

TROUBLESHOOTING PROCEDURES

As with any troubleshooting procedure, there is no substitute for a clear understanding of the installation procedures involved. The contents of this manual should be studied and **THOROUGHLY UNDERSTOOD**.

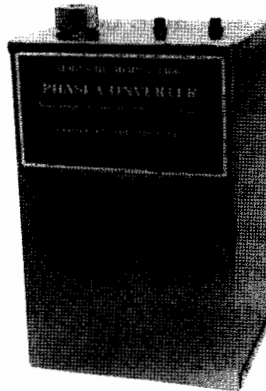
Make absolutely certain that all factory installation procedures regarding physical mounting, protection from foreign material, wire sizing, fuse protection, etc..., have been followed. Check all connections to be certain that they are tight.

The following troubleshooting chart is divided into two sections, one for Series 1B & Series 3 Static Converters and one for Rotary Converters. This chart should be helpful in isolating problems. Please refer to this chart prior to contacting the factory.

CAUTION - This is a high voltage (220V) device. Disconnect power prior to installing or removing the phase converter or attempting to troubleshoot the installation.



Series 1B
Permits starting of
220V 3 ϕ motors on
220V 1 ϕ current



Series 3
Provides continuous 3 ϕ power to
220V 3 ϕ motors from
220V 1 ϕ current

TROUBLESHOOTING PROCEDURES FOR STATIC PHASE CONVERTERS

Prior to discussing troubleshooting of Cedarberg Static Phase Converters, it is important to understand the principal of operation of a static phase converter, Cedarberg Static Phase Converters are designed to start 220V three phase motors within a specified horsepower range on 220V single phase current. Before referring to the following troubleshooting guide, make **ABSOLUTELY CERTAIN** that:

1. The horsepower of the motor you are attempting to start is within the specified nameplate horsepower range of your converter.
2. The motor you are attempting to start is wired for 220V and not 440V.
3. Always check the incoming voltage. Voltage must be - 10 % of rated voltage. If not, contact your power company.

PROBLEM	SYMPTOM	CORRECTIVE ACTION
<p>I. Motor will not start.</p>	<p>A. Is your motor single phasing? (Is your motor turning very slowly and / or making a growling or grinding sound?)</p> <p>1. No You do not have single phase power to your machine.</p> <p>2. Yes Single phase power is reaching your machine. Refer to symptom B, below.</p> <p>B. What is the red light doing?</p> <p>1. Light is flashing on & off? There is a clicking sound in the converter.</p> <p>2. Light stays on over 3-5 seconds.</p> <p>3. Light does not come on.</p>	<p>a) You have an open circuit. Check all switches, starters, fuses & breakers.</p> <p>b) Your system is wired incorrectly. Re-read Section D, Electrical Installation, (page 8) for proper wiring procedures. Make <u>absolutely certain</u> that M3 (mfg leg) is used to power motor only.</p> <p>a) Your motor may be wired for 440V. Check to determine that the motor is wired for 220V.</p> <p>b) You may have a bad connection. Check that all connections are tight. Re-read Section D, Electrical Installation, (page 8) for proper wiring procedures.</p> <p>c) The starting characteristics of your motor may not be compatible with this phase converter. Some motors have special or unique starting requirements and a one size smaller converter is necessary.</p> <p>Disconnect power immediately or damage could occur to your converter.</p> <p>a) You may have (mfg leg) connected to a transformer load or improperly wired. Check internal machine wiring. Re-read Section D, Electrical Installation, (page 8) for proper wiring procedures.</p> <p>b) The starting load is too severe for this type of converter.</p> <p>Solutions are:</p> <ol style="list-style-type: none"> 1. Upgrade your installation to a Cedarberg Rotary Phase Converter. 2. Install an idler motor into the circuit. Refer to diagram on page 17 for proper wiring procedures. 3. Use a larger (approximately 1/3) three phase motor on your machine. <p>a) You may have a bad connection or an open fuse. Check all fuses and connections. Re-read Section D, Electrical Installation (page 8) for proper wiring procedures.</p>

