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Sorensen DLM 600 Series

Half Rack Programmable DC Power Supply

375–600 W

5–300 V

2–75 A

	~	110	220

GPIB LXI RS232

- High Power Density: 600 watts in 1U (1.75 inches) high, half rack (8.5 inches) wide; no top or bottom clearance spacing required.
- Near Linear Ripple & Noise Ripple as low as 2.5mV rms, noise as low as 15mV p-p.
- Remote Control
- LXI Compliant Ethernet LAN / RS-232C (16 bit)
- IEEE-488.2 / RS-232C (12 bit)
- Standard analog programming 0-5V, 0-10V, or 0-5kΩ.



The Sorensen DLM 600 series of programmable power supplies is designed to provide continuously variable output voltage and current for a broad range of applications in a compact 1U (1.75 inches) high, half-rack (8.5 inch) wide chassis.

With the use of Zero Voltage Switching (ZVS) technology, these supplies are able to achieve exceptionally low ripple and noise rivaling larger and more expensive linear power supplies. In addition, the high efficiency and fast load transient response assure that the DLM 600 is ideal for even the most demanding applications.

The DLM 600 models are ideal for high density multiple output rackmount requirements or low profile benchtop applications. Output voltages from 0-5VDC to 0-300VDC and currents from 0-2A to 0-75A are available.

The cooling air intake is at the front and sides with exhaust at the rear and sides. Variable speed fans are controlled as a function of ambient air temperature and load, thus reducing acoustic noise and increasing fan life. This allows supplies to be stacked one directly on top of another without space in between, yielding maximum rackmount packing density and a wide operating temperature of 0-50° C. An optional rackmount kit is available to easily mount one or two units side-by-side.

The front panel layout makes the DLM 600 series easy to use. Voltage and current can be set from individual 10-turn potentiometer knobs. Control push buttons include power on, output on, local/remote, voltage/current preview and overvoltage protection preview. Set-point or actual voltage/ current values can be viewed on two 3 ½digit LED displays.

Supplies can be connected in series or parallel. All models automatically accept any standard single phase input without manual set up.

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Programmable Power
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PROGRAMMABLE POWER

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DLM 600 Series : Product Specifications

Common	
Remote Sense	The maximum load line drop is up to the full voltage rating of the supply. The drop in the load leads subtracts from the maximum voltage available for the load except as follows: maximum rated voltage is available at the load and voltage regulation specifications apply for line drops of<1V on DLM5-75 and DLM8-75, <2V for all other DLM600 models
Remote Programming	Voltage, current (0-100%) and OVP (5-110%) of full scale can be programmed by selectable 0-5VDC, 0-10VDC, or 0-5kΩ
Remote Monitoring	Voltage or current can be monitored with user selectable ranges, scaled to 0-5 VDC or 0-10 VDC
Operational Features	Master/slave parallel operation, up to 4 units of the same model can be connected in parallel, with active current sharing control. Series operation, multiple units of the same model can be connected in series, limited by 300Vpk between either output terminal and chassis.
Software	IVI-COM, LabVIEW® or LabWindow®/CVI driver for Ethernet and IEEE-488.2
Regulatory Compliance	CE Compliant: • Low Voltage Directive (73/23/EEC) using EN 61010-1, and • EMC Directive (89/336/EEC) using EN 61326 Certified to UL 61010-1, CSA C22.2 No. 61010.1 and IEC/EN 61010-1
Input	
Voltage and Frequency	90-132 VAC or 180-264 VAC max, auto ranging, 47-63 Hz, single phase, 2-wire plus ground
Current	11A maximum at 115VAC, 6A maximum at 230 VAC
Connector	IEC 320 with detachable line cord
Power Factor	0.6, typical at full load; dependent on the impedance of the AC input.
Output	
Line Regulation	Voltage: 0.005% of V max + 2 mV Current: 0.01% of I max + 2 mA See table for input voltage variation over the AC input voltage range, with constant rated load.
Load Regulation	Voltage: 0.005% of V max + 2 mV Current: 0.02% of I max + 5 mA See table For 0-100% load variation, with constant nominal line voltage
Transient Response	500 µs to steady-state output voltage (within 0.1% of Vmax) for 50-100% or 100-50% load change
Stability	±0.05% of maximum voltage or current over 8 hours after 30 minute warm-up time at fixed line, load and temperature
Efficiency	84% typical at maximum output power; 82% typical for DLM 5-75 and DLM 8-75
Temperature Coefficient	0.02%/°C of maximum output voltage, 0.03%/°C of maximum output current. Change in output per °C change in ambient temperature, with constant line and load.
Environmental	
Operating Temperature	0°C to 50°C (no derating)
Storage Temperature	-40°C to 65°C
Cooling	Internal variable speed fans with over temperature protection. Air intake is from the front and sides with exhaust at rear and sides for maximum rackmount packing density.
Physical	
Dimensions	Width: 8.5" (216 mm) Height: 1U or 1.75" (44 mm) Depth: 17" (432 mm) Option M6 depth 20" (508 mm)
Weight	9.7 lbs. (4.4 kg)
Shipping Weight	12.7 lbs. (5.8 kg)

