BONITRON

Solutions for AC Drives

Model M3484

Industrial Line Noise Filter Module

Customer Reference Manual

Web: www.bonitron.com ● Tel: 615-244-2825 ● Email: info@bonitron.com

Bonitron, Inc.
Nashville, TN

An industry leader in providing solutions for AC drives.

ABOUT BONITRON

Bonitron designs and manufactures quality industrial electronics that improve the reliability of processes and variable frequency drives worldwide. With products in numerous industries, and an educated and experienced team of engineers, Bonitron has seen thousands of products engineered since 1962 and welcomes custom applications.

With engineering, production, and testing all in the same facility, Bonitron is able to ensure its products are of the utmost quality and ready to be applied to your application.

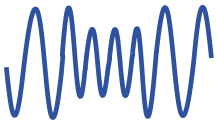
The Bonitron engineering team has the background and expertise necessary to design, develop, and manufacture the quality industrial electronic systems demanded in today's market. A strong academic background supported by continuing education is complemented by many years of hands-on field experience. A clear advantage Bonitron has over many competitors is combined on-site engineering labs and manufacturing facilities, which allows the engineering team to have immediate access to testing and manufacturing. This not only saves time during prototype development, but also is essential to providing only the highest quality products.

The sales and marketing teams work closely with engineering to provide up-to-date information and provide remarkable customer support to make sure you receive the best solution for your application. Thanks to this combination of quality products and superior customer support, Bonitron has products installed in critical applications worldwide.

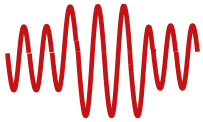
AC Drive Options

In 1975, Bonitron began working with AC inverter drive specialists at synthetic fiber plants to develop speed control systems that could be interfaced with their plant process computers. Ever since, Bonitron has developed AC drive options that solve application issues associated with modern AC variable frequency drives and aid in reducing drive faults. Below is a sampling of Bonitron's current product offering.

World Class Products



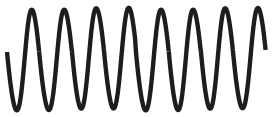
Undervoltage Solutions
Uninterruptible Power for Drives
(DC Bus Ride-Thru)
Voltage Regulators
Chargers and Dischargers
Energy Storage



Overvoltage Solutions
Braking Transistors
Braking Resistors
Transistor/Resistor Combo
Line Regeneration
Dynamic Braking for Servo Drives

Common Bus Solutions
Single Phase Power Supplies
3-Phase Power Supplies
Common Bus Diodes

Portable Maintenance Solutions
Capacitor Formers
Capacitor Testers



Power Quality Solutions
12 and 18 Pulse Kits

Green Solutions
Line Regeneration

1. PREFACE

1.1. WHO SHOULD USE THIS MANUAL

This manual is intended for use by anyone who is responsible for integrating, installing, maintaining, troubleshooting, or using this equipment with any AC drive system.

Please keep this manual for future reference.

1.2. PURPOSE AND SCOPE OF THIS MANUAL

This manual is a user's guide for the model M3484 industrial line noise filter module. It will provide the user with the necessary information to successfully install, integrate, and use the M3484 module in a variable speed AC drive system.

In the event of any conflict between this document and any publication and/or documentation related to the AC drive system, the latter shall have precedence.

1.3. REPAIRS

Repairs or modifications to this equipment are to be performed by Bonitron approved personnel only. Any repair or modification to this equipment by personnel not approved by Bonitron will void any warranty remaining on this unit.

Figure 1-1:M3484D3-H06C50-F16 Filter

2. SAFETY PRECAUTIONS

WARNING!

- HIGH VOLTAGES MAY BE PRESENT!
- NEVER ATTEMPT TO OPERATE THIS PRODUCT WITH THE ENCLOSURE COVER REMOVED.
- NEVER ATTEMPT TO SERVICE THIS PRODUCT WITHOUT FIRST DISCONNECTING POWER TO AND FROM THE UNIT.
- ALWAYS ALLOW ADEQUATE TIME FOR RESIDUAL VOLTAGES TO DRAIN BEFORE REMOVING THE ENCLOSURE COVER.
- FAILURE TO HEED THESE WARNINGS MAY RESULT IN SERIOUS BODILY INJURY OR DEATH.

