

M1965 SERIES

TRIPLE-OUTPUTS OR SINGLE OUTPUTS, 130W 1-PHASE AC TO DC POWER SUPPLY

The M1965 is a series of mechanically robust, base plate cooled, high performance, 130W triple or single output AC to DC power supplies, for Navy shipboard, Airborne, and ground applications.

The M1965 converts 85VAC – 265VAC, 50/060/400Hz, to three or one well-regulated, filtered and protected DC Outputs.

The product meet MIL-STD requirements (specified herein).



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Standard Models List (for other voltages – consult factory)

Part number	Input	Output 1		Output 2		Output 3	
		Voltage	Voltage	Voltage	Current	Voltage	Current
M1965-100	85-265VAC Single Phase 50/60/400Hz	12V	3A	12V	3A	5V	8A
M1965-101	85-265VAC Single Phase 50/60/400Hz	28V	2A	28V	2A	3.3V	5A
M1965-102	85-265VAC Single Phase 50/60/400Hz	5V	5A	5V	5A	5V	8A

- Additional standard configurations available. **Contact factory for more details.**
- All our products can be configured to comply with EU REACH regulations. **Contact factory for more details.**

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THE MAIN FEATURES OF THE M1965 ARE:

- AC/DC Triple outputs power supply up to 130W
- 85 to 265VAC Standard Input version
- Miniature size
- High efficiency
- High power factor (up to 96%)
- Input / Output isolation
- Fixed switching freq. (450 kHz for output converters)
- EMI filters included
- Remote inhibit (On/Off)
- Limited inrush current
- Non-latching protections:
- Overload/short-circuit
- Over temperature

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SPECIFICATIONS:

AC Input	Voltage Range	Option 1: 85 to 265 V _{AC} ; 50/60Hz; Single-phase Option 2: 103 to 127 V _{AC} ; 400Hz ; Single-phase For 440V _{AC} input version - Please contact factory for more details				
	Transient	Work through 80V and 180V IAW MIL-STD-704F figure 3				
	Isolation	Input to Output: 500 VDC Input to Case: 500 VDC				
	Input transient	Voltage overshoot at during power on is less than 3% nominal voltage.				
	Input Current Harmonics	Meets current harmonics requirements of MIL-STD-1399:300B and EN 61000-3-2 Classes A, B and D.				
DC Output	OUTPUT RANGE	Out #	Option	Voltage Range	Max current	Max Power
		1	A	0.8-12V	5A	60W
			B	0.8-40V	3.5A	
		2	A	0.8-12V	5A	60W
			B	0.8-40V	3.5A	
		3	A	0.6-5V	8A	40W
			B	0.6-5V	16A	80W
	Voltage Regulation	Less than ±1% (no load to full load, –40 °C to +85 °C at baseplate).				
	Ripple & Noise	100÷150 mVp-p, typical (max. 1%) without external capacitance.				
	Isolation	Output to Case: 100 VDC Output to Output: 100 VDC				
	Current Limit & Overload	Overload / short-circuit protection Continuous protection (constant current) for unlimited time.				
	Efficiency	83% Typical (at nominal input voltage, full load, room temperature)				
	Overvoltage Protection	Passive transorbs selected at 120%± 10% of nominal voltage.				
	Over Temp. Protection	Shutdown at baseplate temperature of +105 °C ± 5 °C. Automatic recovery when baseplate temperature returns to +95 °C ± 5 °C.				
	Line/Load regulation	Less than ±1% (no load to full load, –40 °C to +85 °C at baseplate).				

