PE-AORDF-1 Fully Automatic Oil Resistivity & Dissipation Factor Tester

Oil suffers from electrical and mechanical stresses while a transformer is in operation. In addition there are contaminations caused due to chemical interactions with windings and other solid insulations, catalyzed by high operating temperature. As a result the original chemical properties of Transformer Oil changes gradually, rendering it ineffective for its intended purpose after extensive usage. Hence this oil has to be periodically tested to ascertain its basic electrical properties, and make sure it is suitable for further use, or be able to advise necessary filtration / regeneration to be done.

Features

- Complete automatic test procedure. Once test voltage is selected, it applies excitation to the 3-terminal Oil cell, measures R, C, DF, and then displays and prints the results on integrated printer
- High Accuracy, Best resolution in its class
- Programmable AC & DC test voltages
- Pure Sine test operation for AC measurements and low ripple for DC measurements
- Heater interfaced with main unit for temperature set, control and display
- Multiple temperature set values programmable
- Facility for measuring or inputting Cell Constant for Resistivity and Dielectric Constant
- SF6 Gas Capacitor integrated inside for std reference
- Big color Touch-screen 7” TFT LCD with backlit for user convenience
- Integrated panel printer for immediate printing
- Pre-programmed 9 test sequences, and user-programmable 10 test sequences
- USB2.0 interface for PC
- On-site calibration possible for yearly schedule
- Optional RS232 interface with PC software, for Automated Laboratory setup (LIMS)

PE-AORDF-1 Fully Automatic Oil Resistivity & Tan-Delta

tester is an integrated unit, consisting of Heater unit and Measuring Bridge. The Stainless Steel oil cell is to be mounted inside the HF Induction heater cubicle, and HV is engaged to it automatically. Measuring Bridge consists of AC/DC high voltage supply, Tera-ohm meter, and precision electronic bridges to measure & derive the readings for

**Resistivity**

**Capacitance**

**Power Factor**

**Tan-Delta**

**Watt-Loss**

**Dielectric Constant**

**Temperature**

Pre-programmed international test methods compliant to

- ASTM-D924-04
- ASTM-D1169
- VDE-0380-2
- IEC-60247
- IEC-61620
- BS-5737
- IS-6262/6103
- NBR 12133
Operation

The PE-AORDF-1 has been designed to be used in extreme atmospheric conditions and rough handling by experienced but unskilled persons. The user interface is either a touch panel graphical LCD, or through the PC software. Parameters can be set on both sides, and display and printing of test results can too be done either side. The user has to either select from an array of pre-programmed test options including most international standards, or his own customized test sequence. He has to then load the Oil cell with Oil and put it in the heater compartment, connect the HV, LV and GND wires to the Oil test cell and the main equipment, and then press the Start Test button on the display. The user can then rest while the equipment controls the Heater to take it up to the programmed elevated temperature and upon reaching that temperature, measures all the necessary readings. Exception is only in the case of measuring Dielectric Constant, whereby user has to first load a clean empty test cell, and then upon prompting by the equipment, reload it with an oil filled test cell. De-polarization is done automatically between AC and DC measurements to avoid faulty readings. The test results are then automatically stored in the internal memory with the unique ID that was allotted at the time of start of test. The synopsis of the test results is automatically printed on the integrated thermal printer. The user can anytime access the last 99 stored records on the internal non-volatile memory of AORDF-1 thro a PC, and print them on the local printer or store them for future reference.

Safety

User safety has been given paramount importance while designing, followed by instrument safety. Integrated interlocks have been designed to make sure that despite connection errors, the automatic systems prevent the user and instrument from any hazards. Important safety features that have been incorporated are
- **Ground Open interlock.** The set will not function ahead unless a proper Gnd is provided to the instrument
- **Different pin systems** on test leads and terminals for Temp & LV connection, that cannot be mated together
- **Ultra fast blow fuse** installed internally to avoid accidental short-circuit
- **High-Voltage suppressor** and **line filters** integrated to avoid supply fluctuation and effect
- **Completely shielded test leads,** tested with 1.5 times test voltage to avoid shock hazard to user
- **Automatic discharging** of test object (Oil cell) after test completion to avoid residual charge impact on user
- **Heater incorporated with Fire retardant** materials to restrict hazards

Specifications

**Input**
- Power Supply – Single Phase 220V AC 50 Hz + 10%
- Input pin type – Round 3-pin (L, N, E). European, Australian, US pin types available on request
- Measuring Bridge VA – max 500VA
- Heater VA – max 500VA

**Heater**
- Temperature Range – ambient to 110 deg C, resolution 0.1 deg C
- Temperature error – 0.5 deg C (max)
- Time to 100 deg C – < 20 mins
### Test Voltage
- For Dielectric Constant & Tan-Delta
  - 60V to 2000V AC (in steps of 1V)
- For DC Resistivity
  - 100V to 2000V DC (in steps of 1V)
- Accuracy of Voltage setting
  - ± (1% of set value + 10V)

### Measured Parameters
- Tan Delta range
  - 0 to 4
- Tan Delta resolution
  - 0.000001 (10⁻⁶)
- Tan Delta Accuracy
  - ± 1% of reading ± 0.00005
- Capacitance range
  - 0.1pF to 1000 pF
- Capacitance resolution
  - 0.1 pF
- Capacitance Accuracy
  - ± 0.1%
- Dielectric Constant range
  - 1 to 20 when using a typical test cell (C ~ 50-60pF)
- Dielectric Constant resolution
  - 0.001
- Dielectric Constant Accuracy
  - ± 0.1%
- Resistance Range
  - 1 MΩ to 10 TΩ (not calibrated above 10TΩ)
- Resistance Resolution
  - 4 digits
- Resistance Accuracy
  - 5% of reading over entire range, 10% beyond 1TΩ
- Resistivity Range
  - 500 MΩ cm to 10000 TΩ cm (for typ Cmin = 55pF)
- Resistivity Resolution
  - 4 digits
- Resistivity Accuracy
  - 5% of reading over entire range, 10% for > 500 TΩ cm

### Atmospheric
- Storage Temp
  - minus 20 deg C to +60 deg C
- Operating Temp
  - minus 10 deg C to +50 deg C
- Humidity
  - < 90% non-condensing

### Physical
- Size
  - 200mm(H) × 375mm(W) × 450mm(D)
- Gross Weight
  - 27 kgs (incl accessories), except packing
Standard Accessories

Test equipment – 1 no *
Heater unit – 1 no
Closed cup SS Oil cell – 1 no
Printer roll – 1 no (already loaded), plus 1 spare roll
Connecting AC mains cable – 1 no
Connection test leads – 1 set
User manual (Video CD) – 1 no
Test certificate – 1 no
Warranty Certificate – 1no (Standard warranty 1 yr)

* Default language is English. Spanish, French and Portuguese language options also available, but need to be defined before placing order.

Note – Power Electronical reserves the right to change product specifications for continual improvement. Please order a fresh copy of specs from contact@powerelectronical.com, before placing new orders. Jurisdiction limits within territory of Republic of India only.

Our other Products are —

- Automatic Cap & Tan Delta test system 10kV / 12kV
- Manual C&DF test system 12kV
- Automatic Oil Breakdown Voltage Tester 80kV / 100kV
- Motorised Oil BDV set 0-100kV
- Hipot AC/DC Testers up to 500kV
- Insulation Testers (10M to 1ST, 2% accuracy)
- High Voltage Breakdown testers (10kV-50kV)
- SF6 Gas filled Standard Capacitors (upto 1000kV)

PREVENTION is better and cheaper than CURE
Trust the experts!!