

## M1156 Series– AC/DC Power Supply

# M1156 SERIES

### PRELIMINARY

**COMPACT, HIGH DENSITY, HIGH EFFICIENCY, SINGLE OUTPUT,  
THREE-PHASE AC / DC CONVERTERS**  
Up to 500 W



#### Applications

Military (Airborne, ground-fix, shipboard), Ruggedized, Telecom, Industrial Power Supply

#### Special Features

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote Inhibit (On/Off)
- Fixed internal switching freq.
- External sync. capability
- Power factor 0.8-0.9 @ full load
- EMI filters included
- Non-latching protections:
  - Overload / short-circuit
  - Over temperature

#### Electrical Specifications

##### AC Input

Voltage range:  
115 (103-127)\* V<sub>AC,L-N</sub> 50/60/400 Hz, 3-phase  
per MIL-STD-704A.

\*Optional extended range:  
(95-140 V<sub>AC</sub>) Consult factory

##### Line/Load regulation:

Less than ±1% (low line to high line voltage, no load to full load, -55 °C to +85 °C).

##### Ripple and Noise:

50-150 mV<sub>p-p</sub>, typical (max. 1%) without external capacitance. Additional load capacitance reduces ripple significantly.

##### DC Output

Voltage range: 5 to 50 V<sub>DC</sub>  
Current: 0 to 25 A  
Power output: 0 to 500 W

##### Efficiency

90% - Typical (full load, room temperature)

##### Turn on Transient

No Voltage over shoot during power on.

##### Isolation

Input to Output: 500 V<sub>DC</sub>  
Input to Case: 500 V<sub>DC</sub>  
Output to Case: 100 V<sub>DC</sub>

##### EMC

Designed to meet<sup>†</sup> MIL-STD-461F (CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103) with M1289 line filter

Designed to also meet CE101 with M1289 line filter, for loads up to 200W.

#### Protections \*\*

##### General

##### • Over temperature protection

Shutdown at base plate temperature of +105 °C ± 5 °C. Automatic recovery at base plate temperature lower than +95 °C ± 5 °C.

##### Output

##### • Passive transorb on outputs

20% above nominal voltage.

##### • Current limiting

Continuous protection (10-30% above maximum current) for unlimited time.

\*\* Thresholds and protections can be modified / removed – please consult factory.

† Compliance achieved when tested with shielded cables and static resistive load

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<b><i>Environmental Conditions</i></b>		
Designed to meet MIL-STD-810F		
<b><u>Temperature</u></b> Operating: –55 °C to +85 °C (at baseplate) Storage: –55 °C to +125 °C (ambient)	<b><u>Altitude</u></b> Method 500.4 Procedure I (non-operational): Up to 70,000 ft. Procedure II (operational): Up to 40,000 ft.	<b><u>Salt Fog</u></b> Method 509.4
<b><u>Humidity</u></b> Method 507.4 Up to 95% RH	<b><u>Vibration</u></b> Method 514.5 Category 24 - General minimum integrity exposure 1 hour per axis	<b><u>Shock</u></b> Method 516.5 Saw-tooth, 20 g peak, 11 ms.

***Reliability***

At least 150,000 hours.  
 Calculated IAW MIL-HDBK-217F Notice 2 with +85 °C baseplate temperature at Ground Fix conditions.

***Environmental Stress Screening (ESS)***

Including random vibration and thermal cycles is also available. **Please consult factory for details.**

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## Pin Assignment

### J1 - Input Connector

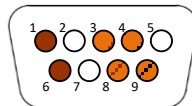
Connector type: M24308/24-37F or eq.

Mating connector type: M24308/2-1F or eq.

Pin #	Function	
1	Phase A	●
2	N.C.	
3	Phase B	●

Pin #	Function	
4	Phase C	●
5	Chassis	
6	Phase A	●

Pin #	Function	
7	N.C.	
8	Phase B	●
9	Phase C	●



### J2 - Output Connector

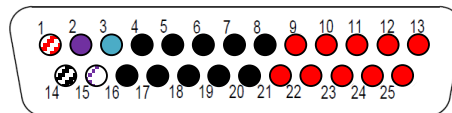
Connector type: M24308/23-39F or eq.

Mating connector type: M24308/4-3F or eq.

Pin #	Function	P	
1	SENSE	+	●
2	SYNC	+	●
3	INHIBIT	+	●
4	OUT RTN	-	●
5	OUT RTN	-	●
6	OUT RTN	-	●
7	OUT RTN	-	●
8	OUT RTN	-	●
9	OUT	+	●

Pin #	Function	P	
10	OUT	+	●
11	OUT	+	●
12	OUT	+	●
13	OUT	+	●
14	SENSE RTN	-	●
15	SYNC RTN	-	●
16	OUT RTN	-	●
17	OUT RTN	-	●
18	OUT RTN	-	●

Pin #	Function	P	
19	OUT RTN	-	●
20	OUT RTN	-	●
21	OUT	+	●
22	OUT	+	●
23	OUT	+	●
24	OUT	+	●
25	OUT	+	●



**Note:** All output pins with same designation should be connected together for best performance.

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### Functions and Signals

#### **INHIBIT** (connector J2, pin 3)

Description: The **INHIBIT** signal is used to turn the power supply ON and OFF.

