POWER

DS3000TE

3000 Watt Front-End AC-DC Power Supply

Data Sheet

Distributed Power Bulk Front-end
Single Ouptut Standard
Total Output Power:
3000 W continuous
208 Vac to 264 Vac, 3000 W[1]

PMBus

SPECIAL FEATURES

- 3000 W output power
- High power and narrow form factor
- Six (6) units can fit in a 19" inch rack for a total of 16.2 kW
- High density design: 24 W/in^3
- Active Power Factor Correction
- EN61000-3-2 harmonic compliance
- Inrush current control
- 80plus titanium efficiency
- N+1 or N+N redundant
- Hot-pluggable
- Active current sharing
- Full digital control
- PMBus compliant
- Compatible with Artesyn's universal PMBus GUI
- Two-year warranty

COMPLIANCE

- Conducted/Radiated EMI EN55022 Class A Limits
- RoHS

SAFETY

- UL/cUL
- DEMKO+ CB Report EN60950
- BSMI
- CE Mark
- China CQC

Electrical Specifications

Input	
Input voltage range	Forward air: 208 to 264 Vac[1], 3000 W Reverse air: 208 to 264 Vac[2] , 2960 W
Frequency	47 Hz to 63 Hz
Efficiency	96.0% peak
Max input current	<16.0 Arms @ 208 Vac
Inrush current	55 Apk
Conducted EMI	Class A
Radiated EMI	Class A
Power factor	>0.98 at full load
ITHD	10% at 50% load
Leakage current	0.75 mA
Hold-up time	11 ms

Ordering Information	
DS3000TE-3	Standard Airflow
DS3000TE-3-402	Reverse Airflow

[1] 2700 W output rating at 180-207 Vac

[2] 2664 W output rating at 180-207 Vac

ARTESYN™
An Advanced Energy Company

Electrical Specifications

Output			
Main DC Output	**MIN**	**NOM**	**MAX**
Nominal setting	-0.20%	12.1	0.20%
Total output regulation range	11.5 V		12.7 V
Dynamic load regulation range	-5%		+5%
Output ripple			160 mVp-p
Output current	1.0		250 A
Current sharing	Within 16 A of each other		
Capacitive loading	1,000 µF		17,000 µF
Start-up from AC to output			2500 ms
Output rise time	5 ms		60 ms
Standby DC Output			
Nominal setting	-2%	12.0 V	2%
Total output regulation range	11.5 V		12.7 V
Dynamic load regulation range	-5%		+5%
Output ripple			160 mVp-p
Output current	0 A		4.5 A
Current sharing		N/A	
Capacitive loading	27 µF		620 µF
Start-up from AC to output			2000 ms
Output rise time	2 ms		60 ms
Protections			
Main Output			
Overcurrent protection[2]	260A		280A
Overvoltage protection[1]	14.0 V		15.0 V
Undervoltage protection[1]	9.6 V		10.5 V
Overtemperature protection[2]		Yes	
Fan fault protection		Yes	
Standby Output			
Overcurrent protection[2]	110%		150%
Overvoltage protection[1]	13.5 V		15.0 V
Undervoltage protection	9.2 V		10.1 V

[1] Latch mode
[2] Autorecovery if the overcurrent is less than 104% and last only for <500 ms.
[3] Standby protection is latch off

Control and Status Signals

Input Signals

PSON

Active LOW signal which enables/disables the main output. Pulling this signal LOW will turn-on the main output.
Recommended pull-up resistor to 12 VSB is 8.2 k with a 3.0 k pull-down to ground. A 100 pF decoupling capacitor is also recommended.

		MIN	MAX
V_{IL}	Input logic level LOW	0.0 V	0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.6 V
$T_{RISE/FALL}$	Expect rise and fall times		1 µs

PSKIL

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 50 ohm resistor. A 100 pF decoupling capacitor is also recommended.

