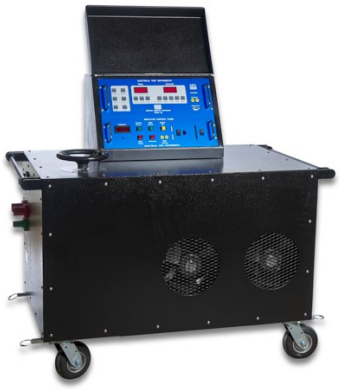
PI-6000
Portable Circuit Breaker Test Set

- Input: 208-240 or 480 VAC +/- 10% (Switch Selectable)
- 45KVA Continuous (Test up to 6000 Amp Circuit Breakers)
- Digital Memory Ammeter Controller MAC-21
- Programmable Output Phase Angle with SCR Controller
- Motorized Vernier with Manual Override for Fast Adjustment
- Regulate Current Hold Feature for Long Time Testing
- Preset ON Times For Convenient Jogging of Output Currents
- Rugged Solid Copper Universal & Horizontal 1/2" and 3/4" Output Stabs
- Ground Safety Interlock



DESCRITION

PI-6000 is a versatile and technologically advanced primary injection test set capable of testing circuit breakers up to 6000 amperes frame size. It incorporates an output transformer with dual primaries to facilitate its use on power sources of 480 VAC as well as 240 and 208 VAC, and dual secondaries to provide optimal impedance matching to a wide range of breaker sizes. An internal voltage sensor automatically configures the AC control power section to be energized only when properly configured for the applied voltage.

PI-6000 is constructed in a rugged steel enclosure with removable sides and top for easy access to internal components. The sides are clear of protruding components, and full-width handles with provisions for lifting hooks are on both ends. Locking swivel castors on all four corners provide ease of mobility. The entire test set has been designed for reliability, ruggedness, and ease of use.

MAC-21 instrumentation controller provides advanced state of the art accuracy and convenience for testing The unique manual / motorized vernier design increases your test reliability and productivity. The vernier position is displayed on an LED indicator bar graph.

PI-6000 features temperature protection one for the output bus, and the other for the vernier Powersatat™. If either temperature exceeds a safe operating level, the interlock is asserted and the output section is de-energized. Primary catastrophic overload protection for the test set is accomplished with input fuses having high interrupting current capacity.

Accessary Outlet: Ground-fault-protected, 120 volt outlet with a capacity of 1.0 kVA is provided for convenient connection of accessory equipment.

Output Stab Voltage Binding Post: is provided for convenient Multimeter connection monitor external stab voltages..

APPLICATIONS

This test set will test low-voltage, molded-case and metal-clad, direct acting AC circuit breaker from various manufactures. The test set can also be used on high current applications like ratio transformers, and heat runs.

Using SCR's the PI-6000 eliminates closing time errors. Initiation at the zero crossover point eliminates DC offset in the current waveform and results in accurate, repeatable test results even with short-duration currents for high speed solid state or electromechanical trip devices.

ADVANCED FEATURES

Serial port: This standard serial port may be connected to a printer, computer, or other device to print or store time and current values of test results in ASCII format. It is set for 9600 baud, 8 bits, 1 stop bit, no parity. This interface enables you to download data into various computer software programs.

Initiating Control: The advance initiate circuitry provides both pulse preset modes for cycles or seconds for output duration. The pulse mode automatically pulses the output to any preset programmed duration. This provides additional testing capabilities for electromechanical and solid state trip devices. A short preset pulse duration also allows for instantaneous tripping without preheating the breaker under test. A long preset time can used for heat runs on cables or other devices up to maximum 9999 seconds.

Zero DC Offset: Use of digitally controlled SCR's instead of a contactor to initiate the output of the test set eliminates closing time error and thereby ensures precise initiation at the zero crossover point of the output current waveform every time. Initiation at the zero crossover point ensures symmetrical output current by eliminating DC offset in the current waveform. Therefore accurate, repeatable test results are assured even with currents of very short duration, as when conducting tests of instantaneous or short delay trips

Ground Safety Interlock: Circuit ensures that the test set chassis is connected to system ground before the output of the test set can be energized.

