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Data Sheet 8.35/1

Control and Feeding Unit for Resonant Test System of Variable Frequency, Type RSE

Description

The control and feeding units RSE are used for the manual or automatic control of frequency-tuned series resonant test systems. With respect to their output power they are especially designed for the on-site testing of specialized test objects (table 1).

Table 1: Typical test objects

Type	Test objects
RSE 70	gas-insulated substations (GIS), medium voltage cables, power generators and transformers
RSE 400	long HV and EHV voltage cables and gas-insulated lines (GIL)
RSE 800	very long HV and EHV voltage cables

The three-phase line voltage is rectified and the generated direct voltage is buffered by a capacitor bank. A connected inverter bridge generates a square-wave voltage of adjustable frequency and pulse width. The inverter bridge consists of power transistor modules (IGBT's) and is driven by a microcontroller.
The type RSE 800 contains two inverters (master and slave).
The test sequence and the supervision of the complete test system are controlled by a PLC type SIMATIC. An operator panel with LCD display is used for the data input and the display of preselected and measured parameters or other information. The test voltage value is measured by a built-in peak voltmeter, type MU 18 (Data Sheet 5.56).
The resonant frequency of the test circuit is determined automatically at small duty (low output voltage) at the beginning of each test. After that, at the resonant frequency, the duty is increased exactly until the test voltage will reach the preselected value. Now a counter is started for the test duration, which will terminate the test after the preselected time. The automatic procedure can be interrupted at any time to change the preselected values, e.g. test voltage or frequency.
Test object and test system are protected against misoperations, unstable feeding voltage, overload, breakdowns of the test objects and other critical events by safety measures as e.g. voltage or current limiters.
Optionally, an external PC (e.g. a notebook computer) can be connected to the RSE via a network connection (Ethernet). This enables the remote control, the recording and evaluation of the test parameters (voltage, frequency, currents, etc.) and also the printing of a test report.
Because PD measurement could be disturbed by the switching transients of the IGBT's, the RSE supplies a gate-off signal of some 10 µs (adjustable duration) which can disable the PD measurement for that short moment.
All components of the RSE are built in a movable desk or in a cubicle (see figures 1, 2, 3 and table 4).

Table 2: Main parameters

Type	Main supply			Output parameters			Operating conditions	
	Voltage	Frequency	Power	Voltage (peak)	Current (max.)	Frequency	Temperature	Humidity (max.)
	V	Hz	kVA	V	A	Hz	°C	%
RSE 70	230/400 ±10%	50/60	50	560	70	18 … 300	5 … 40	90
RSE 400	230/400 ±10%	50/60	300	560	400	10 … 300	5 … 40	90
RSE 800	230/400 ±10%	50/60	600	560	800	10 … 300	5 … 40	90

Table 3: Interfaces

Type	Measuring input		PD gating output		Safety interface[1)]	Signal lamps output	
	Voltage (r.m.s.)	Resistance	Voltage	Duration	Operating voltage	Voltage	Current (max.)
	V	MΩ	V	µs	V	V	A
RSE 70	100	10	5 (TTL)	1 … 1000	230	230	0.8
RSE 400	100	10	5 (TTL)	1 … 1000	230	230	0.8
RSE 800	100	10	5 (TTL)	1 … 1000	230	230	0.8

[1)] including the emergency-off circuit and the safety loop

Table 4: Dimensions and connectors

Type	Design	Length x Width x Height (approx.)	Weight (approx.)	Power connection[2)]
		mm	kg	
RSE 70	movable desk	644 x 800 x 1173	110	pluggable
RSE 400	rack with two front doors	600 x 1000 x 1600	330	bus bars
RSE 800	rack with four front doors	600 x 2000 x 1600	600	bus bars

[2)] all other connections are pluggable

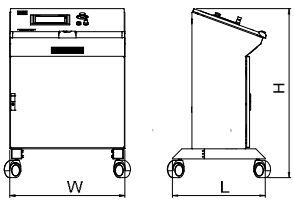

Figure 1: RSE 70

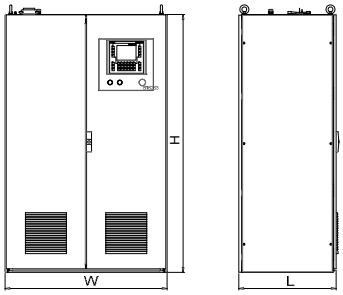

Figure 2: RSE 400

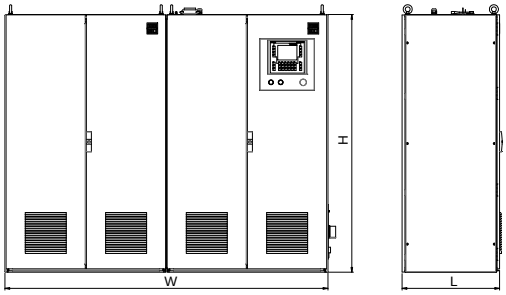

Figure 3: RSE 800

Type designation

RSE a
a = output current in A