Sorensen DCS Series

General Purpose Systems Power Supply

- High power density / low ripple and noise
- High programming resolution with Ethernet interface
- Constant voltage and current mode
- Remote sensing
- Isolated analog control and monitoring (optional)

1–3 kW

8–600 V

1.7–350 A

	~	115	230
	≋	208	230

GPIB LXI RS232

DCS Applications

The Sorensen DCS Series (hereafter DCS Series) is ideally suited for a wide range of applications requiring DC power in a small form factor. Applications range from manufacturing test and burn-in of automotive components, avionics electronics, telecommunications and consumer products to beam steering, process control and laboratory R&D use.

The DCS Series is comprised of 1kW, 1.2kW and 3kW programmable power supplies utilizing switchmode technology to achieve high power density in a low profile chassis. The design platform provides a highly reliable power supply for years of constant use. The unique design is available in a variety of maximum voltages from 8V to 600V and maximum currents from 1.7A to 350A with low ripple and noise.

This user-friendly platform can be controlled from the front panel with 10-turn potentiometers to adjust voltage, current and OVP settings. LEDs indicate over temperature, remote programming, shutdown and overvoltage protection

Remote control options allow full computer control through IEEE-488 (option M9C), LXI Standard Compliant* Ethernet LAN (option M130) or RS-232 (options M9C, M130)

Automotive Component Test

The 16-bit resolution of the Ethernet programming and hardware triggering allows for detailed sequencing associated with battery fluctuation simulation. The tight load regulation capability of the DCS series makes it a superior source for validation and acceptance testing and burn-in of automotive components. The 20V models, in particular, provide a full range of testing to simulate battery conditions. Margin testing of 12V and 14V nominal components, such as electronic control units (ECU) and electromechanical components, is easily achieved.

Rackmount ATE Systems

The high power density of the DCS series makes it ideal for ATE System integration. The wide variety of voltage and current combinations in 1U and 2U heights allows multiple voltage outputs in a small amount of space. The wide variety of control methods possible, allows easy integration into legacy systems as well as high speed systems.

Battery Charging

Battery charging requires high accuracy voltage and stable current output for fast bulk and absorption phase charging and high accuracy and stable voltage for float charging to avoid "gassing" the battery. The DCS series provides a high accuracy voltage output to optimize battery charging. With the remote interface options, the charging process can easily be automated for volume production.)

AMETEK
Programmable Power
9250 Brown Deer Road
San Diego, CA 92121-2267
USA

AMETEK® PROGRAMMABLE POWER

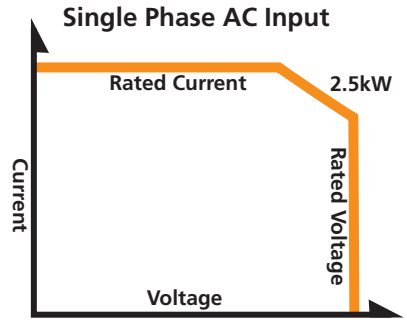
DCS Series : Product Specifications

Common			
Meter Accuracy	1% of full scale + 1 count		
Max. Voltage Differential from Output to Safety Ground	150 VDC		
Remote Start/Stop and Interlock	TTL compatible input or 12-250 VAC (12-130 VDC) or a contact closure		
Cooling	Internal fan, over temperature shutdown if internal heat sink exceeds set temperature		
Remote Sense	The maximum allowed sense line drop is 4V per line (2V on the DCS 8/10V 1 kW/1.2 kW models and 1V/line for all 3 kW models). Line drop subtracts from the maximum available output voltage at full rated power.		
Remote Programming	Enabled via external jumper on 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)		
Remote Analog Programming Linearity	Typical error is less an 0.5% setting.		
Accuracy	Accuracy is 1% of rated output.		
Regulatory	Certified to UL/CSA 61010 and IEC/EN 61010-1 CE. Compliant (LVD and EMC directive)		
Input	**1 kW**	**1.2 kW**	**3 kW**
Voltage Ranges	200-250 VAC / 100-132 VAC	200-250 VAC / 100-132 VAC	190-250 VAC / 200-250 VAC
Phases	Single Phase	Single Phase	Three Phase / Single Phase * (See Below)
Current	8A typical, 47-63 Hz 15A typical, 47-63 Hz	9A typical, 47-63 Hz 18A typical, 47-63 Hz	190-250 VAC, three phase, 14A, 47-63Hz. * (See Below) User configurable for: 200-250VAC, single-phase operation, 20A, 47- 63Hz.
			* See the modified operation curve below.
Output			
Stability	±0.05% of maximum voltage or current over 8 hours after 30 minute warm-up time at fixed line, load and temperature		
Line Regulation	For input voltage variation over the AC input voltage range, with constant rated load.		
Load Regulation	For 0-100% load variation, with constant nominal line voltage.		
Voltage Resolution	0.02%		
Transient Response	Typically recovers in 500 µs (1 & 1.2 kW) or 1ms (3k W) to 1% of steady-state output voltage (within 1% of Vmax) for 70-100% or 100-70% load change.		

