# AC Resonant Test Systems

PHENIX TECHNOLOGIES

AC Resonant Test Systems measure dielectric breakdown and dielectric strength of electrical equipment and insulating materials at all levels of commercial power frequencies.

PHENIX offers:

- Ratings from 15 kV to over 2 million Volts, 50 or 60 Hz
- Variable Inductance systems and Variable Frequency systems from 20 to 300 Hz
- High Q ratings for low input current requirements
- Dead Tank and Insulated Cylinder designs
- Series and Parallel Resonance configurations
- Computer-assisted controls with user-friendly software
- Stand-alone systems for factory/laboratory use
- Transportable, skid-or truck-mounted for outdoor use

The information contained herein is an overview of Phenix Technologies' AC Resonant Test Systems. Please consult with your Phenix Technologies' Sales Representative for complete detailed specifications on PHENIX AC Resonant Test Systems.

**Phenix Technologies produces several configurations of variable voltage AC Resonant Test Systems and offers options to add significant testing capabilities. Our designs meet your testing requirements, space, and environmental conditions.**

CABLE | CIRCUIT BREAKER | GENERATOR | GIS SWITCHGEAR | INSULATION MATERIALS | MOTOR | TRANSFORMER

## Testing Applications

AC Resonant Test Systems are used where the load is largely capacitive with low loss such as power cables, gas insulated switchgear, generator windings, motors, and dry tests of insulator strings. Options may include partial discharge testing and tan § measurements. Phenix test sets are built for indoor or fair weather outdoor operation, but may be designed to operate in adverse outdoor conditions. Phenix also builds transportable variable frequency AC resonant test systems for field testing of installed power cables or generator windings, and other equipment (refer to PHENIX brochure no. 80400). These units can be used in field tests where reduced power consumption is required.

## Description

All Phenix AC Resonant Test Systems consist of two main components: a High Voltage Reactor and Regulator. The system's controls may be contained within the regulator cabinet or in a separate console. The component design depends on customer requirements and may include options necessary to perform at very high voltage levels. Substantial safety features are built-in to protect personnel and equipment from potential injury, loss, or damage. To protect against flashovers or short circuits, our units have an adjustable electronic overload circuit. The test sets have an input circuit breaker and backup overload protection in the primary input of the high voltage transformer. Additional safety features are included in our automated control software.

## On-Site Services and Calibration

Long-term customer support is provided from our fully experienced and knowledgeable staff. Phenix Technologies' service department offers assistance with on-site installation and operator training. We support our customers worldwide with a full-line of additional services such as on-site calibration, maintenance, upgrades and repair.

## Benefits of Resonant Testing

AC Resonant Test Systems have several major advantages over conventional AC dielectric test sets including:

- Much Lower Input Power Required
  - Input Power Required = Output Power / Test Circuit Quality Factor "Q"
  - In GIS testing, the test circuit "Q" is mainly determined by losses in the HV reactor, and is often > 100 at full load
- Low Fault Energy Compared to Transformer Sources
  - In conventional transformer circuits, maximum available power frequency follow through fault current is typically ≈ 10 x rated current
  - For series resonant circuits, Maximum Available Power Frequency Fault Current = Maximum Exciter Voltage / Reactor Impedance at Test Frequency = Rated Current / "Q"
- Low Distortion Test Voltage
  - Properly tuned resonant sources typically exhibit < 1% total harmonic distortion
  - The test circuit itself functions as tuned narrow band pass filter
- Excellent Mains Noise Rejection
  - The inherent low series capacitance of the series resonant circuit provides excellent blocking of mains noise voltages that appear as background noise in PD measurements
- Test equipment is reduced in both size and weight

**Control Box for Field Testing**

## Quality Construction Ensure Reliability

Our ISO9001 compliance ensures optimum standards of quality are met through each step of the design and manufacturing process resulting in a superior test system with an excellent service life. Prior to shipment, we conduct final tests and certifications at our facility where your representative can be present. Testing and operator training are available at that time.

PHENIX® TECHNOLOGIES


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