

Drives Troubleshooting 301



Agenda

- Drive will not start
- Drive will not get to speed
- 10 Common Fault codes
 1. Overcurrent
 2. Current limit controller
 3. Ground fault
 4. Output phase fault
 5. Overvoltage Fault
 6. Overvoltage controller
 7. Undervoltage fault
 8. Unit over temperature
 9. Motor over temperature
 10. Input phase fault

Drive does not start

Causes

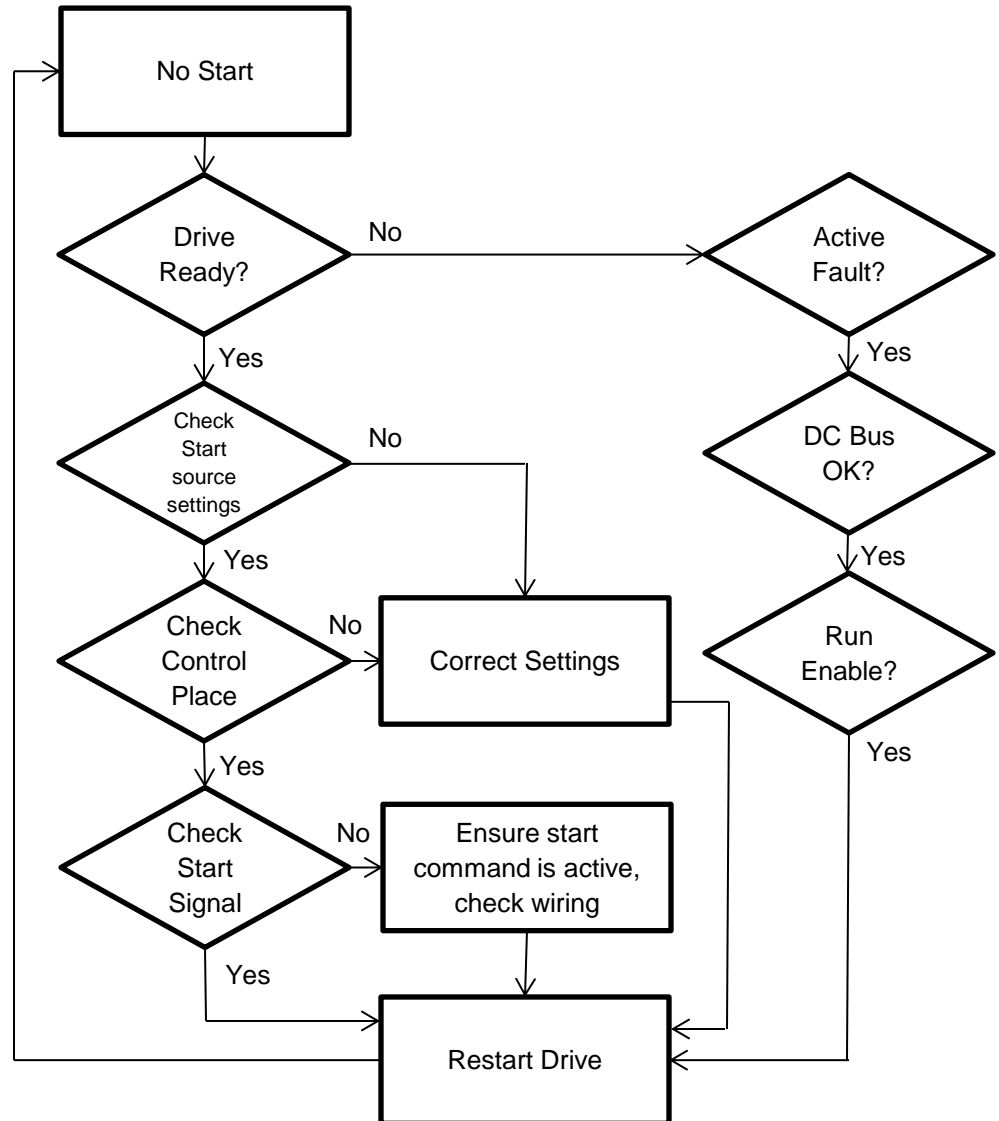
- Drive not ready
- Drive not receiving a Run Signal