Output : Voltage and Current

1 kW Model	Voltage	Current	1.2 kW Model	Voltage	Current	3 kW Model	Voltage	Current
DCS 8-125E	0-8	0-125	DCS 8-140E	0-8	0-140	DCS 8-350E	0-8	0-350
DCS 10-100E	0-10	0-100	DCS 10-120E	0-10	0-120	DCS 12-250E	0-12	0-250
DCS 20-50E	0-20	0-50	DCS 20-60E	0-20	0-60	DCS 20-150E	0-20	0-150
DCS 33-33E	0-33	0-33	DCS 33-36E	0-33	0-36	DCS 40-75E	0-40	0-75
DCS 40-25E	0-40	0-25	DCS 40-30E	0-40	0-30	DCS 55-55E	0-55	0-55
DCS 50-20E	0-50	0-20	DCS 50-24E	0-50	0-24	DCS 60-50E	0-60	0-50
DCS 60-18E	0-60	0-18	DCS 60-20E	0-60	0-20	DCS 80-37E	0-80	0-37
DCS 80-13E	0-80	0-13	DCS 80-15E	0-80	0-15	DCS 150-20E	0-150	0-20
DCS 100-10E	0-100	0-10	DCS 100-12E	0-100	0-12			
DCS 150-7E	0-150	0-7	DCS 150-8E	0-150	0-8			
DCS 300-3.5E	0-300	0-3.5	DCS 300-4E	0-300	0-4			
DCS 600-1.7E	0-600	0-1.7						

Modified Operation Curve for DCS Series 3 kW



Environmental			
Operating Temperature	0°C to 50°C (no derating)		
Storage Temperature	-55°C to 85°C		
Humidity (Non-condensing)	0 to 85% RH		
Physical	**1kW**	**1.2kW**	**3kW**
Dimensions	Width: 19″ (483 mm) Height: 1.72″ (43 mm) - 1U Depth: 17.52″ (445 mm)	Width: 19″ (483 mm) Height: 1.72″ (43 mm) - 1U Depth: 17.52″ (445 mm)	Width: 19″ (483 mm) Height: 3.46″ (87 mm) - 2U Depth: 17.52″ (445 mm)
Weight	19 lbs. (8.6 kg)	19 lbs. (8.6 kg)	33 lbs. (15 kg)
Shipping Weight	24 lbs. (10.9 kg)	24 lbs. (10.9 kg)	42 lbs. (19 kg)

Model	Programming Accuracy M130 / M131 / M9C / M85 Options			Readback Accuracy	
	Voltage 0.1%+	Current 0.1%+	OVP 0.5%+	Voltage 0.1%+	Current 0.1%+
DCS Series 1 kW					
DCS 8-125E	8mV	500mA	44mV	12mV	500mA
DCS 10-100E	10mV	400mA	55mV	15mV	400mA
DCS 20-50E	20mV	200mA	110mV	30mV	200mA
DCS 33-33E	33mV	132mA	182mV	50mV	132mA
DCS 40-25E	40mV	100mA	220mV	60mV	100mA
DCS 50-20E	50mV	80mA	275mV	75mV	80mA
DCS 60-18E	60mV	72mA	330mV	90mV	72mA
DCS 80-13E	80mV	52mA	440mV	120mV	52mA
DCS 100-10E	100mV	40mA	550mV	150mV	40mA
DCS 150-7E	150mV	28mA	825mV	225mV	28mA
DCS 300-3.5E	300mV	14mA	1650mV	450mV	14mA
DCS 600-1.7E	600mV	6.8mA	3300mV	900mV	7mA
DCS Series 1.2 kW					
DCS 8-140E	8mV	560mA	44mV	12mV	560mA
DCS 10-120E	10mV	480mA	55mV	15mV	480mA
DCS 20-60E	20mV	240mA	110mV	30mV	240mA
DCS 33-36E	33mV	144mA	182mV	50mV	144mA
DCS 40-30E	40mV	120mA	220mV	60mV	120mA
DCS 50-24E	50mV	96mA	275mV	75mV	96mA
DCS 60-20E	60mV	80mA	330mV	90mV	80mA
DCS 80-15E	80mV	60mA	440mV	120mV	60mA
DCS 100-12E	100mV	48mA	550mV	150mV	48mA
DCS 150-8E	150mV	32mA	825mV	225mV	32mA
DCS 300-4E	300mV	16mA	1650mV	450mV	16mA
DCS Series 3 kW					
DCS 8-350E	8mV	1400mA	44mV	12mV	1400mA
DCS 12-250E	12mV	1000mA	66mV	18mV	1000mA
DCS 20-150E	20mV	600mA	110mV	30mV	600mA
DCS 40-75E	40mV	300mA	220mV	60mV	300mA
DCS 55-55E	55mV	220mA	303mV	83mV	220mA
DCS 60-50E	60mV	200mA	330mV	90mV	200mA
DCS 80-37E	80mV	148mA	440mV	120mV	148mA
DCS 150-20E	150mV	80mA	825mV	225mV	80mA

