



Certificate No.: TC-5389

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Fax : +91 (0265) 2638382

E-mail : erda@erda.org

Web : http://www.erda.org

**TEST REPORT**

ULR NO.: TC538919000014145F

SHEET 1 OF 9

|                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           |                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>NAME &amp; ADDRESS OF CUSTOMER</b><br><br><b>RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.</b><br>Khasra No. 911-914,<br>Karola-Bhinmal Road,<br>Karola, Sanchoe,<br>Rajasthan-343041 (India)                                                                                                                                                                                                 | <b>REPORT NO.:</b> RP-1920-004065<br><b>DATE:</b> 30.04.2019                                                                                                                                                                                                                                                              |                                       |
| <b>SAMPLE DESCRIPTION</b><br><br><b>63 kVA Distribution Transformer</b><br><br>11000/433 Volts,<br><br>3.306/84 Amp.,<br><br>Oil filled,<br><br>Vector Group: Dyn-11,<br><br><b>ENERGY EFFICIENCY LEVEL: 2</b><br><br>Further details as per sheet No. 3 of 9.                                                                                                                              | <b>CUSTOMER REF. No.:</b><br>Nil                                                                                                                                                                                                                                                                                          | <b>DATED:</b><br>03.04.2019           |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>DATE OF SAMPLE RECEIPT:</b>                                                                                                                                                                                                                                                                                            | <b>DATE OF TESTING:</b>               |
|                                                                                                                                                                                                                                                                                                                                                                                             | 20.03.2019                                                                                                                                                                                                                                                                                                                | 11.04.2019 to 25.04.2019              |
| <b>TEST DETAILS</b><br>Short-circuit withstand test<br>[Cl. No. (17 & 21.3 c)]<br><br><b>ENCLOSURES:</b><br>Number of oscillograms : Eleven<br>Number of photograph : One<br>Number of test circuit diagram : One<br>Number of drawings : Five<br><br><b>REMARKS:</b> The sample <b>conforms</b> to the requirements of standard for short-circuit withstand test as specified by customer. | <b>SAMPLE IDENTIFICATION</b><br><br><b>ERDA SAMPLE CODE NO.:</b><br>ERDA-00307718<br><br><b>SERIAL NO.:</b> RPTPL-001<br><br><b>DRAWING NO.:</b><br>RPTPL-63KVA-RP-01/02-2019<br>RPTPL-63KVA-RP-02/02-2019<br>RPTPL-GA-63KVA-02-2019<br>RPTPL-TD-63KVA-03-2019<br>RPTPL-IA-63KVA-04-2019<br><br><b>YEAR OF MFG.:</b> 2019 |                                       |
|                                                                                                                                                                                                                                                                                                                                                                                             | <b>TEST SPECIFICATIONS</b><br>As per customer's requirement,<br>Test procedure followed as per<br>IS 1180 (Part 1): 2014<br>[Amendment No. 1 & 2]                                                                                                                                                                         |                                       |
| <b>PREPARED BY</b> <i>Wp</i>                                                                                                                                                                                                                                                                                                                                                                | <b>CHECKED BY</b> <i>Sain</i>                                                                                                                                                                                                                                                                                             | <b>APPROVED BY</b> <i>K. B. Patel</i> |

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SHEET 2 OF 9

| Contents                                                        |                                                                                                                                      |
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| 1. Technical specifications of test object assigned by customer | Sheet No. 3 of 9                                                                                                                     |
| 2. Routine test results before short circuit                    | Sheet No. 4 of 9 to 5 of 9                                                                                                           |
| 3. Short-circuit withstand test                                 | Sheet No. 6 of 9 to 7 of 9                                                                                                           |
| 4. Routine test results after short circuit                     | Sheet No. 8 of 9 to 9 of 9                                                                                                           |
| 5. Oscillogram No.                                              | 0051/01 to 0051/11                                                                                                                   |
| 6. Photograph No.                                               | 1920-000295/0071                                                                                                                     |
| 7. Test circuit diagram No.                                     | OLSC/DTC/01                                                                                                                          |
| 8. Drawing No.                                                  | RPTPL-63KVA-RP-01/02-2019<br>RPTPL-63KVA-RP-02/02-2019<br>RPTPL-GA-63KVA-02-2019<br>RPTPL-TD-63KVA-03-2019<br>RPTPL-IA-63KVA-04-2019 |

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**TECHNICAL SPECIFICATIONS OF TEST OBJECT ASSIGNED BY CUSTOMER**

- |                                     |                                                                                                                                                     |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Name of manufacturer             | : <b>RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.</b>                                                                                                   |
| 2. Equipment                        | : <b>63 kVA Distribution Transformer</b>                                                                                                            |
| 3. Standard No.                     | : As per customer's requirement,<br>Test procedure followed as per<br>[Cl. No. (17 & 21.3 c)] of<br>IS 1180 (Part 1): 2014<br>[Amendment No. 1 & 2] |
| 4. Serial No.                       | : RPTPL-001                                                                                                                                         |
| 5. Energy efficiency level          | : 2                                                                                                                                                 |
| 6. Type                             | : Outdoor, Oil Cooled,<br>Aluminum wound, Non sealed type                                                                                           |
| 7. kVA rating                       | : 63                                                                                                                                                |
| 8. Rated voltage H.V. (Volts)       | : 11000                                                                                                                                             |
| L.V. (Volts)                        | : 433                                                                                                                                               |
| 9. Rated current H.V. (Amp.)        | : 3.306                                                                                                                                             |
| L.V. (Amp.)                         | : 84                                                                                                                                                |
| 10. Number of phases                | : 3                                                                                                                                                 |
| 11. Connection H.V./L.V.            | : Delta/Star                                                                                                                                        |
| 12. Frequency (Hz.)                 | : 50                                                                                                                                                |
| 13. Type of cooling                 | : ONAN                                                                                                                                              |
| 14. Temperature rise of oil/winding | : 35°C/40°C                                                                                                                                         |
| 15. Percentage Impedance            | : 4.5%                                                                                                                                              |
| 16. Primary winding conductor       | : SE Aluminium wire, bare dia. 1.68 mm                                                                                                              |
| 17. Secondary winding conductor     | : DPC Aluminium strip, bare size<br>(4.8 mm x 9 mm) x 2 Nos. in parallel                                                                            |
| 18. Quantity of oil (Litre)         | : 150                                                                                                                                               |
| 19. Weight of oil (kg.)             | : 126                                                                                                                                               |
| 20. Total weight (kg.)              | : 505                                                                                                                                               |
| 21. Vector group                    | : Dyn-11                                                                                                                                            |
| 22. Year of manufacture             | : 2019                                                                                                                                              |
| 23. Insulation level H.V.           | : 28 kVrms                                                                                                                                          |
| 24. Insulation level L.V.           | : 03 kVrms                                                                                                                                          |
| 25. Total losses at 75°C (Watts)    | : 340 Max. (at 50 % load)                                                                                                                           |
| 26. Total losses at 75°C (Watts)    | : 1140 Max. (at 100 % load)                                                                                                                         |

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**ROUTINE TEST RESULTS BEFORE SHORT CIRCUIT**a) MEASUREMENT OF WINDING RESISTANCE

| Measurement at oil temperature: 37.1°C |        |        |                              |        |        |
|----------------------------------------|--------|--------|------------------------------|--------|--------|
| LV Winding resistance<br>(mΩ)          |        |        | HV Winding Resistance<br>(Ω) |        |        |
| u - v                                  | v - w  | w - u  | U - V                        | V - W  | W - U  |
| 27.756                                 | 27.722 | 27.886 | 23.524                       | 23.480 | 23.590 |

b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF PHASE DISPLACEMENT

Vector group: Dyn-11 was verified.

| Rated<br>turns<br>Ratio | Measured turns ratio between<br>Terminals |                 |         |                 |         |                 |
|-------------------------|-------------------------------------------|-----------------|---------|-----------------|---------|-----------------|
|                         | U-V/u-n                                   | Difference<br>% | V-W/v-n | Difference<br>% | W-U/w-n | Difference<br>% |
| 44.001                  | 44.029                                    | 0.064           | 44.024  | 0.052           | 44.044  | 0.098           |

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

Oil temp.: 37.3°C

| Test<br>current<br>(Amp.)<br>I <sub>avg</sub> | Impedance<br>voltage (V)<br>V <sub>avg</sub> | Frequency<br>(Hz.) | Load loss<br>measured<br>(Watts) | Impedance<br>Voltage<br>(%Z)<br>at 50 Hz. | Load loss<br>computed<br>at 75°C<br>(Watts) | %Z at<br>75°C |
|-----------------------------------------------|----------------------------------------------|--------------------|----------------------------------|-------------------------------------------|---------------------------------------------|---------------|
| 3.305                                         | 478.484                                      | 50.030             | 709.410                          | 4.348                                     | 804                                         | 4.389         |

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

Oil temp.: 37.3°C

| Test<br>current<br>(Amp.)<br>I <sub>avg</sub> | Impedance<br>voltage (V)<br>V <sub>avg</sub> | Frequency<br>(Hz.) | Load loss<br>measured<br>(Watts) | Load loss<br>computed at<br>75°C (Watts) |
|-----------------------------------------------|----------------------------------------------|--------------------|----------------------------------|------------------------------------------|
| 1.653                                         | 239.139                                      | 50.016             | 177.390                          | 201                                      |

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e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT

Oil temp.: 37.3°C

| Applied Voltage (V)<br>Vavg. | Current (Amp.)<br>Iavg. | Frequency<br>(Hz.) | Losses Measured<br>(Watts) |
|------------------------------|-------------------------|--------------------|----------------------------|
| 433.173                      | 0.298                   | 50.025             | 116                        |

- Total losses at 75°C: 317 Watts (at 50 % load)

- Total losses at 75°C: 920 Watts (at 100% load)

f) MEASUREMENT OF INSULATION RESISTANCE

Oil temp.: 37.1°C

| Measured Between         | DC Test Voltage (V) | IR value (MΩ) |
|--------------------------|---------------------|---------------|
| HV to LV winding         | 2500                | > 2000        |
| HV winding to LV + EARTH | 2500                | > 2000        |
| LV winding to HV + EARTH | 500                 | > 2000        |

g) INDUCED OVER-VOLTAGE WITHSTAND TEST

| Sr. No. | Test                                              | Applied voltage (V) | Applied Freq. (Hz.) | Duration (sec.) | Remarks   |
|---------|---------------------------------------------------|---------------------|---------------------|-----------------|-----------|
| 1.      | Between LV windings with tank connected to earth. | 866                 | 100                 | 60              | 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 | 28                   | 60              | Withstood |
| 2.      | Between LV winding and HV winding connected to the tank and earth | 03                   | 60              | Withstood |

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**DATE:** 30.04.2019**SHORT-CIRCUIT WITHSTAND TEST:**

The verification of the short-circuit withstand test was performed on the high voltage winding connected to three phase-balanced source and low voltage winding short circuited through current measuring instruments. Test conducted with pre set short circuit as per schematic circuit diagram No.: OLSC/DTC/01.