Not Ready Causes

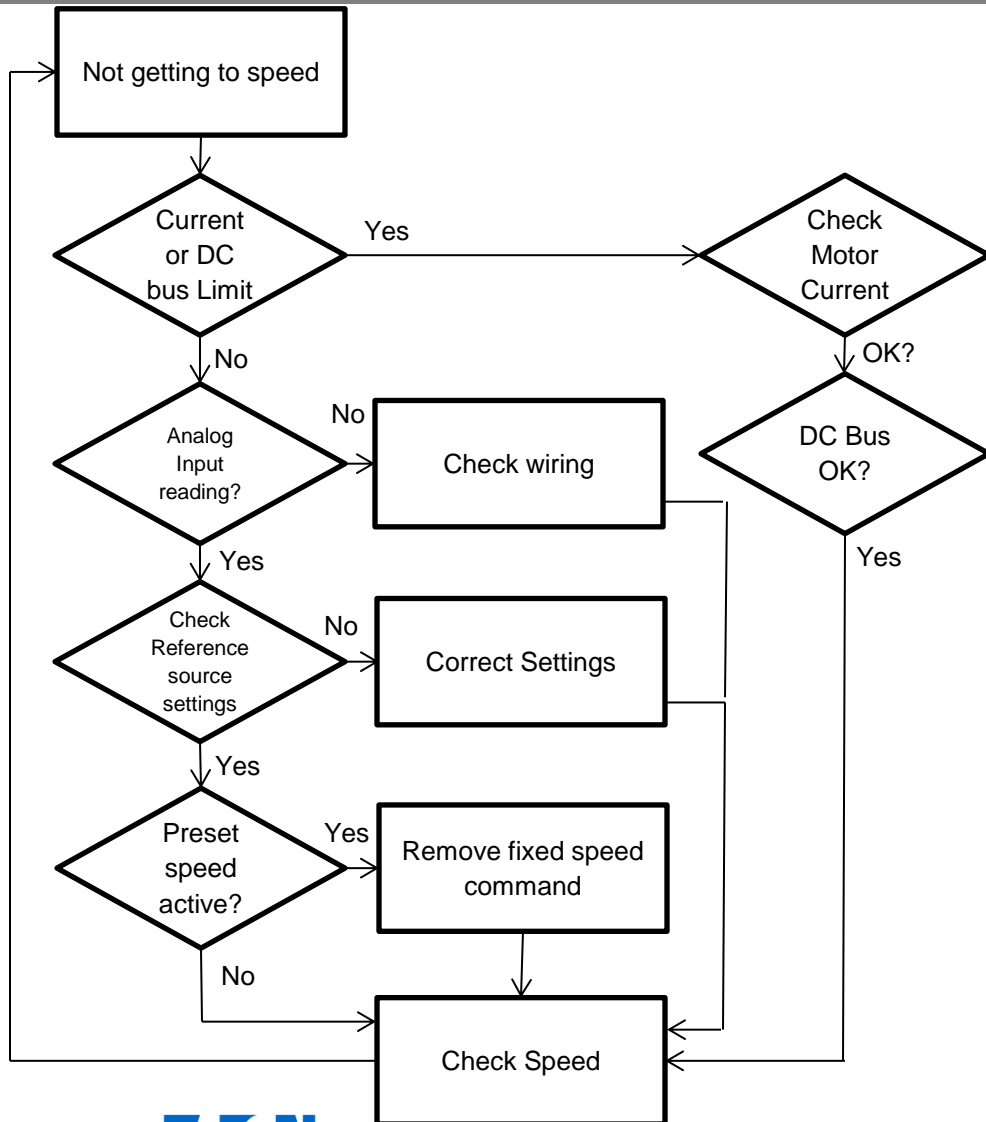
- Active fault
- DC bus too high or low
- Run enable input not present

Run Signal not present

- Control place not correct
Example trying to start from I/O when active control place is keypad.



