



**INSTALLATION INSTRUCTIONS
AND
OPERATION MANUAL**

Fire Door Operator

FTS-51X / FTS-51XK

FTS Series

IMPORTANT INSTALLATION INSTRUCTIONS

WARNING –To reduce the risk of death or serious injury to persons:

1. READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

WARNING! – Components may be under **extreme spring tension** and can cause death or serious injury.

2. **CAUTION:** Review all installation instructions, procedures, cautions and warnings contained within this manual prior to installing and/or servicing this product. As with all releasing device systems, maximum fire protection is provided when installed in accordance with factory specifications.
3. Installation and testing to factory specifications shall be performed by factory authorized personnel for proper operation in accordance with all of the latest National fire Protection Association (NFPA), National electrical Code (NEC), Canadian Electrical Code (CEC), local, state, county, district and/or other applicable building and fire standards, guidelines, regulations and codes including, but not limited to, all appendices and amendments and the requirements of the local authority having jurisdiction (AHJ).
4. Clear fire door opening and prohibit all traffic through door opening during testing of system!
5. The door might be under extreme spring tension. Have a trained door systems technician make all necessary adjustments and repairs to the operator.
6. When not factory installed. The operator must be installed by a trained door systems technician using proper tools and equipment.
7. Install only on a properly operating door. A door that is operating improperly could cause death or serious injury. Trained door systems technicians must make all necessary adjustments and repairs to the door before installing the operator.

Note: Fire doors with spring tension must be adjusted per the manufacturer's installation instructions to allow for automatic closing during a drop test, fusible link/alarm activation and/or power failure (Power failure condition only applies to operators capable of fail-safe closing).

8. Remove all pull ropes.
9. Unless the door operator includes an internal lock sensing system, or external electrical interlocks are installed, remove or make all door locks inoperative, or secure locks in the unlocked position to prevent operation with the locks engaged.

10. Do not connect the door operator to the source of power until instructed to do so.
11. Locate the control station: (a) within sight of the door, and (b) at a minimum height of 5 feet above floors, landings, steps, or any other adjacent walking surface and (c) away from all moving parts of the door.
12. Install the Entrapment Warning Placard next to the control station in a prominent location.
13. Make sure the available power supply to be connected to the operator is of the same voltage, frequency, phase and wattage as indicated on the nameplate of the operator.
14. Read and understand the wiring diagram of the operator and the control station and any other equipment to be connected to the operator.
15. Always disconnect power whenever installing or servicing the door operator or door.
16. All wiring must be permanent and comply with National Electrical Code (NEC) and local code requirements.
17. Any change in mounting position may result in a change of operator rotation and consequently in a change of control functions. Consult factory for any changes.
18. For products having a manual release, instruct the end user on the operation of the manual release.

SYSTEM DESCRIPTION

This device is a motorized mechanism. It is designed for use on fire doors. Inside the device, contact relays receive the alarm signal from the fire alarm control panel. When the device receives the signal, the device releases door and the door closes by gravity. The alarm signal can be a Form C dry contact. The release has a 10 second delay on alarm, 24VDC power output of alarm warning and 24VDC power output for warning prior to and during door closing.

SPECIFICATIONS

MOTOR				
Type:	Restricted cycle duty (10 cycles per hour)			
Rating:	150 ft.lb/sec per motor			
Speed:	1560 RPM			
Voltage:	115V, 1 phase			
Current:	See motor nameplate			
ELECTRICAL				
Transformer:	24VAC			
Wiring Type:	Momentary pressure open, stop, constant pressure close (provided standard), with provision for momentary pressure close*			
Limit Adjustment:	Linear driven, fully adjustable screw type cams.			
MECHANICAL				
Drive Reduction:	FTS6-51 60:1	FTS8-51 88:1	FTS13-51 113:1	FTS44-51 144:1
Output Shaft Speed:	26 RPM	18 RPM	14 RPM	11 RPM
Door Speed:	6 - 8" per sec. average (typical)			
Brake:	Solenoid actuated brake			
ENTRAPMENT PROTECTION				
Sensing Edge*:	(Optional) Sensing device attached to the bottom edge of the door.			
Non-Contact Device*:	(Optional) Photo eye device.			
<p>* Per the requirements of UL Standard 325, the door operator is setup for constant pressure to close the door. As an alternative, the door may be provided with a monitored entrapment protection device that will reverse the door upon contact with or detection of an obstruction during closing. Adding an entrapment device would enable momentary close operation.</p>				

Notes:

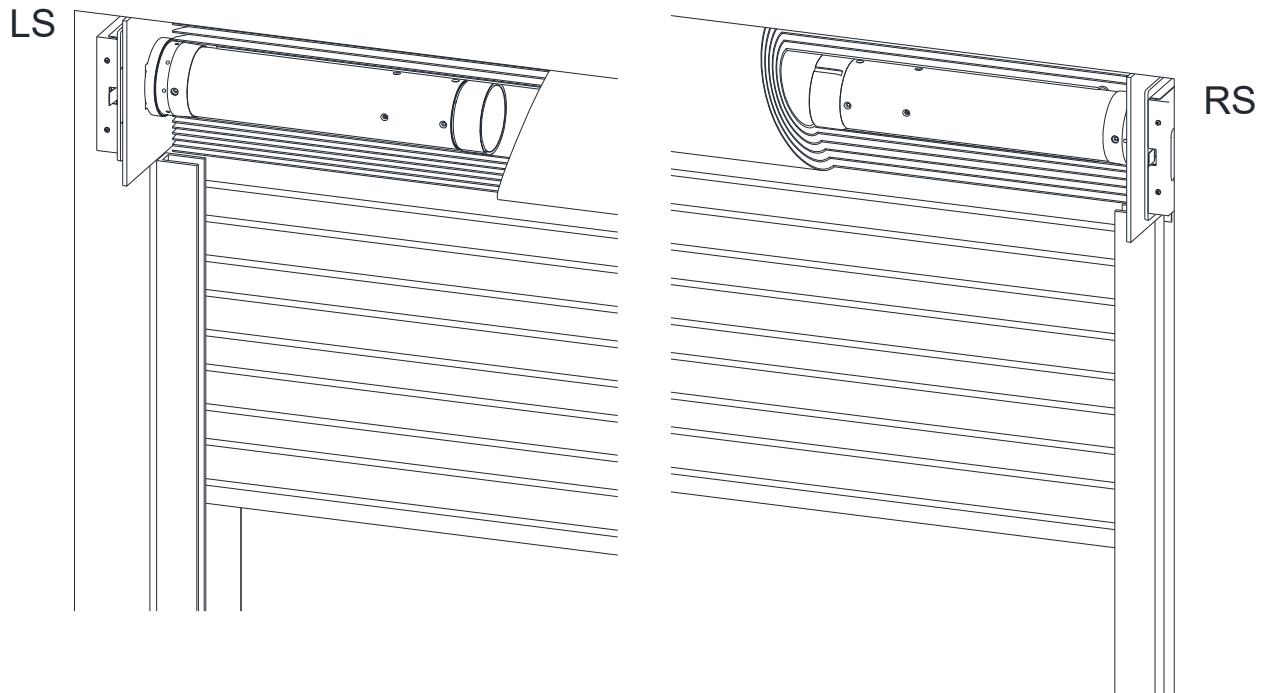
1. Non-contact device (photo eye) can be used on doors up to 35 ft. wide (or maximum rated range of device if less than 35 ft.). Use a sensing edge to provide entrapment protection on doors over 35 ft. wide.
2. Sensing edge can be used on all doors.
3. 115V input power can be from any source including normal building current.
4. 18-gauge wire recommended for all control signals.
5. For "Indoor Dry" location use only.

TYPES AND SIZES OF DOORS

Consult factory for details.

INSTALLATION INSTRUCTIONS

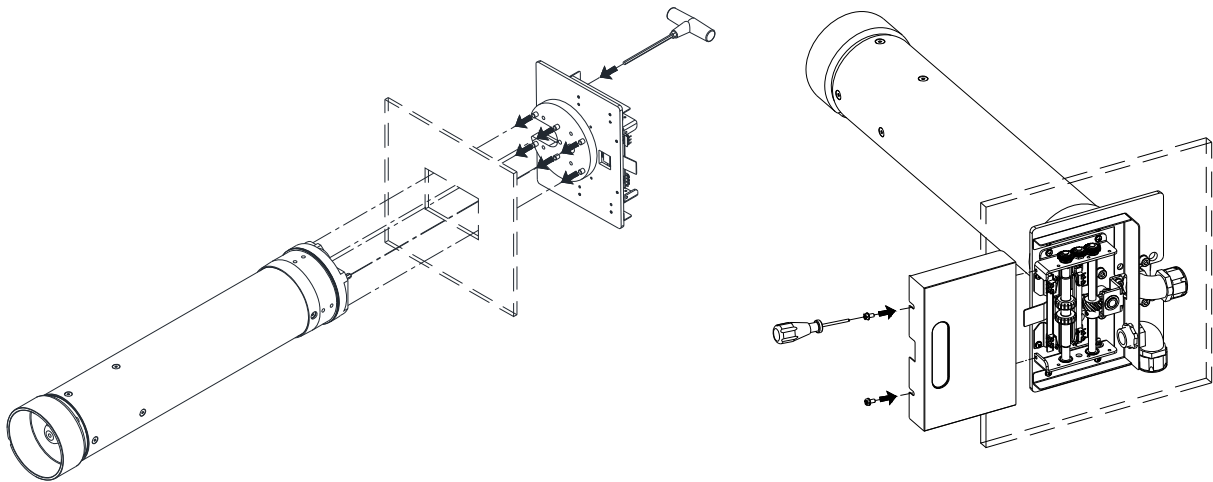
INSTALLATION POSITIONS



NOTE: Any change in mounting position may result in a change of operator rotation and consequently in a change of control functions. Consult factory for any changes. (LS mounting position is LH operator, RS position is RH operator)

OPERATOR MOUNTING

1. Before the operator is installed, verify that the door is properly operating and balanced.
2. Dismantle the limit switch mechanism before mounting on the bracket if required.
3. Make sure the layout of the mounting holes on the bracket is correct.
4. Mount the operator to the mounting plate.
5. Mounting the limit switch mechanism on operator by fastening screws x6.



