POWER

DS1200HE

1200 Watts Distributed Power System

Data Sheet

Front-end Bulk Power
Total Output Power:
180 to 264 Vac: 1200 W continuous
90 to 140 Vac: 1000 W/
1200 W[1] continuous

80 PLUS PLATINUM

PMBus

SPECIAL FEATURES

- 1200 W output power
- High power
- 1U x 2U power supply
- High density design: 21.66 W/in^3
- Active Power Factor Correction
- EN61000-3-2 Harmonic compliance
- Inrush current control
- 80plus Platinum efficiency
- N+1 or N+N redundant
- Hot plug operation
- N + 1 redundant
- Active current sharing
- Full Digital control
- PMBus compliant
- Input power reporting
- Compatible with Artesyn's Universal PMBus GUI
- Reverse airflow option
- Two-year warranty

COMPLIANCE

- Conducted/Radiated EMI Class B
- RoHS

SAFETY

- UL/cUL 60950 (UL Recognized)
- NEMKO+ CB Report EN60950
- CE Mark
- China CCC

Electrical Specifications

Input	
Input voltage range	90 - 140 Vac: 1000 W/1200 W[1] 180 - 264 Vac: 1200 W
Frequency	47 Hz to 63 Hz
Efficiency	94.0% peak
Max input current	15 Arms
Inrush current	55 Apk at 240 Vac, cold start
Conducted EMI	Class B
Radiated EMI	Class B
Power factor	0.9 typical
ITHD	10%
Leakage current	1.4 mA
Hold-up time	12 ms

[1] 1000 W at forward air, 1200 W at reverse air. See power derating table

Ordering Information	
DS1200HE-3	12 V / 100 A, 3.3 Vsb / 6 A, standard airflow
DS1200HE-3-002	12 V / 100 A, 5.0 Vsb / 4 A, standard airflow
DS1200HE-3-003	12 V / 100 A, 3.3 Vsb / 6 A, reverse airflow
DS1200HE-3-004	12 V / 100 A, 5.0 Vsb / 4 A, reverse airflow

ARTESYN™
An Advanced Energy Company

Electrical Specifications

Output			
Main DC Output	**MIN**	**NOM**	**MAX**
Nominal setting	-0.50%	12	0.50%
Total output regulation range	11.4 V		12.6 V
Dynamic load regulation range	11.4 V		12.6 V
Output ripple			120 mVp-p
Output current	0 A[4]		100.0 A
Current sharing		Within ±5% of full load ratin	
Capacitive loading	2,000 uF		40,000 uF
Start-up from AC to output			2000 ms
Output rise time	5 ms		50 ms
Standby DC Output (VSB)			
Output setpoint range	-1%	3.3 V (5.0 V)	1%
Total output regulation range	+5%		-5%
Dynamic load regulation range	+5%		-5%
Output ripple			50 mVp-p
Output current	0		6.0 A (4 A)
Current sharing		N/A	
Capacitive loading	0 uF		680 uF
Start-up from AC to output			1000 ms
Output rise time	2 ms		50 ms
Protections			
Main Output			
Overcurrent protection[2]	120%		150%
Overvoltage protection[1]	13.5 V		15.0 V
Undervoltage protection	10.5 V		11.0 V
Overtemperature protection		Yes	
Fan fault protection		Yes	
Standby Output			
Overcurrent protection[3]			
Overvoltage protection[3]			

[1] Latch mode
[2] Autorecoverys if the overcurrent is less than 130% and last only for <1000 ms. Otherwise, latch mode
[3] Standby protection is auto-recovery
[4] For output transient testing, the minimum load shall be at 10 A

Control and Status Signals

Input Signals

PSON_L

Active LOW signal which enables/disables the main output. Pulling this signal LOW will turn-on the main output.
A 100pF decoupling capacitor is recommended at the system side.

		MIN	MAX
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	5.0 V
I_{SOURCE}	Current that may be sourced by this pin		2 mA
I_{SINK}	Current that may be sunk by this pin at low state		0.5 mA

PSKILL_L

First break/last mate active LOW signal which enables/disables the main output. This signal will have to be pulled to ground at the system side with a 220 ohm resistor. A 100 pF decoupling capacitor is also recommended.