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

Supply Frequency: 50 Hz.

| Test No. | Oscillogram No. | Applied voltage (kVrms) | Short circuit current on LV (A) |                      |      | Duration (sec.) | Remarks                         |
|----------|-----------------|-------------------------|---------------------------------|----------------------|------|-----------------|---------------------------------|
|          |                 |                         | Peak                            | RMS                  | Avg. |                 |                                 |
| 1.       | 0051/01         | -                       | -<br>3115<br>-                  | 1503<br>1505<br>1475 | 1494 | 0.1             | Calibration shot                |
| 2.       | 0051/02         | 11                      | -<br>3928<br>-                  | 1885<br>1866<br>1844 | 1865 | 0.5             | No Abnormality                  |
| 3.       | 0051/03         | 11                      | -<br>3832<br>-                  | 1876<br>1870<br>1843 | 1863 | 0.5             | No Abnormality                  |
| 4.       | 0051/04         | 11                      | -<br>3885<br>-                  | 1881<br>1872<br>1844 | 1866 | 0.5             | No Abnormality                  |
| 5.       | 0051/05         | 11                      | -<br>-<br>3717                  | 1876<br>1869<br>1839 | 1861 | 0.5             | No Abnormality                  |
| 6.       | 0051/06         | 11                      | -<br>-<br>3721                  | 1875<br>1867<br>1837 | 1860 | 0.5             | No Abnormality                  |
| 7.       | 0051/07         | 11                      | -<br>-<br>3699                  | 1870<br>1867<br>1834 | 1857 | 0.5             | No Abnormality                  |
| 8.       | 0051/08         | 11                      | 3779<br>-<br>-                  | 1869<br>1863<br>1835 | 1856 | 0.5             | No Abnormality                  |
| 9.       | 0051/09         | 11                      | 3759<br>-<br>-                  | 1866<br>1859<br>1834 | 1853 | 0.5             | No Abnormality                  |
| 10.      | 0051/10         | 11                      | 3742<br>-<br>-                  | 1863<br>1858<br>1831 | 1851 | 0.5             | No Abnormality                  |
| 11.      | 0051/11         | 11                      | -<br>3835<br>-                  | 1864<br>1853<br>1827 | 1848 | 2.0             | Thermal Shot*<br>No Abnormality |

\*As per customer's requirement

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**DATE:** 30.04.2019**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. | Measurement performed |     | Measured value of % reactance at 50 Hz. |      |      | %Change in % reactance |      |      |
|---------|-----------------------|-----|-----------------------------------------|------|------|------------------------|------|------|
|         |                       |     | U                                       | V    | W    | U                      | V    | W    |
| 1.      | Before test           |     | 4.22                                    | 4.23 | 4.23 | -                      | -    | -    |
| 2.      | After the test no.    | 2.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 3.      | After the test no.    | 3.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 4.      | After the test no.    | 4.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 5.      | After the test no.    | 5.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 6.      | After the test no.    | 6.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 7.      | After the test no.    | 7.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 8.      | After the test no.    | 8.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 9.      | After the test no.    | 9.  | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 10.     | After the test no.    | 10. | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |
| 11.     | After the test no.    | 11. | 4.22                                    | 4.23 | 4.23 | 0.00                   | 0.00 | 0.00 |

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**ROUTINE TEST RESULTS AFTER SHORT CIRCUIT****a) MEASUREMENT OF WINDING RESISTANCE**

| Measurement at oil temperature: 34.3°C |        |        |                              |        |        |
|----------------------------------------|--------|--------|------------------------------|--------|--------|
| LV Winding resistance<br>(mΩ)          |        |        | HV Winding Resistance<br>(Ω) |        |        |
| U - V                                  | V - W  | W - U  | U - V                        | V - W  | W - U  |
| 27.778                                 | 27.734 | 27.890 | 23.450                       | 23.410 | 23.516 |

**b) MEASUREMENT OF VOLTAGE RATIO AND CHECK OF PHASE DISPLACEMENT**

Vector group: Dyn-11 was verified.

| Rated<br>turns<br>Ratio | Measured turns ratio between<br>Terminals |                 |         |                 |         |                 |
|-------------------------|-------------------------------------------|-----------------|---------|-----------------|---------|-----------------|
|                         | U-V/u-n                                   | Difference<br>% | V-W/v-n | Difference<br>% | W-U/w-n | Difference<br>% |
| 44.001                  | 44.028                                    | 0.061           | 44.008  | 0.016           | 44.040  | 0.089           |

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

Oil temp.: 34.1°C

| Test<br>current<br>(Amp.)<br>I <sub>avg</sub> | Impedance<br>voltage (V)<br>V <sub>avg</sub> | Frequency<br>(Hz.) | Load loss<br>measured<br>(Watts) | Impedance<br>Voltage<br>(%Z)<br>at 50 Hz. | Load loss<br>computed<br>at 75°C<br>(Watts) | %Z at<br>75°C |
|-----------------------------------------------|----------------------------------------------|--------------------|----------------------------------|-------------------------------------------|---------------------------------------------|---------------|
| 3.304                                         | 478.332                                      | 50.024             | 709.470                          | 4.349                                     | 813                                         | 4.394         |

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

Oil temp.: 34.1°C

| Test<br>current<br>(Amp.)<br>I <sub>avg</sub> | Impedance<br>voltage (V)<br>V <sub>avg</sub> | Frequency<br>(Hz.) | Load loss<br>measured<br>(Watts) | Load loss<br>computed at<br>75°C (Watts) |
|-----------------------------------------------|----------------------------------------------|--------------------|----------------------------------|------------------------------------------|
| 1.653                                         | 239.125                                      | 50.003             | 177.516                          | 203                                      |

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**e) MEASUREMENT OF NO-LOAD LOSS AND CURRENT**

Oil temp.: 34.1°C

| Applied Voltage (V)<br>Vavg. | Current (Amp.)<br>Iavg. | Frequency<br>(Hz.) | Losses Measured<br>(Watts) |
|------------------------------|-------------------------|--------------------|----------------------------|
| 433.205                      | 0.300                   | 50.039             | 116                        |

- Total losses at 75°C: 319 Watts (at 50 % load)

- Total losses at 75°C: 929 Watts (at 100% load)

**f) MEASUREMENT OF INSULATION RESISTANCE**

Oil temp.: 34.3°C

| Measured Between         | DC Test Voltage (V) | IR value (MΩ) |
|--------------------------|---------------------|---------------|
| HV to LV winding         | 2500                | > 2000        |
| HV winding to LV + EARTH | 2500                | > 2000        |
| LV winding to HV + EARTH | 500                 | > 2000        |

**g) INDUCED OVER-VOLTAGE WITHSTAND TEST**

| Sr. No. | Test                                             | Applied voltage (V) | Applied Freq. (Hz.) | Duration (sec.) | Remarks   |
|---------|--------------------------------------------------|---------------------|---------------------|-----------------|-----------|
| 1.      | Between LV windings with tank connected to earth | 866                 | 100                 | 60              | 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 | 28                   | 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.

- Condition of conductor, core and clamping:
  - No visible damage, deformation or displacement.
- Condition of oil : Clear
- Condition of spacers : Intact

**Results:** 1) % Change in % reactance is within tolerance limits as per standard.

- The results of routine tests carried out before and after the short-circuit withstand test found within limits as per standard.

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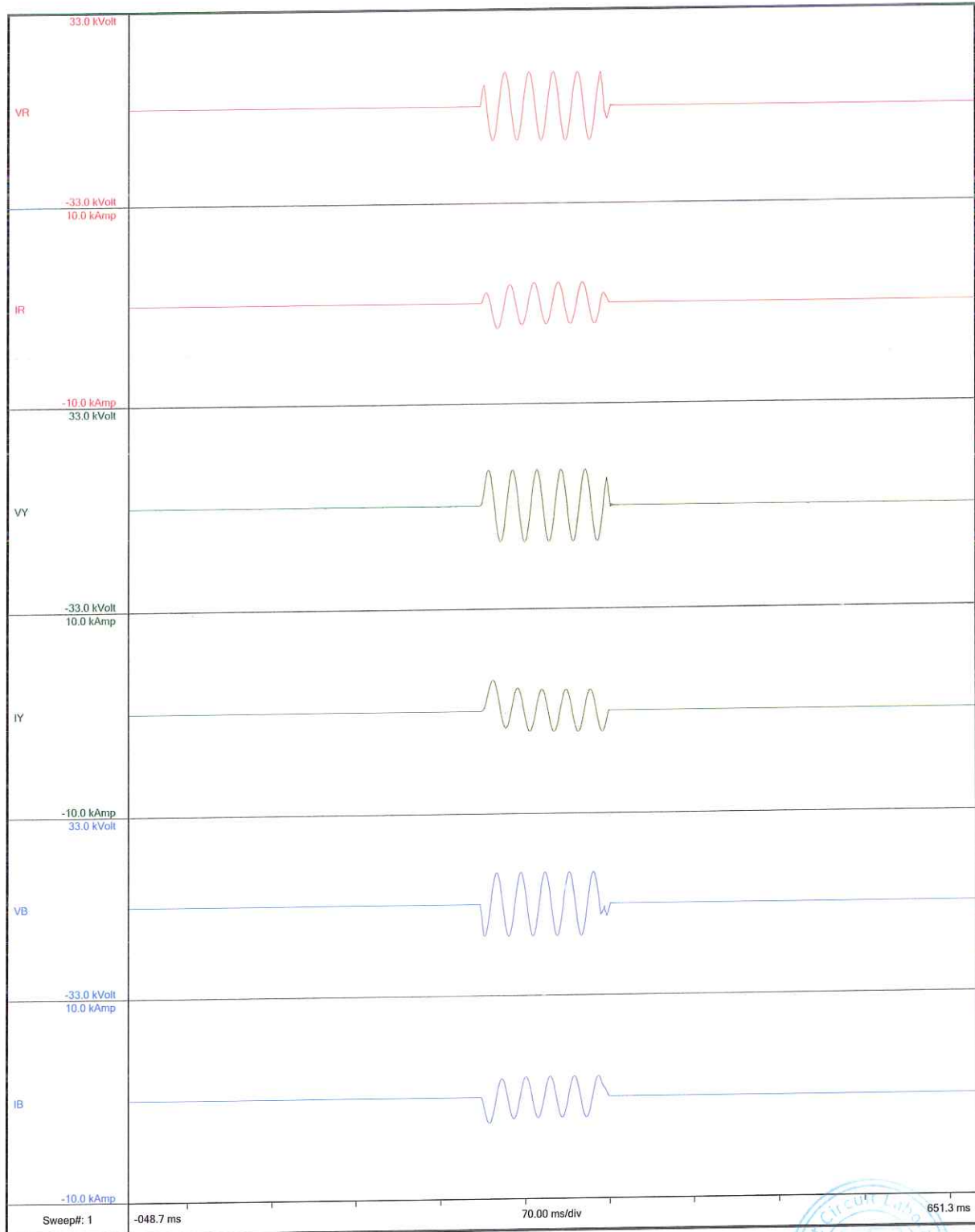
E-mail : erda@erda.org