WIRING INSTRUCTIONS



WARNING

Disconnect power at the fuse box before proceeding with any wiring.

1. **ELECTRICAL CONNECTIONS** – Installation of all wiring and connections shall be performed in accordance with, but not limited to, the latest NFPA, NEC and CEC standards. In addition, all installations subject to Canadian standards shall be performed in accordance with the Canadian Electrical Code, Part I, with respect to wiring material, wiring gauge related to power capacity requirements and circuit length and wiring methods.
2. Verify voltage rating of power source is compatible with the device.
3. Connect power with min.14 gauge wire and alarm signal with min. 18 gauge wire (not for AC power use) to this device.
4. Do not install any wiring or attempt to run this operator without checking the wiring diagram located on the inside of the control box cover.
5. Do not turn on power until you have finished making all power and control wiring connections.
6. Do not run power and control wiring in the same conduit.
7. Any wire connected to the control panel must be protected by conduit or other means to ensure the safety and permanency of the wiring.
8. Use copper wire inside the control panel.
9. A separate fuse line of adequate capacity is needed for the operator.
10. The operator must be properly grounded. The ground screw, painted green, is located inside the control panel.
11. For an operator, system, or external device requiring field installed wiring between a Class 2 output of an operator and an external device, the type of wiring shall be R/C (AVLV2/8), AWM, min. 22 AWG, rated 60°C, with VW-1/FT2.



WARNING

Failure to properly ground the operator could result in electric shock and death or serious injury.



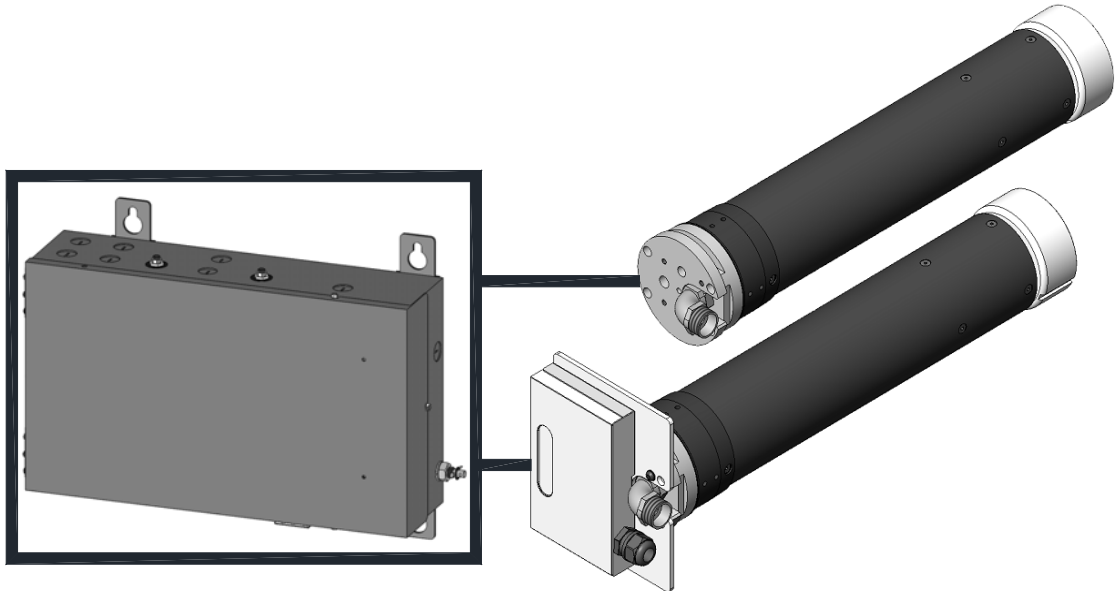
WARNING

Unless the operator includes an internal lock sensing system, or external electrical interlocks are installed, remove or make all door locks inoperative, or secure locks in the unlocked position. Failure to disable the locks could result in damage to the door or operator.

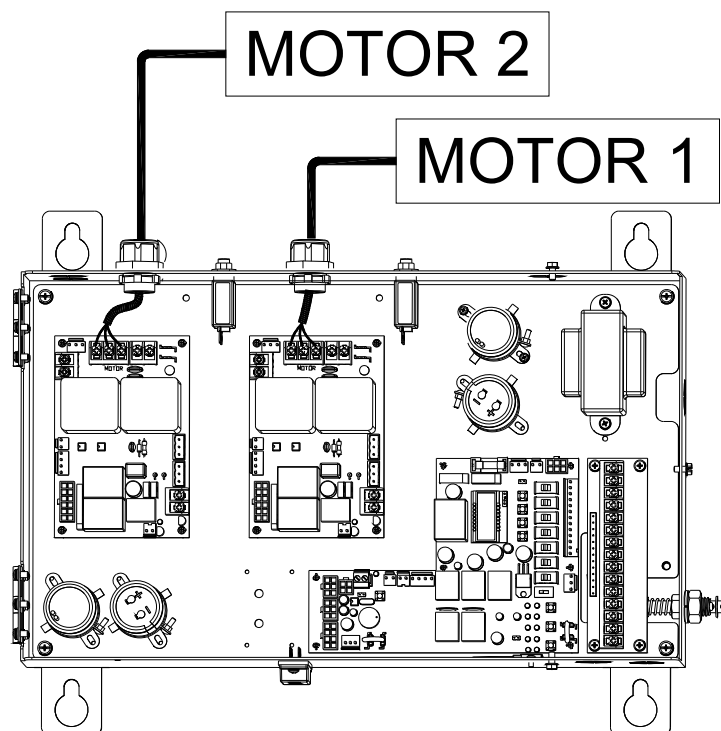
MOTOR WIRING

FTS-51X / FTS-51XK

1. One (1) motor can be connected on one (1) power PC board.
2. Two (2) power PC boards can be mounted in FTS-51XK control panel.
3. See wiring diagrams for power PC boards wiring details.



Motors connections routing, illustration only. Consult factory for details.



Motors connections on power PC boards, illustration only. Consult factory for details.

LIMIT SWITCH ADJUSTMENT

Make sure the limit cams are positioned between the limit switch actuators before proceeding with adjustments.

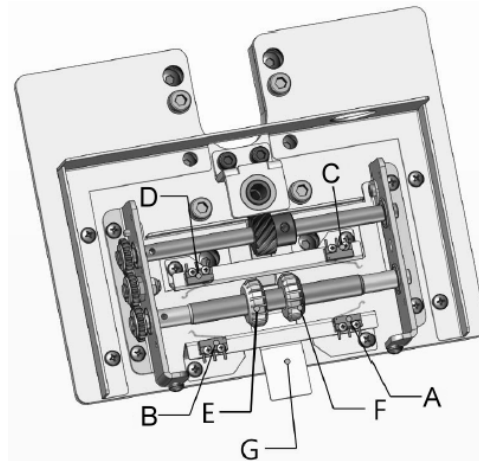
1. Open / remove the control panel cover.
2. Open or close door to determine the moving direction of the limit switch cams.
3. Open or close door to the desired position.



WARNING

Disconnect power before adjusting limit switch cams.

4. While pressing the spring-loaded lever (G), which holds the limit switch cams in place, adjust the limit switch cam (E or F) until the micro switch (C or D) clicking sound is heard.
5. If the limit switch cam cannot be rotated to its desired position, release the lever and move the door away from the desired position, then adjust the limit switch cam to its desired position. It may be necessary to repeat this step until the exact position has been reached.
6. Repeat step 3 and 4 for the opposite direction. Adjust close limit cams so that actuator is engaged as door fully seats at the floor.
7. Micro switch (A or B) can be adjusted to accommodate sensing edge cut-off position.



NOTE: “C” is usually the opening side and “D” is usually the closing side.

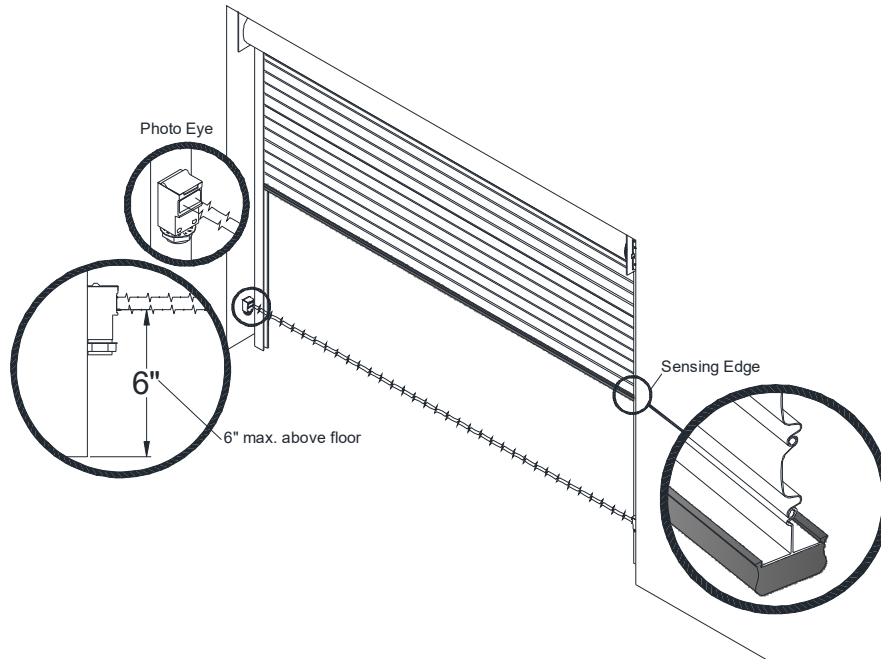
CONTROL WIRING



WARNING

If the door is not visible from the control station, or if any device other than the control station is used to activate the door, an entrapment protection device **must** be installed on the door. Failure to install an entrapment protection device may result in serious injury or death to person(s) trapped beneath the door.