		MIN	MAX
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	5.0 V
I_{SOURCE}	Current that may be sourced by this pin		2 mA
I_{SINK}	Current that may be sunk by this pin at low state		0.5 mA

VSENSE+, VSENSE-, STBY_VSENSE+

VSENSE+, VSENSE-, and STBY_VSENSE+ lines are the remote sense lines for regulation. Each line will compensate for a maximum of 100 mV.

Output Signals

ACOK_L

Signal used to indicate the presence of AC input to the power supply. A logic level HIGH will indicate that the AC input to the power supply is within the operating range while a logic level LOW will indicate that AC has been lost.

This is an open collector/drain output. This pin is pulled high by a 1.0 kohm resistor connected to 3.3 V inside the power supply. It is recommended that this pin be connected to a 100 pF decoupling capacitor and pulled down by a 100 kohm resistor at the system side.

		MIN	MAX
V_{IL}	Output logic level LOW		0.6 V
V_{IH}	Output logic level HIGH	2.0 V	5.0 V
I_{SOURCE}	Current that may be sourced by this pin		3.3 mA
I_{SINK}	Current that may be sunk by this pin at low state		0.7 mA

PWR_GOOD / PWOK_H

Signal used to indicate that main output voltage is within regulation range. The PWR_GOOD signal will be driven HIGH when the output voltage is valid and will be driven LOW when the output falls below the under-voltage threshold.

This signal also gives an advance warning when there is an impending power loss due to loss of AC input or system shutdown request. More details in the Timing Section. This is an open collector/drain output. This pin is pulled high by a 1.0 kohm resistor connected to 3.3 V inside the power supply. It is recommended that this pin be connected to a 100 pF decoupling capacitor and pulled down by a 10 kohm resistor.

		MIN	MAX
V_{IL}	Output logic level LOW		0.8 V
V_{IH}	Output logic level HIGH	2.0 V	5.0 V
I_{SOURCE}	Current that may be sourced by this pin		3.3 mA
I_{SINK}	Current that may be sunk by this pin at low state		0.7 mA

Control and Status Signals

Output Signals

PS_PRESENT

Signal used to indicate to the system that a power supply is inserted in the power bay. This pin is connected to ground via a 220 ohm resistor within the power supply

PS_INTERRUPT

Active low signal used by the power supply to indicate to the system that a change in power supply status has occurred. This event can be triggered by faults such as OVP, OCP, OTP, and fan fault. This signal can be cleared by a CLEAR_FAULT command. A 100pF decoupling capacitor is recommended.

		MIN	MAX
V_{IL}	Output logic level LOW		0.8 V
V_{IH}	Output logic level HIGH	2.0 V	5.0 V
I_{SOURCE}	Current that may be sourced by this pin		4 mA
I_{SINK}	Current that may be sunk by this pin at low state		4 mA

BUS Signals

ISHARE

Bus signal used by the power supply for active current sharing. All power supplies configured in the system for n+n sharing will refer to this bus voltage inorder to load share.

Voltage Range	The range of this signal for active sharing will be up to 8.0 V, which corresponds to the maximum output current.		
		MIN	MAX
I_{SHARE} Voltage	Voltage at 100% load, stand-alone unit	7.65	8.35
	Voltage at 50% load, stand-alone unit	3.65	4.35
	Voltage at 0% load, stand-alone unit	0	0.5
I_{SOURCE}	Current that may be sourced by this pin		160 mA

SCL, SDA

Clock and data signals defined as per I²C requirements. It is recommended that these pins be pulled-up to a 2.2 kohm resistor to 3.3 V and a 100 pF decoupling capacitor at the system side.

		MIN	MAX
V_L	Logic level LOW		0.8 V
V_H	Logic level HIGH	2.0 V	5.0 V

Note: All signal noise levels are below 400 mVpk-pk from 0 - 100 MHz.

Electrical Specifications

LED Indicators

A single bi-color LED is used to indicate the power supply status.