Web : <http://www.erda.org>



**ULR NO.:** TC538919000014145F  
**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/01



TC 2716250



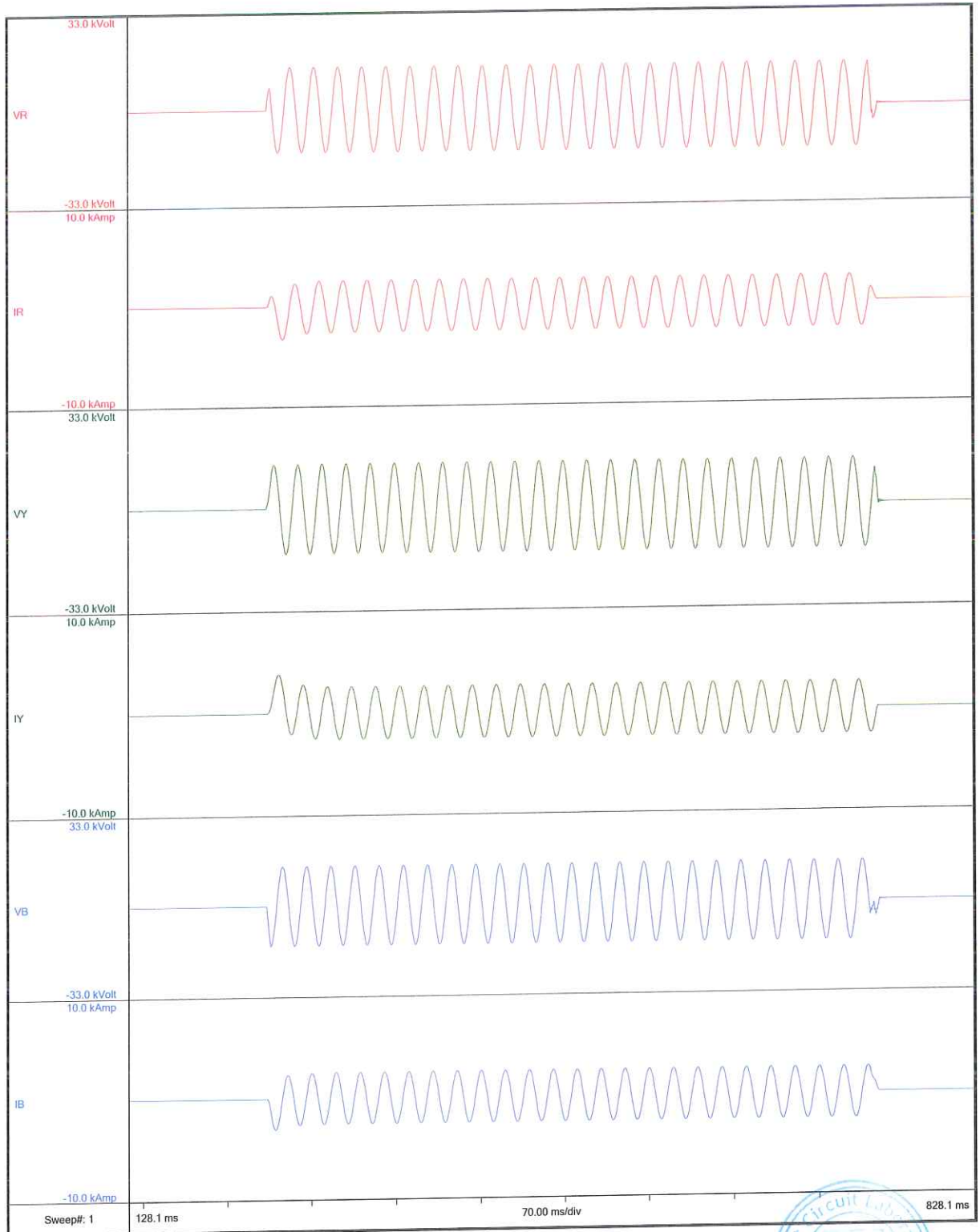
Certificate No. : TC-5389

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**DATE:** 30.04.2019



**OSCILLOGRAM NO. :** 0051/02

TC 2716293





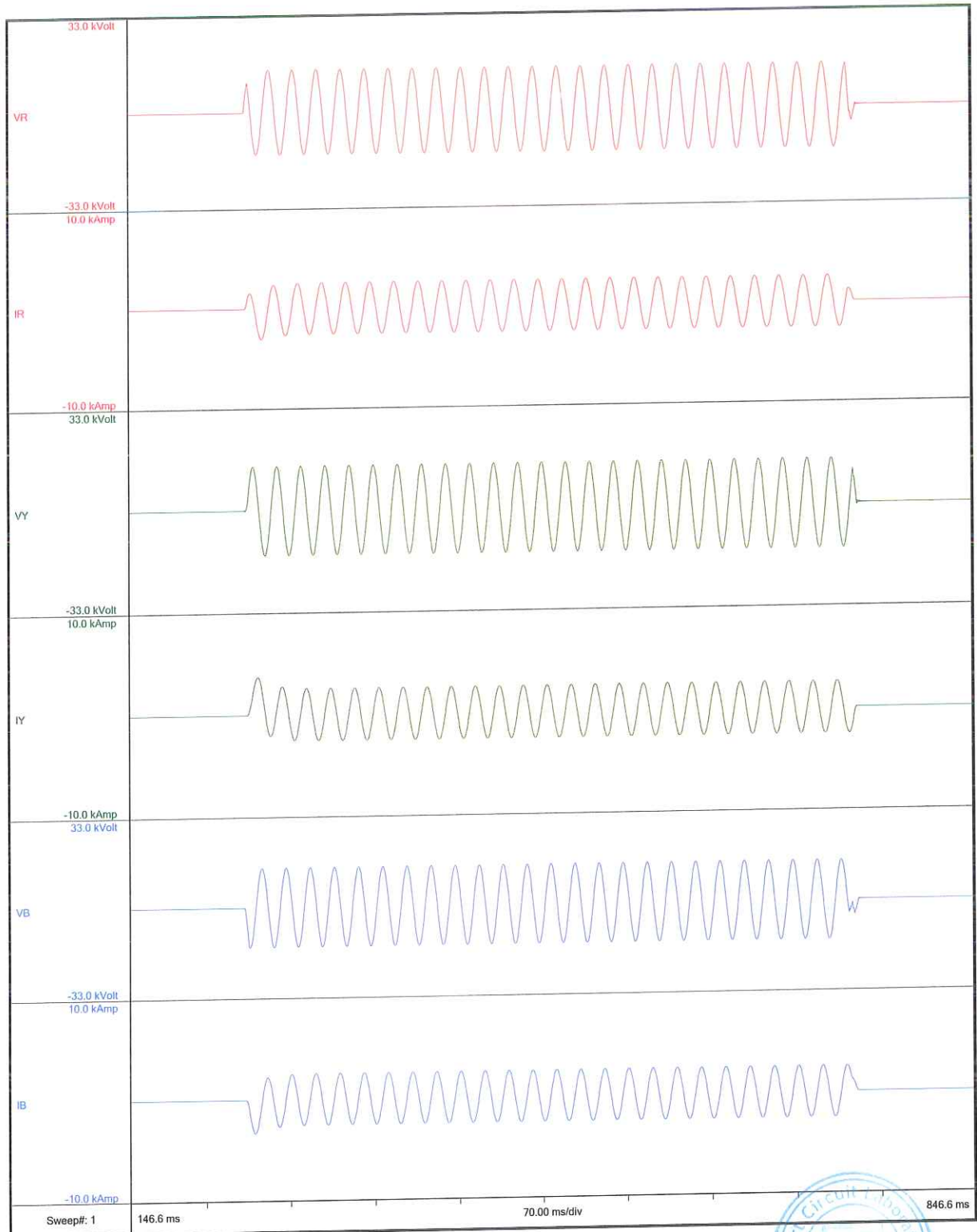
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**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/03



