Pump Quickstart Guide

Wiring
Warning: Input, Output and Control wiring must be in separate conduits.
Note: Do not wire any wire to the DC bus “P1”, “P2” & “N” terminals.

VFD Only
Verify correct input voltage and wiring to the VFD power and motor terminals. Connect 3-phase input power wires to VFD terminals R, S & T or single-phase power wires to VFD terminals R & S. Connect 3-phase motor wires to VFD terminals U, V & W. Connect power source ground wire and motor ground wire to VFD ground terminal.

Enclosed VFD
Verify correct input voltage and wiring to enclosed VFD panel power and motor terminals. Connect 3-phase input power wires to enclosure or disconnect terminals L1, L2 & L3 or single-phase input power wires to terminals L1 & L2. Connect 3-phase motor wires to enclosure terminals T1, T2 & T3. Connect power source ground wire and motor ground wire to enclosure ground terminal.

Control Wiring: The start dry contact should be wired to VFD terminals CM and M7 or 1 and 2 in enclosed VFD panel. If jumper is installed on start terminals, VFD will run when power turned on.

Transducer:
Enclosed Drive Instructions: (terminals mounted on back panel)

Terminal Blocks
12VDC Transducer (FCS Provided)

Notes:
1) Put shrink tube or electrical tape on bare shield wire to prevent short circuit of any VFD terminals.
2) Wiring may vary for non-FCS provided transducers

Main Display:

DRV - Current parameter group. (SET, DRV, FG1, FG2, I/O, APP, EXT & COM)
00L - Shows the current parameter number within a current group. An “L” will appear when VFD is switched to Local control mode by either LOC/REM key or digital input.
K - Shows source for VFD frequency command (K = Keypad, V = 0-10VDC, I = 4-20mA, O = Communication)
0.0A - Shows the actual motor current
STP - Shows the current status of the VFD (STP = Stop, FWD = Forward, REV = Reverse)
0.00Hz - Shows frequency reference or PID set-point in VFD stop mode and actual VFD output frequency in VFD run mode.

Keypad Programming

1) Mode: Use to cycle through parameter groups: SET>DRV>FG1>FG2>....
2) Loc/Rem: Toggles between Local and Remote operation
3) Enter: Use to enter programming mode of any parameter as well to submit a change. A flashing cursor will appear when VFD is in programming mode.
4) Up & Down: Use to cycle through parameters of the current group. Use to adjust parameters when in programming mode.
5) Shift: Use to cycle backwards through parameter groups. When in programming mode, use to shift cursor to the right (one position per press).
6) Rev. Stop/Reset & Fwd: Use to Start and Stop VFD Forward or Reverse in Local mode. Use Stop to reset VFD fault.

Transducer verification – From main DRV-00 screen go to DRV-98 by pressing Down key. The reading is in 4-20mA range and it should match to transducer output current. If reading is less than 4mA, verify transducer wiring and voltage on V+ and 24 terminals.

Transducer placement: Placing the transducer too close to the pump discharge may cause oscillations and improper operation of the VFD.
Note: If two transducers are used for redundancy, refer to VFD manual for details.

WARNING: Submersible pumps can develop very high pressure in some situations. Always use a properly selected and installed pressure relief valve to prevent damage and injury from over-pressurization of pipes and tanks. Installation of cut-off pressure switch is recommended.
System Initial Start Up & Control Settings

The majority of drive setups can be accomplished by going through only one group: the setup [SET] group. This group was designed to have start-up specific parameters to make start-up easy. Navigate to the SETUP group [SET] by pressing the SHIFT button once from the main screen. Your display will show SET in the upper left hand corner of the display.

Parameter Programming Description

1) Press [MODE] or [SHIFT] key until the desired parameter group is displayed.
2) Press UP [▲] or DOWN [▼] keys to scroll to the desired parameter. If you know the desired parameter number, you can set its number in the first parameter #00 “Jump code” of any parameter group (except SET and DRV groups) and after pressing [ENTER] key display will show that parameter.
3) Press [ENTER] key to enter the programming mode, which is indicated by a flashing cursor. Some parameters cannot be changed during VFD run or fault modes. Refer to the manual to check if desired parameter can be programmed during run.
4) For selectable parameters press [▲] or [▼] keys to change parameter selection.
5) When programming a numerical value, the value will be changed from minimum to maximum by pressing UP or DOWN key. In order to change any digit in a numeric value, use the SHIFT key to move the flashing cursor to that digit and UP or DOWN keys to adjust the selected digit.
6) Press [MODE] or [SHIFT] key to finish programming for this parameter. The flashing cursor disappears.

