

LAB-HP-E

ESSENTIAL HIGH POWER DC SOURCE



POSITIVE PROBLEM SOLVING **+ =**

The LAB-HP-E provides up to 21kW of power in just a 3U high case. A 10 turn digitally encoded potentiometer allows for straight forward front panel operation.

The front panel 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, LAN and isolated analogue interface with user switchable ranges (0 - 5VDC / 0 - 10VDC) as standard. If computer control is required then any combination of integrated RS-485, GPIB and USB interfaces can be specified.

- + Constant Voltage and Current Modes
- + High Power Models on Request
- + Optional Computer Interfaces
- + Simple Front Panel Operation
- + Worldwide Input Options
- + Efficiency up to 94%

SELECTION TABLE

| OUTPUT VOLTAGE | OUTPUT CURRENT | | | | | |
|----------------|----------------|------------|------------|------------|-------------|-------------|
| | 3kW Models | 4kW Models | 5kW Models | 7kW Models | 10kW Models | 15kW Models |
| 0 - 15V | 0 - 250A | 0 - 500A | 0 - 500A | 0 - 500A | 0 - 750A | 0 - 1000A |
| 0 - 20V | 0 - 250A | 0 - 250A | 0 - 250A | 0 - 500A | 0 - 500A | 0 - 750A |
| 0 - 25V | 0 - 240A | 0 - 240A | 0 - 240A | 0 - 480A | 0 - 480A | 0 - 600A |
| 0 - 30V | 0 - 234A | 0 - 234A | 0 - 234A | 0 - 234A | 0 - 400A | 0 - 500A |
| 0 - 35V | 0 - 200A | 0 - 200A | 0 - 200A | 0 - 200A | 0 - 400A | 0 - 430A |
| 0 - 40V | 0 - 175A | 0 - 175A | 0 - 175A | 0 - 175A | 0 - 350A | 0 - 375A |
| 0 - 45V | 0 - 156A | 0 - 156A | 0 - 156A | 0 - 156A | 0 - 320A | 0 - 340A |
| 0 - 50V | 0 - 140A | 0 - 140A | 0 - 140A | 0 - 140A | 0 - 280A | 0 - 300A |
| 0 - 60V | 0 - 117A | 0 - 117A | 0 - 117A | 0 - 117A | 0 - 170A | 0 - 250A |
| 0 - 70V | 0 - 100A | 0 - 100A | 0 - 100A | 0 - 100A | 0 - 150A | 0 - 220A |
| 0 - 80V | 0 - 88A | 0 - 88A | 0 - 88A | 0 - 88A | 0 - 125A | 0 - 190A |
| 0 - 100V | 0 - 70A | 0 - 70A | 0 - 70A | 0 - 70A | 0 - 100A | 0 - 150A |
| 0 - 150V | 0 - 47A | 0 - 47A | 0 - 47A | 0 - 47A | 0 - 70A | 0 - 100A |
| 0 - 300V | 0 - 24A | 0 - 24A | 0 - 24A | 0 - 24A | 0 - 35A | 0 - 50A |
| 0 - 600V | 0 - 12A | 0 - 12A | 0 - 12A | 0 - 12A | 0 - 17A | 0 - 25A |
| 0 - 800V | 0 - 9A | 0 - 9A | 0 - 9A | 0 - 9A | 0 - 13A | 0 - 19A |
| 0 - 1000V | 0 - 7A | 0 - 7A | 0 - 7A | 0 - 7A | 0 - 10A | 0 - 15A |
| 0 - 1200V | 0 - 5.8A | 0 - 5.8A | 0 - 5.8A | 0 - 5.8A | 0 - 9A | 0 - 13A |
| 0 - 1500V | 0 - 4.7A | 0 - 4.7A | 0 - 4.7A | 0 - 4.7A | 7kW | 0 - 10A |