TC 2716294



Certificate No. : TC-5389

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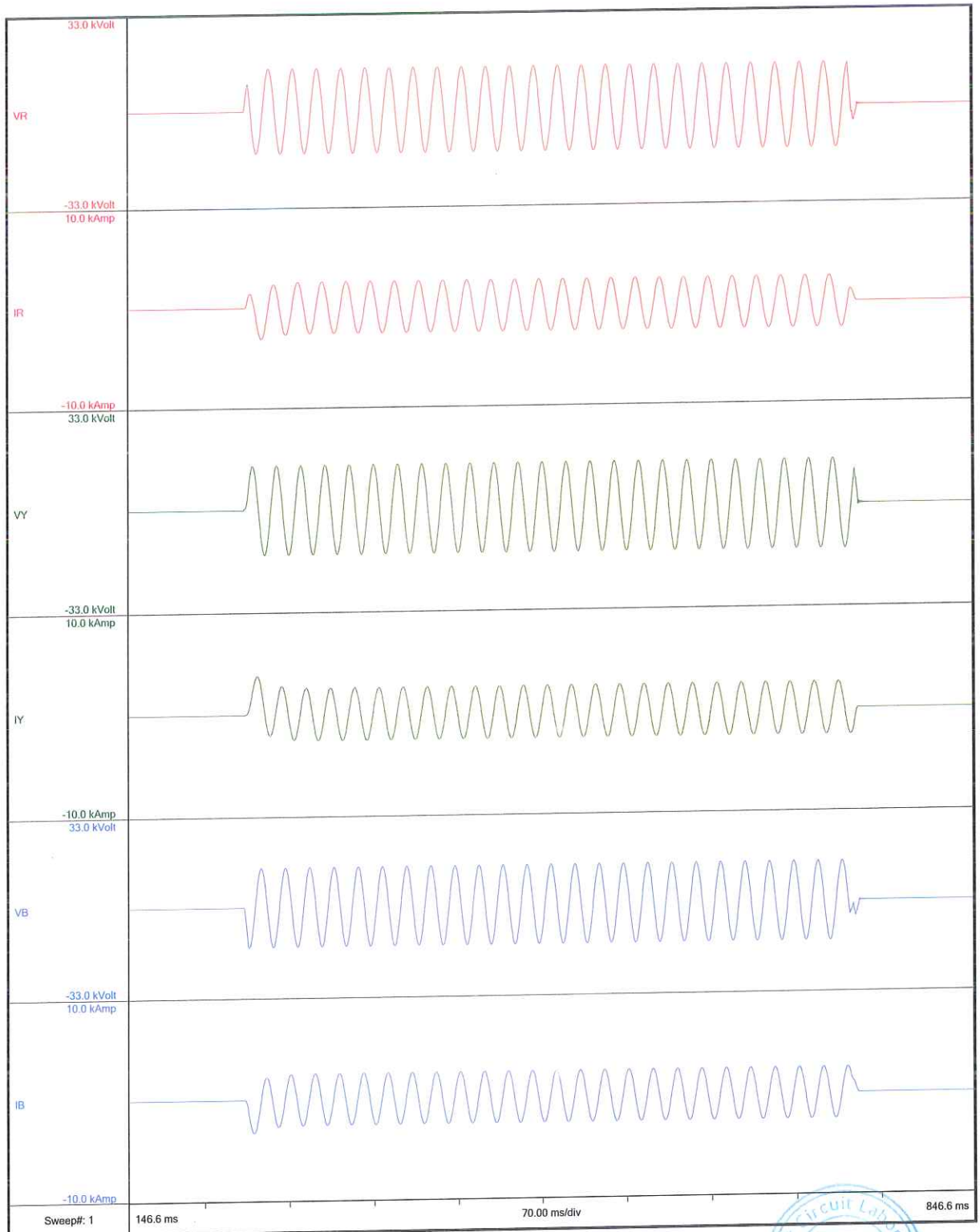
Web : http://www.erda.org



**ULR NO.:** TC538919000014145F

**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/04

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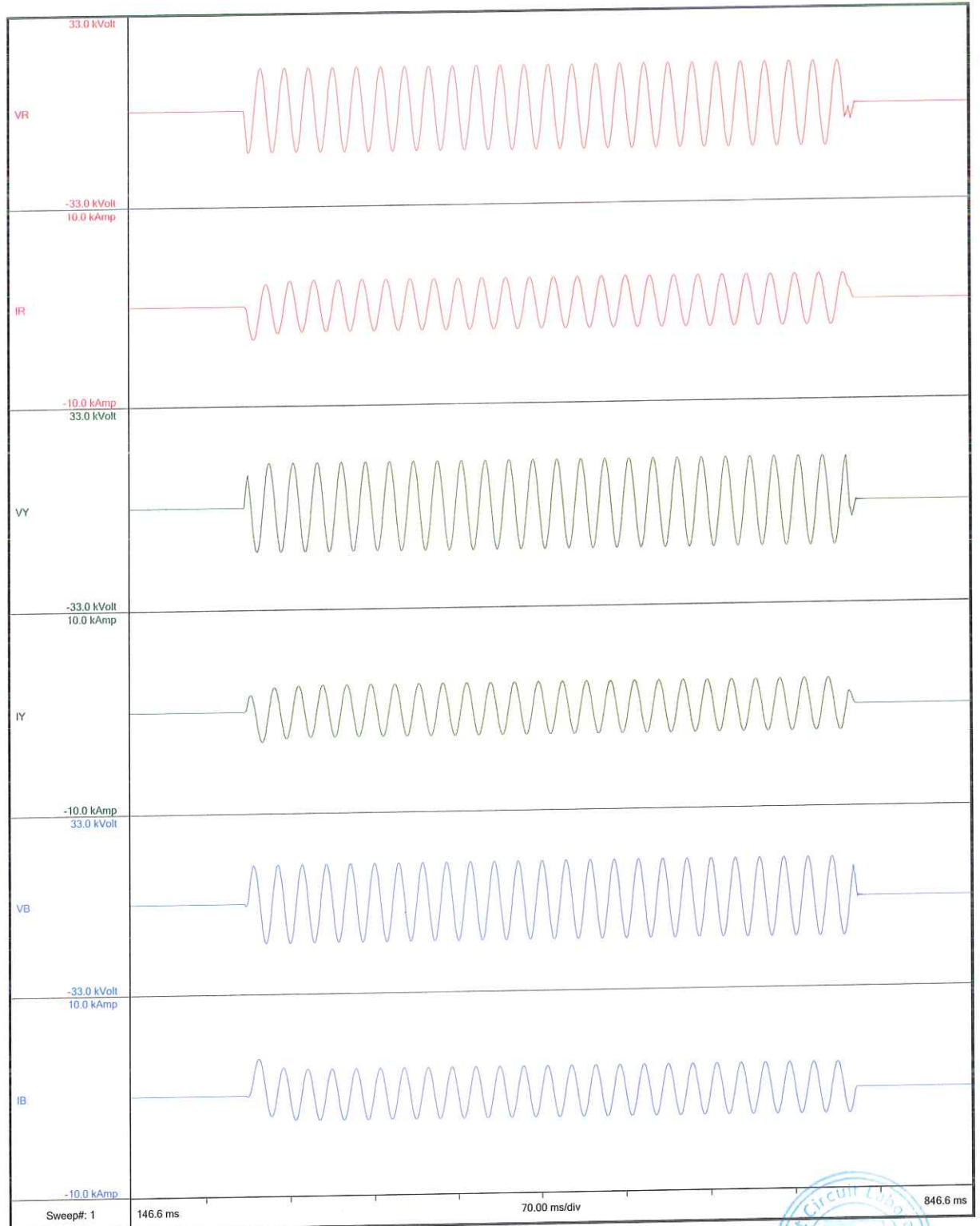
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**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/05



TC 2716296



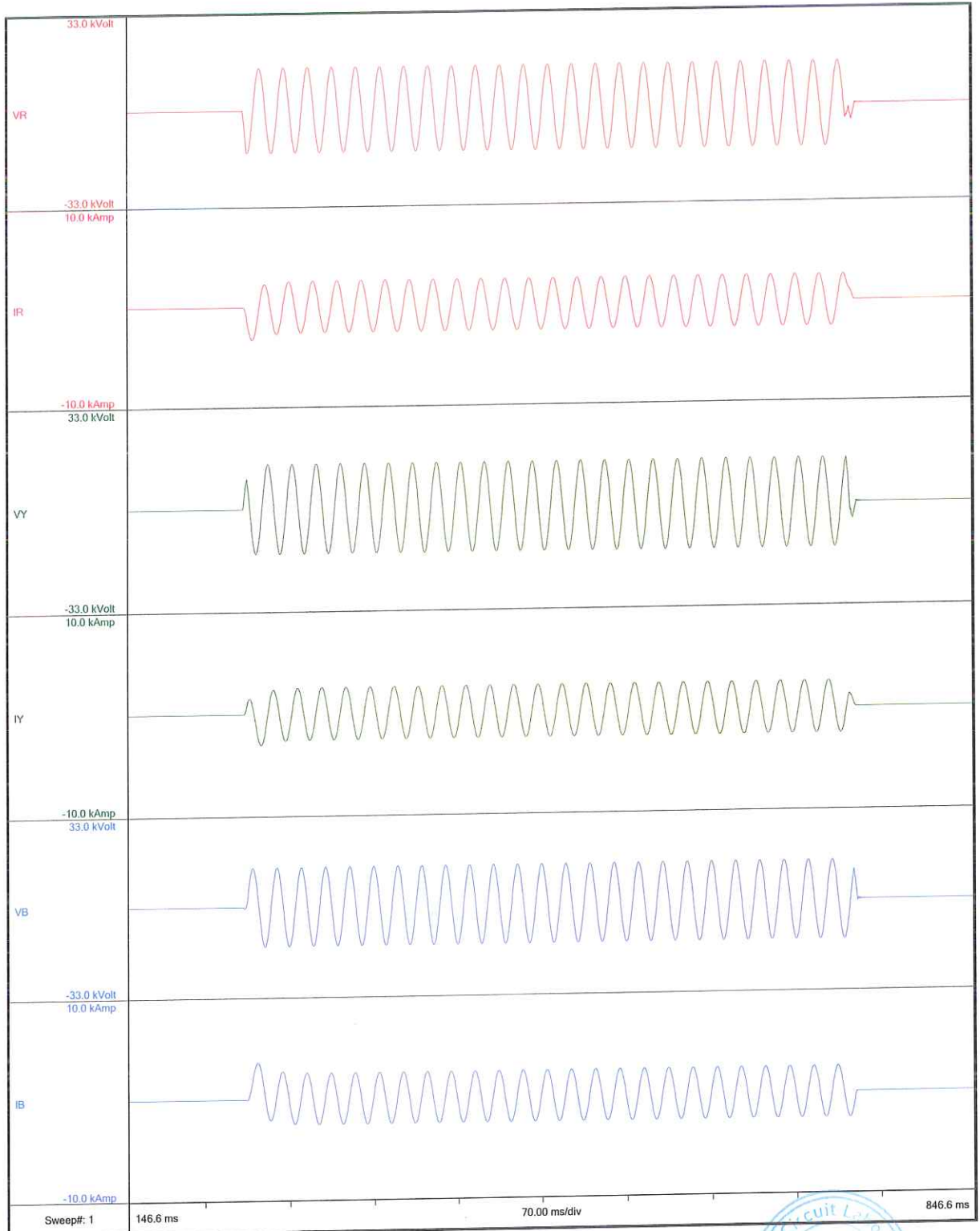
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**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



