

# Advanced Test Equipment Rentals - www.atecorp.com 800-404-ATEC (2832)

## **Sorensen ASD Series**

10-320 kW

### **Programmable Precision High Power DC Power Supply**

40-60 Vdc

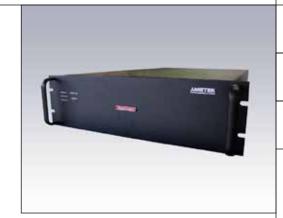
- Highest Power Density: 30kW in 3U
- Water-Cooled
- Full Digital Control Loops
  - Stable operation over wide range of complex load impedances
- Advanced Digital Features
  - "Flight data" recorder-like function
  - Oscilloscope function
  - Output impedance measurement
  - Advanced fault detection
  - PLC feature: close loop on external variable such as temperature

**The ASD** with DaVinci Power™ technology represents the next generation of precision programmable AC-DC power conversion.

The ASD with its 3U, 30kW water-cooled packaging provides the highest power density available. The ASD is designed for industry leading load transient response with outstanding output ripple and noise. The water-cooling packaging allows for use in environments that normally exclude air-cooled power supplies.

The ASD advanced digital architecture, with realtime digital control and Graphical User Interface (GUI), enables many features to better control and monitor your process or application. The optional advanced features package includes a built-in oscilloscope function for measurement and display of: power, voltage, current, output impedance, output cable impedance and output cable voltage drop. The ASD allows you to program different "fault levels", enabling detection of output cabling, connections or load problems before they cause critical system problems. The ASD can replace your PLC device by closing the loop on an external parameter such as temperature. The ASD's Advanced Diagnostics And Maintenance (ADAMsm) feature includes a flight data recorder feature that lets you access multiple recorded parameters, such as: voltage, current, power, load impedance, faults and input voltage. This allows you to easily determine "why" you had an unexpected outcome.

The advanced digital monitoring and control features combined with industry leading power density and reliability makes the Sorensen ASD the supply of choice for stringent and high value processes and applications.



#### Advanced features include:

- Precise programming of voltage and current slew rate for sensitive loads.
- Modules within one chassis can be connected to different loads and controlled independently.
- Industrial field bus interface (Modbus-TCP, Modbus-RTU, Ethernet/IP (Industrial Protocol)) enable real-time digital control.
- Built-in energy meter calculates the delivered energy throughout a process or period of time.
- Optional real time clock enables accurate timestamping of events.
- Built in power quality monitoring detects and saves input voltage anomalies which can be saved for later diagnostic analysis.
- Programmable analog interface scaling facilitates incorporating the ASD to existing systems with minimal effort.
- Load impedance measurement, including rate-of-change calculations, enable load "state of health" monitoring and implementation of system preventive maintenance algorithms
- Programmable filter bandwidth of the output voltage, current and power monitors let the user accommodate their response speed to particular needs.
- Full featured GUI (Graphical User Interface) helps to test and debug the system by communicating with the power supply in real time

## 167-8000 Adc

**8** 380 400 480

(Modbus-TCP or Ethernet/IP) R\$485 (Modbus-RTU)

**EtherCAT** 

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



858.458.0223 sales.ppd@ametek.com 10102012 1

# **ASD Series : Product Specifications**

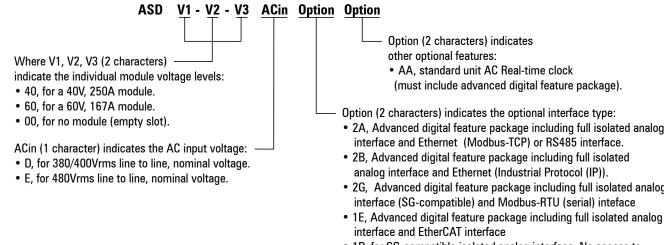
Input	Type: 3-phase, 3-wire	e plus ground, n	eutral not required. N	ot phase rota	tion sensitive			
Voltage Ranges		342VAC to 440VAC (model D). Nominal rating is 380/400VAC. 432VAC to 528VAC (model E). Nominal rating is 480VAC						
Frequency	Rated 47 through 63 Hz							
Efficiency	>91% (typical), nominal I	>91% (typical), nominal line, full load.						
Max Current, per phase, low line		400/380Vac 480Vac						
	10kW unit (1 module)	10kW unit (1 module)		21Arms		17Arms		
	20kW unit (2 modules)	20kW unit (2 modules)		42Arms		33Arms		
	30kW unit (3 modules)	30kW unit (3 modules)		63Arms		50Arms		
Current Inrush	200A Typical	200A Typical						
Power Factor	>0.9 @ Full Load and at r	>0.9 @ Full Load and at nominal line						
Brownout Provisions	Designed to meet SEMI F4	Designed to meet SEMI F47-0706, S3, S8, S14 at nominal input voltages						
Output								
Voltage Output	10kW	20kW	30kW	Nois	se (pk-pk)***	Noise (RMS)***		
40Vdc	250A	500A	750A		150mV	40mV		
60Vdc	167A	334A	501A		150mV	40mV		
(**) RMS noise is measured direct	s, with 1uF in parallel and 6ft of low ly across the output terminal with s tage models. Other variations may	upply operating at t	full load and nominal input		ominal input line vo	oltage.		
Sense	To compensate load cable	To compensate load cables voltage drop, units can generate 2% additional voltage at full scale of output voltage.						
Output								
Load Regulation (Specified at No I	oad to Full load change, nominal AC	input)						
Voltage	0.1% of maximum output	0.1% of maximum output voltage/ current						
Current	0.1% of maximum output	0.1% of maximum output voltage/ current						
Line Regulation (Specified at ±10%	% of nominal AC input, constant loa	d)						
Voltage	0.05% of maximum output voltage/ current							
Current	0.05% of maximum outpo	0.05% of maximum output voltage/ current						
Transient Response	A 50% step load will reco	A 50% step load will recover to within 0.75% of original value within 1mSec						
Stability	±0.05% of set point after	±0.05% of set point after 8 hrs. at fixed line, load and temperature. After 30min warm-up.						
Analog Remote Programming								
Voltage Accuracy	0.5% of full scale	0.5% of full scale						
Current Accuracy	1% of full scale							
Power Accuracy	1.5% of full scale	1.5% of full scale						
Voltage Monitoring	0.5% of full scale	0.5% of full scale						
Current Monitoring	1% of full scale							
D 14 1/2 1	1.5% of full scale							
Power Monitoring			0-10Vdc, 4-20mA					
	0-10Vdc, 4-20mA							
Programming range	0-10Vdc, 4-20mA							
Programming range  Output	·	with the float limit	of output terminals must b	e within ±150V o	f chassis potential			
Programming range  Output  Output Float	Units maybe put in series  Multiple units can be para power systems have the s	alleled to form high same transient resp	of output terminals must b ner power systems. Chassis onse as a 30kW system. Co NT 5 cable (STP) and approp	control loops are	tied together so the are only required to	o be sent to "master"		
Programming range  Output  Output Float  Parallel	Units maybe put in series  Multiple units can be para power systems have the s supply. Parallel supplies re	alleled to form high same transient respre equire a shielded CA	ner power systems. Chassis onse as a 30kW system. Co	control loops are ntrol commands a riate output wirin	tied together so the are only required to g connections by t	o be sent to "master" the user.		
Programming range  Output  Output Float  Parallel  Calibration  Digital Control (Optional)	Units maybe put in series  Multiple units can be para power systems have the s supply. Parallel supplies re	alleled to form high same transient resp equire a shielded CA oported. All standar	ner power systems. Chassis onse as a 30kW system. Co NT 5 cable (STP) and approp d and digital calibration car	control loops are ntrol commands a riate output wirin	tied together so the are only required to g connections by t	o be sent to "master" the user.		

