DYNACO

Technical Manual

Door Model M2

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Chapter 1:
Before You Begin

1.1. Safety

1.1.1. Hazard Standards

Throughout this manual you will see a label that indicates situations during the installation process that pose risks to installers and/or equipment.

Warning: Installation technicians may be exposed to injury from electrical components.

Caution: Damage to equipment is possible.

The mechanical and electrical components of the door may have posted warning and caution information as well. These will typically include the following symbols indicating the type of risk and precaution to be taken.

The Warning sign indicates a danger of severe physical harm or death. The symbol includes specific information regarding the risk such as “High Voltage” or “Keep Hands Clear”.

The Caution sign indicates safe operating procedures. Failure to comply with the procedure may result in injury or damaged equipment. The sign will include procedural text such as “Lock Out for Safety” or “Lookout for Forklifts.”

1.1.2. Installation Precautions

Only certified DYNACO door installers may install DYNACO doors. Always use of the proper tools, procedures, and techniques when installing your DYNACO door. Installation of the DYNACO door requires the assistance of qualified electricians and forklift operators. Installation contractors should ensure that those participating in the installation process have received the appropriate training and certification required to complete the installation.

Installation performed by untrained technicians may result in injury and/or damage to equipment.

Note: Failure to follow the instructions found in this manual may result in an inoperable door and void its warrantee. Installation by unauthorized persons may also void the warrantee

1.1.3. Operation Precautions

The following precautions should be taken when operating DYNACO doors.

- Read this manual prior to operating DYNACO doors.
- Keep the control box closed while operating the door.
- Keep all safety features such as covers and safety warnings visible and readable at all times. Observe all safety warnings and procedures.
- Avoid contact with all chains, bearings and other moving parts during activation of the door.

1.1.4. Maintenance Precautions

The following precautions should be taken when performing maintenance on DYNACO doors.

- Only certified personnel should perform maintenance on DYNACO doors. Maintenance performed by untrained technicians may result in injury and/or damage to equipment.
  Note: Service performed by unauthorized persons may void the DYNACO Door warrantee.
- Only use DYNACO Factory Direct replacement parts. All door parts are engineered specifically for use within the door.
- Return the door to the original factory condition when maintenance is complete. Take extra care to ensure that all safety features are restored to their original condition.
- Observe all electrical precautions.

1.1.5. Electrical Precautions

Electrical shock can be deadly. Take extreme care when performing installation and maintenance task on the electrical components of the door. Following the precautions listed below.

- All electrical parts used to install or repair DYNACO doors must be UL approved.
- Lock out and tag electrical components in accordance with OSHA regulations and approved electrical codes prior to performing maintenance. Lock out is required for service or maintenance on all mechanical and electrical components including performance of the following tasks.
  - Removal of covers, side guides, motor, limits, and other protective devices.
  - Inspection of the door.
  - Inspection or maintenance of the Control Box.
  - Maintenance or repair of the opening commands.
- Disconnect the Uninterruptible Power Supply (UPS), if present, when performing maintenance. Refer to the UPS manual for information on disconnecting the UPS.

Take special care when addressing frequency inverter failure modes. The frequency inverter stops the door when it senses voltage loss, phase differences, and thermal overload. This stops the door from further operation, but does not disconnect the power. Observe the following precautions related to the frequency inverter.

- Keep the frequency inverter cover closed at all times.
- Disconnect the main power supply, wait 15 minutes, and reconnect the power supply after resolving frequency inverter failure modes.
- Disconnect power and proceed with lock out procedures to perform service after the frequency inverter has stopped the door.

1.2. Installation Tools

You will need the following tools to complete the installation of your DYNACO door successfully.

- 1 water level
- 2 ladders
- 1 wire stripper
- 3 clamps
- 1 set of screw-drivers
- 1 grinder
- 1 tape measure
- 1 utility knife
- 1 circuit tester V.O.M.
- 1 punch
- 1 hammer drill
- 1 threaded rod
- 1 universal pliers
- 1 set of Allen keys (metric/US)

1.3. Pre-installation Build-out

Ensure that the doorframe has the necessary structural support, such as a fore frame or build out *before* you begin. See Appendix A: Optional Door Mounting Techniques for optional build-out techniques.

1.4. Unpack the Door

The door should be unpacked immediately before installing the door.

1. Carefully unpack each item and check it off on the following manifest.

2. Arrange the head assembly and the side guides on the floor, as close to the door opening as reasonably possible making sure that the head assembly is closest to the door opening. (This makes it easier to lift and mount the door with a forklift.)

1.5.

M2 Manifest

Check off each item on the manifest, complete and sign the manifest, and fax this page to DYNACO at (800) 459-1930. **This is necessary to validate the warranty**.

Inspect the crate for damage before you begin unpacking. If damaged, do not sign-off on the shipment. Call the shipper and DYNACO within 24 Hours!

Standard Components

- ☐ Door serial number (located in the Control Box and on the side guides) matches order.
- ☐ Head Unit
- ☐ 2 Side-Guides
- ☐ Factory installed covers (You will need to disassemble these before you can mount the door.)
- ☐ Control Box
- ☐ Counterweight
- ☐ Accessory Box (with factory packing list)
  - o Motor Key
  - o Side-Guide Attachment Bolts
  - o Counterweight Attachment Hardware
  - o Pneumatic Tube

Optional Accessories

Be sure to place these items in a secure place. Installation of these items occurs *after* the door is properly mounted, secured to the wall, and finalized. Install these accessories one at a time. Make sure that you test the functionality of each accessory after you have installed it before moving on to the next accessory.

- ☐ Pull Cord
- ☐ Push Button
- ☐ Motion Sensor
- ☐ Magnetic Loop Activator
- ☐ Remote Control
- ☐ Other _____

I have visually confirmed each of the above items was received in good condition.

Door Serial Number _____

Name	Company
Phone	Address
Date	City, State and Zip

Chapter 2: Mechanical Installation

2.1. Introduction

Complete any additional structure support for the doorframe before you begin assembling the door. To ease the installation of the door, you may find it desirable to use a fore frame, particularly where the mounting wall is substantially out of true and plumb. See Appendix A: Optional Door Mounting Techniques for information on alternative door mounting techniques.

Remember to verify the door measurements. For the most accurate measurements, measure the width of the door just above the reintroduction points located on each side. See Figure 2-1.

1. Measure the height and width of the door opening.

2. Compare these measurements to the width of the head assembly.

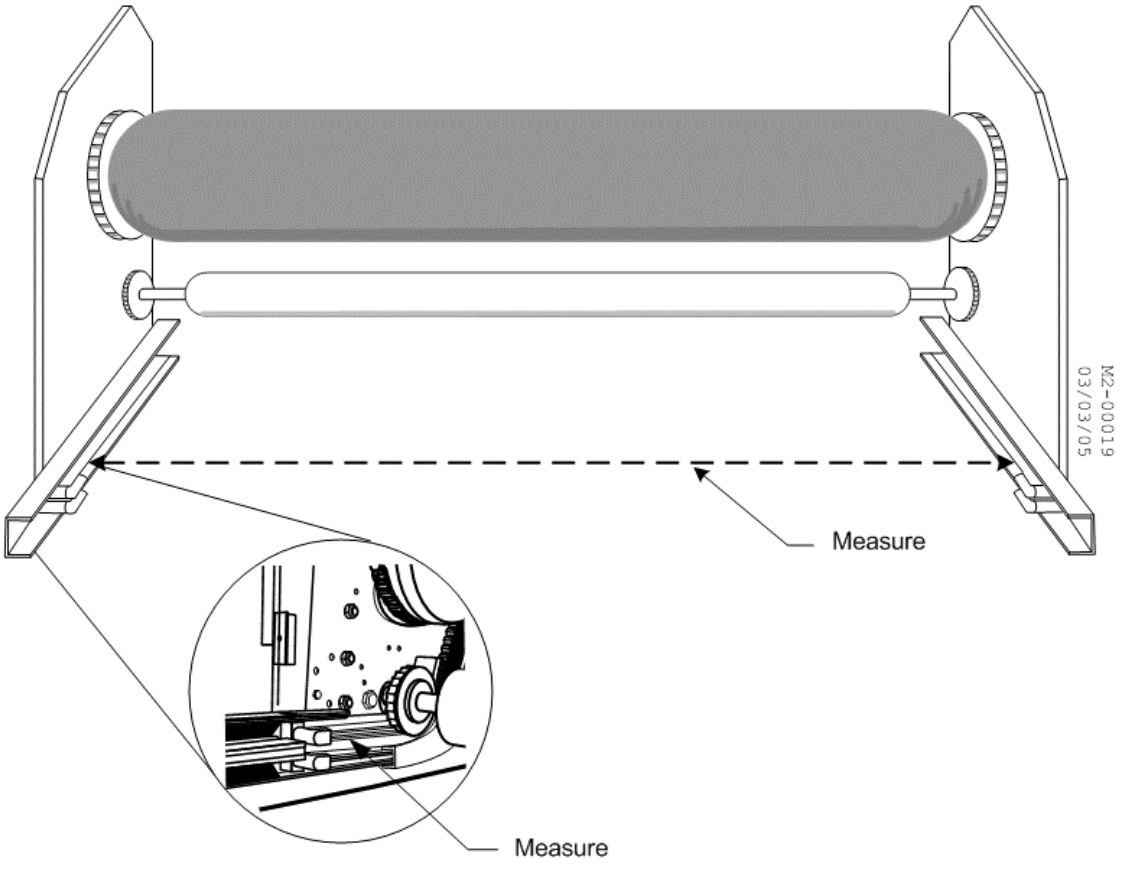

Figure 2-1: Measuring the Door

2.2. Assemble the Door

1. Clear the door mounting area of all obstructions.

2. Attach the side guides to the head assembly. See Figure 2-2.

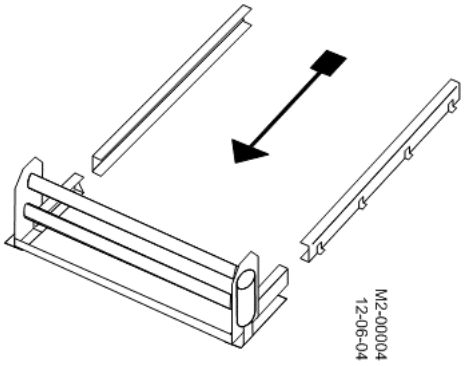

Figure 2-2: Attaching the Side-guides

3. Secure the side guides to the header unit with the bolts, nuts and washers. See Figure 2-3.

   Note: Tighten the hold-down screws first.

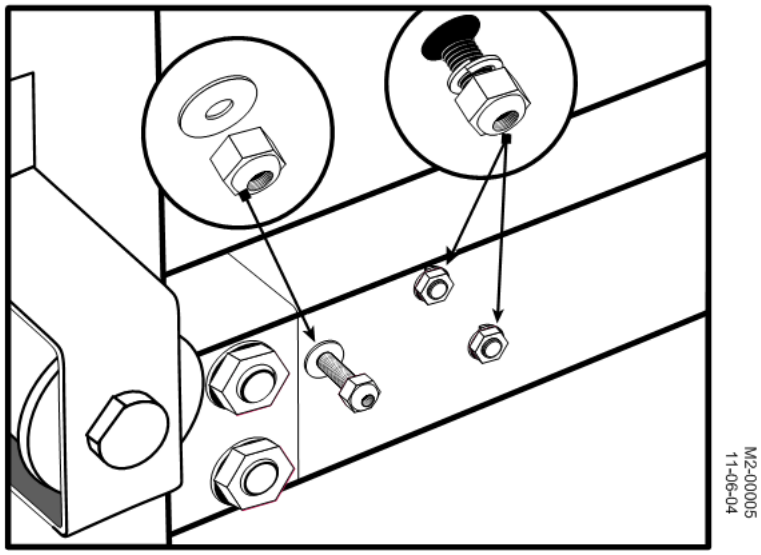

Figure 2-3: Securing the Side-guides

4. Align the inner guide with the re-introduction points to assure a straight path for the curtain to travel. See Figure 2-4.

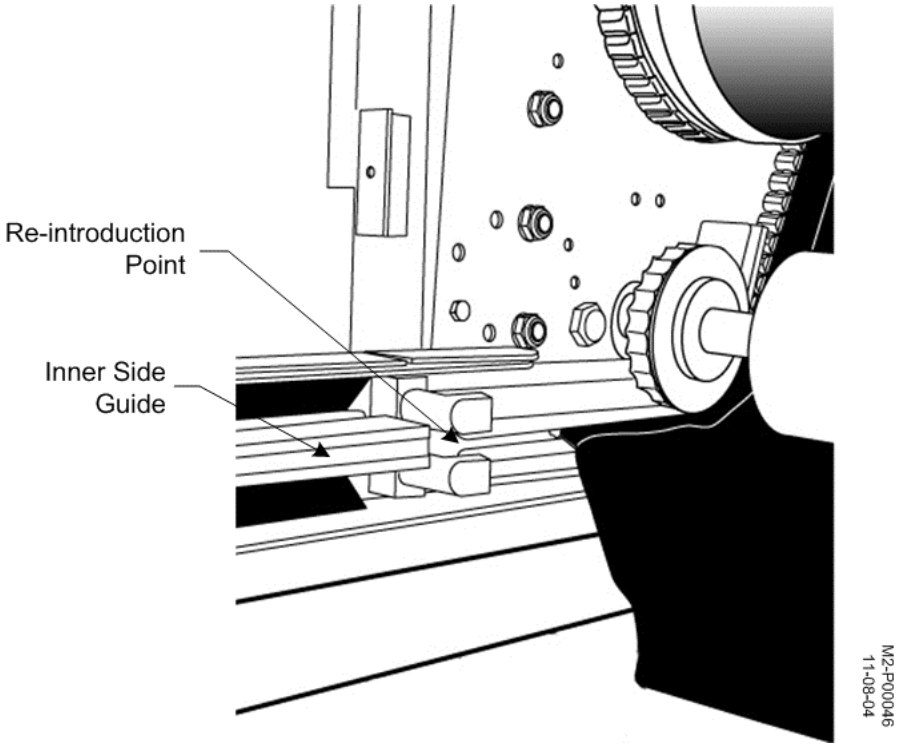

Figure 2-4: Aligning the Inner Guide

5. Tighten the top stud with the lock nut when the path is achieved.

6. Place the head assembly of door of the forklift, ensuring that the forks are beneath the u-profile. See Figure 2-5.

   Caution: Strap the head unit to the forks to ensure that it does not slip from the forks while you are raising it.

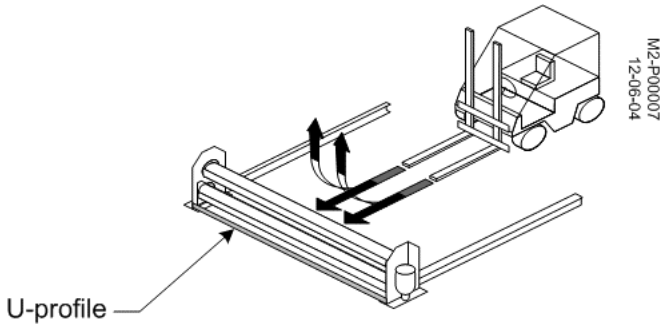

Figure 2-5: Placing the Head Assembly on the Forks

7. Lift the door with the forklift. The door will tilt to a vertical position as you lift the forks as in Figure 2-6.

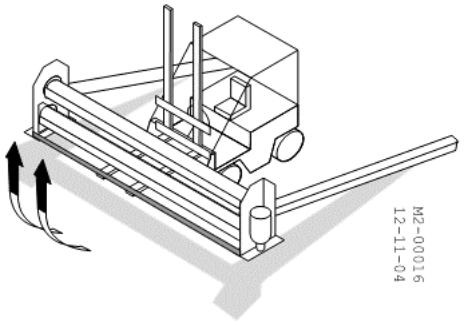

Figure 2-6: Tilting the Door

Caution: Clear area of obstructions. The frame drags along the ground and may be snagged or damaged during installation.

2.3. Mount the Door

1. Place the unit against the door opening while checking the levels (drum, struts and side posts). See Figure 2-7.

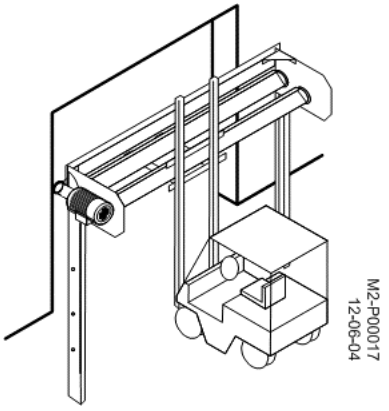

Figure 2-7: Placing the Unit Against Door Opening

Note: Do not permanently secure the door yet. You must first ensure the door is level (true horizontal) and plum (true vertical).

2. Temporarily attach the door with clamps or some other secure method. See Figure 2-8.

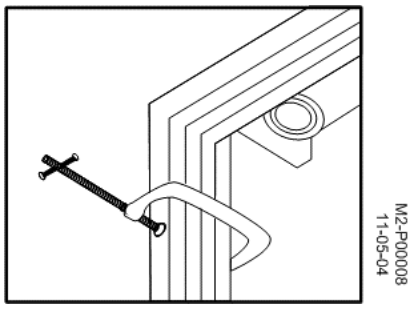

Figure 2-8: Temporarily Attaching the Door

3. Using a level, check each side of the door opening for level and plum. See Figure 2- 9.

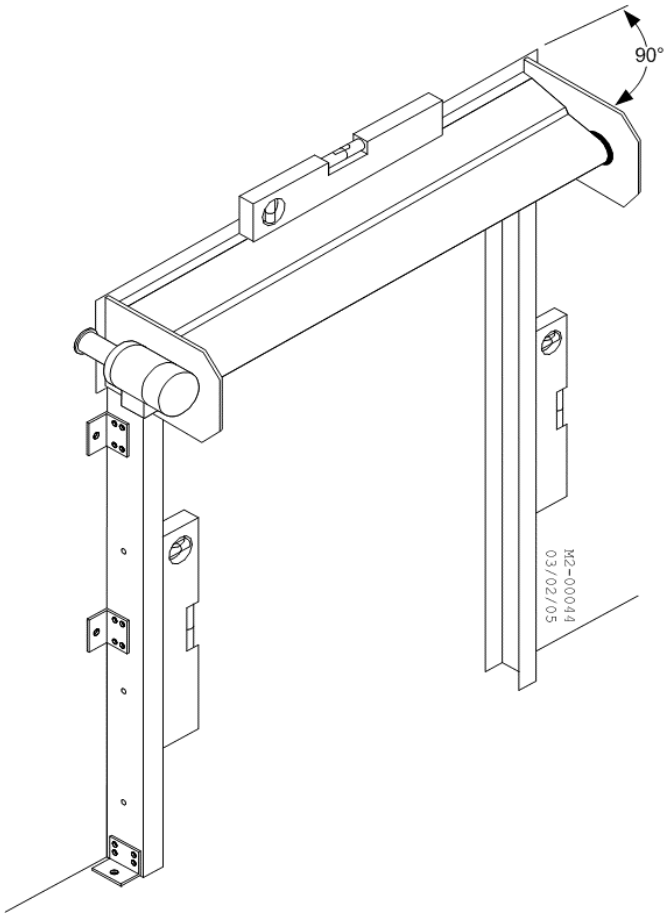

Figure 2-9: Level and Plumb the Door

4. If necessary shim the low side of the opening where the side guide of the door will be positioned.

5. Continue to adjust the doors until it is absolutely plumb and level.

6. Measure the inside dimension <W> between the two side-guides ensuring that it is the same at the top, middle and bottom. See Figure 2-10.

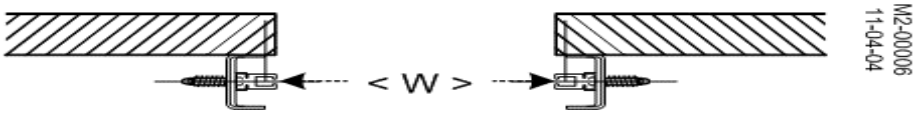

Figure 2-10: Inside Dimension Measurements

7. Permanently anchor the door in the following order. See Figure 2-11.

a. Head Unit Mounting Points

b. Side-Rail Mounting Brackets

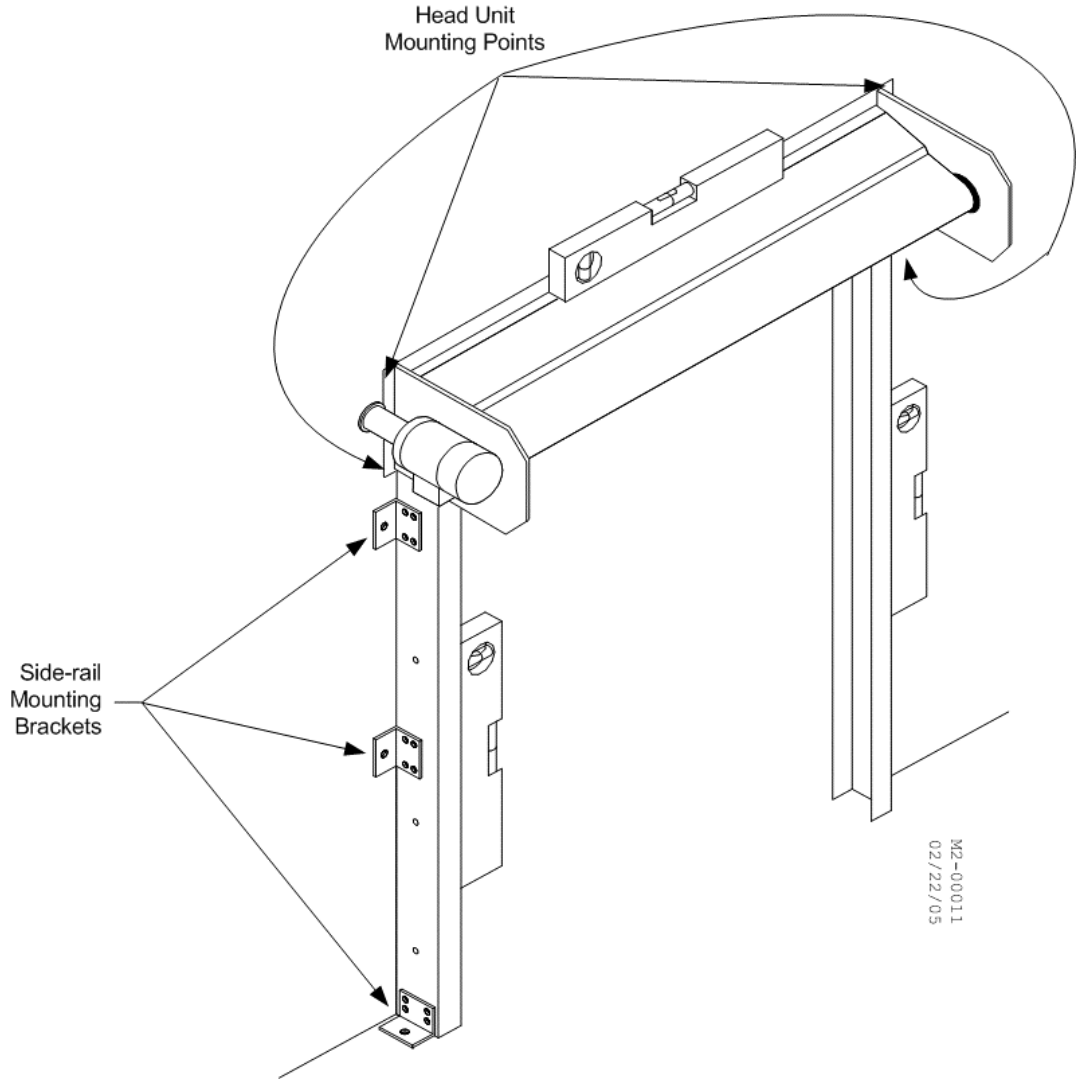

Figure 2-11: Anchoring the Door

2.4. Install the Curtain

1. Remove protective shipping material from the curtain.

2. With one person at each end of the door, loosen the curtain from the roll-up drum and position the first tooth at each side within the drive mechanism.

