

PS-9116

Microprocessor-Based Circuit Breaker Test Sets



- **Portable, lightweight, rugged, three-piece chassis**
- **Tests a wide range of air-frame circuit breakers**
- **Fast setup**
- **Tests many low-voltage breakers**
- **Automated Testing**

DESCRIPTION

The Model PS-9116 is part of the PS line of primary injection circuit breaker test sets that incorporate the latest developments in high-current transformers, SCR-controlled output and microprocessor-based control.

Model PS-9116 combines lightweight, modular portability with high-output capacity and maximum flexibility through microprocessor control technology. The test set provides all the controls, instrumentation and output capabilities to test low-voltage circuit breakers in a three-module configuration. These three modules include:

Module 1 — Model PLC-2000 controller and instrumentation package contains a microprocessor-based control and instrumentation package for automated testing of low-voltage circuit breakers.

Module 2 — Driver module contains the coarse- and fine-current controls, along with the SCR-initiate package.

Module 3 — Output module contains the high-current output transformer and the current sensors.

Model PS-9116 comes complete with all interconnect cables. Each module is housed in its own rugged, compact enclosure. The test set is easily transported and may be connected to the test device by cables or stab assemblies.

APPLICATIONS

Ideally suited for industrial, utility and testing service company use, Model PS-9116 is designed to maintain and test low-voltage power circuit breakers rated up to 1600

ampere frame size. In addition, it can be used for verifying the ratio of current transformers and testing thermal or magnetic motor overload relays.

In a series configuration, the higher voltage output of Model PS-9116 permits ready use in substations for primary injection testing of high-voltage circuit breakers and protective relays.

FEATURES AND BENEFITS

- **Portable:** Model PS-9116 is housed in a portable, lightweight, rugged, three-piece chassis that can be carried. It reduces the need for heavy equipment to transport the test set.
- **Versatile:** Model PS-9116 is designed to test a wide range of air-frame and molded-case circuit breakers. Able to deliver 19,200 amperes of instantaneous output current, it will test air-frame breakers rated up to 1600 amperes and molded-case breakers rated up to 1200 amperes.
- **Fast setup:** The unit's modular design with polarized interconnecting cables reduces setup time.
- **Standardized controller:** The Model PLC-2000 provides automated control of the high-current test set. It also stores test results, which can be printed immediately in the field or in the office.
- **Motorized vernier:** The motorized vernier in combination with Model PLC-2000 provides an automatic circuit breaker test set.

Model PLC-2000

- **Integral clock/calendar:** A battery carry-over allows the test data to be stored with the time and date of the test.
- **Easy-to-read display:** Bright vacuum fluorescent alphanumeric display provides easy reading in both sun and low light.
- **High-accuracy digital memory am-meter:** Provides easy reading of instantaneous output by retaining the reading until the output is again initiated.
- **Bar-graph display:** Analog LED segmented bar-graph display provides at-a-glance approximation of output current.
- **High-accuracy digital timer:** Easy-to-read digital timer measures elapsed time in seconds or cycles. Selection of cycles or seconds allows easy comparison of test time to published trip curves of the circuit breaker during testing.
- **Preset initial conditions:** The following preset initial conditions provide flexibility in testing procedures: contact input, normally open/closed, audible continuity signal, current latch for breaker testing and momentary/maintain mode operation.
- **Maximum test time/current:** A programmable maximum test time and maximum current ensures that the test set does not damage itself or the circuit breaker during test.
- **Series/parallel output mode:** Allows Model PLC-2000 to make the proper calculation for the output test configuration.
- **Tap selection:** This option from Model PLC-2000 provides coarse current control.
- **Versatile ammeter:** The ammeter operates as a real-time ammeter for overcurrent test or as a memory ammeter for instantaneous trip test.
- **Indicators:** The following indicators provide at-a-glance understanding of Model PS-9116 operational status: thermal status, output on, input power, breaker status, coarse output position, digital ammeter, plus continuity and interlock.
- **RS-232 printer interface:** Allows stored test data to be printed immediately after test or at user convenience.
- **Auto-jog:** Fully automatic instantaneous trip test capabilities are provided.



Model PLC-2000 controller provides automatic control of the test set.

SPECIFICATIONS

Model No.	Input Voltage (single phase)	Input Frequency	Input Current
PS-9116	460 V ± 5%	60 Hz	150 A
PS-9116 /50	380 V ± 5%	50 Hz	150 A

Other input voltages are available through an optional Input Autotransformer (Model AT-5): 208 V, 240 V, 575 V, 1φ. Refer to the Optional Accessories section.

Output

The output is easily adjustable from zero to maximum current available through the impedance of the device under test. For low-current, high-impedance devices, the output can be connected in series (with the optional series bar) to double the output voltage.

Maximum Output Current

The maximum current available from the test set is determined primarily by the test circuit impedance. The duration of the available current is determined by the thermal conditions within the test set.

