

ARTESYN DS760SL SERIES

760 Watts Bulk Front End



Advanced Energy's Artesyn DS760SL series bulk front end AC-DC power supply accepts a wide range 90–264 Vac input and provides a main 12 V output plus a 5 V standby output. Rated at 760 watts it has a high peak efficiency of 91%. Housed in a slimline 1U high, 2.1 inch wide rack-mounting package, the power supply is primarily designed for 'always-on' enterprise servers and similar space-constrained applications. This series comes in two airflow versions – dc-connector to ac-connector and vice versa.

DATA SHEET

Total Output Power:

760 Watts +5.0 Vdc Standby

SPECIAL FEATURES

- 760 W output power
- 18.1 W/cu-in
- 1U X 54.5 mm form factor (slimline)
- N + 1 redundant
- Hot-swap
- Internal OR'ing
- 5.0 V housekeeping
- High efficiency 91% @ 230 Vac, 50% load
- Variable speed "smart fans"
- EMI Class A
- EN61000 Immunity
- Two years warranty

SAFETY

- UL/cUL 60950-1
- CSA 60950-1
- VDE 60950-1
- China CCC
- CB Scheme Report/Cert

ELECTRICAL SPECIFICATIONS

Input		
Input range (operating)	90 - 264 Vac	
Input range (nominal)	115 / 230 Vac	Input through IEC connector
Frequency	47 - 63 Hz	
Input fusing	Internal 10 A fuses	Both lines fused
Inrush current	< = 25 A peak	Either hot or cold start
Power factor	0.99 typical	Meets EN61000-3-2
Harmonics	Meets IEC 1000-3-2 requirements	
Input current	8.8 A RMS max input current	At 100 Vac
Holdup time	12 ms minimum for main O/P 20 ms minimum for standby	At full rated load
Undervoltage lockout	85 ± 2.5 Vac 80 ± 2.5 Vac	Turn-on voltage Turn-off voltage
Overvoltage lockout	N/A	
Leakage current	< 0.8 mA	At 264 Vac
On/Off power switch	N/A	
Power line transient	MOV directly after the fuse	

ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-10 ° to 50 °C
Storage temperature	-40 ° to 85 °C
Cooling	Internal fan (fan speed control)
Operating relative humidity	5% to 95% non-condensing
Altitude	10,000 feet
RoHS compliant	Yes



ENVIRONMENTAL SPECIFICATIONS (CONTINUED)



Input		
Output rating	12 V @ 62.3 A; 748 W 5.0 Vsb @ 2.4 A; 12 W	90 - 264 Vac
Setpoint	12.0 V	
Total regulation range	12 V ± 1% 5.0 Vsb ± 3%	Line/load/transient when measured at output connector
Rated load	760 W maximum	No derating over operating temp range
Minimum load	12 V @ 0.0 A 5.0 Vsb @ 0.0 A	No loss of regulation
Output noise (PARD)	100 mV Max P-P 100 mV Max P-P	12.0 V output 5.0 Vsb output Measured with a 0.1 uF ceramic and 10 uF tantalum capacitor on any output; 20 Mhz
Output voltage overshoot	300 mV; 12 V main 200 mV; 5.0 standby	1 A/uSec slew rate
Transient response	< 250 uSec	50% load step @ 1 A/us Step load valid between 10% to 100% of output rating Recovery time to within 1% of set point at onset of transient
Max units in parallel	Up to 4	Output to return
Short circuit protection	To 120% of rated output	
Remote sense	Compensation up to 100 MV	
Output isolation	Standard per Safety Requirements	
Forced load sharing	To within 10% of all shared outputs	Digital sharing control
Overload protection (OCP)	120% to 130% 120% to 170%	12 V output 5.0 Vsb output
Overvoltage protection (OVP)	110% to 120% 110% to 125%	12 V outpu 5.0 Vsb output
Overtemperature protection	10 - 15 °C above safe operating area	Both PFC and output converter monitored



