

# PCU1/E



# Primary Current Injection System



## Features

- 6.9kVA output capability
- Continuously variable output
- Multi-function digital timing system
- Digital true RMS ammeter with memory
- Digital true RMS voltmeter
- Automatic switch-off at end of test
- Rugged, compact design
- Secondary injection up to 100A
- Loading units from 500A-3000A
- Low impedance, dual-range outputs

The PCU1/E Mk5 primary current injection system is ideally suited to commissioning and maintenance testing where high currents up to 3000A are required. The system consists of separate control and loading units for maximum flexibility. The control unit contains all control and metering circuitry, and is linked to the loading unit by control and metering cables. The control unit is capable of injection of currents up to 100A, and adding an optional external loading unit up-rates the output capability to 500A-3000A.

The combination of the PCU1/E and a suitable loading unit is ideal for all low power primary current injection tasks up to 3000A, including testing under and over current relays, circuit breakers and CT ratio testing.

Where higher power is required, the PCU2/E and associated loading units can supply up to 20kVA and inject currents up to 6000A.

Four loading units are available, delivering output currents between 250A and 3000A. Each loading unit has two outputs which may be connected in series or parallel for maximum flexibility. For example, the LU3000LP may be configured to either give a maximum current of 1500A at 4V or 3000A at 2V.

A full range of output leads are available to complement the PCU1/E and loading units.

The control unit is rated at 6.9kVA, and has digital current and voltage metering. A memory facility is provided on the metering to hold the current reading when the output trips or is switched off. The current is automatically switched off when the device under test trips.

The PCU1/E has a flexible timing system, allowing timing tests to be carried out to a resolution of 1ms. Selection for normally open or normally closed contacts is automatic, and the status of the contacts is shown on the front panel. Timing modes are available to test under and over current devices, re-closers, under and over voltage devices, and many current trips and circuit breakers.



LU3000LP,  
LU500 and  
PCU1/E



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## PCU1/E Control Unit Specification

### Secondary Injection Output

The secondary current injection output on the unit has two taps, allowing the injection of currents up to 100A.

| Range | Continuous current | Intermittent current<br>5min on/15 min off |
|-------|--------------------|--|
| 0-5V  | 0-50A              | 0-100A                                     |
| 0-10V | 0-25A              | 0-50A                                      |

### Voltage Output (non-isolated)

| Voltage | Current (cont.) | Current (5 min on/15 off) |
|---------|-----------------|---------------------------|
| 0-230V  | 0-15A           | 0-25A                     |

The voltage output is metered by two 4 digit true RMS digital meters to measure voltage and current.

| Meter   | Full scale | Resolution | Accuracy                           |
|---------|------------|------------|------------------------------------|
| Voltage | 300.0V     | 0.1V       | $\pm 0.6\% \text{rdg} + 6\text{d}$ |
| Current | 30.00A     | 0.01A      | $\pm 0.6\% \text{rdg} + 6\text{d}$ |

### Loading Unit Output (non-isolated)

| Voltage | Current (cont.) | Current (5 min on/15 off) |
|---------|-----------------|---------------------------|
| 0-230V  | 0-15A           | 0-30A                     |

### Current Metering

The AC output current is metered by a true RMS 4 digit memory ammeter (acquisition time 200ms) with an LED display.

| Range     | Full scale | Resolution | Accuracy                           |
|-----------|------------|------------|------------------------------------|
| 0-10V 50A | 50.00A     | 0.01A      | $\pm 0.6\% \text{rdg} + 6\text{d}$ |
| 0-5V 100A | 100.0A     | 0.1A       | $\pm 0.6\% \text{rdg} + 6\text{d}$ |

| Loading unit | Full scale | Resolution | Accuracy                           |
|--------------|------------|------------|------------------------------------|
| LU500        | 500.0A     | 0.1A       | $\pm 0.6\% \text{rdg} + 6\text{d}$ |
| LU1000       | 1000A      | 1A         | $\pm 0.6\% \text{rdg} + 6\text{d}$ |
| LU2000       | 2000A      | 1A         | $\pm 0.6\% \text{rdg} + 6\text{d}$ |
| LU3000LP     | 3000A      | 1A         | $\pm 0.6\% \text{rdg} + 6\text{d}$ |

