CHAMBERLAIN®

LiftMaster®

PROFESSIONAL

OWNER'S MANUAL
MODEL FDC

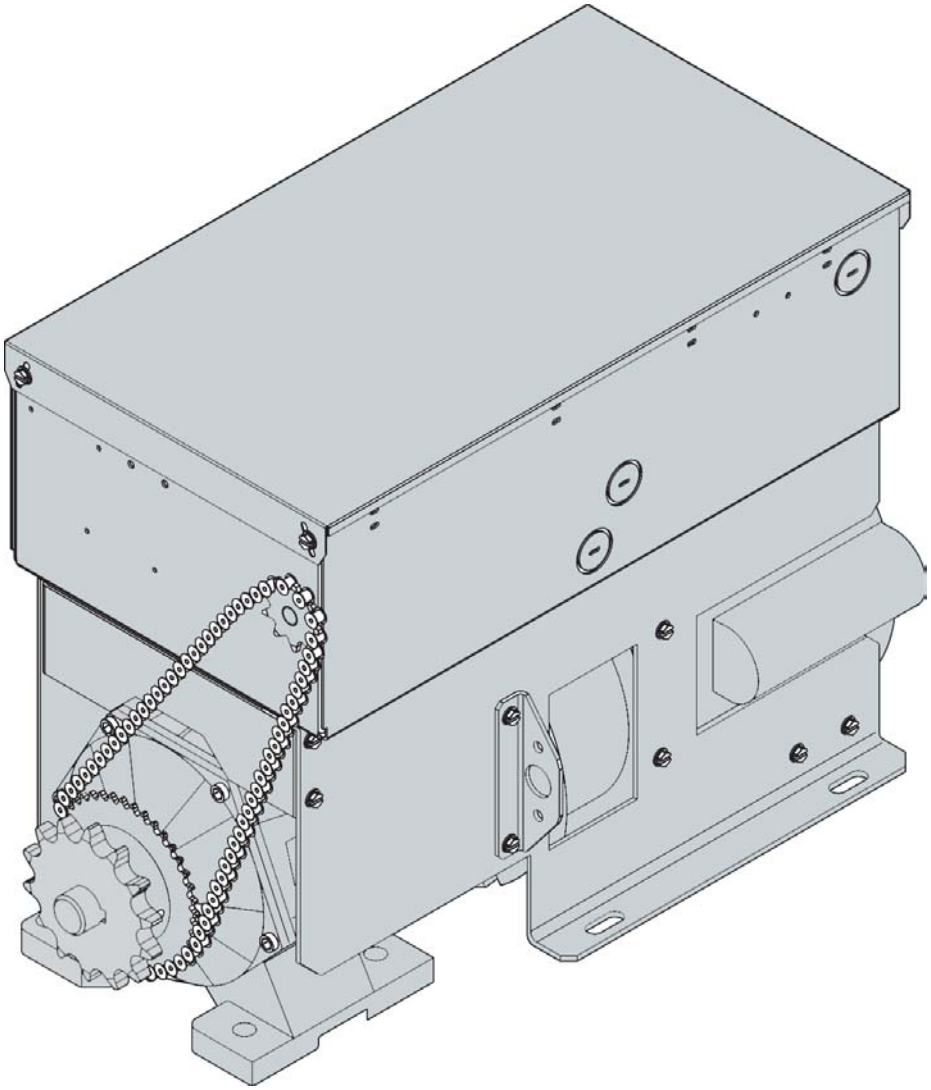
ADVANCED LOGIC
INDUSTRIAL DUTY FIRE DOOR OPERATOR

US PATENT NO. 6,014,307

LMPLC CONTROL

LMPLC

CONTROL WIRED



2 YEAR WARRANTY
Serial # _____ (located on electrical box cover)
Installation Date _____
Wiring Type _____

NOT FOR RESIDENTIAL USE

FM APPROVED

41B6

C UL US

LISTED DOOR OPERATOR

SPECIFICATIONS

DRIVE SYSTEM

GEAR REDUCERS:.....Helical inline, oil bath permanently lubricated, non-vented.

CONTINUOUS POWER RATING:

1/2 HP: .....175 ft-lbs/sec

1 HP: .....275 ft-lbs/sec

RATIO:

1/2 Hp: 48.8:1

1 Hp:.....49.8:1

OUTPUT SPEED

1/2 HP:.....36 rpm

1 HP: .....35 rpm

OUTPUT TORQUE

1/2 HP:.....658 in-lbs.

1 HP: .....1345 in-lbs.

OUTPUT SHAFT DIA.

1/2 HP: .....1”

1 HP: .....1-1/4”

OUTPUT SPROCKET

1/2 HP:.....#50-14T

1 HP: .....#60-14T

MAX. OVERHUNG LOAD: (1” from output bearing face)

1/2 HP:.....698 Lbs.

1 HP: .....1036 Lbs.

MAX. BACK DRIVING FORCE: (torque)

1/2 HP: .....100 in-lbs.

1 HP: .....100 in-lbs.

Operators available left hand mount. Must be inverted for right hand mount. Limits and motor direction must be reversed when changing handing. (See Pages 16 - 17)

MOTOR

TYPE:.....Continuous duty

HORSEPOWER: .....1/2 HP
1 HP

SPEED: .....1725 RPM

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

ENCLOSURE:.....ODP NEMA 56c face mount

ELECTRICAL

TRANSFORMER: .....1PH: 120/240 VAC 24VAC
3PH: 240/480 VAC 24VAC

BATTERY BACKUP: (2) 12VDC 7AH sealed lead acid batteries

CONTROL STATION: .....NEMA 1 three button station. OPEN/CLOSE/STOP

WIRING TYPE: .....B2 (Standard)

LIMIT ADJUST: .....Linear driven, fully adjustable screw type cams. (70 rev. max @ limit shaft)

DUTY CYCLE:.....25 Reversing cycles per hour

BRAKE: .....24VDC electromagnetic disc

THERMAL SENSORS:.....160 deg. F (Open on rise manual reset, see page 12)
(see page 12)

ELECTRICAL ENCLOSURE RATINGS: motors, electrical enclosure and control station are rated **NEMA1**

WEIGHTS & DIMENSIONS

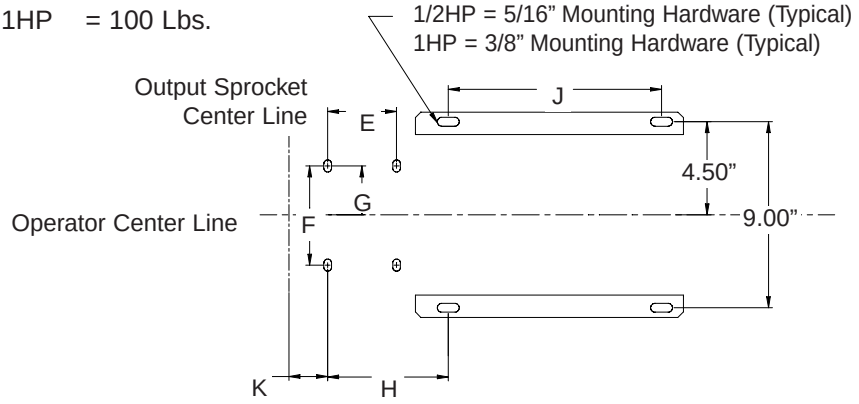
ITEM	DIMENSIONS	
	1/2HP	1HP
A	13.00”	14.38”
B	21.00”	25.73”
C	16.93”	16.31”
D	2.44”	2.93”
E	3.35”	3.94”
F	4.53”	5.61”
G	2.26”	2.80”
H	6.67”	7.22”
J	8.25”	7.50”
K	2.12”	2.51”

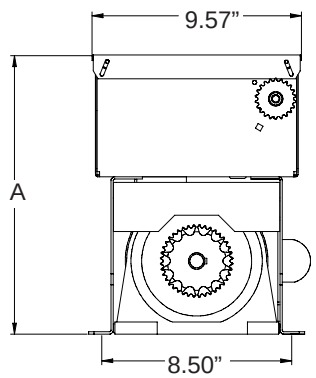
HANGING WEIGHT

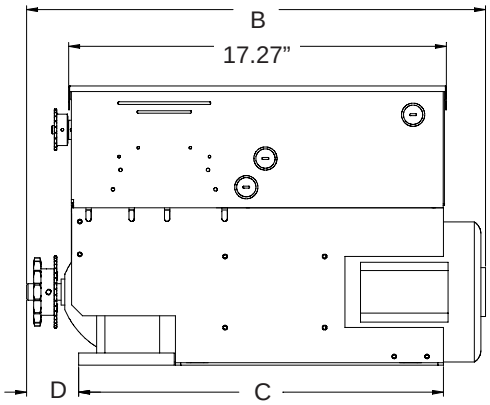
1/2HP = 80 Lbs.

1HP = 100 Lbs.

MOUNTING DIMENSIONS







GENERAL DESCRIPTION

The Fire Door Controller, FDC, is configurable as a standard CDO or a Fire Door controller (selectable via DIP Switch 2). The Fire Door Mode Type I functions as an integrated fire door control system. It is designed to interface with a normally close (NC) or normally open (NO) dry contact alarm system to control the operation of a fire door. The control station is the standard B2 wiring, momentary contact to open, close and stop, plus wiring for sensing device to reverse and auxiliary devices to open and close with open override.

NOTICE

THIS OPERATOR IS NOT A FIRE ALARM SYSTEM. IT CAN NOT DETECT A FIRE CONDITION.

