



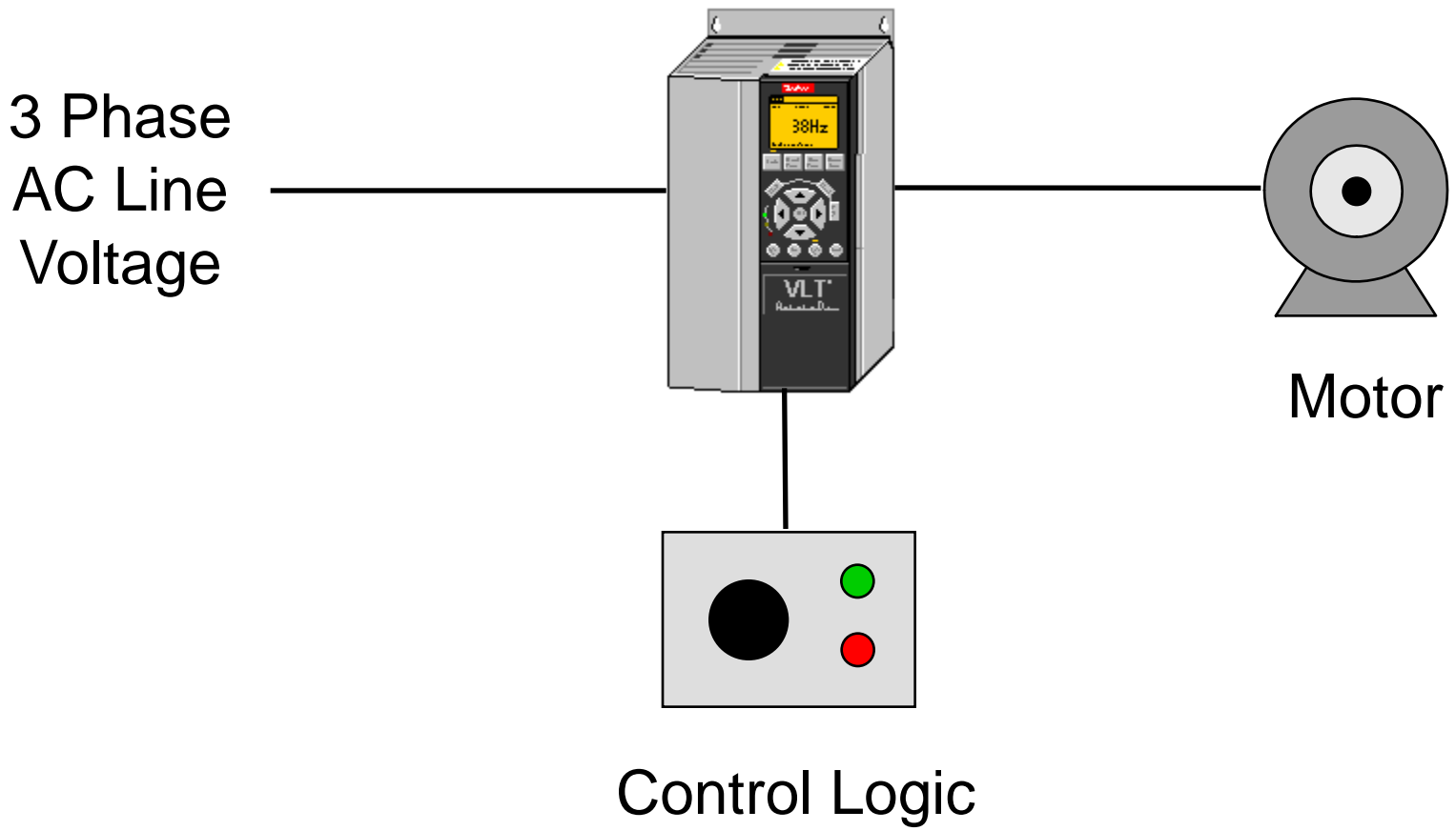
# TR200 Basic Troubleshooting

# Alarm Log

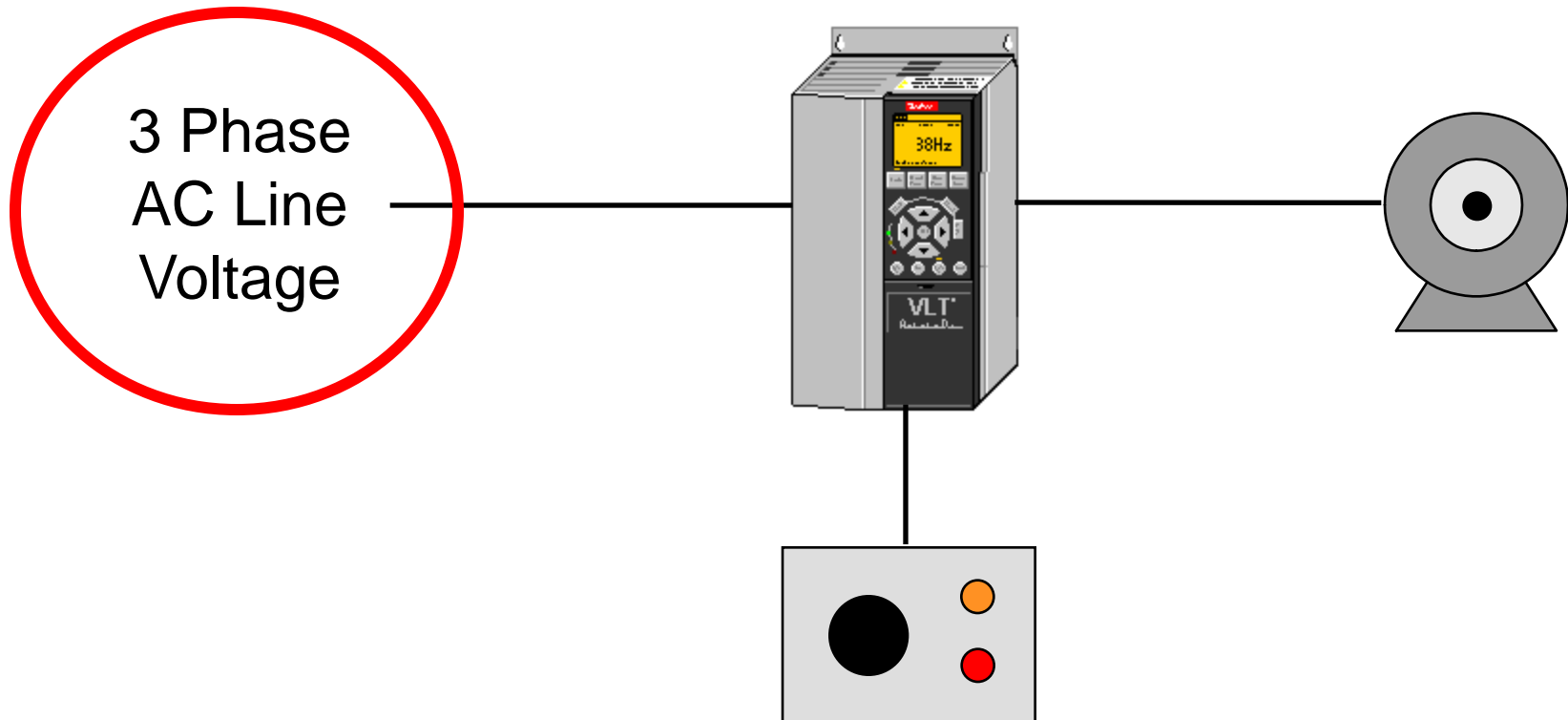
- Last 10 alarms displayed
- Status info for each alarm
- Graphic displays



