

# Elimia Industrial

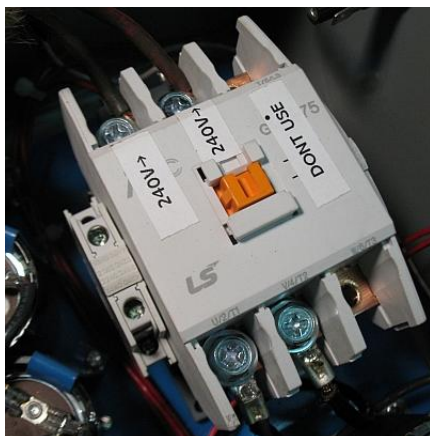
## Phase converter installation instructions:

Your converter should be located indoors at a location dry and easily accessible. You will need to provide suitable wiring and fusing from your existing main service or subpanel. Refer to your schematic for minimal wire fusing sizes. If fed from a circuit breaker the breaker will need to be a double pole type. Your wiring should be protected in conduit as required by national and local electrical codes. If your feed power is located more than 50 feet from the phase converter panel you should up size your feeder wire by one size or more to reduce voltage drop in the fed wiring.

If your nominal 240 VAC feeder wiring is NOT a 4 conductor cable you will need to provide a separate 120 VAC wire to operate the converter controls. If using a 4 conductor cable (2 hot wires, insulated neutral and ground) that is all that will be needed. The schematic can help you determine what is easiest for you. If you do run a separate 120 VAC wire it will need to be properly fused and include a hot, neutral and ground. Jumping off an existing 120 VAC circuit is acceptable.

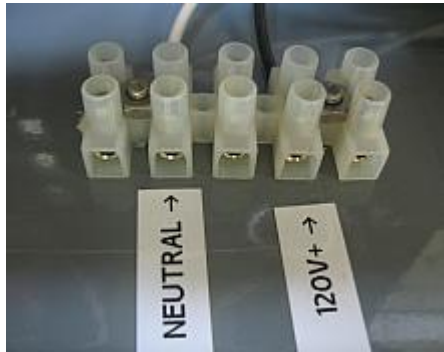
In most cases Elimia converters use the main contactor for your 220 Volt input power connection. In other cases a terminal block or lugs will be provided and marked for this connection. In the picture below the main contactor is labeled and ready for the input power. This is where your converter gets the main single phase power. The two hot wires coming from your electrical panel or subpanel are connected to the converter at this point. Don't skimp on wire size! Using wiring that is undersized results in voltage drop. Voltage drop can greatly affect the operation of your converter and your three phase equipment. Nominal main power is 220 – 240 VAC. If your main's power is on the low end of nominal you should limit voltage drops as much as possible.

*The main power for your converter is connected directly to the contactor as labeled. Your cable should be properly stripped avoiding cutting the individual wire strands. Use the screw lugs for your connection, not the fast-on connections. Tighten the wires until it becomes difficult to turn your screwdriver. After about 1 hour or so retighten as the copper relaxes over time. Pull test your connection. Only use connections labeled 220/240V, do not use connection L3.*



*The picture to the left is main power connection for larger converters (20 HP plus). We recommend you use ring terminals to make the connections to the contactor. You should also solder the wire to terminal connection. Voltage drops can greatly affect the operation of your equipment. Don't settle for a "rigged" connection.*

Typically, Elimia converters will utilize a terminal block for the 120 VAC connections. It will usually look like the picture below. There will be a contact marked 120 positive and Neutral. If you ran a four conductor cable for your main power to the converter the neutral wire of the cable should be connected directly to the terminal block pictured below. With a four conductor cable you will not need to provide the separate 120 VAC wiring. Larger converters will likely be equipped with an inline fuse holder and jumper wire. The jumper wire will be shipped loose and installed only if you use the 4 conductor power supply (hot, hot, neutral, ground). Jumper installs between the fuse holder and the main power L1 connection on the main contactor.



*Make sure when you insert your wires in to the terminal block that all individual strands are inserted. It is a good idea to twist your stripped wires to prevent tiny strands from sticking out. Tighten the terminal screws and test pull your wires.*

*If you are using a four conductor cable for your converter power and not using a separate 120 Volt supply you will need to add a jumper from the 120V+ connection to one of the two main power wires at the contactor where marked 220V.*

Some converters have been provided with fusing for your machine wiring. Please note that this fusing is intended to protect the wiring to your machine, not the machine itself. It should not be used as a replacement for protection required or already built in to your machine. For converters where the wiring from the converter is feeding a subpanel, the fusing is not meant to replace a main breaker for that subpanel. Please refer to the schematic for sizing wire and fuses, in some cases the fusing provided from the factory may need to be changed based on wire size and load.

