

# FLEXPak<sup>PLUS</sup>/ MINPAK<sup>PLUS</sup>

## ACCESSORY

INSTRUCTION MANUAL D-3969

### TACHOMETER FEEDBACK KIT MODEL NUMBER 14C221

The equipment described below should be installed only by qualified electrical maintenance personnel familiar with the construction and operation of the equipment and the hazards involved.

#### DESCRIPTION

The FlexPak Plus/MinPak Plus Controller is supplied as standard as a d-c armature voltage feedback controller. With the addition of the optional Tachometer Feedback Kit, it can operate as a speed-regulated unit, thereby improving regulation to as little as 0.5% with specified tachometers. (Refer to Figure 1). Either an a-c or d-c tachometer may be used. The maximum allowable input voltage is 175 volts.

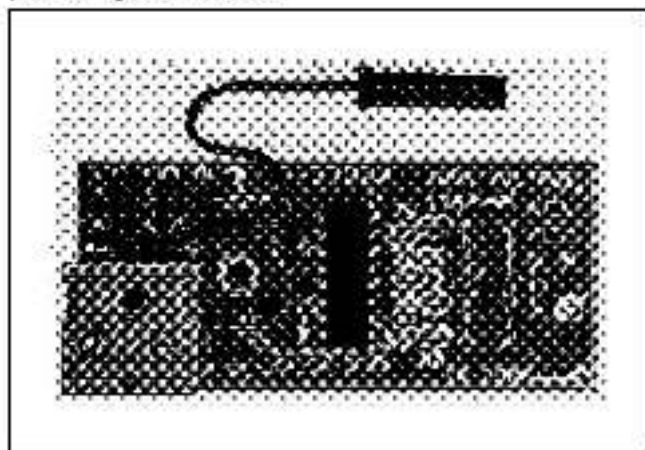


Figure 1 — Tachometer Feedback Kit

A 1% speed regulation with 95% load change can be obtained when using a Reliance Electric a-c tachometer (RE-015) or d-c tachometer (5 PY or RE-020). A 0.5% speed regulation with a 95% load change can be obtained when using a Reliance Electric d-c tachometer (BC-12). Equivalent tachometers are acceptable.

The Kit contains a Module that has a jumper that must be connected by the user to provide proper scaling of the feedback into the regulator. There is also a mounting screw. The user must supply the tachometer and the required lengths of specified signal wire. (Refer to Table 1). No other equipment is necessary although certain adjustments must be made on the Regulator Module.

Table 1 — Tachometer Voltage Scaling

Motor Base Speed (rpm)	Tachometer (volts/1000 rpm)	100% Voltage Connection
1150	20 VDC	23
1750	20 VDC	35
1150	50 VDC	58
3450	20 VDC	69
1750	50 VDC	88
1150	100 VDC	115
3450	50 VDC	175
1750	100 VDC	175
1150	45 VAC	52
1750	45 VAC	79
3450	45 VAC	155

#### INSTALLATION INSTRUCTIONS

##### WARNING

**BEFORE ATTEMPTING TO INSTALL THIS MINPAK PLUS/FLEXPak PLUS MODIFICATION KIT DISCONNECT AND LOCK OUT ALL SOURCES OF INCOMING POWER TO THE CONTROLLER UNIT AND CABINET.**

To install the Kit, follow these procedures. Check the tachometer to determine which wires are T1 (1) and T2 (2).

1. Orient the Tachometer Module over the designated area of the Regulator Module, just over the two pins. (Refer to Figure 2.) Lower it so that the pins pass through the guides in the Module. Use the screw to secure it.
2. Connect the tachometer wires to the terminal strip on the Module. Plus (+) is the left side, minus (–) the right. Do not strip off more than 1/8 inch (3 mm) of insulation since shorts occur at exposed points. Maintain the twist as long as possible.

