USER'S GUIDE AND
TECHNICAL REFERENCE

AC SOURCE

BEHLMAN MODEL BL-PLUS SERIES
25KVA FREQUENCY CONVERTER

MODEL NUMBER BL25K-1-C3-480-100RR-6232

FOR SERVICE ASSISTANCE

CONTACT BEHLMAN
CUSTOMER SERVICE DEPARTMENT
PHONE TOLL FREE 1-800-874-6727

OR WRITE

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DATE: 07/14 REV. 1

SAFETY SUMMARY

The following safety precautions must be observed during all phases of operation, service, and operation of this equipment. Failure to comply with these precautions or with specific warnings elsewhere in the manual violates safety standards associated with the design and intended use of this equipment.

GROUND THE EQUIPMENT

To minimize shock hazard, the equipment chassis(s) must be connected to an electrical safety ground (protective earth). This equipment is supplied with a three conductor line connection for single phase applications and a five wire connection for three phase applications. Both types include an earth terminal intended for safety ground connections. Failure to use the protective earth connection may expose operating personnel to hazardous voltages. In addition this earth connection provides a return path for the equipment EMI filter(s).

DO NOT OPERATE IN EXPLOSIVE ATMOSPHERE

Do not operate the equipment in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

KEEP AWAY FROM LIVE CIRCUITS

Operating personnel must not remove equipment covers. Component replacement and internal adjustments must be made by qualified maintenance personnel. Do not replace components with power applied. Under certain conditions, dangerous voltage may exist even with the power removed. To avoid injuries, always disconnect power and discharge circuits before touching them.

DO NOT SERVICE OR ADJUST ALONE

Do not attempt internal service or adjustment unless another person, capable of rendering first aid and resuscitation is present .

DO NOT SUBSTITUTE PARTS OR MODIFY EQUIPMENT

Because of the danger of introducing additional hazards, do not install substitute parts or perform any unauthorized modification to this equipment. Contact Behlman Electronics for proper replacement parts and specific service information.

DANGEROUS PROCEDURE WARNINGS

Warnings will precede potentially dangerous procedures in this manual. Instructions contained in the warning must be followed.

CLAIM FOR DAMAGE IN SHIPMENT

Under the FOB factory terms of sale, ownership and responsibility are transferred to the customer when the equipment leaves the factory. Each Behlman product is shipped from the factory in proper operating condition.

Immediately upon receiving equipment, unpack and inspect it for evidence of damage incurred in shipment. File a claim with the freight carrier if the equipment has been damaged in any way or it fails to operate properly. Forward a copy of the damage claim report to Behlman. Include the model number, serial number and date the shipment was received. Behlman will advise the disposition of the equipment and will arrange for necessary repair or replacement.

RETURNING EQUIPMENT TO FACTORY

Do not return equipment to the factory without prior authorization from Behlman.
A RETURN MATERIAL AUTHORIZATION NUMBER (RMA) is required to return equipment.

This equipment, like all precision electronic equipment, is susceptible to shipping damage. It contains heavy magnetic components as well as delicate electronic components.

If equipment is returned without prior authorization, the shipment will be refused, the customer being liable for all shipping, handling and repair costs.

When packing for reshipment, use the original shock absorbent material and shipping container to preclude damage to the equipment.

Insure that the return authorization numbers (RMA) is available on the container for identification.

SHIPPING INSTRUCTIONS

RACK MOUNTED UNITS

1) Box (es) must be double wall with minimum 350 lbs. bursting test.
2) Box (es) must provide for a minimum of 3to 4 inches of clearance around sides, top and bottom of unit.
3) When packing unit, utilize either a foam-in-place system or high density foam. Clearance provided for above must be completely filled with foam.

FAILURE TO COMPLETELY SECURE UNIT IN BOX WILL ALLOW MOVEMENT DURING SHIPPING. RESULTING IN DAMAGE.

4) Secure box (es) to pallet (s). This is necessary to insure proper handling and protection during shipping.
5) Place the following warning label on box (es)

DO NOT STACK

6) Ship unit (s) using a freight cargo carrier; air or ground.

CABINET MOUNTED UNITS

Cabinet mounted units require that a special crate be used. The crate should be manufactured of plywood (3/8" or thicker) and reinforced (using 1 x 3 or larger pine) on all edges. The unit must be firmly secured to the crate's base. The crate must be shock mounted to avoid damage during shipping. Detail drawings for Behlman's crates are available upon request.

WARRANTY CERTIFICATE

Behlman Electronics, Inc. warrants to the original purchaser, for a period of one (1) year from the shipment from Behlman, each item to be free from defects in material and workmanship. Behlman's obligation and the Purchaser's sole remedy for any breach or violation of this agreement is limited to adjustments, repair or replacements for parts which have been promptly reported by the Purchaser as having been in its opinion, defective and so found by Behlman upon inspection. All replacement parts will become the property of Behlman on an exchange basis. This warranty will not apply if such adjustment repair or parts replacement is required because accident, neglect, misuse, failure of environmental controls, transportation damage or causes other than normal use.

If during the warranty period a defect should impair the performance of the unit, Behlman agrees, at its option, to repair or replace the unit or its defective components F.O.B. Behlman at 80 Cabot Court, Hauppauge NY 11788 or at another Behlman service facility at Behlman's option. To obtain service under this warranty, the original Purchase shall notify Behlman at the above address or by telephone at 631-435-0410 and provide information about the defect or impairment of performance. Behlman with then supply the Purchaser a Return Material Authorization (RMA) number. This number must be attached to the equipment sent back for warranty repair. Equipment must be shipped back to Behlman prepaid. No collect shipments will be accepted.

