

# High Power Programmable Power Supplies

## LAB-DCH

Voltage 0-20V to 0-1500V

5kW to 60kW

Current 0-2A to 0-3000A

100 Models



LAB-DC H		Preset	
V	11.99 V	V	11.99 V
I	0 A	I	0 A
P	0.00 W		
R	-----		
	⏏	Mode: VI	
		CV	Loc

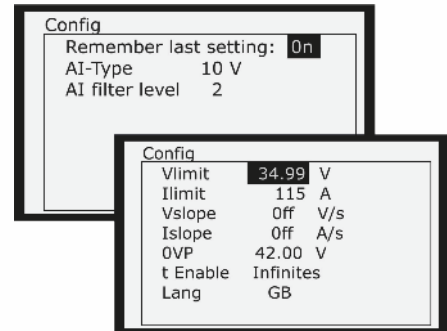
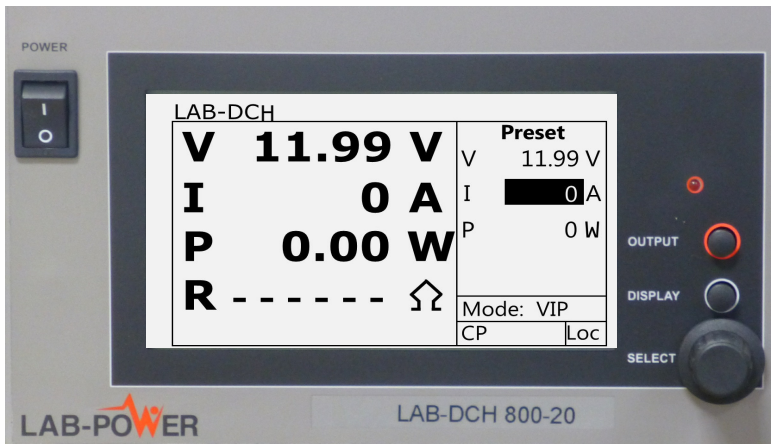


# LAB-POWER

## OVERVIEW

The Lab-Power LAB-DCH range of DC power supplies are a natural choice for any application requiring a compact, efficient, high performance power supply. A wide range of models offering just the voltage and current range you require. Switch mode technology combines with advanced digital control to give a cost effective solution.

## FRONT PANEL



## Quality and Innovation

Whether we are producing a standard unit or creating one of our special models, we strive to maintain two core engineering values: refined quality and practical innovation. Our units are built using the best electronic components and are checked with painstaking accuracy. This ensures that only products of uncompromising quality are supplied to you, our customer.

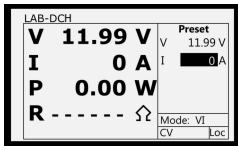
We also regard the continued innovation of new and current products as crucial to our future success. This philosophy has always kept us more than the proverbial jump ahead of the competition. We continue to add new and original features to our product lines that you're unlikely to find elsewhere. We also continue to lead the industry in achieving extraordinary power densities ensuring the most compact units possible.

Efficient, compact and easy-to-use are important criteria today. These units have been designed to meet exacting standards and have proved highly effective in laboratories, test and production environments, indeed anywhere that reliable power is needed. Safety of valuable equipment is assured by an Over Voltage Protection feature: if either the operator of the power supply, or the device being powered exceeds the preset OVP value, the supply shuts down and will not automatically come back on line until it is manually (or remotely) reset.

- **Compact 3U design (5-15 kW), up to 94% efficient**
- **High performance**
- **Power range from 5kW to 60kW. More by paralleling several units**
- **Intuitive front panel operation**
- **Fast response to load changes**
- **Constant current/voltage/power /resistance simulation**
- **Over Voltage Protection – the output shuts down at the programmed level**
- **Short-circuit and overload proof**
- **RS232 & Digital/analogue control interfaces (Standard)**
- **Solar simulation software with Lab-View driver is available**
- **Temperature controlled fans, no unnecessary noise**
- **Air flow is front to back, no additional cooling needed in racked systems**
- **Long life at full power**
- **Master/Slave parallel and series configurations**
- **Output On for preset time, Volts/Amps per second slew, both user selectable**
- **Special versions on request. High slew rate option available**
- **Remember last settings feature**
- **Sensing**

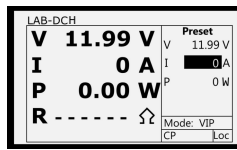
# OPERATION MODES

## VI



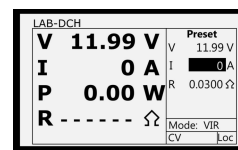
Constant V (CV)  
Or  
Constant I (CC)

