

Field Regulator

The Field Range Regulator is used in applications where regulated field control is desired or motor field strength must be trimmed for optimum motor performance. Other applications include: (1) controlled field weakening for extending motor speed range above the base speed while maintaining constant horsepower output, and (2) motor field economizing to extend motor field insulation life and reduce power requirements during periods of motor non-use. This kit requires the use of a tachometer.

This option has the following features: adjustable current regulated field output, field weakening controller circuitry for maintaining constant motor voltage for extended motor speed range, armature overvoltage protection, field loss protection with manual reset, and field economizing mode.

Note: The 150VA, 115VAC control transformer (222-9120) is required. The motor nameplate speed rating must be sufficient for extended speed operation to use this option.

Interface Specifications:

Power Supply:	115VAC 50/60Hz
Power Consumption:	6 Watts
Ambient Temperature:	0° C. - 55° C.
Field Supply Input:	2 phase halfwave rectified to third phase with back diode supplied from MELLTRUM controller field output

Armature Voltage Inputs:

Two input, 600VDC or 300VDC maximum, differential, 700 Volt common mode rejection rate

Performance Specifications:

Current Range: .15 Amps minimum, 10 Amps maximum

Operational Adjustments:

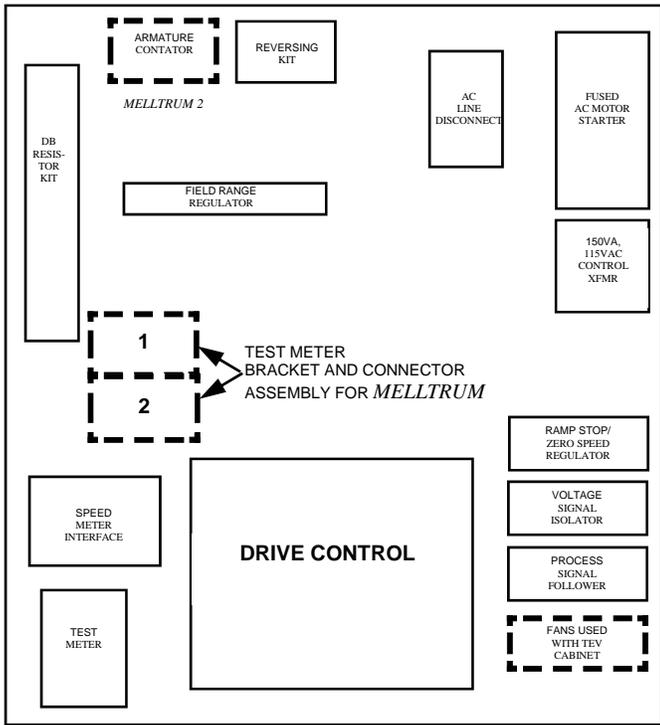
Maximum Current Feedback: Sets 100% level of field current (Maximum level)

Crossover Voltage: Sets crossover point required in constant horsepower operation. Adjustment range $\pm 25\%$ of rated armature voltage

Crossover Range: Allow 4 to 1 field weakening range in constant horsepower application.

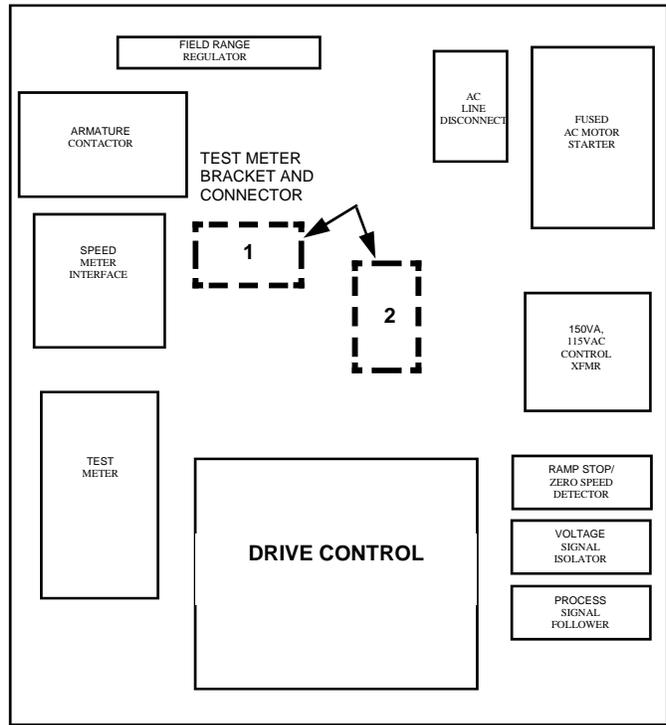
Installation Procedure:

1. The drive control and a 150VA, 115VAC Control Transformer (222-9120) must be mounted near the drive before proceeding.
2. Place a plastic printed wiring board mounting track at the position shown on panel diagram Figures 1A and 1B. Secure to panel with three plastic rivets.
3. Snap printed wire board assembly in track by locating one edge in track slot and pressing opposite end into slot (see FIGURE 3).
4. Install a jumper at Terminals N and O of TB3 on the main control board of the *MELLTRUM* Drive Control.
5. Refer to drawing 222-1650-I, the block diagram (FIGURE 4), and the terminal connection table while performing the following set-up procedure.



MELLTRUM
1 & 2
MODIFICATIONS
KIT LOCATIONS

FIGURE 1A



MELLTRUM
2+,3 & 4
MODIFICATIONS
KIT LOCATIONS

FIGURE 1B

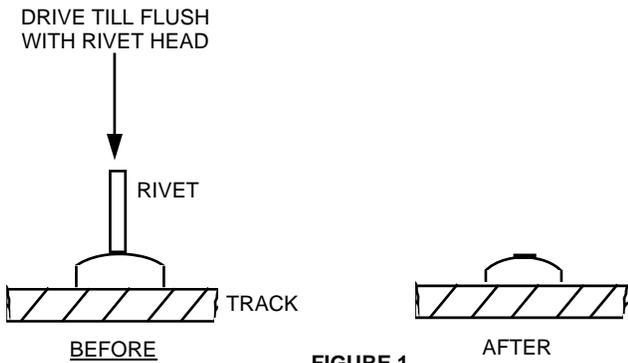


FIGURE 1

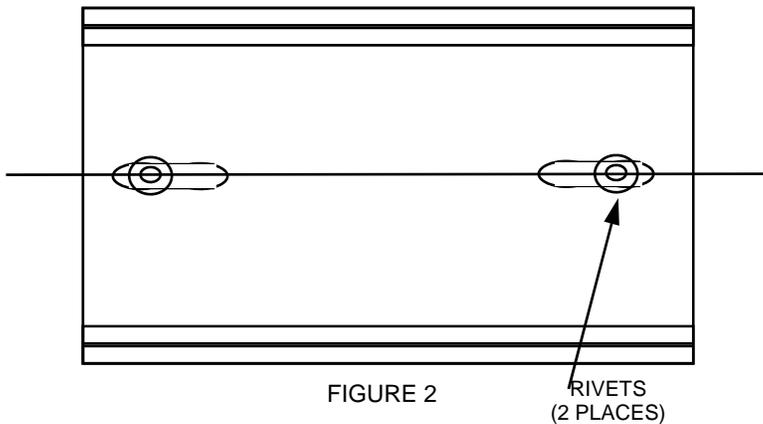


FIGURE 2

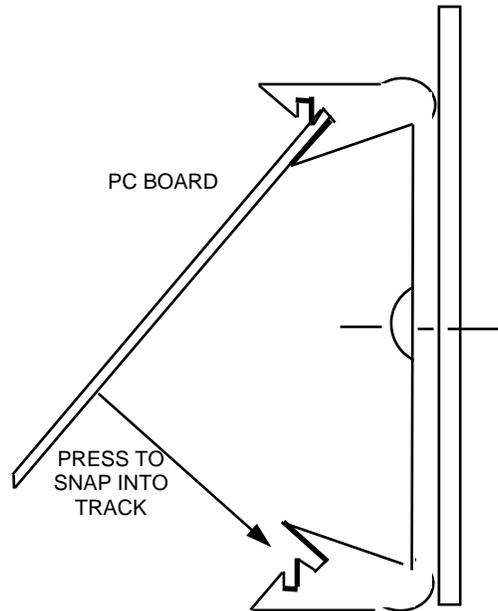
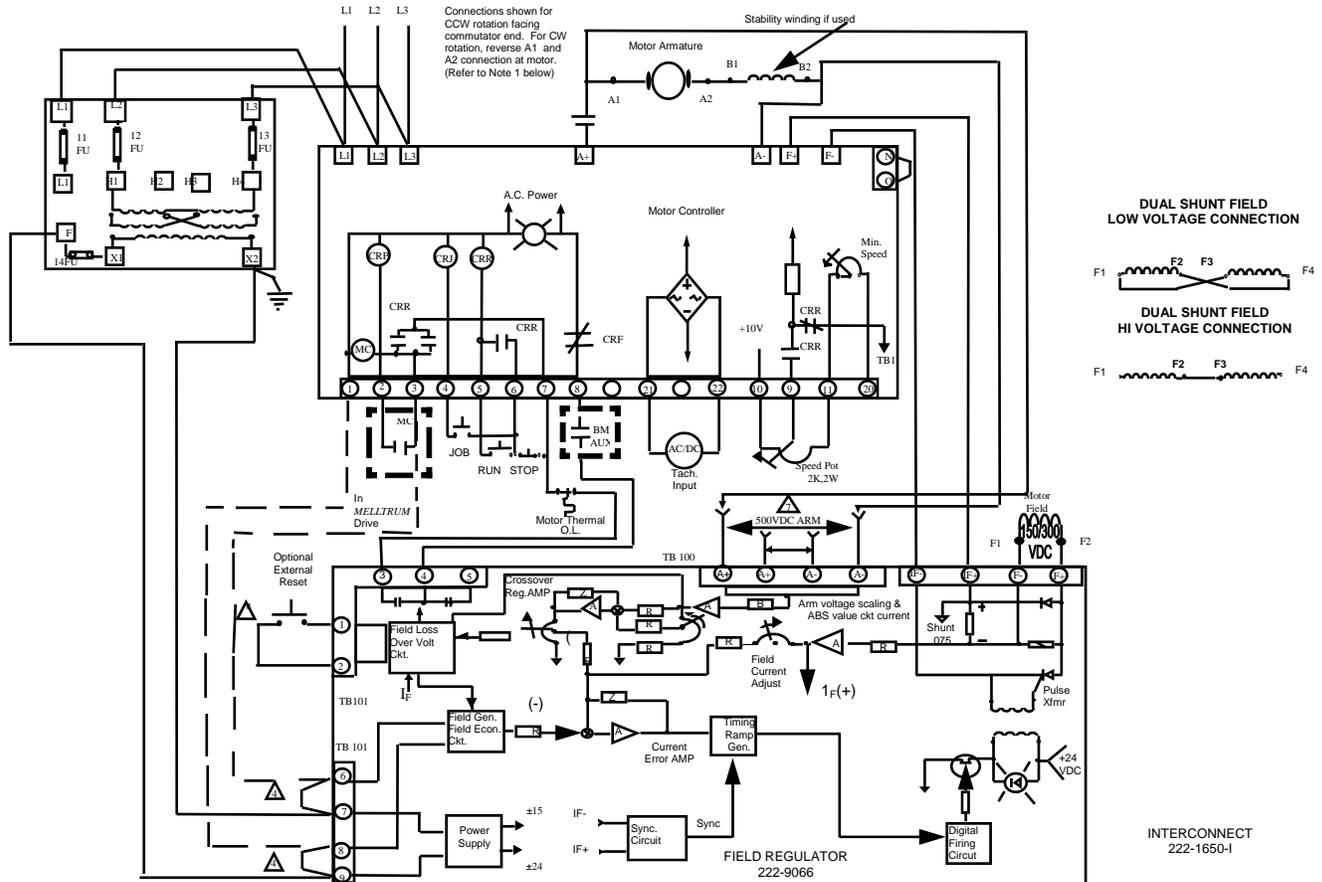


FIGURE 3



NOTE: THE INTENT OF THIS PRINT IS TO HOW A TYPICAL INTERCONNECT SCHEME OF THE MELLTRUM OPTION SHOWN.

