

## 1332 TROUBLESHOOTING GUIDE

### Maintenance

The Drive is convection or fan cooled by air flowing through the heat sink slots. The slots must never be allowed to become obstructed with dirt or foreign matter. Periodically check and clean the heat sink slots. Air flow must never be restricted in any way.

### Troubleshooting Prechecks

The following descriptions indicate the operation of protective circuitry in the Bulletin 1332. What is thought to be an operational problem with the Drive may, in reality be, normal operation of the Drive protective circuitry. Refer to the following descriptions before attempting to troubleshoot what may seem to be a Drive related malfunction.

#### Overcurrent Stall Protection

Function: If overcurrent, which is 140% of rated Drive current, flows during acceleration of the motor, the Overcurrent Stall Protection Circuit operates. This circuit stops the rise of frequency temporarily in order to avoid currents in excess of 140% and an OVERCURRENT trip. When load current falls below 140%, this circuit lets the frequency rise again, and continue acceleration to set frequency.

Remarks: If this function is not appropriate for the application, it can be eliminated by turning off DSW1, switch 3.

#### Overvoltage Stall Protection

Function: If DC bus voltage rises above a preset bus level by regenerative energy during deceleration of the motor, the Overvoltage Stall Protection Circuit stops frequency decrease temporarily in order to prevent an OVERVOLTAGE trip. When regenerative energy decreases and bus voltage falls below this level, this circuit lets frequency fall again and decelerate to set frequency.

Remarks: If this function is not appropriate for the application, it can be eliminated by turning off DSW1, switch 2.

#### Overcurrent Protection

Function: If overcurrent exceeding 200% of rated current of the inverter flows, the protective circuit operates, stops operation of transistors and annunciates the condition. The "OVERCURRENT" LED illuminates.

Remarks:

1. Inertia of the load is excessively large, and acceleration time is extremely short.
2. The motor experienced an excessive overload condition while operating.
3. A short circuit exists in the output leads or motor windings.
4. A device in the Drive inverter section output has short circuited.

### **Overvoltage Protection**

Function: When bus voltage rises above a preset level by a high line or regenerative energy, the protective circuit operates, stops operation of transistors, and annunciates the condition. The "OVERVOLTAGE" LED illuminates.

Remarks: Extremely short deceleration time is the main cause. Increase the deceleration time by adjusting the pot VR3. If this condition occurs while at rated speed the condition might be considered an overhauling load. In this case and when deceleration time is critical, a dynamic brake is required.

### **Momentary Power Failure Protection**

Function: When incoming line power failure exceeding 15ms occurs, the protective circuit operates to prevent misoperation and stops operation of transistors. If momentary power failure is within 15ms, operation continues.

### **Undervoltage Protection**

Function: When incoming line voltage falls below 90%, a protective circuit operates to prevent misoperation, stop operation of transistors and annunciate the condition. The "LOW VOLTAGE" LED illuminates.

Remarks: When it is desired to restart automatically after incoming line voltage is reapplied, remove the jumper CN6.

### **Overtemperature Protection**

Function: When temperature of the heat sink rises and the cooling effect to transistors is reduced, the protective circuit stops operation of transistors and annunciates the condition. The "TEMP" LED illuminates.

Remarks: Check specifications and ambient temperature around the Drive and the cooling fan operation (7.5 - 20 HP units).

### **Fault Trip**

Function: It is possible that the Drive has stopped by means of an external interlock. The interlocks (e.g. thermal overload relay, external sequence circuit) are connected to terminals (14) and (15). The "AUX" LED will illuminate when an external Fault has occurred.

## Troubleshooting Guide

The following charts indicate several Drive malfunctions and the approved procedure for correcting these malfunctions.

**WARNING:** Voltages behind the enclosure cover are atbus voltage or incoming line potential. Hazards off electrical shock exist if accidental contact is made with voltage carrying components during troubleshooting procedures where power must be applied.

**WARNING:** Before proceeding with any maintenance or troubleshooting activity, allow at least one minute after input power has been removed to allow for bus circuit discharge. A bus Discharge LED is incorporated on the Drive to provide visual indication of the presence of bus voltage. The bus voltage may be verified by using a voltmeter to measure the voltage between terminals "P" (+) and "N" (-) on the Power Terminal Block. Do not attempt any servicing until the LED has extinguished or the bus voltage has diminished to **zero**.

Hazards of electrical shock exist if accidental contact is made with parts carrying bus voltage.

