

SECTION 23 05 14 – VARIABLE FREQUENCY DRIVES FOR HVAC EQUIPMENT

This document is to be used to assist consultants with adding Delta to the above referenced specification section of THEIR master spec. Please read associated notes for each section below.

For Delta VFD specification:

Variable Frequency Drive Specification

for Heating, Ventilating and Air conditioning
Variable Torque Pump and Fan Applications

SECTION 23 00 00 Mechanical (Use below add ins or reference the Delta CP2000 VFD spec for more)

SECTION 26 00 00 Electrical (Example: 26 29 23.11)

2.1 WARRANTY

- A. Special Warranty: Manufacturer agree to repair or replace VFD that fail in materials or workmanship within specified warranty period.
- B. Warranty Period: **Five years** (2 year standard with an option to purchase 3 additional years)

Comment [GM1]: You get 1 year free by completing the course. 2 additional years can be purchased for a maximum of 5 years. You can purchase 3 years if you don't take the course.

2.2 Acceptable Manufacturers

- A. **Variable** Frequency Drives shall be provided by Delta Products Corporation or approved equal, meeting the exact requirements of these specifications. Substitutions must be submitted in writing three weeks prior to original bid date with supporting documentation demonstrating that the alternative manufacturer meets all aspects of the specifications herein. Supporting documentation should include a line by line review of this specification indicating if the substitution meets or does not meet each item in this specification.
- B. The AC Drive manufacturer shall be able to demonstrate at least 10 years of experience in manufacturing general purpose AC motor Drives and their capability to provide parts and service support.

Comment [MG2]: This option would accompany the Delta Electronics VFD specification. Flat spec.

OR

2.2 Acceptable Manufactures

- A. **Subject** to compliance with requirements, provide products by one of the following:
- B. VFDs that are manufactured by a third party and "brand labeled" shall not be acceptable.
 - 1. Delta Electronics CP2000 or CFP2000 with eZVFD Integration Module
 - 2. Vendor B
 - 3. Vendor C

Comment [MG3]: This option would accompany consultants master specification for VFDs with multiple acceptable manufactures.

2.3 ADDITIONAL FEATURES

All eZVFDs shall have the following features:

- A. BACnet/IP and BACnet over Ethernet communication protocols
- B. BACnet controller fully programmable in GCL+ (Remove "in GCL+" if not flat spec)
- C. Dual port Ethernet for daisy-chaining multiple VFD devices
- D. VFD I/O terminals monitored and controlled as BACnet I/O
 - 1. 3x Analog Input
 - 2. 2x Analog Output
 - 3. 10x Digital Input
 - 4. 3x Digital Output
- E. VFD setup and configuration using enteliWEB. Read, write, save, and load VFD parameters through object manipulation or VFD dedicated Module in enteliWEB.

2.4 All VFDs shall have the following features:

- A. LCD keypad - Easy-to-use text panel
- B. Quick setting functions to support self-defined parameter groups and parameter duplication for fast and easy installation
- C. Modular design for flexible extension and easy maintenance
- D. High-speed communications include BACnet and Modbus. eZVFD module provides BACnet IP/Ethernet.

- E. Extended life cycle
- F. Enhanced conformal coating on PCBs for superior durability in critical environments
- G. Fire mode and bypass functions: continuous pressure to extract smoke when emergencies occur
- H. Various modes for fans/pump applications including PID control, sleep/wake up functions, flying start and skip frequency
- I. Multi-pumps synchronous control of up to 8 motors at one time and provides fixed amount and fixed time/circulation control
- J. Built-in 10K steps PLC programming capacity and Real Time Clock (RTC)
Building Automation Applications
- K. 4-point adjustable V/F control - Real-time adjustment of output voltage under variable torque load environments, especially for pump and fan applications.
- L. Flying start and auto restart after momentary power loss functions, suitable for fan application.
- M. Skip frequency function avoids mechanical resonance and protects the equipment.
- N. Low-current protection function prevents free load operation.
- O. Built-in BACnet communication protocol saves wiring for building automation applications.
Bypass and Disconnect Options
- P. Multiple enclosure styles for different environments available
- Q. Optional Input Disconnect
- R. Fault tolerant mechanical Bypass switch
- S. Optional Input and Output Filtering