DCS Series : Product Specifications

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) mV	Noise** (p-p) mV	Transient Response Time µs (Typ)			Ohms / V	V / V
DCS Series 1 kW										
DCS 8-125E	0-8	0-125	0.2	4	60	500	0.02	0.05	625	0-10V = 0-100% V_o or 0-5V = 0-100% V_o
DCS 10-100E	0-10	0-100	0.2	4	60	500	0.02	0.05	500	
DCS 20-50E	0-20	0-50	0.2	4	60	500	0.02	0.05	250	
DCS 33-33E	0-33	0-33	0.2	4	60	500	0.02	0.05	151.5	
DCS 40-25E	0-40	0-25	0.2	4	60	500	0.02	0.05	125	
DCS 50-20E	0-50	0-20	0.2	4	60	500	0.02	0.05	100	
DCS 60-18E	0-60	0-18	0.2	4	60	500	0.02	0.05	83	
DCS 80-13E	0-80	0-13	0.2	4	60	500	0.02	0.05	62.5	
DCS 100-10E	0-100	0-10	0.2	6	60	500	0.02	0.05	50	
DCS 150-7E	0-150	0-7	0.2	12	160	500	0.02	0.05	33.3	
DCS 300-3.5E	0-300	0-3.5	0.2	20	200	500	0.02	0.05	16.67	
DCS 600-1.7E	0-600	0-1.7	0.2	50	300	500	0.02	0.05	8.33	
DCS Series 1.2 kW										
DCS 8-140E	0-8	0-140	0.2	5	60	500	0.02	0.05	625	0-10V = 0-100% V_o or 0-5V = 0-100% V_o
DCS 10-120E	0-10	0-120	0.2	5	60	500	0.02	0.05	500	
DCS 20-60E	0-20	0-60	0.2	5	60	500	0.02	0.05	250	
DCS 33-36E	0-33	0-36	0.2	5	60	500	0.02	0.05	151.5	
DCS 40-30E	0-40	0-30	0.2	5	60	500	0.02	0.05	125	
DCS 50-24E	0-50	0-24	0.2	5	60	500	0.02	0.05	100	
DCS 60-20E	0-60	0-20	0.2	5	60	500	0.02	0.05	83	
DCS 80-15E	0-80	0-15	0.2	5	60	500	0.02	0.05	62.5	
DCS 100-12E	0-100	0-12	0.2	10	60	500	0.02	0.05	50	
DCS 150-8E	0-150	0-8	0.2	15	160	500	0.02	0.05	33.3	
DCS 300-4E	0-300	0-4	0.2	25	200	500	0.02	0.05	16.67	
DCS Series 3 kW										
DCS 8-350E	0-8	0-350	0.2	15	100	1000	0.02	0.05	625	0-10V = 0-100% V_o or 0-5V = 0-100% V_o
DCS 12-250E	0-12	0-250	0.2	10	100	1000	0.02	0.05	416.7	
DCS 20-150E	0-20	0-150	0.2	10	100	1000	0.02	0.05	250	
DCS 40-75E	0-40	0-75	0.2	20	100	1000	0.02	0.05	125	
DCS 55-55E	0-55	0-55	0.2	20	100	1000	0.02	0.05	90.9	
DCS 60-50E	0-60	0-50	0.2	20	100	1000	0.02	0.05	83	
DCS 80-37E	0-80	0-37	0.2	20	100	1000	0.02	0.05	62.5	
DCS 150-20E	0-150	0-20	0.2	30	200	1000	0.02	0.05	33.3	