# DIVIDE AND CONQUER



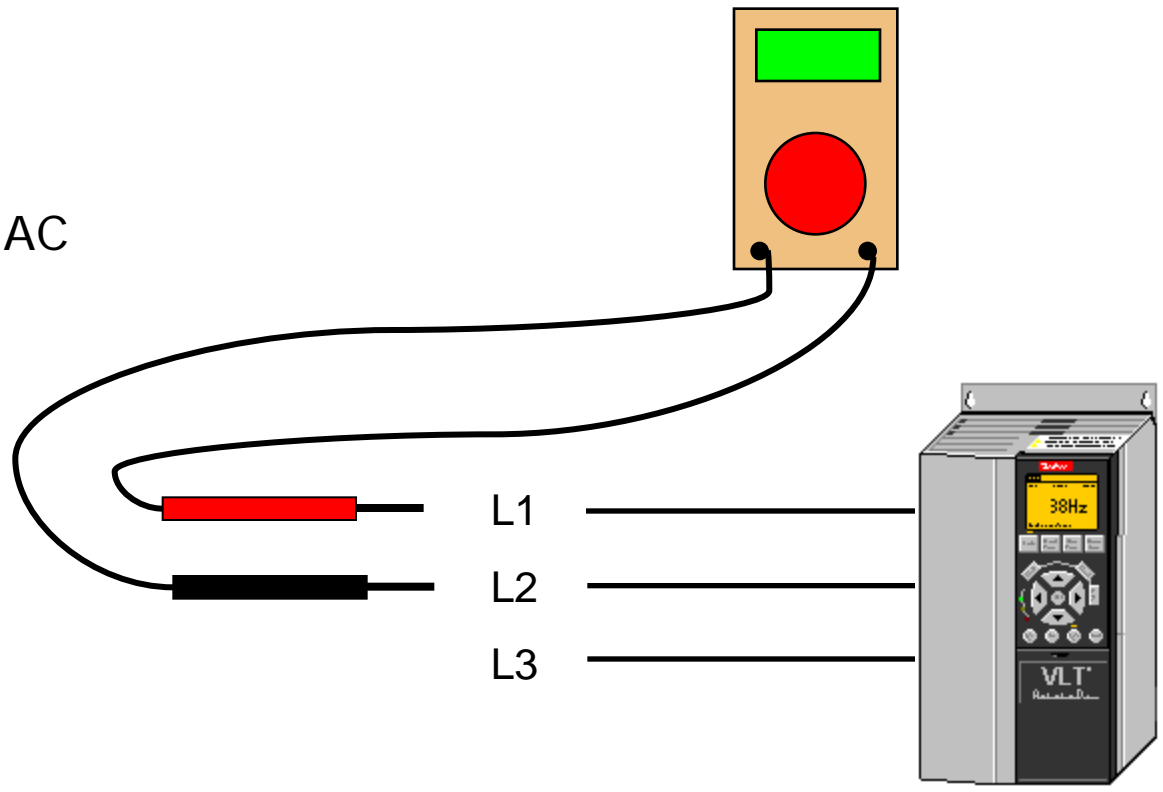
# Input Power



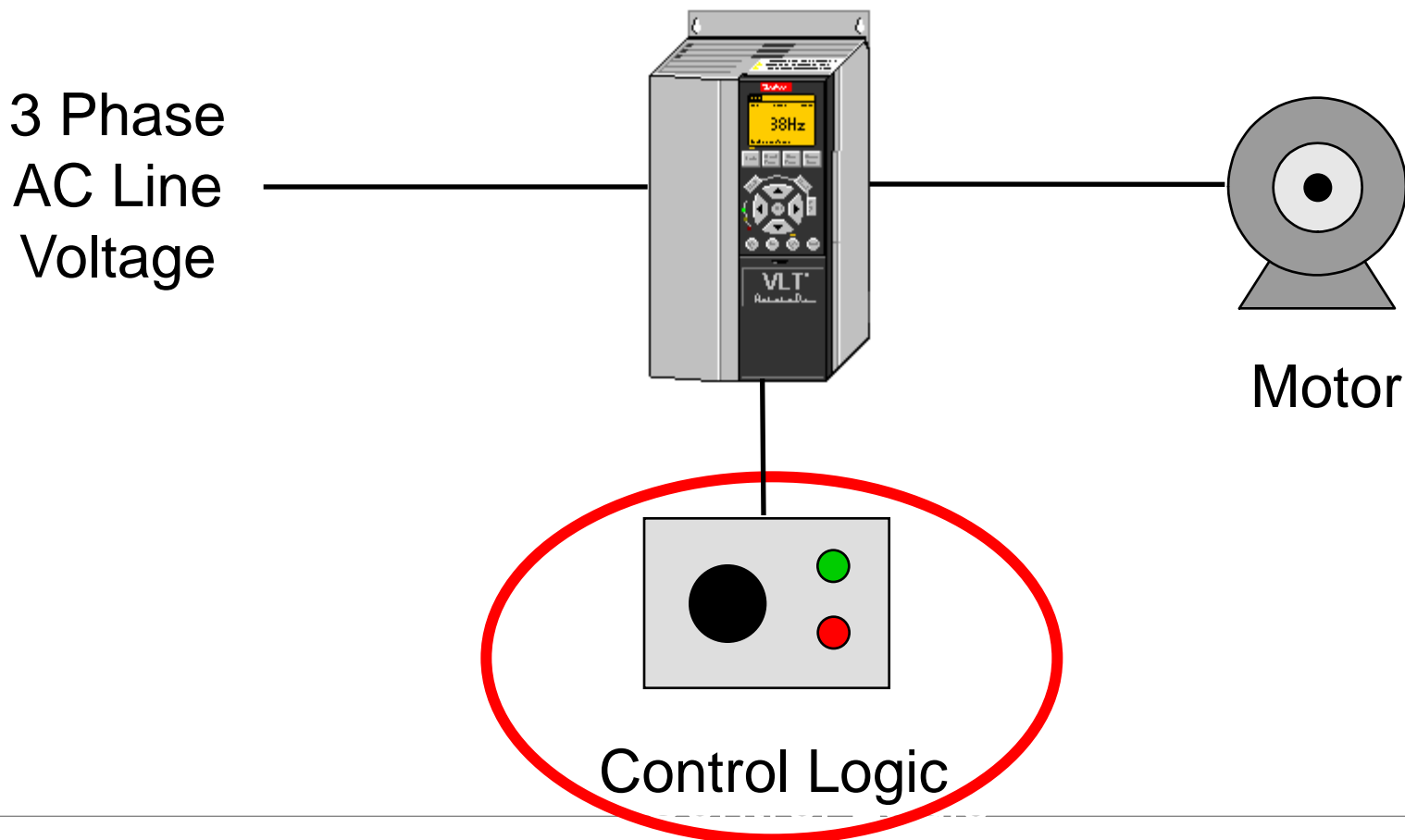
# Checking Line Voltage

■ Measure Phase to Phase AC Line Voltage

- L1 - L2
- L1 - L3
- L2 - L3



# Control Logic



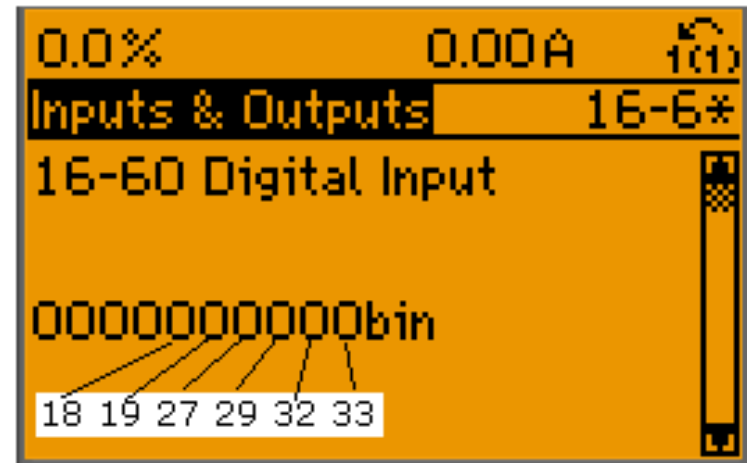
# Digital Inputs

- Press up or down arrows or Set Parameter 0-23 to Display Digital Inputs