	Status LED
No AC input to PSU	Off
AC present, STBY ON, main output OFF	Blinking GREEN
Main output ON	Solid GREEN
Over-voltage/Under-voltage failure	Blinking AMBER
Power supply failure (OVP, OTP, FAN FAULT)	Solid AMBER

I²C Addressing Table

PMBUS ADDRESSING		
A1	A0	Address
LOW	LOW	0 x B0
LOW	HIGH	0 x B2
HIGH	LOW	0 x B4
HIGH	HIGH	0 x B6

Firmware Reporting And Monitoring			
		MIN/MAX	
Output loading	5 to 20%	20% to 50%	50% to 100%
Input voltage	±5%		
Input current	±0.7 A fixed error	±5%	
Input power	±10 W at <125 W input	±5%	
Output voltage	±4%		
Output current	0.5 A fixed error	±5%	
Temperature	±5 degC on the operating range		
Fan speed	Actual ±250 RPM		

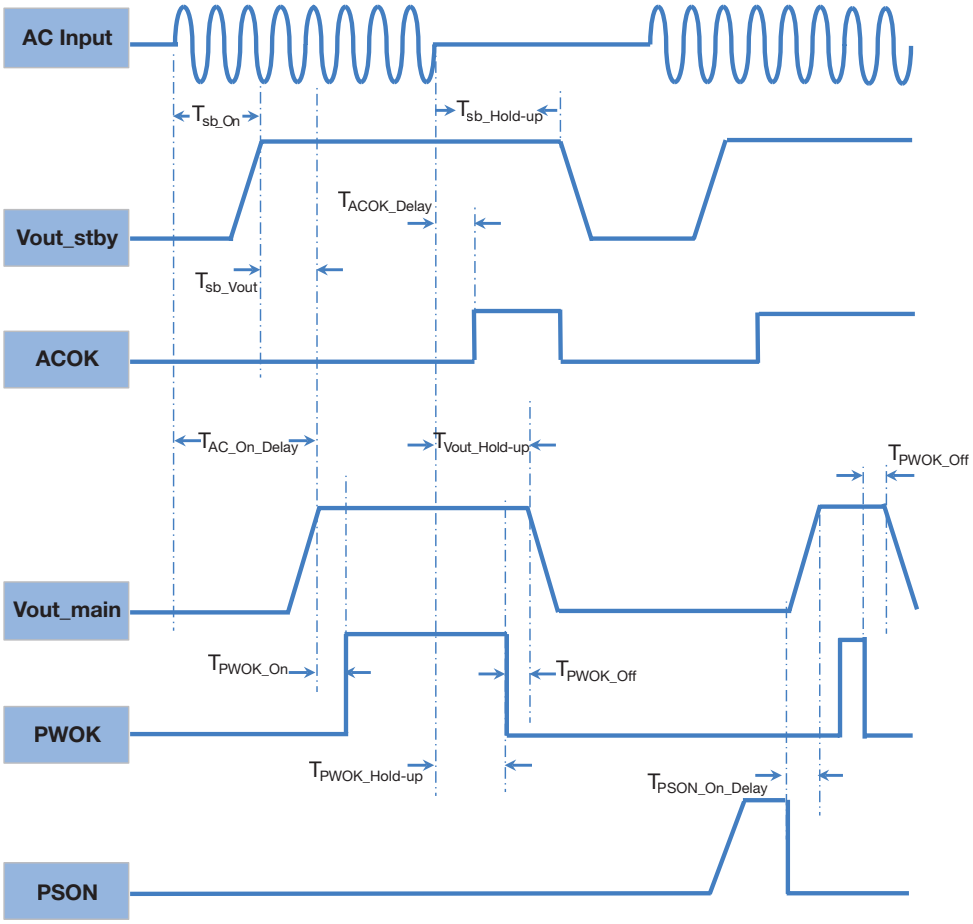
PMBus	YES
Remote ON/OFF	YES

Timing Specifications				
	Description	**Min**	**Max**	**Unit**
T_{sb_On}	Delay from AC being applied to standby output being within regulation		1700	ms
$T_{AC\_On\_Delay}$	Delay from AC being applied to main output being within regulation		2000	ms
T_{PWOK_On}	Delay from output voltages within regulation limits to PWOK asserted	100	1000	ms
T_{ACOK_Delay}	Delay from loss of AC to assertion of ACOK	7	14	ms
$T_{PWOK\_Hold\text{-}up}$	Delay from loss of AC to deassertion of PWOK	11		ms
$T_{Vout\_Hold\text{-}up}$	Delay from loss of AC to main output being within regulation	12		ms
$T_{sb\_Hold\text{-}up}$	Delay from loss of AC to standby output being within regulation	400		ms
T_{PWOK_Off}	Delay from deassertion of PWOK to output falling out of regulation	1		ms
$T_{PSON\_On\_Delay}$	Delay from PSON assertion to output being within regulation		350	ms
$T_{PWR\_GOOD\_Off}$	Delay from deassertion of PWOK to output falling out of regulation	1		ms
$T_{PSON\_On\_Delay}$	Delay from PSON assertion to output being within regulation		350	ms

