D-2000/D-2050 Operation Overview

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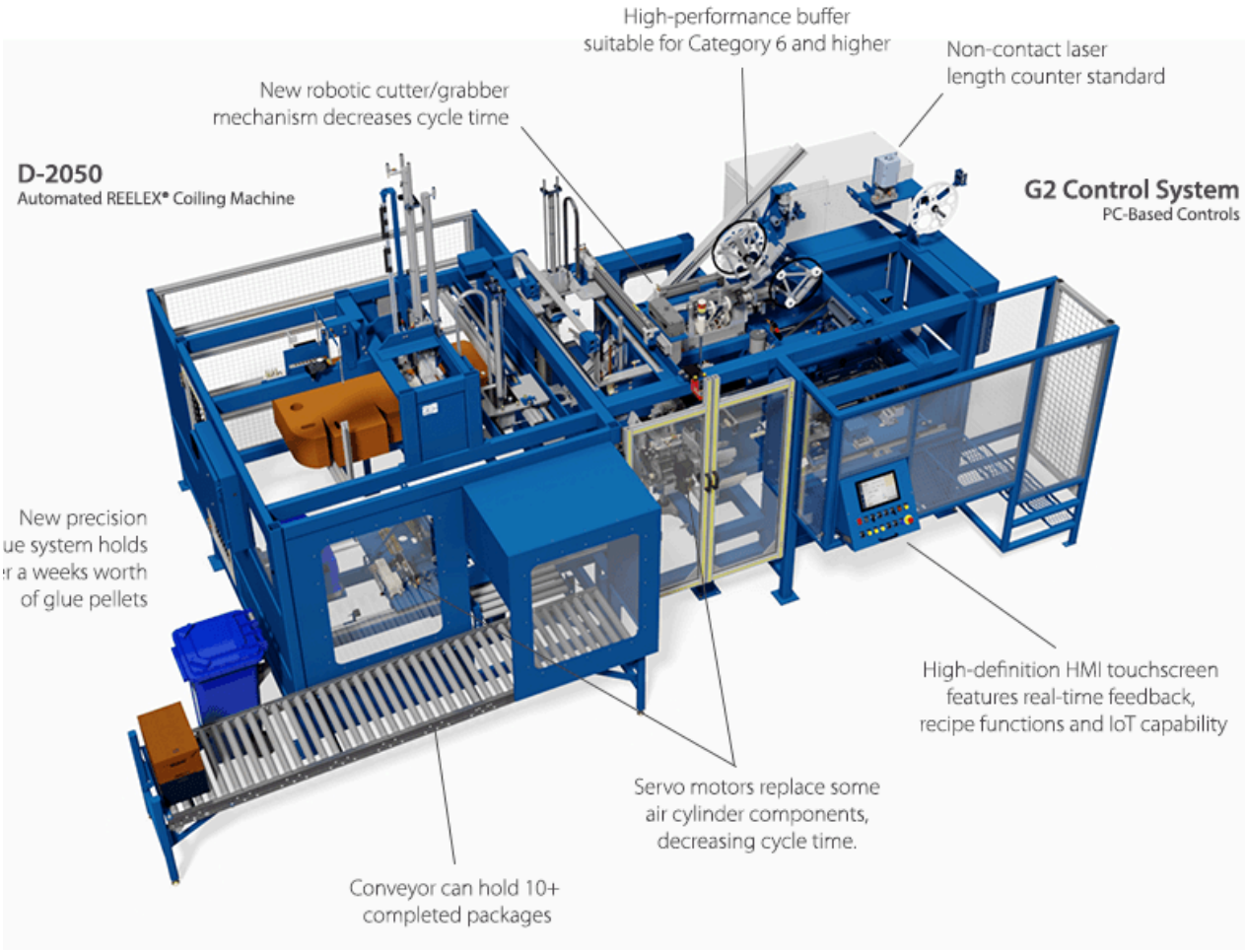
Overview



The D-20XX is a fully-automated packaging machine designed to perform coiling and boxing tasks continuously without the attention of a machine operator. This allows the manufacturer to achieve significant labor cost savings while maintaining high production rates and producing consistently high-quality coils.