Drive does not get to speed



Causes

- **Missing reference**
- **Preset speed or jog speed active**

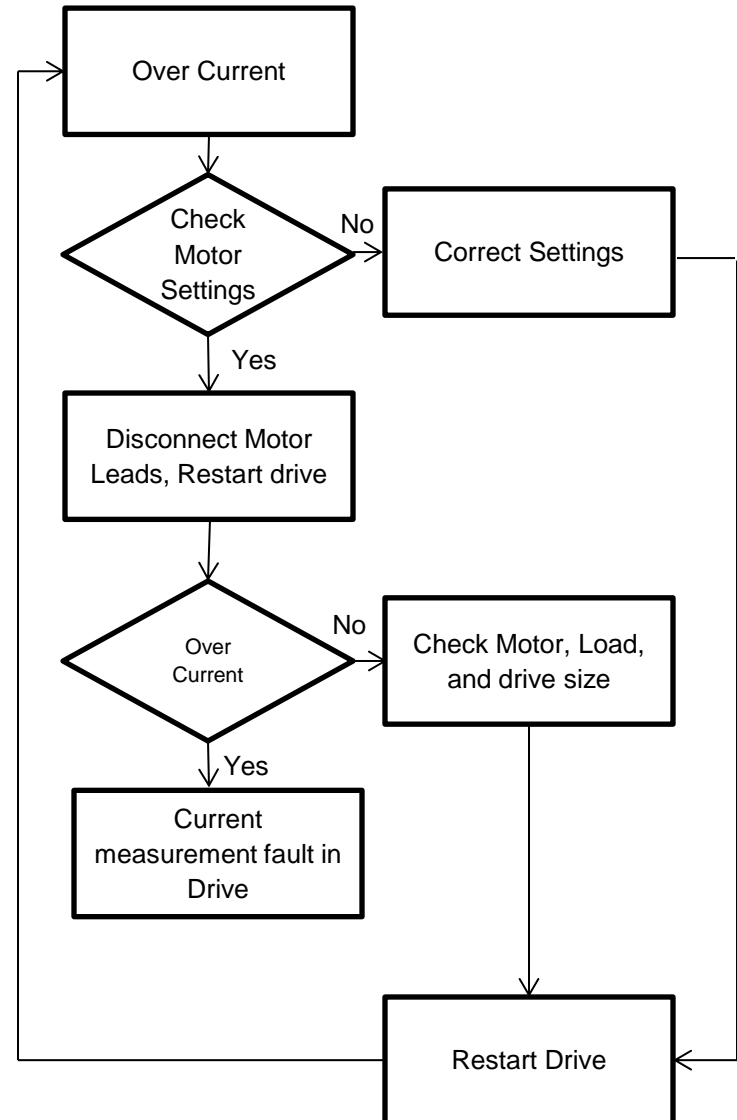
Missing Reference

- Check analog input monitor
- Check that the drive is programmed to follow the correct input
- Ensure the drive is not hitting any other limits
- Check frequency reference compared to output frequency

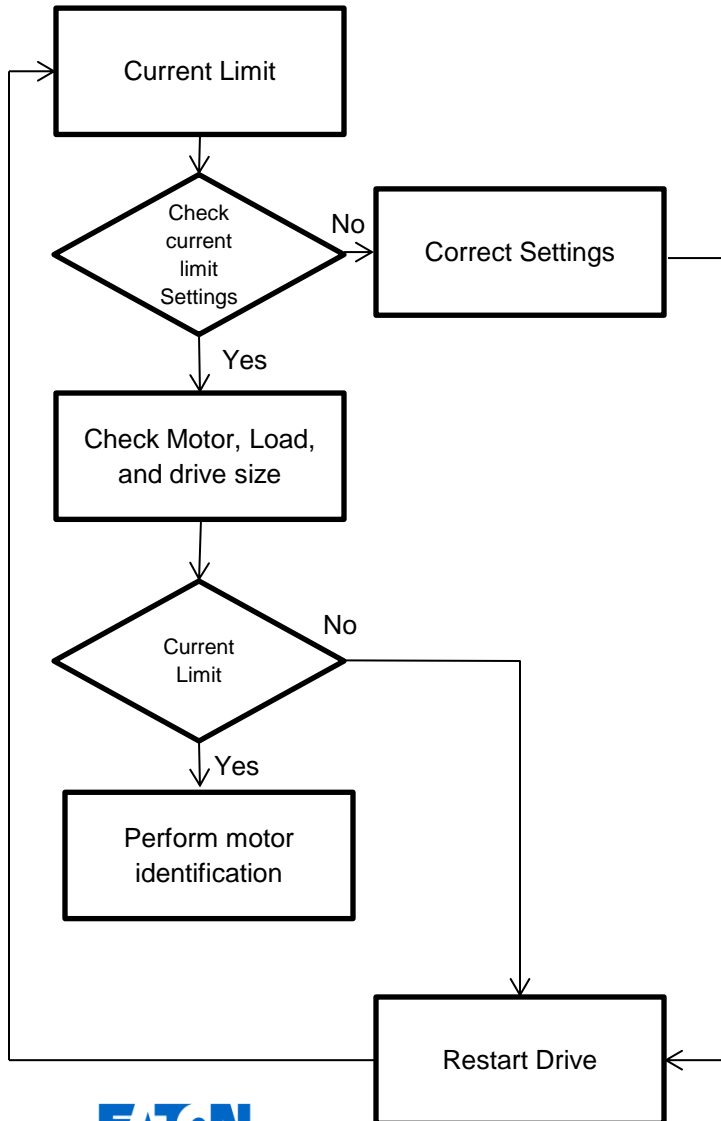
10 Common Fault Codes - Overcurrent

Causes

- **Incorrect motor parameters**
 - **Mechanical fault**
 - **Electrical fault**
 - **Current measurement error**
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- Check wiring and motor for insulation failures and proper connections
 - Check for mechanical overload, Locked rotor
 - Check for proper drive size



