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DCS SERIES

Power Supplies

Instruction Manual

Manual covers DCS models:

- | | |
|-------|---------|
| 8-125 | 80-13 |
| 20-50 | 150-7 |
| 33-33 | 300-3.5 |
| 40-25 | 600-1.7 |
| 60-18 | |

SORENSEN

Division of Elgar
 9250 Brown Deer Road
 San Diego, CA 92121-2294
 1-800-525-2024
 Tel: (858) 450-0085
 Fax: (858) 458-0267
 Email: sales@sorensen.com
 www.sorensen.com

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SECTION 1. FEATURES AND SPECIFICATIONS

1.1 Description

DCS Series power supplies are 1000W supplies designed to provide highly stable, continuously variable output voltage and current for a broad range of development, system and burn-in applications. The series consists of nine models designated by the DCS prefix, followed by the output voltage and current ratings. For example, the model number DCS 60-18 indicates that the unit is rated at 0-60 Vdc and 0-18 Amps while a model DCS 20-50 is rated at 0-20 Vdc and 0-50 Amps. The DCS Series employs high frequency switching regulator technology to achieve high power density and small package size.

1.2 Operating Modes

The DCS Series supply has two basic operating modes: Constant Voltage and Constant Current. In constant voltage mode the output voltage is regulated at the selected value while the output current varies with the load requirements. In constant current mode the output current is regulated at the selected value while output the voltage varies with the load requirements.

An **automatic crossover** system enables the unit to switch operating modes in response to varying load requirements. If, for example, the unit is operating in voltage mode and the load current attempts to increase above the setting of the current control, the unit will switch automatically from voltage mode to current mode. If the load current is subsequently reduced below the setting of the current control the unit will return to voltage mode automatically.

1.3 Power Supply Features

- Nine models with voltage ranges from 0-8Vdc to 0-600Vdc and current outputs from 1.7A to 125A.
- 115/230Vac selectable input voltage, 47-63 Hz single phase.
- Simultaneous digital display of both voltage and current.
- Ten turn potentiometer voltage and current controls permit high resolution setting of the output voltage and current from zero to the rated output.
- Automatic mode crossover into current or voltage mode.
- Flexible output configuration: multiple units can be connected in parallel or series to provide increased current or voltage.
- High frequency switching technology allows high power density, providing increased power output in a small, light package.
- Remote sensing to compensate for losses in power leads up to 1V/lead (0.5V/lead for DCS 8-125 model).
- Adjustable Over-Voltage Protection (OVP)
- External TTL, AC or DC shutdown
- Remote voltage, current limit and OVP programming with selectable programming constants.

1.3 Power Supply Features (continued)

- External indicator signals for remote monitoring of OVP status, local/remote programming status, thermal shutdown, and output voltage and current.
- Optional IEEE-488 interface for complete remote programming and readback capability.

1.4 Specifications

1.4.1 Electrical Specifications¹

MODELS	8-125	20-50	33-33	40-25	60-18	80-13	150-7	300-3.5	600-1.7
Output Ratings:									
Output Voltage	0-8V	0-20V	0-33V	0-40V	0-60V	0-80V	0-150V	0-300V	0-600V
Output Current	0-125A	0-50A	0-33A	0-25A	0-18A	0-13A	0-7A	0-3.5A	0-1.7A
Output Power	1000W	1000W	1089W	1000W	1080W	1040W	1050W	1050W	1020W
Line Regulation²:									
Voltage	8mV	20mV	33mV	40mV	60mV	80mV	150mV	300mV	600mV
Current	125mA	50mA	33mA	25mA	18mA	13mA	7mA	3.5mA	1.7mA
Load Regulation³:									
Voltage	8mV	20mV	33mV	40mV	60mV	80mV	150mV	300mV	600mV
Current	125mA	50mA	33mA	25mA	18mA	13mA	7mA	3.5mA	1.7mA
Meter Accuracy:									
Voltage	0.09V	0.3V	0.43V	0.5V	0.7V	0.9V	1.6V	4.0V	7.0V
Current	1.35A	0.6A	0.43A	0.35A	0.28A	0.23A	0.08A	0.045A	0.018A
OVP Adjustment Range	0.4-8.8V	1.0-22V	1.65-36.3V	2-44V	3-66V	4-88V	7.5-165V	15-330V	30-660V
Output Noise and Ripple (V)									
rms	10mV	10mV	10mV	10mV	20mV	20mV	30mV	40mV	100mV
p-p (20Hz-20MHz)	100mV ⁴	100mV ⁴	100mV ⁴	100mV ⁴	100mV	100mV	200mV	200mV	500mV

