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FNP300 Series
AC-DC Power Supplies
12V, 24V, 48V Output, 300 W



RoHS Compliant

The FNP300 Series provides highly-efficient AC-DC power supplies, each with one high current output and an additional standby output, which can be used in a wide range of applications.

Passive current share along with internal ORing diodes allow the FNP300 to be used in redundant, hot-swap applications.

All models meet international safety standards and display the CE Mark for the low Voltage Directive.

Key Features & Benefits

- RoHS lead free solder and lead solder exempted products are available
- Wide input voltage range 85-264 VAC
- Two outputs (one high current output)
- Low conducted and radiated EMI (EN 55022 class B)
- Safety approved to UL/CSA 62368-1, EN 62368-1 and IEC 62368-1
- High density design 4” x 1.58” x 8.5” cassette
- Highly efficient topology
- I^2C interface
- Overtemperature, output overvoltage, and output overcurrent protection
- Supervisory signaling
- Included ORing diode for true redundant operation

Applications

- Telecommunication Equipment

bel POWER SOLUTIONS & PROTECTION
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belfuse.com/power-solutions

Please read our datasheet & drawing disclaimer here.

1. MODEL SELECTION

MODEL	INPUT VOLTAGE VAC	OUTPUT 1		OUTPUT 2		RATED POWER W
		$V_{O\ NOM}$ VDC	$I_{O\ MAX}$ ADC	$V_{O\ NOM}$ VDC	$I_{O\ MAX}$ ADC	
FNP300-1012G FNP300-1012HG *	85-264	12	25	12	0.7	310
FNP300-1024G	85-264	24	12.5	12	0.7	310
FNP300-1048G	85-264	48	6.25	12	0.7	310

* H option indicates hiccup current limitation

OPTIONS	SUFFIXES TO ADD TO PART NUMBER
RoHS lead solder exemption	No RoHS character required.
RoHS compliant for all 6 substances	Add "G" as the last character of the part number.

2. ABSOLUTE MAXIMUM RATINGS

Stresses in excess of the absolute maximum ratings may cause performance degradation, adversely affect long-term reliability, and cause permanent damage to the converter.

PARAMETER	CONDITIONS/DESCRIPTION	MIN	MAX	UNITS
Input Voltage	Continuous Transient, 60 ms		264 300	VAC VAC
Operating Temperature	Ambient; V_{min}-V_{max}, $I_{O\ nom}$, cooling by internal fan	0	55	°C
Storage Temperature	Non-operational	-40	85	°C

3. INPUT SPECIFICATIONS

All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Input Voltage			85	115/230	264	VAC
Turn-On Input Voltage	Ramping up		70	-	85	VAC
Turn-Off Input Voltage	Ramping down		70	-	85	VAC
Input Frequency			47	50/60	63	Hz
Inrush Current Limitation	115/230 VAC				15/20	A
Power Factor	V_{nom}, $I_{O\ nom}$		0.96			
Efficiency	V_I = 230 VAC, $I_{O\ nom}$	FNP300-1012G FNP300-1024G FNP300-1048G	83 86 88			%

4. OUTPUT SPECIFICATIONS

All specifications apply over specified input voltage, output load, and temperature range unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Output Voltage Setpoint Accuracy FNP300-1012G	V_i = 230 VAC, I_{o1} @ 12.5 ADC, T_C = 25 °C	-0.5		0.5.	% $V_{o\,nom}$
Output Voltage Setpoint Accuracy FNP300-1024G	V_i = 230 VAC, I_{o1} @ 3.125 ADC, T_C = 25 °C	-0.5		0.5.	% $V_{o\,nom}$
Output Voltage Setpoint Accuracy FNP300-1048G	V_i = 230 VAC, I_{o1} @ 12.5 ADC, T_C = 25 °C	-0.5		0.5.	% $V_{o\,nom}$
Output Current V1 Output Current V2	FNP300-1012G FNP300-1012G	0 0	25 0.7	25 0.7	ADC ADC
Output Current V1 Output Current V2	FNP300-1024G FNP300-1024G	0 0	12.5 0.7	12.75 0.7	ADC ADC
Output Current V1 Output Current V2	FNP300-1048G FNP300-1048G	0 0	6.25 0.7	6.4 0.7	ADC ADC
Static Line Regulation V1	$V_{i\,min}$- $V_{i\,max}$, $V_{i\,nom}$, 5-100% $I_{o\,nom}$	-0.5		0.5	% $V_{o\,nom}$
Static Load Regulation V1 (Droop Characteristic)	$V_{i\,min}$- $V_{i\,max}$, $V_{i\,nom}$, 5-100% $I_{o\,nom}$	-5		5	% $V_{o\,nom}$
Hold-Up Time	Starting at V_i = 230 VAC, $P_{o\,nom}$	20			ms
Dynamic Load Regulation	Load change = ±33%, dI_o/dt = 2A/µs voltage deviation recovery time	-2		2 400	% $V_{o\,nom}$ µs
Start-Up Time	$V_{i\,nom}$, $I_{o\,nom}$			1	s
Output Voltage Ripple and Noise	$V_{i\,nom}$, $I_{o\,nom}$, 20 MHz bandwidth			120	mVpp

