

# LAB-HP

## COMPACT HIGH POWER DC SOURCE



POSITIVE PROBLEM SOLVING **+ =**

The LAB-HP provides up to 15kW of power in just a 3U high case. A 10 turn digitally encoded potentiometer allows for straight forward front panel operation.

The large display indicates all relevant output quantities simultaneously. Output values can be preset and read prior to releasing the output. ATE options are offered for system integration. Each unit has an RS-232 and isolated analogue interface with switchable ranging as standard. If computer control is required then any combination of Integrated RS-485, GPIB, USB & LAN interfaces can be specified.

- + CV, CC, CP, CR & PVsim Modes
- + Optional Computer Interfaces
- + Simple Front Panel Operation
- + Memory Card Slot Option
- + Worldwide Input Options
- + Datalogging Capability

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## FURTHER DETAILS

The LAB-HP's compact design delivers high efficiencies of up to 94%. 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.

The power supply can be operated in constant current, voltage, power or resistance modes. The adjustable internal resistance and optional automotive starting curves make this range ideal for automotive simulation as well as general laboratory and production work.

A PV operation mode is built in as standard. This enables a photo-voltaic generator's MPP tracking to be simulated. The MPP is available in both voltage and current modes. An SD card slot can be specified on order. 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 and recalled from the front panel of the LAB-HP. The data card can also be used for data logging. 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. Each unit is built with a systems interface as standard for master/slave operation. This enables setting values to be equally shared amongst units that are configured in parallel.

## HIGHLIGHTED FEATURES

### SD MEMORY CARD

An integrated SD card provides a convenient low cost method of recording and editing complex waveforms, using simple WAV or script files via a PC.

### MODIFICATIONS

Existing platforms can be modified by ETPS's design specialists to meet unusual test needs. Voltage or current outputs can be tailored to suit your requirements.

### MASTER / SLAVE

Operation of several PSUs in series or parallel is possible. This allows users to retrospectively expand systems to meet ever changing power requirements.

### INTERFACES

A variety of analogue and digital interfaces are available providing flexibility for users. Each system can be configured with multiple interfaces.

## SELECTION TABLE

Part Number	Max Power	Output Voltage	Output Current
LAB-HP 520	5kW	0 - 20V	0 - 250A
LAB-HP 540	5kW	0 - 40V	0 - 125A
LAB-HP 580	5kW	0 - 80V	0 - 65A
LAB-HP 5100	5kW	0 - 100V	0 - 50A
LAB-HP 5150	5kW	0 - 150V	0 - 35A
LAB-HP 5300	5kW	0 - 300V	0 - 17A
LAB-HP 5600	5kW	0 - 600V	0 - 8.5A
LAB-HP 5800	5kW	0 - 800V	0 - 6.25A
LAB-HP 51000	5kW	0 - 1000V	0 - 5A
LAB-HP 51200	5kW	0 - 1200V	0 - 4A
LAB-HP 51500	5kW	0 - 1500V	0 - 3.4A
LAB-HP 1020	10kW	0 - 20V	0 - 500A
LAB-HP 1040	10kW	0 - 40V	0 - 250A
LAB-HP 1080	10kW	0 - 80V	0 - 130A
LAB-HP 10100	10kW	0 - 100V	0 - 100A
LAB-HP 10150	10kW	0 - 150V	0 - 70A
LAB-HP 10300	10kW	0 - 300V	0 - 34A
LAB-HP 10600	10kW	0 - 600V	0 - 17A
LAB-HP 10800	10kW	0 - 800V	0 - 13A
LAB-HP 101000	10kW	0 - 1000V	0 - 10A
LAB-HP 101200	10kW	0 - 1200V	0 - 8A
LAB-HP 101500	10kW	0 - 1500V	0 - 7A
LAB-HP 1520	15kW	0 - 20V	0 - 750A
LAB-HP 1540	15kW	0 - 40V	0 - 375A
LAB-HP 1580	15kW	0 - 80V	0 - 195A
LAB-HP 15100	15kW	0 - 100V	0 - 150A
LAB-HP 15150	15kW	0 - 150V	0 - 100A
LAB-HP 15300	15kW	0 - 300V	0 - 50A
LAB-HP 15600	15kW	0 - 600V	0 - 25A
LAB-HP 15800	15kW	0 - 800V	0 - 19A
LAB-HP 151000	15kW	0 - 1000V	0 - 15A
LAB-HP 151200	15kW	0 - 1200V	0 - 12A
LAB-HP 151500	15kW	0 - 1500V	0 - 10A

