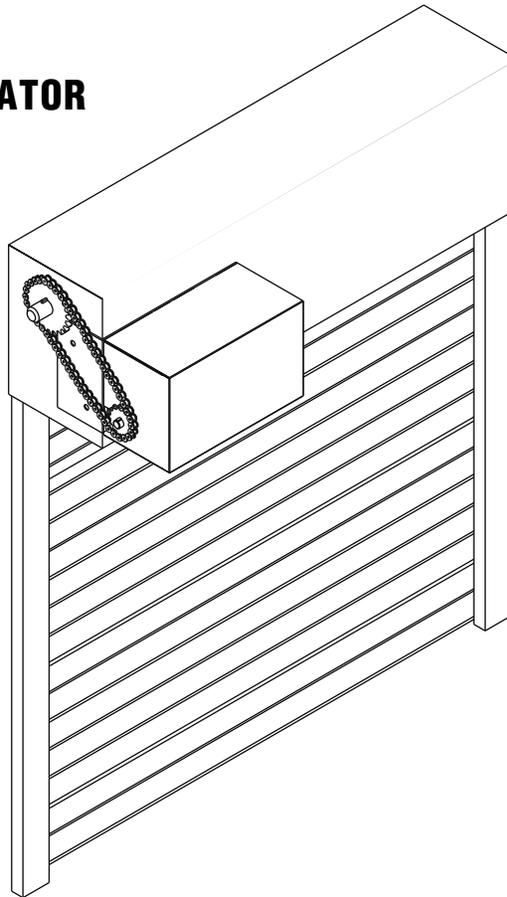


LiftMaster®

Commercial Door Operators

OWNER'S MANUAL MODEL FDCL U

**ADVANCED LOGIC
INDUSTRIAL DUTY
COMMERCIAL DOOR OPERATOR**



2 YEAR WARRANTY

Serial # Box _____
(located on electrical box cover)

Installation Date _____

Wiring Type _____

**THIS PRODUCT IS TO BE INSTALLED AND
SERVICED BY A TRAINED DOOR SYSTEMS
TECHNICIAN ONLY.**

Visit www.liftmaster.com to locate a professional
installing dealer in your area.

NOT FOR RESIDENTIAL USE



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SAFETY INFORMATION

WARNING

Mechanical

WARNING

Electrical

CAUTION

When you see these Safety Symbols and Signal Words on the following pages, they will alert you to the possibility of **serious injury** or **death** if you do not comply with the warnings that accompany them. The hazard may come from something mechanical or from electric shock. Read the warnings carefully.

When you see this Signal Word on the following pages, it will alert you to the possibility of damage to your door and/or the door operator if you do not comply with the cautionary statements that accompany it. Read them carefully.

IMPORTANT NOTES:

- *BEFORE attempting to install, operate or maintain the operator, you must read and fully understand this manual and follow all safety instructions.*
- *DO NOT attempt repair or service of your commercial door and operator unless you are an Authorized Service Technician.*

SPECIFICATIONS

OPERATOR SPECIFICATIONS

DRIVE SYSTEM

GEAR SYSTEM:Mixed Spurgear/Sprocket and Chain

CONTINUOUS POWER RATING:

1/2 HP: 140 ft-lbs/sec

OUTPUT SPEED

1/2 HP: 42.7 RPM

OUTPUT TORQUE

1/2 HP:400 in-lbs.

OUTPUT SHAFT DIAMETER

1/2 HP:1"

OUTPUT SPROCKET

1/2 HP:#50-18T

MAX. OVERHUNG LOAD:

1/2 HP:375 lbs.

MAX. BACK DRIVING FORCE: (torque)

1/2 HP:20 in-lbs.

CURRENT (Amperage):

Model FDCL5011U	Voltage-Phase	1/2HP
	115-1Ø, 60Hz	7.2
Model FDCL5021U	Voltage-Phase	1/2HP
	230-1Ø, 60Hz	3.6
Model FDCL5023U	Voltage-Phase	1/2HP
	230-3Ø, 60Hz	2
Model FDCL5043U	Voltage-Phase	1/2HP
	460-3Ø, 60Hz	1

MOTOR

TYPE: Continuous duty

HORSEPOWER: 1/2 HP

SPEED: 1750 RPM

VOLTAGE:115/230 Single phase 230/460 Three Phase

ENCLOSURE:ODP NEMA 48 Base Mount

ELECTRICAL

TRANSFORMER:1PH: 120/240 Vac 24 Vac

.....3PH: 240/480 Vac 24 Vac

BATTERY BACKUP:.....(2) 12 Vdc .8AH Lead Acid

CONTROL STATION:..... 3-Button Station

OPEN/CLOSE/STOP

WIRING TYPE: C2 (Standard),
B2 (Optional with LMEP installed)

LIMIT ADJUST:..... Linear driven, fully adjustable
screw type cams. (60 rev. max @ limit shaft)

DUTY CYCLE: 25 Reversing cycles per hour

BRAKE: 24 Vdc Electromagnetic Disc

THERMAL SENSORS:..... 160° F (Open on rise manual
reset, see page 19)

FUSE: 250V, 3AG, 2 AMP Slow-Blow

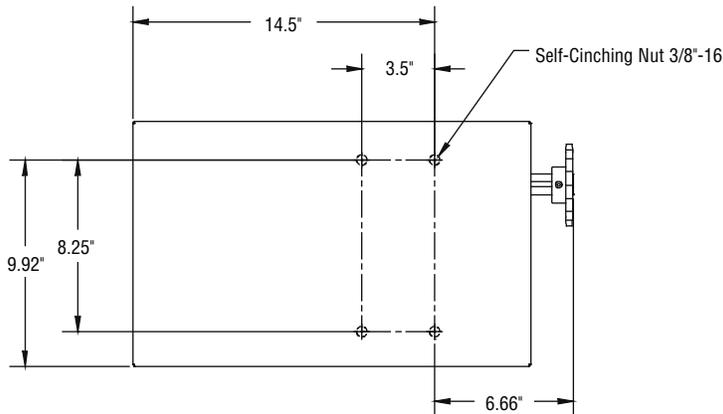
SPECIFICATIONS

DOOR TYPE AND MAXIMUM DOOR AREA (SQ. FT.)

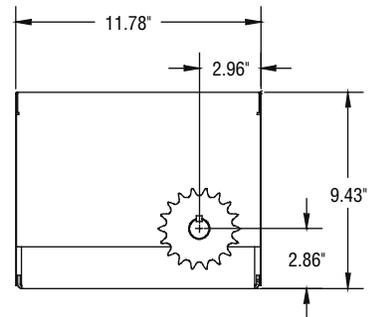
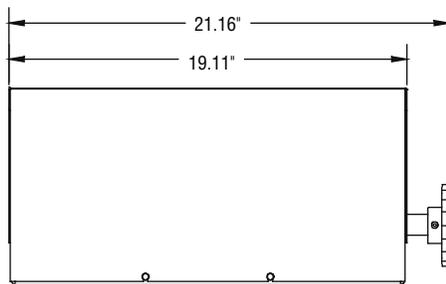
For use on overhead rolling doors not to exceed 100 Square Feet.

NOTE: Door size may vary due to door manufacturer's qualification testing. Do not exceed door manufacturer's maximum qualified door size for this operator.

OPERATOR WEIGHTS AND DIMENSIONS



HANGING WEIGHT
1/2HP = 68 lbs.



THEORY OF OPERATION

GENERAL DESCRIPTION

The Commercial Door Operator, FDCL U, is intended for use within an integrated fire door control system. It is designed to interface with normally close (NC) or normally open (NO) dry contact alarm system to control the operation of a fire door. Wiring for sensing device to reverse and auxiliary devices to open and close are provided. The control station is selectable between "Fire Door Mode Type I" and "Fire Door Mode Type II" by means of dip switch 2. When "Fire Door Mode Type 1" is selected the control station is the standard B2 wiring (with an LMEP is installed), momentary contact to open, close and stop. When "Fire Door Mode Type II" is selected the control station is a revised C2 wiring, momentary contact to open and stop and constant pressure to close with no open override. In addition, when "Fire Door Mode Type II" is selected, the door will Gravity Close governed descent on alarm. "Fire Door Mode Type I" is described throughout this manual. Refer to the above exceptions when in "Fire Door Mode Type II."

NOTE: This operator is not a fire alarm system. It can not detect a fire condition.

FIRE DOOR MODE TYPE I FUNCTIONAL OPERATION

1. BATTERY TEST DESCRIPTION

The FDCL U provides internal battery testing to ensure the battery has not been disconnected and the system can perform its intended functionality in the event of a loss of AC power. The battery is checked for presence once an hour for 10 seconds. If this test fails, the battery has failed or has been disconnected. A major fault (see below) is declared and must be immediately rectified. The battery is also load tested for one minute. The one minute load test is performed once per week to ensure that the power remaining in the batteries is sufficient to handle an emergency condition. The test will not occur within 12 hours of a power outage or an aborted test due to user input.

The battery test results are categorized as a minor fault or a major fault and are described as follows:

b. Minor Fault. This fault mode occurs when the system determines that the batteries hold between 10 seconds and one minute of capacity. The alarm within operator will begin notification at 3 seconds per minute. The batteries will be retested every week. The controller will attempt to close the door after 45 days of notification and test failures.

c. Major Fault. This fault mode occurs when the system determines that less than 10 seconds of battery backup is available. The batteries are either not connected or are severely depleted. The system will attempt to close the door after the dip switch selected alarm delay (see dip switch section of this manual). Notification will occur as a 1 second on 1 second off pulse train until Battery Test passes.

Whenever a battery test failure occurs, the batteries must be connected or replaced immediately in order to ensure normal system operation. If for any reason the battery voltage drops below the minimum voltage (22.1 Vdc), the unit will activate the optional warning system and automatically close the door via a controlled descent.

If the system passes the Battery Test, then all alarms are cleared.

2. UNIT HAS AC POWER AND NO ALARM CONDITION:

- The 3-button control station is used to operate the door electrically.
- Activation of an LMEP device while the door is closing will reverse the door to the full open position. Activation of an LMEP device while opening has no effect.
- Activation of the safety edge or LMEP while the door is closing will cause the door to reverse to the full open limit.
- Activation of the 2-wire non-monitored safety edge while the door is opening will stop the door. An LMEP input will have no effect.

- Activating the key-test switch for at least 6 seconds will put the operator in active alarm mode. See ACTIVE ALARM section for detail operation of active alarm mode.

3. UNIT HAS AC POWER AND ACTIVE ALARM CONDITION (ALARM INPUT #1 - Smoke Detector, etc.):

- The unit will activate the **OPTIONAL** warning signal, the door will automatically close after the preset time delay (powered down by motor except in Fire Door Mode Type II). The time delay is set by means of dip switch 1.
- If the door is in the open position and an alarm condition occurs, the door will automatically close under motor operation except in Fire Door Mode Type II. In the event the door should meet an obstruction while closing, it will reverse and return to the full open position, and then start the closing cycle (with delay and warning) again. If the obstruction is not removed, after 2nd attempt, the door will close stopping at the lowest possible position holding the brake for 2 seconds, then releasing the door to gravity close (governed descent). If after the door has finished the cycling mode and obstruction has been removed, the door will proceed to the floor.
- In the event of a failure in motor operation, the operator will gravity close (governed descent).

4. UNIT HAS AC POWER AND ACTIVE ALARM CONDITION (ALARM INPUT #2 - Thermal sensor, fuse link.):

- The unit will activate the **OPTIONAL** warning signal (horn/strobe), the door will automatically power down by the motor after the preset time delay (powered down by motor except in Fire Door Mode Type II). The time delay is set by means of dip switch 1.
- If the door is in the open position and the alarm condition occurs, the door will automatically close under motor operation (except in Fire Door Mode Type II). In the event the door should meet an obstruction while closing, the door will stop for 2 seconds, then release the door to gravity close (governed descent). After the obstruction has been removed, the door will proceed to the floor.
- In the event of a failure in motor operation, the operator will gravity close (governed descent).
- All control station functions will be rendered inactive in this condition.
- The safety edge will remain active.