The product enters the machine from either a motorized payoff or an extrusion line, is automatically coiled on a specialized turret-head mandrel, and then boxed and moved to a conveyor for further processing, palletizing or sorting.

The D-20XX REELEX Coiling and Boxing Machine includes a mounted buffer, a uniquely designed dual mandrel turret-style REELEX coiling head, a tube insertion device, and a box folding and gluing station. All operations are synchronized via a computer processor. This processor also includes troubleshooting, diagnostic, coil density and preset programs accessed via a keypad / LCD screen interface.

The D-2050 is an evolution of the D-2000, with myriad improvements, new features and upgrades. Equipped with an entirely new glue system, upgrades to nearly every major component, unique programming improvements and the option to configure glued EcoCore tube usage, the D-2050 represents the latest in REELEX packaging machinery.

For D-2050 and Machines with HMIs

ATTENTION: For **D-2050** users, the screens discussed in this manual refer to the terminal inside the control cabinet. The touch screen HMI provides access to many of these functions, but displays them differently. For details on operation of the touch screen HMI, please refer to **REELEX G2 Controls Operation**

Push Buttons and Switches

STOP: Stops the Winding side of the D-2000/D-2050 with normal deceleration. The boxing side will continue until the coil is boxed and then wait until another coil is ready.

START: Starts the Winding side of the D-2000/D-2050. All doors must be closed and the payoff or the Accumulator must be started in order to start the D-2000/D-2050. Production Run (See SCREEN 1B) must be reset if the display is flashing white indicating the preset length has been reached previously.

SPEED - SLOW/FAST: This is a spring-loaded switch that returns to center when released. To increase speed, turn the switch toward the FAST label and release. If you want to go full speed hold the switch toward the FAST label. There is acceleration involved when this switch is turned so it will not react instantaneously. To slow down the winding process, turn the switch in the opposite direction. The 10 speed rates can be set on SCREEN 11.

TRANSFER: When this button is pressed the winding side slows down, positions and cuts the cable. As soon as the boxing side has removed the previous coil from its side, the turret will turn. The winding side will start winding and the boxing side will box the coil. If the coil is a short length, the operator should press the BOX/NO BOX button before transfer so the coil may be removed. See the BOX/NO BOX button below.

LENGTH RESET: This push button will reset the length counter to zero.

POWER ON LIGHT: This light will illuminate when the main power is on.

PAUSE: This stops the machine at the next switch it is waiting for. To start the boxing side again the CONTINUE button must be pressed.

CONTINUE: This lighted button continues the boxing routine. If the boxing routine stops for some reason (example: dropped box), the light on the push button will be lit and a message will appear in the message center. If the boxing side is stopped manually by pressing the PAUSE button the light will not come on. To continue the boxing process, press the CONTINUE button.

The CONTINUE button is also used when the machine is reset. It is used to step through the reset process so the wire can be strung up to the spindle and other wire can be removed. Please see operator instructions on COLD START for more details.

BOX/NO BOX: This button is primarily used when there is a splice or manual transfer. When the splice is made, press the BOX/NO BOX button. The button will light indicating that the next coil will not be boxed. A No Box message also appears in the

message center of SCREEN 1 on the monitor. Start the D-2000/D-2050 again and once the splice is on the winding coil, press the TRANSFER button. The D-2000/D-2050 will transfer but will not box the coil with the splice in it. The machine will stop and the doors will unlock. Open the door, remove the coil with the splice, close the door, confirm that the coil has been removed by pressing the COIL REMOVED button, and then press start to start winding again. The next coil will be boxed, and the message center will display the box coil.

COIL REMOVED: This button is used to confirm that a coil has been manually removed from the mandrel. This is used when there is a splice or a short length and the no box option has been selected. Once the coil is removed, close the doors and press the COIL REMOVED button. Press start to resume normal winding.

NO GLUE-TOP: This button is used when the operator needs to test the electrical characteristics of the coil. The top flap of the box will not be glued so the coil can be tested easily without having to destroy the box. The status is shown in the message center of SCREEN 1 on the monitor. Only one box is not glued. The next box will be fully glued. The button toggles back and forth between NO GLUE-TOP and GLUE-TOP if pressed repeatedly. This can be seen in the message center box on SCREEN 1.