10 Common Fault Codes – Current Limit



Causes

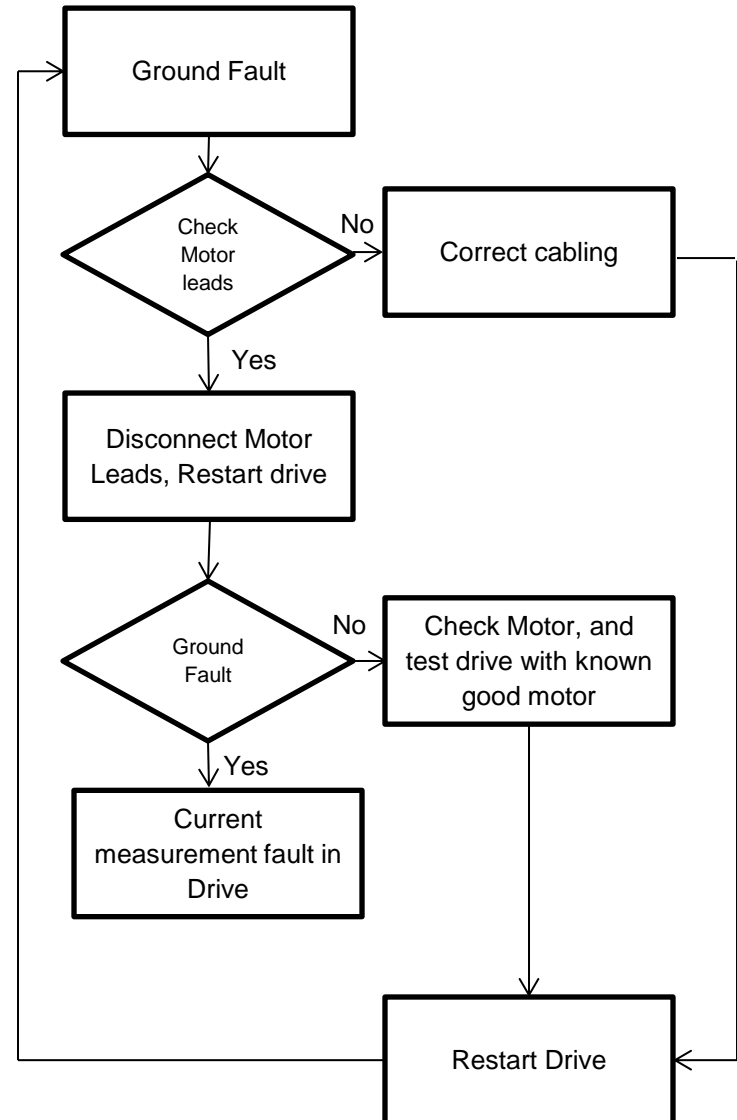
- **Incorrect motor parameters**
 - **Mechanical fault**
 - **Electrical fault**
 - **Current measurement error**
-
- Not all models have an indication when the current limit is reached
 - Current limit will reduce output frequency to reduce output current to at or below the current limit setting

10 Common Fault Codes – Ground Fault

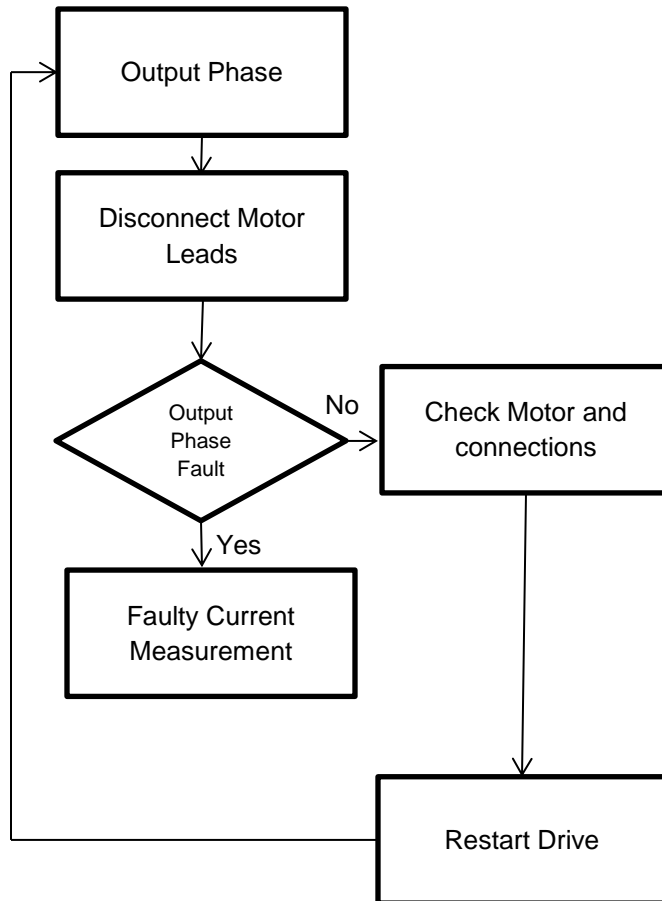
Causes

- Faulty motor
- Electrical fault
- Current measurement error

- Check for loose or high resistance connections to the motor
- Test motor for electrical failure
- Disconnect motor leads or apply known good motor to verify current measurements