**OSCILLOGRAM NO. : 0051/06**



TC 2716297



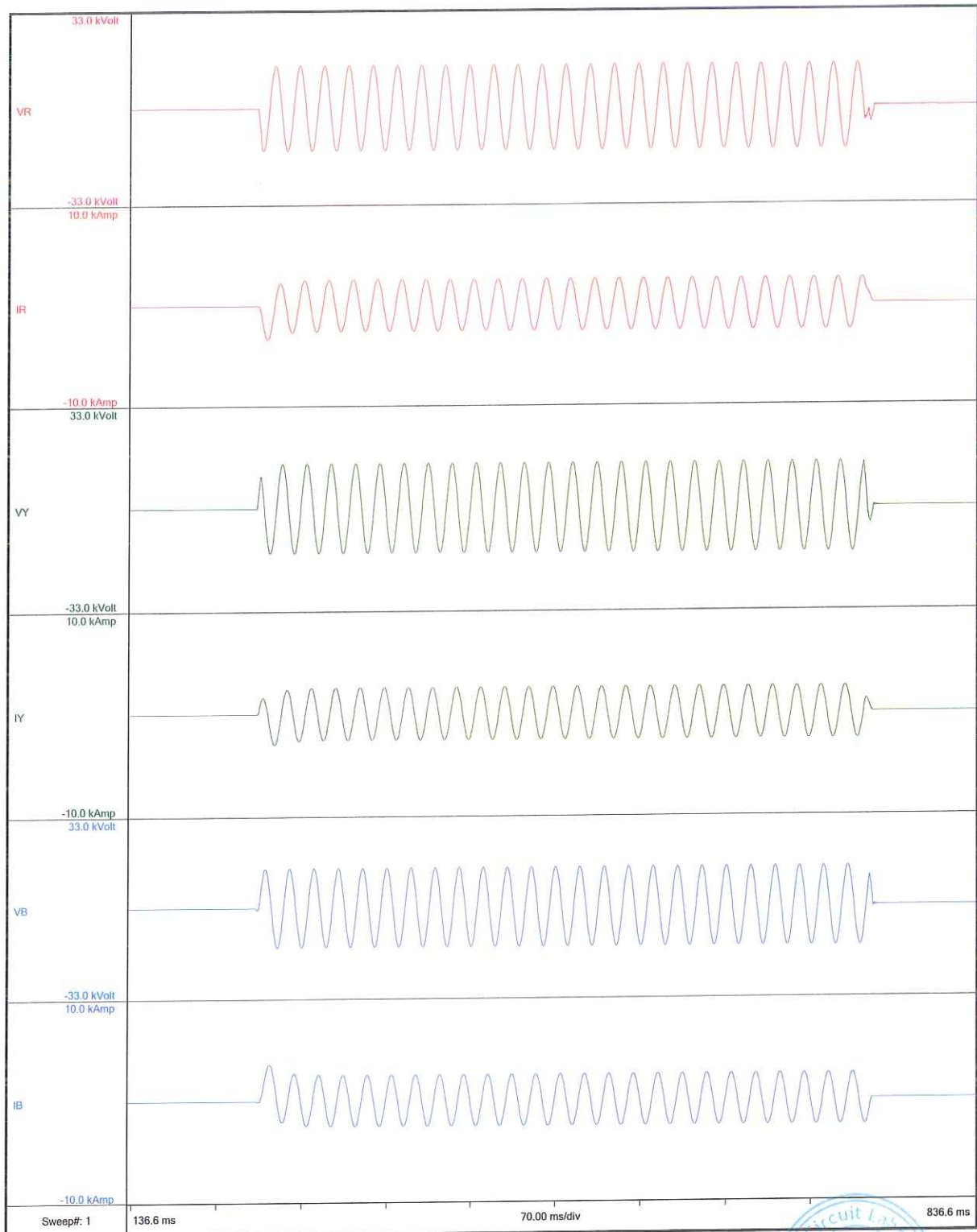
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**ULR NO.:** TC538919000014145F  
**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/07



TC 2731300



Certificate No. : TC-5389

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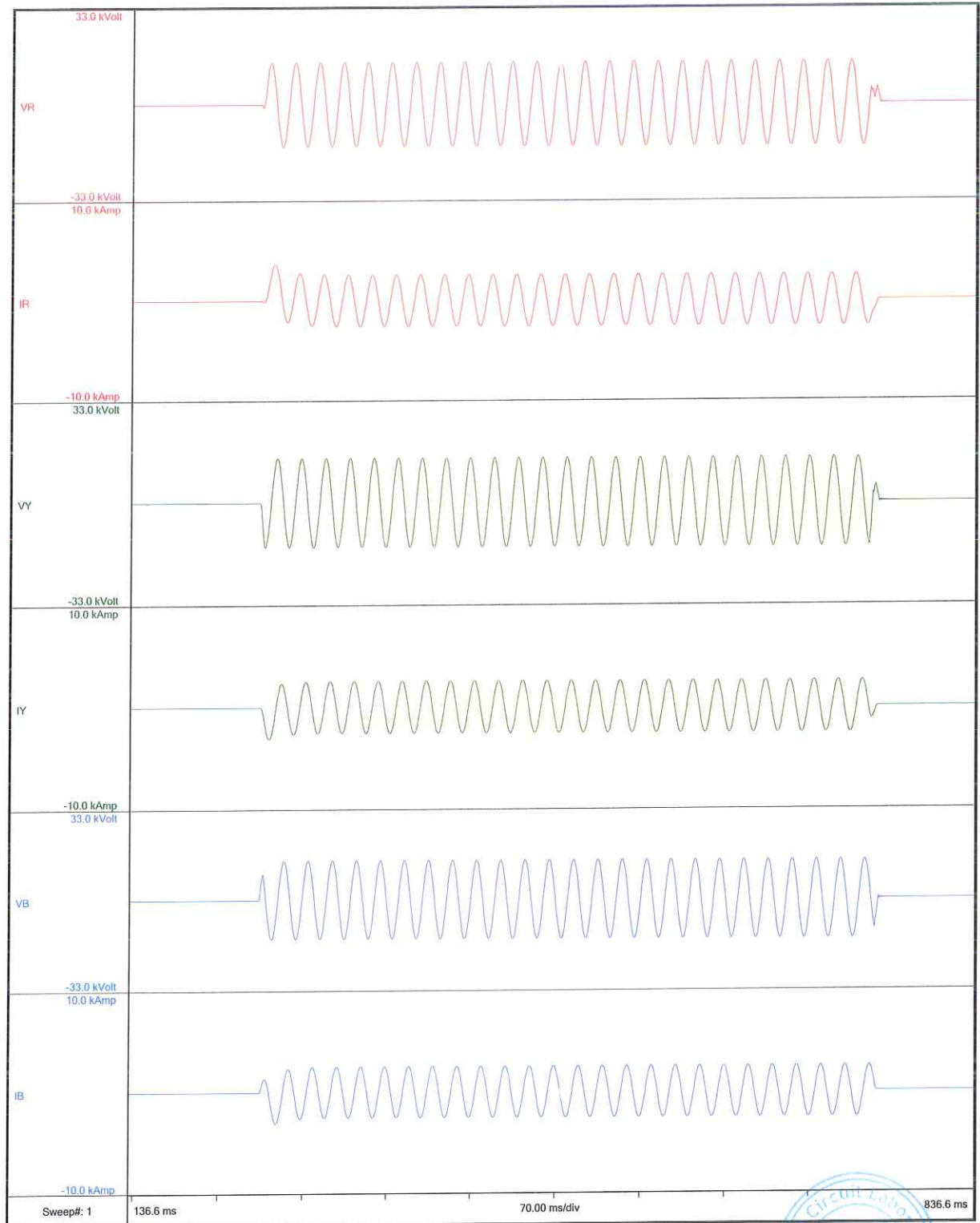
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**ULR NO.:** TC538919000014145F  
**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/08



TC 2731299



Certificate No. : TC-5389

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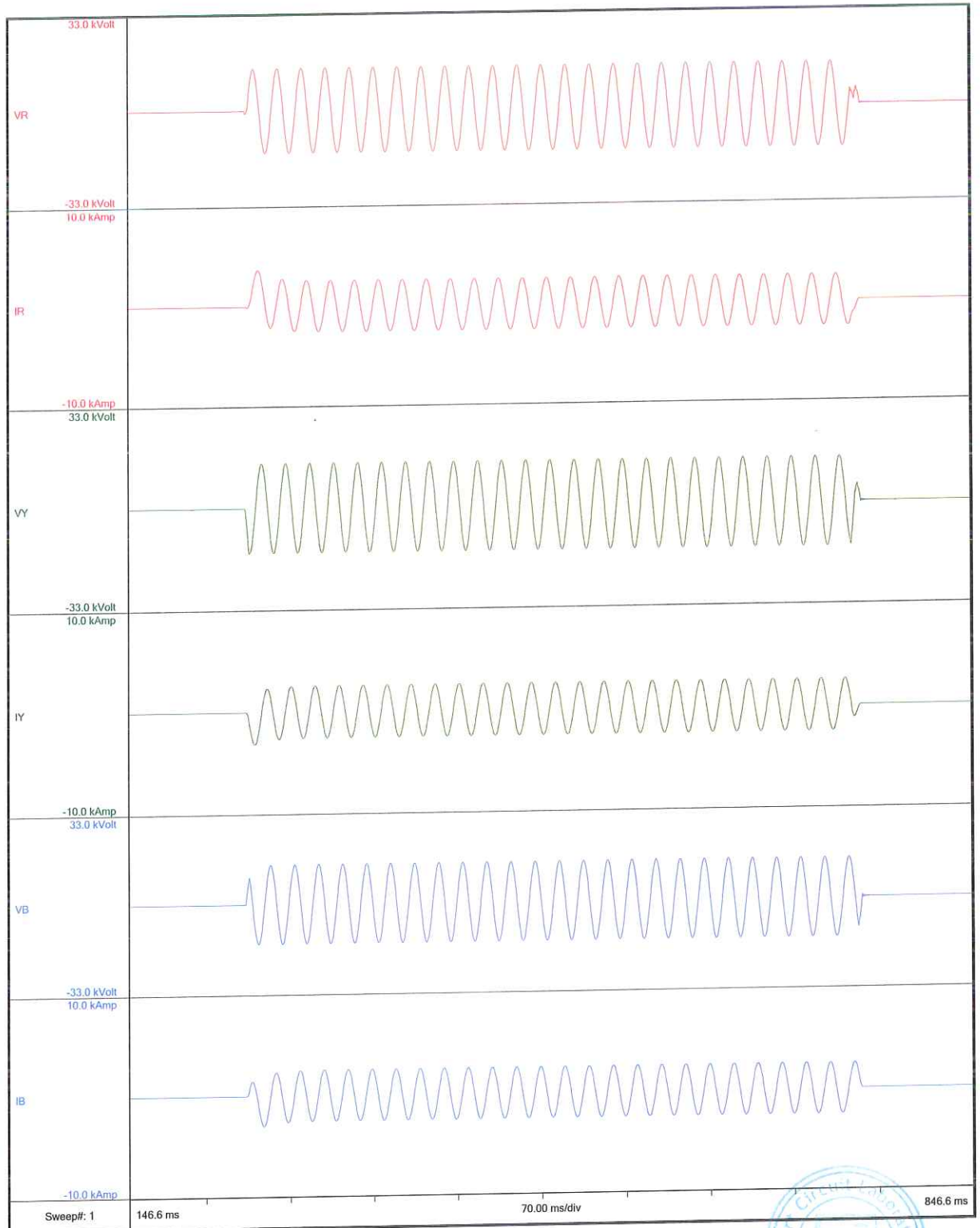
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**ULR NO.:** TC538919000014145F  
**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/09



