

TANK DIMENSION			OVERALL DIMS		
l	b	ht	L	B	HT
985	445	1140	1430	1280	1980

TOTAL WEIGHT OF TRANSFORMER	1280	KG.
CORE & WINDING	625	KG.
TANK & FITTINGS	280	KG.
TOTAL WT. OF OIL IN TRFR.	375	KG.
TOTAL VOLUME OF OIL IN TRFR.	456	LTRS.

	MINIMUM ELECTRICAL CLEARANCE IN AIR	
	PHASE TO PHASE	PHASE TO EARTH
HV	350	320
LV	75	40

- NOTE--
1. SPN--IS 1180 (PART-1)
 2. TYPE-- OUT DOOR
 3. TEM,RISE OIL/WDGS = 35/40°C
 4. COOLING = ONAN
 5. ON OFF PHASE = 3
 5. FREQUENCY = 50HZ
 6. VECTOR GROUP = DYn11

Chief Engineer/Projects
APTRANSCO/VS/Vijawada.

NOTES:-
1- OVERALL DIMENSIONS & WEIGHTS ARE SUBJECT TO TOLERANCE OF ±10% EXCEPT WHERE MARKED * THUS
2- POSITION OF FITTINGS SHOWN ARE TENTATIVE.
3- PAINTING : DARK ADMIRAL GREY PAINTS AS PER TENDER SPEC. & IS 1180 PART 1 OF 2014 SECTION 15.5

PT.No.	LIST OF FITTINGS	QTY.
23	VERTICAL & HORIZONTAL STIFFNER	=
22	LV.TERMINAL CONNECTOR	4
21	HV.TERMINAL CONNECTOR	3
20	RADIATOR BANK (900X226WX2FINS)	1
19	COVER LIFTING LUG	2
18	INSPECTION COVER WITH AIR RELEASE PLUG & L/LUG	1
17	OFF LOAD TAP CHANGER SWITCH OUT SIDE HANDLE & LOCKING ARRGT.	1
16	EXPLOSION VENT WITH AIR RELEASE PLUG	1
15	OIL CONSERVATOR WITH DRAIN PLUG	1
14	AIR RELEASE PLUG	3
13	THERMOMETER POCKET (STEM TYPE)	1
12	NA	NA
11	HV.OUTDOOR BUSHING IS:3347,36KV,250A.	3
10	LV.BUSHING IS:3347,10KV,250A.	4
9	OIL LEVEL GAUGE WITH MINIMUM NORMAL,MAX LEVEL MARKING	1
8	SILICAGEL BREATHER	1
7	NAME,RATING & DIAGRAM PLATE	1
6	OIL FILLING HOLE & CAP NB30	1
5	OIL DRAIN VALVE	1
4	LIFTING LUGS	4
3	OIL DRAIN VALVE (REC TYPE)&SAMPLING VALVE WITH COVER PLATE	1
2	UNDER BASE CHANNEL(SMC 75X40) WITH 4 Nos. UNIDIRECTIONAL PLAIN ROLLERS	-
1	EARTHING TERMINALS	2
PT.No.	LIST OF FITTINGS	QTY.

ENERGY EFFICIENCY LEVEL-1 COPPER WOUND TRANSFORMER

NOTE--
OIL CONSERVATOR WITH DRAIN PLUG & OIL FILLING HOLE WITH BLANKING FLANGE SHALL BE PROVIDED

JOB NO./W.O. NO.:			KOTIA TRANSFORMERS PVT.LTD. KOLKATA, INDIA			
PREPD	BASAK	12.7.24	TITLE	OUTLINE GENERAL ARRGT.FOR 100KVA, 33/0.415 KV.TRANSFORMER		
CHECKED	A.MAITY	12.7.24		DRAWING No.	GA-A30768	
APPVD	MKS	12.7.24			1	
SCALE	N.T.S.		TENDER NO--TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.			
ALL DIM'S ARE IN mm UNLESS OTHERWISE STATED						

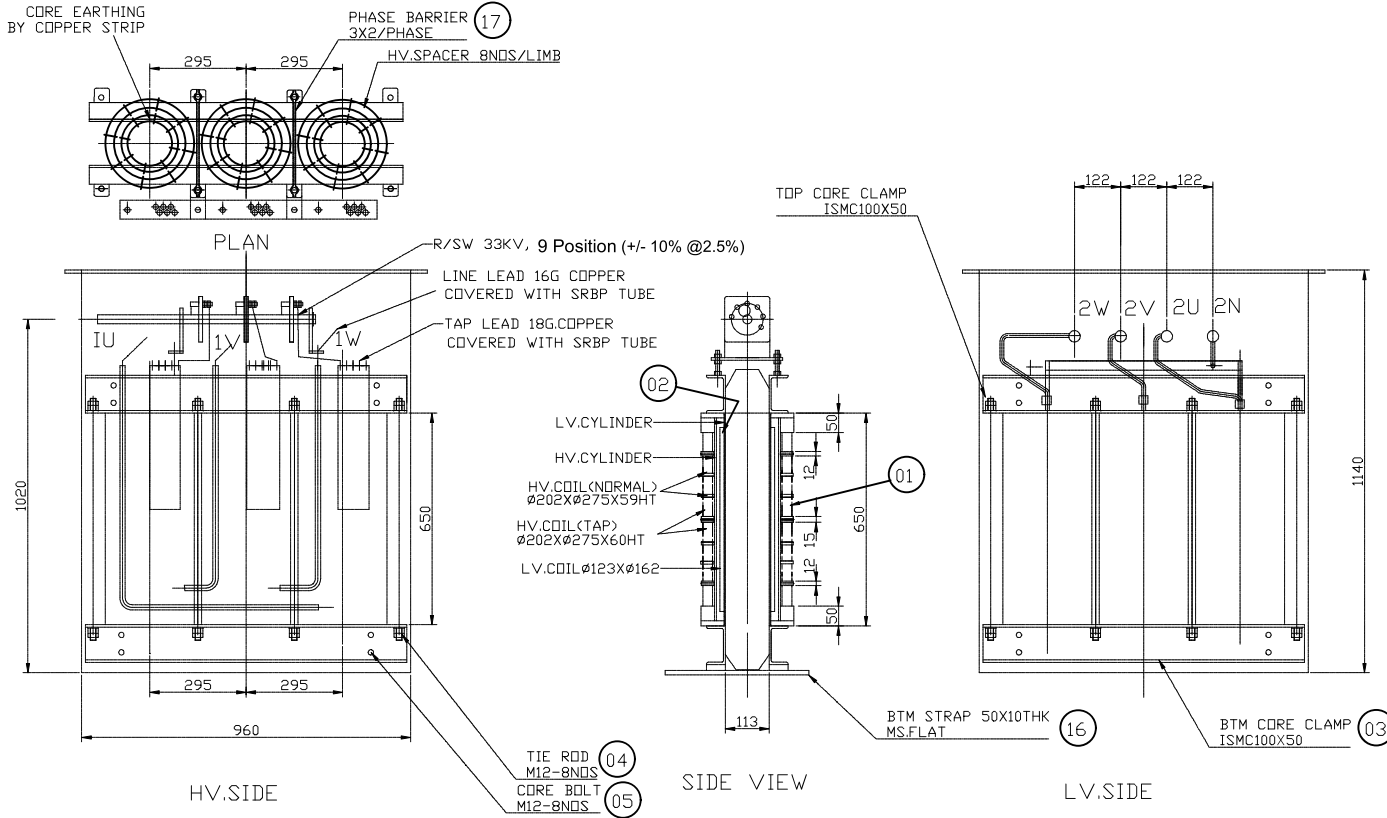
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REVISION	ZONE	BY	DATE

9280533/2024/EEMRT-ENE51

NOTE-

1. ALL BOLTS/NUTS/WASHER EXPOSED TO ATMOSPHERE SHALL BE
 - a) SIZE 12MM & BELOW STAINLESS STEEL
 - b) ABOVE 12MM STEEL WITH SUITABLE FINISH LIKE ELECTROGALVANISED WITH PASSIVATION & HOTDEEP GALVANISED
2. CORE- CRGO AS PER TENDER SPN.



S.NO	DESCRIPTION	QTY
01	HV.COIL/LIMB 8NDS(6-N &2-TAP)	24
02	LV.COIL/LIMB (01)	03
03	CORE CHANNEL	04
04	CORE BOLTS	08
05	TIE RODS	08
06	PB.SPACER BETWN HV.COIL RADIAL	08
07	CORE DIA	117 MM
08	WINDOW HEIGHT	650 MM
09	CORE CENTRE TO CENTRE	295MM
10	HV.TO YOKE GAP	50.0MM
11	LV.TO YOKE GAP	27.5MM
12	HV.TO LV GAP	19 MM
13	9-POSITION OFF CIRCUIT SWITCH	1
14	HV.MAIN COIL I.D/D.D/A.LG-202/275φ/59	6X3
14 A	HV.TAP COIL I.D/D.D/A.LG-202/275/60	2X3
15	L.COIL I.D/D.D/A.LG-123/162	1X3
16	FOOT BASE 50X10THKMS FLAT.	2NDS
17	PHASE BARRIER (3thkX2NDS/PH)	4NDS
18	GAP BTWN HV.COIL	NDR 12 MM TAP 15 MM

RADIAL CLEARANCES:-

- 1.LV.COIL TO CORE 3.0
- 2.PH.BTWN HV.COIL 19

HV.COND(COPPER) 1.12φ SET COVERED SIZE 1.22φ
 LV.CONDUCTOR (COPPER) 7.3X2.75-6NDS COVERING DPC 0.35

COILS { HV.TAP COIL-2NDS/LIMB
 HV.NORMAL COIL-6NDS/LIMB
 LV.COIL-1ND/LIMB

ENERGY EFFICIENCY LEVEL-1

TOLERANCE ON DIMENSION ± 10%

**Chief Engineer/Projects
 APTRANSCO/VIS/Vijayawada.**

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 Design of transformer shall be as per Type test reports.

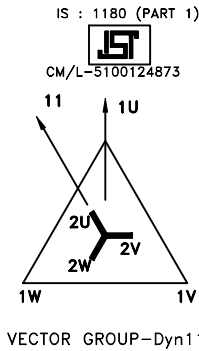
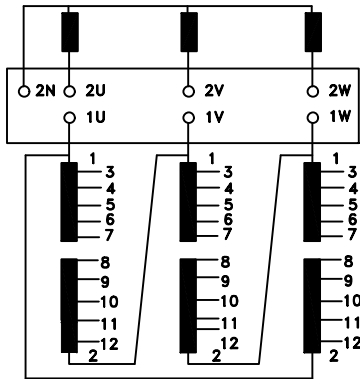
CUSTOMER- TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.			
JOB/W.O.No:		KOTIA TRANSFORMERS PVT.LTD. KOLKATA / INDIA	
PREPD	BASAK	DATE	20.11.23
CHECKED	A.MITY	DATE	20.11.23
APPVD	MKS	DATE	20.11.23
SCALE	N.T.S.	TITLE CORE,COILS ASSEMBLY FOR 100 KVA 33/0.415 KV TRANSFORMER	
DRAWING No. INT-A30769			[R] 1

KOTIA TRANSFORMERS PVT.LTD.
KOLKATA,INDIA

3 PHASE TRANSFORMER

STANDARD	IS 1180(PART-1)	ENERGY EFFICIENCY LEVEL	1
KVA	100	MAX.TOTAL LOSSES AT 50%RATED LOAD	W 510
VOLTS AT NO LOAD	HV 33000	MAX.TOTAL LOSSES AT 100%RATED LOAD	W 1650
	LV 415	TYPE OF COOLING	ONAN
BIL	HV 170Kvp	TEMP RISE	OIL °C 35
	LV 3		WDG °C 40
AMPERES	HV 1.75	MASS OF OIL	KG 375
	LV 139.12	TOTAL MASS	KG 1280
FREQUENCY HZ	50	VOL OF OIL	l 456
VECTOR GROUP	Dyn 11	M/YEAR OF MFG.	/2024
IMPEDANCE VOLT %	*	SERIAL NO.	*
TAPPINGS	OFF CKT		
FOR HV VARIATION +10% TO -10% @2.5%			
PH TO PH(HV-350, LV-75) PH TO EARTH(HV-320, LV-40)			
CONDUCTOR(HV/LV) : COPPER CORE MATERIAL : CRGO			
CUSTOMER: TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.			

OFF CIRCUIT TAP SW.	SW.POS.	CONNECTION	NO LOAD VOLTAGE		VARIATION OF HV.VOLT%
			HV	LV	
1	8 - 7		36300	415	+ 10
2	7 - 9		35475	415	+ 7.5
3	9 - 6		34650	415	+ 5
4	6 - 10		33825	415	+ 2.5
5	10 - 5		33000	415	NORMAL
6	5 - 11		32175	415	- 2.5
7	11 - 4		31350	415	- 5
8	4 - 12		30525	415	- 7.5
9	12 - 3		29700	415	- 10



200

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS
2. FOR EPC CONTRACTS ONLY

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APTRANSCO/VS/Vijayawada.