ORDERING INFORMATION

Model Number	O/P Voltage Set Point	Set Point Tolerance	Total Regulation	Minimum Current	Maximum Current	Output Ripple P/P	Stand-by Voltage	Air Flow
DS760SL-3	12.0 Vdc	± 0.2%	± 1%	0 A	62.3 A	120 mV	5.0 V @ 2.4 A	Standard
DS760SL-3-001	12.0 Vdc	± 0.2%	± 1%	0 A	50.0 A	120 mV	5.0 V @ 2.4 A	Reverse
DS760SL-3-002	12.0 Vdc	± 0.2%	± 1%	0 A	62.3 A	120 mV	3.3 V @ 2.4 A	Standard
DS760SL-3-003	12.0 Vdc	± 0.2%	± 1%	0 A	50.0 A	120 mV	3.3 V @ 2.4 A	Reverse

OUTPUTS - ALL MODELS



Timing Diagram



OUTPUTS - ALL MODELS (CONTINUED)

Turn On/Off Timing				
Item	Description	Min	Max	Units
Tvout_rise	+12 Output rise time	10	300	mSec
Tvout_rise	5.0 Vsb output rise time	1	50	mSec
Tsb_on_delay	Delay from AC being applied to 5.0 Vsb being within regulation.		1500	mSec
Tac_on_delay	Delay from AC being applied to all output voltages being within regulation.		3000	mSec
Tvout_holdup	Time all output voltages, including 5.0 Vsb, stay within regulation after loss of AC.	12		mSec
Tpwok_holdup	Delay from loss of AC to de-assertion of PWOK	5		mSec
Tpson_on_delay	Delay from PSON# active to output voltages within regulation limits.	50	2500	mSec
Tpson_pwok	Delay from PSON# de-active to PWOK being de-asserted.		100	mSec
Tacok_delay	Delay from loss of AC input to de-assertion of ACOK#.	10		mSec
Tpwok_on	Delay from output voltages within regulation limits to PWOK asserted at turn on.	100	1000	mSec
Tpwok_off	Delay from PWOK de-asserted to 12 Vdc or 5.0 Vsb dropping out of regulation limits.	1	1000	mSec
Tpwok_low	Duration of PWOK being in the de-asserted state during an off/on cycle using AC or the PSON# signal.	100		mSec
Tsb_vout	Delay from 5.0 Vsb being in regulation to 12 Vdc being in regulation at AC turn on.	50	1000	mSec

PSON#

The PSON# signal is required to remotely turn on/off the power supply. PSON# is an active low signal that turns on the +12 Vdc power rail. When this signal is not pulled low by the system, or left open, the +12 Vdc output turns off. The 5.0 Vsb output remains on. This signal is pulled to a standby voltage by a pull-up resistor internal to the power supply. The power supply fan(s) shall operate at the lowest speed.

PWOK# (Power Good	J)
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PPWOK is a power good signal and will assert HIGH when the outputs are within the regulation limits. PWOK will be pulled LOW by the power supply to indicate when either output falls below regulation limits or when AC power has been removed for a time sufficiently long so that power supply operation is no longer guaranteed. The start of the PWOK# delay time shall be inhibited as long as the +12 Vdc output is in current limit or the 5.0 Vsb output is below the regulation limit.

PSON Signal Characteristics						
Signal Type	Accepts an open collector/ drain input from the system. Pulled-up to the 5.0 Vsb located in power supply.					
PSON# = Low	ON					
PSON# = Open	OFF					
	MIN	MAX				
Logic level low (power supply ON)	0 V	0.8 V				
Logic level high (power supply OFF)	2.0 V	4.125 V				
Source current, Vpson = low		4 mA				
Power up delay: Tpson_on_delay	5 msec	200 msec				

PWOK Signal Characteristics			
Signal Type	Open collect output from p Pullup to 5.0 to the power	oower supply. Vsb external	
PWOK = High	Power	Good	
PWOK = Low	Power N	Not Good	
	MIN	MAX	
To tLogic level low voltage, lsing = 4 mA	0 V	0.8 V	
Logic level high voltage, Isource = 200 µA	2.0 V	4.125 V	
Sink current, PWOK = Iow		4 mA	
Source current, PWOK = high		2 mA	



OUTPUTS - ALL MODELS (CONTINUED)

PSKILL

The +12 Vdc output only from the power supply shall be disabled if the PSKILL input is high and V Standby will continue to be provided, outputs may be enabled if this signal is low. The power supply includes a pull up to disable all outputs if this signal is open. PSKILL whall not be connected during a hot insertion before all of the other pins are connected.