Verify Basic Settings

APPLICATION SELECTION: Select either Submersible or Circulating pump to load preset programming. Refer to the parameter table at the end of this quick-start for presets.

INPUT POWER # OF PHASES: Default is 3-Phase. Select 1-Phase for single-phase to three-phase conversion application which will change a motor HP rating setting to 50% of the VFD rating.

RATED MOTOR HP: Put the motor horsepower rating from the motor nameplate.

RATED MOTOR CURRENT: Put the motor FLA (full load amps) rating from the motor nameplate.

PRESSURE TRANSDUCER RANGE: The SET-25 default is for a 0-100PSI transducer. Program the maximum range of your pressure transducer. E.g. Program a value of 250PSI for a 250PSI transducer.

PRESSURE SET-POINT: Set SET-26 to desired pressure (psi) that VFD needs to maintain. The default is 50PSI and can be changed to any number within pressure transducer range. The pressure Set-point can be changed in DRV-00 parameter in remote mode too (in local mode it shows Hz).

Verify Rotation

Move HOA switch to AUTO position and the VFD will begin to run the motor. Check the output flow and verify proper rotation. If rotation is incorrect, stop the VFD, turn the VFD power off and wait 5 minutes. Swap two motor leads to change rotation.

Advanced Control Features

These parameters are set to optimal and safe default settings for the Submersible Pump application and can be changed in the field to fit application requirements. You may need to adjust some parameters to provide better control for your system.

-Pre-PID Settings (Pipe Fill Mode)

Pre-PID is designed for pump systems with long pipes that require filling pipe at every start. Upon Pre-PID time delay expiration or when system pressure (PSI) exceeds the Pre-PID Ext Level, the VFD will switch to PID control and maintain a system pressure at pressure set-point.

Note: SET-36 is set to 0.0Hz (Pre-PID is disabled by default) and can be enabled by changing SET-36 frequency.

Pre-PID FREQUENCY: Navigate to SET-36 and put VFD frequency at which drive will run to fill an empty pipe. Set this parameter for frequency above PID Low Frequency Limit and VFD will run to fill the pipe system for the time delay set in SET-37 or until pressure exceeds the exit level set in SET-36. Default setting is 0.0 Hz.

Pre-PID STOP DELAY: This sets the time to fill an empty pipe. Test how much time it takes to fill an empty pipe during startup and adjust as necessary. Default setting is 180 sec.

Pre-PID EXIT LEVEL: PSI level above which the VFD will switch to PID control mode to maintain a system pressure at set-point. Default setting is 25 PSI.

-Broken Pipe Trip

Broken pipe will stop VFD operation if a broken pipe is detected while running in PID control mode to protected from flooding the field.

For trip specifics, please refer to the installation & operation manual.

-Broken Pipe Mode

Broken Pipe Mode: Set to YES to enable, NO to disable. Default setting is NO.

1) If drive is running over the speed indicated in SET 41,

2) If drive is running longer than time indicated in SET 42,

3) If the pressure is below PSI indicated in SET 43.

-Under-Level Protection (Dry Well)

Under-Level trip (known as dry well protection) is designed to trip the VFD when the pump motor current draw is less than SET-78 for SET-77 time delay when VFD output frequency is above SET-76. For submersible pumps it is typically 65-70% and for centrifugal pumps 30-35%. For the correct adjustment check with motor manufacturer.

LEVEL DETECTION: Change SET-74 to NO to disable. Default setting is UnderLevel.

UNDERLOAD AMPERAGE: Adjust SET-78 to 65-70% of SET-03 (FLA) for submersible and 30-35% for centrifugal pump. Default setting is 0.0 A.

WELL FILL TIME: If parameter SET-80=Yes, SET-81 fill time setting should be sufficient to fill the well before VFD attempting to start again. Default setting is 60.0 min. If VFD trips again on Under Level fault during restart attempt, the SET-81 value will be doubled for next restart.

-Setting Sleep Mode

Sleep mode will stop the VFD in no-demand condition when system pressure is slightly above SET-26 set-point and output frequency is below SET-32 Sleep mode frequency setting for SET-33 Sleep mode delay time. The most critical step is to determine and set a correct SET-27 PID Frequency Low Limit.

