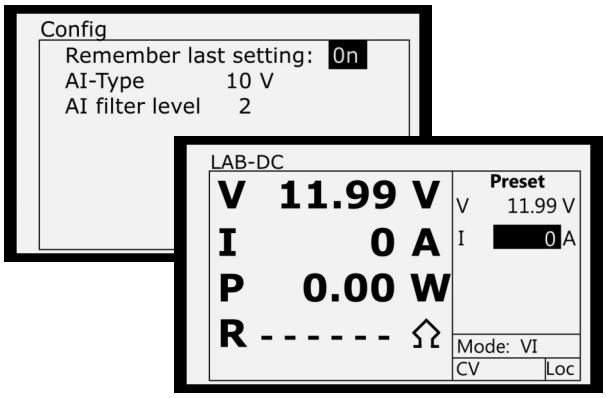
Overview

The Lab-Power LAB-DC 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 & 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.

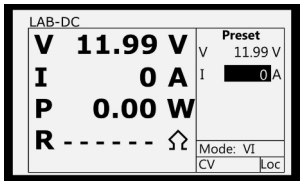
We also regard the continued innovation of new and current products as crucial to our future success. This philosophy has always kept us more than the proverbial jump ahead of the competition. We continue to add new and original features to our product lines that you're unlikely to find elsewhere.

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 2U design, up to 94% efficient
- Power range from 3kW to 10kW. More by paralleling several units
- Fast response to load changes
- Constant current/voltage/power /resistance simulation
- Over Voltage Protection – the output shuts down at the programmed level
- Voltage/Current Limit Configuration
- 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
- 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
- Remote Voltage Sensing

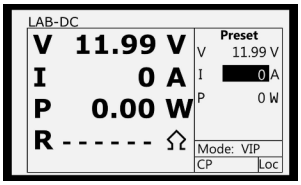
Operation Modes

VI



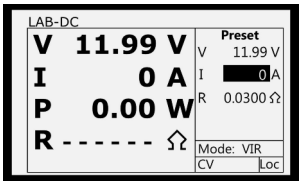
Constant V (CV)
Or
Constant I (CC)

VIP



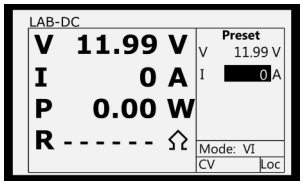
V Constant
I falls when
V*I

VIR



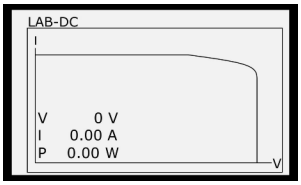
V sags to
emulate a
resistor of R
ohms

PV Sim

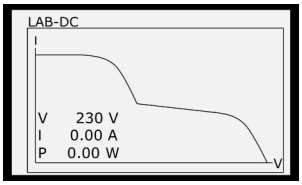


Constant V (CV)
Or
Constant I (CC)

IV Curve



IV Curve (Shaded)



In the Pvsim mode the characteristics of a PV generator can be simulated. Open-circuit voltage Vo and short-circuit current Ik.
Value for Vmpp may be in the range from 0.6 to 0.95 * V.
Value for Impp may be in the range from 0.6 to 0.95 * I.
See additional datasheet for more details

LAB-DC 3-10kW

For the 5-60kW range please click here

3kW Range

Model	Voltage	Current
LAB-DC15-200	0-15V	0-200A
LAB-DC20-150	0-20V	0-150A
LAB-DC25-120	0-25V	0-120A
LAB-DC35-90	0-35V	0-90A
LAB-DC45-70	0-45V	0-70A
LAB-DC70-45	0-70V	0-45A
LAB-DC100-30	0-100V	0-30A
LAB-DC120-25	0-120V	0-25A
LAB-DC150-20	0-150V	0-20A
LAB-DC200-15	0-200V	0-15A
LAB-DC250-12	0-250V	0-12A
LAB-DC300-10	0-300V	0-10A
LAB-DC400-7.5	0-400V	0-7.5A
LAB-DC500-6	0-500V	0-6A
LAB-DC600-5	0-600V	0-5A
LAB-DC800-4	0-800V	0-4A
LAB-DC1000-3	0-1000V	0-3A
LAB-DC1200-2.6	0-1200V	0-2.6A
LAB-DC1500-2	0-1500V	0-2A