1. Complete limit switch adjustments before making any sensing edge/non-contact device wiring connections to the operator.



Monitored Sensing Device Options:

Sensing Device Type	Device Manufacturer	Model
ELR 2-wire terminated sensing edge	ASO	25.30TLL [A2530L-M], 15.25TTL [A1525-M], 30.70TTLa [A3070L-M], GE245, GE F45, GE F50, GE F56, GE F65, GE F85, GE F115
	Miller Edge Inc. * Must have model number with Suffix T2.	ME110*, ME111*, ME120*, ME123*, ME112*, ME113*, ME116*, ME117*
		MT21*, MU21*, MT22*, MU22*, MC22*, MU33*, MC271*, CPT223*
		MEL-TXYY, MEL-RXYY RB-G-K10
IR Emitter/receiver reflective photo eyes and sensing edge	FRABA Inc.	Optical photo eyes and optical sensing edge, Models OPTOEYE [FOPE], OPTOEDGE; OSE, OPE, OSE-P, OSE-R, OSE-T, RAY-N Reflective Photo Eye, Ray/RT -1004, -2004 [FRPE]
	Martec Access Products Inc.	1266
	Miller Edge Inc.	IG2, MIRM, MLC-K36, MLC-K72 RB-D-K10

Other approved devices may also be available – consult manufacturer for compatibility.

[denotes Lawrence reference]

Note: Refer to sensing device manufacturer for specific installation and maintenance requirements.



Disconnect power at the fuse box before proceeding with any wiring.

WARNING

2. Locate the control station where the user can clearly see the operation of the door. Mount the enclosed placard adjacent or near the door.



WARNING

Controls shall be far enough from the door, or positioned such that the user is prevented from coming in contact with door while operating the controls.

3. Do not run control wiring in the same conduit as power wiring.
4. Any wire connected to the control panel must be protected by conduit or other means to ensure the safety and permanency of the wiring.



WARNING

Do not use radio controls with your operator unless some type of entrapment protection device has been installed. Failure to do so may result in death or serious injury to person(s) trapped beneath the door.

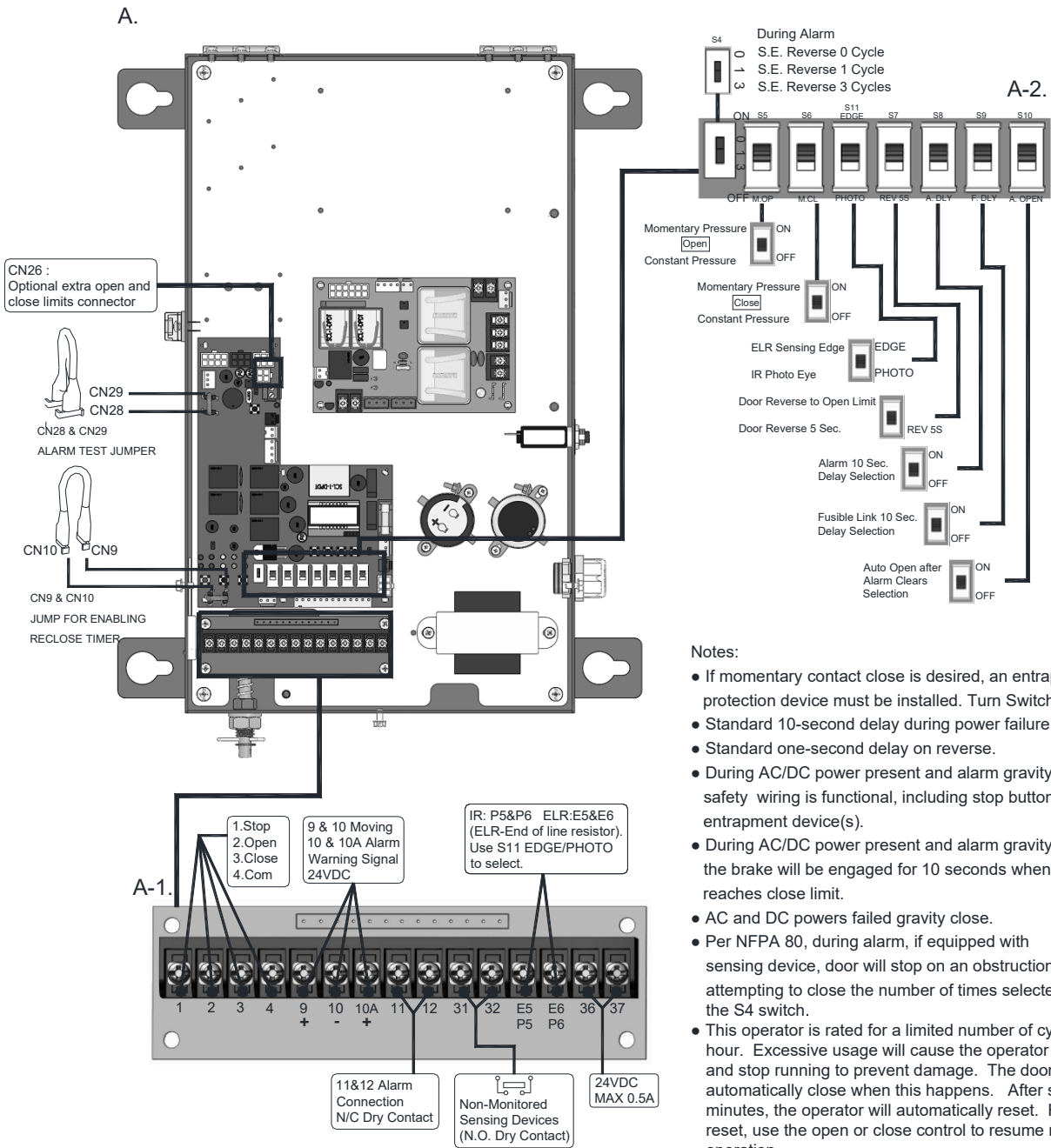


WARNING

Changing from left hand to right hand or vice versa could result in change of control wiring. Consult factory for details.

5. After installation, be sure that the operator, controls, and sensing edge or other entrapment protection devices have been tested and function properly.

A. Control Function:

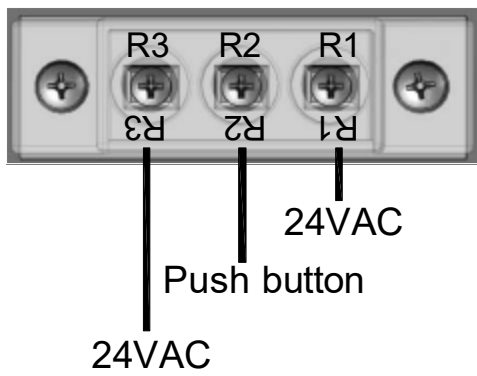


- Notes:
- If momentary contact close is desired, an entrapment protection device must be installed. Turn Switch (S6) to **ON**.
 - Standard 10-second delay during power failure.
 - Standard one-second delay on reverse.
 - During AC/DC power present and alarm gravity closing, safety wiring is functional, including stop button and entrapment device(s).
 - During AC/DC power present and alarm gravity closing, the brake will be engaged for 10 seconds when the door reaches close limit.
 - AC and DC powers failed gravity close.
 - Per NFPA 80, during alarm, if equipped with sensing device, door will stop on an obstruction after attempting to close the number of times selected on the S4 switch.
 - This operator is rated for a limited number of cycles per hour. Excessive usage will cause the operator to overheat and stop running to prevent damage. The door may also automatically close when this happens. After several minutes, the operator will automatically reset. Following reset, use the open or close control to resume normal operation.

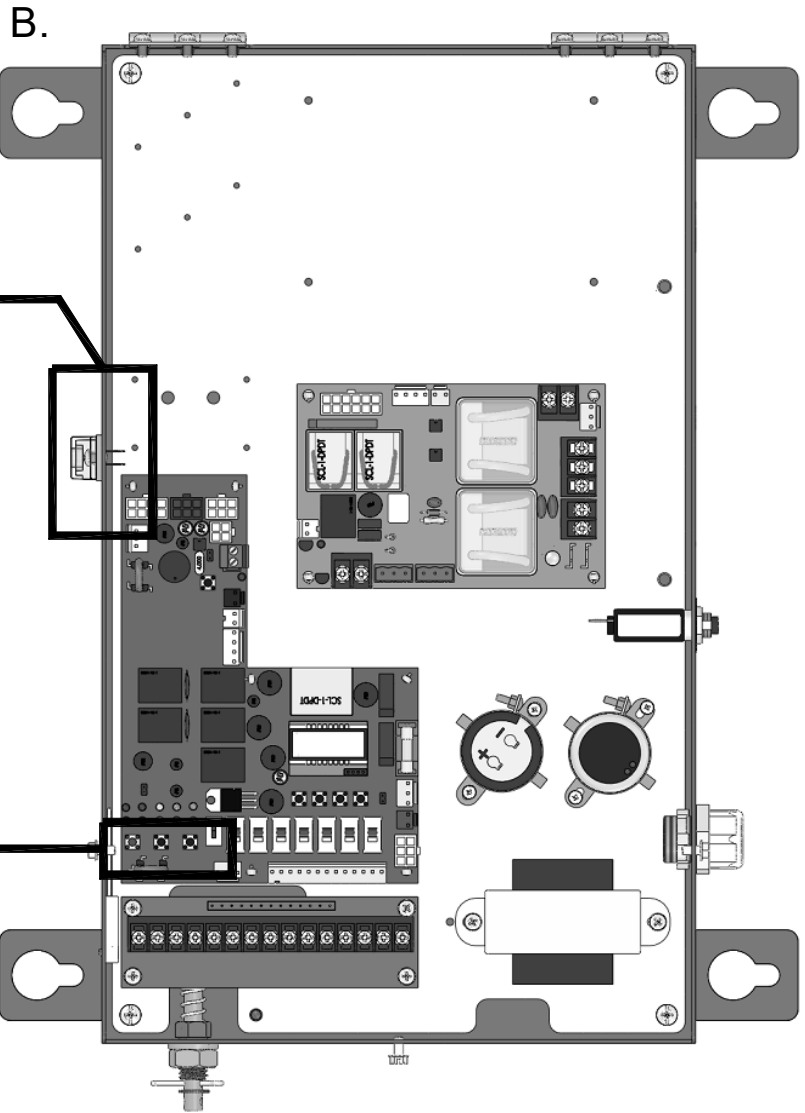
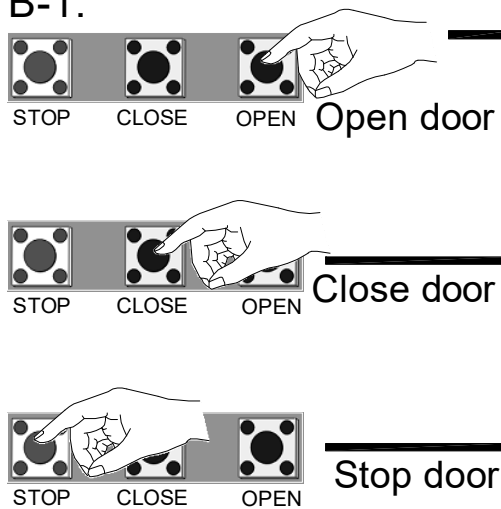
**FTS-51X is shown as above, FTS-51XK unit is similar.*