The test set will deliver rated continuous current for a 24-hour period. The maximum current through an air-frame circuit breaker is the maximum current the test set can deliver through a breaker connected with stabs. The maximum current through a molded-case circuit breaker is the maximum current the test set can deliver through a breaker connected with 5 ft (1.5 m) cables.

Output Connections

To provide maximum use of the test set, the unit is equipped with the appropriate stab adapter and stab set for use with drawout-style, metal-clad breakers. To obtain the maximum current output of Model PS-9116, use the stab adapter Model CBS-7. The stab adapter connects the output bus in a parallel configuration while providing an output base for stab set Model CBS-1, CBS-2 or CBS-3.

Refer to the catalog entry for Megger Circuit Breaker Stab Sets to determine the uses of the included stab sets. If the included stab sets will not test all breakers, refer to the Model CBS-3 optional stab set list.

Model No.	Maximum Continuous Current	Output Current	
		Maximum Current Through Air-Frame Circuit Breaker	Maximum Current Through Molded-Case Circuit Breaker
PS-9116	1,600 A	19,200 A	14,400 A
PS-9116/50	1,580 A	16,000 A	12,000 A

Instrumentation—Model PLC-2000

Digital Memory Ammeter

Display: Vacuum fluorescent, 3½ digit display

Ranges: 200/2000/20,000/200,000 A

Accuracy: ±1% full scale, ±LSD after two cycles ±2% full scale on 200A range

Digital Timer

Display: Vacuum fluorescent, 4-digit display

Ranges

0.001 to 9999 s

0.1 to 9999 cycles

Accuracy

Seconds Mode: ±0.0133 seconds, ± 0.005 reading, ±LSD

Cycles Mode: ±0.1% reading, ±LSD

Dimensions and Weight

Model No.	Module	Weight		Dimensions	
		lb	kg	H x W x D (in.)	H x W x D (cm)
PS-9116	PLC-2000	19	8.6	10.75 x 21.1 x 9.75	27 x 54 x 24.8
	Driver	110	50	14 x 29 x 12.5	35.6 x 73.6 x 31.8
	Output	210	95.4	7.5 x 33 x 18	19 x 83.8 x 45.7

OPTIONAL ACCESSORIES

Model AT-5 Input Autotransformer

If nameplate input voltage is not available, or if Model PS-9116 is to be used at various locations that require the capability to operate the test set from several different input voltages, specify Model AT-5 Input Autotransformer. The multitapped autotransformer with power ON/OFF switch and appropriate sockets and plugs is housed in a rugged, sheet-metal enclosure with casters and handles.

Model PS-9116 is designed to be placed on top of the Model AT-5, providing a compact, transportable system. The AT-5 tap selections are: 208, 240 and 575 volts; 60 Hertz; single-phase. For other input voltages and frequencies, contact Technical Sales. Model AT-5 may reduce the maximum output of Model PS-9116. For example, a 208 volt input stepped up to 460 volts may not be sufficient to provide maximum output.

Transport Cart

The transport cart is a mobile base that supports Model PS-9116. This allows the test set to be rolled from one test site to another.

Printer Package

All Model PLC-2000 controllers are equipped with the ability to store and transfer test data to the RS-232 printer port. The test data can be printed immediately after a test is conducted or after an entire test series. The printer package consists of a parallel printer, serial-to-parallel communication interface and all interconnecting cables.



Model PS-9116 with Model AT-5 Input Autotransformer

ORDERING INFORMATION

Item (Qty)	Cat. No.	Item (Qty)	Cat. No.
Model PS-9116	PS-9116		
Model PS-9116/50	PS-9116/50		
Included Accessories		Optional Accessories	
Logic cable interconnect (1)	5086229400	Model AT-5 autotransformer	AT-5
Metering cable interconnect (1)	5086233400	Transport cart	11685
Remote-start pushbutton (1)	5083505000	Printer package	801029
Power cord for PLC-2000 (1)	6828	Serial-to-parallel converter [1]	11969
Input leads, 15 ft (4.5 m), 4 AWG, (2)	17165	Serial cable, 3 ft (1 m) [1]	15300
Timer leads, 12 ft (3.7 m) (1 set)	2997	Parallel cable, 6 ft (1.8 m) [1]	12172
Ground lead, 3 in (45.7 cm) (1)	15067	Series bar [1]	CBS-8
Power Cable Interconnect (1)	14783	Model CBS-3 stabs	Contact Technical Sales
Instruction manual (1)	13922		
Fuses			
3 A, 250 V MDA (5)	951		
2 A, 250 V MDA (5)	983		
1 A, 250 V MDL (5)	4139		
1.6 A, 500 FLQ (5)	15533		
Stab adapter (1)	CBS-7		
Stab set (1)	CBS-1 and CBS-2		
Output leads, quadruple 4/0, 5 ft (1.5 m) [1 set]	15397		

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