Amphenol
MILITARY HIGH SPEED

CF-02EM4252
DC/AC INVERTER

DESCRIPTION:

The M4252 Series is a compact, high-efficiency inverter solution designed for applications requiring reliable power conversion. It features a wide input range and provides robust input/output isolation. The inverter operates at a fixed switching frequency of 250 kHz and includes external synchronization capability. Built-in EMI filters enhance noise suppression, while non-latching protections guard against overload, short-circuit, over-voltage, and over-temperature conditions. Additionally, the M4252 Series offers a remote inhibit function for convenient on/off control.

APPLICATIONS:

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

FEATURES

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Remote Inhibit (On/Off)
- Fixed switching freq. (250 kHz)
- External sync. capability
- EMI filters included
- Non-latching protections:
    - o Overload/Short-Circuit
    - o Over-voltage
    - o Over temperature

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HOW TO ORDER

Part number	Input	Output		
	Voltage Input Range	Voltage	Frequency	Current
CF-02EM4252-1	18 to 70 VDC	115 VAC	50/60/400Hz	3 A
CF-02EM4252-2	18 to 70 VDC	115 VAC	50/60/400Hz	3 A

SPECIAL FEATURES

- CF-02EM4252-2: this variant is REACH Compliant
- CF-02EM4252-2: The aluminum parts comprising this variant are chromate conversion coated per MIL-DTL-5541F, Type II CLASS 1A or eq.
- CF-02EM4252-2: The shell of the connectors are Zinc:
- J1 - Input connector: M24308/24-39Z
- J2 - Output connector: M24308/23-39Z

PRODUCT SPECIFICATIONS:

ELECTRICAL SPECIFICATIONS	
DC Input	Normal range: 18 to 70 VDC
Output Voltage Regulation	Less than ±3% (no load to full load, –40°C to +85°C).
AC Output	Voltage range: 75 to 115 VAC Current range: 0 to 3.5 A Power range: 0 to 350 VA Optional Peak power: 500 VA for 45 sec Please consult factory for details. Frequency: 50 / 60 / 400 Hz
Output Waveform	Sinusoidal with max 5% (for 50,60Hz) and 7% (for 400Hz) harmonic distortion into a resistive load.
Efficiency	82 ± 1% - Typical (115 VAC /400 Hz output, full load, room temperature) 79 ± 1% - Typical (115 VAC /50/60 Hz output, full load, room temperature)
Isolation	Input to Output: 200 VDC Input to Case: 200 VDC Output to Case: 500 VDC
EMC	Designed to meet† MIL-STD-461F: CE101, CE102, CS101, CS114, CS115, CS116, RE101, RE102, RS101, RS103
Turn-On Transient	Soft Start – no voltage overshoot.

PROTECTIONS	
Input	Under Voltage Lock-Out Unit shuts down when input voltage falls below 17 VDC ± 1V
	Over Voltage Lock-Out Unit shuts down when input voltage exceeds 82 VDC ± 2V
Output	Overvoltage Protection Shuts down if output voltage exceeds 110% ± 5% of nominal voltage due to internal failure.
	Current Limiting Output hiccups as long as overload (120% ± 10% of nominal) or short-circuit condition exists.
General	Over Temperature Protection Shutdown if baseplate temperature exceeds +105 ±5 °C. Automatic recovery upon cooldown to below +95 ±5°C.

ENVIRONMENTAL CONDITIONS	
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
Vibration	Method 514.5 General minimum integrity exposure IAW Figure 514.5C-17 1 hour per axis.
Altitude	Method 500.4 Procedures I – Storage/Air transport: up to 70,000 ft. (non-operational) Procedure II – Operation/Air Carriage: up to 70,000 ft. (operational)
Salt Fog	Method 509.4
Shock	Method 516.5 20 g, 11 ms terminal peak saw-tooth Optional: 40, 11ms saw-tooth. Please consult factory for details.
Reliability	150,000 hours, calculated IAW MIL-HDBK-217F Notice 2 at +85°C baseplate, Ground Fixed conditions

PIN ASSIGNMENT:

J1 - Input connector
Connector type: M24308/24-39F or eq.
Mates with: M24308/2-3F or eq.

