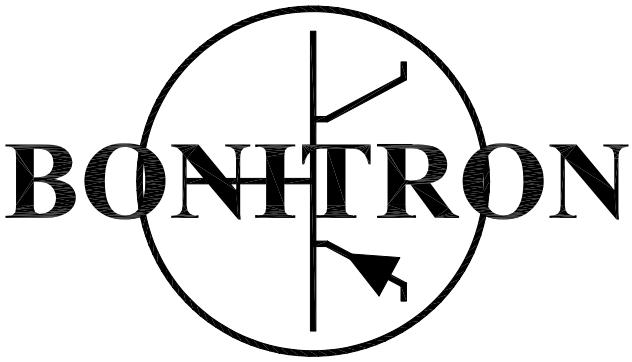


Model M3484

Industrial Line Noise Filter Module

Customer Reference Manual

(615) 244-2825 • Fax (615) 244-2833 • www.bonitron.com

Bonitron, Inc.

An Industry Leader in AC Drive Systems and Industrial Electronics

OUR COMPANY

Bonitron Inc. is an industrial electronics and electrical systems design, engineering, and manufacturing company founded in 1962 and located in Nashville, Tennessee. Bonitron designs and manufactures custom and standard product modules and systems for industry with the highest possible degree of quality and reliability.

Bonitron has all the necessary resources in-house for complete electronic product development and manufacturing. Engineering facilities include a CAD lab for circuit board design and engineering labs for prototype testing and evaluation. Production facilities include production areas for circuit board assembly, a machine tool and sheet metal shop for chassis fabrication, and a systems assembly and checkout area. With these assets, Bonitron is positioned to be a leader into the future while maintaining first class support for their current customer base.

Sales of equipment, generated mainly by reputation and referrals, are worldwide. The customer base includes ABB, Allen-Bradley, Control Techniques, GE, Magnetek, Reliance, Siemens, and other fine companies. Equipment is installed in most of the fifty states, Canada, Mexico, Brazil, Argentina, Northern Ireland, Holland, Spain, India, Hungary, Turkey, Indonesia, and China.

TALENTED PEOPLE MAKING GREAT PRODUCTS

The engineering team at Bonitron has the background and expertise needed to design, develop, and manufacture the quality industrial systems demanded by today's client. A strong academic background supported by continuing education is complemented by many years of hands-on field experience. Expertise encompasses a broad range of applications and engineering solutions such as modern design techniques for power conversion and microprocessor-based controls. This insures a solution tailored to the specific needs of the client.

A clear advantage that Bonitron has over many competitors is combined on-site engineering labs and manufacturing facilities. This allows the engineering team to have immediate access to and response from testing and manufacturing. This not only saves time during prototype development, but also is essential to providing only the best quality products.

AC DRIVE OPTIONS

In 1975, Bonitron began working with the AC inverter drive specialists at synthetic fiber plants to develop speed control systems that could be interfaced to their plant process computers. Since that time, Bonitron has developed AC drive option modules that help overcome many of the problems encountered in applications of modern AC adjustable speed drives. Bonitron's Ride-Thru module provides protection from AC line voltage sags while the Line Regen and Resistive Braking modules provide protection from over-voltage faults due to regenerated voltage. Today, many drive system integrators use Bonitron AC drive option modules with their adjustable speed drives.

WORLD CLASS PRODUCTS

Bonitron has developed over 3000 different modules and systems, and is willing and able to meet the unique specifications the client may request.

Some Bonitron products include:

- Power Sag Ride-Thru Modules
- Power Outage Ride-Thru Modules
- Line Regen Modules
- Resistive Braking Modules
- Modular High Speed Precision AC Inverter Systems
- Inverter Upgrade Modules
- Multi-motor, Multi-phase Current Sensors
- Battery Production Charging Systems
- Data Acquisition Systems
- Process Controllers
- Temperature Control Systems
- RMS True Reading Digital Voltmeters, Ammeters, and Frequency Meters

Table of Contents

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 2 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 (ex. 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

