

# SVERKER 650

## Relay Test Set



- **Designed for rugged field use**
- **0 to 100 Amp output current**
- **Suitable for testing many different types of relays such as power, voltage and current**
- **Easy to operate**

### DESCRIPTION

The SVERKER 650 testing unit, whose design incorporates benefits gleaned from many years of experience in field relay testing, enjoys a well-earned reputation for reliability and convenience. Compact and powerful, it provides all of the functions needed for secondary testing of almost all types of single-phase protection now available on the market.

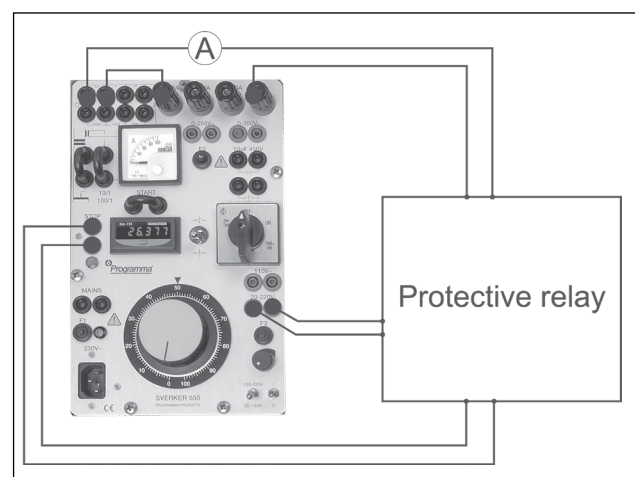
SVERKER650 features logical design and construction, and it is extraordinarily easy to learn and use. Its compact design and light weight makes it extremely portable.

Auxiliary equipment for SVERKER650 includes a test lead set and a rugged transport case. Another useful accessory is the ACA120 voltage source which makes it easier to test directional relays.

### APPLICATION

The SVERKER650 is for use in high-voltage substations and industrial environments. The built-in capacitor provides phase shift when testing directional protective relays, a set of resistors can be used to divide voltages.

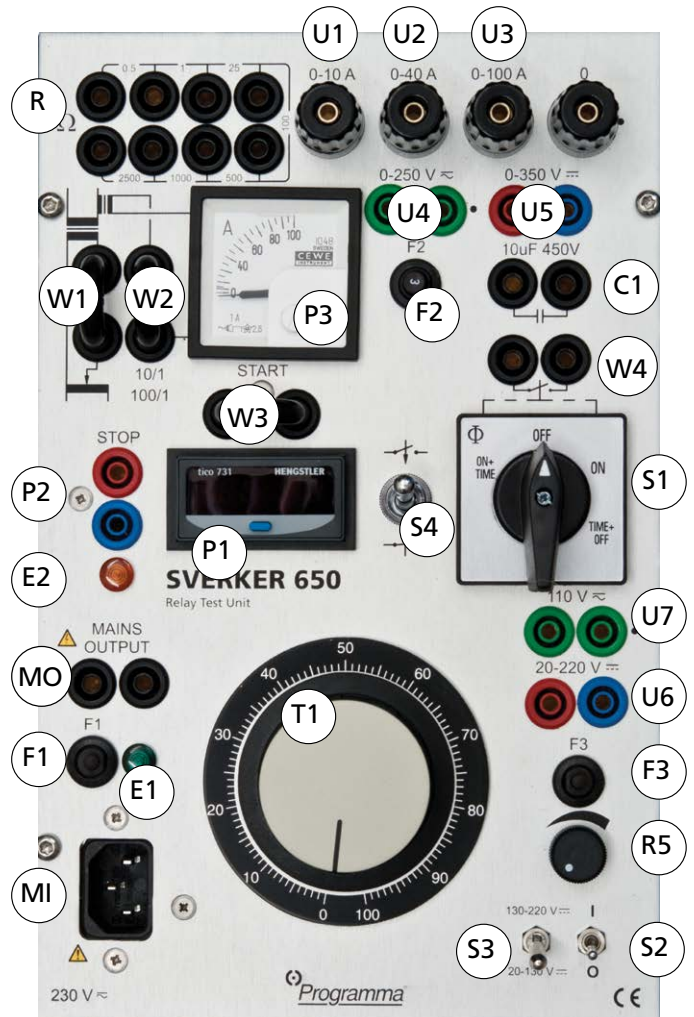
The SVERKER650 is intended primary for secondary injection testing of protective relays. Virtually all types of single phase protection can be tested.



