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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT

ULR- TC538923000018518F

NAME & ADDRESS OF CUSTOMER **THE TRANSFORMER COMPANY.** PLOT NO. 2201/A, ZONE A-10. G.I.D.C. VITHAL UDHYOGNAGAR 388121	**TEST REPORT NO.:** RP-2324-013379 **DATE OF ISSUE:** 07-08-2023 **CUSTOMER REF. No.:** LETTER — **DATED:** 03/07/2023 **DATE OF SAMPLE RECEIPT:** 03/07/2023 — **DATE OF TESTING:** 08/07/2023 to 22/07/2023
SAMPLE DESCRIPTION **(As provided by customer)** **10 kVA DRY TYPE TRANSFORMER** Primary:1000V, 5.77A, Secondary: 415V, 13.91Amp Vector Group: YnYno Further details as per sheet No. 3 OF 26.	**SAMPLE IDENTIFICATION** **ERDA SAMPLE CODE NO.:** ERDA-00528508 **SERIAL NO.:** 178676 **YEAR OF MFG.:** 2023
TEST DETAILS As per sheet 4 OF 26.	**TEST SPECIFICATIONS** As per sheet 4 OF 26.
Witnessed by: Mr. Anand katariya (The transformer Company) **REMARKS:** On respective sheets from 5 OF 26 to 25 OF 26.	
CHECKED BY	**APPROVED BY** **(Kapil J. Sharma)**

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. This report shall not be used for any purpose such as PR brochures, propaganda, advertisement and/or legal proceedings, unless for the granted purpose.
5. Only the tests asked for by the customer have been carried out.
6. 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.
7. In case of any dispute, Vadodara will be the exclusive jurisdiction & shall be construed as where the cause has arised.

Caution: ERDA is not responsible for the authenticity of photocopied or reproduced test reports. ERDA provides support to customers for verification of the authenticity of test reports issued by ERDA within 10 years of date of issue of report.

TC 3508746

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023

Enclosures			
1. Oscillogram No.			0520/01 to 0520/10
2. Photograph No.			2324-004425/0204 As per sheets 26 OF 26
3. Test circuit diagram No.			OLSC/DTC/03
4. Drawing No.	Issue Status		Description
	Revision	Date	
70-2412023-10KVA-NAME PLATE	1	05-07-2023	NAME PLATE
70-2412023-10 KVA-GA	2	05-07-2023	GA DRAWING
71-2412023-10KVA-WINDING	2	05-07-2023	GA-WINDING TOP VIEW

CHECKED BY

TC 3517295

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023

TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER

1. Name of manufacturer	:	**THE TRANSFORMER COMPANY.**
2. Equipment	:	**10 kVA DRY TYPE TRANSFORMER**
3. Standard No.	:	As per customer's requirement, testing procedure followed as per cl. No. IS 11171:1985
4. Sr. No.	:	178676
5. Type	:	Indoor, Dry type, circular coils
6. kVA rating	:	10 KVA
7. Rated voltage primary (Volts)	:	1000
secondary (Volts)	:	415
8. Rated current primary (Amp.)	:	5.77
secondary (Amp.)	:	13.91
9. Number of phases	:	3
10. Connection Primary/Secondary	:	STAR/STAR
11. Frequency (Hz.)	:	50
12. Type of cooling	:	AN
13. Temperature rise of winding	:	Max 90°C Above Ambient
14. Type of coil	:	Concentric
15. Class of Insulation	:	F
16. Guaranteed Percentage Impedance	:	3.2 % (±IS Tolerances)
17. Primary winding conductor	:	Copper*
18. Secondary winding conductor	:	Copper*
19. Total weight (Kg.)	:	125 MAX
20. Vector group	:	YnYn0
21. Year of manufacture	:	2023
22. Guaranteed No Load loss (Watts)	:	175 Max.
23. Guaranteed Load loss at 75°C (Watts)	:	300 Max.
24. Insulation level Primary	:	03 kVrms
25. Insulation level Secondary	:	03 kVrms

***Note:-** Primary & secondary conductor size was not verified as per customer's requirement.

CHECKED BY

TC 3506517

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
TC-5389

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-0013379 **SHEET :** 4 OF 26
DATE OF ISSUE: 07-08-2023

Sr. No.	TEST DETAILS	TEST SPECIFICATION
1.	Short circuit withstand test with routine test before and after Short circuit withstand test	As per customer's requirement, Test procedure followed as per Cl No. 20 of IS 11171:1985.
2.	Temperature rise test	As per customer's requirement, testing procedure followed as per cl.no.17 of IS 11171 : 1985
3.	No load current at 112.5 percent voltage	As per customer's requirement
4.	Measurement of magnetizing current at 90%, 110% and 112.5 % of rated voltage	As per customer's requirement
5.	Measurement of no-load loss and current at 90%, 110% and 112.5% of rated voltage	As per customer's requirement
6.	Magnetic balance test	As per CBIP manual; Publication no.317 - 2013

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023

Discipline: Electrical Testing Group: Short-Circuit Test Facility

1. Short circuit withstand test with routine test before and after Short circuit withstand test

ROUTINE TEST RESULTS BEFORE SHORT CIRCUIT

a) MEASUREMENT OF WINDING RESISTANCE

Measurement ambient temperature:31.1°C					
Secondary Winding resistance (mΩ)			Primary Winding resistance (Ω)		
2U - 2V	2V - 2W	2W - 2U	1U – 1V	1V – 1W	1W – 1U
447.24	447.26	447.22	1.8454	1.8441	1.8448

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF PHASE DISPLACEMENT

Vector group: YnYn0 was verified.

Rated voltage Ratio	Measured voltage ratio between Terminals					
	1U-1V/ 2U-2N	Difference %	1V-1W/ 2V-2N	Difference %	1W-1U/ 2W-2N	Difference %
2.4096	2.4040	-0.232	2.4036	-0.249	2.4007	-0.369

c) MEASUREMENT OF SHORT-CIRCUIT IMPEDANCE AND LOAD LOSS

Ambient temp.: 31.2°C

Test current (Amp.) Iavg.	Impedance voltage (V) Vavg.	Frequency (Hz.)	Load loss measured (Watts)	Impedance Voltage (%Z) at 50 Hz.	Load loss computed at 75°C (Watts)	%Z at 75°C
5.7679	31.458	50.040	223.065	3.147	260.012	3.418

TC 3508742

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
TC-5389

d) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Applied Voltage (Vmean)	Applied Voltage (Vrms)	Current (Amp.) Iavg.	Freq. (Hz.)	Losses Measured (Watts)	Corrected Losses (Watts)
415.067	416.88	0.490	50.038	72.756	72.436

e) SEPARATE SOURCE AC WITHSTAND VOLTAGE TEST

Sr. no.	Test	Applied voltage (kV)	Duration (sec.)	Remarks
1.	The test voltage of 3 kV ac, rms was applied between the primary winding and earth. The tank and secondary winding were shorted together and earthed.	03	60	Withstood
2.	The test voltage of 3 kV ac, rms was applied between the secondary winding and earth. The tank and primary winding were shorted together and earthed.	03	60	Withstood

f) INDUCED AC VOLTAGE TEST

Sr. No.	Test	Applied voltage (V)	Applied Freq. (Hz.)	Duration (sec.)	Remarks
1.	The test voltage of 830 Volts, 3 – phase was applied to the secondary winding of the transformer.	830	100	60	Withstood

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023

SHORT-CIRCUIT 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.	Applied voltage (Vrms)	Short circuit current on primary (A)			Duration (sec.)	Remarks
			Peak	RMS	Avg.		
1.	0520/01	-	496 - -	332 319 329	327	0.1	Calibration shot
2.	0520/02	415	601 - -	409 392 405	402	0.5	No Abnormality
3.	0520/03	415	602 - -	404 389 401	398	0.5	No Abnormality
4.	0520/04	415	597 - -	401 385 397	394	0.5	No Abnormality
5.	0520/05	415	- 599 -	401 385 398	395	0.5	No Abnormality
6.	0520/06	415	- 583 -	399 383 396	393	0.5	No Abnormality
7.	0520/07	415	- 579 -	396 380 393	390	0.5	No Abnormality
8.	0520/08	415	- - 587	394 378 391	388	0.5	No Abnormality
9.	0520/09	415	- - 579	393 378 391	387	0.5	No Abnormality
10.	0520/10	415	- - 587	393 378 391	387	0.5	No Abnormality

TC 3508740

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379 SHEET 8 OF 26
DATE OF ISSUE: 07-08-2023