THEORY OF OPERATION

FIRE DOOR MODE TYPE I FUNCTIONAL OPERATION

5. UNIT HAS NO AC POWER AND NO ACTIVE ALARM

CONDITION:

- The Close and Stop buttons of the 3-button control station are functional.
- The door's descending speed is controlled by the internal governor.
- The door will stop if an obstruction is encountered while closing.
- Open button is not functional.

6. UNIT HAS NO AC POWER AND ACTIVE ALARM CONDITION

(Alarm Input #1 or Alarm Input #2):

- The unit will activate the **OPTIONAL** warning signal (horn/strobe), the door will automatically close via governed descent after the preset time delay. The time delay is set by means of dip switch 1.
- If the door encounters an obstruction while closing, the door will stop on the obstruction, and release the brake after 2 seconds. If the obstruction is then removed, the unit will perform a governed descent of the door (not powered down by the motor).

NOTE: The LMEP has no effect.

DOOR SYSTEM TESTING PROCEDURES

Before beginning any testing, secure the door area, keep unauthorized personnel from entering the area during testing. Be sure AC power is present at the operator, (the green "AC" LED will be lit on the operator's control board) and that the batteries are connected.

NOTE: The red "DC" led will **NOT** be lit on the operator's control board when AC power is present.

1. Begin the test with the door at the full "OPEN" position.
2. If the door is equipped with LMEP's, make certain dip switch #4 is in the "ON" position. LMEP is not active during this test.

NOTE: If 2 minutes total time elapses from the beginning of step 11 and the conclusion of step 15, the unit will automatically exit the "TEST" mode. To re-enter the "TEST" mode repeat step 4, and continue testing.

3. Turn the wall mounted key test switch to the "TEST" position and hold for a minimum of 6 seconds. This action simulates an "ALARM" signal.
4. If dip switch #1 is in the "ON" position, the door should begin to close immediately. If dip switch #1 is in the "OFF" position, the door should begin to close after 10 seconds time has elapsed (the door will not motor down, it will gravity descend).
5. Using a "stop-watch" verify that your door is closing between 6" and 24" per second (i.e., A 10' high door should close in a time between 5 and 20 seconds). Your door should now be fully closed.
6. Open the door by depressing the "OPEN" button on the 3-Button Control Station.
7. Repeat step 3.

7. ACTIVATION OF THE KEY TEST STATION (WITH AC POWER ON):

- This will test the signalling devices and time delay.
- Key must be activated for 6 seconds.
- The unit will activate the **OPTIONAL** warning signal (horn/strobe), the door will automatically close via governed decent after the preset time delay (controlled by internal governor). The time delay is set by means of dip switch 1.
- The door will close via governed descent in order to test the door balance, descent speed, and the moment of the door.
- The stop button will be active with constant pressure which will reengage the brake. Close and open buttons are not active. All sensing devices will no be active.
- The test mode will expire after 1 minute.

WARNING

To avoid **SERIOUS PERSONAL INJURY** or **DEATH**, **DO NOT** introduce **ANY** part of your body to the door system during testing.

8. When the door is approximately 3 to 4 feet from the floor, activate the door's reverse edge, (if so equipped) using a crate, skid or alike. **Do not introduce any part of your body to the door system during testing.** The door should stop. Remove the obstruction.
9. The door will begin to close within 1 second, if dip switch #1 is in the "ON" position. If dip switch # 1 is in the "OFF" position, the door will wait 10 seconds before beginning to close, the door should fully close to the floor (the door will not motor down, it will gravity descend).
10. Repeat steps 5 and 6.
11. When the door is approximately half way to the floor, interrupt the safety photo eye beam, (if so equipped) by blocking with a piece of cardboard or alike. **Do not introduce any part of your body to the door system during testing.** The door should reverse to the full open position. Remove the obstruction.
12. Step 10 repeats.
13. When the door is approximately half way to the floor, depress and hold the "STOP" button on the 3-Button Control Station. The door should stop.
14. Release the "STOP" button on the control station. Step 10 repeats.
15. Depress the "OPEN" button on the 3-Button Control Station. The door should open to the full open position. The unit is now ready to be returned to service.

INSTALLATION

IMPORTANT INSTALLATION INSTRUCTIONS

WARNING

To reduce the risk of **SEVERE INJURY** or **DEATH**:

1. READ AND FOLLOW ALL INSTALLATION WARNINGS AND INSTRUCTIONS.
2. Install door operator ONLY on a properly operating, balanced and lubricated door. An improperly balanced door may NOT reverse when required and could result in SEVERE INJURY or DEATH.
3. ALL repairs to cables, spring assemblies and other hardware MUST be made by a trained door systems technician BEFORE installing operator.
4. Disable ALL locks and remove ALL ropes connected to door BEFORE installing operator to avoid entanglement.
5. Install door operator 8 feet (2.44 m) or more above floor.
6. NEVER connect door operator to power source until instructed to do so.
7. NEVER wear watches, rings or loose clothing while installing or servicing operator. They could be caught in door or operator mechanisms.
8. Install control station:
 - within sight of the door.
 - out of reach of children at minimum height of 5 feet (1.5 m).
 - away from ALL moving parts of the door.
9. Install the control station far enough from the door to prevent the user from coming in contact with the door while operating the controls.
10. Install the entrapment warning placard on wall next to the control station in a prominent location that is visible from the door.
11. Place manual release/safety reverse test label in plain view on inside of door.
12. Upon completion of installation, test entrapment protection device.
13. **SAVE THESE INSTRUCTIONS.**

PREPARATION

Before your operator is installed, be sure the door has been properly aligned and is working smoothly. The operator may be wall mounted or mounted on a bracket or shelf. Refer to the illustration and instructions on the following page that suits your application. This motor operator is an integral part of the door system. The motor operator, controls door descent speed under power outage conditions, therefore the motor operator mounting surface is of major importance. The mounting must provide the following:

- All surfaces should be flat, square, and parallel to the door shaft.
- The mounting surface must be rigid, and braced off as required.
- When wall mounting the motor operator, it should be through bolted to the wall.
- All (4) motor operator mounting points MUST be used.
- All mounting hardware should be a minimum of grade 5.

WARNING

To prevent possible **SERIOUS INJURY** or **DEATH**:

- DO NOT connect electric power until instructed to do so.
- If the door lock needs to remain functional, install an interlock switch.
- ALWAYS call a trained professional door serviceman if door binds, sticks or is out of balance. An unbalanced door may NOT reverse when required.
- NEVER try to loosen, move or adjust doors, door springs, cables, pulleys, brackets or their hardware, ALL of which are under **EXTREME** tension and can cause **SERIOUS PERSONAL INJURY**.
- Disable ALL locks and remove ALL ropes connected to door BEFORE installing and operating door operator to avoid entanglement.
- To prevent possible **SERIOUS INJURY** or **DEATH** from a falling door, ALL doors intended to be motor operated should be manufactured with solid door shafts.
- This commercial door operator will NOT close a balanced door in the absence of AC power. The door system MUST be able to generate a minimum backdriving torque of 20 in/lbs. at the operator output shaft.
- Fasten the operator **SECURELY** to structural supports if not mounted to door shield.
- Concrete anchors MUST be used if installing ANY brackets in masonry.

INSTALLATION

OPERATOR MOUNTING

Bracket or Shelf Mounting

The operator may be mounted either above or below the door shaft. The optimum distance between the door shaft and operator drive shaft is between 12" - 15" (Figure 1 or 3).

Wall Mounting

The operator should generally be installed below the door shaft, and as close to the door as possible. The optimum distance between the door shaft and operator drive shaft is between 12" - 15" (Figure 2 or 4).

LiftMaster products are shipped for inside wall mount applications. If the operator is mounted to the front of the hood the "Handing" is reversed. The second to last letter of the model number indicates the mounting with a "R" for right and "L" for left.

Left Hand Models: FDCL5011UL, FDCL5021UL, FDCL5023UL, FDCL5043UL (Figures 1 & 2).

Right Hand Models: FDCL5011UR, FDCL5021UR, FDCL5023UR, FDCL5043UR (Figures 3 & 4).

NOTE: The door hood, end plates, and mounting bracket must be rigid, and provide adequate structural support.

1. Place door sprocket on the door shaft. Do not insert the key at this time.
2. Wrap drive chain around door sprocket and join roller chain ends together with master link. (Link clip should face away from operator.)
3. Raise operator to approximate mounting position and position chain over operator sprocket.
4. Raise or lower operator until the chain is taut (not tight). Make sure the operator output shaft is parallel to door shaft and sprockets are aligned. When in position, secure the operator to wall or mounting bracket.
5. Install all remaining drive keys and set screws. Apply locking compound to set screws. Check that all mounting hardware is tight, and the drive chains are taut.