## VIP



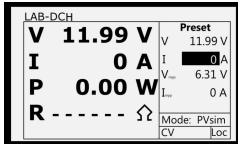
V Constant  
I falls when  
 $V \cdot I$

## VIR

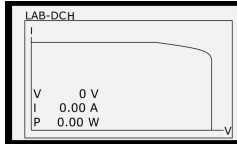


V sags to  
emulate a  
resistor of R  
ohms

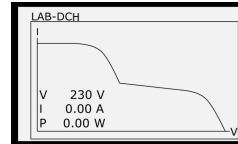
## PV Sim



IV CURVE



IV CURVE (Shaded)



In the Pvsim mode the characteristics of a PV generator can be simulated. Open-circuit voltage  $V_o$  and short-circuit current  $I_k$ .

Value for  $V_{mpp}$  may be in the range from 0.6 to  $0.95 \cdot V_o$ .

Value for  $I_{mpp}$  may be in the range from 0.6 to  $0.95 \cdot I_k$ .

**See additional datasheet for more details**

## LINE UP

LAB-DCH 5-60KW

Model	Voltage	5KW	10KW	15KW	20KW	25KW	30KW
LAB-DCH20-XX	0-20V	0-250A	0-500A	0-750A	0-1000A	0-1250A	0-1500A
LAB-DCH40-XX	0-40V	0-125A	0-250A	0-375A	0-500A	0-625A	0-750A
LAB-DCH80-XX	0-80V	0-65A	0-130A	0-195A	0-260A	0-325A	0-390A
LAB-DCH100-XX	0-100V	0-50A	0-100A	0-150A	0-200A	0-250A	0-300A
LAB-DCH150-XX	0-150V	0-35A	0-70A	0-100A	0-140A	0-175A	0-200A
LAB-DCH200	0-200V	0-25A	0-50A	0-75A	0-100A	0-125A	0-150A
LAB-DCH300-XX	0-300V	0-17A	0-34A	0-50A	0-68A	0-85A	0-100A
LAB-DCH450	0-450V	0-11A	0-22A	0-33A	0-44A	0-55A	0-66A
LAB-DCH600-XX	0-600V	0-8.5A	0-17A	0-25A	0-34A	0-42A	0-50A
LAB-DCH800-XX	0-800V	0-6.25A	0-13A	0-19A	0-26A	0-32A	0-38A
LAB-DCH1000-XX	0-1000V	0-5A	0-10A	0-15A	0-20A	0-25A	0-30A
LAB-DCH1200-XX	0-1200V	0-4A	0-8A	0-12A	0-16A	0-20A	0-24A
LAB-DCH1500-XX	0-1500V	0-3.4A	0-7A	0-10A	0-14A	0-17A	0-20A

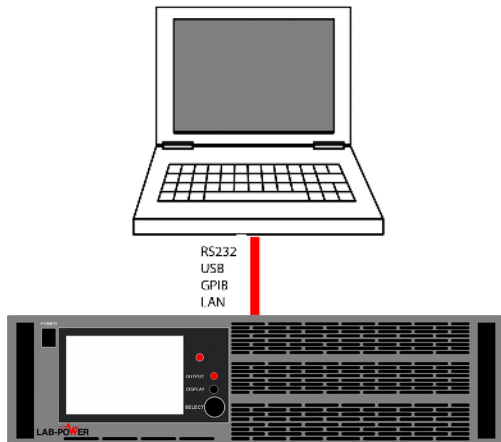
Dimensions 19" 3U x 620mm 3U x 620mm 3U x 620mm 6U x 620mm 6U x 620mm 6U x 620mm

Model	Voltage	35KW	40KW	45KW	50KW	55KW	60KW
LAB-DCH20-XX	0-20V	0-1750A	0-2000A	0-2250A	0-2500	0-2750A	0-3000A
LAB-DCH40-XX	0-40V	0-875A	0-1000A	0-1125A	0-1250	0-1375A	0-1500A
LAB-DCH80-XX	0-80V	0-450A	0-520A	0-585A	0-650A	0-700A	0-780A
LAB-DCH100-XX	0-100V	0-350A	0-400A	0-450A	0-500A	0-550A	0-600A
LAB-DCH150-XX	0-150V	0-235A	0-270A	0-300A	0-350A	0-375A	0-400A
LAB-DCH200	0-200V	0-175A	0-200A	0-225A	0-250A	0-275A	0-300A
LAB-DCH300-XX	0-300V	0-117A	0-136A	0-150A	0-170A	0-185A	0-200A
LAB-DCH450	0-450A	0-77A	0-88A	0-99A	0-110	0-121	0-132
LAB-DCH600-XX	0-600V	0-59A	0-68A	0-75A	0-84A	0-92A	0-100A
LAB-DCH800-XX	0-800V	0-45A	0-52A	0-57A	0-64A	0-70A	0-76A
LAB-DCH1000-XX	0-1000V	0-35A	0-40A	0-45A	0-50A	0-55A	0-60A
LAB-DCH1200-XX	0-1200V	0-30A	0-34A	0-36A	0-40A	0-46A	0-50A
LAB-DCH1500-XX	0-1500V	0-24A	0-27A	0-30A	0-34A	0-37A	0-40A

