RODIX INC.
FEEDER CUBE®
FC-40-PLC *Plus Series*

FC-40-PLC *Plus Series* ADVANCED APPLICATION NOTE

OVERVIEW

The **FC-40-PLC *Plus Series*** of feeder controls is built around circuit boards 24-488 and 24-489. Each board contains two power supplies, phase-angle firing control for the triac, an interlock voltage input, a jumper programmable "Run" input, and two speed inputs.

POWER SUPPLIES

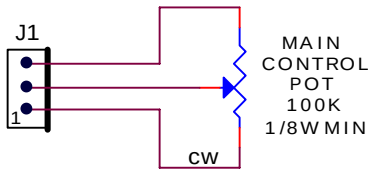
One 5 VDC power supply is for internal use only, and the second 5 VDC power supply is used for providing power for the RUN JUMPER pull up resistors. Both supplies share the same ground.

0-5VDC & 4-20mA ANALOG INPUTS

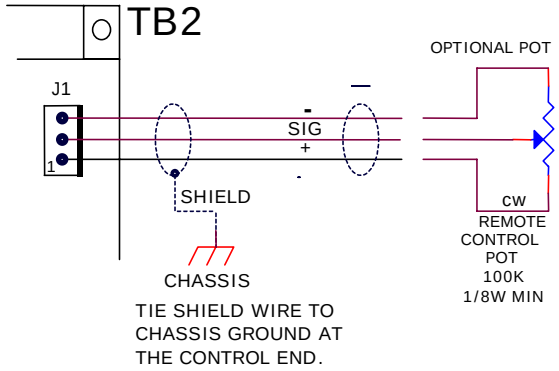
The **FC-40 *Plus Series*** feeder control has a **0-5VDC** analog signal input and a **4-20mA** analog signal input for controlling the vibration level of the feeder bowl.

0-5VDC input: Either a potentiometer or a 0-5VDC input signal can be used to control the output level of the control.

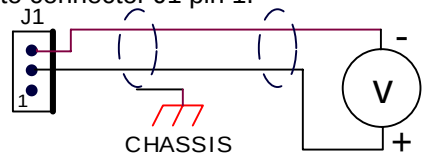
A potentiometer (Main control pot) normally is connected to the analog input of J1 to vary the output level of the control. This pot acts as a voltage divider across the 5VDC power supply providing a 0-5VDC signal.



Remote pot operation can be achieved by using a 3-wire shielded cable connected to J1, the analog input. The shield or drain wire should be connected to the chassis ground only at the Rodix end of the cable. See the wiring diagram for pot wiring connections.

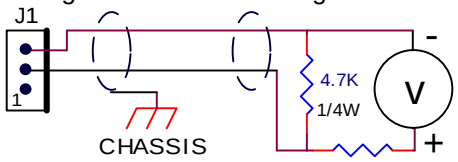


A 0-5VDC signal can be applied to J1, the analog input instead of using the Main pot. The 0-5VDC analog input signal may be applied between terminals 2 and 3 of header J1. Connect the ground to terminal 3 and the signal to terminal 2. To improve noise immunity, disconnect the wire going to connector J1 pin 1.



0-5VDC Input Diagram

A 0-10VDC signal can be applied to the analog input by using a voltage divider circuit to scale the input voltage to 0-5VDC. See figure below.



0-10VDC Input Diagram

The J1 cable is provided with the **FC-94 *Plus*** control. The cable, P/N 123-145 may be used anytime a remote signal or a remote pot is used. The shield of the "J1" cable should be tied to chassis ground at the Rodix end of the cable.

4-20mA input: a 4-20mA Remote Speed Interface is the second type of input signal that can control the output vibration level. This method has a better signal to noise ratio than the 0-5VDC input control. Connect the 4-20mA signal to TB2-8 (GND) and TB2-9 (SIG) to allow the bowl's vibration level to be adjusted remotely.

The Main control pot is automatically disabled whenever the 4-20mA input current is above 4mA. When the 4-20mA input current is at 0mA, control of the vibration level goes back to the J1 Main pot input.

Application Hints:
For Local/Remote control of the vibration level, use a switch to toggle between the 4-20mA input and the control pot by interrupting the 4-20mA current at TB2-9.