LEFT HAND MOUNTS - FIGURES 1 & 2

RIGHT HAND MOUNTS - FIGURES 3 & 4

FIGURE 1

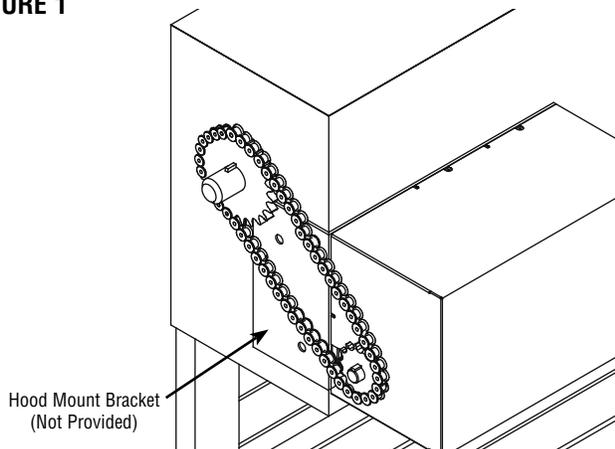


FIGURE 3

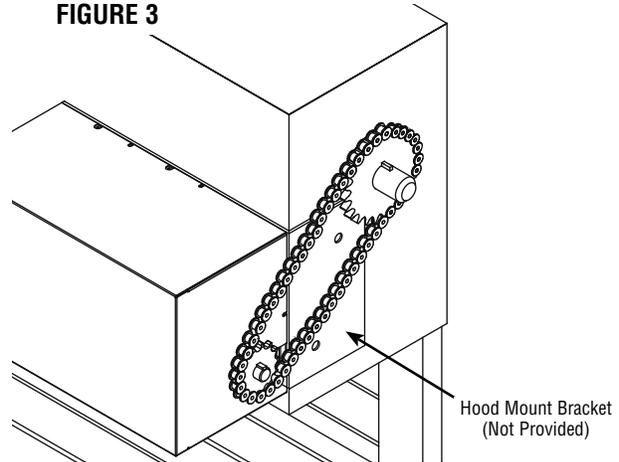


FIGURE 2

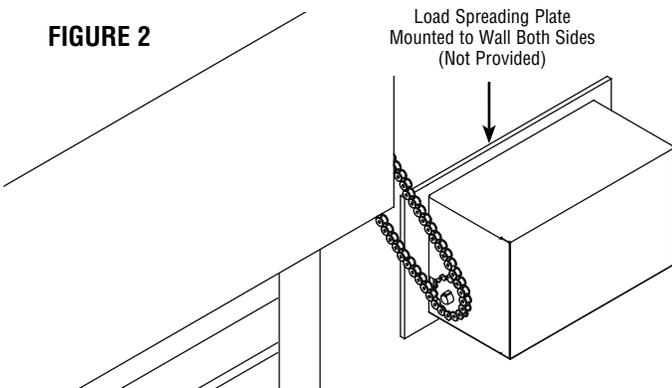
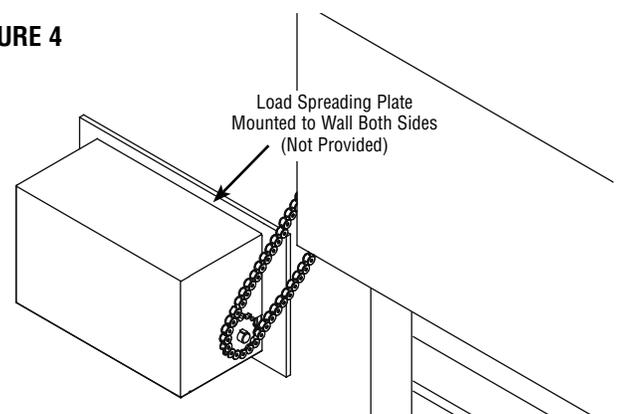
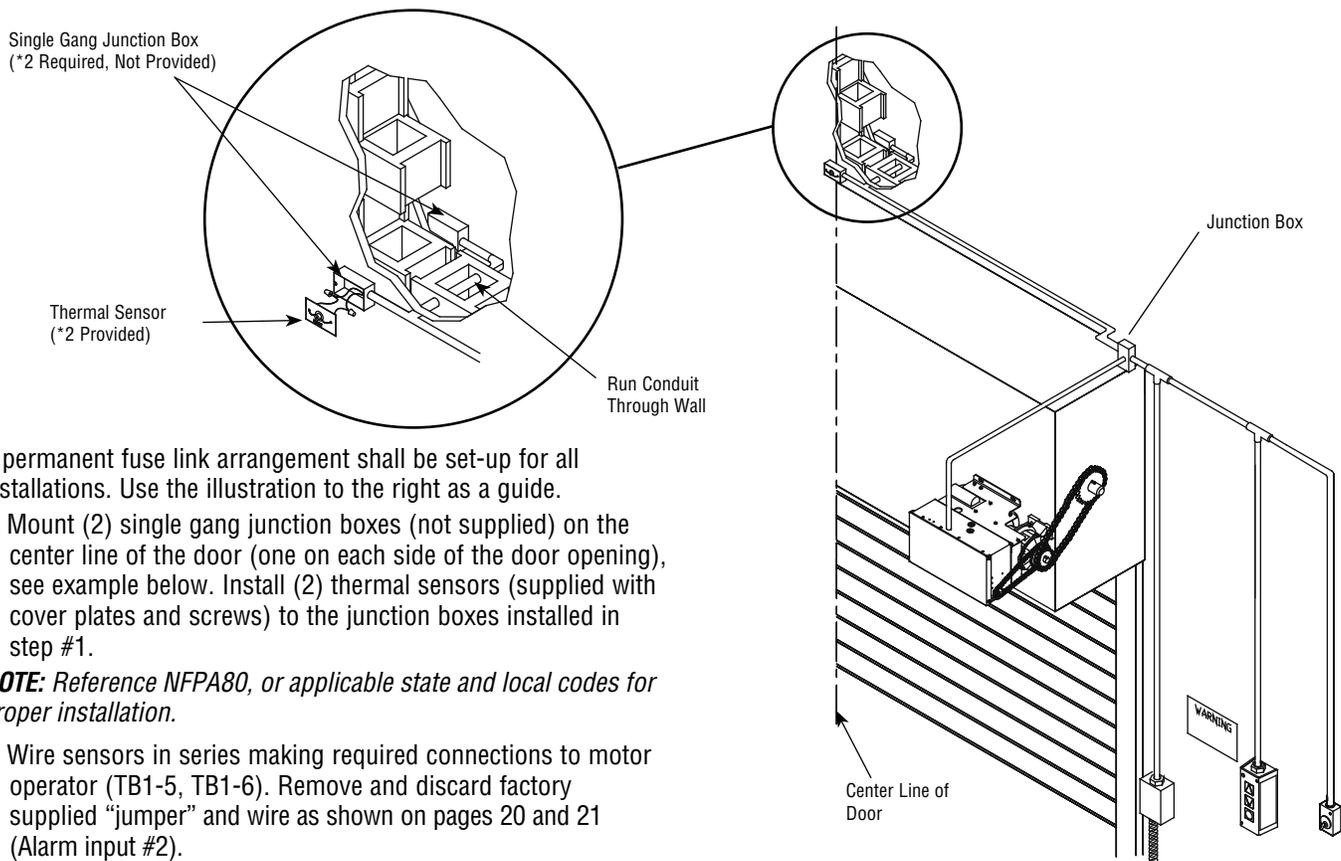


FIGURE 4



FUSE LINK INSTALLATION

ELECTRONIC FUSE LINK ARRANGEMENT



A permanent fuse link arrangement shall be set-up for all installations. Use the illustration to the right as a guide.

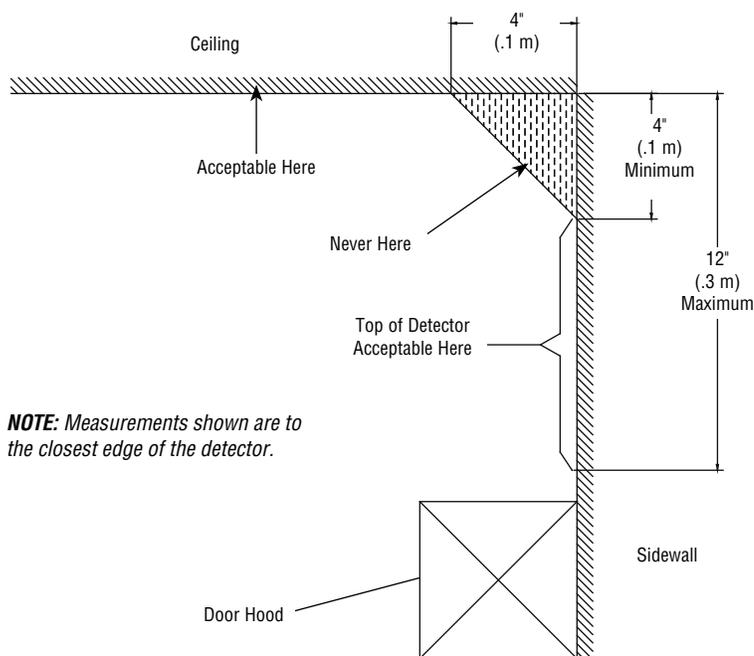
1. Mount (2) single gang junction boxes (not supplied) on the center line of the door (one on each side of the door opening), see example below. Install (2) thermal sensors (supplied with cover plates and screws) to the junction boxes installed in step #1.

NOTE: Reference NFPA80, or applicable state and local codes for proper installation.

2. Wire sensors in series making required connections to motor operator (TB1-5, TB1-6). Remove and discard factory supplied "jumper" and wire as shown on pages 20 and 21 (Alarm input #2).

3. All wiring and conduit should be run in accordance with all state and local electrical codes.

EXAMPLE OF PROPER MOUNTING FOR DETECTORS



NOTE: Measurements shown are to the closest edge of the detector.

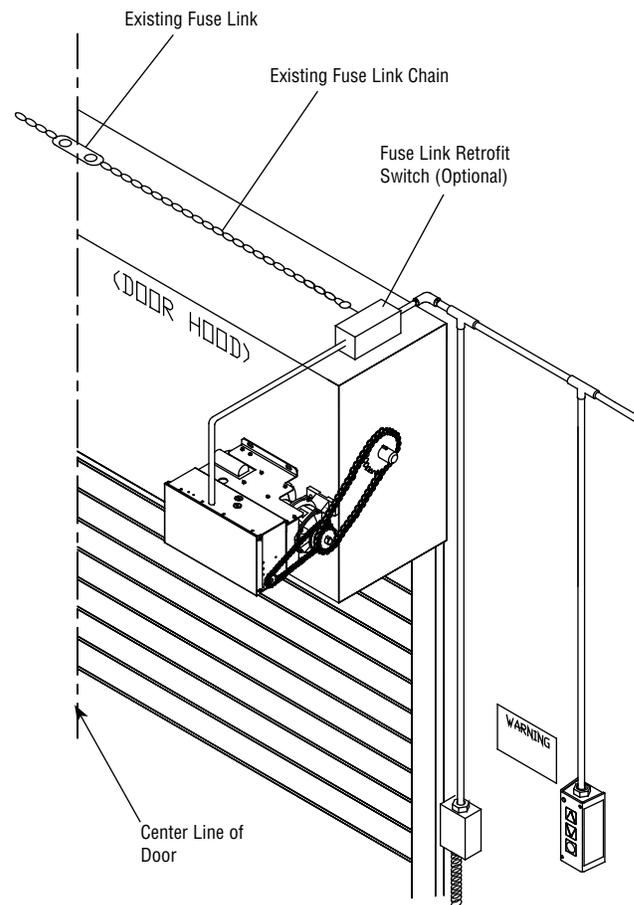
FUSE LINK INSTALLATION

OPTIONAL MECHANICAL (RETROFIT) FUSE LINK ARRANGEMENT 71-17148

1. Mount (optional) fuse link retrofit switch in any convenient location to interface with existing fuse link arrangement.
2. Connect existing fuse link chain to “key-ring” on fuse link switch.
3. Adjust existing fuse link arrangement to be sure that proper tension is supplied to the fuse link switch actuator (key-ring). The actuator should be fully extended. There should be continuity between the switch leads (Normally Closed).
4. Release the fuse link and be sure the fuse link switch actuator (key-ring) retracts completely with no binding. There should be NO continuity between the switch leads (Open Electrically).
5. Wire fuse link switch leads through conduit (not supplied).
 - a Remove factory supplied “Jumper” between TB1-5, TB1-6 and discard.
 - b Make required connections to motor operator TB1-5, TB1-6 (Alarm Input #2).

NOTE: For additional wiring help refer to wiring diagrams on pages 20 and 21.

6. All wiring and conduit should be run in accordance with all national and local electrical codes.



ADJUSTMENT

IMPORTANT SAFETY INSTRUCTIONS

WARNING

To reduce the risk of **SEVERE INJURY** or **DEATH**:

1. READ AND FOLLOW ALL WARNINGS AND INSTRUCTIONS.
2. ALWAYS keep remote controls out of reach of children. NEVER permit children to operate or play with door control push buttons or remote controls.
3. ONLY activate door when it can be seen clearly, it is properly adjusted and there are no obstructions to door travel.
4. Personnel should keep away from a door in motion and ALWAYS keep door in sight until completely closed. NO ONE SHOULD CROSS THE PATH OF THE MOVING DOOR.
5. NO ONE SHOULD GO UNDER A STOPPED, PARTIALLY OPENED DOOR.
6. If possible, use manual release handle to disengage door ONLY when door is CLOSED. Weak or broken springs or unbalanced door could result in an open door falling rapidly and/or unexpectedly causing SEVERE INJURY or DEATH.
7. NEVER use manual release handle unless doorway is clear of persons and obstructions.
8. After ANY adjustments are made, the entrapment protection device MUST be tested. Failure to adjust the operator properly may cause SEVERE INJURY and DEATH.
9. Entrapment Protection device MUST be tested every month. Failure to adjust the operator properly may cause SEVERE INJURY and DEATH.
10. ALWAYS KEEP DOOR PROPERLY OPERATING AND BALANCED. An improperly balanced door may NOT reverse when required and could result in SEVERE INJURY or DEATH. See door manufacturer's owners manual.
11. ALL repairs to cables, spring assemblies and other hardware, ALL of which are under EXTREME tension, MUST be made by a trained door systems technician.
12. ALWAYS disconnect electric power to door operator BEFORE making ANY repairs or removing covers.
13. **SAVE THESE INSTRUCTIONS.**

LIMIT SWITCH ADJUSTMENT

NOTE: Make sure the limit nuts are positioned between the limit switch actuators before proceeding with adjustments.