STATUS INDICATIONS

See table below for Summary of Status signals, Ports and Indicators. The condition column assumes 2 or more power supplies present and ON and 5.0 Vsb shared for management interface. On the "Fan Blocked" condition, the assumption is that all outputs are within spec and not over temperature. This would be considered a "warning" condition. On the "Standby" condition, the system differentiates this state by knowing PS_ONL in negated (requesting Standby).

AC INPUT PRESENT INDICATOR (ACOK#)

The ACOK# signal is used to indicate presence of AC input to the power supply. This signal shall be connected to 5.0 Vsb through a resistor on the host system side. A logic "High" level on this signal shall indicate AC input to the power supply is present. A Logic "Low" on this signal shall indicate a loss of AC input to the power supply.

ACOK# Signal Characteristics						
Signal Type Pull up to 5.0 Vsb through resistor in the host system						
PWOK = High	Present					
PWOK = Low	Not Present					
	MIN	MAX				
Logic level low voltage, lsink = 4 mA	0 V	0.8 V				
Logic level high voltage, $lsink = 50 \ \mu A$	2.0 V	4.125 V				
Sink current, PRESENT# = low		4 mA				
Sink current, PRESENT# = high		50 μsec				

Status Indicators	Status Indicators											
Condition	Status Signals		Status I	Status Register		Shutdown Register			LED's			
Condition	ACOK/H	PWOK/H	PSON	PWOK	Fan-Fail	AC-Loss	0-Temp	0-Current	Fail	AC	DC	Fail
Normal Operation	1	1	1	1	0	0	0	0	0	On	On	Off
V1 12 V Overcurrent	1	0	1	0	0	0	0	1	1	On	Off	On
AC Input Fail	0	0	1	0	0	1	0	0	1	Off	Off	Off
Fan Blocked or Running Under Speed. O/P's ok	1	1	1	1	0	0	0	0	0	On	On	Off
UV on V1 12 V and PS Has Latched Off	1	0	1	0	0	0	0	0	1	On	Off	On
UV on Vsb +5.0 and PS Has Turned Off	1	0	1	0	0	0	0	0	1	On	Off	On
OV on V1 12V or Vsb +5.0 & PS Has Latched Off	1	0	1	0	0	0	0	0	1	On	Off	On
Over Temp and PS Has Turned Off	1	0	1	0	0	0	1	0	1	On	Off	On
Fan Below Shutdown Limit	1	0	1	0	1	0	0	0	1	On	Off	On
No Problems But PS is in Standby Mode	1	0	0	0	0	0	0	0	0	On	Off	Off