FIRE DOOR MODE TYPE I FUNCTIONAL OPERATION

1. Battery Management System

- The batteries are charged, tested, and monitored automatically by the microprocessor based system.
- The batteries are tested under load every thirty days. If for any reason the batteries fail this load test the on board buzzer will sound for 3 seconds of every minute to indicate that the batteries need to be replaced. If the batteries are not replaced within 45 days (from initial test) the door will automatically close and remain inoperable until the batteries have been replaced. The load test will detect a catastrophic failure such as full loss of batteries when conducted with AC power present (customary situation).
- When in Battery Backup mode (loss of AC power), the battery voltage is continuously moni tored. If for any reason the voltage drops below 22 VDC (this is the minimum operating volt age for the brake controls) the unit will activate the **optional** warning signal and automati cally close the door. The door will remain inoperable until such time that the batteries come back to charge, or they are replaced. Low battery condition will be indicated by the on board buzzer sounding 3 seconds out of every minute, and the low battery indicator (located on the key test station) flashing , until the batteries come to the full charge or are replaced. The batteries must be present and at a working voltage level (21V +) for this function to work.

2. Unit has AC power & no alarm condition:

- The B2 control station is used to operate the door electrically.
- Activation of the safety edge while the door is closing will cause the door to reverse to the full open limit.
- Activation of the safety edge while the door is opening will NOT effect operation, the door will continue to the open limit.
- Activating the key-test switch for at least 6 seconds will put the operator in alarm active mode. (see ACTIVE ALARM section for detail operation of alarm active mode)

3. Unit has AC power & active alarm condition (ALARM #1 - smoke alarm etc.):

- The unit will activate the **OPTIONAL** warning signal, the door will automatically close after the preset time delay (powered down by motor). 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. 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, the door will close stopping at the lowest possible position holding the brake for 2 seconds, then releasing the door to GRAVITY CLOSE (controlled 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 (controlled descent).

FUNCTIONAL OPERATION CONTINUED

4. Unit has AC power & active alarm condition (ALARM #2 - Fire Sensor, thermal sensor, fuse link.):

- The unit will activate the **optional** warning signal (siren/strobe), the door will automatically close after the pre set time delay. (powered down by motor) 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. 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 (controlled 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 (controlled descent)
- All control station functions will be rendered inactive in this condition.
- The safety edge will remain active.

5. Unit has No AC power & No active alarm condition:

- The Close and Stop buttons of the B2 control station are functional.
- The door's descending speed is controlled by the integrated braking system.
- The door will stop if an obstruction is encountered while closing.
- The Open button is not functional

6. Unit has No AC power & active alarm condition (Alarm #1 or Alarm #2):

- The unit will activate the **OPTIONAL** warning signal (siren/strobe), the door will automatically close after the preset time delay. (controlled by integrated braking system) 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 controlled drop of the door. (not powered down by the motor)

7. Activation of the internal Thermal Sensor:

- Will activate an alarm #2 switch.
- With AC power present the unit will react as stated in paragraph 4.
- With No AC power present the unit will react as stated in paragraph 6.

8. Activation of the Key Test Station:

- Key must be activated for 6 seconds
- The unit will activate the **OPTIONAL** warning signal (siren/strobe), the door will automatically close after the preset time delay. (controlled by integrated braking system) The time delay is set by means of DIP switch 1. (to test the signal devices and the delay time)
- The door will close using gravity close mode (Controlled Descent) in order to test the door balance, descent speed, and the moment of the door.
- All sensing devices and control devices will be active. (In order to test these devices)

(See page 5 for procedures)

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 lighted on the operators control board) and that the batteries are connected and fully charged. (the red "DC" led will **NOT** be lighted on the operators control board)

1. Begin the test with your door at the full "OPEN" position.

2. Make certain dip switch #2 is in the "ON" position "FIREDOOR TYPE I" mode.

3. If your door is equipped with safety photo eyes, make certain dip switch #4 is in the "ON" position.

Note: If 2 minutes total time elapses from the beginning of step #11and 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.

4. 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.

5. 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)

6. Using a "stop-watch" verify that your door is closing between 6" and 24" per second. (i.e.. A 10ft high door should close in a time between 5 and 20 seconds.) Your door should now be fully closed.

7. Open the door by depressing the "OPEN" button on the three button control station.

8. Repeat step #4.

9. When the door is approximately 3 to4 feet from the floor, activate the doors safety 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 reverse to the full open position. Remove the obstruction.

10. The door will begin to close within 1 sec., If dip switch #1 is in the "ON" position. If dip switch # 1 is in the "OFF" position, the door will wait 10 sec. Before beginning to close. The door should fully close to the floor. (the door will not motor down, it will gravity descend)

11. Repeat steps #7 and #8.

12. When the door is approximately ½ 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 test ing.** The door should reverse to the full open position.Remove the obstruction.

13. Step #10 repeats.

14. When the door is approximately ½ way to the floor, depress and hold the "STOP" button on the three button control station. The door should stop.

15. Release the "STOP" button on the control station. Step #10 repeats.

16. Depress the "OPEN" button on the three button control station. The door should open to the full open position. The unit is now ready to be returned to service.

OPERATOR MOUNTING

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 below 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 (8) motor operator mounting points MUST be used**
- **All mounting hardware should be a minimum of grade 5**

1a. **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". Refer to Figure 1.

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

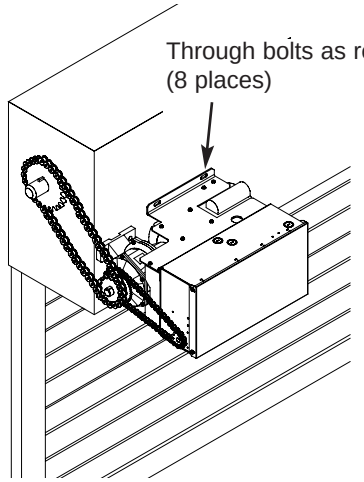


FIGURE 1
(Right Hand Unit Shown)

1b. **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". Refer to Figure 2.

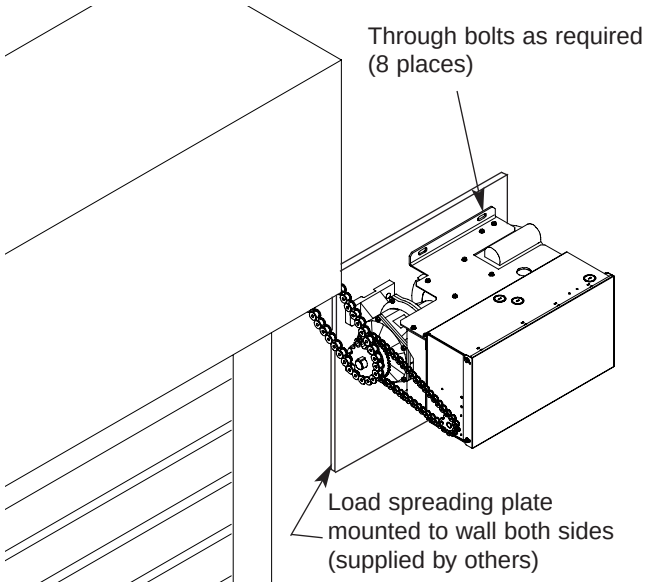


FIGURE 2
(Right Hand Unit Shown)

1c. 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 "Loctite-262" or equivalent locking compound to set screws. (Check that all mounting hardware is tight, and the drive chains are taut.

WARNING

THIS FIREDOOR CONTROLLER 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 100 IN/LBS.,AT THE OPERATOR OUTPUT SHAFT. STICKING OR BINDING DOORS MUST BE REPAIRED. DOORS, DOOR SPRINGS, BRACKETS AND THEIR HARDWARE MAY BE UNDER EXTREME TENSION AND CAN CAUSE SERIOUS PERSONAL INJURY. CALL A PROFESSIONAL DOOR SERVICEMAN TO MOVE OR ADJUST DOOR SPRINGS OR HARDWARE.

ENTRAPMENT PROTECTION ACCESSORIES

PHOTO EYES

NOTE: LiftMaster recommends the use of safety photo eyes as a non-contact method of entrapment protection.

The operator has been manufactured to accept direct connection of LiftMaster Infrared Eyes. See page 11 for proper dip switch settings, and pages 14 & 15 for wiring connections. Follow the wiring instructions supplied with your LiftMaster Infrared Eyes.

ELECTRIC OR PNEUMATIC EDGE

This operator will also accept various safety edges offered by LiftMaster. See pages 14 and 15 for proper wiring connections to the operator.

LIMIT SWITCH ADJUSTMENT

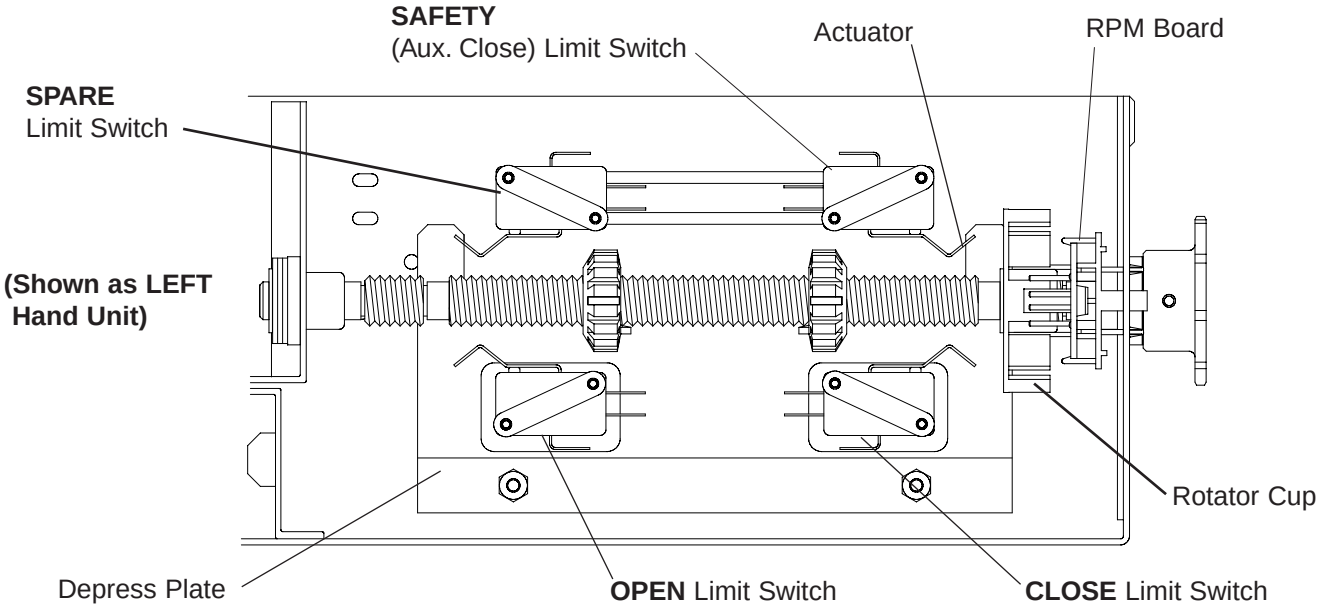
MAKE SURE THE LIMIT NUTS ARE POSITIONED BETWEEN THE LIMIT SWITCH ACTUATORS BEFORE PROCEEDING WITH ADJUSTMENTS. BE CERTAIN THAT DIP SWITCH #2 IS IN THE "OFF" POSITION (CDO MODE) BEFORE MAKING ADJUSTMENTS.

