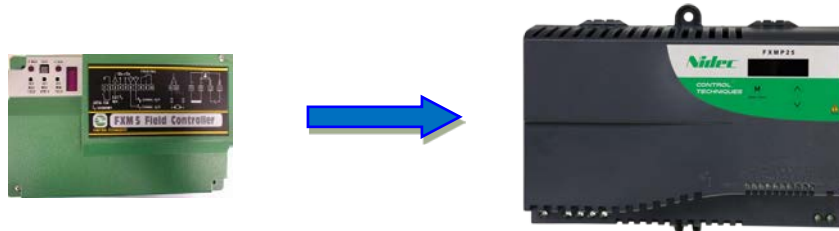**This Application Note applies to the FXMP25**

# FXM5 to FXMP25 Conversion Using Cable Control

Background:

In this document we will discuss the necessary steps to replace an existing FXM5 with a new FXMP25. The new FXMP25 unit has the capability to operate with a Mentor II or Quantum III in Digital / Cable Control, the same way that the FXM5 did using a 10 pin ribbon cable.

Motor Information:

Extract the motor's nameplate information. Some nameplates will have multiple currents like shown below.

- Field Voltage _____Voltage or_____ / _____Voltage
- Field Current _____Adc or_____ / _____ Adc
- Measured Resistance of the field (cold) _____ Ω
- Calculated Field current _____Amps

Two values indicates motor is capable of Field Weakening
Full Field current is the higher value
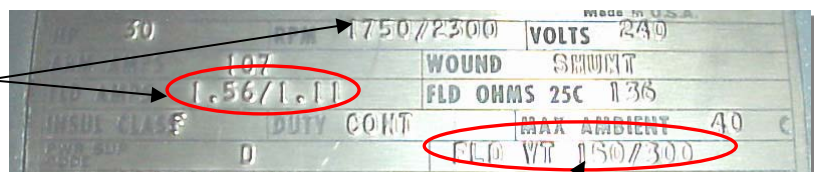
Indicates motor has 4 field wires and can be wired for 150 Vdc or 300 Vdc field supplies- typically wire for 150 V for 240 Vac lines and 300 V for 480 Vac power lines.
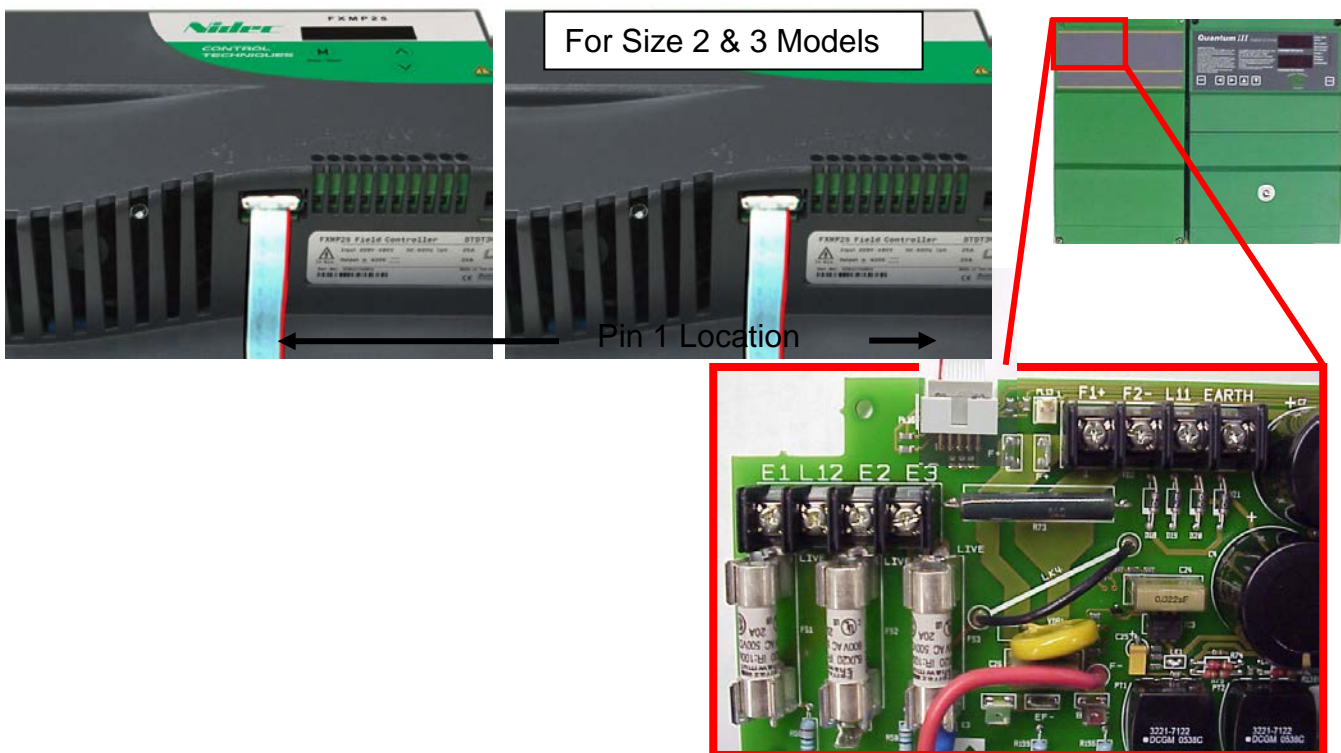
Physical Setup:

1. Mounting of the FXMP25 has not changed, so no new holes will need to be drilled.

2. Connections to the power (E1 / L1 & E3 / L3) are no longer going to be a ring terminal connection. This will now be screw in terminals.

3. **Phasing** is still required to be maintained with the power going into the drive and to the field regulator. E1 to L1 & E3 to L3.

CONTROL TECHNIQUES™

4. On the under side of the field regulator you will see a plastic cover (pictured below in RED) that will need to be removed with a set of snips. This will expose the 10 pin ribbon cable connection point for the Mentor II / Quantum III.

5. The ribbon cable connection maintains the same orientation as the FXM5. Part number is for the **Short cable – 3471-0374** / for the **Long cable – 9500-7035**.

For Size 2 & 3 Models

Pin 1 Location

![Nidec - All for dreams]

FXM5 Jumper Setting:

Only one of the original settings from the FXM5 will be needed to properly set up the new field regulator. The typical setting is Half Control or 2.H for normal applications.
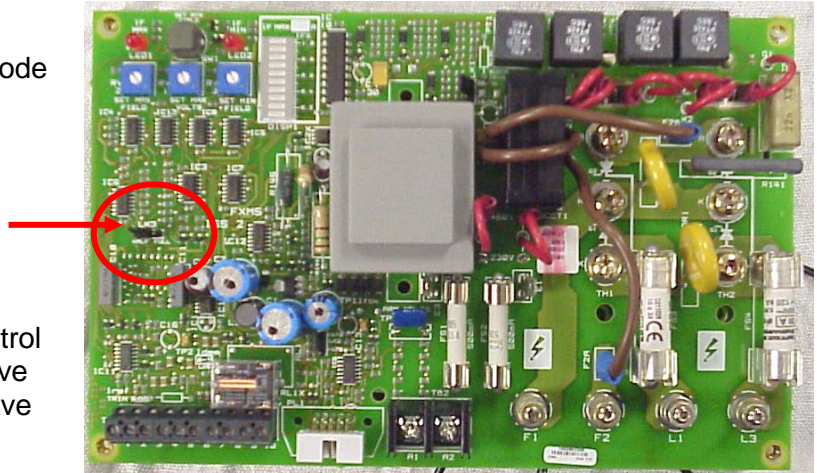
LK3's position, Half or Full, will set the Mode used in the new FXMP25.