Measurement of the % reactance during the short circuit test

Secondary winding was short circuited. Three phase AC supply was connected to Primary 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		
			U	V	W	U	V	W
1.	Before test		2.207	2.241	2.208	-	-	-
2.	After the test no.	2.	2.205	2.240	2.211	-0.091	-0.045	0.136
3.	After the test no.	3.	2.203	2.241	2.210	-0.181	0.000	0.091
4.	After the test no.	4.	2.203	2.243	2.211	-0.181	0.089	0.136
5.	After the test no.	5.	2.204	2.243	2.211	-0.136	0.089	0.136
6.	After the test no.	6.	2.204	2.244	2.210	-0.136	0.134	0.091
7.	After the test no.	7.	2.206	2.444	2.211	-0.045	0.134	0.136
8.	After the test no.	8.	2.206	2.244	2.210	-0.045	0.134	0.091
9.	After the test no.	9.	2.207	2.245	2.208	0.000	0.178	0.000
10.	After the test no.	10.	2.209	2.246	2.206	0.091	0.223	-0.091

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023

ROUTINE TEST RESULTS AFTER SHORT CIRCUIT

a) MEASUREMENT OF WINDING RESISTANCE

Measurement ambient temperature:30.2°C					
Secondary Winding resistance (mΩ)			Primary Winding resistance (Ω)		
2U - 2V	2V - 2W	2W - 2U	1U – 1V	1V – 1W	1W – 1U
445.44	445.54	445.48	1.8379	1.8367	1.8374

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF PHASE DISPLACEMENT

Vector group: YnYno was verified.

Rated voltage Ratio	Measured voltage ratio between Terminals					
	1U-1V/ 2U-2N	Difference %	1V-1W/ 2V-2N	Difference %	1W-1U/ 2W-2N	Difference %
2.4096	2.4050	-0.191	2.4049	-0.195	2.3984	-0.465

c) MEASUREMENT OF SHORT-CIRCUIT IMPEDANCE AND LOAD LOSS

Ambient temp.: 30.0°C

Test current (Amp.) Iavg.	Impedance voltage (V) Vavg.	Frequency (Hz.)	Load loss measured (Watts)	Impedance Voltage (%Z) at 50 Hz.	Load loss computed at 75°C (Watts)	%Z at 75°C
5.7639	31.415	50.079	222.332	3.145	260.033	3.416

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379 SHEET 10 OF 26
DATE OF ISSUE: 07-08-2023

d) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Applied Voltage (Vmean)	Applied Voltage (Vrms)	Current (Amp.) Iavg.	Freq. (Hz.)	Losses Measured (Watts)	Corrected Losses (Watts)
415.058	416.816	0.493	50.047	72.775	72.466

e) SEPARATE SOURCE AC WITHSTAND VOLTAGE TEST

Sr. no.	Test	Applied voltage (kV)	Duration (sec.)	Remarks
1.	The test voltage of 3 kV ac, rms was applied between the primary winding and earth. The tank and secondary winding were shorted together and earthed.	03	60	Withstood
2.	The test voltage of 3 kV ac, rms was applied between the secondary winding and earth. The tank and primary winding were shorted together and earthed.	03	60	Withstood

f) INDUCED AC VOLTAGE TEST

Sr. No.	Test	Applied voltage (V)	Applied Freq. (Hz.)	Duration (sec.)	Remarks
1.	The test voltage of 830 Volts, 3 – phase was applied to the secondary winding of the transformer.	830	100	60	Withstood

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 test found within limits of standard as specified by customer.

