PULSAFEEDER
27101 Airport Road
Punta Gorda, FL 33982
www.pulsatron.com

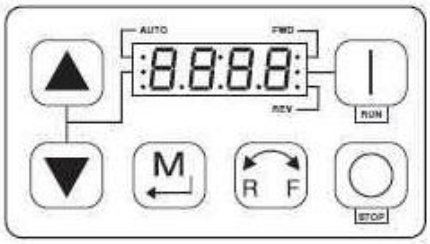
Pulsafeeder Technical Bulletin

Topic – VFD Vector Programming and Connections

Pulsafeeders VFD Vector provides control capability with a 3 phase motor. This control can be either local at the VFD or externally from a control source. This bulletin covers the programming and all of the electrical hook-ups.

FROM THE VFD IOM:

4.1 Local Keypad & Display

SMV Models: 0.33-10HP (0.25-7.5kW)

4-Character Display

Display	START BUTTON
	In Local Mode (P100 = 0, 4, 6), this button will start the drive.
	STOP BUTTON
	Stops the drive, regardless of which mode the drive is in. ⚠ **WARNING!** When JOG is active, the STOP button will not stop the drive!
	ROTATION
	DO NOT CHANGE ROTATION. THIS CAN DAMAGE THE PUMP.
	MODE
	Used to enter/exit the Parameter Menu when programming the drive and to enter a changed parameter value.
	UP AND DOWN BUTTONS
	Used for programming and can also be used as a reference for speed, PID setpoint, or torque setpoint. When the ▲ and ▼ buttons are the active reference, the middle LED on the left side of the display will be on.

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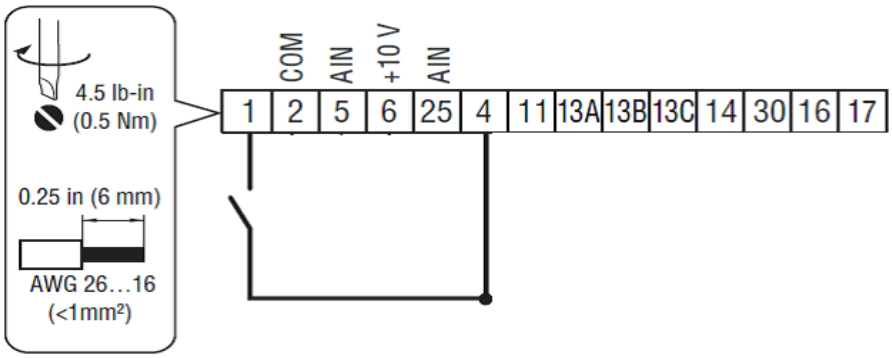
External Start/Stop Setup

To start and stop the pump externally, you must connect a dry contact as shown below and follow these steps:

3.2.3 Control Terminals

Control Terminal Strip for 0.33 - 10 HP (0.25 - 7.5 kW):



- Press *red* **STOP [O]** key (reads - ***StoP***)
- Press **M** key
- Press **UP ARROW** key to parameter ***P 100***
- Press **M** key (reads - ***00***)
- Press **UP ARROW** to ***01*** (this enables ext. start/stop)
- Press **M** key (reads - ***StoP***)
- Press *green* **RUN [I]** key and ***ERR*** will appear on the display.
- Connect terminals 1 and 4 and the pump will start.

NOTE: To return to Manual (keypad) mode, change ***P100*** from ***01*** to ***00***.

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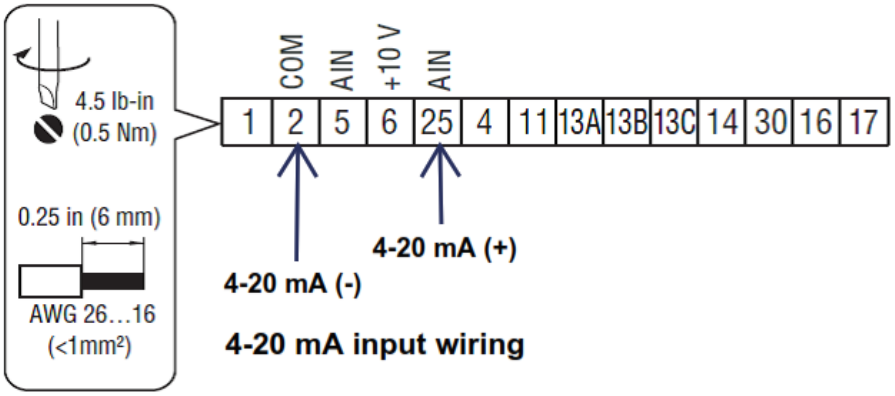
Analog Input Setup (4-20mA)