ENERGY EFFICIENCY LEVEL -1

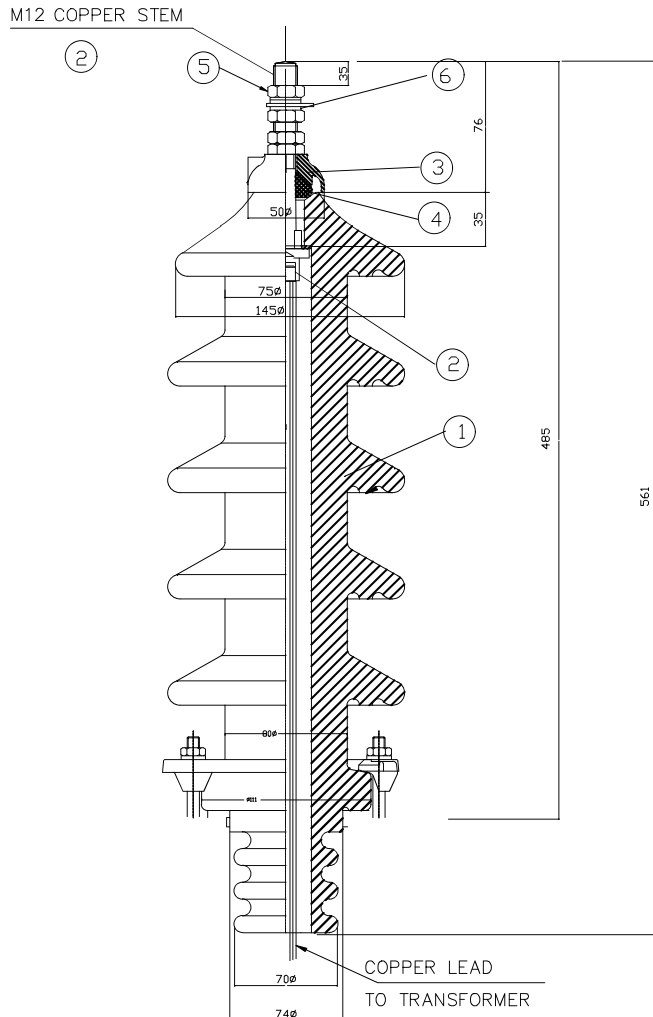
- NOTE:-
- 1 ALL LETTERS TO BE ENGRAVED TYPE, WHITE WITH BLACK GROUND
 - 2 MATERIAL: 20 GAUGE S.S.SHEET.
 - 3 SIZE : 105WX210LG
 - 4.* MARKED TO BE PUNCHED AFTER TESTING AND BEFORE DESPATCH
 - 5 ALL SHARP EDGES TO BE ROUNDED TO SMOOTH SURFACE

JOB/W.O.No: _____	
NAME	DATE
PREPD BASAK	16.03.24
CHECKED RIZIA	16.03.24
APPVD MKS	16.03.24
SCALE	N.T.S.
ALL DIMN'S ARE IN mm UNLESS OTHERWISE STATED	

KOTIA TRANSFORMERS PVT.LTD.	
KOLKATA / INDIA	
TITLE	NAME,RATING & DIAGRAM PLATE FOR 100KVA 33/0.415KV. 3-PH,50HZ, CU.WOUND TRANSFORMER
DRAWING No.	A30411 [R] 1
TENDER NO-	TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.

2	3	4	5	6	7	8	9
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PARTS	MATERIAL	QTY.
1. Insulator	Porcelain IS: 8603 (brown glazed)	1
2. Stem	COPPER IS: 613-1964	1
3. Cap	Brass IS: 292-1961	1
4. Sealing washer (Stem)	Oil Resistant Nitrile rubber made from Vulcanized Butadine / acrylonitrile rubber compound (Hardness of 70 ±5 IRHD)	1
8. Nut (Hex)	BRASSI IS:1364	3
9. Plain Washer	Steel IS:2073	3



Chief Engineer/Projects APTRANSCO/VS/Vijayawada.

NOTES :-

- RATED VOLT. _____ 36 KV
- RATED CURRENT _____ 250 A
- DRY POWER FREQ. WITHSTAND VOLT. (FOR 1min) _____ 70 KV rms
- WET POWER FREQ. WITHSTAND VOLT. (FOR 1min) _____ 70 KV rms
- DRY LIGHTNING IMPULSE WITHSTAND VOLT. _____ 170 kv (peak)
1.2/50 micro sec.
- RELEVANT STANDARD _____ IS : 8603,2099 & 3347
- CANTILEVER STRENGTH OF BUSHING _____ AS PER IS: 2099
- TOTAL CREEPAGE _____ 900 mm (min)
- APPROX. WEIGHT BUSHING IN KG _____ 10 KG.
- APPROX. OIL QTY. IN LIT & KG _____ N/A AS PER IS: 8603
- ANGLE OF MOUNTING _____ 30° INCLINED ON TANK BODY
- MAKE _____ CJI/GENESIS

ENERGY EFFICIENCY
LEVEL -1

TOTAL CREEPAGE DISTANCE=900MM

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Design of transformer shall be as per Type test reports.

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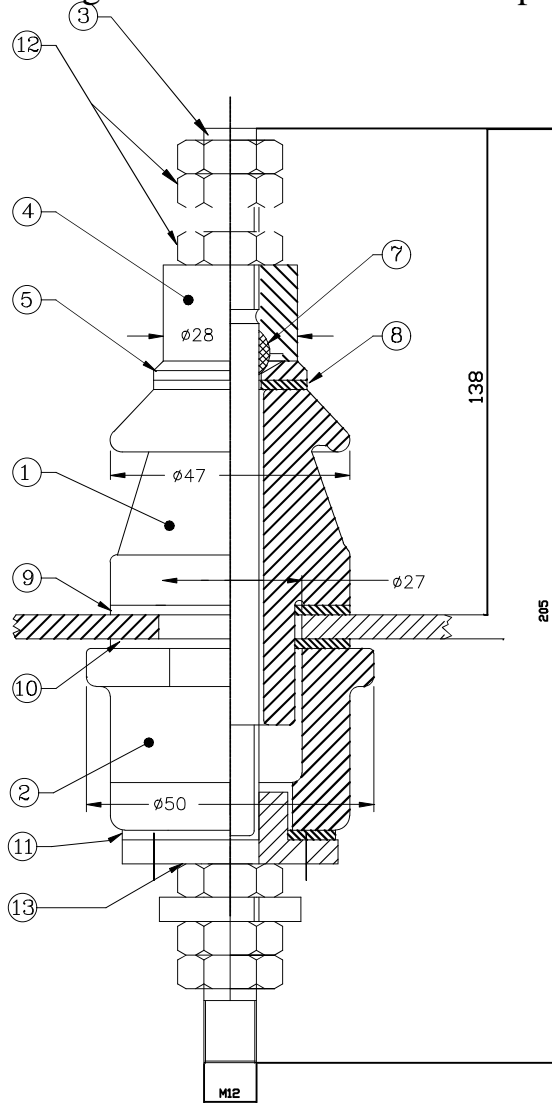
JOB/W.D.No _____			KOTIA TRANSFORMERS PVT.LTD. KOLKATA / INDIA	
PREPD	BASAK	20.11.23	TITLE HV.BUSHING FOR 33KV,50HZ, COPPER WOUND,3-PH,100KVA TRANSFORMER	
CHECKED	A.MAITY	20.11.23		
APPVD	MKS	20.11.23		
SCALE	N.T.S.		DRAWING No.	A30770
			ALL DIM'S ARE IN mm UNLESS OTHERWISE STATED	
			CUSTOMER - TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.	

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ENERGY EFFICIENCY
LEVEL -1

PARTS	MATERIAL	QTY
1. Insulator top	Porcelain	1
2. Insulator bottom	Porcelain	1
3. Stem	COPPER IS:613-1964	1
4. Washer (Top end)	Brass Type-I of IS:319-1974	1
5. Washer (Stem)	Brass Type-I of IS:319-1974	1
7. Sealing washer (Stem)	Nitrile rubber Type-C, Gr.-rc-70C of IS:4253	1
8. Sealing washer Type M	Oil resistant nitrile rubber made from vulcanized butadiene/acrylonitrile rubber compound having a hardness of 65 to 70 IRHD	1
9. General purpose washer	Nitrile rubber Type-C, Gr.-rc-70C of IS:4253	1
10. Gasket X	PTFE or Polyamide	1
11. Gasket R	PTFE or Polyamide	1
12. Lock nut	Brass IS:3488-1966	5
13. Nut	Brass IS:3488-1966	1

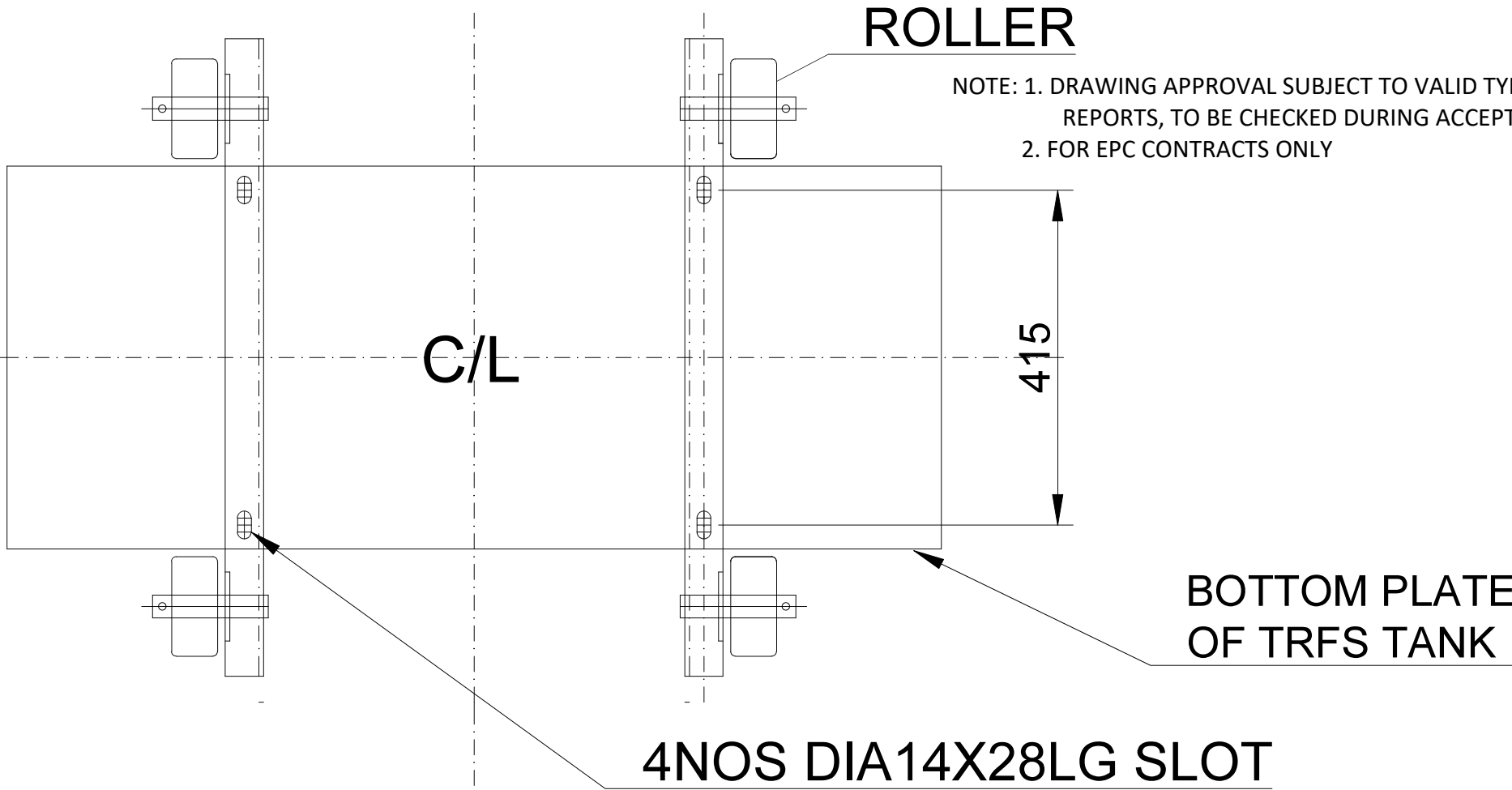
NOTE

- 1. RATED VOLT. _____ 1.1KV
- 2. RATED CURRENT _____ 250 A
- 3. DRY POWER FREQ. WITHSTAND VOLT. (FOR 1min) _____ 10 KV rms
- 4. WET POWER FREQ. WITHSTAND VOLT. (FOR 1min) _____ 10 KV rms
- 5. POWER FREQ. PUNCTURE WITHSTAND VOLT. _____ 1.3 X ACTUAL DRY POWER FREQ. WITHSTAND VOLT.
- 6. RELEVANT STANDARD _____ IS : 3347 & IS : 7421
- 7. MIN.CREEPAGE DISTANCE: _____ 25MM(MIN)/KV
- 8. RATED SHORT TIME CURRENT: _____ 25KA FOR 2 SEC WITH 2.5X25KA PEAK
- 9. WT.OF ASSEMBLY BUSHING: _____ 1.8KG
- 10. ANGLE OF MOUNTING: _____ 90° HORIZONTAL TO TANK BODY
- 11. MAKE _____ CJI/ GENESIS

**Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.**

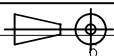
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- 2. FOR EPC CONTRACTS ONLY

JOB/W.O.No: _____		KOTIA TRANSFORMERS PVT.LTD.	
		KOLKATA / INDIA	
PREPD	BASAK	07.11.23	TITLE LV.BUSHING FOR 100KVA 33/0.415KV, 3-PH,50HZ, CU.WOUND TRANSFORMER
CHECKED			
APPVD	MKS	07.11.23	
SCALE	N.T.S.		DRAWING No. A30771 [R] 1
		TENDER NO- TRANSMISSION CORPORATION OF ANDHRA PRADESH LTD.	