   Note: For best results use two people to complete this procedure.

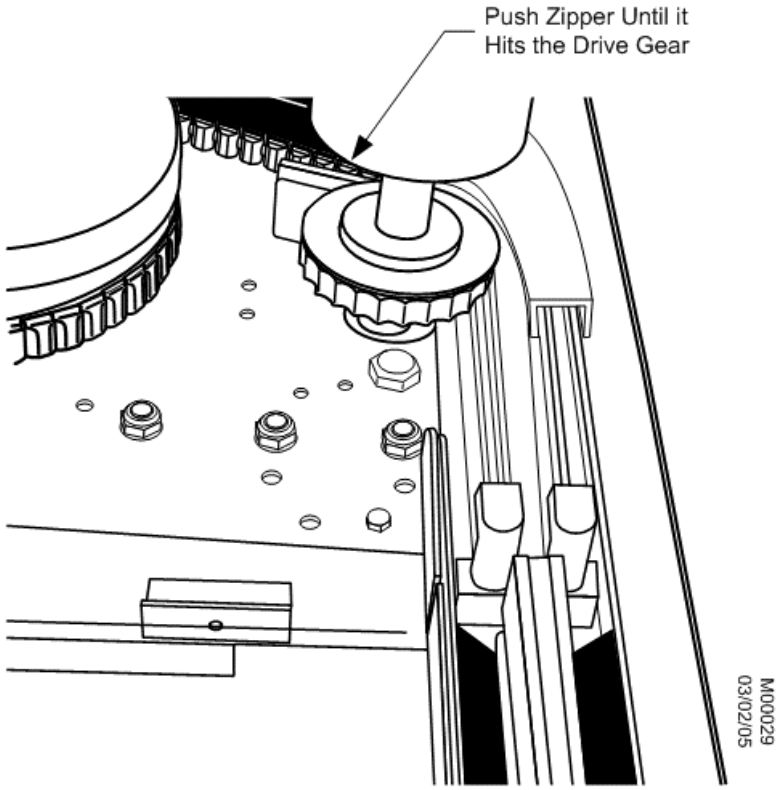

Figure 2-12: Feeding the Curtain

3. Insert the ratchet and key into the drive motor fan opening. See Figure 2-13.

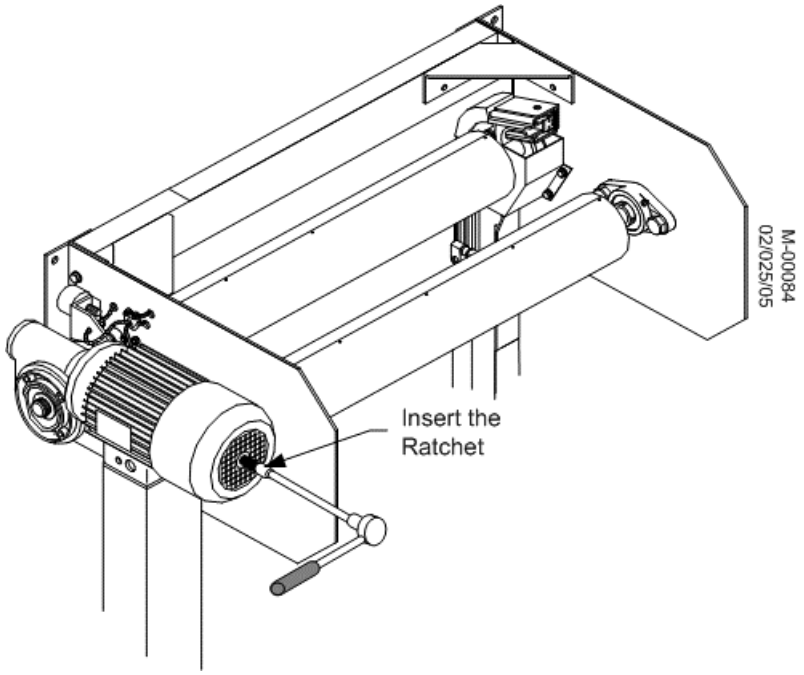

Figure 2-13: Move Curtain through Drive

4. While holding moderate pressure to each zipper, rotate the drive motor backwards slowly to push the zipper back and slip the first tooth of each zipper into the next tooth of the drive gears.

5. Reverse direction of the ratchet and rotate the drive motor until the last tooth on booth sides of the curtain are even with the reintroduction point.

Caution: Do not leave the door unattended without the counterweight installed. Until you install the counterweight, there is risk of the curtain slowly unraveling onto the floor.

2.5. Install the Counterweight

1. Ensure the curtain is in the up position.
2. Locate the pre-assembled belt on the rollup drum shaft.
3. Unroll the belt until 2" remain on the shaft. See Figure 2-14.

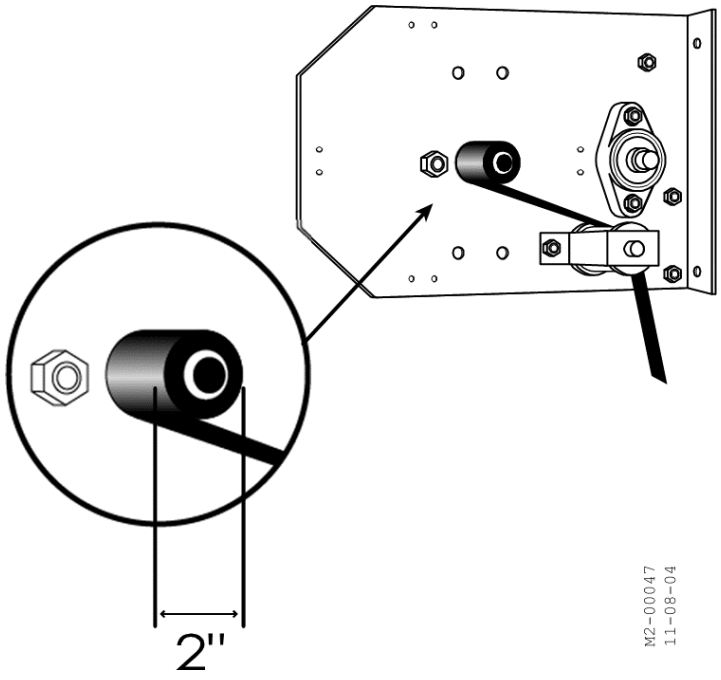

Figure 2-14: Wind Belt on Shaft

4. Pass the belt behind the Counter-weight Pulley without twisting it. See Figure 2-15.

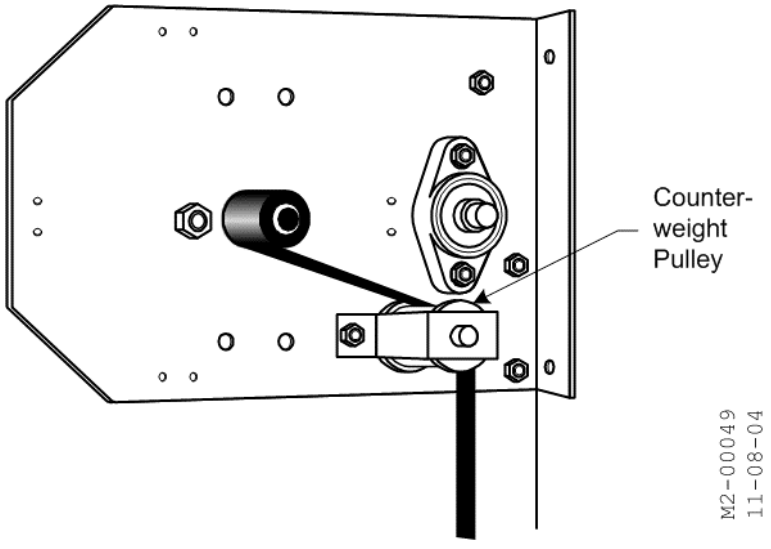

Figure 2-15: Counterweight Pulley

5. Securely support the counterweight at 20 inches above the floor. (The counterweight may be lower depending on door size).

6. Attach the belt to the counterweight with the hardware provided. See Figure 2-16.

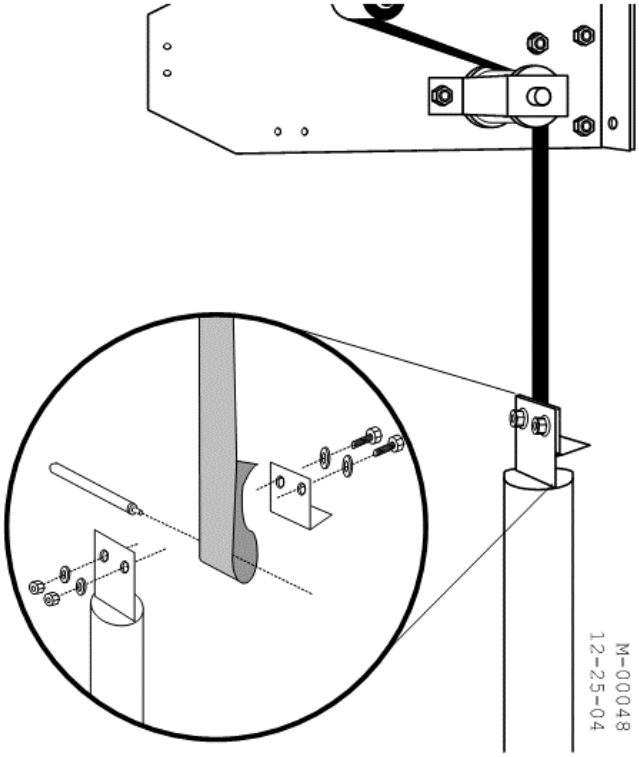

Figure 2-16: Attach Counterweight

7. Manually lower the door to verify that travel of the counterweight is unobstructed.

8. Remove any excess belt.

9. Verify that the weight is mounted straight vertically and at an angle.

2.6. Mount the Control Box and Photo Eyes

Caution: Run conduit and cables into the ***bottom*** of the Control Box only! Do not drill into the side or top of the Control Box. Doing so will void the warranty! (If you are running conduit, place the motor cable in its own conduit.)

1. Mount the Control Box on the ***motor side*** of the door, approximately 5' 3" above the floor level. See Figure 2-17.

1. Run the conduit as appropriate.

2. Mount the photo eyes in the pre-drilled holes in the side guides (located approximately 12" from the floor). See Figure 2-17.

   Caution: Ensure that the photo eye is flush with the inside attachment nut and does not project into the side rail.

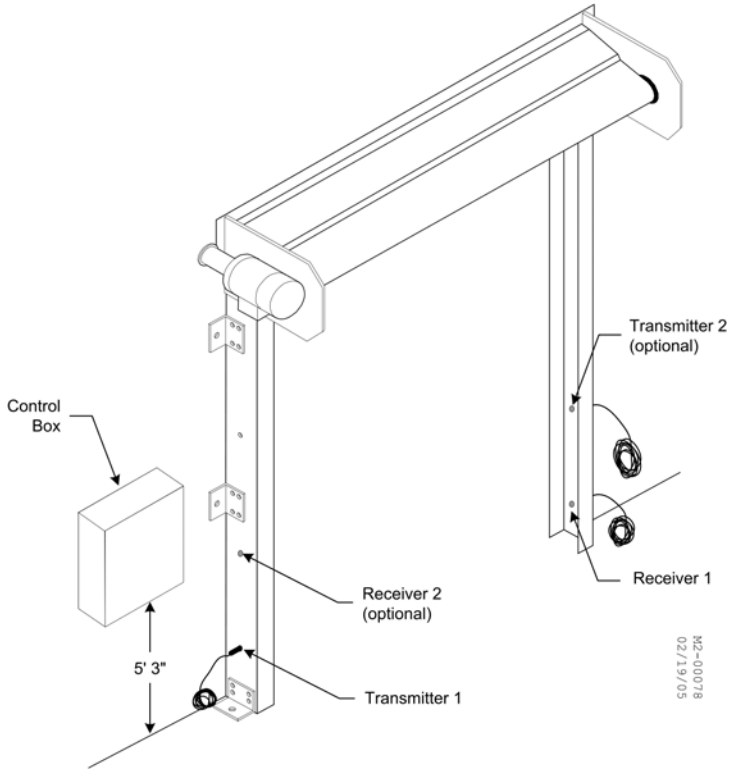

Figure 2-17: Photo Eyes

Note 1: If more than one pair of photo eyes is used, do not install two transmitters on the same side.

Note 2: The photo eyes emit a low frequency pulsed signal. They must be clean and directly aligned for proper operation.

Note 3: The photo eyes will not line up if the side guides are not plum and level.

2.7. Connect Pneumatic Tube

1. Connect the pneumatic tube at the drum. See Figure 2-18.

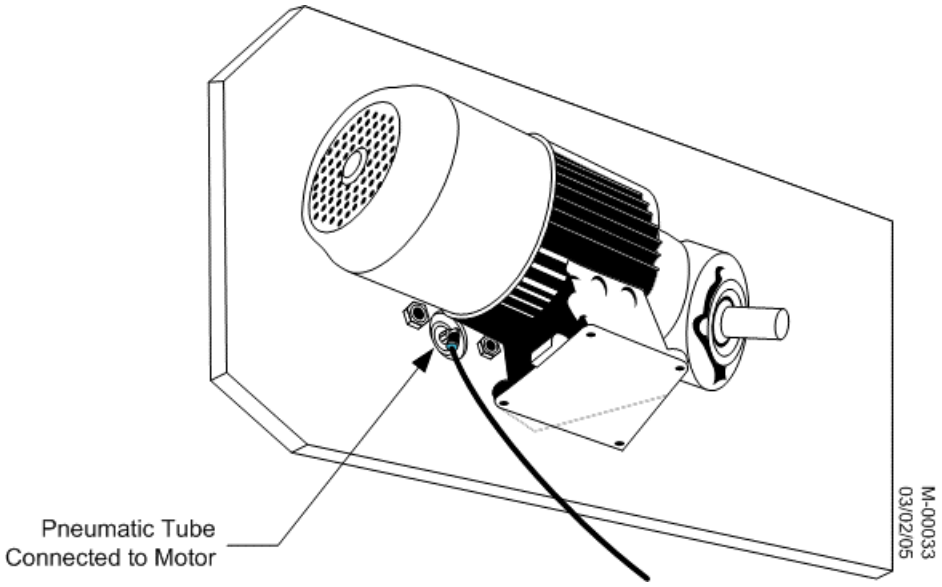

Figure 2-18: Pneumatic Tube on Drum Shaft

2. Connect the pneumatic tube to the press-in fitting within the Control Box. See Figure 2-19.

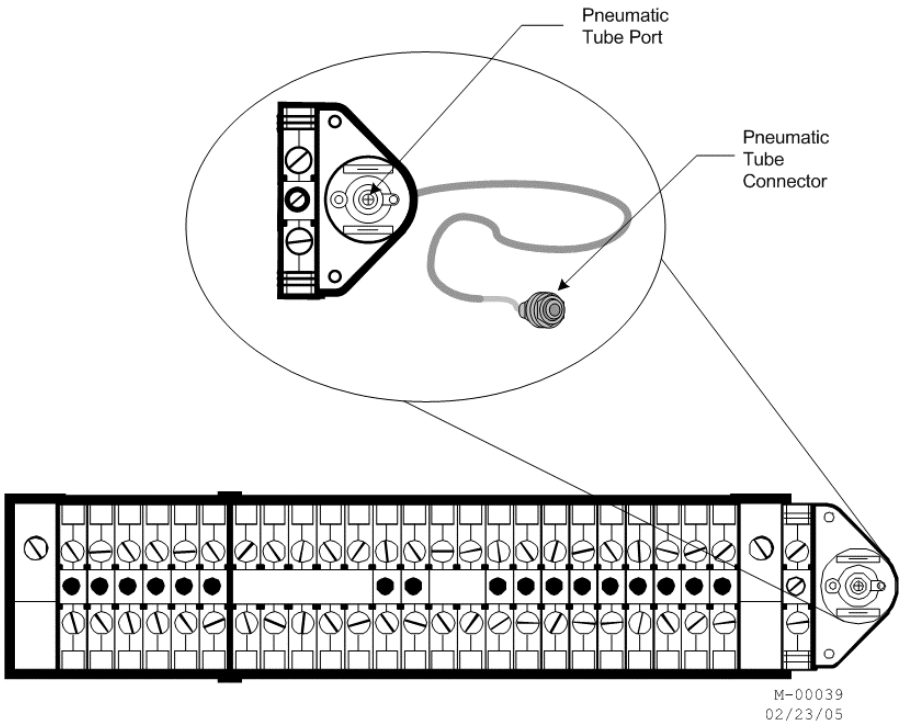

Figure 2-19: Pneumatic Tube Connection in Control Box

Chapter 3: DYNALOGIX (DY2000)

3.1. Specifications

The DYNALOGIX (DY2000) monitors all operations of the door. You use this device to:

- Define the automatic close timers,
- Monitor and troubleshoot the input connections,
- Interpret and correct any malfunctions or alarms.

Note: The door will not run until the DYNALOGIX display reads **rEAdy.**

3.1.1. Controls

Figure 3-1 illustrates the controls located on the DYNALOGIX control box.

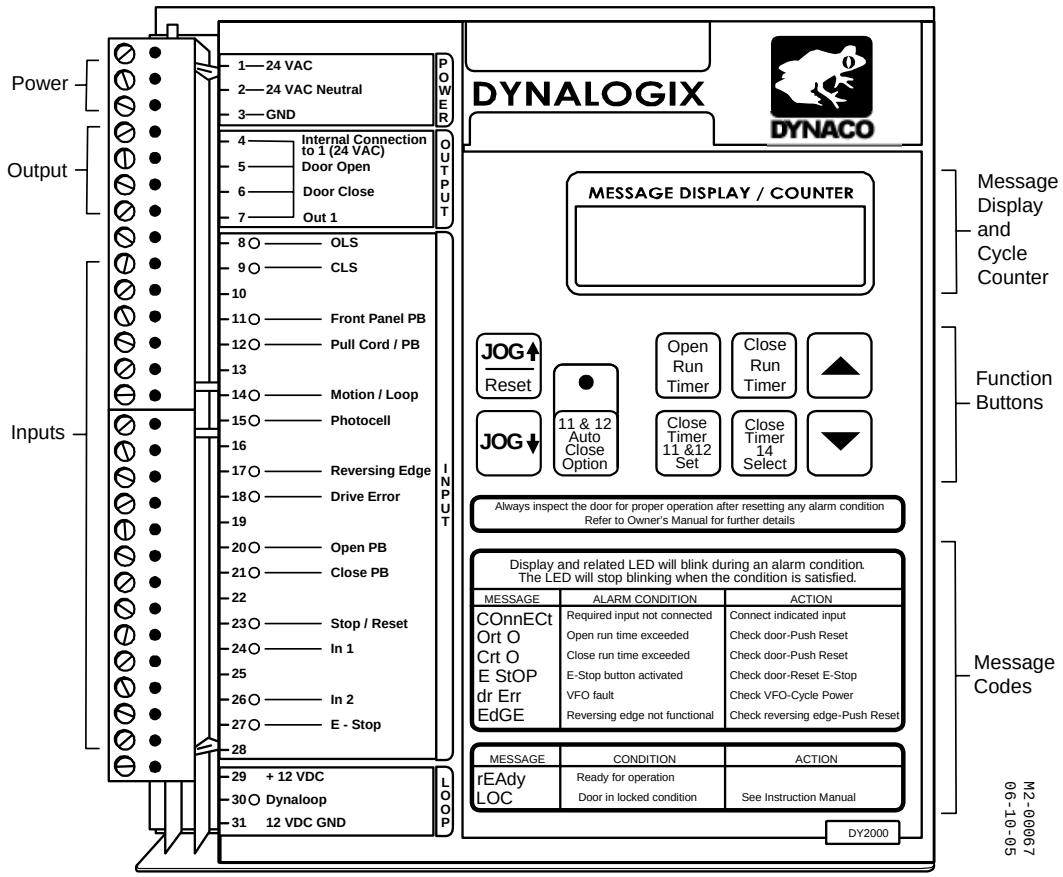

Figure 3-1: DYNALOGIX Controls

Table 3-1 describes the DYNALOGIX buttons and controls.

Table 3-1: DYNALOGIX Controls

Control	*Function*
JOG Buttons	Moves the door up and down. The door moves while the button is depressed and stops as soon as it is released. The **JOG**⇧ button also acts as the **RESET** button. Press this button after the Open or Close Run Timer goes to zero, an Edge Error occurs, or a Drive Error occurs.
Open Run Timer	Begins a countdown as the door opens. In the event that the door becomes stuck and does not reach the open limit setting by the time the countdown reaches 0, the DYNALOGIX shuts down the motor. (Press the RESET button to reset the DYNALOGIX.) Press this button once to display the Open Run Timer's current time setting. Use the up and down buttons to change the setting.
Close Run Timer	Begins a countdown as the door closes. In the event that the door becomes stuck and does not reach the close limit by the time the countdown reaches 0, the DYNALOGIX shuts down the motor. (Press the RESET button to reset the DYNALOGIX.) Press this button once to display the Close Run Timer's current time setting. Use the up and down buttons to change the setting. The DYNALOGIX automatically saves changes when the display changes.
Close Timer 11 & 12 / Set	Controls the automatic close timer for push button or pull cord operation of the door. It begins its countdown as soon as the door reaches the open limit setting. Press this button once to display its current settings. Use the up and down arrows to adjust the timer.
11 & 12 Auto Close Option	Turns the Automatic Close option on and off (set by the Close Timer 11 & 12 button). If the LED is lit, the door will automatically close after "x" seconds. If the LED light is not lit, an operator must manually press the push button or pull the pull cord to close the door.
Close Timer 14 / Select	Controls the automatic close timer for motion loop sensor operation of the door. Press this button once to display its current settings. Use the up and down arrows to adjust the time.