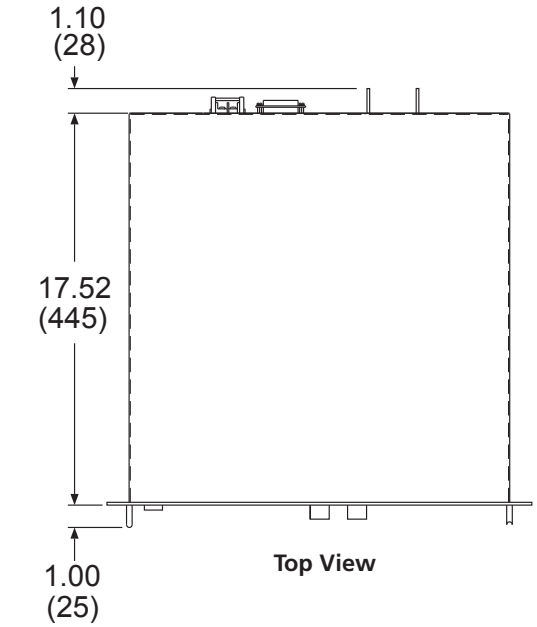
* Typical resolution is 0.02% ** Typical P-P noise and ripple (20Hz to 300kHz)

Model	Constant Current Mode*		Temperature Coefficient %/°C (Typ.)	Current Drift %I out Max. (Typ.)	Programming Constants, Current Mode		Efficiency % (Typ.)
	Regulation Line and Load% Combined	Ripple (rms)** mA			Ohms/A	V/A	
DCS Series 1 kW							
DCS 8-125E	0.2	160	0.03	0.05	40	0-10V = 0-100% I_o or 0-5V = 0-100% I_o	82
DCS 10-100E	0.2	128	0.03	0.05	50		82
DCS 20-50E	0.2	25	0.03	0.05	100		82
DCS 33-33E	0.2	10	0.03	0.05	151.5		84
DCS 40-25E	0.2	7	0.03	0.05	200		84
DCS 50-20E	0.2	7	0.03	0.05	250		84
DCS 60-18E	0.2	6	0.03	0.05	277.8		86
DCS 80-13E	0.2	4	0.03	0.05	384.6		86
DCS 100-10E	0.2	3	0.03	0.05	500		86
DCS 150-7E	0.2	2	0.03	0.05	714.3		86
DCS 300-3.5E	0.2	1	0.03	0.05	1428.6		86
DCS 600-1.7E	0.2	1	0.03	0.05	2941.2		86
DCS Series 1.2 kW							
DCS 8-140E	0.2	180	0.03	0.05	35.7	0-10V = 0-100% I_o or 0-5V = 0-100% I_o	82
DCS 10-120E	0.2	153	0.03	0.05	41.7		82
DCS 20-60E	0.2	30	0.03	0.05	83.3		82
DCS 33-36E	0.2	11	0.03	0.05	138.9		84
DCS 40-30E	0.2	9	0.03	0.05	166.7		84
DCS 50-24E	0.2	8.5	0.03	0.05	208.3		84
DCS 60-20E	0.2	6.6	0.03	0.05	250.0		85
DCS 80-15E	0.2	6	0.03	0.05	333.3		85
DCS 100-12E	0.2	3.6	0.03	0.05	416.7		85
DCS 150-8E	0.2	2.3	0.03	0.05	625.0		85
DCS 300-4E	0.2	1.2	0.03	0.05	1250.0		85
DCS Series 3 kW							
DCS 8-350E	0.2		0.03	0.05		0-10V = 0-100% I_o or 0-5V = 0-100% I_o	82
DCS 12-250E	0.2		0.03	0.05			82
DCS 20-150E	0.2		0.03	0.05			82
DCS 40-75E	0.2		0.03	0.05			86
DCS 55-55E	0.2		0.03	0.05			82
DCS 60-50E	0.2		0.03	0.05			86
DCS 80-37E	0.2		0.03	0.05			86
DCS 150-20E	0.2		0.03	0.05			86

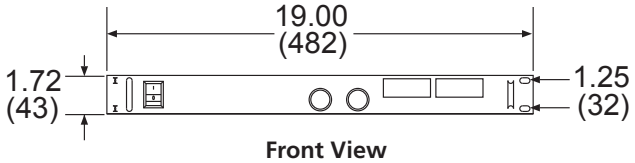
* Typical resolution is 0.02% ** rms ripple typical from 20 Hz to 300 kHz