1. To adjust limit nuts depress retaining plate to allow nut to spin freely. After adjustment, release plate and move nut back and forth to ensure it is fully seated in slot.
2. To **increase** door travel, spin nut **away** from actuator. To **decrease** door travel, spin limit nut **toward** actuator.
3. Adjust open limit nut so that door will stop in open position with the bottom of the door even with top of door opening.
4. Repeat steps 1 and 2 for close cycle. Adjust close limit nut so that actuator is engaged as door fully seats at the floor.

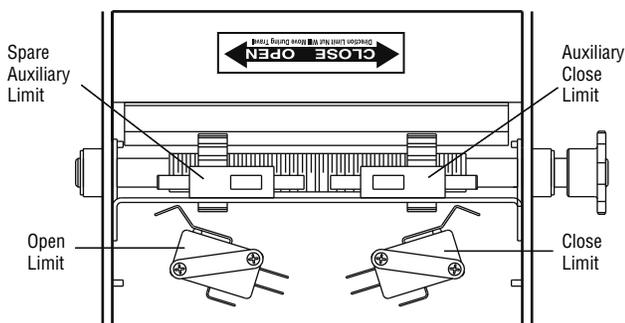
WARNING

To avoid **SERIOUS** personal **INJURY** or **DEATH** from electrocution:

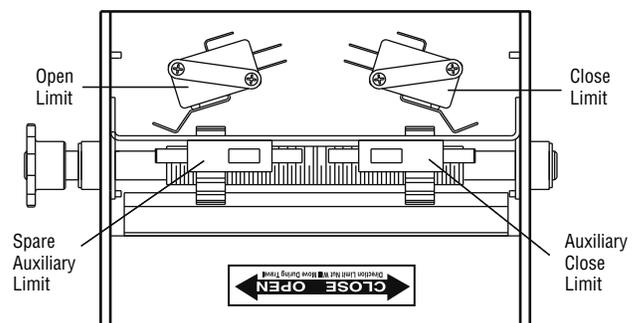
- Disconnect electric power **BEFORE** performing ANY adjustments or maintenance.

If other problems persist, call our toll-free number for assistance: **1-800-528-2806**.

LEFT HAND, FRONT OF HOOD / RIGHT HAND, WALL MOUNT



RIGHT HAND, FRONT OF HOOD / LEFT HAND, WALL MOUNT



ADJUSTMENT

INSTALLATION MODE

ALARM INPUTS

Alarm Input #1:

Used for electronic alarm devices such as smoke detection devices or similar alarm systems. Devices may be N/O or N/C. Switchable using dip switch #3. This alarm will activate a motored closure of the door (except in Fire Door Mode Type II), and all sensing and control devices will remain active.

It is imperative that the alarm signal contact is maintained for a time period greater than the alarm delay to close setting. I.E. If dip switch #1 is in the "OFF" position (10 seconds) the alarm system must supply a "**DRY**" **contact** signal to terminals J2-11 and J2-12 for a minimum of 12 seconds.

Alarm Input #2:

Used for the thermal sensors (electronic fusible links), fuse link kit or similar systems. (N.C. state only) **The sensor or similar system must supply a "DRY N.C." contact signal.** This alarm condition will activate a motored closure of the door (except in Fire Door Mode Type II), and all sensing devices and control stations will be rendered inactive. EXCEPT THE SAFETY EDGE. This alarm will override any other alarm condition or input.

WARNING

To avoid SERIOUS PERSONAL INJURY or DEATH:

- It is the end users sole responsibility to check that ALL systems are installed and functional.
- The motor operator **MUST** be switched to the "firedoor mode type 1" to enable ALL alarm and warning systems.
- Dip switch #2 **MUST** be switched to the "ON" position to enable the "firedoor" mode. Failure to do so, could result in loss of life and property.

POWER WIRING & GROUND WIRING

WARNING

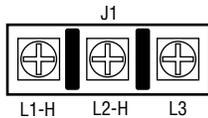
To reduce the risk of SEVERE INJURY or DEATH:

- ANY maintenance to the operator or in the area near the operator MUST NOT be performed until disconnecting the electrical power and locking-out the power. Upon completion of maintenance the area MUST be cleared and secured, at that time the unit may be returned to service.
- Disconnect power at the fuse box BEFORE proceeding. Operator MUST be properly grounded and connected in accordance with national and local electrical codes. The operator should be on a separate fused line of adequate capacity.
- ALL electrical connections MUST be made by a qualified individual.
- DO NOT install ANY wiring or attempt to run the operator without consulting the wiring diagram.
- ALL power wiring should be on a dedicated circuit and well protected. The location of the power disconnect should be visible and clearly labeled.
- ALL power and control wiring MUST be run in separate conduit.

Remove the cover from the electrical enclosure. Inside this enclosure you will find the wiring diagram(s) for your unit. Refer to the diagram (glued on the inside of the cover) for all connections described below. If this diagram is missing, see contact information on page 32.

POWER WIRING CONNECTIONS

1. Connect power wires to the J1 terminal block located on the circuit board.



2. Be sure to run all power wires through the conduit hole in the electrical box enclosure marked with the label shown below. Service voltage must be run separately from class 2 circuits (controls). See pages 20 and 21 for standard power connections.

POWER WIRING
USE COPPER WIRE ONLY 40-10031B

GROUND WIRING CONNECTIONS

1. Connect earth ground to the chassis ground screw in the electrical box enclosure.
2. Use same conduit entry into the electrical box as the power wiring.

IMPORTANT NOTE: This unit must be properly grounded. Failure to properly ground this unit could result in electric shock and serious injury.

CONTROL STATION WIRING & INSTALLATION

WARNING

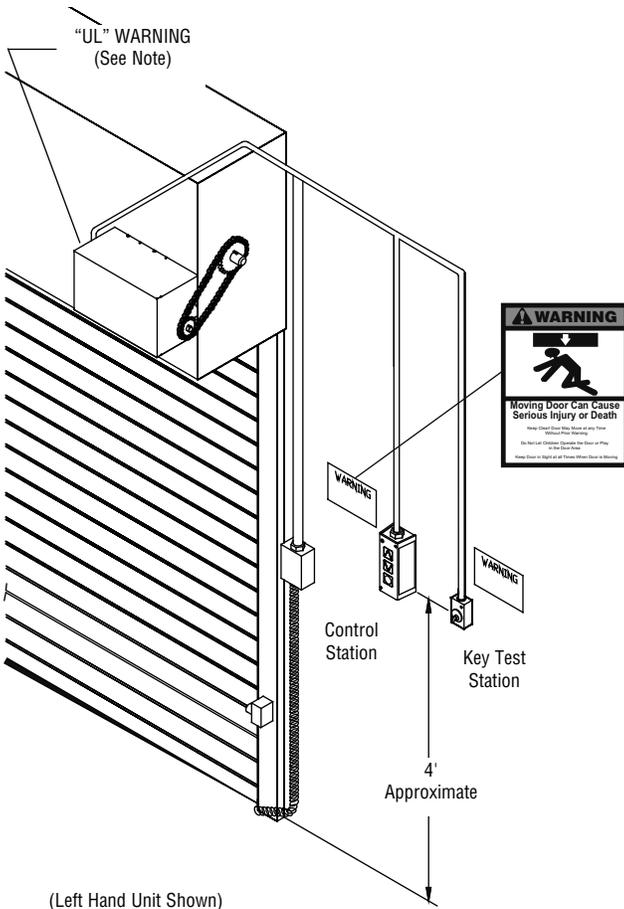
To prevent possible SERIOUS INJURY or DEATH from electrocution:

- Be sure power is NOT connected BEFORE installing door control.

To prevent possible SERIOUS INJURY or DEATH from a closing door:

- Install door control within sight of door, out of reach of children at a minimum height of 5 feet (1.5 m) and away from ALL moving parts of door.
- Install the control station far enough from the door to prevent the user from coming in contact with the door while operating the controls.

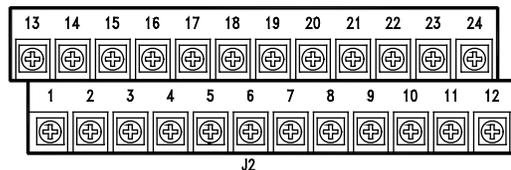
- Install the entrapment warning placard on wall next to the control station in a prominent location that is visible from the door.
- NEVER permit children to operate or play with door control push buttons or remote controls.
- Activate door ONLY when it can be seen clearly, is properly adjusted and there are no obstructions to door travel.
- ALWAYS keep door in sight until completely closed. NEVER permit anyone to cross path of closing door.



NOTE: The “UL” Warning label must be read “right side up” from the floor level. Should your operator mounting cause this label to be read “upside down,” your accessory kit is supplied with an additional label. Install the new label so that it will be read “right side up” from the floor level.

CONTROL WIRING CONNECTIONS

1. Connect control wires to the J2 terminal block located on the logic board (shown below).



2. Be sure to run all control wires through the conduit hole in the electrical box enclosure marked with the label shown below. Class 2 circuits (controls) must be run in separate conduit from service voltage.

CONTROL WIRING
USE COPPER WIRE ONLY 40-10032B

3. Apply power to the operator. Press OPEN push button and observe direction of door travel and then **Press the STOP button.** If door did not move in the correct direction, check for improper wiring at the control station or between operator and control station (see pages 20 and 21).

MOUNTING INSTRUCTIONS

4. Mount control station and key test switch no further than 12" from each other.
5. Mount control station and key test switch within clear line of sight of door.
6. Mount WARNING PLACARD beside or below the control station and key test station as shown to the left.

ENTRAPMENT PROTECTION

LIFTMASTER MONITORED ENTRAPMENT PROTECTION (LMEP)

IMPORTANT INFORMATION ABOUT THE LIFTMASTER MONITORED ENTRAPMENT PROTECTION DEVICES

A LiftMaster Monitored Entrapment Protection (LMEP) device is required for most wiring types. If a LiftMaster Monitored Entrapment Protection device is not installed, constant pressure to close will be required from the control station.

When properly connected and aligned, the photoelectric sensors will detect an obstruction in the path of its invisible light beam. If an obstruction breaks the light beam while the door is closing, the door will stop and typically reverse to the full open position.

The photoelectric sensors must be installed facing each other across the door, no more than 6" (15 cm) above the floor.

Each photoelectric sensor has an LED that will glow steady when the sensor is properly connected and aligned. The LEDs on both photoelectric sensors will flicker rapidly when obstructed or misaligned.

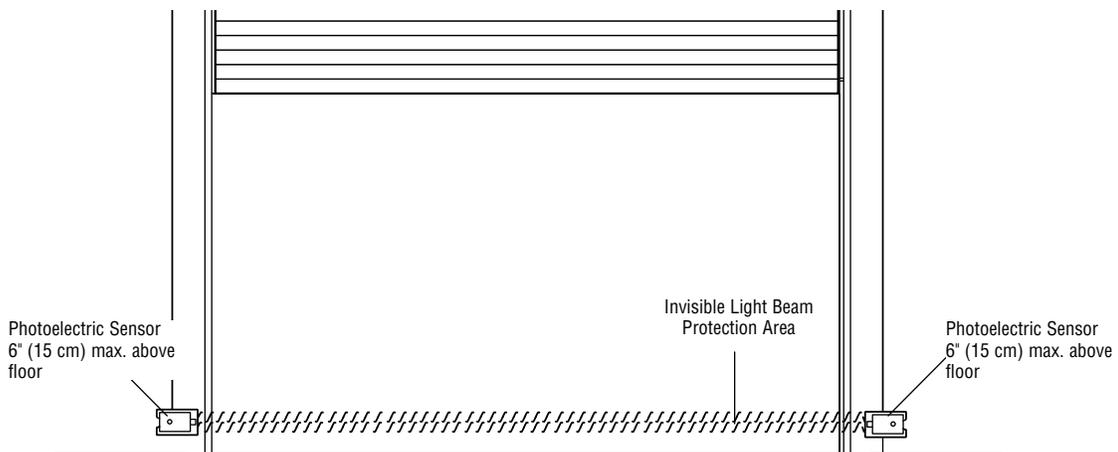
WARNING

To prevent possible **SERIOUS INJURY** or **DEATH** from a closing door:

- Be sure power is **NOT** connected to the door operator **BEFORE** installing the photoelectric sensor.
- The door **MUST** be in the fully opened or closed position **BEFORE** installing the LiftMaster Monitored Entrapment Protection device.