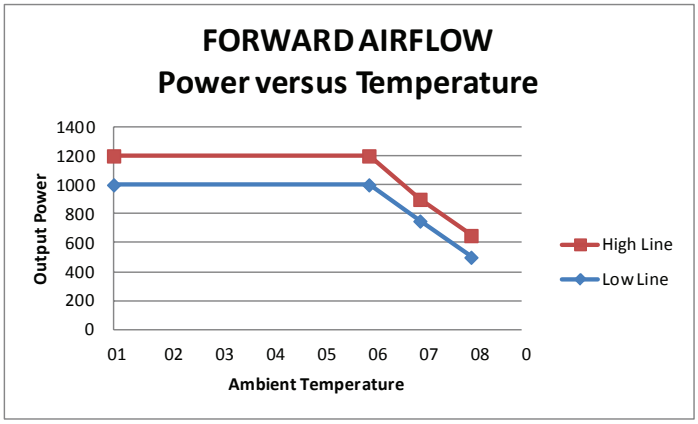
Environmental Specifications

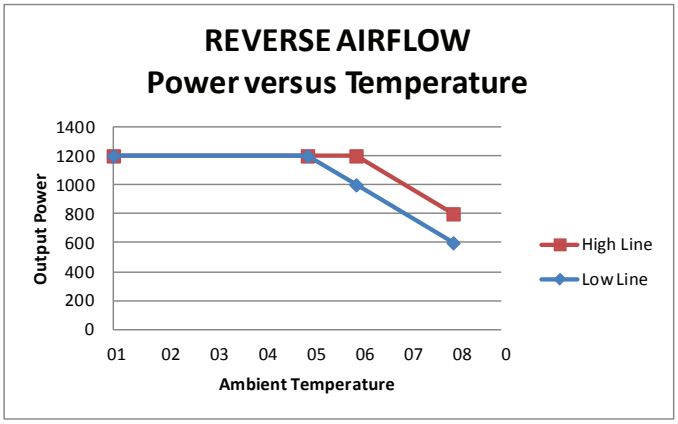
Operating temperature	-10 to 50 °C, can provide derated power up to 70 °C. See power derating curve
Operating altitude	Up to 10,000 feet
Operating relative humidity	10% to 90% non-condensing
Non-operating temperature	-40 to +85 °C
Non-operating relative humidity	10% to 95% non-condensing
Non-operating altitude	Up to 50,000 feet
Vibration and shock	Standard oprating/non-operating random shock and vibration
ROHS compliance	Yes
MTBF	200,000 hours using Bell Core TR-332, issue 6 specification, Method 1 Case 3 at 25 degC ambient at full load.
Operating life	Minimum of 5 years
Reliability	All electronic component derating analysis and capacitor life calculation is done as per Artesyn Network Power standards. The QAV report will be available upon request.