B. Auxiliary Function:

B-2. Radio control

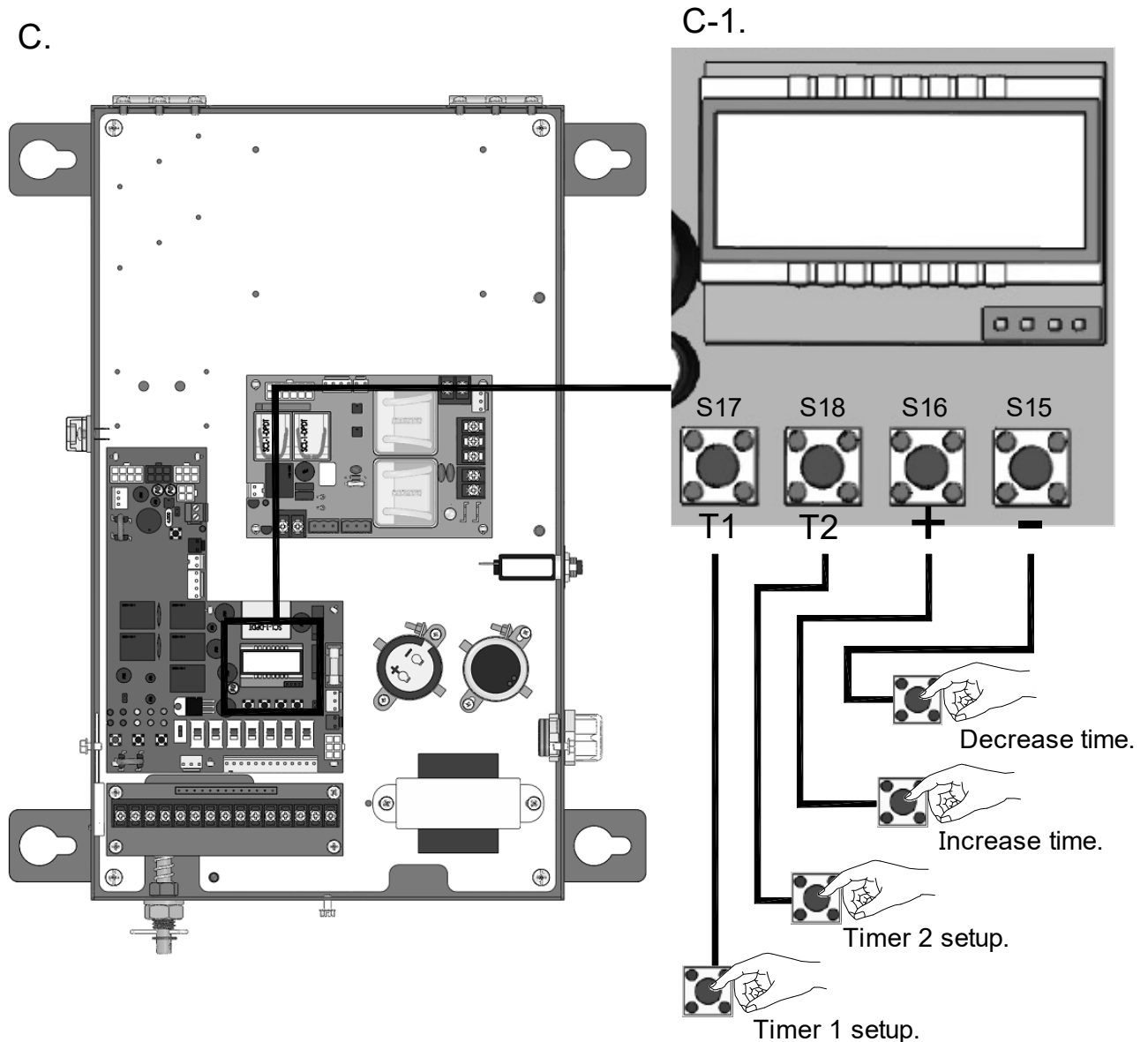


B-1.



**FTS-51X is shown as above, FTS-51XK unit is similar.*

C. Timer Instruction:







**FTS-51X is shown as above, FTS-51XK unit is similar.*

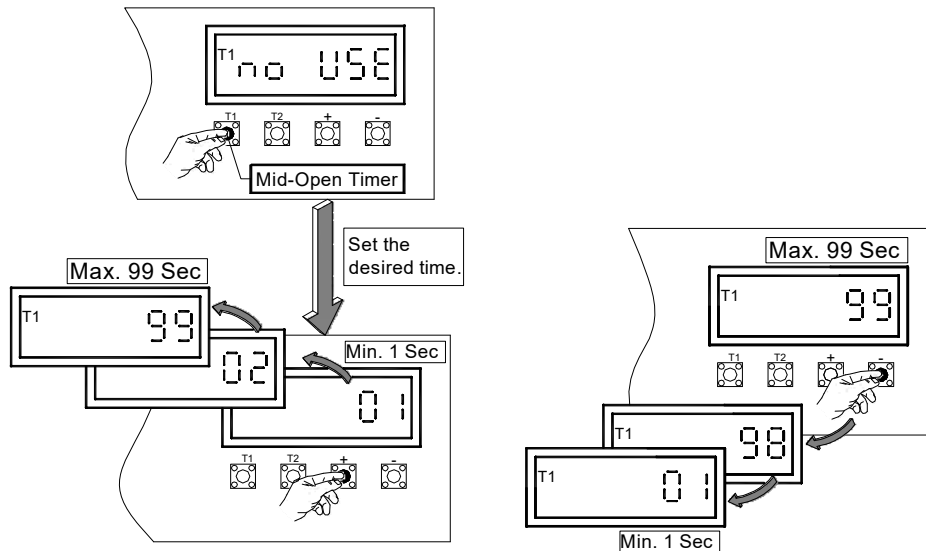
(1) Timer 1 – Mid-open timer: Timer starts counting when door leaves close limit. Door stops after opening for set time. Pressing open again at mid-open position will cause door to open limit.

Timer 2 – Close timer: Timer is active when door stops and is not at close limit.





(2) Standard Mode: Cycle counter

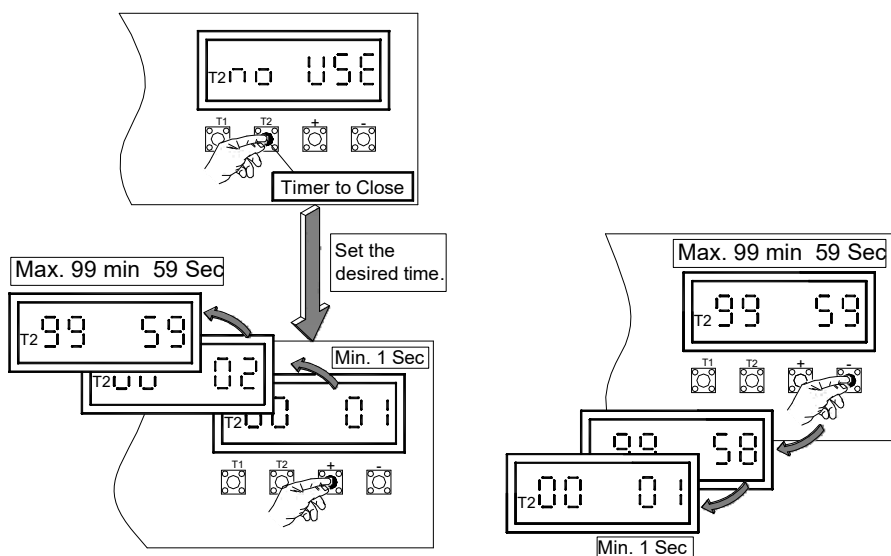
(3) To Set Timer 1 (Mid-open Timer):

- Press  and hold for 5 seconds. Display will flash.
- Use  or  to increase or to decrease time.
- Press  to save setting. Without pressing, no adjustment is saved.