Note: The DYNALOGIX automatically saves changes when the display changes.

3.1.2. Messages

Table 3-2 describes the DYNALOGIX display messages.

Table 3-2: DYNALOGIX Messages

Message	***Cause***
rEAdY or #	All required connections are correct and the door is ready for operation. A number displayed is the cycle counter.
LOC	The door is in a lockout condition. Typically indicates an airlock condition.
COnnECt	One of the required terminal connections is loose or missing. The DYNALOGIX will light up the LED of the connection in question. Refer to the description next to the LED to determine which specific component is causing the error.
Ort 0	The open run time timer reached 0. This is usually caused by an obstruction somewhere that stops the door from reaching the open limit setting (full open). When the open run timer reaches 0 the DYNALOGIX shuts down the motor. Once you have determined the cause and made corrections, press the **JOG ⇧/RESET** button.
Crt 0	The close run time timer reached 0. This is usually caused by an obstruction somewhere that stops the door from reaching the close limit setting (full close). When the close run timer reaches 0 the DYNALOGIX shuts down the motor. Once you have determined the cause and made corrections, press the **JOG ⇧/ RESET** button.
E StOP	The **E Stop** button was pressed. Confirm that everything is ok with the door and then twist the **E Stop** button to release the E Stop function.
drErr	A drive error occurred.
EdGE	The pneumatic switch may be malfunctioning. Check it for sensitivity and proper operation.

3.2. Electrical Installation

Warning: Ensure that the power supply shipped with the door is compatible with the transformer, motor and inverter.

Frequency Inverter Voltage Range:

575 V = 3 Phase

480 V = 3 Phase

230 V = 1 to 3 Phase

208 V = 1 to 3 Phase

Failure to ensure compatible power supply may result in fire and will damage the door.

Caution: Ensure that the electrical installation for this door complies with the National Electrical Code (NEC) and/or your local electrical code.

Caution: Refer to the electrical schematic shipped with the door for appropriate circuit protection.

3.2.1. Make the Primary Connections

1. Connect the incoming power. Run the wires (conduit) through the ***bottom*** of the Control Box, up the left side, and connect them into the top of the fused disconnect. See Figure 3-2.

   - For a 3-phase unit, use terminals L1, L2, and L3.
   - For a 1 or 2-phase unit use terminals L1 and L2.

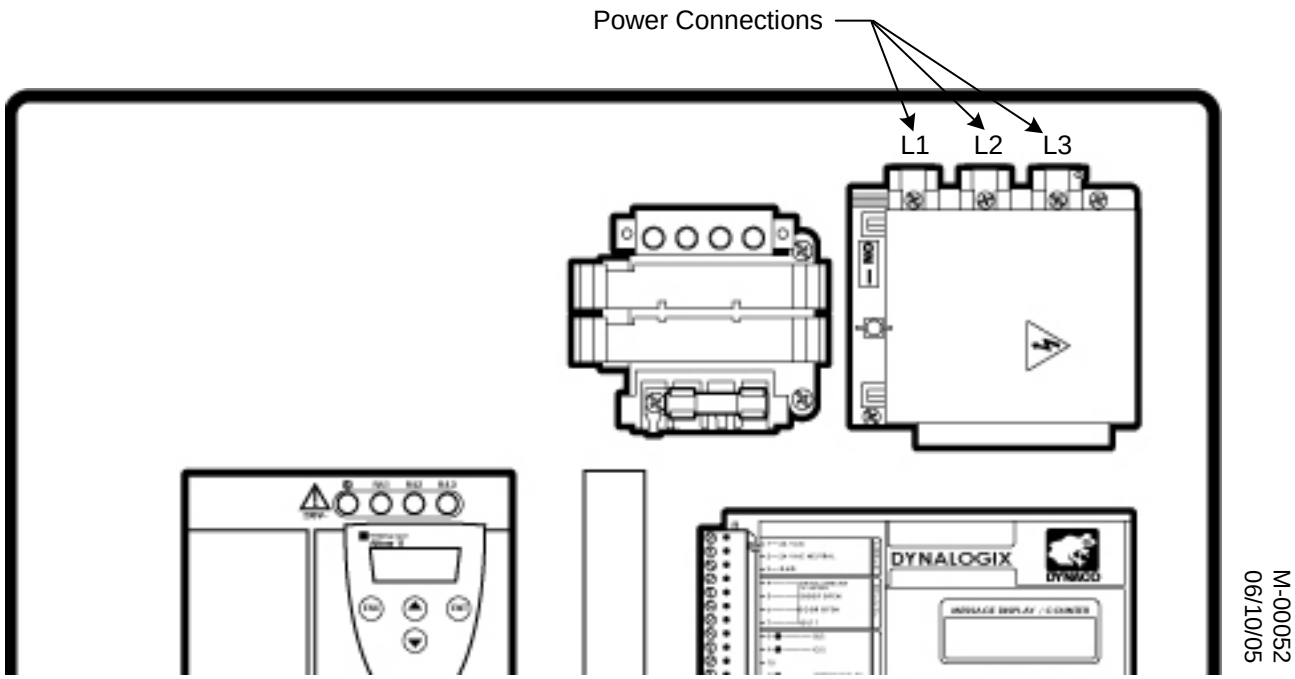

Figure 3-2: Power Connections in Control Box

2. Connect the grounding wire (ground wires and shield wire) to the ground terminals. See Figure 3-3.

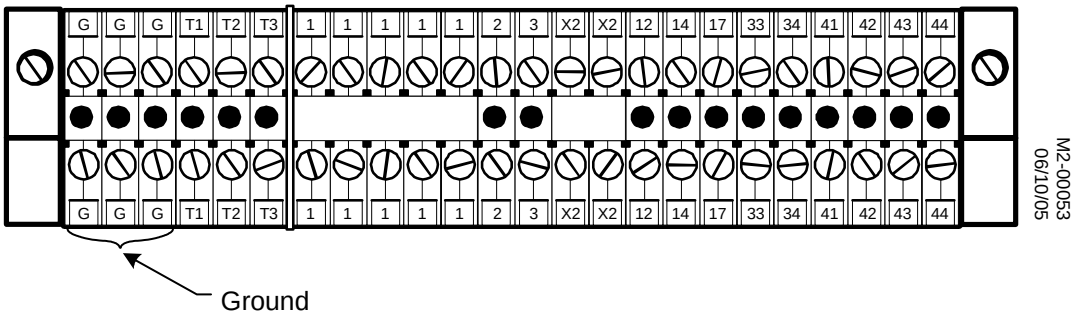

Figure 3-3: Ground Connection on Terminal Block

3. Connect the motor wires (black) to terminals T1, T2, and T3. See Figure 3-4.

Warning: Use only the motor cable provided. Do not splice the cable. Doing so will void the warranty.

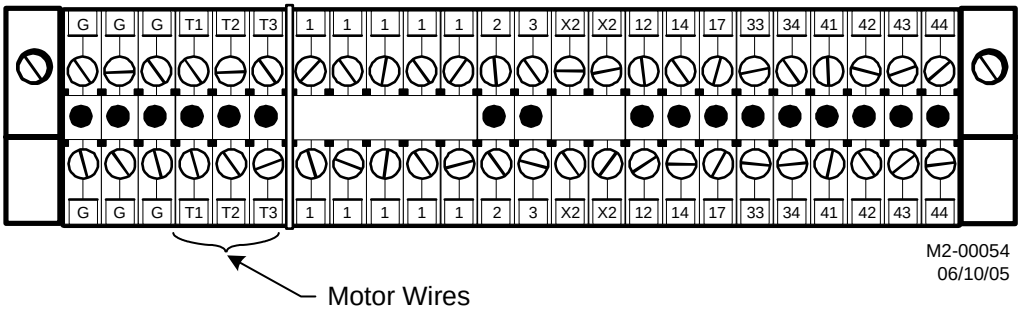

Figure 3-4: Motor Wire Connections on Terminal Block

4. Connect the photo-eye wiring to the terminal block. See Figure 3-5.

- Connect the white wire in the grey transmitter cable to terminal 41.
- Connect the shielded wire in the grey transmitter cable to terminal 42.
- Connect the white wire in the black receiver cable to terminals 43.
- Connect the shielded wire in the black receiver cable to terminal 44.

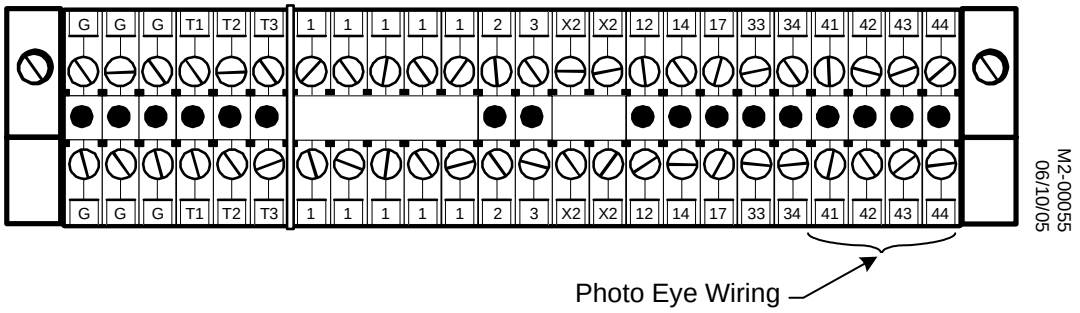

Figure 3-5: Photo Eye Connections on Terminal Block

5. Plug the photo eye amplifier into the 11-pin socket. See Figure 3-6

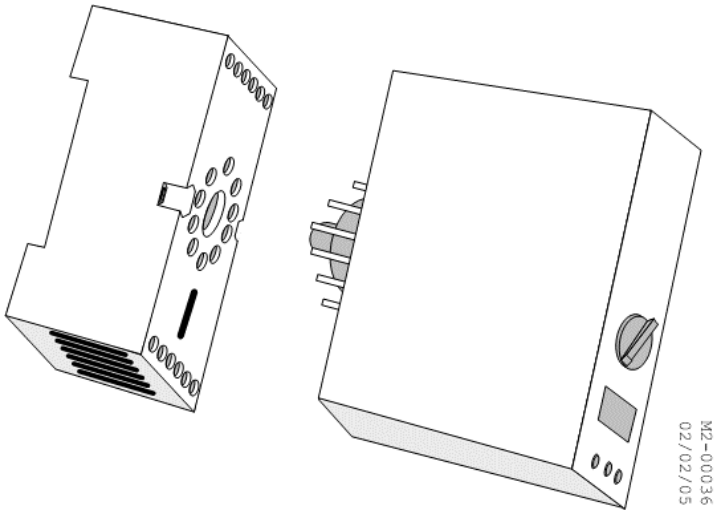

Figure 3-6: 11 Pin Socket for Photo Eye Amplifier

6. Set up the amplifier. See Section 3.3.3: Adjust the Photocell Sensitivity for details.

3.2.2. Make the Encoder Connections

1. Insert the wires into the green connector as listed below. (Terminals are ordered left to right.) See Figure 3-7.

- Shielded = terminal 1
- White = terminal 2
- Black = terminal 3
- Red = terminal 4
- Green = terminal 5

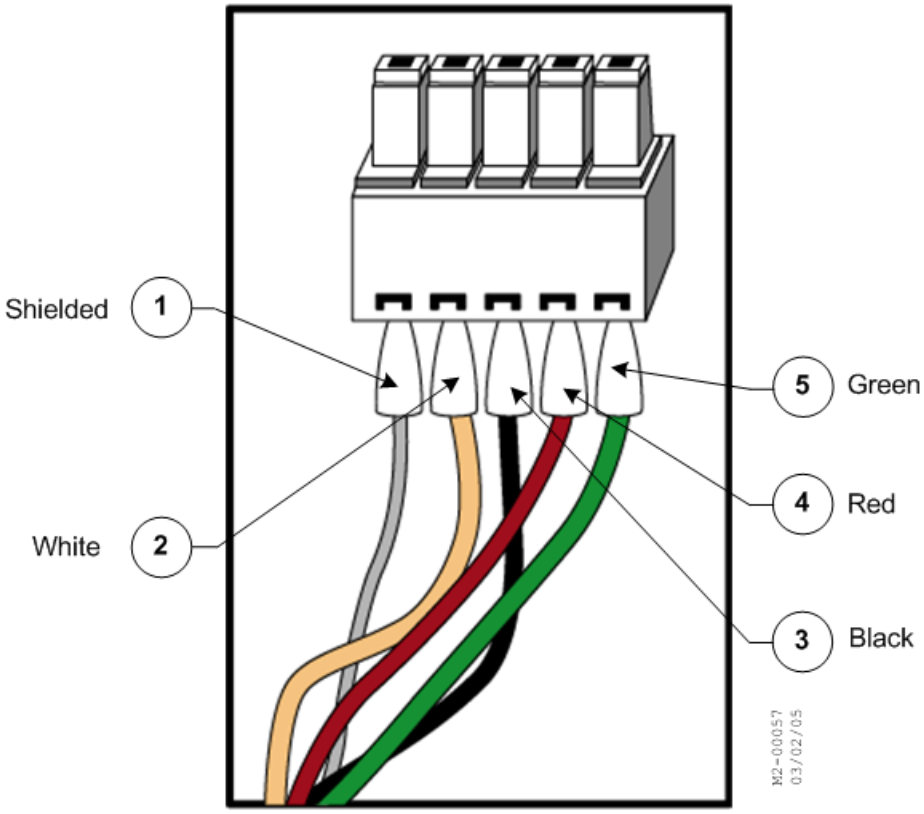

Figure 3-7: Wiring the Green Connector

Warning: Use only the provided cables. Do not splice the cables. Doing so will void the warranty.

2. Insert the green connector into the Dynacoder (DY3000) . See Figure 3-8.

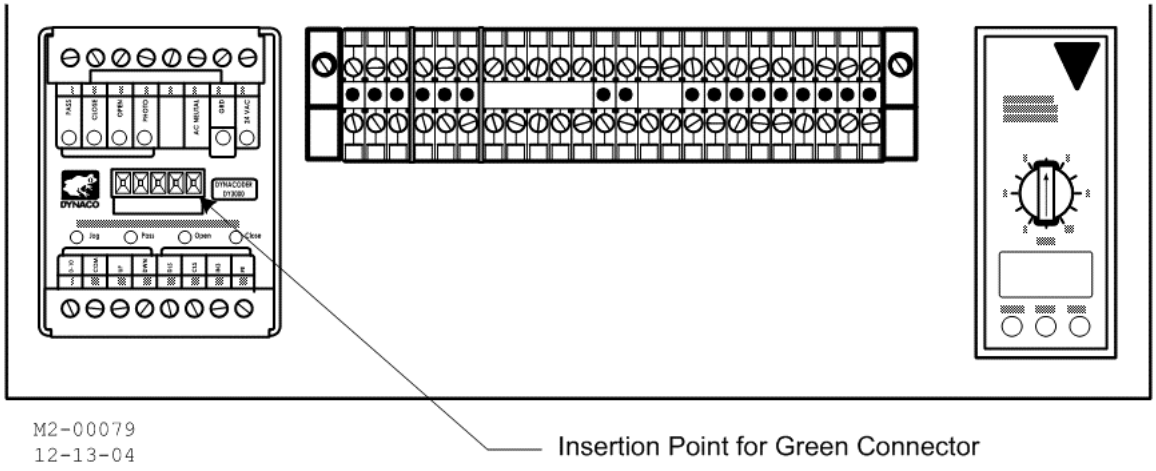

Figure 3-8: Insertion Point for Green Connector

3.2.3. Run Wire for Accessories

Run the wiring for the activation accessories but do not connect them. See the appropriate appendices in this manual for wiring. Connect the activation accessories after the DYNACO installer has finalized the door.

3.2.4. Power the Door

Turn on the main disconnect by rotating it clockwise. See Figure 3-9.

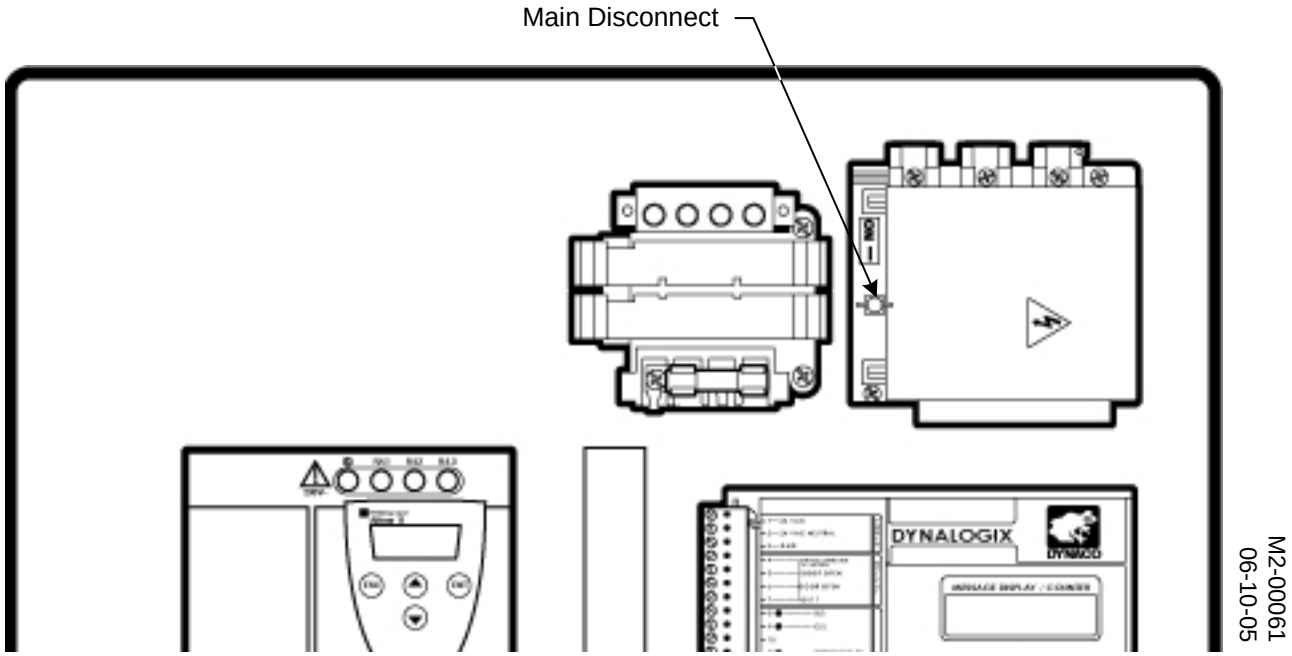

Figure 3-9: Main Disconnect

The display will show one of the following messages:

- Ready
- Connect
- Cycle Counter

The DYNALOGIX display should read “rEAdY.” If the DYNALOGIX display reads COnnECt then twist and release the Emergency Stop button located on the front panel of the Control Box. See Chapter 5: Troubleshooting for more information on how to find and eliminate problems.

3.3. Final Checks and Verification

Finalizing the door includes setting the door's open and close limits, ensuring that the door works properly, and connecting the activation accessories.

Note: An electrician should connect the accessories to the terminal block if possible.

Before you begin:

- Verify that the wiring is properly connected and the Control Box has power.
- Confirm that the connections are properly grounded.
- Confirm that the three cable connections are positioned in their terminal slots correctly. (Photo Eyes, Dynacoder (DY3000), Reversing Edge)

3.3.1. Set the Door Limits

The Dynacoder (DY3000) controls and monitors the curtain's open and closed position. Once you set the open and closed limits, test the door to ensure that it is working properly.

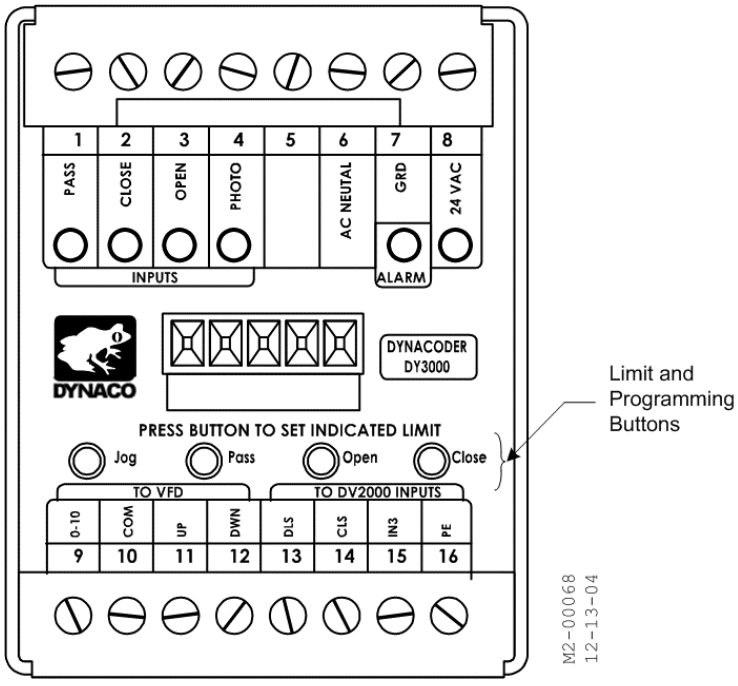

Figure 3-10: Dynacoder with Limit & Programming Buttons

1. Enter the Dynacoder ’s programming mode.

   a. Press and hold the **JOG** button for 4 seconds.

      Note: The **JOG** buttons referenced on this page are the buttons located on the Dynacoder. Do ***not*** use the **JOG** buttons on the DYNALOGIX to set the door limits.

   b. While pressing the **JOG** button, press and release the **PASS** button. (Release the **JOG** button simultaneously as you release the **PASS** button.)

   When the red and green LED indicators flash alternately the Dynacoder is in the program mode.

2. Set the close limit position. (This is the base/reference position and must be set before you set the open position.)

   a. While pressing the **JOG** button, press and release the **CLOSE** button - moving the door into the desired closed position. (The **JOG** button allows you to move the door at a reduced speed.)

      Note: If the door moves in the direction opposite of what you expected, stop and review the "Verify Rotation of the Motor" section of this chapter.

   b. Release the **JOG** button. Wait one second and then press and release the **CLOSE** button. (This step sets the close limit.)

      - If the close limit has been set successfully, the green LED flashes four times.
      - If the close limit was not set successfully, the red LED flashes four times. See Table 5-1 for other LED indicators.

3. Set the open limit position.

   a. While pressing the **JOG** button, press and release the **OPEN** button - moving the door into the desired open position.

      Note: The door's open limit should be set about one inch above the re-introduction point. See Figure 3-11.