REFER TO THE MELLTRUM CUSTOMER INSTRUCTION MANUAL FOR TYPICAL CONTROLLER CONNECTIONS.

- ⚠ -FIELD LOSS CIRCUIT MUST BE DEFEATED WHEN FIELD REGULATOR IS SUPPLIED
- ⚠ -OPTIONAL EXTERNAL RESET FOR FIELD LOSS OVER VOLTAGE TRIP.

NOTE: NEITHER OF THE CONNECTIONS SHOULD EVER BE CONNECTED TO EARTH COMMON.

- ⚠ -ARMATURE VOLTAGE CONNECTIONS REQUIRE IN FIELD WEAKENING APPLICATIONS SELECT PROPER CONNECTION FOR APPLICABLE ARMATURE VOLTAGE REATING (500 VOLT ARMATURE CONNECTIONS SHOWN).

NOTE: ALL FIELD WEAKENING APPLICATIONS REQUIRE TACHOMETER FEEDBACK TO THE CONTROLLER.

- ⚠ -IF FIELD ECONOMY REQUIRED, REMOVE JUMPER STRAPS BETWEEN TERM. #6 & #7 AND TERM. # 8 & #9 OF TB101 AND ADD WIRES SHOWN BY DOTTED LINES
- ⚠ -MELLTRUM 1 - DC LOOP CONTACTOR MELLTRUM 2 - PILOT RELAY
- ⚠ -BLOWER MOTOR STARTERS INTERLOCK IF USED

ALL EXTERNAL WIRING TO FOLLOW LOCAL AND NATIONAL ELECTRICAL CODES ARMATURE CONTACTOR IS MANDATORY.

REFER TO CUSTOMER INSTRUCTION MANUAL.

SET-UP PROCEDURE FOR *MELLTRUM* FIELD REGULATOR

A. Field Current Regulator:

Wire per the diagram shown after thoroughly reading the notes listed below:

1. Set the adjustment pot as follows:

Field Current Adjust - Mid Position,

Crossover Voltage Adjust - Fully Clockwise,

Field Range Adjust - Fully Counter-clockwise.