Typical protective relay test connection

**FEATURES AND BENEFITS**

Terminals		Unloaded (Mains 230 V)	
U1	0–10 A	85–90 V AC	Settable with T1
U2	0–40 A	25–27 V AC	Settable with T1
U3	0–100A	10.0–11.0V AC	Settable with T1
U4	0–250 V, 3 A	250–270 V AC	Settable with T1
U5	0–350 V, 2A	350–370 V DC	Settable with T1
U6	20–220 V DC		Settable with R5
The voltage is stabilized and variable in two steps with the switch S3. Characteristics at input voltage 220 V AC + 10 % Ripple (peak to peak) max 4 % Load regulation 3 % Line regulation less than 4 %			
U7	110 V 0.3 A	110–125 V AC	
F1	Automatic cut-out for the mains voltage, 4 A		
F2	Automatic cut-out 3 A		
F3	Automatic cut-out 0.5 A		
E1	Green indicator for mains voltage		
E2	Yellow signal lamp in the trip circuit		
MI	Mains input		
MO	Mains output		
P1	Electric timer, independent of mains frequency Measuring range 0–999.999 sec. Accuracy 0.002% of readout +0,-2 ms		
P2	Input for stop of timer		
P3	Ammeter class 1.5		
R	Resistors		
C1	Capacitor 10 µF/450 V AC for reactive power relays		
S1	Main switch		
S2	On/off switch for terminals U6 and U7		
S3	Selector voltage range terminal U6		
S4	Make/break switch for timer		
T1	Variable transformer		
R5	Voltage adjustment terminal U6		
W1	Terminal for connection of a resistor on the primary side of the output transformer		
W2	Terminal for an external ammeter		
W3	Terminal for external start and stop of timer		
W4	Terminal for starting external operation		



## SPECIFICATIONS

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

### Environment

*Application field* The instrument is intended for use in high-voltage substations and industrial environments.

### Temperature

*Operating* 0°C to +50°C (32°F to +122°F)  
*Storage & transport* -40°C to 70°C (-40°F to +158°F)

*Humidity* 5% – 95% RH, non-condensing

### CE-marking

*LVD* 2006/95/EC  
*EMC* 2004/108/EC

### General

*Mains voltage* 115/230 V AC, 50/60 Hz  
*Power consumption* 1100 VA (max)  
*Protection* Thermal cut-outs, miniature circuit breakers

### Dimensions

*Instrument* 280 x 178 x 250 mm (11" x 7" x 9.8")  
*Transport case* 560 x 260 x 360 mm (22" x 10.2" x 14.2")

*Weight* 16 kg (35.3 lbs)  
26 kg (57.3 lbs) with accessories and transport case.

*Test lead set, with 4 mm stackable safety plugs* 2 x 0.25 m (0.8 ft), 2.5 mm<sup>2</sup>  
2 x 0.5 m (1.6 ft), 2.5 mm<sup>2</sup>  
8 x 2.0 m (6.6 ft), 2.5 mm<sup>2</sup>

*Test leads with spade-tongue connectors* 2 x 3.0 m (9.8 ft), 10 mm<sup>2</sup>

## Measurement section

### Current measurement

#### Built-in ammeter

*Ranges* 0 – 10 A / 0 – 100 A  
*Inaccuracy* ±5%

#### External ammeter

*Output for external ammeter* Connected to built-in current transformer

*Inaccuracy* ±1%

#### Timer

*Range* 0 – 999.999 s  
*Resolution* 1 ms  
*Inaccuracy* ±0.02% of displayed value, +2 ms  
Independent of mains frequency

## Outputs

### Current outputs, AC

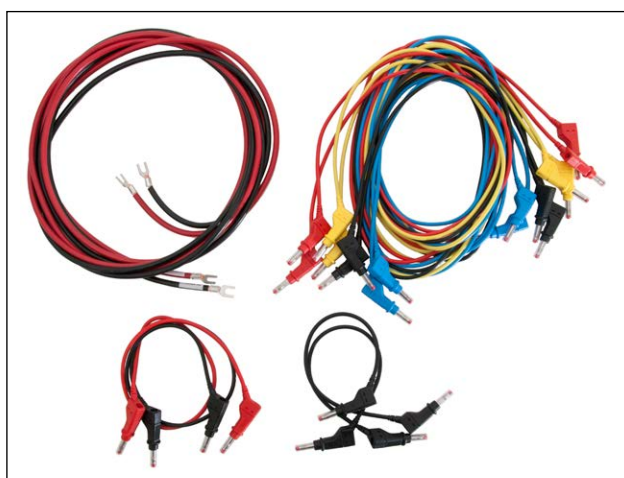
Range	No-load voltage (min)	Output voltage (min)	Load / un-load times On (max) / Off (min)
0 – 10 A	85 V	75 V (10 A)	2 min / 30 min
0 – 40 A	25 V	19 V (40 A)	20 s / 15 min
0 – 100 A	10 V	7.7 V (100 A)	20 s / 5 min

### Voltage outputs, AC / DC

Range	Output voltage (min)
0 – 250 V AC	220 V (2.7 A)
110 V AC (fixed)	110 V (0.3 A)
0 – 350 V DC	280 V (2 A)
20 – 220 V DC (stab.)	200 V (0.25 A)

### Other

Built-in capacitor provides phase shift when testing directional protection, and a set of resistors can be used to divide voltages. Output used to start external cycles. Terminal for external start/stop of built-in timer. Terminal for connecting serial impedance when testing nonlinear protection.



Test lead set GA-00030

## ORDERING INFORMATION

Item	Art. No.
<b>SVERKER 650</b>	
Incl. Test lead set GA-00030 Transport case GD-00010	
<b>115 V Mains voltage</b>	BA-11190
<b>230 V Mains voltage</b>	BA-12290
<b>Optional Accessories</b>	
ACA120 Variable output, 0-120 V AC	BA-90040

**Postal address**  
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