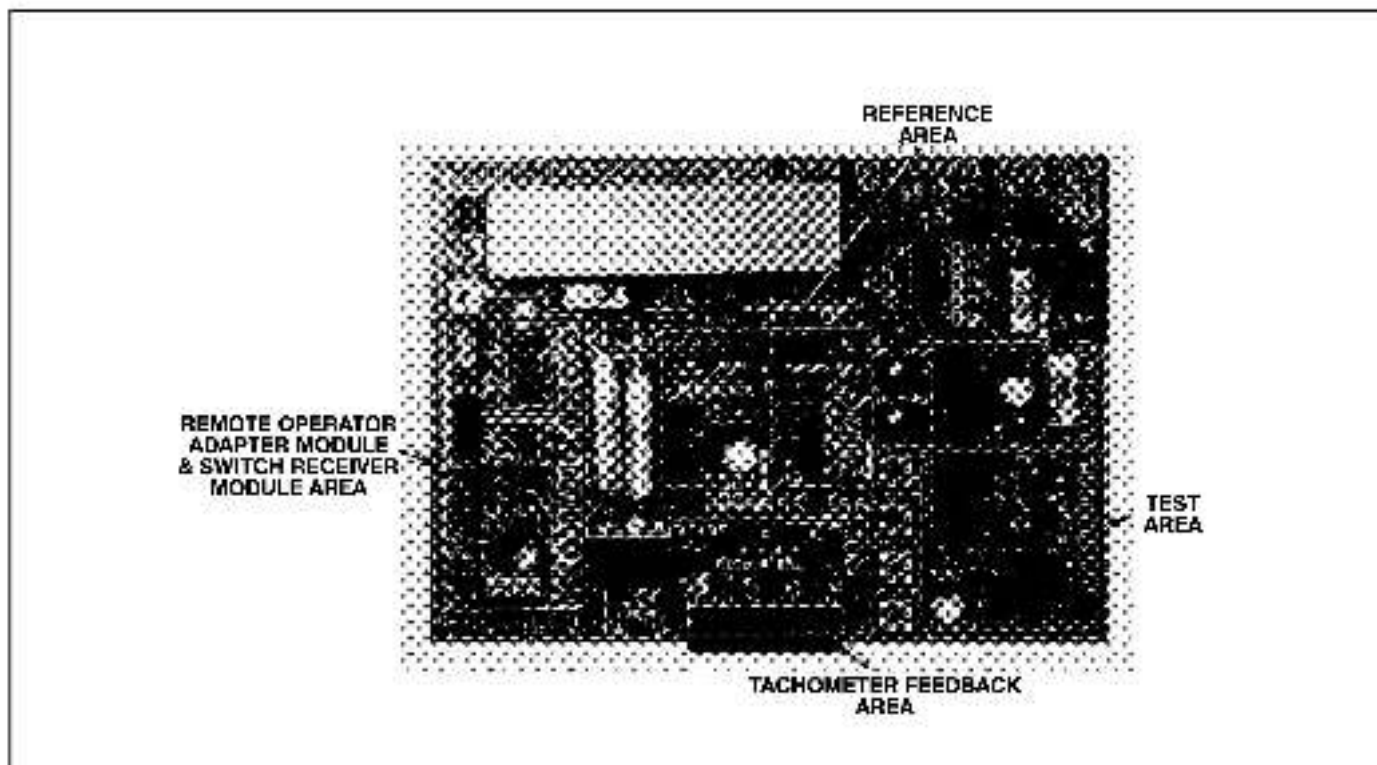


Figure 2 – Regulator Module Kit Locations

3. Locate the black pig-tail jumper on the Tachometer Module. It is to be placed on one of ten pins on the Module. Exactly which depends on the voltage scaling factor. On the motor's nameplate, find the base speed (rpm). On the tachometer's nameplate, find the output voltage per 1000 rpm.

Take these two figures and relate them to Table 1. Read across to the right column, where the 100% voltage figure is indicated. Place the jumper on the Module's pin that corresponds to the figure.

#### **DANGER**

**WHEN A REVERSING CONTACTOR IS INSTALLED OR FOR ANY REASON THE TACHOMETER OUTPUT VOLTAGE IS REVERSED, JUMPERS J1 AND J2 ON THE TACHOMETER FEEDBACK KIT MUST BE REMOVED REGARDLESS OF THE TYPE TACHOMETER USED. PERSONAL INJURY MAY RESULT IF THIS PROCEDURE IS NOT FOLLOWED.**

4. Follow this Step **only** if an a-c tachometer is being used. Skip to Step 5 if a d-c device is used.

On the Tachometer Module, locate jumpers J1 and J2 on the right of the terminal strip. (Refer to Figure 3). Clip out and discard these jumpers for a-c operation.