CLEAR FAULT: When low boxes, low glue, or low tube is indicated by the stack light or message center, the appropriate supply must be filled. After filling the depleted supply, the CLEAR FAULT button must be pressed to verify that boxes, glue, or tubes have been added. If the appropriate supply is not replenished, the D-2000/D-2050 will cycle two more times and then stop until the fault is cleared.

DOOR RELEASE: This button is used to stop the D-2000/D-2050 and unlock the doors to gain access to the inside of the machine. The machine will not stop instantly but will stop in a safe place. Once the button has been pushed, Request guarding opens in the message center of SCREEN 1, the button is illuminated and will flash indicating a door open request is pending. When the sequence permits, the button will illuminate without flashing. At this time, the air is removed from all valves and the motor contactors are released.

Access to the inside of the machine is permitted at this time, though no machine parts can move while the doors are opened, as damage to the machine may result. To regain normal operation, press the DOOR RELEASE button again. The message center displays request guarding closed. The machine can resume operation as long as the doors are closed. Pressing Start will resume winding.

NOTE: Machines equipped with latching table vacuum will maintain vacuum through door release and E-Stop. Vacuum will be released when the program is restarted.

E-STOP: When the emergency E-STOP button is pressed, all air is dumped, motor contactors released, and power to the valving is removed. The power to the switches and computer remains on for troubleshooting purposes. The computer reboots only when the E-STOP RESET button is pressed.

E-STOP RESET: This is a lighted push button that is pressed after an E-STOP. When lit, it needs to be pressed. Pressing E-STOP RESET also saves all values that have input since the last save. All E-Stops must be pulled out in order to reset the machine. For a complete startup sequence please see the operator instructions on COLD

START.

Operation Mode Data Entry

NOTE: The following information is for pre-G2 controls. For HMI touchscreen controls, please see the “Control System” chapter.

The keyboard/pad can be used to make changes to the settings of the machine. To change screens press PAGE UP or PAGE DOWN.

OPERATOR MAIN SCREEN: SCREEN 1 is the Operator Main Screen.

MESSAGE CENTER: The MESSAGE CENTER is located on the right side of SCREEN 1. Messages from the computer will be displayed on this screen. Under fault conditions, when a message is displayed, the yellow light above the machine will turn on, and an audible alarm will sound.

COIL LENGTH: The COIL LENGTH is displayed below the Message Center.

OPERATOR INPUTS: The OPERATOR INPUTS box is on the left side of SCREEN 1. Inside the OPERATOR INPUTS box are menu choices for items that can be changed. The blinking number for each smaller box indicates which keyboard/pad key will activate the menu.

COIL PARAMETERS: The menu window will appear if the number 1 is pressed. Each of the coil parameters has a blinking number. Selecting the blinking number will allow entry of the chosen parameter. Once the number is pressed, that parameter can be changed. After changing the parameter, press ENTER to enter the value or press ESC to leave the previous value intact. The on-screen keypad will disappear and selecting another number can enter a new parameter.

LENGTH SETTINGS: To enter coil length settings enter the number 2, and the LENGTH SETTINGS menu will appear. The function that the D-2000/D-2050 performs at each of the length settings will depend on the mode that the machine is set to. ESC returns to the main page.

OPERATING MODE: To enter operating mode selection, enter the number 3 and the OPERATING MODE menu will appear. ESC returns to the main page. Once the OPERATING MODE menu appears, select the mode that is desired.

NOTE: Operator Inputs can be locked. See Screen Overview, SCREEN 12: Setting Permissions.

Operating Procedures and Information

Machine Startup

Cold Start – No Power On The Line

IMPORTANT: The glue unit may need to warm up first in order to run the machine. See the glue unit manual for more details. (Or go to www.nordson.com for the latest version/s)

