HIPOTRONICS

TSR Series

Tank Series Resonant Systems - 30...350kV : 250kVA...9,000kVA

■ **The TSR series** is a high voltage source that ensures your power cables, power factor correction capacitors, generators, bushings and GIS are tested in accordance with the latest standards.

TSR systems, with multiple taps, can power a range of applications. As part of a series resonant circuit, they provide undistorted high voltage at system frequency for testing high kVAR capacitive loads. TSR systems are designed with high system Q's, and hence, require low single phase input power which results in lower installation and operating costs.

A comprehensive range of voltages between 30kV to 350kV and power ratings from 250kVA to 9000kVA are available.

FEATURES

- ☑ **Multiple Q Values** to meet variety of applications
- ☑ **Minimum Power** input requirements
- ☑ **Compact** Design
- ☑ **Series or Parallel** Resonant Operation
- ☑ **Low PD** Operation
- ☑ **No EMI Mains Noise / Interference**
- ☑ **Oil Temperature Indicator(s)**
- ☑ **Windows** Based Controls

BENEFITS

Low Life-Cycle Cost - rugged design minimizes system down time

Series Resonant - provides a protective voltage collapse should device under test fail

Pure AC Sine Wave at output

Lower Installation Cost for power service

Testing Made Easy with upgraded software

INDUSTRY APPLICATIONS

Ideal for testing:

- Power Cables
- Generators
- Power Factor Correction Capacitors
- Other Possible Applications (CTs, PTs, and CCVTs; GIS; Bushings; PD Testing)

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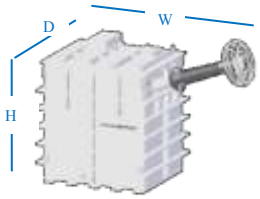
TYPICAL MODELS AND RATINGS BY APPLICATION

FOR POWER CABLE						
Model	**kV Class Cables** (maximum voltage)		**Voltage (kV)**	**Tap Voltage**	**Tank Size (m)** W x H x D *including output*	**Tank Weight (kg)**
	Per **IEC**	Per **AEIC**				
TSR75-750	45 kV	35 kV	75	75/50	1.4 x 1.9 x 1.95	4300
TSR100-1M0	66 kV	46 kV	100	100/75/50	1.5 x 2.1 x 2.2	5700
TSR150-2M0	66 kV	69 kV	150	150/125/100/75	1.7 x 2.1 x 2.4	7100
TSR200-2M0	138 kV	115 kV	200	200/100/50	2.0 x 3.2 x 4.9	14000
TSR250-2M5	161 kV	138 kV	250	250/150/75	2.1 x 3.8 x 4.9	23000
TSR350-6M0	230 kV	230 kV	350	350/250/175/100	2.6 x 4.1 x 5.7	32000
TSR350-9M0	230 kV	230 kV	350	350/250/175/100	2.6 x 4.1 x 5.7	32000

FOR HIGHER VOLTAGE CABLE TESTING, SEE MODULAR SERIES RESONANT (MSR) SYSTEMS.

Included:
- Double-Shielded Isolation Transformer (DSIT)
- Power Regulator / Line Filtering
- Exciter Transformer
- High Voltage Variable Reactor
- High Voltage Filter / Base Load
- High Voltage & Grounding Cables
- Voltage Divider
- Windows-based Controller
- Control / Power Interconnect Cables (10, 20, 30 or 50m)

Accessories & Options:
- Cable Terminations (KEV, CTTS)
- Partial Discharge Test Equipment (DDX7000/8003)
- Power Factor / Tan □ Measuring Equipment (2840)
- Shielded Room
- Engineering Package

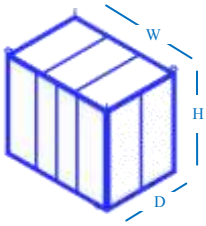


Consolidated prior to shipment.

FOR GENERATORS				
Model	**Voltage (kV)**	**Tap Voltage**	**Cabinet Size (m)** W x H x D	**Cabinet Weight (kg)**
TSR60-600	60	60/30	2.0 x 2.0 x 2.7	4500
TSR60-750	60	60/30	2.0 x 2.0 x 2.7	5000
TSR60-1M2	60	60/30	2.0 X 2.3 X 2.8	5500
TSR60-2M2	60	60/30	2.0 X 2.3 X 2.8	6500

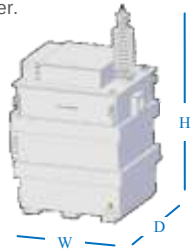
Included:
- Power Regulator
- Exciter Transformer
- High Voltage Variable Reactor
- Control / Power Interconnect Cables
- Portable System Enclosure
- Protective Sphere Gap
- Windows-based Controller
- Voltage Divider
- Base Load

