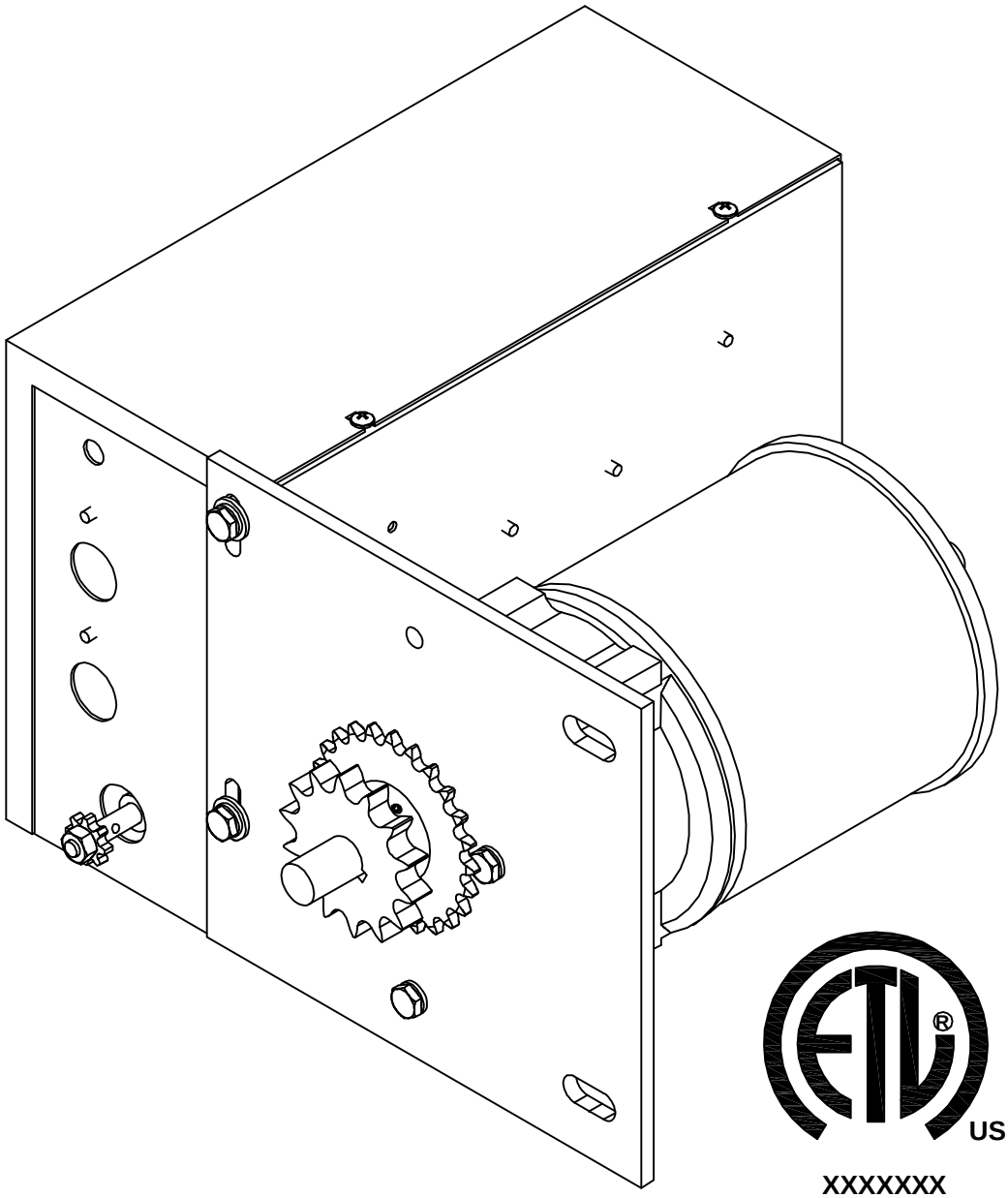
COOKSON OWNER'S MANUAL

FDO-A10E

INDUSTRIAL DUTY FIRE DOOR OPERATOR

NOT FOR RESIDENTIAL USE



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WARNING

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

OPERATOR

SERIAL#

9001(7) ECN 1057 4/10/010

SPECIFICATIONS

MOTOR

TYPE:.....INTERMITTENT

HORSEPOWER:.....1/8 H.P.

VOLTAGE:.....115 SINGLE PHASE

CURRENT:.....2.5 AMP

MAX LOAD:.....250 IN-LBS

ELECTRICAL

DC POWER SUPPLY:.....24VDC, 15W

CONTROL STATION:.....NEMA 1 3 BUTTON STATION OPEN/CLOSE/STOP

WIRING TYPE:.....C2/B2 (STANDARD)