5. PROTECTION

All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION		MIN	NOM	MAX	UNITS
Input Fuse	Not user accessible				6.3AT	
Input Transient Protection	With varistor					
Output	No-load and short circuit proof short circuit proof overload (latch style)		 110		 130	% $I_{o\,nom}$ % $I_{o\,nom}$ % $I_{o\,nom}$
Overvoltage Protection	Latch style Latch style Latch style	FNP300-1012G FNP300-1024G FNP300-1048G	115 115 115		130 130 122	% $V_{o\,nom}$ % $V_{o\,no}$ % $V_{o\,no}$
Overtemperature Protection	Automatic power shutdown at T_C = 95 °C					

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6. CONTROL

All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION
I²C Digital Bus	Reports information and monitors alarm functions
PS Seated Signal	Contact closure to GND
PS Remote Shutdown	TTL compatible signal, open collector. Power supply enabled at Low or TTL "0" (e.g. by connecting of pin 22 to 0V or GND) and inhibited to latching mode** at High or TTL "1", or leave it open.
AC fail pre-warning (I²C & OC) *	Supervisory AC input voltage; Pre-warning time >6 ms
DC fail (I²C & OC) *	Supervisory under- and overvoltage pre-ORing diode of V1
Temperature Warning (I²C & OC) *	Indicates if unit is operating normally or in overtemperature, Pre-warning time >10 ms
Fan OK (I²C & OC) *	Indicates if fan is operating or has failed
Current Share	Droop load characteristic for V1 and V2
Status Indication	LEDs: DC OK (green), AC OK (green)

NOTE:

* Signal provided by I²C interface or by open collector (OC)

** (1) Standard FNP300 models (without "H" at the end of part number) have latching inhibit function, i.e., once PSU is inhibited, it needs input power re-cycle to allow using enable state again.
(2) FNP300 variants marked with "H" character do have non-latching inhibit function so there's no need to re-cycle input power when enabling unit after inhibit state.

7. FEATURES

All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION
Fan speed control	4 fan speed levels depending on inlet temperature Fan speed level and temperature information available on I²C digital bus
µC supply voltage in-/output (Pin 10)	If unit is operating: 5 to 7V is provided at pin 10. If unit is NOT operating, pin 10 is input from a parallel connected unit for µC supply.