Accessories & Options:
- Power Factor / Tan δ Measuring Equipment (2820a, 2840)
- Partial Discharge Test Equipment (DDX9101)



FOR CAPACITORS			
Model	**Voltage (kV)**	**Tank Size (m)** W x H x D *including output*	**Tank Weight (kg)**
TSR30-2M0	30	1.9 x 3.2 x 2.2	14000
TSR45-4M6	45	1.7 x 3.4 x 2.4	15000
TSR60-7M4	60	1.9 x 3.5 x 2.4	19000
TSR85-5M1	85	1.9 x 3.5 x 2.4	19000

FOR CAPACITORS:
The models listed in this table (left) are **typical** orders. However, several more models exist. Customers are required to provide specs (e.g. minimum and maximum voltage) and the unit is designed thereafter.



Consolidated prior to shipment.

Included:
- Power Regulator
- Exciter Transformer
- High Voltage Variable Reactor
- Control / Power Interconnect Cables (10, 20, 30 or 50m)
- Windows-based Controller
- Voltage Divider
- Base Load

Accessories & Options:
- Power Factor / Tan δ Measuring Equipment (2840)
- Partial Discharge Test Equipment (DDX9121 with AKV9330)

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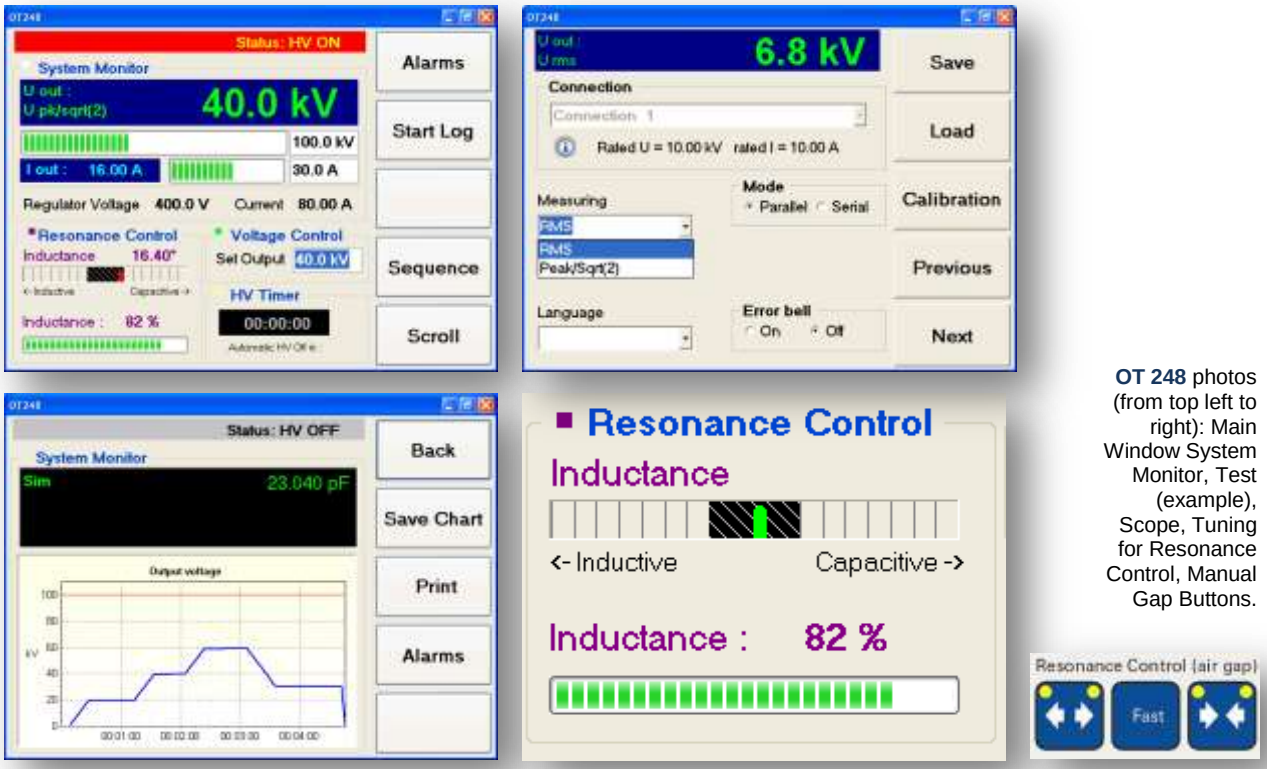
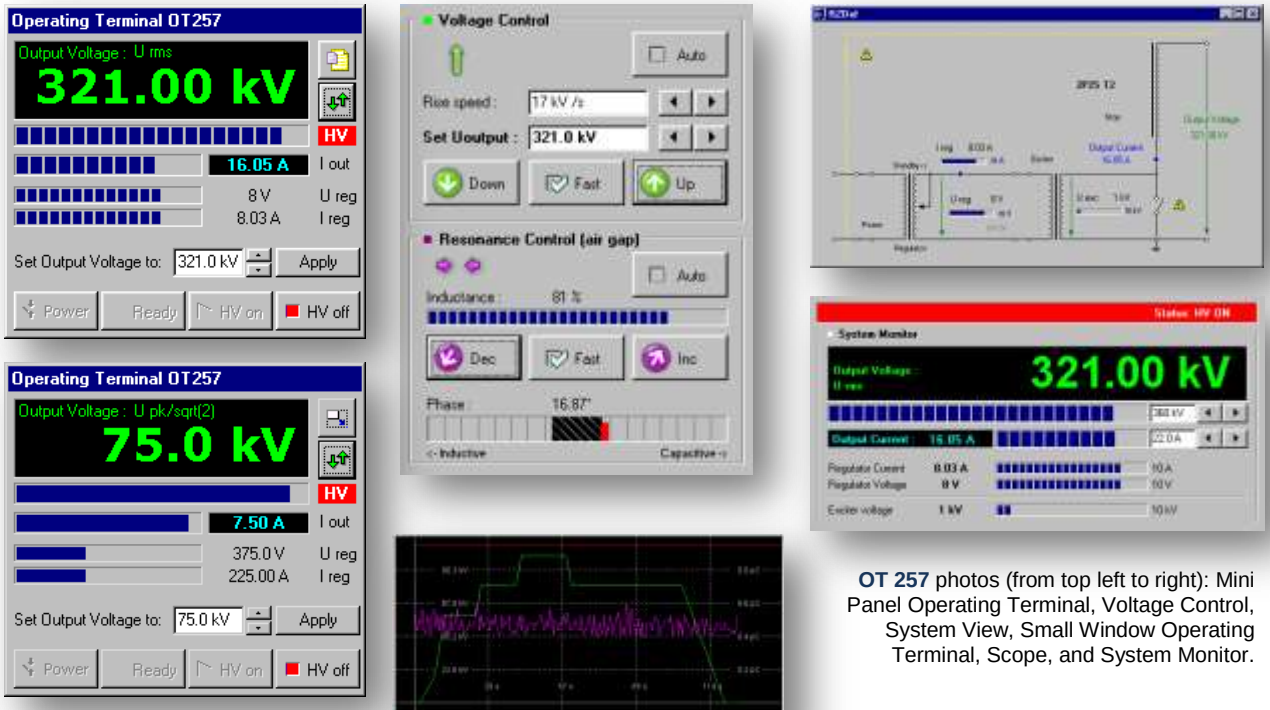
SOFTWARE