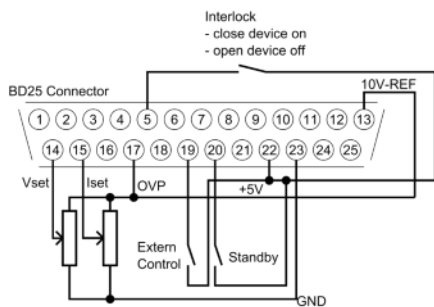
Dimensions 19" 9U x 620mm 9U x 620mm 9U x 620mm 12U x 620mm 12U x 620mm 12U x 620mm

## MULTIPLE INTERFACES

Isolated analogue control and RS-232 interfaces come as standard. Options are: Ethernet, GPIB bus, RS-485, USB, CAN and WLAN.



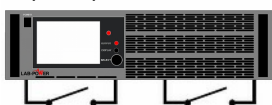
## ISOLATED ANALOGUE CONTROL (Standard) 0-5 / 10V



### External Voltage Control



### O/P On/Off & Interlock



### External Resistance Control



### External V/I/P Monitor



## Pin Assignment AI Interface

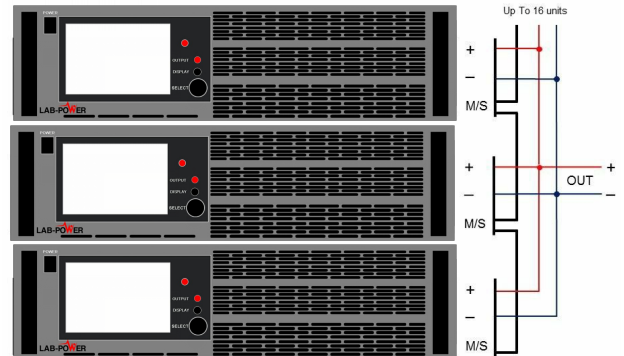
Pin (D25)

1	analogue out $V_{mon}$	10	digital out	Standby
2	analogue out $I_{mon}$	11	gnd	
3	analogue out $P_{mon}$	12	-nc-	
4	analogue out $OVP_{mon}$	13	REF10	$10 V_{ref}$
5	digital in Soft-Interlock	14	analogue in	$V_{set}$
6	-nc-	15	analogue in	$I_{set}$
7	digital out CV Signal	16	analogue in	In 2 -
8	analogue out $V_{mon}$	17	analogue in	$OVP_{set}$
9	gnd	18	analogue in	In 4 -
19	digital in Ext. Control	Activates analog control		
20	digital in Standby	Activates standby		
21	analogue out $I_{istmon}$	Monitor output current		
22	pwr + 5 V	Output 5 V supply voltage		
23	gnd -			
24	digital out Error	Signals shut down by OVP		
25	gnd -			
26	-nc- - -			

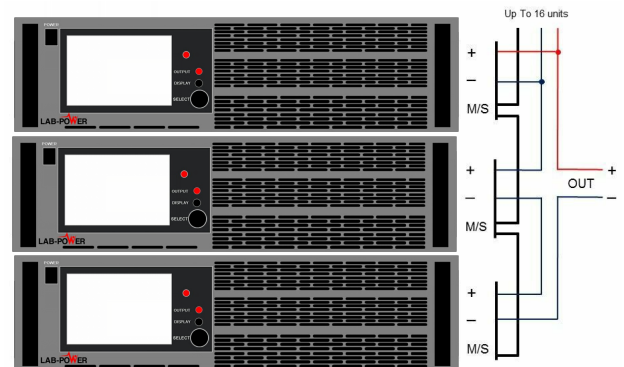
## MASTER / SLAVE

The intelligent control senses that multiple units are connected in series / Parallel. Set points are respectively calculated. Displays will show the total voltage or Current