LIMIT ADJUST:.....LINEAR DRIVEN, FULLY ADJUSTABLE SCREW TYPE CAMS

MECHANICAL

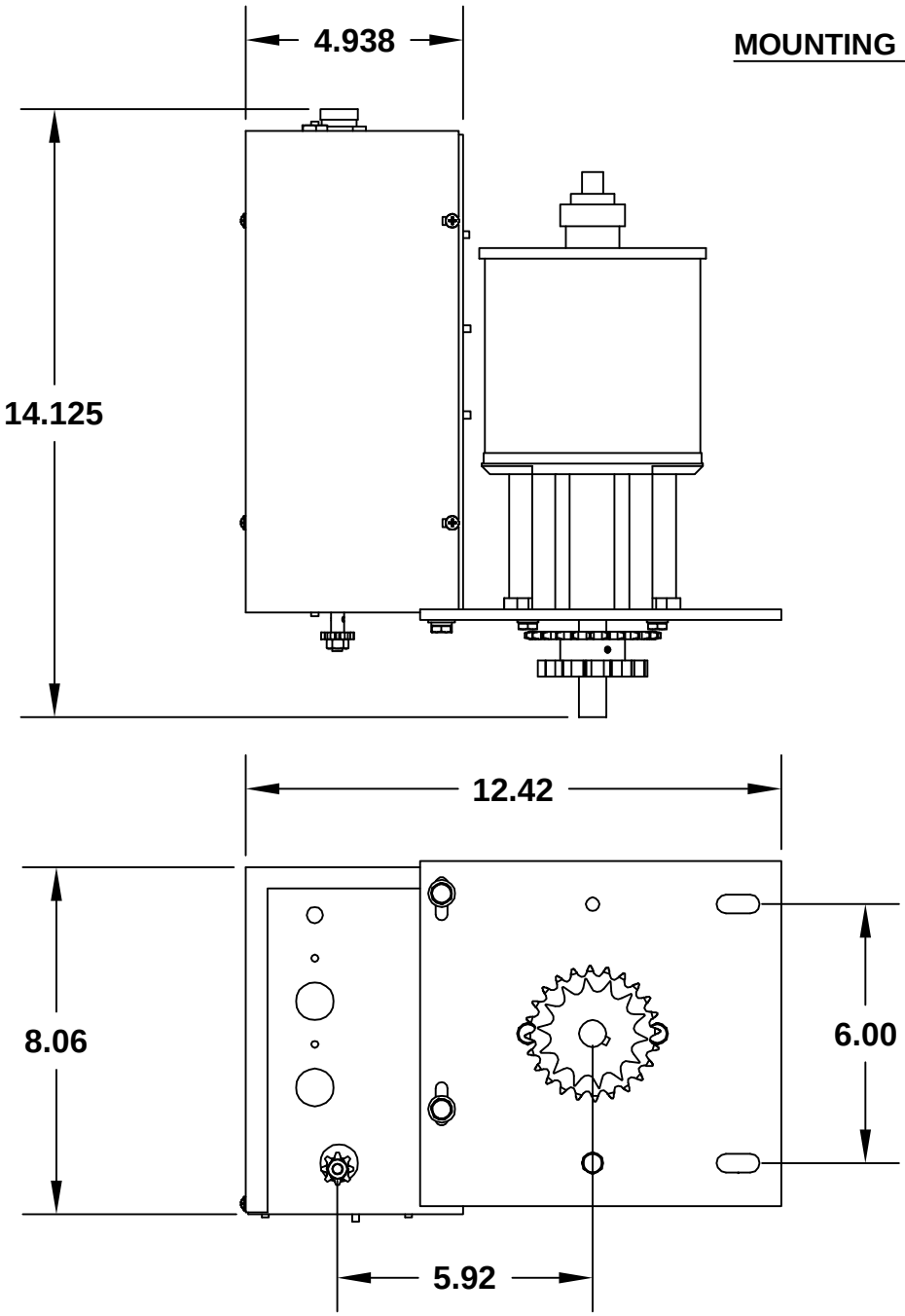
DRIVE REDUCTION:.....43:1 REDUCTION IN LINE GEAR REDUCED MOTOR

OUTPUT SHAFT SPEED:.....29 R.P.M.

DOOR SPEED:.....12" PER SECOND

BRAKE:.....SOLENOID ACTUATED DISC BRAKE

MOUNTING DIMENSIONS



THEORY OF OPERATION

The FDO-A10E medium duty motor operator is designed for use only with Service Counter Fire Door models FD1O-1M and FD10-2M as manufactured by the Cookson Company Inc.
Door sizes range from 4'-0" x 4'-0" to 14' max opening width to 9'-0" max clear opening height.
(Smaller doors may be available with Engineering approval on a case-by-case basis.

GENERAL DESCRIPTION:

The UL-325 compliant Fire Door Operator, FDO-A10, is an integrated fire door control system. It is designed to interface with Normally Closed (NC) or Normally Open (NO) dry contacts from the alarm system or initiating device to control the operation of a fire door. The control station will operate with either standard B2 or C2 wiring. This operator will require the proper self diagnostic entrapment protection device(s) to be connected and working properly to allow B2 (Momentary Pressure on the Close button) to close the door.

NOTICE

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

WARNING

TO REDUCE THE RISK OF INJURY TO PERSONS, USE THIS OPERATOR ONLY WITH ROLLING DOORS.

1. FDO-A10 MODEL: (With entrapment detection devices installed and working properly.

1.1 UNIT HAS AC POWER & NO ALARM CONDITION:

- **The B2 control station is used to operate the door electrically.**
- **Activation of the sensing edge or Photo eyes while door is closing will cause it to reverse to full open limit.**

1.2 ALARM CONDITION W/ AC POWER:

- **Door begins closure after a preset time delay of 0 or 10 seconds (Set at 10 seconds on basic unit, 0 second selectable if unit is equipped with expansion module).**
- **If obstruction is encountered by entrapement protection device(s), door will reverse to OPEN position and attempt closure again. The door will cycle up to 3 times before resting on the obstruction. If the obstruction is removed, the door will continue to the fully CLOSED position.**
  The OPEN button will raise the door to the fully open position, and after a 10 second delay will begin closing again. This will work until the third attempt to close has been used, and then all OPEN functions will be disabled until the alarm has been reset.
  Note: All OPEN functions initiated by the photo eyes or sensing edge can be disabled in the event of an active alarm condition, if the unit is equipped with the expansion module. When this feature is selected, and an obstruction is detected by the entrapement protection device(s), the door will rest on the obstruction. If the obstruction is later removed, the door will travel to the fully CLOSED position.

