

# VLT 4000 Start-Up Check List



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| <b>1. Reference Material</b>      |   |
|                                   | a. VLT 4000 Installation, Operation and Maintenance Manual.   |
|                                   | b. Customer Connection Diagram (specific for the order).  |
|                                   | c. Schematic Diagram (specific for the order).  |
| <b>2. Pre-Installation Checks</b> |   |
|                                   | a. Compare the drive model number to what was ordered.  |
|                                   | b. Be sure the following are for the same voltage:  |
|                                   | i) Drive.   |
|                                   | ii) Power line.   |
|                                   | iii) Motor.   |
|                                   | c. Record the following motor data:   |
|                                   | i) Voltage  |
|                                   | ii) Frequency   |
|                                   | iii) Full load current  |
|                                   | iv) Full load speed   |
|                                   | v) Power (convert HP to Kw – see the description of parameter 102)  |
|                                   | d. Be sure that rated drive current is greater than or equal to the total full load current of all motors which will be driven at once.                   |
|                                   | e. Check motor wiring:  |
|                                   | i) A disconnect or contactor between the drive and the motor may need to be interlocked to the drive or else nuisance trips may occur.                    |
|                                   | ii) Multiple motors have individual motor overload and short circuit protection.  |
|                                   | iii) No power factor correction capacitors between the drive and the motor.   |
|                                   | iv) Two speed motors must be wired permanently for full speed.  |
|                                   | v) Y-start, $\Delta$ -run motors must be wired permanently for run.   |
|                                   | vi) Part winding start motors must be wired permanently for run.  |
| <b>3. Installation Checks</b>     |   |
|                                   | a. Verify appropriate short circuit protection is provided at the input of the drive. Specific fuse requirement necessary for UL (see instruction manual) |
|                                   | b. Measure phase to phase line voltage and ensure measured voltage is within drive specification (see instruction manual)                                 |
|                                   | c. Measure phase to ground voltage. If any measured phase voltage is greater than 60% of phase to phase voltage, open RFI switch.                         |
|                                   | d. Environmental concerns.  |
|                                   | i) Suitable for drive enclosure type, Chassis, NEMA1, NEMA12  |
|                                   | ii) Max 95% relative humidity, non-condensing.  |
|                                   | iii) 14°F to 104°F ambient temperature range (typical).   |
|                                   | iv) 3300 foot maximum elevation with no de-rating.  |
|                                   | v) Non-corrosive environment or unit conformal coated.  |
|                                   | e. Mounting   |
|                                   | i) No heat sink fins exposed out the back.  |
|                                   | ii) Drive mounting clearances observed (see instruction manual)   |
|                                   | iii) No excessive vibration.  |
|                                   | iv) Keep dirt and debris out of the drive   |
|                                   | v) Use knock-outs provided or conduit entry plates for wire entry   |
|                                   | f. Connections and Wiring   |
|                                   | i) Check all wiring connections are secure.   |
|                                   | ii) Each drive grounded individually, no daisy chain grounds.   |
|                                   | iii) 0-10Vdc and ma signal wires protected from noise.  |
|                                   | iv) Separated runs for input power, motor power, and control wiring.  |

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|   | v) Note some control connections may be 115VAC.  |
|   | vi) Motor thermistor wires separate from load wires.   |
| <b>4. Powering Drive</b>  |  |
|   | a. Double check all wire connections (correct terminal connection, correct tightness)  |
|   | b. All RUN commands off, all speed commands set to zero.   |
|   | c. Switch Power on.  |
|   | d. Display and PWR LED on.   |
| <b>5. Setting Up the Drive for the Motor — <i>This step is essential!</i></b> |  |
|   | a. Parameter 101, TORQUE CHARACTERISTICS   |
|   | i) For single motor applications, set this to AEO FUNCTION.  |
|   | ii) Otherwise set this to MULTIPLE MOTORS. (May then be necessary to adjust Parameter 108 for reliable starts and minimum starting current.) |
|   | b. Parameter 102, MOTOR POWER (in Kw)  |
|   | c. Parameter 103, MOTOR VOLTAGE  |
|   | d. Parameter 104, MOTOR FREQUENCY  |
|   | e. Parameter 105, MOTOR CURRENT  |
|   | f. Parameter 106, MOTOR SPEED  |
|   | g. Parameter 107, run AUTOMATIC MOTOR ADAPTATION   |
| <b>6. Check Additional Parameter Settings</b>                                 |  |
|   | a. Parameter 201, MIN. FREQUENCY (per customer needs)  |
|   | b. Parameter 202, MAX. FREQUENCY (typically set to 60Hz)   |
|   | c. Parameter 206, RAMP UP TIME (per customer needs)  |
|   | d. Parameter 207, RAMP DOWN TIME (per customer needs)  |
|   | e. Parameter 208, AUTORAMPING (ENABLE)   |
| <b>7. Operational Tests — HAND</b>  |  |
|   | a. Check the motor's rotation from the drive. If incorrect, reverse two leads between the drive and the motor.                               |
|   | b. If a bypass is provided, check the motor's rotation in bypass mode. If incorrect, reverse two input power lines.                          |
|   | c. Accelerate the motor to full speed and verify operation.  |
|   | d. Decelerate the motor to a stop and verify operation.  |
|   | e. Slowly operate the motor over the speed range and check for resonance. Adjust parameters 109 and 216 thru 220 to eliminate resonance.     |
| <b>8. Operational Tests — AUTO, Open Loop</b>                                 |  |
|   | a. Parameter 204, MIN. REFERENCE (usually the same as parameter 201)   |
|   | b. Parameter 205, MAX. REFERENCE (usually the same as parameter 202)   |
|   | c. Ensure that the drive follows run/stop commands from the system.  |
|   | d. Ensure that the drive follows the speed command from the system.  |
| <b>9. Operational Tests — Auto, Closed Loop</b>                               |  |
|   | a. Set up the PID control parameters as required.  |
|   | b. Ensure that the drive follows run/stop commands from the system.  |
|   | c. Ensure that the drive responds to the feedback signal from the system.  |
| <b>10. Final Adjustments</b>  |  |
|   | a. Set up parameter 402, FLYING START, as required.  |
|   | b. Copy parameters to other setups as required, Parameter 003  |
|   | c. Copy parameters to the LCP, Parameter 004   |