PIN OUT TABLE

Pin142 VPin242 VPin3GroundPin4GroundS1412 V RTN SenseS2412 V RTN SenseS3412 V Current ShareS4SMB_ALERT/LS6SOAS7SCL*S7SCL*S8PSON/LS9PSON/LS1S0 V_STBYS12S10S12S0 V_STBYS13ReservedS14PESENT/LS15SA V_STBYS14ReservedS14ServedS15SENT/LS16SENT/LS17SCL*S18EEPROM_WPS19S12S14S0 V_STBYS15S14S16ServedS17S16S18EEPROM_WPS19S12S19S12S12S14S14S14S15S14S16Served for factory useS17S16S18COX/HS19S12S19S12S19S13S19S12S10S10 UsedS11S10 UsedS12S10 UsedS13S10 UsedS14S10 UsedS15S10 UsedS16S10 UsedS17S10 UsedS18S10 UsedS19S10 UsedS19S10 UsedS10 UsedS10 UsedS10 Use		
Pin 242 VPin 3GroundPin 4GroundS1412 V SenseS2412 V RTN SenseS3412 V Current ShareS4SMB_ALERT/LS5SOAS6SCL*S7SKILLS8PSON/LS9PV_OKS11450 V_STBYS13ReservedS14PS_A1S15PS_A1S16ServedS17StareS18ReservedS19StareS12ACOK_JS13ReservedS14PS_A0S15SAS16ACOK/HS17StareS18ACOK/HS19StareS19StareS12Reserved for factory useS14StareS15StareS16StareS17StareS18ACOK/HS19StareS19	Pin	Signal Name
Pin 3GroundPin 4GroundS1412 V SenseS212 V RTN SenseS312 V Current ShareS4SMB_ALERT/LS6SOAS7SCL*S8SOL*S9PSON/LS9PSON/LS1S0.V <td< td=""><td>Pin 1</td><td>+12 V</td></td<>	Pin 1	+12 V
Pin 4GroundS1412 V SenseS2412 V RTN SenseS3412 V Current ShareS4SMB_ALERT/LS5SDAS6SCL*S7SSILLS8PSON/LS9PV_OKS1145.0 V_STBYS13SOL V_STBYS14PSENT/LS15SAS16Sol V_STBYS17StateS18SCL*SENT/LS19SCL*SENT/LS19SAS10SCL*SENT/LS15SAS16Sol V_STBYS17SCLS16SLS17SLS16SLS17SLS16SLS17SLS17SLS18SLS19SLS19SLS19SLS19SLS19SLS10SLS11SLS12SLS13SLS14SLS15SLS16SLS17SLS18SLS19SLS19SLS19SLS19SLS19SLS10SLS11SLS12SLS13SLS14SLS15SLS15SLS16SLS17SLS17SL <td>Pin 2</td> <td>+12 V</td>	Pin 2	+12 V
\$12 V Sense \$2 \$12 V RTN Sense \$3 \$12 V Current Share \$4 \$MB_ALERT/L \$5 \$DA \$6 \$CL* \$7 \$SKLL \$8 \$SON/L \$9 \$SON/L \$10 \$SUS \$11 \$SUS \$12 \$SUS \$12 \$SUS \$13 \$SUS \$14 \$SUS \$15 \$SUS \$16 \$SUS \$17 \$SUS \$18 \$SUS \$19 \$SUS \$12 \$SUS \$13 \$SUS \$14 \$SUS \$15 \$SUS \$16 \$Served \$17 \$SUS \$18 \$SUS \$19 \$CUSYH \$19 \$SUS \$19 \$SUS \$21 \$SUS \$22 \$SUS \$23 <t< td=""><td>Pin 3</td><td>Ground</td></t<>	Pin 3	Ground
S2+12 V RTN SenseS3+12 V Current ShareS4SMB_ALERT/LS5SDAS6SCL*S7PSN/LS8PSON/LS9PW_OKS10PS_A1S11+5.0 V_STBYS13ReservedS14PSCN/LS15PS_A0S16ReservedS17Reserved for factory useS18CMS19ACOK/HS19NUS12NuS14Reserved for factory useS15Reserved for factory useS16ACOK/HS19ACOK/HS19Nu usedS11Nu usedS12Nu usedS13Reserved for factory useS14Reserved for factory useS15S16S16Reserved for factory useS17Reserved for factory useS18ACOK/HS19Nu usedS11S10S12S10S13S10S14S10S15S10S16S10S17S10S18S10S19S10S19S10S19S10S19S10S10S10S10S10S10S10S11S10S12S10S13S10S14S10S15S10S16S10S17S10	Pin 4	Ground
S3+12 V Current ShareS4SMB_ALERT/LS5SDAS6SCL*S7PSKILLS8PSON/LS9PW_OKS10PS_A1S11+5.0 V_STBYS13ReservedS14PRSENT/LS15PS_A0S16ReservedS17ReservedS18ReservedS19ReservedS19ReservedS19Reserved for factory useS19Reserved for factory useS19ACOK/HS19Not usedS19Not usedS19Not usedS11Not usedS12Not usedS13SERTAS14Not usedS15S16S16Not usedS17Reserved for factory useS18S16S19Not usedS19S10S19S10S19S10S10S10S11S10S12S10S13S10S14S10S15S10S16S10S17S10S18S10S19S10S19S10S19S10S10S10S10S10S10S10S10S10S10S10S10S10S11S10S12S10S13S10S	S1	+12 V Sense
S4SMB_ALERT/LS5SDAS6SCL*S7SKILLS8PSON/LS9PW_OKS10PS_A1S11+5.0 V_STBYS13ReservedS14PS_A0S15PS_A0S16ReservedS17Reserved for factory useS18EEPROM_WPS19ACOK/HS19Not usedS19Not usedS12Not usedS13S14S14Reserved for factory useS15S16S16Reserved for factory useS17Not usedS19Not usedS19Not usedS11S12S12S14S13S14S14S14S15S15S16S15S17S16S18S16S19S10S19S10S11S10S12S10S13S10S14S10S15S10S15S10S16S10S17S10S18S10S19S10S19S10S11S10S12S10S13S10S14S10S15S10S15S10S16S10S17S10S18S10S19S10S19S10S10S	S2	+12 V RTN Sense