### 1. Motor Does Not Run - Fault LED's Are Not Illuminated

Is rated input voltage present at terminals L1, L2 and L3?	No	Check input side for breaker trip, contactor coil malfunction, blown fuse, etc.
Yes		
Is motor connected securely to output terminals M1, M2 and M3 of Power Terminal Block? Are there any broken wires etc.?	No	Verify and change connections if necessary. Check motor thermal overloads.
Yes		
Is selector switch SW3 set for appropriate start control?	No	<p>SW3- <b>Local</b> - START/STOP by SW1</p> <p><b>Remote</b> - START/STOP by terminals 9, 10, 11. Refer to section 3.6 for proper wiring.</p>
Yes		
Is the proper speed reference being used?	No	<p>SW4 - <b>Local</b> - The Local FREQUENCY pot is the speed reference signals at terminals 3, 4, and 5 will have an effect on Drive operation.</p> <p><b>Remote</b> - Speed input signals at terminals 3, 4, and 5 are reference signals. Local FREQUENCY pot has no effect on Drive operation. Check for proper polarity at the terminal block</p>
Yes		
Replace Drive.		

2A. Motor Does Not Run Continuously - " OVERCURRENT " LED is Illuminated

"OVERCURRENT" LED is illuminated.

Yes

Does a short circuit to ground exist between the Drive output and motor?

Yes

Remove the cause of the short circuit.

No

Is acceleration time too short and is the Overcurrent Protection circuit OFF(DSW1-3)?

Yes

Increase the acceleration time or switch the Overcurrent Stall Protection Circuit ON (DSWI-3).

No

Is load within the rated current of the Drive?

No

Lighten the load or replace the drive with an appropriate size.

Yes

Does the "OVERCURRENT" LED illuminate even if the output terminals are "open?" (Open circuit at terminals Block).

No

Verify motor operation by line operating the motor or repeating the above steps. Is proper motor operation observed?

Yes

Yes

No

Replace the Drive.

Consult motor manufacturer's instruction manual.

2B. Motor Does Not Run Continuously- " OVERVOLTAGE " LED is Illuminated

"OVERVOLTAGE" LED is illuminated

Yes

Is deceleration time too short? Is Over-voltage Protection Circuit Off (DSW1-2)

Yes

Increase the deceleration time or switch the Overvoltage Stall Protection Circuit ON (DSW1-2).

No

Does the Drive and motor encounter an overhauling load (load increases motor speed beyond set speed)?

Yes

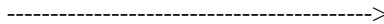
Install the Dynamic Brake option.

2C. Motor Does Not Run Continuously- LOW VOLTAGE" LED is Illuminated

"LOW VOLTAGE" LED is illuminated.

Yes

Incoming line voltage



Monitor incoming line voltage. Correct the low voltage condition.

2D. Motor Does Not Run - "TEMP" LED is Illuminated

"TEMP" LED is illuminated.

Yes

Is ambient temperature above the rated limit of 50°C? Is the cooling fan rotating (7.5 - 20 HP units)? Is the heatsink dirty or cooling fins clogged?

Yes

Lower the ambient temperature or replace the cooling fan (7.5 - 20 HP units). Clean heat sink.

2E. Motor Does Not Run - "AUX" LED is Illuminated

"AUX" LED is illuminated.

Yes

Are interlocks connected to terminals(14) and (15) open?

Yes

Remove the cause of the Fault interlock trip or jumper terminals 14 and 15 if external interlocks are not used.

3. Fuse Blown

Has wiring (input, output) of the Power Circuit caused a ground Fault?

Yes

Repair the ground Fault.

No

Is the capacity of the fuse sized correctly (see section 2.1 )?

No

Replace fuse with the one that has suitable capacity. Refer to section 2.1 of this manual for more information.

Yes

Are input terminals (L1, L2 and L3) and output terminals (M1, M2 and M3) correctly-wired?

No

Make changes in wiring as necessary. Does fuse still blow?

Yes

Yes

Replace Drive

4. Motor Generates an Excessive Amount of Heat

Is full load demanded continuously at low frequency?

Yes

Reduce the load. Consult motor manufacturer for thermal limitations at frequencies below 30 Hz.

No

Is motor operating above full load current?

Yes

Load is beyond the motor capacity. Check mechanical installation. Is motor/Drive undersized?

No

Check motor and wiring connections for an open phase condition.

5. Drive will Not Reverse in Local Mode

Is the Local/Remote selector switch (SW3) in the Remote position?	Yes	Position SW3 to Local, permitting Local forward/reverse and start/stop control.
No		
Has the Operator Panel been modified	Yes	Replace jumper if Local reversing is desired.
No		
Replace Drive.		