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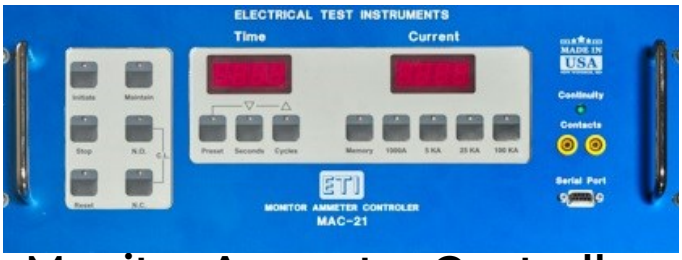

Monitor Ammeter Controller
MAC-21

INITIATE key: This key is used to turn ON the output of the test set. The LED in the key indicates that the MAC-21 is attempting to turn the output ON. In MOMENTARY mode, the key must be held to keep output current on. In MAINTAIN mode, once current is detected, the output will stay on until the breaker trips, or the STOP or RESET button are pressed.

STOP key: This key is used to turn the output of the test set OFF. Use of this key is usually necessary only when in MAINTAIN mode, and it is necessary to abort the test before the breaker trips. The STOP key is also used to access peak RMS and last average RMS values. See description of CURRENT DISPLAY for details.

RESET key: This key resets the displays on the MAC-21, and arms the pulse reading system. The LED on the key indicates that the system is reset and armed. RESET also takes the unit out of PRESET ADJUST mode.

DOWNLOAD key combination: On models equipped with a printer option, the STOP and RESET keys may be pressed simultaneously to send the time and current readings in ASCII format to a printer or computer, via the serial port.

MAINTAIN key: This key toggles the MAINTAIN or MOMENTARY mode for initiation; its LED indicates that this mode is enabled. When in MAINTAIN mode, the INITIATE key need only be pressed briefly to turn output on. For test sets with motorized Vernier, the MAINTAIN key may be pressed while output is ON to provide automatic current hold feature. The LED in the MAINTAIN key will blink while this mode is set, and the Vernier motor will be activated whenever the current varies more than 5 amperes from the value displayed when the key was pressed. The key may be pressed again to return to normal mode. STOP or RESET will also discontinue current hold.

NORMALLY OPEN key: This key is used to set the Normally Open contacts mode when testing a device with an normally open auxiliary contacts. In N.O. mode, the timer starts as soon as current (about 3% of range) is detected after the INITIATE key is pressed, and stops when the STOP key is pressed or a break in continuity is sensed at the CONTACTS binding posts. Timing accuracy in this mode is typically +/- 0.01 seconds.

NORMALLY CLOSED key: This key is used to set the Normally Closed contacts mode when testing a device with an normally closed auxiliary contacts. In N.C. mode, the timer starts as soon as current (about 3% of range) is detected after the INITIATE key is pressed, and stops when the STOP key is pressed or a break in continuity is sensed at the CONTACTS binding posts. Timing accuracy in this mode is typically +/- 0.01 seconds.

Current Latch key combination: When the N.O. and N.C. keys are pressed simultaneously, both LEDs light, indicating C.L. mode (Current Latch). This is the normal power-up default mode for the test set, and is recommended for all tests. In this mode, current is continuously sampled, and when it exceeds approximately 10% of the current range value, the timer starts, and calculation of pulse current begins. When current stops the timer stops and the final value for pulse current is calculated and displayed as well as the time.

PRESET key: This key toggles the PRESET ADJUST mode, indicated by illumination of its LED. This feature is used to set current test durations for short times (jog or instantaneous) using the cycles or long times (heat runs) using the seconds modes. When not in PRESET mode, the LED will flash if the displayed time exceeds the preset limit.

TIME DISPLAY: This 4 digit LED display indicates the elapsed time of a current pulse. In SECONDS mode, it displays time up to 9.999 seconds, then auto ranges to 99.99 seconds, 999.9 seconds, and 9999 seconds. In CYCLES mode, it reads time (based on 60 Hz), up to 999.9 cycles, then auto ranges to 9999 cycles

SECONDS key: This key normally selects the SECONDS time base. SECONDS or CYCLES time base may be selected at any time before, during, or after a test.