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TOTAL WT OF TRANSFORMER - 1280 KG

JOB/W.O.No: _____			KOTIA TRANSFORMERS PVT.LTD. KOLKATA / INDIA	
PREPD	NAME	DATE	TITLE	
CHECKED	BASAK	20.11.23	FOUNDATION FOR 100KVA,33/0,415KV TRANSFORMER	
APPVD	MKS	20.11.23	DRAWING No. A30772 R 0	
SCALE	N.T.S.		CUSTOMER APTRANSCO	
		ALL DIM'S ARE IN mm UNLESS OTHERWISE STATED		

GUARANTEED TECHNICAL PARTICULARS

Sl. No.	Particulars	For 100 KVA, 33/0.415KV Transformer
1.	Make	Kotia Transformers Pvt. Ltd.
2.	Normal Full Load output (KVA)	100 KVA
3.	Type of Transformer: I) Winding Type A) H.V. B) L.V. II) Material	Core Type, 3 Ph, Oil immersed outdoor type. Cross over Spiral Copper
4.	Type of Cooling	ONAN
5.	Indoor or Outdoor	Out door
6.	Rated High Voltage (V)	33000 V
7.	Rated Low Voltage (V)	415 V
8.	Connection and Vector group	Delta-Star, Dyn-11 HV- Delta LV- Star
9.	Maximum temperature rise of i) Winding by resistance (deg.c.) ii) Oil by thermometer (deg.c.) iii) Maximum ambient air temperature (deg.c.)	40 35 50
10	Energy Efficiency Level	Level 1
11	Max total losses at 50% of rated load: A).	510 W
	B) . Max total losses at 100% of rated load:	1650 W
12.	Impedance (Percentage)	4.5 % +- IS tolerance
13.	Tap Changer i) Make: ii) Type: iii) Indicator arrangement: iv) Packing arrangement: v) Other details:	Always OCTC (Off Circuit Tap Changer) Numbering (Position indication on handle and as per IS:- 1180) N.A.
14.	Tapping on HV side for LV variation Tap Range No.ofTaps: Each Tap: Normal Tap	HV Side +/-10% @2.5% per step
15.	Impulse strength of HV winding	170KV
16.	Impulse strength of LV winding	
17.	Overall dimensions of transformer in mm.	1430x1280x1980
18.	Approximate weight of i) Core cum windings (Kgs.) ii) Oil (Kgs.) iii) Complete transformer with all fittings including oil (Kgs.)	625 kgs 375 kgs 1280 kgs.
19.	Type of Tank	Rectangular fabricated
20.	Make and type of breather fitted to the transformer	Transparts make Silicagel breather
21.	Particulars of bushings i) Country of origin ii) Rating iii) Types a) HV bushing b) LV bushing	India 36 & 1.1kv / 250A. Porcelain Porcelain

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GUARANTEED TECHNICAL PARTICULARS

	iv) Impulse & Flash over voltage.	170KV(Peak) Power frequency voltage (HV/LV), 70KV(Rms)/3KV(Rms).
22.	Efficiency at i) u.p.f. a) 100% b) 75% c) 50% ii) 0.8 pf a) 100% b) 75% c) 50%	98.73 % 99.17% 99.17% 98.72% 98.97% 98.96%
23.	Regulation at full load i) u.p.f. ii) 0.8 pf	1.1358 3.5003
24.	Terminal arrangements of bushings (HV and LV)	Bare Bushing
25.	Mounting arrangement for the transformer	As per Ts
26.	List of fittings and accessories provided	As per tender specification and IS

Supply of Transformers shall be as per IS:-1180 and Tender Specification.

TITLE	GTP 100KVA, 33/0.415KV STATION TRANSFORMERS.
CUSTOMER	APTRANSCO
MANUFACTURER	KOTIA TRANSFORMERS PVT. LTD.

NOTE: 1. DRAWING APPROVAL SUBJECT TO VALID TYPE TEST REPORTS, TO BE CHECKED DURING ACCEPTANCE TESTS
2. FOR EPC CONTRACTS ONLY

KOTIA TRANSFORMERS PVT LTD

DIRECTOR

Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.

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Design of transformer shall be as per Type test reports.

9289537/2024/EEMRT-ENE51



TC-5389

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

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Fax : +91 (0265) 2638382

E-mail : erda@erda.org

Web : http://www.erda.org

**TEST REPORT**

ULR-TC538922000022045F

SHEET 1 OF 20

NAME & ADDRESS OF CUSTOMER KOTIA TRANSFORMERS PVT. LTD. SHED NO.-10A, BUDGE BUDGE TRUNK ROAD, CHAKMIR, MAHESHTALA, KOLKATA-700142.	TEST REPORT NO.: RP-2223-015603 DATE OF ISSUE: 12/08/2022	
	CUSTOMER REF. No.: Letter	DATED: 20/07/2022
	DATE OF SAMPLE RECEIPT: 20/07/2022	DATE OF TESTING: 27/07/2022 to 09/08/2022
	SAMPLE DESCRIPTION (As provided by customer) 100 kVA Distribution Transformer 33000/415 Volts, 1.75/139.12 Amps., Oil filled, No. of taps: 6, Vector Group: Dyn-11, ENERGY EFFICIENCY LEVEL: 1 Further details as per sheet No. 3 OF 20	
SAMPLE IDENTIFICATION ERDA SAMPLE CODE NO.: ERDA-00474282 SERIAL NO.: 1588 YEAR OF MFG.: 2022		
TEST DETAILS Short-circuit withstand test (Ability to withstand the dynamic effects of short-circuit) [Cl. No. (17 & 21.3 c)] ENCLOSURES: Number of oscillograms : Ten Number of photograph : One Number of test circuit diagram : One Number of drawings : Three	TEST SPECIFICATIONS IS 1180 (Part 1): 2014 [Amendment No. 1, 2, 3 & 4]	
REMARKS: The sample conforms to the requirements of standard for short-circuit withstand test.		
PREPARED BY	CHECKED BY	J. R. TAHILWANI APPROVED BY

Note:

1. This report relates only to the particular sample received for testing in good condition at ERDA, Vadodara.
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 the tests asked for by the customer have been carried out.
5. Particulars of manufacturer/supplier; given in this report are based on information supplied by the customer, along with the test request/sample. ERDA does not assume any responsibility for the correctness of the information for above mentioned Sample Under Test (SUT). ERDA will not be responsible for any changes in SUT made after the test. This test report is given as per instrument status while testing.
6. In case of any dispute, Vadodara will be the exclusive jurisdiction & shall be construed as where the cause has arisen.

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ULR-TC538922000022045F

TEST REPORT NO.: RP-2223-015603

SHEET 2 OF 20

DATE OF ISSUE: 12/08/2022

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1. Technical specifications of test object assigned by customer			Sheet No. 3 OF 20
2. Routine test results before short circuit			Sheet No. 4 OF 20 to 5 OF 20
3. Short-circuit withstand test			Sheet No. 6 OF 20 to 7 OF 20
4. Routine test results after short circuit			Sheet No. 8 OF 20 to 9 OF 20
5. Oscillograms			Sheet No. 10 OF 20 to 19 OF 20
6. Photograph			Sheet No. 20 OF 20
7. Oscillogram No.			0425/01 to 0425/10
8. Photograph No.			2223-004959/0388
9. Test circuit diagram No.			OLSC/DTC/03
10. Drawing No.	Issue Status		Description
	Revision	Date	
KT-33-100-03	R0	6.3.2017	NAME, RATING & DIAGRAM PLATE
KT-33-200-01	R0	6.3.2017	OUTLINE GENERAL ARRGT.
INT-100-33-04	R0	20.4.2017	CORE, COIL INTERNAL ASSEMBLY



PREPARED BY



CHECKED BY

TC 3337520

Chief Engineer/Projects
APTRANSCO/VS/Vijayawada.



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ULR-TC538922000022045F

TEST REPORT NO.: RP-2223-015603

SHEET 3 OF 20

DATE OF ISSUE: 12/08/2022**TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER**

1. Name of manufacturer : **KOTIA TRANSFORMERS PVT. LTD.**
2. Equipment : **100 kVA Distribution Transformer**
3. Standard No. : [Cl. No. (17 & 21.3 c)] of
IS 1180 (Part 1): 2014
[Amendment No. 1, 2 & 3]
4. Sr. No. : 1588
5. Energy efficiency level : 1
6. Type : Outdoor, Oil cooled, Non-sealed type,
Copper wound, CRGO core, Circular Coil
7. kVA rating : 100
8. Rated voltage H.V.(volts) : 33000
L.V. (volts) : 415
9. Rated current H.V.(Amp.) : 1.75
L.V. (Amp.) : 139.12
10. Number of phases : 3
11. Connection H.V./L.V. : Delta/Star **Chief Engineer/Projects**
12. Frequency (Hz) : 50 **APTRANSCO/VS/Vijayawada.**
13. Type of cooling : ONAN
14. Temperature rise of oil/winding(°C) : 35/40
15. Percentage Impedance : 4.5 % + IS Tolerance
16. Type of winding : Concentric
17. Primary winding conductor : DPC Copper wire, bare dia. 1.12mm
18. Secondary winding conductor : DPC Copper strip, bare size
(7.3mm x 2.75mm) x 6 Nos. in parallel
19. Quantity of oil (Litre) : 456
20. Weight of Oil (kg.) : 375
21. Total weight (kg.) : 1280
22. Vector group : Dyn-11
23. Year of manufacture : 2022
24. Max. Total losses at 75°C (Watts) : 510 (at 50 % load)
25. Max. Total losses at 75°C (Watts) : 1650 (at 100 % load)
26. Insulation level H.V. : 70kVrms
27. Insulation level L.V. : 03kVrms
28. Tapping details :

Tap position	Primary voltage (V)	Secondary Voltage (V)	Primary Current (A)	Impedance (%)
1	34650	415	1.67	-
2	33825	415	1.71	-
3	33000	415	1.75	4.5 % + IS Tolerance
4	32175	415	1.79	-
5	31350	415	1.84	-
6	30525	415	1.89	-

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ULR-TC538922000022045F

TEST REPORT NO.: RP-2223-015603

SHEET 4 OF 20

DATE OF ISSUE: 12/08/2022

Discipline: Electrical Testing

Group: Short-Circuit Test Facility

ROUTINE TEST RESULTS BEFORE SHORT CIRCUITa) MEASUREMENT OF WINDING RESISTANCE

Tap Changer position	Measurement at average oil temperature 31.4°C					
	LV Winding resistance (mΩ)			HV Winding resistance (Ω)		
	U - V	V - W	W - U	U - V	V - W	W - U
1	-	-	-	91.38	91.34	91.33
3	9.743	9.753	9.748	86.450	86.420	86.425
6	-	-	-	79.640	79.685	79.685

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF PHASE DISPLACEMENT

Vector Group: Dyn-11 was verified.

Tap position	Rated turns Ratio	Measured turns ratio between Terminals					
		U-V/u-n	Difference (%)	V-W/v-n	Difference (%)	W-U/w-n	Difference (%)
1	144.61	144.71	-0.069	144.72	-0.076	144.53	0.055
2	141.17	141.26	-0.064	141.28	-0.078	141.10	0.050
3	137.73	137.83	-0.073	137.84	-0.080	137.70	0.020
4	134.28	134.39	-0.082	134.40	-0.089	134.25	0.022
5	130.84	130.95	-0.084	130.96	-0.092	130.98	-0.107
6	127.40	127.52	-0.094	127.52	-0.094	127.54	-0.110

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

Average oil temp.: 31.4°C

Tap Position	Test current Iavg. (Amp.)	Impedance voltage Vavg. (V)	Freq. (Hz.)	Load loss measured (Watts)	Impedance voltage (%Z) at 50 Hz.	Load loss computed at 75°C (Watts)	%Z at 75°C
1	1.6644	1544.25	50.082	723.2	4.47	828.08	4.48
3	1.7432	1452.39	50.054	734.4	4.42	842.99	4.44
6	1.8969	1408.60	50.102	778.2	4.60	879.92	4.61

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

Average oil temp.: 31.4°C

Tap Position	Test current Iavg. (Amp.)	Impedance voltage Vavg. (V)	Freq. (Hz.)	Load loss measured (Watts)	Load loss computed at 75°C (Watts)
3	0.8747	727.54	50.022	183.16	209.24

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TEST REPORT NO.: RP-2223-015603

SHEET 5 OF 20

DATE OF ISSUE: 12/08/2022e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Average oil temp.: 31.4°C

Applied Voltage Vavg. (V)	Current Iavg. (mA)	Freq. (Hz.)	Losses Measured (Watts)
416.20	400.79	50.140	222.28

- Total losses at 75°C: 431.52 Watts (at 50 % load)

- Total losses at 75°C: 1065.27 Watts (at 100 % load)

f) MEASUREMENT OF INSULATION RESISTANCE

Average oil Temp.: 31.4°C

Measured between	DC Test Voltage (V)	IR value (MΩ)
HV to LV winding	5000	> 2000
HV winding to LV + EARTH	5000	> 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 tank connected to earth	830	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	70	60	Withstood
2.	Between LV winding and HV winding connected to the tank and earth	03	60	Withstood


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TEST REPORT NO.: RP-2223-015603

SHEET 6 OF 20

DATE OF ISSUE: 12/08/2022**SHORT-CIRCUIT WITHSTAND TEST:**

The verification of short-circuit withstand test was performed on transformer by connecting the secondary windings to three phase balanced source and primary windings 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/03.