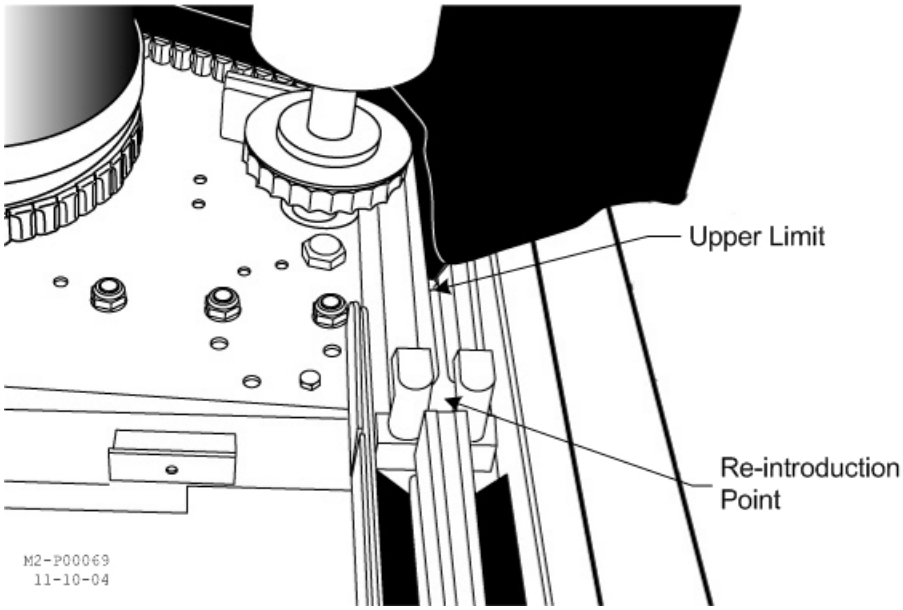

Figure 3-11: Re-introduction Point and Upper Limit

b. Release the **JOG** button. Wait one second and then press and release the **OPEN** button. (This step sets the open limit.)

- If the open limit has been set successfully, the green LED flashes four times.
- If the open limit was not set successfully, the red LED flashes four times. See Table 4-1 for other LED indicators.

4. While pressing the **JOG** button (for four seconds), press and release the **PASS** button to exit programming mode. When the red and green LED indicators stop flashing exit is complete.

5. Reset the DYNOLOGIX by pressing and releasing the **JOG**⇧ button.

6. Test the upper and lower limits by pressing the **JOG** buttons on the DYNALOGIX.

3.3.2. Verify the Rotation of the Motor

This step ensures that the motor connections are terminated into the correct slots.

1. Switch the main switch located on the cover of the Control Box to the **OFF** position.

2. Swap any two of the motor leads on the terminal box. See Figure 3-12.

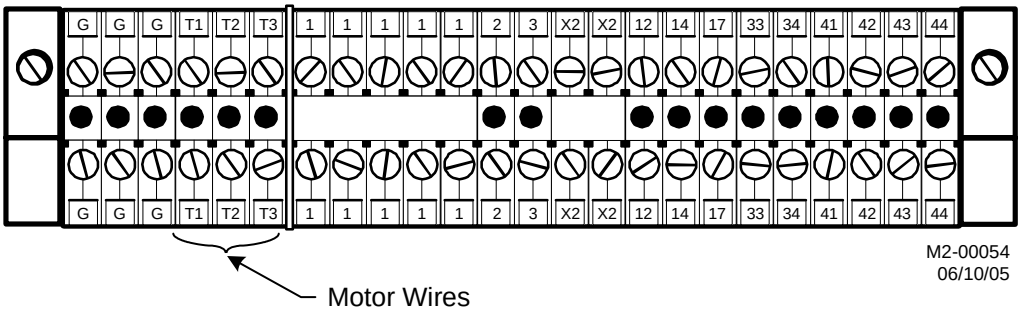

Figure 3-12: Connections for Motor Wires on Terminal Block

3. Switch the main switch located on the cover of the Control Box to the **ON** position.

4. Return to Section 3.1 and continue with setting the limits.

3.3.3. Adjust the Photocell Sensitivity

1. Verify that the transmitter and receiver are aligned with each other, and that the surface of each is clean. Both photo eyes must be mounted flush to the side guides.

2. Confirm that the wiring of the transmitter and receiver is properly connected to the Control Box.
- Transmitter (grey cable) to terminals 41 and 42
- Receiver (black cable) to terminals 43 and 44

4. Adjust the sensitivity of the amplifier by turning the Sensitivity Adjustment knob and the two dipswitches. See Figure 3-13.

Note 1: The left-hand dipswitch controls the range of sensitivity. When it is in the up position the photocell is sensitive up to 50 feet. When it is in the down position, it is sensitive up to 16 feet. The adjustment knob controls the sensitivity within these two ranges.

Note 2: The normal adjustment knob setting is between 2 and 4 with the left dipswitch in the up position.

Note 3: When amplifier is working normally, all LEDs are lit.

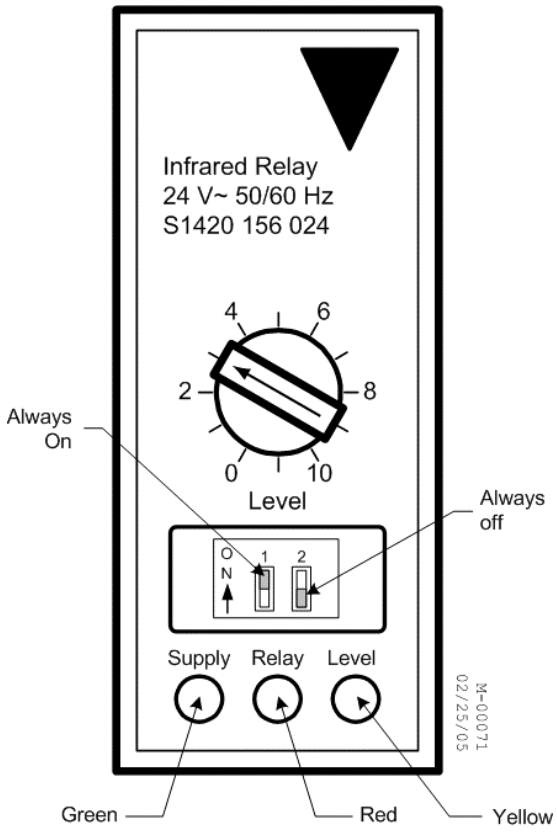

Figure 3-13: Photocell Amplifier

3.3.4. Adjust Reversing Edge Detector Sensitivity

1. Ensure that both ends of the pneumatic tube are properly connected. See Section 2.7: Connect Pneumatic Tube for detailed instructions.

2. Close the door.

3. Slowly turn the adjustment screw on the pneumatic sensor clockwise until the red light on the DYNALOGIX comes on. See Figure 3-14.

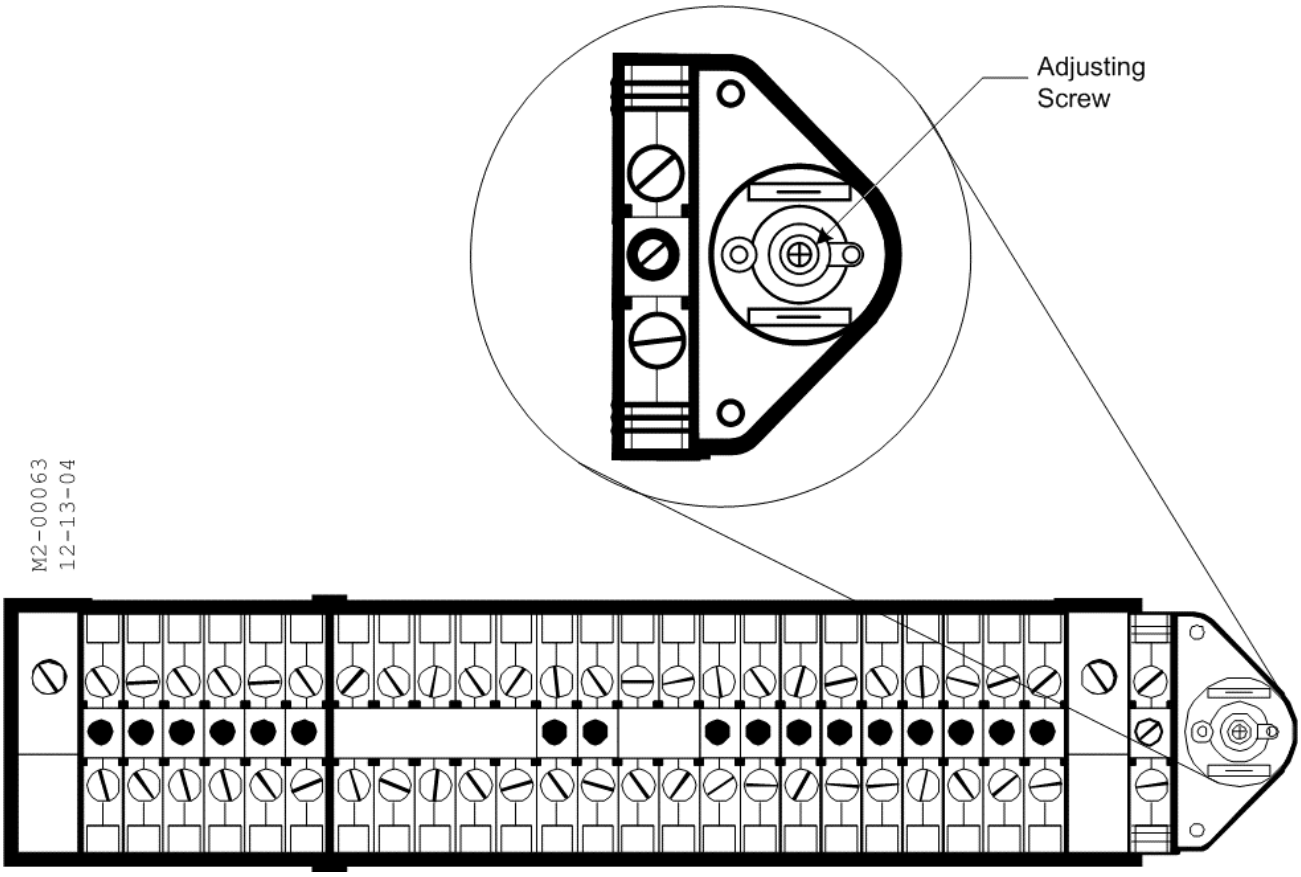

Figure 3-14: Pneumatic Sensor with Adjustment Screw

4. Slowly turn the adjustment screw in the reverse direction (counter clockwise) until the red light extinguishes (usually about 1/4 turn).

5. Open and close the door to test the sensitivity making additional adjustments as necessary.

3.3.5. Install and Test Activation Accessories

See the appendices of this manual and/or the accessory's documentation from the manufacturer for installation instructions. Activation accessories include but are not limited to:

- Motion Sensors
- Magnetic Loop
- Pull Cords
- Additional Open/Close buttons
- Remote Control Activation

Caution: Install, connect, and then test each of the activation accessories individually before proceeding to the next accessory. This allows troubleshooting of each component individually.

3.3.6. Set Automatic Timers

The DYNALOGIX allows you to set two automatic close timers. The first sets a count down timer that closes the door after either the **OPEN** button or Pull Cord is used to open the door. The second sets a count down timer that closes the door when the door is opened by a triggering of the motion detector or loop. These timers have a default setting of 1 second.

The DYNALOGIX monitors and controls the function of the door. Should anything go wrong, such as a bad / missing connection or stuck door, the DYNALOGIX displays an error message on its LCD panel or LED indicators.

3.3.7. Set Close Timer 14

Automatic Close Timer 14 activates a countdown timer when a motion or loop detector is used with your DYNACO door.

1. Press the **CLOSE TIMER 14** button on the DYNALOGIX controller. The current countdown time displays in the LCD. See Figure 3-15.

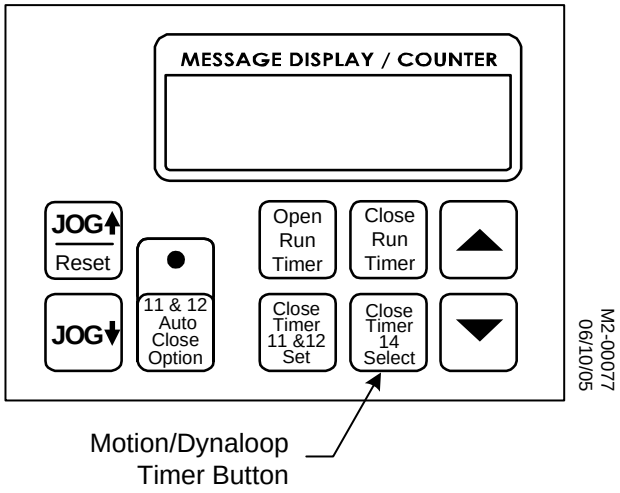

Figure 3-15: Auto Close Timer Setting

2. Use the **UP** and **DOWN** arrow buttons to change the countdown time to the desired duration. The DYNALOGIX will automatically save any changes that you make. See Figure 3-16.

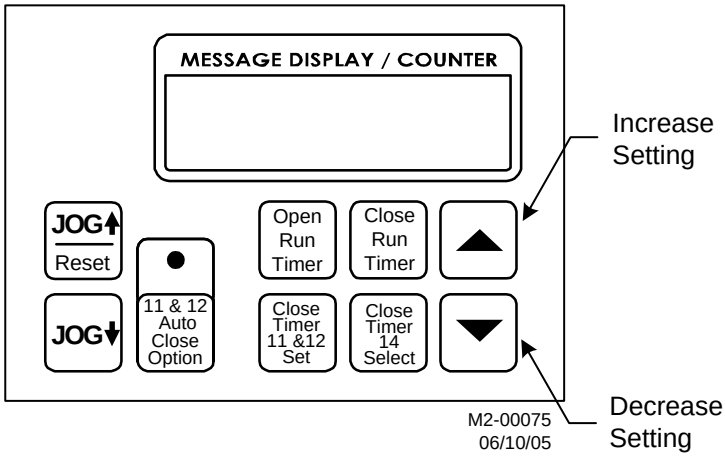

Figure 3-16: Raise/Lower Countdown Timer

The LCD display remains on for few seconds. If no action is taken during that time, the LCD display reverts to **rEAdY** or the cycle counter.

3.3.8. Set Close Timer 11 & 12

Automatic Close Timer 11 & 12 activates a countdown timer after you use the front panel **OPEN** button or the Pull Cord to open the door.

1. Press the **CLOSE TIMER 11 & 12** button on the DYNALOGIX controller. The current countdown time displays in the LCD. See Figure 3-17.

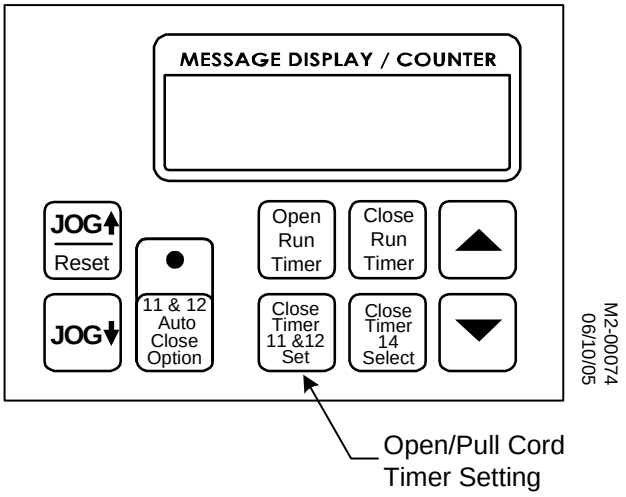

Figure 3-17: Auto Close Timer Setting

2. Use the **UP** and **DOWN** arrow buttons to change the countdown time to the desired duration. The DYNALOGIX will automatically save any changes that you make. See Figure 3-18.

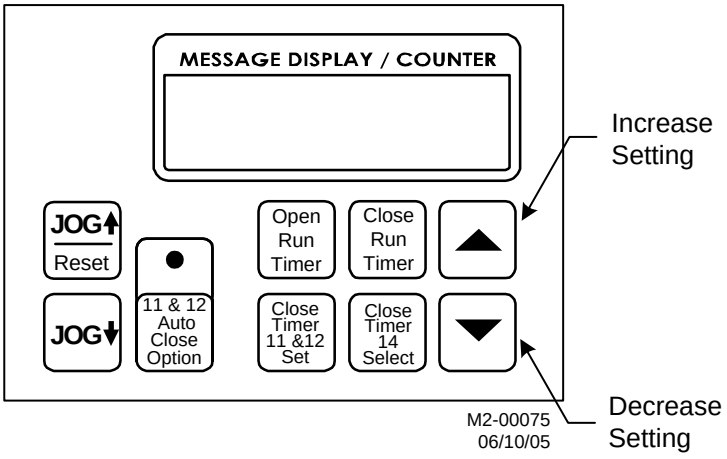

Figure 3-18: Raise/Lower Countdown Timer

The LCD display remains on for a few seconds. If no action is taken during that time, the LCD display reverts to **rEAdY** or the cycle counter.

3. Press the **11 & 12 Auto Close Option** button. The light on the Auto Close option shines. This indicates that the Auto Close option is now active. See Figure 3-19.

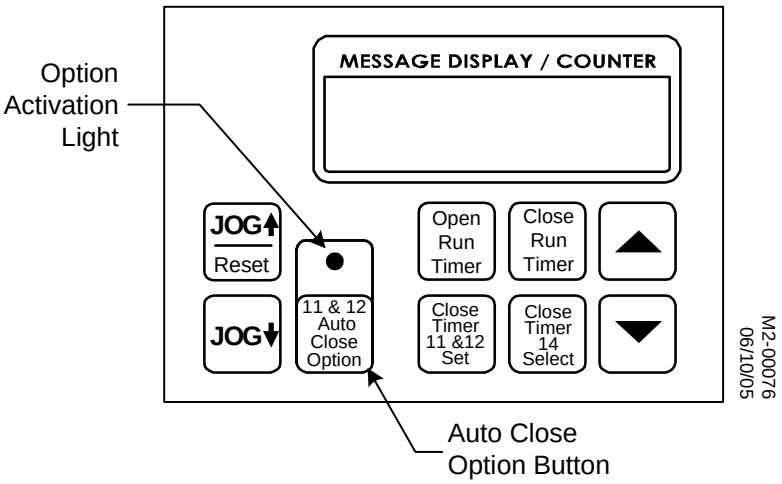

Figure 3-19: Auto Close Option Button

Note: You can deactivate the Auto Close option by pressing the button again.

3.3.9. Set the Open and Close Run Timers

The Open Run Timer and Close Run Timer act as a failsafe to prevent the door from running continuously when the open or close limit switches fail to shut down the motor. These two timers should be set for a period that exceeds the duration of a full open or close cycle (from fully closed to fully open and vice versa).

1. Press the **OPEN RUN TIMER** button on the DYNALOGIX controller. The current countdown time displays in the LCD. See Figure 3-20.

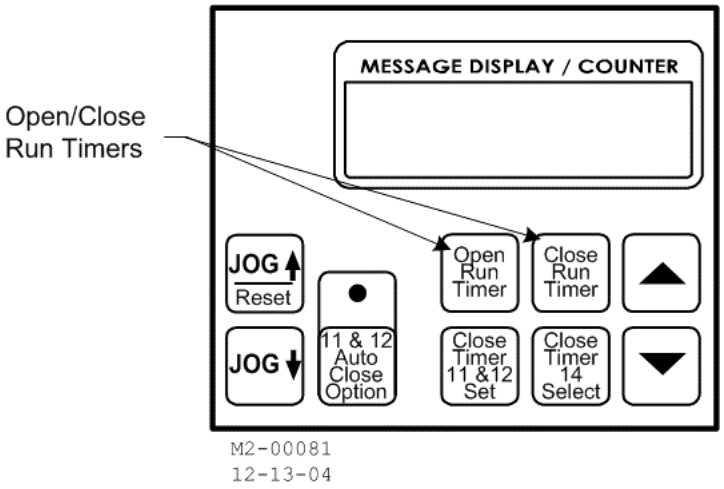

Figure 3-20: Auto Close Timer Setting

2. Use the **UP** and **DOWN** arrow buttons to change the countdown time to the desired duration. The DYNALOGIX will automatically save any changes that you make. See Figure 3-21.

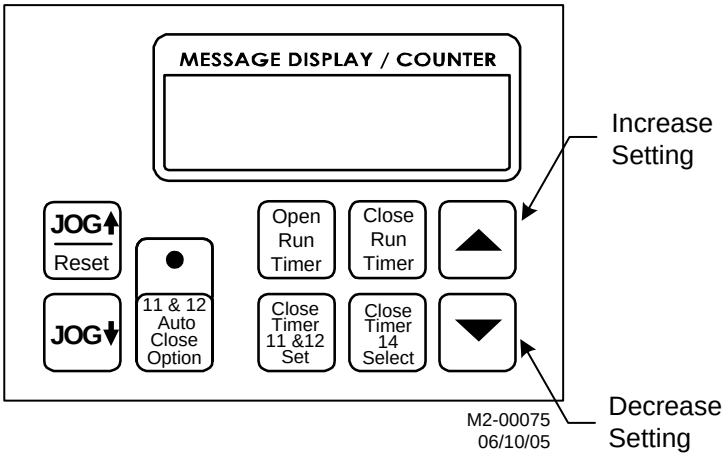

Figure 3-21: Raise/Lower Countdown Timer

The LCD display remains on for a few seconds. If no action is taken during that time, the LCD display turns off and retains the displayed setting.

3. Repeat steps 1 and 2 to set the Close Run Timer.

3.3.10. Install Covers

As a final step, ensure that all covers are installed on the door.

- Motor
- Drum
- Counterweight
- Side-guides

3.3.11. Set Photo-Eye Disable Position

CAUTION: This procedure should only be used if photo-eye disable position is not set properly from the manufacturer or photo-eye position has changed after the door has left the manufacturer.

