



T4-78

HIGH VOLTAGE, LOW CURRENT DRY ARC TEST APPARATUS (DRT 12500 V) UL 746A

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KEYWORDS

T4-78 HIGH VOLTAGE, LOW CURRENT DRY ARC TEST APPARATUS, IEC TEST EQUIPMENT, DRT, UL 746A, ASTM D495.

COMPLIANCE

It is constructed in compliance with UL 746A, ASTM D495.

INTRODUCTION

T4-78 HIGH VOLTAGE, LOW CURRENT DRY ARC TEST APPARATUS The purpose of this test is to determine High-Voltage, Low Current, Dry Arc Resistance Performance Level Categories of Solid Electrical Insulation

We designed HIGH VOLTAGE, LOW CURRENT DRY ARC TEST APPARATUS with the following goals:

- Reliability
- Maximum repeatability of test results
- Maximum comparability of test results
- Ease of operation
- Ergonomical design

The **BOLD** features below are some of advantages that were introduced to reach these goals.

MAIN FEATURES

- A power transformer rated at 900 VA, primary 120 V ac root-mean square 60 Hz, secondary open-circuit volts– 12500 V ac rms.
- Variable Autotransformer, autotransformer rated at more than 7 A adjustable
- Voltmeter, readable to 1 V in the range 90 to 130 V, is permanently connected across the output of the autotransformer to indicate the voltage supplied to the primary circuit.
- Line voltage stabilizer.
- Milliammeter, ac milliammeter capable of reading from 10 to 40 mA with an error of not over $\pm 1,5\%$ normally shorted out by a by-pass switch.
- Current Control Resistors, R10, R20, R30, R40 - adjustable to
- permit exact settings of the currents during calibration.
- Closing switches S20, S30 and S40 are controlled by Siemens LOGO microcontroller
- Suppressing Resistor, R3—Rated at $15\,000\ \Omega$ and at least 24 W
- Air Core Inductors for suppressing parasitic high frequency in the arc circuit. Inductance totaling from 1.2 to 1.5 H is obtained from 8 coils of enamel-covered wire. Each coil consists of 3000 to 5000 turns of wire wound on insulating nonmetallic cores of about $\frac{1}{2}$ in. (12.7 mm) diameter and $\frac{5}{8}$ in. (15.9) inside length.
- Interruptor, SIEMENS Microcontroller is used to give the required cycles for the three lower steps of the test by opening and closing the primary circuit according to the schedule in Table 1 SIEMENS microcontroller also operates as Timer
- Door safety protection switch - test voltage can only be applied when doors are closed
- Sharpening Jig for Tungsten Rod Electrodes—A steel jig for securing the electrodes during sharpening to ensure finishing the pointed tips to the proper geometry. Electrodes are ground so that the end of the rod form an angle of 30° to the axis
- Stainless Steel Strip Electrodes— Cut 0.006 in. (0.15 mm) thick stainless steel into $\frac{1}{2}$ by 1 in. (12.7 by 25.4 mm) strips. (The edges must be free of burrs.)
- Tungsten Rod Electrodes $\frac{3}{32}$ in. (2.4 mm) diameter tungsten rod 45 mm long
- Electrode assembly is so designed that it enables exerting a force of 50 \pm 5 g of each electrode on the top of the specimen.
- Housing is so designed, that prevents the specimen from air drafts, and allows venting of combustion products
- Stainless Steel Strip Electrode Assembly: two stainless steel strip electrodes spaced at 6.35 ± 0.08 mm apart, and at angles of 45° .
- Tungsten Rod Electrode Assembly enables positioning of the electrodes so that they lie in the same vertical plane and are both inclined 35° from the horizontal, and tips are 6.35 ± 0.08 mm apart. It is so designed, that the following factors can be controlled: (a) axis of tungsten rod is perpendicular to the axis of the support rod, (b) support rods are gripped in the pivot blocks in a position such that the axis of each electrode is

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inclined at 35° when the support rods are horizontal, (c) electrodes are mounted in square shanks and sharpened in a correctly made jig, and (d) the spacing between electrode tips is adjusted with the support rods in a horizontal position.