Pin No.	Function	P
1	SYNC OUT RTN	–
2	SYNC IN	+
3	INHIBIT	+
4	VIN	+
5	VIN	+
6	VIN	+
7	VIN	+
8	VIN	+
9	VIN RTN	–
10	VIN RTN	–
11	VIN RTN	–
12	VIN RTN	–
13	VIN RTN	–

Pin No.	Function	P
14	SYNC OUT	+
15	SYNC IN RTN	–
16	SIGNAL IN RTN	–
17	VIN	+
18	VIN	+
19	VIN	+
20	VIN	+
21	VIN RTN	–
22	VIN RTN	–
23	VIN RTN	–
24	VIN RTN	–
25	CHASSIS	

J2 - Output connector
Connector type: M24308/23-39F or eq.
Mates with: M24308/4-3F or eq.

Pin No.	Function	P
1	START 120	+
2		
3	START 240 RTN	–
4		
5	SIGNAL OUT RTN	–
6	FREQ SELECT A	+
7	MASTER / SLAVE	+
8		
9		
10	NEUTRAL OUT	0
11		
12		
13	PHASE OUT	~

Pin No.	Function	P
14	START 120 RTN	–
15		
16	START 240	+
17		
18	FREQ SELECT B	+
19	START 0	+
20		
21		
22	NEUTRAL OUT	0
23		
24		
25	PHASE OUT	~

FUNCTIONS AND SIGNALS:

INHIBIT (connector J1, pin 3)
The INHIBIT signal is used to turn the power supply ON or OFF.
TTL “1”or OPEN – power supply turns ON (For always-on operation, leave this pin unconnected). TTL “0” or SHORT to SIGNAL IN RTN – power supply turnsOFF.
This signal is referenced to SIGNAL IN RTN pin (connector J1, pin 16).

SYNC IN (connector J1, pin 2)
The SYNC IN signal is used to synchronize the power supply’s switching frequency to an external clock. The external clock frequency is allowed to be 250 kHz ± 10 kHz, with dutycycle of 50% ± 10%. When not connected, the power supply will synchronize to its internal clock, set at 250 kHz ± 10 kHz. This signal is referenced to SYNC IN RTN pin (connector J1, pin 15).

SYNC OUT (connector J1, pin 14)
The SYNC OUT signal is a buffered clock signal that can be used to synchronize other power supplies to the power supply’s switching frequency. This feature can be used in a master/slave setup – see typical 3-phase connection diagrams for more information.
This signal is referenced to SYNC OUT RTN pin (connector J1, pin 1).

MASTER / SLAVE (connector J2, pin 7)
This signal is used in a three-phase setup – see typical 3-phase connection diagrams for more information.
This signal is referenced to **SIG OUT RTN** pin (connector J2, pin 5).

START 0, START 120, START 240 (connector J2, pins 19, 1 and 16 respectively)
These signals are used in a three-phase setup – see typical 3-phase connection diagrams for more information.

Chassis (connector J1, pin 25)
This pin is connected to the converter's chassis.

