DCSE 1 kW and 3 kW DC Programmable Switching Supplies

The DCSE Family of 1 kW and 3 kW programmable power supplies incorporate current mode switching rates up to 100 kHz in high power density, low profile chassis. Utilizing unique packaging techniques, the DCSE Family provides continuous full output power (1 kW or 3 kW) in any volt/amp combination within the rated output voltage and current limits.

This family has 10-turn potentiometers to adjust voltage and current settings that are displayed simultaneously. LEDs indicate overtemperature, remote programming, shutdown and overvoltage protection, status and constant-voltage/current mode operation.

The DCSE 3 kW Models have push button control of the output standby mode, OVP reset, remote/local programming and preview status of voltage, current and OVP setpoints.

Options include an internal IEEE-488/RS 232 interface, isolated analog programming of voltage or current, and the multichannel slave interface (Option M85).

Features

- **Output Voltage**
  Voltage ranges from 0-8 VDC to 0-600 VDC; current levels from 1.7A to 350A

- **Power Density**
  - 1 kW of power in a 19 lb. package only 1.75 inches high
  - 3 kW of power in a 33 lb. package only 3.5 inches high

- **Input Voltage**
  - **1 kW:** 100-132 VAC, single phase, or 200-250 VAC, single phase 47-63 Hz (other inputs available)
  - **3 kW:** 190-250 VAC, three phase or 200-250 VAC, single phase 47-63 Hz (2.5 kW max with single phase input; other inputs available)

- **Remote Programming**
  - Selectable remote programming for voltage, current and OVP
  - Optional internal IEEE-488/RS 232 Interface Card with voltage and current readback and adjustable OVP (Option M9C)
  - Optional isolated analog programming (Option M51)
  - Optional multichannel slave interface (Option M85)

- **Regulation**
  - Line regulation: 0.1%
  - Load regulation: 0.1%

- **Software**
  LabVIEW® driver for M9C/M85 can be downloaded at no cost at www.sorensen.com/support/downloads.cfm

- **Regulatory Compliance**
  CE Mark, UL 1012, FCC Part 15 Class A and CSA 22.2 #220

- **5 Year Warranty**

CE

DCSE Family

Output

Voltage and Current

1 kW Model	Voltage	Current
DCSE 8-125E	0-8	0-125
DCSE 10-100E	0-10	0-100
DCSE 20-50E	0-20	0-50
DCSE 33-33E	0-33	0-33
DCSE 40-25E	0-40	0-25
DCSE 50-20E	0-50	0-20
DCSE 60-18E	0-60	0-18
DCSE 80-13E	0-80	0-13
DCSE 150-7E	0-150	0-7
DCSE 300-3.5E	0-300	0-3.5
DCSE 600-1.7E	0-600	0-1.7

3 kW Model	Voltage	Current
DCSE 8-350E	0-8	0-350
DCSE 12-250E	0-12	0-250
DCSE 20-150E	0-20	0-150
DCSE 40-75E	0-40	0-75
DCSE 55-55E	0-55	0-55
DCSE 60-50E	0-60	0-50
DCSE 80-37E	0-80	0-37
DCSE 150-20E	0-150	0-20

Voltage Resolution: 0.02%

Ripple (mV RMS or P-P): See table

Regulation (Line or Load)

Voltage: 0.1%

Current: 0.1%

Transient Response: Typically recovers in <1 ms to 1% of steady-state output voltage (within 1% of Vmax) for 70-100% or 100-70% load change. 500 µs typical

Stability: ±0.05% of maximum voltage or current over 8 hours after 30 minute warm-up time at fixed line, load and temperature

Efficiency: See table

Temperature Coefficient: 0.02%/°C of maximum output voltage; 0.03%/°C of maximum output current

Input

Voltage and Frequency

1 kW: 200-250 VAC, single phase, 8.5A typical, 47-63 Hz; or 100-132 VAC, single phase, 15A typical, 47-63 Hz, internal jumper selectable (see M1 option)

3 kW: 190-250 VAC, three phase, 14A typical, 47-63 Hz; or 200-250 VAC, single phase, 26A typical, 47-63 Hz

Note: Maximum power output of 3 kW supplies must be limited to 2.5 kW for single phase input

Soft Start: Line current is lower than full load peak value during turn-on or power application after restart

General

Operating Temperature: 0°C to 50°C (no derating), 50°C to 70°C (derate 2%/°C above 50°C)

Storage Temperature: -55°C to 85°C

Humidity Range: 0 to 80% RH, non condensing

Meter Accuracy: 1% of full scale + 1 count

Max. Voltage Differential from Output to Safety Ground

1 kW: 150 VDC

3 kW: 150 VDC

Remote Start/Stop and Interlock: TTL compatible input or 12-250 VAC (12-130 VDC) or a contact closure

Cooling: Internal fan, overtemperature shutdown at internal heat sink temperature of 90°C

Remote Sense: The maximum allowed sense line drop is 1V (0.5V on the DCSE 8-125E model)