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

Supply frequency: 50 Hz.

Test No.	Oscillogram No.	Tap Changer Position	Applied voltage (Vrms)	Short circuit current on LV (kA)			Duration (sec.)	Remarks
				Peak	RMS	Avg.		
1.	0425/01	3	-	-	2.334 2.281 2.279	2.298	0.1	Calibration Shot
2.	0425/02	3	415	6.588	3.001 3.145 3.116	3.087	0.5	No Abnormality
3.	0425/03	3	415	6.597	3.008 3.295 3.160	3.154	0.5	No Abnormality
4.	0425/04	3	415	6.670	3.122 3.353 3.119	3.198	0.5	No Abnormality
5.	0425/05	1	415	7.072	3.063 2.898 2.963	2.975	0.5	No Abnormality
6.	0425/06	1	415	7.006	3.213 3.099 2.956	3.089	0.5	No Abnormality
7.	0425/07	1	415	6.942	3.406 2.958 3.111	3.158	0.5	No Abnormality
8.	0425/08	6	415	6.800	2.854 3.024 3.060	2.979	0.5	No Abnormality
9.	0425/09	6	415	6.812	3.039 2.902 3.159	3.033	0.5	No Abnormality
10.	0425/10	6	415	6.802	2.875 3.187 3.318	3.127	0.5	No Abnormality

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TEST REPORT NO.: RP-2223-015603

SHEET 7 OF 20

DATE OF ISSUE: 12/08/2022**Measurement of the % reactance during the short circuit test**

LV winding was short circuited. Three phase 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.	Tap changer position	Measurement performed	Measured value of % reactance at 50 Hz.			%Change in % reactance		
			U	V	W	U	V	W
1.	1	Before test	4.40	4.40	4.40	-	-	-
2.	3	Before test	4.26	4.25	4.25	-	-	-
3.	6	Before test	4.52	4.52	4.53	-	-	-
4.	3	After the test no. 2.	4.26	4.25	4.25	0.00	0.00	0.00
5.	3	After the test no. 3.	4.26	4.25	4.25	0.00	0.00	0.00
6.	3	After the test no. 4.	4.26	4.25	4.25	0.00	0.00	0.00
7.	1	After the test no. 5.	4.41	4.41	4.40	0.23	0.23	0.00
8.	1	After the test no. 6.	4.41	4.41	4.40	0.23	0.23	0.00
9.	1	After the test no. 7.	4.41	4.41	4.40	0.23	0.23	0.00
10.	6	After the test no. 8.	4.52	4.52	4.53	0.00	0.00	0.00
11.	6	After the test no. 9.	4.52	4.52	4.53	0.00	0.00	0.00
12.	6	After the test no. 10.	4.52	4.52	4.53	0.00	0.00	0.00
13.	3	After the test no. 10.	4.26	4.25	4.25	0.00	0.00	0.00
14.	1	After the test no. 10.	4.40	4.40	4.40	0.00	0.00	0.00

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TEST REPORT NO.: RP-2223-015603

SHEET 8 OF 20

DATE OF ISSUE: 12/08/2022**ROUTINE TEST RESULTS AFTER SHORT CIRCUIT**a) MEASUREMENT OF WINDING RESISTANCE

Tap Changer position	Measurement at average oil temperature 29.5°C					
	LV Winding resistance (mΩ)			HV Winding resistance (Ω)		
	u - v	v - w	w - u	U - V	V - W	W - U
1	-	-	-	91.44	91.46	91.39
3	9.759	9.752	9.767	86.510	86.485	86.470
6	-	-	-	79.705	79.670	79.705

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF PHASE DISPLACEMENT

Vector Group: Dyn-11 was verified.

Tap position	Rated turns Ratio	Measured turns ratio between Terminals					
		U-V/u-n	Difference (%)	V-W/v-n	Difference (%)	W-U/w-n	Difference (%)
1	144.61	144.66	-0.034	144.64	-0.020	144.46	0.105
2	141.17	141.23	-0.044	141.21	-0.030	141.04	0.091
3	137.73	137.79	-0.047	137.77	-0.033	137.64	0.062
4	134.28	134.36	-0.058	134.34	-0.043	134.20	0.061
5	130.87	130.92	-0.062	130.90	-0.047	130.93	0.070
6	127.40	127.49	-0.074	127.47	-0.058	127.49	0.074

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

Average oil temp.: 29.5°C

Tap Position	Test current Iavg. (Amp.)	Impedance voltage Vavg. (V)	Freq. (Hz.)	Load loss measured (Watts)	Impedance voltage (%Z) at 50 Hz.	Load loss computed at 75°C (Watts)	%Z at 75°C
1	1.6689	1547.97	50.035	736.80	4.47	841.74	4.49
3	1.7109	1423.57	49.964	716.60	4.41	856.67	4.43
6	1.8964	1406.80	50.023	788.60	4.59	894.77	4.61

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

Average oil temp.: 29.5°C

Tap Position	Test current Iavg. (Amp.)	Impedance voltage Vavg. (V)	Freq. (Hz.)	Load loss measured (Watts)	Load loss computed at 75 °C (Watts)
3	0.8428	700.49	49.992	174.97	215.16

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TEST REPORT NO.: RP-2223-015603

SHEET 9 OF 20

DATE OF ISSUE: 12/08/2022e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Average oil temp.: 29.5°C

Applied Voltage Vavg. (V)	Current Iavg. (mA)	Freq. (Hz.)	Losses Measured (Watts)
414.73	405.75	49.957	221.29

- Total losses at 75°C: 436.45 Watts (at 50 % load)

- Total losses at 75°C: 1077.96 Watts (at 100% load)

f) MEASUREMENT OF INSULATION RESISTANCE

Average oil temp.: 31.4°C

Measured between	DC Test Voltage (V)	IR value (MΩ)
HV to LV winding	5000	> 2000
HV winding to LV + EARTH	5000	> 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 tank connected to earth	830	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	70	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 clampings:
- No visible damage, deformation or displacement.
- 2) Condition of spacers : Intact
- 3) 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 specified by the standard.

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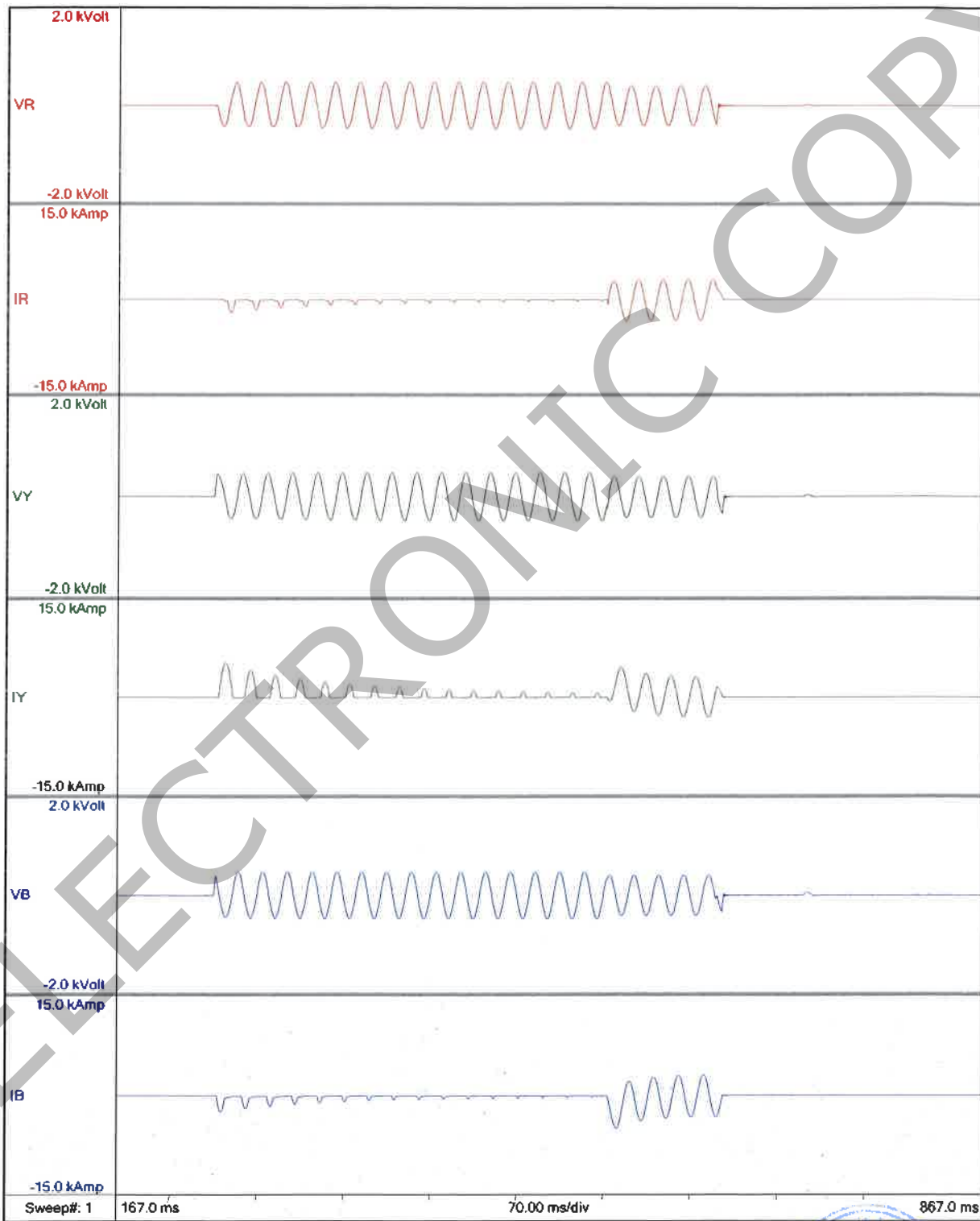


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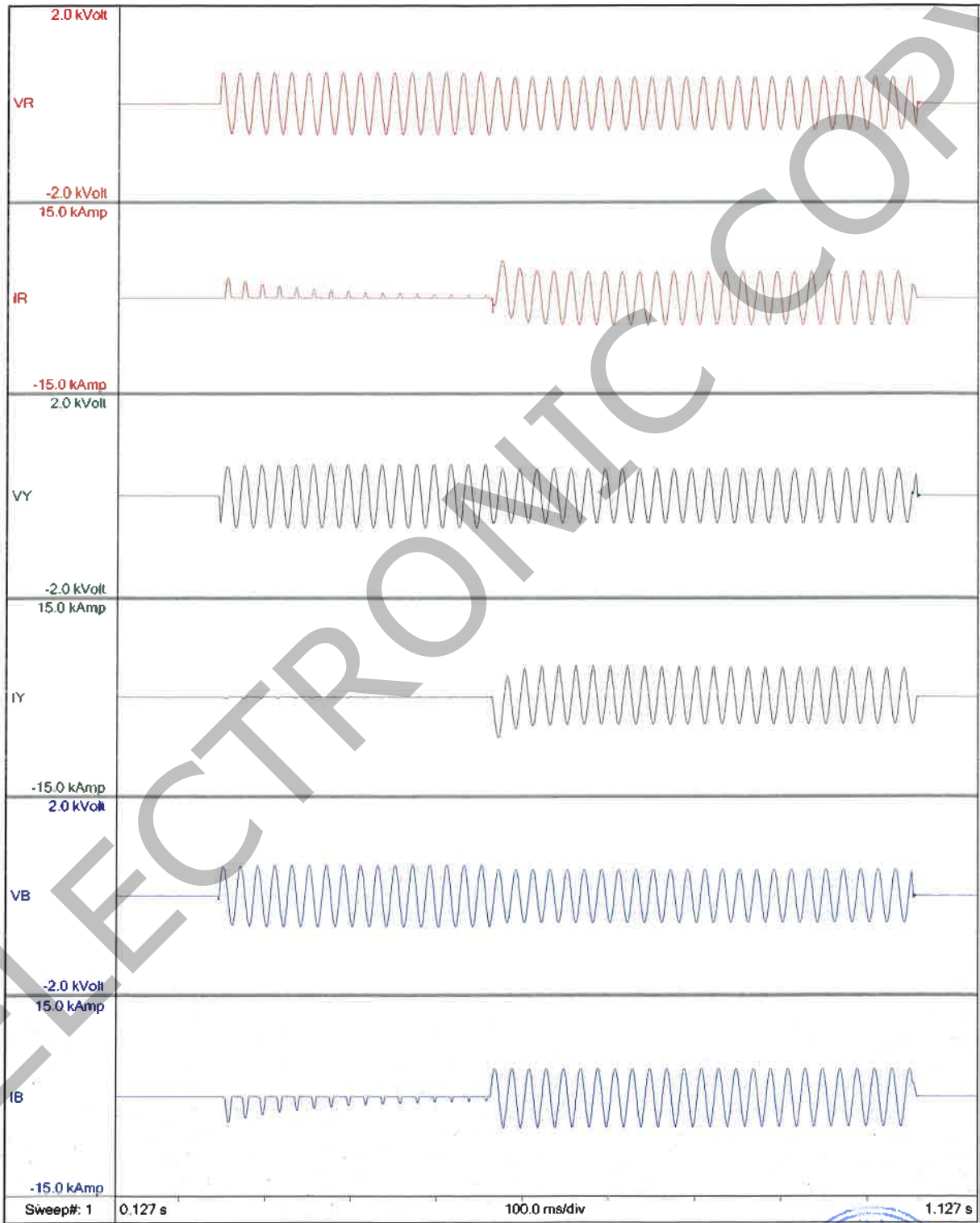