Determine No-Demand Frequency and PID Frequency Low Limit

PID LIMIT LOW: Turn the HOA switch to Auto position and run system with No demand. When system pressure is at pressure set-point and frequency is stabilized, add 1Hz to this frequency and set it in SET-27. If system pressure is above pressure set-point, the first of three conditions for activation of the Sleep mode is met. For Flat curve pumps Minimum frequency is typically 50-55Hz.

SLEEP MODE FREQUENCY: Set this parameter to [SET-27] +0.5Hz. If VFD frequency is below SET-32, the second condition for activation of the Sleep mode is met.

SLEEP MODE DELAY TIME: The SET-33 is a delay time to activate Sleep Mode when other two conditions are met. If any of two above conditions is off, the Sleep Delay Timer will be reset.

WAKE-UP LEVEL: The SET-35 is a percentage of SET-25 pressure transducer range. The VFD will wake-up if system pressure is less than wake-up pressure that can be calculated [SET-26]-([SET-25]*[SET-35]/100). For 100PSI transducer the SET-35 value equals to PSI (2% would be 2PSI).

Sleep Boost Mode: When pump system is ready to go into Sleep mode, it can increase a system pressure by some PSI to prevent short cycling at low demand changes.

SLEEP BOOST: The VFD will boost the system pressure by the programmed in SET-34 value before going to sleep. Default is 3PSI for submersible and 2PSI for Centrifugal pumps.

Program a value of UPSIL to disable this feature.

SLEEP BOOST TIMER: When VFD is ready for sleep mode it will increase pressure set-point by Sleep Boost value. When Set-point is met or Sleep Boost Timer SET-47 expires, VFD will activate sleep mode.

Pipe Leak protection: Refer to VFD manual for detailed description on Dual Demand and Pipe Leak features.

Pump Speed Limit by Well Water Level: Refer to VFD manual for details. Requires well level transducer.

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System Validation

1. Switch HOA in the AUTO position with low demand and run VFD for one minute after the system is at pressure set-point. The VFD should maintain a set-point and not go into sleep mode.
2. Close demand completely and VFD should drop frequency to minimum and after delay time it should boost system pressure (if boost is enabled) and go to sleep mode.
3. Open low demand and VFD should wake up after pressure drops below the wake-up pressure.
4. Run VFD with different demand levels to check if control is stable.

- Saving Parameters

Saving parameters to the keypad is recommended after the start-up is performed and you are satisfied with pump system operation. If the programming is changed later and your VFD is no longer operating the way you intended it to, you can always load your previously saved parameters from the keypad. Additionally, the programmed keypad can be used to copy same parameter settings to another VFD.

SAVE PARAMETERS TO KEYPAD: Change FG2-91 to YES to save parameters to the keypad. After pressing ENTER key, this parameter will go back to NO after saving is done (approximately one minute).

LOAD PARAMETERS FROM KEYPAD: Change FG2-92 to YES to load parameters from the keypad. After pressing ENTER key, this parameter will go back to NO after loading is done (approximately one minute).

Factory Programmed Parameters

<table>
<thead>
<tr>
<th>Function</th>
<th>Parameter</th>
<th>Description</th>
<th>Submersible</th>
<th>Circulating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup</td>
<td>SET-04</td>
<td>Motor RPM</td>
<td>3600 rpm</td>
<td>1800 rpm</td>
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<tr>
<td></td>
<td>SET-11</td>
<td>VFD acc. time</td>
<td>2 sec</td>
<td>20 sec</td>
</tr>
<tr>
<td></td>
<td>SET-12</td>
<td>VFD dec. time</td>
<td>2 sec</td>
<td>30 sec</td>
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<td></td>
<td>SET-16</td>
<td>Sleep mode</td>
<td>Coastal</td>
<td>Coastal</td>
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<td></td>
<td>SET-20</td>
<td>PID Operation</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td></td>
<td>SET-21</td>
<td>PID Feedback Signal</td>
<td>0-10mA</td>
<td>0-10mA</td>
</tr>
<tr>
<td></td>
<td>SET-22</td>
<td>Feedback unit</td>
<td>PSI</td>
<td>PSI</td>
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<td></td>
<td>SET-25</td>
<td>Transducer range</td>
<td>50 PSI</td>
<td>50 PSI</td>
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<td></td>
<td>SET-26 &amp; DRV00</td>
<td>Pressure Set-Point</td>
<td>50 PSI</td>
<td>50 PSI</td>
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<td></td>
<td>SET-27</td>
<td>PID low limit frequency</td>
<td>30Hz</td>
<td>30Hz</td>
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Sleep Mode