To use only the 4-20mA input to control the vibration level, disconnect the pot cable connected to J1.

When an analog input signal is used, the analog input signal should be applied after line power has been applied to the control.

The control produces a special logarithmic-tapered power output curve from the information given by the Main pot or 4-20mA input. The special taper spreads the power curve broadly across the pot range, helping to give maximum fine control over the control's output. For extra fine pot control, five and ten-turn pot kits are available from RODIX.

Step Up/Down Remote Speed Interface P/N 123-120 allows remote control of output power level, and replaces the Main control pot on the **FC-40 *Plus*** and **FC-90 *Plus Series*** **Feeder Cube®** controls. When used, two customer provided pulsed signals (5-30VDC) increase or decrease the output power level of the control. This allows for remote level control without expensive PLC analog output cards. This add-on option is available from Rodix.

ISOLATION

The **FC-40 *Plus Series*** control is transformer isolated from the line, the isolation is rated at 2500V. The Run Jumper input (TB2-5, 6 & 7), 4-20mA analog input, 0-5VDC analog or Pot. Input all share the same power supply common.

NOISE IMMUNITY

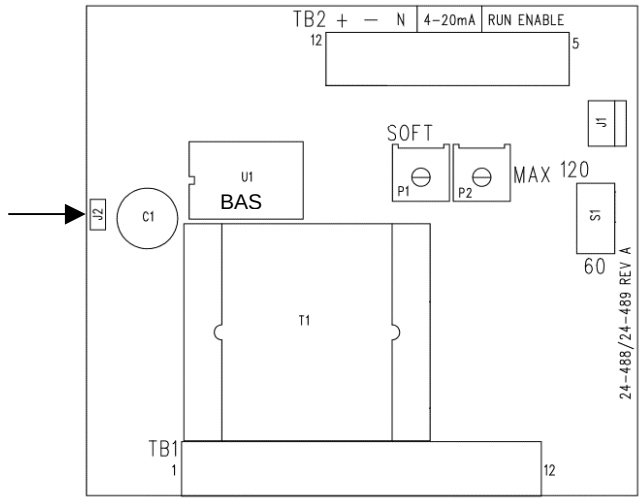
For further details about noise immunity, see the **Feeder Cube®** application note for your model and the Rodix Solution titled Good Wiring Practices for Avoiding Electrical Noise Problems.

60 PULSE POLARITY REVERSAL

Normally in the 60 Pulse (half-wave rectified) mode, the output voltage is turned on only during the bottom half of the sine wave. However with the 60 Pulse Polarity Reversal software feature, the top half of the sine wave is used instead of the bottom half.

Use this feature to reduce mechanical interaction between two vibratory feeders. Interaction occurs when both feeders use the 60 Pulse mode and they share the same machine base. This can cause the vibration from one feeder to effect the other feeder. A typical symptom of this is when turning one feeder's vibration up causes the vibration to decrease on the other one, and vice versa. To solve this problem more mass can be added to the machine base or use the Polarity Reversal feature to alter the timing on one feeder so that each feeder is pushing against the machine base at a different time.

To implement the Polarity Reversal feature, cut the jumper at location J2. The jumper is actually a circuit board trace located between two holes (feed-throughs). The jumper can be cut through with a sharp knife or the board can be notched at this location with side cutter pliers. Make a record that J2 was cut by writing POL on the chip label that reads BAS.