TC 2716299



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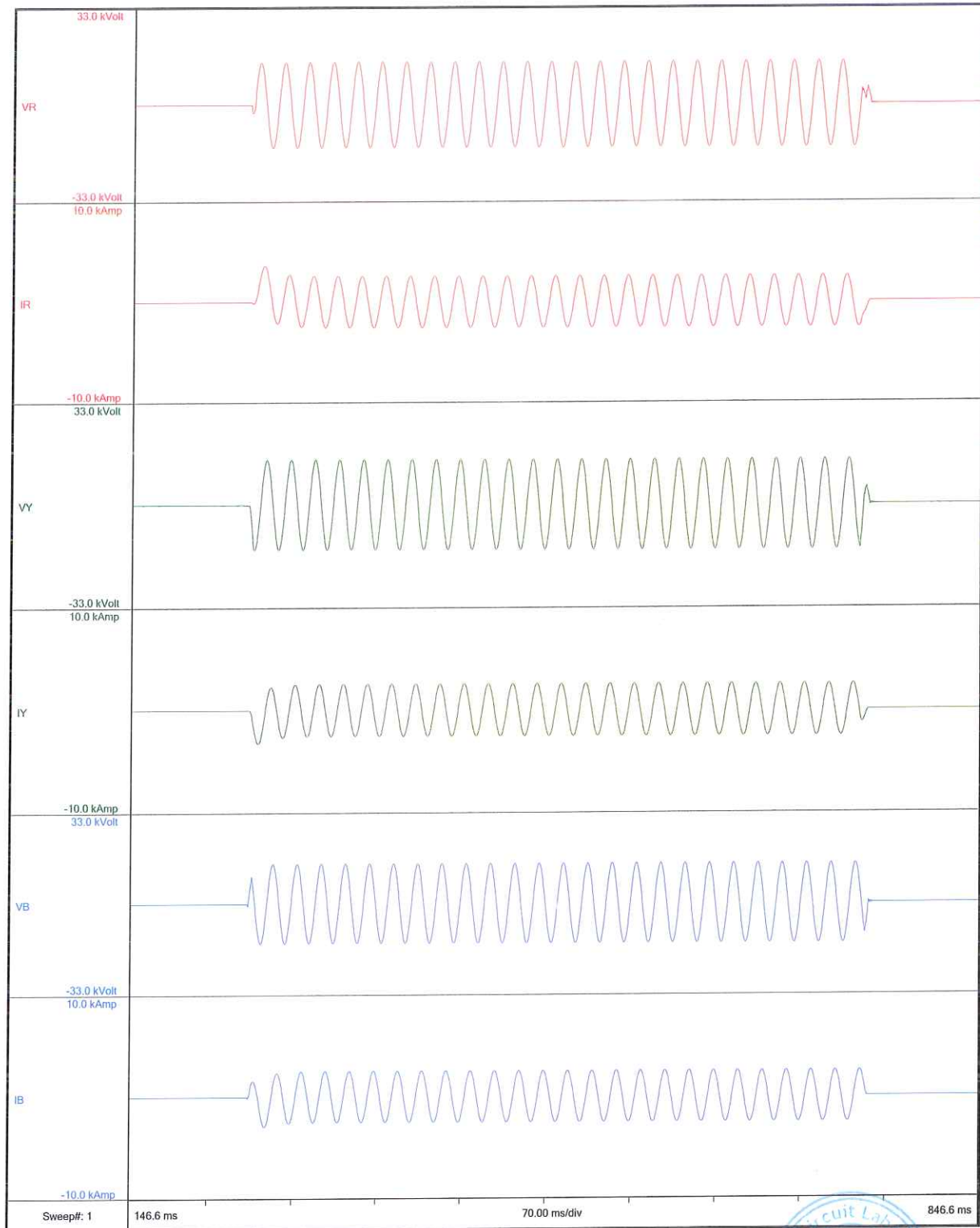
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**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO. : 0051/10

TC 2731297





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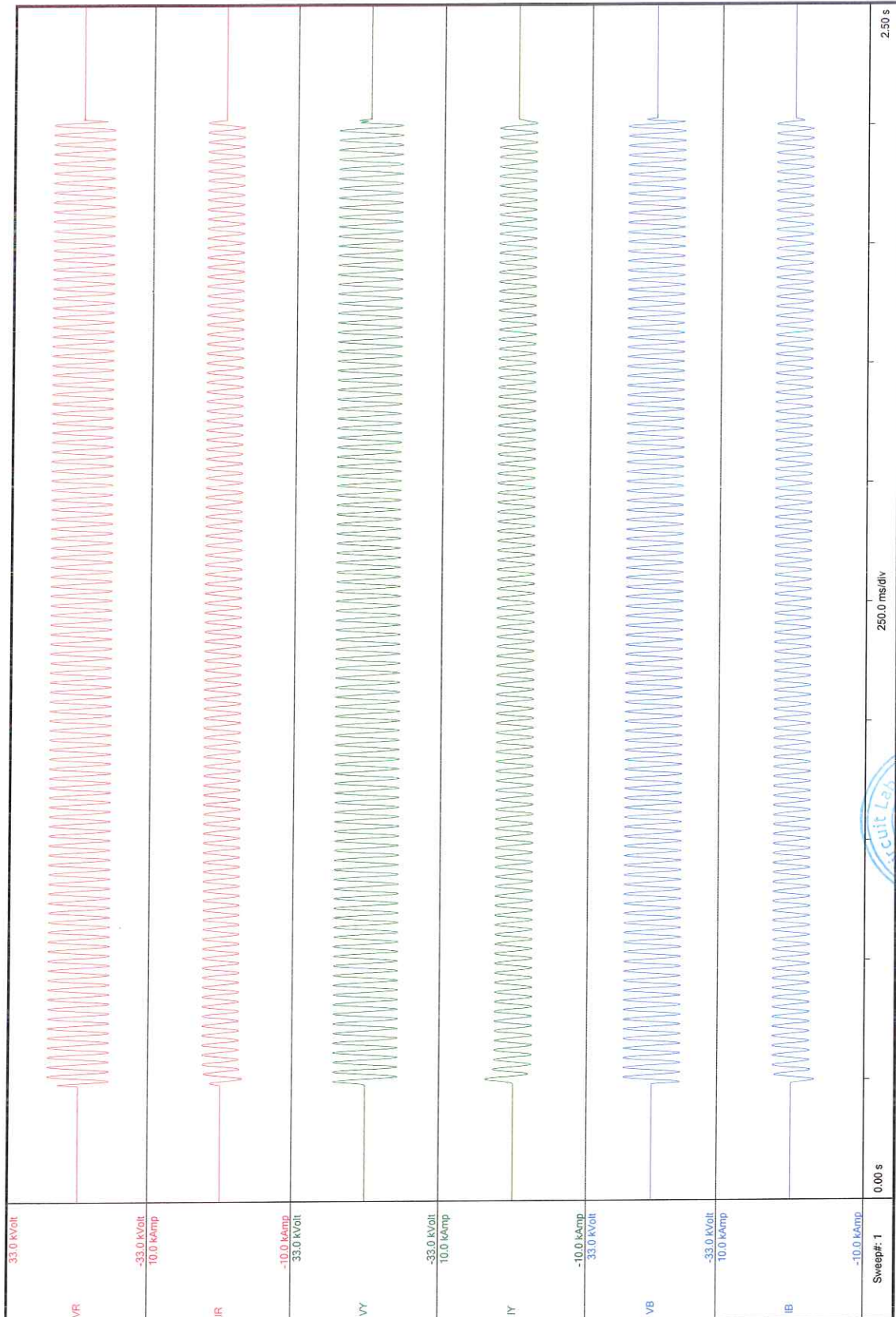
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**ULR NO.:** TC538919000014145F  
**REPORT NO.:** RP-1920-004065

