

FXM5 Startup with Mentor II & Quantum III

This guide is pertinent to Mentor II and Quantum III Drives using our external FXM5 Field Regulator when controlled via ribbon cable. If the FXM5 is being used in a stand-alone mode (w/o use of the ribbon cable), this guide does not apply.



Advantages

Field Economy – allows your motor to be set for a lower field current when not running thereby saving considerable otherwise wasted energy, prevents insulation degradation, keeps your motor warm in standby and can eliminate internal condensation/rust.

Field Weakening – allows the motor to operate in its' extended speed range (if motor is designed for such operation).

DO NOT ASSUME POWER IS OFF BECAUSE THE DRIVE DISPLAY APPEARS DEAD OR NO FANS ARE HEARD.

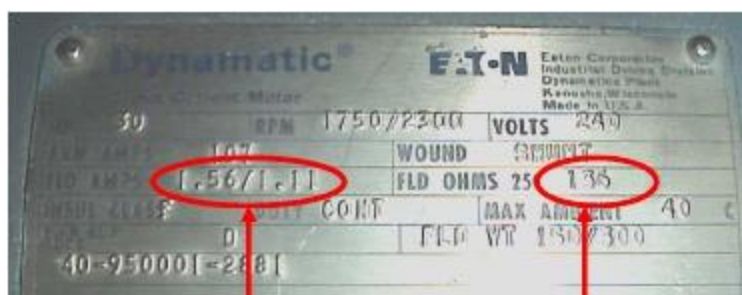


THE VOLTAGE APPLIED TO THIS DRIVE CAN BE LETHAL IF TOUCHED !



Setup

1. We need to know what the field current is from the motor's nameplate. Some nameplates will have multiple currents like shown below; this is used to attain the higher speed rating and operate in the constant Horsepower range.



Motor Field Current

Motor Field Resistance

2. In the example above the Full Field current rating is 1.56. In order to attain 1.56A we would select 2A from the chart below. By reducing the value in parameter # 6.08 to the value determined by the reduction factor formula below we can achieve our 1.56A desired.

Reduction Factor Formula:

Your Field Amps / Column A Value = _____ x 1000 = _____ = **Par # 6.08**
 (Value should not be above 1)

Parameters # 6.09 and # 6.10 is typically set to half of the value of Parameter #6.08

To enable Field Economy, parameter # 6.15 must be set to a 1 and parameter # 6.12 will set the Economy timeout (default is 30 = 30 seconds).

Our example:

1.56 / 2 = 0.780 X 1000 = 780

Par # 6.07 =1000

Par # 6.08 = 780

Par # 6.09 = 390

Par # 6.10 = 390

Par # 6.12 = 30

Par # 6.11 = 2 (D)

Par # 6.15 = 1

Number of turns through the current transformer will be: **10 turns (B)**

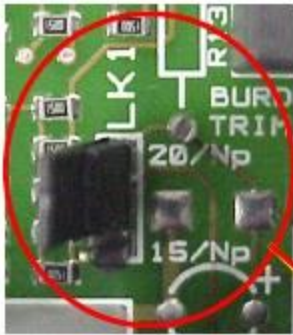
LK1 setting will be: **20/Np (C)**

Maximum field Current	Number of Primary Turns	LK1 Setting	Setting of Parameter # 6.11
A	B	C	D
1	10	15/Np	1
2	10	20/Np	2
3	5	15/Np	3
4	5	20/Np	4
5	4	20/Np	5
6	3	20/Np	6
7	2	20/Np	7
8	2	20/Np	8
9	2	20/Np	9
10	2	20/Np	10
11	1	15/Np	11
12	1	15/Np	12
13	1	15/Np	13
14	1	15/Np	14
15	1	15/Np	15
16	1	20/Np	16
17	1	20/Np	17
18	1	20/Np	18
19	1	20/Np	19
20	1	20/Np	20

3. We need to set LK1 (Column C) and the CT (Current Transformer) turns (Column B) to also per the chart. Remove the FXM5 cover to gain access to these items.

