

# 100A/E Current Injection System



## Features

- Wide range of output currents
- AC and DC voltage outputs
- All outputs continuously variable
- Output current metering from 40mA-200A
- Automatic switch-off in all modes of operation
- Multi-function timing system
- Suitable for testing thermal devices
- Compact and highly portable
- Voltage and current outputs available simultaneously

T&R Test Equipment is a market leader in the field of current injection equipment. The range includes secondary injection units with 100A output capability up to 6000A primary injection systems. All have true RMS metering, a flexible timing system, and an easy to understand user interface.

The 100A/E Mk3 secondary current injection test set has been designed to give the maintenance and commissioning engineer a large number of facilities in one self-contained instrument.

The unit is portable, compact and simple to use. The mains supply for the unit is either 240V±10% or 115V +10% -6% at either 50 or 60Hz. Full load can be obtained at the supply voltage extremes.

The current and voltage outputs are independently controlled and metered. The output current and voltage are displayed on large, clear panel instruments. An additional four range CT is provided, extending the ammeter range down to 0-100mA.

All of the outputs are fully isolated by means of double wound transformers.

The timing system on the 100A/E is very flexible, without compromising ease of use. Four modes of operation and two contact inputs are provided allowing for a wide range of events to be timed. Both contact inputs automatically select

for normally open or normally closed contacts. Operation of the different timing modes is described below.

Internal start mode starts the timer when the 'on' pushbutton is pressed, and stops the timer when the first contact set changes state. This mode is ideally suited to timing over-current relays.

Single contact mode starts and stops the timer on the first and second changes of state of the first contact set, and dual contact mode starts the timer from the first set of contacts and stops it from the second set. These modes allow reset and re-close times of protective devices to be easily measured.

The final mode of operation of the timer starts the timer when the current exceeds 20% of the selected metering range, and stops it when the current falls below 20%. This allows the timing of trips with no auxiliary contacts such as miniature circuit breakers.

Automatic control has been provided such that all outputs can be switched off once the device under test has operated. The automatic control can be switched in or out of circuit for all outputs, enabling setting up procedures to be carried out.

The instrument is housed in a robust case complete with a protective cover and fold away carrying handles.

## 100A/E Mk3 Specification

### Current Output

The current output on the unit has eight ranges, allowing the selection of output voltages up to 150V and output currents up to 200A. The current outputs may also be used as voltage outputs.

Range	Continuous	5 minutes	1 minute	VAC
200A	50A	100A	200A	0-5V
50A	25A	50A	-	0-10V
25A	12.5A	25A	-	0-20V
10A	5.0A	10A	-	0-50V
5.0A	2.5A	5.0A	-	0-50V
2.5A	1.25A	2.5A	-	0-50V
1.0A	0.5A	1.0A	-	0-150V

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

### Voltage Output

The voltage output on the unit has three ranges, allowing the selection of output voltages up to 500Vac and 250Vdc.

Voltage Range	Output current Continuous	5 minutes
0-250Vac	0.5A	1.0A
0-500Vac	0.25A	0.5A
0-250Vdc	0.5A	1.0A

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

### Metering

The output is metered by an analogue true RMS system with separate instruments for current and voltage.

AC current is metered by a dual scaled ammeter reading 0-1A and 0-5A. The following scaling factors are used:

Range	1A Scale	5A Scale	Accuracy
0.1A	x0.1	x0.02	Class 1.5
0.25A	x0.25	x0.05	Class 1.5
0.5A	x0.5	x0.1	Class 1.5
1.0A	x1	x0.2	Class 1.5
2.5A	x2.5	x0.5	Class 1.5
5.0A	x5	x1	Class 1.5
10A	x10	x2	Class 1.5
25A	x25	x5	Class 1.5
50A	x50	x10	Class 1.5
100A	x100	x20	Class 1.5
200A	x200	x40	Class 1.5

AC voltage is metered by a dual scaled ammeter reading 0-300V and 0-600V. The following scaling factors are used:

Range	300V Scale	600V Scale	Accuracy
300V	x1	x0.5	Class 1.5
600V	x2	x1	Class 1.5

### Timing System

Range	0-999.999s
Resolution	1ms
Accuracy	±0.1% rdg ±2d (all modes except current op.)
Accuracy	±0.1% rdg ±3d (current operated mode)

The contact circuit has an open circuit voltage of 24Vdc and a short circuit current of 100mA. Each contact circuit will auto-select for normally open or normally closed contacts. A DC voltage of 24-240Vdc may also be used to trigger either timer channel.

The following functions are provided:

Mode	Timer Start	Timer Stop
Internal start	Press 'ON'	Contact 1
Single contact	Contact 1	Contact 1
Dual contact	Contact 1	Contact 2
Current operated	Current > 20% of range	Current < 20% of range

The output may be automatically switched off at the end of the test to safeguard the relay under test. This is selectable for both the voltage and current output.

### Protection and Safety

The unit is protected by the following fuses:

Input supply	T5A 240V supply T10A 115V supply
Output supplies	T3.15A
Contacts	F0.25A
Aux CT circuit	T315mA and T1.25A

An earth terminal is provided for connection to a local earth.

### Supply Requirements

115V+10%-6% 50/60Hz 1ph 1450VA max  
240V±10% 50/60Hz 1ph 1450VA max

### Temperature Range

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

### Dimensions

490mm x 300mm x 300mm

### Weight

33kg

### Accessories

Operating manual  
2m mains lead  
Non-latching contact lead  
Spare fuse set

### Optional Accessories

100AFS Filter unit  
100AFS-PH Filter unit  
100AL lead set