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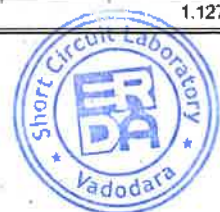


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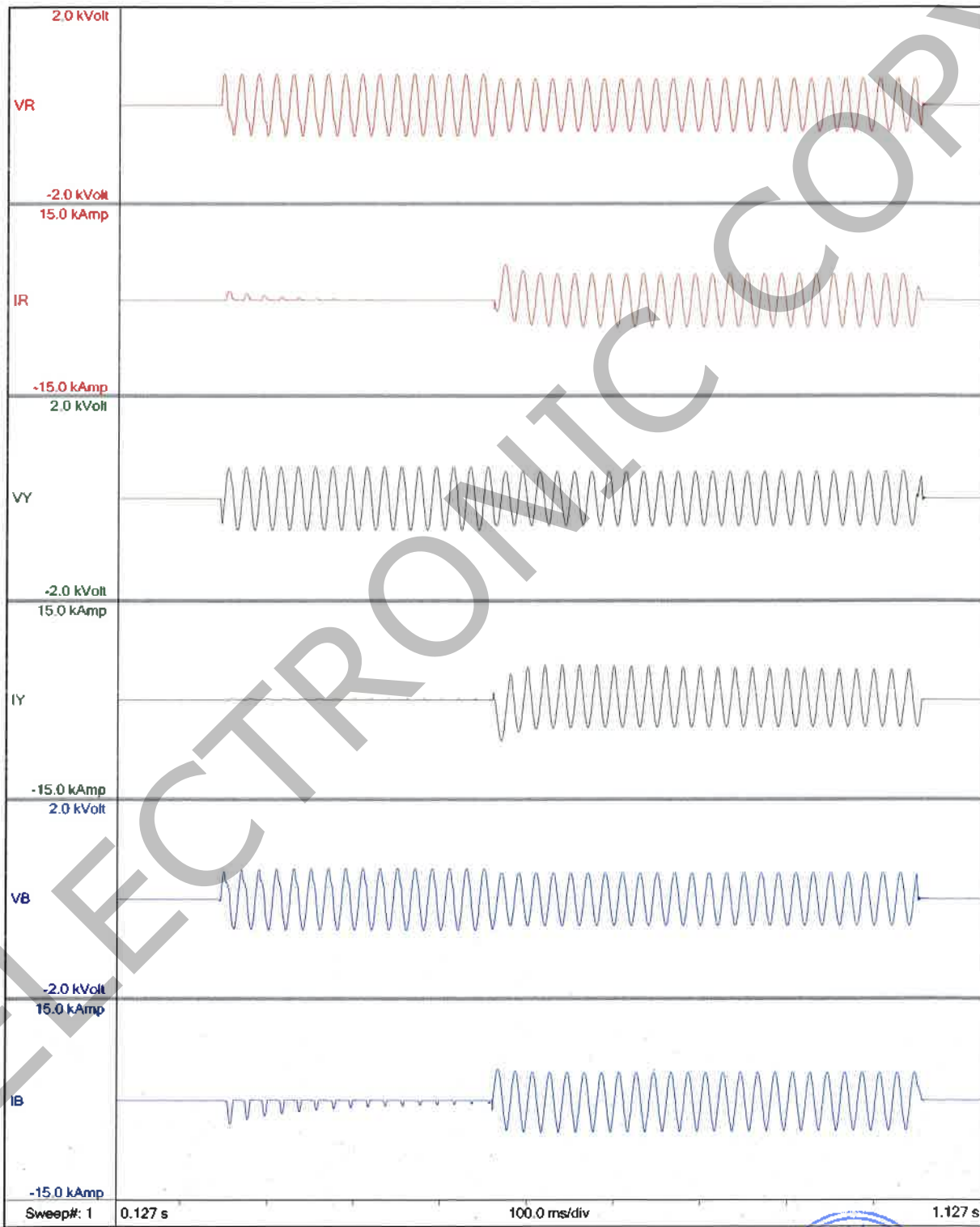


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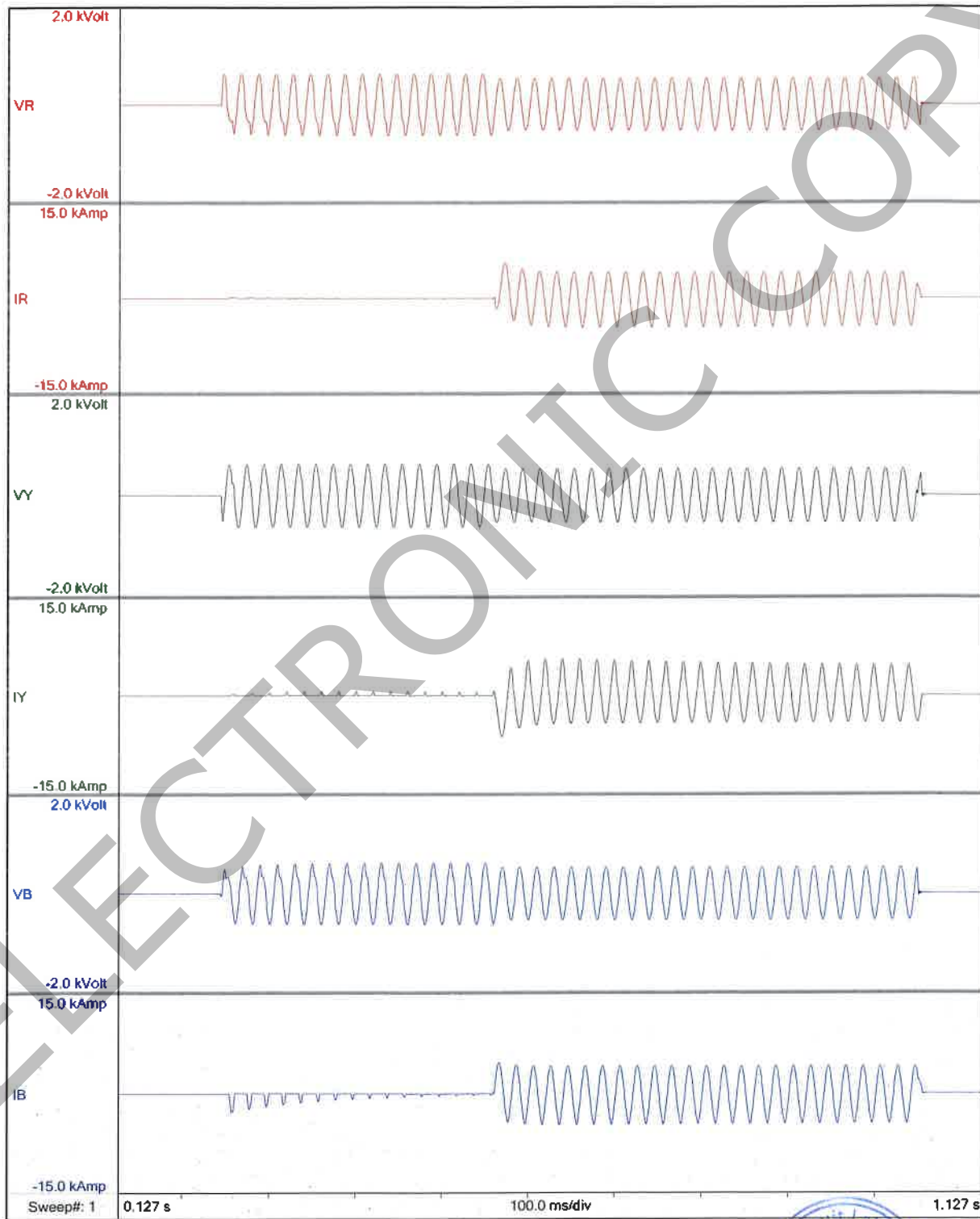


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TEST REPORT NO.: RP-2223-015603

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DATE OF ISSUE: 12/08/2022



TC 3337509

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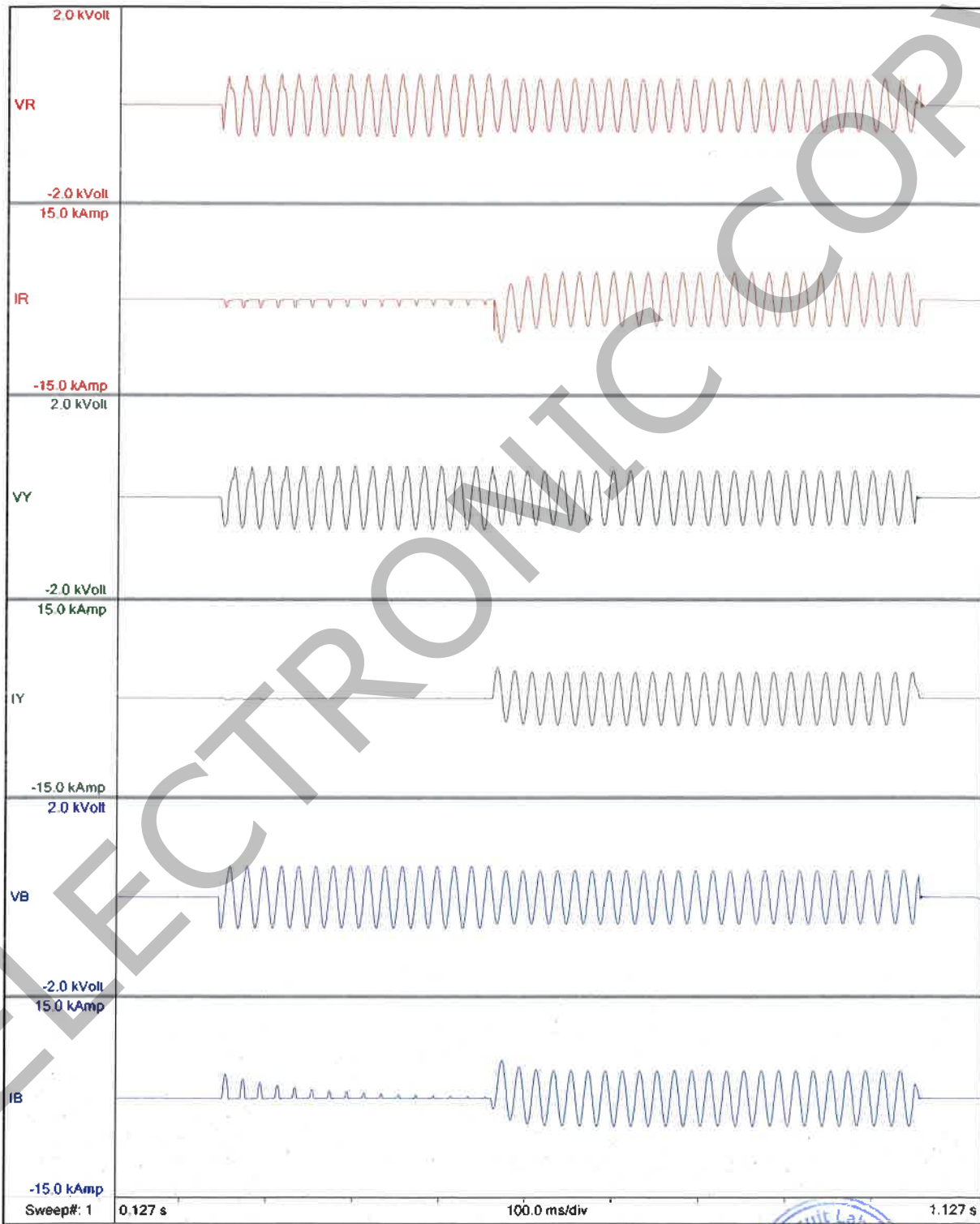


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TEST REPORT NO.: RP-2223-015603