1. Turn on main power to the controller (red switch located on the side of the control cabinet). This also turns on the monitor.
2. Pull out all E-STOP buttons. The E-STOP RESET button light will come on. Pressing it closes the E-STOP circuit.
3. Type D-2000/D-2050 (or alternative program name) at the C Prompt on the computer and press ENTER.
4. If doors are not closed an indicator light above the door will light. Close the door and the program will proceed. The DOOR RELEASE button will light if the machine was E-stopped in DOOR RELEASE mode. Push the button to unlatch.
5. Press the CONTINUE button to proceed. This operation applies the 24V DC power supplies for output power. Table vacuum will stop if the machine is equipped with a latching vacuum.
6. Once the computer is booted and the program is running, if the doors are closed and locked, it applies air and begins the RESET routine.
7. Press the CONTINUE button when the amber CONTINUE light turns on. If light curtains are impeded an indicator light will be on. Make sure they are off. The table, spindle and the traverse will position.
8. When CONTINUE light turns on again, clear any coils or boxes, etc that are in the machine if necessary. Close all doors.
9. Press the CONTINUE button.
10. When CONTINUE light comes on again, the machine is waiting for the cable to be attached to the cleat on the cutter table.
11. Set up payoff supply or sting up Accumulator.
12. String cable through dancer. Set line tension to 10 PSI on REELEX standard 5 over 6, 15-inch sheave Dancer or equivalent.
13. Open the door to steps on the side of D-2000/D-2050 and bring the supply cable to the buffer and thread buffer.
14. Bring wire down into the D-2000/D-2050. Attach wire to clear above traverse. Go down the steps, close the door and return to the front of the machine.
15. Open front door, thread cable through traverse guide tube and into cutting position. Attach cable to cleat For String up. Close the front doors.
16. Start payoff or accumulator.

17. Press the CONTINUE button on the D-2000/D-2050. The D-2000/D-2050 will attach the cable to the mandrel. When prompted by the message center on the screen the D-2000/D-2050 is ready to be started.

18. Press START when the green start light is lit to start the winding process. The D-2000/D-2050 will cycle if:

    a. All safety locks are engaged.

    b. There is a sufficient level of glue.

    c. The glue is hot.

    d. There is an adequate supply of boxes and tubes.

    e. Payoff or Accumulator is started.

    f. The production run length value has not been reached

    g. Other interlocks are set to go.

    h. No other faults exist.

19. If the D-2000/D-2050 will not start, the MESSAGE CENTER will provide information for the reason for not starting.

Box, Glue and Tube Supplies

Payout Tubes: Tubes can be placed into the tube chute at any time. Up to 100 tubes can be placed in the chute.

Boxes: The box magazine can hold 100 unfolded boxes. If equipped, a light curtain will stop the motion of the box load system while the light curtain is blocked, and resume again when the curtain has been reset. However, the machine will continue coiling, so if the beam is blocked long enough while the boxer is trying to fetch an empty box, it will cause the boxer to fall behind the rest of the machine.

Glue: Glue chips can be added at any time by opening the access panel and placing the chips into the top of the gluing machine.

NOTE: If the machine is running and the supply of boxes, tubes, or glue gets low, a warning light on the three tiered stack light will begin to flash followed by a message in the message center indicating what needs filling. After filling the appropriate device, hit the CLEAR FAULT button on the console and the machine will continue running. If the appropriate device is not filled and the CLEAR FAULT button is not pushed the machine will automatically stop after three cycles.

Errors and Stops

Box Error

Reason: The machine has detected a problem with a recently loaded box. The D-2000/D-2050 will stop and the MESSAGE CENTER will provide information on the reason for the stop. The operator has the option of pressing the continue button to fetch another box. This should be done only if there is no box present on the boxing table.

If necessary the operator can gain access to the machine by:

1. Press the DOOR RELEASE button (allows access).
2. Open the door.
3. Remove the jammed box.
4. Close the door.
5. Press the DOOR RELEASE button (removes access).
6. Press CONTINUE.
    a. The D-2000/D-2050 will reset the boxing side and fetch a new box. The boxing side is now ready.
    b. If the jam did not involve the finished coil, the boxing side will box the coil.
7. Press START.
    a. If the winding side was winding, it will resume winding.
    b. If the winding side is finished it will wait.

Tube Error

Reason: The machine has detected the lack of a tube at the holder at the bottom of the tube magazine. The D-2000/D-2050 will stop and the MESSAGE CENTER will provide information for the reason for the stop.

The operator should proceed as follows:

1. Check tube supply to ensure that the tubes are not jammed together, or stuck on ramp.
2. When a jammed or stuck tube is removed, the operator can manually place the tube in the cup at the bottom of the ramp, or press CONTINUE to fetch another tube.