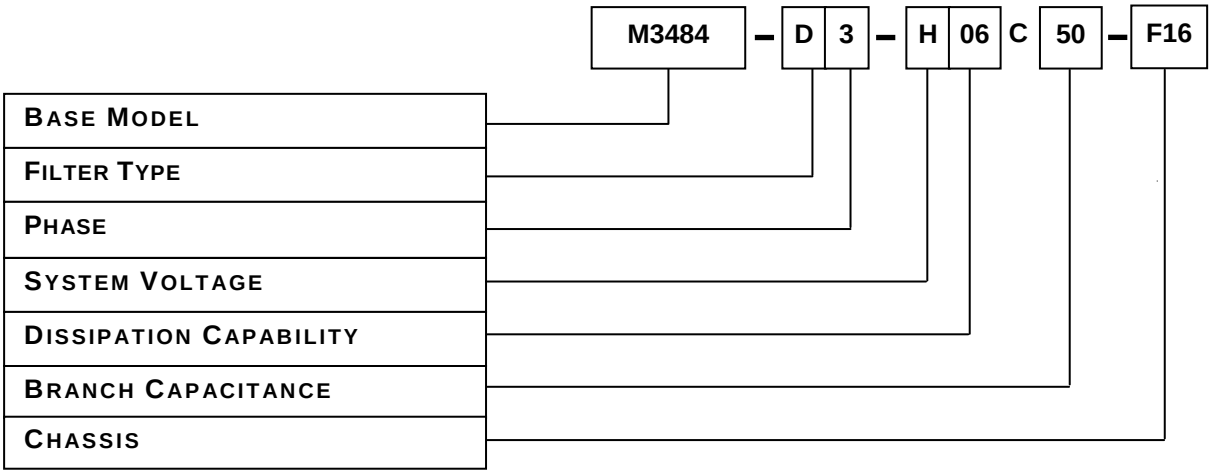
- Possible sources of disturbing noise
- Physical distances to possible noise sources
- Harmonic Distortion Level
- Electrical transformations between filter and noise sources
- Transformer Impedance

4. GENERAL SPECIFICATIONS

Connections:	Input AC Line: • 3 Phase, 230 or 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 M3484.

5.2. FILTER TYPE

The Filter Type is indicated by a code letter.

Table 5-1: Filter Type

FILTER TYPE	CODE
Single	**S**
Delta	**D**

5.3. PHASE

The Phase is indicated by a numerical code.

Table 5-2: Phase

PHASE	CODE
1	**1**
3	**3**

5.4. SYSTEM VOLTAGE

The System Voltage is indicated by a code letter.

Table 5-3: System Voltage

FILTER TYPE	CODE
230VAC- Low	**L**
460VAC - High	**H**
575VAC - Canadian	**C**

5.5. POWER DISSIPATION CAPABILITY

The Power Dissipation Capability is indicated by a numerical code.

Table 5-4: Power Dissipation Capability

DISSIPATION	CODE
200	**02**
400	**04**
600	**06**
1200	**12**

5.6. BRANCH CAPACITANCE

The Branch Capacitance is indicated by a numerical code.

Table 5-5: Branch Capacitance

BRANCH CAPACITANCE	CODE
50 uF	**50**

5.7. CHASSIS

The Chassis Code represents the chassis type and size.

Table 5-6: Chassis Codes

TYPE	CHX 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

FILTER	PHASES	INPUT VOLTS	DISSIPATION	BRANCH CAPACITANCE	KVAR @60 HZ	FUSE AMPS	MODEL NUMBER
Single	1	230	200	50 uF	1	15	M3484S1-L02C50
Single	1	460	200	50 uF	4	15	M3484S1-H02C50
Single	1	230	400	50 uF	2	35	M3484S2-L04C50
Single	1	460	400	50 uF	8	35	M3484S2-H04C50
Delta	3	230	600	50 uF	3	30	M3484D3-L06C50
Delta	3	460	600	50 uF	12	30	M3484D3-H06C50
Delta	3	230	1200	50 uF	3	40	M3484D3-L12C50
Delta	3	460	1200	50 uF	12	40	M3484D3-H12C50
Delta	3	575	600	50 uF	19	40	M3484D3-C06C50