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Specifications (Cont.):

Control & Indication	ON/OFF Input	<p>The INHIBIT signal is used to turn the power supply ON and OFF. The internal 20kΩ pullup, voltage is 3.3V typical and the IPULLDOWN current to RTN needed to turn on the PSU is 165μA Typical.</p> <p>Table 1 – Inhibit Functionality</p> <table><tr><td></td><td>Inhibit logic</td></tr><tr><td>'ON'</td><td>V > 2.4V or Inhibit = 'OPEN'</td></tr><tr><td>'OFF'</td><td>Inhibit = 'SHORT' or V < 0.8V</td></tr></table> <p>The INHIBIT signal is floating from output return.</p> <p>Additional optional ON/OFF inputs: Enable OR 28V between Inhibit pin to signal RTN to active the power supply (output turned on) - Please consult factory.</p>		Inhibit logic	'ON'	V > 2.4V or Inhibit = 'OPEN'	'OFF'	Inhibit = 'SHORT' or V < 0.8V
		Inhibit logic						
	'ON'	V > 2.4V or Inhibit = 'OPEN'						
	'OFF'	Inhibit = 'SHORT' or V < 0.8V						
PS_OK	<p>The PS OK signal indicates the status of the output voltage. When the output voltages rise above 90% ± 5% of its nominal value, "PS OK" will be pulled down to pin 6 through a 100 Ω ± 1% resistor phototransistor.</p> <p>When one of the output voltages falls below 90% ± 5% of its nominal value, "PS OK" will be in high impedance mode.</p> <p>If not used, leave the signal unconnected.</p> <p>Return line: This signal is referenced to PS_OK_RTN and is floating from all other pins.</p>							
SYNC	<p>The SYNC signal is used to allow the power supply frequency to sync with the system frequency. SYNC frequency can be 250 ± 10 kHz, TTL level. When left open, the power supply will work at 250 ± 10 kHz (internal clock).</p>							
SIGNAL RTN	<p>INHIBIT and SYNC signals are referenced to this pin. This pin is referenced to VIN RTN.</p>							

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Environment Designed to meet MIL- STD-810F	Temperature	Methods 501.4 & 502.4 Operating: –40°C to +85 °C (at baseplate) Storage: –55 °C to +125 °C (ambient)
	Humidity	Method 507.4 Up to 95% RH
	Salt-fog	Method 509.4
	Altitude	Method 500.4 Procedures I – up to 70,000 ft. (non-operational) Procedure II – up to 40,000 ft. (operational)
	Mechanical Shock	Method 516.5 20 g, 11 ms terminal peak saw-tooth
	Vibration	Method 514.5 General minimum integrity exposure IAW Figure 514.5C-17 1 hour per axis.
	Fungus	Does not support fungus growth, in accordance with the guidelines of MIL-STD-454, Requirement 4
EMI	Designed to meet* MIL-STD-461F	CE102-1 (115V limit), CS101, CS114, CS115, CS116, RE102 (44bdµV/m), RS103 (50V/m), CE101-4 curve #1, RE101-1 and RS101.
Reliability	100,000 hours, calculated per MIL-STD-217F Notice 2 at +85 °C baseplate, Ground Fix conditions.	
Cooling Requirements	The M1965 is a baseplate cooled unit. The base of the M1965 should be thermally attached to suitable heatsink that maintains it below +85 °C.	
Form factor	4" wide, 5.194" high and 0.79" deep. For detailed dimensions and tolerances see Drawing: M1965001	
Weight	470g typical	
Connectors	See page 7	

* Compliance dependent on specific configuration and is achieved when using shielded interconnection cable.

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PIN ASSIGNMENT: J2 - OUTPUT CONNECTOR

Connector type:- M24308/23-27F OR EQ.

Function	Pin No.
ENABLE	13
SYNC	25
SIGNAL RTN	12
PS_OK	24
PS_OK RTN	11
OUT 3	8,9,10,21,22,23
OUT 3 RTN	5,6,7,18,19,20
OUT 2	4,17
OUT 2 RTN	3,16
OUT1	2,15
OUT1 RTN	1,14