THEORY OF OPERATION (CONT.)

- **The unit is not functional and the brake is released.**
  (This unit when equipped with the Expansion Module is available with an optional Battery Back-Up power unit)
  This power unit will keep the processor in the controller energized and continue to monitor the alarm contacts for a change of status for up to 12 hours. With the battery back-up power unit the door will stay in the open position until the batteries have become depleted, 12 hours have elapsed with no power, or a change of status in the alarm contact has occured. If one of these events occur, the unit is not functional and the brake will be released. The door will close without delay. 5 minutes prior to this closure the unit will activate the output for the sounder strobes to give a pre-closure warning.

IMPORTANT INSTALLATION INSTRUCTIONS

WARNING - TO REDUCE THE RISK OF SEVERE INJURY OR DEATH:

1) READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

2) Install only on a properly operating door. A door that is operating improperly could cause severe injury. Have qualified service personnel make repairs to cables, spring assemblies, and other hardware before installing this operator.

3) The Firedoor Controller will not close a balance door in the absence of AC power. The door system must be able to generate a minimum backdriving torqueof 50 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 cause serious personal injury. Call a professional door serviceman to move or adjust door springs or hardware.

4) Remove all pull ropes and remove, or make inoperative, all locks (Unless mechanically and/or electrically interlocked to the power unit) that are connected to the door before installing the operator.

5) Install the door operator at least 8 feet or more above the floor if the operator has exposed moving parts.

6) Do not connect the door operator to the source of power until instructed to do so.

7) Locate the control station: (a) within sight of the door, (b) at a minimum height of 5 feet so small children cannot reach it, and (c) away from all moving parts of the door.

8) Install the Entrapement Warning Placard next to the control station in a prominent location.

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.

IMPORTANT SAFETY INSTRUCTIONS (CONT.)

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.

ELECTRICAL

1) DISCONNECT POWER AT THE FUSE/BREAKER BOX/DISCONNECT BEFORE PROCEEDING WITH ANY WIRING OF THIS UNIT.

2) THE 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 ELECTRICAL SHOCK AND SERIOUS INJURY.

3) FIELD WIRING OF OPERATOR MUST BE PERFORMED BY QUALIFIED PERSONNEL.

4) OPERATOR MUST BE WIRED PER WIRING DIAGRAMS PROVIDED IN THIS OWNERS MANUAL ONLY.

5) OPERATOR MUST BE WIRED IN ACCORDANCE WITH LOCAL ELECTRICAL CODES. NOTE: THE OPERATOR SHOULD BE ON A SEPARATE FUSED LINE OF ADEQUATE CAPACITY.

6) USE 18 GA STRANDED COPPER WIRE MINIMUM FOR ALL CONTROL CIRCUIT CONNECTIONS.

7) DO NOT INSTALL ANY WIRING OR ATTEMPT TO RUN THE OPERATOR WITHOUT CONSULTING THE WIRING DIAGRAM.

8) SET OPERATOR LIMIT SWITCHES BEFORE CONNECTING ANY ENTRAPEMENT PROTECTION DEVICES TO THE OPERATOR.

OPERATOR MOUNTING

Before your operator is installed, be sure the door has been properly aligned and is working smoothly. Refer to the Door Installation Instructions for proper operator installation. This motor operator is an integral part of the door system. The motor operator and governor (if provided) controls door descent speed under power outage conditions.

ALARM INPUTS

1) Alarm inputs (Terminals 5 & (-) minus) may be used to supply 24VDC for electronic alarm devices such as smoke detectors or similar systems. The alarm activation must be normally closed and must open in an alarm condition. If a normally closed contact is not available, a normally open (NO) contact may be used between terminals 12 & 13 with a jumper wire installed between terminals 3 & 11. If this option is used, the (NO) contact must close in an alarm condition. See sheet 12 for an example of wiring a typical 4-wire smoke detector.

DURING INITIAL SETUP MAKE SURE A CLOSED CIRCUIT IS CONNECTED TO ALARM INPUT. FAILURE TO DO SO MAY CAUSE THE OPERATOR TO ACTIVATE SUDDENLY WITHOUT WARNING.

AN ALARM DEVICE MUST BE CONNECTED TO THE ALARM INPUT BEFORE INSTALLATION IS COMPLETE.

ENTRAPMENT PROTECTION ACCESSORIES

In accordance with UL-325 requirements, this operator requires specific primary entrapment detection devices connected and working properly before B2 (momentary contact) on the CLOSE control station is enabled. Without the proper primary entrapment detection accessories connected and working properly, the unit will require constant pressure on the CLOSE control station to close, during normal operation. DO NOT ATTEMPT TO BYPASS OR DEFEAT THIS FEATURE. Damage to the unit is possible. This damage is not covered under the manufacturer's warranty.
When a second entrapment protection device is desired, any device with a normally OPEN (N/O) dry contact type output is compatible with this door. (See control connection diagram for connections). Entrapement protection will not function when the CLOSE limit switch is activated.

IMPORTANT NOTES:
1) Proceed with Limit Switch Adjustments before making any connections from the entrapment protection devices (If equipped) to the operator as described below.
2) Verify that the alarm terminals (3 and 11) are connected to a normally closed (NC) circuit before applying power to the operator controller.

LIMIT SWITCH ADJUSTMENT

MAKE SURE THE LIMIT NUTS ARE POSITIONED BETWEEN THE LIMIT SWITCH ACTUATORS BEFORE PROCEEDING WITH ADJUSTMENTS. MAKE SURE OPENING AND THE AREA NEAR DOOR/OPERATOR AND MECHANISMS ARE CLEAR OF OBSTRUCTIONS AND PERSONNEL.