To prevent **SERIOUS INJURY**, **DEATH**, **ENTRAPMENT**, or **PROPERTY DAMAGE**:

- Correctly connect and align the photoelectric sensor.
- Install the photoelectric sensor beam **NO HIGHER** than 6" (15 cm) above the floor.
- This is a required safety device for B2, TS, T, and FSTS wiring types and **MUST NOT** be disabled. For D1, C2, and E2 wiring the installation of an entrapment device is recommended.
- LiftMaster Monitored Entrapment Protection devices are for use with LiftMaster Commercial Door Operators **ONLY**. Use with **ANY** other product voids the warranty.
- If an edge sensor is being used on a horizontal slide door, then place one or more edge sensors on both the leading and trailing edge.
- If an edge sensor is being used on a vertically moving door, then place one or more edge sensors on the bottom edge of the door.



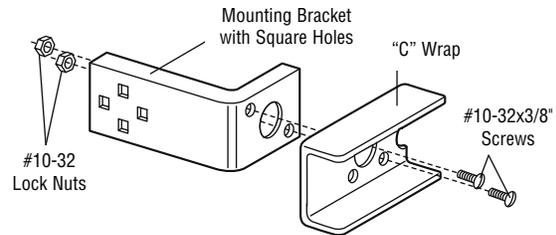
ENTRAPMENT PROTECTION

INSTALL THE PHOTOELECTRIC SENSORS

The following instructions show recommended assembly of the bracket(s) and "C" wrap based on the wall installation of the photoelectric sensors on each side of the door or on the door tracks themselves. There are also alternate mounting methods which may fit your installation requirements better.

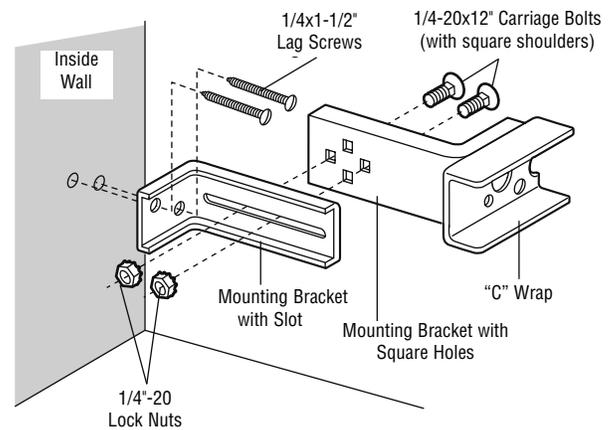
Make sure the wraps and brackets are aligned so the photoelectric sensors will face each other across the door.

1. Fasten the "C" wraps to the mounting brackets having square holes, using hardware shown.

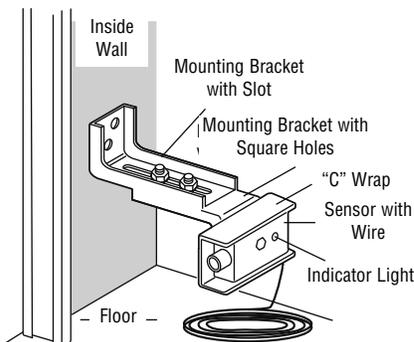


WALL INSTALLATION

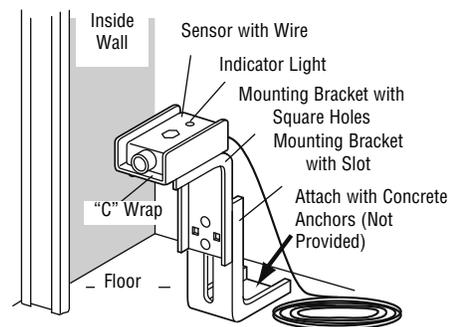
2. Connect each assembly to a slotted bracket, using the hardware shown. **Note alignment of brackets for left and right sides of the door.**
3. Finger tighten the lock nuts.
4. Use bracket mounting holes as a template to locate and drill (2) 3/16" diameter pilot holes on both sides of the garage door, 4-6 inches (10-15 cm) above the floor. Do not exceed 6 inches (15 cm).
5. Attach bracket assemblies with 1/4"x1-1/2" lag screws.
6. Adjust right and left side bracket assemblies to the same distance out from mounting surface. Make sure all door hardware obstructions are cleared. Tighten the nuts securely.



ALTERNATE WALL INSTALLATION



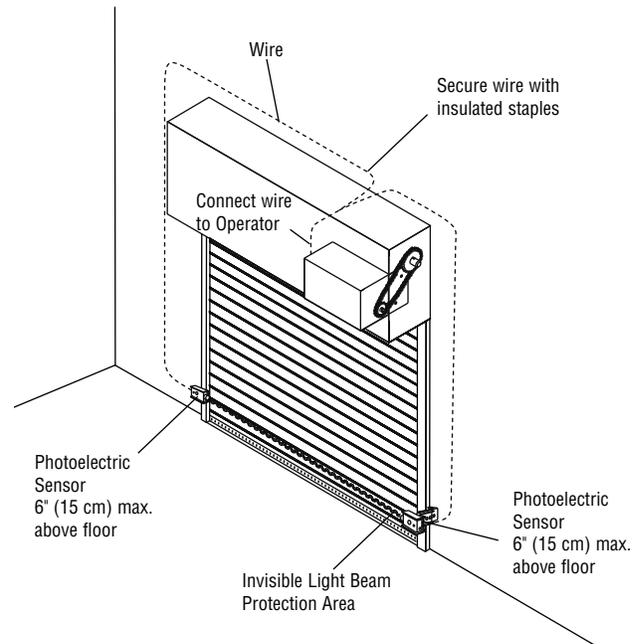
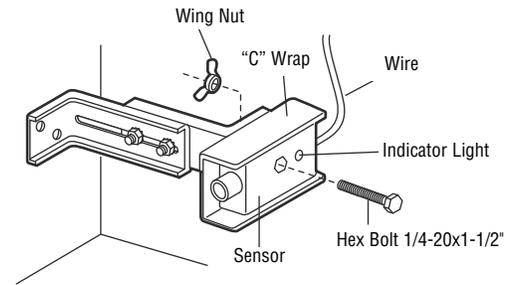
ALTERNATE FLOOR INSTALLATION



ENTRAPMENT PROTECTION

MOUNT THE PHOTOELECTRIC SENSORS

1. Center each sensor in the bracket with the lenses pointing toward each other across the door.
2. Attach the sensors to the brackets with the provided hardware. Finger tighten the *receiving sensor* wing nut. Securely tighten the *sending sensor* wing nut.
3. Run the wires from both sensors to the operator. Use insulated staples to secure wire to the wall and ceiling.
4. Connect the sensor wires to the operator.



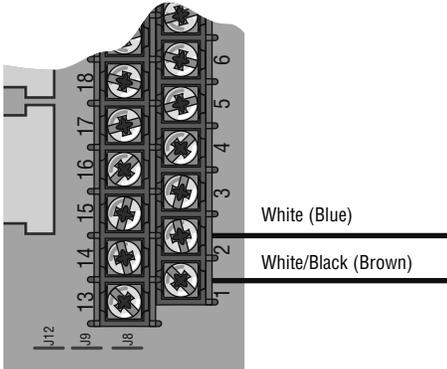
ENTRAPMENT PROTECTION

ENTRAPMENT PROTECTION WIRING OPTIONS

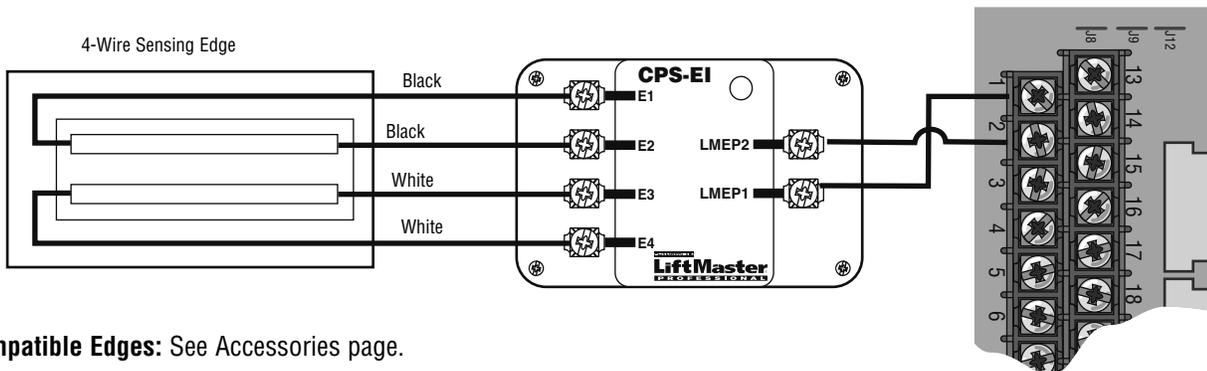
LIFTMASTER MONITORED ENTRAPMENT PROTECTION WIRING:

Connect the LiftMaster Monitored Entrapment Protection (LMEP) device to the logic board according to the models shown below:

CPS-U and CPS-UN4



CPS-EI



Compatible Edges: See Accessories page.

CONTROL SETTINGS

OPTIONAL CONTROL SETTINGS

NOTE: All functions are independent of each other and do not require other control settings to be set at any certain configuration. For dip switch location refer to illustration below. All switches are factory preset to the "OFF" position.

SI-1 ALARM DELAY TO CLOSE

Alarm Delay to Close is the time between when the operator first receives an active alarm signal and the door starts to close (in seconds).

SI-4 LMEP

The operator will support LiftMaster Monitored Entrapment Protection (LMEP) when enabled, and ignore sensor inputs when disabled. Switch must be ON with LMEP connected, OFF if not.

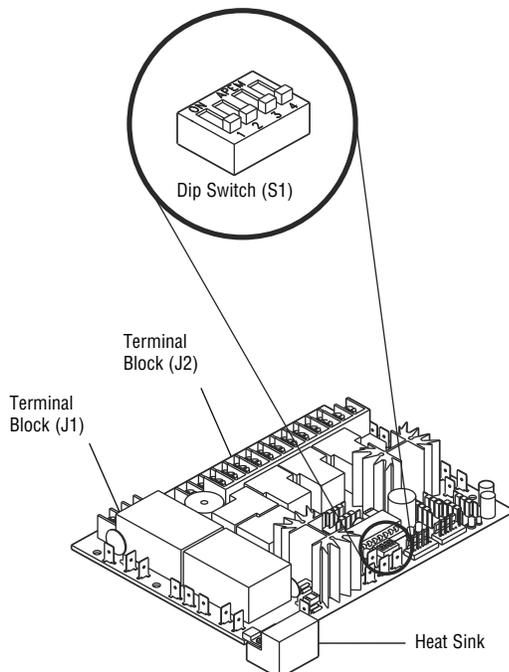
INSTALLER CONTROL SETTINGS

SI-2 MODE

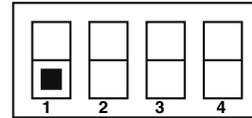
The factory default for the operator is standard Fire Door Mode Type I (OFF). Setting S1-2 to the (ON) position selects the Fire Door Mode Type II. When Fire Door Mode Type I is selected, the control station is in the standard B2 wiring, momentary contact to open, close and stop. When Fire Door Mode Type II is selected, the control station is in revised C2 wiring, momentary contact to open and stop, constant pressure to close with no open override. In addition, when Fire Door Mode Type II is selected, the door will Gravity Close (governed descent) on alarm.