WARNING!

- CERTAIN COMPONENTS WITHIN THIS PRODUCT MAY GENERATE HIGH AMBIENT TEMPERATURES DURING OPERATION.
- ALWAYS ALLOW AMPLE TIME FOR THE UNIT TO COOL BEFORE ATTEMPTING SERVICE ON THIS PRODUCT.

ATTENTION!

- BEFORE ATTEMPTING INSTALLATION OR REMOVAL OF THIS PRODUCT, BE SURE TO REVIEW ALL AC DRIVE DOCUMENTATION FOR PERTINENT SAFETY PRECAUTIONS.

ATTENTION!

- INSTALLATION AND/OR REMOVAL OF THIS PRODUCT SHOULD ONLY BE ACCOMPLISHED BY A QUALIFIED ELECTRICIAN IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE OR EQUIVALENT REGULATIONS.

ANY QUESTIONS AS TO APPLICATION, INSTALLATION OR SERVICE SAFETY SHOULD BE DIRECTED TO THE EQUIPMENT SUPPLIER.

3. OVERVIEW

Bonitron's model M3484 line filters are designed to be used in applications where power electronic devices experience problems from line harmonics, capacitor switching transients and DC drive notching. Typically, devices with these problems have over voltage faults. Usually, the problems are more severe when the devices are in a standby or lightly loaded mode. For this reason, chokes alone are unable to filter the transients.

The Bonitron M3484 modules are composed of resistor, diode, and capacitive elements offering very good electrical damping of continuous and intermittent transients. Each device includes two parallel filters, one which dampens over voltage events and the other which dampens under voltage events. The transient/harmonic energy is dissipated in the resistors. The units are protected by a combination of fusing and thermal protection via three phase contactor.

The devices require some impedance (at least 5%) between the noise source and their point of installation for proper filtering. Usually, existing AC chokes or system transformers provide this impedance.

3.1. APPLICATIONS

The model M3484 line filter is commonly used on applications involving:

- VFD installations where DC drives in close proximity are causing line notching
- VFD installations where high frequency carrier waveforms or other continuous oscillations are superimposed on the local power grid
- VFD installations where the three phase power is coupled by brushes or other means to the VFD (example: overhead cranes)

3.2. ADVANTAGES

- Unlike capacitive filters, these modules filter without shifting the resonant frequency of the electrical system.
- The modules provide additional system kvar for power factor correction and KVA demand reduction

3.3. SIZING

Proper filter sizing is critical to operation. Consult Bonitron engineering for assistance.

- Modules are available for standard line voltages.
- Modules are selected based on resistive watts required to dissipate the disturbance.
- Modules may be paralleled for additional dissipation.

3.4. CONSIDERATIONS

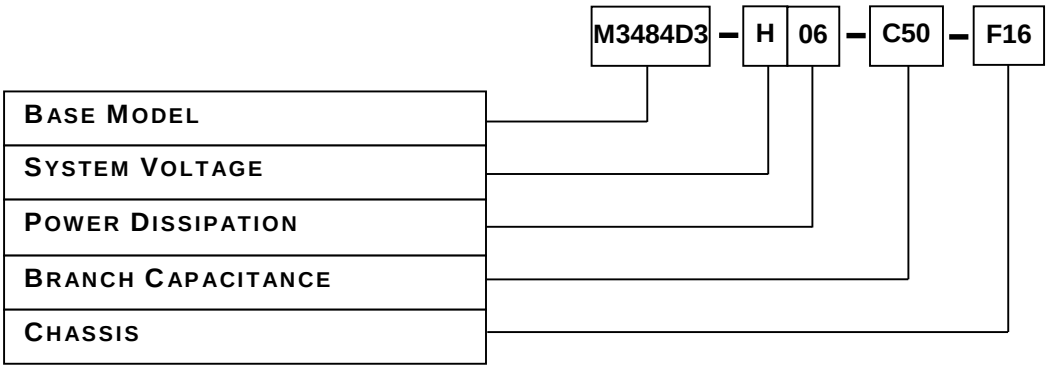
- Possible sources of disturbing noise
- Physical distances to possible noise sources
- Harmonic distortion Level
- Electrical transformations between filter and noise sources
- Transformer impedance

