



## Features

- ✓ Dissipation Factor, Volume Resistivity, Dielectric Constant (Permittivity), Watt Loss
- ✓ Inbuilt test cell heating and cooling systems with precise temperature control
- ✓ Test Cell according to IEC 60247 help for easy assembly and Cleaning
- ✓ Preprogrammed & Customized Test Sequences
- ✓ Inbuilt Thermal Printer
- ✓ Internal Memory for 250 Test
- ✓ USB Interface
- ✓ Portable Calibrator
- ✓ Oil Auto Drain Facility
- ✓ Auto Sequence Test
- ✓ Bluetooth enabled for Motware Mobile App
- ✓ Calibration certified to ISO 17025



## MOTR

### Oil Tan Delta & Resistivity Tester

CAT III	IP	CE	USB	Bluetooth
600V	54			

Motwane's MOTR is a microprocessor-based compact designed for precise measurement of the dissipation factor and volume resistivity of insulating oils. MOTR is built in a single unit and on boarded with international test standards for automatic measurement of all parameters and also available with customized test sequences to conduct tests as per the user's requirement. The test cell is designed as per IEC 60247 with precise control for measuring dissipation factor and resistivity at 27°C & 90°C. MOTR also has an auto drain facility. It is provided with internal memory & printer for on-field reports and also has a USB interface available for data transfer. The calibrator with standard dissipation factor & resistivity ranges are available for validating the performance of MOTR.

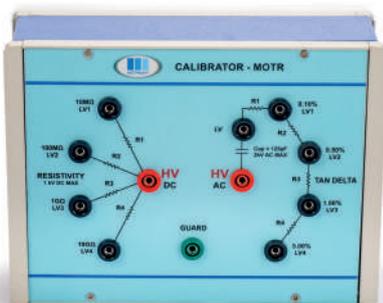
## Applications

The dissipation factor indicates the dielectric loss of the liquid and thus it's dielectric heating. The dissipation factor test is widely used as an acceptance and preventive maintenance test for insulating oil. The dissipation factor of new oil should not exceed 0.05 % and the dissipation factor can gradually increase in service to a value as high as 0.5%, in most cases, indicating deterioration and/or contamination with moisture, carbon, varnish, glyptal, sodium soaps, or deterioration products.

Used Oil having a dissipation factor of less than 0.5% is usually considered satisfactory for service and with dissipation factor between 0.5% and 2% should be considered as being in doubtful and further investigation recommended and in excess of 2.0 % may be an operational hazard. It should be reconditioned or replaced.

**Useful for measuring the quality of insulating oil, used in electrical apparatuses like:**

- Power & Distribution Transformers
- OLTC
- HV Cables
- Switchgear
- Capacitor
- Bushing
- Instrument Transformer



Calibrator



Test Cell

## Technical Details

## MOTR

### Technical Specification

<b>Measuring Parameter</b>	Dissipation Factor, volume resistivity, Dielectric constant, watt loss
<b>Tan Delta Measurement or Dissipation Factor range</b>	1 x 10 <sup>-6</sup> to 4.0
<b>Resolution</b>	1 x 10 <sup>-6</sup>
<b>Accuracy</b>	±1% of reading ± 0.0001 (1 x 10 <sup>-4</sup> )
<b>Relative Permittivity or Dielectric constant Measurement Range</b>	1 to 30
<b>Resolution</b>	0.001
<b>Accuracy</b>	±0.1% + 10 digits
<b>Resistivity Measurement or Volume Resistivity range</b>	10 <sup>-6</sup> TO 10 <sup>-13</sup> Ohm Cm 1MΩm to 1000 TΩm
<b>Resolution</b>	0.001
<b>Accuracy</b>	±2% at 10 <sup>-9</sup> TO 10 <sup>-15</sup> cm ±5% at 10 <sup>-13</sup> TO 10 <sup>-14</sup> cm ±10% above 10 <sup>-14</sup> cm
<b>AC Voltage</b>	400v-2400V
<b>DC Voltage</b>	100V - 1000V
<b>Resolution</b>	1V
<b>Accuracy</b>	±2%, ±1V
<b>Results Frequency</b>	Tandelta - 45 - 55Hz

### Test Cell

<b>Cell Constant</b>	620 Nominal
<b>Capacitance</b>	55pF + 1pF
<b>Insulation</b>	Teflon (PTFE)
<b>Electrode Spacing</b>	2 mm
<b>Volume of Oil</b>	60ml

### Heater:

<b>Temperature Range</b>	20°C - 150°C
<b>Accuracy</b>	+0.5°C
<b>Resolution</b>	0.1°C
<b>Temperature Control</b>	One set point (max110°C)
<b>Heating Element</b>	Induction Type
<b>Sensor</b>	Solid state (Pt100)

### Environmental Specifications

<b>Operating Temperature Range</b>	0°C - 50°C, 90% non-condensing
<b>Storage Temperature Range</b>	-10 to 55deg
<b>Humidity</b>	95% Non condensing
<b>Dimensions</b>	510mm(L) x 320mm(W) x380mm(H)
<b>Weight Instrument</b>	24 Kg.
<b>Interface</b>	USB Type B
<b>Test Standards</b>	IEC 60247, VDE 0380, BS 5737, ASTM D924, ASTM D1169, JISC2101:20104
<b>Display</b>	Alphanumeric LCD Display
<b>Printer</b>	Inbuilt Thermal Printer
<b>Memory</b>	250 Test
<b>Power Supply</b>	110V / 230V, 50/60Hz +15% Single Phase
<b>Power Consumption</b>	< 250VA @ 230V / 50Hz
<b>IP Rating</b>	IP54 with Carrying Case
<b>EMC</b>	IEC61010-1, IEC61326-1
<b>Oil test cell heater</b>	Induction type
<b>Optional Auto Drain Feature provided</b>	
<b>Safety-1</b>	Interlock provided in heating chamber to connect the oil cell
<b>Safety-2</b>	Emergency stop provided on front panel

### Accessories

#### Standard

■ Test Lead	: 1 Set.
■ Oil Test Cell with 3 terminals	: 1 No.
■ Standard Calibrator	: 1 No.
■ Pen Drive with PC Communication software	: 1 No.
■ USB Cord	: 1 No.
■ Test & Calibration Certificate	: 1 No.
■ Instruction Manual	: 1 No.

**Technical Details****MOTR****Optional**

- Oil Auto Drain Facility

**Note:**

- Bluetooth Software (Optional)
- Motware Desktop Application (Optional)

**ORDERING INFORMATION**

<b>Product</b>	<b>Order Code</b>
<b>MOTR with Standard Accessories</b>	<b>109614010</b>