1. Press the **JOG** buttons to move the door to the desired position.

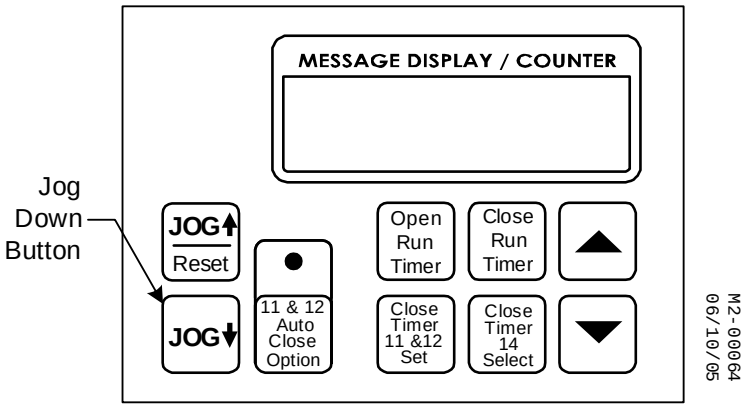

Figure 3-22: Raise/Lower Door

2. Press and hold the Dynacoder **Close** button for 3 seconds.

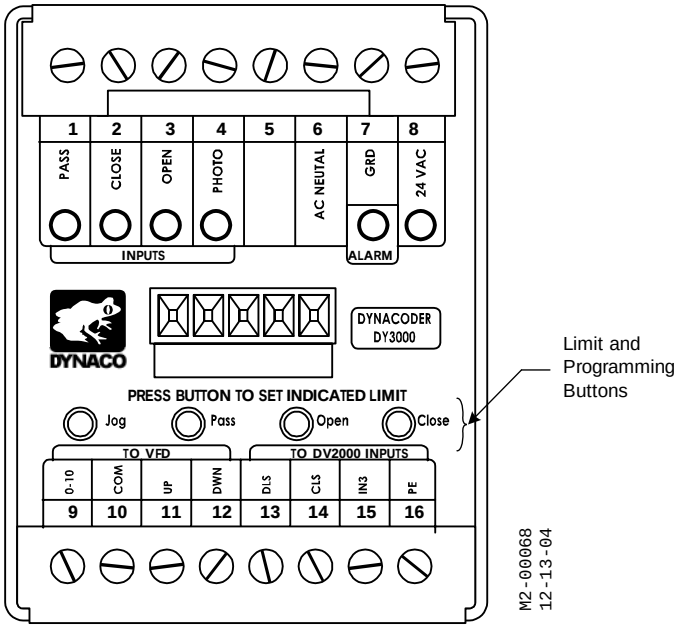

Figure 3-23: Raise/Lower Door

3. Press and release the Dynacoder **Open** button.
The green LED indicator will flash four times to indicate success.

Chapter 4:Chapter 4: DYNALOGIX II (DY 4000)

4.1. Specifications

The DYNALOGIX II (DY4000) monitors all operations of the door. You use this device to:

- Define the automatic close timers,
- Monitor and troubleshoot the input connections,
- Interpret and correct any malfunctions or alarms.

Note: The door will not run until the DYNALOGIX II display reads **Ready.**

4.1.1. Controls

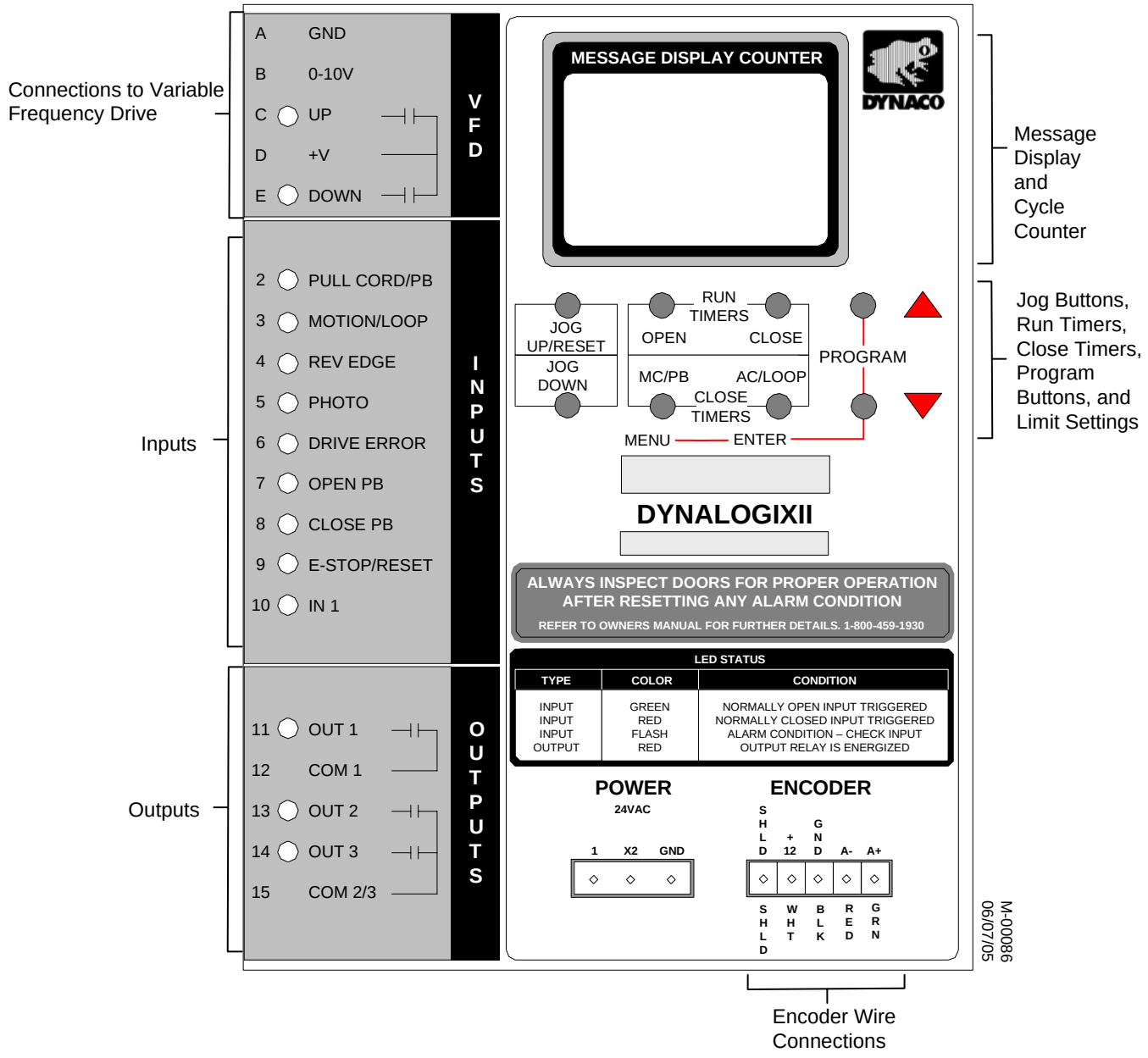

Figure 4-1: DYNALOGIX II Controls and Connections

4.1.2. Messages

Table 4-1 describes the messages that the DYNALOGIX II displays.

Table 4-1: DYNOLOGIX II Messages

Message	***Cause***
Ready ###	All required connections are correct and the door is ready for operation. The number indicates the cycle counter. The DYNALOGIX II will not allow the door to operate unless this message displays.
Drive Error	A drive error occurred. Check drive display for error code.
Rev - Edge Tripped	The reversing edge is staying or was activated. Check pneumatic switch for proper operation.
Opening Expired	The open run time timer expired. This is usually caused by an obstruction somewhere that stops the door from reaching the open limit setting (full open). To prevent motor burn out, when the open run timer reaches 0 the DYNALOGIX II shuts down the motor. Once you have determined the cause and made corrections, press the **JOG ⇧/RESET** button.
Closed Expired	The close run time timer expired. This is usually caused by an obstruction somewhere that stops the door from reaching the close limit setting (full close). To prevent motor burn out, when the close run timer reaches 0 the DYNALOGIX II shuts down the motor. Once you have determined the cause and made corrections, press the **JOG ⇧/ RESET** button.
SET LIMITS	The limits have not been set. Set limits (see Secton 4.3.1: Set the Door Limits for instructions.)
ENCODER COM_LOSS	Lost encoder feedback. Check if the encoder is connected and wired correctly.

4.2. Electrical Installation

Warning: Ensure that the power supply shipped with the door is compatible with the transformer, motor and inverter.

Frequency Inverter Voltage Range:

575 V = 3 Phase

480 V = 3 Phase

230 V = 1 to 3 Phase

208 V = 1 to 3 Phase

Failure to ensure compatible power supply may result in fire and will damage the door.

Caution: Ensure that the electrical installation for this door complies with the National Electrical Code (NEC) and/or your local electrical code.

Caution: Refer to the electrical schematic shipped with the door for appropriate circuit protection.

4.2.1. Make the Primary Connections

1. Connect the incoming power. Run the wires (conduit) through the ***bottom*** of the Control Box, up the left side, and connect them into the fused disconnect. See Figure 4-2.

   - For a 3-phase unit, use terminals L1, L2, and L3.
   - For a 1 or 2-phase unit use terminals L1 and L2.

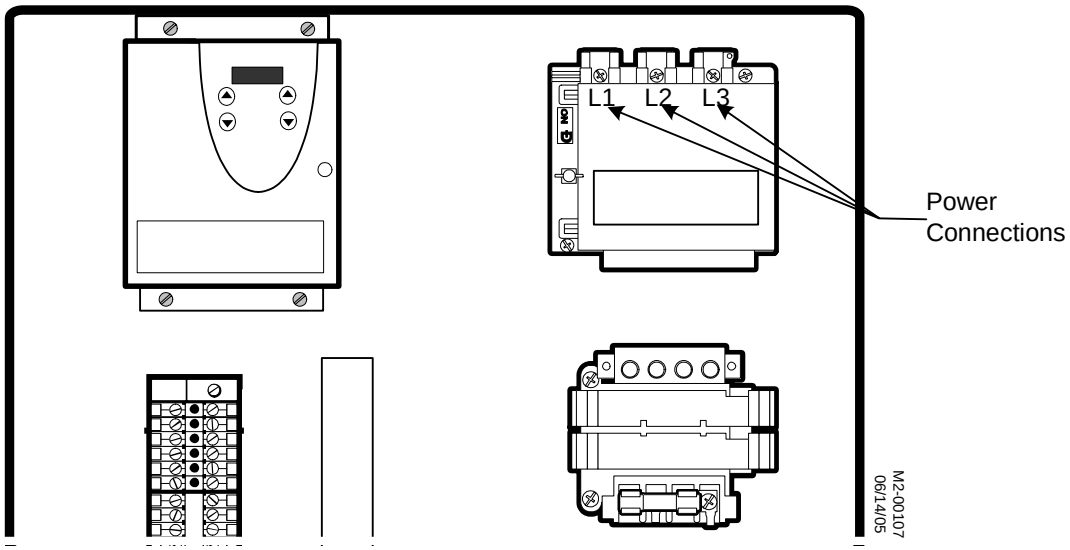

Figure 4-2: Power Connections in Control Box

5. Connect the grounding wire (ground wires and shield wire) to the ground terminals. See Figure 4-3.

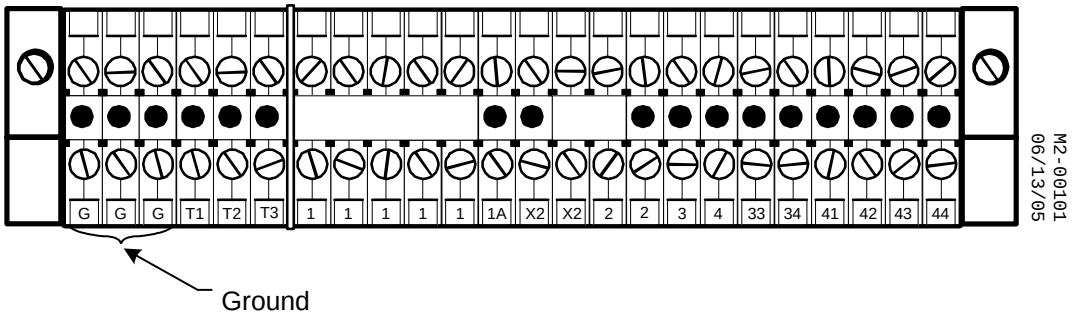

Figure 4-3: Ground Connection on Terminal Block

4. Connect the motor wires (black) to terminals T1, T2, and T3. See Figure 4-4.

Warning: Use only the motor cable provided. Do not splice the cable. Doing so will void the warranty.

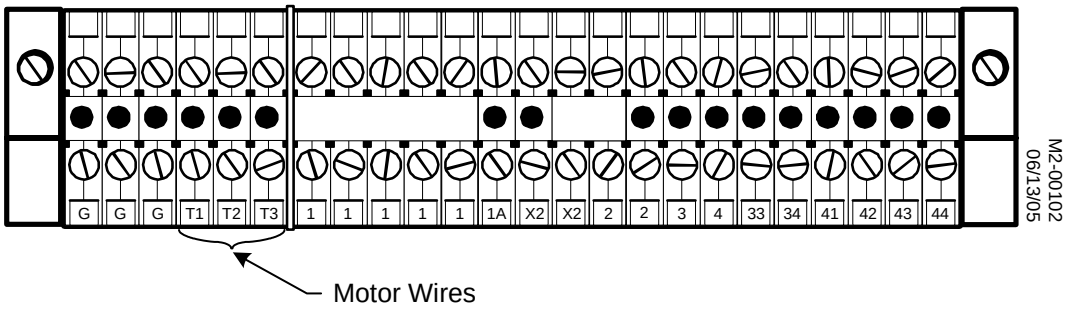

Figure 4-4: Motor Wire Connections on Terminal Block

4. Connect the photo-eye wiring to the terminal block. See Figure 4-5.

   - Connect the white wire in the grey transmitter cable to terminal 41.
   - Connect the shielded wire in the grey transmitter cable to terminal 42.
   - Connect the white wire in the black receiver cable to terminals 43.
   - Connect the shielded wire in the black receiver cable to terminal 44.

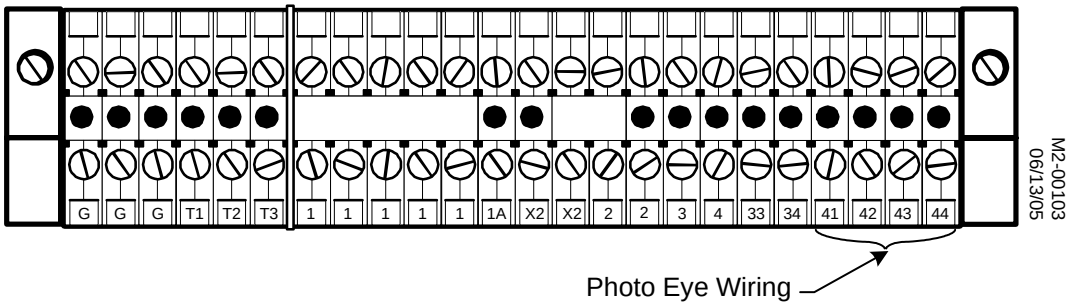

Figure 4-5: Photo Eye Connections on Terminal Block

5. Plug the photo eye amplifier into the 11-pin socket. See Figure 4-6

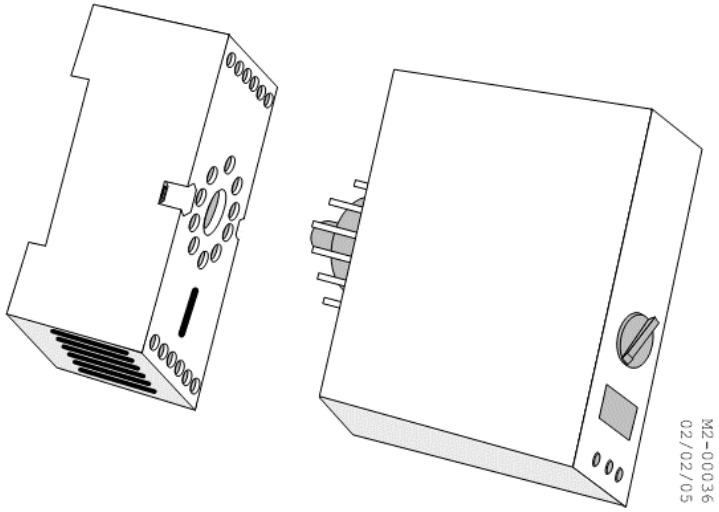

Figure 4-6: 11 Pin Socket for Photo Eye Amplifier

6. Set up the amplifier. See Section 3.3.3: Adjust the Photocell Sensitivity for details.

4.2.2. Make the Encoder Connections

1. Insert the wires into the green connector as listed below. (Terminals are ordered left to right.) See Figure 4-7.

- Shielded = terminal 1
- White = terminal 2
- Black = terminal 3
- Red = terminal 4
- Green = terminal 5

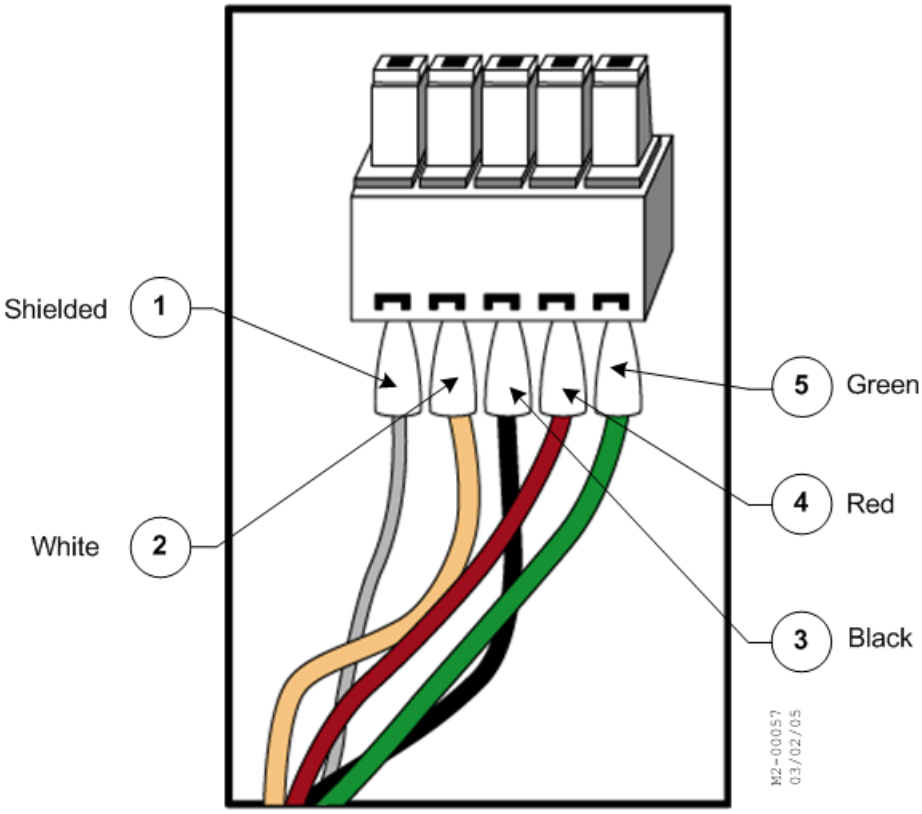

Figure 4-7: Wiring the Green Connector

2. Insert the green connector into the DYNALOGIX II. See Figure 4-8.

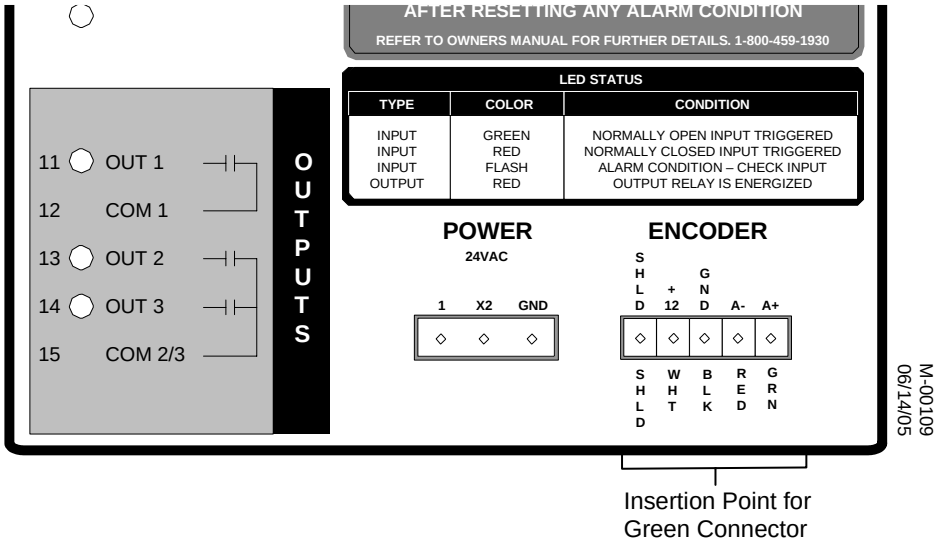

Figure 4-8: Insertion Point for Green Connector

4.2.3. Run Wire for Accessories

Run the wiring for the activation accessories but do not connect them. See the appropriate appendices in this manual for wiring. Connect the activation accessories after the DYNACO installer has finalized the door.

4.2.4. Power the Door

Turn on the main disconnect by rotating it clockwise. See Figure 4-9.

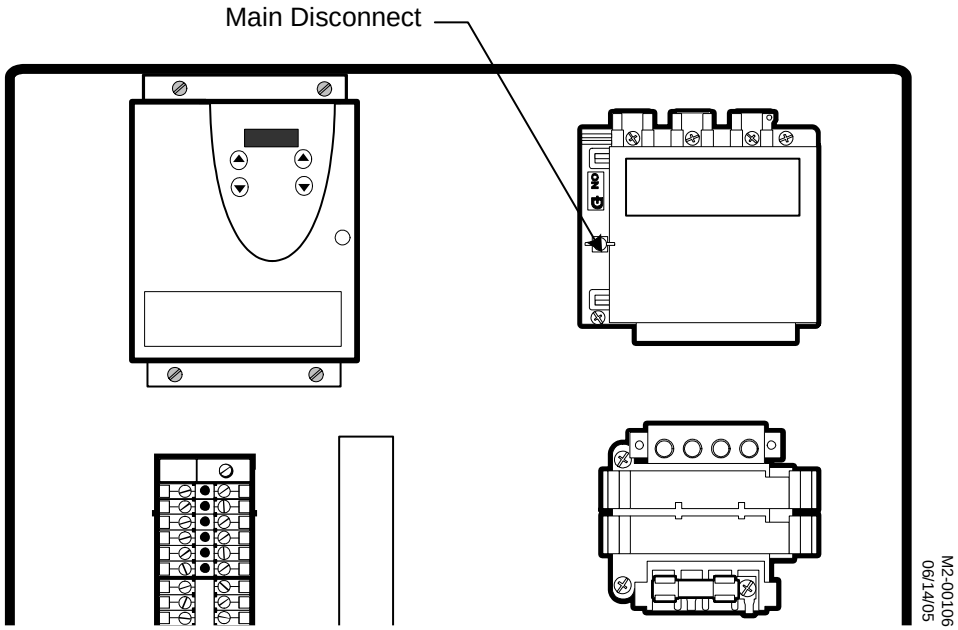

Figure 4-9: Main Disconnect

The DYNALOGIX II display should read **SET LIMITS** on initial power up. See Section 4.3.1: Set the Door Limits for more information on setting the door's limits.

4.3. Final Checks and Verification

Finalizing the door includes setting the door's open and close limits, ensuring that the door works properly, and connecting the activation accessories.

Note: An electrician should connect the accessories to the terminal block if possible.