Remote Programming: External jumper via rear panel connector J3

Overvoltage Protection: Crowbar type adjustable from 5-110% of rated output using front panel control (local or remote program selectable via J3 jumper)

Analog Programming Linearity: ±1%

Analog Programming Accuracy: ±5%

Software: LabVIEW® driver for M9C/M85, programs can be downloaded at no cost at www.sorensen.com/support/downloads.cfm

Regulatory Compliance: CE Mark

Dimensions

1 kW: 1U or 1.75" (44 mm) H x 19" (482 mm) W x 17.5" (444 mm) D

3 kW: 2U or 3.5" (88 mm) H x 19" (482 mm) W x 17.5" (444 mm) D

Weight

1 kW: 19 lbs. (8.62 kg)

3 kW: 33 lbs. (15 kg)

Shipping Weight

1 kW: 24 lbs. (10.89 kg)

3 kW: 42 lbs. (19 kg)

Options & Accessories

M1: Factory configured for 115 VAC input (1 kW units only)

M9C*: Internal IEEE-488/RS 232 Interface

M13: Locking shafts (front panel potentiometers)

M32: Master/slave cable configured for two or more units

M33: Replace input connector with terminal block (3 kW only)

M51: Isolated analog programming control of either the output current or voltage using analog signals that can be biased up to 60V relative to the supply's return line

M85*: Multichannel slave interface

** See digital programming discussion on page 49.*

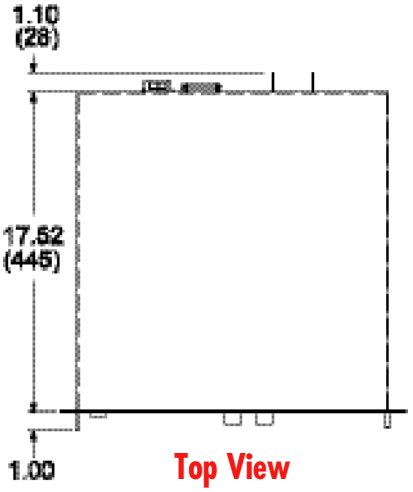
Model	Output Power		Combined Regulation Line and Load %	Constant Voltage Mode*			Temp. Coeff. Voltage %/°C (Typ)	Voltage Drift % Vmax (Typ)	Programming Constants Voltage Mode	
	Voltage VDC	Current ADC @ 50°C		Ripple (RMS)**	Noise (P-P)	Transient Response Time µs (Typ)			Ohms/V	V/V
DCS 8-125E	0-8	0-125	0.2	10 mV	100 mV	500	0.02	0.05	625	0-10V = 0-100% V_0 or 0-5V = 0-100% V_0
DCS 8-350E	0-8	0-350	0.2	15 mV	100 mV	1000	0.02	0.05	625	
DCS 10-100E	0-100	0-100	0.2	10 mV	100 mV	500	0.02	0.05	500	
DCS 12-250E	0-12	0-250	0.2	10 mV	100 mV	1000	0.02	0.05	416.7	
DCS 20-50E	0-20	0-50	0.2	10 mV	100 mV	500	0.02	0.05	250	
DCS 20-150E	0-20	0-150	0.2	10 mV	100 mV	1000	0.02	0.05	250	
DCS 33-33E	0-33	0-33	0.2	10 mV	100 mV	500	0.02	0.05	151.5	
DCS 40-25E	0-40	0-25	0.2	10 mV	100 mV	500	0.02	0.05	125	
DCS 40-75E	0-40	0-75	0.2	20 mV	100 mV	1000	0.02	0.05	125	
DCS 50-20E	0-50	0-20	0.2	20 mV	100 mV	500	0.02	0.05	100	
DCS 55-55E	0-55	0-55	0.2	20 mV	100 mV	1000	0.02	0.05	90.9	
DCS 60-18E	0-60	0.18	0.2	20 mV	100 mV	500	0.02	0.05	83	
DCS 60-50E	0-60	0-50	0.2	20 mV	100 mV	1000	0.02	0.05	83	
DCS 80-13E	0-80	0-13	0.2	20 mV	100 mV	500	0.02	0.05	62.5	
DCS 80-37E	0-80	0-37	0.2	20 mV	100 mV	1000	0.02	0.05	62.5	
DCS 150-7E	0-150	0.7	0.2	30 mV	200 mV	500	0.02	0.05	33.3	
DCS 150-20E	0-150	0-20	0.2	30 mV	200 mV	1000	0.02	0.05	33.3	
DCS 300-3.5E	0-300	0-3.5	0.2	40 mV	200 mV	500	0.02	0.05	16.67	
DCS 600-1.7E	0-600	0-1.7	0.2	100 mV	500 mV	500	0.02	0.05	8.33	

