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OCR-8015 and OCR-9150
Automatic Oil Circuit Recloser Test Sets
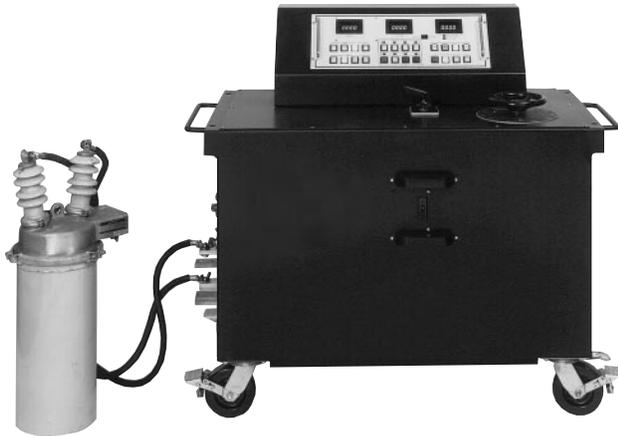
- **Preprogrammed test sequences for reclosers and sectionalizers**
- **High-capacity outputs to test virtually all reclosers**
- **Accurate duplication of high-voltage test results**
- **Simple operation and precise test results**
- **Simplified adjustment of test current**

DESCRIPTION

The Model OCR-8015and Model OCR-9150 Automatic Oil Circuit Recloser Test Sets are self-contained mobile test sets specifically designed to verify the proper operation of automatic circuit reclosers under simulated overload and fault conditions. This ensures reliable system protection and coordination. Microprocessor-based control and instrumentation systems ensure simple operation with precise test results. Model OCR-8015 and Model OCR-9150 provide a variable high-current output with an impedance compensation network to stabilize the output current.

They include appropriate instrumentation and control circuitry to efficiently, accurately and safely test virtually all single-phase and three-phase direct-acting reclosers produced by manufacturers such as Cooper Power Systems, Inc., McGraw-Edison (Kyle, Line Material), Westinghouse, General Electric, Kearney, and Lexington Switch and Controls.

APPLICATIONS

The Automatic Oil Circuit Recloser Test Sets not only test reclosers incorporating either oil or vacuum interrupters, but also easily test sectionalizers. Additionally, they can perform primary injection (high-current) testing of electronically controlled reclosers. The following tests are performed on reclosers.

Minimum trip current: This test determines the minimum operating (pickup) point. The minimum pickup test is performed by increasing current flow through the operating coil of the recloser until the recloser begins to operate.

The microprocessor in either unit will detect, measure and display the test current at this point. This is the pickup and is usually two times the current rating of the coil.

Time-current characteristics: This test determines the operating characteristics of the recloser under simulated fault conditions. The time-current characteristics and sequence of events tests are performed by subjecting the recloser to simulated overloads using recommended test current of four to six times the coil rating.

The current, trip time and reclose time for each operation, as well as the total clearing time, are all automatically measured by the test sets. Model OCR-9150 has the additional capability to test the time-current characteristics by simulating overloads as high as eight to ten times the continuous current rating.

Sequence of operation: The units verify the number and sequence of operations to lockout.

Operating time: A digital timer measures the elapsed time of each operation.

Reclosing time: A digital timer measures the reclosing interval between each operation.

Total clearing time: A digital timer measures the total elapsed time to lockout.

Similar tests can be performed on electronically controlled reclosers using primary injection testing. Primary injection not only tests the electronic control, but also checks the entire system including the CTs, control cable, auxiliary solenoids or wiring connections.

These test sets can also be used to perform a lockout test on sectionalizers. The lockout test is automatically performed by a special programmed test sequence that automatically applies and removes activating current to the sectionalizer. This simulates the upstream operation of a recloser; therefore, the sectionalizer should go through its normal sequence to lockout. The number of current pulses required to reach lockout is compared to the sectionalizer nameplate data.

Model OCR-8015 and Model OCR-9150 can also be used for other high-current applications such as ratioing current transformers, performing heat runs or testing direct-acting circuit breakers.

FEATURES AND BENEFITS

- **Simple operation and precise test results:** The microprocessor-based control and instrumentation systems of the test sets ensure simple operation and precise test results. When performing a minimum pickup test, the microprocessor will automatically detect and display the minimum current at which the recloser operates. The number of expected operations is selected prior to the start of the operational test.

  As the test is in progress, the micro-processor will store current magnitude, trip time and reclose time for each operation of the recloser. Total operating time to lockout is also measured. Data recall for each operation is by simple pushbutton selection of the desired operation.

- The microprocessor measures the number of operations and alerts the operator if there were insufficient or excessive operations of the recloser. Additionally, the control system will turn off the output of the test set if the recloser exceeds the allowed time to lockout.