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DLM 600 Series : Product Specifications

375–600 W

Model	Output Ratings			Line Regulation		Load Regulation	
	Voltage (VDC)	Current (ADC)	Power (Watts)	Voltage (0.005% of Vmax + 2 mV)	Current (0.01% of Imax + 2 mA)	Voltage (0.005% of Vmax + 2 mV)	Current (0.02% of Imax + 5 mA)
DLM 5-75	0-5	0-75	375	2.25 mV	9.5 mA	2.25 mV	20 mA
DLM 8-75	0-8	0-75	600	2.4 mV	9.5 mA	2.4 mV	20 mA
DLM 10-60	0-10	0-60	600	2.5 mV	8 mA	2.5 mV	17 mA
DLM 20-30	0-20	0-30	600	3 mV	5 mA	3 mV	11 mA
DLM 40-15	0-40	0-15	600	4 mV	3.5 mA	4 mV	8 mA
DLM 60-10	0-60	0-10	600	5 mV	3 mA	5 mV	7 mA
DLM 80-7.5	0-80	0-7.5	600	6 mV	2.75 mA	6 mV	6.5 mA
DLM 150-4	0-150	0-4	600	9.5 mV	2.4 mA	9.5 mV	5.8 mA
DLM 300-2	0-300	0-2	600	17 mV	2.2 mA	17 mV	5.4 mA

Model	Programming Accuracy‡						Display Accuracy	
	Ethernet (M130/M131)			GPIB (M9G/M85)				
	Voltage (0.1% of VMax)	Current (0.25% of IMax)	Power (0.5% of 1.1 x Vmax)	Voltage (0.2% of VMax)	Current (0.5% of IMax)	OVP (1.0% of 1.1 x Vmax)	Voltage (0.5% of Vmax + 1 count)	Current (1.0% of Imax + 1 count)
DLM 5-75	5 mV	188 mA	44 mV	16 mV	375 mA	55 mV	35 mV	850 mA
DLM 8-75	8 mV	188 mA	44 mV	16 mV	375 mA	88 mV	50 mV	850 mA
DLM 10-60	10 mV	150 mA	55 mV	20 mV	300 mA	110 mV	60 mV	700 mA
DLM 20-30	20 mV	75 mA	110 mV	40 mV	150 mA	220 mV	200 mV	400 mA
DLM 40-15	40 mV	38 mA	220 mV	80 mV	75 mA	440 mV	300 mV	260 mA
DLM 60-10	60 mV	25 mA	330 mV	120 mV	50 mA	660 mV	400 mV	210 mA
DLM 80-7.5	80 mV	19 mA	440 mV	160 mV	38 mA	880 mV	500 mV	85 mA
DLM 150-4	150 mV	10 mA	825 mV	300 mV	20 mA	1.65 V	850 mV	50 mA
DLM 300-2	300 mV	5 mA	1.65 V	600 mV	10 mA	3.3 V	2.5 V	30 mA

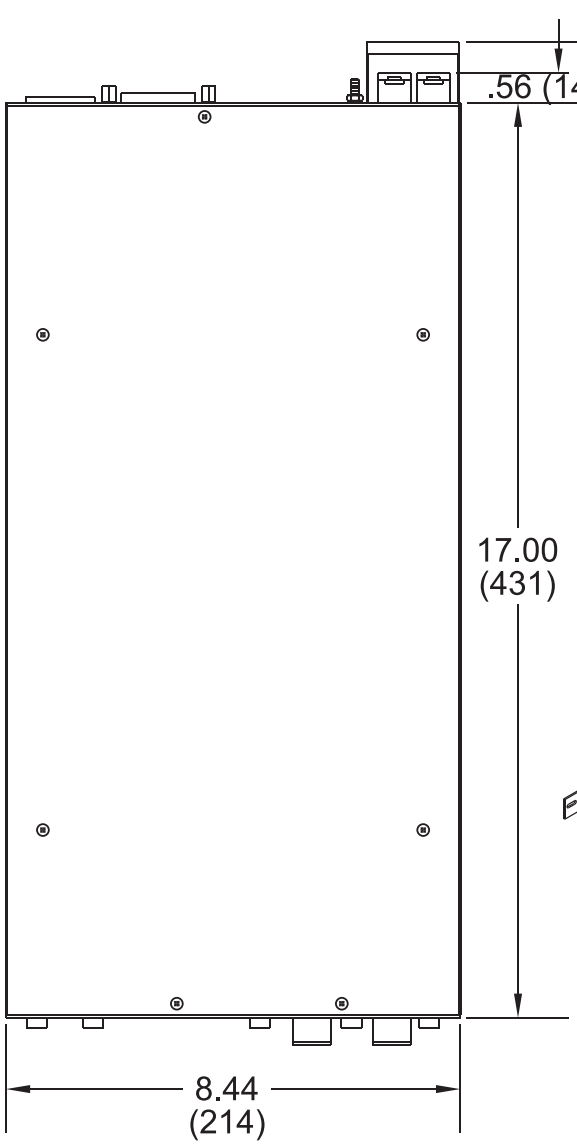
‡ Readback accuracy is the same as programming accuracy for all parameters except GPIB Voltage readback which is 0.25% of VMax

