



(205) 533-0571  
www.pfixcontrols.com

VFD-17-A  
Variable Frequency Drive  
Controller



Quick Reference  
Card Guide

Pin #	Description	Pin #	Description
1	Pump 1 Select	27	Power Supply Input - Ground
2	Pump 2 Select	28	Power Supply Input - +24VDC
3	Pump 3 Select	29	
4	Pump 4 Select	30	
5	Pump 5 Select	31	
6	Pump 6 Select	32	
7	Pump 7 Select	33	
8	VFD Run Control	34	Programming / Communication Port
9		35	
10	Pump 1 Run	36	
11	Pump 2 Run	37	
12	Pump 3 Run	38	
13	Pump 4 Run	39	
14	Pump 5 Run	40	
15	Pump 6 Run / Suction Control	41	
16	Pump 7 Run	42	
17	VFD Run Enable	43	
18		44	
19	+24VDC Loop Power	45	Remote LCD and Keypad Port
20	VFD Speed	46	
21	+24VDC Loop Power	47	
22	Discharge Pressure	48	
23	+24VDC Loop Power	49	Analog Output 1 Ground
24	Suction Pressure	50	VFD Speed Control 4mA-20mA
25	+24VDC Loop Power	51	Analog Output 2 Ground
26	4mA-20mA Input 4	52	Analog Output 2 4mA-20mA

**Digital Inputs:**

Activate by switching to GND.  
Internal pull-up to +5VDC

**Digital Outputs:**

+24VDC @ 250mA  
Activates by switching to GND.

**Analog Inputs:**

4mA – 20mA @ +24VDC

**Analog Outputs:**

4mA – 20mA @ +24VDC

**Physical Equipment:**

DIN Rail Mountable  
6.125" Wide, 3.375" High, 2.281" Deep

**User Interface:**

2 Line, 16 Character LCD with back light  
4 Button User Interface

PFIX Controls®

## Main Screen

D 107PSI SP> 108  
S 50PSI RUNNING

D 107PSI SP> 108  
SP 47HZ RUNNING

D 107PSI SP> 108  
S 50PSI RUNNING

D 107PSI SP> 108  
S 50PSI RUNNING

D 107PSI SP> 108  
S 50PSI RUNNING

D 107PSI SP> 108  
S 50PSI RUNNING

Press **MENU** from the main screen to display setup menu.

The main screen displays the discharge pressure reading, optional suction pressure reading or VFD controller output speed, discharge pressure control setpoint, and controller status.

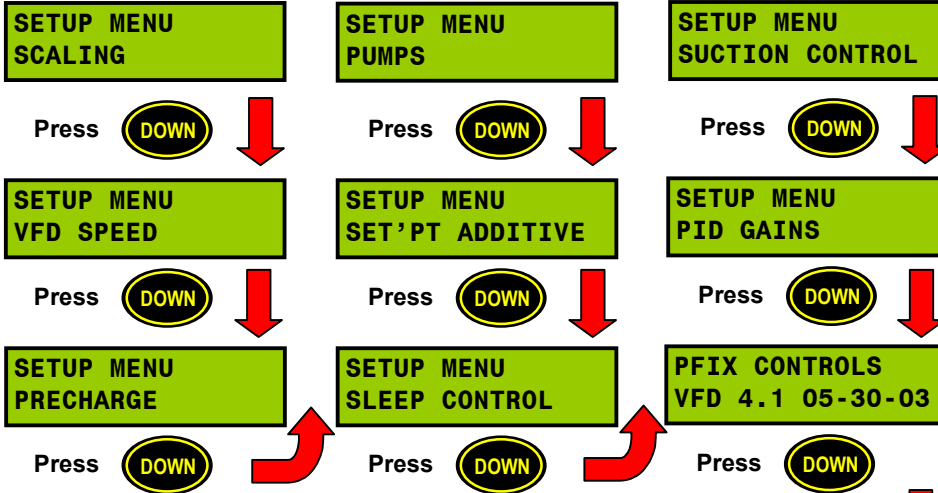
**Discharge Pressure Reading, D 107PSI** displays the control feedback for the VFD Controller. The VFD Controller drives the inverter to keep this reading equal to the setpoint, (SP).

**Optional Suction Pressure Reading, S 50PSI** displays the suction pressure reading, if Suction Control is enabled. The VFD Controller attempts to keep this reading above the Minimum Suction Pressure Setting.