To use an Analog input for remote speed control connect as shown below and follow these steps:

3.2.3 Control Terminals

Control Terminal Strip for 0.33 - 10 HP (0.25 - 7.5 kW):



4-20 mA input wiring

- Press *red* **STOP [O]** key (reads - ***StoP***)
- Press **M** key
- Press **UP ARROW** key to parameter ***P 101***
- Press **M** key (reads - ***00***)
- Press **UP ARROW** to ***02*** (this enables 4-20mA input)
- Press **M** key (reads - ***StoP***)
- Press **M** key again
- Press **ARROW UP** key to parameter ***P 160*** (this is the speed at which the pump will run when the minimum signal is received, e.g., 4 mA). Instead of setting to 0% and 100% run speed, this VFD is set as frequency: 0% run speed = 00.0, 100% run speed = 60.0
- Press the **M** key
- Press **UP ARROW** or **DOWN ARROW** key to ***00.0*** to have the pump run at 0% speed with the lowest input signal of 4 mA.
- Press **M** key (reads ***StoP***)
- Press **M** key again.
- Press arrow up key to parameter ***P 161*** (this is the speed at which the pump will run when the maximum signal is received, e.g., 20 mA).
- Press the **M** key

- Press **UP ARROW** or **DOWN ARROW** key to ***60.0*** to have the pump run at 100% at the highest input signal of 20 mA.
- Press **M** key (reads ***StoP***)
- Press *green* **RUN [I]** key and the pump will start and run at a speed proportional to your 4 -20 mA input signal.

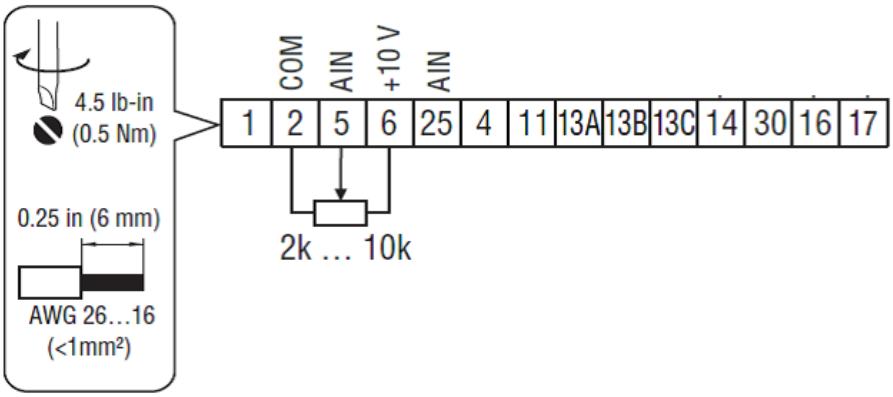
NOTE: The 4-20 mA input is fully scalable.

Analog Input Setup (Potentiometer)

To use a potentiometer input for remote speed control connect as shown below and follow these steps:

3.2.3 Control Terminals

Control Terminal Strip for 0.33 - 10 HP (0.25 - 7.5 kW):



- Press *red* **STOP [O]** key (reads - ***StoP***)
- Press **M** key
- Press **UP ARROW** key to parameter ***P 101***
- Press **M** key (reads – ***00***)
- Press **UP ARROW** to 0***1***
- Press **M** key (reads ***StoP***)

Press *green* **RUN [I]** key and the pump's speed will now be controlled by the potentiometer.

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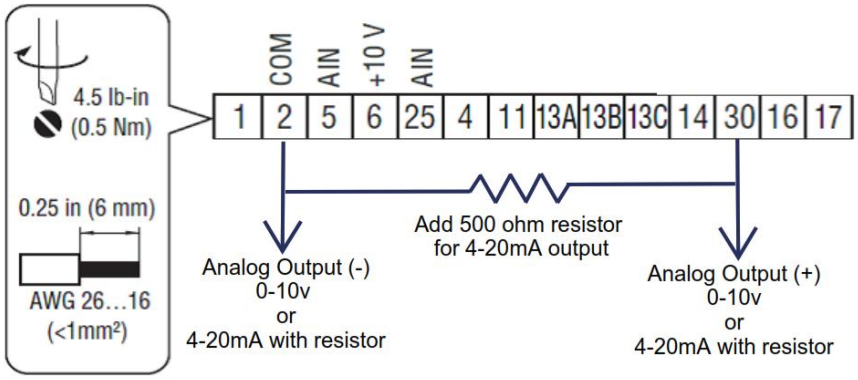
Analog Output Setup (4-20mA)

To configure the VFD for 4-20mA output, connect as shown below *and follow these steps*:

3.2.3 Control Terminals

Control Terminal Strip for 0.33 - 10 HP (0.25 - 7.5 kW):



- Press *red* **STOP [O]** key (reads - ***Stpp***)
- Press **M** key
- Press **UP ARROW** key to parameter ***P 150***
- Press **M** key (reads - ***00***)
- Press **UP ARROW** to ***02*** - this enables 4-20mA (2-10 VDC) output
- Press **M** key (reads - ***StoP***)

NOTE: The 4-20 mA output is obtained by converting the 2-10 VDC signal to a current signal when the total circuit impedance is 500 ohms (an additional resistor may be required to attain 500 ohms).