**DATE:** 30.04.2019



OSCILLOGRAM NO.: 0051/11

TC 2731298



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ULR NO.: TC538919000014145F

REPORT NO.: RP-1920-004065

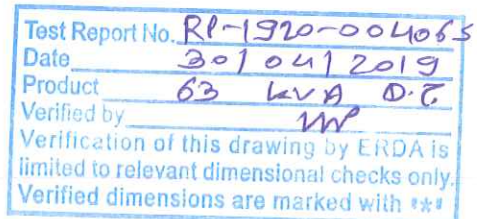
DATE: 30.04.2019



| DISTRIBUTION TRANSFORMER                                  |                         |
|-----------------------------------------------------------|-------------------------|
| <b>RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.</b>           |                         |
| Karola-Bhinmal Road, Sanchore<br>Dist - Jalore, Rajasthan |                         |
| IS 1169                                                   |                         |
| PART 1<br>CML 4450030105                                  |                         |
| PHASE TRANSFORMER                                         | ENERGY EFFICIENCY LEVEL |
| STANDARD                                                  | MAX. TOTAL LOSSES       |
| KVA                                                       | AT 50% RATED LOAD W     |
| VOLTS AT NO LOAD                                          | MAX. TOTAL LOSSES       |
| H.V.                                                      | AT 100% RATED LOAD W    |
| L.V.                                                      | TYPE OF COOLING         |
| BIL                                                       | TEMP RISE OIL DEG C     |
| H.V.                                                      | TEMP RISE WDG DEG C     |
| L.V.                                                      | MASS OF OIL KGS         |
| AMPERES                                                   | TOTAL MASS KGS          |
| FREQUENCY Hz                                              | VOL. OF OIL L           |
| VECTOR GROUP REF.                                         | MONTH & YEAR OF MFG.    |
| IMPEDANCE VOLT %                                          | SERIAL NO.              |
| TAPPING                                                   |                         |
| FOR HV VARIATION                                          |                         |
| IN STEP FROM TO %                                         |                         |
| CUSTOMER                                                  |                         |
| ORDER NO.                                                 |                         |
| MADE IN INDIA                                             |                         |
|                                                           |                         |







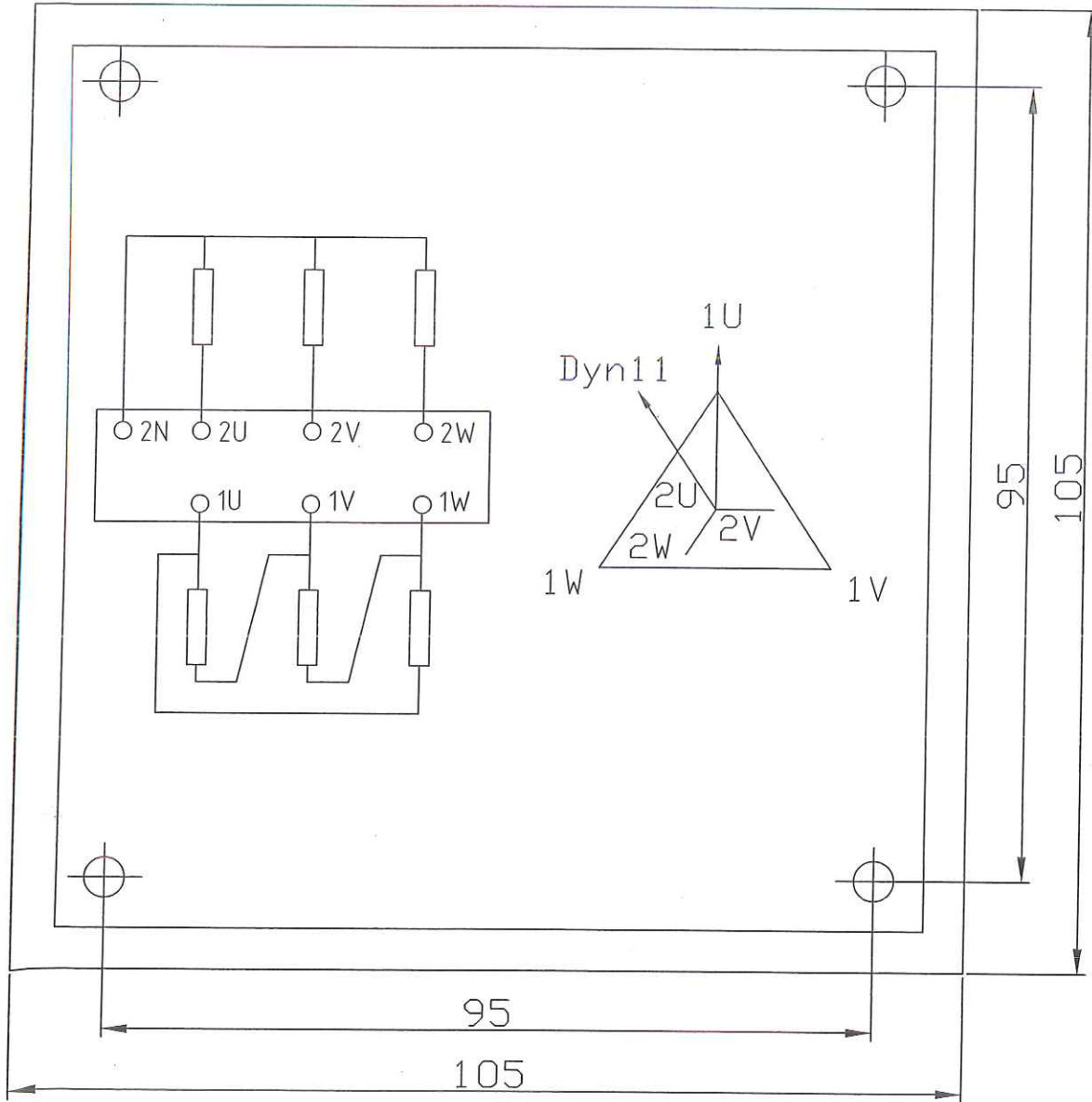
SIZE: 105x105 mm HOLE CENTER: 95x95 mm

|             |              |                      |
|-------------|--------------|----------------------|
|             | 16.03.2019   | 01 of 02             |
| REV.<br>NO. | DATE<br>SIGN | BRIEF<br>DESCRIPTION |





Test Report No. RP-1920-004065  
Date 30/04/2019  
Product 63 KVA 0.7  
Verified by WV  
Verification of this drawing by ERDA is limited to relevant dimensional checks only.  
Verified dimensions are marked with \*\*



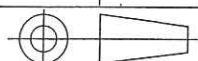
SIZE: 105x105 mm HOLE CENTER: 95x95 mm

NOTE:  
\* SERIAL NO.,  
YEAR OF MANUFACTURE &  
MONTH OF MANUFACTURE  
WILL BE PUNCHED AT THE TIME OF DISPATCH  
MATERIAL : Anodized Aluminum  
THICKNESS : 1.5 mm

RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.

KAROLA-BHINMAL ROAD KAROLA SANCHORE-343041  
RAJASTHAN.

|         |  |                                                                                                                           |
|---------|--|---------------------------------------------------------------------------------------------------------------------------|
| DRN BY  |  | RATING & TERMINAL MARKING PLATE FOR<br>63 KVA, 11/0.433 KV DISTRIBUTION TRANSFORMER<br>3 PHASE, ENERGY EFFICIENCY LEVEL-2 |
| CHD BY  |  |                                                                                                                           |
| APPD BY |  |                                                                                                                           |



DRG. NO. RPTPL-63KVA-RP-02/02-2019

|          |            |                   |
|----------|------------|-------------------|
| REV. NO. | DATE SIGN  | BRIEF DESCRIPTION |
|          | 16.03.2019 | 02 of 02          |



| S.N.                                     |                                   | TECHNICAL DETAILS |       |       |       |       |       |       |       |       |       |                |       |
|------------------------------------------|-----------------------------------|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------|-------|
|                                          |                                   | AS PER SPECIFIED  |       |       |       |       |       |       |       |       |       | AS OFFERED     |       |
| 1                                        | PRIMARY VOLTAGE (KV)              | 11                |       |       |       |       |       |       |       |       |       | LV             |       |
| 2                                        | SECONDARY VOLTAGE (KV)            | 0.433             |       |       |       |       |       |       |       |       |       | ALU            |       |
| 3                                        | RATING (KVA)                      | 63                |       |       |       |       |       |       |       |       |       | 2.83           |       |
| 4                                        | VECTOR GROUP                      | DYN-11            |       |       |       |       |       |       |       |       |       | 1.68 DIA       |       |
| 5                                        | CONFORMING TO I.S.                | 1180 PART-1, 2014 |       |       |       |       |       |       |       |       |       | 2.167          |       |
| 6                                        | PERMISSIBLE VOLTAGE FLUCTUATION % | 12.5              |       |       |       |       |       |       |       |       |       | 84.68          |       |
| 7                                        | TEMP OF TOP OIL (MAX) °C          | 35                |       |       |       |       |       |       |       |       |       | SE             |       |
| 8                                        | TEMP OF WINDING (MAX) °C          | 40                |       |       |       |       |       |       |       |       |       | 0.8612         |       |
| CORE DETAIL                              |                                   |                   |       |       |       |       |       |       |       |       |       |                |       |
| a) CORE MATERIAL                         |                                   | CRGO              |       |       |       |       |       |       |       |       |       | 104 each       |       |
| b) PRINCIPAL SOURCE OF CORE MATERIAL     |                                   | OPEN MARKET       |       |       |       |       |       |       |       |       |       | 4              |       |
| c) GRADE OF LAMINATION                   |                                   | M4 OR BETTER      |       |       |       |       |       |       |       |       |       | AS PER OFFERED |       |
| d) FLUX DENSITY wb/m <sup>2</sup>        |                                   | 1.69 MAX          |       |       |       |       |       |       |       |       |       |                |       |
| e) NO STEPS OF CORE (NOS)                |                                   | 13                |       |       |       |       |       |       |       |       |       |                |       |
| 10                                       | % IMPEDENCE                       | 4.5               |       |       |       |       |       |       |       |       |       |                |       |
| 11                                       | CORE DIMENSIONS                   | 4.5               |       |       |       |       |       |       |       |       |       |                |       |
| STEP NO.                                 | 1                                 | 2                 | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12             | 13    |
| L MM                                     | 105                               | 100               | 95    | 90    | 85    | 80    | 75    | 70    | 65    | 60    | 55    | 50             | 40    |
| W MM                                     | 25.2                              | 24.7              | 24.2  | 23.7  | 23.2  | 22.7  | 22.2  | 21.7  | 21.2  | 20.7  | 20.2  | 19.7           | 19.2  |
| GROSS SECTION cm <sup>2</sup>            | 26.46                             | 25.40             | 24.34 | 23.28 | 22.22 | 21.16 | 20.10 | 19.04 | 17.98 | 16.92 | 15.86 | 14.80          | 13.74 |
| TOTAL GROSS SECTION AREA cm <sup>2</sup> | 86.84                             | 84.23             | 81.62 | 79.01 | 76.40 | 73.79 | 71.18 | 68.57 | 65.96 | 63.35 | 60.74 | 58.13          | 55.52 |
| EFFECTIVE CORE AREA                      | 86.84                             | 84.23             | 81.62 | 79.01 | 76.40 | 73.79 | 71.18 | 68.57 | 65.96 | 63.35 | 60.74 | 58.13          | 55.52 |