**Optional VFD Speed Feedback, SP 47HZ** displays the VFD speed reading if Suction Control is disabled. See the VFD Speed Menu to select between internal or external speed feedback.

**Discharge Pressure Control Setpoint, SP> 108** is an operator selectable value that the VFD Controller attempts to maintain.

**Current Operating Status** appears in the lower right-hand corner: DISABLED, OFF, STOPPING, MINIMUM, CHARGING, **RUNNING**, SLEEP, RESTART, PRE-LUBE, SUCTION, and RESET.



Press **SELECT** to display the sub-menus.  
 Press **MENU** to return to the main screen.

The **SCALING** menu defines units of measure and maximum values used within the system.

The **VFD SPEED** menu defines the speed feedback source, minimum speed and delay.

The **PRECHARGE** menu defines precharge use, speed, and release pressure.

The **PUMPS** menu defines use of fixed speed pumps, source of pump selection, number of pumps, pump add conditions, and pump removal conditions.

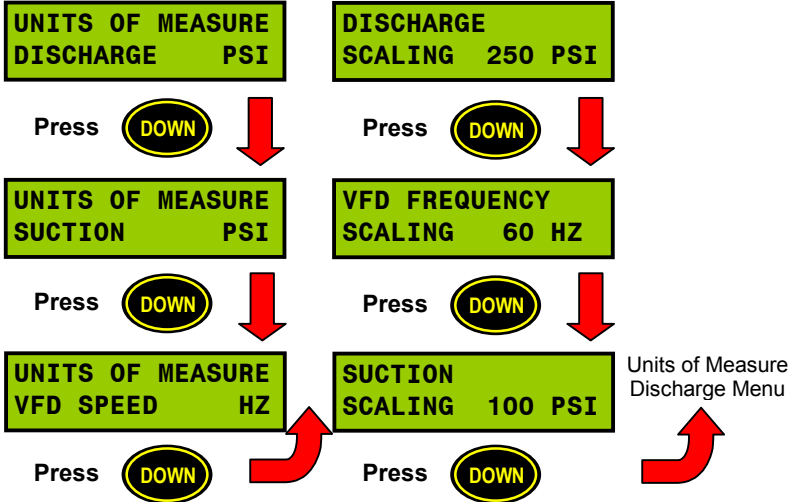
The **SETPOINT ADDITIVE** menu defines the setpoint changes required for each additional fixed speed pump.

The **SLEEP** menu defines the use of low speed sleep control, sleep speed and delay, restart use, pressure and delay.

The **SUCTION** menu defines use of low suction control, pressure, and shutdown use and delay.

The **PID** menu defines the “P” gain, “I” gain, “D” gain and loop time.

The **PFIX CONTROLS** screen displays the software version and date.



Press **SELECT** to activate data-entry mode.  
 Press **MENU** to return to the **SCALING** menu.

The **UNITS OF MEASURE DISCHARGE** menu defines units of measure for discharge pressure or control value, (i.e. PSI, %, FT, IN, GPM, FPS, or HZ).

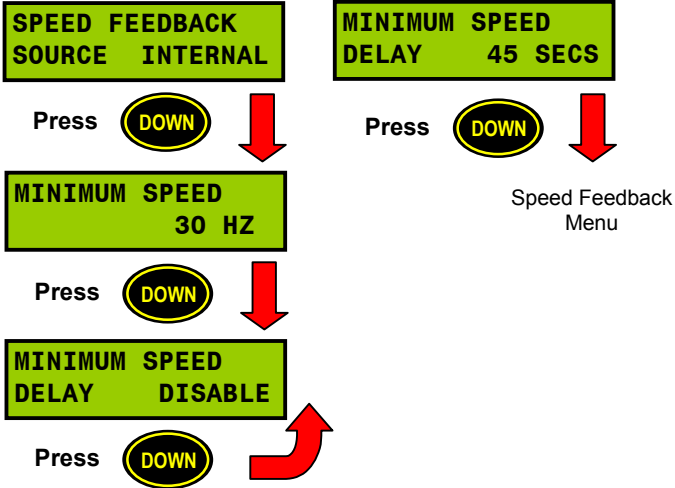
The **UNITS OF MEASURE SUCTION** menu defines units of measure for suction pressure or input value.

The **UNITS OF MEASURE VFD SPEED** menu defines units of measure for VFD speed feedback.

The **DISCHARGE SCALING** menu defines the full-scale-value of the discharge pressure transmitter.

The **VFD FREQUENCY SCALING** menu defines to fastest speed available on the VFD Inverter.