⚠ WARNING

TO AVOID SERIOUS PERSONAL INJURY OR DEATH FROM ELECTROCUTION, DISCONNECT ELECTRIC POWER BEFORE MANUALLY MOVING LIMIT NUTS.

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.

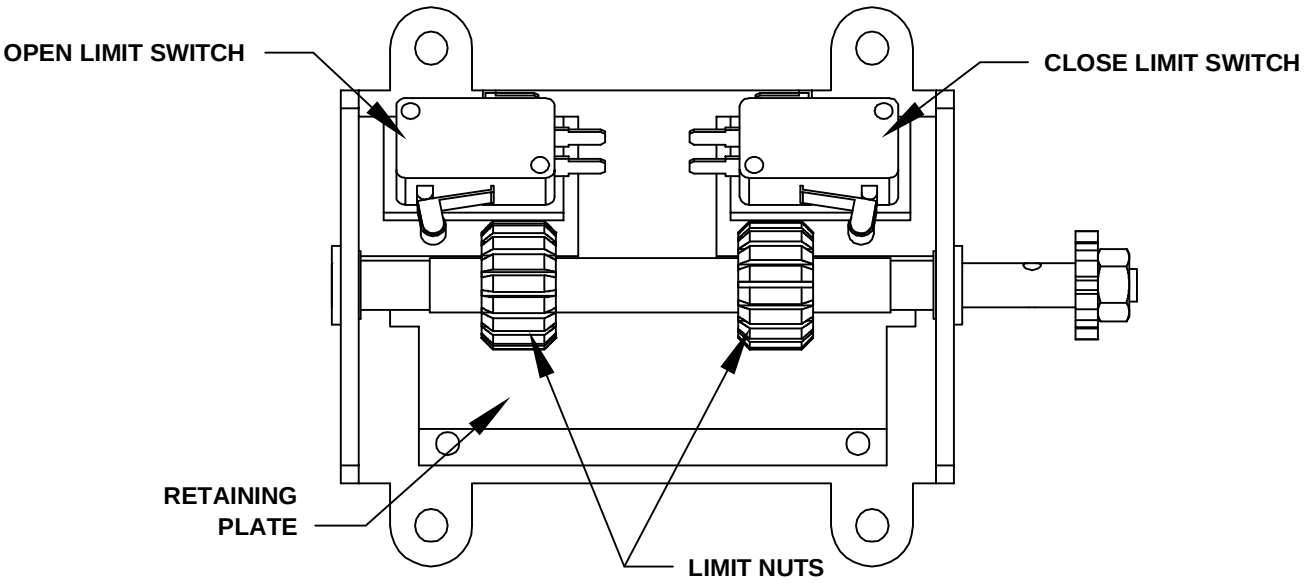
2) To increase door travel, spin nut away from actuator. To decrease door travel, spin limit nut toward actuator.

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.

5) Connect Photo Electric Sensors per the wiring diagram on page 10 and test operation.

6) Connect sensing edge to controller terminals 3 & 10 and test operation - if equipped.



ADJUSTING DOOR SPRING BALANCE

1) Tension door as per Door Installation Instructions.

2) With the door in the fully open position, remove power from the door controller either by activating the optional keyed test station or by turning the circuit breaker off. The door should close via gravity with the door speed controlled by the motor and governor (if provided). The door should descend at an average rate of at least 6 in/sec not to exceed 24 in/sec.

3) If door closes too slowly or not at all, restore power and fully open door. Remove 1/5 turn of tension (See Door Installation Instructions for tensioning procedure). Repeat Step 2 until door descent rate is adequate. NOTE: Never back wind the spring.

4) If door closes too rapidly follow Step 3 except ADD 1/5 turn of tension then redo Step 2.

⚠ WARNING

IF PROPER DOOR BALANCE CANNOT BE OBTAINED, STOP IMMEDIATELY AND CALL TECHNICAL SUPPORT.

AUTOMATIC CLOSING TESTING

NOTE: IF THE SELF DIAGNOSTIC ENTRAPMENT PROTECTION EQUIPMENT RECOMMENDED FOR USE WITH THIS OPERATOR IS NOT INSTALLED AND WORKING PROPERLY, THE OPERATION OF THIS DOOR DURING AN ACTIVE ALARM CONDITION WILL ALWAYS OPERATE SIMILAR TO "LOSS OF LINE POWER" DESCRIPTION BELOW. THERE WILL BE A 10 SECOND DELAY ON CLOSURE UPON ALARM ACTIVATION, AND NO DELAY WITH LOSS OF LINE POWER. TEST-A-FIRE FUNCTION WILL NOT BE AVAILABLE.

1) LOSS OF LINE POWER

a) With door fully open, and optional battery back-up (If equipped) disconnected, remove power by throwing the circuit breaker. Door should fully close as defined in "Adjusting Door Spring Balance" section.

b) Restore power and press the OPEN button to reset.