2. Connect an ammeter in series with the motor field (Simpson 260 or equivalent, with 10A or greater capacity).

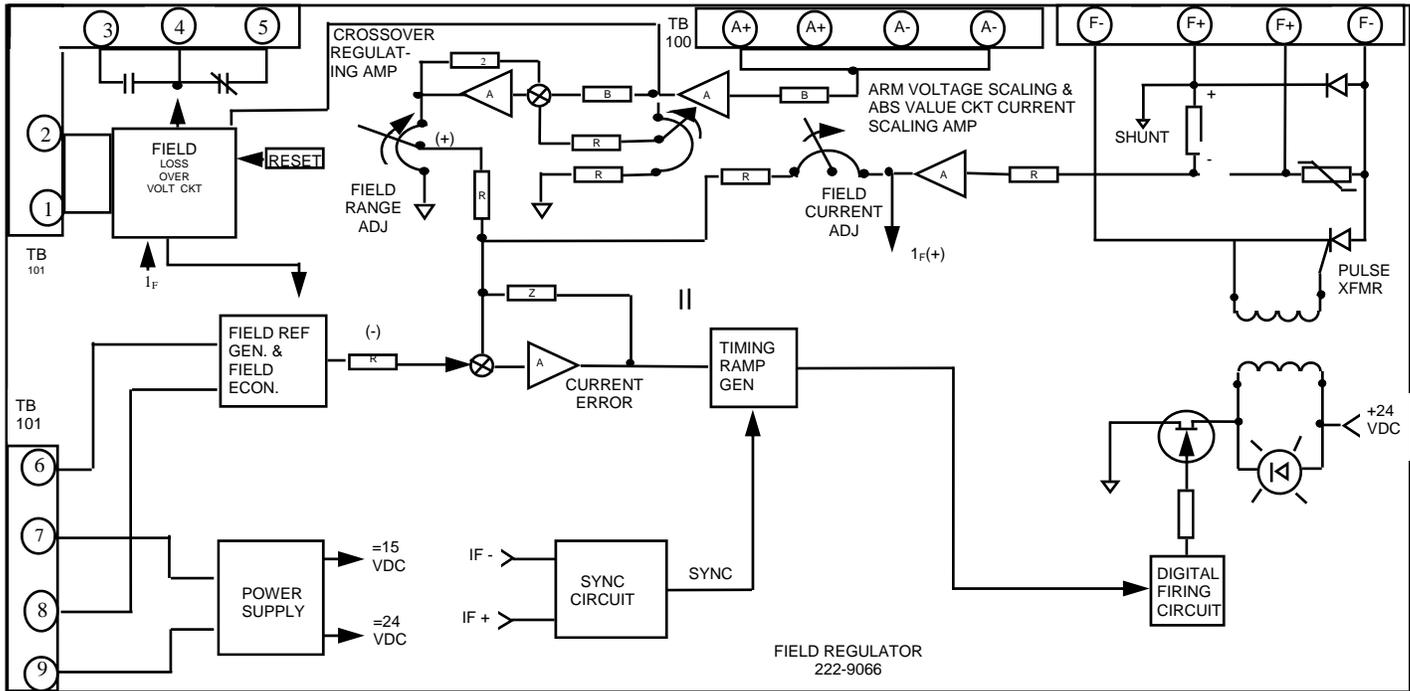
NOTE: DO NOT DISCONNECT FIELD WHILE ENERGIZED!

3. Apply AC power and adjust field current to motor nameplate rating by adjusting the field current adjust potentiometer. If field economy is used, the drive must be into the run mode for this adjustment (speed pot set fully counter-clockwise).
4. Set-up complete.

B. Field Current Regulation with Field Weakening.

NOTE: DRIVE MUST HAVE TACHOMETER FEEDBACK WHEN THE REGULATOR IS OPERATED IN THIS MODE.

1. Repeat step 1 through 4 under Section A above.
2. Set field range adjustment potentiometer fully clockwise.
3. Start drive and adjust maximum speed pot for rated motor speed.
4. While monitoring armature voltage and field current, increase maximum speed pot until armature voltage reaches related voltage plus 5% (250 VDC for 240 Volt armature and 525VDC for 500 Volt armature).
5. Turn crossover voltage adjust pot counter-clockwise until armature voltage decreases to rated armature voltage (240 or 500VDC). Note that field current decrease slightly.
6. Slowly increase maximum speed pot until desired maximum field weakened speed is achieved. Note that field current has reduced.
7. Slowly adjust field range pot counter-clockwise until armature voltage increases by 5%, Then turn clockwise until armature voltage returns to rated motor volts.
8. Set -up complete.

Interconnect DWG Field Regulator Option

FIGURE 4
TERMINAL CONNECTIONS

TB1 Term. IF+ and IF-

TB1 Term. F+ and F-

TB 100 A+ and A- (inner terminals)

TB 101 Term. # 1 & #2

Term. #3, #4 & #5

Term. #6 & #8

Term. #7 & #9

FUNCTION

Field input from controller

Motor field Connection

240VDC armature connection. (Field weakening application only)

External field loss/overvoltage reset, N.O., not isolated.

Form C contacts from fault trip relay

Field economy input*

115VAC Input Power.

*Connections are made to MC relay (#6 to #3 TB1 on *MELLTRUM* drive control #8 to #1 TB1 on *MELLTRUM* drive control). If field economy is not required, jumper #6 to #7 and #8 to #9 of TB101. Jumper straps are supplied as standard equipment. Refer to Interconnect drawing 222-1650-I.

For further information and assistance, contact the Service Department at:

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