Testing Applications

Variable Frequency Resonant Test Systems are generally used where a lightweight, transportable unit is a requirement. Primary application is cable and rotating machine testing. Other test objects which are capacitive in nature such as cables, generators, and motors may also be tested. Non-mobile systems for factory or laboratory use are also available.

➤ Lightweight, transportable, easy to set-up
➤ Pure sinusoidal output voltage
➤ Complies with IEC 60517, IEC 62271-203, and IEC’s frequency range of 20 to 300 Hz
➤ Virtually maintenance free, no movable internal parts

Theory of Operation

A Variable Frequency Resonant Test System takes advantage of resonance theory. To achieve resonance, the capacitive reactance (test object) has to equal the inductive reactance (high voltage reactor). In a Variable Frequency Resonance System, the reactor is non-variable; therefore, the frequency of the circuit is adjusted until resonance is achieved. This adjustment of the resonant circuit is commonly referred to as “tuning”. Once resonance has been achieved only the resistive (real) losses in the circuit have to be supplied. The output voltage and the incoming power drawn from the mains is a function of the “Q” or quality factor of the circuit. The higher the system Q, the lower the incoming power requirement.
Phenix Technologies’ reactors are constructed in a grounded, painted steel tank encapsulating the oil insulated reactor coils. One of the main features of tank-type reactors is the capability to offer multiple output taps via a tap switch or multiple output bushings. When multiple reactors are connected in parallel, very high currents can be achieved. The unique reactor coil design is manufactured of radially laminated magnetic cores enclosed by copper windings. The use of high quality materials results in a low loss, high Q reactor. This design provides a lightweight and transportable test system. Tank-type reactors operate in series resonance mode.

At the heart of the system is a specially designed electronic regulator that converts the mains service into a variable voltage, variable frequency power source that is ideally suited for use with a Variable Frequency Resonant Test System. The excellent resolution and frequency stability maintain a reliable, controllable resonant test circuit.

High voltage protection or dampening impedances are supplied to provide protection to the system when a test object breakdown or flashover occurs. Fast transients are blocked and shunted to ground without causing damage to the high voltage components.

A high precision measuring system is designed to enable accurate measurements of voltages and currents. The metered information is displayed on the Human Machine Interface (HMI). The values displayed on the HMI are performed as a function of the Programmable Logic Controller (PLC).

Our systems function in compliance with IEC 60060, IEEE 4, and other recognized national and international industry testing standards.

Calibration Certificate traceable to NIST (National Institute of Standards and Technology, USA) is issued with every system. ISO17025 traceable voltmeter calibration is available as an option upon request.
Phenix Technologies uses the latest development in computer-assisted controls. Our configuration creates ease in set-up and simplicity in testing. The test system features a full-color, liquid crystal display and Ethernet port to select automation modes through a remote personal computer interface. The controls allow the operator to easily perform repeatable testing. All test data is collected by the data acquisition software and stored for later recall or test report generation.

Advanced Controls

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Testing of rotating machinery requires a system that is easily transported and packaged for frequent movement. Transport containers, sturdy shipping boxes and accessories such as shielded high voltage cables for the Variable Frequency Resonant Test System can be supplied by Phenix Technologies.

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Operator Training/Worldwide Service and Support

Commissioning and training are available to provide your operator with the information and resources they need for efficient and safe use of the test system. Long-term customer support is provided from our fully experienced and knowledgeable staff. Future periodic calibration of the metering is easily accomplished by one of our PHENIX service technicians keeping your system at top performance for many years.

### Model and Specifications

<table>
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<tr>
<td>VRTS8TC60-300</td>
<td>60 [0.44]</td>
<td>24 [2.76]</td>
<td>12 [11.0]</td>
<td>[20]-30..300</td>
<td>1200</td>
<td>1200</td>
<td>1350</td>
<td>1800</td>
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<tr>
<td>20 Hz Operation</td>
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<td>16 [19.8]</td>
<td>TBD</td>
<td>Duty Cycle</td>
<td></td>
<td></td>
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<tr>
<td>VRTS8TC100-1000</td>
<td>100 [2.12]</td>
<td>50 [10.6]</td>
<td>TBD</td>
<td>[20]-30..300</td>
<td>2300</td>
<td>1270</td>
<td>1620</td>
<td>4800</td>
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<tr>
<td>VRTS8TC200-1000</td>
<td>200 [2.12]</td>
<td>100 [10.6]</td>
<td>TBD</td>
<td>[20]-30..300</td>
<td>2500</td>
<td>1270</td>
<td>1620</td>
<td>9600</td>
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<tr>
<td>20 Hz Operation</td>
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<td>64 [9.95]</td>
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### Dimensions and Weight

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<tr>
<th>Power Supply</th>
<th>Length inches (mm)</th>
<th>Width inches (mm)</th>
<th>Height inches (mm)</th>
<th>Weight lbs (kgs)</th>
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<tr>
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<td>85 (2159)</td>
<td>38 (965)</td>
<td>80 (2032)</td>
<td>3200 (1451)</td>
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<table>
<thead>
<tr>
<th>Control Box</th>
<th>Length inches (mm)</th>
<th>Width inches (mm)</th>
<th>Height inches (mm)</th>
<th>Weight lbs (kgs)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>22 (559)</td>
<td>22 (559)</td>
<td>20 (508)</td>
<td>50 (23)</td>
</tr>
</tbody>
</table>

*Other designs and duty cycles upon request. Dimensions and weight are approximate.*

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**PHENIX TECHNOLOGIES**

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