| OUTPUT VOLTAGE | OUTPUT CURRENT | | | | | | |
|----------------|----------------|-------------|-------------|-------------|-------------|-------------|-------------|
| | 21kW Models | 30kW Models | 35kW Models | 45kW Models | 49kW Models | 56kW Models | 63kW Models |
| 0 - 20V | 0 - 1250A | 0 - 1500A | 0 - 1750A | 0 - 2250A | N/A | N/A | N/A |
| 0 - 25V | 0 - 1000A | 0 - 1250A | 0 - 1500A | 0 - 1800A | 0 - 2000A | 0 - 2250A | N/A |
| 0 - 30V | 0 - 700A | 0 - 1000A | 0 - 1200A | 0 - 1500A | 0 - 1650A | 0 - 1900A | 0 - 2100A |
| 0 - 35V | 0 - 600A | 0 - 857A | 0 - 1000A | 0 - 1285A | 0 - 1400A | 0 - 1600A | 0 - 1800A |
| 0 - 40V | 0 - 525A | 0 - 750A | 0 - 900A | 0 - 1125A | 0 - 1240A | 0 - 1400A | 0 - 1575A |
| 0 - 45V | 0 - 470A | 0 - 666A | 0 - 800A | 0 - 1000A | 0 - 1100A | 0 - 1250A | 0 - 1400A |
| 0 - 50V | 0 - 420A | 0 - 600A | 0 - 700A | 0 - 900A | 0 - 1000A | 0 - 1150A | 0 - 1260A |
| 0 - 60V | 0 - 350A | 0 - 500A | 0 - 600A | 0 - 750A | 0 - 840A | 0 - 950A | 0 - 1050A |
| 0 - 70V | 0 - 300A | 0 - 425A | 0 - 500A | 0 - 640A | 0 - 700A | 0 - 800A | 0 - 900A |
| 0 - 80V | 0 - 270A | 0 - 375A | 0 - 450A | 0 - 560A | 0 - 620A | 0 - 700A | 0 - 800A |
| 0 - 100V | 0 - 210A | 0 - 300A | 0 - 350A | 0 - 450A | 0 - 500A | 0 - 560A | 0 - 640A |
| 0 - 150V | 0 - 140A | 0 - 200A | 0 - 240A | 0 - 300A | 0 - 330A | 0 - 380A | 0 - 420A |
| 0 - 300V | 0 - 70A | 0 - 100A | 0 - 120A | 0 - 150A | 0 - 170A | 0 - 190A | 0 - 210A |
| 0 - 600V | 0 - 35A | 0 - 50A | 0 - 60A | 0 - 75A | 0 - 85A | 0 - 95A | 0 - 105A |
| 0 - 800V | 0 - 27A | 0 - 37A | 0 - 44A | 0 - 56A | 0 - 62A | 0 - 70A | 0 - 80A |
| 0 - 1000V | 0 - 21A | 0 - 30A | 0 - 35A | 0 - 45A | 0 - 49A | 0 - 56A | 0 - 63A |
| 0 - 1200V | 0 - 18A | 0 - 25A | 0 - 30A | 0 - 37A | 0 - 41A | 0 - 47A | 0 - 53A |
| 0 - 1500V | 0 - 14A | 0 - 20A | 0 - 24A | 0 - 30A | 0 - 33A | 0 - 38A | 0 - 42A |

CUSTOM OUTPUT MODIFICATIONS

You can specify your own nominal output voltage and current ranges outside of the selection table above, often at no additional cost. So if you needed to power a device which needs exactly 850V at 15kW, we can provide a new unit with exactly those output ranges without increasing the lead time.

MODEL PART NUMBERS

To request a specific model is simple. The LAB-HP-E product family name precedes the requested nominal output power, followed by the nominal voltage. The example below shows how to create the part number for a 30kW/1500V unit.