### Parallel Mode

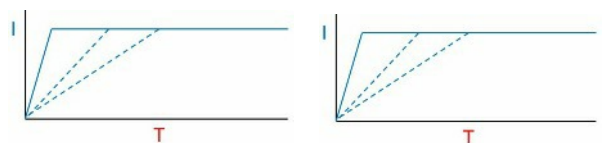


### Series Mode



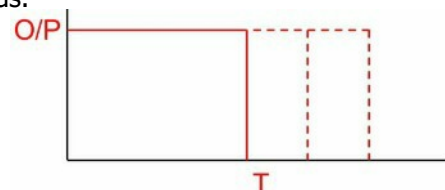
## Soft Start

Adjustable rise time – Soft Start for voltage and current rise. Less stress on powered device.



## Time limit output on

Output can be programmed to turn off automatically after a programmed number of seconds.



## Remember Last Setting

If this feature enabled (**On**), selected parameters will be retained after a power-cycle.

If this option is deactivated (**Off**), standard setting (0V/0A/VI-Mode) will be loaded after a power-cycle

# SPECIFICATION

## Output

Output Voltage / [V]		15	35	70	100	300	600	800	1000	1200	
Output Current for 5kW Unit/ [A]		250 <sup>4</sup>	142	72	50	17	8.5	6.25	5	4.2	
Static Regulation		± 0.05% of F.S.									
Line Regulation	Voltage	±0.01% F.S.									
	Current	±0.01% F.S.									
Load Regulation	Voltage	±0.02% F.S. ± 2mV									
	Current	±0.02% F.S. ± 20mA									
Dynamic Responce Time @ Load Step 10%-90%		< 2ms									
Ripple and Noise	Voltage Ripple (p-p)	TBD <sup>6</sup>									
	Voltage Ripple (mv rms) <sup>5</sup>	15	35	60	400			800			
	Current Ripple (p-p)	TBD <sup>6</sup>									
	Current Ripple (rms)	< 0.2% of F.S.									
Isolation	Primary /Secondary	3000VDC									
	DC-Output /Earth	500VDC				2000VDC					
	Primary /Earth	2150VDC									
Programming Response Time		< 10ms									
Rise Time, Full load		6ms		12ms		20ms		40ms			
Rise Time, No load		5ms		10ms			20ms				
Fall Time, Full Load		15ms		20ms		20ms		40ms		50ms	
Fall Time, No Load		1500ms to get below 50V									
Relative Accuracy / [%] <sup>7</sup>											
Voltage / [V]	0.25	0.038	0.088	0.175	0.250	0.750	1.500	2.000	2.500	3.000	
Current / [A]	0.4	1.000	0.568	0.288	0.200	0.068	0.034	0.025	0.020	0.017	
relative Accuracy for Sens Operation (worst case) <sup>7</sup> / [%]											
Voltage / [V]	0.5	0.075	0.175	0.350	0.500	1.500	3.000	4.000	5.000	6.000	
Absolute Accuracy for Master-Slave Operation <sup>7</sup> / [%]											
M/S-Parallel-Mode <sup>7 8</sup>   N: number of parallel connected device; example N=3											
Voltage / [V]	0.25	0.038	0.088	0.175	0.250	0.750	1.500	2.000	2.500	3.000	
Current / [A]	0.4 x N	3.000	1.704	0.864	0.600	0.204	0.102	0.075	0.060	0.050	
M/S-Serial-Mode <sup>7 8</sup>   N: number of serial connected device; example N=3											
Voltage / [V]	0.25 x N	0.113	0.263	0.525	0.750	2.250	4.500	6.000	7.500	9.000	
Current / [A]	0.4	1.000	0.568	0.288	0.200	0.068	0.034	0.025	0.020	0.017	
<b>DISPLAY RESOLUTION</b>											
Resolution Voltage Display & Voltage Setting Resolution		10V - 60V		70V - 90V		100V - 900V		1000V - 1200V			
		00.00		00.0		000		0000			
Resolution Current Display & Current Setting Resulation		2A - 60A		70A - 100A		100A - 900A		1000A - 2000A			
		00.00		00.0		000		0000			

