

<b>MODEL – MV VSD</b>	 <b>YORK</b> <small>BY JOHNSON CONTROLS</small>	<b>OptiSpeed™</b>
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**INSTALLATION & START-UP CHECKLIST**

TO: \_\_\_\_\_ JOB NAME: \_\_\_\_\_  
 \_\_\_\_\_ LOCATION: \_\_\_\_\_  
 \_\_\_\_\_ CUSTOMER ORDER NO. \_\_\_\_\_  
 YORK TEL. NO. \_\_\_\_\_ YORK ORDER NO. \_\_\_\_\_ YORK CONTRACT NO. \_\_\_\_\_

<b>MEDIUM VOLTAGE VARIABLE SPEED DRIVE</b>	
MODEL NO. _____	SERIAL NO. _____
The work (as check below) is in process and will be completed by _____ / _____ / _____ <div style="display: flex; justify-content: space-around; font-size: small;"> <span>Month</span> <span>Day</span> <span>Year</span> </div>	

The following work must be completed in accordance with installation instructions:

**A. INSTALLATION CHECKLIST**

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| <ol style="list-style-type: none"> <li>1. Remove shipping materials and inspect cabinets for any physical damage..... <input type="checkbox"/></li> <li>2. Position cabinets adjacent to chiller in location that motor output wires will reach ..... <input type="checkbox"/></li> <li>3. Remove 2 cabinet bolts along front edge allowing the cabinet sides to be within 1/4"..... <input type="checkbox"/></li> <li>4. Verify 2" x 3" openings in both cabinets line up closely to allow power wiring to pass through..... <input type="checkbox"/></li> <li>5. Connect copper bus link between the 2 cabinets (air grill must be removed for access)..... <input type="checkbox"/></li> <li>6. Remove cover plate inside output section to permit entrance of output wires to motor..... <input type="checkbox"/></li> <li>7. Remove inner cover plate to access incoming power lugs ..... <input type="checkbox"/></li> <li>8. Remove 2 fan cover plates from top of cabinets and set aside ..... <input type="checkbox"/></li> <li>9. Remove 2 clear plastic covers in transformer cabinet and one cover in inverter cabinet ..... <input type="checkbox"/></li> <li>10. Lift fans onto cabinet roof using sling and crane or forklift. Plug electrical connectors into sockets in fans..... <input type="checkbox"/></li> <li>11. Bolt fans onto cabinets using the same hardware removed from the cover plates..... <input type="checkbox"/></li> <li>12. Cut wire ties from control cables and plug the 3 cables into the keyed sockets in the side of transformer cabinet... <input type="checkbox"/></li> <li>13. Inspect output Power Module assemblies                         <ol style="list-style-type: none"> <li>A. Remove 3 output cables from Power Module assembly lugs... <input type="checkbox"/></li> <li>B. Remove neutral bus bar across top of 3 assemblies ..... <input type="checkbox"/></li> <li>C. Power Modules are racked out one at a time to inspect assemblies thoroughly ..... <input type="checkbox"/> <ol style="list-style-type: none"> <li>C-1 Remove front barrier cover ..... <input type="checkbox"/></li> <li>C-2 Remove electrical connectors - edge connector and 2-pin power connector ..... <input type="checkbox"/></li> <li>C-3 Remove center bolt securing assemblies..... <input type="checkbox"/></li> <li>C-4 Pull Power Module assembly out from cabinet on sliding track until track locks into extended position... <input type="checkbox"/></li> <li>C-5 Inspect all ring-lugs, connectors, electrical connections for tightness, and pulling on wires to verify tightness ..... <input type="checkbox"/></li> <li>C-6 Inspect under Power Modules for tightness of fuses, connectors, etc. .... <input type="checkbox"/></li> </ol> </li> </ol> </li> </ol> | <ol style="list-style-type: none"> <li>C-7 Note torque markings on bolts securing bus bars and power connections, verify none of the bolts have rotated from markings ..... <input type="checkbox"/></li> <li>C-8 Depress 2 green buttons in sliding rails and push Power Module assembly back into position in one smooth motion ..... <input type="checkbox"/></li> <li>C-9 Re-install bolt to secure Power Module in place..... <input type="checkbox"/></li> <li>C-10 Insert 2 electrical cables into sockets ..... <input type="checkbox"/></li> <li>C-11 Re-install barrier cover ..... <input type="checkbox"/></li> <li>C-12 Repeat steps C-1 through C-11 for the remaining 2 Power Module assemblies ..... <input type="checkbox"/></li> <li>D. Re-install neutral bus bar across 3 Power Module assemblies ..... <input type="checkbox"/></li> <li>E. Reconnect output wires for U, V, and W to lugs on Power Module assemblies ..... <input type="checkbox"/></li> <li>14. Re-install plastic cover over Power Module assemblies in inverter cabinet..... <input type="checkbox"/></li> <li>15. Check bolt torque markings on all Diode Modules in the transformer cabinet..... <input type="checkbox"/></li> <li>16. Inspect connections to transformer behind panels holding diode modules in the transformer cabinet ..... <input type="checkbox"/></li> <li>17. Inspect the Special Transformer which supplies 3-phase 460 VAC and 1-phase 120 VAC..... <input type="checkbox"/></li> <li>18. Inspect the 3 Pre-charge Inductors ..... <input type="checkbox"/></li> </ol> <p style="text-align: center;"><b><i>ONLY perform the following when incoming power has NOT been wired to the unit!</i></b></p> <ol style="list-style-type: none"> <li>19. Check operation of Isolation Switch by lifting the cabinet door interlock and operating the switch ..... <input type="checkbox"/></li> <li>20. Check all power wiring to and from vacuum contactors..... <input type="checkbox"/></li> <li>21. Vacuum out all areas around transformer and on panels around outside of transformer ..... <input type="checkbox"/></li> <li>22. Re-install plastic covers over all diode assemblies ..... <input type="checkbox"/></li> <li>23. Inspect the internal cabinet location of output wiring connections, behind the door in the logic section ..... <input type="checkbox"/></li> <li>24. Check the GFI board, DCCT's, ground bus connection between cabinets, and output bus lugs..... <input type="checkbox"/></li> <li>25. Vacuum out the internal output wiring enclosure ..... <input type="checkbox"/></li> <li>26. Inspect all connections for tightness inside the logic section ..... <input type="checkbox"/></li> <li>27. Check adjustment of fan overloads..... <input type="checkbox"/></li> </ol> |
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**B. PRE-ENERGIZATION CHECKLIST**