4. GENERAL SPECIFICATIONS

Connections:	• AC Line: 230VAC, 460 VAC ±10%, 50/60 Hz • Ground
Operating Temperature:	0 to +40 C°
Storage Temperature:	-20 to +65 C°
Humidity:	Below 90%, Non condensing
Atmosphere:	Free of corrosive gas and dust
Indicators:	Door mounted power light
Adjustments:	None
Auxiliary Contact:	Indicates if unit is off line due to thermal overload
Thermal Overload:	Disconnects from line at 160°F heatsink temp

5. PART NUMBER BREAKDOWN

Figure 5-1: Example of M3484 Part Number Breakdown



5.1. BASE MODEL

The basic model number for all Industrial line noise filter modules is M3484D3.

5.2. SYSTEM VOLTAGE

The system voltage is indicated by a code letter.

Table 5-1: System Voltage

FILTER TYPE	CODE
230 VAC	**L**
460 VAC	**H**

5.3. POWER DISSIPATION

The power dissipation capability is indicated by a numerical code.

Table 5-2: Power Dissipation Capability

DISSIPATION (Watts)	CODE
600 W	**06**
1200 W	**12**

5.4. BRANCH CAPACITANCE

The branch capacitance is indicated by an alpha-numeric code.

Table 5-3: Branch Capacitance

BRANCH CAPACITANCE	CODE
50 uF	**C50**

5.5. CHASSIS

The chassis code represents the chassis type and size.

Table 5-4: Chassis Codes

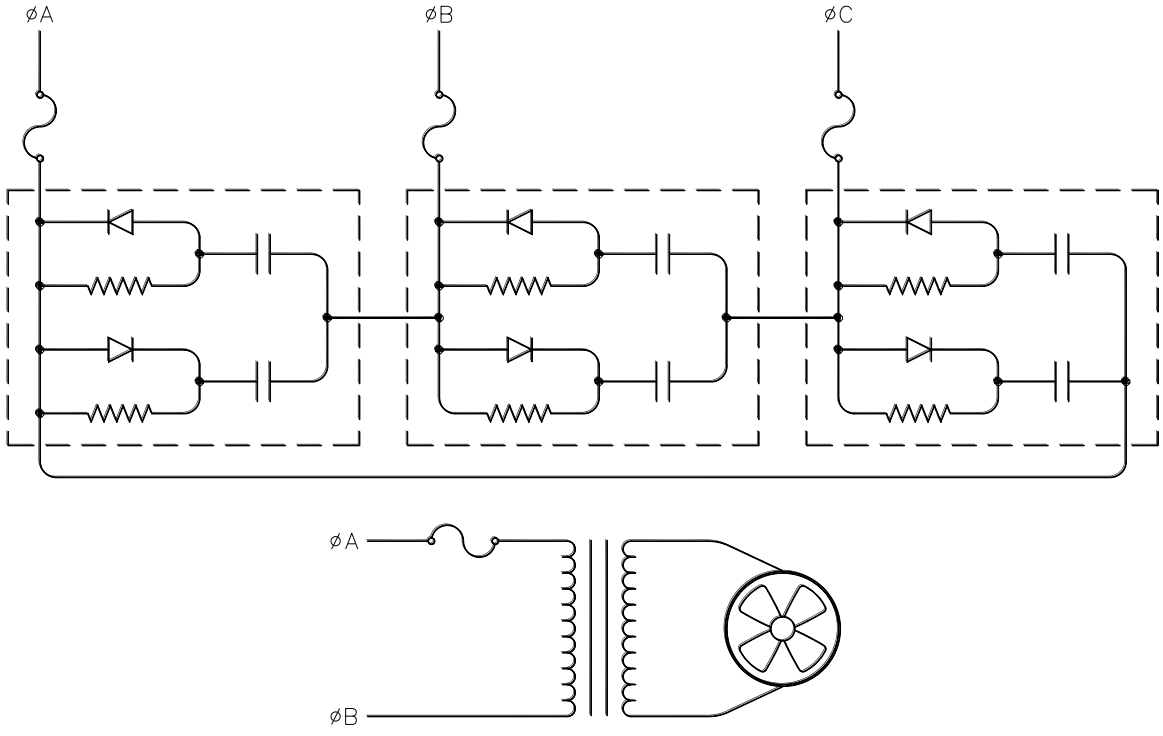
TYPE	Chassis Code	DIMENSIONS (H x W x D)
NEMA 12	**J21**	(16 x 14 x 8)
NEMA 3R	**F16**	(18 x 18 x 10)