7. BASIC FILTER CONFIGURATIONS

Figure 7-1: M3484S1

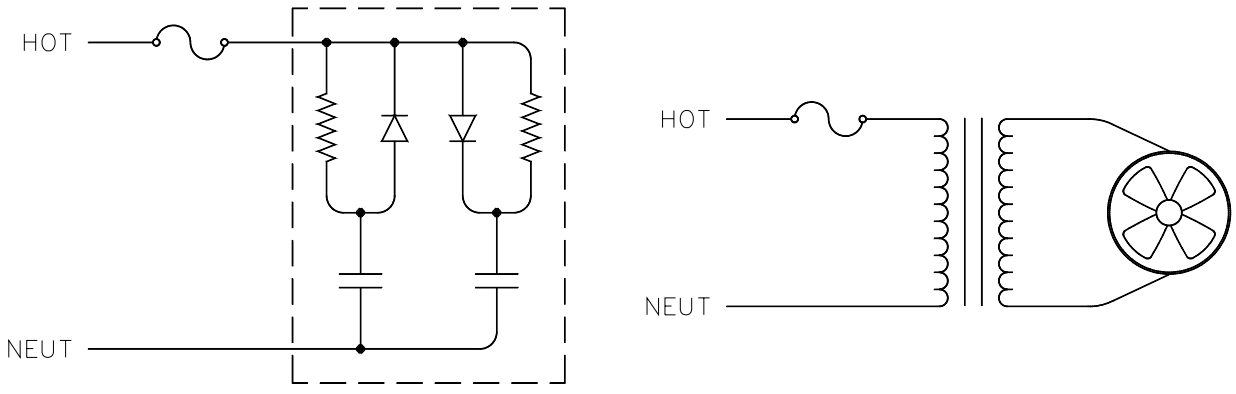


Figure 7-2: M3484S2

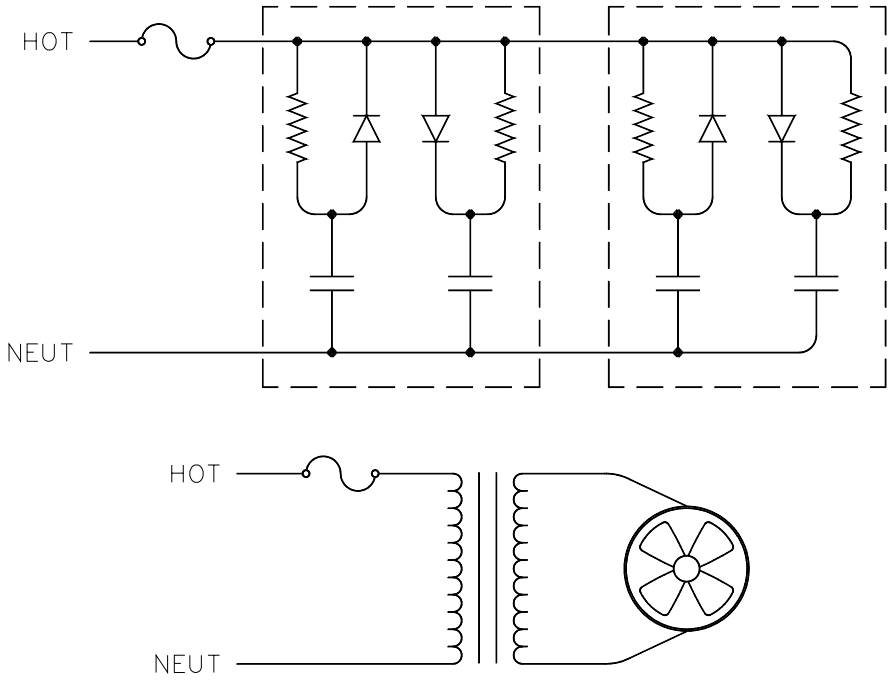
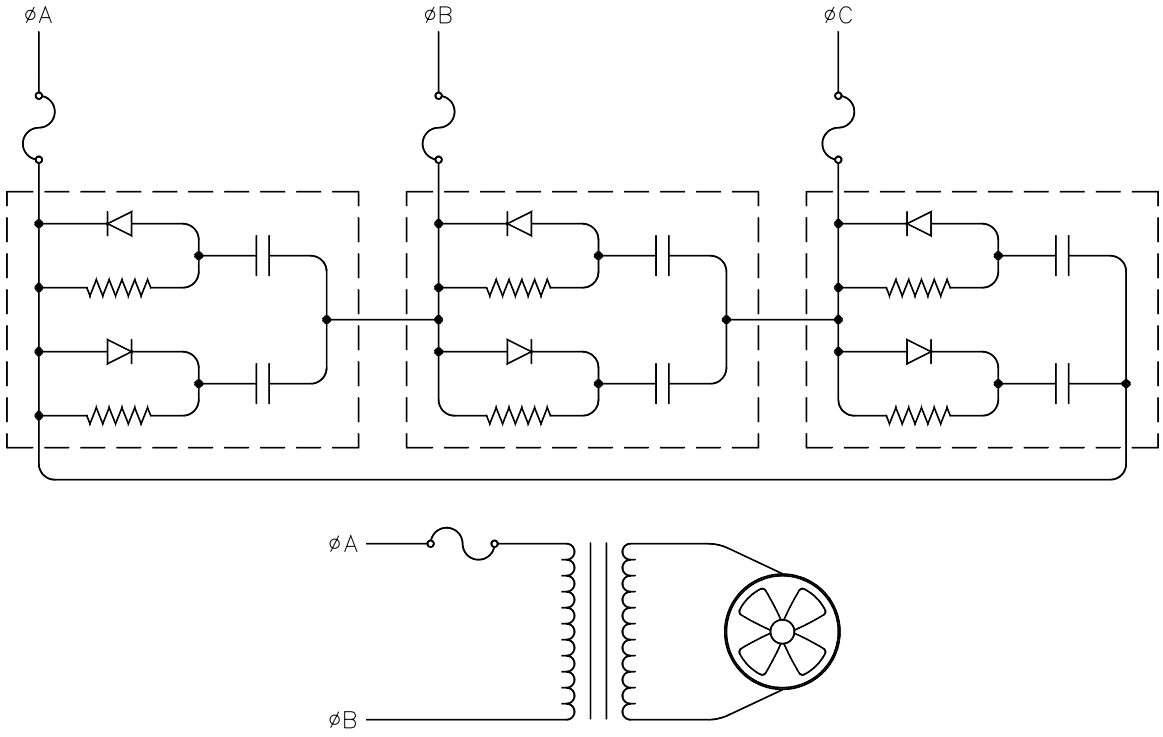


