

POWERTEC

INDUSTRIAL MOTORS, INC.

2606 Eden Terrace
Rock Hill, SC 29730
Phone 803-328-1888
Fax 803-328-1870
www.powertecmotors.com

MEMO

Date : 10/9/02
To : Users Replacing Millennium Drives
From : Ed Lee
Subject : Flexmax/Millennium Conversions

Information in the Flexmax manual referenced in this document for wiring can be found on our website at:

www.powertecmotors.com/fmaxmanual.html Once there, select chapter 4 and the pages referred to here can be found.

1. AC Power: The Flexmax drive requires high-speed SCR type fuses for the AC input. They are not mounted on the drive. These fuses are described in the manual on page 49 where both European and US manufacturers types are shown. For instance for a PX-125 being used at 75 hp, 460 vac input, the fuse type would be FWP175 or A70P175. Of course you will need appropriate fuse blocks on which to mount them. AC power input is marked on the drive as L1, L2, L3 as well as being marked in the European designation of U1, W1, V1. An appropriately sized thermal and magnetic trip breaker can be used in lieu of the fuses.

2. Input Inductance: Either an appropriately sized input transformer (approximately 1 kva per HP) or line chokes should be used in the AC input lines going to the drive. This is to provide for both line harmonic current reduction and for DI/DT protection of the input power diodes and assure normal life for the bus capacitors. We consider the chokes (or transformer) mandatory for drives larger than PX-30. Chokes can

be purchased through Powertec or directly from the several US manufacturers of AC drive line chokes. Sizing is straightforward and done by HP rating and voltage. 2 to 3% impedance is appropriate.

3. Motor Output Wiring: Terminals are marked T1, T2, T3, in addition to the European markings U2, V2, W2.

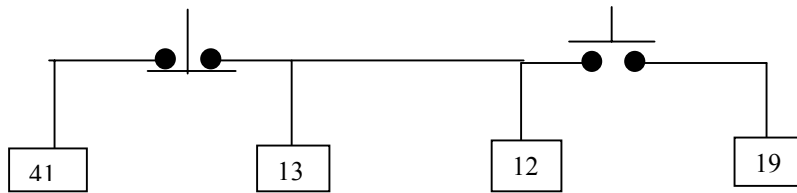
4. Bus Braking Unit for 4 quadrant applications: The drive has a built-in braking unit (less resistor) in all units standard up through the PX-100. For units larger than PX-100, the braking unit is available from Powertec as an option in various current ratings, depending on the braking power needed in the application. They are not sized to the drive, but sized to the braking effort required. In ALL cases, resistors have to be added in order for braking action to occur. Ohmic value of braking resistors and wattage can be found in the manual on page 55, or call Powertec and get the information. We can help. The resistor is connected to terminals BR1 and C on drives up through PX-100. On larger drives, the braking unit is wired according to the instructions in the braking unit package.

5. Resolver Feedback: The motor resolver for Flexmax is the same resolver used for Millennium with no modifications. Flexmax uses a 15 pin D-sub connector at the drive end to connect the resolver. We furnish the drive with the connector, but the wiring must be wired to the connector. Powertec can also provide (at optional cost) the connector with as much wire as necessary to make the field connection to the motor conduit box. In retrofit situations where the existing resolver wire is in place, it is best to bring the resolver wires to a terminal strip near the drive and wire from the D-sub connector on the drive to the terminal strip with Belden 9504 4 pair twisted pair cable. This is much smaller wire and easier to work with than the larger conductor wire typically used to the motor. Powertec can provide the D-sub wired to a few feet of this cable for this interface if desired. The connections from the Powertec Motor terminal strip in the conduit box

to the pins on the D-sub connector are shown in table 4.3.5.2.1 on page 42 (chapter 4) of the manual. This table also shows the motor PTC connections. The NTC can be wired in the same cable as the resolver and brought outside the shell of the connector several inches (not connected to pins on the connector) and connected to terminals 78 and 27 of the drive, with a 1N914 diode connected across 78 and 79 (marked end to 79). This wiring for an NTC is different than for a PTC which would be wired directly to 78 and 79. The drive is shipped from the factory with a 1000 ohm resistor between 78 and 79, which looks like a PTC in normal range to the drive. If the resistor is not there, the drive will alarm on "motor-overtemp". If you connect an NTC (Millennium standard device) directly to 78 and 79, you will also get a "motor-overtemp". Therefore to use the NTC, make the connection as indicated above for the NTC connected to 27 and 78 with the diode between 78 and 79. This is covered in the printed manual on page 27, but is not shown in the manual version on the website. The D-sub connector for resolver feedback is connected to the right hand connector on the small board on top of the regulator board on the drive. This is designated XFR on the board.

6. Connections to the digital I/O is shown on page 37 with the standard default functions shown for enable, run, inverse(reverse), and Jog. These can be reassigned using the keypad or WinPX. Like Millennium, the I/O is 24 vdc and can be used with the internal 24 vdc, or sourced from a remote device providing it's own 24 vdc and isolated from the drive completely. The standard default set up is to run from contacts for run and enable. In most applications run and enable can be tied together and be activated at the same time. There are some applications where it may be desirable, however to have enable be a separately controlled input. Assuming the drive is being operated using the drive 24 vdc, then a jumper is placed from 16 to 18 and the inputs are made from 19 (24 vdc) to 12, 13, 14, or 15 as shown.

If you are trying to run the drive from momentary start-stop pushbuttons, wire as shown below:



Note: Digital output 0 comes out on 41 and Digital output zero must be assigned the function "enable" using the keypad or WinPX. This acts as the seal-in function for run. When the start button is pushed the enable is made high. When enable is high, the digital output on 41 becomes high and makes run and enable high. When the start button is released, enable stays high (and run remains high) until stop is pushed again.

7. Analog input 0 is defaulted to speed. Wire the pot as shown in the diagram on page 37. CCW side of pot to 9. CW side of pot to 7 (or 8 for reverse operation), wiper to 1. Jumper between 2 and 9.

8. Analog outputs for speed and load are available from 22 to 21 (Speed) and 22 to 23 (Current). See page 37. These can be scaled and offset and reversed as desired using the keypad or WinPX.

Contact Powertec for specific instructions on other operating modes.