1. To adjust limit nuts depress retaining plate to allow nut to spin freely. After adjustment, release plate and ensure it seats fully in slots of both nuts.
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 MANUALLY MOVING LIMIT NUTS.

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



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.

INSTALLATION MODE

The motor operator is manufactured as a standard commercial operator with standard B2 wiring functionality. Once installation is completed and all alarm devices are connected, and tested, the installer must then switch the dip switch setting (See page 11). Upon completion of installation, the unit's functionality should be checked by activating the key test station (See page 5).If for any reason your unit does not respond as described in this manual, check that you have read and followed all installation and operating instructions. If difficulties persist contact the Lift-Master technical hotline.

1-800-528-2806.

⚠ WARNING

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 I" 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.

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, 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 & J2-12 for a minimum of 12 seconds.

Alarm Input #2: Used for the thermal sensors (electronic fusible links) or similar systems. (N.C. state only) This alarm condition will activate a motored closure of the door, 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.

INSTALL POWER WIRING & CONTROL STATION

Before installing power wiring or control stations be sure to follow all specifications and warnings described below. Failure to do so may result in severe injury to persons and/or damage to operator.

Do not install any wiring or attempt to run the operator without consulting the wiring diagram. Install the optional Reversing Edge before proceeding with the Control Station installation.

IMPORTANT SAFETY NOTES

WARNING

INSTALL THE CONTROL STATION WHERE THE DOOR IS VISIBLE, BUT AWAY FROM THE DOOR AND ITS HARDWARE. DO NOT INSTALL CONTROL STATION DIRECTLY BENEATH THE OPERATOR. IF CONTROL STATION CANNOT BE INSTALLED WHERE DOOR IS VISIBLE, OR IF ANY DEVICE OTHER THAN THE CONTROL STATION IS USED TO ACTIVATE THE DOOR, *A* SAFETY DEVICE MUST BE INSTALLED ON THE DOOR, THE MINIMUM ACCEPTABLE DEVICE WOULD BE SAFETY PHOTO EYES, OR A REVERSING EDGE INSTALLED ON THE BOTTOM OF THE DOOR. THE BEST PROTECTION IS AFFORDED BY THE COMBINATION OF THESE TWO DEVICES.

WARNING

TO ENSURE DOOR DESCENT IN AN “ALARM” CONDITION, AND AVOID DAMAGE TO DOOR AND OPERATOR, MAKE ALL DOOR LOCKS INOPERATIVE. SECURE LOCK(S) IN "OPEN" POSITION.

IMPORTANT

THIS UNIT MUST BE PROPERLY GROUNDED. A GROUND SCREW IS SUPPLIED IN THE ELECTRICAL BOX FOR CONNECTION OF THE POWER SUPPLY GROUND WIRE. FAILURE TO PROPERLY GROUND THIS UNIT COULD RESULT IN ELECTRIC SHOCK AND SERIOUS INJURY.

WARNING

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 VIA, THE MAIN DISCONNECT SWITCH. UPON COMPLETION OF MAINTENANCE THE AREA MUST BE CLEARED AND SECURED, AT THAT TIME THE UNIT MAY BE RETURNED TO SERVICE.

WARNING

DISCONNECT POWER AT THE FUSE BOX BEFORE PROCEEDING.

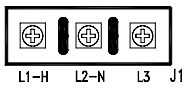
OPERATOR MUST BE PROPERLY GROUNDED AND PERMANENTLY WIRED IN ACCORDANCE WITH LOCAL ELECTRICAL CODES. NOTE: THE OPERATOR SHOULD BE ON A SEPARATE FUSED LINE OF ADEQUATE CAPACITY.

ALL ELECTRICAL CONNECTIONS MUST BE MADE BY A QUALIFIED INDIVIDUAL.

POWER WIRING

POWER WIRING CONNECTIONS

1. Connect power wires to the J1 terminal block located on the Printed Circuit Board (shown below).



2. Be sure to run all power wires through the conduit hole in the electrical box enclosure marked with the label shown below.

GROUND WIRING

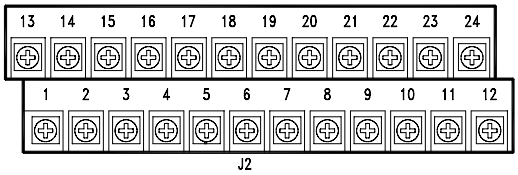
1. Connect earth ground to chassis ground screw in the electrical box enclosure marked with the label shown below.

2. Use same conduit entry into the electrical box as the power wiring.

CONTROL STATION WIRING

CONTROL WIRING CONNECTIONS

1. Connect control wires to the J2 terminal block located on the Printed Circuit Board (shown below).

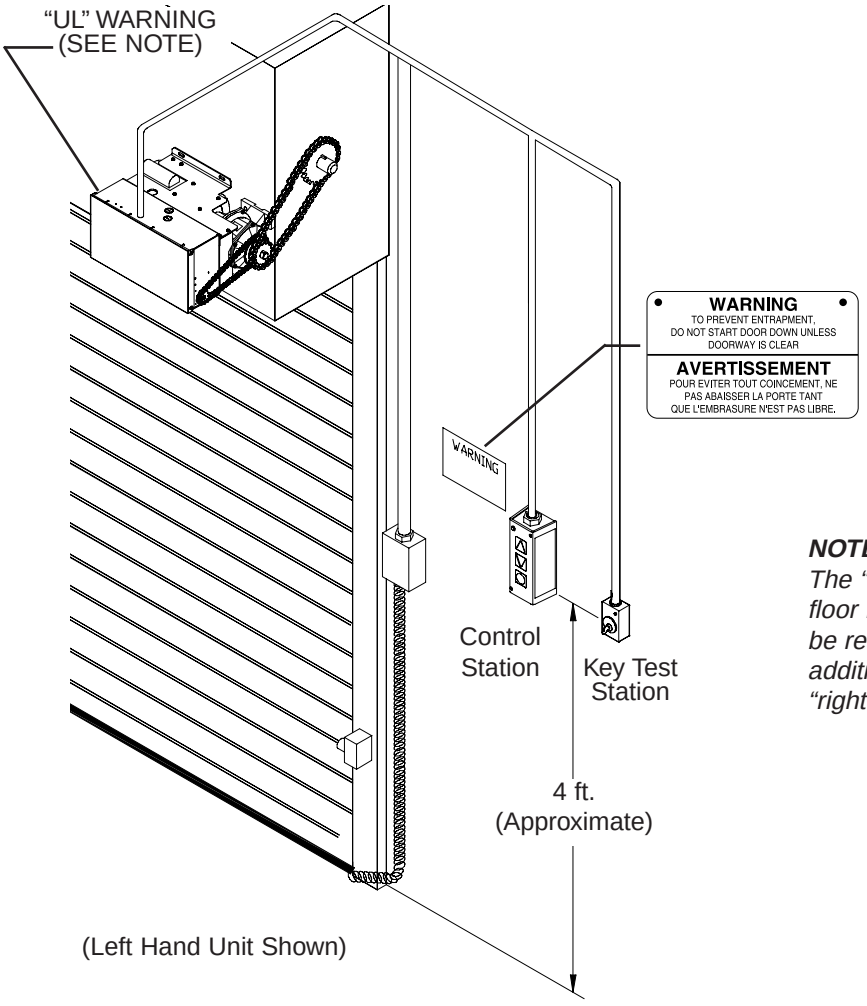


2. Be sure to run all control wires through the conduit hole in the electrical box enclosure marked with the label shown below.

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 page 19)

CONTROL STATION MOUNTING



1. Mount Control Station and Key Test Switch no further than 12" from each other.

2. Mount Control Station and Key Test Switch no further than 12" from the door jamb.
(Do not mount directly under the operator)

3. Mount WARNING NOTICE beside or below the Control Station.

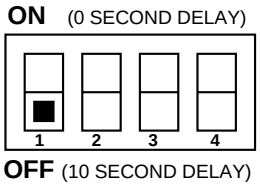
NOTE:
The "UL" Warning label must be read "right side up" from the floor level. Should your operator mounting cause this label to be read "upside down", your accessory kit is supplied with an additional label. Install the new label so that it will be read "right side up " from the floor level.

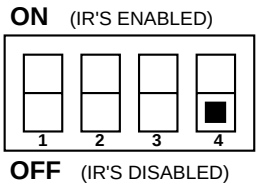
OPTIONAL CONTROL SETTINGS

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 on next page. 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 INFRARED EYES STATE - The operator will support LiftMaster Infrared Safety Photo Eyes when enabled, and ignore IR inputs when disabled.