### Timing System

The PCU1/E has a flexible timing system with two contact inputs and 5 operating modes. Both the start and stop contact circuits will accept volt free contacts or contacts connected to a dc voltage system (220V max). Each contact circuit automatically selects for N/O or N/C contacts, and the status of each contact input is shown by an LED. The timing channels may also be triggered by a dc voltage between 24 and 240V. The timing system will also respond to the rise and fall of current in the test object for devices where no auxiliary contact is available.

|                     |  |
|---------------------|--|
| Timer resolution    | 1ms  |
| Timer full scale    | 999.999s   |
| Timer accuracy      | $\pm 0.1\% \text{rdg} + 2\text{d}$ (3d current mode) |
| Contact O/C voltage | 24V  |
| Contact S/C current | 100mA  |
| Vdc input range     | 24-240Vdc  |

| Timer mode            | Timer start      | Timer stop   |
|-----------------------|------------------|--------------|
| Internal Start        | 'On' button      | Contact      |
| Single contact        | Contact 1        | Contact 1    |
| Dual contact          | Contact 1        | Contact 2    |
| Current operated 50%  | Current >10%     | Current <10% |
| Current operated 100% | Current >20%     | Current <20% |
| Off                   | Setting position | of range     |

### Supply Requirements

230V $\pm 10\%$  45-65Hz 1ph 7.2kVA max

### Dimensions

490mm x 300mm x 300mm

### Weight

35kg

### Temperature Range

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

### Protection and Safety

The PCU1/E and loading units are CE marked and are designed to meet the requirements of BS EN61010. The system is protected by electronic trips on the outputs, circuit breakers on the mains input and control unit output, and fuses on the contact inputs.

### Control Unit Standard Accessories

Mains lead (2m), loading unit power and metering leads (5m), operating manual and spare fuses.

### Optional Loading Unit Specifications

Loading units are available to increase the output capabilities of the unit with a range of current ratings. The output of the loading unit is isolated, and consists of two windings which may be connected in series or parallel. All metering functions are handled by the control unit.

#### Loading unit intermittent ratings (5 min on/15 off)

| Unit     | Series connection | Parallel connection | Max     |         |     |
|----------|-------------------|---------------------|---------|---------|-----|
| Type     | Current           | Voltage             | Current | Voltage | kVA |
| LU500    | 0-250A            | 0-8V                | 0-500A  | 0-4V    | 2   |
| LU1000   | 0-500A            | 0-8V                | 0-1000A | 0-4V    | 4   |
| LU2000   | 0-1000A           | 0-6V                | 0-2000A | 0-3V    | 6   |
| LU3000LP | 0-1500A           | 0-4V                | 0-3000A | 0-2V    | 6   |

#### Loading unit continuous ratings

| Unit     | Series connection | Parallel connection | Max     |         |     |
|----------|-------------------|---------------------|---------|---------|-----|
| Type     | Current           | Voltage             | Current | Voltage | kVA |
| LU500    | 0-125A            | 0-8V                | 0-250A  | 0-4V    | 1   |
| LU1000   | 0-250A            | 0-8V                | 0-500A  | 0-4V    | 2   |
| LU2000   | 0-500A            | 0-6V                | 0-1000A | 0-3V    | 3   |
| LU3000LP | 0-750A            | 0-4V                | 0-1500A | 0-2V    | 3   |

#### Unit Dimensions Weight

|          |                   |      |
|----------|-------------------|------|
| LU500    | 290 x 320 x 425mm | 29kg |
| LU1000   | 290 x 320 x 425mm | 37kg |
| LU2000   | 290 x 320 x 425mm | 45kg |
| LU3000LP | 290 x 320 x 475mm | 52kg |

### Optional Output Lead Set Specifications

A range of output lead sets are available in a range of lengths to complement the PCU1/E system, with current ratings between 500A and 3000A.

| Type      | Length   | CSA                | Termination |
|-----------|----------|--------------------|-------------|
| 500AL     | 1m to 5m | 70mm <sup>2</sup>  | Ring crimp  |
| 1000AL    | 1m to 5m | 140mm <sup>2</sup> | Copper bar  |
| 2000AL    | 1m to 5m | 280mm <sup>2</sup> | Copper bar  |
| 3000AL-LP | 1m to 2m | 420mm <sup>2</sup> | Copper bar  |