Behlman shall be excused from supplying warranty service if the unit's case has been open or if the unit has been subject to unauthorized repair. All service outside the scope of this warranty shall be paid for by the Purchaser at Behlman's rates in effect at the time of this repair. Behlman will not perform any repairs outside of the warranty without written authorization by the Purchaser. If the repair is a warranty repair, Behlman will ship the unit back to the Purchaser, by a method determined solely by Behlman, prepaid. If the Purchaser requests, any other means of transportation it shall be at the Purchaser's expense.

The use of the equipment shall be under the Purchaser's exclusive management and control. The Purchaser will be responsible for assuring the proper installation, use, management and supervision of the equipment. Behlman will not be liable for personal injury or property damage.

The forgoing warranties are in lieu of all other warranties, expressed or implied including without limitation warranties of merchantability and fitness for purpose.

In no event shall Behlman be liable for loss of profits, loss of use, or any indirect, consequential or incidental damages. Purchaser agrees that Behlman will not be liable for any damages caused by the Purchaser's failure to fulfill any of the Purchaser's responsibilities set forth herein.

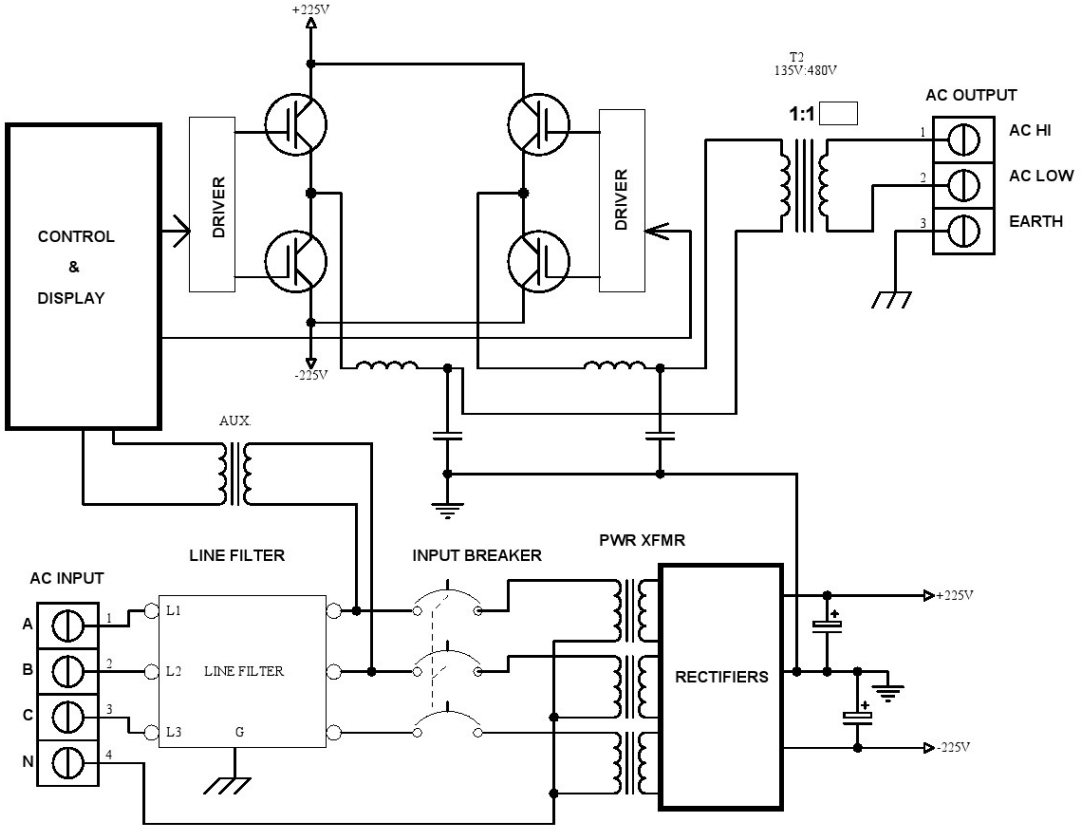
BEHLMAN MODEL BL25K-1-C3-480-100RR
TECHNICAL REFERENCE

TABLE OF CONTENTS

SECTION 1.0
INTRODUCTION

The Behlman model BL25-C-3-480-100RR is a solid state frequency converter. It provides regulated AC power at a frequency not available from local utility power. The output of this model is transformer coupled providing an isolated voltage source similar to utility power. The converter incorporates the latest in hard switched, PWM technology. A high frequency "Class D" type output stage provides a savings in weight and waste heat. This accounts for high power capability of this AC power source. The following is a brief description of the conversion process performed by the frequency converter.

Line power at 480Vac, phase power at 47 to 63 Hz is applied to the input of the unit. After passing through control contactors, the input AC is converted to a bulk DC link voltage. This DC voltage is applied to the output inverter (refer to block diagram). The output inverter is a switch mode power amplifier. A sine wave signal of the desired frequency is developed by the control circuitry and applied to the input of the power amplifier. This sine wave is amplified and "stepped - up" by the output transformer to provide the required output voltage. The output voltage is sensed electronically and used as feedback to regulate the output. This action rejects fluctuations in the input line voltage and provides an output that may be adjusted above or below the input line. The output current of the power source is monitored and used to provide overload protection for the output inverter.