NOMINAL POWER
LAB-HP-E 301500
NOMINAL VOLTAGE

OPTIONS

| CODE | DESCRIPTION |
|--------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| OPERATING RANGES AND FEATURES | |
| /2000V | Unit built with 2000V output |
| /HS | High speed model - secondary rise and fall time shortened by a factor of 10 |
| /PR | Reversible output polarity (only in standby mode) |
| OPERATING MODES | |
| /HP | Advanced model with constant power, adjustable resistance & Pvsim modes as well as master/slave operation |
| INPUT | |
| /IP | Input voltage is 230VAC \pm 10% (for models with outputs of 3kW to 5kW only) |
| /3P200 | 3 Phase input of 3 \times 200VAC (180 - 220VAC), 50/60Hz |
| /3P208 | 3 Phase input of 3 \times 208VAC (187 - 229VAC), 50/60Hz |
| /3P440 | 3 Phase input of 3 \times 440VAC (396 - 484VAC), 50/60Hz |
| /3P480 | 3 Phase input of 3 \times 480VAC (432 - 528VAC), 50/60Hz |
| /400HZ | 400Hz input frequency |
| /DC | Any nominal in the input range 250 - 750VDC \pm 10% (eg. 500VDC \pm 10% = 450 - 550VDC input) |
| INTERFACES AND CONTROL | |
| /ATE | No front panel control or display |
| /CE | TFT display |
| /IEEE488 | IEEE 488.2 (GPIB) remote control interface on rear panel |
| /RS485 | RS-485 remote control interface on rear panel |
| /USB | USB remote control interface on rear panel |
| SAFETY AND PROTECTION | |
| /AOP | Active overvoltage protection |
| /DDS | Decoupling diode |
| /EMO | DC output emergency off: the DC output is safely short-circuited when the mains supply is switched off |
| /FD | Freewheeling diode |
| /LOCK-AC | Interlock for mains input |
| /LOCK-DC | Interlock for DC output |
| /POP | Passive overvoltage protection |
| /SC | Metal cover set with cable glands for input and output terminals |
| ISOLATION | |
| /IIO | Models up to 300V _{NOM} built with increased 2000VDC isolation between DC-output and earth |
| MECHANICAL | |
| /CC | Conformal coating of PCBs (for the /HP version the /ATE option must also be selected) |
| /RUG | Ruggedised modifications to protect the unit against shock and vibration (for the /HP version the /ATE option must also be selected) |
| FORM FACTOR AND ENCLOSURES | |
| /LR | Integration into a 19" lab rack |
| /FC | Integration into a flightcase |
| GENERAL SPECIFICATIONS | |
| /3Y | 3 year warranty |
| /5Y | 5 year warranty |

CUSTOM OPTIONS

Around a third of our units are custom builds or modified in some way. So if you require a custom modification or option please let us know.



OPERATING RANGES AND FEATURES

STANDARD FEATURES

| TECHNICAL DATA | | | | | | | | | | | |
|-------------------------------------|--------------------------------------------------------------------|----------|----------|-----------|------------|------------|------------|-------------|--------------|--------------|--|
| | 0 - 15V | 16 - 35V | 36 - 70V | 71 - 120V | 121 - 350V | 351 - 700V | 701 - 900V | 901 - 1150V | 1151 - 1400V | 1401 - 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. ±20mV | | | | | | | | | | |
| Load Regulation Current | ±0.05 % F.S. ±20mA | | | | | | | | | | |
| Dynamic Response (10%-90%) | Typically <3ms assuming an ohmic load | | | | | | | | | | |
| Typical Voltage Ripple (p-p) 20MHz | 40mV | 80mV | 140mV | 140mV | 900mV | 350mV | 350mV | 400mV | 850mV | 900mV | |
| Typical Voltage Ripple (p-p) 300kHz | 15mV | 35mV | 60mV | 60mV | 400mV | 250mV | 250mV | 300mV | 500mV | 550mV | |
| Typical Voltage Ripple (rms) 20MHz | 15mV | 35mV | 60mV | 60mV | 400mV | 150mV | 150mV | 150mV | 150mV | 200mV | |
| Typical Voltage Ripple (rms) 300kHz | 10mV | 25mV | 40mV | 40mV | 300mV | 100mV | 100mV | 100mV | 100mV | 150mV | |
| Current Ripple (p-p) | <0.5 % of F.S. of I_{MAX} | | | | | | | | | | |
| Current Ripple (rms) | 600mA | 380mA | 260mA | 220mA | 60mA | 30mA | 25mA | 15mA | 12mA | 12mA | |
| Rise Time [Full Load] | 6ms | 6ms | 12ms | 20ms | 20ms | 20ms | 40ms | 40ms | 40ms | 6ms | |
| Rise Time [No Load] | 5ms | 5ms | 10ms | 10ms | 10ms | 10ms | 10ms | 20ms | 20ms | 5ms | |
| Fall Time [Full Load] | 15ms | 15ms | 20ms | 20ms | 40ms | 50ms | 60ms | 80ms | 100ms | 25ms | |
| Fall Time [No Load] | tf <5s at Va <60V | | | | 10s | | | | 15s | 1s | |
| Voltage Set-Value Accuracy | ± 0.1% V_{MAX} | | | | | | | | | | |
| Current Set-Value Accuracy | ±0.2% I_{MAX} | | | | | | | | | | |
| Relative Voltage Sense Accuracy | ±0.5% V_{MAX} (relative accuracy for worst case sense operation) | | | | | | | | | | |