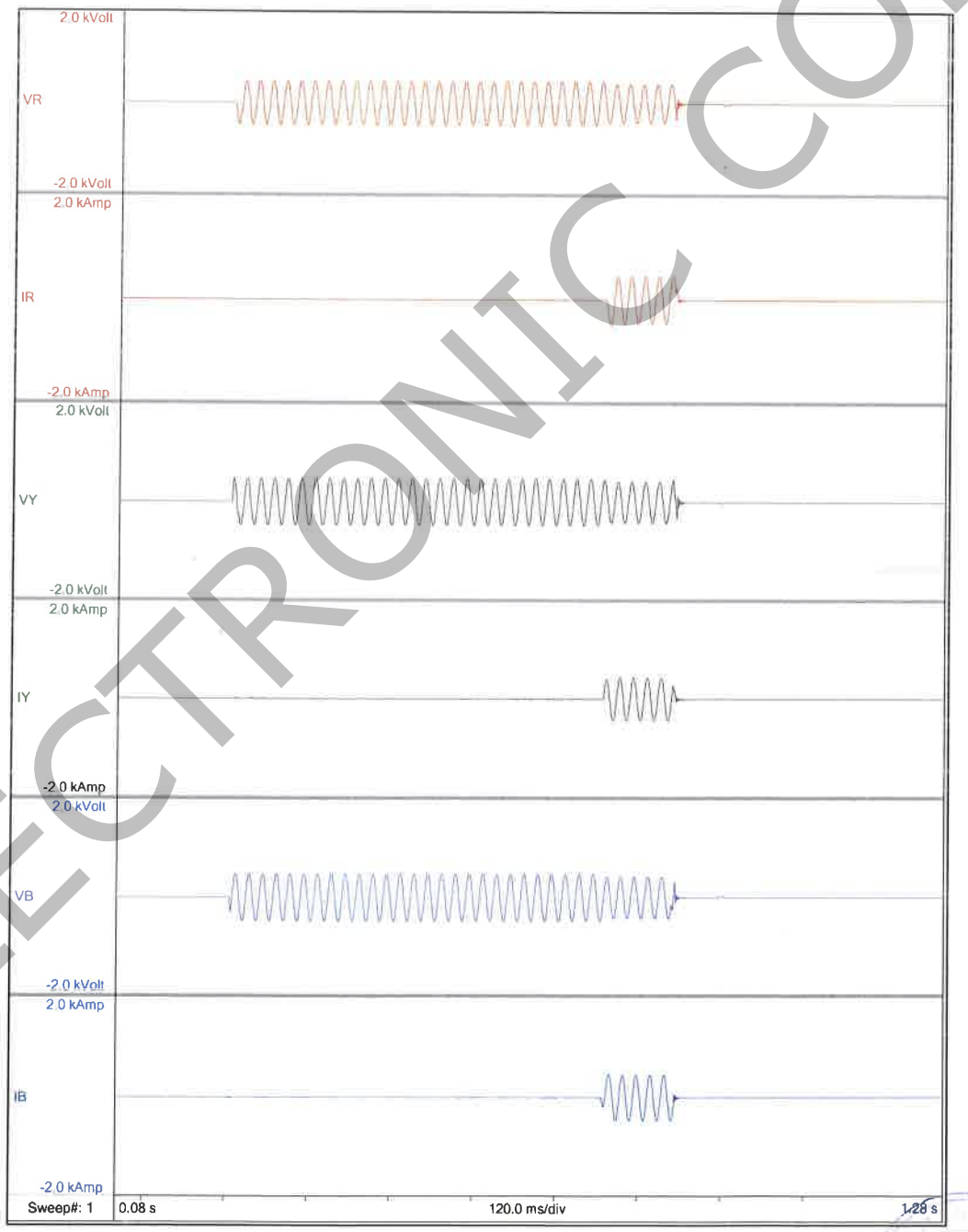
CHECKED BY

TC 3508780

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/01

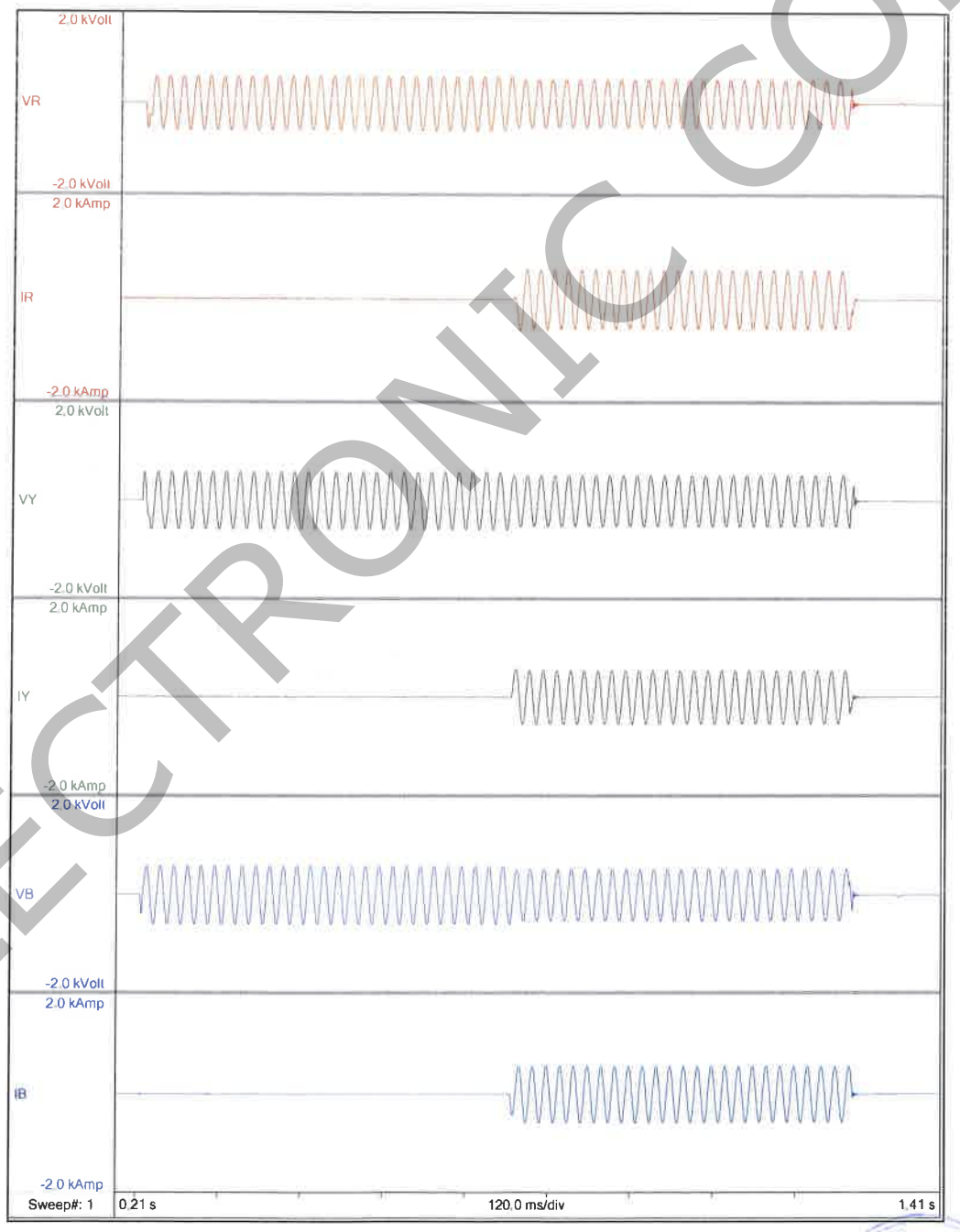
TC 3508329

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/02

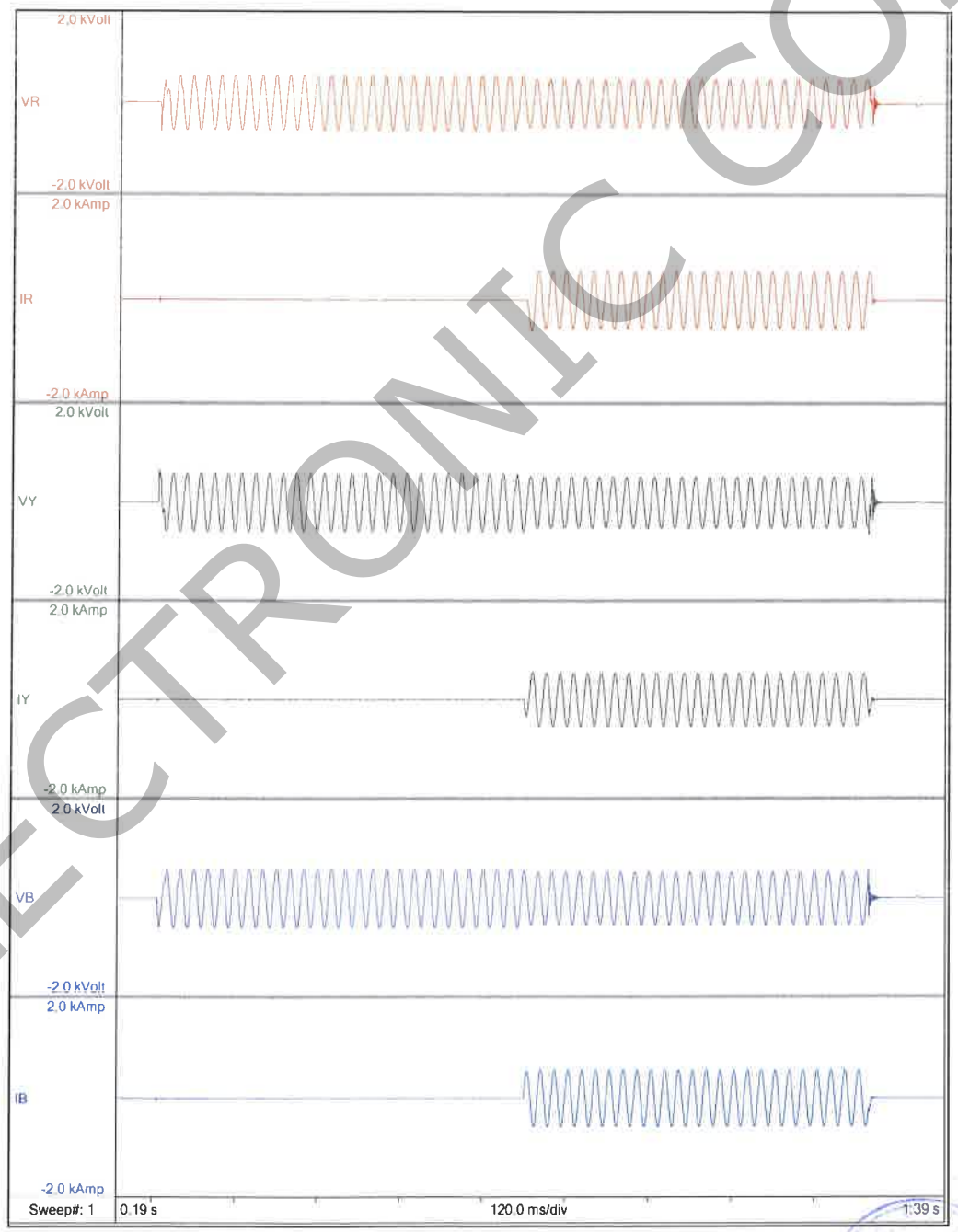
TC 3508328

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/03

