

# Sorensen DHP Series

5–20 kW

## DC High Power Programmable Supplies

5–50 V

- **Modular Design** : The series has a unique modular design that results in two rackmount profiles according to output power
- **External Shutdown** : An external shut down to inhibit the output
- **Sequencing** : Power and auto-step sequence settings
- **Protection** : Overvoltage, over-temperature, surge limit, soft start, brown out and short circuit protection current limit fold back.



133–3000 A



208

400

480

 GPIB RS232

The Sorensen DHP Series provides models ranging in output power from 5 kW to 20 kW in a single chassis. Programmable output voltages range from 5V to 50 VDC, delivering up to 3,000 amperes. This family has two operational modes, constant-voltage and constant-current.

The DHP Series uses control technology permits up to nine (9) steps per sequence with a maximum sequence duration of up to 27.75 hours.

This family has standard analog and a variety of combinations of IEEE-488.2, RS-232 and/or isolated analog input control interface options.

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# DHP Series : Product Specifications

| Common                              |  |  |
|-------------------------------------|--|--|
| Front Panel Controls                | Keypad to select/adjust voltage, current and power with non-volatile memories to store commonly used parameters  |  |
| Remote Control/Monitor (Rear Panel) | On/off control via contact closure, 6-120 VDC, 12-240 VAC, TTL or CMOS switch, output voltage and current monitor, (0-10 volt) OVP limit set, summary fault status         |  |
| Remote Sense                        | The maximum line drop is 3% per line or 1V for 5-15V units, 3V for all others. Line drop subtracts from the maximum available output voltage at full rated power.          |  |
| Internal Programming                | 9 memories are on-board for auto-step programming. Each step can be 1 second to 99,999 seconds or 27.78 hours long   |  |
| Protection                          | Over temperature, brown out, turn on surge limit, slow start, overvoltage (OVP resettable without recycling power)   |  |
| Displays and Indicators             | Back lit LCD alphanumeric display and LEDs   |  |
| Regulatory                          | CE mark (LVD and EMC directive), Certified to UL/cUL 61010 (Up to 10kW output), EMC is to IEC 61326-1  |  |
| Input                               |  |  |
| Voltage Ranges                      | 190-253 VAC, 47-63 Hz (Standard)<br>360-440 VAC, 47-63 Hz (Option)<br>432-528 VAC, 47-63 Hz (Option)   |  |
| Phases                              | Three phase, 3-wire plus ground, Delta or Wye input may be used (Wye does not require the neutral connection)  |  |
| Power Factor                        | 0.72 min.  |  |
| Output                              |  |  |
| Stability                           | ±0.05% maximum rating per 8 hours after a 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.<br>Voltage: 0.1% of maximum rated output.<br>Current: 0.5% of maximum rated output. |  |
| Load Regulation                     | For 0-100% load variation, with constant nominal line voltage.<br>Voltage: 0.1% of maximum rated output.<br>Current: 0.5% of maximum rated output.                         |  |
| Transient Response                  | 2 ms to steady state output voltage (within 2% of Vmax) for 30% step load change   |  |
| Efficiency                          | 80% minimum at full load   |  |
| Temperature Coefficient             | 0.02%/°C of rated output voltage; 0.03%/°C of rated output current. Change in output per °C change in ambient temperature, with constant line and load.                    |  |
| Environmental                       |  |  |
| Operating Temperature               | 0°C to 50°C (no derating)  |  |
| Storage Temperature                 | -20°C to 70°C  |  |
| Physical                            |  |  |
|                                     | Case 1   | Case 2   |
| Dimensions                          | Width: 19" (482 mm)<br>Height: 5.25" (133 mm) - 3U<br>Depth: 22" (558 mm)  | Width: 19" (482 mm)<br>Height: 10.5" (43 mm) - 6U<br>Depth: 22" (558 mm) |
| Weight                              | 80 lbs. ( 55 kg )  | 160 lbs. ( 73 kg )   |
| Shipping Weight                     | 120 lbs. ( 73 kg )   | 200 lbs. ( 91 kg )   |
| Remote Digital Control              |  |  |
| Programming Resolution              | Voltage: 0.3% of full scale;<br>Current: 0.3% of full scale;<br>Overvoltage Protection: 0.5% of full scale (full scale is 110% of maximum output voltage)                  |  |
| Programming Accuracy                | Voltage: 0.1% + 0.3% of maximum output voltage<br>Current: 0.3% + 0.3% of maximum output current*<br>Overvoltage Protection: 0.5% + 0.5% of maximum output voltage         |  |
| Readback Accuracy                   | Voltage: 0.1% + 0.3% of full scale output voltage;<br>Current: 0.3% + 0.3% of full scale output current*   |  |
| Soft Calibration                    | Calibration via front panel without removing chassis covers  |  |
| Software                            | LabVIEW® driver for M9D, programs can be downloaded at no cost at : <a href="http://www.programmablepower.com">www.programmablepower.com</a>                               |  |

