

# SITS-120

## Secondary Injection Test Set



- **Digital metering includes memory ammeter**
- **Timer has independent start and stop gates**
- **Interface provided for EPS-1000A/PVS-1000 phase shifters**

### DESCRIPTION

The SITS-120 incorporates expanded output capability, digital instrumentation and control, and unique features for testing protective relays, small molded case circuit breakers, motor overload relays and other special applications. The SITS-120 has one ac current channel, one ac/dc voltage channel and a digital timer with separate start and stop gates for virtually any timing application.

### APPLICATIONS

The SITS-120, Secondary Injection Test Set, is a portable self-contained test set designed specifically for testing electro-mechanical, solid-state and microprocessor-based overcurrent, under/over voltage, ground, directional ground overcurrent, thermal, timing and various auxiliary relays. Additionally, it can perform minimum operating point and timing on current balance and differential relays.

Designed to operate in conjunction with the EPS-1000A or PVS-1000 Electronic Phase Shifters, Model SITS-120 output current can be synchronized with the voltage output of the EPS-1000 or PVS-1000 for testing more complex relays like directional power, distance and loss of excitation.

The SITS-120 may also be used to test small molded case circuit breakers and motor overload relays rated up to 50 Amperes\*. As a variable power supply it may also be used to calibrate ammeters, voltmeters and ratio small current and voltage transformers. The separate start and stop gates on the digital timer allow timing of circuit breakers.

### FEATURES AND BENEFITS

- **All digital metering** - Easy to read, no interpolation of analog meter scales. Saves time in testing relays.
- **Memory ammeter** - Allows user to set test currents faster. Reduces heating of device under test.
- **AC/DC voltage outputs can be operated independently of the AC current output** - Can provide DC logic voltage to solid-state relays prior to applying simulated fault current. Also allows user to test voltage controlled/restraint overcurrent relays, without blocking voltage element contacts closed. Eliminates elaborate test circuit connections, purchasing a separate DC voltage source or using station battery.
- **Timer has independent Start and Stop Gates** - Perform timing functions independent of relay test set operation. Eliminates purchasing a separate timer for timing circuit breakers.
- **Current Actuate mode** - Multi-purpose test set capable of testing small molded-case circuit breakers and motor overload relays commonly found in industrial applications.
- **PAM (Phase Angle Meter) Jack** - Provides interface to Megger Phase Shifters. Allows SITS unit to be used with phase shifter to test complex relays. Saves time in making test connections. Multi-purpose test system saves money.
- **Time base 50/60 Hz. selector switch** - Sets time base for timing relays in cycles mode. Allows timing in either cycles or seconds.
- **IEC power cord connector** - Standard power cords fit test set, no need for special power cords or connectors.

**SPECIFICATIONS****Input Power**

120 or 240 Vac (specify one)  $\pm$  10%, 50/60 Hz

**Outputs**

Two independently controlled adjustable outputs are available from the test set, one ac current and one ac/dc voltage. The voltage output can be operated either simultaneously or independently from the current output.

**Output Current**

**Continuously adjustable in the following ranges:**

Output Current	Full Load Voltage
0 - 5 Amperes	140 Volts
0 - 10 Amperes	70 Volts
0 - 25 Amperes	28 Volts
0 - 120 Amperes	5 Volts

When the voltage is sufficient to push higher than rated current through the load, the current ratings listed in the table can be exceeded for short duration's.

**Duty Cycle**

Maximum time on is 5 minutes followed by 15 minutes off. Short time overloads are possible.

**AC Voltage Output (Switch Selected)**

Output Voltage	Current Rating
0-240 Volts	2 Amp

**DC Voltage Output (Switch Selected)**

Output Voltage	Current Rating
0-240 Volts	1 Amp

**Metering**

Measured quantities such as AC Current, AC Voltage, DC Voltage and Time are displayed on large, LED displays. The Ammeter/Voltmeter is a dual purpose meter, whose function is switch selected. When selected as a voltmeter it will measure either ac or dc depending on the selector switch.