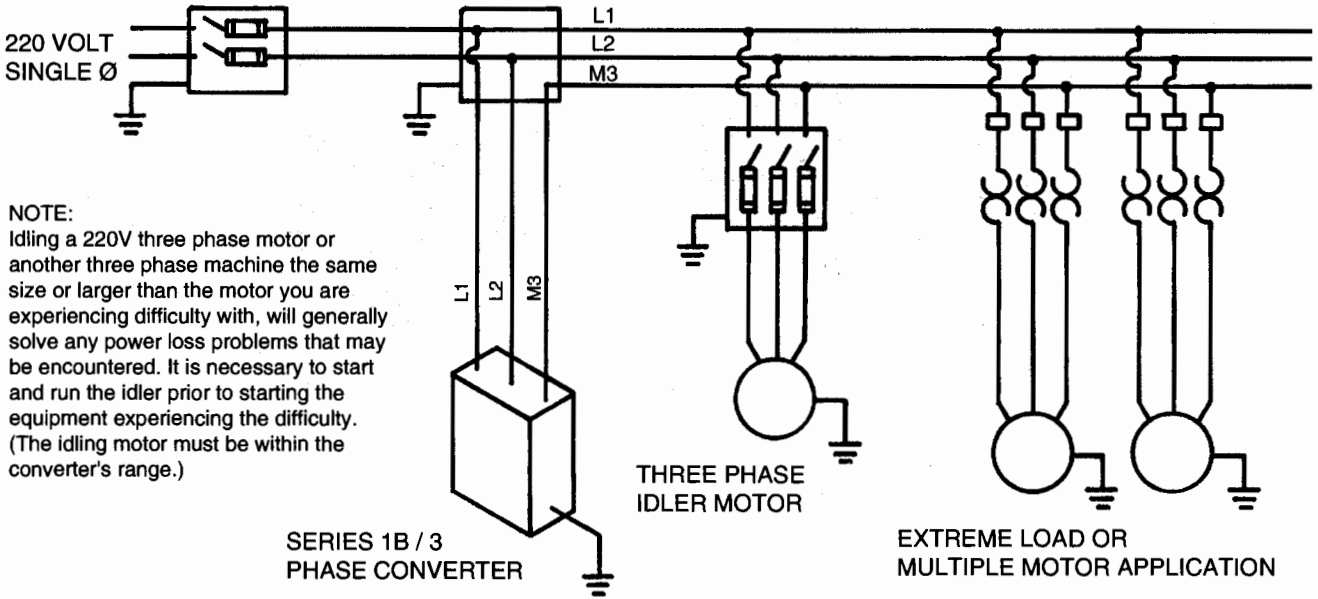
PROBLEM	SYMPTOM	CORRECTIVE ACTION
<p>I. Motor will not start. (cont.)</p> <p>II. Motor starts but will not come up to full RPM.</p> <p>III. Motor Starts & comes up to full RPM but...</p>	<p>3. Light does not come on. (cont.)</p> <p>A. Motor slows down. Red light turns on. Motor RPM increases Red light turns off. Unit cycles as above.</p> <p>A. Converter pulsates on-off at regular intervals.</p> <p>B. Motor suffers a RPM loss under load.</p>	<p>b) You may have the wrong converter. Check to see that the motor you are attempting to start is within the horsepower range of your converter; i.e., a converter that is too large for your motor will not work.</p> <p>a) You may have the wrong size converter. Check to see that the motor you are attempting to start is within the horsepower range of the converter you are using.</p> <p>b) Starting load is too severe for this type of converter.</p> <p>Solutions are:</p> <ol style="list-style-type: none"> 1. Upgrade your installation to a Cedarberg Rotary Phase Converter. 2. Install an idler motor into the circuit. Refer to (page 17) for proper wiring procedures. 3. Use a larger (approximately 1/3) three phase motor on your machine. <p>a) The running load may be too severe for this type of converter. Disconnect motor drives and if problem is eliminated:</p> <ol style="list-style-type: none"> 1. Upgrade your installation to a Cedarberg Rotary Phase Converter. 2. Install an idler motor into the circuit. Refer to (page 17) for proper wiring procedures. 3. Use a larger (approximately 1/3) three phase motor on your machine. <p>a) Your load requires a higher running efficiency than your converter is allowing.</p> <p>Solutions are:</p> <ol style="list-style-type: none"> 1. Upgrade your installation to a Cedarberg Rotary Phase Converter. 2. Install an idler motor into the circuit. Refer to (page 17) for proper wiring procedures.

