

DLM - 3 kW and 4 kW Programmable DC Power Supply

The DLM 3 kW and 4 kW Series programmable DC power supplies are designed to provide highly stable, continuously variable output voltage and current for a broad range of applications in a compact 2U (3½" high) chassis.

The 4 kW power rating is new to the Sorensen Family of power supplies. Both the 3 kW and 4 kW models have output voltages from 0-5 VDC to 0-600 VDC and a current range from 0-5A to 0-450A. The output RMS noise is as low as 10 mV. The output will recover to 1% of its steady-state voltage within 1 ms for a step load change of 100% to 70% or 70% to 100%. The front panel layout makes the series extremely easy to use. Control switches include: power on, enable/ standby and local/remote. Displays and indicators show



programmed set points and operational control status. The programmed voltage, current and overvoltage set points are displayed with two large 3½ digit LED displays. Operational Status LEDs indicate power on, shutdown, overtemperature, overvoltage, constant current and voltage mode status. Control Status LEDs indicate front panel lockout, remote control and standby status. IEEE-488.2 control LEDs indicate error, service request and remote address status. The 3 kW Models will accept 200*/230 VAC single phase and 200*/208 VAC

three phase input power. The 4 kW Models will accept 200*/208 VAC, three phase or optional 400 or 480 VAC three phase input power.

**Operating temperature below 40°C*

Features

- ◆ **High Power Density**
3 kW and 4 kW models, 2U (3½" high), (19" wide); no top or bottom clearance spacing required
- ◆ **Wide Range of Output Voltages**
3 kW and 4 kW outputs 0-5V, 8V, 16V, 32V, 40V, 60V, 80V, 150V, 300V and 600V
- ◆ **Preview Push-button**
Overvoltage protection (OVP), voltage and current preview buttons allow viewing these set points at any time with or without the output enabled
- ◆ **Remote Voltage Sense**
Sense leads are easily connected to a solderless connector
- ◆ **Remote Operation**
 - Standard analog programming
 - Output enable/disable remotely
 - Optional IEEE-488.2 and RS 232
 - Optional optically isolated analog programming (M51A)
- ◆ **Calibration**
All models can be calibrated without removing the covers
- ◆ **Operating Modes**
Constant voltage and constant current, with LED indicators
- ◆ **Parallel or Series Operation**
Field configurable
- ◆ **Input Power Factor**
0.95 typical (three phase)
0.98 typical (single phase - 3kW only)
- ◆ **CE Mark**
- ◆ **5 Year Warranty**



DLM 3-4 kW - Specifications

OUTPUT

Voltage and Current

3 kW Model	Voltage	Current
DLM 5-350E	0-5	0-350
DLM 8-350E	0-8	0-350
DLM 16-185E	0-16	0-185
DLM 32-95E	0-32	0-95
DLM 40-75E	0-40	0-75
DLM 60-50E	0-60	0-50
DLM 80-37E	0-80	0-37
DLM 150-20E	0-150	0-20
DLM 300-10E	0-300	0-10
DLM 600-5E	0-600	0-5

4 kW Model	Voltage	Current
DLM 5-450E	0-5	0-450
DLM 8-450E	0-8	0-450
DLM 16-250E	0-16	0-250
DLM 32-125E	0-32	0-125
DLM 40-100E	0-40	0-100
DLM 60-66E	0-60	0-66
DLM 80-50E	0-80	0-50
DLM 150-26E	0-150	0-26
DLM 300-13E	0-300	0-13
DLM 600-6.6E	0-600	0-6.6

Noise and Ripple: See table

Regulation (Line or Load)

Voltage: 0.05% of maximum rated output +2 mV

Current: 0.1% of maximum rated output

Transient Response: Typically recovers in 1 ms to within 1% of steady-state output voltage (greater than 50% Vmax) for a 70% to 100% or 100% to 70% load change

Stability: $\pm 0.05\%$ maximum voltage or current over 8 hours after 15 minute warm-up time at fixed line, load and temperature

Efficiency

5-8V Model: 82% typical

16-80V Models: 87% typical

150-600V Models: 85% typical (at maximum output power)

Temperature Coefficient: 0.02%/°C of rated output voltage, 0.03%/°C of rated output current

INPUT

Voltage and Frequency

3 kW: 180-264 VAC, 47-63 Hz, single or three phase (<200 VAC range limited to 40°C maximum)

4 kW: 180-264 VAC, 47-63 Hz, three phase (<200 VAC range limited to 40°C maximum)

Power Factor: 0.95 typical with three phase input, 0.98 typical with single phase input

GENERAL

Operating Temperature: 0°C to 50°C, no derating (<200 VAC range limited to 40°C maximum)

Storage Temperature: -40°C to 65°C

Cooling: Internal fans with overtemperature protection

Front Panel Controls: Knobs with 3½ digit digital displays to control output voltage and current settings. Power on/off switch, output enable/standby switch and local/remote switch. Voltage, current and overvoltage preview push buttons allow you to preview the programmed settings at any time; overvoltage limit is adjusted with a set screw accessible through the front panel.