**AC Ammeter (Switch Selected)**

**Ranges and Resolution:** 0 to 1.999/19.99/199.9/400 Amperes

**Accuracy:**  $\pm$  1 % of range

**Measurements:** True RMS, Continuous Mode. Peak Hold in Memory Mode

**AC Voltmeter (Switch Selected)**

**Ranges and Resolution:** 0 to 1.999/19.99/199.9/400 Volts

**Accuracy:**  $\pm$  1 % of range

**Measurements:** True RMS

**DC Voltmeter (Switch Selected)**

**Ranges and Resolution:** 0 to 1.999/19.99/199.9/ 400 Volts

**Accuracy:**  $\pm$  1 % of range

**Measurements:** Average

**Timer**

**Display:** Five (5) digits

**Ranges and Resolution:** Seconds and cycles with the following range and resolution (switch selected):

**Seconds:** a) 0 to 999.99

b) 0 to 99.999

**Cycles:** 0 to 99999

**Accuracy:**  $\pm$  least significant digit or  $\pm$  0.005% of reading whichever is greater.

**Start/Stop/Monitor Gate**

Two identical, independent, Start, Stop or Monitor Gate circuits are provided. To monitor operation of relay contacts or trip SCR, a continuity light is provided for the Stop gate. Upon sensing continuity the monitor lamp will glow and a tone generator will sound.

The following modes are provided for the Start, Stop/Monitor Gates:

1. Timer will start, stop or continuity indicator darkens at the opening of normally closed contacts or when conduction through a semiconductor device such as a triac or transistor is interrupted.
2. Timer will start, stop or continuity indicator glows at the closing of normally open contacts or upon conduction through a semiconductor device such as a triac or transistor.
3. Timer will start, stop or continuity indicator glows or darkens upon the application or removal of either an ac or dc voltage (60 to 300 Vac), (5 to 300 Vdc). The maximum voltage to be applied is 300 Volts ac or dc.
4. Starting or Stopping with any selected output. The Timer can be started or stopped when turning on or off any (or all) selected outputs.
5. In the Current Accurate Mode the Timer stops when output current is interrupted.

**Start Latch:** The Timer Start Gate is provided with a latch feature which allows timing to be initiated by a Start Gate and to be stopped only by the selected Stop Gate. When unlatched, the Start Latch allows timing to be stopped when the Start Gate is reversed (such as when timing the closing and opening of a single contact as in measuring the trip-free operating time of a circuit breaker).

**Stop Latch:** The Timer Stop Gate latch feature which allows timing to be stopped at the first operation of any Stop Gate (thus ignores contact bounce). When unlatched, the Stop Latch allows timing to be stopped by any Stop Gate and then restarted if the Stop Gate reverses (provided a Start Gate is still energized), and then stopped again when the gate reverses (total time including contact bounce).

**Protection**

Input and outputs are protected from short circuits and prolonged overloads.

**Ancillary Interface**

A voltage signal output, in phase with the main current output, is provided to input into the EPS-1000A or PVS-1000 for phase reference. This will allow testing of more complex relays which require phase shifting between a three-phase voltage output and a current output.

**Enclosure**

The unit comes mounted in a rugged plastic transit case for field portability. The tongue and groove lid protects the unit from rain and dust intrusion. Spring loaded carry handles are located on each side.

**Temperature Range**

**Operating:** 32 to 122° F (0 to 50° C)

**Storage:** - 40 to +158° F (- 40 to 70° C)

**Dimensions**

11 H x 15 W x 12 D in. (281 H x 383 W x 306 D mm)

**Weight**

47 lb (21.4 kg)

## ORDERING INFORMATION

Item (Qty)	Cat. No.	Item (Qty)	Cat. No.
Model SITS-120 with 120 V input	SITS120-115		
Model SITS-120 with 240 V input	SITS120-230		
<b>Included Accessories</b>		<b>Optional Accessories</b>	
Line cord, [1 ea]	6828	Optional high current test leads are recommended when testing small molded case circuit breakers.	
Instruction manual [1 ea]	50377	# 4 High current test leads, 5 ft, [1 pr]	2265
15 A Input fuse [5 ea]	50232	An optional Phase Angle Meter (PAM) interface cable is required to interface the SITS-120 to Phase Shifters. Models CS-6B, CS-7B or PSA-100 [1 ea]	12680
10 A Fuse [5 ea]	11333	Models EPS-1000A and PVS-1000 [1 ea]	15746
6.25 A Fuse [5 ea]	FT52		
5 A fuse [5 ea]	952		
Test lead, red/black [2 pr]	1282		
Test lead, current [1 pr]	7934		



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