(4) To Set Timer 2 (Reclose Timer):

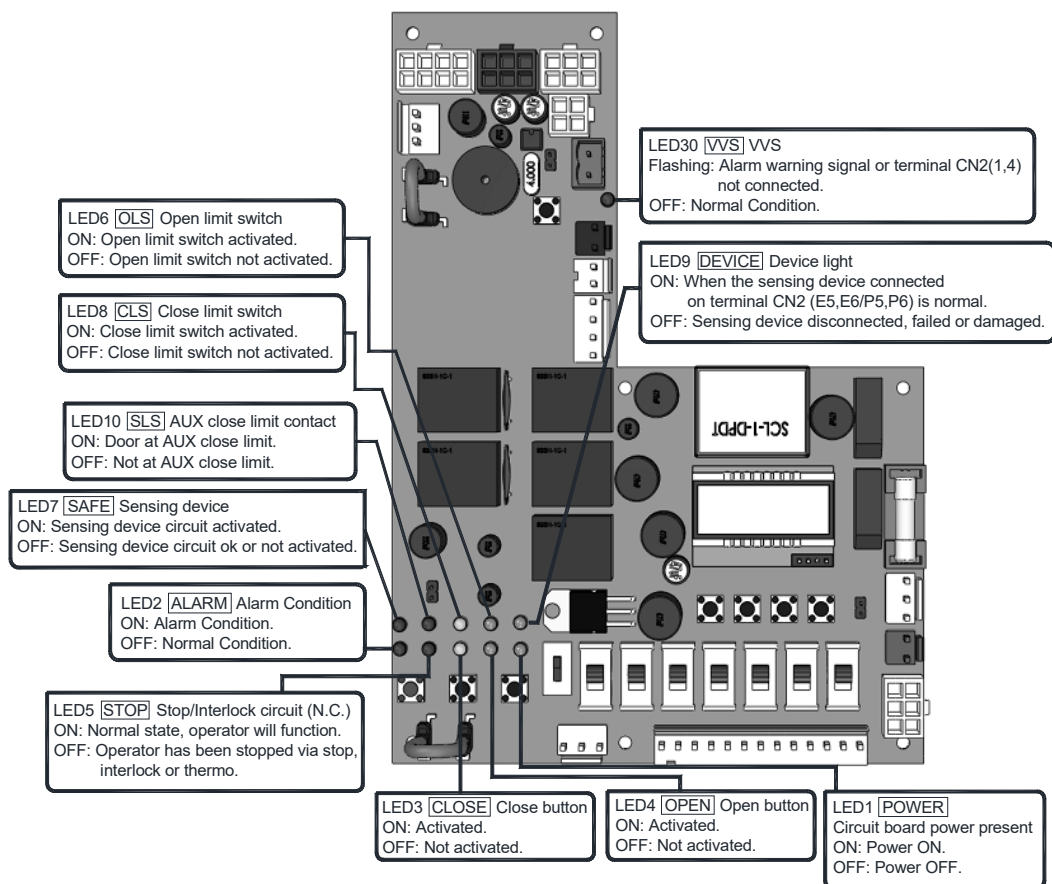
- Press  and hold for 5 seconds. Display will flash.
- Use  or  to increase or to decrease time.
- Press  to save setting. Without pressing, no adjustment is saved.



D. LCD Display Instruction:

Display	Status	Display	Status
	T1 setting		Door closing
	T2 setting		Door opening
	T1 or T2 setting completed		Alarm condition

E. Light Indication:

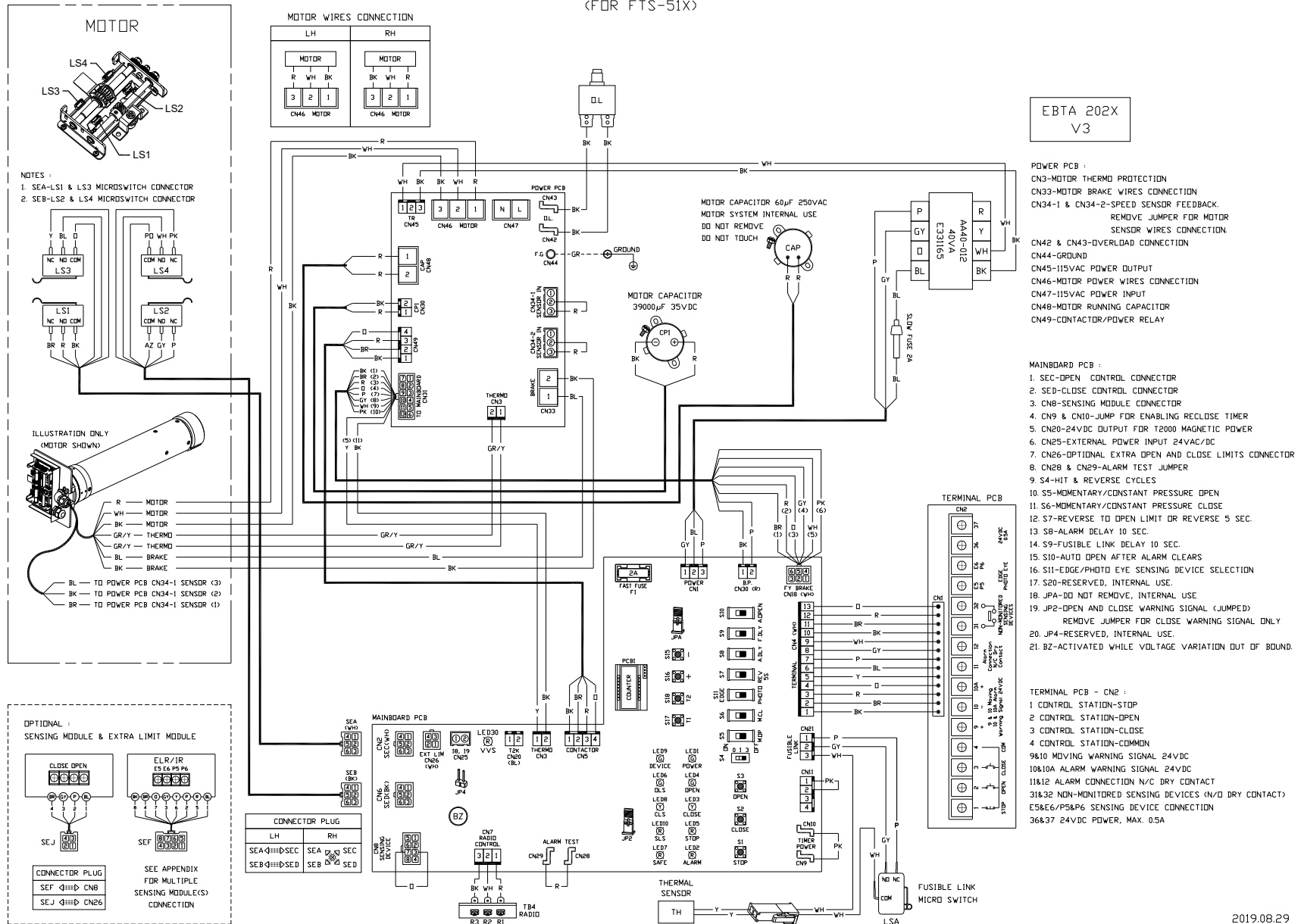


F. Sound Warnings:

Item	Description	Sound
A	Alarm warning signal	B _ _ _ B _ _ _ B _ _ _ B _ _ _
B	Terminal CN2 (1,4) not connected or thermal protection triggered*	B.B.B.B. B.B.B.B. B.B.B.B.

*The thermal protection is reset automatically after motor temperature cooling off.

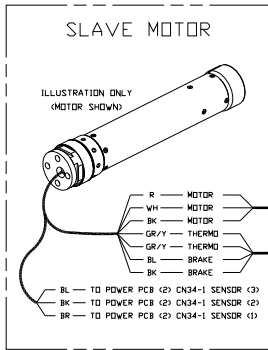
TUBULAR OPERATOR FTS 115V 1 PHASE 50/60HZ
(FOR FTS-51X)



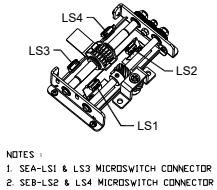
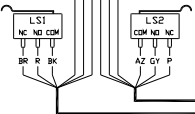
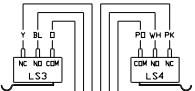
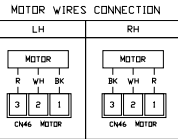
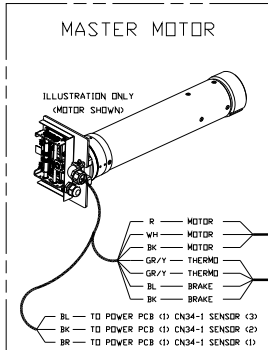
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TUBULAR OPERATOR FTS 115V 1 PHASE 50/60HZ
DUAL MOTORS (FOR FTS-51XK)

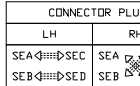
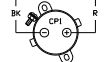
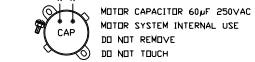
EBTA 202XK
V3



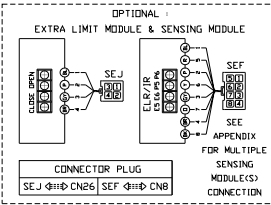
POWER PCB (1) & (2) :
 CN3 - MOTOR THERMO PROTECTION
 CN33 - MOTOR BRAKE WIRES CONNECTION
 CN34-1 & CN34-2 - SPEED SENSOR FEEDBACK
 REMOVE JUMPER FOR MOTOR SENSOR WIRES CONNECTION
 CN42 & CN43 - OVERLOAD CONNECTION
 CN44 - GROUND
 CN45 - 115VAC POWER OUTPUT
 CN46 - MOTOR POWER WIRES CONNECTION
 CN47 - 115VAC POWER INPUT
 CN48 - MOTOR RUNNING CAPACITOR
 CN49 - CONTACTOR/POWER RELAY