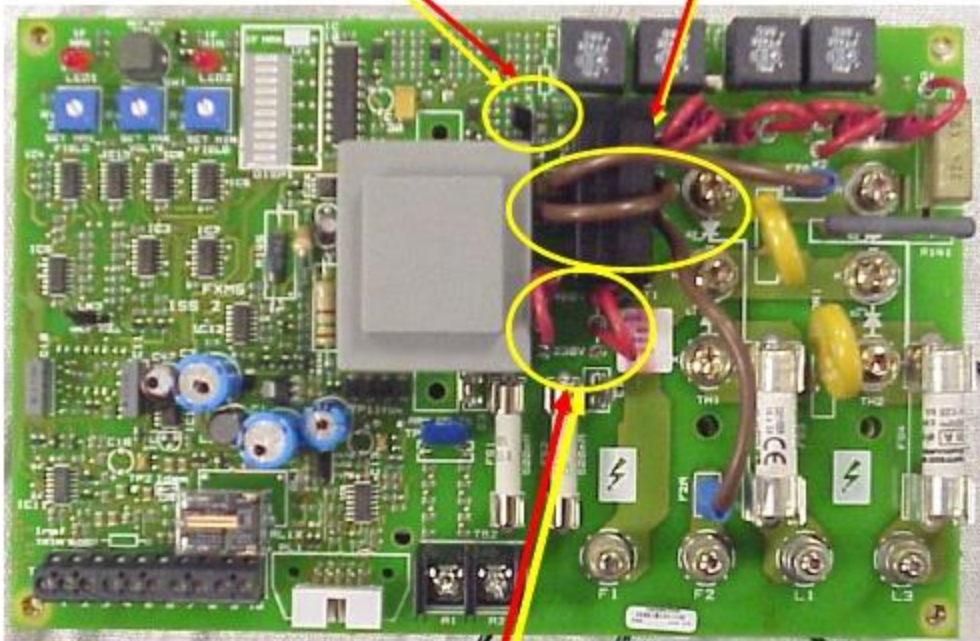


LK1
15/Np or 20/Np



Number of CT turns

The arrows show the direction of the wire flow.