4kW Range

Model	Voltage	Current
LAB-DC20-200	0-20V	0-200A
LAB-DC25-160	0-25V	0-160A
LAB-DC35-115	0-35V	0-115A
LAB-DC45-90	0-45V	0-90A
LAB-DC70-60	0-70V	0-60A
LAB-DC100-40	0-100V	0-40A
LAB-DC120-33	0-120V	0-33A
LAB-DC150-30	0-150V	0-30A
LAB-DC200-20	0-200V	0-20A
LAB-DC250-16	0-250V	0-16A
LAB-DC300-15	0-300V	0-15A
LAB-DC400-10	0-400V	0-10A
LAB-DC500-10	0-500V	0-8A
LAB-DC600-7	0-600V	0-7A
LAB-DC800-5	0-800V	0-5A
LAB-DC1000-4	0-1000V	0-4A
LAB-DC1200-3.4	0-1200V	0-3.4A
LAB-DC1500-2.7	0-1500V	0-2.7A

5kW Range

Model	Voltage	Current
LAB-DC25-200	0-25V	0-200A
LAB-DC35-150	0-35V	0-150A
LAB-DC45-120	0-45V	0-120A
LAB-DC70-75	0-70V	0-75A
LAB-DC100-50	0-100V	0-50A
LAB-DC120-41	0-120V	0-41A
LAB-DC150-35	0-150V	0-35A
LAB-DC200-25	0-200V	0-25A
LAB-DC250-20	0-250V	0-20A
LAB-DC300-17	0-300V	0-17A
LAB-DC400-12.5	0-400V	0-12.5A
LAB-DC500-10	0-500V	0-10A
LAB-DC600-8.5	0-600V	0-8.5A
LAB-DC800-6.25	0-800V	0-6.25A
LAB-DC1000-5	0-1000V	0-5A
LAB-DC1200-4.2	0-1200V	0-4.2A
LAB-DC1500-3.4	0-1500V	0-3.4A

6kW Range

Model	Voltage	Current
LAB-DC15-400	0-15V	0-400A
LAB-DC20-300	0-20V	0-300A
LAB-DC25-240	0-25V	0-240A
LAB-DC35-175	0-35V	0-175A
LAB-DC45-140	0-45V	0-140A
LAB-DC70-90	0-70V	0-90A
LAB-DC100-60	0-100V	0-60A
LAB-DC120-50	0-120V	0-50A
LAB-DC150-40	0-150V	0-40A
LAB-DC200-30	0-200V	0-30A
LAB-DC250-24	0-250V	0-24A
LAB-DC300-20	0-300V	0-20A
LAB-DC400-15	0-400V	0-15A
LAB-DC500-12	0-500V	0-12A
LAB-DC600-10	0-600V	0-10A
LAB-DC800-7.5	0-800V	0-7.5A
LAB-DC1000-6	0-1000V	0-6A
LAB-DC1200-5	0-1200V	0-5A
LAB-DC1500-4	0-1500V	0-4A

8kW Range

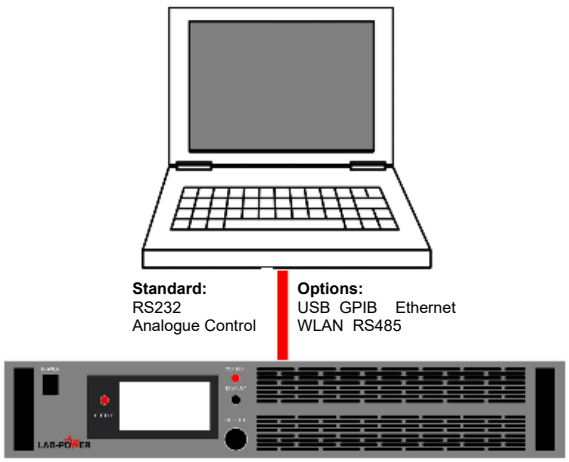
Model	Voltage	Current
LAB-DC15-500	0-15V	0-500A
LAB-DC20-440	0-20V	0-440A
LAB-DC25-320	0-25V	0-320A
LAB-DC35-230	0-35V	0-230A
LAB-DC45-180	0-45V	0-180A
LAB-DC70-115	0-70V	0-115A
LAB-DC100-80	0-100V	0-80A
LAB-DC120-66	0-120V	0-66A
LAB-DC150-55	0-150V	0-55A
LAB-DC200-40	0-200V	0-40A
LAB-DC250-32	0-250V	0-32A
LAB-DC300-30	0-300V	0-30A
LAB-DC400-20	0-400V	0-20A
LAB-DC500-16	0-500V	0-16A
LAB-DC600-15	0-600V	0-15A
LAB-DC800-10	0-800V	0-10A
LAB-DC1000-8	0-1000V	0-8A
LAB-DC1200-6.7	0-1200V	0-6.7A
LAB-DC1500-5.4	0-1500V	0-5.4A