Model	Constant Current Mode*		Temp. Coeff. %/°C (Typ.)	Current Drift $\%I_0$ Max. (Typ.)	Programming Constants, Current Mode		Input Current, A Nominal		Efficiency % (Typ.)	Case
	Regulation Line and Load % Combined	Ripple (RMS)** mA			Ohms/A	V/A	230V Single Phase	208V Three Phase		
DCS 8-125E	0.2	160	0.03	0.05	40	0-10V= 0-100% I_0 or 0-5V= 0-100% I_0	8.5	N/A	82	I
DCS 8-350E	0.2	870	0.03	0.05	14.3		24	13	82	II
DCS 10-100E	0.2	128	0.03	0.05	50		8.5	N/A	82	I
DCS 12-250E	0.2	400	0.03	0.05	20		26	14	82	II
DCS 20-50E	0.2	25	0.03	0.05	100		8.5	N/A	82	I
DCS 20-150E	0.2	100	0.03	0.05	33.3		26	14	82	II
DCS 33-33E	0.2	10	0.03	0.05	151.5		8.5	N/A	82	I
DCS 40-25E	0.2	7	0.03	0.05	200		8.5	N/A	82	I
DCS 40-75E	0.2	75	0.03	0.05	66.7		26	14	86	II
DCS 50-20E	0.2	7	0.03	0.05	250		8.5	N/A	86	I
DCS 55-55E	0.2	40	0.03	0.05	90.9		26	14	82	II
DCS 60-18E	0.2	6	0.03	0.05	277.8		8.5	N/A	86	I
DCS 60-50E	0.2	33	0.03	0.05	100		26	14	86	II
DCS 80-13E	0.2	4	0.03	0.05	384.6		8.5	N/A	82	I
DCS 80-37E	0.2	20	0.03	0.05	135		26	14	86	II
DCS 150-7E	0.2	2	0.03	0.05	714.3		8.5	N/A	82	I
DCS 150-20E	0.2	10	0.03	0.05	250		26	14	86	II
DCS 300-3.5E	0.2	1	0.03	0.05	1428.6		8.5	N/A	82	I
DCS 600-1.7E	0.2	1	0.03	0.05	2941		8.5	N/A	82	I

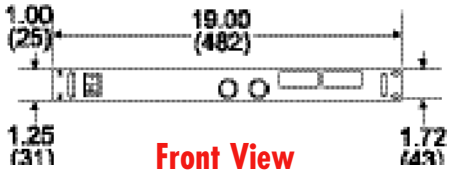
* Typical resolution is 0.02% ** RMS ripple typical from 20 Hz to 300 kHz

DCSE Family

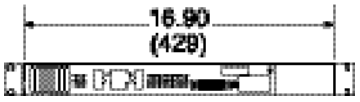
Case I



Top View



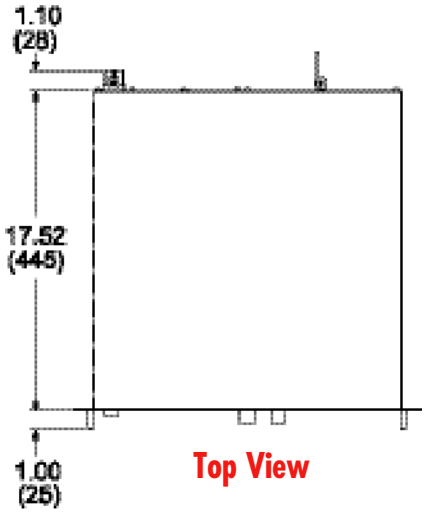
Front View



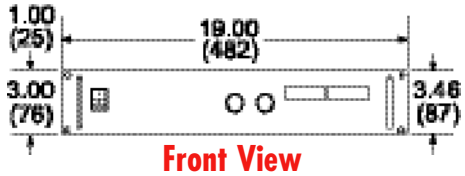
Rear View

Dimensions in inches (millimeters)

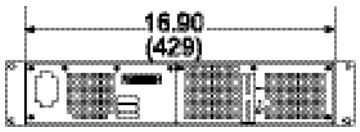
Case II



Top View



Front View



Rear View

Options & Accessories

Input Voltage Options	
M1	Factory configured for 115 VAC input (1 kW only)
Remote Interface Options	
M9C	Internal IEEE-488/RS 232 interface
M13	Locking shafts (front panel potentiometers)
M32	Master/slave cable configured for two or more units
M33	Replace input connector with terminal block (3 kW only)
M51	Isolated analog programming control
M85	Multichannel slave interface

J3 Program and Sense			
1	90-250 VAC Remote Shutdown	14	TTL Shutdown
2	Shutdown Return	15	+12 VDC
3	OVP Program	16	1 mA Current Source (OVP)
4	Remote/Local Status Indicator	17	OVP Indicator
5	Mode Status Indicator	18	Thermal S/DN Status
6	Ground	19	0-5V Voltage Monitor
7	0-5V Current Monitor	20	Remote Voltage Select
8	Voltage Control	21	1 mA Current Source (V)
9	Voltage Program Input	22	1 mA Current Source (I)
10	Current Program Unit	23	Remote Current Select
11	Current Control	24	Return
12	Return Sense	25	POS Output (8-80V Models Only)
13	POS Sense (8-80V Models Only)		