

Variable Frequency Drive Specification Document

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Variable Frequency Drive Specifications

B. Related Sections:

1. Division 00 – Bidding Requirements
2. Division 01 – General Requirements
3. Section 26 00 00 – Electrical: Basic Requirements

1.2 QUALITY ASSURANCE

A. Referenced Standards:

1. Underwriters Laboratories, Inc.
 - a. UL 508A Listed – Industrial Control Panel

1.3 QUALIFICATIONS

- #### A. Manufacturer shall provide a complete factory assembled and tested unit.

1.4 SUBMITTALS

A. Shop Drawings

1. Product technical data:
 - a. Product dimensions with front and side elevation views
 - b. Enclosure type
 - c. Interior components outlined
 - d. Assembly ratings including horsepower, phases and voltage
 - e. Mounting hole arrangement

1.5 WARRANTY

A. Factory Warranty

1. Variable Frequency Drive shall be covered by a manufacturer's warranty for a period of one (1) year from date of shipment from the manufacturer.

PART 2 – PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- #### A. Power Assemblies LLC.
- #### B. No Substitutions

2.2 VARIABLE FREQUENCY DRIVES (VFD)

A. GENERAL

1. Variable Frequency Drive is defined as a type of motor controller that drives an electric motor by varying the frequency and voltage supplied to the electric motor.
2. In the event the Contractor is furnishing the VFD, the Contractor shall be responsible for the equipment until it has been installed, inspected, tested and accepted in accordance with the requirements of the specifications.
3. Variable Frequency Drive shall be PowerTEK™ Series as manufactured by Power Assemblies LLC.

B. CONSTRUCTION

1. All equipment shall be new.
2. Enclosure shall be NEMA Type 3R.
 - a. Unit shall be constructed of 0.075" carbon steel, seamless, continuously welded, and ground smooth. Enclosure will have a flange trough collar around all sides of door opening(s).
 - b. Enclosure will have mounting holes in back of enclosure for wall mounting and mounting hardware with sealing washers shall be included.
 - c. Unit will have concealed hinges with removable, interchangeable door(s) capability, padlocking handles, 3-point latching mechanisms on all forward facing doors, removable print pocket, oil & water resistant gasketing and will include ground stud on door(s) and body for grounding.
 - d. Unit will have disconnect cutout provided on the flange and black zinc die cast coinproof/padlocking handle.
 - e. All components shall be UL/CSA listed or recognized.
3. ANSI-61 gray powder coating inside and out.
4. Sub-panels may be powder coated white.

C. ENCLOSURE

1. Mount: Wall Mount
2. Material: Carbon Steel
3. Finish: ANSI 61 Gray
4. Additional Listing Requirements
 - a. NEMA Type 3R/12
 - b. UL Listed/CSA Type 3R/12
 - c. IEC 60529 IP 66

D. PARAMETERS

1. Product Designation: Asynchronous motors
2. Torque: Variable Torque
3. Application: Pumps, Fans, HVAC
4. Supply Frequency: 50-60 Hz
5. EMC Filter: Class C2 EMC Filter Integrated
6. Isolation: Electrical between power and control
7. Assembly Style: With Heat Sink
8. Local Signaling: 1 LED – red – DC bus energized
9. Acceleration and Deceleration Ramps: Automatic based on load
10. Supply: Internal supply at 24 VDC derived operating voltage
11. Motor Slip Compensation: Adjustable
12. Braking to Standstill: By DC injection
13. Insulation Resistance: > 1 MOhm at 500 VDC for 1 minute
14. Communications Protocol
 - a. APOGEE FLN
 - b. BACnet
 - c. METASYS N2
 - d. Modbus
15. Communications Protocol – Optional – with option card only
 - a. LonWorks
16. Physical Interface: 2-wire RS 485
17. Transmission Rate: 9600 bps or 19200 bps
18. Noise Level: 51 dB conforming to 86/188/EEC
19. Ambient Air Temperature for Operation: -10°C to 50°C with derating factor

- 20. Wire Size:
 - a. Power: Varies with amperage, refer to NEC
 - b. Control: AWG 14 conductor.
- 21. Tightening Torque:
 - a. Power: Varies with wire size, refer to NEC
 - b. Control: 5.31 lb.in (VIA, VIB, FM, FLA, FLB, FLC, RY, RC, F, R, RES)
- 22. Inputs/Outputs
 - a. Analog inputs: 2
 - b. Analog outputs: 1
 - c. Discrete inputs: 3
 - d. Discrete outputs: 2; 1 NO and 1 NO/NC relay
- 23. Keypad: 7 Segment LED Display with a 7 button keypad

PART 3 – EXECUTION

3.1 INSTALLATION

A. Procedures for Installation

- 1. Prior to installation of Variable Frequency Drive, Contractor shall examine the area and conditions under which the unit is to be installed and notify the Engineer in writing if unsatisfactory conditions exist.
- 2. Unit shall be installed as shown on the drawings. In addition, the installation shall:
 - a. Meet the requirements of local codes, the National Electrical Code and National Electrical Contractors Association's "Standard of Installation."
 - b. Only use copper wire conductors for all field wiring.
 - c. All terminations must be torqued according to the label provided.