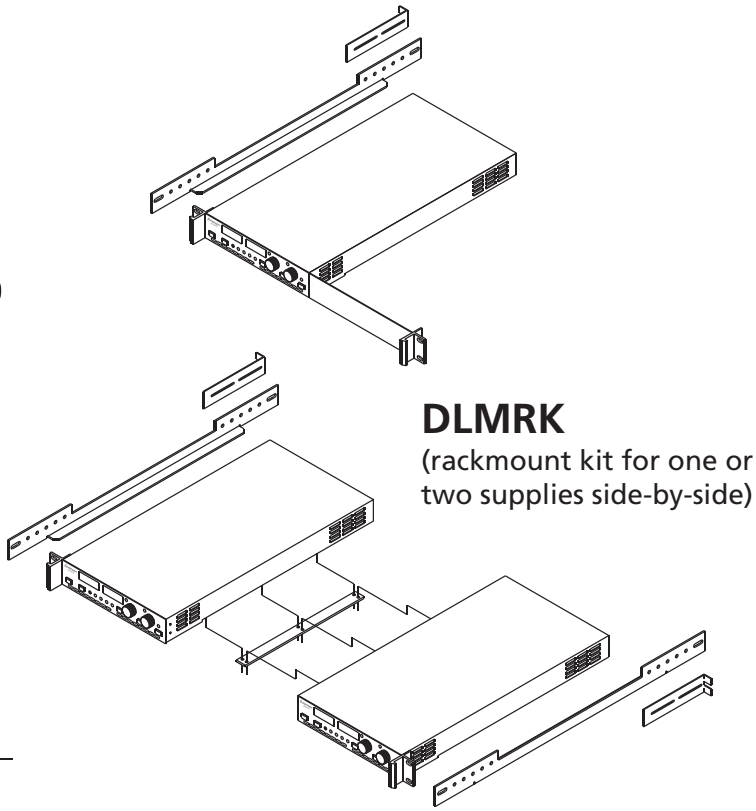
Model	Ripple and Noise, Voltage Mode		OVP Adjustment Range (5% - 110% of Vmax)	Stability		Temperature Coefficient		Maximum Total Remote Sense Drop
	Ripple (rms)*	Noise (p-p)*		Voltage (0.05% of Vmax)	Current (0.05% of Imax)	Voltage (0.02%/°C of Vmax)	Current (0.03%/°C of Imax)	
DLM 5-75	5 mV	30 mV	0.25-5.5 V	2.5 mV	37.5 mA	1 mV/°C	22.5 mA/°C	1 V
DLM 8-75	5 mV	30 mV	0.4-8.8 V	4 mV	37.5 mA	1.6 mV/°C	22.5 mA/°C	1 V
DLM 10-60	5 mV	30 mV	0.5-11 V	5 mV	30 mA	2 mV/°C	18 mA/°C	2 V
DLM 20-30	2.5 mV	15 mV	1-22 V	10 mV	15 mA	4 mV/°C	9 mA/°C	2 V
DLM 40-15	2.5 mV	15 mV	2-44 V	20 mV	7.5 mA	8 mV/°C	4.5 mA/°C	2 V
DLM 60-10	2.5 mV	20 mV	3-66 V	30 mV	5 mA	12 mV/°C	3 mA/°C	2 V
DLM 80-7.5	4 mV	20 mV	4-88 V	40 mV	3.8 mA	16 mV/°C	2.25 mA/°C	2 V
DLM 150-4	7 mV	40 mV	7.5-165 V	75 mV	2 mA	30 mV/°C	1.2 mA/°C	2 V
DLM 300-2	10 mV	60 mV	15-330 V	150 mV	1 mA	60 mV/°C	0.6 mA/°C	2 V