SIMPLIFIED BLOCK DIAGRAM

SPECIFICATIONS

INPUT POWER

Voltage:	277 / 480VAC 3φ /4wire +/-10%
Frequency:	47 - 63 Hz
Current:	38A / phase maximum @ 480V (@ full output load)

OUTPUT POWER

Voltage:	480 VAC 1φ (Adjustable +/- 10%)
Frequency:	fixed at 100.0 Hz, +/- 0.3 Hz
Maximum Power:	25000 VA
Maximum Current:	52 amperes.
Current Crest Factor:	3:1 (max peak current is approx. 125 amperes)
Power Factor:	100% of rated output into any power factor load.
Distortion:	3% maximum THD (measured at full load, 480 Vac, 100 Hz Resistive).
Load Regulation:	±0.7% from no load to full load. (@ output terminals)
Line Regulation:	±0.3% for ± 10% of line change.
Efficiency:	85-90%
I/O Signals:	Sync input = 480VAC max. @ 2VA
Alarm Signal:	4 “C” form contacts rated 2A to 32Vdc or 125V A.C.

MECHANICAL

Dimensions:	59 in. High, 31.6 in Deep, 22 in Wide (160 cm H, 80.3 cm D, 56.1 cm W)
Weight:	1200 lbs. (544 kg). Weight is approximate.
Operating Temperature:	0°C to 40°C (32°F to 105°F).

SECTION 2
UNPACKING AND INSTALLATION

2.1 UNPACKING

This equipment is shipped upright with a wooden carton assembled over its shipping skid. To unpack, carefully remove hardware securing wooden panels. A forklift base is provided for ease of handling. After unpacking the AC Source (unit), carefully conduct a thorough inspection of controls, indicators, and chassis. If the unit shows signs of damage, do not attempt to operate. File a damage claim with the carrier responsible. Notify Behlman immediately.

2.2 INSTALLATION

1) This unit is shipped as a standard EIA rack assembly. These units require proper cooling air circulation. Cool air is taken in through the front and exhausted to the rear. When selecting the installation site, care must be taken to ensure exhausted hot air does not build up behind the unit. A minimum clearance of 24 inches should be maintained between the rear door of the rack assembly and nearest obstruction (i.e. wall or bulkhead). Consult with qualified personnel.

2) The location site must protect the unit from coming in contact with any fluids or other moisture.

WARNING

INSTALLATION AND OPERATION OF THIS EQUIPMENT EXPOSES PERSONNEL TO HAZARDOUS VOLTAGES. ALL INSTALLATION AND OPERATION MUST BE PERFORMED BY QUALIFIED PERSONNEL ONLY. FAILURE TO FOLLOW INSTALLATION INSTRUCTIONS MAY CREATE A SAFETY HAZARD.

2.3 WIRING

All input and output wiring may be accessed by opening the rear door of the equipment enclosure. Figure 2-1 illustrates the location of the input and output terminal blocks. All wiring must enter/leave the enclosure through holes in the bottom of the cabinet.

A) INPUT POWER- Connect 47-63 Hz, power lines to the φA, φB, φC and neutral terminals of the input power block, TB1. The terminal marked “GND” is to used to attach a safety earth connection (protective earth). This terminal is tied to the chassis. The required wire gauge is dependent on the connection length and input current. Check local code requirements. See additional cautions in this section. ¼ inch AAR terminals are provided.

B) To make the “earth” connection, tie the installation protective earth conductor to the power supply enclosure “GND” stud with a minimum of AWG 4 wire or equivalent ground strap. The output neutral terminal can be tied to this point for additional safety. See figure 2-2. If output isolation is not required, the input and output neutrals may be connected together to provide a “carried through” neutral as illustrated in figure 2-3. Note that certain electrical safety codes require a grounded conductor as part of the output wiring. Consult with a licensed electrician for more information.

C) OUTPUT POWER- Output power lines are connected to the Hi, and Lo output terminals. (if desired) terminals of TB2 on the inverter output assembly. Wire must be routed to the bottom rear of the cabinet for exit. See figure 2-1

2.3 **WIRING** (continued)

IMPORTANT NOTE:
If this unit is to be installed as part of a permanent power source with wiring distributed in a building, the user is responsible for conformance to local electrical codes. The National Electrical Code (NEC) section 250 requires that all separately derived AC power sources (generators, inverters, UPs, etc.) must have one output conductor tied to the system earth conductor .This connection may be provided by connecting the input Neutral to the output Neutral or connecting the output neutral to the chassis ground (assuming the chassis is tied to earth). Consult local codes and a qualified electrician.