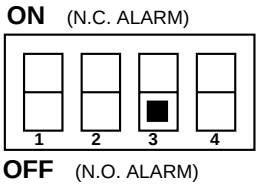


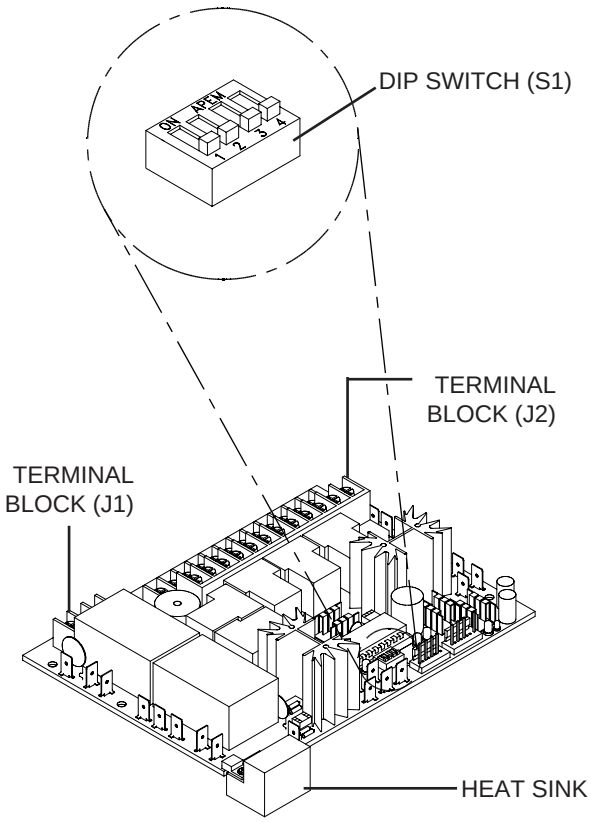


INSTALLER CONTROL SETTINGS

SI-2 FIRE DOOR MODE TYPE I/CDO MODE - The operator only monitors alarm inputs when in the Fire Door Mode Type I. The operator functions as a standard CDO with B2 wiring when in the CDO mode.

SI-3 ALARM STATE - The operator can accept either a normally open or normally closed dry contact alarm input. DO NOT INDUCE VOLTAGE!





NOTICE:
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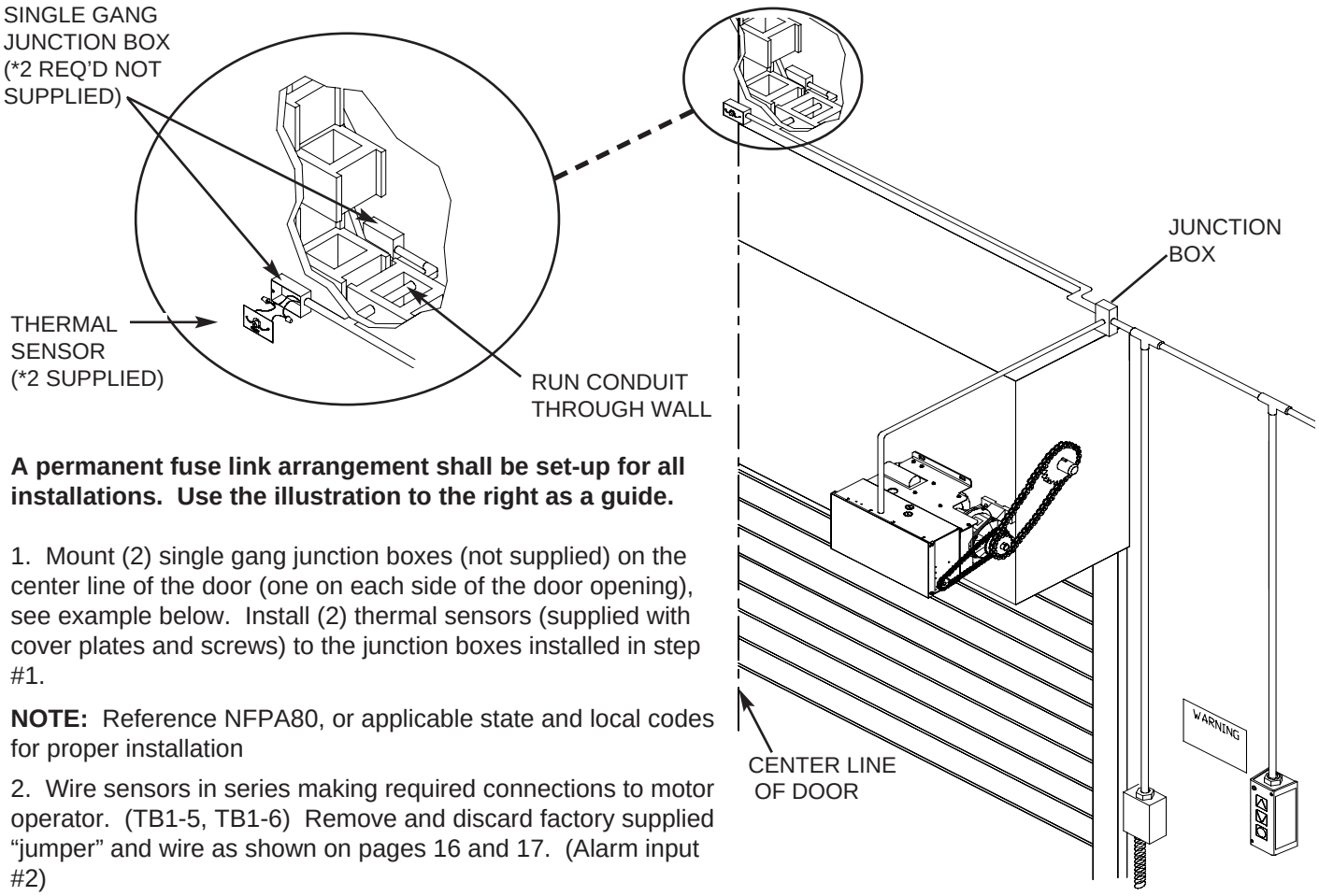
ELECTRONIC FUSE LINK ARRANGEMENT



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

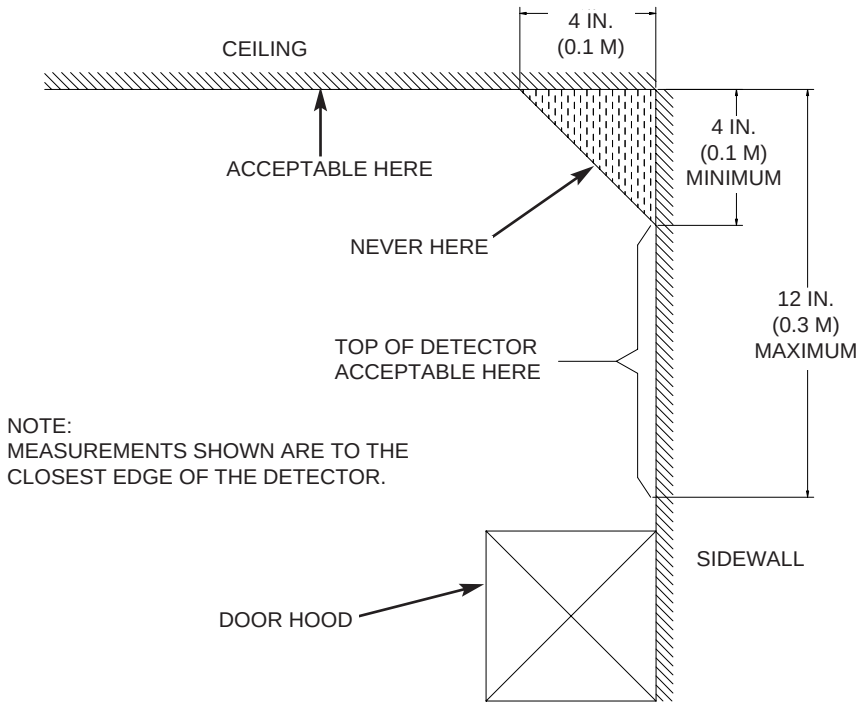
1. Mount (2) single gang junction boxes (not supplied) on the center line of the door (one on each side of the door opening), see example below. Install (2) thermal sensors (supplied with cover plates and screws) to the junction boxes installed in step #1.

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 16 and 17. (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



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.

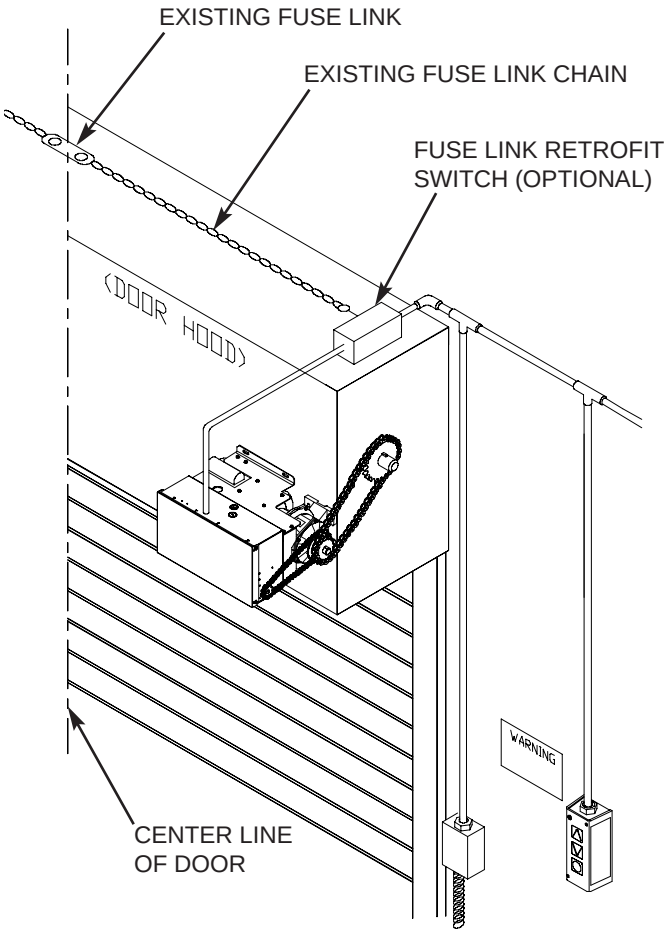
3. Adjust existing fuse link arrangement to be sure that proper tension is supplied to the fuse link switch actuator (key-ring). The actuator should be fully extended. There should be continuity between the switch leads. (Normally Closed).