Figure 7-3: M3484D3



8. WIRING DIAGRAMS

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

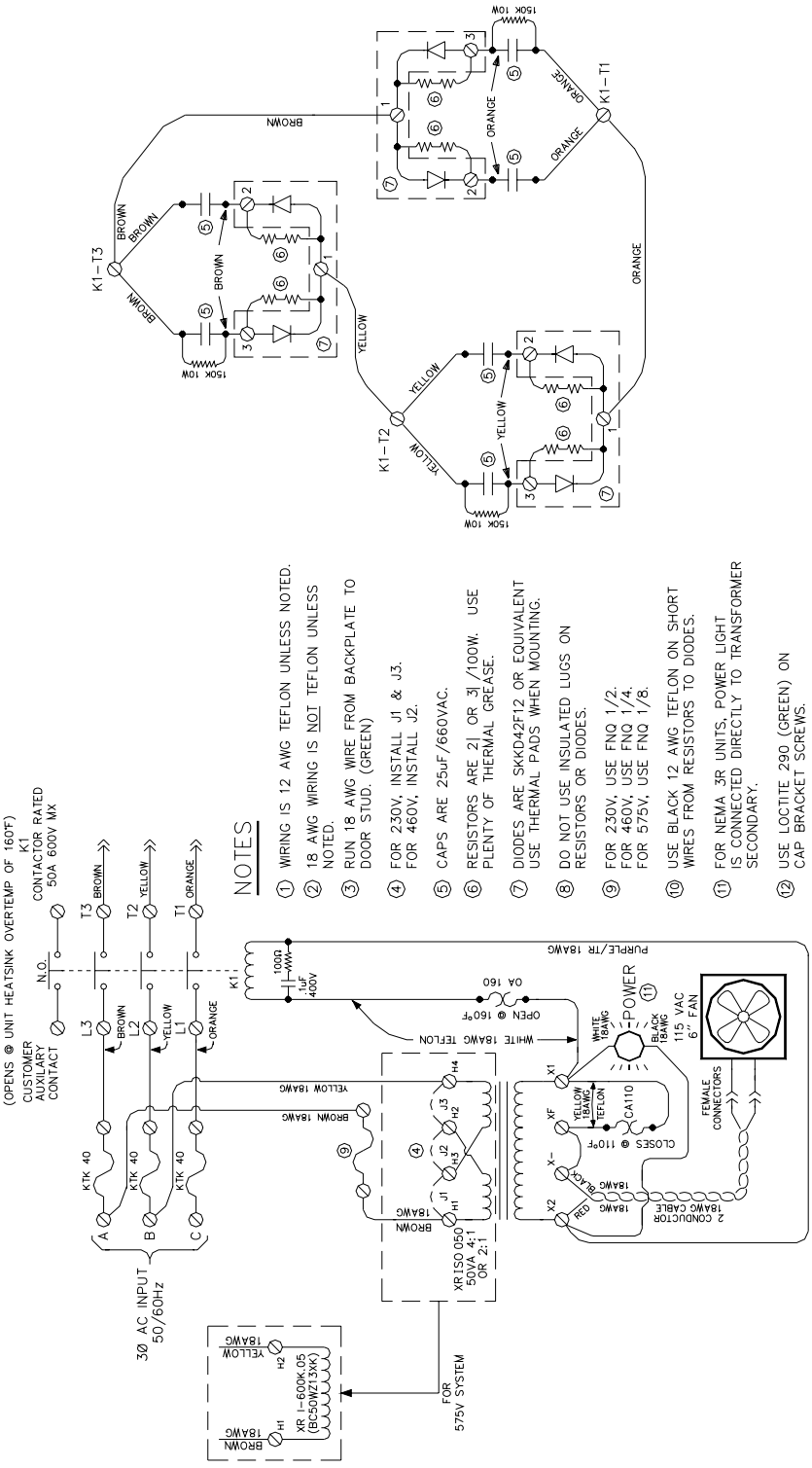
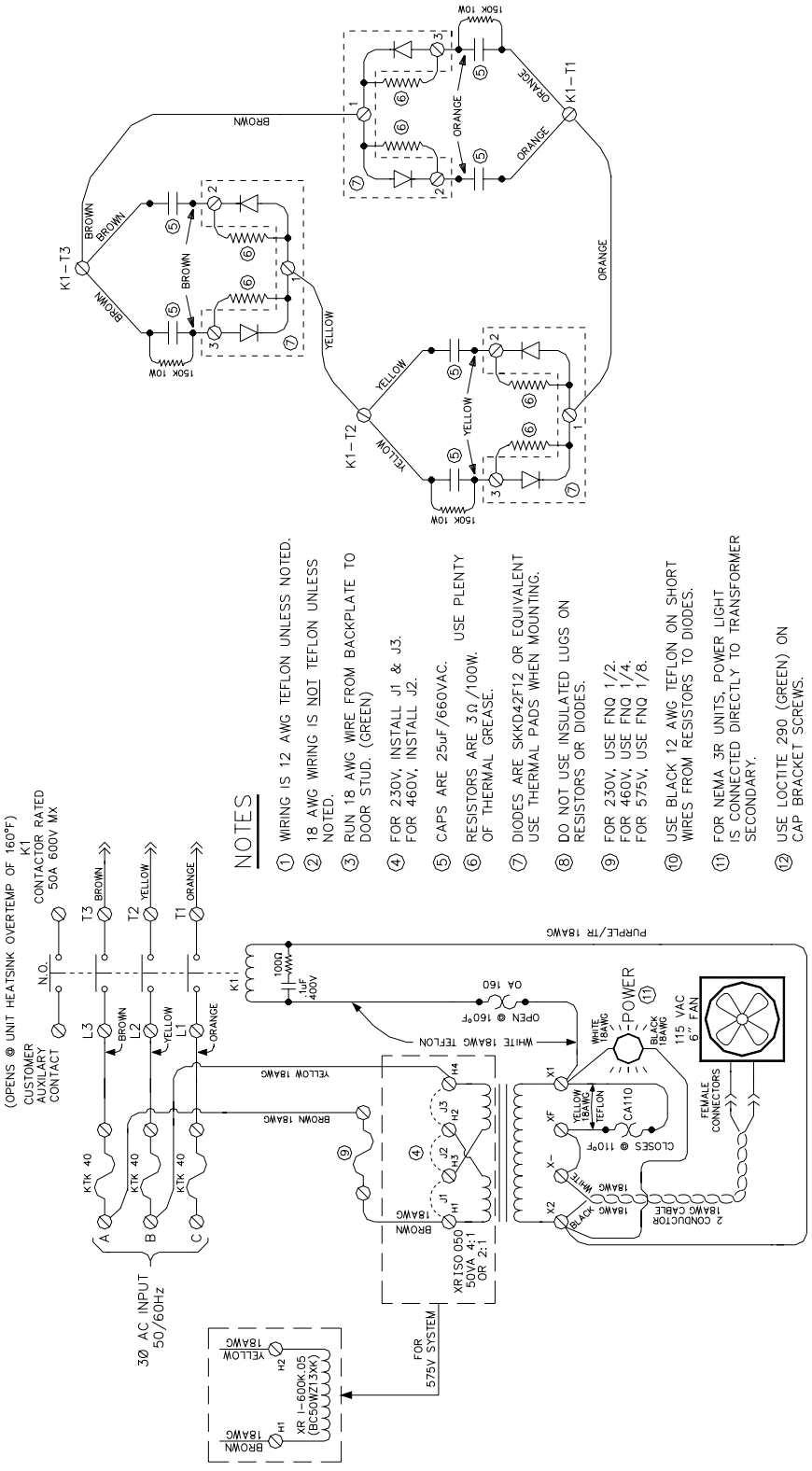