2) ALARM ACTIVATION W/AC POWER PRESENT (WITH ENTRAPMENT PROTECTION EQUIPMENT)

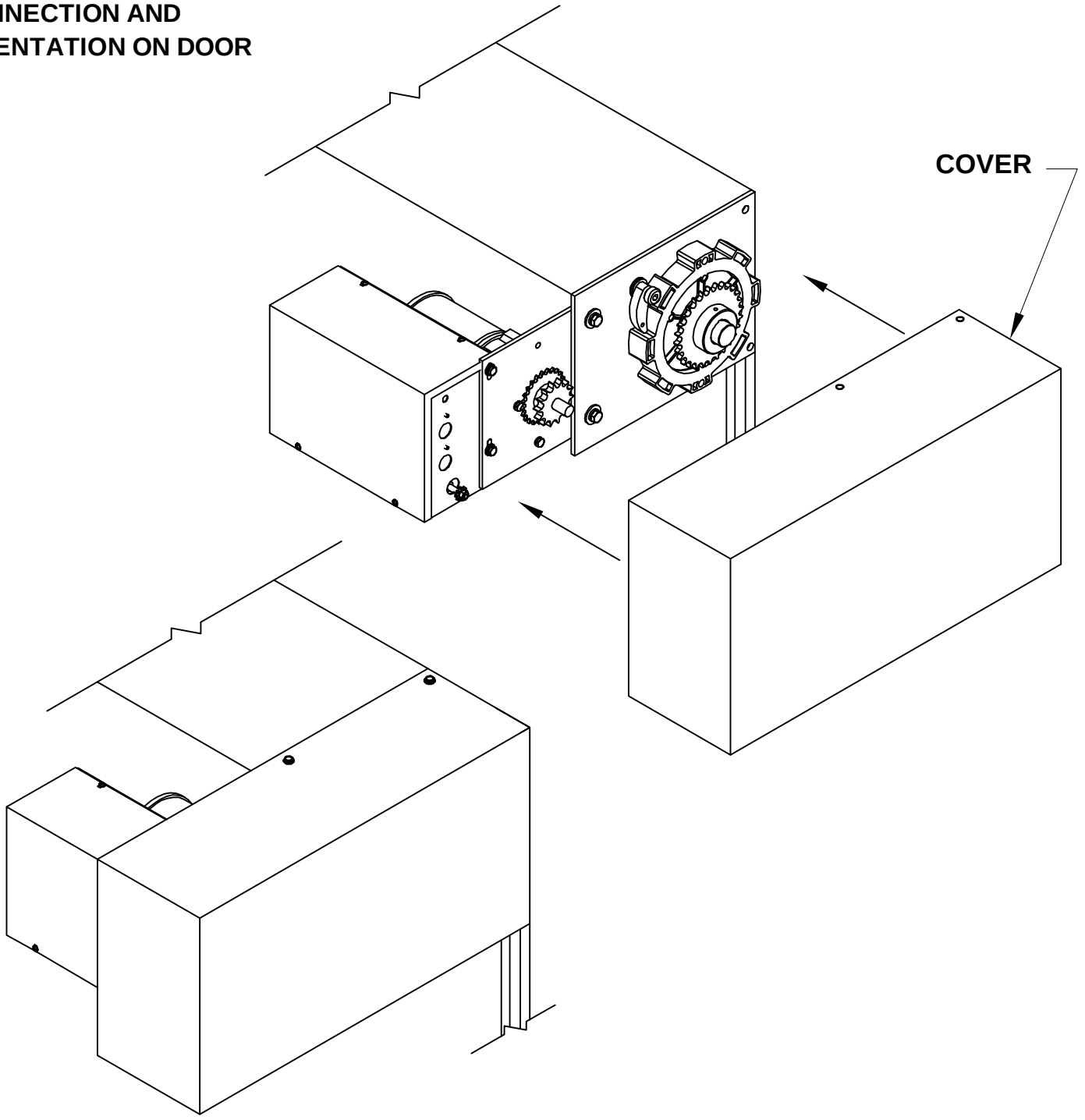
a) With the door in the fully open position simulate an alarm condition. After a 10 second delay, the door will power down to the fully closed position. The default factory setting is a 10 second delay. With the optional expansion module installed, this is selectable to "no delay" if desired.

b) Clear alarm and press the OPEN button to reset.

c) Test-A-Fire cycling function: Repeat Step a) but this time activate the sensing edge or photo eye before the door reaches the closed position. The door will reverse to the fully open position and after a 10 second (See default description in step a) delay the door will begin closing. On the 3rd closing cycle the door will stop and not reverse when the sensing edge is activated. The door will continue to close when the sensing edge is deactivated. Clear alarm and press the OPEN button to reset. The default factory setting is 3 cycles, with the optional expansion module, this feature is selectable to stop on the obstruction and disable any OPEN function initiated by the photo eyes or sensing edge during an active alarm condition.