10 Common Fault Codes – Output Phase



Causes

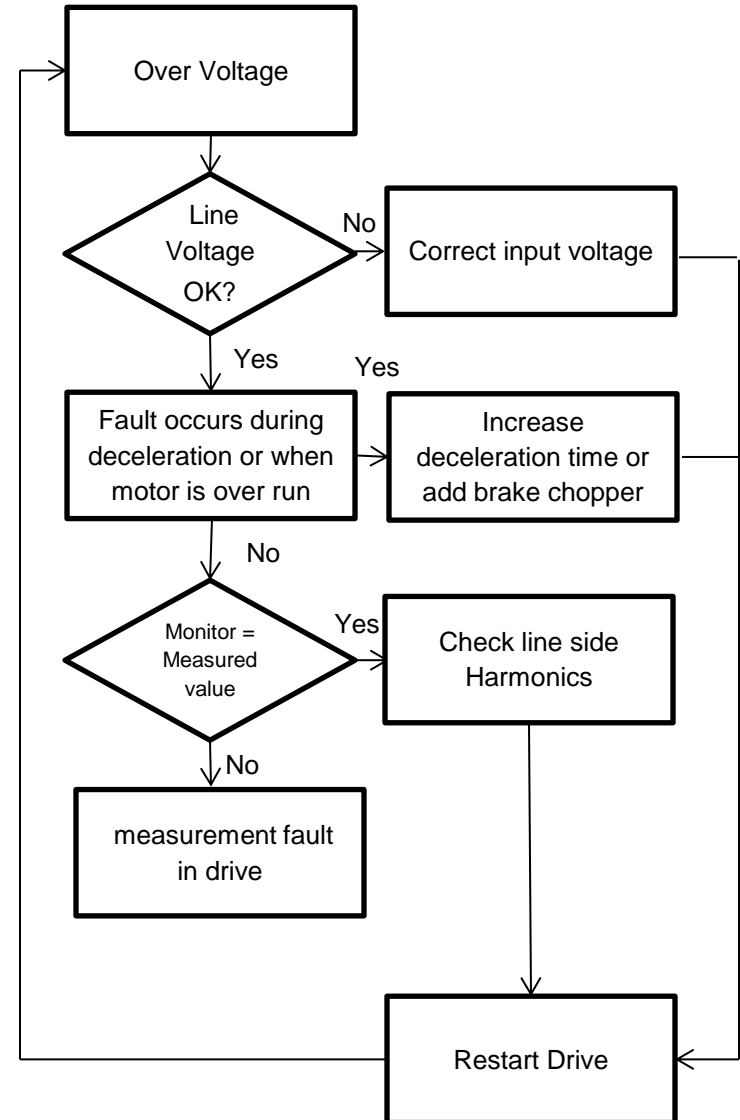
- **Loose Motor Connections**
 - **Faulty Motor**
 - **Current measurement error**
-
- Caused by current imbalance on the output of the VFD
 - Look for loose connections or fault in motor windings