		MIN	MAX
V_{IL}	Input logic level LOW	0.0 V	0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.6 V

A0, A1, A2

Addressing pins of the power supply for I^2C communications. It is recommended for the system to have pull-ups and decoupling on the address lines for better noise immunity. Refer to the addressing tables below.

		MIN	MAX
	1k ohm Internal pull-ups to 3.3 V		
V_{IL}	Input logic level LOW		0.8 V
V_{IH}	Input logic level HIGH	2.0 V	3.6 V
I_{SOURCE}	Current that may be sourced by this pin		4 mA

Output Signals

ACOK

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 k ohm 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 k ohm resistor.

		MIN	MAX
V_{OL}	Output logic level LOW		0.4 V
V_{OH}	Output logic level HIGH	2.4 V	3.6 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		0.5 mA

Control and Status Signals

PWR_GOOD / PWOK

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 k ohm 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 k ohm resistor.

		MIN	MAX
V_{OL}	Output logic level LOW		0.4 V
V_{OH}	Output logic level HIGH	2.4 V	3.6 V
I_{SOURCE}	Current that may be sourced by this pin		4 mA

PS_PRESENT

Signal used to indicate to the system that a power supply is inserted in the power bay. Recommended pull-up resistor to 12 VSB is 8.2 k with a 3.0 k pull-down to ground. A 100 pF decoupling capacitor is also recommended.

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. Recommended pull-up resistor to 12 VSB is 8.2 k with a 3.0 k pull-down to ground. A 100 pF decoupling capacitor is also recommended.

		MIN	MAX
V_{OL}	Output logic level LOW		0.4 V
V_{OH}	Output logic level HIGH	2.4 V	3.6 V
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	7.75	8.25
	Voltage at 50% load, stand-alone unit	3.85	4.15
	Voltage at 0% load, stand-alone unit	0	0.3
I_{SOURCE}	Current that may be sourced by this pin		10.0 mA

SCL, SDA

Clock, data and addressing signals defined as per I^2C requirements. The maximum system side resistor pull-up and decoupling capacitance