SI-3 ALARM STATE

The operator can accept either a normally open or normally closed dry contact alarm input. DO NOT INDUCE VOLTAGE!

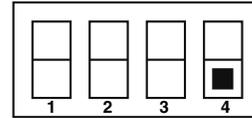


ON (0 SECOND DELAY)



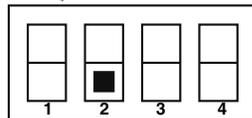
OFF (10 SECOND DELAY)

ON (LMEP ENABLED)



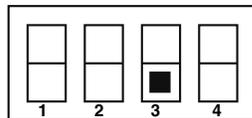
OFF (LMEP DISABLED)

ON (FIRE DOOR MODE TYPE II)



OFF (FIRE DOOR MODE TYPE I)

ON (N.C. ALARM)



OFF (N.O. ALARM)

NOTICE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

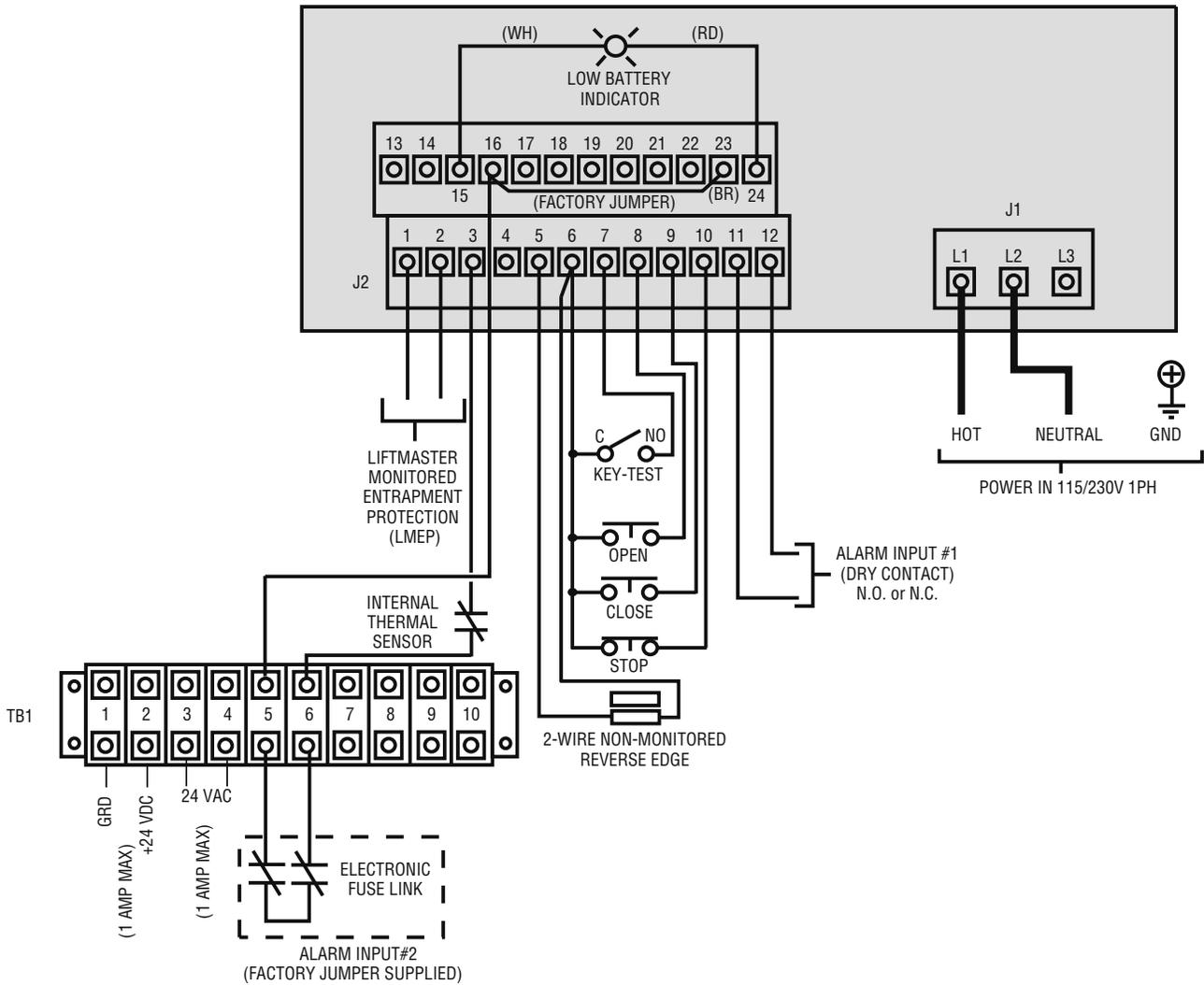
DIAGRAMS

STANDARD POWER & CONTROL CONNECTION DIAGRAMS

NOTE: The operator should be on a separate fused line of adequate capacity.

LMPLC BOARD - 115/230V 1PH

Operator must be permanently wired as per NFPA 70 (National Electrical Code). Ground must be pulled with each service. Service voltage must be run separately from class 2 circuits (controls).



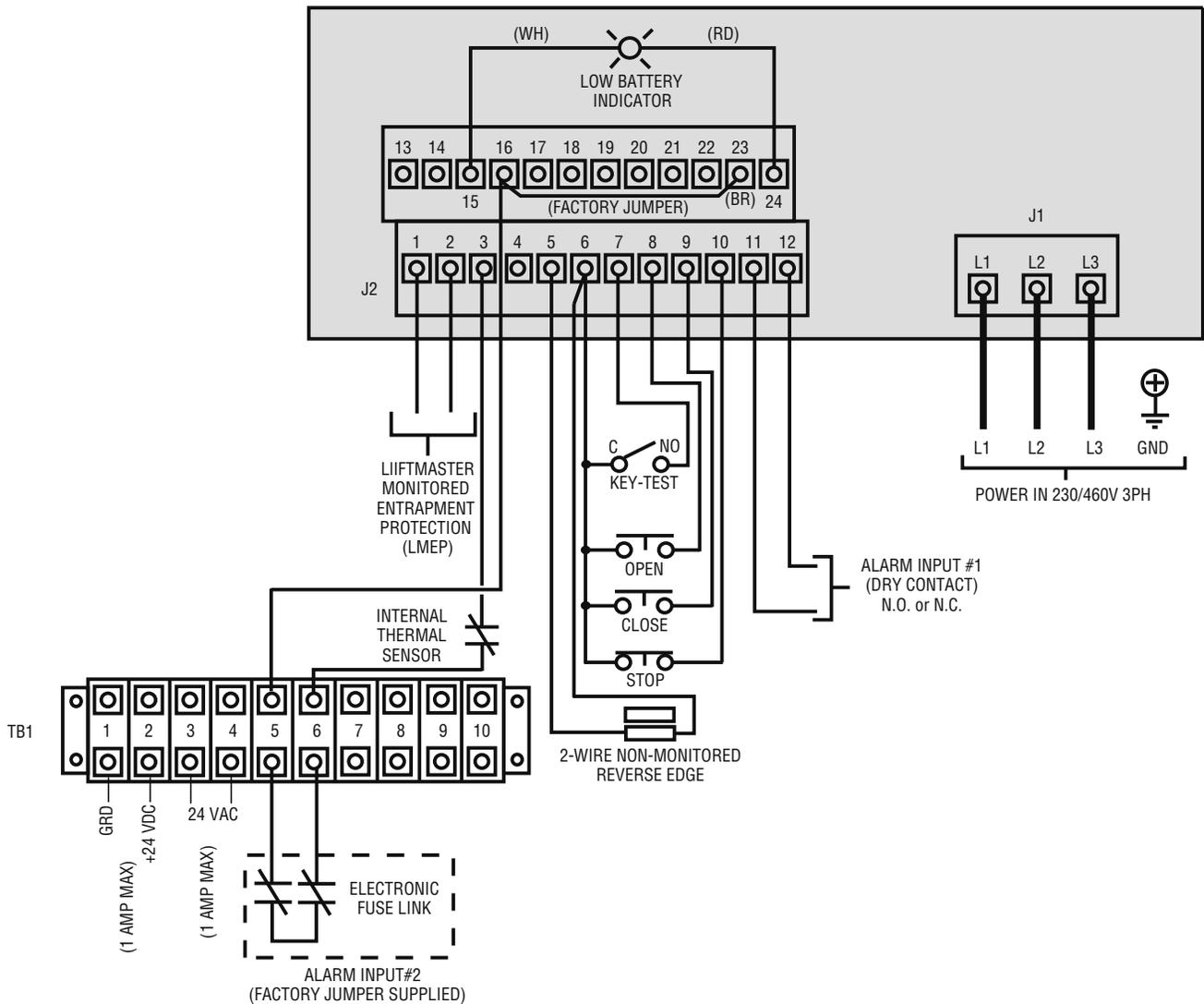
DIAGRAMS

STANDARD POWER & CONTROL CONNECTION DIAGRAMS

NOTE: The operator should be on a separate fused line of adequate capacity.

LMPLC BOARD - 230/460V 3PH

Operator must be permanently wired as per NFPA 70 (National Electrical Code). Ground must be pulled with each service. Service voltage must be run separately from class 2 circuits (controls).



MAINTENANCE SCHEDULE

Check at the intervals listed in the following chart:

ITEM	PROCEDURE	EVERY 3 MONTHS	EVERY 6 MONTHS	EVERY 12 MONTHS	EVERY 24 MONTHS
Drive Chain	Check for excessive slack. Check and adjust as required. Lubricate.	●		◆	
Sprockets	Check set screw tightness.	●		◆	
Fasteners	Check and tighten as required.		●	◆	
Bearings & Shafts	Check for wear and lubricate.	●		◆	
Battery Maintenance	Replace batteries.				●
Functionality	Activate Key Test switch (see page 6).	Monthly or as required by regulatory agency.			

Gearbox: The gearbox on the motor operator is factory sealed, and non vented, and should not require service for the life of the operator.

Brake Friction Material: The electromagnetic brake on the motor operator is factory adjusted, and should not require service for the life of the operator. Should service be required, the entire unit should be replaced.

◆ **Use SAE 30 Oil (Never use grease or silicone spray).**

◆ **Repeat ALL procedures.**

- Do not lubricate motor. Motor bearings are lubricated and sealed at the factory.
- Inspect and service whenever a malfunction is observed or suspected.

BATTERY DISPOSAL

Replaced batteries must be treated as a hazardous waste and disposed of in accordance with State, Local and Federal Regulations. See the battery manufacturer's Material Safety Data Sheets (01-30839 "MSDS Sheets, Battery, Standard").

BATTERY REPLACEMENT

Service kits are available for battery replacement. Please contact Technical Support (see back of this document for contact information).

MOTOR OPERATOR MAINTENANCE

Operators require practically no special maintenance other than periodic checking to see that mechanical parts where necessary are lubricated and the electrical compartments are clear of dirt.

Service technicians should familiarize themselves with the proper sequence of operation and all related controls. Power to operator must be disconnected when removing or replacing covers on electrical components, making adjustments, or performing maintenance.

1. Check wire connections for tightness and wire insulation for defects of abrasions.
2. Check to see that all conduit connections are secure.
3. Check wires to safety edge, or infrared safety eyes, if unit is equipped with a safety to reverse feature.
4. Inspect operation of brake.
5. Inspect debris.

 WARNING
<p>To avoid SERIOUS personal INJURY or DEATH:</p> <ul style="list-style-type: none"> • Disconnect electric power BEFORE performing ANY adjustments or maintenance. • ALL maintenance MUST be performed by a trained door systems technician.