- 28. Visually confirm that there is NO power factor correction caps on the motor (the motor terminal box MUST be opened for this check).....
- 29. Obtain the appropriate schematic drawings for reference.....
- 30. Make an overall visual inspection to verify the drive system is NOT damaged.....
- 31. Verify that all parts are installed and match the type and ratings shown on the schematic drawings (circuit boards, circuit breakers CT's, fuses, etc.).....
- 32. Verify suitable labelling for all unit devices and components.....

**C. MECHANICAL INSPECTION & DEVICE OPERATION CHECK**

- 33. Verify the cables and connector assemblies are routed neatly and NOT pulled excessively. Check for cable termination and bus bar hardware torque marks. Check for any shipping damage to transformer. ....
- 34. Verify phase-to-phase and phase-to-ground wiring clearances from adjacent circuits.....
- 35. Check PCB's for component leads that may be touching, and all board connections seated properly. Perform "lug test" on all control circuit wiring.....
- 36. Manually exercise all relays, switches, and other mechanical devices to ensure that they operate freely. Operate the JK starter isolation switch handle several times to prove correct operation. Adjust and lubricate if necessary.....
- 37. Adjust timers, overload relays, etc. per project drawings.....
- 38. Use vacuum cleaner to remove all metal chips from the cabinet. Metal chips may be present due to site wiring and cabling work. Any foreign metal can result in drive failure due to NOT enough clearance. Use vacuum at least for a half day, cleaning every area of the cabinet thoroughly.....

**D. POWER OFF OHMMETER TEST**

- 39. Visually inspect transformer secondary windings to the corresponding rectifier section.....
- 40. Visually inspect Power Module-to-Rectifier, and Power Module-to-dv/dt filter interconnections.....
- 41. Visually verify ACN buss bar to the ground fault circuit resistor, GDI board, and ground connections to board.....
- 42. Visually inspect U, V, and W Power Module output to VFD output terminals, bypass contactor, or other devices .....
- 43. Check the input contactor fuses are correct.....

- 44. Use Ohmmeter to perform a point-to-point test of all Current Transformers (CT & HCT), verifying phasing and continually to all points. An open circuit can cause damage to the drive .....
- 45. Check the impedance of power supply loads at power supply outputs, investigate any circuits that are low. Check that there are NO ground connections to each power supply output, test Ohmmeter-to-ground .....
- 46. Verify all external unput signals to XIO terminal strip TB2 by manually operating the feedback relays or switches, and checking the continually from terminal Z24 (TB2-29) of XIO.....
- 47. Verify the analog input and output connections between XIO PWB and transducers.....
- 48. Check the continuity of the transducer power input connections from the CPT .....
- 49. Verify the transducer power and signal configuration dip switch settings.....
- 50. Check for good tightness of fuse clips on PT's .....
- 51. Verify correct connections of the remaining XIO interface terminals to external devices such as a resolver, speed sensor, or rotor temperature sensor.....

**E. CONTROL POWER TEST**

- 52. Check N25 (TB8 & 5) and P15 (TB1 & 4) voltage supply to the Hall CT (HCT) terminal block ( $\pm 14.25 - 15.75$  VDC).....
- 53. Check 10VAC (CN1 pins 4 & 5) on the PDM PC8 for CPSF signal .....
- 54. Check 10VAC (CN1 pins 1, 2, & 3) on the PDM PC8 (acceptable value 20.6-27.4 VDC) .....
- 55. Check fan rotation. Apply 480VAC power to the control power supply. Primary side 480V phase rotation must be clockwise at TB for correct fan operation .....

**F. VERIFY POWER SUPPLY VALUES**

- Record the actual values:
- 56. Power Supply (required value VDC) .....
  - 57. P15 (required Value 14.25-15.75) .....
  - 58. N15 (required value -15.75 - -14.25) .....
  - 59. P5 (required value 4.8-5.2) .....



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