- Binary # Corresponds to Digital Inputs

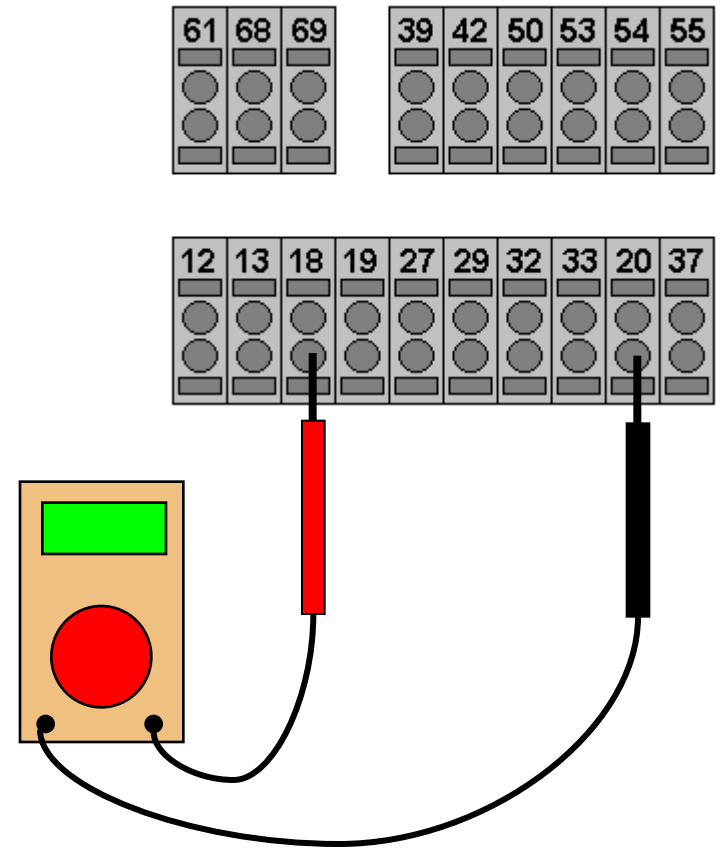
MSB = Term. 18

LSB = Term. 33



# Digital Inputs

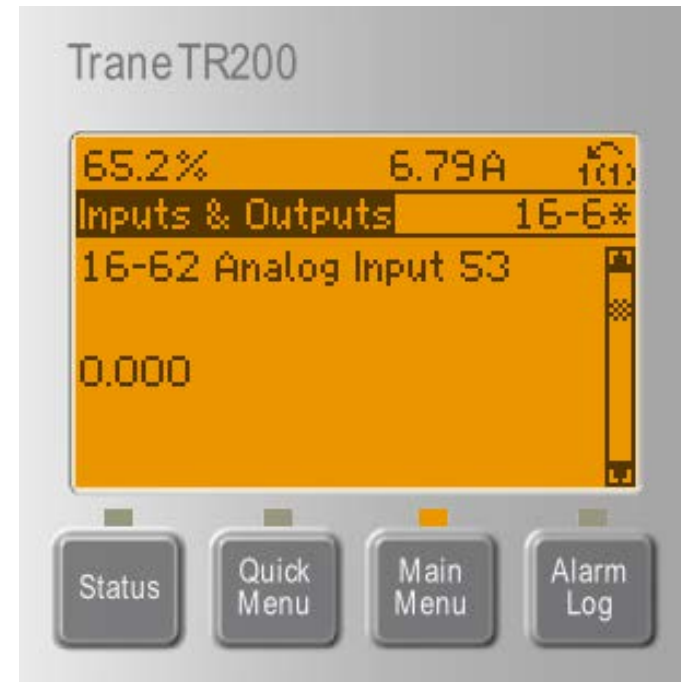
- If Input State is not Displayed Correctly, Measure Voltage at Terminal.
- Reference Meter on Terminal 20.
- Digital Inputs Must be 10-28VDC to be High (Logic 1)