OPTIONS

| CODE | DESCRIPTION |
|--------|-----------------------------------------------------------------------------|
| /2000V | Unit built with 2000V output |
| /HS | High speed model - secondary rise and fall time shortened by a factor of 10 |
| /PR | Reversible output polarity (only in standby mode) |

OPERATING MODES

STANDARD FEATURES

| TECHNICAL DATA | |
|----------------|--------------------------------------------------------------------------------|
| VI Mode | Voltage and current operation mode: voltage and current limit are programmable |

OPTIONS

| CODE | DESCRIPTION |
|------|-----------------------------------------------------------------------------------------------------------|
| /HP | Advanced model with constant power, adjustable resistance & Pvsim modes as well as master/slave operation |

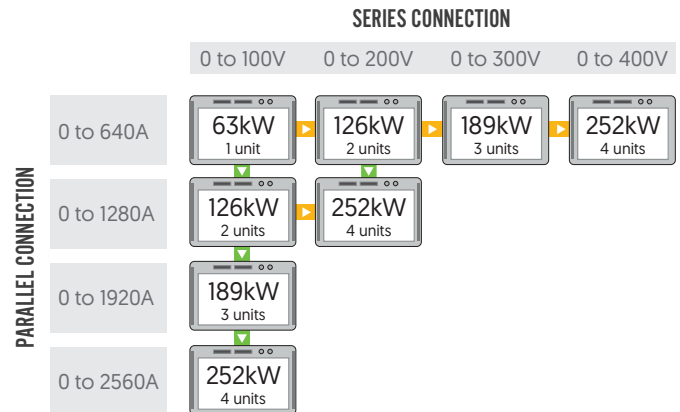
ADVANCED MODELS (/HP)

Advanced LAB-HP models are available which feature selection of additional features discussed below.



MASTER/SLAVE OPERATION

Each advanced LAB-HP unit is built with a systems interface as standard for master/slave operation. Up to 8 units can be arranged in parallel, series or matrix configurations to achieve higher output voltages/currents. Each power system is able to operate independently, so that systems can be reconfigured, expanded or broken up as needs dictate. The diagram shows all the possible configurations with four 100V/63kW systems.



CONSTANT POWER MODE

Each unit has a constant power mode, which is particularly useful for replicating the standard discharge curve of a battery pack. An adjustable resistance mode is also provided.

PV SIMULATION

LAB-HP units are built with a PV simulation mode as standard which enables a photovoltaic generator's MPP tracking to be simulated. The MPP is available in both voltage and current modes. A specialised PV simulation software package is also provided which contains many pre-loaded solar panels from different manufacturers.

LARGE LCD DISPLAY

A large LCD display indicates all relevant output quantities simultaneously. Output values can be preset and read prior to releasing the output. If preferred the unit can be built with a blank front panel (option /ATE). The LCD screen cannot be combined with conformal coating (/CC) or ruggedised (/RUG) options, so the units must be built with a blank front panel to choose them.

SD CARD OPTION

An SD card slot can be specified on order with the LAB-HP. This is a useful feature to enable the power system 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.

SOFT INTERLOCK

A soft interlock circuit is provided with all advanced LAB-HP models. This 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.

REDUNDANCY

To ensure minimal disruption, redundancy is provided when operating multiple LAB-HP units in master/slave. Values set on the master unit are multiplied by number of units in series or parallel (e.g. if you have three units in parallel and set 10A on the master unit, each unit will provide 10A for a combined 30A total). If a unit device fails, the remaining units continue to provide their pre-assigned output (e.g. in the example above each unit will would provide 10A for a combined 20A total should one unit fail).