6. MODEL RATINGS

MODEL NUMBER	INPUT VOLTS	POWER DISSIPATION	BRANCH CAPACITANCE	KVAR AT 60 HZ	FUSE AMPS
M3484D3-L06C50-J21	230 VAC	600 W	50 µF	3 kvar	30 A
M3484D3-L06C50-F16	230 VAC	600 W	50 µF	3 kvar	30 A
M3484D3-L12C50-J21	230 VAC	1200 W	50 µF	3 kvar	40 A
M3484D3-L12C50-F16	230 VAC	1200 W	50 µF	3 kvar	40 A
M3484D3-H06C50-J21	460 VAC	600 W	50 µF	12 kvar	30 A
M3484D3-H06C50-F16	460 VAC	600 W	50 µF	12 kvar	30 A
M3484D3-H12C50-J21	460 VAC	1200 W	50 µF	12 kvar	40 A
M3484D3-H12C50-F16	460 VAC	1200 W	50 µF	12 kvar	40 A

7. BASIC FILTER CONFIGURATIONS

Figure 7-1: M3484D3



8. WIRING DIAGRAMS

Figure 8-1: 1200W 3-Phase Line Filter

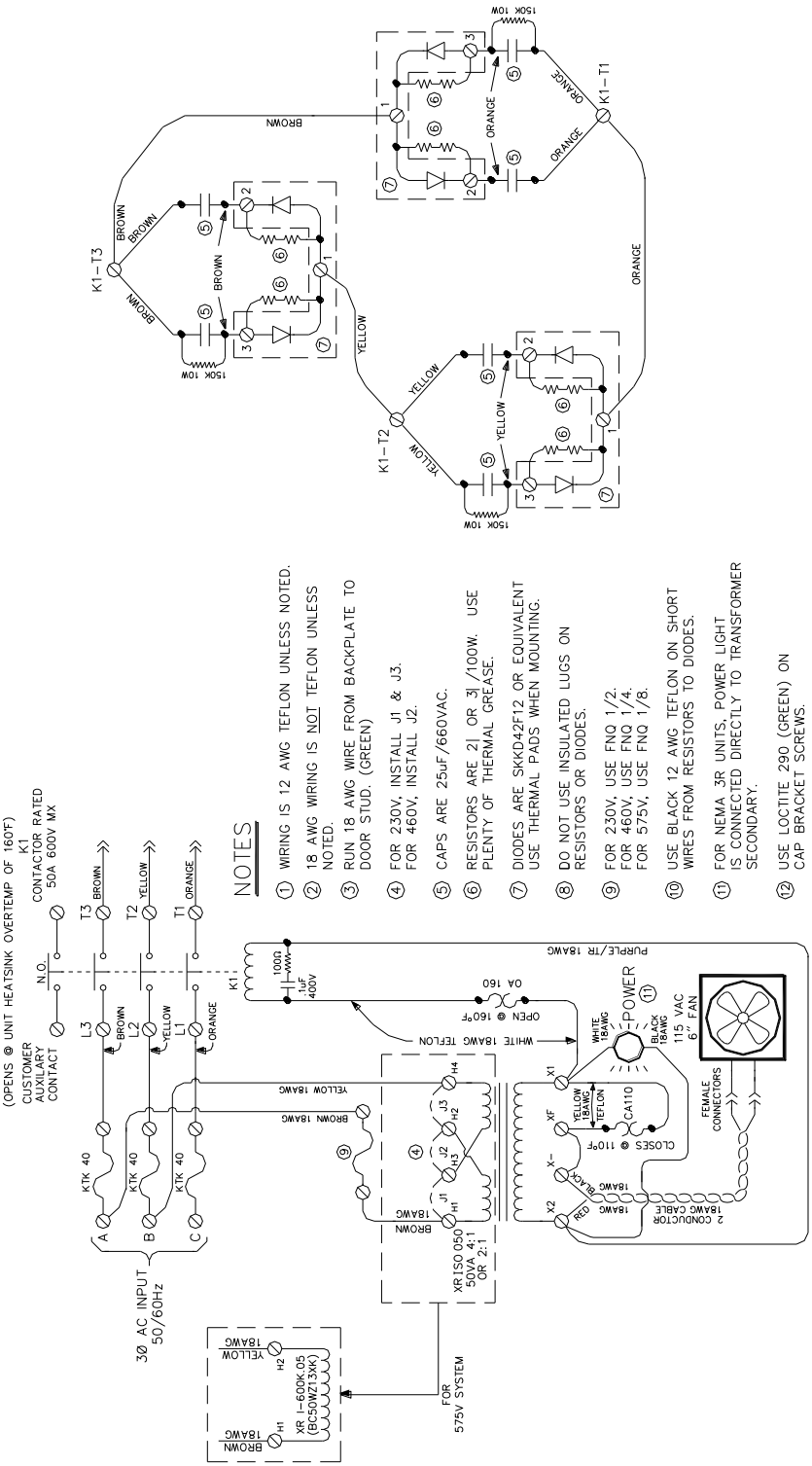
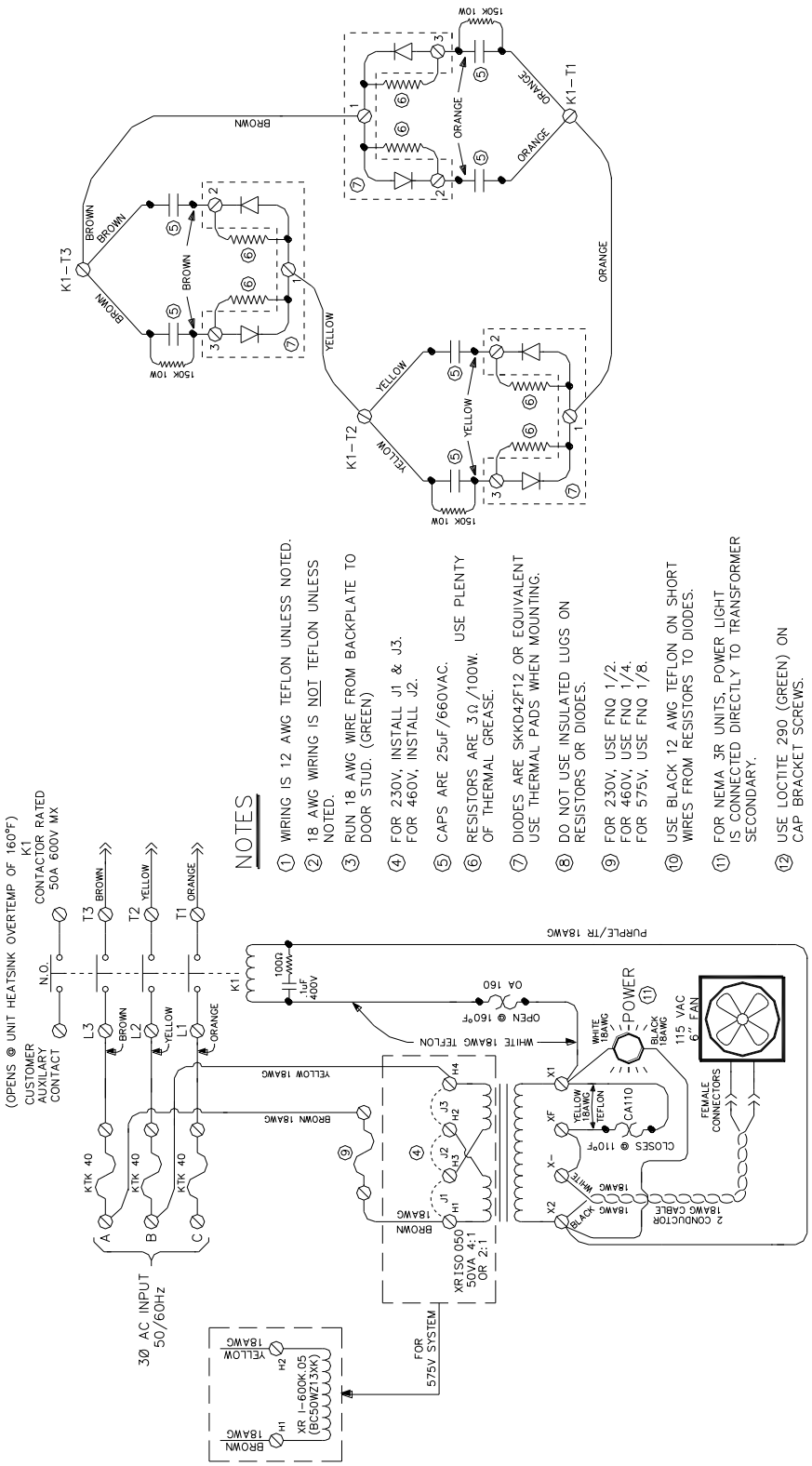