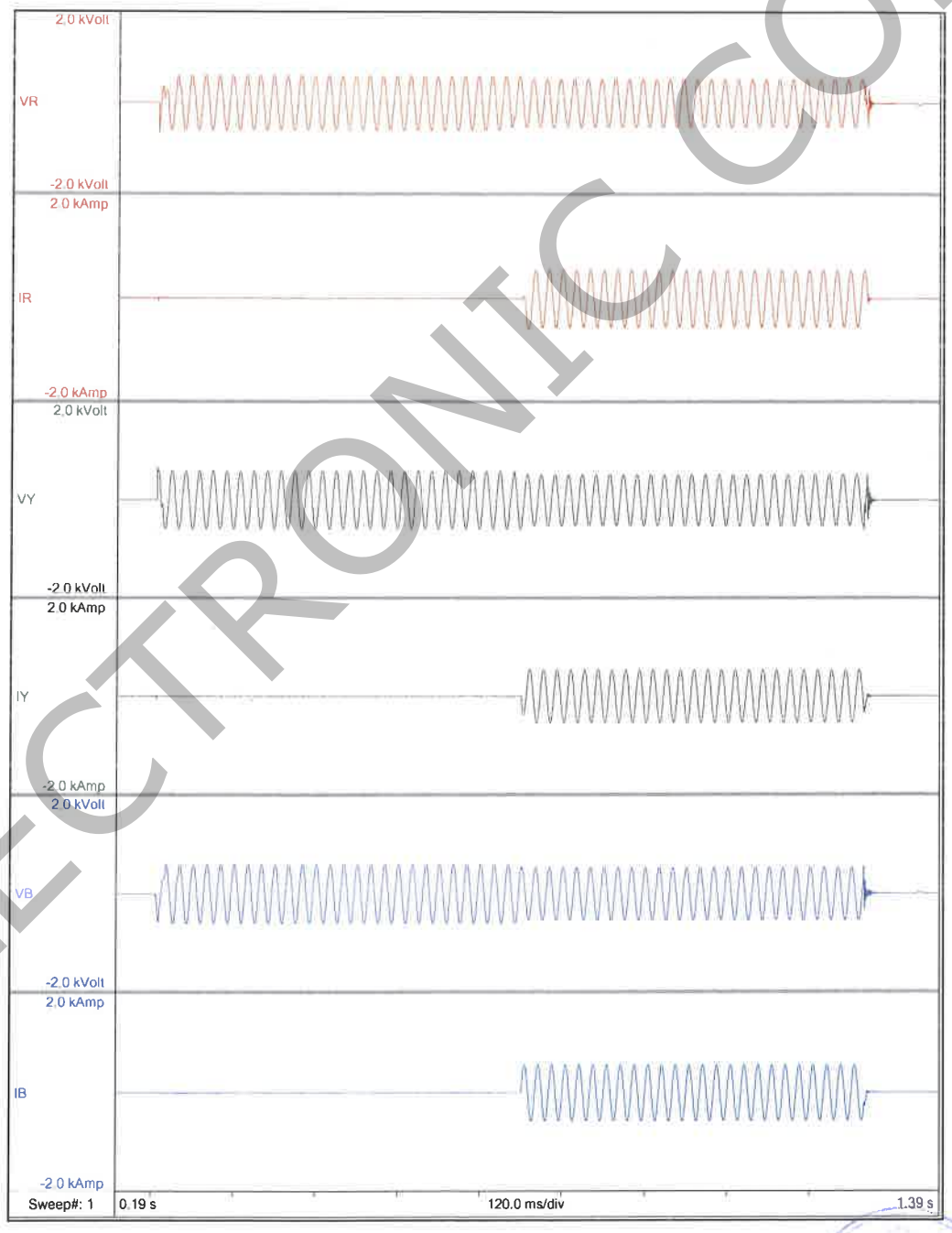
TC 3508327

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/04

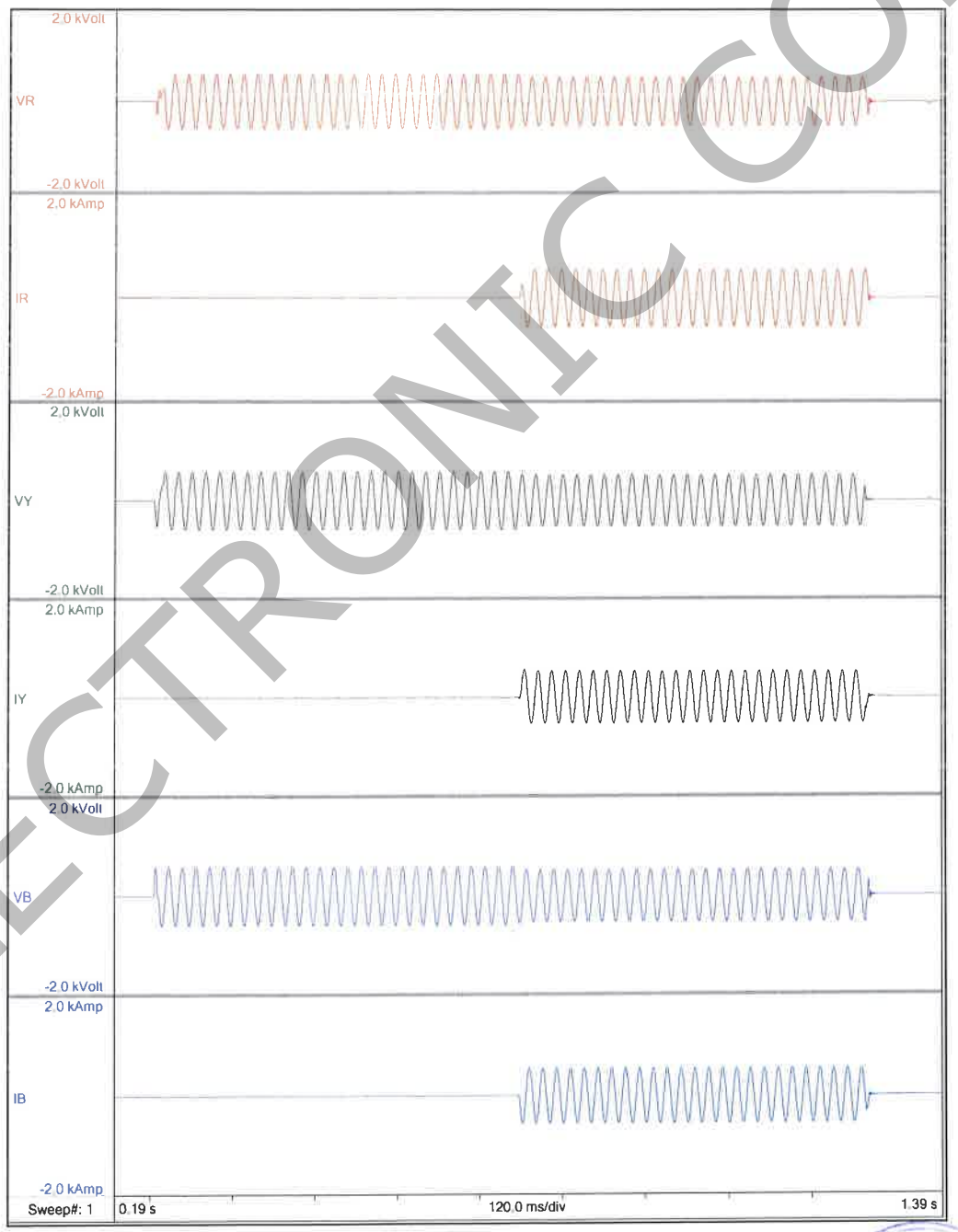
CHECKED BY

TC 3508326

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/05

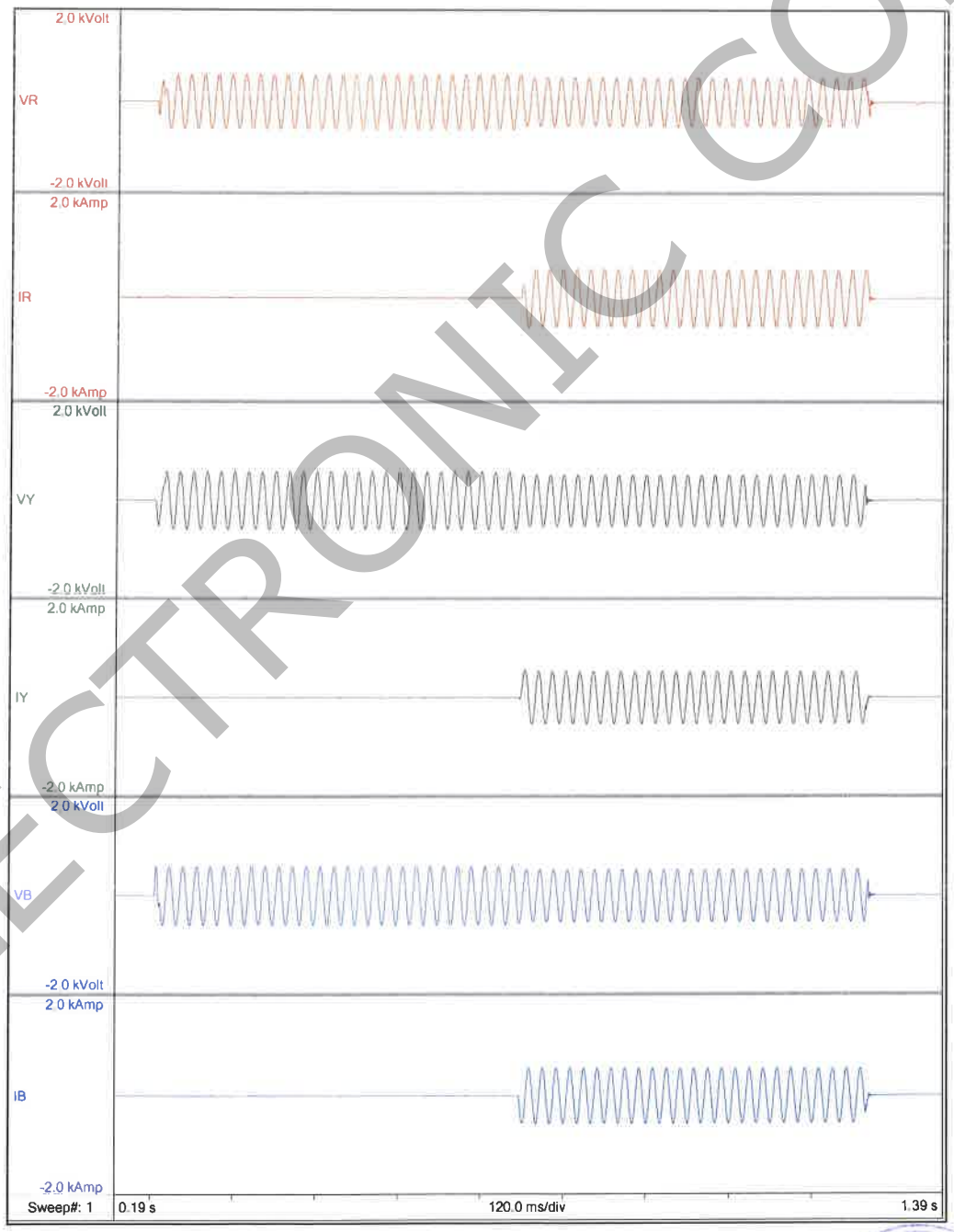
CHECKED BY

TC 3508325