PROBLEM	SYMPTOM	CORRECTIVE ACTION
<p>IV. Motor is running backwards.</p> <p>V. Motor is running hot.</p>	<p>A. Improper rotation.</p> <p>A. Are your thermal overloads tripping?</p> <p>2. Yes.</p>	<p>a) Line leads are hooked up wrong for proper rotation. Reverse any two lines at the motor only.</p> <p>1. No.</p> <p>a) Your motor is operating within accepted NEMA specifications.</p> <p>a) Your thermal overloads may be set too close to nominal. Check trip point and readjust if necessary,</p> <p>b) You may have a loose connection. Check that <u>all</u> connections are tight.</p> <p>c) You may have used insufficient wire size for the installation. Re-read Section D, Electrical Installation (page 8) for proper wiring procedures.</p> <p>d) You may have insufficient motor ventilation. Check and provide ample ventilation for the motor.</p> <p>e) Motor may be dirty. Check & clean motor.</p> <p>f) You may have a bad motor. Have motor checked and repaired as required.</p> <p>g) Your motor load may require a higher motor efficiency than the converter is allowing,</p> <p>Solutions are:</p> <ol style="list-style-type: none"> 1. Upgrade your installation to a Cedarberg Rotary Phase Converter. 2. Install an idler motor into the circuit. Refer to (page 17) for proper wiring procedures. 3. Use a larger (approximately 1/3) three phase motor on your machine.
<p>VI. Multiple speed motor will not start at all speeds.</p>	<p>A. Motor starts & runs fine at one speed, but will not start at other speeds</p>	<p>a) One or more motor speed is not within the horsepower range of the converter.</p> <p>Solutions are:</p> <ol style="list-style-type: none"> 1. Upgrade your installation to a Cedarberg Rotary Phase Converter.

PROBLEM	SYMPTOM	CORRECTIVE ACTION
VI. Multiple speed motor will not start at all speeds. (cont.)	A. Motor starts & runs fine at one speed, but will not start at other speeds. (cont.)	2. Install an idler motor into the circuit. Refer to (page 17) for proper wiring procedures.
VII. Magnetic switch chatters or does not close.	A. Chattering.	a) You may have a M3 (mfg leg) wired to your magnetic coil. Re-read Section D, Electrical Installations (page 8) for proper wiring procedures. M3 (mfg leg) must be used to power the motor only.
VIII. Excessive blowing of fuses, circuit breakers or heaters.	A. Instant blowing of fuses or circuit breakers. B. Nuisance tripping of fuses, circuit breakers or heaters.	a) You have a short circuit. Check circuit for broken or loose wires. Check motor for shorts. Check <u>all</u> connections. a) You have a bad connection. Check that all connections are clean and tight. Re-read Section D, Electrical Installations (page 8) for proper wiring procedures. b) You may have used insufficient wire size for the installation. Re-read Section D, Electrical Installation, (page 8) for proper wiring procedures. c) You may have used insufficient fuse sizing for the installation. Re-read Section D, Electrical Installations (page 8) for proper wiring procedures. You are not running on true three phase, the starting & running amperage is often higher than it would normally be. To solve the problem, go to one step higher fuse or breaker or adjust the heater to compensate. d) Your motor load may require a higher motor efficiency than the converter is allowing. Solutions are: 1. Upgrade your installation to a Cedarberg Rotary Phase Converter 2. Install an idler motor into the circuit. Refer to (page 17) for proper wiring procedures.

If at any time you experience a popping sound, see smoke or liquid coming from within the converter, you can assume that the converter has internal damage and will have to be returned to the factory for repair.

Idler Motor Schematic Diagram



All Installations must conform to the National Electrical Code and appropriate local codes.

If you are unable to determine the cause of your problem, contact our Service & Repair department for assistance, our telephone is:

Cedarberg Companies
Service & Repair Department
(651) 452-5012

IMPORTANT! Prior to contacting the factory please assemble the following information. This information will assist the technician in helping you and may eliminate the need for a follow-up call later.

Phase Converter Details

Model # _____
 Serial # _____
 Where Purchased _____
 When Purchased _____
 HP range of converter _____
 Machine being started _____
 Manufacturer _____
 HP Rating _____

Installation Details

Service entrance size _____
 Phase Converter circuit size _____
 Power source fusing _____
 Distance:
 Service entrance
 to converter _____
 Converter to machine _____
 Wire size:
 Service entrance
 to converter _____
 Converter to machine _____
 Fused disconnect sizing _____