Before you begin:

- Verify that the wiring is properly connected and the Control Box has power.
- Confirm that the connections are properly grounded.
- Confirm that the cable connections are positioned in their terminal slots correctly. (Photo Eyes and Reversing Edge)

4.3.1. Set the Door Limits

The DYNALOGIX II controls and monitors the curtain's open and closed position. Once you set the open and closed limits, test the door to ensure that it is working properly.

Caution: Confirm that all electrical connections are properly wired and terminated before power up. Refer to the wiring diagram that was enclosed with the DYNACO Door.

Caution: Automatic activations should be disconnected prior to setting limits. If connected, the door may activate and injury or damage may occur.

1. Enter the programming mode.

2. Press and hold both **PROGRAM** buttons until display changes to Password. After display changes, release buttons. See Figure 4-10.

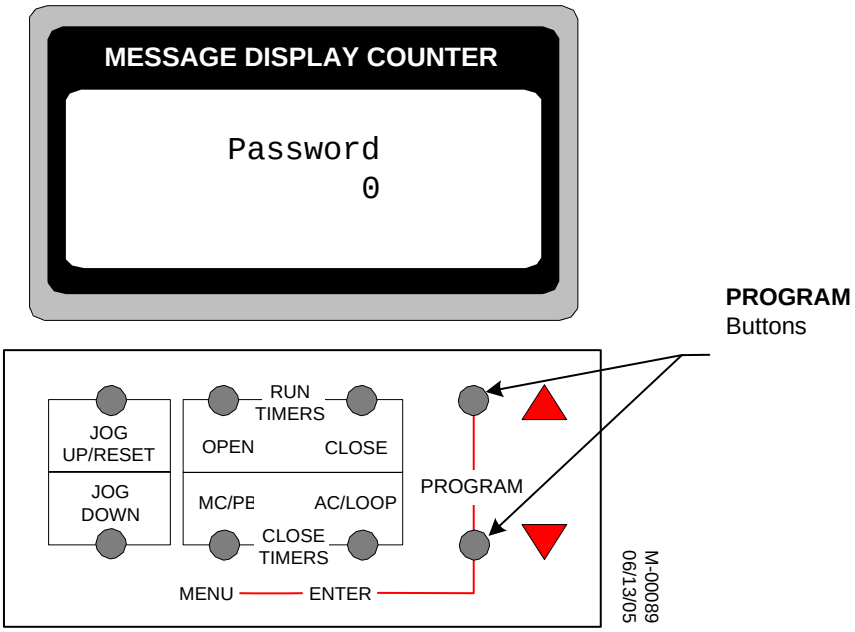

Figure 4-10: DYNALOGIX II Program Mode

a. Press and release one of the **PROGRAM** buttons to scroll up or down until the password, **562**, displays in the LCD.

b. Press and release the **ENTER** button.
LimitSet displays in the LCD.

Note: On initial start up the **Password** screen will be bypassed, and the DYNALOGIX will directly enter the **LimitSet** screen. See Figure 4-11.

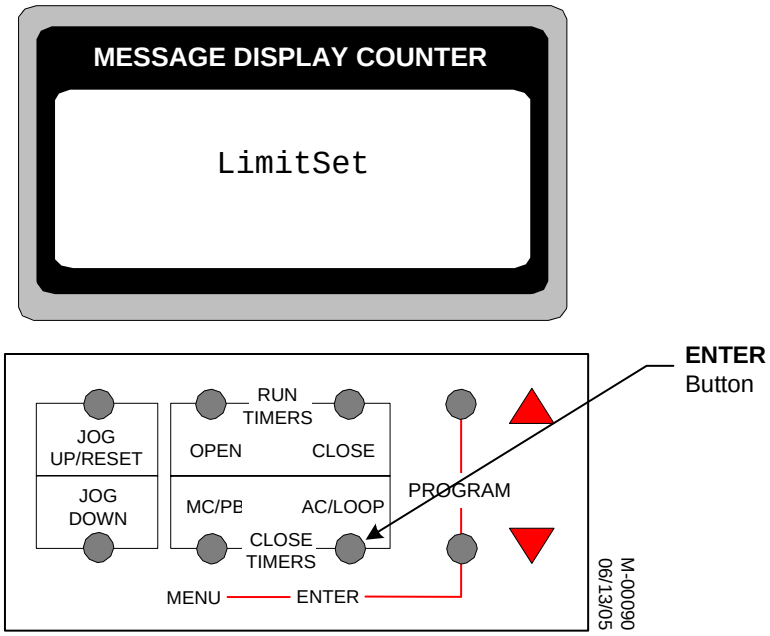

Figure 4-11: ENTER Button

3. Set the close limit position.

a. Press and release the **Enter** button.
ClsLimit displays in the LCD.

b. Press and release the **Enter** button.
JogToCls displays in the LCD.

c. Press the **JOG DOWN** button to bring the door down to desired close position. See Figure 4-12.

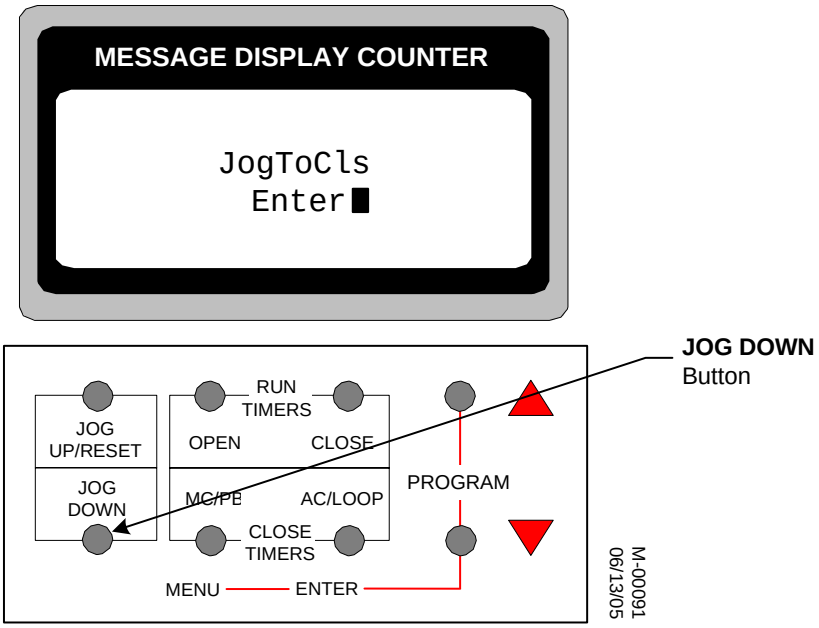

Figure 4-12: JOG DOWN Button

Note: The door is out of phase if it moves up instead of down. Turn power off and switch T2 & T3 on the terminal block. Turn power on and return to Step One.

d. Press and release the **ENTER** button to save limit setting. **ClsLimit_Set—OK** displays in the LCD.

4. Set the photo eye shut-off position.

a. Press and release one of the **PROGRAM** buttons to scroll up or down until the **PhtLimit** message displays in the LCD (photo eye shut off position).

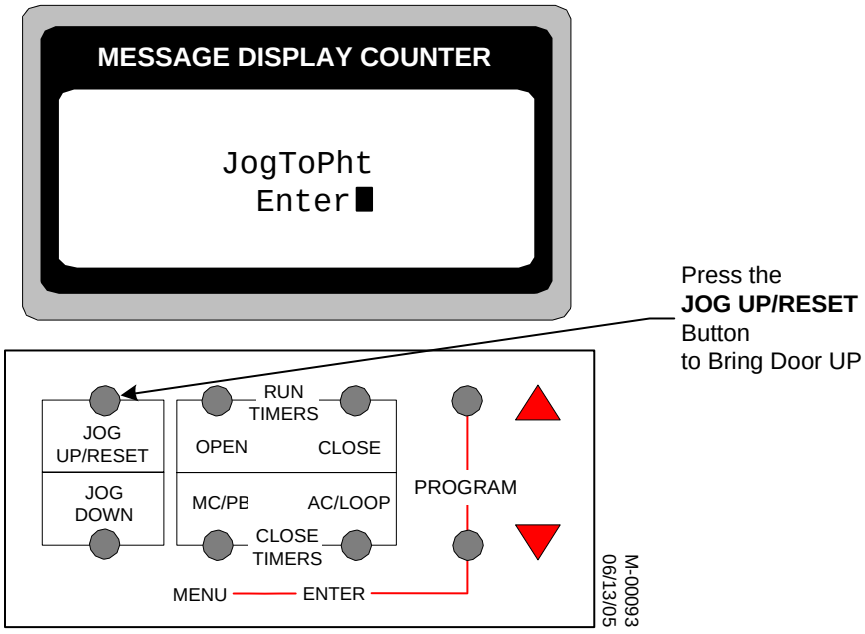

Figure 4-13: Scroll Through Menu

b. Press and release **ENTER** button.
JogToPht_Enter displays in the LCD.

c. Press the **JOG UP/RESET** button to bring door up one inch above the photo eyes.

d. Press and release the **ENTER** button to save limit setting.
PhtLimit_Set—OK displays in the LCD.

5. Set the open limit position.

a. Press and release one of the **PROGRAM** buttons until the **OpnLimit** message displays in the LCD.

b. Press and release the **ENTER** button.
JogToOpn_Enter displays in the LCD.

c. Press and release the **JOG UP/RESET** button until the door is in the desired open position (roughly an inch and a half above the reintroduction point). See Figure 4-14.

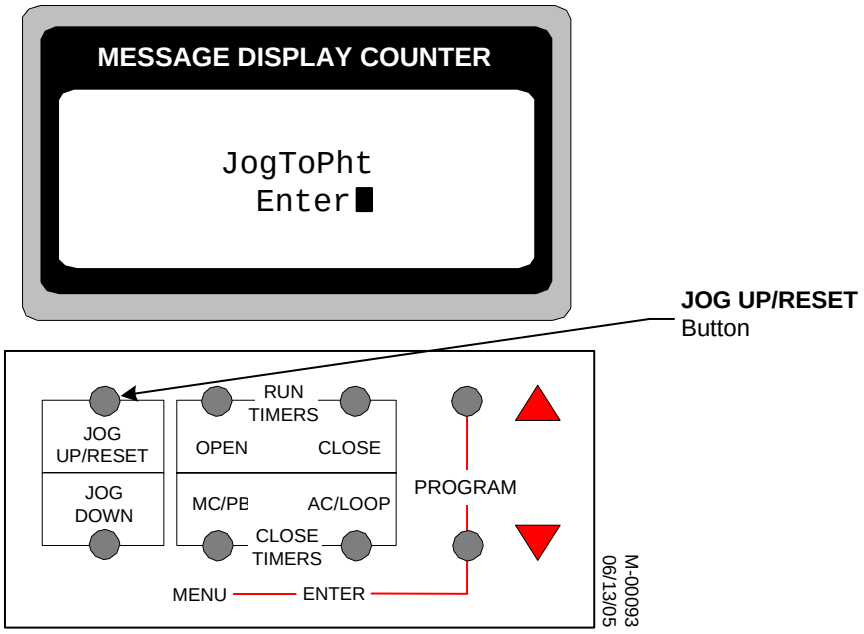

Figure 4-14: JOG UP/RESET Button

d. Press and release the **ENTER** button to save limit setting. **OpnLimit_Set—OK** displays in the LCD.

6. Press and release the **MENU** button twice. **Ready** displays in the LCD.

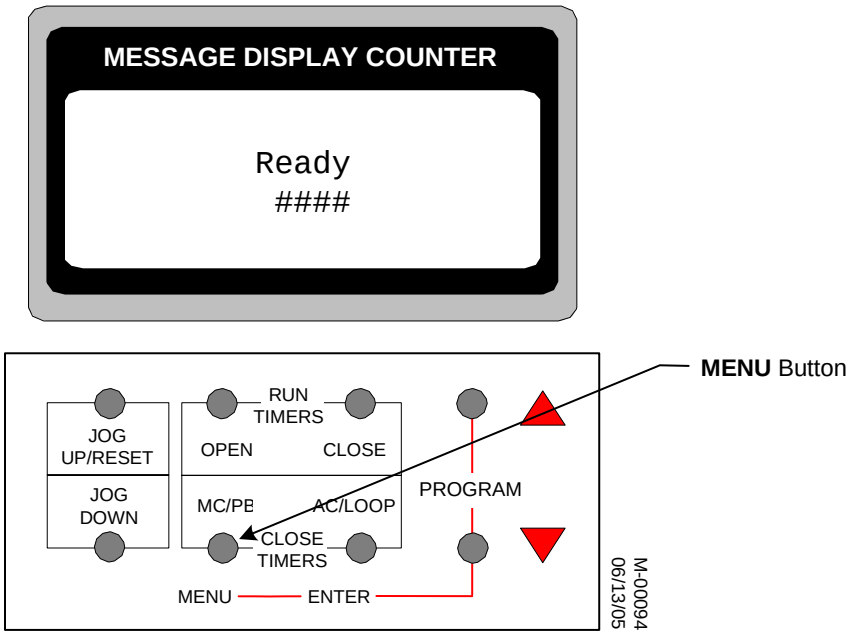

Figure 4-15: Menu Button

7. Press the **JOG** buttons to test the open and close limits.

4.3.2. Install and Test Activation Accessories

The DYNALOGIX II has nine inputs. Inputs are signals coming to the DYNALOGIX II that get interpreted to create a certain response. For example, if a pull cord is wired to terminal 2, pulling the cord sends a signal to the DYNALOGIX II. The DYNALOGIX II knows what the signal based on the assigned input (terminal 2), thus moving the door up or down. All the inputs have indicator lights and identification. See Figure 4-16.

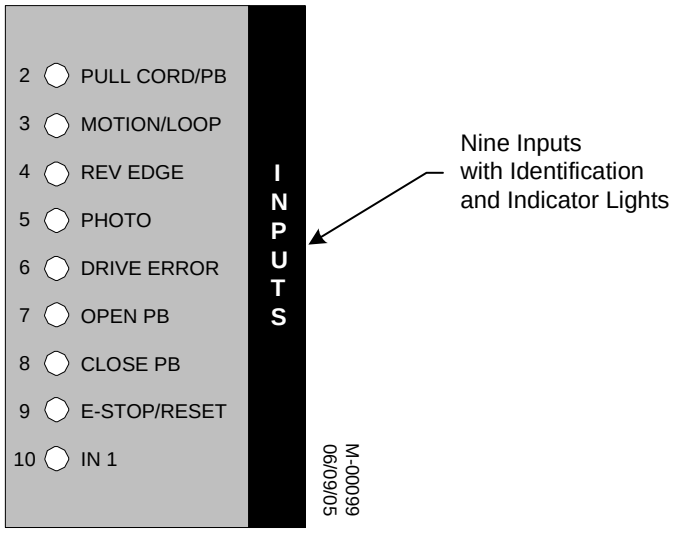

Figure 4-16: Accessory Inputs

See the appendices of this manual and/or the accessory's documentation from the manufacturer for installation instructions.

Caution: Install, connect, and then test each of the activation accessories individually before proceeding to the next accessory. This allows troubleshooting of each component individually.

4.3.3. Set Automatic Timers

The Open Run Timer and Close Run Timer act as a failsafe to prevent the door from running continuously when the open or close limit switch fails to stop the door. These timers should be set for a period that exceeds the duration of a full open or close cycle.

1. Press and release the **OPEN** run timer button. **Opening_Time=##** displays in the LCD. See Figure 4-17.

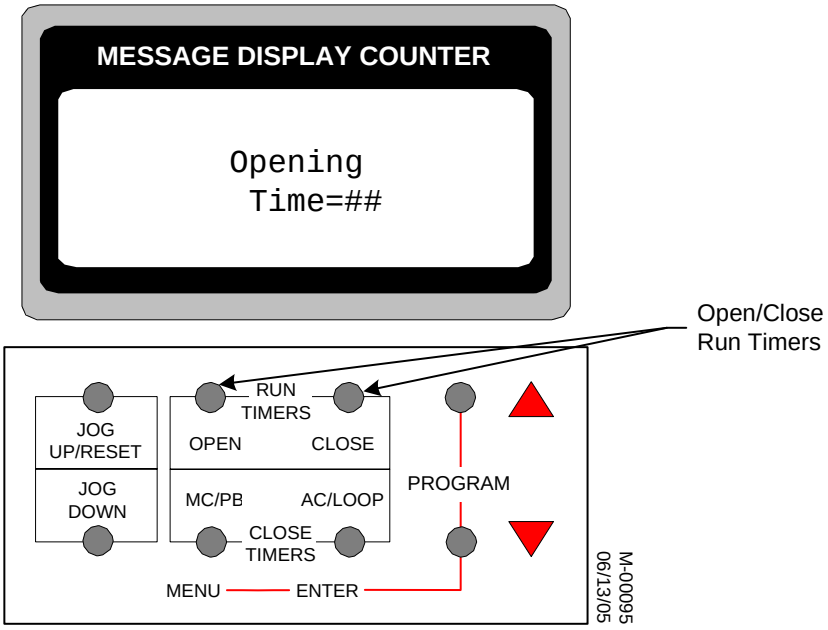

Figure 4-17: RUN TIMERS buttons

2. Press and release the **PROGRAM** buttons to change the countdown time to the desired duration. See Figure 4-18.

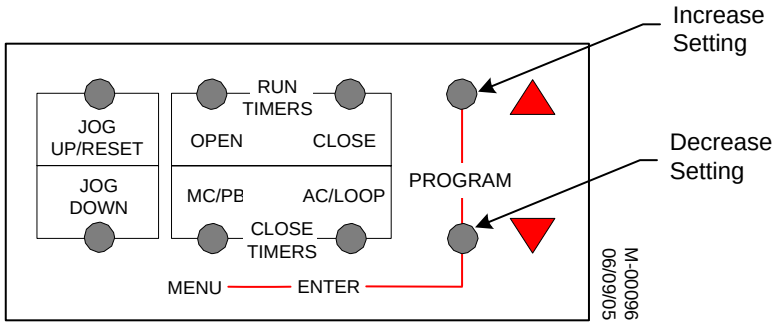

Figure 4-18: Adjust Countdown Time

3. The DYNALOGIX II automatically saves the changes.
4. Press and release the **CLOSE** run timer button.
   Closing_Time=## displays in the LCD.
5. Press and release the **PROGRAM** buttons to change the countdown time to the desired duration.
   The DYNALOGIX II automatically saves the changes.

4.3.4. Set the MC/PB Timer

The MC/PB timer activates a countdown timer for use with an activation installed on terminal number 2 (most commonly used for pull cords or pushbuttons). The MC/PB timer may be turned on or off, enabling manual operation or automatic operation by assigning a countdown value to the timer.

1. Press and release **MC/PB** close timer button.
   MC Delay_Time=## displays on the LCD. See Figure 4-19.

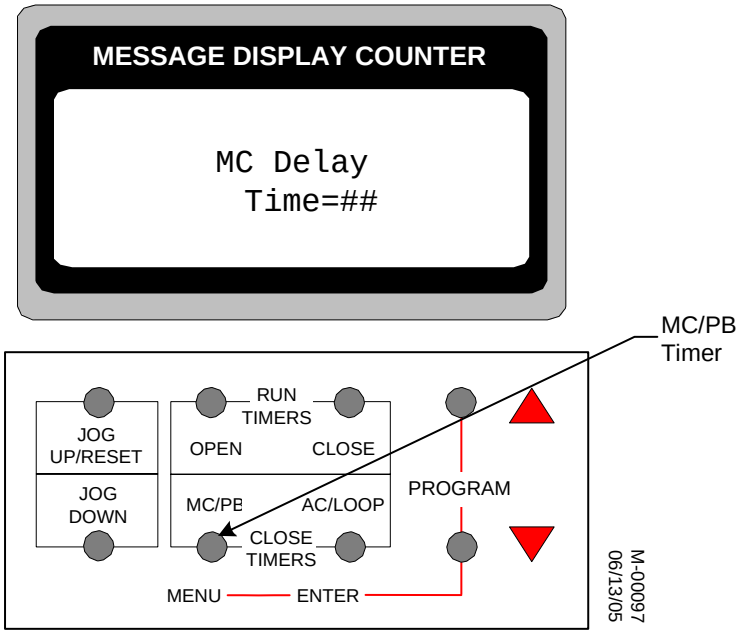

Figure 4-19: Adjust Countdown Time

Note: If the value is set to zero, the timer is deactivated and the activations put on terminal number 2 is now in manual operation.

2. Press and release the **PROGRAM** buttons to change the countdown time to the desired duration.

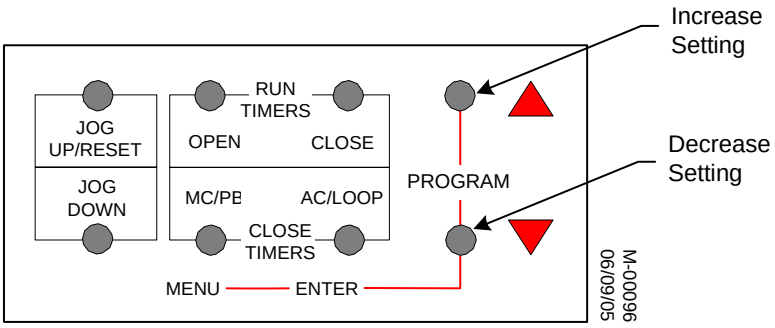

Figure 4-20: Change Setting

The DYNALOGIX II automatically saves the changes.

4.3.5. Set the AC/LOOP Timer

The AC/LOOP timer activates a countdown timer for use with a motion detector or floor loop. The AC/LOOP timer is also used when the reversing edge is triggered.

1. Press and release **AC/LOOP** close timer button. **AC Delay_Timer=##** displays on the LCD.

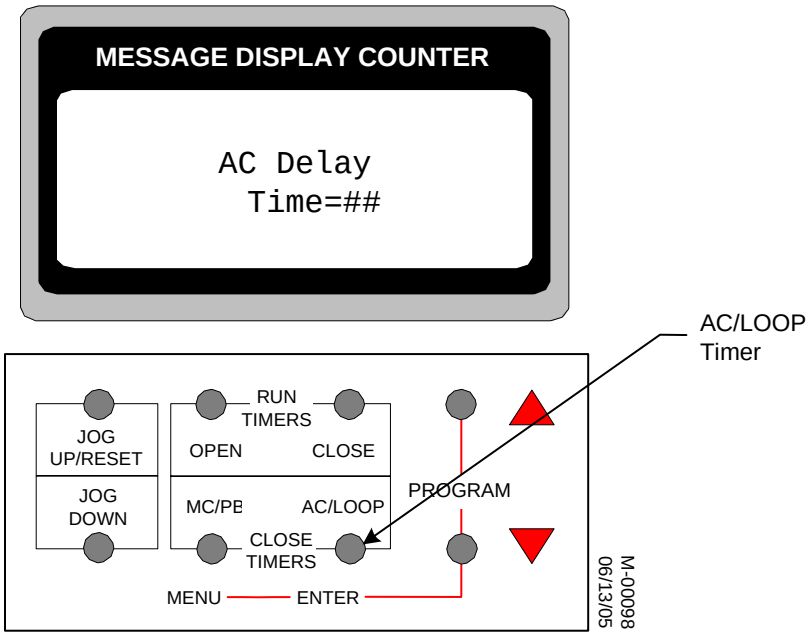

Figure 4-21: AC/LOOP Close Timer

Note: If the value is set to zero, the door will come down after it reaches the open limit.