INPUT

STANDARD FEATURES

| TECHNICAL DATA | | | | | | | |
|---------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--|
| | 3kW | 4kW | 5kW | 7kW | 10kW | 15kW | |
| Connection | 3 wire [P+N+PE] | | 5 wire [3P+N+PE] | | | | |
| Maximum Allowed Non-Symmetry | <3% | | | | | | |
| Standard Input Voltage | 230VAC ±10% | | 3 × 400VAC ±10% | | | | |
| Standard Input Frequency | 47 - 63Hz | | | | | | |
| Standard Input Current ¹ | 22A _{eff} | 9.3A _{eff} | 11.6A _{eff} | 16.6A _{eff} | 23.2A _{eff} | 34.7A _{eff} | |
| Recommended Supply Breaker Value and Curve [3 × 400VAC Input] | 16A type D/K [Op. /3P400] | 16A type D/K | 16A type D/K | 32A type D/K | 32A type D/K | 63A type D/K | |
| Input Voltage [Option /1P] | Standard | 230VAC ±10% | 230VAC ±10% | N/A | | | |
| Input Current [Option /1P] ¹ | Standard | 28A _{eff} | 33A _{eff} | N/A | | | |
| Input Voltage [Option /3P200] | 3 × 200VAC ±10% | | | | | | |
| Input Current [Option /3P200] ¹ | 13.9A _{eff} | 18.5A _{eff} | 23.2A _{eff} | 32.5A _{eff} | 46.3A _{eff} | 69.4A _{eff} | |
| Input Voltage [Option /3P208] | 3 × 208VAC ±10% | | | | | | |
| Input Current [Option /3P208] ¹ | 13.4A _{eff} | 17.8A _{eff} | 22.3A _{eff} | 31.2A _{eff} | 44.5A _{eff} | 66.7A _{eff} | |
| Input Voltage [Option /3P400] | 3 × 400VAC ±10% | | Standard | | | | |
| Input Current [Option /3P400] ¹ | 7A _{eff} | | Standard | | | | |
| Input Voltage [Option /3P440] | 3 × 440VAC ±10% | | | | | | |
| Input Current [Option /3P440] ¹ | 6.4A _{eff} | 8.5A _{eff} | 10.6A _{eff} | 14.8A _{eff} | 21.1A _{eff} | 31.6A _{eff} | |
| Input Voltage [Option /3P480] | 3 × 480VAC ±10% | | | | | | |
| Input Current [Option /3P480] ¹ | 5.8A _{eff} | 7.8A _{eff} | 9.7A _{eff} | 13.6A _{eff} | 19.3A _{eff} | 28.9A _{eff} | |
| Inrush Transient Current ² | <25A | <25A | <25A | <25A | <51A | <51A | |
| Leakage Current | <35mA | | | | | | |
| Cos Phi | >0.7 | | | | | | |
| Harmonic Content ² | 50Hz = 72 % 100Hz = 2 % 150Hz = 0.9 % 200Hz = 0.1 % 250Hz = 11 % 350Hz = 0.6 % | | | | | | |
| Efficiency | Up to 94% | | | | | | |

| | 21kW | 30kW | 35kW | 45kW | 49kW | 56kW | 63kW |
|--------------------------------------------|------------------------------------------------------------------------------------------|-----------------------|-----------------------|----------------------|-----------------------|-----------------------|-----------------------|
| Connection | 5 wire [3P+N+PE] | | | | | | |
| Maximum Allowed Non-Symmetry | <3% | | | | | | |
| Standard Input Voltage | 3 × 400VAC ±10% | | | | | | |
| Standard Input Current ¹ | 48.6A _{eff} | 69.4A _{eff} | 80.9A _{eff} | 104A _{eff} | 113.3A _{eff} | 129.5A _{eff} | 145.6A _{eff} |
| Recommended Supply Breaker Value and Curve | 63A type D/K | 80A type D/K | 120A type D/K | 120A type D/K | 150A type D/K | 150A type D/K | 180A type D/K |
| Input Voltage [Option /3P200] | 3 × 200VAC ±10% | | | | | | |
| Input Current [Option /3P208] ¹ | 97.1A _{eff} | 138.7A _{eff} | 161.8A _{eff} | 208A _{eff} | 226.5A _{eff} | 258.9A _{eff} | 291.2A _{eff} |
| Input Voltage [Option /3P208] | 3 × 208VAC ±10% | | | | | | |
| Input Current [Option /3P208] ¹ | 93.4A _{eff} | 133.4A _{eff} | 155.6A _{eff} | 200A _{eff} | 217.8A _{eff} | 248.9A _{eff} | 280A _{eff} |
| Input Voltage [Option /3P440] | 3 × 440VAC ±10% | | | | | | |
| Input Current [Option /3P440] ¹ | 44.2A _{eff} | 63.1A _{eff} | 73.6A _{eff} | 94.6A _{eff} | 103A _{eff} | 117.7A _{eff} | 132.4A _{eff} |
| Input Voltage [Option /3P480] | 3 × 480VAC ±10% | | | | | | |
| Input Current [Option /3P480] ¹ | 40.5A _{eff} | 57.8A _{eff} | 67.4A _{eff} | 86.7A _{eff} | 94.4A _{eff} | 107.9A _{eff} | 121.4A _{eff} |
| Inrush Transient Current ² | <76A | <102A | <127A | <153A | <178A | <203A | <229A |
| Leakage Current | <35mA | | | | | | |
| Cos Phi | >0.7 | | | | | | |
| Harmonic Content ² | 50Hz = 72 % 100Hz = 2 % 150Hz = 0.9 % 200Hz = 0.1 % 250Hz = 11 % 350Hz = 0.6 % | | | | | | |
| Efficiency | Up to 94% | | | | | | |