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/06

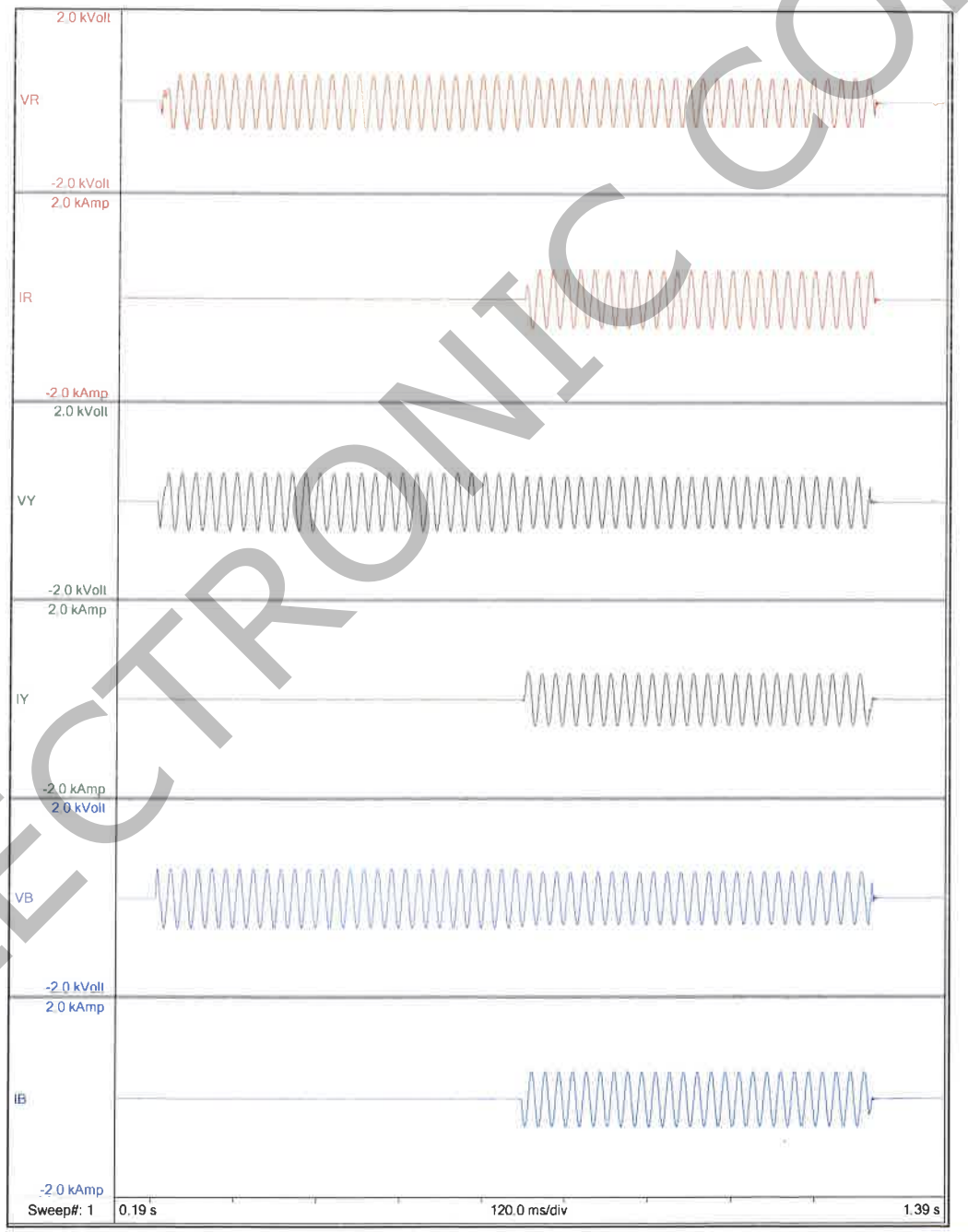
CHECKED BY

TC 35083324

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/07

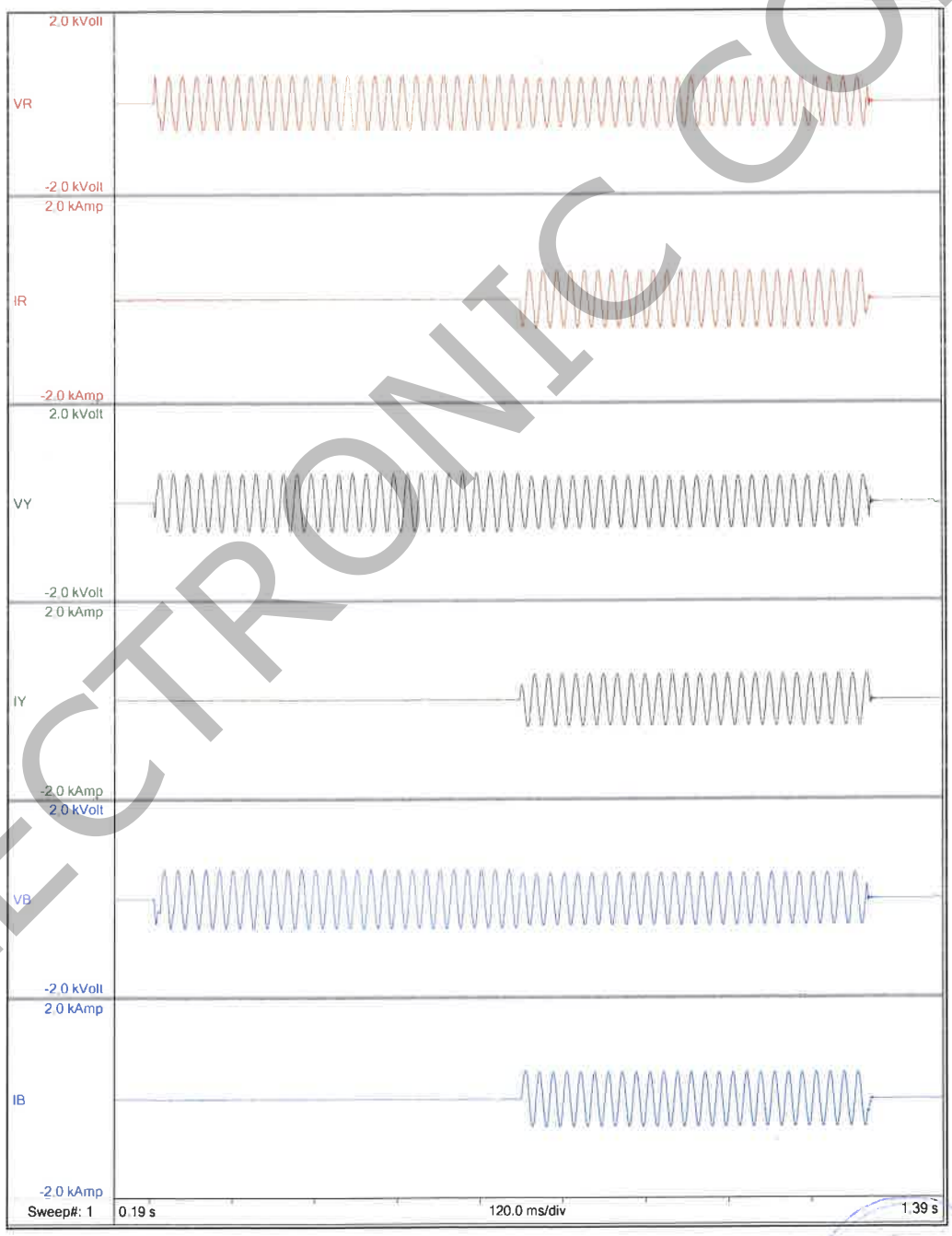
CHECKED BY

TC 3508323

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/08

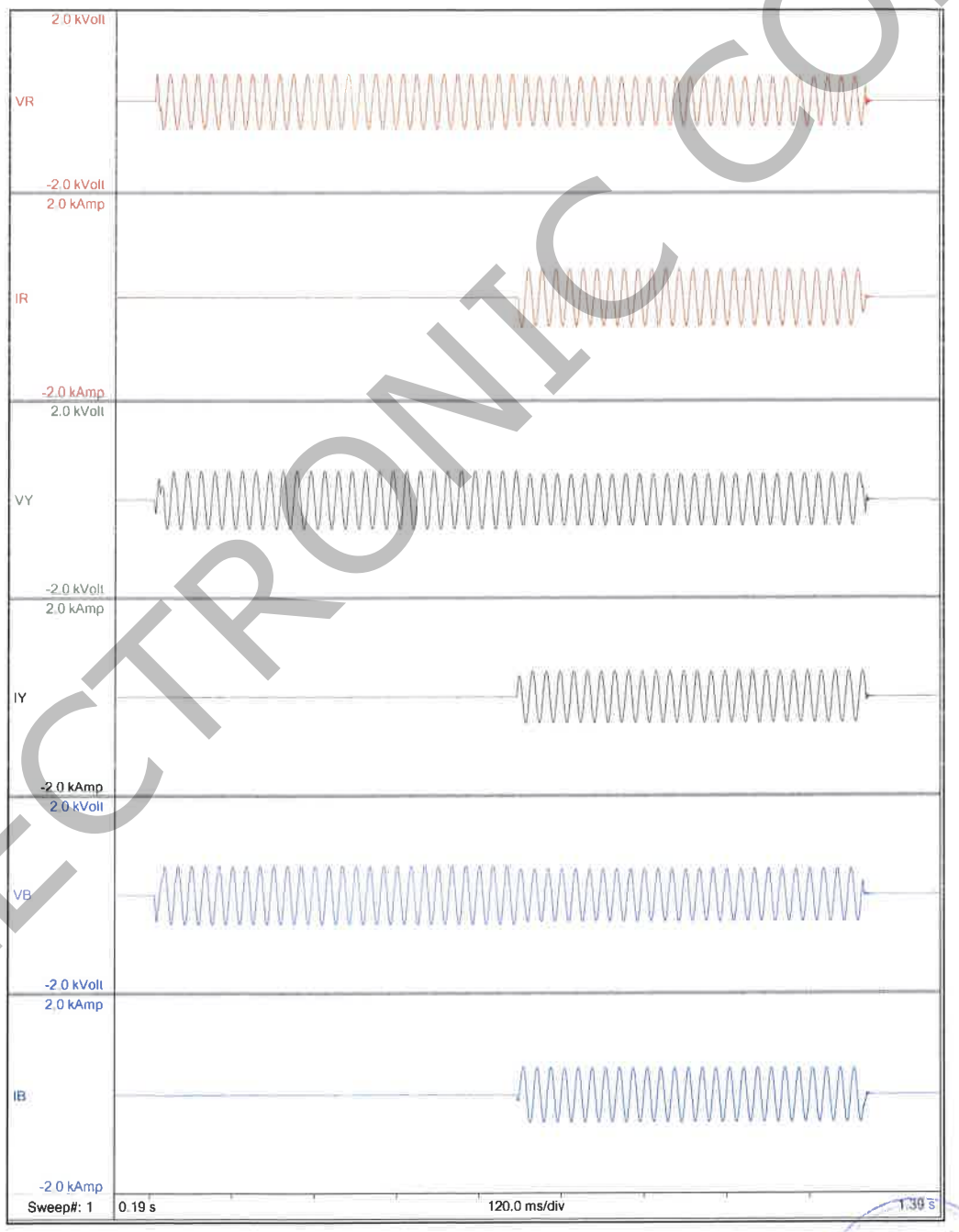
