

# M186 SERIES

**COMPACT, HIGH DENSITY  
HIGH EFFICIENCY, SINGLE OUTPUT,  
THREE-PHASE AC / DC CONVERTERS**  
Up to 2000W



## Applications

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

## Special Features

- Miniature size
- High efficiency
- Wide input range
- Input / Output isolation
- Limited Inrush Current
- External On/Off Inhibit
- Fixed switching frequency (400 kHz)
- EMI filters included
- High Density up to 30.5 W/in<sup>3</sup>
- power factor 92%-93% (75-100% load)
- Indefinite short circuit protection with auto-recovery
- Over-voltage shutdown with auto-recovery
- Over temperature shutdown with auto-recovery

## Electrical Specifications

### AC Input / DC Input Range:

AC Input range:  
115 ±10%V<sub>AC,L-N</sub>,  
50/60/400 Hz, 3-Phase  
Per MIL-STD-704A.  
DC Input range:  
220-350V<sub>DC</sub>

### DC Output:

Output range – 5V to 60V  
Output power – 2000W  
Output current – max 80A.

### Isolation:

500V between Input and Output  
500V between Input and Case  
100V between Output and Case

### Line/Load regulation:

Less than 1% (no load to full load, –55°C to +85°C).

### Efficiency:

90% - Typical (full load, room temperature)

### EMC:

Designed to meet MIL-STD-461C:  
CE102, CS101, CS114, CS115,  
CS116, RE102, RS101, RS103

### Ripple and Noise:

100±150mVp-p, typical (max. 1%) without external capacitance.

### Load Transient Overshoot and

#### undershoot

Current change from 50%-100% output voltage change less than 0.1-0.3V within 200-300µSec

### Turn on Transient

No Voltage over shoot during power on.

## Protections \*

### Input

- **Inrush Current Limiter**  
peak value of 6x I<sub>IN</sub> for less than 50µSec.

### Output

- **Passive transorb on outputs**  
20% above nominal voltage.
- **Current limiting**  
Continuous protection (10-30% above maximum current) for unlimited time.

### 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)

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

***Environmental***

Design to Meet MIL-STD-810F

***Temperature:***

Operating: -55°C to +85°C  
(base plate)

Storage: -55°C to +125°C

***Altitude:***

Method 500.4, Procedure I & II,  
40,000 ft. and 70,000 ft. Operational

***Salt Fog:***

Method 509-4

***Humidity:***

Method 507.4 - Up to 95%.

***Vibration and Shock:***

Shock - Saw-tooth, 20g peak, 11mS.

Vibration - Figure 514.5C-17.

General minimum integrity  
exposure. (1 hour per axis.)

***Reliability***

150,000 hours, calculated per  
MIL-STD-217F at +85°C base  
plate, Ground fixed.

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

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

### Pin Assignment

Pin No.	Description
4, 5, 17	Phase A
7, 8, 20	Phase B
10, 11, 23	Phase C
15	+ Sense*
2	- Sense*
14	Inhibit
1	Signal Return
25	Chassis

\* If sense lines are not in use, please inform factory.

### Functions and Signals

#### **INHIBIT signal**

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

OPEN – will turn on the power supply.

SHORT – between pin 14 and pin 1 will turn off the power supply.

#### **SENSE signals**

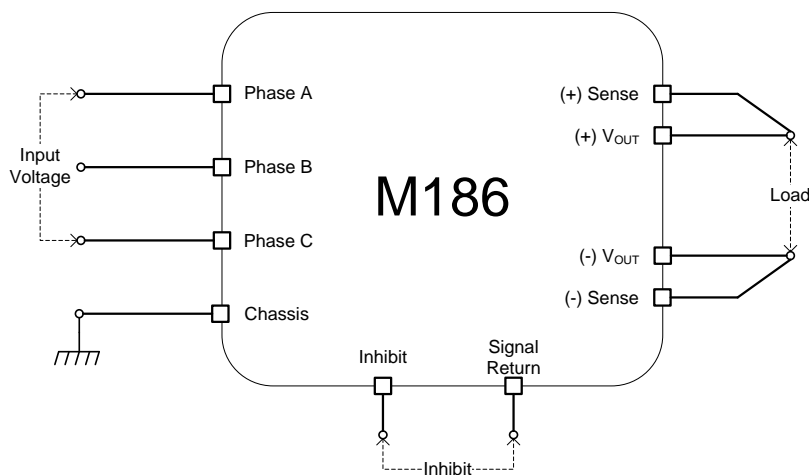
The SENSE is used to achieve accurate load regulations at load terminals (this is done by connecting the pins directly to the load's terminals).