BATTERY MAINTENANCE / TESTING

The batteries are maintenance free. However, to insure proper and safe operation, it is recommended that the batteries be replaced every two years. Battery testing is conducted automatically. See the Battery Test Description section for manually initiating the battery test.

BATTERY HANDLING / STORAGE

Refer to the battery manufacturer's Material Safety Data Sheets (01-30839 "MSDS Sheets, Battery, Standard"). LiftMaster does not recommend storage of batteries in the field. Batteries are intended for immediate use.

6. Inspect roller chain and drive sprockets. Align, lubricate the sprockets, and tighten the set screws.
7. Generally inspect the motor mounting, and tighten the fasteners and bracing.
8. Verify that all conduit connections are tight and have no exposed wires.
9. Inspect the electrical enclosure for debris, arching and moisture. Check for and tighten loose wiring connections.
10. Test motor operation through all control stations.
11. Check limit switch settings.
12. Examine safety edge, coil cord and take-up reel for damage.
13. Test the operation of the safety edge.
14. Check motor amperage draw for a full open and close cycle. Compare readings to those listed on the motor nameplate.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	REPAIR
Motor does not run when OPEN or CLOSE button is pushed.	Circuit breaker tripped or power fuse blown.	Check circuit breaker, power fuses, safety switch; check cause.
	Thermal overload tripped.	Reset; check cause.
	Secondary transformer fuse blown.	Check fuse, check cause.
	External interlock open (if provided).	Close interlocks.
Motor runs but door does not move.	Sprocket key missing or drive chain broken.	Check drive train for operation.
	Intermediate shaft or key damaged.	Close and lock off door, remove motor and inspect; check cause.
Motor hums but does not run.	Door jammed. Drive train jammed.	Check door. Try to operate manually.
	Dead phase in 3 phase system.	Check power supply.
	Brake does not release.	Check power to brake coil.
	Open motor winding.	Check all motor connections.
Operator runs in wrong direction and limits do not function.	On 3 phase operators power supply is out of phase.	Interchange any 2 wires in 3Ø.
	NOTE: All operators are checked for proper rotation at factory. Limit switch adjustment instructions in electrical enclosure indicates proper direction of travel for OPEN and CLOSE limit nuts.	
Limit switches do not hold their settings.	Drive chain loose, allows chain to jump sprocket teeth.	Adjust chain to proper tension.
	Limit nut retainer not engaging slots in limit nuts.	Be sure retainer is in slots of BOTH nuts.
	Limit nuts binding on screw threads which allows them to jump position on retainer.	Lubricate screw thread. Limit nuts should turn freely.
Door 'drifts' when motor shuts off.	Brake inoperative or worn.	Check brake operation.
Operator does not shut off at full OPEN or at full CLOSE position.	Limit nuts not adjusted properly.	Adjust (see above).
	Sprocket on limit shaft loose or limit drive chain broken.	Inspect limit chain and sprocket. Adjust chain tension, replace sprocket and chain if required.
	Defective limit switch.	Operate limit switch manually to determine.
Operator functions erratically.	Low line voltage. Bad ground. "Noise" on electrical line. Faulty alarm wiring.	Check line voltage at operator. Low voltage, check cause. Check circuit for high current draws. Eliminate all other units from the circuit. Check ground connections. Check alarm circuits. Simultaneously depress the "OPEN" and "CLOSE" limit switches, this will reset the operator's microprocessor.
Alarm within operator sounds for 3 seconds per minute.	Batteries have failed the weekly load test.	Batteries must be replaced. Call Technical Support to order.
Alarm within operator sounds continuously at 1 second on and 1 second off.	Batteries are not connected to the circuit or have experienced a major fault condition.	Check the battery connections including the battery disconnect plug and battery terminal connections.

REPAIR PARTS

REPAIR PARTS KITS - ELECTRICAL BOX

Refer to the parts lists below for replacement kits available for your operator. If optional modifications and/or accessories are included with your operator, certain components may be added or removed from these lists. Individual components of each kit may

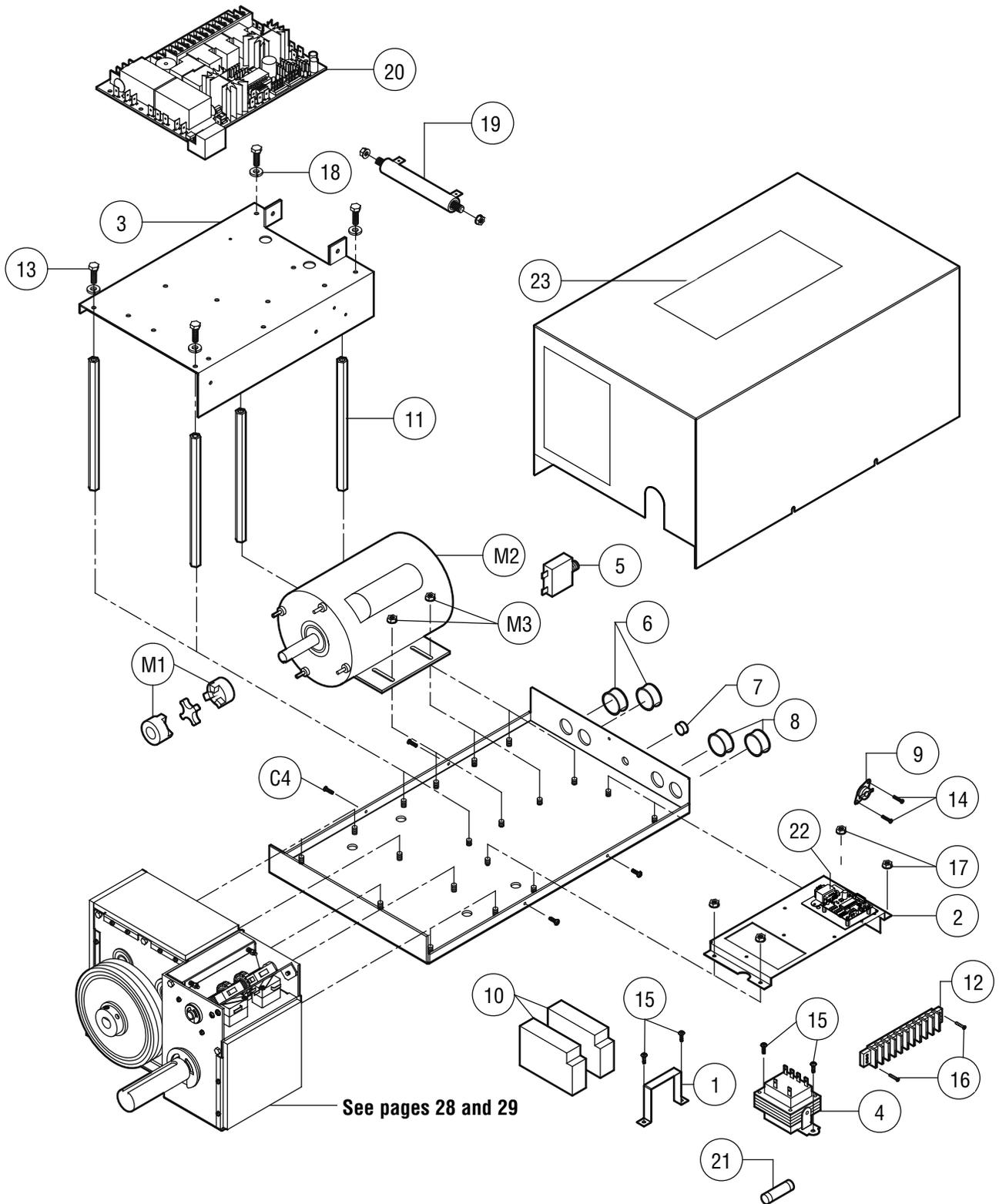
not be available. Please consult a parts and service representative regarding availability of individual components. Refer to page 32 for all repair part ordering information.

ELECTRICAL ASSEMBLY			
ITEM	PART #	DESCRIPTION	QTY
1	10-17214	Battery Bracket	1
2		Component Bracket	1
3		Mounting PCB Bracket	1
4	21-16699	Transformer (115/208/240V 1 Phase Units)	1
	21-16698	Transformer (208/240/460V 3 Phase Units)	1
5	25-2010	Overload (115V 1 Phase Units)	1
	25-2006	Overload (230V 1 Phase Units)	1
6		Vent Plug, 29/64 Long	2
7		Dome Plug, 13/32 Long	1
8		Hole Plug	2
9	29-16241	Thermal Sensor	1
10	29-NP08-12	Battery	2
11		Standoff	4
12	42-110	Terminal Block	1
13		Hex Bolt, 1/4-20	4
14		Screw, #6-32 Self Tapping	2
15		Screw, #8-32	4
16		Screw, #8-32	2
17		Flange Nut #8	4
18		Lock Washer	4
19	K74-32686	Power Resistor Kit	1
20	K79-13493-2-600	Logic Board Kit	1
21		Fuse-2 AMP	1
22	K-002D0776	Charging Circuit Board	
23	K75-17351-1	Cover	1

MOTOR ASSEMBLY KIT			
ITEM	PART #	DESCRIPTION	QTY
M1	K07-17247	Coupling-L-Jaw	2
		Coupling-Spider	1
M2	20-1050B-2F	Motor, 1/2HP 115/230V (1 Phase Units)	1
	20-3050B-4F	Motor, 1/2HP 230/460V (3 Phase Units)	
M3		Flange Nut, 1/4"	4

REPAIR PARTS

ILLUSTRATED PARTS - ELECTRICAL BOX



REPAIR PARTS

REPAIR PARTS KITS - MODEL FDCL U

Refer to the parts lists below for replacement kits available for your operator. If optional modifications and/or accessories are included with your operator, certain components may be added or removed from these lists. Individual components of each kit may

not be available. Please consult a parts and service representative regarding availability of individual components. Refer to page 32 for all repair part ordering information.

GEAR HOUSING ASSEMBLY			
ITEM	PART #	DESCRIPTION	QTY
1		Main Side Plate	1
2		Output Side Plate	1
3		Spur Gear Side Plate	1
4	19-25047M	Chain, #25 x 47 Links	1
5	19-35047M	Chain, #35 x 47 Links	1
6		Standoff, 5.312 Long	2
7		Standoff, 3.625 Long	4
8		Standoff, 1.562 Long	2
9		Hex Bolt 1/4 x 1/2"	6
10		Flange Nut, 1/4"	15
11		Lockwasher, 1/4"	6
BRAKE SHAFT ASSEMBLY			
12		Spur Gear, 12 DP 18	1
13		Spur Gear, 16 DP 64	1
14		Reduction Shaft	1
15		Flanged Bearing, 5/8"	2
16		Key, 3/16" x 3/4"	1
17		Key, 3/16" x 1"	2
18		Set Screw, 5/16 x 3/8"	4
19		E-Ring, 5/8"	4
GOVERNOR SHAFT ASSEMBLY			
20		Spur Gear 16 DP 16	1
21		governor Shaft	1
22		Flanged Bearing 1/2"	2
23		Key, 3/16" x 3/4"	1
24		Set Screw, 5/16 x 3/8"	2
25		E-Ring, 1/2"	3
RPM SHAFT ASSEMBLY			
26		Spur Gear 16 DP 60	1
27		RPM Shaft	1
28	12-17206	Flanged Bearing	2
29	15-35B13GEF	Sprocket, 35B13	1
30		Key, 3/16" x 1-1/4"	1
31		Key, 3/16" x 1/2"	1
32		Set Screw, 1/4-20	2
33		Set Screw, 5/16 x 3/8"	2
34		E-Ring 3/4"	4
GOVERNOR SHAFT ASSEMBLY			
35	11-17068	Output Shaft	1
36	12-10715	Bearing	2
37	15-25B25LGF	Sprocket, 25B25	1
38	15-35B40LGF	Sprocket, 35B40	1
39		Spacer	1
40		Spacer	1
41		Key, 1/4" x 1/4"	1
42		Key, 1/4" x 1/2"	1
43		Set Screw, 1/4-20	4
44		E-Ring, 1"	3

