PHYSICAL FACILITIES
2019 Consultant’s Handbook
Division 26 Electrical
2923 Variable Frequency Motor Controllers

1 Integral Disconnects
1.1 In general, we use an integral disconnect switch. The disconnect type shall be a molded case breaker. Provide an integral service bypass on each VFD only when called out to do so.

2 Ratings
2.1 The VFD shall be sized at 100% of the motor current based on the motor horsepower as described in the NEC 430.250.
2.2 The VFD shall be rated (and name plated) for a 40°C ambient temperature unless specified otherwise.

3 Line Reactor
3.1 The VFDs shall be equipped with a 3% – 5% line reactor or equivalent.

4 Isolation By-Pass
4.1 The VFD by-pass shall be isolated with barriers from components in the VFD “normal” operation mode.

5 Power Wiring
5.1 All power wiring shall be routed by itself in metallic conduit.

6 Control Wiring
6.1 All control wiring shall be routed in a separate metallic conduit apart from the power wiring. This includes wiring to Electrical Interlock contacts referenced below.

7 Electrical Interlocks
7.1 All safety disconnects located on the load side of the VFD will be equipped with a set of normally open electrical interlock contacts connected in series with the VFD control circuit.
7.2 Specify the electrical interlock contacts to break before and make after the primary contacts of the associated disconnect.
7.3 The wiring to the electrical interlock will be in metallic conduit and routed separately from the power conductors.

8 Isolation Transformers

8.1 Use isolation transformers for voltage matching only, or when the VFD manufacturer specifically recommends that they be used for their drive.
8.2 When input power transformers are required, it should be stipulated that they not be located directly below the VFD in order to avoid raising the ambient temperature around the drive.
8.3 The contract drawings should clearly illustrate the location of the drive isolation transformer away from the VFD.

9 VFD Installation
9.1 The VFD specification should indicate that the wiring methods and installation of the drive be per the manufacturers’ recommendations.
Note: Coordinate VFD and motor to prevent premature bearing failure.
9.2 The VFD and Motor combination should be recommended by both the VFD and Motor manufacturers as an acceptable matched set.
9.3 The wire length from the VFD to the motor shall not exceed manufacturers’ recommendations.

10 Diagrams
10.1 The drawings need sufficient wiring diagrams, illustrations, and notes for the EC to terminate all wiring for the VFD and its associated systems, i.e. fire alarm etc.
10.2 The VFD specification should indicate that the wiring methods and installation of the drive be per the manufacturers’ recommendations. This would include items such as the routing of all conductors in metallic conduit as well as the routing of control conductors in separate metallic conduits from the power conductors.

11 VFD Location
11.1 The designing A & E firm shall locate the VFD where the ambient temperature is within the limits designated by the VFD manufacturers.

12 Acceptable Manufacturers
12.1 ABB
12.2 Allen Bradley (Power Flex)
12.3 Square. D