

HZJD-2Z

Automatic $\tan\delta$, permittivity & DC resistivity



Test cell, temperature control, AC/DC sources and standard capacitor in a single automatic instrument

HZJD-2Z

Insulating oil dielectric loss & resistivity tester

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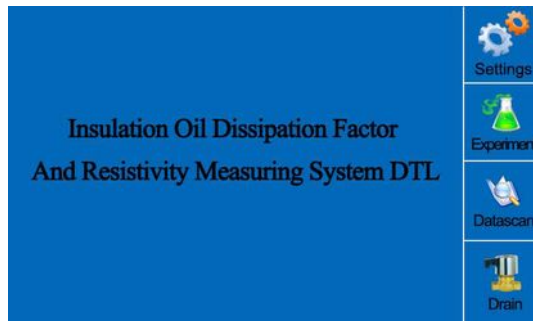
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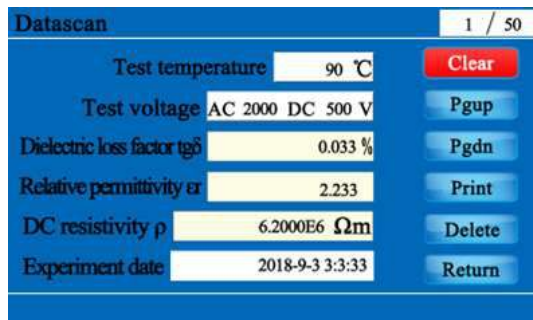
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Measures the dielectric dissipation factor ($\tan\delta$), relative permittivity and DC resistivity of insulating oil, transformer oil and other insulating liquids.

Description and touch interface



Guided main menu on the 800×480 full-touch colour screen



DataScan recalls any of the stored records with its full result set

All-in-one architecture

The HZJD-2Z integrates the three-electrode test cell, the temperature controller and sensor, the dielectric-loss bridge, the AC test source, the SF₆ standard capacitor, the high-resistance meter and the DC high-voltage source into a single instrument. Measurement is full digital and fully automatic, so any operator, without specialised training, obtains repeatable, storable and printable results.

Touch interface and automatic report

- Guided menu on an 800×480 full-touch colour display, with dedicated keys for settings, test, DataScan and oil drain.
- Automatic test report showing oil-cup capacitance Cx, dielectric loss factor $\tan\delta$, relative permittivity ϵ_r and DC resistivity ρ , with on-board printing.
- DataScan stores and recalls up to 100 records, each with test temperature, test voltage, $\tan\delta$, ϵ_r , ρ and the date and time of the test.
- Built-in oil-drain control, with confirmation prompt, to empty the cell without removing it between tests.

Where it is used

- Power transformers and other critical assets.
- Substations and transmission and generation facilities.
- Oil laboratories and acceptance or maintenance testing.



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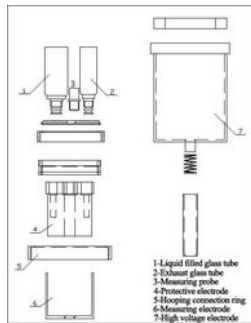
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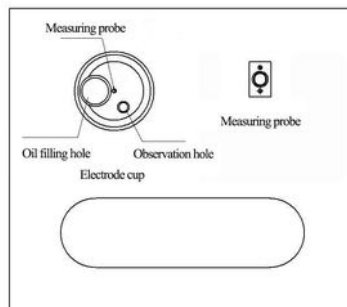
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A three-electrode test cell with a 2 mm electrode gap eliminates stray-capacitance and leakage effects on the result.

Measurement workflow and test cell



Exploded view of the three-electrode oil cup



Top view: oil filling hole, observation hole and measuring probe

Six-step automatic measurement

- Load and connect: place the cleaned test cell in the groove and connect the test cable and temperature probe.
- Set conditions: define temperature (0-125 °C), AC voltage (500-2000 V) and DC voltage (0-500 V).
- Dry-cell calibration: run the empty-cup calibration; the data is auto-saved for accurate ϵ_r and p .
- Fill sample: pour about 40 mL of oil, refill the inner electrode and let bubbles settle for over 15 minutes.
- Automatic test: select $\tan\delta/\epsilon_r$ and/or DC resistivity; the instrument completes the test automatically.
- Store and print: results are stored, recalled via DataScan and printed; drain the cell for the next test.

Three-electrode test cell

Compliant with the international standard for this type of cell, the 2 mm gap between the high-voltage and measuring electrodes eliminates the effect of stray capacitance and leakage on the $\tan\delta$ result. An integrated oil-drain solenoid empties and rinses the cell in place with the sample, without removing it between tests.



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Measuring ranges, accuracy and resolution

Parameter	Range	Accuracy	Resolution
Capacitance	5 pF - 200 pF	$\pm(1\% \text{ of reading} + 0.5 \text{ pF})$	0.01 pF
Relative permittivity	1.000 - 30.000	$\pm 1\% \text{ of reading}$	0.001
Dielectric loss factor ($\tan\delta$)	0.00001 - 100	$\pm(1\% \text{ of reading} + 0.0001)$	0.00001
DC resistivity	2.5 M Ω ·m - 20 T Ω ·m	$\pm 10\% \text{ of reading}$	-

Resolution not published by the manufacturer for DC resistivity.



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Test parameters and power supply

Test voltage AC (RMS)	500 - 2000 V, continuously adjustable, 50 Hz
Test voltage DC	0 - 500 V, continuously adjustable
Measured temperature range	0 - 125 °C
Temperature measurement error	±0.5 °C
Temperature control method	Medium-frequency induction heating, non-contact, with PID control
Thermal limiting relay	Stops heating above 120 °C
Voltage supply	AC 220 V ±10%
Power frequency	50 Hz / 60 Hz ±1%
Power consumption	100 W



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Physical data, environment and standards

External dimensions (W×D×H)	500 × 360 × 420 mm
Total weight	22 kg
Ambient temperature	0 - 40 °C
Relative humidity	< 75 % RH
Standards and compliance	CE; IEC 60247; ASTM D924; ASTM D1169; GB/T 5654-2007; GB/T 507-2002; DL 429.9-91; DL/T 846.7-2004



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Three-electrode test cell and standard capacitor

HV-LV electrode distance	2 mm
Dry-cell capacitance	$60 \pm 5 \text{ pF}$
Max. test voltage (power frequency)	2000 V
Dry-cell loss	$\tan\delta < 1 \times 10^{-4}$
Liquid capacity (sample volume)	~40 mL
Electrode material	Stainless steel
Cell volume	70 mm (D) $\times$ 120 mm (H)
Standard capacitor	SF ₆ gas-filled, three-electrode reference; loss and capacitance independent of ambient temperature and humidity

Dry-cell (empty-cup) calibration is auto-saved for accurate relative permittivity and DC resistivity calculation.



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Scope of supply

Main engine	1
Oil cup	1
Oil tube	1
Dedicated test cable	1
Temperature probe cable	1
50 mL measuring cylinder	1
Power line	1
Fuse pipe	2
Thermal print paper	2
Allen wrench (5×30)	1
Allen wrench (1.5×15)	1
User manual	1

Safety: the instrument must be reliably grounded before use. The protective cover interlocks the heating and high-voltage circuits. During a test, high voltage and high temperature are present: do not touch the test cell, cable or sockets while energised.