TC 35083322

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379 SHEET 19 OF 26
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/09

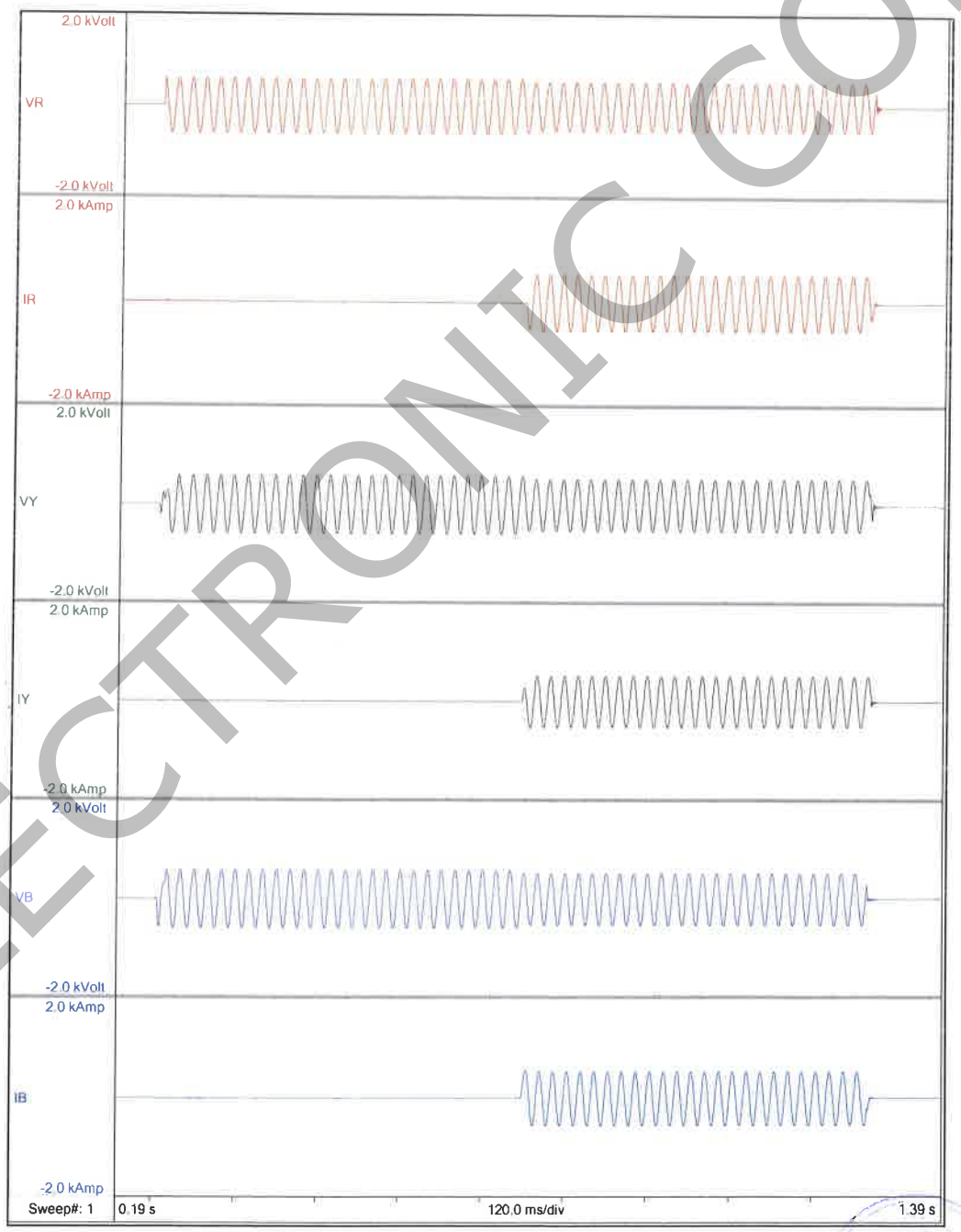
TC 35083321

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F
TEST REPORT NO.: RP-2324-013379
DATE OF ISSUE: 07-08-2023



