FOLDEX

PERFORMANCE BACKFOLD CONTROLLER

Owner's Manual

FOLDEX

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SYSTEM COMPONENTS

The FOLDEX folding system consists of:

Clutch Brakes (2)	*Vacuum-powered clutch brakes, driven by the belt drive motor, serve to mechanically stop and start the fold fingers.*
Controllers (2)	*Located in the cabinet, each fold section has its own controller. The controller has consists of a clutch brake power supply as well as a conputer card which manages the timing of the fingers.*
Vacuum Pumps (2)	*Each clutch brake has its own vacuum pump, gauge and regulator.*
Stepper Discs (2)	*Mounted inside each clutch brake there is a metal disc disc with slots machined in it. The number of slots equals the number of fingers. This disc is timed to the fingers when the finger position is at the* ***paper line (0 degrees).*** *The slot position is sensed by photointerrupters.*
Photointerrupters (2)	*These are mounted inside the clutch brake, and are equipped with LED's for visual monitoring of slot location.*
Velocity Encoder (1)	*There is one optical encoder mounted to the feed belt. Its function is to fee BOTH of the controls velocity, as well as position the belt.*
Fold Arm Encoders (2)	*On each of the clutch brakes is mounted an optical encoderThese encoders work in conjunction with the slotted discs above to inform the controller of the exact position of the fold arms in degrees.*
Trigger Photocells (2)	*These photocells pick up the trailing edge of the carton and signal the controller that a box is coming into the folding station. It is these photocells which start the entire fold cycle. The RESET BUTTON mimics the trigger photocells so that the system thinks there is a box present when there is not.*

SETTING THE PARAMETERS

There are two identical sets of parameter controls, one for FOLD SECTION 1 and one for FOLD SECTION 2.

EACH SECTION HAS:

Four (4) thumbwheel inputs
One (1) 2-position set up button
One (1) set up push button

THE SYSTEMS SHARE:
One (1) on/off switch
One (1) emergency stop button
One (1) reset button
One (1) remote reset button located on the opposite side of the machine

SETTING PARAMETERS

Each system has four (4) thumbwheel inputs labeled:

THETA 1 ANGLE: **Represents the # of degrees of travel (360 degrees=1 revolution) of the finger from the 0 degree paper line to its first wait position. Use this control to adjust how tight the fold will be.**

THETA 2 ANGLE: **Represents the # of degrees of finger travel from the 0 degree paper line to where the finger makes its second and final stop, prepared for the next box to fold. Use this control to fine tune where the flipper waits prior to the folding of the next box.**

NOTE! Theta 2 Angle must be > Theta 1 Angle.

NOTE!! Theta 2 Angle value must be < the number of degrees between fingers (i.e., with 3 fingers, Theta 2 Angle < 120 degrees; with 2 fingers, <180 degrees).

IMPACT DISTANCE

This value controls how much box travel will occur after the trigger photoeye sees the trailing edge of the box and before the flipper starts to move. Therefore, the greater the number, the LATER the fold will commence with respect to the box. The smaller the number, the EARLIER the fold will occur. Use this control to fine tune the exact location on the box that the finger will hit during a given fold cycle.

ESCAPE DISTANCE

This controls how much belt travel will occur before the finger leaves from the Theta 1 Angle interim position to go to the Theta 2 Angle (dwell). The bigger the number, the LONGER the flipper will wait for the box to clear before going to the "home" or "wait" position.

NOTE! At this writing there is no standard measurement that relates to the actual setting number on the impact or escape thumbwheel settings.

NOTE!! Only minor adjustments should be required once the initial parameters are set for any given box; therefore, it would be wise to KEEP A LOG of the 4 thumbwheel settings for BOTH Fold Section 1 and Fold Section 2, for referral during later use.

RESET BUTTON

Use of the reset button acts as a mimic of the Trigger photocell. It makes the system think that there is a box present to be folded when actually there is not. Use this button to reset the system after jams, line speed changes, set ups, coffee breaks, etc. In order to reset the fingers properly, the reset button MUST BE PRESSED AT LEAST TWICE!

*******CAUTION*******

The Reset button activates BOTH Fold Station 1 and Fold Station 2 simultaneously!!! Make sure both stations are clear before activating the reset function!

