Accessories

Relay Testing

Programma®

A Megger Group Company

Relay testing accessories - SVERKER

Item	*Description*	*SVERKER 650*	*SVERKER 750/760*	*Art. No.*
Power source				
ACA120	The ACA120 voltage source provides a variable output voltage of 0 to 120 V AC. This makes it easier to test directional protection using SVERKER 650. Power is supplied from the relay testing unit's 110 V AC output. Housed in a small plastic case. Maximum output current is 90 mA. Dimensions**:** 80 x 150 x 65 mm (3.1" x 5.9" x 2.6") Weight: 0.6 kg (1.3 lbs)	X		BA-90040
CSU20A	CSU20A is a small light-weight current and voltage source primarily intended to work together with the SVERKER 750/760 Relay Testing Unit when testing differential relays. Using the CSU20A together with SVERKER 750/760 gives the user two independent current sources, and the timer/measurement section in SVERKER 750/760 is used both for measuring the two outputs as well as measuring the trip time of the relay. Besides testing differential relays the unit can be used as a multi-purpose AC/DC source. The CSU20A features one AC current/voltage output, one fully rectified DC output and one half-wave rectified DC output for harmonic restraint testing. Other features are a current measurement shunt, selectable current/voltage ranges and an AC mains input/output. Connecting the SVERKER 750/760 mains to the mains output of the CSU20A gives an in-phase synchronization of the two units. Complete with cables and transport case 115 V Mains voltage		X	BF-41190
	Complete with cables and transport case 230 V Mains voltage		X	BF-42390
Phase selector switch				
PSS750	The Phase Selector Switch PSS750 is specifically designed to work with SVERKER 750/760 when testing three-phase relays. It is connected between SVERKER 750/760 and the relay inputs and allows the user to easily select which phase to test. The PSS750 handles both the current and voltage sources and single-phase or phase-phase testing can be selected. Together with the output-input switching the unit also contains a variable resistor that can be used together with the built-in capacitor in SVERKER 750/760. This feature gives the user the possibility to create a variable phase shift at a decreased amplitude of the test voltage. The design is passive which makes it very general. You may for example use any of the inputs for current or voltage as long as you do not exceed the specification. It is also possible to connect the measuring inputs of the SVERKER 750/760 to the PSS750 and use the switch for selecting measurement signals. The PSS750 simplifies phase switching, selecting type of fault, phase reversing and gives a possibility to create a variable phase shift.			CD-90020
Other				
Cable organizer	Velcro straps, 10 pcs.			AA-00100

For test leads and other standard cables, please see the appropriate catalogue pages.
For more information about optional accessories please contact Programma.

Specifications CSU20A

Specifications are valid at nominal input voltage and an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

Operating tempera-	-20°C to +50°C (-4°F to +122°F)
Mains voltage	115/230 V AC, 50/60 Hz
Thermal protection	Built-in
Dimensions	280 x 178 x 246 mm (11" x 7" x 9.7")
Weight	5.9 kg (13 lbs) excl. transport case
Current measure-	Current shunt 0.1 A / 1 V, ± 2%

Output, AC

20 A setting	***Output voltage (min)***	***Load time***
Idle/non-load	26 V	Continuous
5 A	25 V	Continuous
10 A	22 V	Continuous
20 A	18 V	2 min
10 A setting		
Idle/non-load	52 V	Continuous
3 A	50 V	Continuous
5 A	47 V	Continuous
10 A	41 V	10 min

Output, DC

DC current	As above, less the voltage drop over the rectifying diodes

CSU20A

ACA120

Specifications PSS750

Specifications are valid at nominal input voltage and an ambient temperature of +25°C, (77°F). Specifications are subject to change without notice.