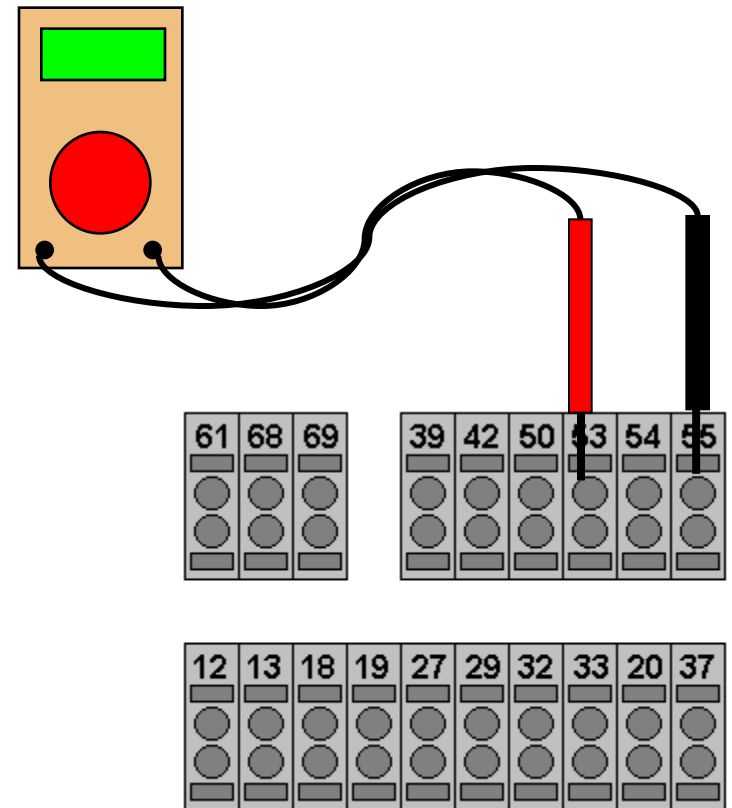
# Analog Inputs

- The Same Procedure can be Used to Check Analog Inputs

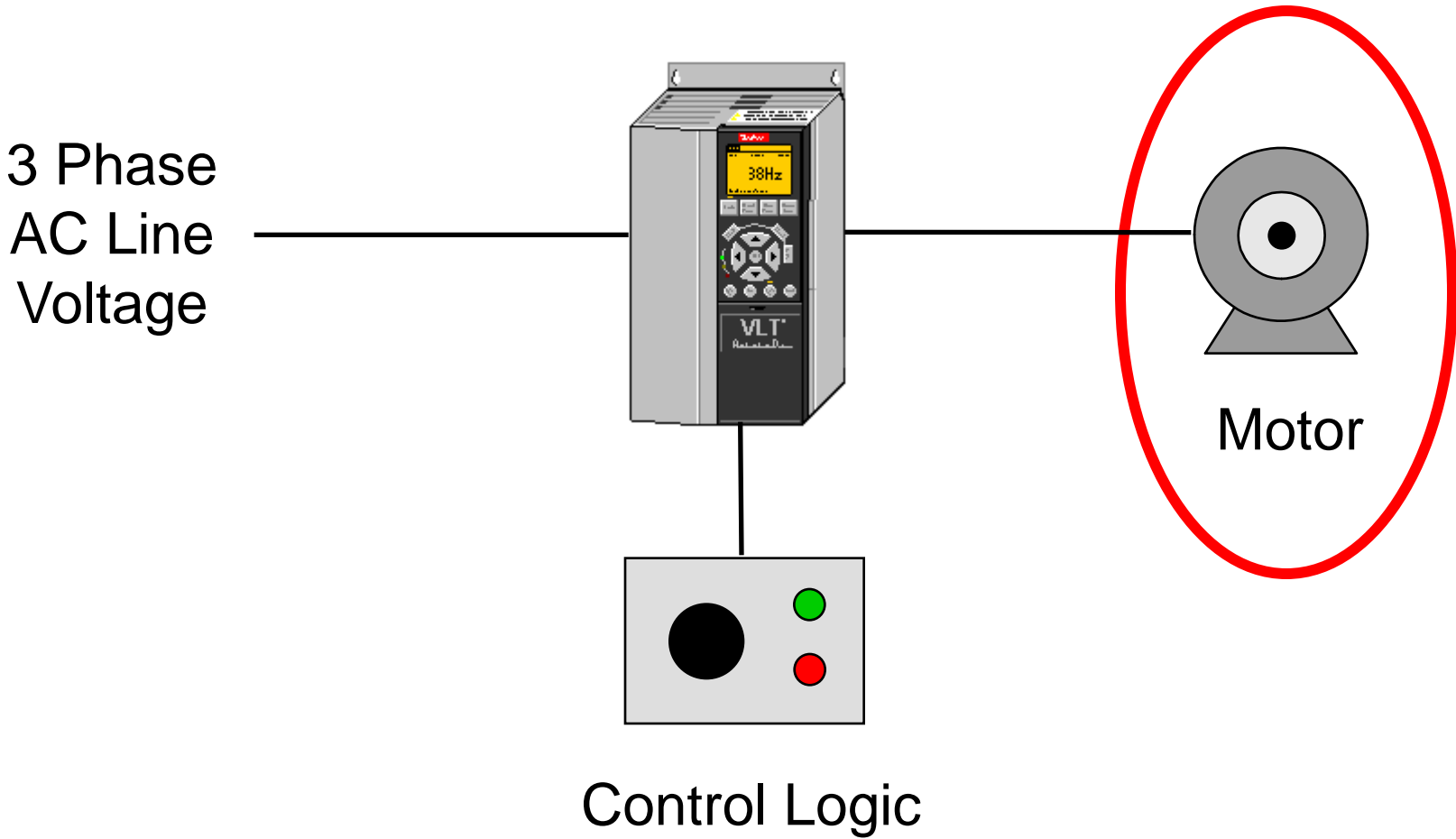