Operation: Applying “1” or leaving open will turn the power supply ON.  
Applying “0” or shorting this pin to **OUT RTN** will turn the power supply OFF.  
For constant operation, leave this pin unconnected.

Signal Type: 5V TTL or dry contact (open/short).

Return line: This signal is referenced to **OUT RTN** (connector J2, pins 4-8, 16-20).

#### **SYNC** (connector J2, pin 2)

Description: The **SYNC** signal can be used to allow the power supply switching frequency to synchronize with a system clock.

Operation: Apply a square wave clock with frequency in the range of 250 kHz  $\pm$  10 kHz and duty-cycle of 50%  $\pm$  10%, TTL level.  
If not required, leave open. The power supply will work at 250 kHz  $\pm$  10 kHz (internal clock).

Signal Type: 5V TTL

Return line: This signal is referenced to **SYNC RTN** (pin 15).

#### **SENSE** (connector J2, pin 1)

Description: The **SENSE** function is used to achieve accurate load regulation at load terminals.

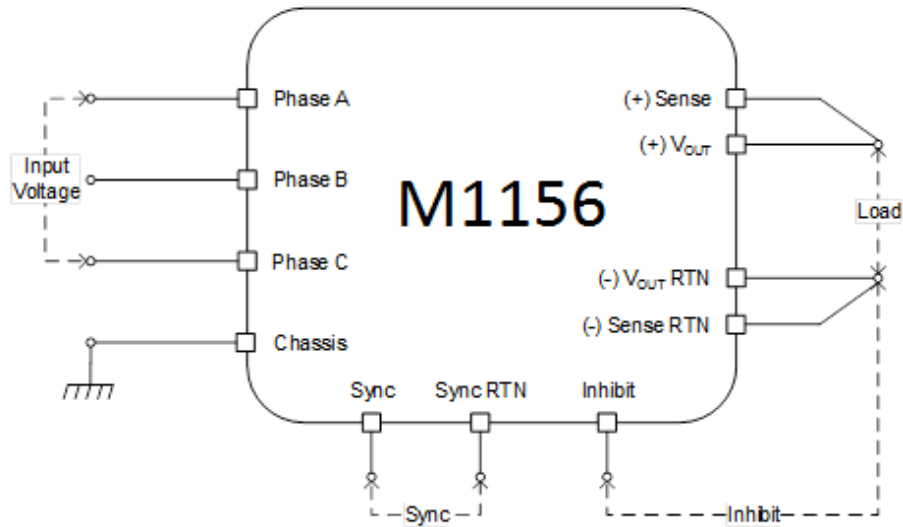
Operation: Connect the pins directly to the load terminals.  
The correction ability is limited to 2 to 10% of nominal voltage output, and up to 2 V.  
Note that if sense correction function is not needed, the sense lines must be shorted to their respective output pins: **SENSE** (pin 1) to **OUT** pins (9-13, 21-25) and **SENSE RTN** (pin 14) to **OUT RTN** (pins 4-8, 16-20).

Signal Type: 5V TTL

Return line: This signal is referenced to **SENSE RTN** (connector J2, pin 14).

