

## NRA301

### AC-DC Power Supply

(Document Rev A08 (6/14/18))



### 3 Phase Delta 60Hz 208Vac Line to Line Input Triple Output, 4505W Max Total

**Market: Military Cots**

**Application: Shipboard Radar Electronic Equipment Rack**

#### Features

- 3 Phase 208Vac Line to Line input.
- Designed to meet MIL-STD-1399B for Type I, 60Hz Power.
- Triple Outputs @ 4505W total.
- Designed to meet portions of Mil-Std-810F environmental specs.\*
- Designed to meet portions of Mil-Std-461F EMI specifications.\*

**Table 1: Maximum Ratings**

Parameter	Rating	Unit	Notes
Vin	208	Vac	3 Phase
Temperature range	-20 to +70	°C	Operating Range
Output power	4505	W	
Input power	5625	W	
+29Vdc output (V1)	2700	W	
+28Vdc output (V2)	900	W	
+28Vdc output (V3)	900	W	
+5Vdc output	5	W	

\* Contact AEGIS Power Systems for specific details.

#### Product Highlights

This ruggedized military commercial off the shelf (Mil-Cots) ac-dc filtered 3 phase 208Vac input power supply has one +29Vdc output, two +28Vdc outputs, and one +5Vdc output with a total output capacity of 4505W. This COTS solution works well for Mil-cots and is designed to meet portions of MIL-STD-810F vibration and shock, and designed to meet portions of MIL-STD-461F EMI requirements. In comparison to other power supplies using conventional technology, this package provides its users with higher efficiency (80% typical), higher power factor (0.99), less weight and higher power output. This power supply incorporates a configured array of AEGIS Power System's cutting edge proprietary high reliability and high density 1PH60 power assemblies, leading the Mil-COTS industry in power density and technical performance.

**AEGIS Power Systems, Inc.** specializes in the front end design, development, and manufacture of Rapid Response Custom Switching Power Supplies for defense, industry, telecomm, aircraft, shipboard, rack mount, electric powered vehicle, and Mil-Cots military power supply applications. Contact Aegis for specific details on what can be designed for your particular military power supply application and what portions of a particular military standard can be offered for that power supply.

## **SPECIFICATIONS**

**(Typical at 25°C, nominal line and 100% load, unless otherwise specified.)**

<b>Input voltage:</b>	Three Phase 208Vac Line to Line, 47Hz - 63Hz.
<b>Input current:</b>	5.46A per phase @ 208Vac, Nominal.
<b>Input power:</b>	5627W (5684VA) Nominal, all three phases combined.
<b>Power factor:</b>	0.99 typical.
<b>Output power:</b>	4505W Maximum all outputs combined.
<b>Output voltages:</b>	+29vdc (V1) 2700W +28vdc (V2) 900W +28vdc (V3) 900W +5vdc 5W
<b>Over voltage:</b>	117% typical. Recycle input power to reset.
<b>Efficiency:</b>	80% Nominal.
<b>Output ripple:</b>	300mVp-p Typical, 20MHz BW
<b>Current Limit:</b>	Short circuit protected with automatic recovery.
<b>Start up time:</b>	700 msec. Maximum (After being enabled).
<b>Voltage set point:</b>	± 2.5%.
<b>Line regulation:</b>	± 2.5%.
<b>Load regulation:</b>	± 2.5%.
<b>Temperature regulation:</b>	± 0.02% / °C.
<b>Temperature:</b>	-20°C to +70°C Operating. -40°C to +100°C Non-Operating.
<b>Cooling:</b>	Conduction through cold plate
<b>Package:</b>	Chassis mounted enclosed metal case.
<b>Dimensions:</b>	11.3" H x 9.75" W x 14.75" L (see mechanical drawing).
<b>Weight:</b>	38 lbs. Typical.
<b>Connector:</b>	AC Input Connector: ITT Cannon; PN CA3102R24-22PF80. DC Output Connectors: See mechanical drawing.
<b>Vibration:</b>	Designed to meet MIL-STD-810F, Method 514.5, Procedure I. 4-15 Hz @ 0.030"; 16-25 Hz @ 0.020"; 26-33Hz @ 0.010".
<b>Shock:</b>	Designed to meet MIL-STD-810F, Method 516.5, Procedure I. 40G, 11mSec half sine pulse.
<b>Humidity:</b>	0 – 95% non-condensing.
<b>EMI:</b>	Designed to meet MIL-STD-461F (CE101, CE102 and CS101).
<b>Status:</b>	DC OK Signal, Opto Isolated, Opto on = DC OK.
<b>Enable:</b>	Apply power to enable outputs, Opto Isolated.