PIN ASSIGNMENT: J1 - INPUT CONNECTOR

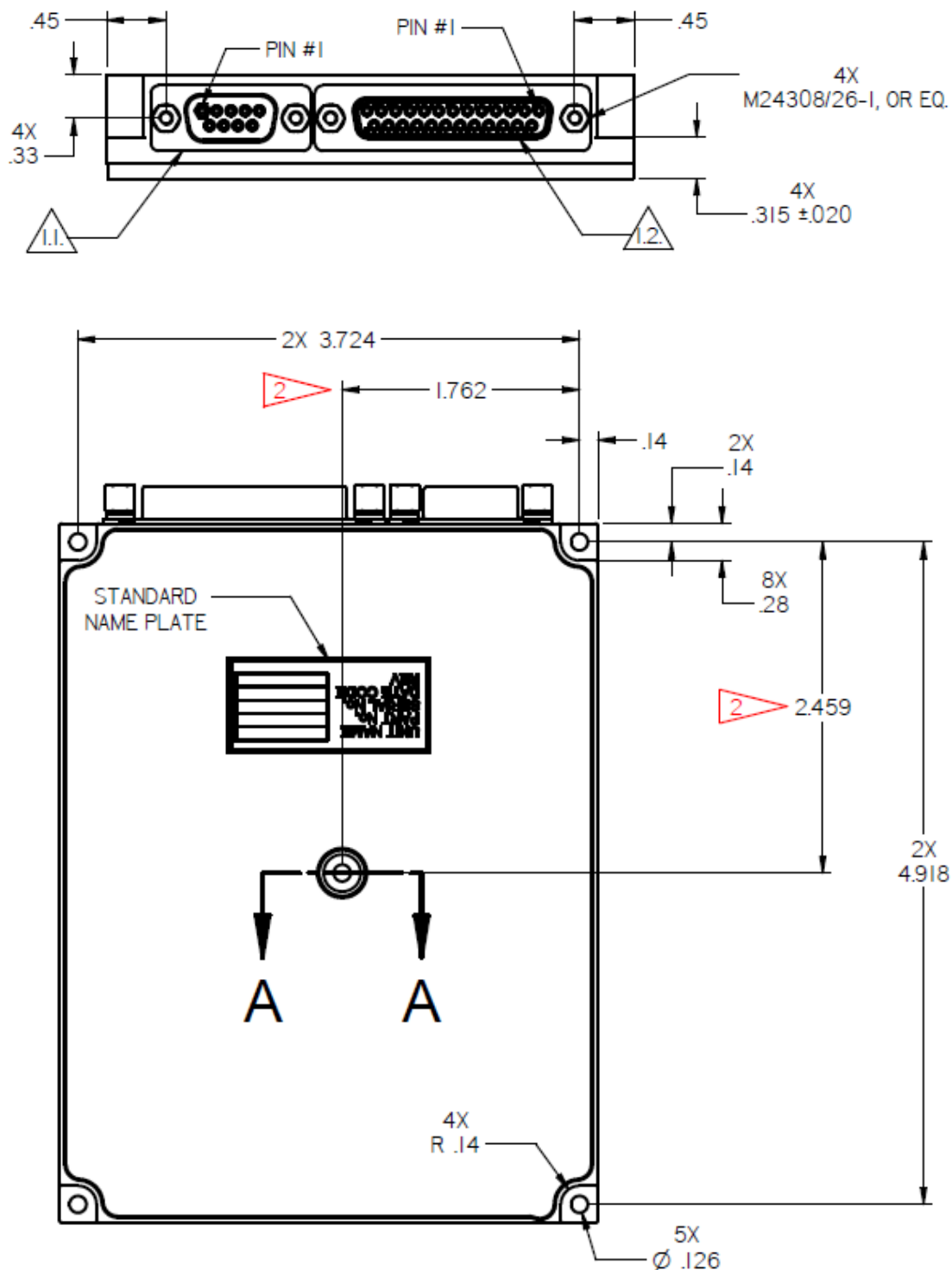
Connector type - M24308/24-31F OR EQ.