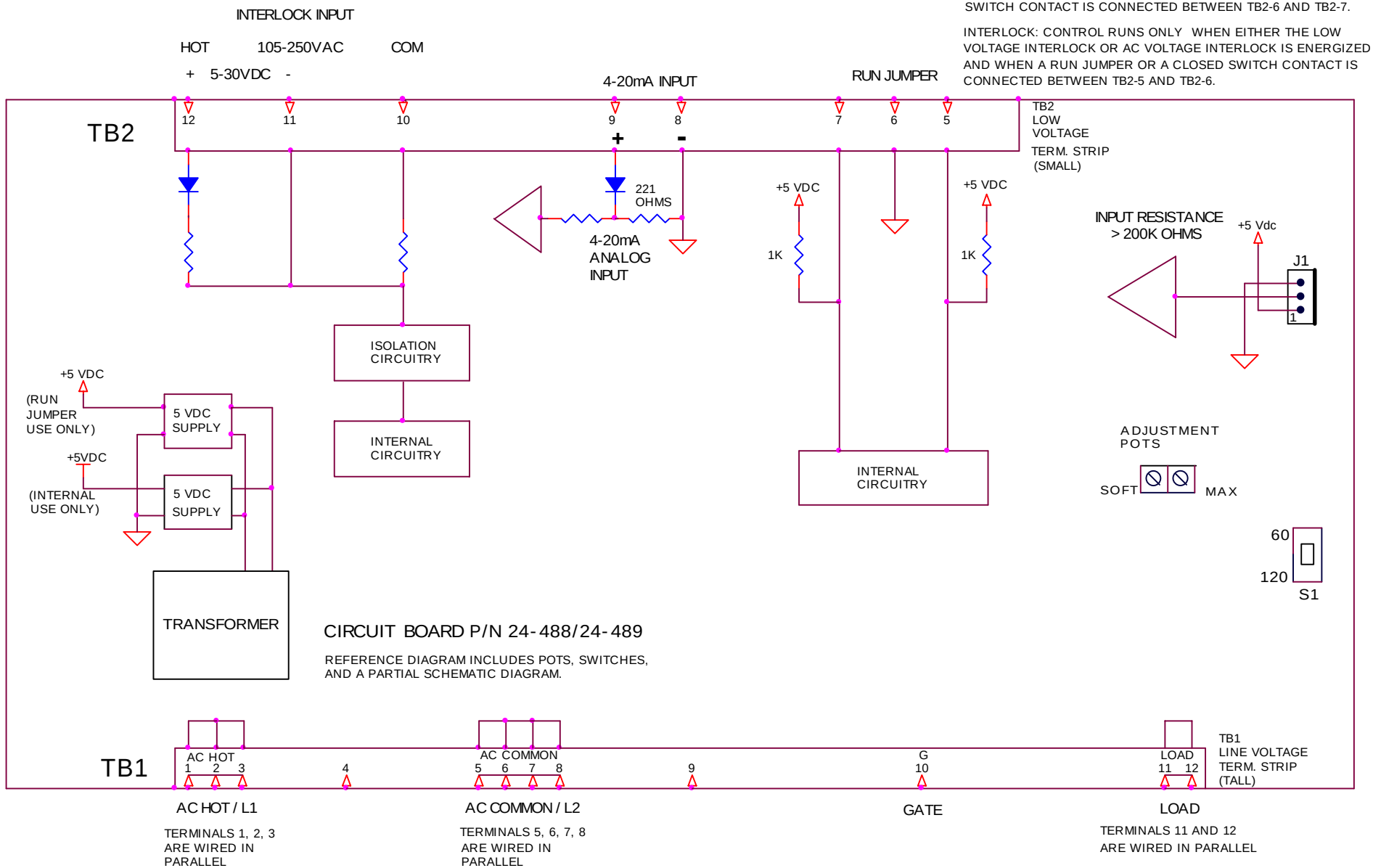
Location of J2
For 60 Pulse Polarity Reversal

RODIX, INC.
2316 23rd Ave, Rockford, IL 61104
Toll Free (800) 562-1868
E-mail custserve@rodix.com
FAX (815) 316-4701
www.rodix.com

RUN CONDITIONS

DIRECT: THE CONTROL RUNS WHEN A RUN JUMPER OR CLOSED SWITCH CONTACT IS CONNECTED BETWEEN TB2-6 AND TB2-7.

INTERLOCK: CONTROL RUNS ONLY WHEN EITHER THE LOW VOLTAGE INTERLOCK OR AC VOLTAGE INTERLOCK IS ENERGIZED AND WHEN A RUN JUMPER OR A CLOSED SWITCH CONTACT IS CONNECTED BETWEEN TB2-5 AND TB2-6.



INTERFACE DIAGRAM

ATTENTION: SENSOR AND/OR FIELD CONNECTIONS HAVE CHANGED FROM PRIOR MODELS.
THIS DIAGRAM IS FOR REFERENCE ONLY, SEE FC-40-PLC PLUS SERIES APPLICATION NOTE FOR INTERCONNECT WIRING.

FC-40-PLC Plus Series equivalent circuit.

FC-40-PLC ADV APP 4-05-04.doc