| S.N.                                                 |                                       | AS PER SPECIFIED |     | AS OFFERED |     |
|------------------------------------------------------|---------------------------------------|------------------|-----|------------|-----|
|                                                      |                                       | HV               | LV  | HV         | LV  |
| 12                                                   | WINDING                               | ALU              | ALU | ALU        | ALU |
| a) MATERIAL                                          |                                       |                  |     |            |     |
| b) ELECTRIC CONDUCTIVITY N/Ω MM <sup>2</sup> AT 20°C |                                       |                  |     |            |     |
| c) CONDUCTOR SIZE IN mm <sup>2</sup>                 |                                       |                  |     |            |     |
| d) CONDUCTOR CROSS SECTION mm <sup>2</sup>           |                                       |                  |     |            |     |
| e) INSULATION MATERIAL                               |                                       |                  |     |            |     |
| f) CURRENT DENSITY A/mm <sup>2</sup>                 |                                       |                  |     |            |     |
| g) NO OF TURNS PER PHASE                             |                                       |                  |     |            |     |
| h) OUTER DIA. mm                                     |                                       |                  |     |            |     |
| i) INSIDE DIA. mm                                    |                                       |                  |     |            |     |
| j) AXIAL LENGTH mm                                   |                                       |                  |     |            |     |
| k) NO OF COILS PER PHASE                             |                                       |                  |     |            |     |
| 13                                                   | BUSHING                               |                  |     |            |     |
| 14                                                   | MINIMUM CREEPSPACE DISTANCE           |                  |     |            |     |
| 15                                                   | LOSSES                                |                  |     |            |     |
| 16                                                   | MAXIMUM TOTAL LOSSES @ 50%            |                  |     |            |     |
| 17                                                   | MAXIMUM TOTAL LOSSES @ 100%           |                  |     |            |     |
| 18                                                   | TANK                                  |                  |     |            |     |
| 19                                                   | SIDE WALL THICKNESS mm                |                  |     |            |     |
| 20                                                   | TOP & BOTTOM PLATE THICKNESS mm       |                  |     |            |     |
| 21                                                   | OIL USED                              |                  |     |            |     |
| 22                                                   | NAME OF MANUFACTURER                  |                  |     |            |     |
| 23                                                   | GRADE                                 |                  |     |            |     |
| 24                                                   | VOLUME (Kgs.)                         |                  |     |            |     |
| 25                                                   | IN TANK (IN Ltrs.)                    |                  |     |            |     |
| 26                                                   | IN CONSERVATOR (IN Ltrs.)             |                  |     |            |     |
| 27                                                   | TOTAL (IN Ltrs.)                      |                  |     |            |     |
| 28                                                   | BREATHER                              |                  |     |            |     |
| 29                                                   | CAPACITY                              |                  |     |            |     |
| 30                                                   | RADIATOR                              |                  |     |            |     |
| 31                                                   | MAKE                                  |                  |     |            |     |
| 32                                                   | DETAILD HEAT DISSIPATION CALCULATIONS |                  |     |            |     |
| 33                                                   | APPROVED MAKE                         |                  |     |            |     |
| 34                                                   | ANY MAKE APPR BY CO.                  |                  |     |            |     |
| 35                                                   | EHV                                   |                  |     |            |     |
| 36                                                   | 126                                   |                  |     |            |     |
| 37                                                   | 145.5                                 |                  |     |            |     |
| 38                                                   | 4.5                                   |                  |     |            |     |
| 39                                                   | 150                                   |                  |     |            |     |
| 40                                                   | ANY MAKE APPR BY CO.                  |                  |     |            |     |
| 41                                                   | 500 gms                               |                  |     |            |     |
| 42                                                   | ANY MAKE APPR BY CO.                  |                  |     |            |     |
| 43                                                   | TO BE ENCLOSED                        |                  |     |            |     |

Test Report No. RP-1920-004065

Date 30/04/2019

Product 63 KVA D.T.

Verified by MP

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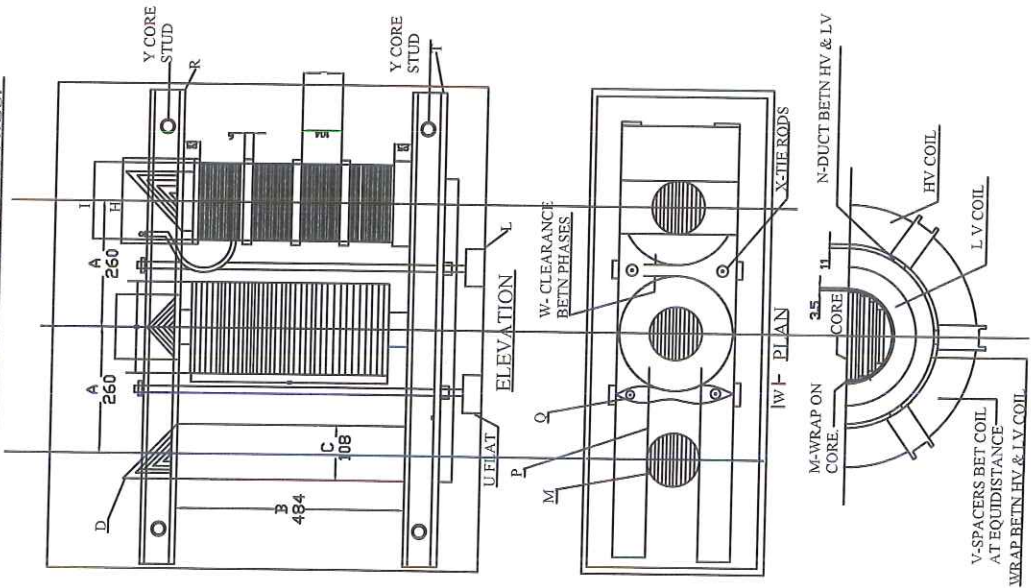
  

**RAJASTHAN POWERGEN TRANSFORMER PVT. LTD.**  
 KAROLA-BHINMAL ROAD KAROLA SANCHORE-343041

TECHNICAL DETAIL DRAWING  
 63 KVA 11/0.433 KV DIST. TRANSFORMER  
 ENERGY EFFICIENCY LEVEL-2

DRG.NO.: RP/TPL-TD-63KVA-03-2019  
 DATE: 16.03.2019

# WINDING & CONSTRUCTION DETAILS.



Test Report No. RP-1920-004065  
 Date 30/04/2019  
 Product 63 kVA  
 Verified by Mr. D. T.  
 Verification of this drawing by ERDA is limited to relevant dimensional checks only.  
 Verified dimensions are marked with \*\*\*

NOTE:  
THICKNESS OF SPACER = 3MM

| CORE       | DESCRIPTION                           | AS PER TECH SPECIFIED. | AS FOR OFFER |
|------------|---------------------------------------|------------------------|--------------|
| A          | LEG CENTRES mm.                       |                        | 260          |
| B          | WINDOW HEIGHT                         |                        | 484          |
| C          | CORE CIRCLE mm.                       |                        | 108          |
| D          | NO OF STEPS                           |                        | 13           |
|            | EFFECTIVE CORE AREA CM <sup>2</sup>   |                        | 84.23        |
| L.V. COIL  |                                       |                        |              |
| E          | OUTER DIA IN mm.                      |                        | 160          |
| F          | INSIDE DIA IN mm.                     |                        | 115          |
| G          | AXIAL LENGTH mm.                      |                        | 437          |
|            | CONDUCTOR CROSS SECT. mm <sup>2</sup> |                        | 84.68        |
|            | CONDUCTOR INSULATION                  |                        | DPC          |
| H.V. COIL  |                                       |                        |              |
| H          | NO OF HV COIL PER PH.                 |                        | 4            |
| I          | OUTER DIA mm.                         |                        | 250          |
| J          | INSIDE DIA mm.                        |                        | 182          |
|            | AXIAL LENGTH mm.                      |                        | 104          |
|            | CONDUCTOR CROSS SECT. mm <sup>2</sup> |                        | 2.2167       |
|            | CONDUCTOR INSULATION                  |                        | S.E.         |
| INSULATION |                                       |                        |              |
| K          | INSULATION BETWEEN (TAP COILS) mm.    |                        |              |
| L          | BASE PLAT INSULATION mm.              |                        | 2            |
| M          | GAP BETWEEN CORE & L.V. mm.           | 3.5                    | 3.5          |
| N          | WEDGES BETWEEN HV & L.V. COILS NO.    |                        | 6            |
| O          | GAP BETN HV & L.V. mm.                | 11                     | 11           |
| P          | FRAME CHANNEL INSULATION              |                        | 2            |
| Q          | PHASE BARRIER mm.                     | 2 x 1                  | 2 x 1        |
| R          | END INSULATION mm.                    | 25                     | 25           |
| S          | CLEARANCE TO TANK WALL mm.            | 30                     | 30           |
| T          | FROM HV WDG                           |                        |              |
| U          | BOTTOM FRAME SIZE ISMC mm.            | 75 x 40                | 75 x 40      |
| V          | BASE M.S. PLAT SIZE mm.               | 40 x 10                | 40 x 10      |
| W          | NO OF SPACERS BETN TWO HV COILS       | 6                      | 6            |
| X          | INTER PHASE CLEARANCE mm.             | MIN 10 mm              | MIN 10 mm    |
| Y          | TIE ROD SIZE & NO.                    |                        | 12 mm x 4    |
| Y          | CORE STUD SIZE & NO.                  |                        | 12 mm x 4    |

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

INTERNAL ARRANGEMENT DRAWING  
 63 KVA 11/0.433 KV DIST. TRANSFORMER  
 ENERGY EFFICIENCY LEVEL -2

DRG.NO.: RPTPL-IA-63KVA-04-2019



DATE: 16.03.2019