This Application Note applies to the FXMP25 Field Regulator

FXMP25 Product information and the Basics: "Stand Alone" Mode

This application note will describe how to change the operating mode of an FXMP25 to the "Stand Alone". This field regulator model can be used to replace the FXM4, which was strictly a "Stand Alone" analog field current regulator used with the older Mentor I, Quantum II and virtually any manufacturers DC Drive. It also replaces the FXM5 (which replaced the FXM4) which was designed as a "Stand Alone" analog field current regulator with the ability to be controlled "digitally" by the Mentor II and Quantum III DC motor controllers through a 10-pin ribbon cable. When the new Mentor MP and Quantum MP were released to replace the Mentor II and the Quantum III, the FXMP25 was designed to replace all previous field regulator designs as well as being controlled by the Mentor MP and Quantum MP via Modbus RTU using the field serial port connector.

Operating the Keypad

The diagram to the right shows the three states of the display, Status, parameter view and edit modes.
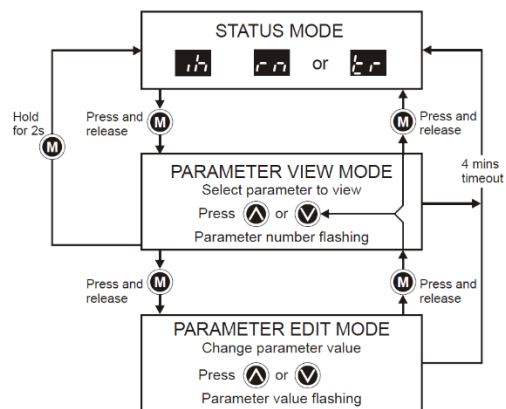
To navigate through the three states simply press the mode button. Inactivity of this button for about 4 minutes will cause the display to revert back to the status display.

When in either the parameter view mode or edit mode, the up / down arrows are used to either select a specific parameter or modify one.
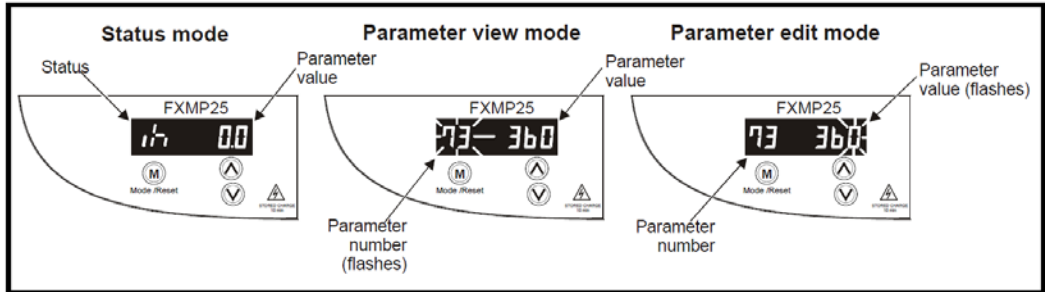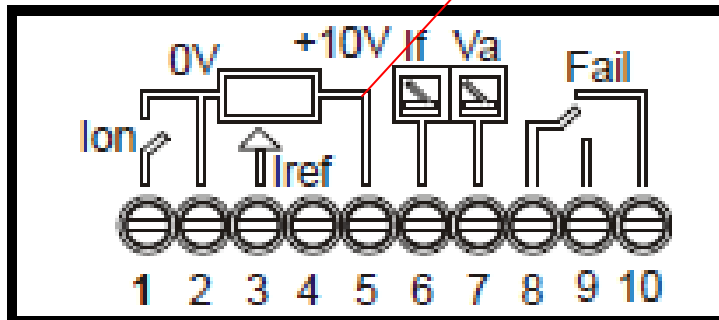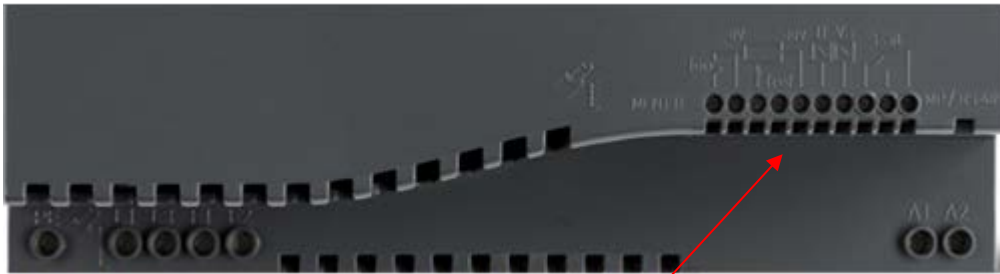