FDO-A10 COVER

PLEASE REFER TO DOOR INSTALLATION MANUAL FOR PROPER MOTOR CONNECTION AND ORIENTATION ON DOOR



⚠ WARNING

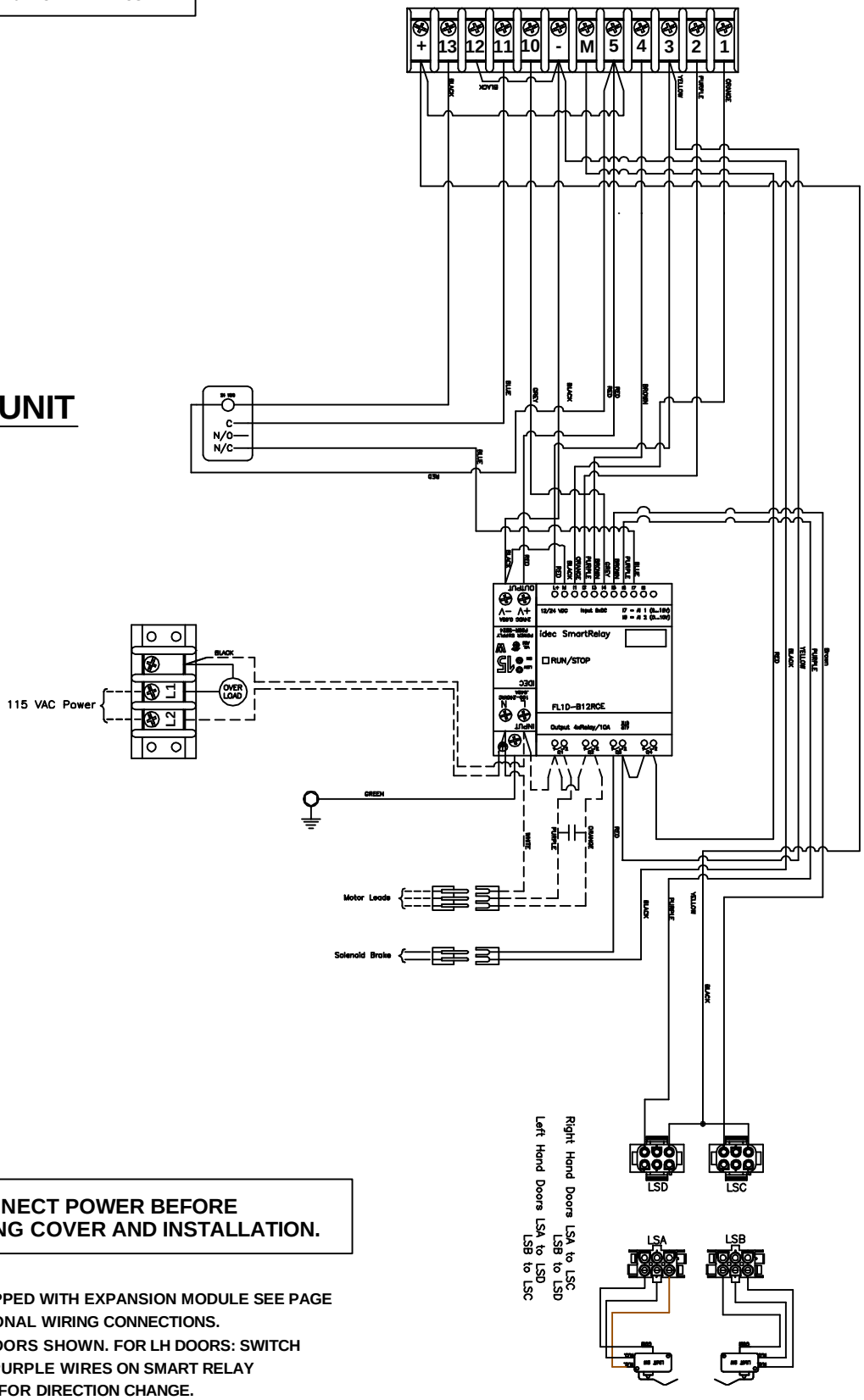
A COVER MUST BE INSTALLED OVER DOOR BRACKET & MOTOR SPROCKETS WHEN MOVING PARTS ARE EXPOSED LESS THAN 8 FT FROM THE FLOOR

FDO-A10 WIRING DIAGRAM

WIRE SCHEDULE

	VOLTAGE	WIRE GAGE
————————	24VDC	18GA
----------	120VAC	18GA

BASE UNIT



CAUTION: DISCONNECT POWER BEFORE OPENING COVER AND INSTALLATION.

NOTES:

1) IF UNIT IS EQUIPPED WITH EXPANSION MODULE SEE PAGE 10 FOR ADDITIONAL WIRING CONNECTIONS.
2) RIGHT HAND DOORS SHOWN. FOR LH DOORS: SWITCH ORANGE AND PURPLE WIRES ON SMART RELAY Q1-2 AND Q2-2 FOR DIRECTION CHANGE.
3) SEE CONTROL CONNECTION DIAGRAM FOR FIELD WIRING CONNECTIONS.

FDO-A10 WIRING DIAGRAM

UPGRADED UNIT W/ADDENDUM

JUMPER CONFIGURATIONS

TERMINALS

+ TO 19 = CHANGES ALARM CLOSURE DELAY FROM 10 SECONDS TO IMMEDIATE.

+ TO 20 = CHANGES SOUNDER STROBE FROM ACTIVATION ON ALARM ONLY TO ANY TIME THE MOTOR IS MOVING THE DOOR.

