ELECTRONIC TEST & POWER SYSTEMS

LAB-HPP

COMPACT HIGH POWER DC SOURCES

POSITIVE PROBLEM SOLVING

The LAB-HPP family can be used as a stand alone power supply or as component in a wider automated test system. The LAB-HPP consists of the 45kW and 60kW models.

Lower power models between 5kW and 30kW are detailed on the separate LAB-HP technical summary. This highly efficient modern design has a wealth of standard and optional features. Along with constant current and voltage operation the user may also select adjustable power limit or resistance modes from the front panel. A simple photo-voltaic simulation mode allows different maximum power points to be set for voltage and current.

- CV, CC, CP, CR & PVsim Modes
- Optional Computer Interfaces
- Simple Front Panel Operation
- Memory Card Slot Option
- Worldwide Input Options
- Fast Response Times

FURTHER DETAILS

The connectivity options of the LAB-HPP help to ensure that the units can be utilised in a wide variety of applications. Both RS232 and isolated analogue 0-5Vdc/0-10Vdc interfaces are provided as standard.

Output voltage and current limit can be set proportionally and actual values read back during operation. It is also possible to force the analogue interface to become active via a high signal on the relevant pin. Computer interfaces are also optionally available. Any combination of GPIB, USB, LAN, RS485 & USB is possible on the same unit.

An integrated memory card reader is another useful option. This enables output waveforms to be programmed graphically on a PC using freely available software that supports the WAV format. Another simple method of controlling the output via an SD card is by text script.

Along with setting output variables the user can program time delays and loop operations. The memory card slot also offers a convenient datalogging function. Sample times of between 1 sec and 71 minutes can be set. When activated each logging event is indicated on the front panel display. LAB-HPPs are provided in standard 19" rackmounting cases. A cabinet integration service can be provided on request.

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. Higher power models are also available on request.

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	Maximum Power	Output Voltage	Output Current
LAB-HPP 4520	45kW	0 - 20V	0 - 2250A
LAB-HPP 4540	45kW	0 - 40V	0 - 1125A
LAB-HPP 4580	45kW	0 - 80V	0 - 562A
LAB-HPP 45100	45kW	0 - 100V	0 - 450A
LAB-HPP 45150	45kW	0 - 150V	0 - 300A
LAB-HPP 45300	45kW	0 - 300V	0 - 150A
LAB-HPP 45600	45kW	0 - 600V	0 - 75A
LAB-HPP 45800	45kW	0 - 800V	0 - 57A
LAB-HPP 451000	45kW	0 - 1000V	0 - 45A
LAB-HPP 451200	45kW	0 - 1200V	0 - 37A
LAB-HPP 451500	45kW	0 - 1500V	0 - 30A
LAB-HPP 6020	60kW	0 - 20V	0 - 3000A
LAB-HPP 6040	60kW	0 - 40V	0 - 1500A
LAB-HPP 6080	60kW	0 - 80V	0 - 750A
LAB-HPP 60100	60kW	0 - 100V	0 - 600A
LAB-HPP 60150	60kW	0 - 150V	0 - 400A
LAB-HPP 60300	60kW	0 - 300V	0 - 200A
LAB-HPP 60600	60kW	0 - 600V	0 - 100A
LAB-HPP 60800	60kW	0 - 800V	0 - 76A
LAB-HPP 601000	60kW	0 - 1000V	0 - 60A
LAB-HPP 601200	60kW	0 - 1200V	0 - 50A
LAB-HPP 601500	60kW	0 - 1500V	0 - 40A

Different output ranges and application/user specific options are possible. Please contact ETPS Ltd to discuss your requirements.

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TECHNICAL DATA

INPUT		
	45kW	**60kW**
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[1,2]	103.1A$_{eff}$	137.5A$_{eff}$
Standard Nominal Current Internal Fuse	135A	180A
Recommended Supply Breaker Value and Curve	120A type D/K	150A type D/K
Input Voltage (Option /3P208)	3 × 208 VAC (187 – 229 VAC 47 – 63 Hz)	
Input Current (Option /3P208)[1,2]	207A$_{eff}$	276A$_{eff}$
Input Voltage (Option /3P440)	3 × 440 VAC (396 – 484 VAC 47 – 63 Hz)	
Input Current (Option /3P440)[1,2]	95A$_{eff}$	127A$_{eff}$
Input Voltage (Option /3P480)	3 × 480 VAC (432 – 528 VAC 47 – 63 Hz)	
Input Current (Option /3P480)[1,2]	87A$_{eff}$	117A$_{eff}$
Inrush Transient Current[2]	<229A	<305A
Leakage Current	<35mA	
Cos Phi	>0.7	
Harmonic Content[3]	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	99kg (45kW), 132 kgs (60kW)
Dimensions	19" × 9U × 620mm (45kW), 19" × 12U × 620mm (60kW)
Fan Noise	42 – 43 dB

[1] For nominal current and nominal voltage [2] For nominal input voltage [3] 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_{MAX}										
Relative Current Accuracy	± 0.4% I_{MAX}										
Maximum Sense Voltage (0 to V_{MAX})	5% of F.S.							No sense function provided			
Maximum Sense Voltage (Operating Over V_{MAX})	± 1% of F.S.							No sense function provided			
Relative Voltage Sense Accuracy	± 0.5% V_{MAX} (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 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	Power limit mode: a powerlimit is programmable										
VIR Mode	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	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_{MAX} resp. I_{MAX}										
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 65000s										

Every effort is made to ensure that the information provided within this technical summary is accurate. However, ETPS Ltd must reserve the right to make changes to the published specifications without prior notice. Where certain operating parameters are critical for your application we advise that they be confirmed at the time of order. ETPS Ltd specialises in modifying its proven platforms to suit your needs. Please contact our office if your requirement is non-standard. Please note that your actual unit may differ from those shown.

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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 $I_{SINKMAX}$: 50 mA
Digital Inputs (Ext. Control, Standby)	Input resistance: 47kΩ Maximum input voltage: 50V High level: V_{IN} >2V Low level: V_{IN} <0.8V
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 premissible input voltage: 25V
Reference Voltage	Reference voltage V_{REF}: 10V ± 10 mV Output resistance: <10 Ω Maximum output current: 10 mA (not short-circuit-proof)
5 V – Supply Voltage	Output voltage: 5V ± 300mV Maximum output current: 50 mA (not short-circuit-proof)
Programming Response Time	<10ms

RS-232 INTERFACE (STANDARD)	
Signal Inputs (RxD, CTS)	Maximum input voltage: ± 25V Input resistance: 5 kΩ (Type) Switching thresholds: VH < -3V, VL > +3V
Signal outputs (TxD, RTS)	Output voltage (at RL >3kΩ): min ± 5V, Type ± 9V, max ± 10V Output resistance: <300Ω; Short circuit current: Type ± 10mA

RS-485 INTERFACE (OPTIONAL)	
Maximum Input Voltage	± 5V
Input Resistance	>12kΩ
Output Current	± 60mA Max
High Level	Vd >0.2V
Low Level	Vd <-0.2V

MASTER SLAVE INFORMATION

GENERAL	
Number of Devices Connectable in Master Slave	Up to 8
Maximum Voltage in Series	1000V
Maximum Power Using Standard Devices	120kW
Maximum Power Using Modified LAB HPP 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

“WE ARE POSITIVE PEOPLE”

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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