Figure 8-2: 600w 3-Phase Line Filter



9. DIMENSIONAL OUTLINES

Figure 9-1: 3484 NEMA 3R (F16) 3 Phase Line Filter Enclosure Dimensions

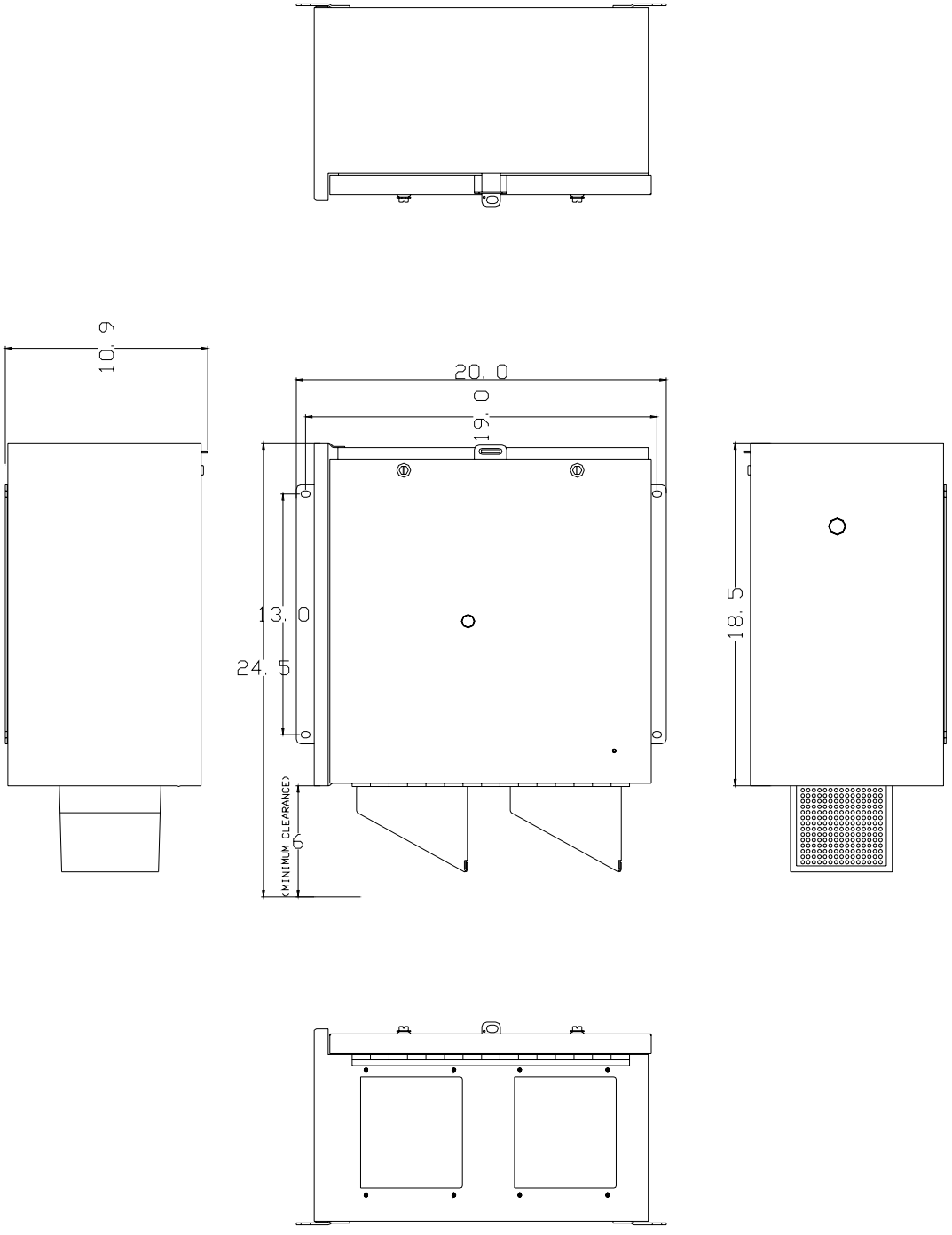