\* After 30 minutes operation with fixed line, load and temperature

# DHP Series : Product Specifications

5–20 kW

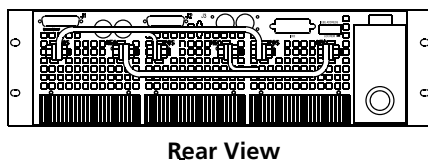
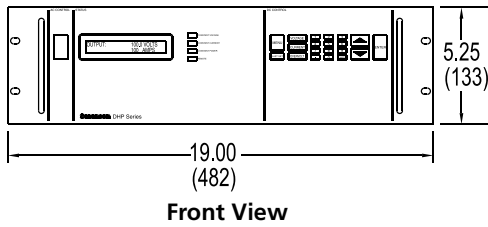
| Output : Voltage and Amps |           |        |                      |      |                 |           |        |                      |      |
|---------------------------|-----------|--------|----------------------|------|-----------------|-----------|--------|----------------------|------|
| 5 kW to 15 kW*            | Output DC |        | Ripple (rms) Typical | Case | 16 kW to 20 kW* | Output DC |        | Ripple (rms) Typical | Case |
|                           | Voltage   | Amps   |                      |      |                 | Voltage   | Amps   |                      |      |
| DHP 5-1000                | 0-5       | 0-1000 | 10 mV                | I    | DHP 8-2000      | 0-8       | 0-2000 | 25 mV                | II   |
| DHP 5-1500                | 0-5       | 0-1500 | 10 mV                | I    | DHP 8-2400      | 0-8       | 0-2400 | 25 mV                | II   |
| DHP 5-2000                | 0-5       | 0-2000 | 15 mV                | II   | DHP 10-1650     | 0-10      | 0-1650 | 25 mV                | II   |
| DHP 5-2500                | 0-5       | 0-2500 | 15 mV                | II   | DHP 10-2000     | 0-10      | 0-2000 | 25 mV                | II   |
| DHP 5-3000                | 0-5       | 0-3000 | 15 mV                | II   | DHP 12.5-1325   | 0-12.5    | 0-1325 | 25 mV                | II   |
| DHP 8-800                 | 0-8       | 0-800  | 10 mV                | I    | DHP 12.5-1600   | 0-12.5    | 0-1600 | 25 mV                | II   |
| DHP 8-1200                | 0-8       | 0-1200 | 10 mV                | I    | DHP 15-1100     | 0-15      | 0-1100 | 25 mV                | II   |
| DHP 8-1600                | 0-8       | 0-1600 | 15 mV                | II   | DHP 15-1320     | 0-15      | 0-1320 | 25 mV                | II   |
| DHP 10-660                | 0-10      | 0-660  | 10 mV                | I    | DHP 20-830      | 0-20      | 0-830  | 25 mV                | II   |
| DHP 10-1000               | 0-10      | 0-1000 | 10 mV                | I    | DHP 20-1000     | 0-20      | 0-1000 | 25 mV                | II   |
| DHP 10-1300               | 0-10      | 0-1300 | 15 mV                | II   | DHP 25-650      | 0-25      | 0-650  | 25 mV                | II   |
| DHP 12.5-530              | 0-12.5    | 0-530  | 10 mV                | I    | DHP 25-800      | 0-25      | 0-800  | 25 mV                | II   |
| DHP 12.5-800              | 0-12.5    | 0-800  | 10 mV                | I    | DHP 30-550      | 0-30      | 0-550  | 25 mV                | II   |
| DHP 12.5-1060             | 0-12.5    | 0-1060 | 15 mV                | II   | DHP 30-660      | 0-30      | 0-660  | 25 mV                | II   |
| DHP 15-440                | 0-15      | 0-440  | 10 mV                | I    | DHP 50-330      | 0-50      | 0-330  | 25 mV                | II   |
| DHP 15-660                | 0-15      | 0-660  | 10 mV                | I    | DHP 50-400      | 0-50      | 0-400  | 25 mV                | II   |
| DHP 15-880                | 0-15      | 0-880  | 15 mV                | II   |                 |           |        |                      |      |
| DHP 20-330                | 0-20      | 0-330  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 20-500                | 0-20      | 0-500  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 20-665                | 0-20      | 0-665  | 15 mV                | II   |                 |           |        |                      |      |
| DHP 25-265                | 0-25      | 0-265  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 25-400                | 0-25      | 0-400  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 25-520                | 0-25      | 0-520  | 15 mV                | II   |                 |           |        |                      |      |
| DHP 30-220                | 0-30      | 0-220  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 30-330                | 0-30      | 0-330  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 30-440                | 0-30      | 0-440  | 15 mV                | II   |                 |           |        |                      |      |
| DHP 50-133                | 0-50      | 0-133  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 50-200                | 0-50      | 0-200  | 10 mV                | I    |                 |           |        |                      |      |
| DHP 50-265                | 0-50      | 0-265  | 15 mV                | II   |                 |           |        |                      |      |