# Analog Inputs

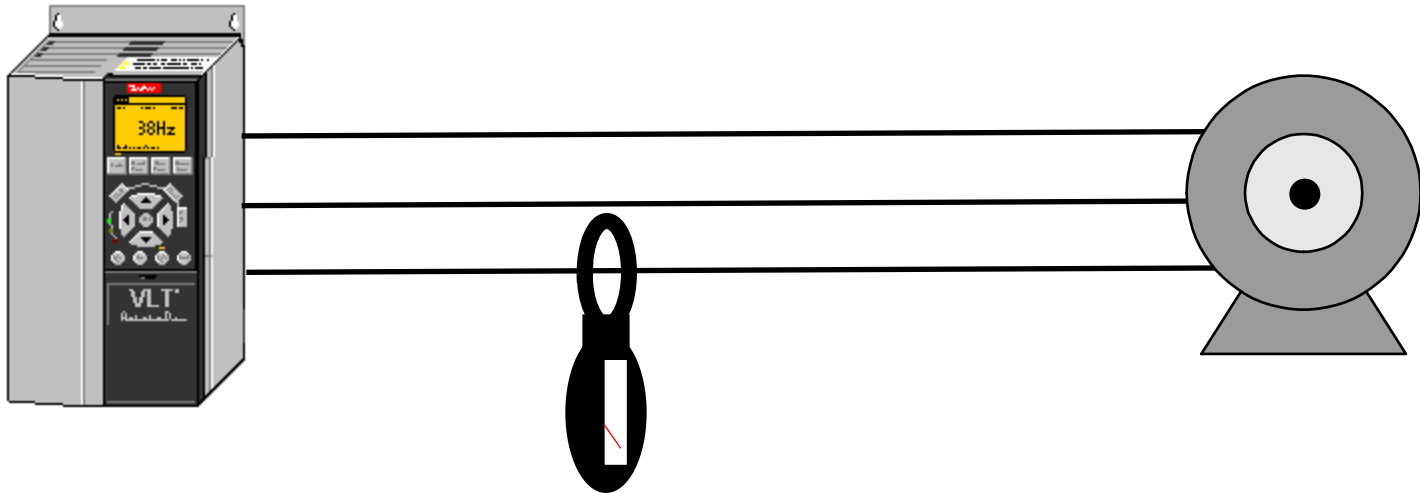
- Reference Meter (-) to Term. 55
- positive Lead to Term. 53 or 54
- For Voltage 0-10VDC
- For Current Put Meter In Series
- Observe Polarity