8. CHARACTERISTIC CURVES

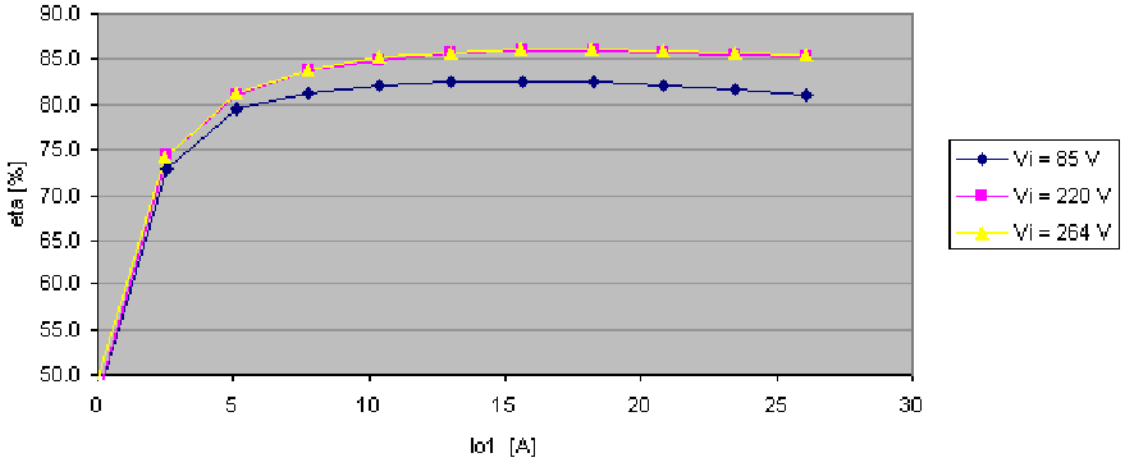


Figure 1. Efficiency vs. Output Load

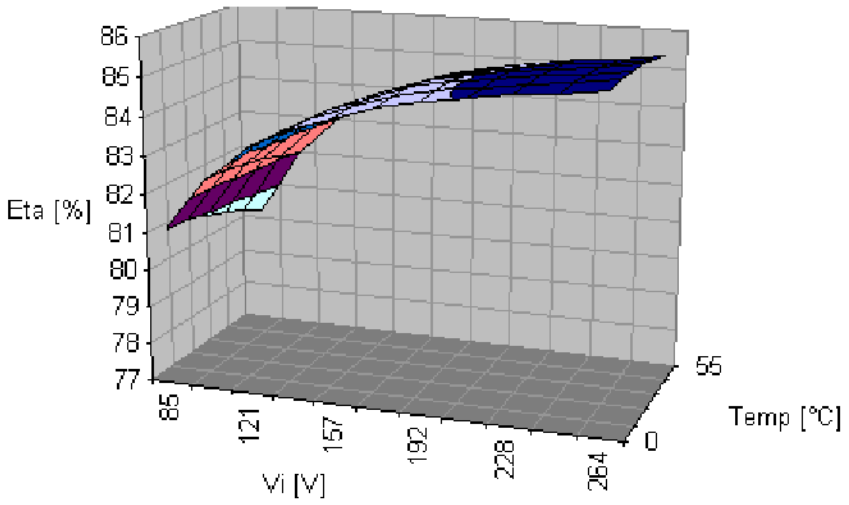


Figure 2. Efficiency vs. Input Voltage and Ambient Temperature, $I_o = I_{o\,nom}$

9. SAFETY AND ISOLATION SPECIFICATIONS

The electric strength test is performed in the factory as routine test in accordance with EN 550116, IEC/EN 62368-1, and UL 1950 and should not be repeated in the field. Bel Power Solutions will not honor any warranty claims resulting from electric strength field tests.

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Safety Standards	UL/CSA 62368-1 EN 62368-1 IEC 62368-1		Certified		
Insulation Safety Rating	Input/Case Input/Output Output/Case		Basic Reinforced Functional		
Electric Strength Test Voltage	Input/Case Input/Output Output/Case	2121 4242 500			VDC

10. EMC SPECIFICATIONS

All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	DESCRIPTION	CRITERION
Electrostatic Discharge	IEC/EN 61000-4-2, level 4 (contact/air)	8/15 kV, criterion B
Electromagnetic Field	IEC/EN 61000-4-3, level 3	10 V/m, criterion A
Electrical Fast Transients / Burst	IEC/EN 61000-4-4, level 4 (direct/capacitive)	2/1 kV, criterion B
Surge	IEC/EN 61000-4-5, level 3 (L/L, L/C)	1/2 kV, criterion B
Voltage Dips and Interruptions	IEC/EN 61000-4-11	Criterion B
RF Conducted Immunity	IEC/EN 61000-4-6	10 VAC, AM 80%, 1 kHz, criterion A
Emissions Radiated/Conducted	CISPR 22/EN 55022/EN 61204	Class B
Harmonics	IEC/EN 61000-3-2	Class B
Voltage Fluctuation and Flicker	IEC/EN 61000-3-3	Pass

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11. ENVIRONMENTAL & RELIABILITY SPECIFICATIONS

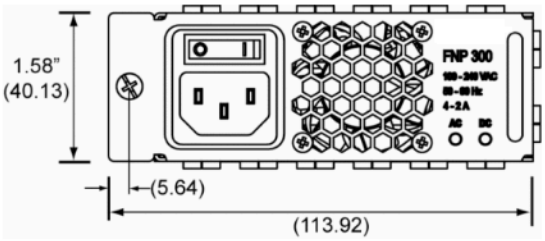
All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Operating Humidity	Relative humidity, non-condensing	10		90	%
Storage Humidity	Relative humidity, non-condensing	5		95	%
Shock	IEC/EN 60068-2-27, 11 ms			30	g_n
Sinusoidal Vibration	IEC/EN 60068-2-6 2-8 Hz 8-200 Hz 200-500 Hz		 7.5 2 4		 mil g_n g_n
MTBF	MIL-HDBK-217F Notice 2, G_B, 25 °C	200			kh

12. MECHANICAL SPECIFICATIONS

All specifications apply over specified input voltage, output load, and temperature range, unless otherwise noted.