2. Press and release the **PROGRAM** buttons to change the countdown time to the desired duration. See Figure 4-22.

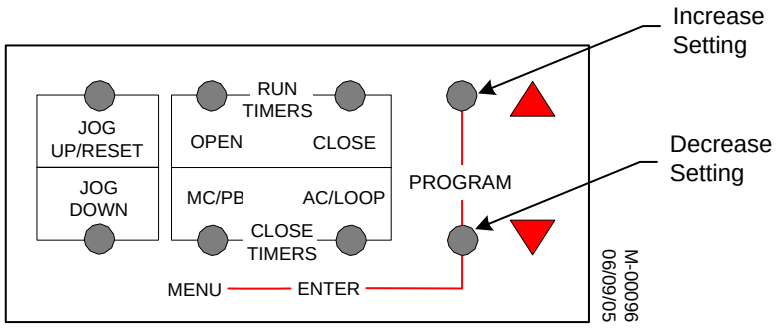

Figure 4-22: Change Setting

3. The DYNALOGIX II automatically saves the changes.

4.3.6. Install Covers

As a final step, ensure that all covers are installed on the door.

- Motor
- Drum
- Counterweight
- Side-guides

Chapter 5:Troubleshooting

5.1. Troubleshooting Techniques

After you have corrected the cause of an error, reset the DYNALOGIX by pressing the **RESET** button. (This is the **JOG** up button, located on the DYNALOGIX.)

5.2. Symptoms

Table 5-1 describes several common door problems and their solutions.

Table 5-1: Door Operation Symptoms

Symptom	*Procedure*
DYNALOGIX displays = "COnnECt"	One of the required NC contacts is missing or isn't completely connected. Note which LED light is blinking and correct the appropriate connection. Also, check the E-Stop to see if it has been activated.
Door stays open until the Photo Cell is triggered. Door only closes while the Photo Cell detects an obstruction.	Check the position of the dipswitches. The right-hand dipswitch should always be in the down position.
Bottom Edge Detector does not detect obstructions or you see "EdGe" in the DYNALOGIX display.	Check for a continuous short and/or adjust the sensor.

5.3. LED Reference

Table 5-2 describes Dynacoder and Photocell Amplifier LED displays.

Table 5-2: Dynacoder LED Indicator Key

Function	*Red LED*	*Green LED*
No Power	Off	Off
Startup ½ Second	Flash (Unison)	Flash (Unison)
OK/Ready	Off	On
Door in Motion	Off	FLASH
Encoder Loss of Feedback	Flash	Off
Jog/Limit (Programming Mode)	Flash Alternately	Flash Alternately

5.4. Manual Operation

In the event that the door must be moved up or down manually, the ratchet and key from the accessory kit may be used to operate the door manually.

1. Check that the door is disconnected from the power source.

2. Insert the ratchet and key into the drive motor fan opening. See Figure 5-1.

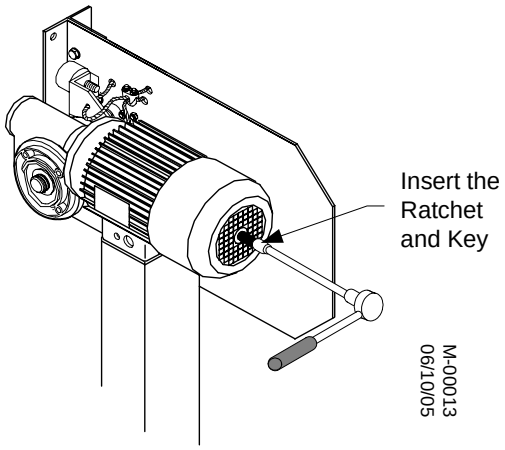

Figure 5-1: Move Curtain through Drive

3. Turn the ratchet to move the door up and down.

WARNING: Remove the ratchet and key before applying power.

Appendix A: Optional Door Mounting Techniques

A.1. Mount the Door

Caution: Vertical alignment of the side-guides is very important! Failure to ensure a plum and level mounting may result in a door with a curtain that is not smooth and flat. This prevents the curtain from properly sealing.

See Chapter 2: Mechanical Installation for details on mounting the door.

A.2. Mounting the Door with a Fore Frame

See Figure A-1 for installation techniques using a fore frame.

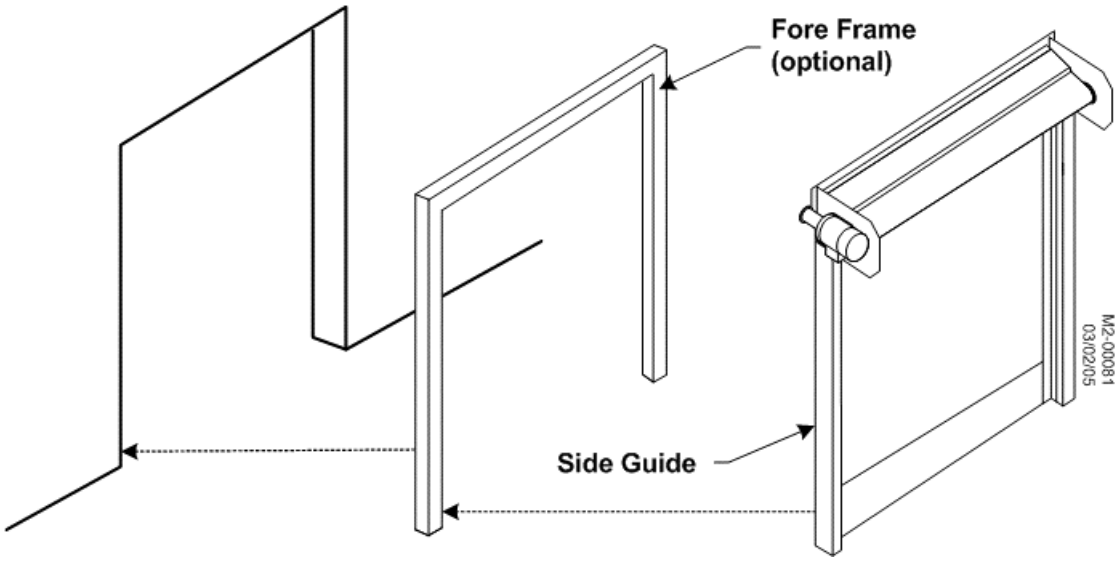

Figure A-1: Door Mounting Using a Fore Frame

See Figure A-2 for various wall mounting techniques.

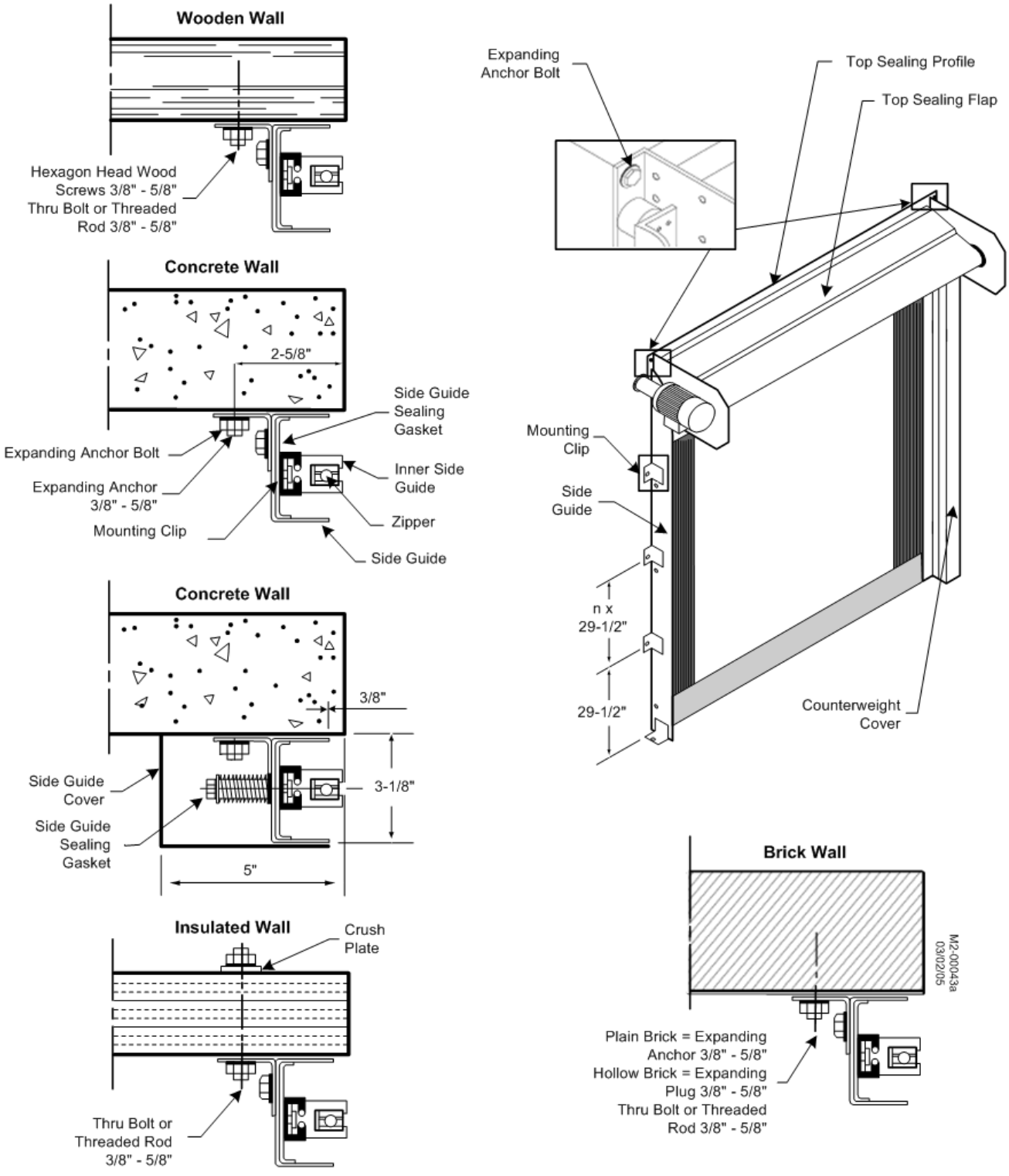

Figure A-2: Wall Mounting Techniques

Appendix B: Radio Frequency Remote Control Installation

B.1. Radio-Frequency Remote Control (RXU)

The RXU superhetrodyne receiver's sensitivity and high selectivity protects it against interference around the receiving frequency. This makes it an ideal receiver in environments containing interference. Its self-instructing programming system allows you to program ROYAL transmitters.

You can program the receiver to one of three functions:

- **Monostable** – Opens the door for as long as the button is pressed. Immediately closes the door when the button is released.
- **Bistable** – Opens the door the first time you press the button. Closes the door the second time you press the button.
- **Timer** – Opens the door when you press the button. The door stays open until the remote control timer runs out, or the DYNALOGIX timer runs out, whichever is first.

B.2. Technical Characteristics

Table B-1: Remote Control Technical Characteristics

Frequency of Use	433.92 MHz
Contact Relay Range	1A 30VCC
Consumption	15 mA at rest
Irradiation on Antenna	-66 dBm
Supply	• 12V CA/CC between connectors and 3 with J6 closed. • 24V CA/CC between connectors 2 and 3 with J6 open.
Operating Temperature	-4 to +140° F
Sensitivity	>= -1 02 dBm (S/N = 1 7 dB, m=100%)
Dimensions	5" 3/16 x 1" 3/16 x 2" 10/16
Weight	3.7 Oz

B.3. Installing the Receiver

The Radio Frequency receiver is located on the inside of the Control Box cover. This comes factory installed. No further installation is required.

B.4. Monostable Programming Instructions

1. Maintain a distance of at least five feet between the transmitter and the antenna of the receiver.

2. Press the desired code on the transmitter dipswitch.

3. Press and release the **SW1** button of the receiver once (twice if you wish to program Channel 2).

4. Save the setting by pressing and holding the transmitter button until the LED light goes out.

Table B-2: Monostable Remote Control Switches

Selected Channel	***# Impulses***	***LED LIT = •***	
	On SW1	***L1***	***L2***
Channel 1 Monostable	1	•	
Channel 2 Monostable	2		•

B.5. Timer – Channel 1

1. Press and hold the **SWI** button on the receiver until LED L1 lights up and then turns off.

LED L1 will flash at low speed (1 flash per second).

3. Count the number of flashes until it reaches the number that corresponds to the desired length of time.

4. Press and release the **SW1** button.

LED L1 displays a steady light.

5. Save the setting by pressing and holding the transmitter button until the LED light goes out. See Table B.3.

Table B-3: Channel 1 Timer Settings

Number of Flashes	***Imposed Time (Seconds)***	***Number of Flashes***	***Imposed Time (Minutes)***
1	01	17	1
2	02	18	1.5
3	03	19	2
4	04	20	2.5
5	05	21	3
6	06	22	3.5
7	07	23	4
8	08	24	4.5
9	09	25	5
10	10	26	5.5
11	11	27	6
12	12	28	6.5
13	13	29	7
14	14	30	7.5
15	15	31	Bistable
16	16		

B.6. Timer – Channel 2

1. Press any code on the dipswitch of the transmitter.
2. Press and release the **SW1** button on the receiver.
   LED L1 goes out.
3. Press and hold the **SW1** button on the receiver until LED L2 lights up and then turns off.
   LED L2 flashes at low speed (1 flash per second).
4. Count the number of flashes until it reaches the number that corresponds to the desired length of time.
5. Press and release the **SW1** button.
   LED L2 displays a steady light.
6. Save the setting by pressing and holding the transmitter button until the LED light goes out.

Table B-4: Channel 2 Timer Settings

Number of Flashes	***Imposed Time (Seconds)***	***Number of Flashes***	***Imposed Time (Minutes)***
1	01	17	1
2	02	18	1.5
3	03	19	2
4	04	20	2.5
5	05	21	3
6	06	22	3.5
7	07	23	4
8	08	24	4.5
9	09	25	5
10	10	26	5.5
11	11	27	6
12	12	28	6.5
13	13	29	7
14	14	30	7.5
15	15	31	Bistable
16	16		

B.7. Bistable Programming Instructions

B.7.1. Programming 1 Channel

1. Press the required code on the transmitter dipswitch.
2. Press and hold the **SW1** button on the receiver until LED L1 lights up and then turns off.
3. The LED L1 will flash at low speed (1 flash per second).
4. Wait until LED L1 cycles through the 30-flash cycle and then remains lit.
5. Save the setting by pressing and holding the transmitter button until LED L1 of the receiver goes out.

B.7.2. Programming 2 Channel

1. Press any code on the dipswitch of the transmitter.
2. Press and release the **SW1** button on the receiver.
   LED L1 goes out.
3. Press and hold the **SW1** button on the receiver until the LED L2 lights up and then turns off.
4. The LED L2 will flash at low speed (1 flash per second).
5. Wait until LED L2 cycles through the 30-flash cycle and then remains lit.
6. Save the setting by pressing and holding the transmitter button until LED L2 of the receiver goes out.

Appendix C: Falcon Motion Sensor Installation

C.1. Specifications

Table C-1: Falcon Motion Sensor Specifications

Characteristic	***Specification***
Technology	Microwave and microprocessor
Transmitter Frequency	24.125 GHz
Transmitter Radiated Power	<20 dBm EIRP
Transmitter Power Density	< 5 mW/cm2
Mounting Height	Falcon: from 11.5 to 23’
	Falcon XL: from 6.5 to 11.5’
Tilt angle	0° to 180° in elevation
Detection Zone (typical)	FALCON: 13’ (W) x 16’ (D) for a mounting height of 16’
	FALCON XL: 13’ (W) x 6.5’ (D) for a mounting height of 8.2’
Detection Mode	Movement
Minimum Detection Speed	2.2 in/s (measured in the sensor axis)
Supply Voltage	12V to 24 V AC +/- 10%
	12V to 24V DC +30% /-10%
Mains Frequency	50 to 60 Hz
Power Consumption	< 2W
Output Relay	Free of potential chargeover contact
	Max contact voltage 42 V AC/DC
	Max contact current 1A (resistive)
	Max switching power 30W (DC) / 60 VA (AC)
Hold Time	0.5s to 9s (adjustable)
Manual Adjustment	Orientation of sensing field (mechanically.)
	Multiple Functions (by push buttons.)
Remote Control Adjustments	Sensitivity, hold time, detection mode, pedestrian and parallel traffic rejection mode, relay configuration
Temperature Range	-22°F to 122°F (-30°C to +60°C)
Degree of Protection	IP65
Product Conformity	R&TTE 1999/5/EC
	EMC 89/366/EEC
Dimensions	5 in (D) x 4 in (W) x 3 ¾ (H)
Weight	0.88 lbs (400 g)
Housing Material	ABS and Polycarbonate
Bracket Material	Black anodized aluminum
Cable Length	33 ft (10 m)
Cable Diameter	1/8” (3 mm) (minimum)
	1/4" (6.5 mm) (maximum)

C.2. Installation Summary

A brief summary of the installation instructions is included below. Follow the detailed instructions found in the Falcon & Falcon XL User's Guide to install the motion sensor. A copy of this guide was enclosed in the shipping box that contained the sensor.

1. Mount the sensor.

2. Set the sensing field dimensions.

3. Configure the sensor with the remote control (or push buttons).

4. Wire necessary connections to the terminal block.

- Brown – AC 12-24 +
- Green – AC Neutral –
- White – COM
- Yellow – NO
- Gray – Not Used

Note 1: Firmly fasten the sensor to avoid vibration.

Note 2: Do not place the sensor directly behind a panel or other material.

Note 3: Clear the sensing field of all moving or vibrating objects.

Note 4: Do not install the sensor under florescent lighting.

Appendix D: Vehicle Loop Detector

D.1. Specifications

The LP4224 detects the presence of metal objects. It is specially suited for detecting vehicles. The system consists of the following components.

- The detector unit (located in the Control Box).
- The loop, which detects the presence of the vehicle.
- The cable, which connects the loop to the detector.

Table D-1: Vehicle Loop Detector Specifications

Characteristic	***Specification***
Information Memorizing	No time limit
Supply Consumption	24 VAC =/- 15%, 48 Hz to 62 Hz less than 1.5 VA
Exit	Inversed relay – contact max. 5 A/250
Operation Temp	-14° to +158° F

D.2. Installation

Caution: Fix the connector cable so that it doesn't move or vibrate. Install the connector cable as far as possible from the power cables such as the motor and main power cables. Ensure that there are no vehicles or other metal objects on the loop while you are connecting and adjusting. The presence of metal objects during this activity causes a sensitivity decrease. A grilled or metal floor may cause loss of sensitivity.

1. Make a slot of 0.15 inches by 1 inch to introduce the loop cable.

2. The right or acute angles are cut at 45° in order not to damage the loop.

3. The loop cable must present a section of at least 3 circ/mils. It is recommended to use multi-wired cables.

4. Twist the connector cable at 20 turns/yard. The cable should not be longer than 219 yards.

Perimeter of loop P=2a+2b	**Number of turns**
3.3 – 13 ft	4 to 8
13 – 26 ft	3 to 4
26 – 52 ft	2 to 3
more than 52 ft	1 to 2

Appendix E:
DYNACO Control Box Power Requirements

The following table describes the Control Box specifications.

Table E-1: Control Box Power Requirements

		Variable Frequency Drives								***Class CC Fuses***						***FLA***
Power		**ATV-IIHUI8M2U**	**ATV-IIHU29M2U**	**ATV-58HU4IM2**	**ATV-3IHU75N4**	**ATV-3IHUI5N4**	**ATV-3IHU22N4**	**ATV-3IHUI5SX**	**ATV-28HU29S6XU**	**6 AMP**	**10 AMP**	**12 AMP**	**15 AMP**	**20 AMP**	**30 AMP**	**Full Load Amps**
Power Mono & Tri-phase																
1	200-240v - 0.75kW - 1HP	**X**										**X**				3.87
2	200-240v - 1.5kW - 2HP		**X**											**X**		7.85
3	200-240v - 2.2kW - 3HP			**X**											**X**	10.2
Power Tri-phase																
4	380-500v - 0.75kW - 1HP				**X**					**X**						1.75
6	380-500v - 1.5kW - 2HP					**X**					**X**					3.55
7	380-500v - 2.2kW - 3HP						**X**						**X**			5.1
8	Canada 575v - 1.5kW - 2HP							**X**	**X**	**X**						2.8

Appendix F: Square-D Frequency Inverter Specifications

F.1. Frequency Inverters

The frequency inverter maintains total control over the breaking and stopping of the DYNACO Door motor by injecting DC current. It can also detect, without damage, a large number of abnormal conditions. When it detects an error, a red LED lights up. DYNACO has selected a range of Square-D™ frequency inverters, which is part of the Schneider-group. These electronic devices are very reliable.

The frequency inverter is factory set and located in the control panel. The factory set parameters correspond to the motor and the size of the door.

Caution: DO NOT CHANGE THESE PARAMETERS. Any changes or alterations to the drive program will immediately void the warranty.

Note: For other display faults contact DYNACO customer service at 800-459-1930.

F.2. ALTIVAR 58 Specifications

Tables F-1 and F-2 list the **ALTIVAR 58** Square-D Frequency Inverter specifications.

Table F-1: ALTIVAR 58 Fault Codes

Displayed Faults	***Probable Cause***	***Procedure***
PHF – Main Power Loss	• Speed controller incorrectly supplied or fuses blown. • Transient fault on one phase.	Check the power connection and the fuses.
USF – Under Voltage	• Line supply too low. • Transient voltage dip.	• Check the line voltage. • Change the load resistor.
OSF – Over Voltage	Line supply too high.	Check the line voltage.
OLF – Motor Overload	Thermal trip due to prolonged overload.	• Check the thermal protection setting and monitor the motor load. • Wait at least 7 minutes to reset.
OPF – Motor Phase Loss	One phase cut at the speed controller output.	Check the motor connections.
SCF – Short Circuit	Short circuit or grounding at the speed controller output.	• Check if the speed controller and motor insulation connection cables are disconnected. • Check the speed controller transistor bridge.