Figure 8-2: 600W 3-Phase Line Filter



9. DIMENSIONAL OUTLINES

Figure 9-1: M3484 NEMA 3R (F16) Enclosure Dimensions

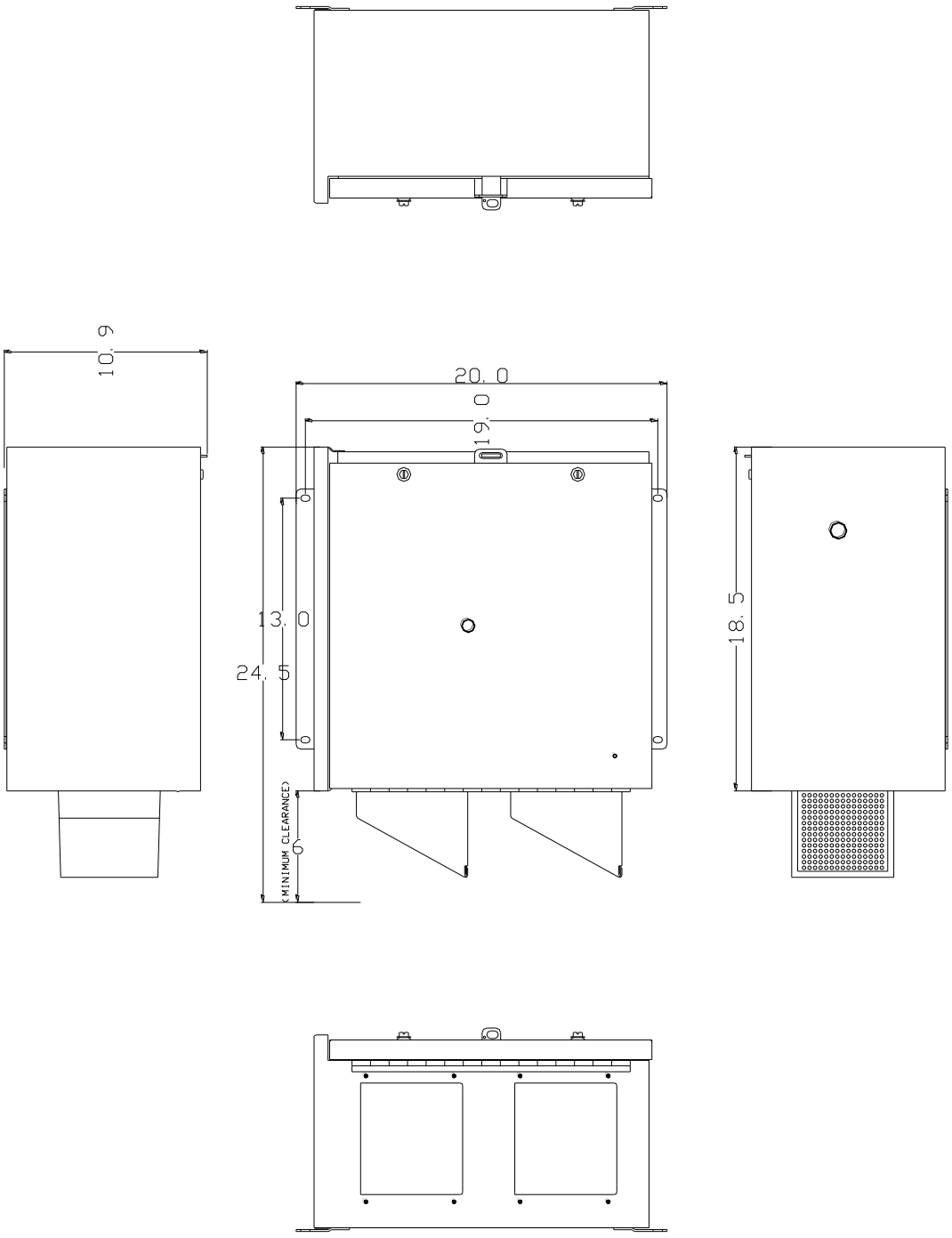


