

CU-Ps MK2

Primary Current Injection System



Features

- 20kVA 5 minute output capability (higher overload currents for 1s)
- Multi-function digital timing
- 5000A and 6000A loading units
- Separate control and loading units
- Secondary injection up to 100A
- Direct reading CT ratio and polarity
- True RMS metering with 1 cycle capture
- Data storage to USB memory key including waveform & harmonics
- USB keyboard interface

The CU-Ps primary current injection system is ideally suited to commissioning and maintenance testing where very high currents 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 may be used with one of two loading units providing between 5000A or 6000A for 5 minutes or up to 10 or 12kA for short periods. Each loading unit has two outputs which may be connected in series or parallel for maximum flexibility. For example, the PLU-6k may be configured to either give a maximum current of 3000A at 6.6V or 6000A at 3.3V.

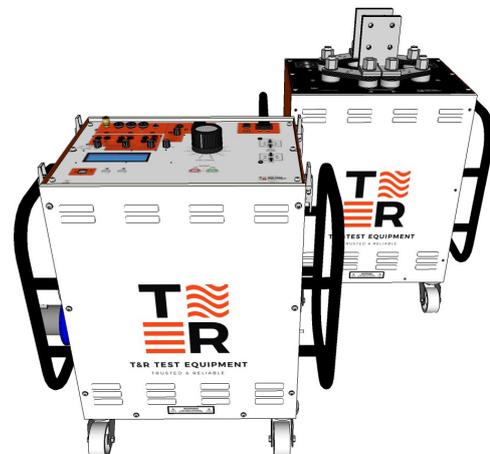
The control and loading units are each housed in tough steel cases fitted with castors and protective lifting handles. The loading units have a small plan area to allow them to be positioned as close as possible to the test object, minimising power requirements and maximising the available current.

The CU-Ps control unit is shown here with a PLU-6k loading unit. This combination may be used to inject currents of up to 6000A for 5 minutes or 12000A for 1 second.

This unit is ideally suited to all primary current injection tasks, including testing under and over current relays, circuit breakers and CT ratio testing.

The control unit is rated at 20kVA and has digital 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 CU-Ps systems have a high accuracy timing system with 1ms resolution. 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.



CU-Ps Specification

Loading Unit Current Metering

The AC output current is metered by a true RMS memory ammeter (acquisition time 20ms) with a liquid crystal display. The current metering has 3 ranges corresponding to 10%, 50% and 100% of the maximum rating of the loading unit. In addition, a 200% metering range is enabled in pulse mode for the 0.2s, 0.5s and 1s settings only.

PLU-5k

Range	Series Mode	Parallel Mode	Resolution	Accuracy
10%	250.0A	500.0A	0.1A	$\pm 0.5\%rdg+5d$
50%	1250A	2500A	1A	$\pm 0.5\%rdg+5d$
100%	2500A	5000A	1A	$\pm 0.5\%rdg+5d$
200%	5000A	10kA	10A	$\pm 1.5\%rdg+5d$

PLU-6k

Range	Series	Parallel	Resolution	Accuracy
10%	300.0A	600.0A	0.1A	$\pm 0.5\%rdg+5d$
50%	1500A	3000A	1A	$\pm 0.5\%rdg+5d$
100%	3000A	6000A	1A	$\pm 0.5\%rdg+5d$
200%	6000A	12kA	10A	$\pm 1.5\%rdg+5d$

$\pm 1.5\%rdg+5d$ pulse mode

*For 60Hz operation the accuracy is reduced to $\pm 1\%rdg\pm 5d$ for first 3 Ranges and $\pm 3\%rdg\pm 5d$ for the 200% Range.



Timing System

The CU-Ps 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 24 and 240V.

Timer resolution	1ms
Timer full scale	999.999s
Timer accuracy	$\pm 0.01\%rdg+2d$
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
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

I < 20% range
Contact 1

*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. The maximum

output current is increased in pulse mode. The maximum obtainable current is set by the impedance of the test object and output leads.

**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. 1000A on the PLU-5k 5000A range). The timer stops when the current falls.

Secondary Injection Output

Output Range	Continuous current	Intermittent current 5min on*	1 min on*
0-5V	33A	67A	100A
0-16V	10A	20A	30A

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

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

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

Supply Requirements

230V $\pm 10\%$, 45-65Hz 1ph 23kVA 5 min/46kVA 1s

Control Unit Standard Accessories

Spare fuse set, operating manual.

1 x 5m loading unit power interconnection lead.

1 x 5m loading unit metering interconnection lead.

1 x 2m mains lead.

1x 5m 100A leads and timer leads.

Dimensions

Control unit 660 x 400 x 740mm

PLU-5k 660 x 400 x 740mm

PLU-6k 660 x 400 x 740mm

Weight

115kg

155kg

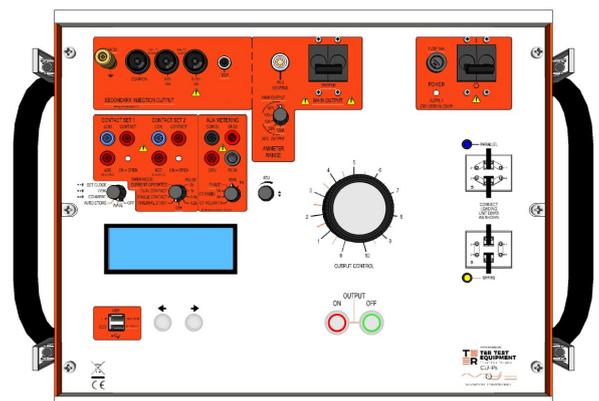
135kg

Temperature Range

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

Protection and Safety

The CU-Ps 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 breaker and fuse on the mains input, and a circuit breaker on the control unit output. The unit also has a duty cycle trip on the loading unit output and thermal protection.