**Table 2: Voltage Outputs**

See mechanical drawing.

**Table 3: Input Connector Pin-Out Assignment**

<b>Pin A</b>	Phase A input power
<b>Pin B</b>	Phase B input power
<b>Pin C</b>	Phase C input power
<b>Pin D</b>	Power Ground

**Table 4: Status/Enable Connector Pin-Out Assignment**

<b>1</b>	<b>+5Vdc, 2Amp, Output</b>
<b>2</b>	<b>+5Vdc, 2Amp, Return</b>
<b>3</b>	<b>+5Vdc, 2Amp, Output</b>
<b>4</b>	<b>+5Vdc, 2Amp, Return</b>
<b>5</b>	<b>Spare</b>
<b>6</b>	<b>Spare</b>
<b>7</b>	<b>Enable Output 1 Anode</b>
<b>8</b>	<b>Enable Output 1 Cathode</b>
<b>9</b>	<b>Enable Output 2 Anode</b>
<b>10</b>	<b>Enable Output 2 Cathode</b>
<b>11</b>	<b>Enable Output 3 Anode</b>
<b>12</b>	<b>Enable Output 3 Cathode</b>
<b>13</b>	<b>Status Output 1 Collector</b>
<b>14</b>	<b>Status Output 1 Emitter</b>
<b>15</b>	<b>Status Output 2 Collector</b>
<b>16</b>	<b>Status Output 2 Emitter</b>
<b>17</b>	<b>Status Output 3 Collector</b>
<b>18</b>	<b>Status Output 3 Emitter</b>
<b>19</b>	<b>No Connection</b>

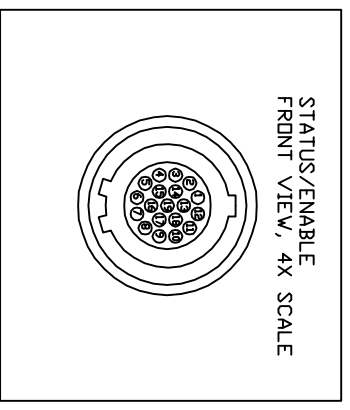
NOTES:  
 1. INTERPRET DIMENSIONS AND TOLERANCES PER ANSI Y14.5M-1994.  
 2. MATERIAL ALUMINUM ALLOY  
 3. FINISH CHEMICAL FILM PER MIL-DTL-5541F, CLASS 3, TYPE II, COLOR CLEAR  
 4. INPUT POWER CONNECTOR (ITT CANNON PNC63102R24-22PF80)  
 1 - PHASE A  
 2 - PHASE B  
 3 - PHASE C  
 4 - CHASSIS GND (TIED TO BASE)  
 5. STATUS/ENABLE - SIGNAL CONNECTOR LEMO PNEG6N2M319XLM)  
 1 - +5V, 2amp, OUTPUT  
 2 - +5V, 2amp, RETURN  
 3 - +5V, 2amp, OUTPUT  
 4 - +5V, 2amp, RETURN  
 5 - SPARE  
 6 - SPARE  
 7 - ENABLE-OUTPUT 1 - ANODE, +5V TO CATHODE = ENABLE  
 8 - ENABLE-OUTPUT 1 - CATHODE, +5V TO CATHODE = ENABLE  
 9 - ENABLE-OUTPUT 2 - CATHODE, +5V TO CATHODE = ENABLE  
 10 - ENABLE-OUTPUT 2 - ANODE, +5V TO CATHODE = ENABLE  
 11 - ENABLE-OUTPUT 3 - CATHODE  
 12 - ENABLE-OUTPUT 3 - ANODE, +5V TO CATHODE = ENABLE  
 13 - STATUS-OUTPUT 1 - COLLECTOR  
 14 - STATUS-OUTPUT 1 - EMITTER  
 15 - STATUS-OUTPUT 2 - COLLECTOR  
 16 - STATUS-OUTPUT 2 - EMITTER  
 17 - STATUS-OUTPUT 3 - COLLECTOR  
 18 - STATUS-OUTPUT 3 - EMITTER  
 19 - NO CONNECTION