Part Number	Output Voltage	Max Power	Output Current
LAB-HP 2020	20kW	0 - 20V	0 - 1000A
LAB-HP 2040	20kW	0 - 40V	0 - 500A
LAB-HP 2080	20kW	0 - 80V	0 - 250A
LAB-HP 20100	20kW	0 - 100V	0 - 200A
LAB-HP 20150	20kW	0 - 150V	0 - 133A
LAB-HP 20300	20kW	0 - 300V	0 - 66A
LAB-HP 20600	20kW	0 - 600V	0 - 33A
LAB-HP 20800	20kW	0 - 800V	0 - 26A
LAB-HP 201000	20kW	0 - 1000V	0 - 20A
LAB-HP 201200	20kW	0 - 1200V	0 - 16A
LAB-HP 201500	20kW	0 - 1500V	0 - 14A
LAB-HP 3020	30kW	0 - 20V	0 - 1500A
LAB-HP 3040	30kW	0 - 40V	0 - 750A
LAB-HP 3080	30kW	0 - 80V	0 - 375A
LAB-HP 30100	30kW	0 - 100V	0 - 300A
LAB-HP 30150	30kW	0 - 150V	0 - 200A
LAB-HP 30300	30kW	0 - 300V	0 - 100A
LAB-HP 30600	30kW	0 - 600V	0 - 50A
LAB-HP 30800	30kW	0 - 800V	0 - 38A
LAB-HP 301000	30kW	0 - 1000V	0 - 30A
LAB-HP 301200	30kW	0 - 1200V	0 - 25A
LAB-HP 301500	30kW	0 - 1500V	0 - 20A

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### TECHNICAL DATA

INPUT					
	5kW	10kW	15kW	20kW	30kW
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>	11.5A <sub>eff</sub>	22.9A <sub>eff</sub>	34.4A <sub>eff</sub>	45.8A <sub>eff</sub>	68.7A <sub>eff</sub>
Standard Nominal Current Internal Fuse	15A	30A	45A	60A	90A
Recommended Supply Breaker Value and Curve	16A type D/K	32A type D/K	63A type D/K	63A type D/K	80A type D/K
Input Voltage [Option /3P208]	3 × 208 VAC [187 – 229 VAC 47 – 63 Hz]				
Input Current [Option /3P208] <sup>1,2</sup>	23A <sub>eff</sub>	46A <sub>eff</sub>	69A <sub>eff</sub>	92A <sub>eff</sub>	138A <sub>eff</sub>
Input Voltage [Option /3P440]	3 × 440 VAC [396 – 484 VAC 47 – 63 Hz]				
Input Current [Option /3P440] <sup>1,2</sup>	11A <sub>eff</sub>	21A <sub>eff</sub>	32.5A <sub>eff</sub>	42A <sub>eff</sub>	63.5A <sub>eff</sub>
Input Voltage [Option /3P480]	3 × 480 VAC [432 – 528 VAC 47 – 63 Hz]				
Input Current [Option /3P480] <sup>1,2</sup>	10A <sub>eff</sub>	19.5A <sub>eff</sub>	30A <sub>eff</sub>	39A <sub>eff</sub>	58A <sub>eff</sub>
Inrush Transient Current <sup>2</sup>	<25A	<51A	<76A	<102A	<153A
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

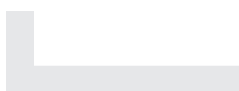
EMC AND SAFETY STANDARDS	
Safety	EN60950
Emissions	EN61000-6-4:2007
Immunity	EN61000-6-2:2005
Measurement, Control and Laboratory Equipment	EN61000-1:2010

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	19 / 26 / 33 / 52 / 66 kgs
Dimensions	19" × 3U × 620mm [5kW / 10kW / 15kW], 19" × 6U × 620mm [20kW / 30kW]
Fan Noise	42 – 43 dB

<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											
	20V	40V	80V	100V	150V	300V	600V	800V	1000V	1200V	1500V
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	80mV	140mV	140mV	140mV	900mV	900mV	900mV	1000mV	1200mV	2500mV	2500mV
Typical Voltage Ripple (p-p) 300kHz	35mV	60mV	60mV	60mV	400mV	400mV	400mV	700mV	800mV	1500mV	1500mV
Typical Voltage Ripple (rms) 20MHz	35mV	60mV	60mV	60mV	400mV	400mV	400mV	400mV	400mV	400mV	500mV
Typical Voltage Ripple (rms) 300kHz	25mV	40mV	40mV	40mV	300mV	300mV	300mV	300mV	300mV	300mV	400mV
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						2000VDC				
Isolation [Between Primary and Earth]	2150VDC										
Rise Time [Full Load]	6ms	12ms	20ms	20ms	20ms	20ms	20ms	40ms	40ms	40ms	6ms
Rise Time [No Load]	5ms	10ms	10ms	10ms	10ms	10ms	10ms	10ms	20ms	20ms	5ms
Fall Time [Full Load]	15ms	20ms	20ms	20ms	40ms	40ms	50ms	60ms	80ms	100ms	25ms
Fall Time [No Load]	5s ≤ 50V										
Relative Voltage Accuracy	± 0.25% V <sub>MAX</sub>										
Relative Current Accuracy	± 0.4% I <sub>MAX</sub>										
Maximum Sense Voltage (0 to V <sub>MAX</sub> )	5% of F.S.							No sense function provided			
Maximum Sense Voltage (Operating Over V <sub>MAX</sub> )	± 1% of F.S.							No sense function provided			
Relative Voltage Sense Accuracy	± 0.5% V <sub>MAX</sub> (relative accuracy for worst case sense operation)										
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 temperature 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	Power limit mode: a powerlimit is programmable										
VIR Mode	Output resistor mode: an output resistor is programmable between [R <sub>MAX</sub> =V <sub>OUTMAX</sub> /I <sub>OUTMAX</sub> ] and [R <sub>MIN</sub> =R <sub>MAX</sub> × 0.1]										
PVSIM Mode	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 V <sub>MAX</sub> resp. I <sub>MAX</sub>										
AI Filter	Adjustable filter function for analogue interface set values. Average time is adjustable between 0s to 80s 0=0s; 2=15ms; 3=30ms; 4=60ms; 5=125ms; 6=250ms; 7=500ms; 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 button [standby]. Time is adjustable between 1s and 6500s										