OT 248 photos (from top left to right): Main Window System Monitor, Test (example), Scope, Tuning for Resonance Control, Manual Gap Buttons.



OT 257 photos (from top left to right): Mini Panel Operating Terminal, Voltage Control, System View, Small Window Operating Terminal, Scope, and System Monitor.

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ONSITE PHOTOS

ORDERING INFORMATION

System

Standard TSR Catalog Logic

NOTE: Not all options are displayed. Call for more information.

TSR100-1M0G2F64Z

System Voltage Rating:
60 = 60kV
100 = 100kV
150 = 150kV

System Power Rating:
1M0 = 1000kVA
2M0 = 2000VA
2M5 = 2500kVA

Application:
R = Routine Cable Test
T = Cable Type Test
X = Applied Xfmr Test
P = Instrument Xfmr Test
G = GIS/SF6/Switchgear Test
A = Apparatus - General
C = Power Factor Capacitor

PD Level:
2 ≤ 2pC
5 = 5pC
X = 10pC
T = 20pC
C = 100pC
N = No PD Spec

*Input Voltage:
F = 480V
K = 400V
…

Frequency:
5 = 50Hz
6 = 60Hz

Control Type:
T = OT 248
Z = OT 257

System Q:
1 = 10
2 = 20
3= 30
4= 40
50 = 50

Notes:
- Dimensions and weights are approximate
- For other input voltages please consult factory*

Customer Supplied Cables per Local Electrical Codes:
- Mains Input
- System and Device Under Power

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