Pr 78 in the FXMP25 will be:
> **Full = 2.F**
> **Half = 2.H**

Note: Half / Full refers to Half or Full control – don't confuse this with Half / or Full wave rectification. The FXM5 bridge is Full Wave Single Phase.

Parameter Setup:

When setting the FXMP25 to match the previous field regulators, some parameters will need to be set to achieve the same outcome. They must be followed in exact order:

1. When first powering up the FXMP25 the display will show **ih.00**

2. The **Mode** button must be pressed to display the parameters **01 None**

3. Using the up arrow maneuver to **Pr 78**, Field Mode, Based off the settings that were found under the FXM5 Jumper JP3 setting, set **Pr 78** appropriately.

4. Press the **Mode** button once so **Pr 78** is flashing. (Use the Up & Down arrow select)
   - **2.H** – Mentor II – Half control or
   - **2.F** – Mentor II – Full control

5. Press the **Mode** button once so **Pr 78** stops flashing.

6. Next, **Press** and **Hold** the **Mode** button for at least 2 seconds.

7. Cycle power so the Field Mode change can take place.

8. Change **Pr 11** to match what is in **Pr 6.11** in the Mentor II / Quantum III drive. (i.e. 1, 2,3,…19, 20)

Max Current Desired	Parameter #6.11 setting
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
13	13
14	14
15	15
16	16
17	17
18	18
19	19
20	20

When the ribbon cable is used, Menu 6 of the Mentor II / Quantum III has control over the field regulator.

Using the chart from the previous page, you can select the value that needs to go into **Pr 6.11** of the Mentor II/ Quantum III and **Pr 11** of the FXMP25.

Pr 6.08 will scale the field current more accurately by taking the desired current divided by the value in **Pr 6.11**.

Reduction Factor Formula:

$$\frac{\text{Motor's Field Amps}}{\text{Max Current selected in } \textbf{Pr 6.11}} = \underline{\hspace{1cm}} \times 1000 = \underline{\hspace{1cm}} = \textbf{Pr 6.08 \& Pr11 of FXMP}$$

Example:

$$\frac{5.8A}{6A}$$

$$= 0.966 \times 1000 = 966 = \textbf{Pr 6.08}$$

Pr 6.13 will Enable the field regulator.   **Pr 6.15** will Enable field economy.

Test & Verify: It's always encouraged to check and verify that the field regulator is functioning properly as well as your motor's field is healthy. A few simple checks can save you a lot of money and headaches.

Field Current: The FXMP25 in this configuration is a current regulating device. That being said, a simple clamp-on amp meter can be used to verify that the current that is desired is the current that is being measured.

Field Economy: Field economy can be confirmed after the drive has been disabled (**Pr 8.11** going to zero). Full field current should remain until after the Economy time out (displayed in **Pr 6.12** in seconds). After that time delay the output current will reduce to the secondary field current selection as set by **Pr 6.09**. **Pr 6.09** is defaulted to 500 or 50%. So one would expect ½ of the value set in **Pr 6.11** while in Field Economy. To check full field current while the drive is disabled, simply depress the drive Reset button on the face of the drive RED button. Once again the field current should go to the full value then after the Field Economy delay, reduce to a lower value. Field Economy is activated by **Pr 6.15.**

Field Voltage: Next, the field voltage should be confirmed that it is within proper voltage range. Make note that that the voltage and resistance will change depending on the temperature of the motor. Both variables can change from 20% - 40% from cold to hot. For example, on a 300 Vdc rated motor you could see a voltage of ~260 Vdc when cold and when the motor is warm you could see around ~ 315 Vdc.

FXMP25 Manual:
Visit our website to download all of the latest manuals

Resources: can be found on our website: www.controltechniques.com
For help contact techsupport.cta@mail.nidec.com, or
call Technical Support at 952-995-8000, 24/7/365