\*Note: For high power 40V models and models above 50V see SG Series. Specifications subject to change.

| J3 Connector |                                     |    |                                      |
|--------------|-------------------------------------|----|--------------------------------------|
| 1            | Remote Output Enable                | 14 | TTL/CMOS On/Off Control              |
| 2            | Remote Return for Pins 1 and 14     | 15 | Remote Voltage Programming Input     |
| 3            | Remote OVP Programming Input        | 16 | Remote Current Programming Input     |
| 4            | Voltage Return for Pins 9, 15 or 21 | 17 | Fault State                          |
| 5            | Remote On/Off                       | 18 | Shutdown Fault                       |
| 6            | Circuit Common                      | 19 | Output Voltage Monitor               |
| 7            | Current Monitor Output              | 20 | Voltage Return for Pins 9, 15 or 21  |
| 8            | Local Voltage Control Monitor       | 21 | Voltage Control Resistance           |
| 9            | Remote Voltage Programming Input    | 22 | Current Control Resistance           |
| 10           | Remote Current Programming Input    | 23 | Current Return for Pins 10, 16 or 22 |
| 11           | Local Current Control Monitor       | 24 | Circuit Common                       |
| 12           | Remote Sense –                      | 25 | Current Return for Pins 10, 16 or 22 |
| 13           | Remote Sense +                      |    |                                      |

# DHP Series : Diagram

## Case I



## Case II



Dimensions in inches (millimeters)

## Model Number Description



## Options and Accessories

|     |  |
|-----|--|
| M1  | 360-440 VAC, 47-63 Hz, three phase, 3-wire plus ground, Delta or Wye may be used   |
| M2  | 432-528 VAC, 47-63 Hz, three phase, 3-wire plus ground, Delta or Wye may be used   |
| M8  | Internal RS-232 remote serial interface  |
| M9D | Internal IEEE-488.2 interface  |
| M10 | Both IEEE-488.2 and RS-232   |
| M11 | RS-232 and isolated analog programming   |
| M12 | IEEE-488.2 and isolated analog programming   |
| M14 | IEEE-488.2, RS-232 and isolated analog programming   |
| M51 | Isolated analog programming Input Voltage Options. 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. |

## Software

LabVIEW® driver for M9D, programs can be downloaded at no cost at : [http://www.elgar.com/products/DHP/DHP\\_Downloads.htm](http://www.elgar.com/products/DHP/DHP_Downloads.htm)

