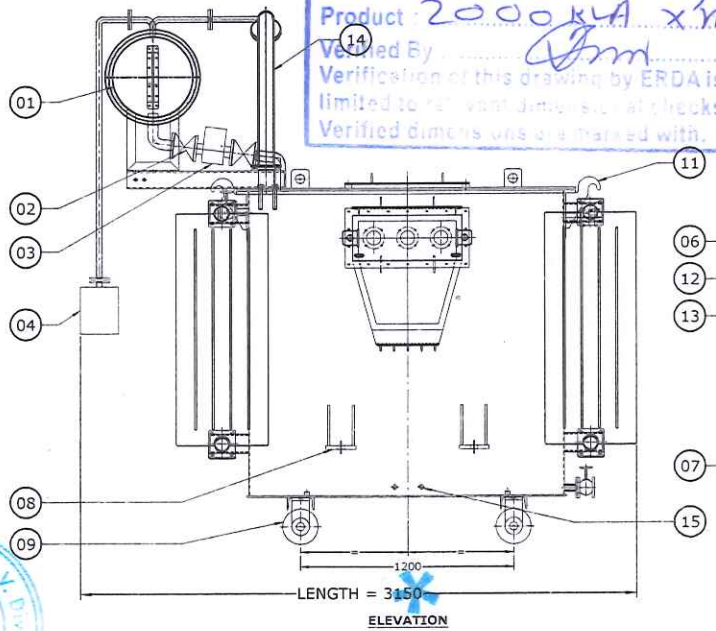
DRN
CHD
APPRD

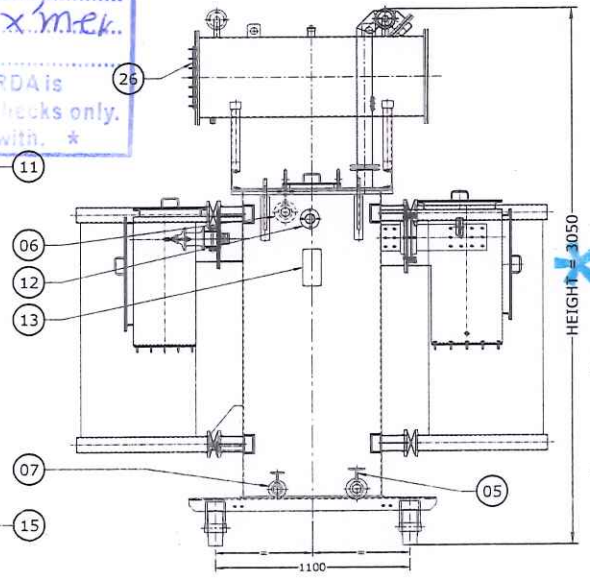
RAJASTHAN POWERGEN TRANSFORMER PVT.LTD
KAROLA-BHINMAL ROAD ,KAROLA SANCHORE
DIST , JALORE 343041

R & D PLATE
(2000 KVA , 11/0.433 KV)

SCALE N.T.S.
W.O.NO. :-
Sh. No. 1/1
DRG.NO. :- RPTPL-2000KVA-R&D-01







NOTES :-

1) ALL DIMENSIONS ARE IN mm
2) ALL DIMENSIONS & WEIGHT ARE SUBJECT TO ±10% TOLERANCE.
3) PAINT :- POLY URETHANE LIGHT GREY SHADE NO.631 OF I.S.:- 5
4) TAPPING ON HV FOR HV VARIATION OF +5 TO -10% IN STEP OF 2.5% BY OFF CKT.
5) POSITION OF FITTINGS SHOWN ARE INDICATIVE. ITS POSITION & SHAPE OF FITTINGS MAY CHANGE WHILE ACTUAL DESIGN & MANUFACTURING.
6) MIN.CLEARANCES :-

	11 KV	0.433 KV
PHASE TO PHASE	130 *	25 *
PHASE TO EARTH	80 *	20 *

7) " * " MARK ITEM ARE NOT PORVIDED DURING TEST.

LEVEL - 2
IS 1180 (PART-1):2014

TANK INSIDE DIMENSIONS IN mm	
LENGTH	1780 *
WIDTH	760 *
HEIGHT	1720 (Avg.)
HEIGHT	1715 (HV SIDE) *
HEIGHT	1725 (LV SIDE) *

APPROX. WEIGHT IN Kgs.	
CORE & WINDING IN Kgs.	4495
TANK & FITTINGS IN Kgs.	2086
OIL IN Kgs.	1537
TOTAL WEIGHT Kgs.	8118
OIL IN Ltrs.	1875

Test Report No. RP-1819-007209
Date : 28/05/2018
Product 2000 KVA x'mer.
Verified By
Verification of this drawing by ERDA is limited to ... checks only.
Verified dimensions are stamped with. *

Sr.No.	DESCRIPTION	QTY.
27		
26	PRISMATIC OIL LEVEL GUAGE	1
25	INSPECTION COVER WITH AIR RELEASE PLUG FOR HV & LV BUSHING	1
24	LIFTING LUGS FOR TOP COVER	2
23	POCKET FOR OTI & WTI	2
22	THERMOMETER POCKET	1
21	AIR RELEASE PLUG	1
20	LV CABLE BOX	1
19	HV CABLE BOX	1
18	ADD. NEURAL EPOXY BUSHINGS (1KV / 2150 Amp.)	1
17	LV EPOXY BUSHINGS (1KV / 3150 Amp.)	4
16	HV PORCELAIN BUSHINGS (17.5 KV / 250 Amp.)	3
15	EARTHING TERMINALS	2
14	EXPLOSION VENT WITH DOUBLE DIAPHRAM	1
13	RATING & DIAGRAM PLATE	1
12	TAPPING SWITCH	1
11	LIFTING LUG FOR TRASFORMER	4
10	DETACHABLE RADIATORS WITH AIR RELEASE PLUG, DRAIN PLUG & LIFTIG LUGS HV SIDE:- 520x1300x14 FINS, 2 Nos. & LV SIDE:- 520x1300x18 FINS, 2 Nos.	4
09	BI-DIRECTIONAL PLAIN ROLLER	4
08	JACKING PAD	4
07	DRAIN-CUM- SAMPLING VALVE (SIZE :- 3/4")	1
06	TOP FILTER CUM SAMPLING VALVE (SIZE :- 1 1/4")	1
05	BOTTOM FILTER VALVE (SIZE :- 1 1/4")	1
04	SILICA GEL BREATHER	1
03	DOUBLE FLOAT BUCHHOLZ RELAY WITH ALARM & TRIP CONTACT	1
02	SHUT OFF VALVES FOR B'RELAY	2
01	CONSERVATOR WITH OIL LEVEL GUAGE, OIL FILLING CAP & DRAIN PLUG	1

REV NO.	DATE & SIGN	BRIEF RECORD

DRN
CHD
APPRD

RAJASTHAN POWERGEN TRANSFORMER PVT.LTD
KAROLA,BHINMAL ROAD KOROLA SANCHORE
DIST . JALORE 343041

GENERAL ARRG. FOR
(2000 KVA , 11/0.433 KV)

SCALE N.T.S.
Sh. No. 1/1
W.O.NO. :-
DRG.NO.:RPTPL-2000KVA-GA-02

Impulse Laboratory • H. V. Div. • Vadodara