Figure 9-2: M3484 NEMA 12 (J21) 600 Watt Enclosure Dimensions

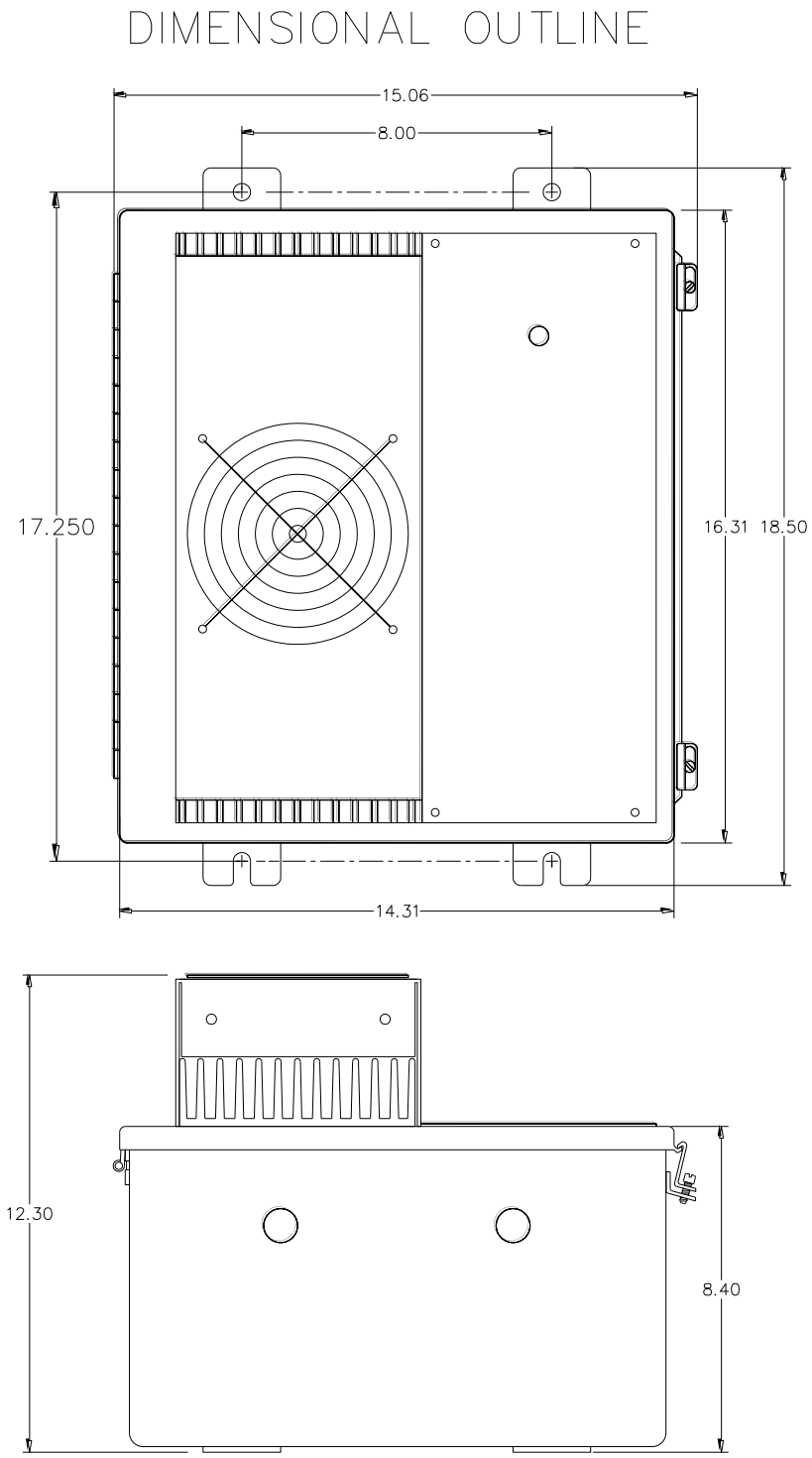
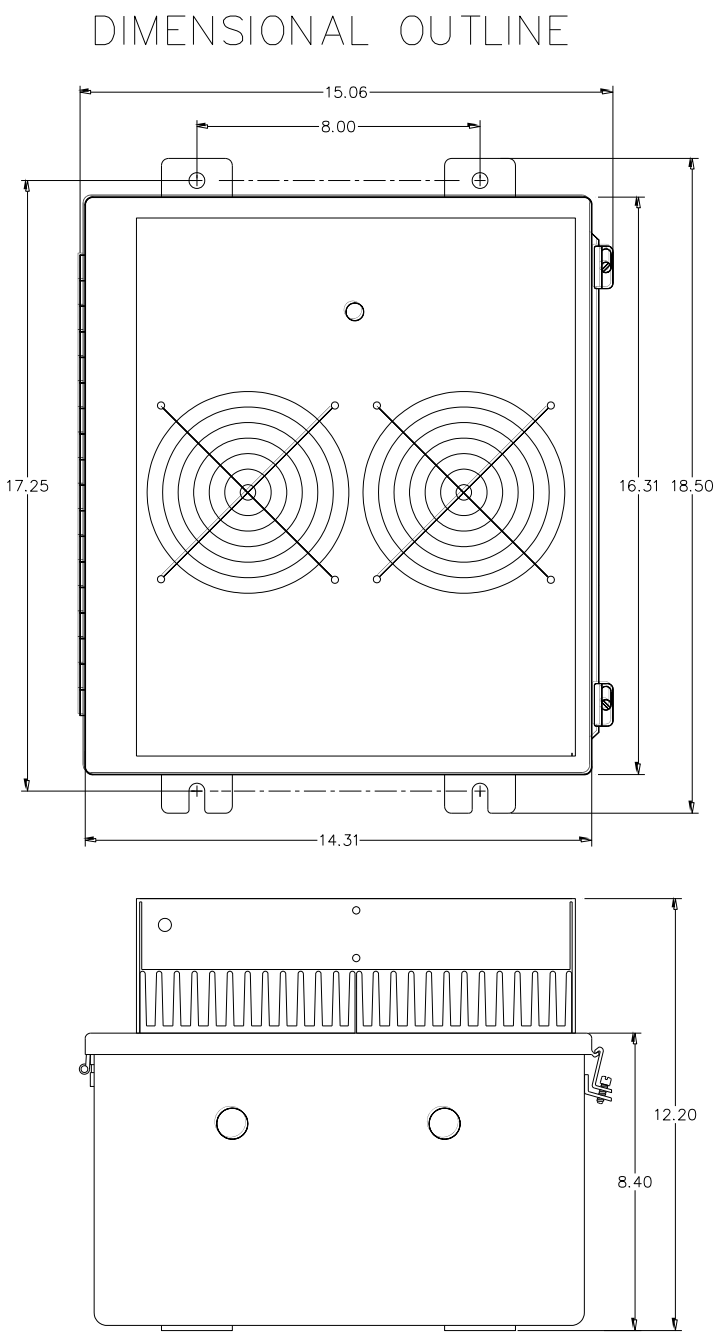


Figure 9-3: M3484 NEMA 12 (J21) 1200 Watt Enclosure Dimensions



521 Fairground Court ● Nashville, TN 37211 ● USA
Tel: (615) 244-2825 ● Fax: (615) 244-2833 ● Web: www.bonitron.com ● Email: info@bonitron.com