CYCLES key: This key normally selects the CYCLES time base. SECONDS or CYCLES time base may be selected at any time before, during, or after a test.

CURRENT DISPLAY: This 4 digit LED display indicates the output current. In CONTINUOUS mode, as well as in MEMORY mode before and during a test, the display indicates true-RMS output current in real time. This display can also indicate peak RMS and last average current. This feature allows the test set to be used to test various solid state trip devices used on circuit breakers. It may not be accurate for times less than half a cycle.

MEMORY key: This key toggles the MEMORY mode, indicated by illumination of its LED. In MEMORY mode (LED on), the current display will read the continuous output current until the test is complete. At this time, the LED will flash, and the display will read the computed true-RMS value of the entire current pulse for the duration indicated on the TIME display. This key may be pressed at any time before, during, or after the test, to toggle between the two modes.

ETI PRECISION

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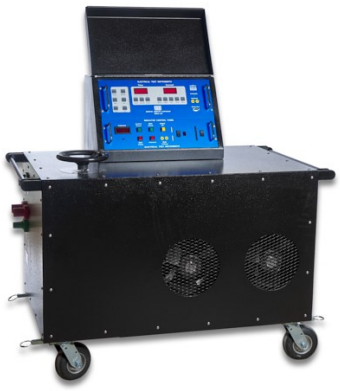
Specifications



PI-6000 Output Current & Overload Capabilities

9V (Parallel)	18 V (Series)	Over-load	Duty	Max ON Time	Min OFF Time	Max Input Current 480 V
6000 A	3000 A	1X	100%	Continuous	N/A	121 Amps
8400 A	4200 A	1.4 X	50%	15 Min	15 Min	175 Amps
12000 A	6000 A	2 X	25%	5 Min	15 Min	260 Amps
18000 A	9000 A	3 X	10%	1.5 Min	15 Min	415 Amps
24000 A	12000 A	4 X	6%	45 Sec	15 Min	582 Amps
30000 A	15000 A	5 X	4%	4 Sec	2 Min	776Amps
42000 A*	21000 A*	7 X	2%	2 Sec	2 Min	1208 Amps
60000 A*	30000 A*	10 X	1%	1 Sec	2 Min	1982 Amps

*Available with 480 VAC input only: *** Not available 240 Volt Input

Current Ranges:
- 0-1000 Amps
- 5 Kilo-Amps
- 25 Kilo-Amps
- 100 Kilo-Amps

Current Accuracy:
- Continuous
- +/- 0.5% of reading + .5% Full Scale
- Pulse
- +/- 1% of reading + 1% Full Scale Pulse

Timer Ranges:
- 0-9999.999 Seconds
- 0-9999.9 Cycles

Timer Accuracy:
- +/- 0.5% of reading +/- 1 count

Digital Voltmeter Input:
- Range: 0-600 Volts AC
- Accuracy 1% of FS

Input Supply:
- 208/240 or 480 VAC + 10%, -15% (Switch Selectable), Single Phase
- 60 Hz (50 Hz at 10% lower maximum line voltages)
- 45 KVA (Continuous) at 36 KVA output (80% efficiency)

Dimensions and Weight:
- Height: 45.0 in. (114.3 cm)
- Width: 48.0 in. (121.92 cm)
- Depth: 27.25 in. (69.22 cm)
- Weight: 1250 Lb. (567 kg)

Standard Accessories:

Stabs, BS-50HV (1/2" horizontal or vertical)	1 Set	M-I211
Stabs, BS-75HV (3/4" horizontal or vertical)	1 Set	M-I212
Input Power Plugs	2 Each	M-C392
Input Ground Plug	1 Each	M-C394
Contact Leads	1 Pair	S-B194
Remote Initiate Cable	1 Each	S-B143
Technical Manual	1 Copy	S-A129
Calibration Certificate	1	

Optional Accessories:

Series Output Bar	PN: M-I213
MAC Report Generator Software	PN: OP-112
Adjustable Stab System	PN: OP-114