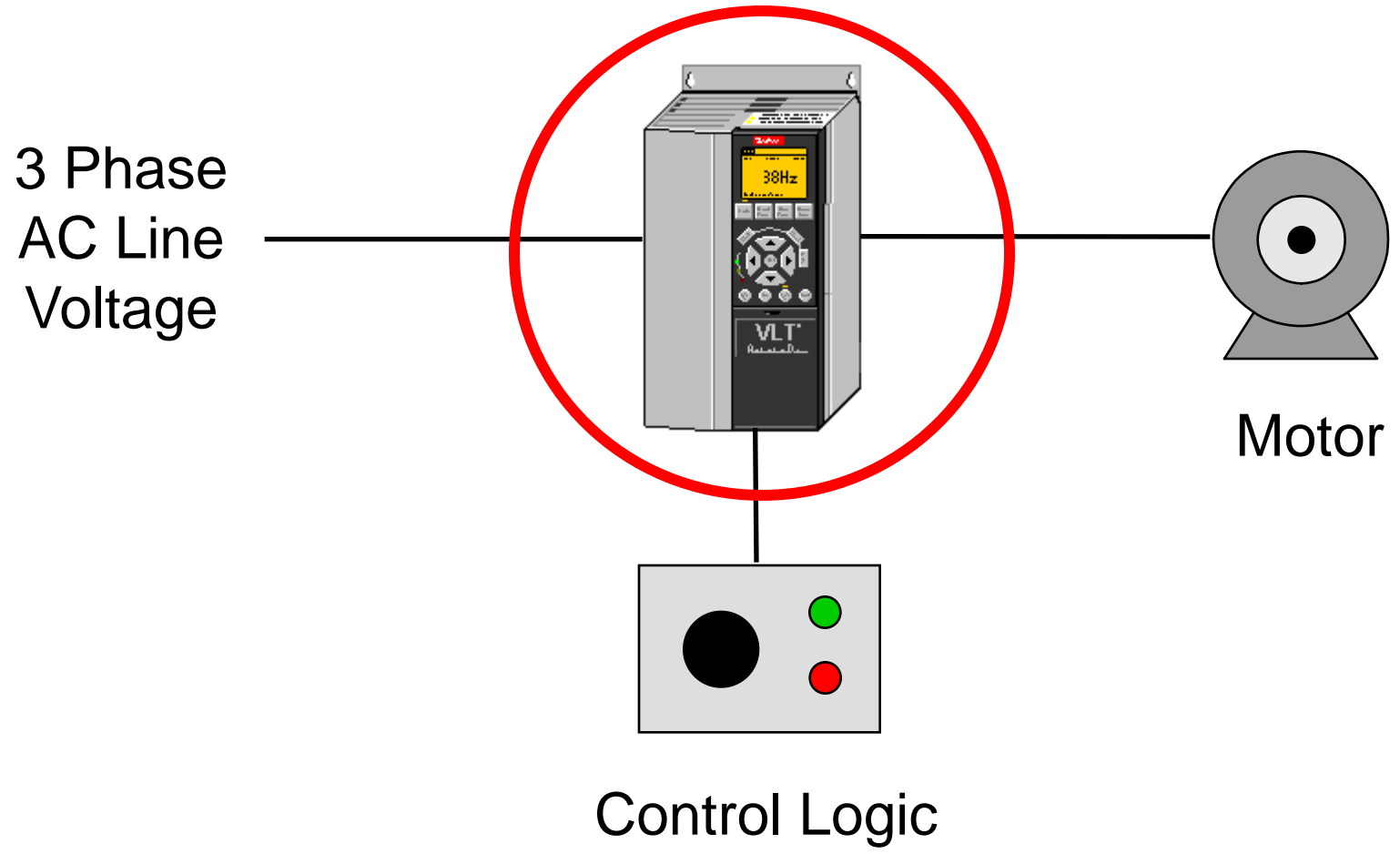
# Output Circuit



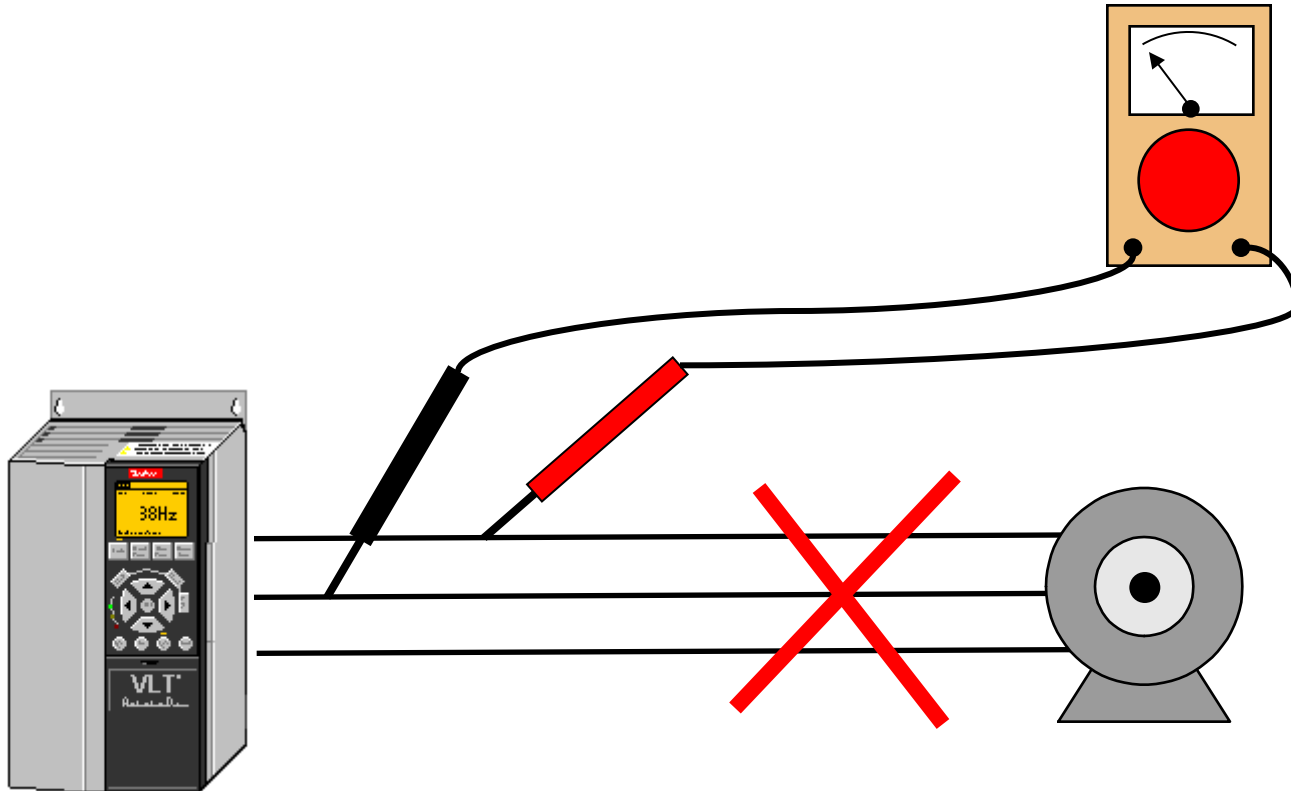
# Measuring Output Current



# Frequency Drive



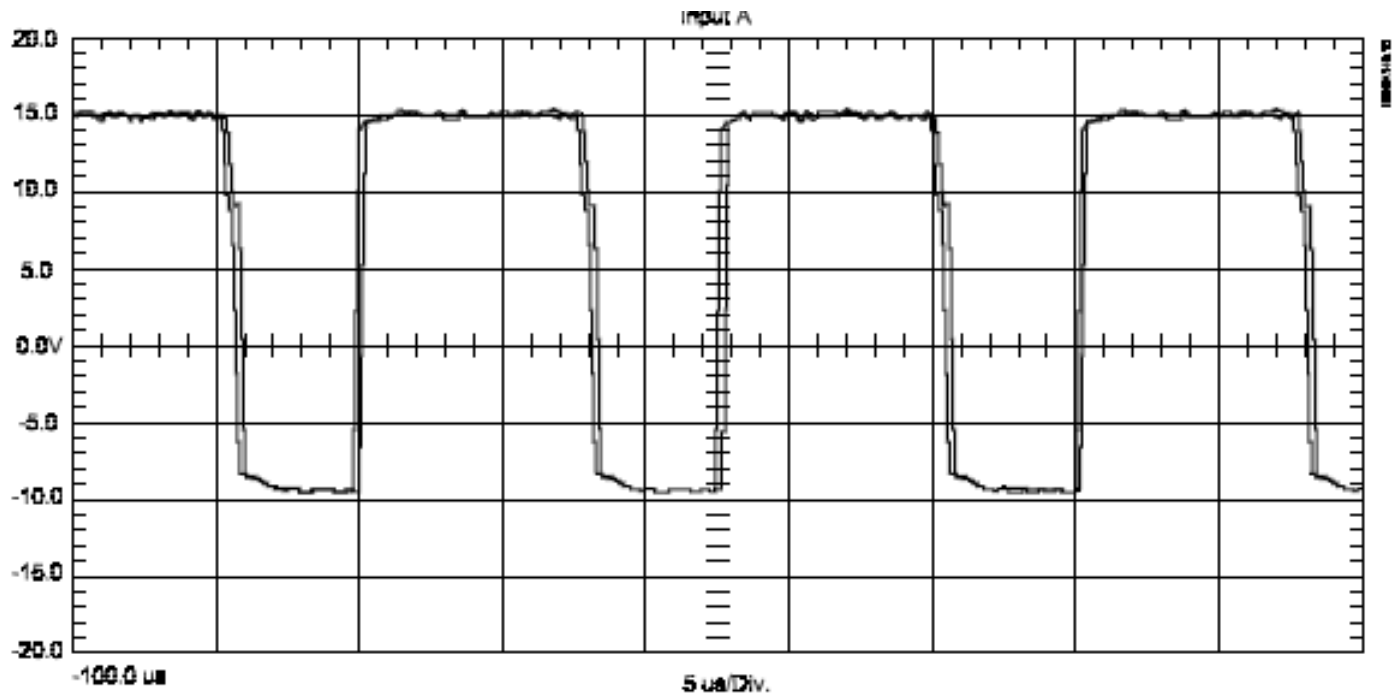
# Measuring Output Voltage



# Drive or Motor?

- Voltage is Balanced But Current is not
  - Drive is Good
  - Problem in Motor or Wiring
  
- Voltage is Unbalanced
  - Drive is Bad
  - Not all IGBT's Switching Correctly.
  - Check Gate Signals & IGBT Gates