DCS Series : Diagram

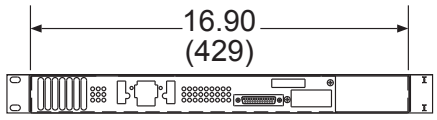
1 kW and 1.2 kW



Top View

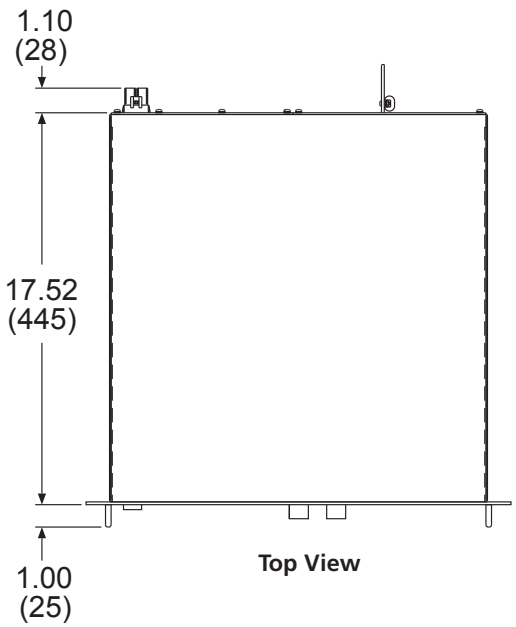


Front View

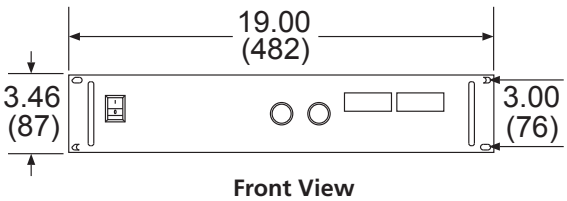


Rear View

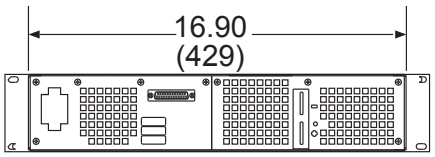
3 kW



Top View



Front View

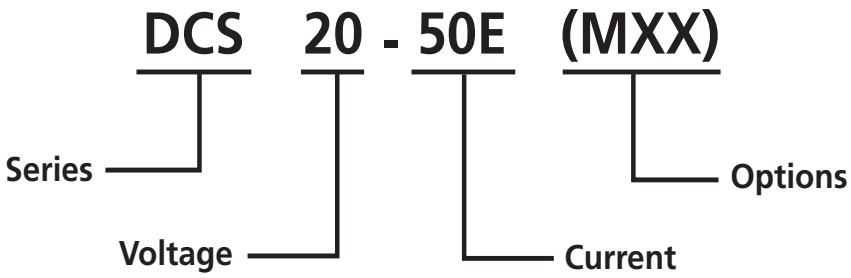


Rear View

Dimensions in inches (millimeters)

J3 Connector			
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 (8-100V Models Only)
13	POS Sense (8-100V Models Only)		

Model Number Description



Options and Accessories	
M1	Factory configured for 115 VAC input (1 kW and 1.2 kW units only)
M9C	Internal IEEE-488/RS-232 Interface (can only support 12-bit slaves)
M13	Locking shafts (front panel potentiometers)
M32	Master/slave paralleling cable configured for two units
M33	Replace input connector with terminal block (3 kW only)
M51A	Isolated analog programming control of V/I/OVP and isolated V/I monitor outputs up to 500V relative to the supply's return line. 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	12-bit slave interface option for use with M9 or M130 master (3 ft. control cable included)
M102	Front panel binding posts for 1 kW or 1.2 kW, Models ≤30A, ≤100V. Not compatible with M9C, M85, M130, M131, M133, M135, M136
M130	LXI™compliant 10/100 Base T Ethernet remote control master interface; includes web server for direct control of power supply via web browser (MS Internet Explorer 6.0 or later)
M131	16-bit slave interface option for use with a M130 master (3 ft. control cable included)
M133	Output disconnect and polarity reversal relays controlled via SCPI commands. Limited to 1kW or 1.2 kW, ≤100V, ≤60A
M135	M130 & M133 combination. Limited to 1kW or 1.2 kW, ≤100V, ≤60A
M136	M131 & M133 combination. Limited to 1kW or 1.2 kW, ≤100V, ≤60A
105-300-26	Rack slide kit (3 kW only)

Software
IVI-Com and Labview drivers available for free download at http://www.elgar.com/products/DCS/DCS_Downloads.htm

Notes