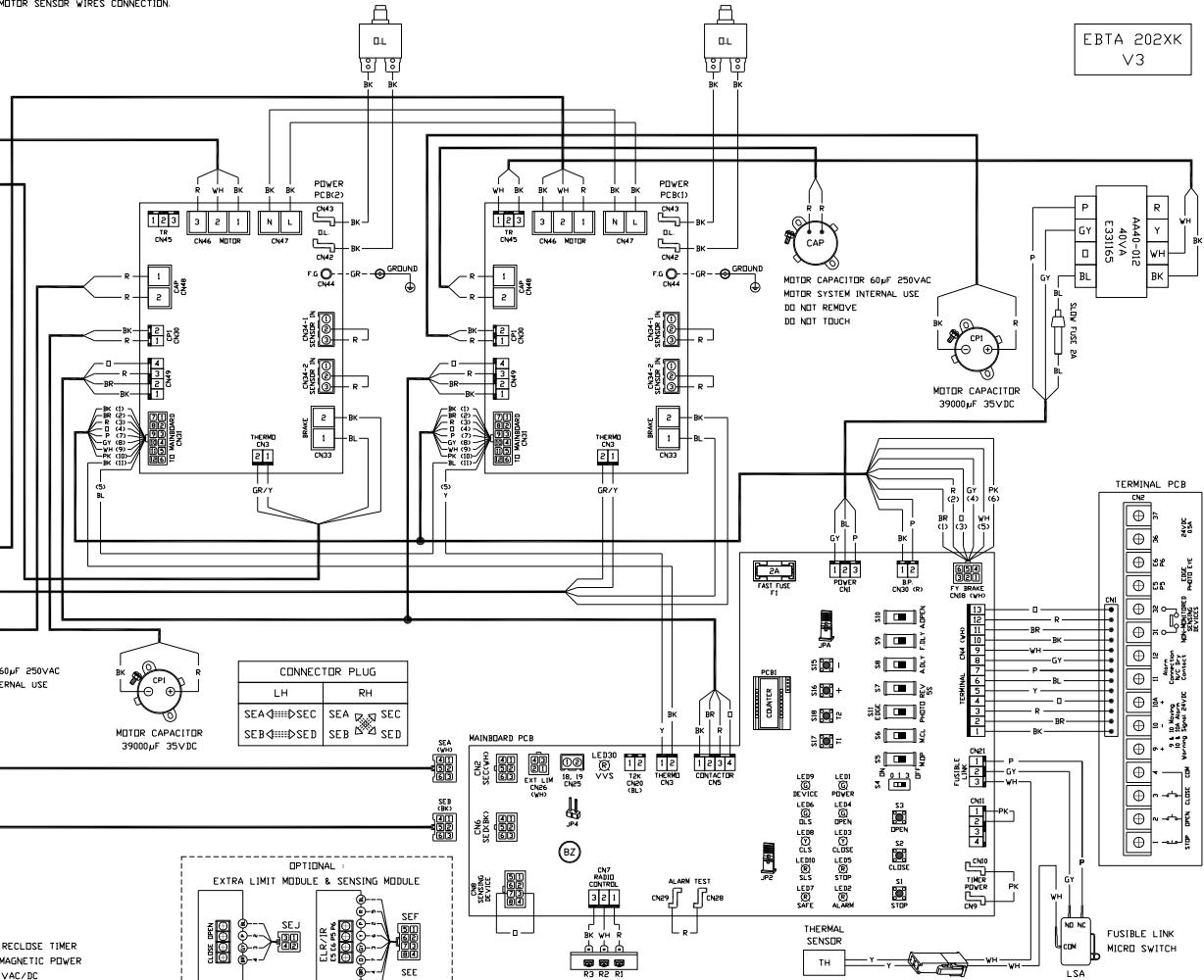
NOTES :
 1. SEA-LS1 & LS3 MICROSWITCH CONNECTOR
 2. SEB-LS2 & LS4 MICROSWITCH CONNECTOR



- MAINBOARD PCB :**
1. SEC-OPEN CONTROL CONNECTOR
 2. SED-CLOSE CONTROL CONNECTOR
 3. CN8-SENSING MODULE CONNECTOR
 4. CN9 & CN10-JUMP FOR ENABLING RECLOSE TIMER
 5. CN20-24VDC OUTPUT FOR T2000 MAGNETIC POWER
 6. CN25-EXTERNAL POWER INPUT 24VAC/DC
 7. CN26-OPTIONAL EXTRA OPEN AND CLOSE LIMITS CONNECTOR
 8. CN28 & CN29-ALARM TEST JUMPER
 9. S4-HIT & REVERSE CYCLES
 10. S5-MOMENTARY/CONSTANT PRESSURE OPEN
 11. S6-MOMENTARY/CONSTANT PRESSURE CLOSE
 12. S7-REVERSE TO OPEN LIMIT OR REVERSE 5 SEC.
 13. S8-ALARM DELAY 10 SEC.
 14. S9-FUSIBLE LINK DELAY 10 SEC.
 15. S10-AUTO OPEN AFTER ALARM CLEARS
 16. S11-EDGE/PHOTO EYE SENSING DEVICE SELECTION
 17. S20-RESERVED, INTERNAL USE.



18. JPA-DO NOT REMOVE, INTERNAL USE
19. JP2-OPEN AND CLOSE WARNING SIGNAL (JUMPED)
REMOVE JUMPER FOR CLOSE WARNING SIGNAL ONLY
20. JP4-RESERVED, INTERNAL USE
21. BZ-ACTIVATED WHILE VOLTAGE VARIATION OUT OF BOUND.



IMPORTANT SAFETY INSTRUCTIONS

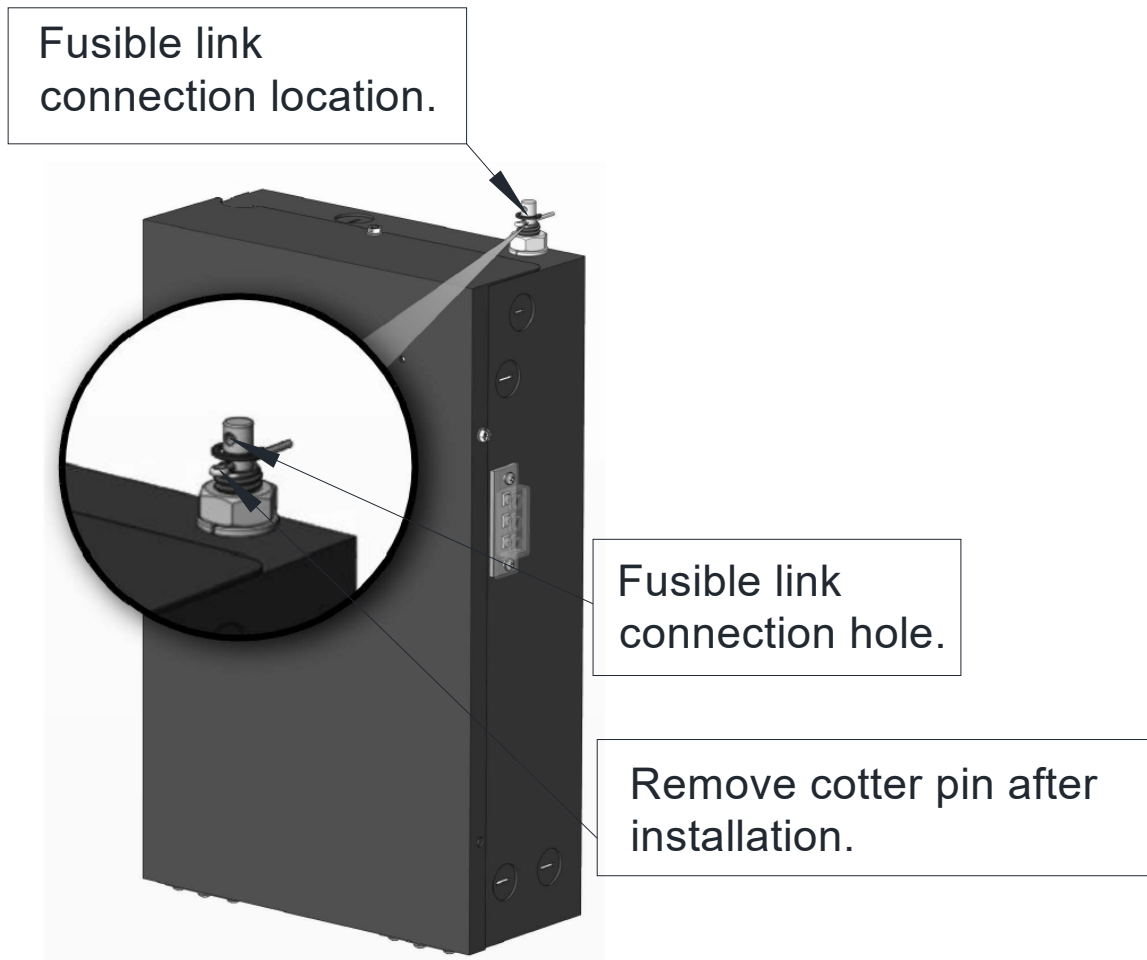
WARNING –To reduce the risk of severe injury or death:

1. READ AND FOLLOW ALL INSTRUCTIONS.
2. Never let children operate or play with door controls. Keep the remote control (where provided) away from children.
3. Personnel should keep away from a door in motion and keep the moving door in sight until it is completely closed or opened. **NO ONE SHOULD CROSS THE PATH OF A MOVING DOOR.**
4. Test the door's safety features at least once a month. After adjusting either the force or the limit of travel, retest the door operator's safety features. Failure to adjust the operator properly may cause severe injury or death.
5. KEEP DOORS PROPERLY OPERATING AND BALANCED. See Door Manufacturer's Owner's Manual. An improperly operating or balanced door could cause severe injury or death. Have trained door systems technician make repairs to cables, spring assemblies, and other hardware.
6. **SAVE THESE INSTRUCTIONS.**

FUSIBLE LINK CONNECTIONS

- ❖ **REMOVE COTTER PIN FROM RELEASE ASSEMBLY AFTER INSTALLATION IS COMPLETE.**

Refer to the fire door installation instructions for connection of the release assembly or consult NFPA-80 and the authority having jurisdiction for fusible link location(s) and method.



* Illustration only, not drawn to scale. See product for actual details.

OPERATING INSTRUCTIONS

1. If a 3-button control station is used to operate the door, push the “OPEN” button to open the door, push the “CLOSE” button to close the door, push the “STOP” button to stop movement of the door while opening or closing. Removing pressure from the “CLOSE” button will cause the door to stop.
2. If a key switch control station is used to operate the door, turn the key to the “OPEN” position to open the door, turn the key to the “CLOSE” position to close the door, push the “STOP” button to stop movement of the door while opening or closing. Removing pressure from the “CLOSE” key position will cause the door to stop.



