

Simplified VFD

User's Guide for FRWA Personnel

Operating Instructions: 10 HP-VFD Runs 2 to 7.5 HP & 10 HP-VFD Runs 10 to 15 HP

The VFD will power up one (1) motor using a single phase generator. The VFD converts single phase to three phase and allows the motor to start at a reduced amp draw. The VFD will allow a motor to run at reduced HP when conditions dictate. This is accomplished by lowering the High Speed Hz. Setting (HSP) to below 100%.

To use the Single Phase Generator/VFD match the field operating conditions below:

Condition 1: Control Motor Directly from VFD at Set Speed. (Hook to Motor Leads)

1. Use Generator/VFD for Rapid Lift Station Pump Down
2. Run Lift Station when HP exceeds Generator or VFD Rating
3. Use where a continuous reduced pumping rate is desirable

| VFD MENU | Code | Description | Recommended Setting (do not run below 45 Hz) |
|----------|------|--------------------------------|---|
| SEt | LSP | Low Speed Setting | 45 Hz (1/2 speed) to 60 Hz (100% speed) |
| | HSP | High Speed Setting | Set to LSP |
| | ItH | Current for Thermal Protection | Set to 1.15 X FLA on motor nameplate or use chart below |
| drC | BFr | Motor Frequency | Always 60 Hz. |
| | UnS | Voltage on Nameplate | 208, 220, or 240 Volts |
| | NCr | Full Load Amperage | FLA on motor nameplate or use chart below. |

Starting VFD – Initialize Start by turning switch to “On” position.

Amp Requirements for Various Motor Applications

* Note: When Generator Output is exceeded, it may be necessary to lower HSP/ SP to below 100%

| HP | 208V | 240V | 440V | Generator Output 220V | Generator Output 440V | VFD Max Output |
|-----|------|------|------|--------------------------|--------------------------|-------------------|
| 2 | 7.5 | 6.8 | 3.4 | 14 | 7 | 99 |
| 3 | 10.6 | 9.6 | 4.8 | 20 | 10 | 99 |
| 5 | 16.7 | 15.2 | 7.6 | 30 | 15 | 99 |
| 7.5 | 24.2 | 22 | 11 | 45 | 23 | 99 |
| 10 | 30.6 | 28 | 14 | 57* | 29 | 99 |
| 15 | 46.2 | 42 | 21 | 85* | 43 | 99 |
| 20 | 59.4 | 54 | 27 | 109* | 55* | 99 |

Note: Never make a VFD-Generator Connection unless Line Power has been isolated by removing the power meter.

Condition 2: Control VFD with a Float Ball

- 1. Use Wet Well Level to Start and Stop VFD at desired speed setting**
- 2. Control one pump in a lift station with an automated stop and start command from a float ball**

All settings in Condition 1 above will apply.

Wiring Instruction: (Do not attempt this procedure unless you have been trained)

A float ball is actually a normally open switch that is activated when the ball is raised from a vertical plane (ball is hanging down) to a horizontal plane (ball is floating sideways). When this happens an electrical switch in the ball allows current to flow signaling a start (or switch closed) condition.

To use a float ball it will be necessary to interrupt the wire to the On-Off VFD- switch to allow the 24V run signal to run through a float ball. This will become the signal to the VFD to start.

Only someone with electrical training should attempt this type of connection.

Condition 3: Use Existing Control System

- 1. Use Existing Controls to stop and start VFD**

All settings in Condition 1 above will apply.

Wiring Instruction: (Do not attempt this procedure unless you have been trained)

Line power that runs motors and control voltage that runs control systems are isolated in a well or lift station application.

Controls in a lift station or a well send 120V of current to a starter relay. The relay is normally open. When the current hits the motor starter relay it causes a magnetic field to close the starter contacts. This allows current (or line power) to flow to the motor.

When the control system senses a “Stop” condition, the 120V control circuit stops current and the magnetic field stops holding in the motor contacts closed. The contacts open stopping current flow to the motor.

To use existing controls it will be necessary to energize the existing control panel with 120 Volts from a single phase generator. Since current must flow from the top of the starter to use the starter contacts, it will be necessary to connect to the top of the panel. In a connection like this it is imperative that all line power be disconnected and isolated from the temporary connection or damage to equipment and potential injury will result.

Only an experienced electrician should make this type of connection.