10 Common Fault Codes - Overvoltage

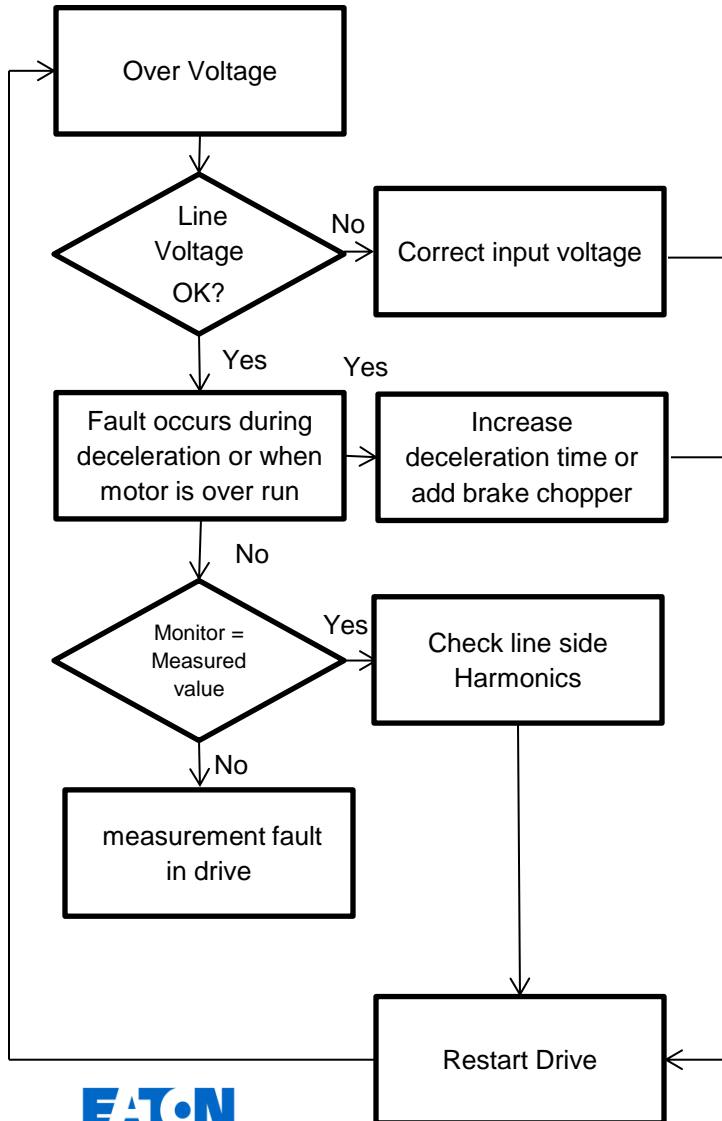
Causes

- High Line Voltage
- Regenerated voltage from load
- Excessive line side harmonics

- If Fault occurs during deceleration or stop command then increase deceleration time or brake chopper may be needed.
- Cyclic loads may need regen unit or brake chopper.
- Excess harmonics may be overcharging DC link capacitors.



10 Common Fault Codes – Overvoltage Controller



Causes

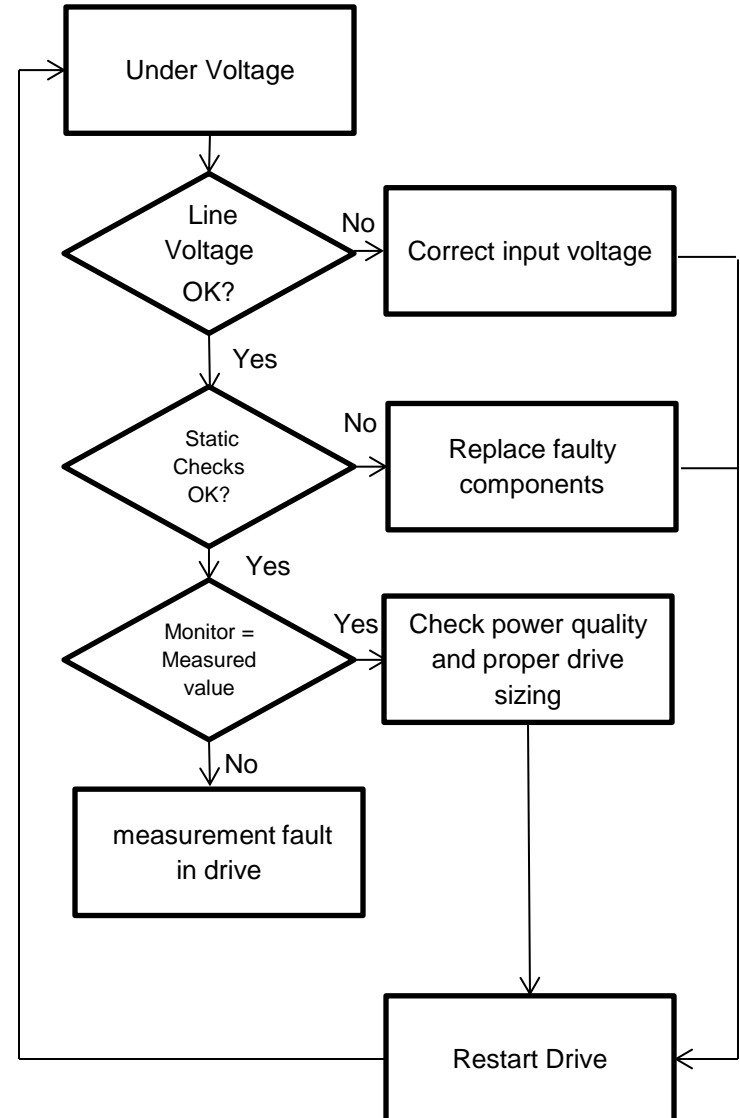
- **High Line Voltage**
 - **Regenerated voltage from load**
 - **Excessive line side harmonics**
-
- Trouble shooting is the same as for the overvoltage fault, the overvoltage controller will increase the reference in an attempt to bleed off excess voltage
 - Not all series of VFD's have an indication of when this controller is active.