WARNING

If a sensing edge is not installed on the bottom of the door, and removing pressure from the “CLOSE” button or key switch position does not cause the door to stop, this condition must be corrected immediately. Improper operation could result in serious injury or death to person(s) trapped beneath the door.

3. Door may also be operated by remote devices.
4. This operator is rated for a limited number of cycles per hour. Excessive usage will cause the operator to overheat and stop running to prevent damage. The door may also automatically close when this happens. After several minutes, the operator will automatically reset. Following reset, use the open or close control to resume normal operation.

MAINTENANCE INSTRUCTIONS

The brake is a self-adjusting brake. It is maintenance free. The brake assembly requires no additional adjustments for its lifetime.

If an entrapment protection device is used, i.e. sensing edge or photoelectric sensors, please consult the manufacturer for maintenance instruction.



WARNING

Disconnect power supply to the operator before servicing.

Check the following items at the intervals listed:

CHECK LIST	DESCRIPTION	EVERY 3 MONTHS	EVERY 6 MONTHS	EVERY 12 MONTHS
Fasteners	Check & tighten as required		●	
Bearings & Shafts	Check for wear & lubricate	●		
Drop-test	Inspect door, drop-test for proper operation and full closure per NFPA-80			●

- ❖ Do not lubricate motor. Motor bearings are rated for continuous operation.
- ❖ Inspect and service whenever a malfunction either door or operator is observed or suspected.
- ❖ Before servicing, always disconnect power supply to the operator.
- ❖ Replace fuses only with those of the same type and rating.
- ❖ All replacement parts must be obtained from the door manufacturer per NFPA-80.



WARNING

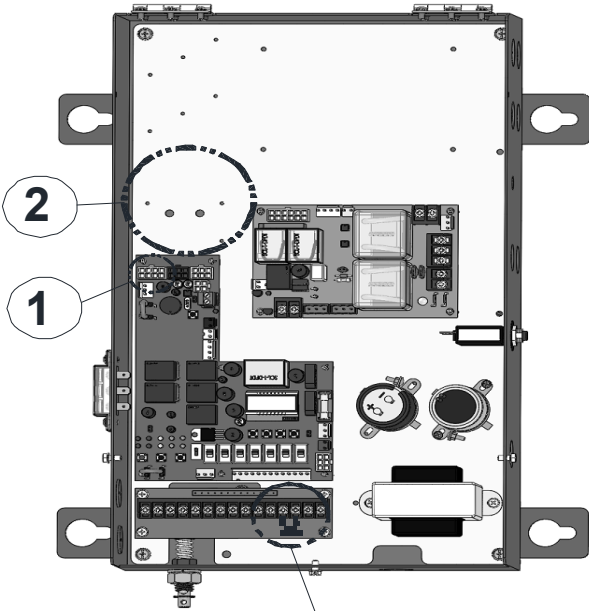
Do not place hands or tools in or near the operator when the power is connected or when testing control or sensing devices. Always disconnect power before servicing or adjusting the operator.

APPENDIX 1

Multiple Sensing Devices Connection Instruction

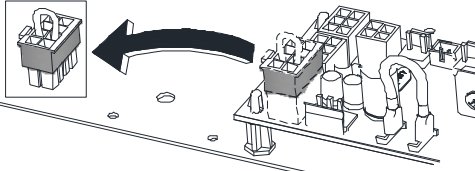
QST-FT-EP-ADAPTER-3

Warning: Power OFF When Connecting.

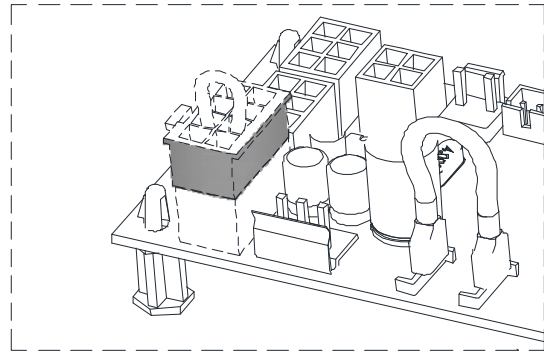


Primary Sensing Device Connection

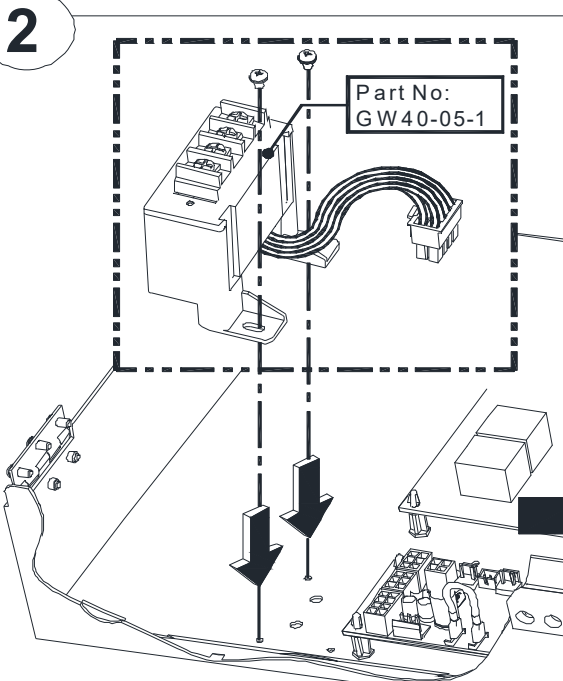
1 Unplug the jumper connector to add modules.



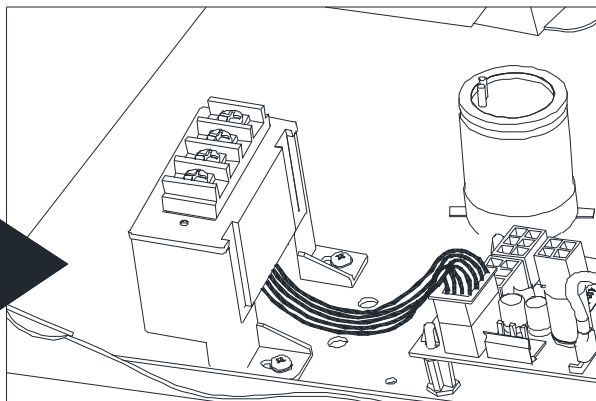
or



Plug back the jumper connector if no additional module is used.



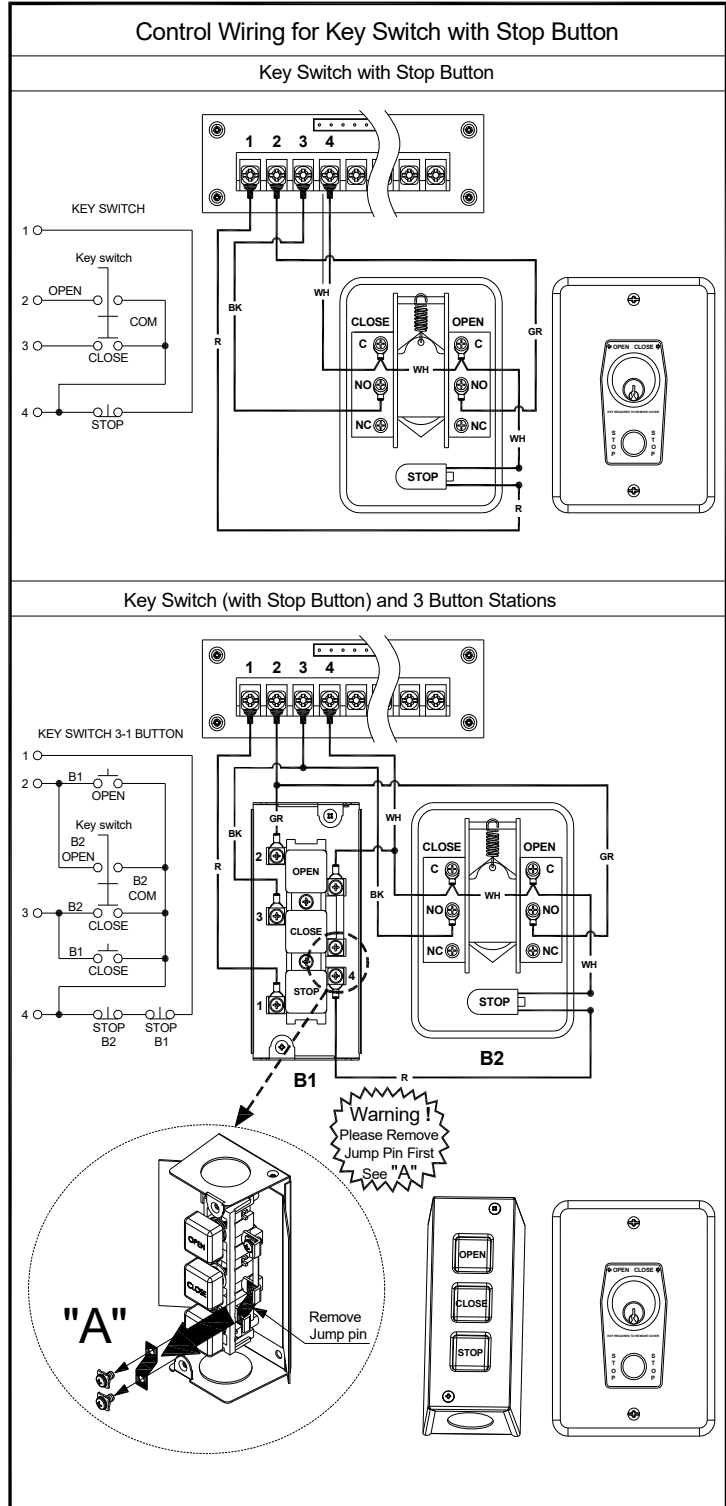
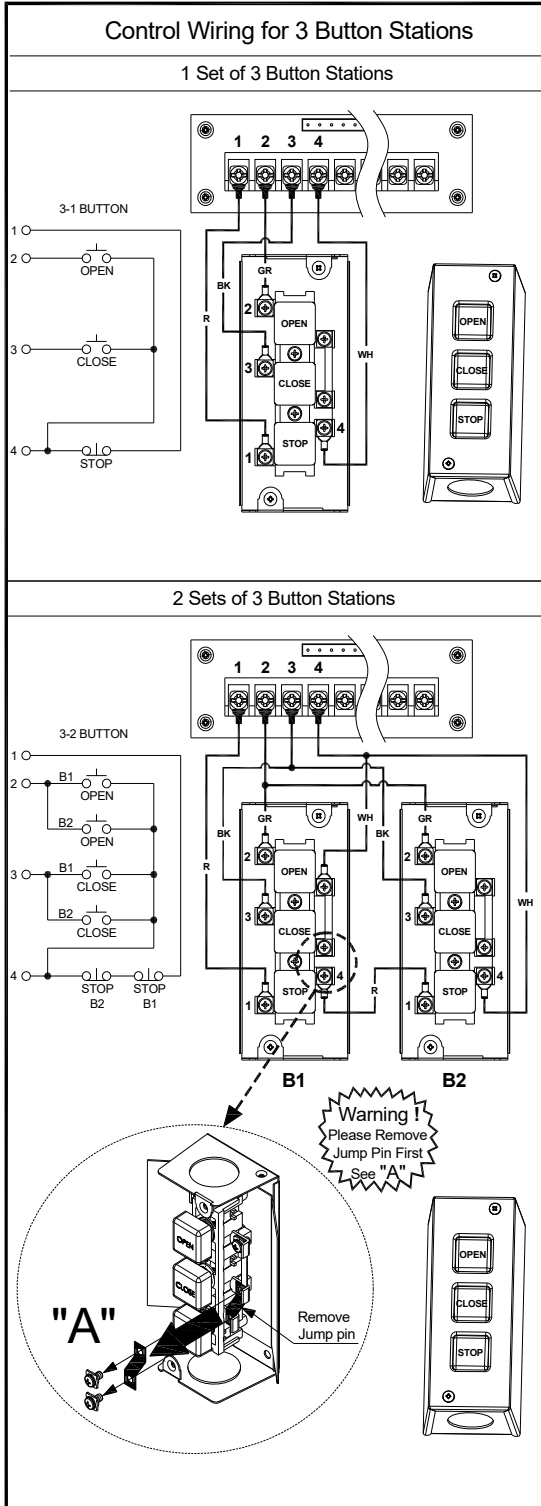
2 Secondary sensing device connects on 1st sensing module.