The **SUCTION SCALING** menu defines to full-scale-value of the suction pressure transmitter.



Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **VFD SPEED** menu.

The **SPEED FEEDBACK SOURCE** menu defines whether the inverter speed is fed back internally or externally into the VFD Controller.

The **MINIMUM SPEED** menu defines the slowest allowable speed sent to the inverter.

The **MINIMUM SPEED DELAY ENABLE** menu defines whether or not the minimum speed is sent to the inverter for a selectable length of time.

The **MINIMUM SPEED DELAY** menu defines the amount of time in seconds that the VFD Controller sends the minimum speed to the inverter.

PRECHARGE  
DISABLE

Press

DOWN



PRECHARGE  
SPEED 45 HZ

Press

DOWN



PRECHARGE  
PRESSURE 95 PSI

Press

DOWN

Precharge  
Menu



Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **PRECHARGE** menu.

**Precharge** forces the motor to run at a set speed until the discharge pressure reaches the selected value.

The **PRECHARGE** menu defines whether or not a precharge cycle is used.

The **PRECHARGE SPEED** menu defines the speed the VFD Controller will send to the inverter during the precharge cycle.

The **PRECHARGE PRESSURE** menu defines the discharge pressure at which normal operations will resume.

USE FIXED SPEED PUMPS? NO

Press **DOWN**

PUMP SELECTION INTERNAL

Press **DOWN**

NUMBER OF FIXED SPEED PUMPS 7

Press **DOWN**

PUMP ON SPEED 55 HZ

Press **DOWN**

PUMP ON SPEED DELAY 15 SECS

Press **DOWN**

SPEED AFTER PUMP ON 45 HZ

Press **DOWN**

PUMP OFF SPEED 40 HZ

Press **DOWN**

PUMP OFF SPEED DELAY 15 SECS

Press **DOWN**

SPEED AFTER PUMP OFF 50 HZ

Press **DOWN**

Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **PUMPS** menu.

Use Fixed Speed Pumps Menu

The **USE FIXED SPEED PUMPS** menu defines whether or not fixed speed pumps will be used in the system.  
The **PUMP SELECTION** menu defines whether pumps are selected internally by the VFD Controller or externally via operator controlled switches.  
The **NUMBER OF FIXED SPEED PUMPS** menu defines the number of fixed speed pumps in the system.  
The **PUMP ON SPEED** menu defines the speed at which the controller will switch on a fixed speed pump.  
The **PUMP ON SPEED DELAY** menu defines the delay in seconds before the controller switches on the pump.  
The **SPEED AFTER PUMP ON** menu defines the speed the controller will ramp down to after switching on the pump.  
The **PUMP OFF SPEED** menu defines the speed at which the controller will switch off a fixed speed pump.  
The **PUMP OFF SPEED DELAY** menu defines the delay in seconds before the controller switches off the pump.  
The **SPEED AFTER PUMP OFF** menu defines the speed the controller will ramp up to after switching off the pump.



PUMP 1 SETPOINT  
ADDITIVE 0 PSI

Press



PUMP 2 SETPOINT  
ADDITIVE 0 PSI

Press



PUMP 3 SETPOINT  
ADDITIVE 0 PSI

Press



PUMP 4 SETPOINT  
ADDITIVE 0 PSI

Press



PUMP 5 SETPOINT  
ADDITIVE 0 PSI

Press



PUMP 6 SETPOINT  
ADDITIVE 0 PSI

Press



PUMP 7 SETPOINT  
ADDITIVE 0 PSI

Press



High  
Pressure  
Menu

Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **SETPOINT ADDITIVE** menu.

The **PUMP 1 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 1. The **PUMP 2 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 2. The **PUMP 3 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 3. The **PUMP 4 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 4. The **PUMP 5 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 5. The **PUMP 6 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 6. The **PUMP 7 SETPOINT ADDITIVE** menu defines the pressure added to the setpoint when running pump 7.

SLEEP CONTROL  
DISABLE

Press **DOWN**

SLEEP CONTROL  
SPEED 30 HZ

Press **DOWN**

SLEEP CONTROL  
DELAY 45 SECS

Press **DOWN**

RESTART CONTROL  
DISABLE

Press **DOWN**

RESTART CONTROL  
PRESSURE 75 PSI

Press **DOWN**

RESTART CONTROL  
DELAY 30 SECS

Press **DOWN**

RESTART CONTROL  
PRE-LUBE DISABLE

Press **DOWN**

Low  
Suction  
Menu

Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **SLEEP CONTROL** menu.