10 Common Fault Codes – Undervoltage

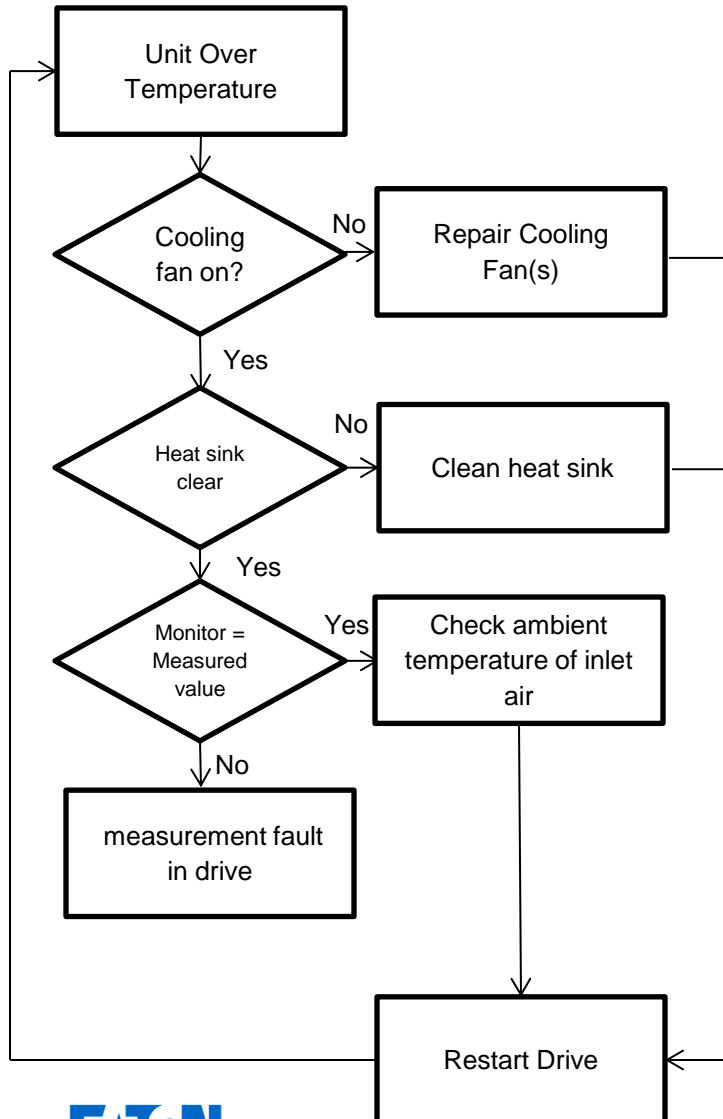
Causes

- Low Line Voltage
- Improperly sized drive

- Check for low line voltage or drops in line voltage under load.
- Check for damaged input rectifiers with static checks
- Check for even current draw on input when drive is running



10 Common Fault Codes – Unit Over temp



Causes

- **High Ambient temperature**
- **Insufficient airflow**
 - **Plugged heat sink**
 - **Failed cooling fan**

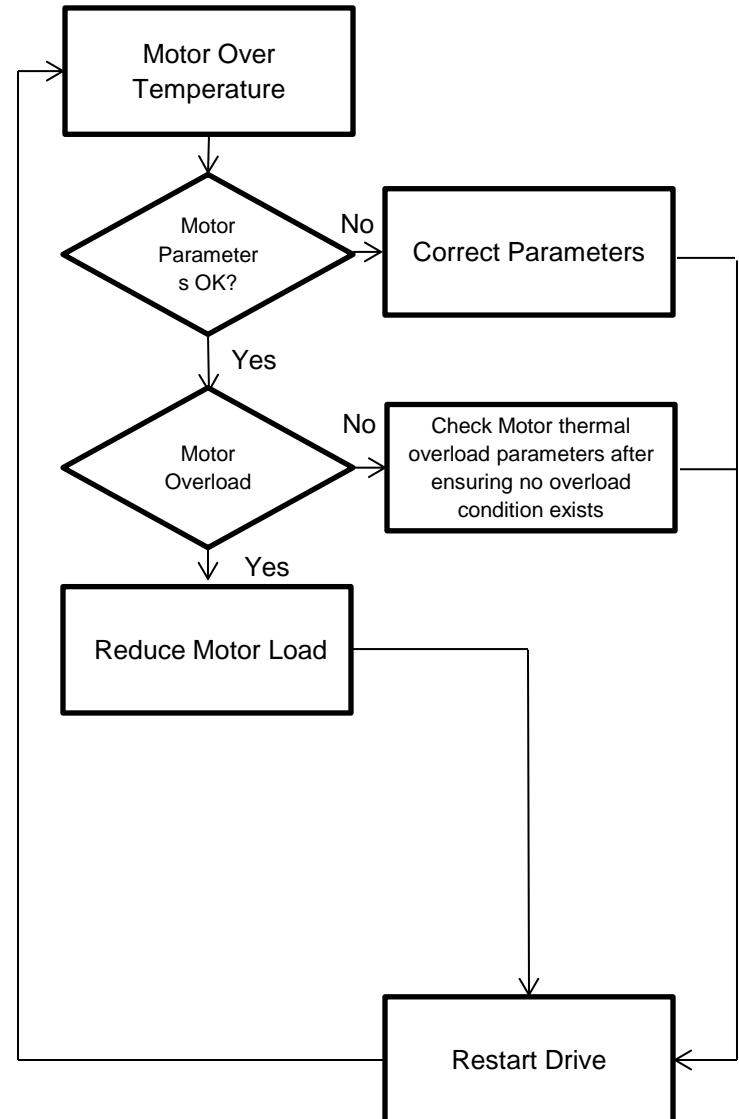
- Check Main cooling fan for rotation
- Ensure unobstructed heat sink and airflow
- Check ambient temperature is below the drives ratings