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### INTERFACE INFORMATION

#### ANALOGUE INTERFACE (STANDARD)

Digital Outputs (CV, Standby, Error)	Output type: Open collector with pull-up resistor 10kΩ after +5 V $I_{\text{SINKMAX}}: 50 \text{ mA}$
Digital Inputs (Ext. Control, Standby)	Input resistance: 47kΩ Maximum input voltage: 50V High level: $V_{\text{IN}} > 2\text{V}$ Low level: $V_{\text{IN}} < 0.8\text{V}$
Analog Outputs (Xmon)	Output resistance: 100Ω Minimum permissible load resistance: 2kΩ Minimum load resistance for 0.1 % accuracy: 100kΩ
Analog Inputs (Xset)	Input resistance: 1MΩ Maximum permissible input voltage: 25V
Reference Voltage	Reference voltage $V_{\text{REF}}: 10\text{V} \pm 10 \text{ mV}$ Output resistance: <10 Ω Maximum output current: 10 mA (not short-circuit-proof)
5 V – Supply Voltage	Output voltage: $5\text{V} \pm 300\text{mV}$ Maximum output current: 50 mA (not short-circuit-proof)
Programming Response Time	<10ms

#### RS-232 INTERFACE (STANDARD)

Signal Inputs (RxD, CTS)	Maximum input voltage: $\pm 25\text{V}$ Input resistance: 5 kΩ (Type) Switching thresholds: $V_{\text{H}} < -3\text{V}$ , $V_{\text{L}} > +3\text{V}$
Signal outputs (TxD, RTS)	Output voltage (at $R_{\text{L}} > 3\text{k}\Omega$ ): min $\pm 5\text{V}$ , Type $\pm 9\text{V}$ , max $\pm 10\text{V}$ Output resistance: <300Ω; Short circuit current: Type $\pm 10\text{mA}$

#### RS-485 INTERFACE (OPTIONAL)

Maximum Input Voltage	$\pm 5\text{V}$
Input Resistance	>12kΩ
Output Current	$\pm 60\text{mA Max}$
High Level	$V_{\text{d}} > 0.2\text{V}$
Low Level	$V_{\text{d}} < -0.2\text{V}$



## MASTER SLAVE INFORMATION

GENERAL	
Number of Devices Connectable in Master Slave	Up to 8
Maximum Voltage in Series	600V
Maximum Power Using Standard Devices	120kW
Maximum Power Using Modified LAB HP Devices	720kW
Set-Value Accuracy (V/A) Using Internal Reference	± 0.5 %
Absolute Voltage Accuracy in Parallel	± 0.25% of $V_{NOM}$
Absolute Current Accuracy in Parallel	± 0.4% of $I_{NOM}$ × number of devices connected in parallel
Absolute Voltage Accuracy in Series	± 0.25% of $V_{NOM}$ × number of devices connected in series
Absolute Current Accuracy in Series	± 0.4% of $I_{NOM}$

## OPTIONS

CODE	DESCRIPTION
/3P208	3 Phase Input of 3 × 208 (187 - 229Vac), 50/60Hz
/3P440	3 Phase Input of 3 × 440 (396 - 484Vac), 50/60Hz
/3P480	3 Phase Input of 3 × 480 (432 - 528Vac), 50/60Hz
/400HZ	400Hz input frequency
/DC	Any nominal in the input range 250 - 750VDC ± 10% (eg. 500VDC ± 10% = 450 - 550VDC input)
/ATE	No front panel control or display, analogue interface provided as standard
/USB	USB interface
/LT	IEEE 488.2 (GPIB) interface
/LTRS485	RS-485 interface
/LAN	Ethernet interface
/KFZ12	Output follows a 12Vdc automotive cranking curve
/KFZ24	Output follows a 24Vdc automotive cranking curve
/KFZXX	Output follows a user specific curve
/SD	Integrated memory card slot on the front panel
/SCS	Metal cover set with cable glands for input and output terminals

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WE ARE  
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ETPS engineer electronic power supply and testing systems. Our problem solving skills provide the spark of innovation to some of the world's leading technology brands.



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