¹ At nominal input voltage. ² At nominal input voltage, the inrush current only occurs at switch-on.

INPUT OPTIONS

| CODE | DESCRIPTION |
|--------|---------------------------------------------------------------------------------------------------|
| /1P | Input voltage is 230VAC \pm 10% (for models with outputs of 3kW to 5kW only) |
| /3P200 | 3 Phase input of 3 \times 200VAC (180 - 220VAC), 50/60Hz |
| /3P208 | 3 Phase Input of 3 \times 208VAC (187 - 229VAC), 50/60Hz |
| /3P440 | 3 Phase Input of 3 \times 440VAC (396 - 484VAC), 50/60Hz |
| /3P480 | 3 Phase Input of 3 \times 480VAC (432 - 528VAC), 50/60Hz |
| /400HZ | 400Hz input frequency |
| /DC | Any nominal in the input range 250 - 750VDC \pm 10% (eg. 500VDC \pm 10% = 450 - 550VDC input) |

INTERFACES AND CONTROL

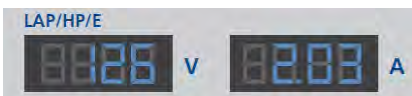
TECHNICAL INFORMATION

| ANALOGUE INTERFACE (STANDARD) | |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital Outputs (CV, Standby, Error) | Output type: Open collector with pull-up resistor 10k Ω after +5 V I_{SINKMAX} : 50 mA |
| Digital Inputs (Ext. Control, Standby) | Input resistance: 47k Ω 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: 100 Ω Minimum permissible load resistance: 2k Ω Minimum load resistance for $\pm 0.1\%$ accuracy: 100k Ω |
| Analog Inputs (Xset) | Input resistance: 1M Ω Maximum permissible input voltage: 25V |
| Reference Voltage | Reference voltage V_{REF} : 10V \pm 10 mV Output resistance: <10 Ω Maximum output current: 10 mA (not short-circuit-proof) |
| 5 V – Supply Voltage | Output voltage: 5V \pm 300mV Maximum output current: 50 mA (not short-circuit-proof) |
| Set Value Accuracy (V/A) When Using Internal Ref. | $\pm 0.5\%$ |
| Programming Response Time | <10ms |
| RS-232 INTERFACE (STANDARD) | |
| Signal Inputs (Rx/D, CTS) | Maximum input voltage: $\pm 25\text{V}$ Input resistance: 5 k Ω [Type] Switching thresholds: $V_{\text{H}} < -3\text{V}$, $V_{\text{L}} > +3\text{V}$ |
| Signal outputs (Tx/D, 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: <300 Ω ; Short circuit current: Type $\pm 10\text{mA}$ |
| RS-485 INTERFACE (OPTIONAL) | |
| Maximum Input Voltage | $\pm 5\text{V}$ |
| Input Resistance | >12k Ω |
| Output Current | $\pm 60\text{mA}$ Max |
| High Level | $V_{\text{d}} > 0.2\text{V}$ |
| Low Level | $V_{\text{d}} < -0.2\text{V}$ |