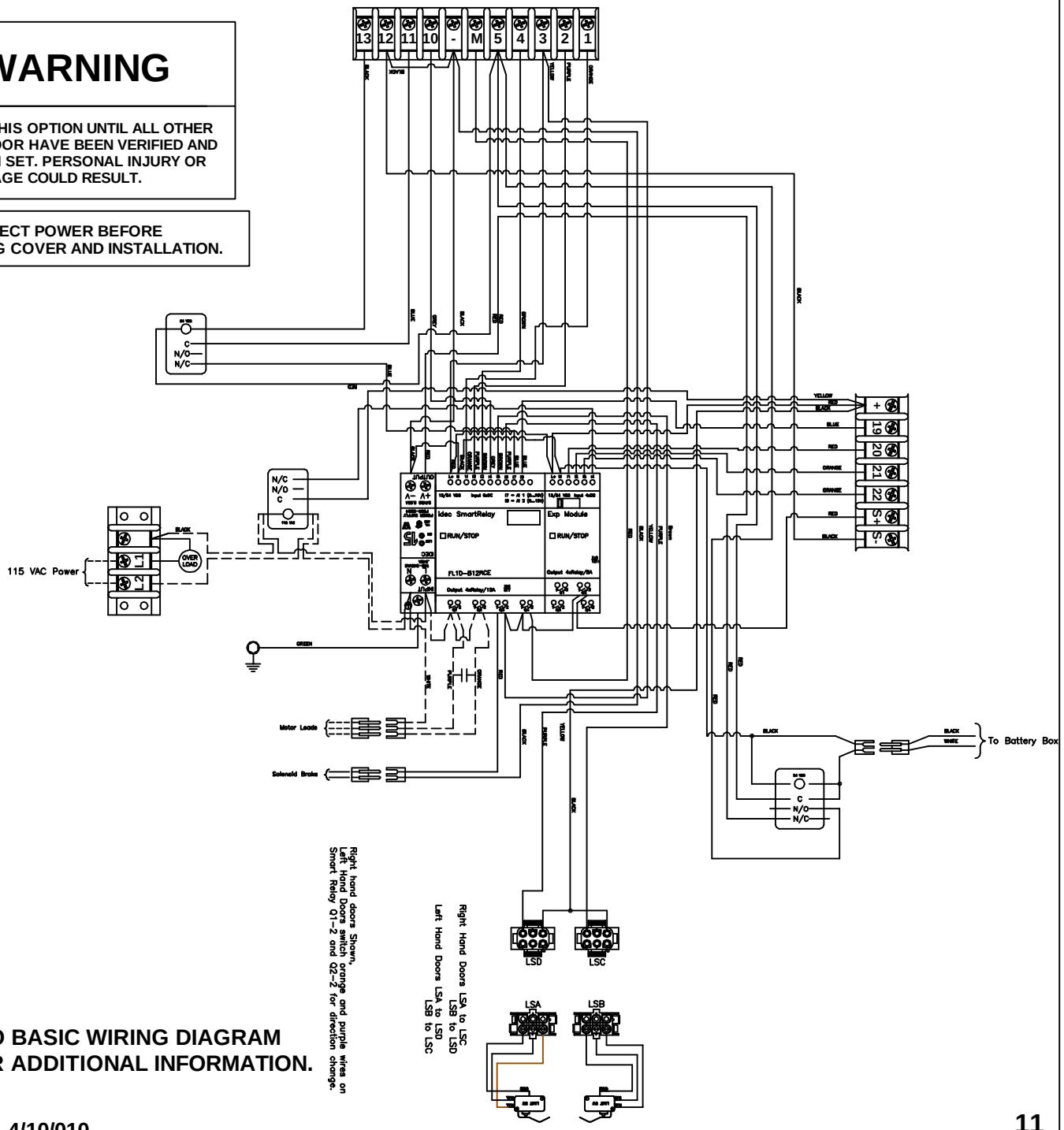
+ TO 21 = WILL CAUSE DOOR TO RETURN TO THE FULLY OPEN POSITION ON ALARM RESET.

+ TO 22 = WILL DISABLE ANY OPEN FUNCTION DURING AN ACTIVE ALARM CONDITION. DOOR WILL STOP AND NOT RELEASE UPON CONTACT WITH AN OBSTRUCTION, AND OPEN BUTTON WILL NOT OPERATE. THIS SETTING ONLY AFFECTS OPERATION DURING AN ACTIVE ALARM CONDITION.

WARNING

DO NOT SELECT THIS OPTION UNTIL ALL OTHER FUNCTIONS OF DOOR HAVE BEEN VERIFIED AND LIMITS HAVE BEEN SET. PERSONAL INJURY OR EQUIPMENT DAMAGE COULD RESULT.

CAUTION: DISCONNECT POWER BEFORE OPENING COVER AND INSTALLATION.



NOTES:

1. **REFER TO BASIC WIRING DIAGRAM (PG9) FOR ADDITIONAL INFORMATION.**

CONTROL CONNECTION DIAGRAM

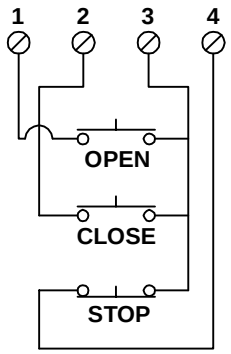
IMPORTANT NOTES:

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

ATTENTION ELECTRICIAN : USE 18 GAUGE STRANDED COPPER OR HEAVIER WIRE FOR ALL CONTROL CIRCUIT WIRING

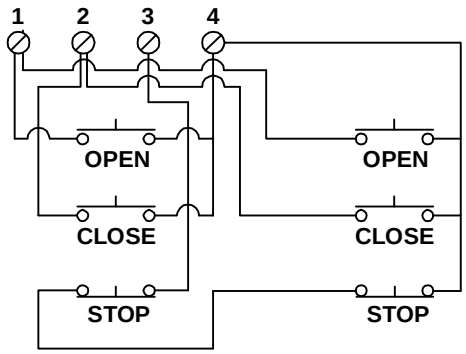
3 BUTTON STATION OR 3 POSITION KEYSWITCH W/SPRING RETURN TO CENTER AND STOP BUTTON

STANDARD



ALL CONTROL WIRING TYPES

2 OR MORE



ALL CONTROL WIRING TYPES

3 BUTTON PUSH BUTTON STATION WITH KEY LOCKOUT

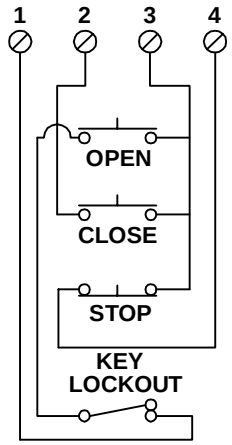
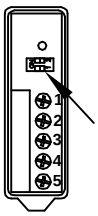
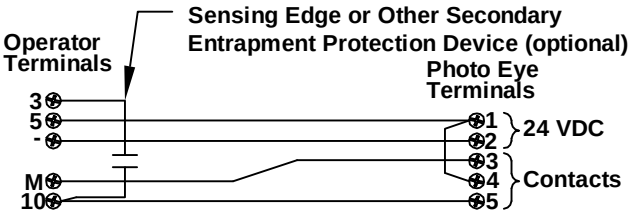