10kW Range

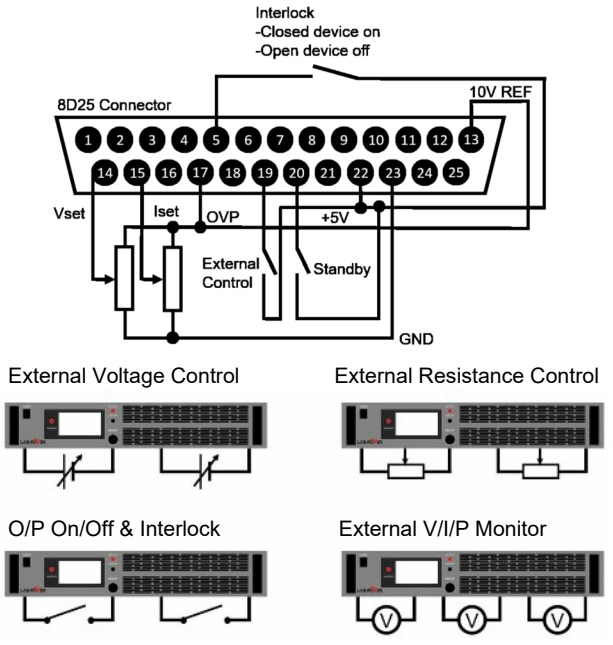
Model	Voltage	Current
LAB-DC20-500	0-20V	0-500A
LAB-DC25-400	0-25V	0-400A
LAB-DC35-350	0-35V	0-350A
LAB-DC45-250	0-45V	0-250A
LAB-DC70-175	0-70V	0-175A
LAB-DC100-100	0-100V	0-100A
LAB-DC120-83	0-120V	0-83A
LAB-DC150-75	0-150V	0-75A
LAB-DC200-50	0-200V	0-50A
LAB-DC250-40	0-250V	0-40A
LAB-DC300-40	0-300V	0-40A
LAB-DC400-25	0-400V	0-25A
LAB-DC500-20	0-500V	0-20A
LAB-DC600-17	0-600V	0-17A
LAB-DC800-13	0-800V	0-13A
LAB-DC1000-10	0-1000V	0-10A
LAB-DC1200-8.4	0-1200V	0-8.4A
LAB-DC1500-7	0-1500V	0-7A

Multiple Interfaces

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



Isolated Analogue Control
(Standard) 0-5 / 10V



External Voltage Control

External Resistance Control

O/P On/Off & Interlock

External V/I/P Monitor

Pin Assignment AI Interface
Pin (D25)

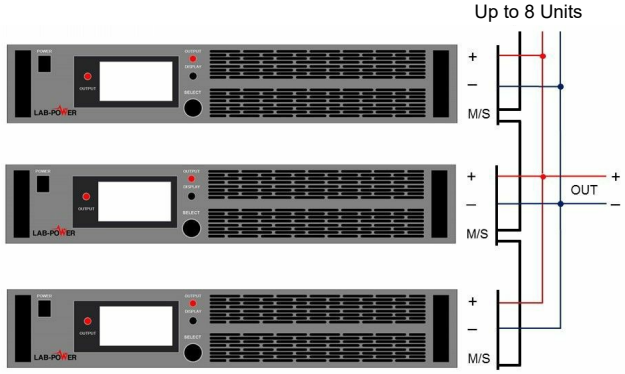
1 analogue out Vmon	10 digital out Standby
2 analogue out Imon	11 gnd
3 analogue out Pmon	12 -nc- - -
4 analogue out OVPmon	13 REF10 10 Vref
5 digital in Soft-Interlock	14 analogue in Vset
6 -nc	15 analogue in Iset
7 digital out CV Signal	16 analogue in In 2 -
8 analogue out Vmon	17 analogue in OVPset
9 gnd	18 analogue in In 4 -