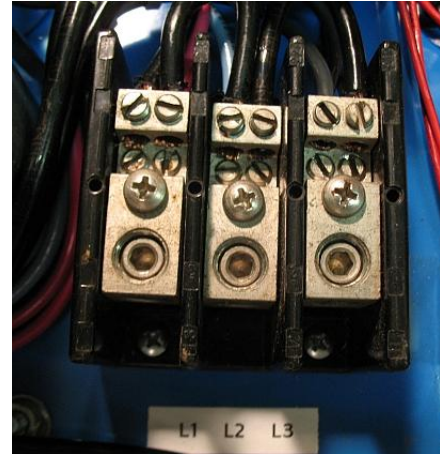
The vacant fuse block lugs are for your three phase load. Fuse blocks and fusing varies depending on converters but this is normally your take off point where three phase power goes out to your equipment. If you are running more than one machine from your phase converter, a subpanel should be installed. A subpanel can split your loads up and provide proper fusing for each machine's feeder wires. See below for typical load connection points.

*The three screws in this picture are your connections for your three phase equipment. In this case the proper connection would be to use ring or fork terminals. For larger converters pressure lugs are used to accommodate the larger cable size. Again we emphasize that you must use proper cable size to eliminate voltage drops.*

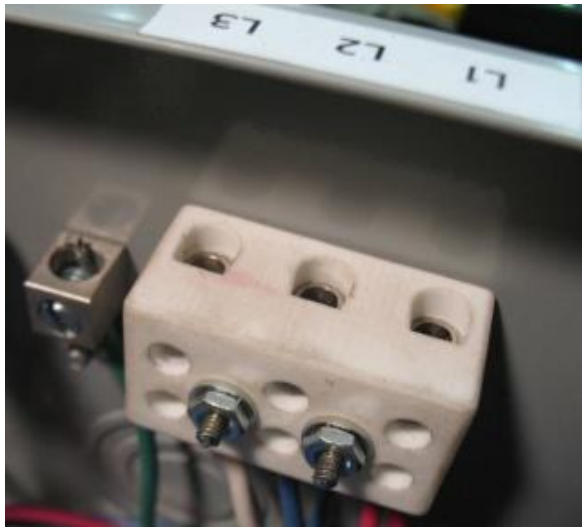


Depending on model, your converter may be equipped with a junction or terminal block labeled "L1 L2 L3" for the three phase power take-off. Your three phase equipment wiring should be connected on this terminal block and no other location in the panel. Remember, if your converter is not equipment with fusing; you are relying on your main's circuit breaker to protect this wiring. Your three phase equipment wiring should be size appropriately to be protected by the main power protection.

*The picture to the right is the 3 phase power connection for your equipment wiring. This style power block is commonly used on converters larger than 20 HP. Remember, for CNC or digitally controlled equipment never use the L3 wire for single phase power! Elimia uses L3 as the “generated” phase or wild-leg. If your CNC equipment uses single phase power for the controls you should use L1 or L2 ONLY. You should verify how your machine is wired internally prior to making connections.*



If you are running multiple machines from your converter, a subpanel should be installed and all machine feeder wiring properly protected based on wire size etc... Elimia offers sub-panels for installations requiring protection for multiple machines and/or can help in determining the best way to power your equipment.



*In the picture to the left, your equipment wiring will connect to the terminal block lugs as shown, L1, L2 & L3. Converters smaller than 20 HP usually have this type connection. It is a good idea to tin your wires with solder coming in to this block. It will help with installation and will also provide a better connection on the pressure lugs. Also note the ground lug on the left. It is ok to double up and use this lug with your main power ground and machine wiring ground.*

Don't forget to properly ground your control panel. Grounding is required for your protection and can save your life. There will be either a terminal block provided for ground wire connection OR a loose wire may be provided for grounding to your input power with a wire nut or crimp connector.

If you are unsure about the installation please consult a professional electrician.

We are also available for support. Call 256-528-7120 during regular business hours and we can help with your concerns. If we are unavailable or after hours please call 256-490-0388.

### Phase converter operation:

Most Elimia converters use a single on/off toggle switch and a push-button for starting. Before you test your converter you should double check all added wiring and connections. Inspect the on-board connections and verify nothing shook loose during shipping. Make sure components are still firmly mounted and secure and that they're no wire unconnected.

Without the load connected, test your converter. When you flip on the power switch (toggle type) you should see the ready indicator light illuminate. Once verified, push and release the start switch. You may hear a rumble or a growl for up to 1 second (on smaller converters ~5HP or smaller you probably will not notice this noise). At the end of this growl you may be able to hear a clip or clap. That is the starting circuit engaging the start capacitors and then disengaging. The starting is done with an electronic device. The starting time is set at the factory and should not be adjusted.

For converters equipped with optional wireless remote starting you should first test the manual starting means. Remote control converters are equipped with two means to start and stop the converter. Once the manual start is verified you can test the wireless starting capabilities. You should be able to start and stop your converter with the remote for up to 150 feet, depending on obstacles. Since your converter may not be located close enough to hear it running all converters equipped with remote control have an “on” indicator light on the panel and should be located to provide visual indication the converter is operating.