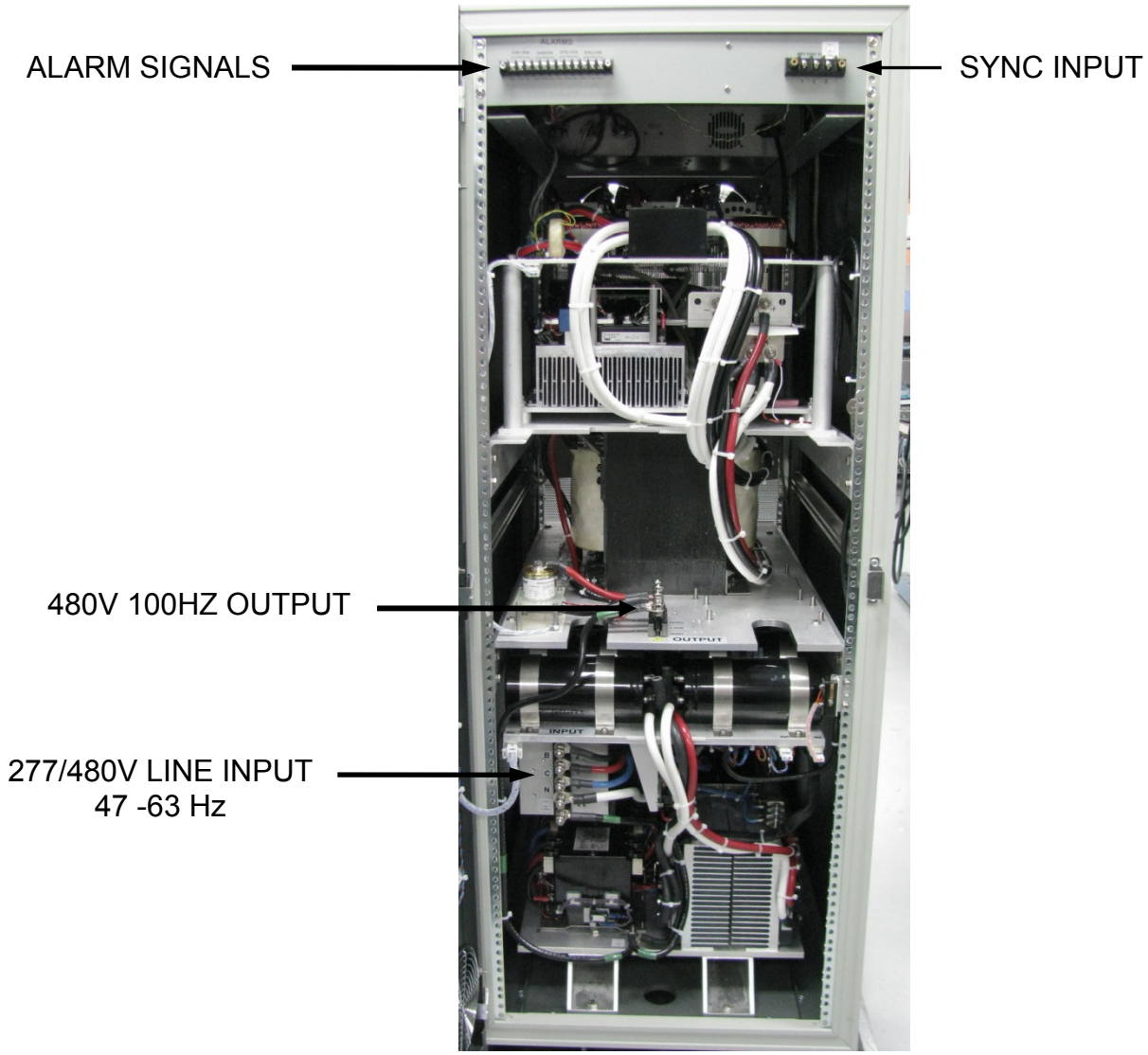
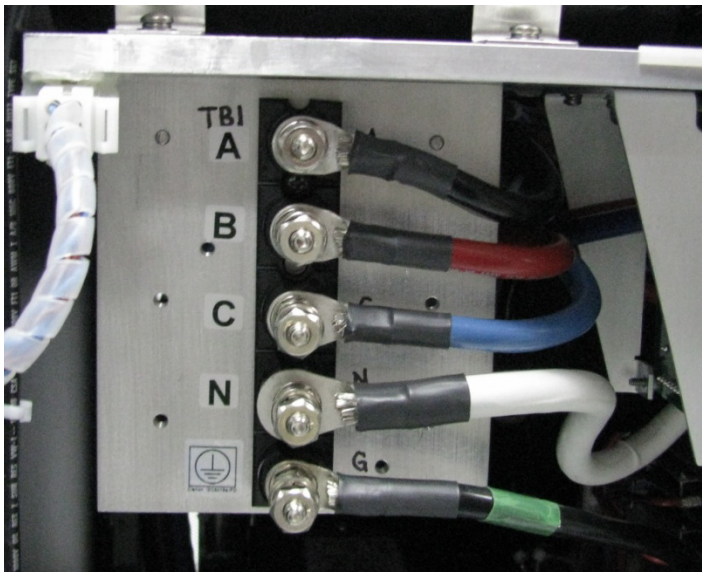


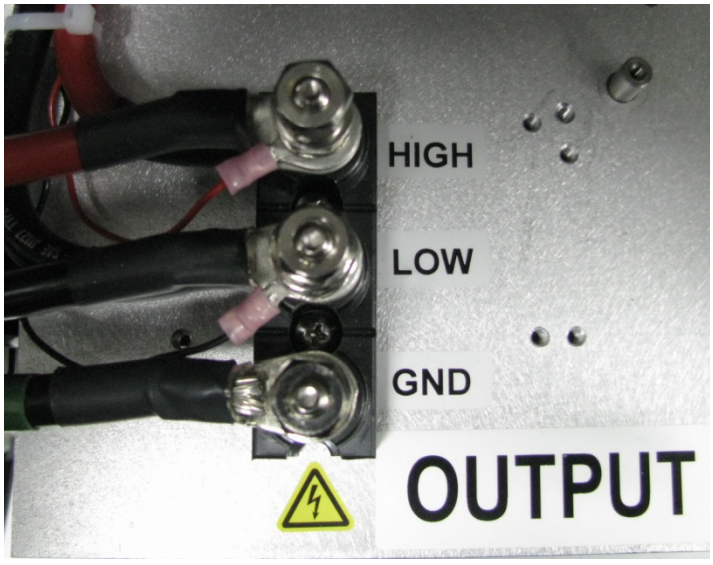
Figure 2-1 above illustrates wiring locations. The rear door must be opened to access wiring points. A lock is provided to keep un-authorized personnel from accessing internal wiring. A safety interlock will shut down the converter if the door is opened. DO NOT bypass this feature.