**Sleep** stops the motor if the motor runs at a selected speed for a selected period of time.

The **SLEEP CONTROL** menu defines whether or not sleep control is used.

The **SLEEP CONTROL SPEED** menu defines the speed which enables sleep.

The **SLEEP CONTROL DELAY** menu defines the number of seconds to wait before starting sleeping.

The **RESTART CONTROL** menu defines whether or not a restart control is used.

The **RESTART CONTROL PRESSURE** menu defines the discharge pressure at which to restart the motor.

The **RESTART CONTROL DELAY** menu defines the number of seconds to wait before restart.

The **RESTART CONTROL PRE-LUBE** menu defines whether or not to use a pre-lube cycle before starting the motor.

SUCTION CONTROL  
MODE DISABLE

Press



SUCTION CONTROL  
PRESSURE 10 PSI

Press



SUCTION CONTROL  
SHUTDOWN DISABLE

Press



SUCTION SHUTDOWN  
DELAY 45 SECS

Press



Suction  
Control Mode  
Menu

Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **SUCTION CONTROL** menu.

**Suction Control** attempts to recover suction pressure by reducing the speed of the motor.

The **SUCTION CONTROL** menu defines whether or not sleep control is used.

The **SUCTION CONTROL PRESSURE** menu defines the suction pressure which enables sleep.

The **SUCTION CONTROL SHUTDOWN** menu defines whether or not to shutdown the motor in a low suction condition.

The **SUCTION CONTROL SHUTDOWN DELAY** menu defines the number of seconds to wait before stopping the motor.

PID P GAIN  
PERCENTAGE .25

Press



PID I GAIN  
PERCENTAGE .15

Press



PID D GAIN  
PERCENTAGE .00

Press



PID LOOP  
RATE 4 SECS

Press



PID P Gain  
Percentage  
Menu

Press **SELECT** to activate data-entry mode.  
Press **MENU** to return to the **PID** menu.

The **PID P GAIN PERCENTAGE** menu defines the proportional gain of the controller as a fraction of 100. This percentage determines how quickly the controller responds to changes in discharge.

The **PID I GAIN PERCENTAGE** menu defines the integral gain of the controller as a fraction of 100. This percentage is added each loop until the discharge equals the setpoint.

The **PID D GAIN PERCENTAGE** menu defines to derivative gain of the controller as a fraction of 100. Pump control rarely uses this setting.

The **PID LOOP RATE** menu defines to number of seconds between control loops.

D 107PSI SP> 108  
S 50PSI RUNNING

Press



D 107PSI SP> 108  
S 50PSI RUNNING

Press



D 107PSI SP> 108  
S 50PSI RUNNING

Press



D 107PSI SP> 118  
S 50PSI RUNNING

Press



D 107PSI SP> 118  
S 50PSI RUNNING

Press



D 107PSI SP> 117  
S 50PSI RUNNING

Press



D 107PSI SP> 116  
S 50PSI RUNNING

Press



D 107PSI SP> 116  
S 50PSI RUNNING

Press



Next menu item

Press **SELECT** key to activate data-entry mode. The black cursor block appears indicating the data entry mode. Edit numeric values one digit at a time, from highest to lowest. Pressing the **UP** and **DOWN** key changes a numeric digit by one respectively. Press **SELECT** to accept the entry and move to the next digit. To skip a digit, press **SELECT**. Pressing **SELECT** at the last digit, accepts the entire number as the new setting for the menu item.

Pressing **MENU** key during data entry, (i.e. Black Cursor Block appears), cancels the changes made and returns the controller to the non-data entry mode, (i.e. Black Cursor Block disappears).

**SPEED FEEDBACK  
SOURCE INTERNAL**

Press



**SPEED FEEDBACK  
SOURCE IINTERNAL**

Press



**SPEED FEEDBACK  
SOURCE EXTERNAL**

Press



**SPEED FEEDBACK  
SOURCE EXTERNAL**

Press



Next  
menu  
item

Press **SELECT** key to activate data-entry mode. The black cursor block appears indicating the data entry mode. Edit selection values by alternating between the two choices. Pressing the **UP** or **DOWN** key alternates between the choices. Pressing **SELECT** accepts the entire selection as the new setting for the menu item.

Pressing **MENU** key during data entry, (i.e. Black Cursor Block appears), cancels the changes made and returns the controller to the non-data entry mode, (i.e. Black Cursor Block disappears).