Function	Pin No.
Line	1
N.C	6,2,7,8,4,9
Neutral	3
Ground	5

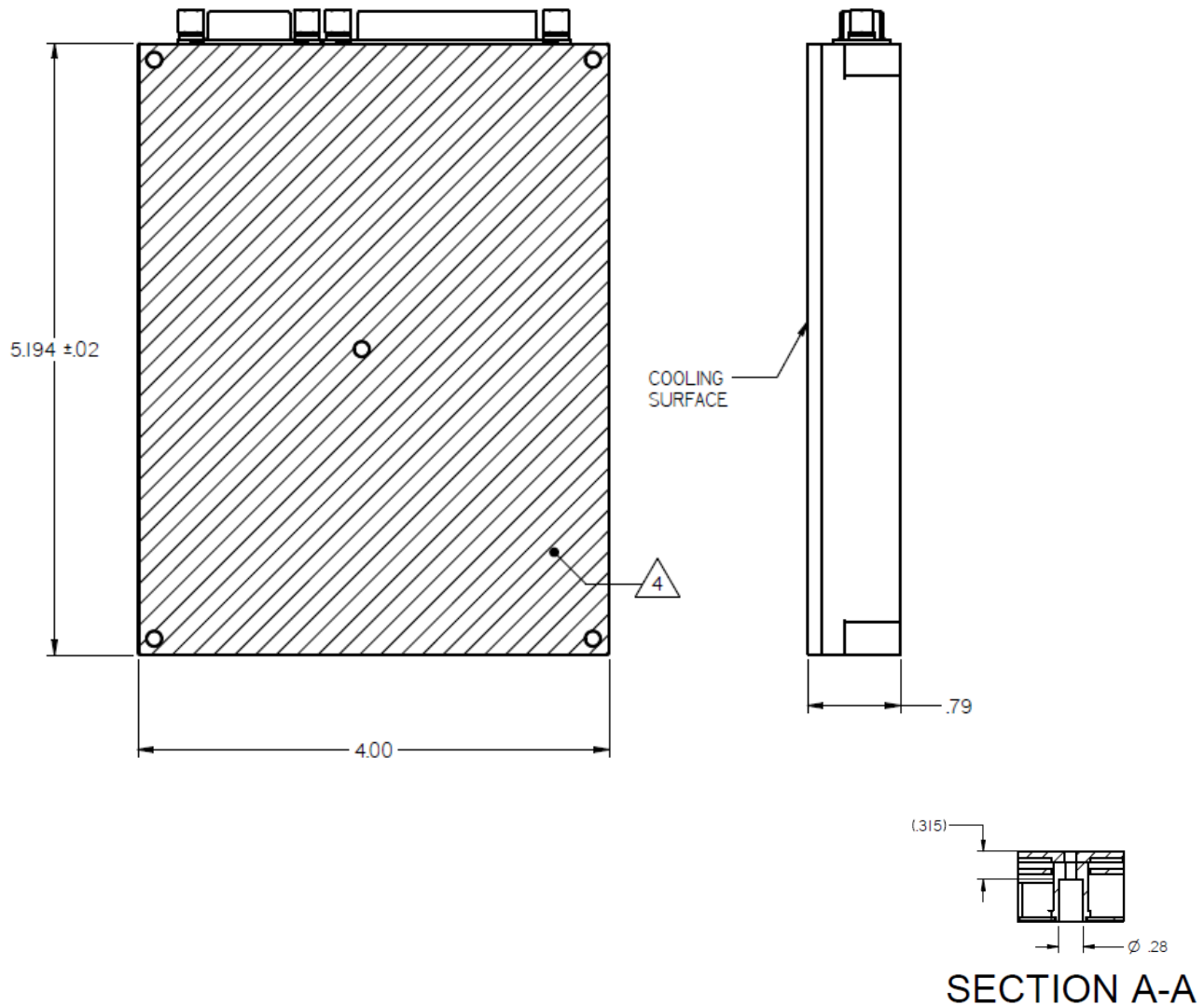
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OUTLINE DRAWING

For detailed dimensions and tolerances see Drawing: M1965001



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NOTES :

1. CONNECTORS LIST:

I.1. INPUT CONNECTOR: D-TYPE 9M, M24308/24-31F OR EQ.

2. I.2. OUTPUT CONNECTOR: D-TYPE 25F, M24308/23-27F OR EQ.

2. MTL. AL 6061-T65I, AL 5052-H32.

3. FINISH: CHROMATE CONVERSION COATING PER MIL -DTL-554I, LAST REVISION, TYPE I, CLASS IA, OR EQ.

4. HEAT DISSIPATION AREA: $20.2 \text{ [IN}^2\text{]}$.

5. WORKMANSHIP SHALL BE MIL-STD-454, REQ. 9.

Please note: Specifications are subject to change without prior notice by the manufacturer.