WARNING !

The rear door must be in place during operation. Besides exposing hazardous voltages, proper cooling is not possible with the door open or removed.



3 PHASE 480VAC INPUT AAR TERMINAL BLOCK



480V 100HZ OUTPUT AAR TERMINAL BLOCK

2.3 WIRING (continued)

The input current requirement is a maximum of 38A per phase. All units incorporate electronic overload detection that will protect the unit from various load related problems. In addition, supplemental ac line protection should be added to the lines feeding this unit. This should be in the form of fuses or magnetic circuit breakers rated for this purpose. The interrupting rating of the supplemental protective device is dependent on the rating of the branch feeding the equipment. Consult a qualified electrician for proper selection of protection devices and their installation.

RECOMMENDED HOOK-UP

Figure 2-2 below illustrates a typical wiring scheme for the B+L30 series units. This will provide the best overall performance and safety.

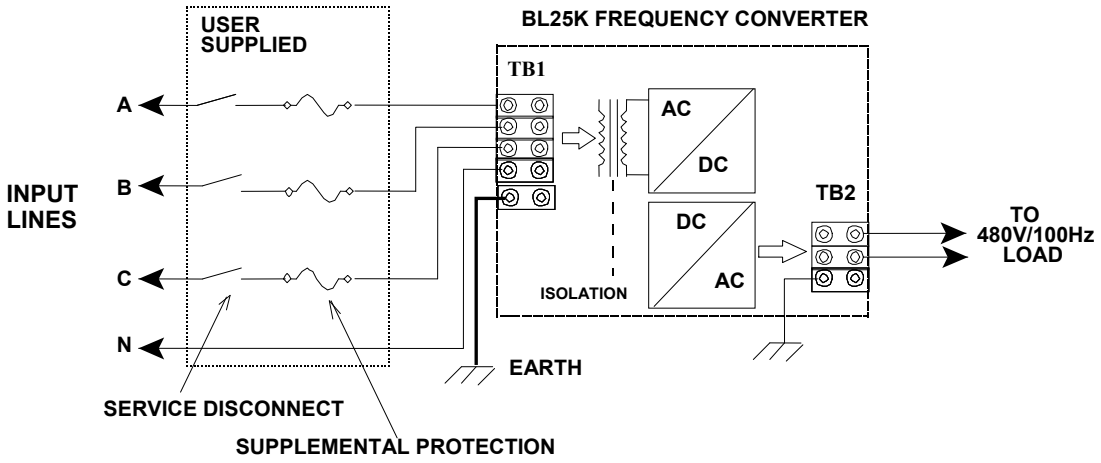


Figure 2-2 recommended hook -up BL25K converter.

All connections should be made with stranded wire using ring type lugs. The required inside diameter of the lugs is 0.25 nominal. Strain relief must be provided by the installation. Wiring access is via a hole located in the bottom of the unit. Once the wiring is accomplished, replace any terminal block covers and close and lock the cabinet door.

THIS EQUIPMENT PRODUCES HAZARDOUS VOLTAGE DURING NORMAL OPERATION. THE INSTALLATION MUST PREVENT INADVERTANT CONTACT WITH PERSONNEL.

2.3 WIRING (continued)

SYNC INPUT

This model has the ability to synchronize its output with reference sine wave applied to the SYNC input. The controller uses a Phase Locked Loop circuit to track this input and maintain phase and frequency in step with the reference input.

The sync input is AC coupled and may be any voltage between 200- 480VAC. A screw type terminal block is provided at the top rear of the unit for attachment of the sync input. The input burden is approximately 2VA.

IMPORTANT

The "stand alone" frequency of this model is crystal stabilized. Appling sync overrides the internal clock. If the sync source is not stable, The output frequency of the converter may become unstable or drift.

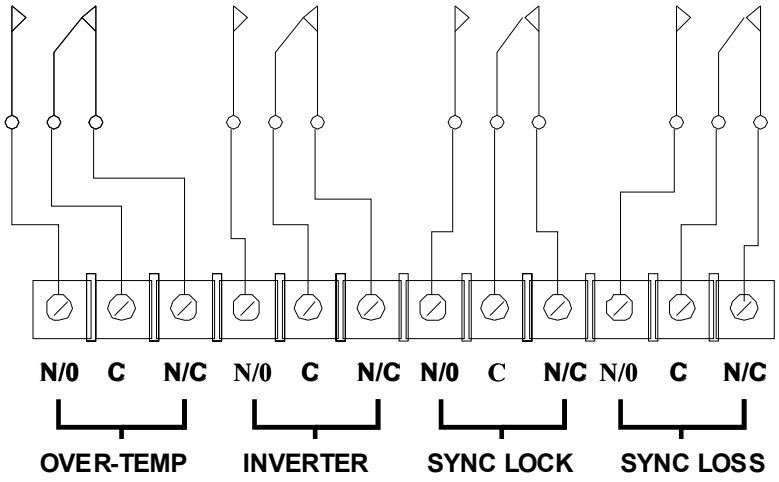
ALARM SIGNAL CONTACTS

A group a four relay contacts is provided to allow monitoring of the frequency converter operation. These can be used to alert the user or system when certain faults occur. A summary of functions is given below:

CONTACT NAME	DESCRIPTION
Sync Loss	contacts transfer when sync signal is lost.
Sync Lock Fail	contacts transfer when output phase lock lost.
Over Temp	contact transfer when internal temp is 75deg C
Inverter	contact transfer when Inverter output is low or missing.(Not ok)

The alarm contacts are "dry" type and are capable of carrying 2 amps @ 120 VAC or up to 32 VDC. Operation beyond these limits will severely impact reliability. The diagram below illustrates the internal wiring of the alarm contacts. All contacts are isolated up to 300 VDC from all other circuit points. Connection is via a 12 position, screw type terminal block at the top rear of the unit.