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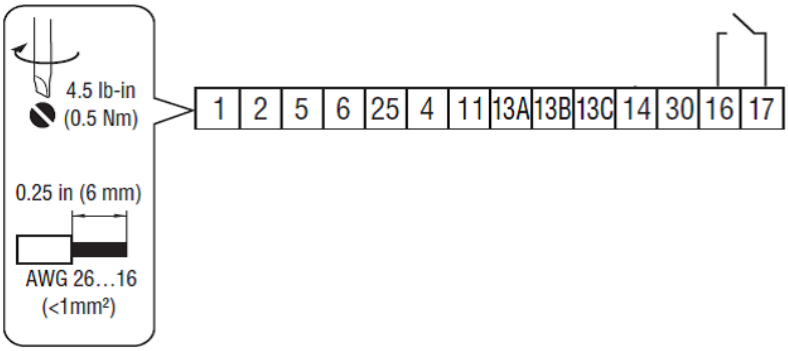
Output Relay Setup

To configure the Output relay, connect as shown below follow these steps:

3.2.3 Control Terminals

Control Terminal Strip for 0.33 - 10 HP (0.25 - 7.5 kW):



- Press *red* **STOP [O]** key (reads - ***StoP***)
- Press **M** key
- Press **UP ARROW** key to parameter ***P 140***
- Press **M** key (reads – ***00***)
- Press **UP ARROW** to ***1*** (this energizes the relay when the pump is running)
- Press **M** key (reads ***StoP***)
- Press *green* **RUN [I]** key and the pump will return to normal operation.

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Possible Settings

Code		Possible Settings		IMPORTANT
No.	Name	Default	Selection	
P140	Relay Output TB-16, 17	0	0 None	Disables the output
			1 Run	Energizes when the drive is running
			2 Reverse	Energizes when reverse rotation is active
			3 Fault	De-energizes when the drive trips, or power is removed
			4 Inverse Fault	Energizes when the drive trips
			5 Fault Lockout	P110 = 3...6: De-energizes if all restart attempts fail
			6 At Speed	Energizes when output frequency = commanded frequency
			7 Above Preset Speed #6	Energizes when output frequency > P136
			8 Current Limit	Energizes when motor current = P171
			9 Follower Loss (4-20 mA)	Energizes when 4-20 mA signal is < P164
			10 Loss of Load	Energizes when motor load drops below P145; Refer to P146 also
			11 Local Keypad Control Active	Energizes when the selected source is active for start control
			12 Terminal Strip Control Active	
			13 Remote Keypad Control Active	
			14 Network Control Active	
			15 Standard Reference Active	Energizes when P101 reference is active
			16 Auto Reference Active	Energizes when Auto Reference is activated using TB-13 input; refer to P121...P124
			17 Sleep Mode Active	Refer to P240...P242
			18 PID Feedback < Min. Alarm	Energizes when PID feedback signal < P214
			19 Inverse PID Feedback < Min. Alarm	De-energizes when PID feedback signal < P214
			20 PID Feedback > Max Alarm	Energizes when PID feedback signal > P215
			21 Inverse PID Feedback > Max Alarm	De-energizes when PID feedback signal > P215
			22 PID Feedback within Min/Max Alarm range	Energizes when PID feedback signal is within the Min/Max Alarm range; refer to P214, P215
			23 PID Feedback outside Min/Max Alarm range	Energizes when PID feedback signal is outside the Min/Max Alarm range; refer to P214, P215
			24 Reserved	
			25 Network Controlled	SMV models < 15HP (11kW) require an optional communication module (refer to the network module documentation).
			26 Loss of 0-10V Input	Energizes when 0-10V signal is < P158
			27 Sequencer Controlled	State set in individual sequencer segments
			28 Sequencer Active	
			29 Sequencer Suspended	
			30 Sequence Done	End Sequence
			31 Output Frequency = 0.0Hz	Output inactive
P142	TB-14 Output	0	0...23 (same as P140)	
			24 Dynamic Braking	For use with Dynamic Braking option
			25...31 (same as P140)	