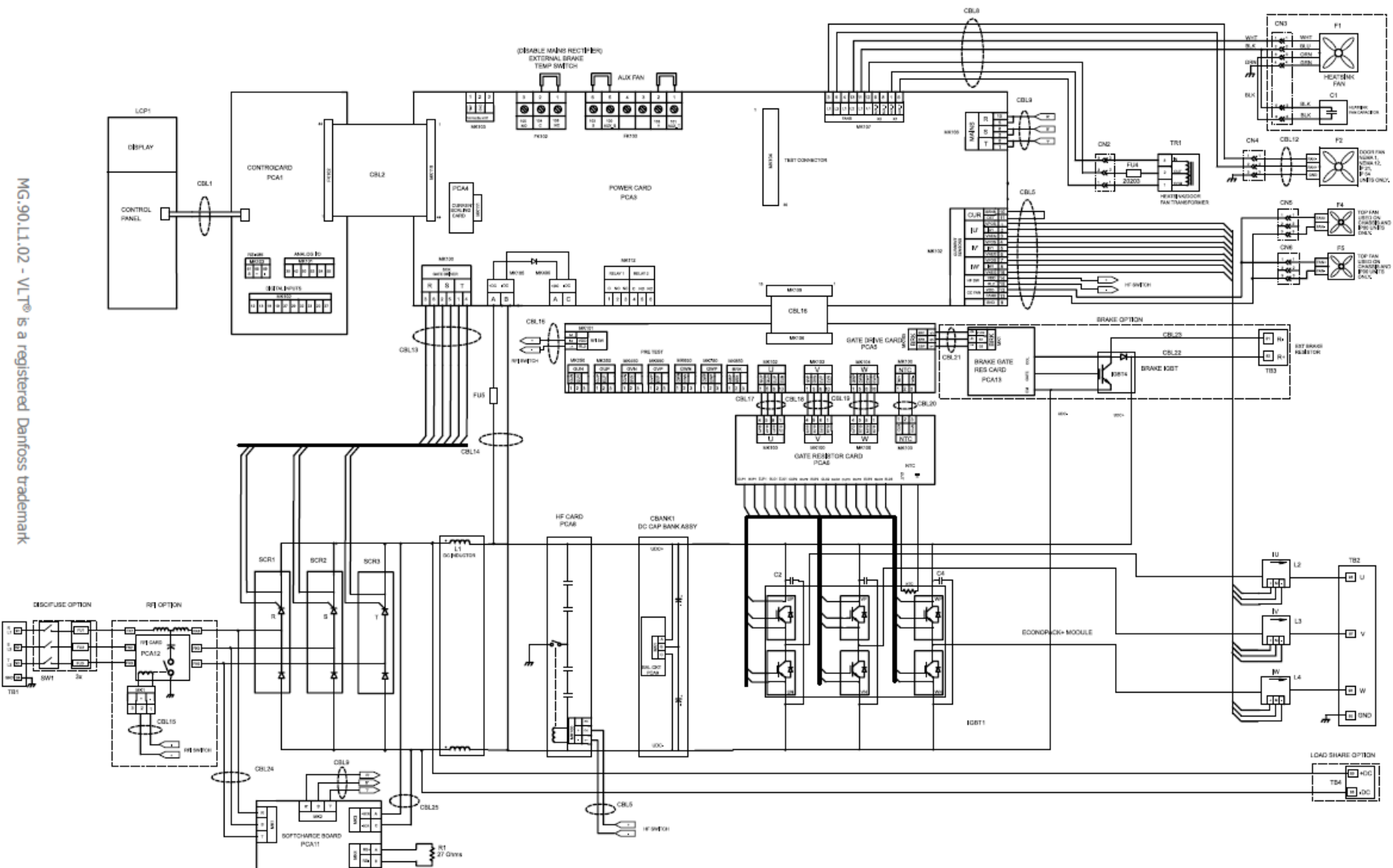
# IGBT Gate Signals







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Inspect For	Description
Auxiliary equipment	Look for auxiliary equipment, switches, disconnects, or input fuses/circuit breakers that may reside on input power side of drive or output side to motor. Examine operation and condition of these items as possible causes for operational faults. Check function and installation of pressure sensors or encoders (etc.) used for feedback to drive.
Cable routing	Avoid routing motor wiring, AC line wiring, and signal wiring in parallel. If parallel routing is unavoidable, try to maintain a separation of 6 - 8 inches (150 – 200 mm) between the cables or separate them with a grounded conductive partition. Avoid routing cables through free air.
Control wiring	Check for broken or damaged wires and connections. Check the voltage source of the signals. Though not always necessary depending on the installation conditions, the use of shielded cable or a twisted pair is recommended. Ensure the shield is terminated correctly. Refer to the section on grounding shielded cables in Section 2.
Drive cooling	Check operational status of all cooling fans. Check door filters on NEMA 12 (IP54) units. Check for blockage or constrained air passages. Verify bottom gland plate is installed.
Drive display	Warnings, alarms, drive status, fault history and many other important items are available through the display on the local control panel of drive.
Drive interior	Drive interior must be free of dirt, metal chips, moisture, and corrosion. Check for burnt or damaged power components or carbon deposits that were the result of a catastrophic component failure. Check for cracks or breaks in the housings of power semiconductors, or pieces of broken component housings loose inside the unit.
EMC considerations	Check for proper installation with regard to electromagnetic capability. Refer to the drive instruction manual and Section 5 of this manual for further details.
Environmental conditions	Under specific conditions these units can be operated within a maximum ambient of 50°C (122°F). Humidity levels must be less than 95% noncondensing. Check for harmful airborne contaminants such as sulfur based compounds.
Grounding	The drive requires a dedicated ground wire from its chassis to the building ground. It is also suggested that the motor be grounded to the drive chassis as well. The use of conduit or mounting of the drive to a metal surface is not considered a suitable ground. Check for good ground connections that are tight and free of oxidation.
Input power wiring	Check for loose connections. Check for proper fusing. Check for blown fuses.
Motor	Check nameplate ratings of motor. Ensure that motor ratings coincide with drives. Check that drive's motor parameters (1-20 – 1-25) are set according to motor ratings.
Output to motor wiring	Check for loose connections. Check for switching components in output circuit. Check for faulty contacts in switch gear.
Programming	Check that drive parameter settings are correct according to motor, application, and I/O configuration.
Proper clearance	These drives require top and bottom clearance adequate to ensure proper air flow for cooling in accordance with the drive size. Drives with exposed heat sinks out the back of the drive must be mounted on a flat solid surface.
Vibration	Though somewhat subjective look for an unusual amount of vibration that the drive may be subjected to. The drive should be mounted solidly or the use of shock mounts employed.



# Before Calling the Factory, Be Able to: Describe the drive

- Serial number
- MATERIAL # 178B0300 (PLUS)
- SERIAL # 805016H336 (all of it!)
- Model number (FC302)
- SOFTWARE VERSION (Parameter 15-43)
- Does the drive have bypass?

# Describe The Problem

- Describe the problem
- Exactly what does the LCP show?
- What does (or doesn't) happen?
- When does the problem occur?
- What time of day?
- What is the drive doing at the time?
- What else is happening at the same time?
- What have you tried?
- Describe the job site

# Service Center Repair

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- Authorized Danfoss service centres can repair the drive
- The problem might be non-warranty
- Get a purchase order



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**This concludes this training module**

If you have any comments or questions, please contact:

■ **TRANE Technical Support**