5. Since the IR compensation is not used with tachometer feedback, it is necessary to turn the IR Potentiometer fully CCW. If IR compensation is left in the circuit, erratic operation may result.
6. The Feedback Jumper on the Regulator Module must be connected for tachometer feedback. (Refer to Figure 4.) Place the Regulator Module's fixed black jumper on the pin marked T.

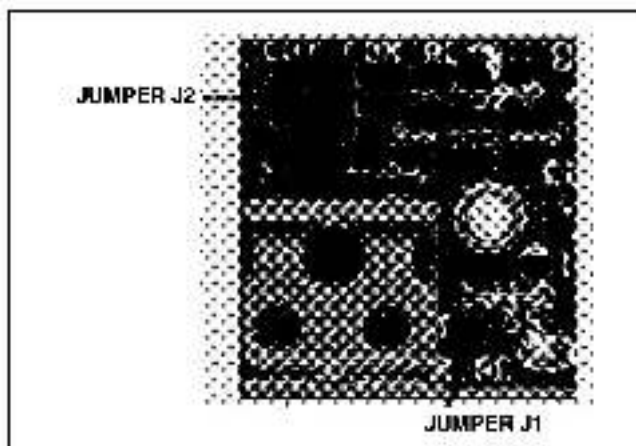


Figure 3 – Jumpers J1, J2

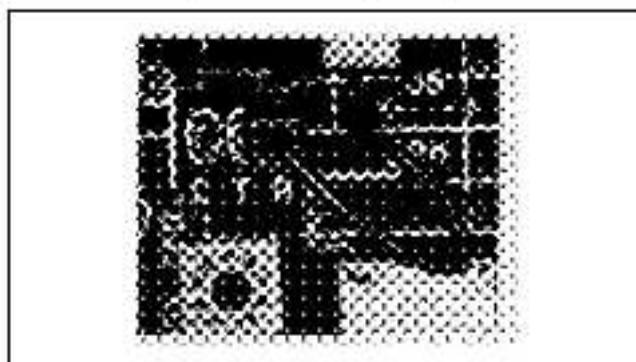


Figure 4 – Feedback Connection on Regulator Module

7. This Step assumes that the complete drive system, including the controller, has been successfully started and debugged. (Refer to your Controller Instruction Manual, start up section to accomplish this.)



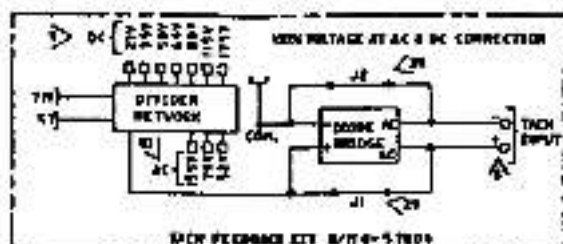
Figure 5 – Tachometer Feedback Kit Mounted on Regulator Module

It is necessary to carry out a power-on test. Set the SPEED Potentiometer at approximately 25% of full rotation. Start the drive. It should run as set. If it accelerates to full speed, the tachometer is not providing a signal.

Stop the drive, turn off all power, and reverse the leads to the Tachometer Module's terminal strip. Repeat the test with power on in order to confirm that proper feedback signals are being received by the regulator.

If erratic behavior continues, check the placement of the two pig-tail jumpers against Steps 3 and 5.

8. The maximum and minimum speed potentiometers should now be adjusted per the start up instructions in your Controller Instruction Manual. DO NOT make any adjustments to the I R compensation potentiometer. It must be set fully CCW.



- 8> Wiring for tachometer input leads must be tightly twisted with two full turns per inch, minimum. Leads must be run physically separated from all power circuit wiring.
- 9> For DC tach, jumper is connected in this location.
- 10> For AC tach, jumper is connected in the location.
- 29> If using an AC Tach, remove J1 & J2

Figure 6 – Tachometer Feedback Kit Schematic

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