DATE OF ISSUE: 12/08/2022

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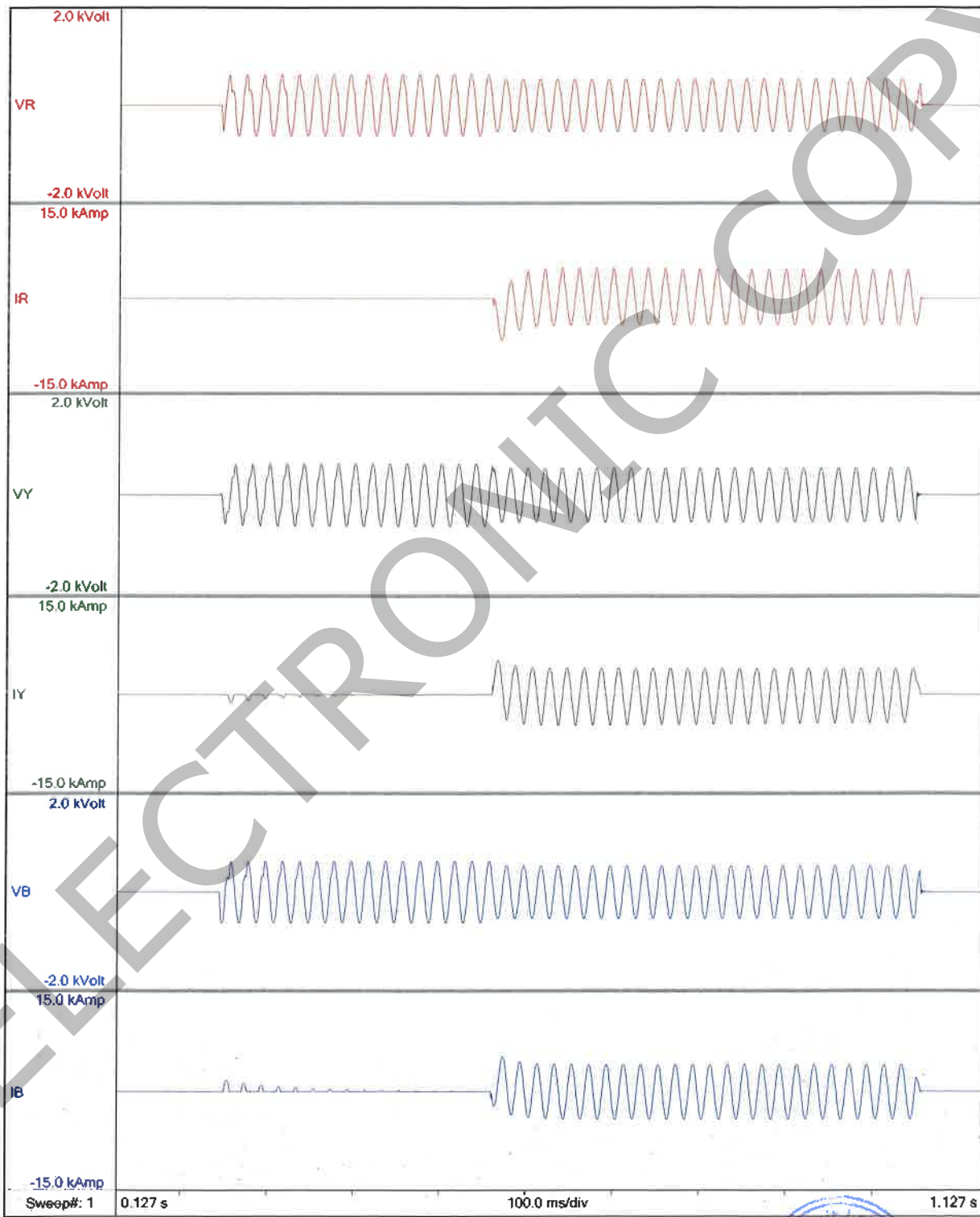


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DATE OF ISSUE: 12/08/2022



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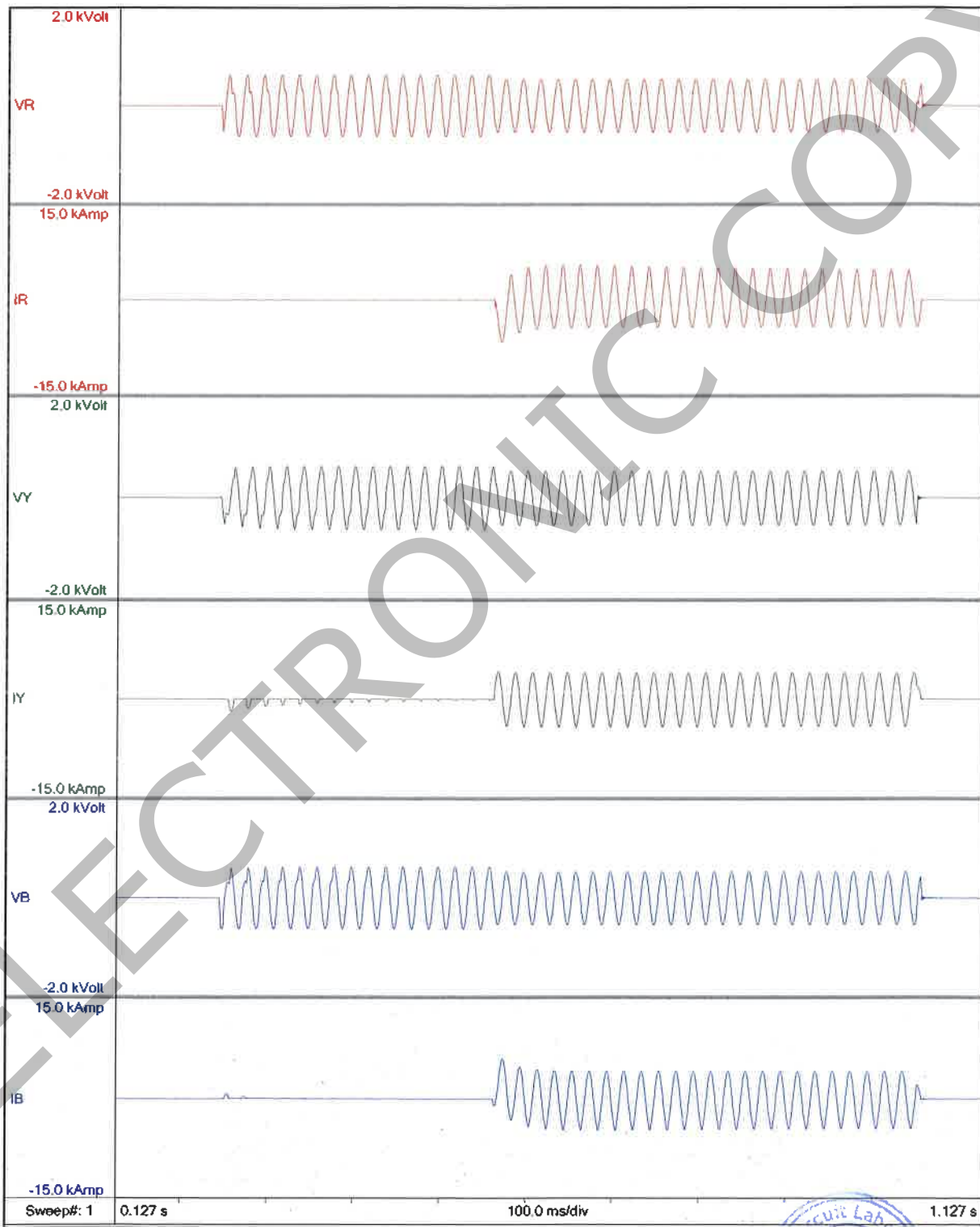


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TEST REPORT NO.: RP-2223-015603

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DATE OF ISSUE: 12/08/2022



TC 3337506

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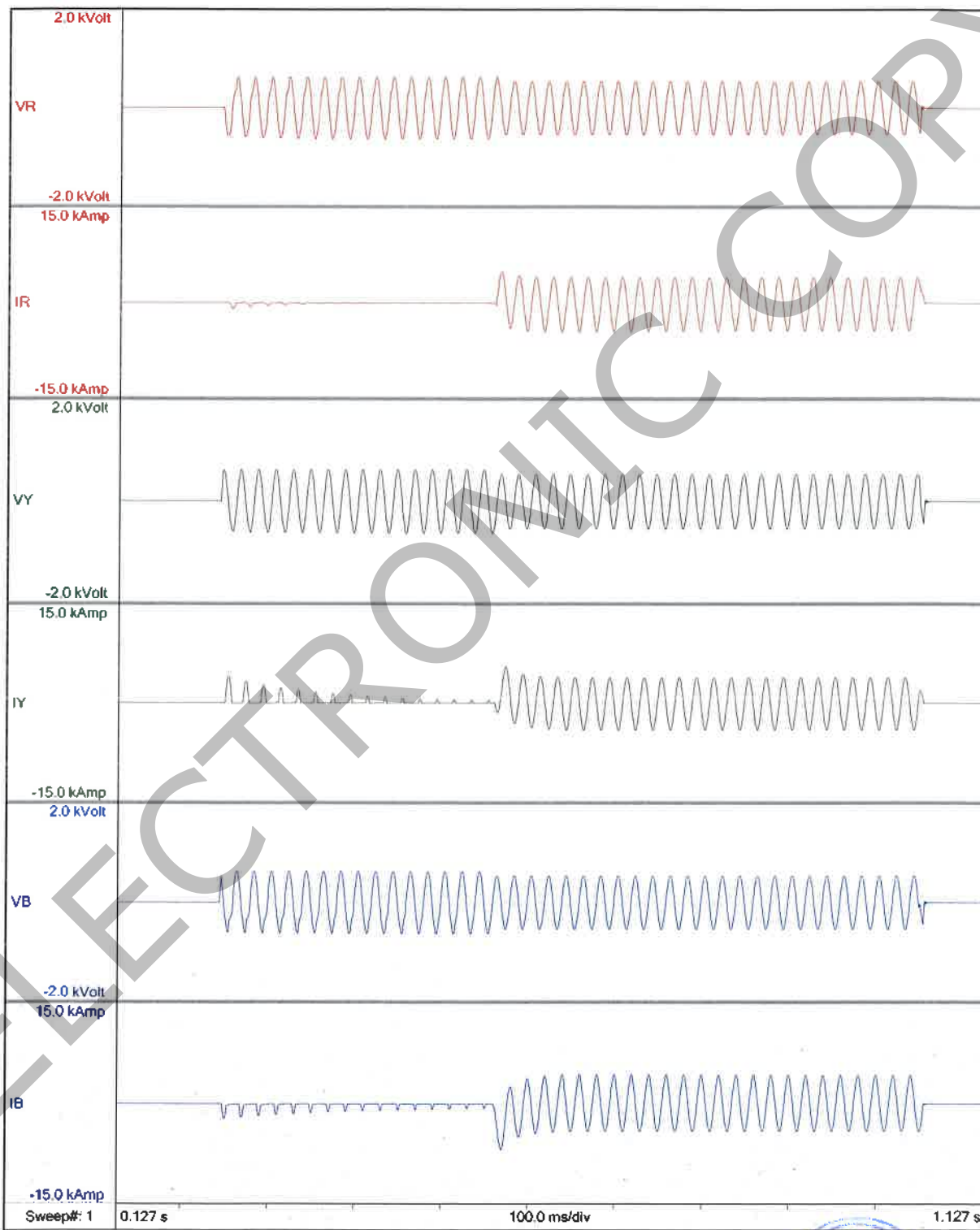


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DATE OF ISSUE: 12/08/2022



OSCILLOGRAM NO. : 0425/08

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TC-5389

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)

ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.

EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33

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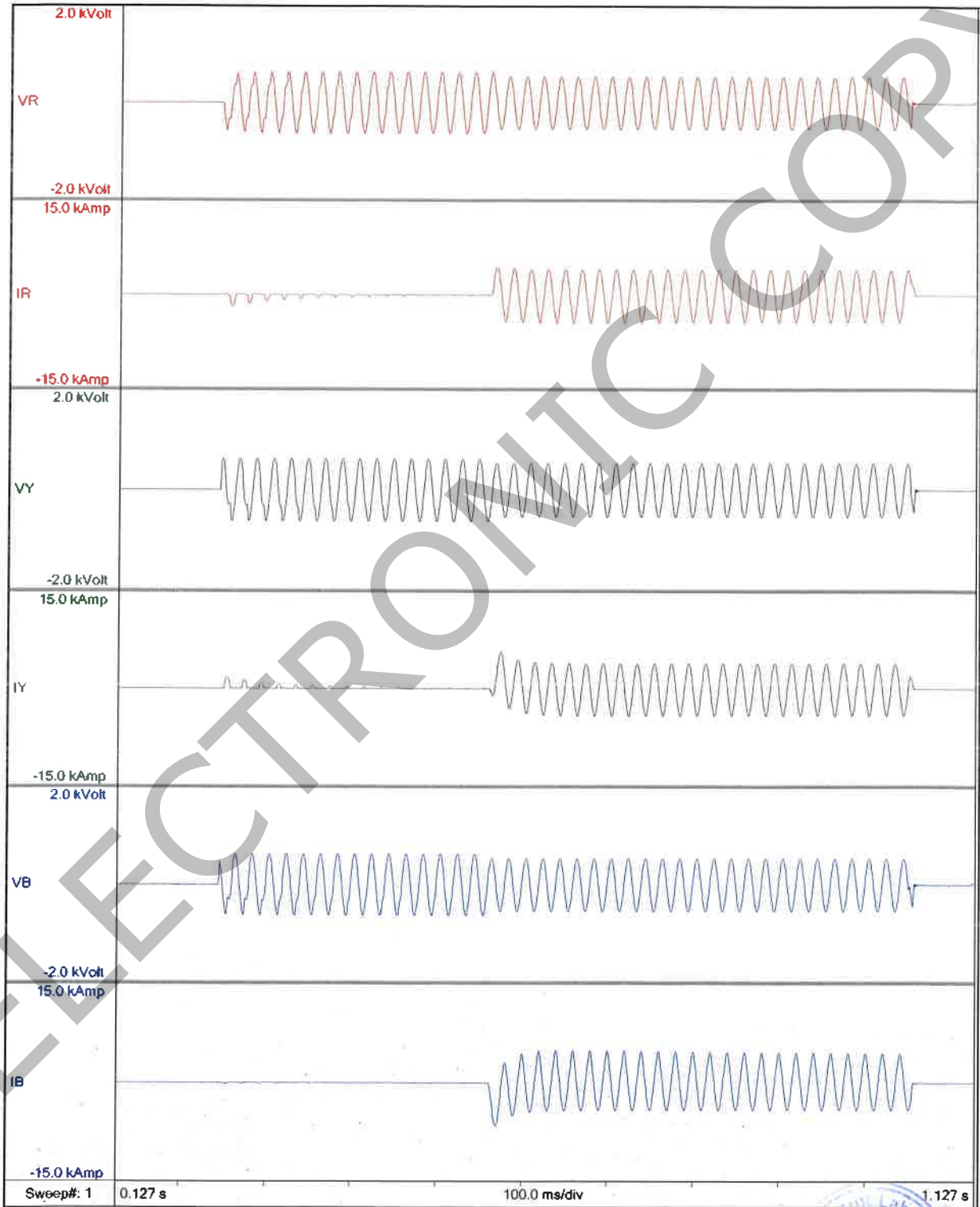