Figure 9-2: 3484 NEMA 12 (J21) 600 Watt Enclosure Dimensions

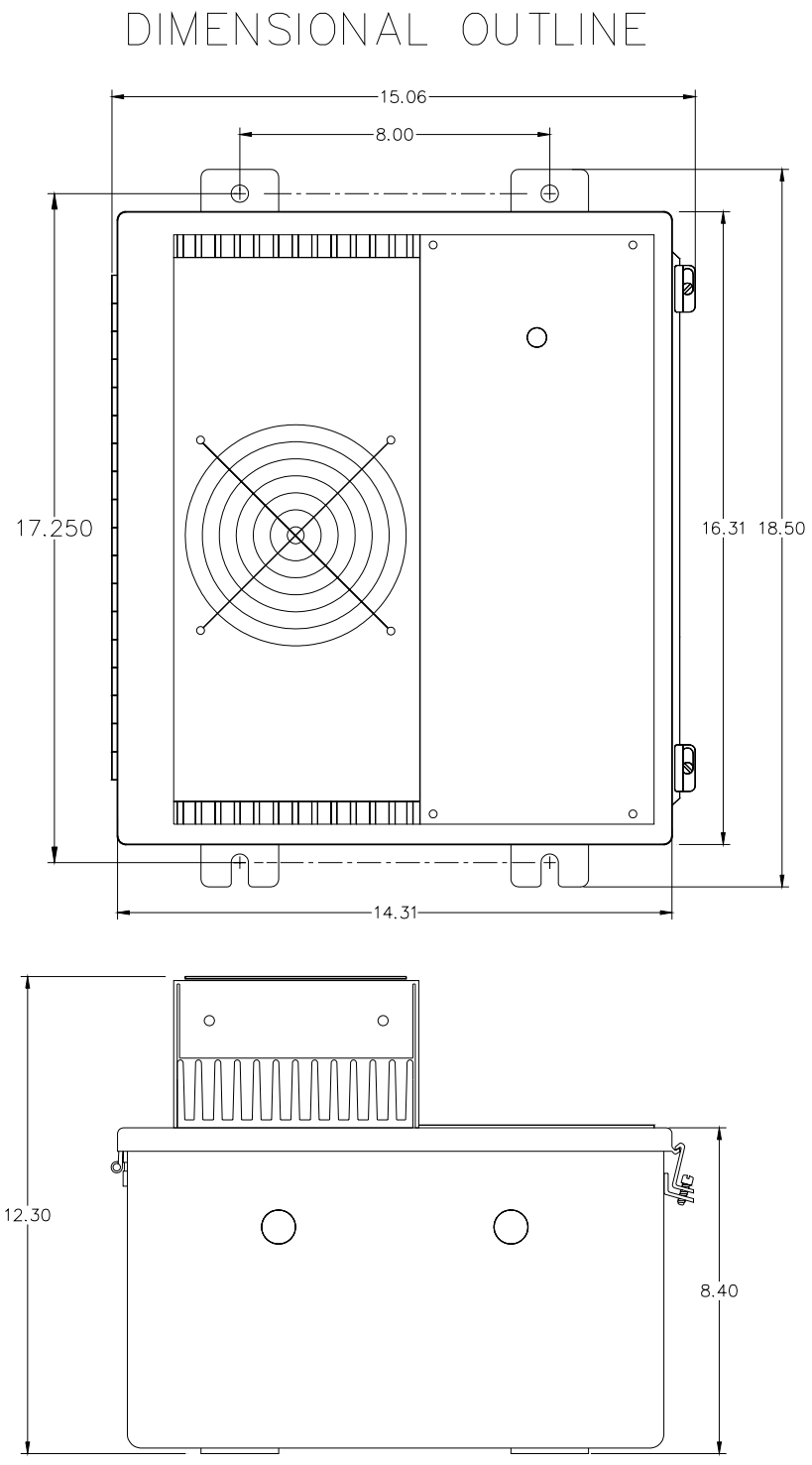
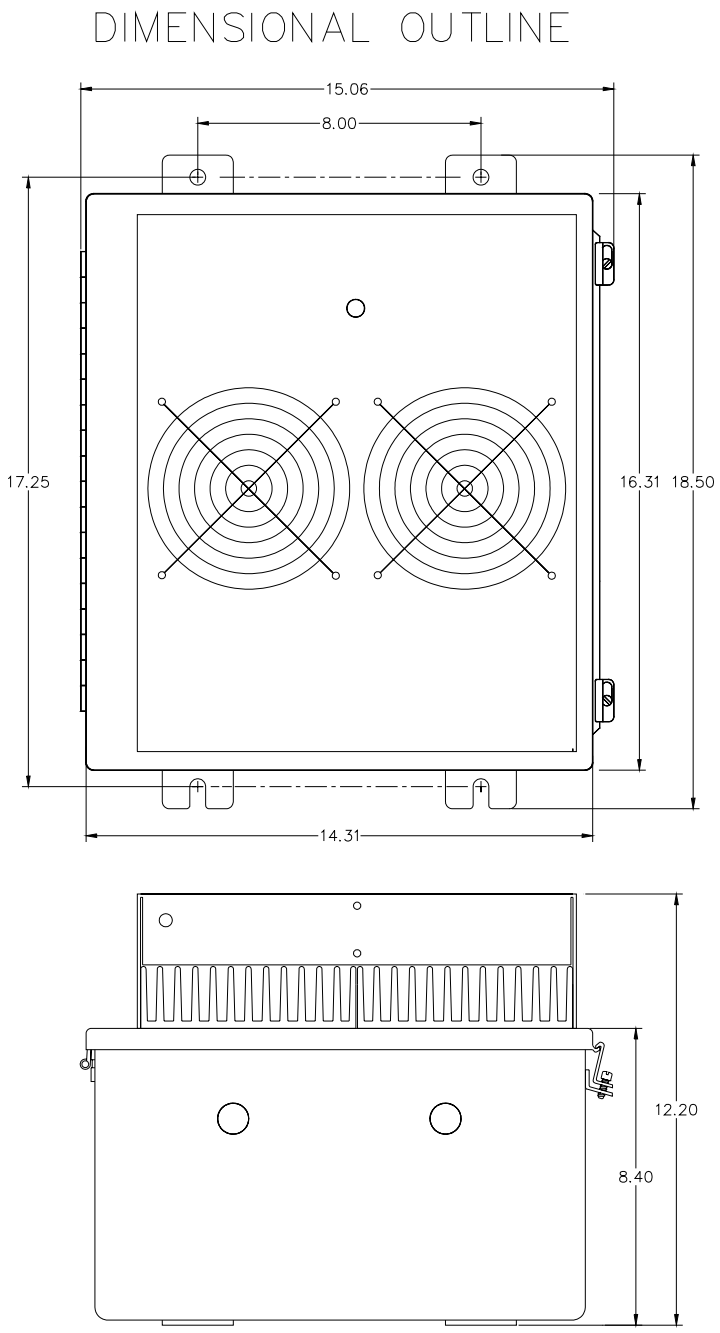


Figure 9-3: 3484 NEMA 12 (J21) 1200 Watt Enclosure Dimensions



521 Fairground Court ● Nashville, Tennessee 37211
(615) 244-2825 ● FAX (615) 244-2823 ● www.bonitron.com