OSCILLOGRAM NO. : 0520/10

CHECKED BY

TC 3508320

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-013379

DATE OF ISSUE : 07-08-2023

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
2.	**Temperature-rise test:** (As per customer's requirement, testing procedure followed as per cl.no.17 of IS 11171:1985) By simulated load method : [A] Temperature rise test by open circuit test with application of rated voltage : Rated voltage [415 V] was applied to the LV winding of the transformer and HV winding was kept open circuited, till steady state temperature rise was attained. For the purpose of determining the steady state condition of temperature rise, sensors were mounted on the following parts of the transformer : (1) Centre of top yoke on core (2) Innermost low voltage winding conductors at the top of the winding, on the center leg.			**Conforms**
	Temperature rise by using sensors			
	Center of top yoke on core :	--	41.7°C	
	Innermost low voltage winding conductors at the top of the winding, on the center leg:	--	6.0°C	
	Ambient temperature :	--	29.1°C	
	Temperature rise by resistance method			
	HV winding :	--	10.3°C	
	LV winding :	--	4.7°C	

CHECKED BY

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-013379 **SHEET :** 22 OF 26

DATE OF ISSUE : 07-08-2023

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
	[B] Temperature rise test by short circuited test with rated current in windings: Applying the voltage to HV winding side such as to circulate the rated current in HV winding and LV winding side. The LV winding was kept short circuited. For the purpose of determining the steady state condition of temperature rise, sensors were mounted on the following parts of transformer :			
	(1) Centre of top yoke on core (2) Innermost low voltage winding conductors at the top of the winding, on the center leg.			
	Temperature rise by using sensors			
	Centre of top yoke on core :		44.6°C	
	Innermost low voltage winding conductors at the top of the winding, on the center leg :		14.1°C	
	Ambient air temperature :		30.5°C	
	Temperature rise by resistance method			
	HV winding :		39.3°C	
	LV winding :		34.5°C	
	The total winding temperature rise of each winding, with rated current in the winding and normal excitation of the core, is calculated.			
	Temperature rise of HV winding :	90°C	45.09°C	
	Temperature rise of LV winding :	90°C	36.77°C	

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
TC-5389

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-013379 **SHEET :** 23 OF 26
DATE OF ISSUE: 07-08-2023

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
3.	**No load current at 112.5 percent voltage :** (As per customer's requirement) 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 (%)	 ---	 466.878 1.0009 7.2	---
4.	**Measurement of magnetizing current at 90%, 110% and 112.5% of rated voltage :** (As per customer's requirement) Test voltage at rated frequency was applied to the L.V. winding terminals and H.V. winding terminals were kept open circuited. Magnetizing current was recorded at 90%, 110% and 112.5 % of rated voltage. (1) At 90% Test voltage (Volts) Magnetizing current (mA) (2) At 110% Test voltage (Volts) Magnetizing current (Amps) (3) At 112.5% Test voltage (Volts) Magnetizing current (Amps)	 -- -- --	 373.662 243.80 456.629 0.8749 466.878 1.0009	---

CHECKED BY

TC 35113816

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TC-5389

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-013379 **SHEET :** 24 OF 26
DATE OF ISSUE: 07-08-2023

Sr. No	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
5.	**Measurement of no-load loss and current at 90%, 110% and 112.5% of rated voltage :** (As per customer's requirement)			---
	At 90% of rated voltage Tested with average 373.662 Volts (on LV side) Frequency : 49.977 Hz			
	RMS Voltage (Volts)		374.528	
	No-load current (mA)		247.43	
	Measured no-load loss (Watts)		53.40	
	Corrected no-load loss (Watts)	---	53.276	
	At 110% of rated voltage Tested with average 456.226 Volts (on LV side) Frequency : 49.963 Hz			
	RMS Voltage (Volts)		457.231	
	No-load current (Amps)		0.8926	
	Measured no-load loss (Watts)		101.05	
	Corrected no-load loss (Watts)	---	100.828	
	At 112.5% of rated voltage Tested with average 466.809 Volts (on LV side) Frequency : 49.996 Hz			
	RMS Voltage (Volts)		467.813	
	No-load current (Amps)		1.0060	
	Measured no-load loss (Watts)		109.43	
	Corrected no-load loss (Watts)	---	109.195	

CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
TC-5389

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-013379 **SHEET :** 25 OF 26
DATE OF ISSUE: 07-08-2023

Sr. No.	Particulars of test and Cl. No.	Requirement as per specification	Obtained Value	Remarks
6.	**Magnetic balance test :** (As per CBIP manual; Publication no. 317-2013)			---

Voltage Applied Between	Applied Voltage (Volts)	Measured Voltage Between		
2u & 2n	100.84	2v & 2n	---	84.84
		2w & 2n	---	17.38
2v & 2n	100.08	2u & 2n	---	47.50
		2w & 2n	---	46.42
2w & 2n	100.89	2u & 2n	---	20.83
		2v & 2n	---	87.34

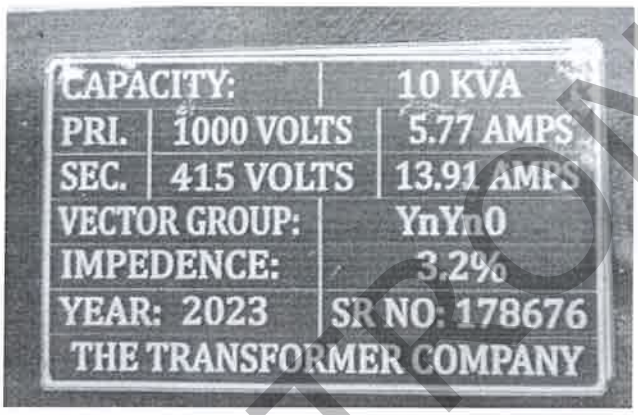
CHECKED BY

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
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
TC-5389

