



VFD System Overview for Ag Pump Owners: Purchasing and Installation

Variable Frequency Drive (VFD) controllers require a variety of auxiliary equipment and are installed as a system (including installation details) on agricultural pumps to increase pumping plant efficiencies across a variety of pumping conditions. There are tremendous variations in quality, life, and cost of VFD systems – and customers receive limited or no information on details such as efficiency, heat removal, special motor requirements, and negative impacts to the electrical grid and neighbors.

These VFD specifications are designed to provide VFD owners with a minimum performance level, without adding extras that are not absolutely necessary, and without the customer needing to be an expert on the topic. Specification-compliant VFD systems should be relatively safe, reliable, energy efficient, and have a reasonable cost. In addition, compliance with these specifications is required to receive the agricultural VFD enhanced specifications rebate from Pacific Gas and Electric.

Steps for Purchasing a Specification-Compliant VFD System

Recommendations are provided below (in sequence) to help guide pump owners through the process of acquiring a specification-compliant VFD system.

1. Contact your preferred irrigation/pump dealer or VFD vendor. Ask about ordering a VFD system for your pumping application(s). Verify that the vendor is aware of the specifications (www.itrc.org/VFD) and is capable of meeting them. There is no shortage of vendors who are capable of meeting the specifications, although meeting specifications may be new to your long-term supplier/vendor. Also, be sure to ask your irrigation/pump vendor to use an UL-listed panel shop to design and fabricate the VFD system.
2. Discuss optional equipment and features with your sales representative. A document entitled “Options and Considerations for Special Cases” was developed to identify and explain some of the more common VFD system options.
3. Request that optional add-ons be listed in the quote as separate line items so you can decide if the additional costs are worth it.
4. Ask about participating in Pacific Gas and Electric rebate programs – many irrigation/pump dealers are familiar with the rebate process and are capable of assisting pump owners with the paper work.
5. Make a decision on which VFD system add-ons will be included and order the VFD system from a vendor of your choosing.
6. Coordinate the installation and commissioning of the VFD system with your sales rep.

Note: The VFD specifications cover a minimum efficiency and quality of hardware and installation. However, automation and convenience items are not included in the specifications – these decisions are left up to the pump owner.

Last Steps

After the VFD system is installed, there are a few remaining steps:

1. Coordinate a field training session with your sales representative. At this session, the sales representative will train you, or one of your staff on the operation and maintenance of the VFD system. The training session should include, at minimum, the following topics:
 - a. How to turn the pump ON/OFF using the VFD and across-the-line, if applicable, as well as how to manually set a pump speed
 - b. If applicable, how to start the pump in AUTO mode and how that is supposed to work, where the sensor(s) is installed, and what the current target set point (pressure or flow rate) is. Adjustment of the target set point should also be covered in the training.
 - c. How to find and interpret alarms or error messages
2. You should also receive a stand-alone documentation package including:
 - a. A single line electrical schematic showing major components between the VFD system service panel and the VFD-controlled pump motor
 - b. Final VFD programming record listing configured values, units and descriptions
 - c. A VFD system wiring diagram
 - d. A recommended maintenance schedule and description of tasks
 - e. Unwitnessed factory testing from the VFD system assembler
 - f. VFD operations and maintenance manual from the manufacturer
 - g. Warranty and contact information
3. Coordinate and finalize any remaining Pacific Gas and Electric rebate program paperwork

Note: It is recommended that the training session occur in the field in-front of the actual VFD. That way, the owner or owner’s representative can “learn by doing”.