Pictured to the left is a board that is wired for 2 turns

Control Power Transformer Selection

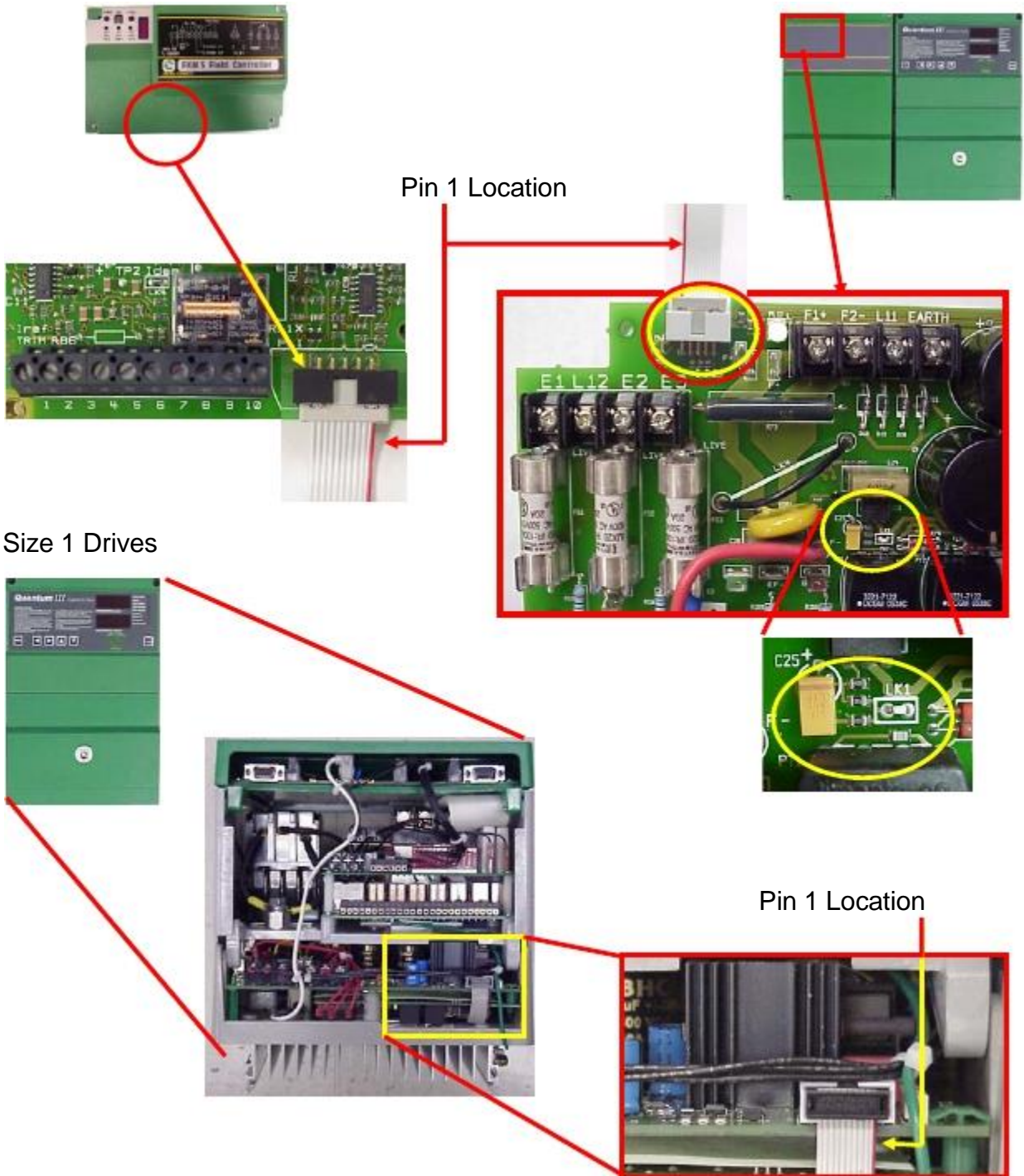


You must set the control transformer up for the Line voltage that is being supplied.

- Now we can set up the Drive for the Field Regulator. To do so we must remove the LK1 link that is shown below on the Drive's Power board. Size 1 drives will have the LK1 link removed standard from the factory. The 10-pin ribbon cable can now be installed to the drive as well. Pay close attention to the pin orientation on both the Power Board and the FXM5.