10 Common Fault Codes – Motor Over temp

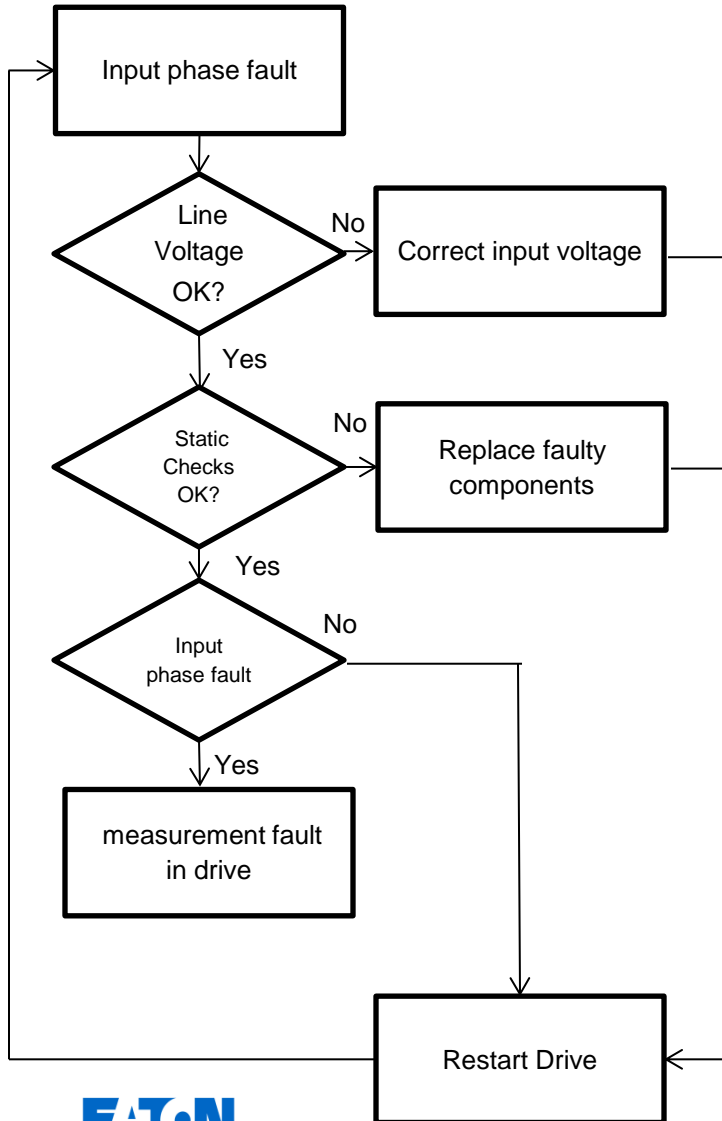
Causes

- **Overloaded Motor**
- **Operating Motor at high load at low speeds**
- **Undersized Motor**
- **Incorrect Motor Parameters**

- Check Motor Parameters
- Observe current and speed
- Current should be nearly proportional to speed, if running half speed at FLA drive will protect motor from increased thermal stress from reduced cooling



10 Common Fault Codes – Input Phase



Causes

- **Missing Input phase**
 - **Damaged Drive**
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- Check for Line Voltage imbalance
 - Check for loose connections or blown fuses
 - Check for damaged input rectifiers with static checks
 - Single phase input drives need to have this protection disabled
 - Check for even current draw on input when drive is running

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