

ORTS Protection Relay Test Set



- Third generation of the time-proven ORTS relay tester
- 2000VA total high power / high burden outputs
- Latest low-distortion, low-loss all-switchmode Digital Signal Processing based technology
- 0-100A main output
- Switchable 0-140V or 0-10A auxiliary output (0-360° phase shiftable)
- 0-260Vdc battery simulator (for powering static relays)
- Ideal for Traction/Railway and general Distribution relay testing

Overview

The ORTS is a multipurpose single-phase field-portable protection relay test set capable of automatically testing a very wide range of relays, from high-burden electromechanical types to the latest solid-state microprocessor-based models. The supplied Windows based software fully controls the test set from any suitable laptop computer.

Relays Tested

- Induction Disc Overcurrent (high burden CDG etc.)
- Directional Overcurrent
- Instantaneous Overcurrent
- Under/Over Voltage
- Under/Over Frequency
- Rate of Change of Frequency (ROCOF)
- Transformer/Generator Differential
- Distance (single-phase Traction-types, e.g. Optimho etc.)
- Thermal Relays

Why Perform Automatic Testing?

Automatic relay testing offers significant speed, repeatability, quality and cost advantages over manual testing. Compliance with quality management systems like ISO9000 require documentary evidence that all essential plant and equipment (i.e. relays) are performing to specification. The ORTS can facilitate this process by generating the required documentation.

The simple-to-use relay testing and results archiving software supplied with the ORTS permits even technician-level staff to perform and automatically document complex relay testing procedures. In the past, such procedures would have a taken a skilled engineer many hours to accomplish utilising a manual test set.

System Concept

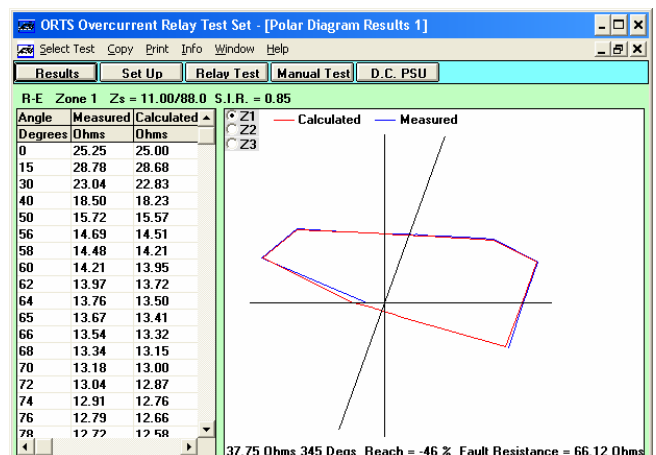
The ORTS receives commands from the controlling laptop/PC to output defined currents and voltages to the relay and measure subsequent relay contact operate times.

The test set digitally generates high-precision sine waves to the required amplitude, frequency and phase angle. These are amplified by the current and voltage output amplifiers and on to the relay under test. The amplifiers are tightly regulated and monitored, maintaining accurate, low distortion, voltage and current levels independently of the supply input or load.

Software Overview

- Total test set control from any Windows® based PC
- Full results archiving, display and printing facilities
- Fully Automatic or Manual Control
- Error and Trend analysis of test results
- Full traceability of results to test set hardware, software and calibration data

All control and relay testing using the ORTS test set is performed from within the supplied software package which includes generic test routines for a wide range of relay types. These generic test routines can be used as-is or extensively customised to the users individual requirements. Once any relay test is saved, the relay settings and any test customisation done are saved with that test. Any saved test can be used as a 'template' for future tests. This speeds up the testing of identical or similar relays later on.



The ORTS being used to test an Alstom OPTIMHO distance relay

Software updates are available approximately twice a year. Updates are completely free for the first year of ownership, thereafter for a small annual subscription charge. A free evaluation version of the ORTS software can be downloaded from www.relayeng.com.

