

# RENTAL Lab-Hp

# **HIGH POWER DC SOURCES**



### A 10 turn digitally encoded potentiometer allows for straight forward front panel operation. Each LAB-HP system is supplied in its own wheeled flight case for ease of transport.

Units have a large screen that displays relevant output quantities simultaneously. Output values can be preset and read prior to releasing the output. Each unit is built with an RS-232 and isolated analogue interface with switchable ranging for remote control of the PSU. Additional computer control interfaces are provided with selected models which includes USB, Ethernet and IEEE 488.2. Please contact ETPS if you require a specific interface.

- + CV, CC, CP, CR and PVsim Modes
- + RS-232 and Analogue Interfaces
- + Simple Front Panel Operation
- + Memory Card Slot Possible
- + Operating GUI



# **FURTHER DETAILS**

All models can be operated in constant current, voltage, power, and resistance modes. The adjustable internal resistance make this range ideal for automotive simulation as well as general laboratory and production work. A PV operation mode is also provided as standard. This enables a photovoltaic generator's MPP tracking to be simulated. The MPP is available in both voltage and current modes.

A large display is provided, which indicates all relevant output quantities simultaneously. Output values can be preset and read prior to releasing the output.

A front panel datalogging slot is provided with selected models. This is a useful feature to enable the DC Source to follow pre-determined voltage and current curves. Data is programmed on a PC using text or .WAV formats. It can then be simply transferred to an SD card or USB drive (model dependant) and recalled from the front panel of the LAB-HP. Output values can be recorded at intervals of 1 sec to 71 mins. The front panel display indicates when the unit is logging data and will alert the user when the memory card becomes full.

Selected models feature a soft interlock circuit allows users to connect the unit to an external safety device, such as an emergency stop. This feature requires a high signal (+10V) to be present between two pins, otherwise the output will be shutdown.

# **SELECTION TABLE**

| SELECTION TABLE             |           |                |                |
|-----------------------------|-----------|----------------|----------------|
| Part Number                 | Max Power | Output Voltage | Output Current |
| LAB-HP 10150-r              | 10kW      | 0 - 150V       | 0 - 70A        |
| LAB-HP 1560-r               | 15kW      | 0 - 60V        | 0 - 250A       |
| LAB-HP 15150-r              | 15kW      | 0 - 150V       | 0 - 100A       |
| LAB-HP 3060-r <sup>1</sup>  | 30kW      | 0 - 60V        | 0 - 500A       |
| LAB-HP 30120-r <sup>2</sup> | 30kW      | 0 - 120V       | 0 - 250A       |

<sup>1</sup> Comprised of 2 × LAB-HP 1560 units in parallel connection. <sup>2</sup> Comprised of 2 × LAB-HP 1560 units in series connection.

# **MASTER-SLAVE CAPABILITY**

The LAB-HP 3060 and LAB-HP 30120 systems are comprised from 2 × LAB-HP 1560 in master/slave. These can be arranged in a series or parallel configuration. Each unit is able to operate independently, so that systems can be reconfigured if needs dictate.

Our LAB-HP 1560 rental systems can be combined in series or parallel configurations with any LAB-HP units you have previously purchased, providing they have the same nominal outputs.





### **TECHNICAL DATA**

| INPUT                                      |   |                              |
|--|---|------------------------------|
|  | 10kW  | 15kW                         |
| Connection                                 | 5 wire (3P+N+E)   |                              |
| Maximum Allowed Non-Symmetry               | <3%   |                              |
| Standard Input Voltage                     | 3 × 400 VAC [360 – 440 VAC 47 – 63 Hz]                    |                              |
| Standard Input Current <sup>1,2</sup>      | 22.9A <sub>eff</sub>                                      | 34.7A <sub>eff</sub>         |
| Standard Nominal Current Internal Fuse     | 30A   | 45A                          |
| Recommended Supply Breaker Value and Curve | 32A type D/K  | 63A type D/K                 |
| Inrush Transient Current <sup>2</sup>      | <51A  | <76A                         |
| Leakage Current                            | <35mA   |                              |
| Cos Phi                                    | >0.7  |                              |
| Harmonic Content <sup>3</sup>              | 50Hz = 72 %   100Hz = 2 %   150Hz = 0.9 %   200Hz = 0.1 % | 250Hz = 11 %   350Hz = 0.6 % |
| Efficiency                                 | Up to 94%   |                              |