		MIN	MAX
V_L	Logic level LOW		0.8 V
V_H	Logic level HIGH	2.0 V	3.6 V

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

I^2C Addressing Tables

FRU ADDRESSING			
A2	A1	A0	Address
HIGH	LOW	LOW	0 x A9
HIGH	LOW	HIGH	0 x AB
HIGH	HIGH	LOW	0 x AD
HIGH	HIGH	HIGH	0 x AF*

PMBus Addressing
Address
0 x B9
0 x BB
0 x BD
0 x BF

FRU ADDRESSING			
A2	A1	A0	Address
LOW	LOW	LOW	0 x A1
LOW	LOW	HIGH	0 x A3
LOW	HIGH	LOW	0 x A5
LOW	HIGH	HIGH	0 x A7*

PMBus Addressing
Address
0 x B1
0 x B3
0 x B5
0 x B7

* Default address when A0 and A1 are open

* Subtract 1 for Write Address

Electrical Specifications

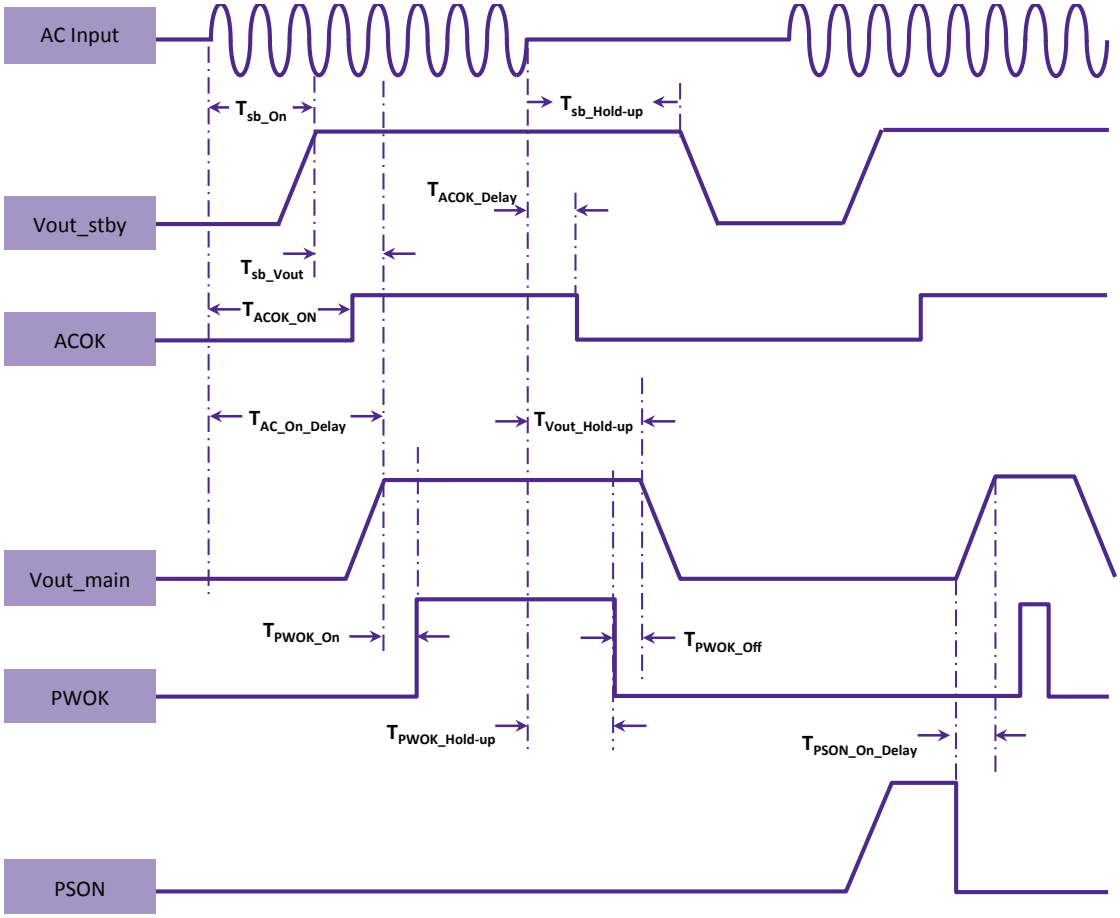
LED Indicators			
	AC GOOD LED	**DC GOOD LED**	**FAULT LED**
Color	GREEN	GREEN	AMBER
No AC input to PSU	Off	Off	Off
AC present, STBY ON, main output OFF	On	Off	Off
Main output ON	On	On	Off
Power supply failure (OVP, OTP, FAN FAULT)	On	Off	Blinking

Firmware Reporting And Monitoring			
	Accuracy Range		
Output loading	5 to 20%	20 to 50%	50 to 100%
Input voltage	±3%		
Input current	±0.55 A fixed error	±4%	
Input power	±20 W at < 100 W input	±5%	
Output voltage	±2%		
Output current	±3 A	±4%	±2%
Temperature	±5 °C on the operating range		
E_{IN}	±15% (at 10% minimum load)	±5%	
Fan speed	±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		2000	ms
T_{sb_vout}	Delay from standby output to main output voltage being within regulation		300	ms
T_{ACOK_ON}	Delay from application of input to ACOK assertion		2020	ms
$T_{ac\_on\_delay}$	Delay from AC being applied to main output being within regulation		2500	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		10	ms
$T_{pwok\_hold\text{-}up}$	Delay from loss of AC to deassertion of PWOK	10		ms
$T_{vout\_hold\text{-}up}$	Delay from loss of AC to main output falling out of regulation	11		ms
$T_{sb\_Hold\text{-}up}$	Delay from loss of AC to standby output being within regulation	150	2000	ms
$T_{PWR\_GOOD\_Off}$	Delay from deassertion of PWOK to output falling out of regulation	1	990	ms
$T_{PSON\_On\_Delay}$	Delay from PSON assertion to output being within regulation		350	ms