Advanced Digital Features (	Requires Optional Digital Control):					
Graphical User Interface	Graphical User Interface (Windows base dvanced features listed below:	Graphical User Interface (Windows based) enables remote control and display of the supply operation including the a dvanced features listed below:				
Oscilloscope Function (125 Hz)	Up to two parameters; Voltage, current,	Up to two parameters; Voltage, current, output impedance, output cable impedance, output cable voltage drop, power delivered				
Data logging		Programmable update rate of 1 sec to 1000 sec (default 10 sec) with last 1000 points stored. Stored parameters include, output voltage/current, programmed set points, input voltage, output impedance, cable impedance, total power deliver, power meter, internal faults				
System fault reporting	Outside of set point, output impedance	Outside of set point, output impedance (detection of cabling, connection or load problems)				
Physical	30 kW	30 kW 20 kW 10 kW				
Width	19.00in (48.3cm)	19.00in (48.3cm)	19.00in (48.3cm)			
Depth	30.00" (76.2 cm)	30.00" (76.2 cm)	30.00" (76.2 cm)			
Height	3U - 5.22" rack mount (13.25 cm)	3U - 5.22" rack mount (13.25 cm)	3U - 5.22" rack mount (13.25 cm)			
Weight	≤125 lbs (56.69 kg)					
Shipping Weight	Contact factory for more product & ship	Contact factory for more product & shipping weights				
Mounting provisions	EIA rack-mount with slide provisions. Ro	EIA rack-mount with slide provisions. Recommended rack slide: Jonathan slide, P/N 370EZ-28				
AC Input Connector	Phoenix Contact terminal block	Phoenix Contact terminal block				
Protective Ground	1/4-20 stud	1/4-20 stud				
Output Connectors	bus bars with 3/8-16 inserted PEM nuts	bus bars with 3/8-16 inserted PEM nuts				
Water Connections	3/8-18 NPTF hex bulkhead	3/8-18 NPTF hex bulkhead				
Ambient Temperature	0 to 50°C	0 to 50°C				
Humidity	Relative humidity up to 95%, non-cond	Relative humidity up to 95%, non-condensing				
Water cooling specifications	5					
Flow		1.5 gpm nominal, 1.25gpm minimum, 1.75gpm maximum. Internal condensation must be prevented by ensuring that the temperature of the coolant is sufficiently high compared with the ambient air dew point				
Temperature	25°C nominal, 20°C minimum, 30°C ma	25°C nominal, 20°C minimum, 30°C maximum				
Maximum pressure	80 PSI	80 PSI				
Pressure drop	typical 12 PSI @ 1.5gpm per chassis	typical 12 PSI @ 1.5gpm per chassis				

#### Regulatory

Certified to UL/CSA 61010 and IEC/EN 61010-1 by a NRTL, CE Compliant, LVD Categories: Installation Category II: Pollution Degree 2; Class II Equipment: for Indoor Use Only. Rack mount equipment requires proper enclosure provided in end use. EMC Directive, EN 61326:1998

#### **Model Number Description**



- 2A, Advanced digital feature package including full isolated analog interface and Ethernet (Modbus-TCP) or RS485 interface.
- · 2B, Advanced digital feature package including full isolated analog interface and Ethernet (Industrial Protocol (IP)).
- · 2G, Advanced digital feature package including full isolated analog interface (SG-compatible) and Modbus-RTU (serial) inteface

3

• 1D, for SG-compatible isolated analog interface. No access to advanced digital features or GUI. Serial port is available with maintenance functions only.

# **ASD Series : Product Diagram**