19 digital in Ext. Control Activates analog control
20 digital in Standby Activates standby
21 analogue out Iistmon 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- - -

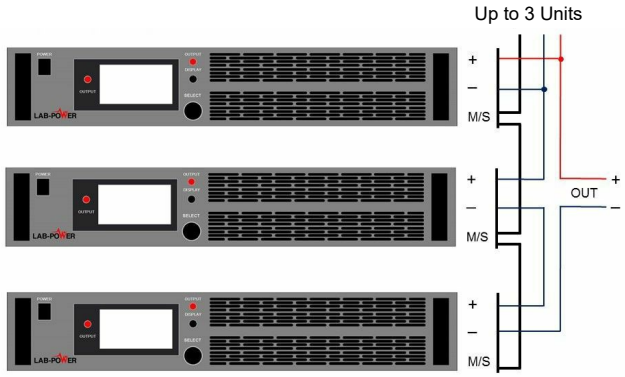
Master / Slave

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

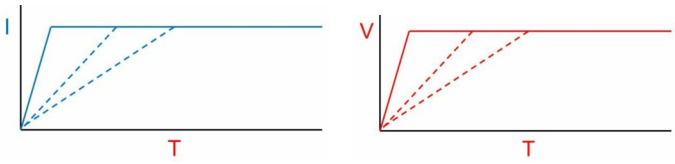


Series Mode



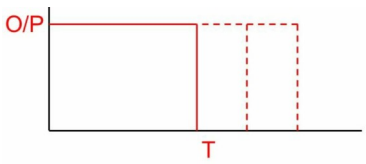
Soft Start

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/VIMode) will be loaded after power cycle.

Specification - Output

Output Voltage / [V]		15	35	70	100	300	600	800	1000	1200	1500
Output Current for 5kW Unit/ [A]		250[4]	142	72	50	17	8.5	6.25	5	4.2	3.3
Static Regulation		± 0.1% of F.S.									
Line Regulation	Voltage	±0.02% F.S.									
	Current	±0.02% F.S.									
Load Regulation	Voltage	±0.05% F.S. ± 2mV									
	Current	±0.05% F.S. ± 20mA									
Dynamic Response Time @ Load Step 10%-90%		< 3ms									
Ripple and Noise	Voltage Ripple (mV rms)[5] 300kHz	10[12]	25[12]	40[12]	40[12]	300[12]	300[12]	300[12]	300	300	400
	Voltage Ripple (mV rms)[5] 20MHz	15	35	60	60	400	400	400	400	400	500
	Voltage Ripple (p-p) 300kHz	15[12]	35[12]	60[12]	60[12]	400[12]	400[12]	700[12]	800	1500	1500
	Voltage Ripple (p-p) 20MHz	40	80	140	140	900	900	1000[12]	1200	2500	2500
	Current Ripple (p-p)	<0.5 % of F.S.									
	Current Ripple (rms)	< 0.4% of F.S.									
Isolation	Primary / Secondary	3000VAC									
	DC-Output / Earth	500VDC					2000VDC				
	Primary / Earth	2150VDC									
Rise Time, Full load		6ms		12ms	20ms			40ms			6 ms[13]
Rise Time, No load		5ms		10ms					20ms		5 ms[13]
Fall Time, Full Load		15ms		20ms		40ms	50ms	60ms	80ms	100ms	25 ms[13]
Fall Time, No Load		5s to get below 50V									
Relative Accuracy / [%][7]											
Voltage / [V]	0.25	0.038	0.088	0.175	0.25	0.75	1.5	2	2.5	3	3.75
Current / [A]	0.4	1	0.6	0.3	0.2	0.068	0.034	0.026	0.02	0.017	0.013
Relative Accuracy for Remote Voltage Sensing Operation (worst case)[7] / [%]											
Voltage / [V]	0.5	0.075	0.175	0.35	0.5	1.5	3	4	5	6	7.5
Maximum Sensing Voltage Over Nominal Voltage		1% of F.S									
Absolute Accuracy for Master-Slave Operation[7] / [%]		Maximum Number of Parallel Units: 8									
M/S-Parallel-Mode[7] [8] | N: number of parallel connected device; example N=3											
Voltage / [V]	0.25	0.038	0.088	0.175	0.25	0.75	1.5	2	2.5	3	3.75
Current / [A]	0.4 x N	3	1.74	0.864	0.6	0.204	0.102	0.078	0.06	0.05	0.04
M/S-Serial-Mode[7] [8] | N: number of serial connected device; example N=3		Maximum Number of Series Units: 3 Maximum Output Voltage to Earth: 2000V									
Voltage / [V]	0.25 x N	0.113	0.263	0.525	0.75	0.525	0.75	2.25	4.5	6	7.5
Current / [A]	0.4	1	0.58	0.288	0.2	0.288	0.2	0.068	0.034	0.026	0.02