DISTRIBUTION CONNECTOR LOCATION

CHAMFERED EDGES

ADDED BLOCKS FOR SIDE STABILITY, 4X

STATUS/ENABLE FRONT VIEW, 4X SCALE



MPM1-4 POWER DUT D38999/24WD18SN

LETTER CONNECTION	
A	#1 +29VDC
B	#1 +29VDC
C	#1 +29VDC
D	#1 +29VDC
E	#1 +29VDC
F	#1 +29VDC
G	#1 +29VDC
H	#1 +29VDC
J	#1 +29VDC
K	#1 +29VDC
L	#1 +29VDC
M	#1 +29VDC
N	#1 +29VDC
P	#1 +29VDC
R	#1 +29VDC
S	#1 +29VDC
T	#1 +29VDC
V	#1 +29VDC
W	#1 +29VDC
X	#1 +29VDC
Y	#1 +29VDC
Z	#1 +29VDC

VXS POWER DUT D38999/24WE6SN

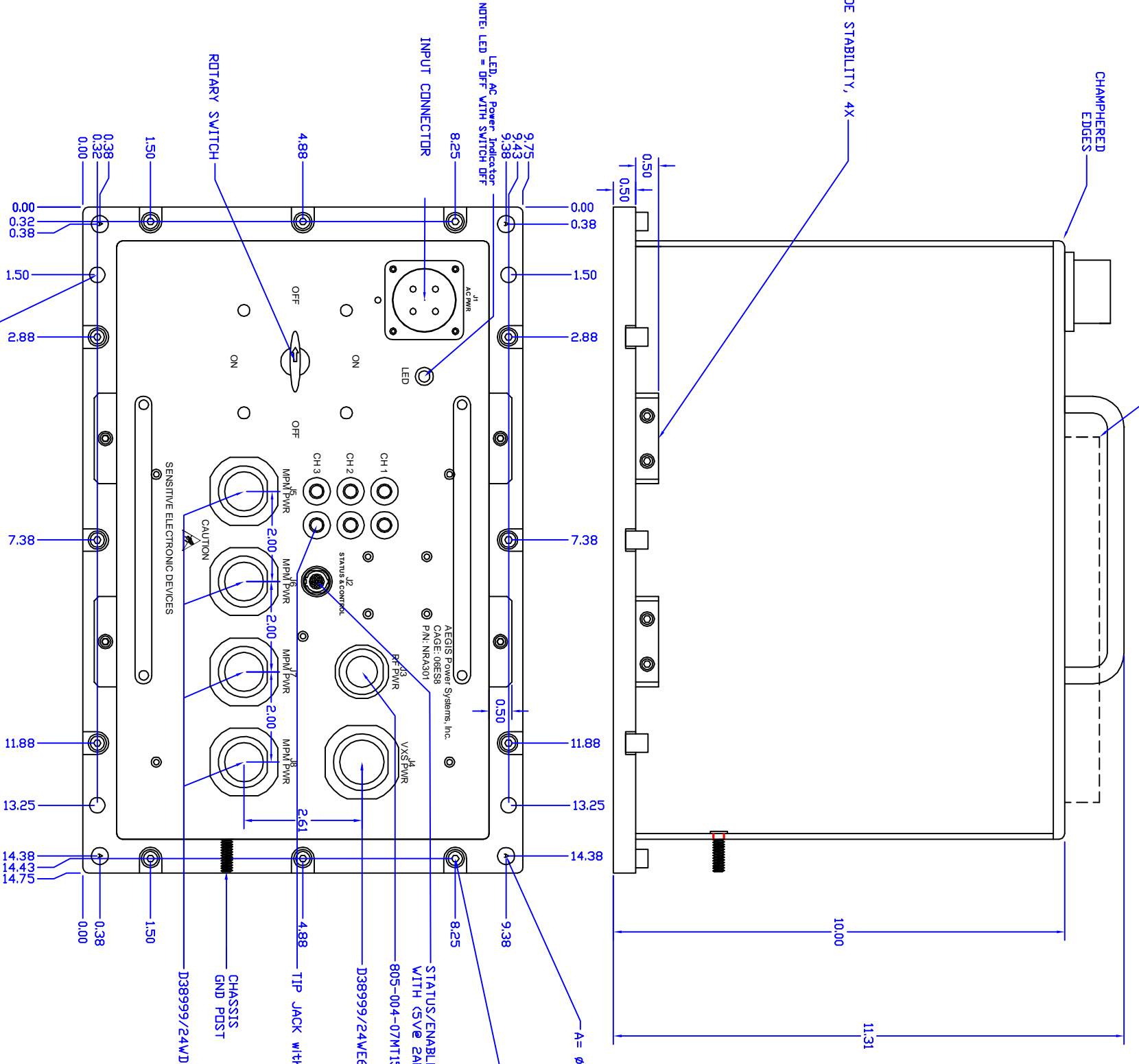
LETTER CONNECTION	
A	#2 +28VDC
B	#2 +28VDC
C	#2 +28VDC
D	#2 +28VDC
E	#2 +28VDC
F	#2 +28VDC