* rms noise typical from 20 Hz to 20 MHz
Specifications subject to change

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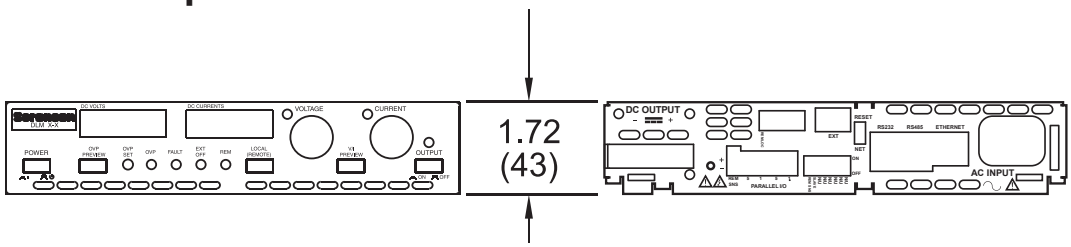
DLM 600 Series : Product Diagram





DLMRK
(rackmount kit for one or two supplies side-by-side)

Top View



Front View **Rear View**

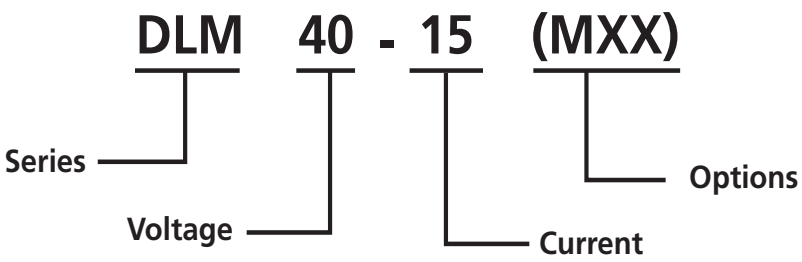
Dimensions in inches (millimeters)

*80V, 150V and 300V models have two position terminal blocks for the output

**M6 Options 20" (508 MM).

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Model Number Description



Voltage and Current Ranges

Model	Voltage	Current
DLM 5-75	0-5 V	0-75 A
DLM 8-75	0-8 V	0-75 A
DLM 10-60	0-10 V	0-60 A
DLM 20-30	0-20 V	0-30 A
DLM 40-15	0-40 V	0-15 A
DLM 60-10	0-60 V	0-10 A
DLM 80-7.5	0-80 V	0-7.5 A
DLM 150-4	0-150 V	0-4 A
DLM 300-2	0-300 V	0-2 A

Options and Accessories

M130	Ethernet/LAN Option (16 bit) • LXI Class C Compliant • 10/100 base-T • TCP/IP Protocol • ICMP (Ping Server) • Web Server: Direct control of power supply via standard web browser. RS-232C Interface
M6	Disconnect & Polarity reversal relays (10V to 300V models only. This option requires one of the following options: M9G, M85, M130 or M131) Output disconnect and polarity reversal relays controlled via SCPI commands. An SPST relay is in line with each output lead.
M9G	IEEE-488.2 and RS-232C Interfaces
M13	Locking shafts (front panel potentiometers)
M51A	Optically Isolated Analog Programming and Monitoring. This isolation allows users to control power supplies not connected to a common ground. In addition, in systems with high ambient noise or with large ground loop currents the control ground can be isolated from the power ground eliminating problems.
M85	Multichannel Slave Interface
M131	Multichannel Slave Interface (16 bit) (M130 Master ONLY)
DLMP1	Paralleling Cable; one cable per slave unit
DLMRK	Rackmount Kit for single DLM with filler panel and for two units mounted side-by-side

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J1 Connector			
1	ANALOG-CONTROL Input	14	EXTERNAL-OFF Input (+)
2	EXTERNAL-OFF Return	15	Auxiliary 5 VDC Output (+)
3	OVP Programming Input	16	OVP Resistance Programming Output
4	REMOTE-CONTROL Status Output	17	OVP Resistance Programming Return
5	VOLTAGE-MODE Status Output	18	FAULT Status Output
6	Auxiliary 5 VDC Return	19	Voltage Monitor Output
7	Current Monitor Output	20	Voltage Resistance Programming Return
8	Voltage/Current Monitor Return	21	Voltage Resistance Programming Output
9	Voltage Programming Input	22	Current Resistance Programming Output
10	Current Programming Input	23	Current Resistance Programming Return
11	Not Used	24	LOCAL-LOCKOUT Input
12	V/I/OVP Programming Return	25	OVP Status Output
13	Not Used		

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