## Input

	LAB-DCH								
	LAB-DC								
Device Power	3kW	4kW	5kW	10kW	15kW	20kW	30kW	45kW	60kW
Connection	3 wire (1P+N+E) / 5 wire (3P+N+E)								
Input 1P/230	1 x 230 Vac (207-253 Vac 47-63Hz)								
Input 3P/208	3 x 208 Vac (187-229 Vac 47-63Hz)								
Input 3P/400	3 x 400 Vac (360-440 Vac 47-63Hz)								
Input 3P/440	3 x 440 Vac (396-484 Vac 47-63Hz)								
Input 3P/480	3 x 480 Vac (432-528 Vac 47-63Hz)								
Max.allowed non symmetry (3P-System)	<3%								
Input Current 1P/230 model	22Arms	28Arms	33Arms	x	x	x	x	x	x
Input Current 3P/208 model	TBD	TBD	23 Arms	46 Arms	69 Arms	92 Arms	138 Arms	207 Arms	276 Arms
Input Current 3P/400 model <sup>1 2</sup>	7,5 Arms	10 Arms	11.5 Arms	22.9 Arms	34.4 Arms	45.8 Arms	68.7 Arms	103.1 Arms	137.5 Arms
Inrush Transient Current <sup>2</sup>	< 25	< 25	< 25	< 51	< 76	< 102	< 153	< 229	< 305
Normal Current Internal Fuse 3P/400 model	15A	15A	15A	30A	45A	60A	90A	135A	180A
Recommended Supply Breaker 3P/400 model (value and curve)	16 A Type D/K	16 A Type D/K	16 A Type D/K	32 A Type D/K	63 A Type D/K	63 A Type D/K	80 A Type D/K	120 A Type D/K	150 A Type D/K
Leakage Current	< 35 mA	< 35 mA	< 35 mA	< 35 mA	< 35 mA	< 35 mA	< 35 mA	< 35 mA	< 35 mA
cos phi	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7	> 0.7
Harmonic Content <sup>3</sup>	50Hz = 72%   100Hz = 2%   150Hz = 0.9%   200Hz = 0.1%   250Hz = 11%   350 Hz = 0.6%								
Efficiency Type	Up to 94%								

1:For nominal current and nominal voltage

2:For nominal input voltage

3:Total harmonic distortion input current ([%]/I<sub>in</sub>)

4:250A is the maximum possible current for a 5kW Unit

5:If the ripple is not specified, the maximum allowed ripple is 0.2% of F.S.

6:The measurement of the peak to peak ripple is very dependent on the measurement setup

7:The quoted accuracy is also valid for all other interfaces

8:The relative accuracy will not change. Only the absolute value will change because the nominal Values of the "Unit" change.

9:All readings are typical values

Note for ripple figures: Measured at 100kHz and 20MHz bandwidth

Analogue Interface	Digital outputs (CV, Standby, Error)	Output type: Open collector with pull-up resistor 10k to +5V Isink(max): 50mA
	Digital inputs (Ext. Control, standby)	Input resistance: 47kΩ
		Maximum input voltage: 50V
		High level: Vin > 2V Low Level: Vin < 0.8V
	Analogue outputs (Xmon)	Output resistance : 100Ω
		Minimum permissible load resistance : 2kΩ Minimum load resistance for 0.1% accuracy: 100kΩ
	Analogue inputs (Xset)	Input resistance: 1MΩ
Maximum permissible input voltage: 25V		
Reference voltage	Reference voltage Vref: 10V ± 10mV	
	Output resistance: < 10Ω Maximum output current: 10mA (not short-circuit-proof)	
5V - supply voltage	Output voltage: 5V ± 300mV	
	Maximum output current: 50mA (not short-circuit-proof)	
RS 232	Signal inputs (RxD,CTS)	Maximum input voltage: ± 25V
		Input resistance: 5kΩ (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	Maximum input voltage	± 5V
	Input resistance	> 12 kΩ
	Output current	± 60 mA
	High level	Vd > 0.2V
	Low Level	Vd < -0.2V

Cooling	Fans
Operating temperature	0 - 50°C
Storage temperature	-20°C - 70°C
Humidity	< 80%
Operating height	< 2000m
Vibration	10- 55Hz / 1 min / 2G XYZ
Shock	< 20G
Weight-LAB-DC	3 - 5kW 18kg, 6 - 10kW 25kg
Weight-LAB-DCH	5kW 19kg, 10kW 26kg, 15kW 33kg

## OPTION LIST (Factory Option)

USB - Interface



LAN - Interface



ATE - Only ATE mode, no front panel



LT - Interface IEEE488



PROT - Output Protection Diode



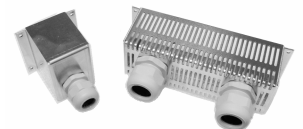
SD - SD Card Slot



FP - Front Panel Output



TC - Input/Output Terminal Covers



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