Displays and Indicators: Voltage and overvoltage setting 3½ digit LED display, current setting 3½ digit LED display. LED indicators for power on, shutdown, remote, overvoltage protection, overtemperature and front panel lockout, constant voltage and constant current modes. IEEE-488.2 indicators include error, SRQ and address.

Built-in Protection: Overvoltage (resets by cycling the enable/standby switch), overtemperature (will automatically reset)

Rear Panel Control/Monitor

Remote Sense: The maximum total allowed sense line drop is 2V for 5V, 8V and 16V models and 5V for all other models.

Remote Sense Protection: Unit will not be damaged due to misconnection of the remote sense leads.

Remote Programming: Voltage, current (0-100%) and OVP (5-110%) of full scale can be programmed by selectable 0-5 VDC, 0-10 VDC, or 0-5 kΩ

Remote Monitoring: Voltage or current can be monitored with user-selectable ranges, 0-5 VDC or 0-10 VDC

Operational Features: Master/slave parallel* operation, up to 2 units can be connected in parallel with active current sharing control to within 10% of each supply. Series operation, up to 3 units of the same model type can be connected in series (consult manual). Negative terminal rated at 150 Vmax above ground

Software: LabVIEW® driver M9E/M85 programs can be downloaded at no cost at www.elgar.com

Regulatory Compliance: CE Mark

Dimensions: 3-1/2" (88 mm) H x 19" (482 mm) W x 18" (508 mm) D

Weight: 40 lbs. (18.2 kg)

Shipping Weight: 49 lbs. (22.3 kg)

OPTIONS & ACCESSORIES

Remote Interface Options

M9E:** SCPI compatible IEEE-488.2 and RS 232 interfaces (May not be combined with M51A or M85)

M13: Locking shafts (front panel potentiometers)

M51A: Isolated analog programming (May not be combined with M9C or M85)

M85:** Multichannel slave interface (May not be combined with M9E or M51A)

Input Voltage Options

M1: 345-455 VAC, 47-63 Hz, three phase, 3 wire plus ground, Delta or Wye may be used (4 kW only)

M2: 432-528 VAC, 47-63 Hz, three phase, 3 wire plus ground, Delta or Wye may be used (4 kW only)

Parallel Cable

Paralleling Cable: P/N 5361969-01

Rack Slide Kit

105-300-26: Rack slide kit

* Consult factory for other configurations.

