

56RS1 SERIES

AC/DC POWER SUPPLY – 300 Watt Single Output



Features

- High Power Density, Low Profile Packaging
- Switching Power Supply – Low Noise
- ESS Screening (Burn-In) and Temperature Cycling
- Designed and Manufactured Per NAVMAT Guidelines
- Full-Mil and COTS-Mil-Type Versions (form, fit, and function identical)
- EMI Filtering Designed to MIL-STD-461
- Remote Error Sensing
- Remote Digital (TTL) Turn On/Off
- Transient Protection per MIL-STD-704

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Description

North Atlantic Industries 56RS1 Series is a high power density, low profile, AC/DC switch mode power supply in a 300 Watt single output configuration. The 56RS1 Series is ideally suited for airborne, shipboard, ground mobile and C³I applications. All North Atlantic Industries AC/DC Power Supplies, as well as DC/DC Converters, are designed and qualified to the most stringent performance and environmental requirements. Full-Mil units receive ESS Screening, including burn-in and temperature cycling.

Electrical Specifications

AC Input Characteristics:

Input	115/220 VAC, See Table 1 and Table 5; 270VDC
Input Frequency Range	47Hz to 440Hz
EMI/RFI Characteristics	Designed to meet the requirements of MIL-STD-461D; CE102
Input Transient Protection	Per MIL-STD-704D; For nominal 115 VAC input: 180 VAC for 0.1 second For nominal 230 VAC input: 292 VAC for 0.1 second
Inrush Current	Limited to 15 times nominal input current

DC Output Characteristics:

Output Power	300 Watts, See Table 2 and Table 3
Output Voltage	5 VDC to 28 VDC, See Table 2
Efficiency	75% minimum
Output Voltage Tolerance	± 1%
Line Regulation	Within 0.1% for low to high line changes at constant load
Load Regulation	0.1% for 0 to 100% of rated load at nominal input line
Power Rating	See Table 3
PARD (Noise and Ripple)	50 mV p-p typical; 100 mV p-p maximum for 5V outputs (20 MHz bandwidth); 1% of the output voltage, with a maximum of 200 mV p-p, for all other outputs (20 MHz bandwidth)

DC Output Characteristics (Continued):

Load Transient Recovery	Output voltage returns to regulation limits within 0.5 msec (typical), half to full load
Load Transient Under/Overshoot	0.35 Volt maximum from nominal output voltage set point for 5 V outputs, all other outputs are 5%
Short Circuit Protection	Under any short circuit condition, continuous short circuit with Auto Recovery
Current Limiting	120% \pm 10% typical
OverVoltage Protection	Automatic electronic shutdown if voltage exceeds 125% \pm 10%
Remote Error Sensing	Compensates for up to 0.5-volt drop on output leads
Remote Turn On/Off	TTL logic 1 inhibits (turns off) the output; a floating input acts as a logic 0 (output on)
Current Share (Optional)	Allows for increased system wattage or redundancy, by connecting 2 or more units (+28vdc and +24Vdc outputs only)
Isolation Voltage	1000 VDC input to output and input to case; 200 VDC output to case (See Page 5)
Insulation Resistance	50 Megohm at 50 VDC

Physical/Environmental Specifications

Temperature Range	Temperature measured at baseplate, conduction-cooled via baseplate only; Operating: -55°C to +85°C; Storage: -55°C to 100°C (See Table 3)
Temperature Coefficient	0.01% per °C
Shock	30 G's each axis, per MIL-STD-810C, Method 516.2, Procedure 1. Hammer shock per MIL-S-901C
Acceleration	6 G's per MIL-STD-810C, Method 513.2, Procedure 11, and 14 G's per Procedure 1
Vibration	Per MIL-STD-810C, Method 514.2, Procedure 1A
Reliability (MTBF)	766,000 hours, ground benign, at 50°C baseplate
Humidity	95% at 71°C per MIL-STD-810C, Method 507.1 (non-condensing)
Altitude	40,000 feet per MIL-STD-810C, Method 504.1, Category 6 Equipment
Dimensions	See Table 6
Salt & Fog	Per MIL-STD-810C, Method 509.1
Sand/Dust/Fungus	Per MIL-STD-810C
Enclosure	Aluminum housing to aluminum baseplate (See Table 6)
Finish	Cover: Black anodized; Baseplate: chemfilm
Interface	Connections via D-subminiature connector (S) per Page 2 of this Data Sheet and Table 4
Weight	38 ounces max