FXM5

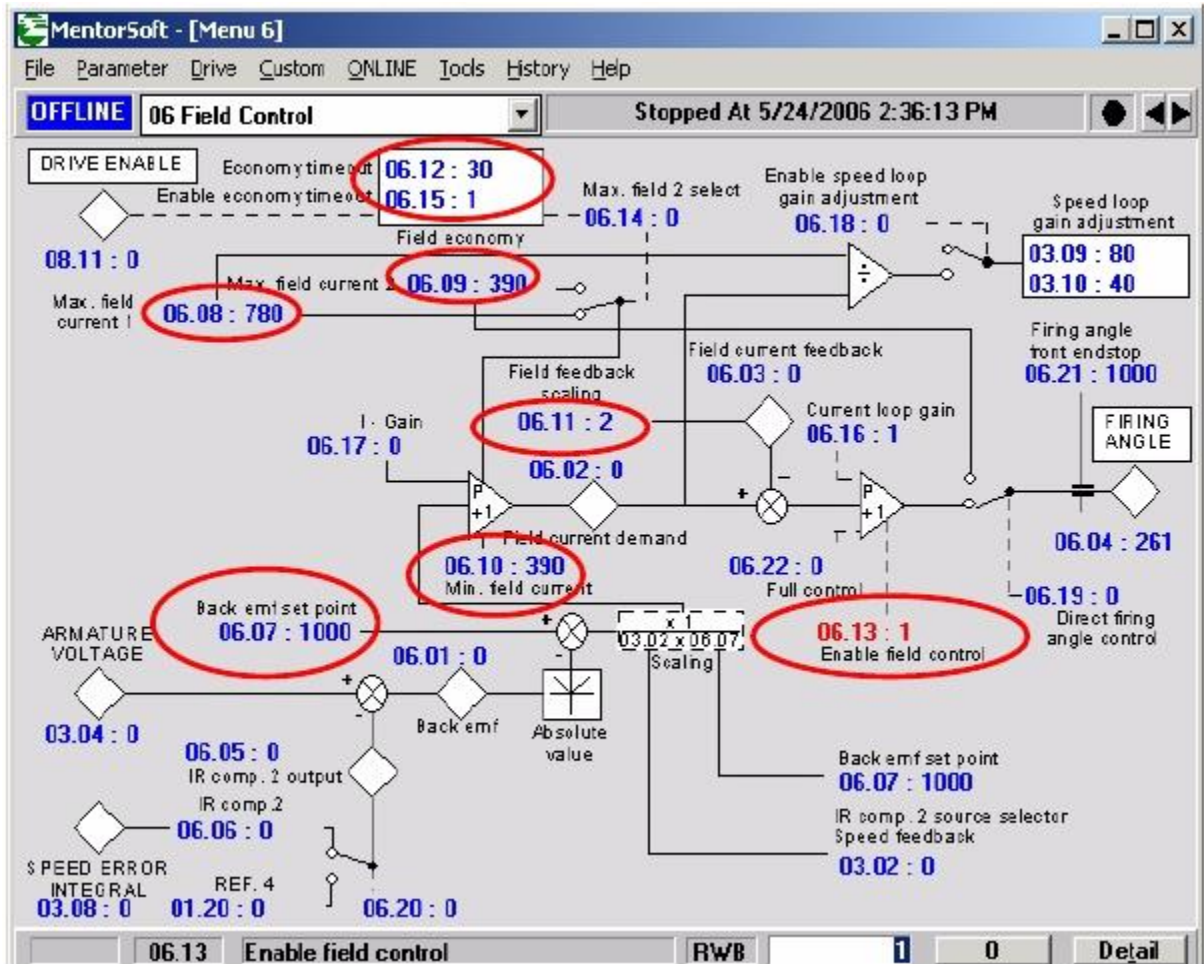
Size 2 & 3 Drives



5. Proper phasing of the main lines of the drive to the FXM5 is also important. L1 and L3 of the drive's incoming power supply should go to L1 and L3 of the FXM5 accordingly. * Failure to do this can cause the 10 segment display to go full on, little to no current output, and have no capability to make changes to the current output. For a visual diagram on how this unit is to be wired up, turn to page 6 & 7 of this Technical note.

6. Now we can set up the Field parameters in menu 6 of the Drive. You can do this up from the front of the drive or you can use **MentorSoft** to program your drive. The free download is provided at the link below.

http://www.emersonct.com/download_usa/software/Msoft224.exe



- Parameter #6.13 is the enable bit for (bit that turns on) the external FXM5 Field Regulator. One should not blindly just turn that bit on without ensuring that at least parameters #6.08, 6.09, 6.10, 6.11 and 6.07 are set correctly for the motor being excited. If you are not sure how to program the drive consult the latest FXM5 user guide. It can be downloaded from the following link:

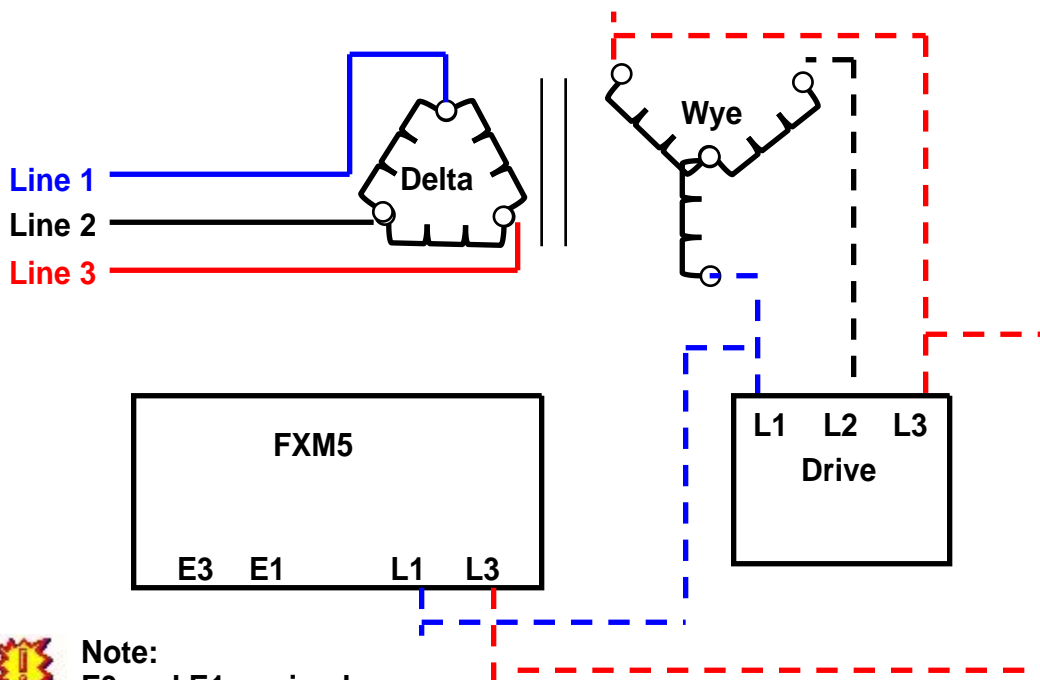
http://www.emersonct.com/download_usa/manuals/FXM5.pdf