ALARM CONTACTS SHOWN DE-ENERGISED (NO FAULT)



SECTION 3
OPERATING INSTRUCTIONS

Once the equipment is connected as described in the previous section it is ready to use. Figure 3-1 below illustrates the various controls and indicators associated with this model.

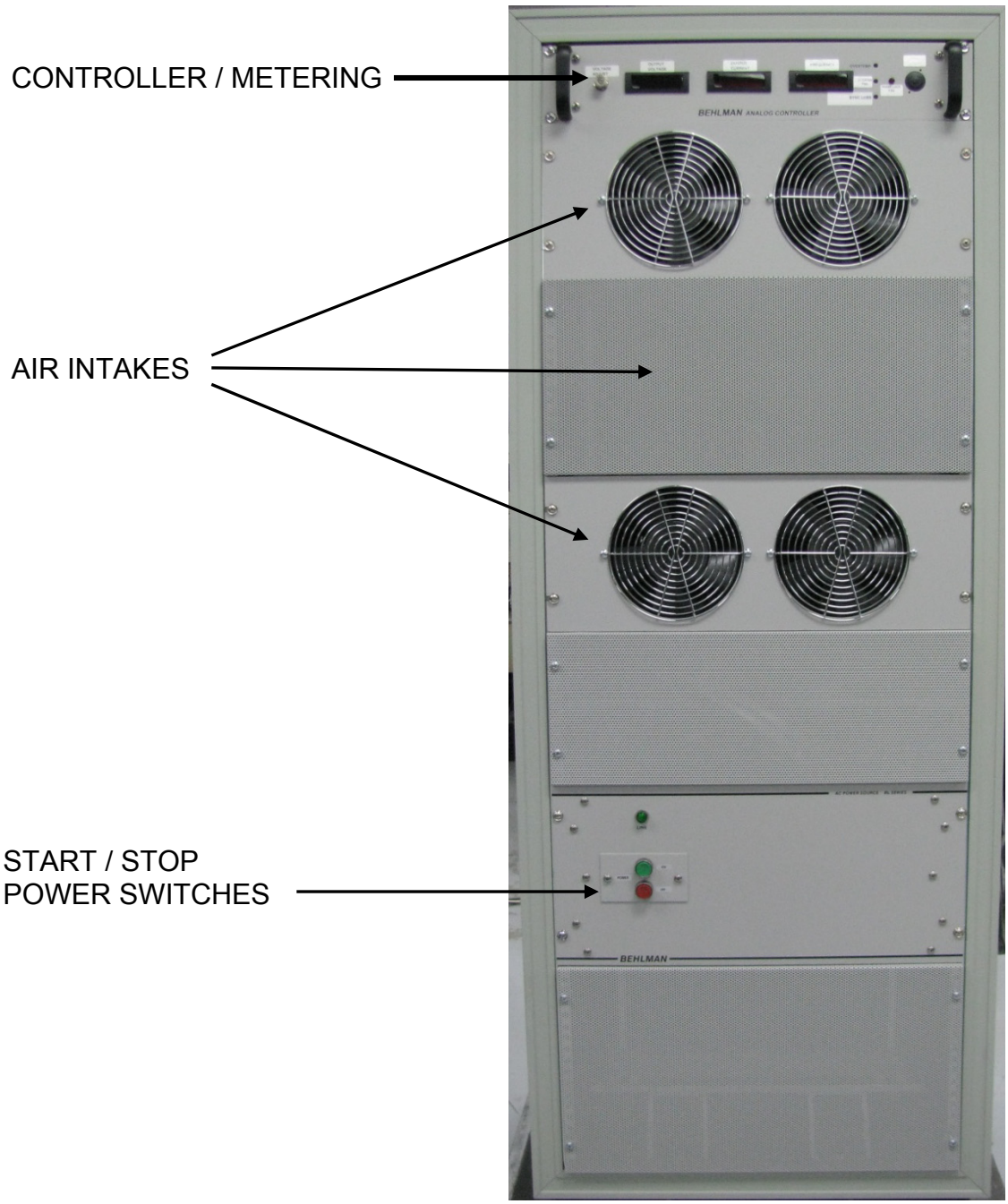
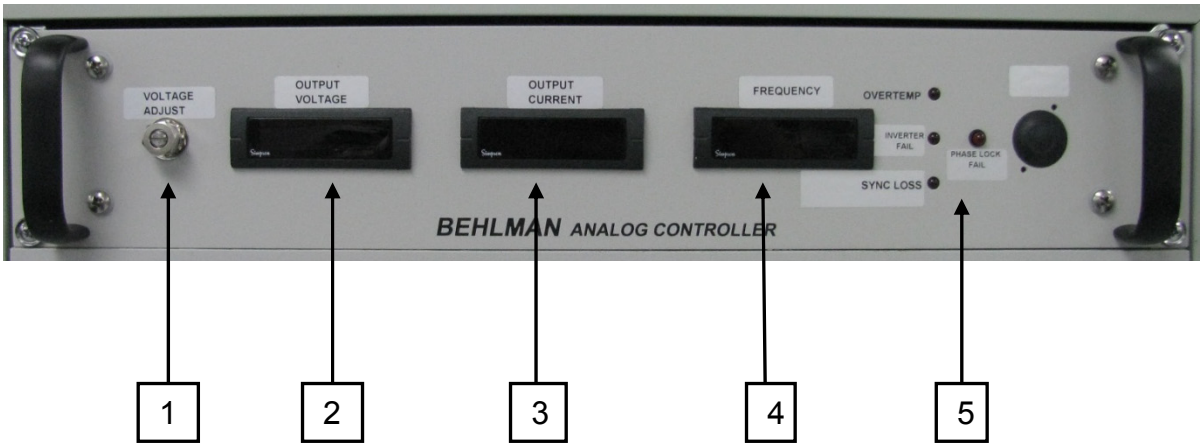