<table>
<thead>
<tr>
<th>Sleep Frequency</th>
<th>SET-32</th>
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<tr>
<td>Sleep mode delay time</td>
<td>SET-33</td>
</tr>
<tr>
<td>Sleep mode boost value</td>
<td>SET-34</td>
</tr>
<tr>
<td>Sleep mode wake-up level</td>
<td>SET-35</td>
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<tr>
<td>Sleep Boost Timer</td>
<td>SET-47</td>
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Pipe Fill

<table>
<thead>
<tr>
<th>Pre-PID frequency</th>
<th>SET-36</th>
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<td>Pre-PID delay time</td>
<td>SET-37</td>
</tr>
<tr>
<td>Pre-PID exit level</td>
<td>SET-38</td>
</tr>
<tr>
<td>Broken pipe enable</td>
<td>SET-40</td>
</tr>
<tr>
<td>Broken pipe frequency</td>
<td>SET-41</td>
</tr>
<tr>
<td>Broken pipe delay time</td>
<td>SET-42</td>
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<tr>
<td>Broken pipe feedback level</td>
<td>SET-43</td>
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</table>

Broken Pipe

<table>
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<tr>
<th>Level detection enable</th>
<th>SET-74</th>
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<td>Level detection source</td>
<td>SET-75</td>
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<tr>
<td>Level detection frequency</td>
<td>SET-76</td>
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<tr>
<td>Level detection delay time</td>
<td>SET-77</td>
</tr>
<tr>
<td>LDT Level</td>
<td>SET-78</td>
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<tr>
<td>Level detection trip enable</td>
<td>SET-80</td>
</tr>
<tr>
<td>Wait fill time</td>
<td>SET-81</td>
</tr>
</tbody>
</table>

ATTENTION INSTALLER: PLEASE READ AND FOLLOW THESE INSTALLATION GUIDELINES. FAILURE TO FOLLOW INSTALLATION GUIDELINES MAY VOID WARRANTY.

A drive is a sensitive piece of power electronics that, when installed properly, will provide you with years of trouble-free operation. While our drives have many built-in protective features, if the installation or application is incorrect, failures due to improper protection or installation will not be covered under warranty. To avoid this ugly situation we have developed the Drive Installation ABC's. Know these basic ABC's with every drive you purchase. An incorrectly applied or installed inverter can result in system malfunction or reduction in product life as well as component damage. You must read and understand the manual thoroughly before proceeding.

**Installation Precautions**

1. Handle the VFD with care to prevent damage to the plastic components. Do not hold the VFD by the front cover.
2. Do not mount the VFD in a location with vibration (level higher than 5.9 m/sec²) such as installing the VFD on a press or other moving equipment.
3. Install in a location where temperature is within the permissible range.
4. The VFD can be hot during operation. Install it on a non-combustible surface.
5. Mount the VFD on a flat, vertical, and level surface. VFD orientation must be vertical (top up) for proper heat dissipation. Also leave sufficient clearances around the VFD. Increase minimum clearance by one inch for 50–75 HP VFDs, by two inches for 100–150 HP VFDs, by three inches for 200–300 HP VFDs, by four inches for 350–700 HP VFDs to provide sufficient cooling airflow.

6. Do not mount the VFD in direct sunlight or near other heat sources.
7. The VFD should be mounted in a Pollution Degree 2 environment. If the VFD is going to be installed in an environment with a high probability of dust, metallic particles, mists, corrosive gases, or other contaminants, the VFD must be located inside the appropriate electrical enclosure of the proper NEMA or IP rating.
8. When two or more VFDs are installed or a ventilation fan is mounted in the VFD panel, the VFD and ventilation fan must be installed in proper positions to keep the internal ambient temperature of the VFD below the permissible value. If they are installed in improper positions, the ambient temperature of the VFD will rise.
9. Install the VFD using screws or bolts to ensure the VFD is firmly fastened.

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AMBIENT TEMPERATURE:
The maximum ambient temperature for a stand alone drive is 40 °C (104 °F) or 50 °C (122 °F) for 20% up sized drive. Here are some recommendations to help keep your drive “cool”:

1. Derating for Temperature: If stand alone VFD is installed on the wall with the maximum ambient temperature exceeding 40 °C or 104 °F or VFD is mounted in ventilated enclosure with ambient temperature exceeding 33.3 °C or 92 °F (non-direct sun), the VFD should be up sized 20%.
2. Reduce the heat load on the Drive: Mount the drive away from direct sunlight or any other source of heat.
3. Exhaust and Intake Clearance: Make sure the drive is mounted in a place where the intake and exhaust air is free from obstructions and the intake air is near another heat source such as transformers or heating elements. Never install one drive such that the exhaust from one blows into the intake of another.
4. Mount the drive in a Separate Enclosure: A simple step that can save a lot of headaches is to mount the drive separately from other heat generating electrical equipment. Just a few extra devices in an enclosure can add significant heat that can push the internal ambient temperature of the cabinet beyond what is acceptable for the drive.