| DISPLAY  |              |             |             |               |
|--|--------------|-------------|-------------|---------------|
| Resolution Voltage Display                         | 10V - 69.99V | 70V – 99.9V | 100V - 999V | 1000V - 1500V |
| Voltage Setting Resolution Single & MS Series Mode | 00.00        | 00.0        | 000         | 0000          |
| Voltage Setting Resolution MS Parallel Mode        | N × 00.01    | N × 00.1    | N × 001     | N × 0001      |
| Resolution Current Display                         | 2A – 69.99A  | 70A – 99.9A | 100A – 999A | 1000A - 2000A |
| Current Setting Resolution Single & MS Series Mode | 00,00        | 00,0        | 000         | 0000          |
| Current Setting Resolution MS Parallel Mode        | N × 00.01    | N × 00.1    | N × 001     | N × 0001      |

| EMC AND SAFETY STANDARDS                      |                  |  |
|---|------------------|--|
| Safety  | EN60950          |  |
| Emissions                                     | EN61000-6-4:2007 |  |
| Immunity                                      | EN61000-6-2:2005 |  |
| Measurement, Control and Laboratory Equipment | EN61000-1:2010   |  |

| AMBIENT CONDITIONS                       |  |  |
|--|--|--|
| Cooling                                  | Forced air, front to back  |  |
| Operating Temperature                    | 0 to 50°C  |  |
| Storage Temperature                      | -20°C to 70°C  |  |
| Humidity                                 | <80%   |  |
| Operating Altitude                       | <2000m   |  |
| Weight (Per Unit Without Flightcase)     | 26kg (10kW models)   33kg (15kW models)  |  |
| Dimensions (Per Unit Without Flightcase) | 19" $\times$ 3U $\times$ 620mm (W $\times$ H $\times$ D), exact flightcase dimensions available on request |  |
| Fan Noise                                | 42 – 43 dB   |  |
| 15                                       |  |  |

<sup>1</sup> For nominal current and nominal voltage <sup>2</sup> For nominal input voltage <sup>3</sup> Total harmonic distortion input current [[%]/lin]



### **TECHNICAL DATA**

| OUTPUT   |   |                  |
|--|---|------------------|
|  | 60V MODELS  | 150V MODELS      |
| Static Regulation  | ±0.1 % of F.S.  |                  |
| Line Regulation Voltage  | ±0.02 % F.S.  |                  |
| Line Regulation Current  | ±0.02 % F.S.  |                  |
| Load Regulation  | ±0.05 % F.S. ± 2mV  |                  |
| Load Regulation Current  | ±0.05 % F.S. ± 20mA   |                  |
| Dynamic Response (10%-90%)   | Typically <3ms assuming an ohmic load   |                  |
| Typical Voltage Ripple (p-p) 20MHz   | 140mV   | 900mV            |
| Typical Voltage Ripple (p-p) 300kHz  | 60mV  | 400mV            |
| Typical Voltage Ripple (rms) 20MHz   | 60mV  | 400mV            |
| Typical Voltage Ripple (rms) 300kHz  | 40mV  | 300mV            |
| Current Ripple (p-p)   | <0.5 % of F.S.  |                  |
| Current Ripple (rms)   | <0.4 % of F.S.  |                  |
| Isolation (Between Primary and Secondary)                                      | 3000VAC   |                  |
| Isolation (Between DC-Output and Earth)  | 500VDC  |                  |
| Isolation (Between Primary and Earth)  | 2150VDC   |                  |
| Rise Time (Full Load)  | 20ms  | 20ms             |
| Rise Time (No Load)  | 10ms  | 10ms             |
| Fall Time (Full Load)  | 20ms  | 40ms             |
| Fall Time (No Load)  | 5s ≤50V   |                  |
| Relative Voltage Accuracy  | $\pm$ 0.25% V <sub>max</sub>  |                  |
| Relative Current Accuracy  | $\pm$ 0.4% I <sub>MAX</sub>   |                  |
| Maximum Sense Voltage (0 to $V_{MAX}$ )  | 5% of F.S.  |                  |
| Maximum Sense Voltage (Operating Over $\mathrm{V}_{_{\mathrm{MAX}}}\mathrm{]}$ | ± 1% of F.S.  |                  |
| Relative Voltage Sense Accuracy  | $\pm$ 0.5% $V_{_{MAX}}$ [relative accuracy for worst case sense ope   | eration)         |
| Over Voltage Protection  | Adjustable between 0 % and 120 % of full voltage range  |                  |
| Over Current Protection  | Limited by the current setpoint   |                  |
| Over Temperature Protection  | If the internal heat sink tempearture rises above 90°C the device will automatically shut down  |                  |
| Under Voltage Lock Out   | If the set limit is reached then the device will automatically shut down  |                  |
| VI Mode  | Voltage and current operation mode: voltage and current limit are programmable  |                  |
| VIP Mode (60V and 150V Models Only)  | Power limit mode: a powerlimit is programmable  |                  |
| VIR Mode (60V and 150V Models Only)  | Output resistor mode: an output resistor is programmable between $[R_{MAX} = V_{OUTMAX}/I_{OUTMAX}]$ and $[R_{MIN} = R_{MAX} \times 0.1]$   |                  |
| PVSim Mode (60V and 150V Models Only)  | Photovoltaic Simulation Mode: simulates a PV generator's MPP tracking in both voltage and current modes   |                  |
| Slope Function   | Adjustable slope for current and voltage: Range-Minimum 1 A/s resp. 1 V/s   Range-Maximum is 30ms to $\rm V_{_{MAX}}$ resp. I $_{_{MAX}}$   |                  |
| Al Filter  | Adjustable filter function for analogue interface set values.<br>Average time is adjustable between 0s to 80s<br>0=0s; 2=15ms; 3=30ms; 4=60ms; 5=125ms; 6=250ms; 7=500ms;<br>8=1s; 9=2s; 10=3s; 11=5s; 12=10s: 13=20s; 14=40s; 15=80s |                  |
| t-Enable   | Adjustable on time for the device after press the start b   | utton (standby). |