S5 SDA S6 SCL* S7 PSKLL S8 PSON/L S8 PV_OK S1 PSA S10 PS_A1 S11 +5.0 V_STBY S12 +5.0 V_STBY S13 Reserved S14 PRESENT/L S15 PS_A0 S16 Reserved S17 Reserved for factory use S18 EEPROM_WP S19 ACOK/H S19 ACOK/H S19 Not used S21 Not used S21 S10	\$3	+12 V Current Share
S6SCL*S7PSKILLS8PSON/LS9PW_OKS10PS_A1S11 $45.0 \vee STBY$ S12 $50 \vee STBY$ S13ReservedS14PRESENT/LS15PS_A0S16ReservedS17ReservedS18EEPROM_WPS19Not usedS19Not usedS12Not usedS13Reserved for factory useS14S14S15S15S16Reserved for factory useS17Not usedS19Not usedS20Not usedS21S21S23S50 \STBY	S4	SMB_ALERT/L
S7PSKILLS8PSON/LS9PW_OKS10PS_A1S11+5.0 V_STBYS12+5.0 V_STBYS13ReservedS14PKSENT/LS15PS_A0S16Reserved for factory useS17Reserved for factory useS18ACOK/HS19Nd usedS12Nd usedS13Reserved for factory useS14Reserved for factory useS15S16S16Reserved for factory useS17Not usedS18Reserved for factory useS19Not usedS21Not usedS22Reserved for factory useS23+5.0 V_STBY	S5	SDA
88 PSON/L S9 PW_OK S10 PS_A1 S11 5.0 V_STBY S12 5.0 V_STBY S13 Reserved S14 PS_A0 S15 PS_A0 S16 Reserved S17 Reserved S18 EEPROM_WP S19 Kestred for factory use S19 ACOK/H S19 Not used S19 Not used S19 S10	S6	SCL*
S9 PW_OK S10 PS_A1 S11 \$5.0 V_STBY S12 \$5.0 V_STBY S13 Reserved S14 PK_SENT/L S15 PS_A0 S16 Reserved S17 Reserved S18 Reserved S19 Reserved S10 Reserved S11 Reserved S12 Reserved S14 Reserved S15 Reserved S16 Reserved S17 Reserved for factory use S18 EPROM_WP S19 Not used S20 Not used S21 Not used S22 Reserved for factory use S23 S00 V_STBY	S7	PSKILL
\$10PS_A1\$11\$5.0 V_STBY\$12\$5.0 V_STBY\$13Reserved\$14PRESENT/L\$15PS_A0\$16Reserved\$17Reserved for factory use\$18EEPROM_WP\$19ACOK/H\$20Not used\$21Not used\$22Reserved for factory use\$23\$5.0 V_STBY	S8	PSON/L
S11 +5.0 V_STBY S12 +5.0 V_STBY S13 Reserved S14 PRESENT/L S15 PS_A0 S16 Reserved for factory use S17 Reserved for factory use S18 EEPROM_WP S19 ACOK/H S20 Not used S21 Not used S22 Feserved for factory use S23 45.0 V_STBY	S9	PW_OK
\$12 +50 V_STBY \$13 Reserved \$14 PRESENT/L \$15 PS_A0 \$16 Reserved for factory use \$17 Reserved for factory use \$18 EEPROM_WP \$19 ACOK/H \$20 Not used \$21 Not used \$22 Feserved for factory use \$23 \$50 V_STBY	S10	PS_A1
Note Note S13 Reserved S14 PRESENT/L S15 PS_A0 S16 Reserved S17 Reserved for factory use S18 EEPROM_WP S19 ACOK/H S20 Not used S21 Not used S22 Reserved for factory use S23 S10 V_STBY	S11	+5.0 V_STBY
\$14PRESENT/L\$15PS_A0\$16Reserved\$17Reserved for factory use\$18EEPROM_WP\$19ACOK/H\$20Not used\$21Not used\$22Reserved for factory use\$23\$4.0 V_STBY	\$12	+5.0 V_STBY
S15 PS_A0 S16 Reserved S17 Reserved for factory use S18 EPROM_WP S19 ACOK/H S20 Not used S21 Not used S22 Reserved for factory use S23 +5.0 V_STBY	S13	Reserved
S16ReservedS17Reserved for factory useS18EEPROM_WPS19ACOK/HS20Not usedS21Not usedS22Reserved for factory useS23+5.0 V_STBY	S14	PRESENT/L
S17Reserved for factory useS18EEPROM_WPS19ACOK/HS20Not usedS21Not usedS22Reserved for factory useS23+5.0 V_STBY	S15	PS_A0
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S19ACOK/HS20Not usedS21Not usedS22Reserved for factory useS23+5.0 V_STBY	S17	Reserved for factory use
S20 Not used S21 Not used S22 Reserved for factory use S23 +5.0 V_STBY	S18	EEPROM_WP
S21 Not used S22 Reserved for factory use S23 +5.0 V_STBY	S19	ACOK/H
S22 Reserved for factory use S23 +5.0 V_STBY	\$20	Not used
\$23 +5.0 V_STBY	\$21	Not used
	\$22	Reserved for factory use
\$24 ±5.0.V. STRV	\$23	+5.0 V_STBY
10.0 101	\$24	+5.0 V_STBY