Table 1. Inputs

100 – 126 VAC; 47 – 440 Hz; 1 Phase
100 – 126 VAC; 47 – 440 Hz; 3 Phase Delta
100 – 126 VAC; 47 – 440 Hz; 3 Phase, 4 Wire Wye
200 – 252 VAC; 47 – 440 Hz; 1 Phase
200 – 252 VAC; 47 – 440 Hz; 3 Phase Delta
270VDC

Table 2. Output Power/Voltage/Current

Watts	Volts	Amps
300	5	60
300	12	25
300	15	20
300	24	12.5
300	28	10.7

Connector Specifications

DC Output Voltage	Unit Connector Series	Mating Connector Series
5 V, 12 V, and 15 V	DEMM9PL	DEMAM9S
	CBM13W6F57R8000	CBM13W6M00000
24 V and 28 V	DCMME37PR	DCMM37S

Table 3. Power Ratings At 300 Watts

Input Power	@ 71°C	@ 85°C
115 VAC; 1 Phase	100%	75% ^{*note}
115 VAC; 3 Phase Delta	100%	100%
115 VAC; 3 Phase, 4 Wire Wye	100%	100%
230 VAC; 1 Phase	100%	100%
230 VAC; 3 Phase Delta	100%	100%
270 VDC	100%	100%

*note: Applies only to +5vdc, +12vdc and +15vdc outputs

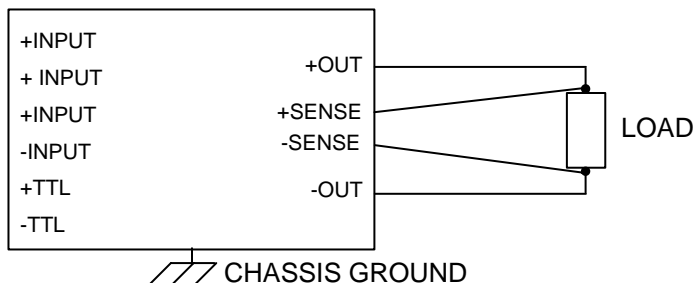
Table 4. Pinout Designations

FOR 5 VOLT, 12 VOLT, AND 15 VOLT OUTPUT POWER SUPPLIES							
9 PIN CONNECTOR (J1)		13 PIN CONNECTOR (J2)					
Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	INPUT A	A1	-OUTPUT	1	+SENSE		
2	INPUT B	A2	-OUTPUT	2	+TTL (ON/OFF)		
3	INPUT C	A3	-OUTPUT	3	N/C		
4	INPUT N	A4	+OUTPUT	4	N/C		
5	CHASSIS GROUND	A5	+OUTPUT	5	-SENSE		
6	INPUT A	A6	+OUTPUT	6	-TTL (ON/OFF)		
7	INPUT B			7	N/C		
8	INPUT C						
9	INPUT N						
FOR 24 VOLT AND 28 VOLT OUTPUT POWER SUPPLIES – 37 PIN CONNECTOR (J1)							
Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	PHASE A	11	N/C	20	PHASE A	29	-TTL (ON/OFF)
2	N/C	12	CURRENT SHARE	21	PHASE B	30	N/C
3	PHASE B	13	+SENSE	22	N/C	31	-SENSE
4	PHASE C	14	+OUTPUT	23	PHASE C	32	+OUTPUT
5	N/C	15	+OUTPUT	24	NEUTRAL	33	+OUTPUT
6	NEUTRAL	16	+OUTPUT	25	N/C	34	+OUTPUT
7	N/C	17	-OUTPUT	26	N/C	35	-OUTPUT
8	N/C	18	-OUTPUT	27	CHASSIS GND	36	-OUTPUT
9	N/C	19	-OUTPUT	28	N/C	37	-OUTPUT
10	+TTL (ON/OFF)						

Table 5. Input Connections for J1 Connector (In Conjunction with Table 4)

AC Input Type	5 V, 12 V and 15 V Output	24 V and 28 V Output
115 VAC, 1 Phase	1 & 6, 4 & 9 (Neutral)	1 & 20, 6 & 24 (Neutral)
115 VAC, 3 Phase Delta	1 & 6, 2 & 7, 3 & 8	1 & 20, 3 & 21, 4 & 23
115 VAC, 3 Phase Wye	1 & 6, 2 & 7, 3 & 8, 4 & 9 (Neutral)	1 & 20, 3 & 21, 4 & 23, 6 & 24 (Neutral)
230 VAC, 1 Phase	1 & 6, 2 & 7	1 & 20, 3 & 21
230 VAC, 3 Phase Delta	1 & 6, 2 & 7, 3 & 8	1 & 20, 3 & 21, 4 & 23
270 VDC	1 & 6 (Positive), 2 & 7 (Return)	1 & 20 (Positive), 3 & 21 (Return)