ULR-TC538922000022045F

TEST REPORT NO.: RP-2223-015603

SHEET 18 OF 20

DATE OF ISSUE: 12/08/2022



TC 3337504

OSCILLOGRAM NO. : 0425/09

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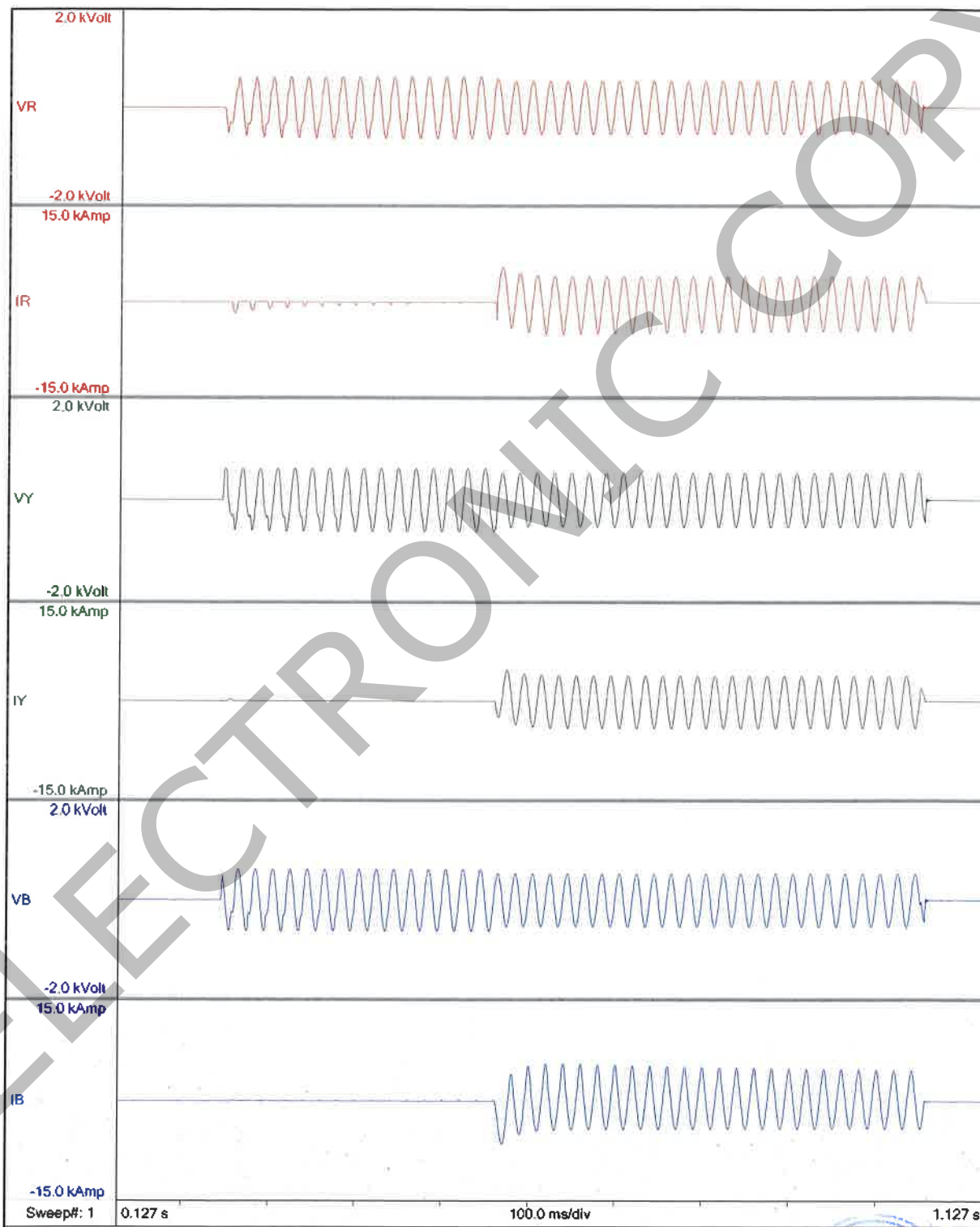


ULR-TC538922000022045F

TEST REPORT NO.: RP-2223-015603

SHEET 19 OF 20

DATE OF ISSUE: 12/08/2022



TC 3337503

OSCILLOGRAM NO. : 0425/10

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ULR-TC538922000022045F

TEST REPORT NO.: RP-2223-015603

DATE OF ISSUE: 12/08/2022

SHEET 20 OF 20



KOTIA TRANSFORMERS PVT. LTD.		KOLKATA, INDIA	
PHASE TRANSFORMER		ENERGY EFFICIENCY LEVEL	1
STANDARD	IS 1180(PART-1)	MAX. TOTAL LOSSES AT 50% RATED LOAD	510
KVA	100	MAX. TOTAL LOSSES AT 100% RATED LOAD	1650
VOLTS AT NO LOAD	HV 33000 LV 415	TYPE OF COOLING	ONAN
BIL	HV 170 LV 3	TEMP. RISE	35
AMPERES	HV 1.75 LV 138.12	TEMP. RISE	40
FREQUENCY	50	MASS OF OIL	375
VECTOR GROUP	Dyn 11	TOTAL GAUGE	1280
IMPEDANCE	4.0%	VOL. OF OIL	466
TYPE	ONAN	W. YEARS OF MFG.	2022
DATE OF MANUFACTURE	12/08/2022	SERIAL NO.	1586

[Signature]
PREPARED BY

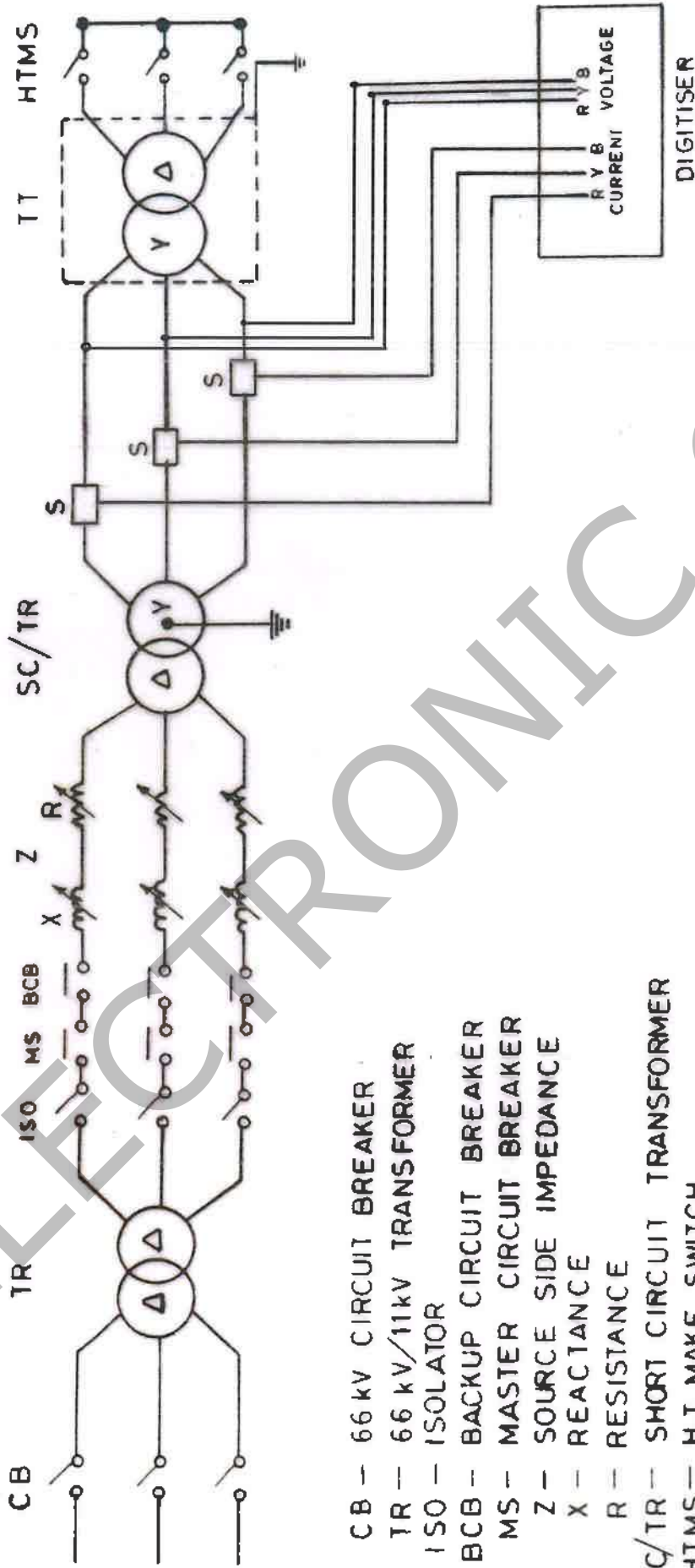
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***** End of Test Report *****

TC 3337502

**Chief Engineer/Projects
APTRANSCO/VIS/Vijayawada.**



- 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.: PP-2023-018603
 DATE: 12/08/2022

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION	
SCHEMATIC CIRCUIT DIAGRAM	
DRN-BY CKD.	DATE
S.B.S.	A.v.B.
	22-5-98
DRG. NO.	OLSC/DTC/03

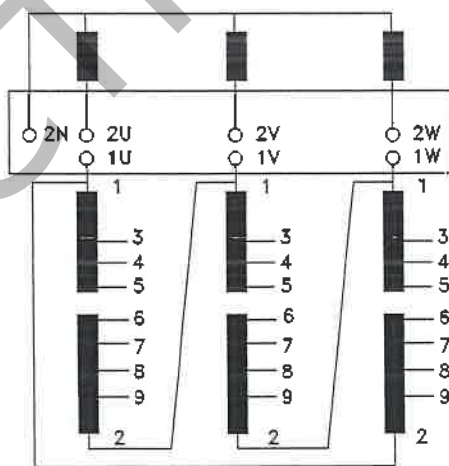
KOTIA TRANSFORMERS PVT. LTD.
KOLKATA

3 PHASE TRANSFORMER

STANDARD	IS 1180(PART-1)	ENERGY EFFICIENCY LEVEL	1
KVA	100	MAX.TOTAL LOSSES AT 50% RATED LOAD	W 510
VOLTS AT NO LOAD	HV 33000 LV 415	MAX.TOTAL LOSSES AT 100% RATED LOAD	W 1650
BIL	HV 170 LV 3	TYPE OF COOLING	ONAN
AMPERES	HV 1.75 LV 139.12	TEMP RISE	OIL °C 35 WDG °C 40
FREQUENCY HZ	50	MASS OF OIL	KG 375
VECTOR GROUP	Dyn 11	TOTAL MASS	KG 1280
IMPEDANCE VOLT %	4.5%	VOL OF OIL	l 456
TAPPINGS	OFF LOAD	M/YEAR OF MFG.	JUNE/2022
FOR HV VARIATION	+5% -7.5% @2.5%	SERIAL NO.	1588 *
CUSTOMER	-	ORDER NO	-

NOTES:
 1. MATERIAL: 1.2mm THK. STAINLESS STEEL
 2. ALL LETTERS, FIGURES & BORDERS TO BE BLACK.
 3. BACK GROUND TO BE NATURAL FINISH.
 4. PLATE TO BE MANUFACTURED BY ETCHING PROCESS.
 5. PLATE SIZE : 210 L X 105 W

SW.POS.	CONNECTION	HV	LV
1	6 - 5	34650	415
2	5 - 7	33825	415
3	7 - 4	33000	415
4	4 - 8	32175	415
5	8 - 3	31350	415
6	3 - 9	30525	415