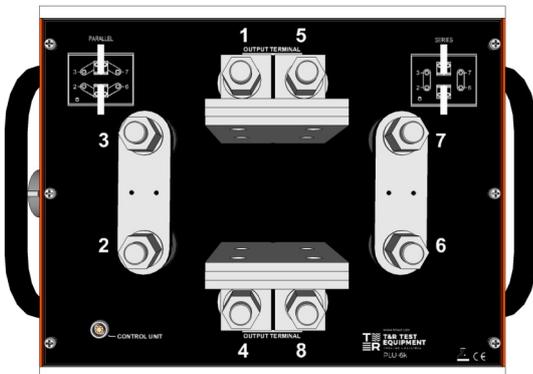
Loading Unit Output

The output of the loading unit is continuously variable from zero. Each unit may be operated in series/parallel mode to allow for a greater range of load impedances. All metering and tripping functions are handled by the control unit.

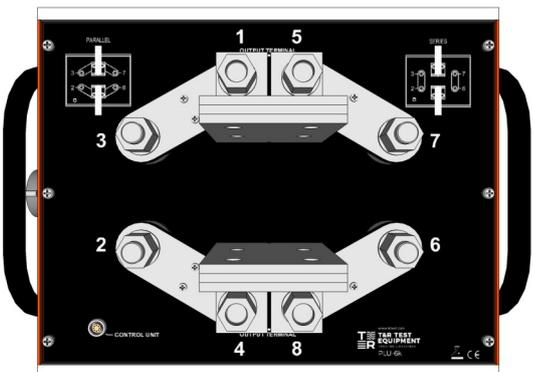
Primary Injection Output		PLU-5k		PLU-6k	
		Parallel mode	Series mode	Parallel mode	Series mode
Open Circuit V*		0-4V	0-8V	0-3.3V	0-6.6V
Continuous	Current	2500A	1250A	3000A	1500A
	Max kVA	10	10	10	10
5 min on/15 min off	Current	5000A	2500A	6000A	3000A
	Max kVA	20	20	20	20
2 sec pulse	Current	8000A	4000A	9600A	4800A
	Max kVA	32	32	32	32
1 sec pulse	Current	10000A	5000A	12000A	6000A
	Max kVA	40	40	40	40
0.5 sec pulse	Current	10000A	5000A	12000A	6000A
	Max kVA	40	40	40	40
0.2 sec pulse	Current	10000A	5000A	12000A	6000A
	Max kVA	40	40	40	40

*open circuit voltage at 230V mains

Series Mode



Parallel Mode



Storage of Results

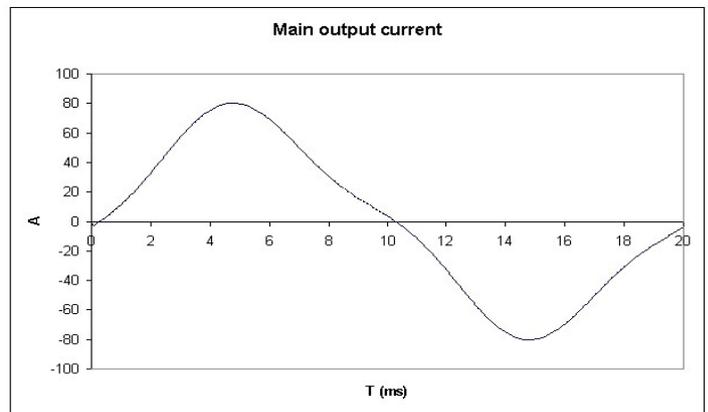
All test results from the CU-Ps can be stored in a USB memory key. The unit has a real-time clock to time and date-stamp all results. To log the results, first enter a comment for your results using the optional keyboard, and then select AUTO STORE.

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.

Sample data stored on USB key

```
Time, Date, Main A, Timer, Aux A, Aux V, Phase, Freq Hz, Comment
10:53:12,12/12/18, 2050, 10.000,0.000, 10.0, 10.3, 50.00, Breaker 12
10:53:30,12/12/18, 5120, 3.000, 0.000, 10.0, 10.3, 50.00, Breaker 12
10:54:10,12/12/18, 1020, 1.000, 0.000, 10.0, 10.3, 50.00, Breaker 12
```

Also the CU-Ps can store a .CSV file of the waveform



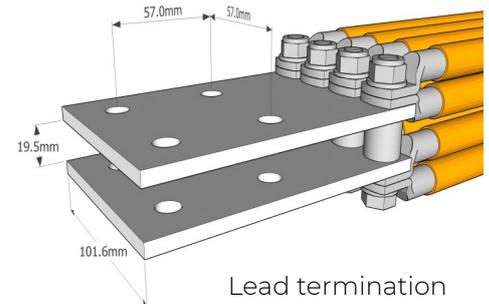
Optional Output Lead Set Specifications

A range of output lead sets are available to complement the CU-Ps system with current ratings between 3000A and 6000A. The leads are double insulated and have good flexibility.

Type	Length	CSA	Termination
3000AL	2.5m	560mm ²	Copper bar
4000AL	2.5m	700mm ²	Copper bar
5000AL	2m	840mm ²	Copper bar
6000AL	2m	1120mm ²	Copper bar

Other output lead lengths are available on request.

Output currents above 3000A require very short leads, and longer leads will restrict the maximum current available.



Lead termination

Note: Due to the company's continuous research programme, the information above may change at any time without prior notification. Please check that you have the most recent data on the product.

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