FIGURE 3-1, FRONT VIEW OF BL+25-1-C3-480-100

3.1 OPERATING INSTRUCTIONS

CONTROLLER FEATURES

The controller “module” sets the output voltage and frequency of the converter. In addition it monitors the output voltage, frequency and current and display these parameters on 3 backlit LCD digital displays. Figure 3-2 below illustrates the front panel of the control module.



CONTROLLER EXPAINATION

ITEM 1	=	Output Voltage Adjust: locking type control allows an approximate +/-10% adjustment of output voltage.
ITEM 2	=	Output Voltage Display
ITEM 3	=	Output Current Display
ITEM 4	=	Output Frequency Display
ITEM 5	=	Status LEDs: four red LED indicators provided for ; Over temp, Over Current, Sync Loss, Sync Lock. LEDS illuminate during a fault and are in parallel with alarm signal contacts.

3.1 OPERATING INSTRUCTIONS

TO OPERATE

1. Depress the green start button to apply power to the converter. The unit will go into a soft start mode the may take several seconds. The sound of cooling fans should become evident, and the meters on the controller panel will be active.

2. Confirm that the output voltage and frequency are correct for the desired load. If required, use the voltage adjustment on the controller to set the output to the required value. Note that the locking nut must be turn counter-clockwise before the adjustment can be made. DO NOT force the adjustment screw.

3. Energize the loads. At this point the output load current can be read from the controller display.

TO SHUT DOWN

Depress the Red STOP button located on the lower front panel.

3.2 OPERATING CONSIDERATIONS

This equipment is protected from output overloads by its internal circuitry . If a load fault occurs, the controller will indicate the fault with LEDs.

SHORT CIRCUITS	The unit is disabled if a short or gross overload is applied to the output. During this time the “INVERTER” LED will illuminate and the “INVERTER” alarm contacts will transfer. The unit will attempt to reset the fault every 5 seconds or so. If the overload is removed, the inverter will recover.
OVER-TEMP	Illuminates to indicate the unit is disabled due to high internal excessive internal temperature. This fault will reset once the temperature returns to normal.
CONSTANT CURRENT MODE	Overloads that exceed the rating of the unit but are not high enough to activate the short circuit protection will cause the output voltage to drop. This indicates the unit is in current limit due to overload. The INVERTER LED will illuminate if the voltage drops below a preset limit of about 20%

GENERAL

All BL series incorporate an input rectifier system followed by a capacitive filter. To limit the in rush current to the unit, a soft start circuit is employed. This circuit prevents nuisance tripping of protective circuits in the line circuits as well as reducing stress on internal components. When the unit is switched off for any reason, a period of about three to five seconds is required to allow the soft start circuit to “reset.” Failure to do so may cause the front panel breaker of the power supply to trip repeatedly as power is reapplied. This may lead to eventual failure of the components.

3.3 OPERATION INTO LINEAR LOADS

The BL series will provide the best overall performance into a linear load. A linear load is characterized by that fact that its current wave shape is sinusoidal. The phase relationship between the voltage and current may be anything between zero and 90 degrees (leading or lagging). Some examples of linear loads are as follows:

Most AC Motors	Power Transformers	Heating Elements
Resistors	Capacitors	Most Inductors
Incandescent Lighting (without dimmers)		Most Solenoids

Operations into these types of loads usually cause little interaction with the output stage of the model BL25000. The main concern with a linear load is the “inrush” current associated with it. Most heating elements and resistors have no inrush concerns and usually do not present any problem for the power source. Inductive and capacitive loads may present a special problem based on their construction and the way in which they are energized. Motors and tungsten filament lamps also present some special “start-up” concerns. The following is intended to give the end user some insight into applying the AC source to these types of loads.

3.4 DRIVING REACTIVE LOADS

Capacitors and inductors are reactive in nature. If the load is applied during the peak of the AC cycle there may be a considerable inrush of current several magnitudes larger than the steady state current. This current is only limited by any series resistance that may be present in the load circuit. Under the right conditions, this could trip the overload protection circuits in the power source. Certain transformers and solenoids (inductance) present the same problem.

Several methods can be used to prevent tripping the protection circuits in the power source. One common method is to insert a limiting impedance in series with the load. This could be a fixed resistor or NTC (negative temperature coefficient) thermistor. Also, zero crossing switching can be employed. The most obvious way to prevent a high inrush current is to apply the load with the voltage set to zero (or some low value) and energize the load slowly by turning up the voltage.

3.5 DRIVING LAMPS

Tungsten filament lamps present a very low resistance when cold. Once they are energized, their resistance quickly climbs to its steady state value. This characteristic must be accounted for when driving tungsten filament lamps. The same methods for driving reactive loads can be applied to tungsten**.**

3.6 DRIVING MOTORS

Driving an AC motor presents a special problem. Most motors require a starting current that is several times higher than the running current. This current may last for a few cycles to several seconds depending on the construction and mechanical load on the motor. This current is sometimes referred to as the motor’s “locked rotor” current. This current is not to be confused with the in rush current that usually occurs over the course of one or two cycles of the AC waveform.