* Supports I²C standard mode (100 kHz) only



MECHANICAL DRAWING





OUTPUT CONNECTOR



Reference	On Power Supply	Mating Connector or Equivalent
AC Input Connector	IEC60320-C14	IEC60320-C13
Output Connector	MOLEX P/N 4598/4005	MOLEX P/N 45984-4343



*Note: The top side of the PSU Output Connector connects with the Bottom Row of the Mating Connector ex: PSU-S13 ↔ Mating Signal Ckt1

Mating Connector Details	
P/N	Molex 45984-4343
Current Rating	30
Receptacle Header	Upper & Lower Blades
No. of Contacts	4 Power Contacts, 24 Signal Contacts

BURN-IN

100% Burn-in at 45°C, at 80 - 90% load. Duration of burn-in determined by Quality Assurance Procedures.

MTBF

The power supply has a minimum MTBF of 300K hours using the Bell core 332, issue 6 specification @ 25 °C and 40 °C, ambient, at full load. With the power supply installed in a system in a 25 °C ambient environment and operating at full load, capacitor life shall be 10 years, minimum for ALL electrolytic capacitors contained within this power supply. The power supply shall demonstrate a MTBF level of > 500,000 hours.

QUALITY ASSURANCE

Full QAV testing shall be conducted in accordance with Artesyn Embedded Power Standards with reports available upon request.

WARRANTY

Artesyn Embedded Power shall warrant the power supply to be free of defects in materials and workmanship for a minimum period of two years from the date of shipment, when operated within specifications. The warranty shall be fully transferable to the end owner of the equipment powered by the supply.





Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

PRECISION | POWER | PERFORMANCE

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