- **Automatic test sequence for sectionalizers:** When testing sectionalizers, test sets are programmed with the number of circuit interruptions the sectionalizer is to count before it operates.

  During the automatic test sequence, the microprocessor automatically applies and removes the test current, thus simulating a recloser's operation. It simultaneously counts and records the number of circuit interruptions seen by the sectionalizer before it operates. Should the sectionalizer take an excess shot to lockout, the display will indicate EXCESS SHOT. Thus, the operator can verify that the sectionalizer has operated after the correct number of circuit interruptions.

- **Automatic error detection:** The microprocessor is also programmed to detect and display several types of errors associated with the operation of the test set, such as operator errors or device-related errors. For example, an error indication is displayed in the event that the operator fails to select an ammeter range or mode of operation.

- **High-capacity outputs test virtually all reclosers:** Model OCR-9150's output is rated a full 50 kVA. Additionally, it has a short-time overload capacity of up to 150 kVA. Model OCR-8015's output is rated a full 15 kVA with a short time overload capacity of 45 kVA.

- Overload and short-circuit protection

- **Detailed instructions:** A comprehensive instruction guide is provided.

SPECIFICATIONS

Input

Model No.	Input Voltage (Single-Phase)	Input Frequency
OCR-8015-208/60	208 V ±5% at 150 A 230 V ±5% at 150 A 460 V ±5% at 40 A 575 V ±5% at 35 A	60 Hz
OCR-8015-220/50	220 V ±5% at 150 A 240 V ±5% at 150 A 380 V ±5% at 40 A 415 V ±5% at 35 A	50 Hz
OCR-9150	460 V ±5% at 150 A	60 Hz

Output

Output Rating
Model OCR-8015: 15 kVA
Model OCR-9150: 50 kVA
Rated Output Ranges: The output is continuously adjustable through the following ranges to meet a wide variety of test circuit impedances:

| Model OCR-8015	Model OCR-9150
0 to 2000 A at 7.5 V max.	0 to 2800 A at 18 V max.
0 to 1500 A at 10 V max.	0 to 2000 A at 25 V max.
0 to 1000 A at 15 V max.	0 to 1400 A at 36 V max.
0 to 500 A at 30 V max.	0 to 1000 A at 50 V max.
0 to 250 A at 60 V max.	0 to 700 A at 71.5 V max.
0 to 100 A at 150 V max.	0 to 500 A at 100 V max.
0 to 50 A at 300 V max.	0 to 350 A at 143 V max.
0 to 25 A at 600 V max.	0 to 250 A at 200 V max.
	0 to 150 A at 334 V max.
	0 to 100 A at 500 V max.
	0 to 50 A at 1000 V max.

Duty Cycle: The test sets will supply the rated output current indicated above for 30 minutes, followed by 30 minutes off.
Overload Capability: For testing reclosers or for other applications requiring high current for short durations, the test sets will provide output currents significantly above the nominal current ratings given above.
Where the output voltage is sufficient to push higher than the rated current through the impedance of the load, the test sets can be overloaded as shown below. The actual output current obtained is determined by the impedance of the load circuit and by the resistance selected in the impedance compensation network.

Percent Rated	Maximum On Time	Minimum Off Time
100%	30 minutes	30 minutes
200%	75 seconds	6 minutes
300%	25 seconds	4 minutes

Impedance Compensation Network: This circuit is used to minimize the change in output current that occurs when the trip rod travels through the series trip coil of the recloser, causing the coil impedance to rise appreciably. A reasonably constant output current is provided by inserting resistance in the primary circuit of the output transformer of the test set. This will minimize the effects of changing impedances within the recloser. The appropriate impedance compensation resistance is selected by a switch mounted on the front panel.
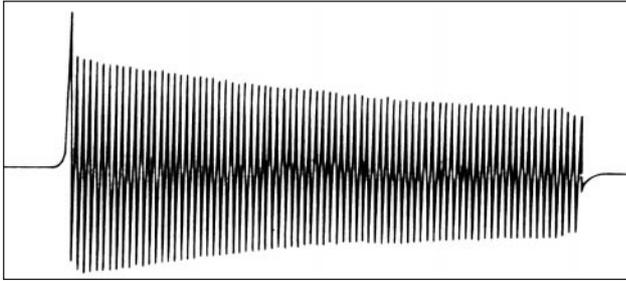
Figure 1: With no impedance compensation network, a recloser with a 50 ampere coil and an initial test current of 210 amperes operated in 2.641 seconds — three times the manufacturer's specifications.
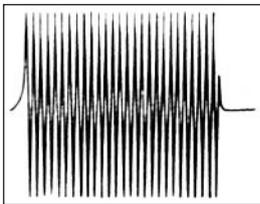
Figure 2: With an impedance compensation network, a recloser with a 50 ampere coil and an initial test current of 210 amperes operated in 0.783 of a second with no significant current decay. The result was well within the manufacturer's specifications.