Max input voltage	250 V AC / 3 A
Max input current	6 A / 250 V AC
Max resistor loading	200 V AC / 200 mA (0.5 A during 5 seconds)
Dimensions	200 x 120 x 85 mm (7.9" x 4.7" x 3.3")
Weight	1.3 kg (2.9 lbs)

Application example with PSS750

IMPORTANT!
Read the User's manual before using the instrument

1. Connect the current and voltage outputs of SVERKER 750/760 to the PSS750 inputs.
2. Connect the current and voltage inputs of the relay to the PSS750 outputs.
3. Select which phase to test and type of test (phase-to-ground or phase-phase) with the selector switch.
4. Proceed with the test for each phase and fault type.
5. To create a phase shift, connect the 10 µF capacitor in SVERKER 750/760 in series between the voltage output and the PSS750 input, and connect the variable resistor in parallel with the PSS750 input.
6. Set the SVERKER 750/760 for phase (and impedance) measurement. Connect the voltage measurement input to the PSS750 input.
7. Start the test with the resistor in maximum position. Gradually decreasing the resistor gives increasing phase shift in the voltage signal. The test voltage/impedance will decrease at the same time so an adjustment of the test current might be necessary to get the correct impedance. Please observe that the phase shift depends on the input resistance and may vary between different relays. Some relays may also have a low voltage limit where the relay will not operate. For additional 180 degrees phase shift use the phase reversal switch.

PSS750

Relay testing accessories - FREJA

Item	*Description*	*FREJA 300*	*FREJA 306*	*CA30*	*Art. No.*
Software					
FREJA Win Standard	incl. software key	X	X		CF-8203X
FREJA Win upgrade	Freja Win Standard upgrade	X	X		CF-8282X
Transient instrument (SW)	The Transient instrument is used to generate transient waveforms from a disturbance recorder.	X	X		CF-8214X
Transducer instrument (SW)	Transducers are used to measure e.g. current, voltage, power, phase angle or frequency. The output from the transducer is then either a DC voltage or a DC current. Standard ranges are 0-10 V or 4-20 mA (or 0-1 mA). The transducers input signals are connected to FREJA's voltage and/or current generators. The transducer's output signal is connected to the Low Analog input. The accuracy of the measurement is very high. You can test all different types of transducers in a fully automatic way. Just press START, and the program will test the transducer and present the full scale, absolute, and relative error. In the report you get both graphs and a table of the result.	X	X		CF-8215X
Differential instrument (SW)	The Differential instrument is designed to test transformer differential protections, primarily intended for two windings transformers but it can be used for other applications like generator differential or multiple windings transformers where the test is done one windings at the time.	X	X		CF-8223X
Auto 21 instrument (SW)	The AUTO21 converts FREJA RTS 11, 21, 21D and FREJA 300 DOS testplans to FREJA Win. This will make it possible to run and printout in a Microsoft® Windows® environment.	X	X		CF-8221X
FREJA Win ProGraph	Automatic reference graph program. Contact Programma for more information.	X	X		
Cables					
FREJA Multi-cable	Shortens hookup time considerably. Consists of a multi-pole connector that connects to FREJA's three voltage and three current outputs, and a number of banana plugs that connect to the protective relay equipment that is to be tested.	X	X		GA-00103
Test lead set	With touch-proof contacts. 2 x 0.25 m (0.8 ft) / 2.5 mm^2, 2 x 0.5 m (1.6 ft) / 2.5 mm^2, 8 x 2 m (6.5 ft) / 2.5 mm^2. Weight**:** 0.8 kg (1.8 lbs). Normally you need two sets.	X	X		GA-00032
Other					
GPS100	The GPS100 makes it possible to synchronize two or more FREJA to conduct end-to-end testing. End-to-end testing provides quick, reliable results showing how two or more protective relay systems interact. The GPS100 includes a power pack, an antenna with 20-metre cable and a carrying case.	X	X		CF-90050
CA30	Current amplifier, see CA30 section	X			
Soft transport case	Dimensions: 470 x 440 x 190 mm (18.5" x 17.3" x 7.5") Weight: 1.8 kg (4 lbs)	X			GD-00215
Cable organizer	Velcro straps, 10 pcs.	X	X	X	AA-00100

For test leads and other standard cables, please see the appropriate catalogue pages.
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Multi cable

GPS100

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Subject to change without notice. Art. No. ZI-AC02E Doc. AC0016BE

2008