KP-HF50

Neutral Electrode Contact Impedance Tester

IEC 60601-2-2:2017 Clause 201.15.101.6 | GB 9706.202-2021

Dedicated high-frequency test platform

Designed to evaluate the electrical connection between a neutral electrode application surface and its cable connection. The instrument supplies controlled sine-wave excitation at the principal test frequencies and supports impedance evaluation for conductive electrodes or capacitance evaluation for capacitive electrodes.

Typical users
Medical-device laboratories, certification bodies, neutral-electrode manufacturers and electrosurgical accessory R&D teams.

200 kHz - 5 MHz	>200 mA RMS	12 Vrms max.
principal test points	at load <=50 ohm	approx. 36 Vpp

Key Capabilities

- Selectable sine-wave output at 200 kHz, 500 kHz, 1 MHz, 2 MHz and 5 MHz
- RMS voltage/current data support for impedance or capacitance calculation
- Color touchscreen operation; optional PC-controlled automated workflow
- BNC output interface and wide AC input supply for laboratory deployment

Technical Specifications

Model	KP-HF50
Applicable standards	IEC 60601-2-2:2017 / GB 9706.202-2021
Referenced test method	Clause 201.15.101.6 - neutral electrode contact impedance
Test object	Neutral electrodes for high-frequency surgical equipment
Signal waveform	Sine wave
Principal test frequencies	200 kHz, 500 kHz, 1 MHz, 2 MHz, 5 MHz
Frequency accuracy	<= +/-0.1%
Maximum output voltage	12 Vrms (approximately 36 Vpp), load >=50 ohm
Maximum test current	>200 mA RMS, load <=50 ohm
Current measurement accuracy	< +/-5%
Current measurement frequency range	50 kHz to 5 MHz
Output interface	BNC
Control mode	Color touchscreen / PC control
PC test software	Optional
Power supply	AC 100-220 V +/-10%, 50/60 Hz
Dimensions	320 x 260 x 150 mm
Weight	Approximately 2 kg

Measurement Principle

Conductive neutral electrode
Contact impedance is derived from RMS high-frequency voltage and current:

Zc = Utest / Itest

Capacitive neutral electrode
Contact capacitance is derived from current, voltage and frequency:

Cc [nF] = (Itest x 10^6) / (2 x pi x ftest x Utest)

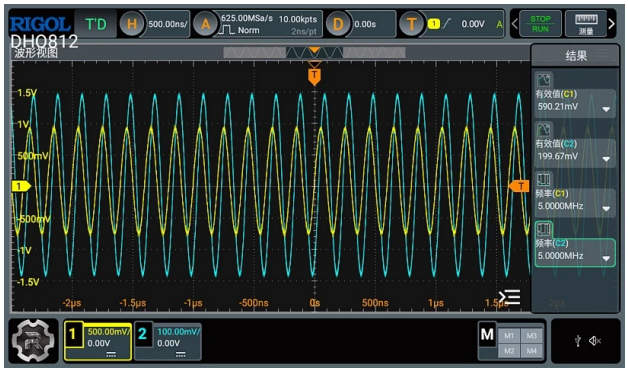
The applicable acceptance criteria, sample quantity and conditioning shall be confirmed against the laboratory-controlled edition of the standard.

Typical Test Workflow

1	**Position the neutral electrode** Place the complete application surface securely against a conductive metal plate.
2	**Connect the measurement circuit** Connect between the metal plate and the electrode cable conductor using suitable fixtures.
3	**Apply HF excitation** Set the required sine-wave frequency and establish the specified test current.
4	**Acquire RMS values** Record true-RMS voltage and current with suitable high-frequency measurement bandwidth.
5	**Calculate and assess** Calculate contact impedance or capacitance, then compare with the applicable controlled test plan.

Representative Waveforms

500 kHz voltage/current waveform



5 MHz voltage/current waveform

System Boundary

The KP-HF50 is a dedicated neutral-electrode contact impedance test instrument, not a general-purpose electrosurgical unit analyzer. A complete laboratory arrangement may additionally require a conductive metal plate, electrode-specific fixture or cable, true-RMS voltage/current measurement equipment, a compatible oscilloscope and optional PC software. Confirm the complete configuration before quotation.

Configuration & Ordering Information

To define a defensible test setup, specify the following before ordering:

- Applicable standard, edition and clause
- Neutral electrode type: conductive or capacitive
- Electrode cable and connector configuration
- Required test frequencies and test current
- Existing oscilloscope or RMS measurement equipment
- Manual or automated test requirement
- Required test plate, fixtures and accessories
- Calibration points, certificate type and documentation requirements

Standard & Scope Notes

Purpose	Evaluation of the electrical connection between the neutral electrode conductive surface and the cable connection near the electrode.
Conductive electrode result	High-frequency contact impedance, calculated from RMS voltage and current.
Capacitive electrode result	Effective contact capacitance, calculated from RMS voltage, RMS current and test frequency.
Compliance statement	The instrument is designed to support the referenced test method. Final DUT compliance depends on the controlled standard edition, complete setup, specimen conditioning and acceptance criteria.

Contact KingPo

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Specifications and supplied accessories are subject to confirmation in the final quotation. Product images are representative. Datasheet revision: 2026-08.