** See interface options discussion on page 44.

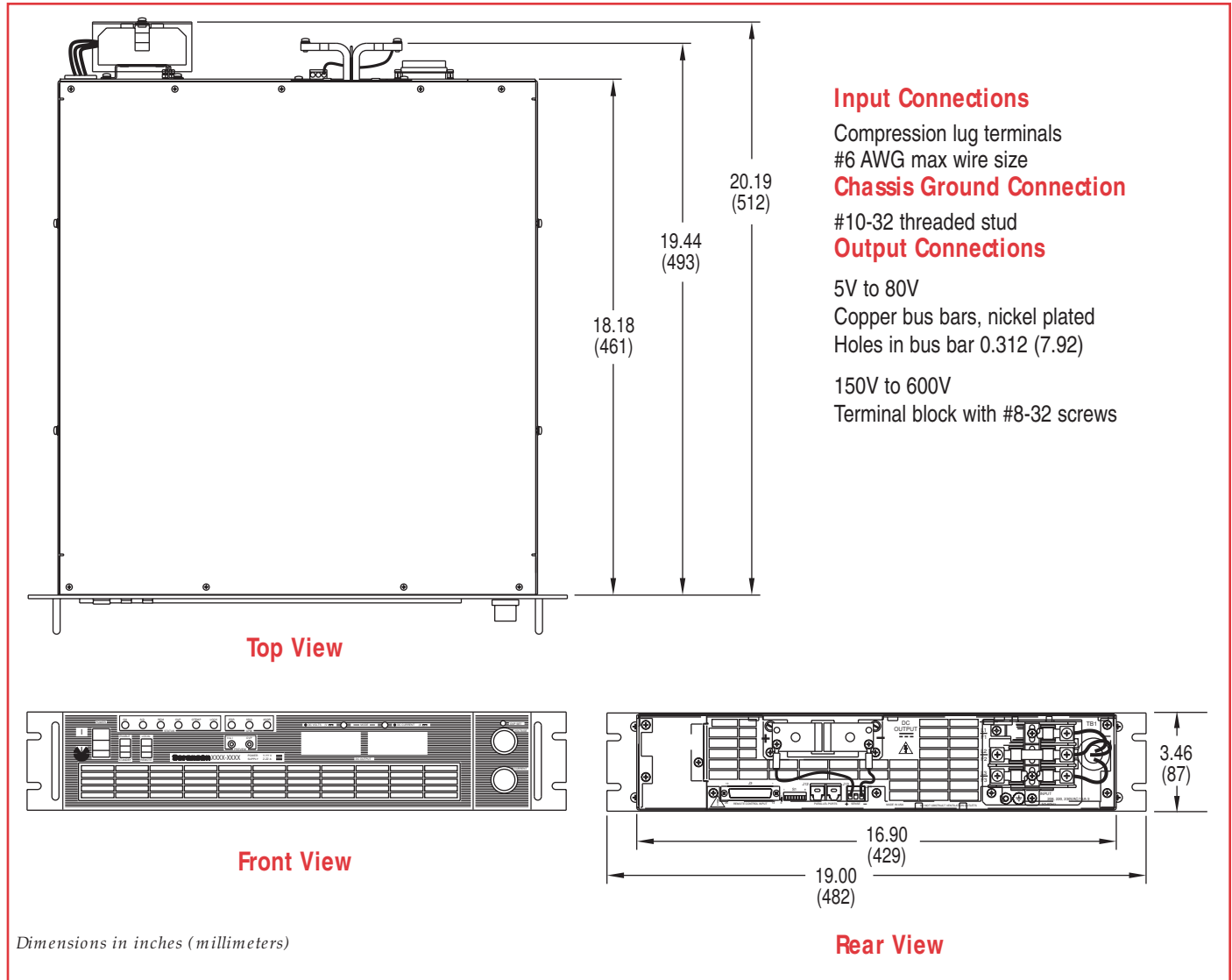
DLM 3-4 kW - Data Tables

Model	Output Ratings		Regulation Line and Load		Meter Accuracy	
	Voltage (VDC)	Current (ADC)	Voltage (0.05% of Vmax + 2 mV)	Current (0.1% of Imax)	Voltage (0.5% of Vmax + 1 count)	Current (0.75% of Imax + 1 count)
DLM 5-350E	0-5	0-350	5 mV	350 mA	0.04V	4A
DLM 5-450E	0-5	0-450	5 mV	450 mA	0.04V	5A
DLM 8-350E	0-8	0-350	6 mV	350 mA	0.05V	4A
DLM 8-450E	0-8	0-450	6 mV	450 mA	0.05V	5A
DLM 16-185E	0-16	0-185	10 mV	185 mA	0.09V	3A
DLM 16-250E	0-16	0-250	10 mV	250 mA	0.09V	3A
DLM 32-95E	0-32	0-95	18 mV	95 mA	0.3V	0.8A
DLM 32-125E	0-32	0-125	18 mV	125 mA	0.3V	1A
DLM 40-75E	0-40	0-75	22 mV	75 mA	0.3V	0.7A
DLM 40-100E	0-40	0-100	22 mV	100 mA	0.3V	0.9A
DLM 60-50E	0-60	0-50	32 mV	50 mA	0.4V	0.5A
DLM 60-66E	0-60	0-66	32 mV	66 mA	0.4V	0.6A
DLM 80-37E	0-80	0-37	42 mV	37 mA	0.5V	0.4A
DLM 80-50E	0-80	0-50	42 mV	50 mA	0.5V	0.5A
DLM 150-20E	0-150	0-20	77 mV	20 mA	0.9V	0.3A
DLM 150-26E	0-150	0-26	77 mV	26 mA	0.9V	0.3A
DLM 300-10E	0-300	0-10	152 mV	10 mA	1.6V	0.09A
DLM 300-13E	0-300	0-13	152 mV	13 mA	1.6V	0.11A
DLM 600-5E	0-600	0-5	302 mV	5 mA	3.1V	0.05A
DLM 600-6.6E	0-600	0-6.6	302 mV	7 mA	3.1V	0.06A