BONDING:
The proper grounding is very important for VFD operation. If metal construction or conduits are used as a ground leak current path, the VFD can have inadequate grounding and ground fault protection. Most problems with grounding are in remote locations (like an irrigation pump) or isolated installations such as cranes or roof tops for HVAC. There are three critical things to remember about grounding your drive:

1. Size of the ground cable: The ground bonding cable must be the proper size to meet the impedance requirements as specified in our manual.
2. Dedicated, direct cable: The ground bonding cable should be dedicated and as short as possible from the bonding point. Longer cable runs will require larger cable to meet the impedance requirements. This is where following the recommendations above will serve you well. Under no circumstances should you use a mechanical connection such as conduit or electrical cables for your ground source.
3. Bonding to the source input: Ideally the grounding and source input are electrically connected such as when there is an isolator transformer or source input. They are recommended in all other cases.

The following bonding methods are not acceptable: Mechanical ground through conduit or through metal chassis, isolated or floating ground systems, grounding through neutral wires, corner grounded delta (call Franklin for recommendations).

CLEAN POWER, CORRECT SIZING, & CLEAN AIR:

Clean Power: The drive will need to be protected from input power problems and load related power issues (mainly due to long cable runs). There are unique issues regarding both input power and output power protection (see notes regarding input reactors, load reactors, and surge suppressors below.)

Correct Sizing: How your drive performs is dependent upon sizing the drive properly for the application. Your load is either constant torque or variable torque. Most Franklin drives are dual rated - the variable torque rating is always higher capacity than the constant torque rating. Here are some examples of variable and constant torque applications:

<table>
<thead>
<tr>
<th>Constant</th>
<th>Fan, Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Conveyor Belt, Mixer, Grinder, Lathe</td>
</tr>
<tr>
<td>High Inertia</td>
<td>Oil Pump, Jack Driveline, Any Flywheel, Crane and Hoist</td>
</tr>
</tbody>
</table>

When sizing a drive you also must consider the inertia of the load. High inertia loads are hard to accelerate and decelerate. This resistance to speed change can cause the drive to trip out on DC overvoltage, as the inertia from the load reverses into the drive and causes the DC bus voltage to rise. When this happens the drive will trip on an overvoltage fault. Resetting the fault and putting the drive back in operation in this situation will void your warranty if done repetitively. In all such cases a DC braking unit should be used. DC braking units are standard on many of our small drives and are optional on all of our larger drives.

Clean Air: A drive that becomes coated with dust or debris cannot cool itself properly and will lead to premature failure of the drive. Make sure the drive has clean, dry air for cooling. If it is installed in an enclosure make sure to replace the air filters once a month to make sure the drive runs at peak performance.

Correct Settings: To protect your drive and to ensure proper operation, follow our quick start guide which includes settings for most applications.

I. Contactors

**Exception as noted below, do not use an output contactor for the purposes of starting and stopping a motor - this will damage the drive and void the warranty.**

A contactor may be used to open the input power to the drive to provide drive isolation for service and repair. An output contactor may only be used to isolate the drive when interlocked utilizing the drive program for multi-motor control or bypass (exchange) operation.

II. Mounting & Installation

To reliably operate the inverter, install the inverter in the proper orientation and with recommended clearances.

**Please refer to installation precautions in the P-Series Installation Manual.**

Incorrect terminal wiring could result in equipment damage. Temperature in the cabinet or where the drive is installed should be between 14 °F and 104 °F non-condensing. Temperatures outside this range will damage drive. Temperatures up to 122 °F are possible with 20% derating.

III. Motor Disconnect

If possible wire an auxiliary contact to the drive terminals to interlock the drive and prevent inadvertent damage.

**The drive must be stopped before operating a motor disconnect.**

IV. AC Power Source

**Input power must be +10/-15% of drive rated voltage for proper operation.** The drive cannot produce output voltage higher than the input power voltage. The input to the drive must have surge voltage and high voltage protection.