Now your converter should be up and running smoothly. If your converter is a TEFC (totally enclosed fan cooled) motor you will notice mainly wind noise from the external motor cooling fan. There should be very little noise from the motor or converter box. If you hear a loud hum, rattle or continuing growl, flip the start switch off immediately! Capacitors can explode and cause injury. If this condition occurs contact Elimia for service or instructions. **Never operate or power up the converter or control panel with the cover removed!**

Please note that TEFC motors especially high speed (3400 RPM) motors make a lot of wind noise. Don't confuse this with abnormal sounds.

Now that your converter is up and running let it run a few minutes. Then flip the switch to off. The converter should immediately shutdown and coast to a stop. Once the shaft is stopped turning flip the converter back on. Repeat this several times and listen for any unusual sounds. **Do NOT start the converter until the shaft has completely stopped turning.** The starting system is designed for a 0 RPM start. With the converter off touch the motor housing. It should only be warm. If the motor is so hot that you can't touch it verify that the fan on the motor is intact and turning with the motor. If no obvious problem exists consult the factory for more information. For motor types ODP (without ribbing) you may here a little rattle during operation. ODP motors have an open design and can occasionally suck up debris. Don't be alarmed, from time to time blow out the motor with air pressure. It is also common that during manufacturing your converter picked up metal shavings while the shaft was being cut off. These small metal flakes usually work themselves out within a few minutes of operation.

Your converter has been designed for flexibility. Some converters may be equipped with a load matching system. This system allows the owner to adjust the converter panel to various load sizing and still maintain peak performance. Converters without this feature are design for optimum performance ¼ to ½ loaded. Meaning, a 5 HP converter is designed for match voltages with a medium 1 – 3 HP load. That doesn't mean you can't run a smaller or larger load it just means that the voltages your equipment will get from the converter will be slightly different referencing L1/L2/L3. The difference will not be enough to affect operation of most equipment but the difference could affect some voltage sensitive equipment such as CNC drives.

Once your machine is wired to the factory supplied fuse block or connections it is time to verify operation. **The converter should ALWAYS be started prior to your machine being started.** If your converter is started under load (your machine already on) it could burn out a relay and or damage the start capacitor(s). We will not replace equipment/parts that exhibit this damage. In the event that there is a main power failure, your converter should be switched off to prevent starting while loaded once the power returns. Also, always kill power to your machine prior to the converter being switched off. Not doing so can damage the converter or blow fuses. Converters equipped with pushbutton starting and remote control operation have an extra circuit installed that prevents momentary power outages that cause the converter to start back up once the momentary power outage ends.

Now that you have verified your converter is running correctly you can power up your 3 phase equipment (machine). With the converter running, power-up your 3 phase machine. Your equipment should sound normal, there should not be any extra humming or growling from your machines motor. If your machine failed to start and only hums, first verify your wiring. Make sure that all three wires are connected to L1/L2/L3 appropriately. Next, verify your machines motor ratings and voltages. Make sure your machines motor is not wired for 440 VAC

operation. Consult factory for more information. If your equipment's motor is turning backwards you will need to inspect your wiring and reverse any two connections on L1/L2/L3 or the take off point from your converter.

With your machine running normal operate it as usual. As long as the converter is not overloaded you will not notice the converter change in sound or motor speed. You may be able to notice that the converter runs slightly quieter with your machine on. This is normal. The converter should run quieter when the optimum load (your machine) is on. This is because the capacitance is balanced for that load.

Please note: Elimia Industrial is not responsible for any damages contributed from misapplication of its products. It is your responsibility to verify our products meet the specifications for your equipment and application.

### Things to remember:

Never operate or power the converter with the cover off

Do not engage the converter with a load (your equipment) already on

Never disengage the converter with a load left on

Never run the converter without proper fusing

Do not leave the converter running unattended

Do not reengage the converter until the converter motor has stopped turning

*Please consult the factory if additional instructions are needed.*

*The design of this system is the sole property of Elimia Industrial and cannot be reproduced or copied in anyway, under penalty of law.*

## **Elimia Industrial**

2404 County Road 26  
Crossville, Al 35962  
256-528-7120

## ***Limited 10 year Warranty***

*Thank you for purchasing an Elimia Industrial phase converter. Elimia converters are built to last and we are confident you will receive excellent service from the converter for years to come! In the event of an unlikely system failure to any part of the converter we shall replace the failed part free of charge for up to 10 years. If a failed part cannot be identified, some or all of your system must be sent back to the factory for support. Warranty shall not cover shipping cost to or from our factory, fuses, motors and indicator lights. Additionally, Elimia Industrial shall not be liable for subsequent damages to equipment or real estate. We reserve the right to replaced part(s) with the same or compatible replacement(s). Your converter and warranty are identified by the model on the front of the control panel.*

*Again, we appreciate your business!*

*Ken Fowler, President, Elimia Industrial*

# **STOP!**

**Do not attempt to  
install your converter  
without reading this  
manual!**