Model	Precision Accuracy		OVP Adjustment Range (5% to 110% of Vmax)	Ripple and Noise		Stability		Temp. Coeff.		Maximum Total Remote Sense Drop
	Voltage (0.5% of Vmax +1 count)	Current (1.0% of Imax + 1 count)		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 5-350E	0.04V	5A	0.3 - 5.5V	12 mV	100 mV	3 mV	175 mA	1 mV	105 mA	2V
DLM 5-450E	0.04V	6A	0.3 - 5.5V	12 mV	100 mV	3 mV	225 mA	1 mV	135 mA	2V
DLM 8-350E	0.05V	5A	0.4 - 8.8V	12 mV	100 mV	4 mV	175 mA	1.6 mV	105 mA	2V
DLM 8-450E	0.05V	6A	0.4 - 8.8V	12 mV	100 mV	4 mV	225 mA	1.6 mV	135 mA	2V
DLM 16-185E	0.09V	3A	0.8 - 17.6V	10 mV	100 mV	8 mV	93 mA	3.2 mV	55 mA	2V
DLM 16-250E	0.09V	4A	0.8 - 17.6V	10 mV	100 mV	8 mV	125 mA	3.2 mV	75 mA	2V
DLM 32-95E	0.3V	1.1A	1.6 - 35V	10 mV	100 mV	16 mV	48 mA	6 mV	30 mA	5V
DLM 32-125E	0.3V	1.4A	1.6 - 35V	10 mV	100 mV	16 mV	63 mA	6 mV	38 mA	5V
DLM 40-75E	0.3V	0.9A	2 - 44V	10 mV	100 mV	20 mV	38 mA	8 mV	23 mA	5V
DLM 40-100E	0.3V	1.1A	2 - 44V	10 mV	100 mV	20 mV	50 mA	8 mV	30 mA	5V
DLM 60-50E	0.4V	0.6A	3 - 66V	15 mV	100 mV	30 mV	25 mA	12 mV	15 mA	5V
DLM 60-66E	0.4V	0.8A	3 - 66V	15 mV	100 mV	30 mV	33 mA	12 mV	19.8 mA	5V
DLM 80-37E	0.5V	0.5A	4 - 88V	15 mV	120 mV	40 mV	19 mA	16 mV	12 mA	5V
DLM 80-50E	0.5V	0.6A	4 - 88V	15 mV	120 mV	40 mV	25 mA	16 mV	15 mA	5V
DLM 150-20E	0.9V	0.3A	7.5 - 165V	30 mV	200 mV	75 mV	10 mA	30 mV	6 mA	5V
DLM 150-26E	0.9V	0.4A	7.5 - 165V	30 mV	200 mV	75 mV	13.0 mA	30 mV	7.8 mA	5V
DLM 300-10E	1.6V	0.11A	15 - 330V	60 mV	300 mV	150 mV	5 mA	60 mV	3 mA	5V
DLM 300-13E	1.6V	0.14A	15 - 300V	60 mV	300 mV	150 mV	6.5 mA	60 mV	3.9 mA	5V
DLM 600-5E	3.1V	0.06A	30 - 660V	100 mV	500 mV	300 mV	2.5 mA	120 mV	1.5 mA	5V
DLM 600-6.6E	3.1V	0.08A	30 - 660V	100 mV	500 mV	300 mV	3.3 mA	120 mV	2.0 mA	5V

* RMS ripple typical from 20 Hz to 300 kHz

DLM 3-4 kW - Case, Options and Accessories



Options & Accessories

Input Voltage Options	
M1	400 VAC (4 kW only)
M2	480 VAC (4 kW only)
Remote Interface Options	
M9E	IEEE-488.2 and RS 232 Interfaces
M13	Locking shafts (front panel potentiometer)
M51A	Optically Isolated Analog Programming
M85	Multichannel Slave Interface
Parallel Cable	
5361969-01	Paralleling Cable, one cable per slave unit
Rack Slide Kit	
105-300-26	Rackslide kit

J3 Connector			
1	Remote Output Enable	14	Remote Shutdown Input (+). Positive or negative true logic selection with S1
2	Remote Shutdown Return (-)	15	+5 VDC Auxillary Output
3	Remote OVP Programming Input	16	1 mA current source for OVP Programming
4	Remote Programming Indicator	17	OVP Status Indicator
5	Operating Mode Indicator	18	Overtemperature Shutdown Indicator
6	Status Indicator Return (-)	19	DC Voltage Monitor Output
7	Current Monitor Output	20	Remote/Local Voltage Control Select
8	N/C	21	1 mA Current Source for Voltage Programming
9	Voltage Programming Input	22	1 mA Current Source for Current Programming
10	Current Programming Input	23	Remote/Local Current Control Select
11	N/C	24	N/C
12	Programming/Monitor Return (-)	25	N/C
13	N/C		