- **Electrodes are easily removable for cleaning, grinding purposes or replacement**
- Table for sample positioning is **free-standing** and enables precise height leveling by thumb screw. It is **removable** to enable easy cleaning.
- Easy removable sample support glass
- Removable bottom lining for easier cleaning
- **Siemens LOGO programmable microcontroller** for adjustment and control of most parameters
- Push buttons for switching the voltage ON and OFF
- START/STOP push-button
- Mains switch
- Signal lamp - failure indication
- Anodized aluminum front plate, with inscriptions that clearly explain the function of **each** component on the front plate
- Light switch

DESCRIPTION

Control unit is built in metal sheet housing and consists of all elements needed to control and monitor the electrical parameters of the test.

On the front plate are the following elements: mains switch with fuse and appliance inlet push buttons for switching the voltage ON and OFF (it is only possible to turn on the voltage when the doors of electrode unit are closed), voltage indication light and instrument, SIEMENS microcontroller, START/STOP push-button and other switches.

Electrode mechanism is mounted on the vertical base plate above the control unit. The complete assembly can be easily taken to pieces for cleaning purposes by enclosed Allen key (Hex wrench). Electrode assembly enables different adjustments that can be preformed to meet standard requests. All settings are simple and are done either by thumb-screws or by Allen head screws.

Each electrode has engraved serial number that enables its traceability and certification.

Electrodes are fixed in jointed holders that enable adjustment of angle and height leveling.

Sample support table is made of anodized aluminum. On top of it is 5 mm sample support glass plate. Table is equipped by two thumb-screws. One is for precise height adjustment and the other one for arresting adjusted position. Both, table and glass plate are completely removable for cleaning purposes.

DESIGN

Table top apparatus solid case, Non-sensitive, scratch-resistant surfaces through powder-coating, side panels, Al extrusion, RAL 7016, Frame, Al die-cast, RAL 7016, Base and cover, Al, 1.5 mm, RAL 9006, with GND/earthing connection, case feet with anti-slip protection, front plate and rear panel anodized aluminum 2,5 mm.

Internal and external dimensions in accordance with: IEC 60297-3. Type of protection IP 20 in accordance with IEC 60529, Protective GND/earthing connections in accordance with: IEC 61010, DIN EN 50178 / VDE 0160, DIN EN 60950 / VDE 0805, DIN EN 61010-1 / VDE 0411 part 1, DIN EN 61010-1A2 / VDE 0411 part 1/A1.

Doors are equipped by safety switch that disconnect the voltage if the doors are opened.

All parts of mechanism are nickel plated, anodized aluminum or made of stainless steel (AISI 304, DIN W. No. 1.4301 X5CrNi18-10) or (AISI 316, DIN W. No. 1.4401 X5CrNiMo17-12-2) http://en.wikipedia.org/wiki/Stainless_steel.

TECHNICAL SPECIFICATION

Supplying voltage 220V, 60Hz
Power consumption approx. 1000VA

Test voltage: 12500 V

A current-limiting resistor bank, with a variable nominal resistance of 2.2 megohms, capable of limiting the short-circuit current at the electrodes to 2.36 mA.

V-meter digital, more than 12500 V max.,
A-meter digital, 50 mA, accuracy better than $\pm 1,5\%$ digit

Microcontroller Siemens LOGO or timer

Electrodes Tungsten Rod Electrodes made of from $\frac{3}{32}$ in. (2.4 mm)
diameter tungsten rods

Dimensions (approx.)

WxDxH 470 x 490 x 535 mm

CALIBRATION CERTIFICATES

Certificates for voltage, dimensions of electrodes, dimensions of distance gauge, are available on request, but are not included in the price.

OTHER CONDITIONS

Warranty: 2 years

Support by E-mail: support@testing.si

On line Skype VIDEO Support: Testing_support, matejsimonic

We will be glad to help you solve your problems and to hear any feedback from you.

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