APPENDIX 2

Control Connections Diagrams

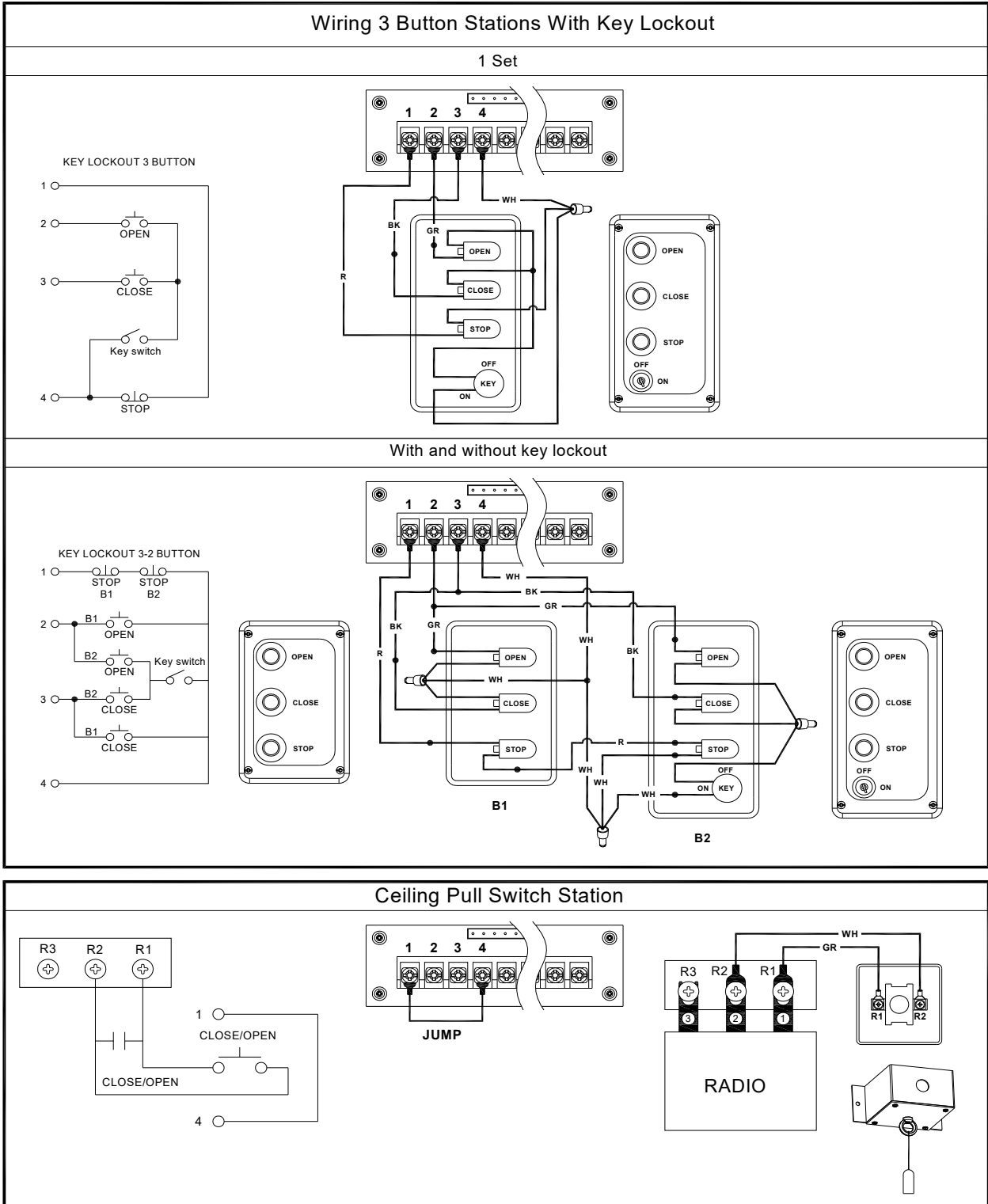
CCD-PCB-A01



APPENDIX 3

Control Connections Diagrams

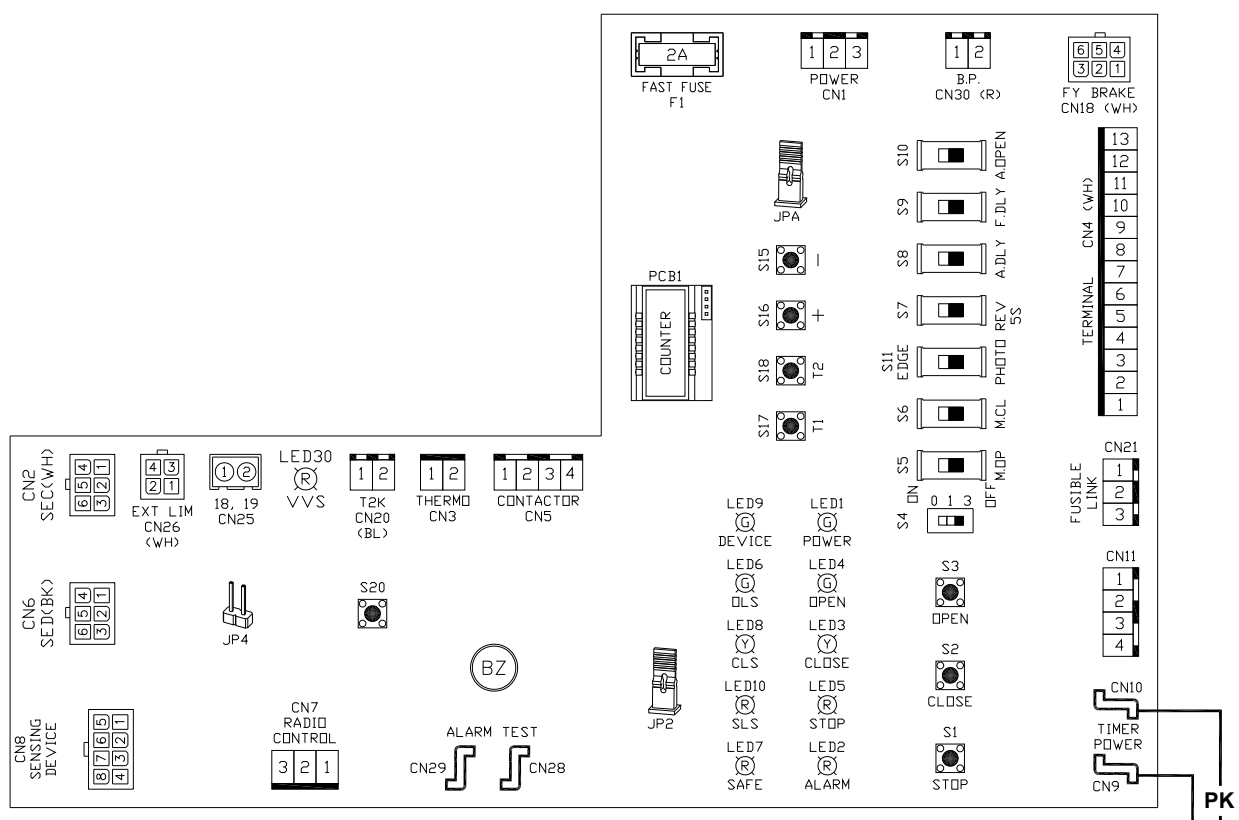
CCD-PCB-B02



APPENDIX 4

EXTERNAL TIMER DEFEAT SWITCH CONNECTION-FTS BOARD

ETDS-FTS-EP-001



CUTTING CN9/CN10 JUMPER AND CONNECTING WIRES TO ON/OFF SWITCH.