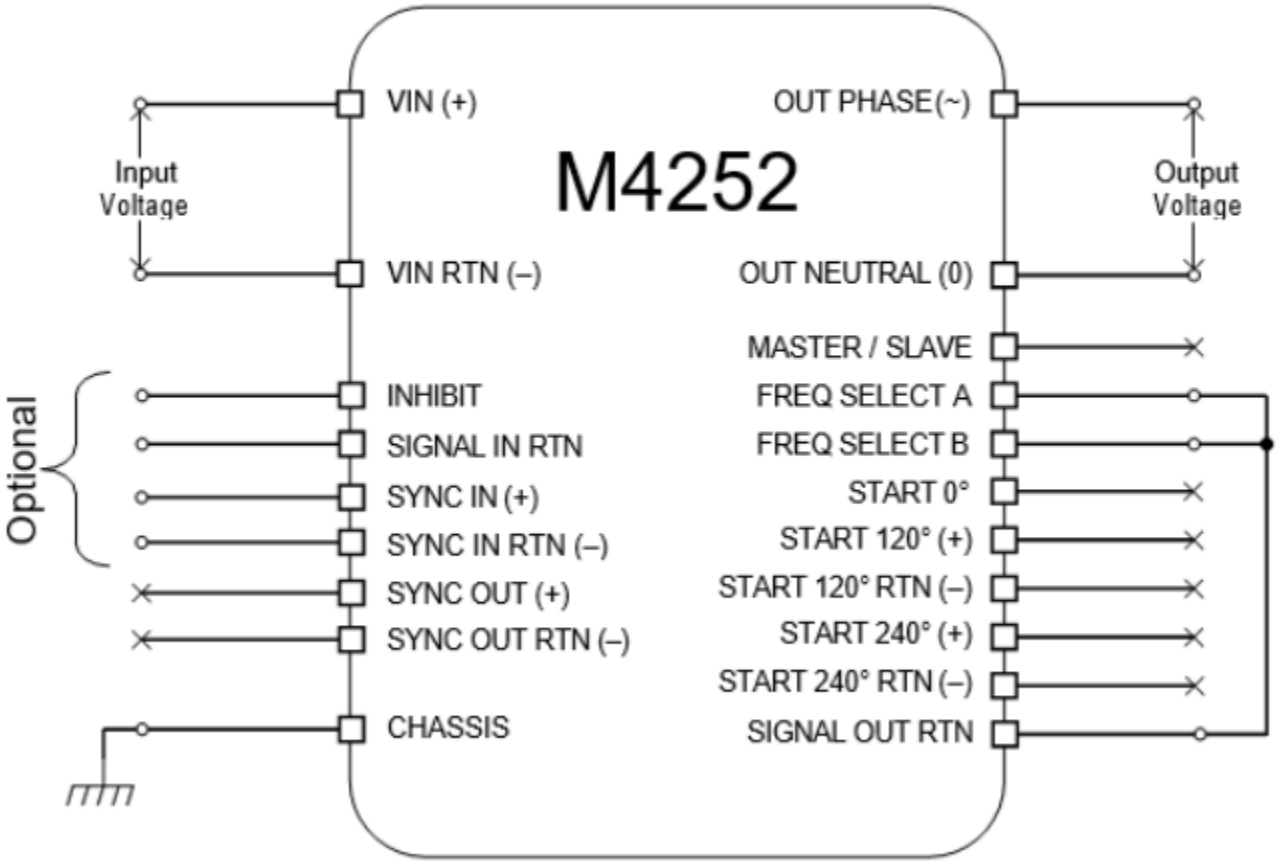
FREQ SELECT A, FREQ SELECT B (connector J2, pins 6 & 18, respectively)
These pins are used to set the output frequency according to the following truth table:

Frequency	FREQ SELECT A (Pin 6)	FREQ SELECT B (Pin 18)
400 Hz	0	0
60 Hz	1	0
50 Hz	0	1
Off	1	1

"0" means the pin is shorted to its reference, "1" means pin is left open. These pins are referenced to **SIGNAL OUT RTN** pin (connector J2, pin 5).