Power Connections

Below are typical connections to the field regulator. If the application does not require Constant Horsepower operation (field weakening), the connections shown to the motor armature are not required.
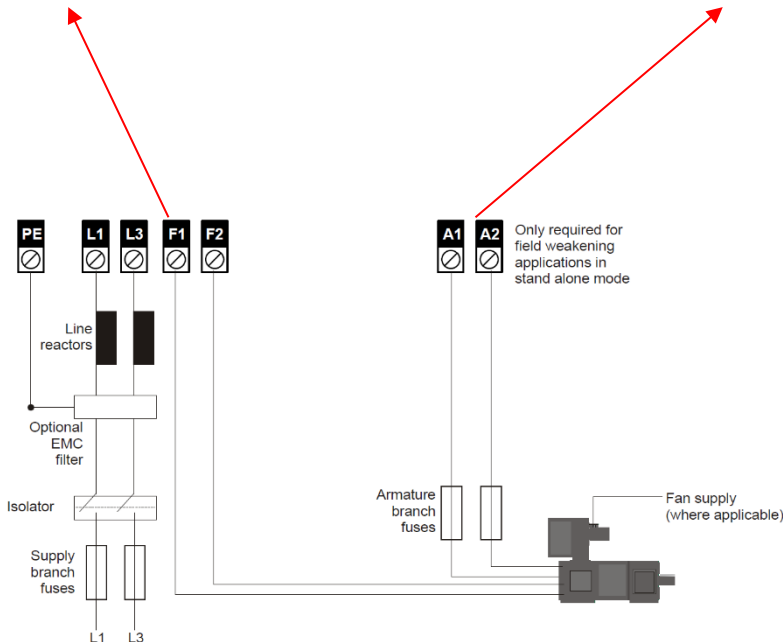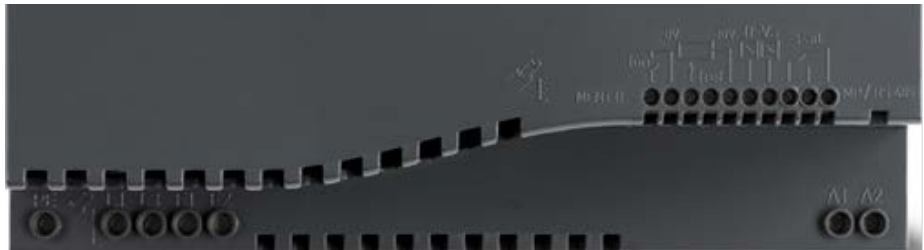
Control Connections

The above diagram shows the basic control connections to the FXMP25.

Terminals #1 and #2 are used for either "field supply ON / OFF" or "Enable full field" from a field economy state. Parameter #81 controls this function: 1 = "field supply ON / OFF", 0 = "Enable full field"

Terminals #3 and #2 are used when either an adjustment potentiometer, which would also use the +10 Vdc supply at terminal 5 (or dancer pot as used in the wire draw industry) or a 0- 10 Vdc signal is to control the field current or field voltage (like an MG set as an example).

Terminals #6 and #7 are isolated analog outputs. Terminal #6 (to #2) is a 0 to 10 Vdc analog output proportional to field current. The output level can be modified by adjusting parameter 07. Terminal #7 (to #2) is a 0 to 10 Vdc analog output proportional to armature voltage, of course, you would need to have the motor armature connected to terminals A1 and A2 as shown above. This is a convenient way of getting an isolated 0 to 10 Vdc signal proportional to armature voltage (i.e. for a simple speed meter) even if you do not need it for field weakening, just be sure to set parameter 59 to the maximum value of 750. The output level can be modified by adjusting parameter 06.

Terminals #8, #9 and #10 are connections to a "Form C" volt-free relay contact that is programmed as a "Field Loss Relay" / fault relay. Terminal #8 to #10 will be closed if the unit is powered up and there are no faults. The field loss level can be set using parameter 25.

Setting the FXMP25 to "Stand Alone" Mode

To set the unit up for a basic field current regulator with field economy is quite simple.

1. Power up the regulator, the display should read ih
2. Press the mode key and use the up arrow to scroll to parameter #78, the display should show "OFF"
3. Press the mode button, the "OFF" should flash. Use the up / down arrow to scroll to St.H, then press
   the mode button
4. Now press and hold in the mode button for 2-3 seconds.
5. Power the unit down, and then up (after the display goes out). Press the mode button and scroll to
   parameter #78, it should still read St.H.
6. Scroll to parameter #75, set to "OFF" for a field current regulator, set to "ON" for a field voltage regulator.
7. Scroll to parameter #73, enter in the motor rated field voltage.
8. Scroll to parameter #70, enter in the rated field current.
9. Power down till the display goes out, then power u p
10. The display should show ih 0.0, press the mode button and scroll to parameter #77 and set to "ON". This turns on the field regulator.
11. Press the mode button in for about 2 seconds, the display should show rn 25.0 This means that the field controller is regulating 25% field voltage or field current (depending on the selection in step 6 above) and is in field economy. To go to full field, close the control connection #1 to #2.

Enhancements

1. If you would like to see Field Current displayed or Field Voltage, simply change parameter #94 to 56 (for field amps) or 60 (for field voltage).
2. If you do not want field economy and would prefer Field "ON" or "OFF" change parameter #81 to "ON,
   F.Ctl". This change is not recommended for motor control applications, more oriented for generator
   excitation supplies.
3. The field loss level is set by parameter #25, the default level is 6.7% (of 150%) which is about 10% field
   current (or voltage). It is recommended that in motor applications, should be set to 13% (which would be just below the 25% field economy level).

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

CONTROL TECHNIQUES™