V. Short Circuit Protection & Disconnect

**An input line reactor and lightning surge arrestor must be used to provide protection when the drive is directly connected to a utility input source. They are recommended in all other cases.**

VI. Input Line Reactors

Please call Franklin for proper sizing and application of a line reactor on the drive input. When properly sized and applied, an input line reactor will reduce input power harmonics, improve power factor, and increase drive protection.

**An input reactor must be used when the drive is directly connected to utility power or when the input power source is more than 10 times the KVA rating of the inverter.**

VII Wiring Output to Motor

**Please follow all wiring precautions as noted in the drive manual.**

Wiring length from the drive to the motor should be short enough to prevent insulation breakdown in the motor due to high voltage. Please call Franklin if the motor leads are longer than 100 feet for application recommendations. Long motor leads will require an output line reactor or output filter.

**Do not connect power factor capacitors, surge arresters or noise filters to the output of the inverter. This will void the warranty.**
**NOTE: Failure to complete this form may delay warranty processing.**

Franklin Control Systems (FCS) cannot provide technical support until the installer completes this form and files it with FCS Technical Support. Only FCS Certified personnel may use this form for FCS (Titan) Variable Frequency Drives.

Please fax this form to (503) 643-4925 or mail to 22985 NW Evergreen Parkway, Hillsboro, Oregon 97124. This form may also be found on our download center at www.franklin-controls.com and emailed to FCSApps@fele.com.

### INSTALLATION INFORMATION

#### Part #

#### Serial #

<table>
<thead>
<tr>
<th>Date of start-up</th>
<th>Date of start-up</th>
<th>Date of start-up</th>
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<tbody>
<tr>
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</tbody>
</table>

### Motor Data

- **Insulation Class/Rated Voltage**
  - Ins. / V / V / V
- **Horsepower/Full Load Amperage**
  - HP / FLA / HP / FLA / HP / FLA
- **Service Factor/RPM**
  - SF / RPM / SF / RPM / SF / RPM

### Application

- **Torque**
  - constant / variable / constant / variable / constant / variable
- **Input phase**
  - three phase / single phase / three phase / single phase / three phase / single phase
- **Description**
  - (i.e. pump jack, centrifuge, fan, blower, etc.)
- **Environmental Temperature**
  - Max: °F Min: °F / Max: °F Min: °F / Max: °F Min: °F
  - Distances in feet from VFD to motor to service to transformer to service to transformer

### Startup information

- **Installed devices**
  - (Indicate the letters of installed devices shown in diagram above, i.e., A, B, D, F)
- **Model Number of Dynamic Brake Unit / Resistor**
  - DB Unit / Resistor / DB Unit / Resistor / DB Unit / Resistor
- **Check proper wiring & grounding**
  - YES / YES / YES
- **Input Voltage on VFD terminals R, S, & T**
  - R-S S-T R-T / R-S S-T R-T / R-S S-T R-T
- **VFD Output Current Parameter Reading @ Max Speed**
  - Amps (see manual for parameter) / Amps (see manual for parameter) / Amps (see manual for parameter)
- **Speed control**
  - Keypad / 0-10V / Keypad / 0-10V / Keypad / 0-10V
  - Potentiometer / 4-20mA / Potentiometer / 4-20mA / Potentiometer / 4-20mA
  - Communication Card / PID / Communication Card / PID / Communication Card / PID
- **VFD parameters set according to quick start guide?**
  - YES / NO / YES / NO / YES / NO
- **Environmental Conditions**
  - (Please select all applicable conditions)
- **VFD enclosed by?**
  - FCS / Customer / Not Enclosed / FCS / Customer / Not Enclosed / FCS / Customer / Not Enclosed

Please complete the fields below if the VFD is installed in an enclosed package that was not built by Franklin Electric.

- **Enclosure NEMA rating**
  - 1 3R 12 4 or 4X / 1 3R 12 4 or 4X / 1 3R 12 4 or 4X
- **Enclosure dimensions in inches**
  - H W D / H W D / H W D
- **Cooling Fan/AC Unit Size**
  - Fan (In.) / AC (BTU) / Fan (In.) / AC (BTU) / Fan (In.) / AC (BTU)

### INSTALLER INFORMATION

- **Name**
- **Phone**
- **Email**
- **Company/Address**

### PURCHASER INFORMATION

- **Name**
- **Phone**
- **Email**
- **Company/Address**

- **Installation date**
- **Install Location**

- **Purchase date**
- **PO#**

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