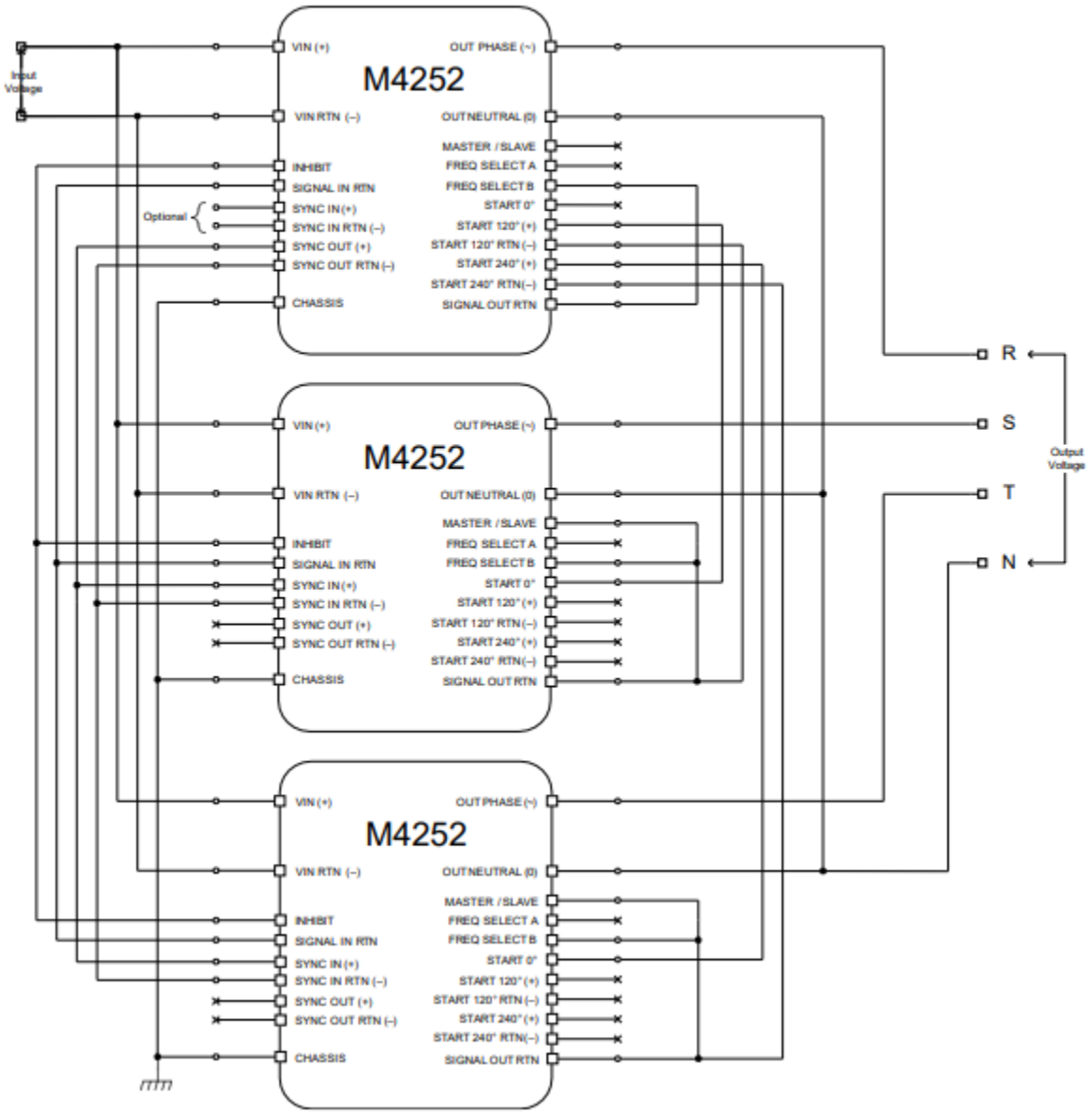
SINGLE-PHASE TYPICAL CONNECTION:

In this example, the unit is configured to 115 V_{AC} / 400 Hz

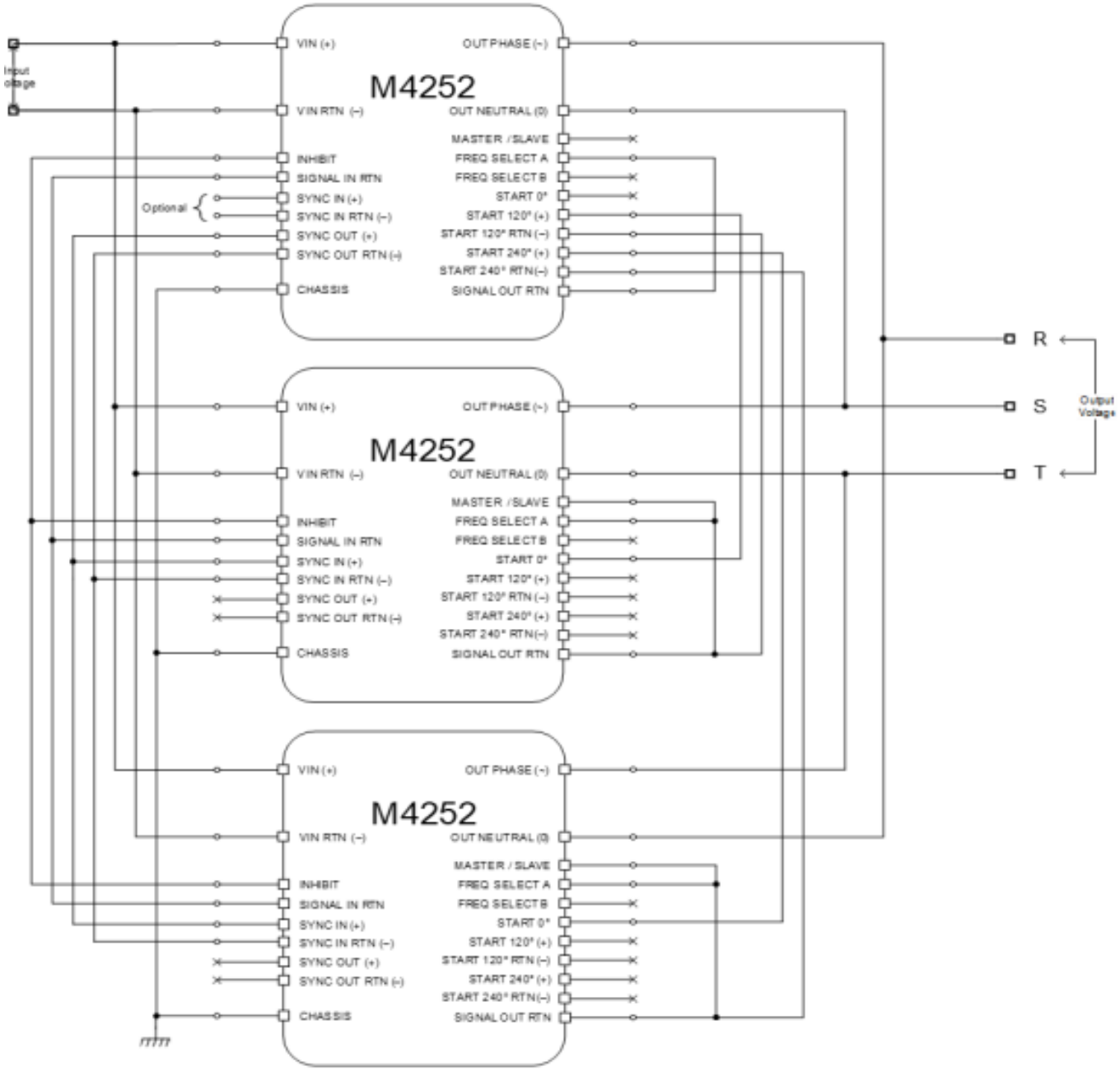


THREE-PHASE WYE TYPICAL CONNECTION:

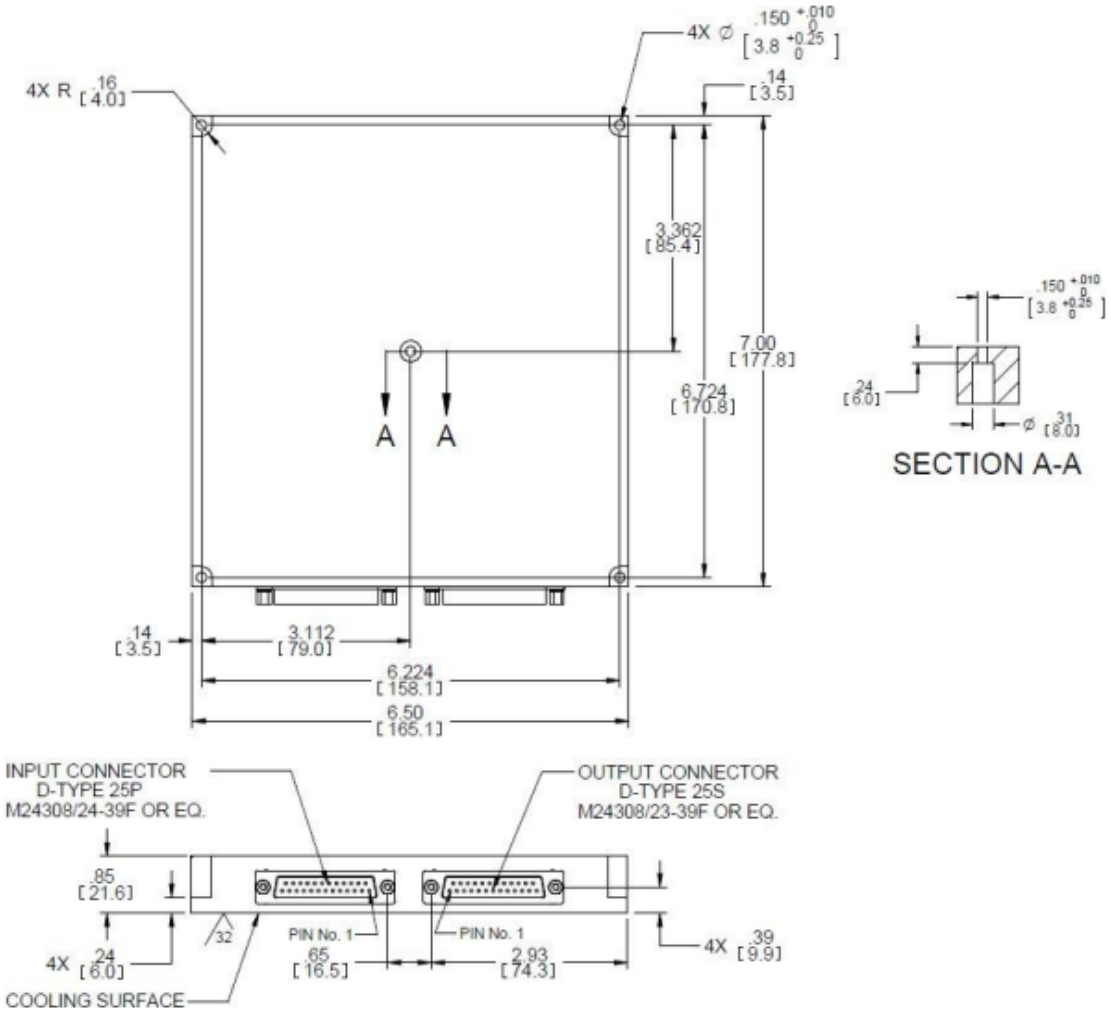
In this example, the units are configured to 115 $V_{line\text{-}neutral}$ / 200 $V_{line\text{-}line}$, 60 Hz Wye connection

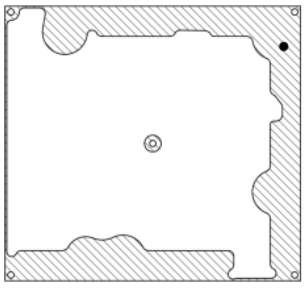


THREE-PHASE DELTA TYPICAL CONNECTION:



OUTLINE DRAWING:





Dissipation Area
13.78 in²
[8890 mm²]

Notes
1. Dimensions are in inches [mm]
2. Tolerance is:
.XX ± 0.01 in
.XXX ± 0.005 in
3. Weight: Approx. 37 oz [1050 g]

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