#### **OPERATING SOFTWARE**

Operating software is available with selected units. Live values of the power systems can be be viewed remotely in a simple and intuitive way. This is particularly useful when operating the power supply in a location that is remote to the DUT.

Voltage, current, power and resistance values can all be controlled through the GUI. A test sequence function allows for more complex DC waveforms to be implemented directly through the software.



A specialised PV simulation feature is also provided as part of the software. This allows the power system to simulate a generator's MPP tracking in both current and voltage modes. The software contains many pre-loaded solar panels from different manufacturers.





#### **INTERFACE INFORMATION**

| ANALOGUE INTERFACE (STANDARD)          |  |  |
|--|--|--|
| Digital Outputs (CV, Standby, Error)   | Output type: Open collector with pull-up resistor 10k $\Omega$ after +5 V $I_{\text{SINKMAX}}$ 50 mA   |  |
| Digital Inputs (Ext. Control, Standby) | Input resistance: $47k\Omega$<br>Maximum input voltage: $50V$<br>High level: $V_{IN} > 2V$<br>Low level: $V_{IN} < 0.8V$                           |  |
| Analog Outputs (Xmon)                  | Output resistance: $100\Omega$<br>Minimum permissible load resistance: $2k\Omega$<br>Minimum load resistance for 0.1 % accuracy: $100k\Omega$      |  |
| Analog Inputs (Xset)                   | Input resistance: $1M\Omega$<br>Maximum premissible input voltage: 25V   |  |
| Reference Voltage                      | Reference voltage V <sub>REF</sub> : 10V $\pm$ 10 mV<br>Output resistance: <10 $\Omega$<br>Maximum output current: 10 mA (not short-circuit-proof) |  |
| 5 V – Supply Voltage                   | Output voltage: $5V \pm 300 \text{mV}$<br>Maximum output current: 50 mA (not short-circuit-proof)  |  |
| Programming Response Time              | <10ms  |  |
| DS-222 ΙΝΤΕΟΕΛ/Ε («ΤΛΝΠΛΟΠ)            |  |  |
| KJ ZJZ INTERTACE (STANDARD)            |  |  |
| Signal Inputs (RxD, CTS)               | Maximum input voltage: ± 25V<br>Input resistance: 5 kΩ (Type)<br>Switching thresholds: VH < -3V, VL > +3V  |  |
| Signal outputs (TxD, RTS)              | Output voltage (at RL >3k $\Omega$ ): min ± 5V, Type ± 9V, max ± 10V<br>Output resistance: <300 $\Omega$ ; Short circuit current: Type ± 10mA      |  |

#### **NEW LAB-HP SYSTEMS**

If you are looking to purchase a system, new LAB-HP units can be found in our DC source range. We don't just offer standard models within the incredibly flexible product platform. You can specify your own nominal voltage and current ranges often at no additional cost. For example you might have a DUT that needs exactly 850V at 15kW. We can provide a new unit with exactly those output ranges without increasing the lead time.

Where necessary, units can be treated to a laboratory rack or flight case integration. Having a programmable power system mounted into a flight case on castors is often advantageous, especially when several departments or test cells share the same equipment.







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