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 16 & 17.

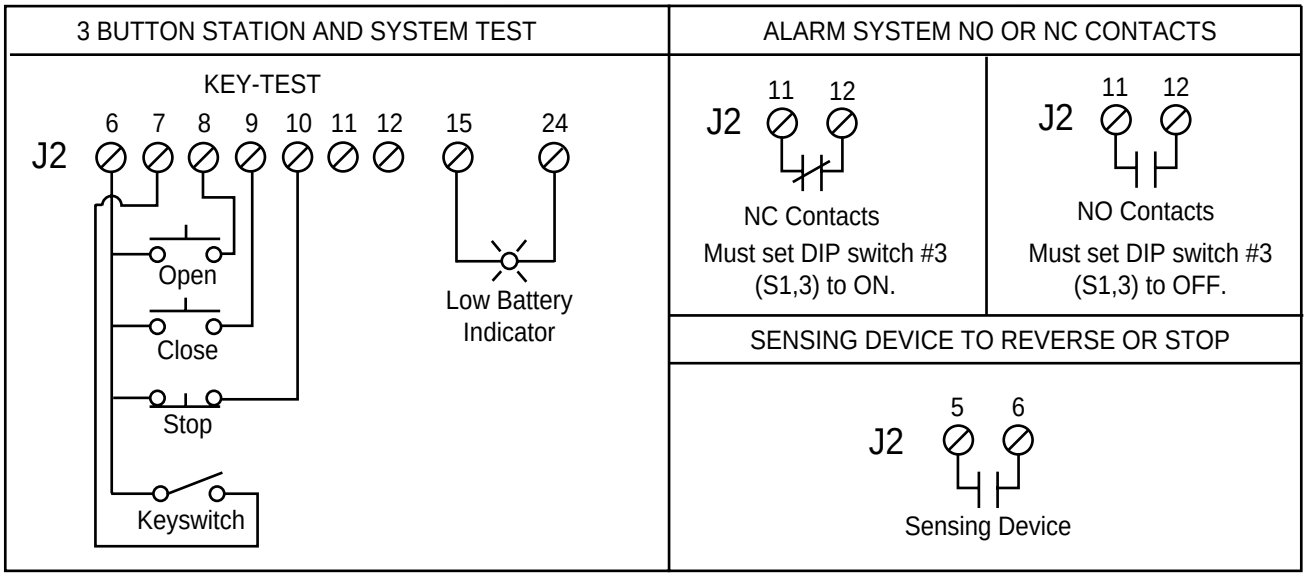
6. All wiring and conduit should be run in accordance with all state and local electrical codes.



CONTROL CONNECTION DIAGRAM

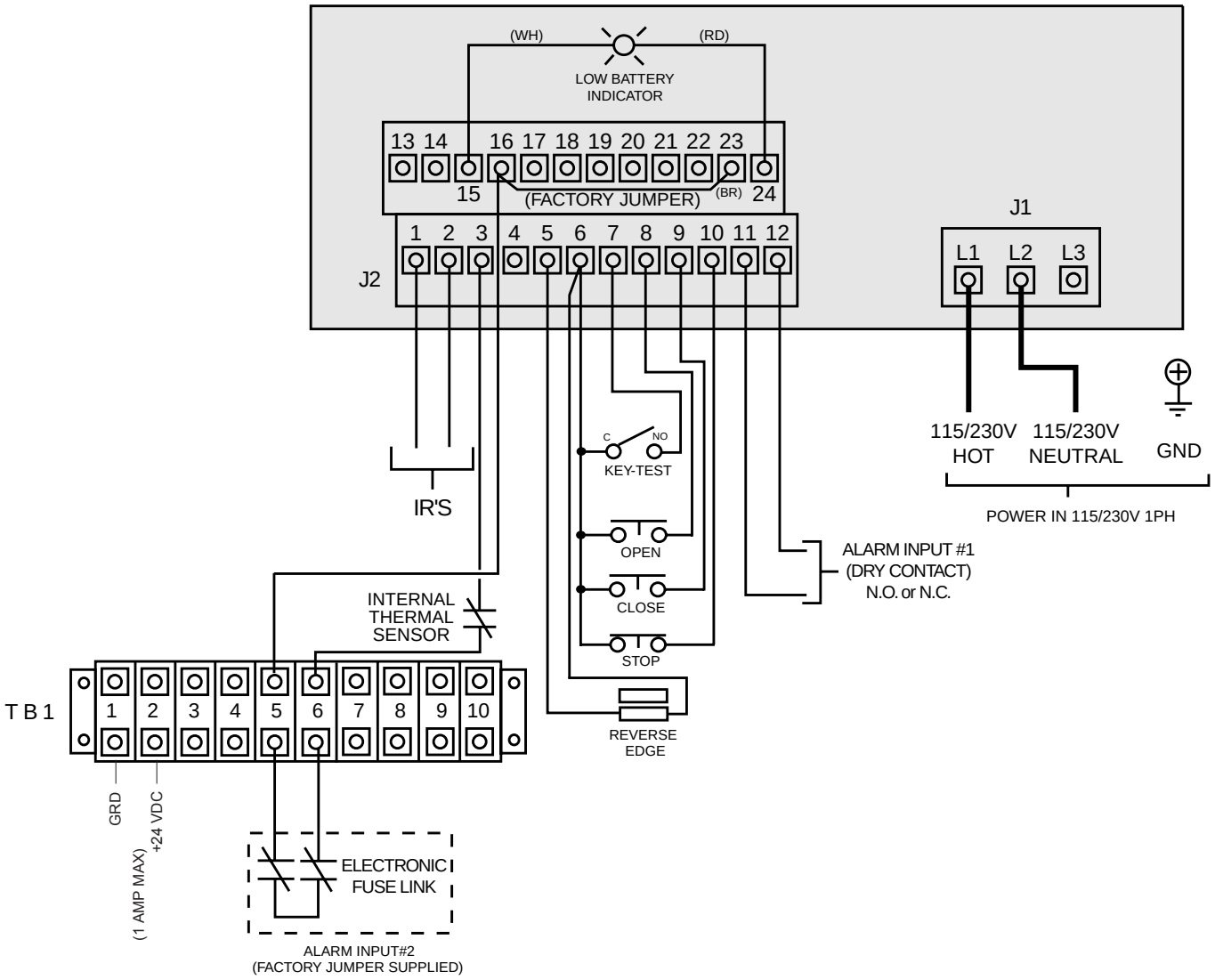
IMPORTANT NOTES:

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



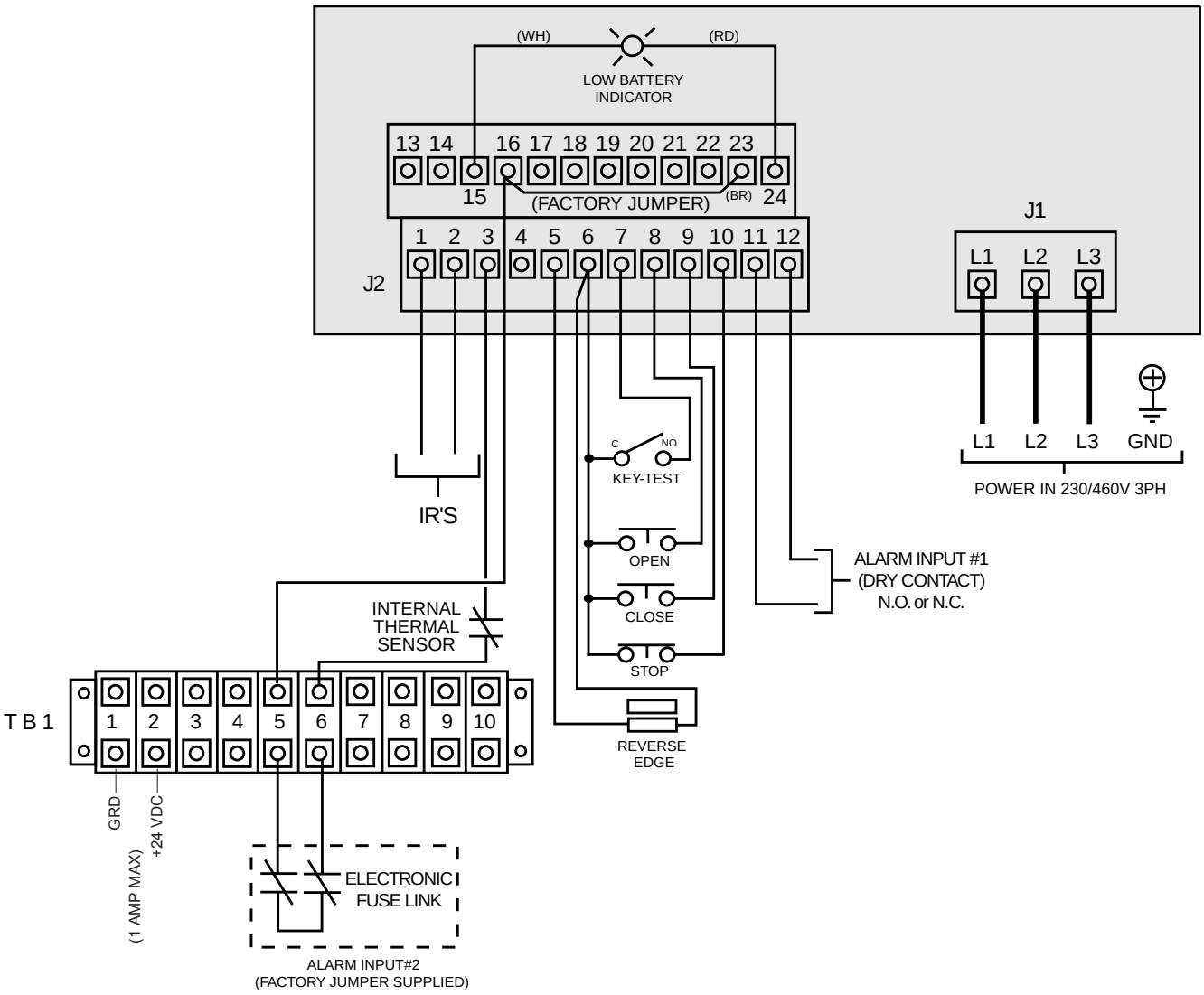
STANDARD POWER & CONTROL CONNECTION DIAGRAMS

LMPLC Board - 115/230V 1PH



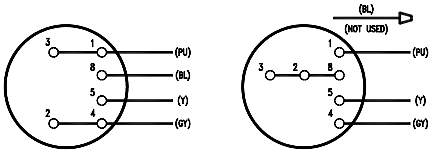
STANDARD POWER & CONTROL CONNECTION DIAGRAMS

LMPLC Board - 230/460V 3PH



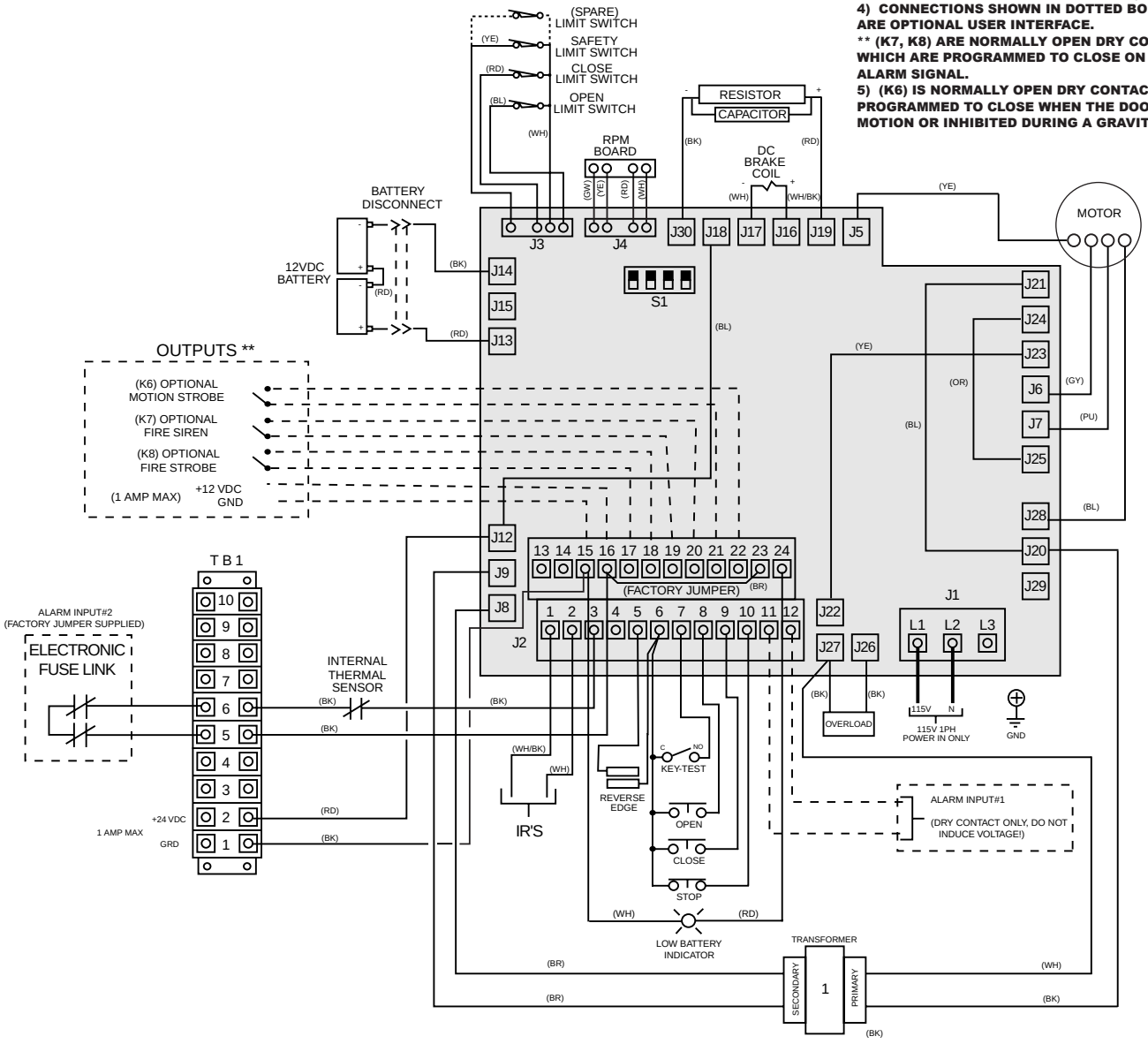
1 PHASE WIRING DIAGRAM (FDC5011,FDC5021,FDC1011,FDC1021)

1892



Notes:
1) See Owner□s Manual for Dip Switch Functions and Programming Procedures
2) TO REVERSE MOTOR DIRECTION: REVERSE PURPLE AND GRAY MOTOR WIRES RUNNING TO J6 AND J7 ON THE BOARD.
3) TO REVERSE LIMIT SWITCH DIRECTION: MOVE YELLOW AND WHITE WIRES FROM SAFETY LIMIT SWITCH TO SPARE AUXILIARY SWITCH (SEE PAGE 7).
4) CONNECTIONS SHOWN IN DOTTED BOUNDARIES ARE OPTIONAL USER INTERFACE.
**** (K7, K8) ARE NORMALLY OPEN DRY CONTACTS WHICH ARE PROGRAMMED TO CLOSE ON ANY ALARM SIGNAL.**
5) (K6) IS NORMALLY OPEN DRY CONTACT WHICH IS PROGRAMMED TO CLOSE WHEN THE DOOR IS IN MOTION OR INHIBITED DURING A GRAVITY CLOSE.

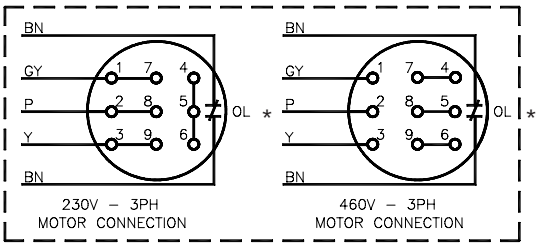
INTERNAL MOTOR CONNECTIONS



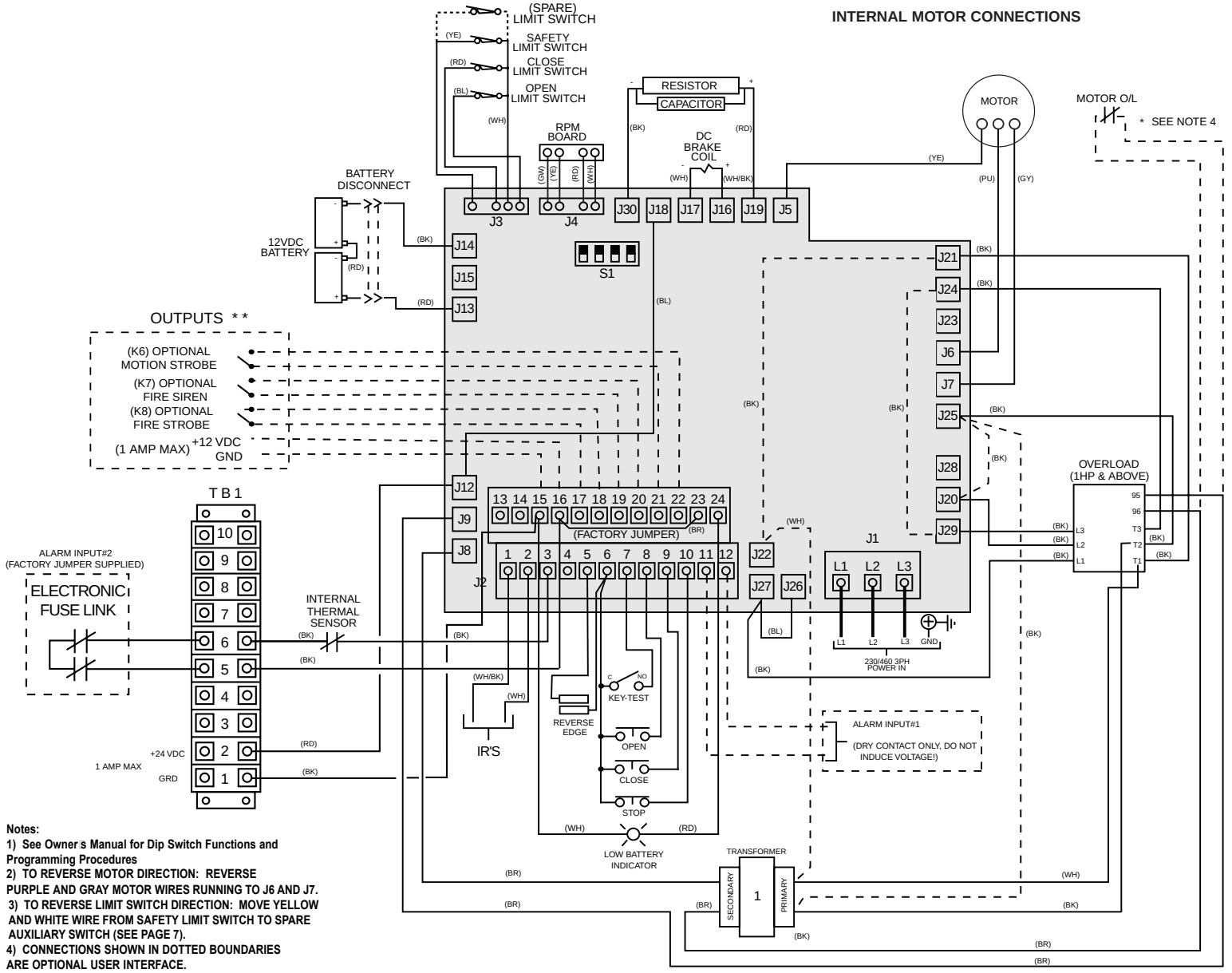
(SHOWN AS LEFT HAND UNIT)

3 PHASE WIRING DIAGRAM (FDC5023,FDC5043,FDC1023,FDC1043)

1893



INTERNAL MOTOR CONNECTIONS



Notes:

1) See Owner's Manual for Dip Switch Functions and Programming Procedures

2) TO REVERSE MOTOR DIRECTION: REVERSE PURPLE AND GRAY MOTOR WIRES RUNNING TO J6 AND J7.