ULR- TC538923000018518F

TEST REPORT NO.: RP-2324-013379 **SHEET :** 26 OF 26
DATE OF ISSUE : 07-08-2023

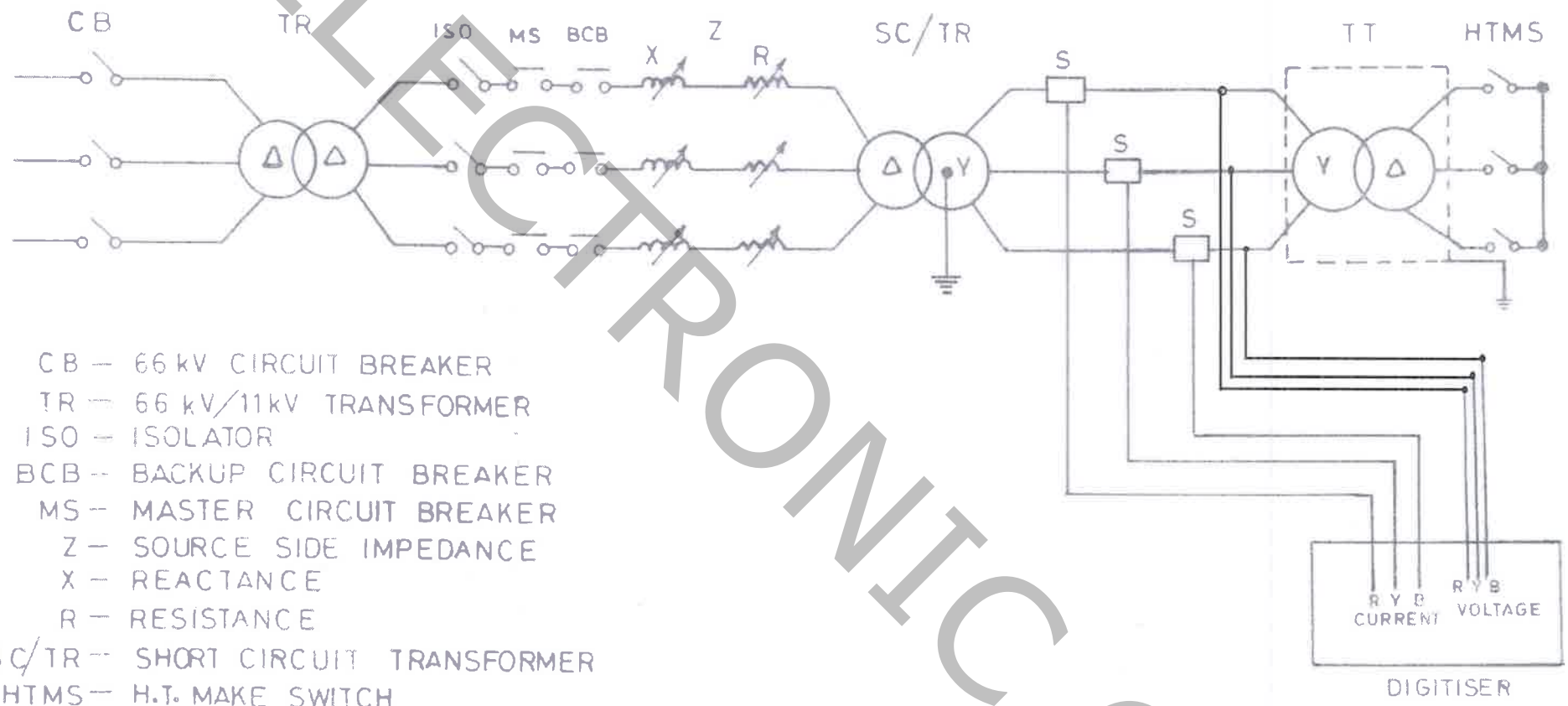
PHOTOGRAPHS OF TEST SAMPLE



CHECKED BY

TC 3508731

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



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

REPORT NO.: RP-2324-013379
DATE : 07/08/2023

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION

SCHEMATIC CIRCUIT DIAGRAM

DRN. BY	CK'D.	DATE	DRG. NO.
S.B.S.	A.V.R.	22-5-98	OLSC/DTC/03

CAPACITY:		10 KVA
PRI.	1000 VOLTS	5.77 AMPS
SEC.	415 VOLTS	13.91 AMPS
VECTOR GROUP		YnYn0
IMPEDENCE		3.2%
YEAR: 2023		SR NO: 178676*
THE TRANSFORMER COMPANY		

ERDA, MAKARPURA

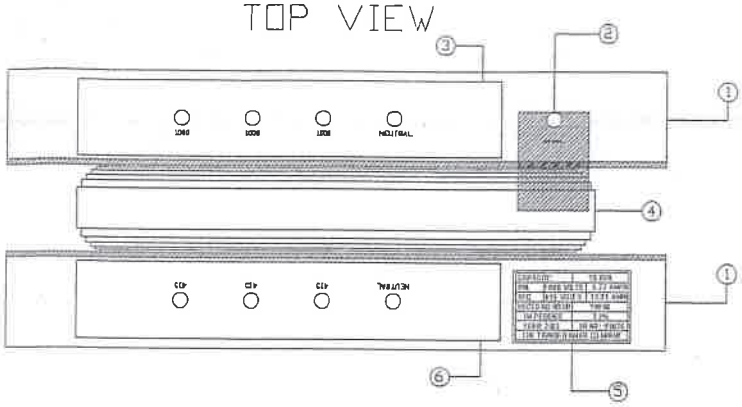
Test Report No. RP-2324-013379
Date 07/08/2023
Product 10 KVA, Dry Type DT
Verified by S.V.Patel

Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'.

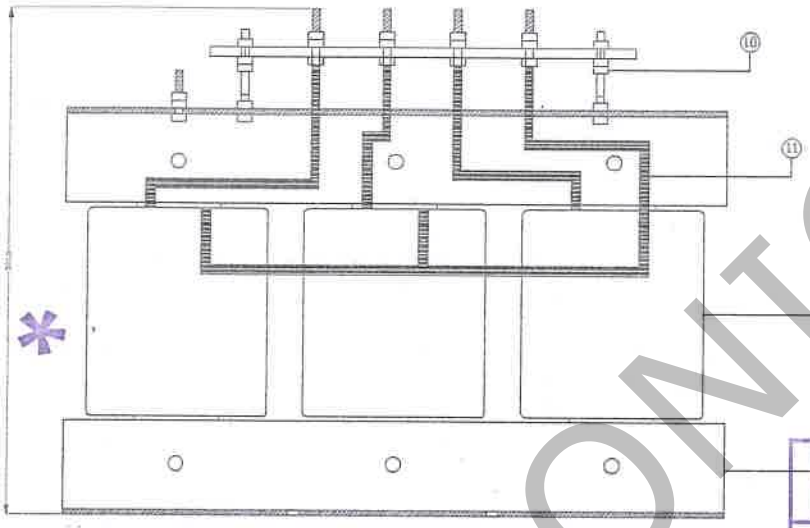
DRG / 12-001

10 KVA TRANSFORMER - NAME PLATE
Date: 05-07-2023
Drawing No: 70-2412023-10 KVA-NAME PLATE - REV 1
THE TRANSFORMER COMPANY

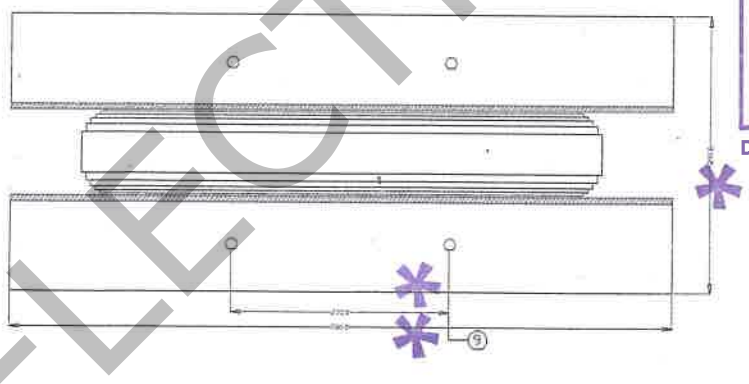
TOP VIEW



FRONT VIEW



BOTTOM VIEW



Nos	Description
1	TOP CLAMPS
2	EARTHING POINT
3	PRIMARY TERMINAL PLATE
4	TRANSFORMER CORE
5	NAME PLATE
6	SECONDARY TERMINAL PLATE
7	TRANSFORMER COIL
8	BOTTOM CLAMP
9	MOUNTING HOLE
10	TERMINAL PLATE HOLDING BOLT
11	NEUTRAL CONNECTION

ERDA, MAKARPURA

Test Report No. RL-2324-013379

Date 07/08/2023

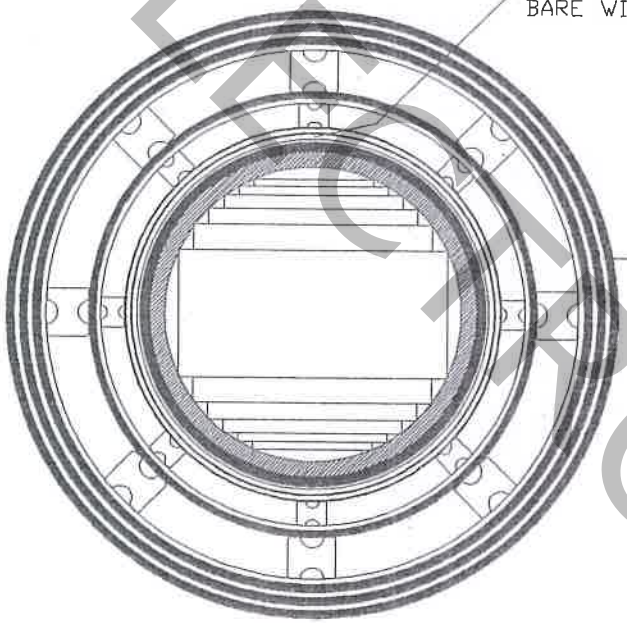
Product 10 KVA Dry Type DT

Verified by S.V. Patel

Verification of this drawing by ERDA is limited to relevant dimensional checks only. Verified dimensions are marked with '*'.

DRG / 12-001

10 KVA TRANSFORMER - GA DRAWING
Date: 05-07-2023
Drawing No: 70-2412023-10 KVA-GA-REV 2
ALL DIMENSIONS ARE IN MM
THE TRANSFORMER COMPANY



PRI. SWG: 15 SWG
WIRE DIA:1.91 MM
BARE WIRE DIA: 1.83 MM

SEC. SWG: 14 SWG + 14 SWG
WIRE DIA: 2.12 MM
BARE WIRE DIA: 2.03 MM

ERDA, MAKARPURA
Test Report No. RP.2324-013379
Date 07/08/2023
Product 10 KVA Dry Type DT
Verified by S.V. Patel
The drawing has been used for reference only.
REF / 12-001

10 KVA TRANSFORMER-GA-WINDING TOP VIEW
DATE: 05-07-2023
DRG NO: 71-2412023-10 KVA-WINDING-REV 2
ALL DIMENSIONS ARE IN MM
THE TRANSFORMER COMPANY