DISPLAY RESOLUTION				
Resolution Voltage Display & Voltage Setting Resulution	15V - 99.99V		100V - 999.9V	1000V - 1500V
	0.000		000.0	0000
Resolution Current Display & Current Setting Resulution	0A - 9.999A	10A - 99.99A	100A - 999.9A	1000A - 9999A
	0.000	00.00	000.0	0000

DEVICE FUNCTION	
OVP	Over Voltage Protection: is adjustable between 0 % and 120 % of Voltage full range
OCP	Over Current Protection: is implemented by the current set point, the output current can not go over the set output current
OTP	Over Temperature Protection: if the internal heat sink temperature goes above 90°C the device will automatically shut down

Specification Input

							LAB-DCHA				
	LAB-DCA										
Device Power	3kW	4kW	5kW	6kW	8kW	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/200	3 x 208 Vac (180-220 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	22 Arms	28 Arms	33 Arms	x[14]	x[14]	x[14]	x[14]	x[14]	x[14]	x[14]	x[14]
Input Current 3P/200 model	15 Arms	20 Arms	25 Arms	30 Arms	40 Arms	50 Arms	74 Arms	99 Arms	148 Arms	221 Arms	295 Arms
Input Current 3P/208 model	14 Arms	19 Arms	23 Arms	28 Arms	37 Arms	46 Arms	69 Arms	92 Arms	138 Arms	207 Arms	276 Arms
Input Current 3P/400 model [1 2]	7.5 Arms	10 Arms	11.5 Arms	15 Arms	20 Arms	22.9 Arms	34.4 Arms	45.8 Arms	68.7 Arms	103.1 Arms	137.5 Arms
Input Current 3P/440 model [1 2]	7 Arms	9 Arms	11 Arms	14 Arms	18 Arms	21 Arms	32,5 Arms	42 Arms	63,5 Arms	95 Arms	127 Arms
Input Current 3P/480 model [1 2]	6.5 Arms	8 Arms	10 Arms	12.5 Arms	16.5 Arms	19.5 Arms	30 Arms	39 Arms	58 Arms	87 Arms	117 Arms
Inrush Transient Current [2]	< 25	< 25	< 25	< 51	< 51	< 51	< 76	< 102	< 153	< 229	< 305
Nominal Current Internal Fuse 3P/400 model	15A	15A	15A	30A	30A	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	32 A Type D/K	32 A Type D/K	40 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										
cos phi	> 0.7										
Harmonic Content[3]	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 ([%]/lin)
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
10: The LAB-DCH unit can also build up at 30 kW, 45 kW, 60 kW, 75 kW and 90 kW units
11: The ripple measurement method of Lab-Power is specified at application note : Ripple-Spec
12: The ripple specification are reservation to change on the part of manufacturer
13: Device Is currently only available with high speed output (Low output cap)
14: Standard unit not available

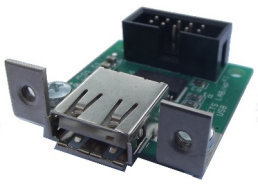
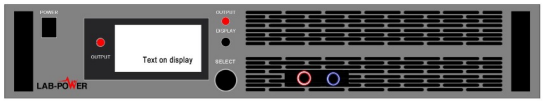
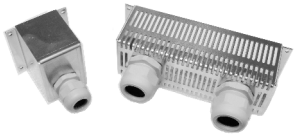
Ambient Conditions

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 - 5hW 18kg, 6 - 10kW 25kg**
Weight-LAB-DCH	**5kW 19kg, 10kW 26kg, 15kW 33kg**

Interface

Analogue Interface	Digital outputs (CV, Standby, Error)	Output type: Open collector with pull-up resistor 10kΩ 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 premissible 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 Max
	High level	Vd > 0.2V
	Low Level	Vd < -0.2V

Options list

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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