Timing Diagram

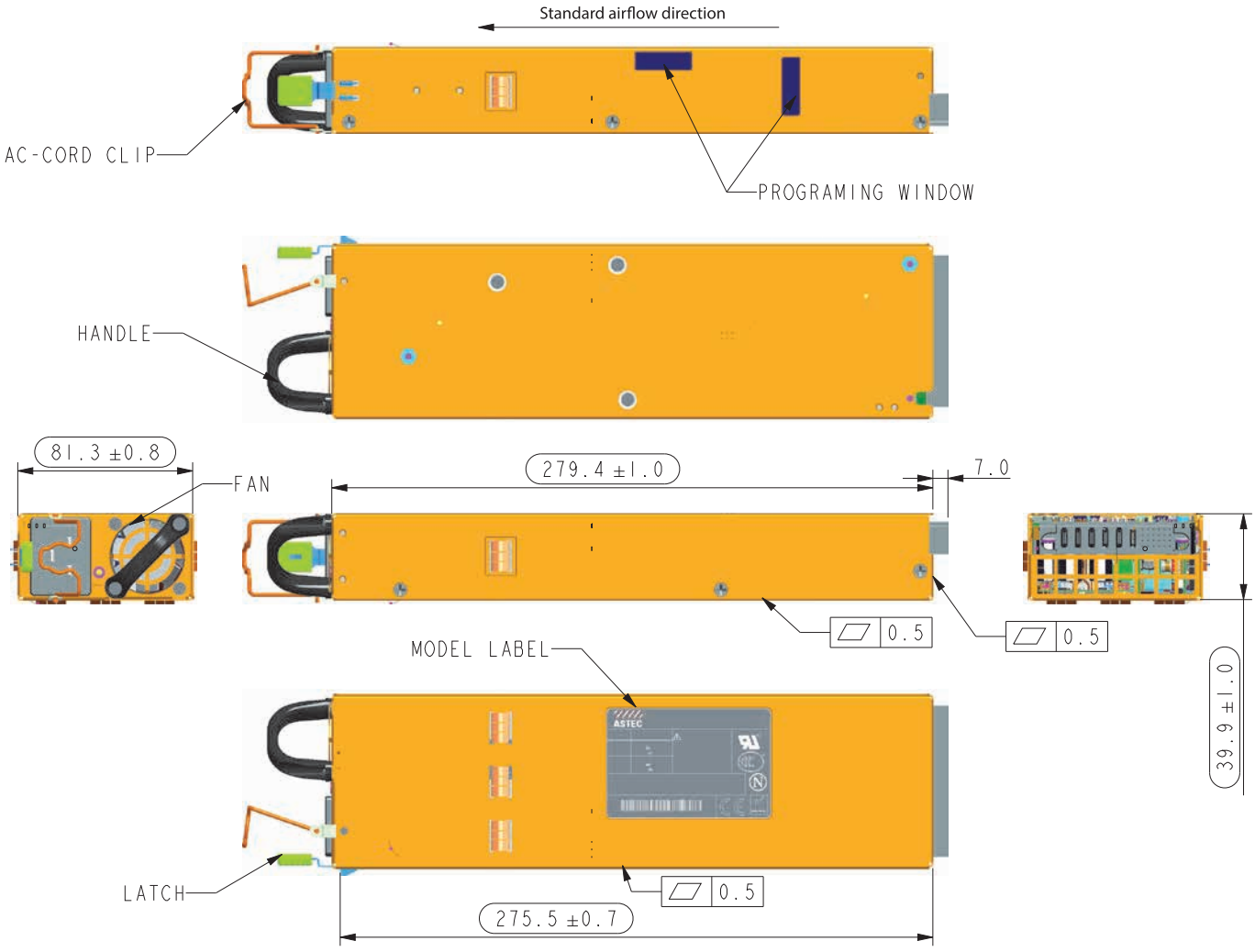


Power Derating Curve





Mechanical Specifications



Mechanical Specifications

DC Output Connector Pinout Assignment

Male connector as viewed from the rear of the supply:

D1	D2	D3	D4	D5	D6	PB1	PB2	PB3	PB4	PB5	PB6
C1	C2	C3	C4	C5	C6						
B1	B2	B3	B4	B5	B6						
A1	A2	A3	A4	A5	A6						

Power Supply Side
1. FCI Power Blade 51721 series 51721-10002406AA
2. Molex Power Connector SD-87667 series 87667-7002
Mating Connector (System Side)
1. FCI Power Blade 51741-10002406CC Straight Pins
2. FCI Power Blade 51761-10002406AALF Right Angle
3. Any other approved equivalent

Pin Assignments	
Pin	**Signal Name**
PB1	Main output return
PB2	Main output return
PB3	Main output return
PB4	+ Main output
PB5	+ Main output
PB6	+ Main output
A1	PSON_L
A2	Main output remote sense return, VSENSE-
A3	Spare
A4	PS_PRESENT
A5	STAND-BY, +VSB
A6	STAND-BY RETURN, -VSB
B1	ACOK_H (AC Input Present)
B2	Main output remote sense, VSENSE+
B3	ISHARE
B4	PS_INHIBIT / PSKILL_LI
B5	STAND-BY
B6	STAND-BY RETURN
C1	SDA (I^2C Data Signal)
C2	SCL (I^2C Clock Signal)
C3	POWER GOOD/ PWOK_H
C4	Spare
C5	STAND-BY, +VSB
C6	STAND-BY RETURN
D1	A0 (I^2C Address BIT 0 Signal)
D2	A1 (I^2C Address BIT 1 Signal)
D3	PS_INTERRUPT (Alarm)
D4	STAND-BY RMT SENSE, VSENSE_STBY
D5	STAND-BY, +VSB
D6	STAND-BY RETURN, -VSB

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