3) TO REVERSE LIMIT SWITCH DIRECTION: MOVE YELLOW AND WHITE WIRE FROM SAFETY LIMIT SWITCH TO SPARE AUXILIARY SWITCH (SEE PAGE 7).

4) CONNECTIONS SHOWN IN DOTTED BOUNDARIES ARE OPTIONAL USER INTERFACE.

*** 5) INTERNAL MOTOR OVERLOAD ON MODELS UP TO AND INCLUDING 3/4 HP. EXTERNAL OVERLOAD LOCATED IN ELECTRICAL ENCLOSURE FOR 1 HP MODELS.**

*** * (K7, K8) ARE NORMALLY OPEN DRY CONTACTS, WHICH ARE PROGRAMMED TO CLOSE ON ANY ALARM SIGNAL.**

6) (K6) IS NORMALLY OPEN DRY CONTACT WHICH IS PROGRAMMED TO CLOSE WHEN THE DOOR IS IN MOTION OR INHIBITED DURING A GRAVITY CLOSE.

(SHOWN AS LEFT HAND UNIT)

MAINTENANCE SCHEDULE

Check at the intervals listed in the following chart.

ITEM	PROCEDURE	EVERY 3 MONTHS	EVERY 6 MONTHS	EVERY 12 MONTHS
Drive Chain	Check for excessive slack. Check & adjust as required. Lubricate.*	●		✔
Sprockets	Check set screw tightness	●		✔
Fasteners	Check & tighten as required		●	✔
Bearings & Shafts	Check for wear & lubricate	●		✔
Functionality	Activate Key Test switch (see pg. 4)	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.

■ CAUTION: BEFORE SERVICING, ALWAYS DISCONNECT OPERATOR FROM POWER SUPPLY.

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 gearbox for leaks.
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.

MOTOR OPERATOR TROUBLE SHOOTING GUIDE

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 supplied)	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 & 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 units 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 & sprocket. Adjust chain tension, replace sprocket & 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" & "CLOSE" limit switches, this will reset the operator's microprocessor.

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 24 for all repair part ordering information.

ELECTRICAL BOX KIT

ITEM	PART #	DESCRIPTION	QTY
E1	K74-16513	RPM Board Kit	1
E2	10-16156	Electrical Box Cover	1
E3	75-16135	Electrical Box	1
E4	10-16133	Battery Plate	1
E5	10-16157	Electrical Box Back Plate	1
E6	21-XXXX	Transformer (See Variable Chart)	1
E7	25-XXXX	Overload (See Variable Chart)	1
E8	25-3000K	Overload Plate **(3 Phase Only)**	1
E9	29-NP712	Battery, 12V	2
E10	K74-16514	Power Resistor Kit	1
E11	03-8024K	Contactor (Optional)	AR
E12	42-110	10 Pole Terminal Block	1
E13	29-16241	Sensor, Thermostat	1
E14	75-13705	Standoff Assembly, FDO PCB	7
E15	K79-13493-1	PCB, LMPLC Assembly	1
E16	28-4875-1	Grommet	1
E17	28-10219	3/8 x 90 deg. Connector	1
	28-10220	Anti-Short Bushing	1
E18	40-10031	Label, Power	2
E19	40-10032	Label, Control	2
E20	29-448	Bridge Rectifier	1

K72-16327 LIMIT SHAFT ASSEMBLY KIT

ITEM	PART #	DESCRIPTION	QTY
L1	09-13701	Rotator Cup	1
L2	11-13361	Limit Shaft	1
L3	12-10028	Flange Bearing	2
L4	13-10024	Limit Nut	2
L5	15-25B22AXX	Sprocket	1
L6	80-10053	Washer, Spacer	4
L7	86-RP04-100	Roll Pin, 1/8" x 1" long	1
L8	87-E-038	E-Ring, 3/8"	2

K75-16515 LIMIT SWITCH ASSEMBLY KIT

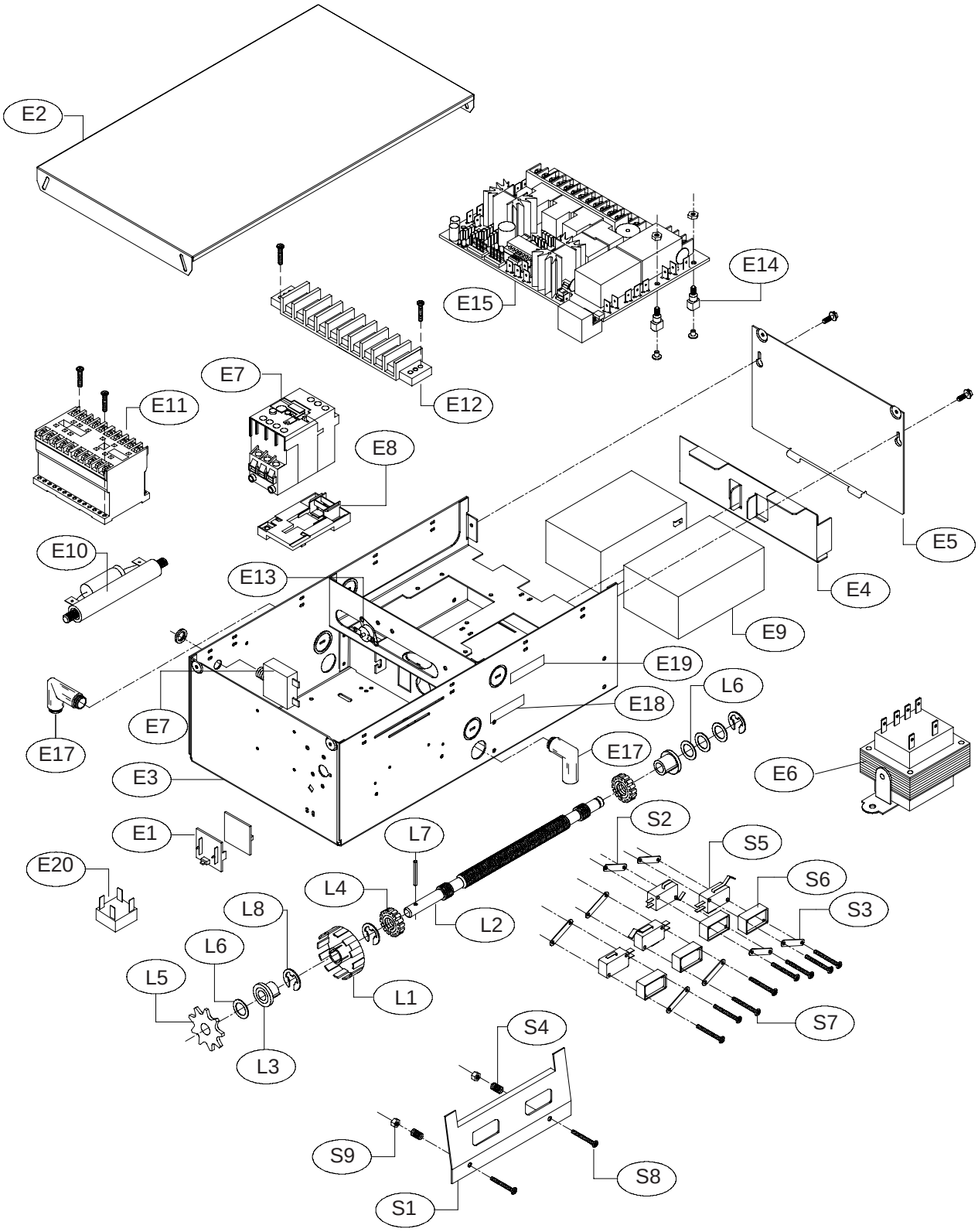
ITEM	PART #	DESCRIPTION	QTY
S1	10-10013	Depress Plate	1
S2	10-12553	Nut Plate Switch	4
S3	10-12806	Backup Plate	4
S4	18-10036	Spring, Depress	2
S5	23-10041	Limit Switch	4
S6	31-12542	Standoff, Switch	4
S7	82-PX04-20	Screw, #4-40 Pan Head	8
S8	82-PX06-16	Screw, #6-32 Pan Head	2
S9	84-LH-06	Lock Nut, #6-32	2

