

PCU1-SP Mk3

Primary Current Injection



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PCU1-SP & NLU5000
with optional trolley.

Features:

- 5kA maximum output current (higher overload currents for 2s)
- Multi-function digital timing system
- True RMS memory ammeter with single cycle capture
- 200A, 2000A and 5000A loading units
- Three range outputs on loading units except NLU200
- Direct reading CT ratio and polarity
- Optional trolley mounting of system
- Secondary injection up to 100A
- Rugged, compact design

The PCU1 series are medium powered primary current injection systems offering output currents up to 5000A. The system consists of a separate control unit containing all metering and control functions and a loading unit that provides the high current output. The PCU1-SP Mk3 is ideally suited to primary current injection, stability testing and circuit breaker testing. In addition, it offers direct-reading CT ratio and polarity tests and a 100A secondary injection output. T&R also offers the higher-powered CU-PS MK2 system.

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 for under and over current devices, re-closers, under and over voltage devices, current trips and circuit breakers.

PCU1-SP Mk3 Specification Protection and Safety

The PCU1 series 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. The unit also has a duty cycle trip on the loading unit output and thermal protection.

Storage of Results

All test results from the PCU1-SP can be stored in a USB memory key. The unit has a real-time clock to time and date-stamp all results. To log the results, first enter a comment for your results using the optional keyboard, and then select AUTO STORE.

Whenever the timer stops, the time, current and all other parameters are added to a spreadsheet file on the USB key. You can then view the current set of results on the display or take the USB key out and open the file on your PC. All results are stored in a folder on the USB key named with the test date in a file named with the time. Also the unit can store a .csv file of the waveform.

Supply Requirements

230V±10%, 45-65Hz 1ph 11.5kVA max (23kVA overload for 2s)

Feature	PCU1-SP Mk3	CU-PS MK2
Primary injection	✓	✓
Max output power	11.5kVA 40s	20kVA 5 min
Secondary injection	✓	✗
CT ratio/polarity test	✓	✗

Three loading units are available, delivering a maximum output current of 200A, 2000A or 5000A. Each loading unit, **except NLU200**, has three output taps to allow for a wide range of load impedances. For example, the NLU5000 may be configured to either give a maximum current of 5000A on the 2.3V range, 2500A on the 4.6V range or 1250A on the 9.2V range.

The control units are rated at 11.5kVA with a 2 second overload capability of 23kVA using pulse mode. All metering is digital and a memory facility is provided to hold the current reading when the output trips or is switched off. The PCU1 systems have a high accuracy timing system with 1ms resolution.

Loading Unit Current Metering

The AC output current is metered by a true RMS memory ammeter (acquisition time 200ms) with an LCD display. The current metering has 3 ranges corresponding to 10%, 50% and 100% of the maximum rating of the loading unit. The maximum obtainable current is set by the impedance of the test object and output leads.

NLU200

Range	Full scale	Resolution	Accuracy 50Hz**
10%	20.00A	0.01A	$\pm 0.5\% \text{rdg} + 5d^*$
50%	100.0A	0.1A	$\pm 0.5\% \text{rdg} + 5d^*$
100%	200.0A	0.1A	$\pm 0.5\% \text{rdg} + 5d^*$

NLU2000

Range	Full scale	Resolution	Accuracy 50Hz**
10%	200.0A	0.1A	$\pm 0.5\% \text{rdg} + 5d^*$
50%	1000A	1A	$\pm 0.5\% \text{rdg} + 5d^*$
100%	2000A	1A	$\pm 0.5\% \text{rdg} + 5d^*$

NLU5000

Range	Full scale	Resolution	Accuracy 50Hz**
10%	500.0A	0.1A	$\pm 0.5\% \text{rdg} + 5d^*$
50%	2500A	1A	$\pm 0.5\% \text{rdg} + 5d^*$
100%	5000A	1A	$\pm 0.5\% \text{rdg} + 5d^*$

* $\pm 1.5\% \text{rdg} + 5d$ pulse mode

** For 60Hz operation the accuracy is reduced to $\pm 1\% \text{rdg} \pm 5d$ for all ranges.

Timing System

The PCU1 systems have a flexible timing system with two contact inputs and 5 operating modes. 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 24V and 240V.

Timer resolution	1ms
Timer full scale	999.999s
Timer accuracy	$\pm 0.01\% \text{rdg} + 2d$ (+4d current mode)
Contact O/C voltage	24V
Contact S/C current	20mA
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	**I>20% rng	I<20% rng/Cont. 1
Pulse mode 0.2s *	'On button'	0.2s
Pulse mode 0.5s *	'On button'	0.5s
Pulse mode 1s *	'On button'	1s
Pulse mode 2s *	'On button'	2s
Off	Setting position	

***Pulse mode** applies current to the load for a maximum of the specified time. If contact set 1 changes state or the current drops below 20% of the metering range during the pulse time, the timer is stopped.

****Current operated mode** is used to time circuit breakers with no auxiliary contacts. The timer is started when the current exceeds 20% of the selected metering range (e.g. 100A on the NLU5000 500A range). The timer stops when the current falls.

Secondary Injection Output

Output Range	Continuous current	Intermittent current
0-5V	33A	5min on* 67A
0-15V	10A	1 min on* 100A
		33A

*All on times must be followed by an off time of 15 minutes

Metering Range	Current trip	Resolution	Accuracy 50Hz*
10.00A	10.5A	0.01A	$\pm 0.5\% \text{rdg} + 5d$
20.00A	21A	0.01A	$\pm 0.5\% \text{rdg} + 5d$
100.0A	105A	0.1A	$\pm 0.5\% \text{rdg} + 5d$

* For 60Hz operation the accuracy is reduced to $\pm 1\% \text{rdg} \pm 5d$ for all ranges.

Control Unit Standard Accessories

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

Dimensions Weight

PCU1-SP Mk3	450 x 275 x 305mm	26kg
NLU200	450 x 275 x 370mm	49kg
NLU2000	450 x 275 x 370mm	50kg
NLU5000	450 x 275 x 370mm	60kg

Temperature Range

Storage	-20°C to 60°C	Operating	0°C to 45°C
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Optional Loading Unit Specifications

Three loading units are available to provide a range of output currents.

Voltage*	Current		
	Cont.	2min	40s
60V	40A	120A	200A
120V	20A	60A	100A

NLU200 Loading Unit Intermittent Ratings

Voltage*	Current			
	Cont.	5 min	1 min	40s
4V	600A	1200A	1800A	2000A
8V	300A	600A	900A	1000A
16V	150A	300A	450A	500A

NLU2000 Loading Unit Intermittent Ratings

Voltage*	Current			
	Cont.	5 min	1 min	40s
2.3V	1500A	3000A	4500A	5000A
4.6V	750A	1500A	2250A	2500A
9.2V	375A	750A	1125A	1250A

NLU5000 Loading Unit Intermittent Ratings

*open circuit voltage at 230V mains

Optional Output Lead Set Specifications

Type	Length	CSA	Termination
2000NAL	1m to 5m	280mm ²	Copper bar
3000NAL**	1m to 3m	420mm ²	Copper bar
5000NAL**	1m to 3m	560mm ²	Copper bar

**Note: Due to the company's continuous research programme, the information above may change at any time without prior notification.*

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