The BL series fold back current limiting can be an advantage when starting motors. During the starting period, the motor will attempt to draw excessive power from the power source. The fold back circuit will reduce the output voltage in order to maintain the maximum output current for the range in use. During this time the current supplied to the motor will remain sinusoidal, this allows the

3.6 DRIVING MOTORS (continued)

motor to start rotating. Once the motor reaches its normal operating speed, it generates the required "back EMF" and the supply current drops off to the nominal "run" current for the motor.

3.7 DRIVING NON-LINEAR LOADS

Loads utilizing rectifiers and SCRs interact with the AC power source and have a profound effect on the distortion of the output waveform. Consider the use of a bridge rectifier followed by a capacitive filter. The input current to this type of circuit is drawn in large "gulps" whenever the voltage across the capacitor falls below the peak of the input waveform. This current is limited only by the series impedance present in the wiring and capacitor. The impedance of large electrolytic capacitors is very small. This action causes a current waveform with a peak value that may be several times the RMS value. This ratio of peak current to RMS current is known as " Crest Factor". High values of crest factor cause distortion of the AC voltage waveform and can cause de-saturation of the power devices and overload latch shutdown.

The amount of distortion incurred is dependent on many factors and is beyond the scope of this manual. It should be noted that this type of load may cause the output waveform to exhibit "flat topping." This should not be associated with a defect of the power source. Most "real world" electric distribution systems exhibit this distortion for this reason.

3.8 OUTPUT NOISE

Because the BL series uses a high frequency PWM conversion technique, a certain amount of output noise or ripple is to be expected. The amount of noise present on the output voltage waveform from this unit varies somewhat with the load. Maximum noise levels are present when there is no load applied. In any event, the noise present should not constitute a problem for properly designed equipment. If the devices being tested are disabled by the noise present on the output waveform, then serious consideration should be given to the design of the unit being tested as it may not pass the European EMI tests.

In special cases where the output noise is objectionable, an external line filter can be added to the output of the unit. If the noise level is interfering with low level measurements, a linear type AC source should be considered. For more information on linear sources, contact Behlman Sales.

SECTION 4
MAINTENANCE AND PERFORMANCE VERIFICATION

WARNING

This equipment involves the use of voltages and currents that can be hazardous. Only qualified personnel should be allowed to operate or service it. All doors and covers must always be in place during operation.

Before performing any work where access to the inside of the equipment is required, be sure to turn off the unit and allow 10 minutes for the dc power supply capacitors to discharge.

4.1 MAINTENANCE

IMPORTANT:

FAILURE TO MAINTAIN OR OPERATE THE UNIT PROPERLY WILL VOID THE WARRANTY. AMONG THE ABUSES THAT ARE INCLUDED (BUT NOT LIMITED TO) ARE:

NOT MAINTAINING THE CLEANLINESS OF THE GRILLES (VACUUMING), OPERATING OUTSIDE THE ALLOWABLE ENVIRONMENT, AND PHYSICALLY DAMAGING THE UNIT AND OPERATION BEYOND ELECTRICAL RATINGS.

The decision on whether a unit's warranty has been voided will be exclusively reserved by Behlman.

Periodic calibration of the frequency converter is generally not required. Periodic verification of performance is left to discretion of users requirements. Preventative maintenance is required to maintain performance. The maintenance interval required is determined by the environment that the unit operates in. A monthly maintenance schedule is recommended for all new units in dirty environments.

Maintaining Air Intake / exhaust

While the unit has no filters, the grilles have small holes which can become clogged. This reduces the volume of cooling air available. In addition to cleaning the grilles it may be necessary to remove the dust and debris from inside of the unit. Care must be taken to prevent static buildup and discharge. In dry climates this can damage the sensitive CMOS circuits. High pressure air hoses should never be used around printed circuit boards for this reason. Vacuuming the grilles with light brushing is the preferred method. Before attempting to clean inside the unit, disconnect (**LOCK OUT**) the main feed to the converter and allow at least 10 minutes before touching any parts inside the unit. This will allow for any electrical charge to dissipate.

4.2 PERFORMANCE VERIFICATION

The following procedure is intended to allow the end user to verify that the AC power source is operating within specifications. In all instances that follow, the power supply will be referred to as the DUT (device under test). In addition, controls located on the power supply will be denoted by boldface capital letters.

This procedure is intended for use by qualified personnel only.

4.3 TEST EQUIPMENT REQUIRED

Below is a list of suggested test equipment:

TEST EQUIPMENT	MINIMUM SPECIFICATIONS
Oscilloscope	20MHz 2 ch. (or equivalent)
Digital Power Analyzer **	Voltech PM3000A (or equivalent)
Test load 1phase 25KW @ 480v)	Avtron resistive.(or equivalent)

**Note: the Voltech power meter allows verification of all output parameters with one instrument and is listed only as a suggestion, verification can be performed with standard test equipment

The procedure that follows is intended as a guide for quick performance verification of the AC power supply. The end user must determine if this sufficient for their individual needs. Any procedure that will check the specifications of the unit may be used. If further information is required, contact the Behlman factory for customer service.

4.4 PROCEDURE

1. Connect the power analyzer between the converter and the loads as per the manufacturer's instructions.

2. Apply power to the system and allow a 10 minute warm-up period.

3. Use the power analyzer to measure and record the following; output voltage, output frequency, and output current. Confirm that these all meet the specifications provided at the beginning of this manual. Note that the load current is load value dependent. If the load value is not known, it is sufficient to make sure the converter front panel displays match the values indicated on the power analyzer.

4. Adjust the output voltage to the required value if required.