PARAMETER	CONDITIONS/DESCRIPTION	MIN	NOM	MAX	UNITS
Mechanical Dimensions (W x H x D)			101.6 x 40.1 x 215.9 4.00 x 1.58 x 8.50		mm in
Weight			1.00 2.205		kg lb



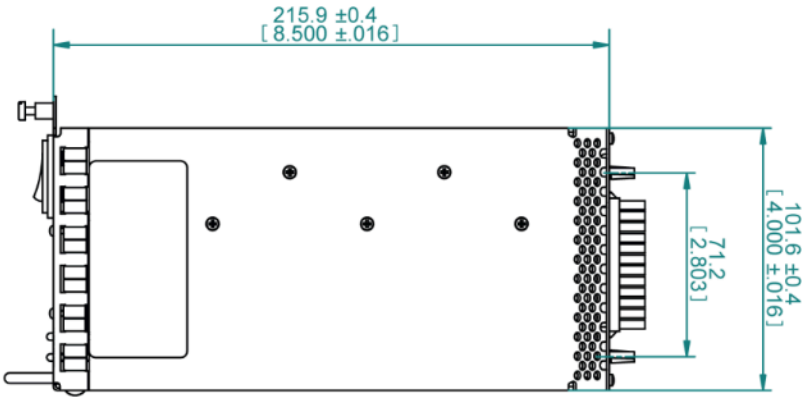
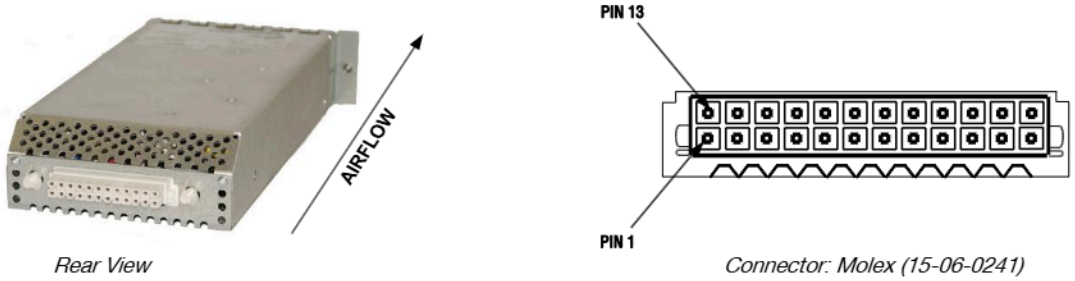


Figure 3. Mechanical Dimensions

13. CONNECTORS



Rear View *Connector: Molex (15-06-0241)*

Figure 4. Output Connector Descriptions

OUTPUT CONNECTOR DESCRIPTION	PIN LOCATION	REFERENCE NAME
12V Output 24V Output 48V Output	4,5,6,16,17,18 4,5,6,16,17,18 4,5,6,16,17,18	Vo1 Vo1 Vo1
12V Output RTN 24V Output RTN 48V Output RTN	1,2,3,13,14,15 1,2,3,13,14,15 1,2,3,13,14,15	Vo1 RTN Vo1 RTN Vo1 RTN
AC-fail, DC-fail, Temp.-fail	9	PS_FAIL
Power Supply Present Signal	23	PS_PRSNT_L
Serial Data Line	11	SDA
Serial Clock Line	12	SCL
Address Input Line A0	21	AO
Address Input Line A1	20	A1
5 to 7V	10	µC supply voltage bus
FAN OK	24	FAN_FAIL
PS Remote Shut Down	22	PS_RSD_H
12V Standby RTN	7	Vo2 RTN / Logic Ground / 5 to 7V RTN
12V Standby	19	Vo2
Address Input Line A2	8	A2

For more information on these products consult: tech.support@psbel.com

NUCLEAR AND MEDICAL APPLICATIONS - Products are not designed or intended for use as critical components in life support systems, equipment used in hazardous environments, or nuclear control systems.
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