RF POWER DUT 805-004-07MT15-3SA

NUMBER CONNECTION	
1	#3 +28VDC
2	#3 +28VDC
3	#3 +28VDC

TP1-TP6 OUTPUT MONITOR

CONNECTION	TERMINATION
#1 +29VDC	TP1
#1 +29VDC	TP2
#2 +28VDC	TP3
#2 +28VDC	TP4
#3 +28VDC	TP5
#3 +28VDC	TP6



A =  $\phi 0.382^{+0.003 - 0.000}, 4x$

B = FCC2P-032-94 PER DRAWING DN 6/17/13, 12X REMOVE PHILLIPS HEAD AND REPLACE WITH ALLEN CAP PER DRAWING 574594-592 REV -

INSTALL F-0420-5 PEM, INSERT THIS SIDE TAKE CARE NOT TO BULGE EDGE BY PLACING FLAT OF INSERT PARALLEL TO EDGE HOLE DIA 0.344 - 0.000 + 0.003, DD NOT DEBURR CTBR 0.312 DIA X 0.020 DEEP, 4X

ZONE	REV	DESCRIPTION	DATE	APPROVED
A01		INITIAL RELEASE		
B01		JACK SCREWS ADD, BREAKERS REMOVE	2/6/14	NVM
B02		ROUND CORNERS, LEADS, TIP JACK	2/20/14	NVM
B03		D4 and 5, connector location	2/26/14	NVM
B04		REMOVED 5V CONNECTOR	2/27/14	NVM
		PUT 5V ON LEMO		
		SWAPPED 24E6SN WITH 805-004-07MT15		
B05		ADDED MPM, RF, VXS AND TP PINDUTS	4/7/14	TLD
		ADDED ROTARY SWITCH		
		ADDED CHASSIS LUG		
B06		CHANGED SILKSCREEN	11/10/14	TLD
B07		ADDED SECOND ON OFF TO SILKSCREEN	2/12/15	TLD
B08		CHANGED OUTPUT 1 TO 29VDC	8/20/15	TLD
B09		Holes marked A change to .382 +.003/9/13/16		TLD

CAD MAINTAINED. CHANGES SHALL BE INCORPORATED BY THE DESIGN ACTIVITY

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UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES FRACTIONS DECIMALS AND DEGREES * N/A .XX * .02 * 5 .XXX * .005	CONTRACT NO.	AEGIS POWER SYSTEMS MURPHY, NORTH CAROLINA
APPROVALS	DATE	TITLE
DESIGNED	12/17/13	THREE PHASE 4500W MECHANICAL OUTLINE
DRAWN		AEGIS P/N: NRA301
FINISH	SEE NOTE 2	
NEXT ASSY	USED IN	
APPLICATION	DO NOT SCALE DRAWING	
SIZE	FCDM NO.	DWG NO.
D	06ES8	NRA301-M01
SCALE	1/1	SHEET 1 OF 1