Specifications - Generators / Amplifiers

Main Current Output

0-100A @ +/-34Vpk **or**
0-10 @ +/-340Vpk
1500VA continuous
0.01A/0.001A Resolution

Auxiliary Output (convertible, voltage or current)

0-140V **or**
0-10A @ ±190Vpk
300VA continuous
0.01V / 0.001A Resolution

Frequency

45.000-64.999 Hz Range
(phase & freq lockable to input supply)
+/-0.001 Hz Resolution
< +/-50 ppm (< +/- 0.005%) Error

Phase Angle

0-360° Range
+/- 0.1° Resolution
< +/- 0.1° Error

DC output (battery simulator, for powering static relays)

0-260Vdc
200W continuous
0.01V Resolution

General (all outputs)

< +/- 0.5% Error
< 0.2% Distortion (THD+N @50/60Hz, 20kHz bandwidth)

Protections

All outputs are individually monitored for overload, short/open circuit, over-temperature and waveform accuracy.

Miscellaneous Specs

Contact In

4x contact inputs, software selectable as wet/dry, contact or 2.5-250V AC/DC voltage sensing
±0.1msec timing resolution

Contact Out

4x contact outputs for relay control.
Rated 10A@250Vac or 1A@120Vdc

Input Power

Fully automatic universal input: 90-260V 45-65Hz AC
200W no load, 2400W continuous max
Electronic Active Power Factor Correction

Miscellaneous

Every generator/ Contact In/Out is galvanically isolated from each other and chassis to 1500V

Interfaces

Isolated RS232 interface for relay comms
Parallel interface for control from PC printer port

Physical

380x210x400mm (not including handle)
19.9Kg

Environmental

0-50°C Operating Temperature
5-90% Relative humidity (non-condensing)
IP20 Protected Enclosure
CE Marked, Tested to EN50081-2 (emissions) & EN50082-2 (susceptibility)

Required Laptop Computer (Controller)

A standard PC compatible laptop/PC is required to control the ORTS test set. Virtually any machine capable of running Win95/98/2000/ME/XP/NT4 is suitable. A minimum recommend spec is: Pentium processor, 32 Mb RAM, 2GB HD, 1.44FDD or CD-Rom, standard parallel port (for comms to test set). The ORTS test set can also be supplied together with a fully configured, modern brand-name Laptop computer.

Supplied Accessories

The following is included with all ORTS test sets

Full Software on CD-ROM (or floppy on request)
PC/ORTS comms cable (with printer pass-through)
Mains cable, 4xTest leads (I, V, trip, DC source)
Padded carrying bag with shoulder strap and pockets
Hard-wall polypropylene wheeled transport case
Operating/Instruction manual

Warranty / Calibration

All RES test sets carry a worldwide 12-month warranty. Thereafter, a fixed-price yearly service & calibration contract is available. Annual calibration is required to maintain accuracy. RES provide a quick turn-around calibration service traceable to UK national standards. The ORTS is calibrated in a 'closed-box' software-based manner, thus enabling suitably equipped customers to calibrate the unit in-house.

The Company

Relay Engineering Services Limited (RES) is a specialist technology company that develops and markets equipment, solutions and know-how exclusively for the relay testing and power systems protection marketplace.

Formed in 1987, the company has built up unrivalled expertise and technical competence in this highly specialised field. RES is the UK market leader in automatic protection relay test equipment, with customers in all the main UK Electricity generation, distribution and Railway maintenance companies as well as in over 30 countries worldwide.

All products are rugged, field-proven instruments with excellent reliability records. This is backed up by responsive customer support and technical assistance services.

The company also manufactures the three-phase APTS relay test set and BTS and TCT test sets for testing substation tripping batteries and HV circuit-breakers respectively.

Training

In order to extract the maximum benefit and cost-savings from automatic relay testing, RES recommends new and existing users take up the option of a tailored training package.

Training can take place at RES premises near London or at any customer location worldwide. All training is administered by a highly experienced and qualified electrical engineer skilled in the use of the ORTS relay test set as well as general aspects of relay testing and commissioning.

Demonstrations / Test Set Hire

RES application engineers are available to demonstrate the ORTS test set free-of-charge at any UK address and select countries overseas.

Test sets can also be hired for periods from one week to one year. Hiring can be a very cost effective option for customers needing to cover short term testing requirements or for even for evaluating test sets in-house prior to purchasing. A discount is offered on any subsequently purchased test sets proportional to hire charges paid.

Our policy of continuous product improvement may mean that equipment supplied differs slightly from specifications in this publication – check at time of ordering.