K74-17359 - LIMIT SWITCH KIT			
ITEM	PART #	DESCRIPTION	QTY
L1		Depress Plate	1
L2		Nut Plate	4
L3		Backing Plate	4
L4		Limit Plate	1
L5		Auxiliary Bracket	1
L6		Spring	2
L7	23-10041	Limit Switch	4
L8		Limit Spacer	2
L9		Screw, #4-40	4
L10		Screw, #4-40	4
L11		Screw, #6-32	4
L12		Screw, #6-32	2
L13		Screw, #10-32	3
L14		Locknut, #6	2

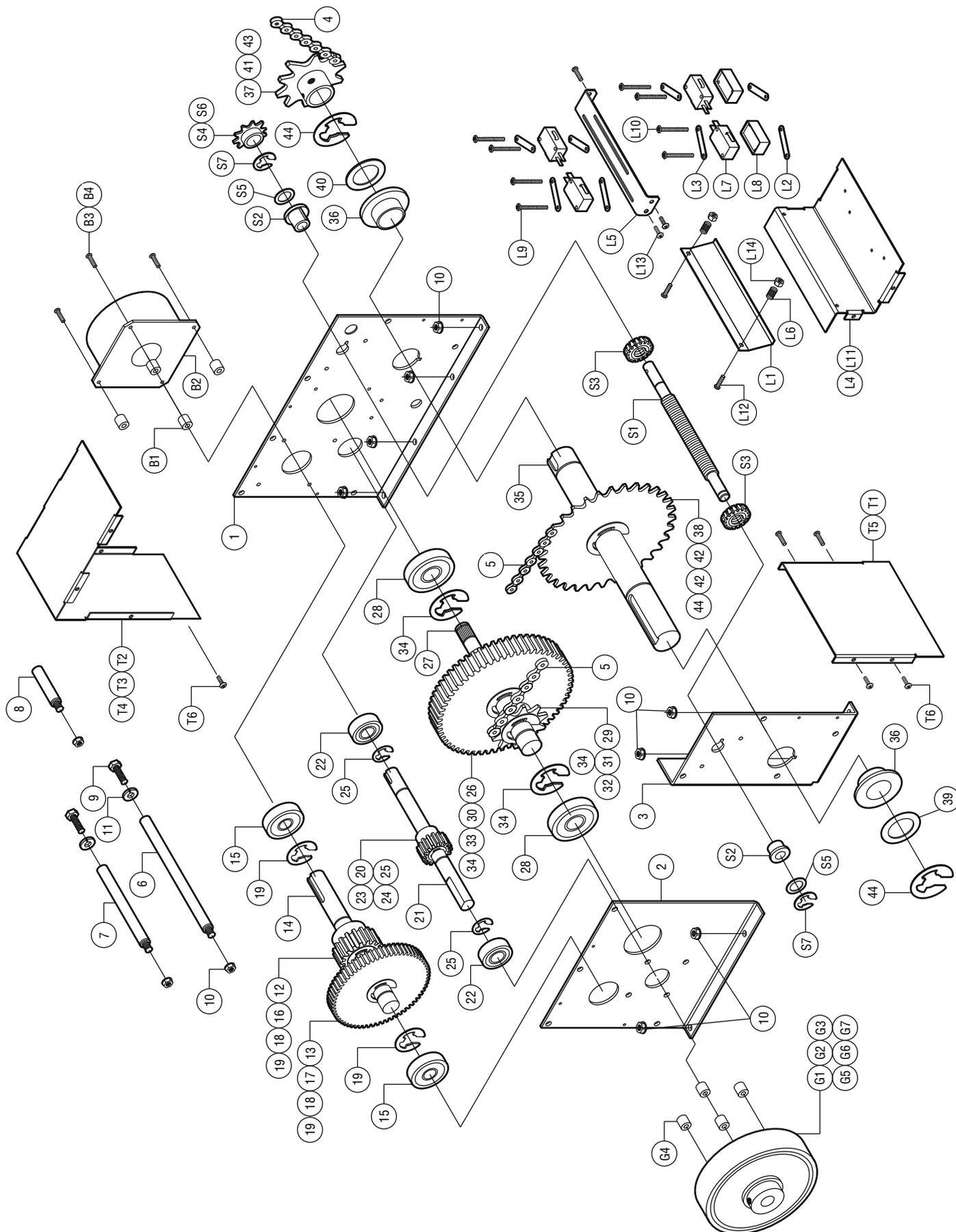
K75-17360 - GOVERNOR KIT		
ITEM	DESCRIPTION	QTY
G1	Acoustical Matting 1-1/4" x 14"	1
G2	Hose Clamp	1
G3	Sleeve, 1/2" x 5/8" x 1-1/4"	1
G4	Spacer, .257" x 1/2" x 3/8"L	4
G5	Governor	1
G6	Flat Head Screw, 1/4" x 1"	4
G7	Flange Nut, 1/4"	4

K75-17361 - BRAKE KIT		
ITEM	DESCRIPTION	QTY
B1	Round Spacer, 3/8"	4
B2	Flange Mounted Brake	1
B3	Flat Head Screw, #8-32 x 3/4"	4
B4	Flange Nut, #8	4

ACCESSORIES	
02-109FDC	Key Test Station
02-103	3 Button Station
74-16685	Thermal Sensor
71-17148	Fuse Link Kit

REPAIR PARTS

ILLUSTRATED PARTS - MODEL FDCL U



ACCESSORIES

CONTROL STATION AND KEYSWITCH

02-103



3-Button Control Station:
Steel enclosure.

02-109 FDC

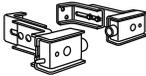


Test Keyswitch:

ENTRAPMENT PROTECTION DEVICES

MONITORED

CPS-U



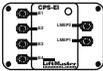
Commercial Protector System®:
Provides protection on doors up to 30' wide.

CPS-UN4



Commercial Protector System®:
Provides protection on doors up to 45' wide.
NEMA-4 rated.

CPS-EI



Monitored Safety Edge Interface:
For use with the approved 4-wire safety edge
(see below).

65ME1234XX

**Miller ME123 4-Wire Monitored
Safety Edge:**
For rolling doors.

NON-MONITORED

65ME123

**Miller ME123 2-Wire Non-Monitored
Safety Edge:**
For rolling doors.

65ME113

**Miller ME113 2-Wire Non-Monitored
Safety Edge:**
For rolling doors.

MOUNTING CHANNELS

65ME123C1

T-Shaped Mounting Channel:

For 65ME1234 or 65ME123 edge when installed on a rolling door. Fits between L-shaped angles used to construct a bottom bar on rolling doors.

65ME113C1

T-Shaped Mounting Channel:

For 65ME1134 or 65ME113 edge when installed on a rolling door. Fits between L-shaped angles used to construct a bottom bar on rolling doors.

FDO ALARM AND NOTIFICATION DEVICES

LM4WB

Smoke Detector 24 Vdc 4-Wire Photo:

Plug-in detector line mounting base included.
N.O. contact output. Power from external source.

LM4WTB

**Smoke Detector 24 Vdc 4-Wire Photo Thermal
and Form C Relay:**

Same as LM4WB but with restorable, built-in,
fixed temperature (135° F) thermal detector.

LMHS2475ADA

Horn/Strobe

24 Vdc

VOICE ANNUNCIATION

LMVASENCNST

Voice Annunciation Kit

Voice board in separate enclosure.

LMVASENCSSS

Voice Annunciation Kit

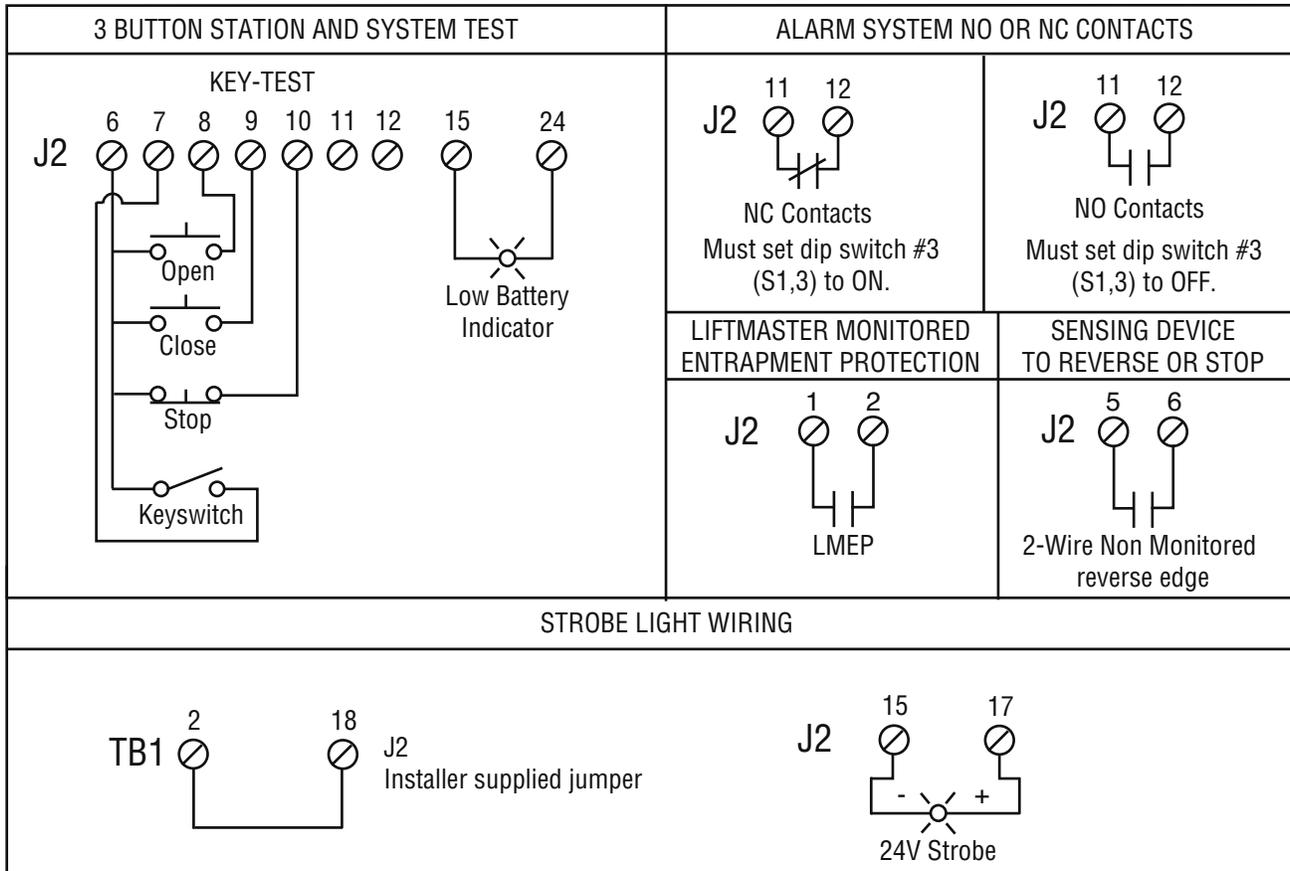
Voice board in separate enclosure with
speaker strobe.

CONTROL CONNECTION DIAGRAM



IMPORTANT NOTE:

The 3-Button Control Station provided must be connected for operation.



HOW TO ORDER REPAIR PARTS

OUR LARGE SERVICE ORGANIZATION SPANS AMERICA

Installation and service information are available.
Call our TOLL FREE number:

1-800-528-2806

www.liftmaster.com