For Information on how to set up for Field Weakening / Extended Speed range click:

http://www.emersonct.com/download_usa/techNotesMisc/CTTN128.pdf

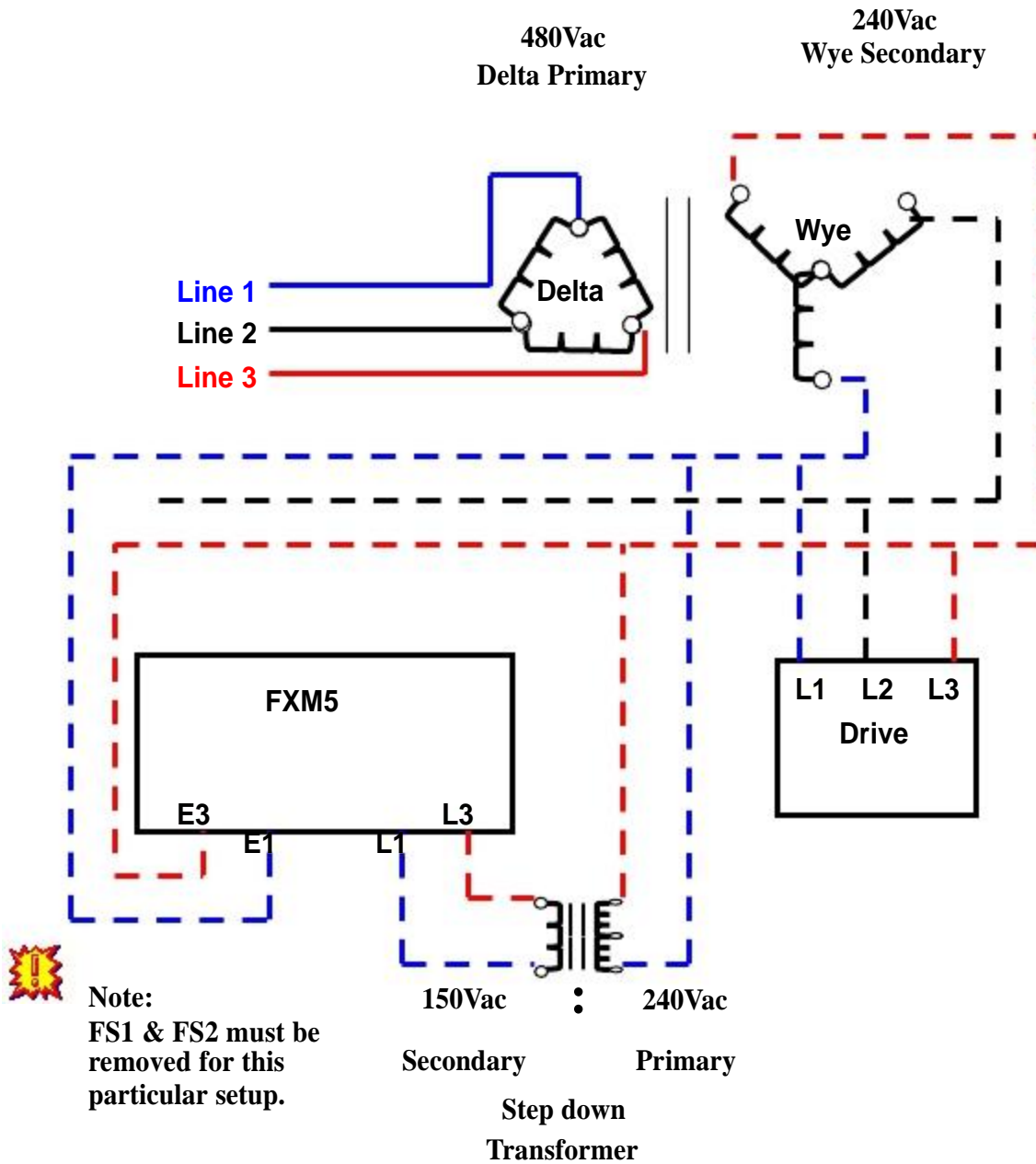
Pictured below is a standard wiring that is seen in a lot of systems that we deal with on a daily basis.

!!! In a Delta / Wye configuration off of the Wye side the unit will be 30° out of phase. !!!



Note:
E3 and E1 are in phase
with L1 and L3 internally
connected by FS1 & FS2.

Illustrated below is a 480Vac supply that is isolated by a 480 to 240Vac Delta/Wye step down isolation transformer. The motor that we have calls out for 240Vac supply and 150V field. This calls for a second step down transformer for the field supply.



Questions: Ask the author ??

Josh Kibler Email: akif@onxcontrol.com

Tel: 716-774-0093