INTERFACE AND CONTROL OPTIONS

| CODE | DESCRIPTION |
|----------|----------------------------------------------------------|
| /ATE | No front panel control or display |
| /CE | TFT display |
| /IEEE488 | IEEE 488.2 (GPIB) remote control interface on rear panel |
| /RS485 | RS-485 remote control interface on rear panel |
| /USB | USB remote control interface on rear panel |

STANDARD LAB-HP-E LED SCREEN



TFT DISPLAY (OPTION /CE)

| LAB/HP/CE | |
|------------|-------------|
| Monitor | Preset |
| V 1500 V | V 1500 V |
| I 42.00 A | I 42.00 A |
| P 63000 W | |
| R 35.715 Ω | |
| | LOC CV Mode |
| | STOP V |

ADVANCED MODEL LCD SCREEN (OPTION /HP)

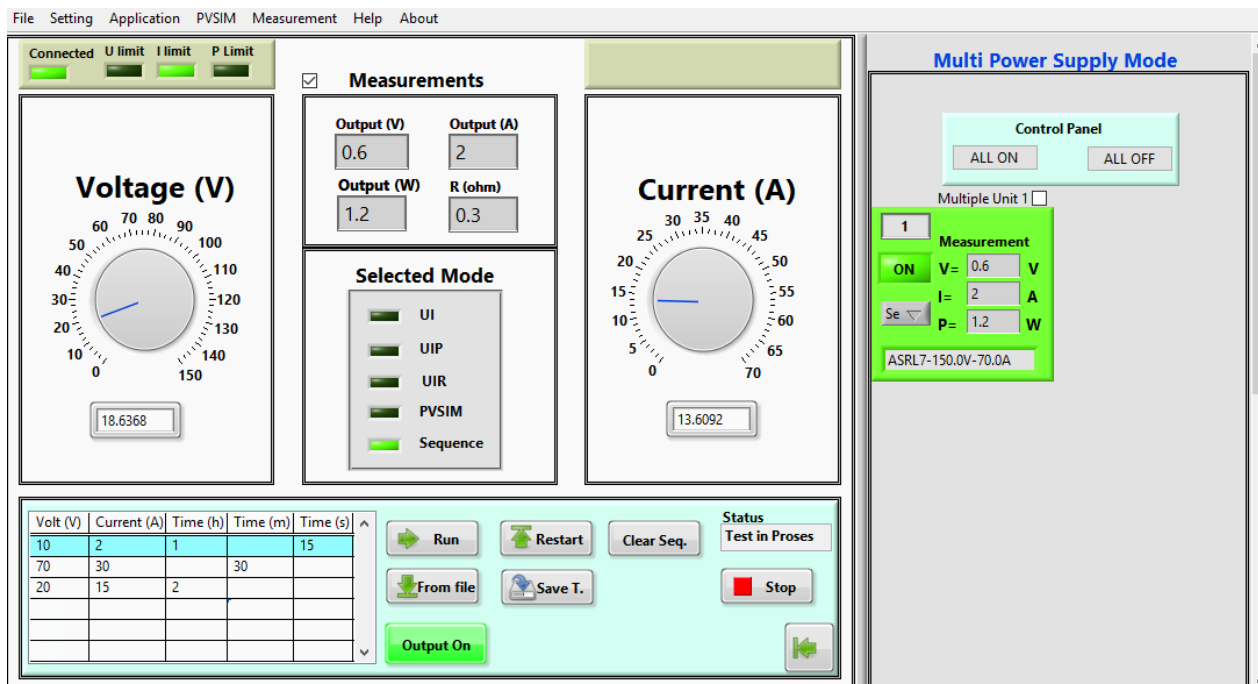
| LAB/HP | |
|------------|------------------|
| V 20.00 V | Preset V 20.00 V |
| I 30 A | I 30 A |
| P 600.00 W | |
| R 0.6666 Ω | |
| | Mode: VI |
| | V-Limit Loc |

SOFTWARE/SOFT TOOLS

STANDARD SOFTWARE

All new LAB-HP-E units are provided with free operating software. Live values of the power systems can 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 and current values can be controlled through the GUI. A test sequence function allows for more complex DC waveforms to be implemented directly through the software.