INITIALIZING THE SYSTEM

Every time the backfold system is started from a power-OFF situation, the electronics must be initialized. Follow these steps:

(1) **Set the power ON/OFF switch in the OFF position.**

(2) **Depress the EMERGENCY STOP button.**

(3) **Set the 2-position STAND BY switch for BOTH stations in the LEFT position.**

(4) **Run the machine belts SLOWLY WITHOUT CARTONS. Make sure that both vacuum pumps are running and that the gauges read between 20 and 23 inches of mercury.**

(5) **Set the power ON/OFF switch to the ON position.**

(6) **Deactivate the EMERGENCY STOP button. The power ON/OFF switch should now light up.**

(7) **Turn the 2-position switch for the first fold section to the NORMAL or RIGHT position.**

(8) **Press the POSITION button for the first fold section and RELEASE.**

The fingers will now make four (4) stop/starts and will come to rest in the proper position, i.e. out of the way of the cartons.

(9) **Repeat the operation starting from Step (7) to initialize the second fold section.**

The machine now has the proper information stored in its memory to fold boxes. As long as the power to the controller is not interrupted, initialization does not need to be repeated. To test whether or not the initialization was successful, push the RESET button. The fingers of the corresponding fold section should start and stop two (2) times and come to rest in the proper position. At least one box should be run at the slow set-up speed to ensure proper operation.

BUT.....WHAT IF:

NOTHING HAPPENS WHEN I PRESS THE RESET BUTTON?

If the initialization operation is not done properly OR if there is a problem in the system, initialization will fail. UNTIL INITIALIZATION IS COMPLETED SUCCESSFULLY, THE BOX PHOTOCELL WILL NOT BE ACTIVATED AND NO BOXES CAN BE FOLDED.

INITIALIZATION FAILS REPEATEDLY??

Call Orbit Motion at 508-539-0100 immediately.

DO'S AND DON'TS

DO....reset the flippers TWICE EVERY TIME prior to feeding boxes into the feed belt.

DO....reset the flippers AFTER EVERY JAM or ANY TIME THE MACHINE IS STOPPED. This reset must be done at speed without boxes.

DO NOT..stop the machine during a fold (when the fingers are folding). This will result in at least one, if not two, major jams.

DO NOT..increase the belt speed more that 5 FPM per fold of the fingers. This will result in a missed fold.

DO....reset the flippers TWICE after a change in any of the parameters (unless they are extremely small changes) while the machine is folding boxes.

DO....run the machine dry of boxes AT SPEED before shutting down for the day, or coffee break. It is a good idea to reset the fingers twice after returning to the machine, but it is not essential if the running speed has not been changed.

WHEN IN DOUBT, RESET TWICE!!!!!!!!!!!

TIMING THE FINGERS

Your folder gluer has been shipped to you with the fingers timed properly. If you change the fingers, change the finger position in relation to the finger shaft or replace the clutch brake. THE FINGERS MUST BE RETIMED TO ENSURE PROPER ELECTRONIC TIMING.

To do this:

(1) **Pry off the cover of the clutch brake using two (2) screwdrivers.**

(2) **Power up the controller (DO NOT RUN THE BELT MOTOR). With the vacuum pumps OFF, rotate the clutch by hand in the same direction as the fingers would normally fold until the red L.E.D. on the photointerrupter JUST COMES ON. This is the ZERO POINT. Maintaining this location the fingers should be adjusted so that the tip of any one of the fingers is JUST TOUCHING THE PAPER LINE. To help do this, try putting a box in the belts and rotate the fingers until one touches the box. To change the finger position relative to the clutch brake, the belt between them will most likely have to be jumped a number of teeth. The same effect can be accomplished by loosening the set screw which secures the stepper disc and ROTATING IT in relation to the fingers (this procedure is more tedious, however).**

REMEMBER: THE FINGER JUST TOUCHES THE PAPER LINE WHEN THE THE LED COMES ON, WHEN ROTATING THE CLUTCH IN THE PROPER DIRECTION.

(3) **Replace the cover. Repeat the procedure for the other station. INITIALIZE BOTH STATIONS!**