Timer Measurements

An autoranging, solid-state timing system with digital display is incorporated to provide individual indication of the elapsed time of each sequence of the recloser's operation. Operating (trip) times, reclosing intervals and total time to lockout are indicated.

Timer Ranges (autoranging)
0 to 999.9 s
0 to 9999 cycles

Timer Accuracy
Seconds Mode: ±1 digit or 0.005% of reading, whichever is greater
Cycles Mode: ±2 digits or 0.005% of reading, whichever is greater

Current Measurements

A microprocessor-based circuit automatically detects, measures and displays the minimum pickup current. Additionally, a solid-state ammeter with digital display is specifically designed to accurately measure short-duration currents using a read- and-store memory circuit. It also will function as a standard ammeter that continuously measures the output current. Current measurements for each operation of the recloser under test are stored by the microprocessor until displayed or reset.

Ranges (switch-selected)
0 to 19.99 A
0 to 199.9 A
0 to 1.999 kA
0 to 19.99 kA
Each range has an over-range capability of 10%. In the event a current measurement exceeds the range in use, measurement can be made of currents up to 10% over that range's full-scale rating.

Overall Metering Accuracy
Instrument: ±0.5% of reading ±0.1% of full scale ± last digit
Current Transducer: ±1% of reading

Panel Indicators
Panel lamps are incorporated for operator safety and convenience. They indicate numerous conditions such as input power on, output energized, excessive shots and excess time.

Accessory Outlet
A ground-fault-protected, 120 volt outlet with a capacity of 1.2 kVA is provided for convenient connection of accessory equipment.

Operator Safety Interlock System
A safety interlock system, in conjunction with a foot switch, is incorporated to prevent the operator from leaving the control area of the test set. This helps to prevent accidental contact between the operator and the output section.

Output Connections
Busbar connections are provided for high-current ranges and insulated terminals are provided for high-voltage ranges.

Protection
Appropriate protective devices are incorporated to protect the test sets from overloads and short circuits.

Enclosure
For safety and mobility, each test set is housed in a single, rugged, sheet-metal enclosure with a low center of gravity, tow ring, lifting eyes and large locking swivel casters with brakes. To increase the maneuverability, all four casters swivel; however, they also can be easily locked into a fixed position when desired. Controls and instrumentation are positioned so the operator can simultaneously observe the recloser under test.

Dimensions
Model OCR-8015:
45 H x 53 W x 26 D in.
(114 H x 135 W x 66 D cm)

Model OCR-9150:
45 H x 60 W x 28 D in.
(114 H x 152 W x 71 D cm)

Weight
Model OCR-8015: 1100 lb (500 kg)
Model OCR-9150: 1620 lb (729 kg)

OPTIONAL ACCESSORIES
Computer Interface and Programmable Time-on Option

Model OCR-8015 and Model OCR-9150 feature an optional computer interface and control package that includes:

- An RS-232 interface for data capture and remote operation of the control panel by a personal computer (Test current output and impedance compensation controls remain manually operated only.)

- A Centronix printer port

- A programmable time-on duration for the OCR TIMING test, which allows the operator to select from 1 to 199 seconds test duration. This option is suggested for electronically controlled reclosers, due to the long reclose time of these systems.
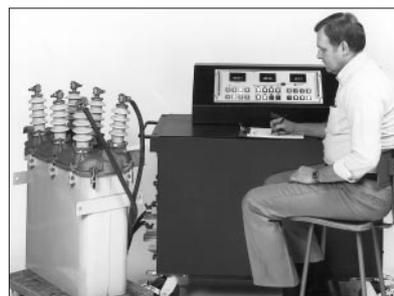
Model OCR-8015

ORDERING INFORMATION

Item (Qty)	Cat. No.
Model OCR-8015	
208-volt, 60-Hz input	OCR-8015-208/60
220-volt, 50-Hz input	OCR-8015-220/50
Model OCR-9150	OCR-9150
Model OCR-8015 with computer interface option	
208-volt, 60-Hz input	OCR8015-208/60C
220-volt, 50-Hz input	OCR8015-220/50C
Model OCR-9150 with computer interface option	OCR-9150/C

Item (Qty)	Cat. No.
Included Accessories	
Input cables, 4/0, 15 ft (4.5 m) [2]	17163
Output cables	
Single 4/0 [1 pr]	1531
Double 4/0 [1 pr]	1532
Timer leads [1 pr]	2997
Optional Accessories	
RS-232 and printer port conversion kit	12563
Protective cover, Model OCR-8015 only [1]	PC-1