The use of remote sense has a limit of voltage dropout between converter's output and load terminals of 2-10% of voltage output (up to 2V).

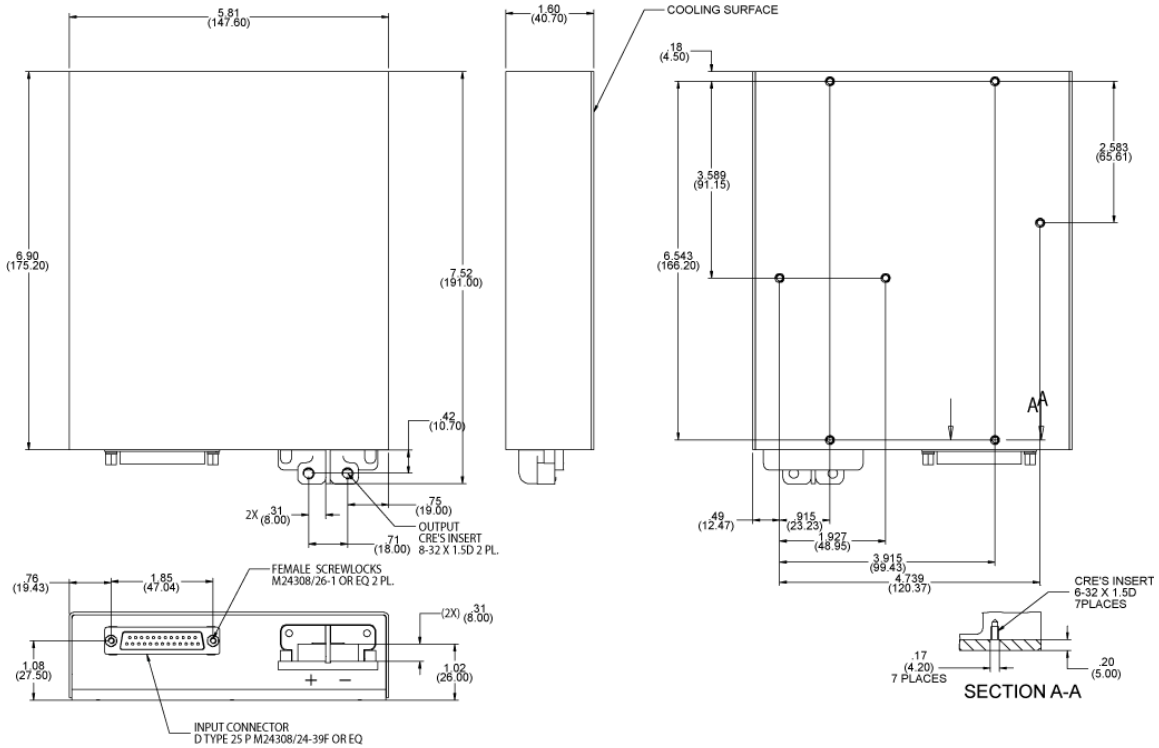
Please note that if Sense lines are not used the output may rise as much as 2V above nominal outputs.

If sense lines are not to be used in the application, please inform factory for internal connection to output pins.

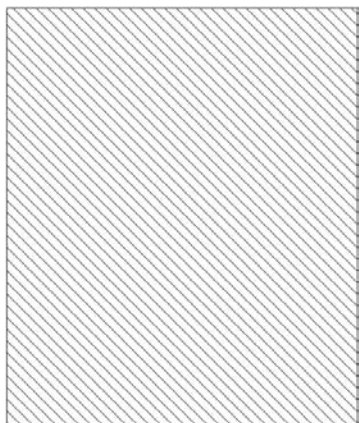
### Typical Connection



**Outline Drawing**



**Heat Dissipation Surface**



Dissipation Area  
40.08 in<sup>2</sup>  
(25860 mm<sup>2</sup>)

**Notes**

1. Dimensions are in Inches [mm]
2. Tolerance is:  
.XX ±0.025 IN  
.XXX ±0.010 IN
3. Weight: Approx. 4.4 lb (2 Kg)
4. 3D model is available.

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