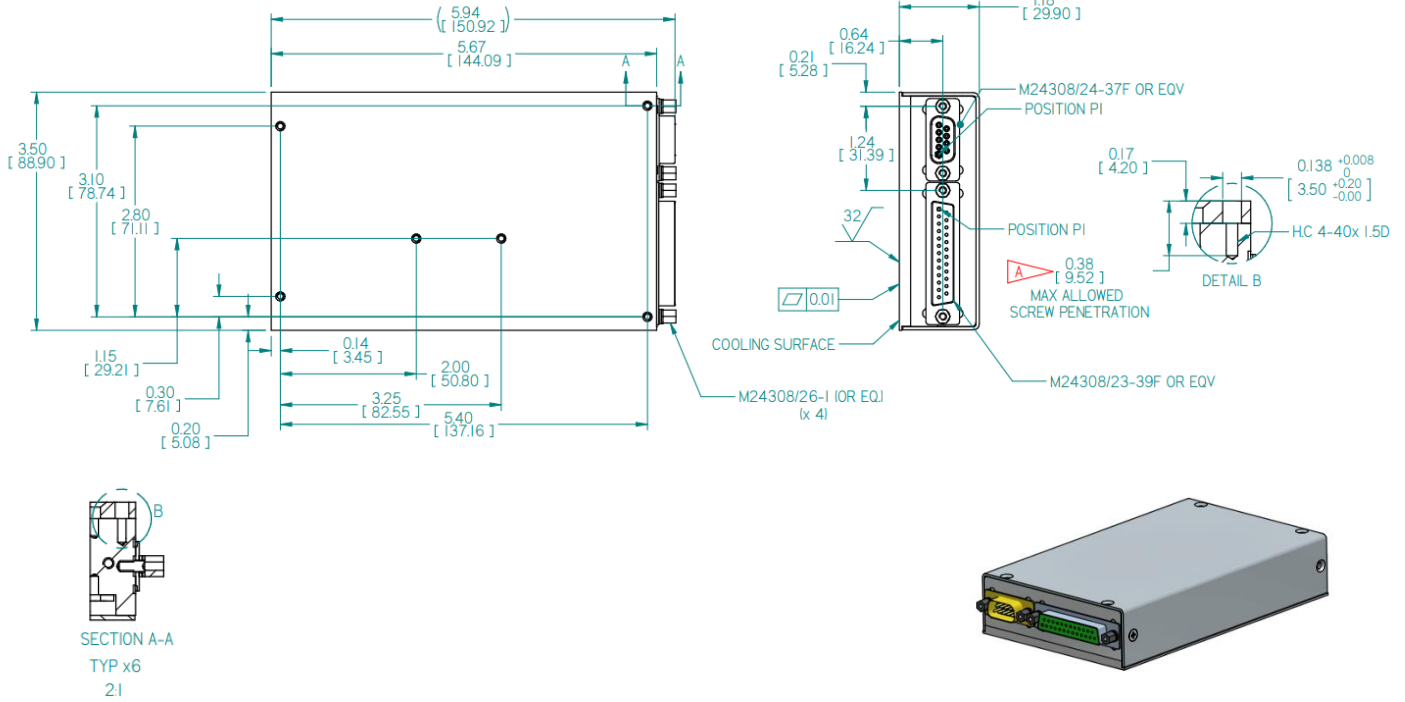
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*Typical Connection Diagram*



**M1156 Series– AC/DC Power Supply**

**Outline Drawing**



**NOTES :**

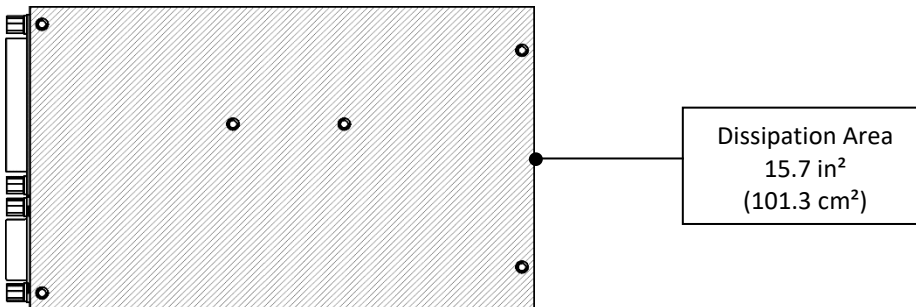
1. HEAT DISSIPATION AREA - TOTAL AREA 19.1 IN<sup>2</sup>
2. WORKMANSHIP SHALL BE MIL-STD-454, REQT. 9
3. MTL. AL 6061-T651& AL 5052-H32
4. CONVERSION COATING PER MIL -C-5541 CL IA

UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCH [MM].  
TOLERANCES ARE:

DECIMALS	ANGLES
.XX ± 0.02	± 5°
.XXX ± 0.01	

DO NOT SCALE DRAWING

**Heat Dissipation Surface**



**Notes**

1. Dimensions are in Inches [mm]
2. Tolerance is:  
.XX ± 0.02 IN  
.XXX ± 0.01 IN
3. Weight: Approx. 1.534 lbs [696 g]

# M1156 Series– AC/DC Power Supply

## Standard Variants

Part number	Normal input voltage range	Output configuration
M1156-100	103 to 127 V <sub>AC</sub> / 50 to 400 Hz	5 V <sub>DC</sub> / 20 A
M1156-101	103 to 127 V <sub>AC</sub> / 50 to 400 Hz	12 V <sub>DC</sub> / 20 A
M1156-102	103 to 127 V <sub>AC</sub> / 50 to 400 Hz	15 V <sub>DC</sub> / 20 A
M1156-103	103 to 127 V <sub>AC</sub> / 50 to 400 Hz	24 V <sub>DC</sub> / 20 A
M1156-104	103 to 127 V <sub>AC</sub> / 50 to 400 Hz	28 V <sub>DC</sub> / 18 A
M1156-105	103 to 127 V <sub>AC</sub> / 50 to 400 Hz	48 V <sub>DC</sub> / 10.4 A

***Note: Specifications are subject to change without prior notice by the manufacturer***