Splice

Reason: The operator has stopped the D-2000/D-2050 and changed supply reels so that there is a splice.

1. Press the NO BOX button. If the NO BOX button has been pressed, it will not box the finished coil.
2. Press START.
3. When the splice is on the coil, press TRANSFER. The D-2000/D-2050 will:
    a. Stop and transfer.
    b. It will retract the mandrel segments that contain the aborted coil.

c. All motion will stop, motor contactors will disengage, and the air will dump.

d. Access will be allowed to remove the coil.

4. Open Door.
5. Remove the coil.
6. Close the door.
7. Press the COIL REMOVED button to acknowledge that the coil has been removed.
8. Press START.

E-Stop With Jam

Reason: The D-2000/D-2050 had to be E-Stopped with a coil in progress, boxing in progress, gluing in progress, or any other condition.

1. Pull out all E-STOPS.
2. Cut cable and place in cleat above traverse.
3. If string up was lost, open the gate to steps on the side of D-2000/D-2050 and bring the supply cable to the buffer and thread buffer.
4. Bring wire down into the D-2000/D-2050. Attach wire to clear above traverse. Go down the steps, close the door and return to the front of the machine.
5. Close all doors around the D-2000/D-2050.
6. Press the E-STOP RESET button at the operator station. Type D-2000/D-2050 (or alternative program name) at the C Prompt on the computer and press < ENTER > . If doors are not closed an indicator light above the door will light. Close the door and the program will proceed. The DOOR RELEASE button will light if the machine was E-stopped in DOOR RELEASE mode. Push the button to unlatch.
7. When the CONTINUE light turns on, open the door and manually clear the coils and boxes that might be in the machine.
8. Close the door.
9. Press CONTINUE. When CONTINUE light comes on again, the machine is waiting for the cable to be attached to the cleat.
10. Open front door, thread cable through traverse guide tube and into cutting position. Attach cable to cleat on the cutter table. Close the front doors.
11. Start payoff or Accumulator.
12. Press CONTINUE on the D-2000/D-2050. The D-2000/D-2050 will attach the cable to the mandrel and wait for the START signal.
13. Press START to start the winding process. The D-2000/D-2050 will start if:

    a. All safety locks are engaged.

b. There is a sufficient level of glue.

c. The glue is hot.

d. There is an adequate supply of boxes and tubes.

e. Payoff or Accumulator is started .

f. The production run length value has not been reached.

g. Other interlocks are set to go.

h. No other faults exist.

14. If the D-2000/D-2050 will not start, the MESSAGE CENTER will provide information for the reason for not starting.

Sequential Printing

Sequential Printing Operation - Ink Mark Method

1. RESET machine as if a cold start. Take note, upon string-up, of how far in the first mark is.
2. Be sure the machine is in Mode 3,4,or 6 for sequential print.
3. Toggle Box/No-Box for no-box option.
4. Be sure that the D-2000/D-2050 is set to Speed 1 in anticipation of the mark.
5. Start the machine.
6. Toggle the switch on the button box to No Window shortly before the mark reaches the ink sensors. This allows the next pulse seen to cause a transfer regardless of footage length.
7. The D-2000/D-2050 will see the mark and pull in the distance set in SCREEN 20 Printer/sensor distance.
8. The machine will then transfer. Toggle the switch to Window. Remove the partial coil and press Coil Removed.
9. The D-2000/D-2050 should now be in sequence with the printer. The D-2000/D-2050 will not allow a pulse until the variable of the open sequential window from Page 2 is reached.

Sequential Printing Operation - Direct Printing

1. RESET the machine as if a cold start.
2. Be sure the machine is in Mode 3 or Mode 4 or Mode 6 for sequential print.
3. Toggle Box/No-Box for no-box option.
4. Be sure the machine is set to Speed 1 in anticipation of the signal.
5. The switch on the button box is set to No Window. This will allow the next pulse seen to cause a transfer regardless of footage length.

6. Start the machine.
7. RESET the sequential printer. This will signal the D-2000/D-2050 to pull in the distance set in SCREEN 20 Printer/Sensor Distance.
8. The machine will then transfer. Remove the partial coil and press Coil Removed.
9. The D-2000/D-2050 should now be in sequence with the printer. The D-2000/D-2050 will allow a pulse at any length.