Table F-2: ALTIVAR 58 Technical Specifications

Characteristic	***Specification***
Voltage range	• 200 V (-10%) to 240V (+10%) single phased • 380V (-10% to 500V (+10%) three phased
Mode of operation	Vectorial flow control without sensor.
Protections and safety features of the inverter	Protection against short-circuits • Between output phases, • Between output phases and earth, • On the exits of the internal sources. Thermal protection against overheating and over currents under voltage and over voltage supply. Loss of supply phase safety circuit (avoid single phase run over three phase inverters).
Conformity to standards	The inverters respect the recommendations regarding electric equipment of industrial control. • Low tension EN-50178 • CEM immunity ▪ IEC 1000-4-2/EN 61000-4-2 level 3 ▪ IEC 1000-4-3/EN 61000-4-3 level 3 ▪ IEC 1000-4-4/EN 61000-4-4 level 4 ▪ IEC 1000-4-5/EN 61000-4-5-level 3 ▪ IEC 1800-3/EN 61800-3, environment 1 and 2
Marking	Respects the 73/23/CEE, 93/68/CEE and CEM89/336/CEE guidelines.
Maximum relative humidity	93% without condensation or streaming, according to IEC 68-2-3
Operating temperature	14 . . +120°F without downgrading
Frequency range	50/60 Hz +/-5%
Electrical isolation	Between power and control (input, outputs, power supply).
Motor protection	Thermal protection integrated in speed controller via continuous calculation of the I^2t, taking into consideration the speed. Memorization of motor thermal state when speed controller is powered off. Protection against motor phase breaks.
CE	CEM, conducted and extended emission. • IEC 1800-3/EN 61800-3, environment 1 and 2 • EN 55011 class A (filters reducing incorporated radio perturbations) • EN 55022 class B, with additional filters
Certificates	UL and CSA
Storage temperature	-13. . . +150°F

F.3. ALTIVAR 11 Specifications

Tables F-3 and F-4 list the **ALTIVAR 58** Square-D Frequency Inverter specifications.

Table F-3: ALTIVAR 11 Fault Codes

Displayed Faults	***Probable Cause***	***Procedure***
OSF – Overvoltage during stead state operation or during acceleration	• Line voltage too high. • Induced voltage on output wiring.	• Check the line voltage. Compare with the drive controller nameplate ratings. • Reset the drive controller. • Verify that the wiring is correct.
PHF – Input phase failure	• Input phase loss, blown fuse. • Input phase imbalance. • Transient phase fault. • 3-phase controller used on a single-phase line supply. • Unbalanced load.	• Verify that the input power is correct. • Check the line fuses. • Verify input power connections. • Supply 3-phase power if needed. • Disable IPL (set to nO)
SCF – Short Circuit	Short circuit or grounding at the speed controller output.	• Check the cables connecting the drive controller to the motor and the motor insulation. • Check the speed controller transistor bridge.
SOF – Overspeed	• Instability • Overhauling load	• Check the motor, gain, and stability parameters. • Contact DYNACO.
USF – Under Voltage	• Line supply too low. • Transient voltage dip. • Damaged precharge resistor.	• Check that the line voltage matches the nameplate rating. • Check the setting of parameter UnS. • Replace the drive controller.

Table F-4: SquALTIVAR 11 Technical Specifications

Characteristic	***Specification***
Voltage range	• 200 V (-10%) to 240V (+10%) single phased • 380V (-10% to 500V (+10%) three phased
Mode of operation	Vectorial flow control without sensor.
Protections and safety features of the inverter	Protection against short-circuits • Between output phases, • Between output phases and earth, • On the exits of the internal sources. Thermal protection against overheating and over currents under voltage and over voltage supply. Loss of supply phase safety circuit (avoid single phase run over three phase inverters).
Conformity to standards	The inverters respect the recommendations regarding electric equipment of industrial control. • Low tension EN-50178 • CEM immunity ▪ IEC 1000-4-2/EN 61000-4-2 level 3 ▪ IEC 1000-4-3/EN 61000-4-3 level 3 ▪ IEC 1000-4-4/EN 61000-4-4 level 4 ▪ IEC 1000-4-5/EN 61000-4-5-level 3 ▪ IEC 1800-3/EN 61800-3, environment 1 and 2
Marking	Respects the 73/23/CEE, 93/68/CEE and CEM89/336/CEE guidelines.
Maximum relative humidity	93% without condensation or streaming, according to IEC 68-2-3
Operating temperature	14 . . +120°F without downgrading
Frequency range	50/60 Hz +/-5%
Electrical isolation	Between power and control (input, outputs, power supply).
Motor protection	Thermal protection integrated in speed controller via continuous calculation of the I^2t, taking into consideration the speed. Memorization of motor thermal state when speed controller is powered off. Protection against motor phase breaks.
CE	CEM, conducted and extended emission. • IEC 1800-3/EN 61800-3, environment 1 and 2 • EN 55011 class A (filters reducing incorporated radio perturbations) • EN 55022 class B, with additional filters
Certificates	UL and CSA
Storage temperature	-13. . . +150°F

F.4. ALTIVAR 31 Specifications

Tables F-5 and F-6 list the **ALTIVAR 58** Square-D Frequency Inverter specifications.

Table F-5: ALTIVAR 31 Fault Codes

Displayed Faults	***Probable Cause***	***Procedure***
bLF – Brake Sequence	Brake release current not reached.	• Check the drive controller and motor connections. • Check the motor windings. • Check the Ibr settings in the Fun-menu.
CrF – Precharge circuit failure	Precharge circuit damaged.	• Reset the drive controller. • Replace the drive controller.
InF – Internal fault	• Internal fault. • Internal connection fault.	• Remove sources of electromagnetic interference. • Replace the drive controller.
OCF -- Overcurrent	• Incorrect parameters settings in the Set- and drC- menus. • Acceleration too rapid. • Drive controller and/or motor undersized for load. • Mechanical blockage.	• Check the SET- and drC- parameters. • Ensure that the size of the motor and drive controller is sufficient for the load. • Clear and mechanical blockage.
SCF – Motor short circuit	• Short circuit or grounding at the drive controller output. • Significant ground leakage current at the drive controller output if several motors are connected in parallel.	• Check the cables connecting the drive controller to the motor and the motor insulation. • Reduce the switching frequency. • Connect output filters in series with the motor.
SOF – Overspeed	• Instability • Overhauling load	• Check the motor, gain, and stability parameters. • Contact DYNACO.
EnF – Auto-tuning failure	• Motor or motor power not suitable for the drive controller. • Motor not connected to the drive controller.	• Use the L or the P ratio. • Check the presence of the motor during auto-tuning. • If a downstream contractor is being used, close it during auto-tuning.
COF – Serial Link Failure	Loss of communication between the drive controller and communication device or remote keypad.	• Check the communication bus. • Refer to the product specific documentation.
EPF – External Fault	User defined.	User defined.
LFF – Loss of 4-20 mA follower	Loss of 4-20 mA reference on input A13.	Check the connection on input A13.
ObF – Over voltage during deceleration	• Braking too rapidly. • Overhauling load.	• Increase the deceleration time. • Install a braking resistor if necessary. • Activate the brA function if it is compatible with the application.

DHF – Drive overload	• Drive controller or ambient temperature is too high. • Continuous motor current load is too high.	Check the motor load, the drive controller ventilation, and the environment. Wait for the drive controller to cool before restarting.
OLF – Motor overload	• Thermal trip due to prolonged motor overload. • Motor power rating too low for the application.	Check the ItH setting (motor thermal protection, page 32), check the motor load. Allow the motor to cool before restarting.
OPF – Motor phase failure	• Loss of phase at drive controller output. • Downstream contactor open. • Motor not connected. • Instability in the motor current. • Drive controller oversized for motor.	• Check the connections from the drive controller to the motor. • If a downstream contactor is being used, set OPL to OAC. Refer to the ATV31 Programming Manual, FLtmenu. • Test the drive controller on a low power motor or without a motor: set OPL to nO. Refer to the ATV31 Programming Manual, FLt- menu. • Check and optimize the UFr, UnS, and nCr parameters and perform auto-tuning.
OSF – Overvoltage during stead state operation or during acceleration	• Line voltage too high. • Induced voltage on output wiring.	• Check the line voltage. Compare with the drive controller nameplate ratings. • Reset the drive controller. • Verify that the wiring is correct.
PHF – Input phase failure	• Input phase loss, blown fuse. • 3-phase controller used on a single-phase line supply. • Input phase imbalance. • Transient phase fault.	• Verify that the input power is correct. • Check the line fuses. • Verify input power connections. • Supply 3-phase power if needed. • Disable IPL (set to nO)
SLF – Serial link failure	Loss of connection between drive controller and communication device or remote keypad.	• Check the communication connection. • Refer to the product-specific documentation.
CFF -- Configuration Fault	The parameter configurations are not suited to the application.	Restore the factory settings or load the backup configuration, if it is valid.
CF I – Configuration fault via serial link	The parameter configurations loaded in the drive controller via the serial link are not suited to the application.	• Load a compatible configuration. • Check the configuration loaded previously.
USF – Under Voltage	• Line supply too low. • Transient voltage dip. • Damaged precharge resistor.	• Check that the line voltage matches the nameplate rating. • Check the setting of parameter UnS. • Replace the drive controller.

Table F-6: ALTIVAR 31 Technical Specifications

Characteristic	***Specification***
Voltage range	• 200 V (-10%) to 240V (+10%) single phased • 380V (-10% to 500V (+10%) three phased
Mode of operation	Vectorial flow control without sensor.
Protections and safety features of the inverter	Protection against short circuits: • Within internal power supplies • Between output phases • Between output phases and ground Protection against input phase loss Thermal protection against overheating and overcurrents Undervoltage and overvoltage faults. Overbraking fault.
Conformity to standards	The inverters respect the recommendations regarding electric equipment of industrial control. • Low tension EN-50178 • CEM immunity ▪ IEC 1000-4-2/EN 61000-4-2 level 3 ▪ IEC 1000-4-3/EN 61000-4-3 level 3 ▪ IEC 1000-4-4/EN 61000-4-4 level 4 ▪ IEC 1000-4-5/EN 61000-4-5-level 3 ▪ IEC 1800-3/EN 61800-3, environment 1 and 2
Marking	Respects the 73/23/CEE, 93/68/CEE and CEM89/336/CEE guidelines.
Maximum relative humidity	96% without condensation or streaming, according to IEC 60068-2-3
Operating temperature	14 . . +120°F without downgrading
Frequency range	50/60 Hz +/-5%
Electrical isolation	Between power and control (input, outputs, power supply).
Motor protection	Thermal protection integrated in speed controller via continuous calculation of the I^2t, taking into consideration the speed. Protection against motor phase breaks.
CE	CEM, conducted and extended emission. • IEC 1800-3/EN 61800-3, environment 1 and 2 • EN 55011 class A (filters reducing incorporated radio perturbations) • EN 55022 class B, with additional filters

Codes and Standards	UL Listed per UL 508C as incorporating electronic overload protection: UL File E164874 CCN NMMS • CSA Certified to CSA C22.2 No. 14: CSA File LR96921 Class 3211 06 • CE Marked in accordance with the European low voltage (73/23/EEC and 93/68/EEC) and EMC (89/336/EEC) directives • Conforms to applicable NEMA ICS, IEC, NOM, C-TICK, and ISO 9001 standards
Storage temperature	-13. . . +150°F

Appendix G: Curtain Material Specifications

G.1. Curtain Material

Table G-1: Curtain Material Specifications

Component/Measure	*Standard*	*Description/Measurement*
Base Fabric		Polyester
Coating		PVC
Total Weight	ASTM D-751	26.5 oz/yd2 (900 g/m2)
Grab Break	ASTM D-751	600/550 lbs.
Strip Resistance	ASTM D-751, Proc. B	430/400 lbs. per inch
Tongue Tear	ASTM D-751, 8" x 10" specimen	70/90 lbs.
Adhesion	ASTM D-751, RF weld	11 lbs. per inch
Cold Crack	ASTM D-2136, 1/8" mandrel	Pass -40F
Standard Roll Data	Size, yards Width, inches	65.62 118"

G.2. Curtain Composition

The DYNACO door curtain is consists of a woven polyester fabric that is coated with plastic polyvinylchloride. See Table I-2 below for details on its composition.

Table G-2: Curtain Composition

Composition	*Percent*	*Standard*
Polyethyleneterephtalate	20-80	
Polyvinylchloride	10-40	
Di-isononylphtalate (DINP)	5-40	CAS nr.: 9002-86-2
Inert Fillers	0-30	CAS nr.: 68515-48-0

G.3. Hazard Identification

The curtain material is not hazardous for man or environment when used under normal conditions.

G.4. Acute and Chronic Health Hazards

No TLV exists for PVC coated fabrics. See Table I-3 for other possible health effects.

Table G-3: Health Effects

Route of Entry	***Effect***
Inhalation	Not applicable
Skin	Not Applicable
Ingestion	Choking may occur depending upon size
Eye	Possible irritation due to mechanical effect
Fax	(32) 51 740 964
In Case Of Emergency	(32) 51 740 900

G.5. First Aid

Table G-4: First Aid Treatments

Route of Entry	***Effect***
Inhalation	Not applicable
Skin	Not Applicable
Ingestion	• Free the respiratory channel • In case of ingesting large quantities, seek medical attention
Eye	In case of severe irritation, seek medical attention.

G.6. Fire Fighting

Only well trained persons, who are informed about the hazards of the product, should fight the fire. The following guidelines should be adhered to.

- Wear suitable protection whenever approaching the fire or in confined places. Use a self-contained breathing apparatus.
- Wear protective, chemical resistant clothes. Avoid exposure to the fumes whenever possible.
- Clean protective clothes after the fire. Aerate and thoroughly clean the surrounding area before re-entry.

Table G-5: Fire Fighting Specifications

Characteristic	***Specification***
Flash Point	Not Applicable
Explosion Limits	Not Applicable
Extinguishing Media	CO2, dry chemical, water or other agents as appropriate for materials in the surrounding fire
Special Risks	Decomposition in the burning flame may result in the formation of HCl (Hydrogenchloride), CO (Carbonmonoxyde), and CO2 (Carbondioxyde).

G.7. Accidental Release

Not Applicable.

G.8. Handling and Storage

No special precautions need be taken for personal protection. Avoid storing the curtain in temperatures above 158° F (70°C). Doing so eliminates slow degradation.

G.9. Other Precautions

The following additional precautions should be taken when handling the curtain.

- Do not overheat the product. Upon fusion of the material, avoid inhaling fumes by providing sufficient ventilation.
- Keep away from fire.
- Respect all local regulations concerning personal protection.

G.10. Exposure Controls and Personal Protection

Table G-6: Exposure Controls and Personal Protection

Condition	***Control/Protection***
Technical Measures	Follow the measures for safe handling and storage.
Release / Spilled Containment	Not applicable
Waste Disposal Method	Disposal must be in accordance with federal, state and local regulations. Use an approved method for solid waste disposal.
Precautions in Handling	Use sufficient ventilation when welding or fusing. To avoid product degradation, do not overheat.
TGG Alkylphtalate	5 mg/m3 based upon ACGIH TLV recommended for di-sec-octylphtalate
Precautions when Machining	When machining the coated fabric dry, a dusty condition may result. Use a suitable dust collection system and an approved dust mask (for respiratory protection).
During Decomposition	Take necessary protective measures to avoid contact with fumes via skin, eye, or inhalation. Protect the eyes and lungs by using a protective facemask with a B-P2 filter class. Use inhalation protection that conforms to the international and national rules of safety and standards.

G.11. Physical and Chemical Properties

Table G-7: Physical and Chemical Properties

Characteristic		***Specification***
Appearance		Fabric sheet coated with plastic
Smell		None
Phase Transitions	Melting Point	Not Applicable
	Boiling Point	Not Applicable
	Softening	Excessive softening occurs from 158°F onwards
	Evaporation Rate	Not Applicable
	Vapor Pressure	Not Applicable
	Flash Point	Not Applicable
	Ignition Temperature	> 660°F (350°C)
	Density	1.3-1.4 g/cm3
	Vapor Density	Not Applicable
Solubility	Insoluble in Water	
	Partly Soluble In	Ketones
		Dimethylsulfoxyde
		Tetrahydrofurane
		Methythydrofurane
Ph		Not Applicable
Viscosity		Not Applicable
Decomposition Temperatures	> 248° F (120° C)	Long Exposure > 3 hrs
	> 482° F (250° C)	Short Exposure
Oxidizing Properties		Not Applicable

G.12. Stability and Reactivity

Table G-8: Curtain Material Stability and Reactivity

Characteristic	*Specification*
Stability	The product is stable under the normal conditions.
Conditions to Avoid	When heated to decomposition / combustion temperatures, products of decomposition (including CO, CO2, HCI, and other volatile agents) are released.
Materials to Avoid	None
Remarks	Material dissolves in some organic solvents.

G.13. Toxicological Information

To our knowledge, the product is biologically inert and not dangerous. No TLV exists for PVC coated fabrics. The hazards associated with the product are related to the individual constituents.

G.14. Environmental Information

The material is biologically inert and non-degradable

G.15. Disposal Considerations

Dispose of the coated fabric in accordance with local, federal, national, and international regulations. Either landfill or incineration is possible if it is in compliance with these regulations.

G.16. Transportation Information

Not Applicable

G.17. Regulation Information

Not Applicable

G.18. Miscellaneous

This product information is based upon our actual knowledge and experience and is not limiting. The information of the product is based on the properties of the product as specified in the product technical data sheet.

Be aware that whenever a product is combined or mixed with other substances new risks may occur.

Keep to all hygiene and safety regulations when working with this product. The MSDS does not have any effect on these regulatory obligations.

Appendix H: Photocell Specifications

H.1. Photoelectric Cell with Transmitter-Receiver

The Photoelectric cell is type S 1420 156 024 +
MHF TR 15/20. Three components make up the photoelectric cell.

- Transmitter (installed on the same side of the door as the Control Box)
- Receiver (install on the opposite side of the door as the Control Box)
- Amplifier (located inside the Control Box)

The transmitter sends an infrared beam to the receiver. When this beam is interrupted, the receiver activates the electric contact in the amplifier. This stops the door from closing and returns it to the open position.

H.2. Transmitter/Receiver Specifications

The following tables describe the Transmitter/Receiver traits.

Table H-1: Transmitter/Receiver Specifications

Characteristic	***Specification***
Maximum range	50 ft (100% sensibility)
	16 ft (25% sensibility)
Protection degree	NEMA 4x
Case	black Luran
Type of Transmitter	GaAIAs LED, 880 nm
Light immunity	maximum 50000 lux
Temperature tolerances	-4°F to +140° F

Table H-2: Photocell Amplifier LED indicator Key

LED	***On***	***Off***
Green	Amplifier Powered	No Power to Amplifier
Red	Barrier Intact	Barrier Broken
Yellow	Sensitivity OK	Sensitivity too low

H.3. Amplifier Specifications

The following table describes the Amplifier traits.

Table H-3: Transmitter/Receiver Specifications

Characteristic	***Specification***
Current tension (pins 2 & 10)	24 VAC +/- 15%, 45 to 65 Hz
Consumption	2.5 VA
Exit contact (pins 1, 3, 4)	AC: 10A/250 VAC resistive charge
	DC: 1A/250 VDC resistive charge
Temperature tolerances	-4°F to +122° F

Appendix I: Recommended Quarterly Maintenance

DYNACO recommends that the following maintenance task be performed on a quarterly basis. Contact DYNACO for assistance.

Only certified personnel should perform maintenance on DYNACO doors. Maintenance performed by untrained technicians may result in injury and/or damage to equipment.

Lock out / tag out procedures must be performed while performing maintenance tasks on DYNACO doors.

Note: Service performed by unauthorized persons may void the DYNACO Door warrantee.
Note: The DYNACO door must be lubricated quarterly to ensure proper operation. Apply white lithium spray grease along the inner face of the side guides and the curtain teeth.

Table I-1: Quarterly Maintenance List

Category	***Component***	***Inspections***	***Corrective Measures***
Safety Controls / Operations	Photo Eyes	• Eyes are clean and free of debris • Door reverses when beam is broken. • Adjusted and aligned in accordance with the specifications described in this manual.	• Clean the Photo eyes. • Replace broken parts. • Adjust as described in this manual. See Section 3.3.3: Adjust the Photocell Sensitivity.
	Bottom Edge	• Door reverses when tripped. • Adjusted and aligned in accordance with the specifications described in this manual. • Inspect air tube for break and kinks.	• Replace or repair broken parts, including air tube. • Adjust as described in this manual. See Section 3.3.1: Set the Door Limits for DY3000 setup or Section 4.3.1: Set the Door Limits for DY4000 setup.
Door Controls	Activations	Test each activation for proper function and distance from the door (where applicable). The distance assures that there is enough time for the door to open.	Adjust as described in this manual. See Section 3.3.5: Install and Test Activation Accessories for DY2000 setup or Section 4.3.2: Install and Test Activation Accessories for DY4000 setup.
	Function Buttons	Test each button on the front panel, the emergency stop, and the main rotary disconnect for proper function.	Repair as needed.

	Timers	Test each timer for adequate times to allow proper door operation and traffic flow.	Adjust as described in this manual. See Sections 3.3.6 to 3.3.9 for DY2000 setup or Sections 4.3.3 to 4.3.5 for DY4000 setup.
	Door Limits	• Test each limit for proper function and distance. • Test door for smooth operation. No jerking should occur.	Repair and adjust as described in this manual. See Section 3.3.1: Set the Door Limits for DY3000 setup or Section 4.3.1: Set the Door Limits for DY4000 setup.
Curtain	Teeth	Inspect for broken or missing teeth.	Replace teeth as needed. Use Craftsman™ two-jaw puller (model #46905) to remove and install teeth.
	Curtain	Inspect for broken cables, rubber delaminating, holes, and other damage.	Repair as needed.
	Windows	Inspect for holes, delaminating, or cracking.	Clean windows. PVC polish or cleaner, such as Novus scratch remover, may take scratches off.
	Air Tube	Inspect for breaks and kinks along the length of the tube.	Replace or repair as needed.
Side Guides	N/A	• Ensure that covers are properly installed. • Test springs and hardware for tightness and proper functionality. • Verify that the Inner side guide plastic track gap does not exceed 9.5mm. • Inspect for heavy splintering present along the guides. • Inspect for collision damage or other damage. • Remove old excess grease.	Repair as needed.
Head Unit	Head Unit	• Inspect drums for damage. • Inspect upper and lower muthylene pieces for excessive wear. • Remove old excess grease from the drive sprockets.	Repair as needed.
	Motor	• Verify that the safety cable is on the motor. • Verify that the motor mounting bumpers are tight against the head unit, to ensure that the motor is not loose. • Test fan for proper operation (the blades move with the shaft).	Repair as needed.
	Counter weight	• Inspect strap for fraying and cuts. • Inspect nylon pulley for wear. • Verify that counter weight movement is not obstructed. • Verify that pulley support is not bent or shifted to the side.	Repair and adjust as described in this manual. See Section 2.5: Install the Counterweight.

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