K77-16669 LABEL KIT

PART #	DESCRIPTION	QTY
132A2060	LABEL, GROUND	1
40-10231	LABEL, 115V 1 PHASE (115V 1PH ONLY)	1
40-10232	LABEL, 230V 1 PHASE (230V 1PH ONLY)	1
40-10233	LABEL, 230V 3 PHASE (230V 3PH ONLY)	1
40-10234	LABEL, 460V 3 PHASE (460V 3PH ONLY)	1
40-10306	LABEL, DIRECTION	1
40-12407	LABEL, (1A-4A)	1
40-16070	LABEL, (1-12)	1
40-16071	LABEL, (13-24)	1
40-16715	LABEL, WIRING DIAGRAM (1PH ONLY)	1
40-16716	LABEL, WIRING DIAGRAM (3PH ONLY)	1
40-16485	LABEL, FDC EBOX UL CAUTION	1
40-16509	LABEL, CLASS 2 CIRCUIT	2
40-16601	LABEL, E-BOX COVER SW.SETTIGS	1
40-6000	LABEL, DOOR OPERATOR WARN. SIGN	1
40-65	LABEL, DOOR EDGE CAUTION	2
40-790	LABEL, RESET	2
40-9054	LABEL, RATING	1

Item	P/N	Description	FDC5011	FDC5021	FDC5023	FDC5043	FDC1011	FDC1021	FDC1023	FDC1043
E6	21-16699	Transformer, 115/230V 75VA 1 Phase	●	●			●	●		
	21-16698	Transformer, 230/460V 75VA 3 Phase			●	●			●	●
E7	25-2006	Overload, 6 Amp		●						
	25-2008	Overload, 8 Amp						●		
	25-2010	Overload, 10 Amp	●							
	25-2015	Overload, 15 Amp					●			
	25-4004-K	Overload, 3.3 - 5.5 Amp							●	
	25-4002-5K	Overload, 1.6 - 2.5 Amp								●

ILLUSTRATED PARTS – ELECTRICAL BOX



REPAIR PARTS KITS – MODEL FDC

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 24 for all repair part ordering information.

Complete Electrical Box Replacement Kits
To order a complete electrical box replacement kit, add a K- prefix to the model number of your operator. For example:

FDC5011 = K-FDC5011

* Electrical Box Kits include parts K72-16327 and K75-16515

INDIVIDUAL COMPONENTS

ITEM	PART #	DESCRIPTION	QTY
1	10-16158R	Frame, Right **(1/2HP Operators)**	1
	10-16159R	Frame, Right **(1HP Operators)**	1
2	10-16158L	Frame, Left **(1/2HP Operators)**	1
	10-16159L	Frame, Left **(1HP Operators)**	1
3	10-16140	Bracket, Frame	4
4	10-16160	Bracket, Front & Rear	2
5	10-16483	Bracket, Lifting	2
6	15-16333	Output Sprocket **(1/2HP Operators)**	1
	15-16244	Output Sprocket **(1HP Operators)**	1
7	11-16112	Extension Shaft	1
8	K20-XXXX	Motor Kit (See Motor Kits)	1
9	28-10219	Connector, 90 Degree	1
	28-10220	Anti-Short Bushing	1
10	28-12029	Connector, Straight	1
	28-10220	Anti-Short Bushing	1
11	28-10218	Brake Conduit **(1/2HP Operators)**	6.5”
		Brake Conduit **(1HP Operators)**	8”
12	28-10218	Motor Conduit **(1/2HP Operators)**	13”
		Motor Conduit **(1HP Operators)**	14”
13	80-16113	Step Key	1
14	82-NH10-04	Set Screw, #10	2
15	82-WX10-10T	Screw, #10-32 x 5/8”	16

MOTOR KITS

K20-1050C2	Models	FDC5011, FDC 5021
K20-3050C4	Models	FDC5023, FDC5043
K20-1100C2	Models	FDC1011, FDC1021
K20-3100C4	Models	FDC1023, FDC1043

K32-16214 GEAR REDUCER 1/2HP ASSEMBLY KIT

ITEM	PART #	DESCRIPTION	QTY
G1	32-16214	Gear Reducer	1
G2	82-HN38-20G5	Hex Bolt, 3/8”	4
G3	85-LS-38	Lockwasher, 3/8”	4
G4	85-FW-38	Flatwasher, 3/8”	4

K32-16234 GEAR REDUCER 1HP ASSEMBLY KIT

ITEM	PART #	DESCRIPTION	QTY
G1	32-16234	Gear Reducer	1
G2	82-HN38-20G5	Hex Bolt, 3/8”	4
G3	85-LS-38	Lockwasher, 3/8”	4
G4	85-FW-38	Flatwasher, 3/8”	4
G5	84-FN38	Flange nut, 3/8”	4

K08-16114 INTERFACE HOUSING ASSEMBLY KIT

ITEM	PART #	DESCRIPTION	QTY
H1	08-16114	Interface Housing	1
H2	82-HN38-16	Hex Bolt, 3/8”	4
H3	85-LS-38	Lockwasher, 3/8”	4

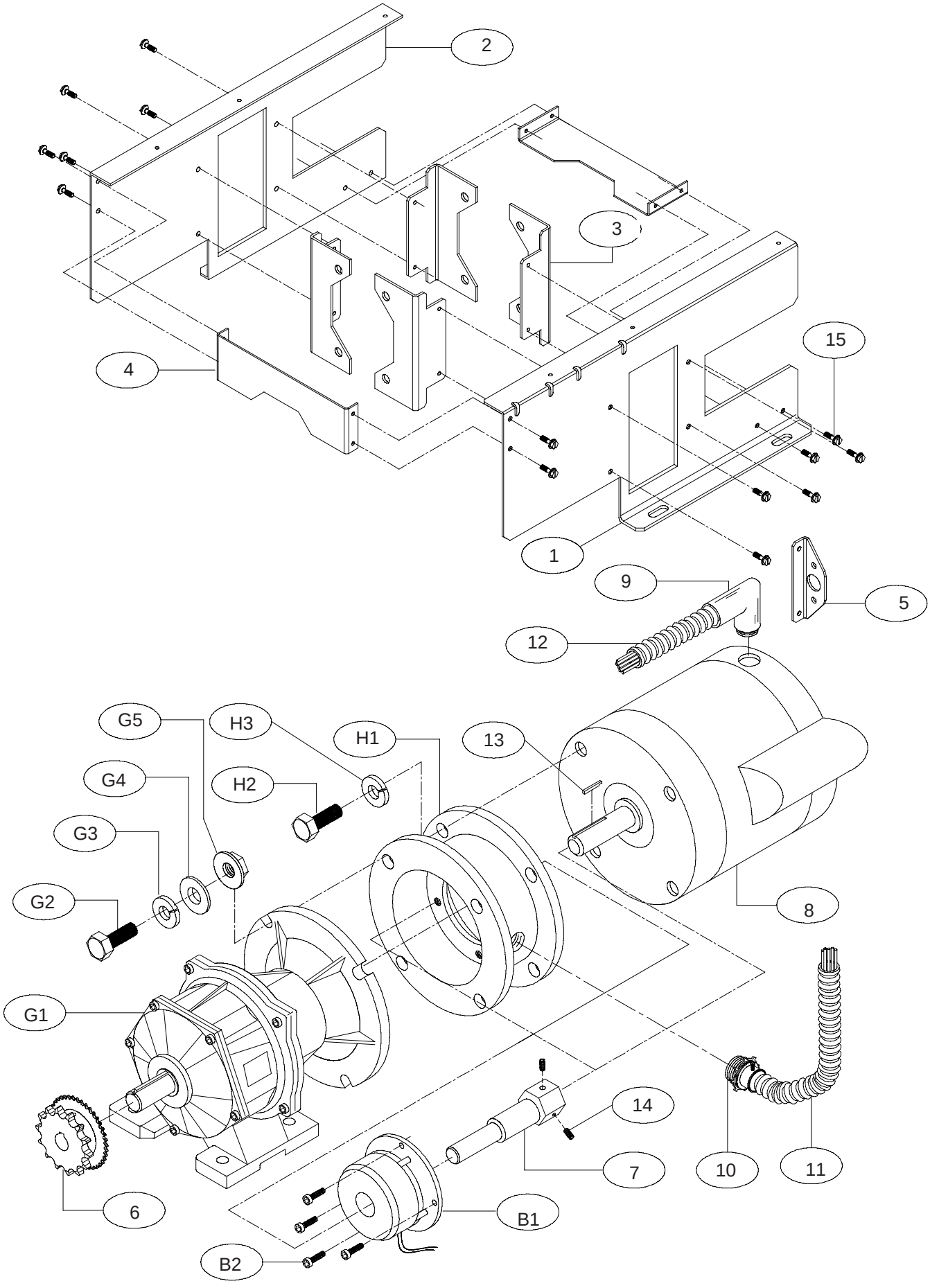
K75-16512 BRAKE ASSEMBLY KIT

ITEM	PART #	DESCRIPTION	QTY
B1	36-16221	Electromagnetic Brake	1
B2	82-SH10-06S	Socket Head Screw, #10	4

ACCESSORIES

02-109FDC	Key Test Station	1
02-103	3 Button Station	1
71-17148	Fuse Link Retrofit Kit (See page 13)	1
74-16685	Thermal Sensor Assembly	2

ILLUSTRATED PARTS – MODEL FDC



HOW TO ORDER REPAIR PARTS

INSTALLATION AND SERVICE INFORMATION AVAILABLE
FROM THE TECHNICAL PARTS AND SERVICE CENTER
ARE AVAILABLE 6 DAYS A WEEK
CALL OUR TOLL FREE NUMBER - 1-800-528-2806
HOURS 7:00 TO 3:30 p.m. (Mountain Std. Time)
MONDAY Through SATURDAY

WHEN ORDERING REPAIR PARTS
PLEASE SUPPLY THE FOLLOWING INFORMATION:
PART NUMBER DESCRIPTION MODEL NUMBER

ADDRESS ORDER TO:

THE CHAMBERLAIN GROUP, INC.
Electronic Parts & Service Dept.
2301 N. Forbes Blvd., Suite 104
Tucson, AZ 85745

41B6

C UL US
LISTED DOOR OPERATOR