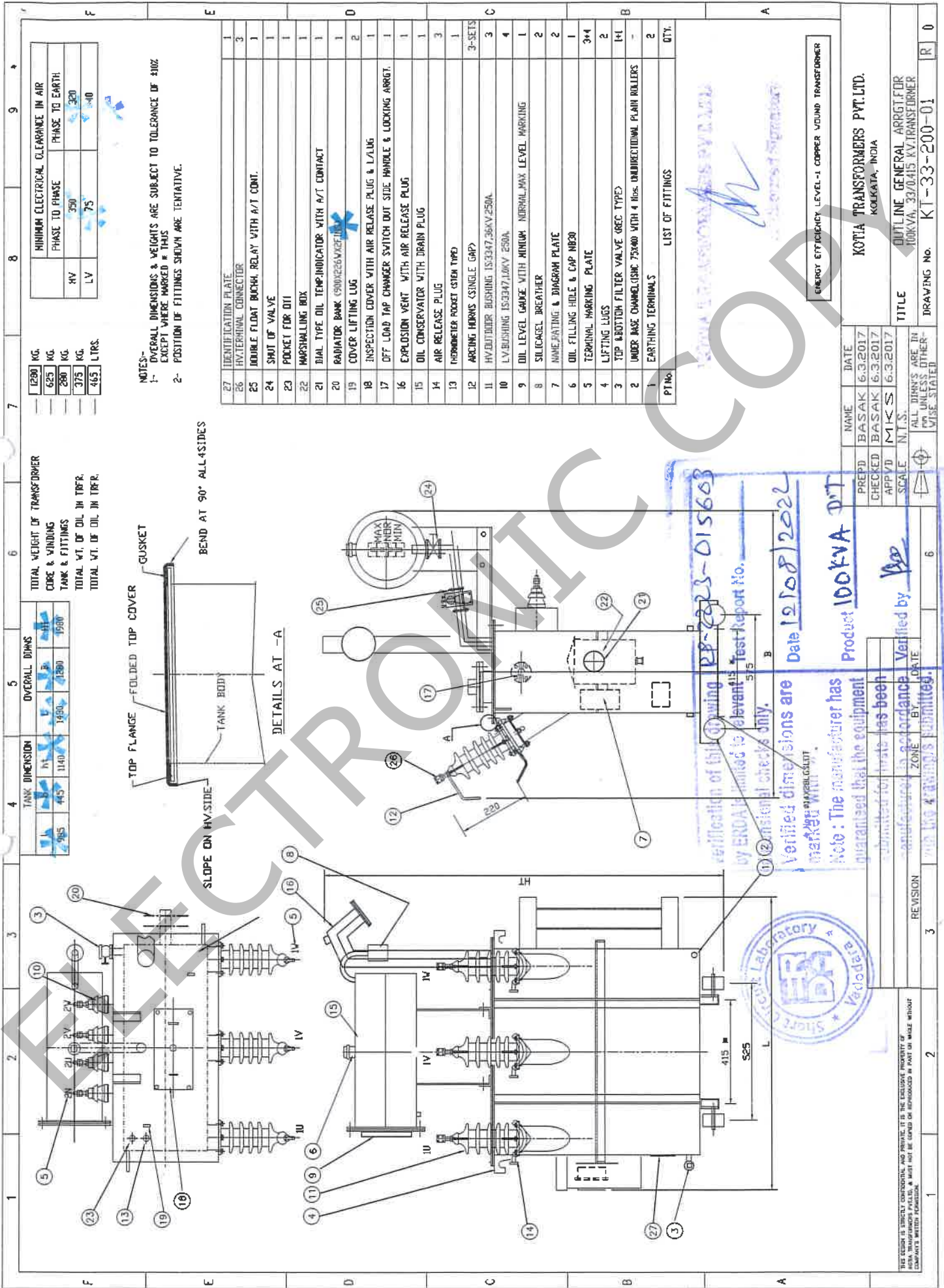


Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'.
 Note: The manufacturer has guaranteed that the equipment submitted for tests has been manufactured in accordance with the drawing/s submitted.

RP-2023-015603
 Test Report No. _____
 Date 12/08/2022
 Product 100KVA OPT
 Verified by PRM

MATL :- 18G SS PLATE

ORDER NO.	ENERGY EFFICIENCY LEVEL-1
PREPD BASAK 6.3.2017	KOTIA TRANSFORMERS PVT. LTD. KOLKATA, INDIA
CHECKED BASAK 6.3.2017	TITLE NAME, RATING & DIAGRAM PLATE FOR 100KVA 33/0.415KV, 3-PH, 50HZ, CU.WOUND TRANSFORMER
APPVD D.BHATT 6.3.2017	DRAWING No. KT-33-100-03
SCALE N.T.S.	CLIENT: -
ALL DIM'S ARE IN MM UNLESS OTHERWISE STATED	

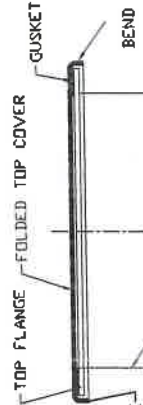


MINIMUM ELECTRICAL CLEARANCE IN AIR	
PHASE TO PHASE	PHASE TO EARTH
HV	350
LV	75

NOTES:-
 1- OVERALL DIMENSIONS & WEIGHTS ARE SUBJECT TO TOLERANCE OF ±10% EXCEPT WHERE MARKED OTHERWISE.
 2- POSITION OF FITTINGS SHOWN ARE TENTATIVE.

PT No.	LIST OF FITTINGS	QTY.
27	IDENTIFICATION PLATE	1
26	HV TERMINAL CONNECTOR	3
25	DOUBLE FLOAT BUCKING RELAY WITH A/T CONT.	1
24	SHUT OFF VALVE	1
23	POCKET FOR DTI	1
22	WATERMETER BOX	1
21	DIAL TYPE OIL TEMP INDICATOR WITH A/T CONTACT	1
20	RADIATOR BANK (500X25X25X25)	1
19	COVER LIFTING LUG	2
18	INSPECTION COVER WITH AIR RELEASE PLUG & L/LUG	1
17	OFF LOAD TAP CHANGER SWITCH OUT SIDE HANDLE & LOCKING ARRGT.	1
16	EXPLOSION VENT WITH AIR RELEASE PLUG	1
15	OIL CONSERVATOR WITH DRAIN PLUG	1
14	AIR RELEASE PLUG	3
13	WATERMETER SOCKET (STEM TYPE)	1
12	ARCING HORNS (SINGLE GAP)	3-SETS
11	HV OUTLETER BUSHING IS5347.36KV.250A	3
10	LV BUSHING IS5347.10KV.250A	4
9	OIL LEVEL GAUGE WITH MINIMUM NORMAL MAX LEVEL MARKING	1
8	SILICAGEL BREATHER	2
7	NAMERATING & DIAGRAM PLATE	2
6	OIL FILLING HOLE & CAP M800	1
5	TERMINAL MARKING PLATE	3*4
4	LIFTING LUGS	2
3	TOP & BOTTOM FILTER VALVE (REC TYPE)	1+1
2	UNDER BASE CHANNEL (S.M. 75X40 WITH 4 Nos. UNIDIRECTIONAL PLAIN ROLLERS	2
1	EARTHING TERMINALS	2

TOTAL WEIGHT OF TRANSFORMER CORE & WINDING	
1290	KG.
625	KG.
280	KG.
375	KG.
465	LTRS.



OVERALL DIMS		
1140	1430	1500
445	1430	1500
965	1430	1500

TOTAL WT. OF OIL IN TRFR.
 TOTAL WT. OF OIL IN TRFR.

Verification of this drawing by ERDA is limited to relevant test report No. 12/2023-015603
 Date 12/08/2022
 Product 100kVA DT
 Verified by [Signature]
 Note: The manufacturer has guaranteed that the equipment submitted for tests has been manufactured in accordance with the drawings submitted.



KOTIA TRANSFORMERS PVT.LTD.
 KOLKATA, INDIA
 TITLE: OUTLINE GENERAL ARRGT FOR 100KVA, 33/0.415 KV TRANSFORMER
 DRAWING No. KT-33-200-01

NAME	DATE
BASAK	6.3.2017
BASAK	6.3.2017
M.K.S	6.3.2017
N.T.S.	

REVISION: 3

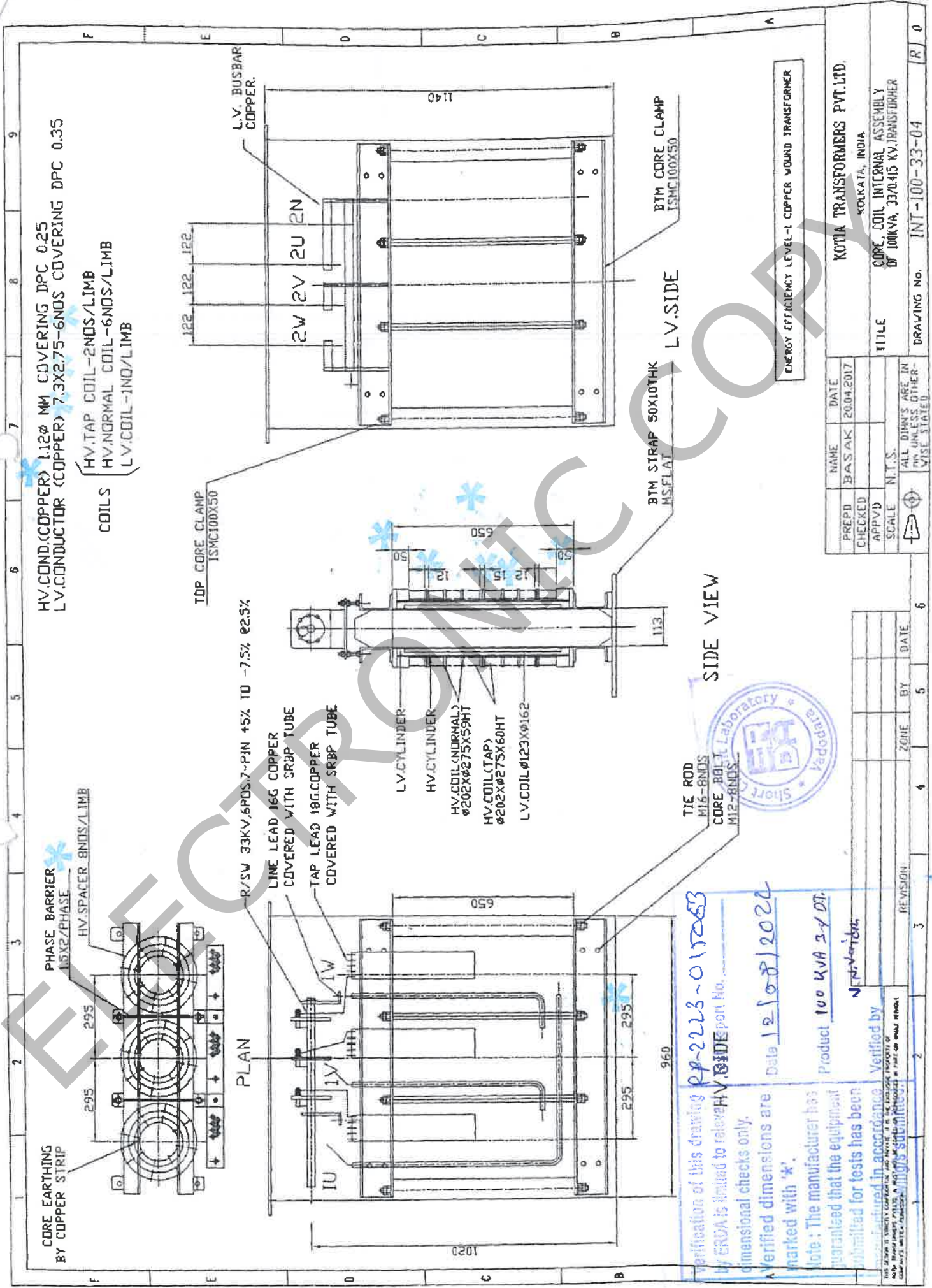
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ALL DIMS ARE IN MM UNLESS OTHERWISE STATED

THIS DRAWING IS UNLESS OTHERWISE SPECIFIED TO BE THE EXCLUSIVE PROPERTY OF KOTIA TRANSFORMERS PVT. LTD. & MUST NOT BE LOANED OR REPRODUCED IN PART OR WHOLE WITHOUT COMPANY'S WRITTEN PERMISSION.



Verification of this drawing PP-2223-012023
 by ERDA is limited to relevant **HV SIDE** report No. _____
 dimensional checks only.
 Verified dimensions are marked with '*'.
 Note: The manufacturer has guaranteed that the equipment submitted for tests has been manufactured in accordance with the specifications submitted.
 Date 12/08/2024
 Product 100 KVA 3- ϕ DT.
 Verified by N. Venkatesh

PREPARED	NAME	DATE
CHECKED	BASAK	20.04.2017
APPROVED		
SCALE	N.T.S.	

ALL DIM'S ARE IN MM, UNLESS OTHERWISE STATED

REVISION	2	3	4	5	6
DATE					
BY					
ZONE					
DATE					

KOTIA TRANSFORMERS PVT. LTD.
 KOLKATA, INDIA
 CORE COIL INTERNAL ASSEMBLY
 OF 100KVA, 3 ϕ /0.415 KV TRANSFORMER
 DRAWING NO. INT-100-33-04
 R 0