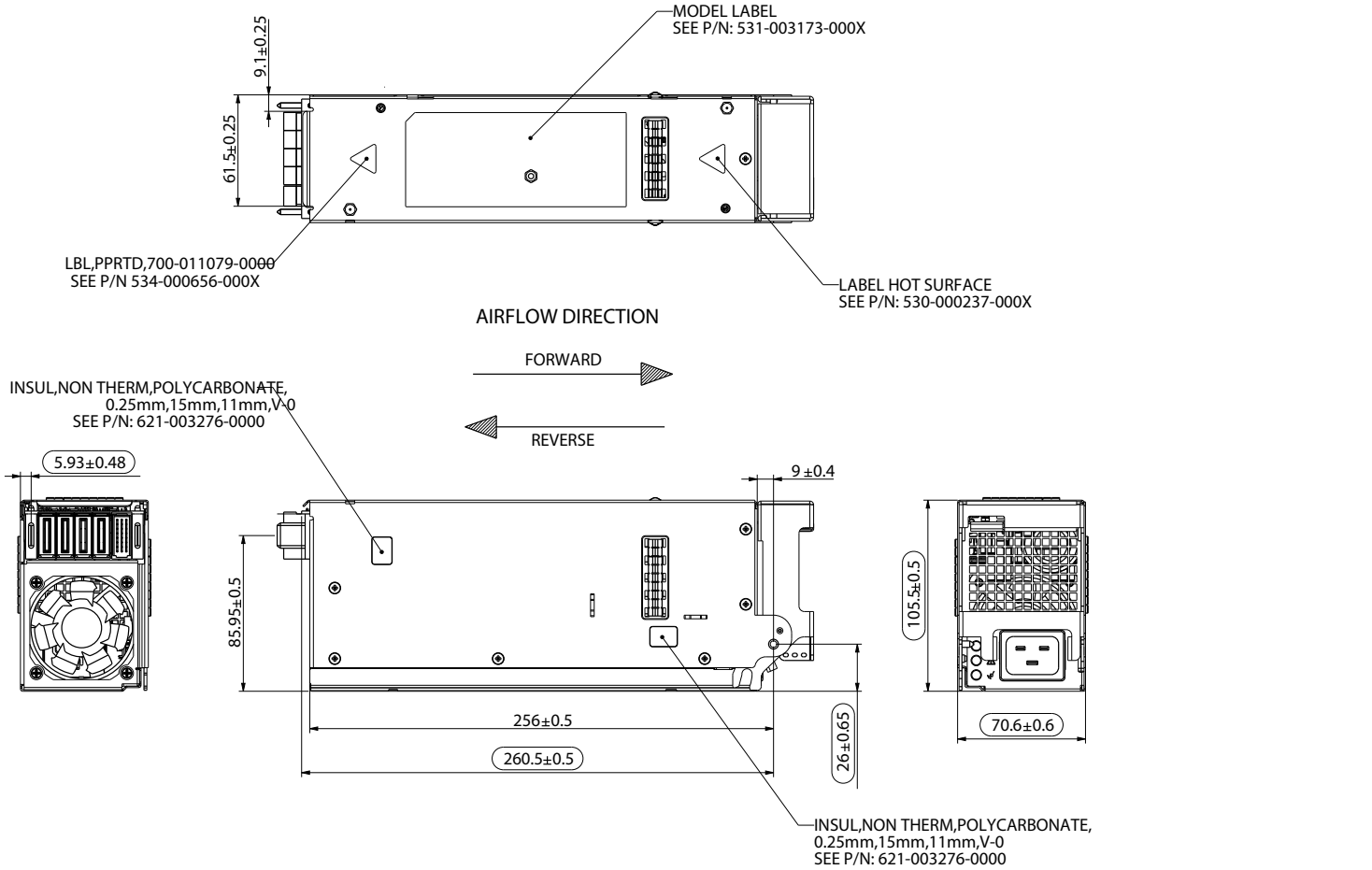
Timing Diagram

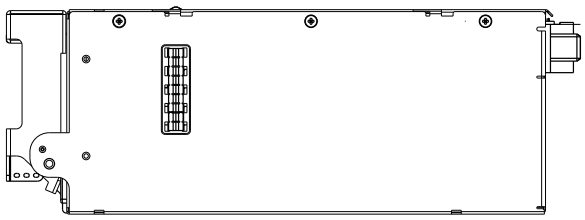


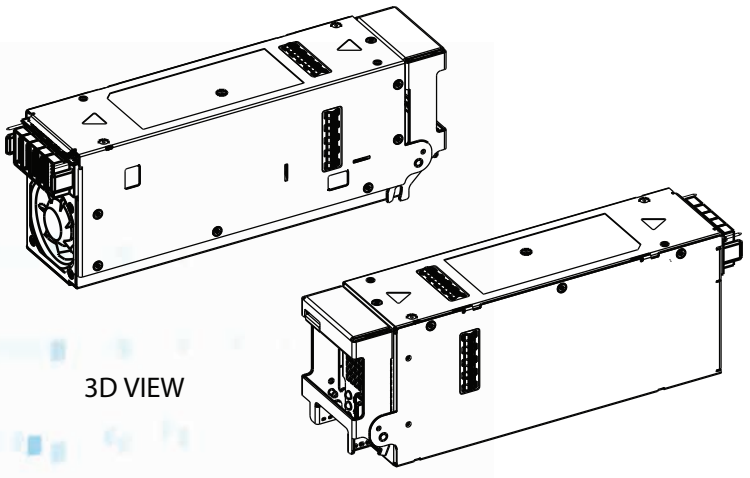
Environmental Specifications

Operating temperature	0 to 40 °C
Operating altitude	up to 13,200 feet
Operating relative humidity	5% to 95% non-condensing
Non-operating temperature	-40 to +90 °C
Non-operating relative humidity	5% to 95% non-condensing
Non-operating altitude	up to 30,000 feet
Vibration and shock	Standard operating/non-operating random vibration/shock
ROHS compliance	Yes
MTBF	400,000 hours
Operating life	Minimum of 5 years

Mechanical Outline



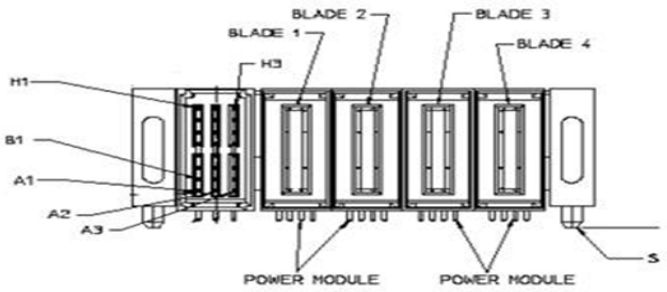




3D VIEW

Connector Definitions

Output Connector Part Number	75555-104
Mating Connector Part Number	75541-104REVB1 or any other Molex recommended part



Pin	Signal Name	Amps per pin[1]
PB1	RETURN	150
PB2	RETURN	150
PB3	12 V	150
PB4	12 V	150
A1	PWR GOOD	N/A
A2	PSKILL	N/A
A3	PRESENT	N/A
B1	RETURN	N/A
B2	ISHARE	N/A
B3	RETURN	N/A
C1	PS_INTERRUPT	N/A
C2	RETURN	N/A
C3	ACOK	N/A
D1	RETURN	N/A
D2	PSON	N/A
D3	RESERVED	N/A
E1	SDA	N/A
E2	SCL	N/A
E3	A0	N/A
F1	RESERVED	N/A
F2	A1	N/A
F3	A2	N/A
G1	RESERVED	N/A
G2	RESERVED	N/A
G3	RESERVED	N/A
H1	12 VSB	2
H2	12 VSB	2
H3	12 VSB	2

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