SECTION 1 INTRODUCING THE DCS-E SERIES 3KW SUPPLY

1.1 **DESCRIPTION**

The DCS-E Series System Supplies are 3000–watt supplies designed to provide highly stable, continuously variable output voltage and current for a broad range of development, system, and burn-in applications. The DCS-E Series employs high frequency switching regulator technology to achieve high power density and small package size.

The series consists of several models designated by the DCS prefix, followed by their output voltage and current ratings. For example, the model number DCS 60-50E indicates that the unit is rated at 0-60 Vdc and 0-50 Amps.

1.2 FEATURES

- Eight models with voltage ranges from 0-8 Vdc to 0-150 Vdc and current outputs from 20A to 350A.
- Input voltage 190-250 Vac, Three Phase, 47-63 Hz or 200-250 Vac, Single Phase, 47-63 Hz. (Output power limited to 2500W for single-phase input.)
- Simultaneous digital display of both DC output voltage and current.
- Ten-turn potentiometer voltage and current controls permit high resolution setting of the output voltage and current from zero to the model-rated output.
- Front panel push button control of Output Standby Mode, OVP reset, Remote/Local Programming Mode selection, and preview of voltage, current, or OVP setpoints.
- External indicator signals for Remote Monitoring of OVP Status, Local/Remote Programming Status, Thermal Shutdown, and Output Voltage and Current.
- Current or Voltage Mode operation with Automatic Mode Crossover to respond to varying load requirements.
- Flexible output configuration where multiple units can be connected in series or in parallel to provide increased voltage or increased current.
- Remote Sensing to compensate for losses in power leads up to 1V per lead.
- Adjustable Over Voltage Protection (OVP).

- External Shutdown using AC, DC, or TTL compatible signals (positive or negative logic).
- Remote Voltage, Current Limit, and OVP Programming with selectable programming ranges.
- Optional IEEE-488 (GPIB) interface for complete digital remote programming and readback capability.

1.3 SPECIFICATIONS

1.3.1 Electrical Specifications¹

Models	DCS 8-350E	DCS 12-250E	DCS 20-150E	DCS 40-75E	DCS 55-55E	DCS 60-50E	DCS 80-37E	DCS 150-20E
Output Ratings Output Voltage Output Current Output Power	0-8V 0-350A 2800W	0-12V 0-250A 3000W	0-20V 0-150A 3000W	0-40V 0-75A 3000W	0-55V 0-55A 3025W	0-60V 0-50A 3000W	0-80V 0-37A 2960W	0-150V 0-20A 3000W
Line Regulation ² Voltage Current	8 mV 350 mA	12 mV 250 mA	20 mV 150 mA	40 mV 75 mA	55 mV 55 mA	60 mV 50 mA	80 mV 37 mA	150 mV 20 mA
Load Regulation ³ Voltage Current	8 mV 350 mA	12 mV 250 mA	20 mV 150 mA	40 mV 75 mA	55 mV 55 mA	60 mV 50 mA	80 mV 37 mA	150 mV 20 mA
Meter Accuracy Voltage Current	0.09V 4.5A	0.13V 3.5A	0.2V 0.1.6A	0.5V 0.85A	0.65V 0.65A	0.7V 0.6A	0.9V 0.47A	1.6V 0.30A
OVP Adjustment Range	0.4-8.8V	0.6-13.2V	1-22V	2-44V	2.75-60.5V	3-66V	4-88V	7.5-165V
Output Noise and Ripple (V) Rms p-p (20 Hz - 20 MHz)	10 mV 100 mV	10 mV 100 mV	10 mV 100 mV	20 mV 100 mV	20 mV 100 mV	20 mV 100 mV	20 mV 100 mV	30 mV 200 mV
Analog Programming Linearity Voltage Current	80 mV 3500 mA	120 mV 2500 mA	200 mV 1500 mA	400 mV 750 mA	550 mV 550 mA	600 mV 500 mA	800 mV 370 mA	1.5V 200 mA

¹ Specifications are warranted over a temperature range of 0–50°C with default local sensing. From 50–70°C, derate 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.

AC Input: 200-250 Vac at 20 Arms Single Phase or 190-250 Vac at 14 Arms Three Phase (Output power limited to 2500W for single phase input)

Maximum Voltage Differential from output to safety ground: 150 Vdc

ADDITIONAL CHARACTERISTICS

Models	DCS8-350E	DCS12-250E	DCS20-150E	DCS40-75E	DCS55-55E	DCS60-50E	DCS80-37E	DCS150-20E
Stability ⁴								
Voltage	4 mV	6 mV	10 mV	20 mV	27.5 mV	30 mV	40 mV	75 mV
Current	175 mA	125 mA	75 mA	37.5 mA	27.5 mA	25 mA	18.5 mA	10 mA
Temperature Coefficient ⁵								
Voltage	1.6 mV/°C	2.4 mV/°C	4 mV/°C	8 mV/°C	11 mV/°C	12 mV/°C	16 mV/°C	30 mV/°C
Current	105 mA/°C	75 mA/°C	45 mA/°C	22.5 mA/°C	16.5 mA/°C	15 mA/°C	11.1 mA/°C	6.0 mA/°C
Maximum Remote Sense Line Drop Compensation	1V/line	1V/line	1V/line	1V/line	1V/line	1V/line	1V/line	1V/line

⁴ Maximum drift over 8 hours with constant line, load, and temperature, after 90-minute warmup.

⁵ Change in input per °C change in ambient temperature with constant and load.

Operating Ambient Temperature:

0 - 50°C No derating. From 50 - 70°C, derate output 2% per °C

Storage Temperature Range: -55 to +85°C

Humidity Range: 0 - 80 % Non-condensing

Time Delay from power on until output stable: 5 seconds maximum

Switching Frequency: Nominal 30 kHz (60 kHz output ripple)

Voltage Mode Transient Response Time:

1 mS 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 – 250 Vac or 12 – 130 Vdc

Remote Analog Programming (Full Scale Input)

Parameter	Resistance	Voltage	Current
Voltage	0 - 5k	0 - 5V, 0 - 10V	0 - 1 mA
Current	0 - 5k	0 - 5V, 0 - 10V	0 - 1 mA
OVP	—	0 - 5V, 0 - 10V	_

1.3.2 Mechanical Specifications

Size: 87.6 mm H x 482.6 mm W x 508 mm D (3.45 in H x 19 in W x 20 in D)

Weight: 16 kg (35 lbs) (approx.)

Output Connector:

Nickel-plated copper bus bars: 2.25" x 1.0" x 0.125" (2.25" x 1.0" x 0.25" for 8V & 12V models)

Bus bar load wiring mounting holes:

One 0.332" diameter hole; 1/4" hardware (5/16" hardware for 8V and 12V models) Two 0.190" diameter holes on 0.5" centers; #10 hardware

Input Connector:

Chassis-Mounted Part: Housing Tyco 641685-1; Contact pins Tyco 350821-1 Mating Connector Parts: Housing Tyco 643267-1; Contact pins Tyco 350821-1



Figure 1-1 DCS-E Series (3kW) Supply Front Panel Controls and Indicators



Figure 1-2 DCS-E Series (3kW) Supply Rear Panel Connectors and Terminals (including optional internal GPIB Interface)