SAFETY AND PROTECTION

STANDARD FEATURES

| TECHNICAL DATA | |
|-----------------------------|------------------------------------------------------------------------------------------------|
| 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 |

OPTIONS

| CODE | DESCRIPTION |
|----------|--------------------------------------------------------------------------------------------------------|
| /AOP | Active overvoltage protection |
| /DDS | Decoupling diode |
| /EMO | DC output emergency off: the DC output is safely short-circuited when the mains supply is switched off |
| /FD | Freewheeling diode |
| /LOCK-AC | Interlock for mains input |
| /LOCK-DC | Interlock for DC output |
| /POP | Passive overvoltage protection |
| /SC | Metal cover set with cable glands for input and output terminals |

ISOLATION

STANDARD FEATURES

| TECHNICAL DATA | |
|-------------------------------------------|-----------------------------------------------------|
| Isolation [Between Primary and Secondary] | 3000VAC |
| Isolation [Between DC-Output and Earth] | 500VDC [0-300V models] 2000VDC [301-1500V models] |
| Isolation [Between Primary and Earth] | 2150VDC |

OPTIONS

| CODE | DESCRIPTION |
|------|-----------------------------------------------------------------------------------------------------|
| /IIO | Models up to 300V _{NOM} built with increased 2000VDC isolation between DC-output and earth |

MECHANICAL

STANDARD FEATURES

| 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 |
| Fan Noise | 42 – 43 dB |

OPTIONS

| CODE | DESCRIPTION |
|------|--------------------------------------------------------------------------------------------------------------------------------------|
| /CC | Conformal coating of PCBs (for the /HP version the /ATE option must also be selected) |
| /RUG | Ruggedised modifications to protect the unit against shock and vibration (for the /HP version the /ATE option must also be selected) |

HIGHLIGHTED OPTIONS



RUGGEDISED MODIFICATIONS (/RUG)

Modifications can be made to the LAB-HP-E to ensure suitability in harsh conditions by providing protection against shock and vibration. This is often ideal for companies who regularly need to move equipment to different sites, to mitigate the risk of any potential transit damage.



CONFORMAL COATING OF PCBs (/CC)

The PCBs of the units are coated with a solution to protect against environmental conditions such as condensing humidity, as well as providing resistance against salt moisture. This option can also be combined with /RUG.

FORM FACTOR AND ENCLOSURES

STANDARD FEATURES

| WEIGHTS AND DIMENSIONS | |
|------------------------|------------------------------------|
| 3kW-7kW Models | 19" x 2U x 440mm (W x H x D), 14kg |
| 10kW Models | 19" x 2U x 600mm (W x H x D), 26kg |
| 15kW Models | 19" x 3U x 620mm (W x H x D), 26kg |
| 21kW Models | 19" x 3U x 620mm (W x H x D), 37kg |
| 30kW Models | 19" x 6U x 620mm (W x H x D), 52kg |
| 35kW Models | 19" x 6U x 620mm (W x H x D), 59kg |
| 45kW Models | 19" x 6U x 620mm (W x H x D), 73kg |
| 49kW Models | 19" x 9U x 620mm (W x H x D), 85kg |
| 56kW Models | 19" x 9U x 620mm (W x H x D), 92kg |
| 63kW Models | 19" x 9U x 620mm (W x H x D), 99kg |

DESKTOP UNITS

On request, your choice of LAB-HP-E can be built without rackmounting flanges for no extra cost. This allows the unit to be used on a desktop or bench.

OPTIONAL ENCLOSURES

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.

Multiple power systems can be fitted into the same flight case. Door hangers are fitted for convenience. Existing ETPS systems can also be retrospectively integrated into new flight cases where requested.



| CODE | DESCRIPTION |
|------|---------------------------------|
| /LR | Integration into a 19" lab rack |
| /FC | Integration into a flightcase |

GENERAL SPECIFICATIONS

STANDARD FEATURES

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

OPTIONS

| CODE | DESCRIPTION |
|------|-----------------|
| /3Y | 3 year warranty |
| /5Y | 5 year warranty |

RENTAL SYSTEMS

If your test requirement is short term, we have multiple advanced LAB-HP units in our rental DC source range. These include 40V, 60V, 120V and 150V systems up to 30kW.



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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