Output Wiring Diagram



Mechanical Layout

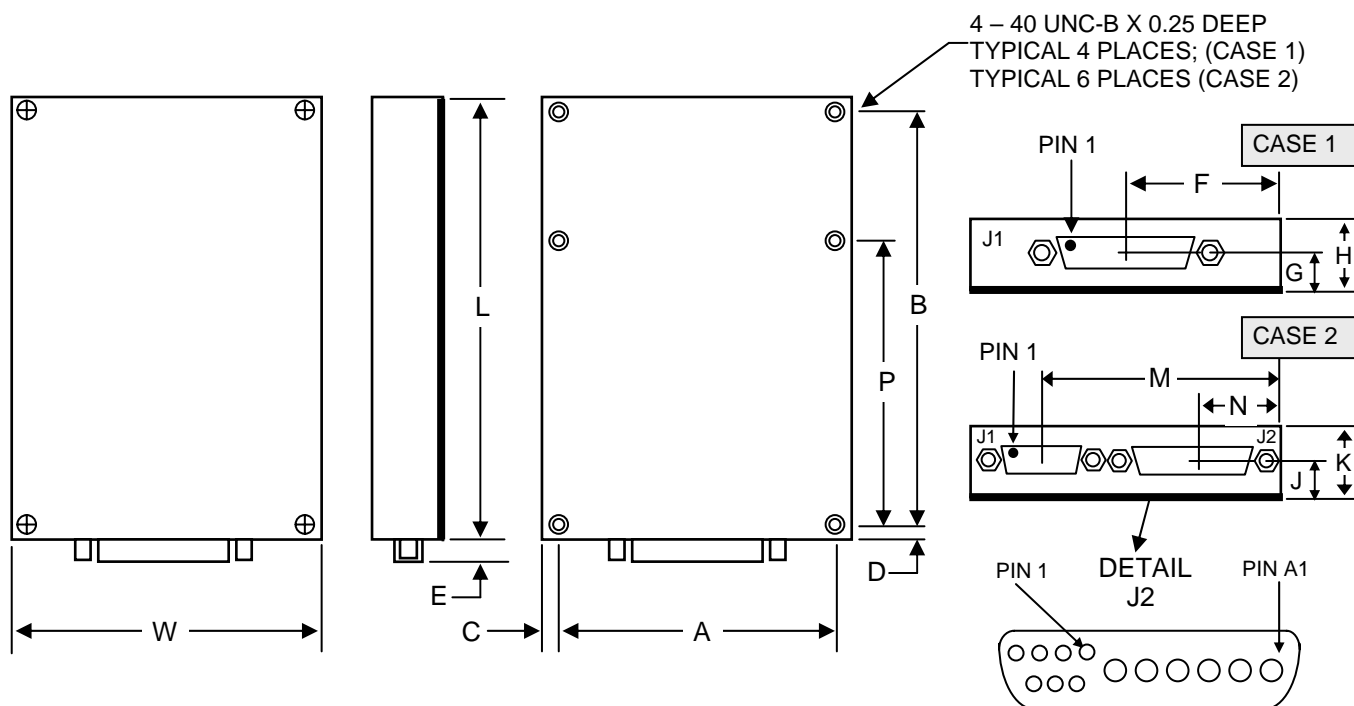


Table 6. Mechanical Dimensions

CASE*	UNITS	W	L	A	B	F
1	Inches	5.50	6.90	5.10	6.50	2.75
1	mm	139.7	175.3	129.5	165.0	69.8
2	Inches	5	7.25	4.6	6.85	N/A
2	mm	127	184	117	174	N/A

*For 24V, 28V – Use Case 1; For 5V, 12V, 15V – Use Case 2

**Consult Factory for Dimensions

Notes:

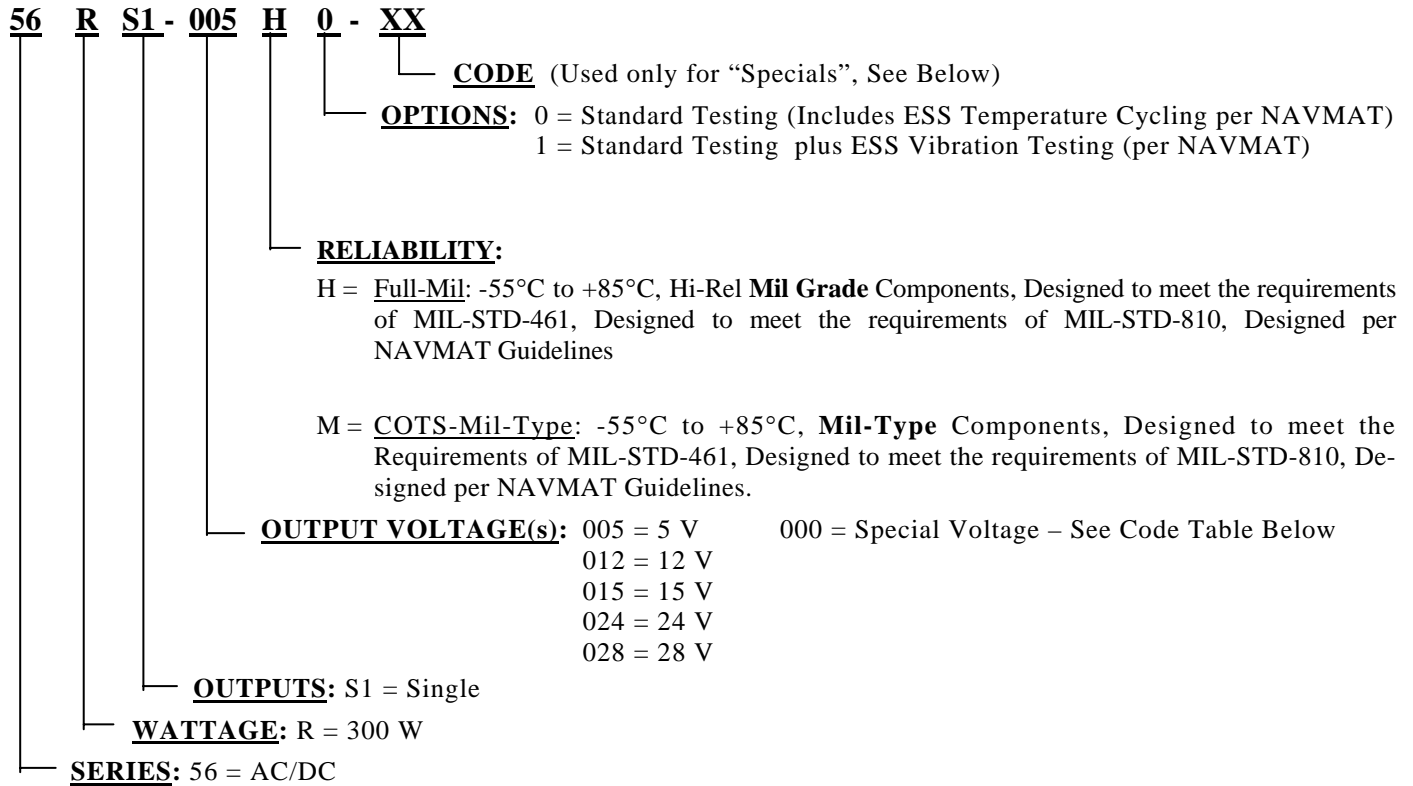
Dimensions C & D: 0.2” (5.1 mm)
 Dimension E: 0.23” (5.84 mm)
 Dimension G: 0.455” (11.56 mm)
 Dimension H: 0.85” (21.6 mm)
 Dimension J: 0.536” (13.61 mm)

Dimension K: 0.85” (21.6 mm)
 Dimension M: 3.94” (100.1 mm)
 Dimension N: 1.82” (46.2 mm)
 Dimension P: 4.92” (124.9 mm)

Tolerances are 0.03” (0.76mm)
 Except as stated below

DIM	TOLERANCE
A	0.01” (0.25mm)
B	0.01” (0.25mm)

Ordering Information for 56RS1 Series (300 Watt Single AC/DC Power Supply)



Example: 56RS1-005H1 = Series 56; 300 Watt; Single Output; +5 V; Full-Mil-Type; ESS Vibration Testing
56RS1-012M0 = Series 56; 300 Watt; Single Output; +12 V; COTS-Mil-Type; Standard Testing

Consult Factory for Additional Options and/or Special Units

Code Table for “Specials”

Code	Code Description
01	Isolation Voltage, 1500 VDC for input to output, output to case and input to case
02	Current share option installed. This option is available for units with +28vdc and +24Vdc outputs only
03	56RS1-028xx-03 15 Amp minimum current limit.
04	Input 115VAC, 3 phase delta, 47-440Hz Single output of 12vdc @ 25A with modifications for compliance with Input and Frequency transients per below description. Uses "case 2" dimensions per specification sheet for model 56RS1. 1. Input Voltage Transients Maximum change relative to 115V: +/-20% (138V-92V) Time to reach maximum change: 0.001 - 0.03 seconds Maximum time to recover to within 5%: 2 seconds 2. Input Frequency Transients Maximum change relative to fundamental: +/-5.5% Time to reach maximum change: 0.1 - 1 second Maximum time to recover to within 5% of fundamental: 2 seconds