

Current Injection System with Phase Shift



Features

- 0-50A output current
- True RMS metering with 1 cycle capture
- Variable auxiliary AC voltage/current output with phase shift
- Auxiliary metering input V, f, ϕ , Z, P, S, PF, CT ratio, harmonics
- Variable auxiliary output 12-220VDC
- Multi-function auto-range timing system
- Current limit mode for fine control
- Data storage to USB memory key including waveform & harmonics
- USB keyboard interface
- Automatic mains voltage selection
- Optional Backpack System

The 50ADM-P is a smaller version of our current injection system the 200ADM-P. The unit has a range of outputs allowing injection of currents from 1mA to 50A. Voltages up to 18V are available on the main outputs. True RMS metering with single cycle capture is provided. Three current ranges allow the full scale of the meter and trip level to be set independently of the selected output. Industry standard safety connectors are used throughout for safe, reliable convenience.

The 50ADM-P has a flexible auxiliary AC output that can be used at up to 260V for voltage relays or up to 10A for current relays. The phase and frequency of this output are fully adjustable. This combination of voltage and current allows testing of relays that require two voltages, one voltage and one current or two currents.

An auxiliary metering input is provided that meters AC and DC voltage, current and frequency from the auxiliary outputs or external signals. The module can also take measurements in conjunction with the main current output to meter phase angle, power, impedance, CT ratio and harmonics.

A variable stabilised DC supply with current limit is provided to power the relay under test. The unit has a comprehensive timing system linked to the outputs allowing trip times, reset times and reclose times to be quickly measured to a high degree of accuracy.



The timer includes a current operated mode and can accurately test instantaneous trips. Two USB host sockets are provided to connect a memory key and keyboard. Results of every test can be stored to the memory key in spreadsheet format for later analysis. The keyboard allows entry of a comment against each result. In addition a graphics file of the waveform may be stored to the memory key. Harmonic analysis results can also be recorded.

Main Output

The main output on the unit has two taps, allowing the selection of output voltages up to 18V and output currents up to 50A.

Range	Continuous	5 minutes	1 minute
3.5V	16A	32A	50A
18V	4A	8A	12A

The above intermittent on times must be followed by an off time of 15 minutes, based on an ambient temperature of 25°C.

Protection: over current trip, duty cycle trip, thermal monitoring.

Auxiliary DC Output

Protection: current limit.

Range	Maximum A	Continuous Rating
12-60V	1A	25W
60-220V	0.23A	25W

50ADM-P Specification

Metering

The output is metered by a digital true RMS system with a memory ammeter - whenever the timer stops and the output is switched off, the current reading is held on the display. The currents for each phase are displayed simultaneously.

A current trip is set to 110% of full scale of the selected metering range. A current trip is automatically set to 105% of full scale of the current metering range to protect the device under test.

Protection: over current trip, duty cycle trip, thermal monitoring.

Range	Resolution	Trip current	Accuracy
5.000A	0.001A	5.25A	$\pm 0.6\% \text{rdg} + 5\text{d}$
20.00A	0.01A	21A	$\pm 0.6\% \text{rdg} + 5\text{d}$
50.00A	0.01A	52.5A	$\pm 0.6\% \text{rdg} + 5\text{d}$

I Limit Mode

The main output has a current limit mode that gives very fine control of output currents up to 10A. It also allows fine current control into very low impedance loads such as digital relays.

Auxiliary Metering Inputs

Protection: fuse on current input.

Setting	Range	Resolution	Accuracy
Volts AC	300.0V	0.1V	$\pm 0.7\% \text{rdg} + 5\text{d}$
Amps AC	5.000A	1mA	$\pm 0.7\% \text{rdg} + 5\text{d}$
Phase	$\pm 180^\circ$	0.1°	$\pm 3^\circ$
Frequency	20-1000Hz	0.1Hz	$\pm 0.2\% \text{rdg} + 1\text{d}$

Timing System

Range 0-999.999s/9999.99s/99999.9s autoranging

Resolution 1/10/100ms

Accuracy 0.01%rdg+2d(+4d current operated mode)

Contact o/c 24V

Contact s/c 20mA

Vdc 24—240V

Mode	Timer Start	Timer Stop
Internal start	Press 'ON'	Contact 1 or 2 change
1 contact	Contact 1 1st change	Contact 1 2nd change
2 contacts	Contact 1 change	Contact 2 change
Current operated	Current > 10% of metering range	Current < 10% of metering range
Pulse	Press 'ON'	200ms
Aux AC	Aux AC on/ switch freq to ϕ / switch ϕ to freq	Contact 1 or 2 change

Supply Requirements

115V/230V $\pm 10\%$ auto-select 50/60Hz 1ph 2300VA max.

Dimensions

464 x 366 x 176mm

Weight

13kg without leads

Temperature Range

Storage -20°C to 60°C Operating 0°C to 45°C

Accessories

The 50ADM-P is supplied with operating manual, output lead set, mains lead, spare fuses, USB key-board, USB memory key, lead bag.

Lead Set specifications

The 50ADM-P is supplied with a high quality lead set including:

2 x 3m 10mm² 50A leads terminated in M10 fork crimps

2 x 5m, 2 x 0.5m 2.5mm² 25A leads terminated in 4mm plugs

1 x 5m 2 core auxiliary leads terminated in 4mm plugs.

Optional accessories

Filter unit, RB10 resistor box, pushbutton lead for run-back timing on disc induction relays, back-pack.

Safety

An earth terminal is provided for connection to a local earth. The unit is designed to comply with BSEN61010 and is CE marked.

50ADM-P Applications

IEEE no.	Type
21	Distance protection (phase at a time)
24	Volts/Hz
25	Check sync
27/59	Under/over voltage
32/P/Q	Directional power
37	Under-current/power
40	Field relay
46N	Negative sequence overcurrent relay
50/76	Instantaneous overcurrent
50	Ground fault relay
50V	Voltage restrained overcurrent
51	IDMT overcurrent relay
55	Power factor relay
59G	Neutral voltage displacement
67	Directional overcurrent
67N	Directional ground fault
78	Phase angle
79	Auto recloser
81	Under/over frequency
85	Pilot wire relay
86	Lockout relay
87	Differential relay
91	Directional voltage relay
92	Power directional relay
94	Tripping relay
	Voltage regulating relay
	Miniature circuit breakers
	Thermal relays
	CT mag curves