¹ Specifications are warranted over a temperature range of 0-50°C with default local sensing. From 50-70°C, derate output 2% per°C.

² For input voltage variation over the AC input voltage range, with constant rated load

³ For 0-100% load variation, with constant nominal line voltage

⁴ Typical P-P noise and ripple is 50mV

AC Input: 200-250Vac at 10Arms or 100-130Vac at 20Arms, 47-63Hz

Maximum Voltage Differential from output to safety ground: 600Vdc

Additional Characteristics

MODELS	8-125	20-50	33-33	40-25	60-18	80-13	150-7	300-3.5	600-1.7
Stability¹:									
Voltage	4mV	10mV	16.5mV	20mV	30mV	40mV	75mV	150mV	300mV
Current	62.5mA	25mA	16.5mA	12.5mA	9mA	6.5mA	3.5mA	1.75mA	0.85mA
Temperature Coefficient²:									
Voltage	1.6mV	4mV	6.6mV	8mV	12mV	16mV	30mV	60mV	120mV
Current	37.5mA	15mA	9.9mA	7.5mA	5.4mA	3.9mA	2.1mA	1.05mA	0.51mA
Maximum Remote Sense Line Drop Compensation /line	0.5V	1V	1V	1V	1V	1V	1V	1V	1V

¹ Maximum drift over 8 hours with constant line, load, and temperature, after 90 minute warmup

² Change in output per °C change in ambient temperature, with constant line and load

Additional Characteristics (continued)**Storage Temperature Range:** -55 to +85°C**Humidity Range:** 0 to 80% Non-condensing**Time Delay from power on until output stable:** 2 seconds maximum**Voltage Mode Transient Response Time:** 1mS recovery to 1% band for 30% step load change from 70% to 100% or 100% to 70%**Remote Start/Stop and Interlock:** TTL compatible input, Contact Closure, 12-250Vac or 12-130Vdc**Switching Frequency:** Nominal 100kHz, 200kHz output ripple (>80V models = 80kHz, 160 kHz output ripple).**Analog Programming Linearity:** Typical error is less than 0.5% setting. Maximum error is 1% of rated output.**Agency Approvals:** CSA, UL**Remote Analog Programming (Full Scale Input)**

Scales are selectable via an internally-mounted switch.

PARAMETER	RESISTANCE	VOLTAGE	CURRENT
Voltage	5k Ω	5V, 10V	1mA
Current	5k Ω	0.1V, 5V, 10V	1mA
OVP	5k Ω	5V, 10V	1mA

1.4.2 Mechanical Specifications

Single Unit	HEIGHT	WIDTH	DEPTH	WEIGHT
	44mm (1.75in)	482.6mm (19in)	508mm (20in)	8.2kg (18lbs)

Output Connector

- **Models DCS 8-125 through DCS 80-13**

Connector type: Nickel plated copper bus bars.**Approximate dimensions:** 1.365" x 0.8" x 0.125"**Distance between positive and negative bus bar centers:** 2.2"**Load wiring mounting holes:** Two 0.257" diameter holes on 0.5" centers (1/4" hardware)
Two 0.191" diameter holes on 0.4" centers (#10 hardware)

- **Models DCS 150-7 through DCS 600-1.7**

Connector type: Six pin Amp Universal Mate-N-Lok connector**Chassis mounted parts:** Housing: Amp part number 1-480705-0

Pins: Amp part number 350547-1

Mating connector parts: Housing: Amp part number 1-480704-0

Socket pins: Amp part number 350550-1

Note: Eight Socket pins and one mating connector housing are supplied in a ziplock bag packaged with each 150V through 600V unit.