PHOTO EYE CONNECTIONS

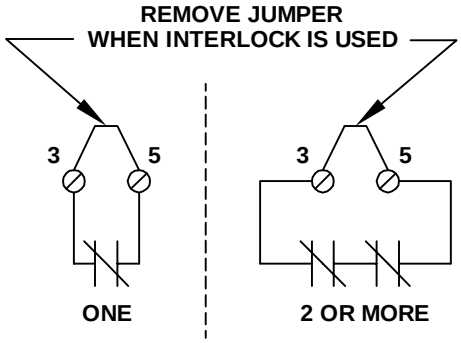
PHOTE EYES (WHEN EQUIPPED) ARE TO BE INSTALLED 6" ABOVE FINISHED FLOOR



DIP SWITCHES #1 AND #2 ARE TO BE SET IN THE OFF POSTITION ONLY (TOWARDS THE NUMBERS)

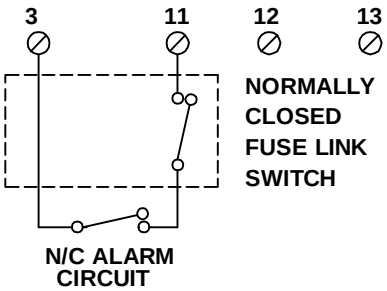


EXTERNAL INTERLOCK (FOR DOOR LOCKS ONLY)

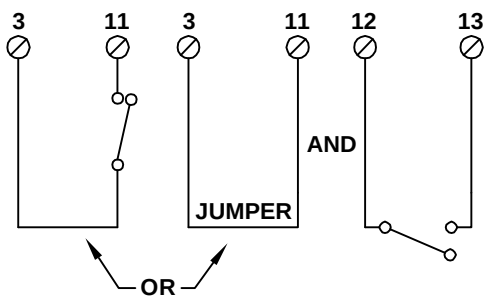


ALL CONTROL WIRING TYPES

NORMALLY CLOSED ALARM OPTIONAL FUSE LINK SWITCH

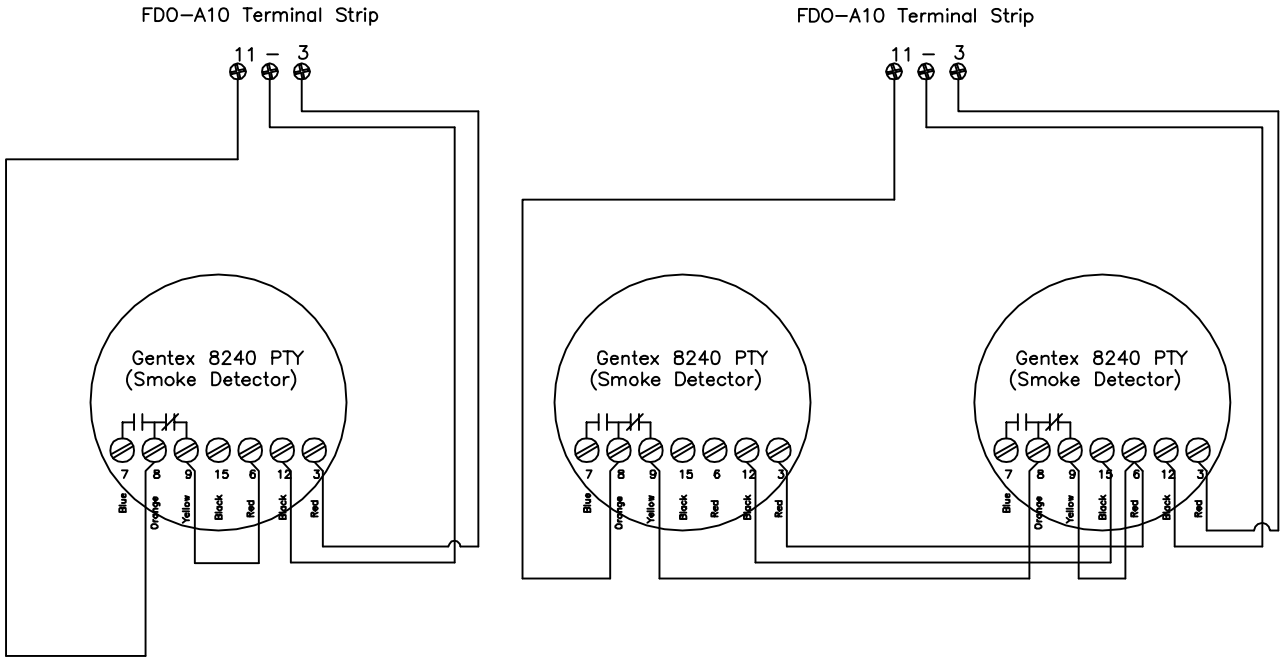


NORMALLY OPEN ALARM OPTIONAL FUSE LINK SWITCH



CONTROL CONNECTION DIAGRAM

SMOKE DETECTOR WIRING



SINGLE **DOUBLE**

EXPANSION MODULE TERMINAL STRIP WITH OUTPUT TO SOUNDER STROBES

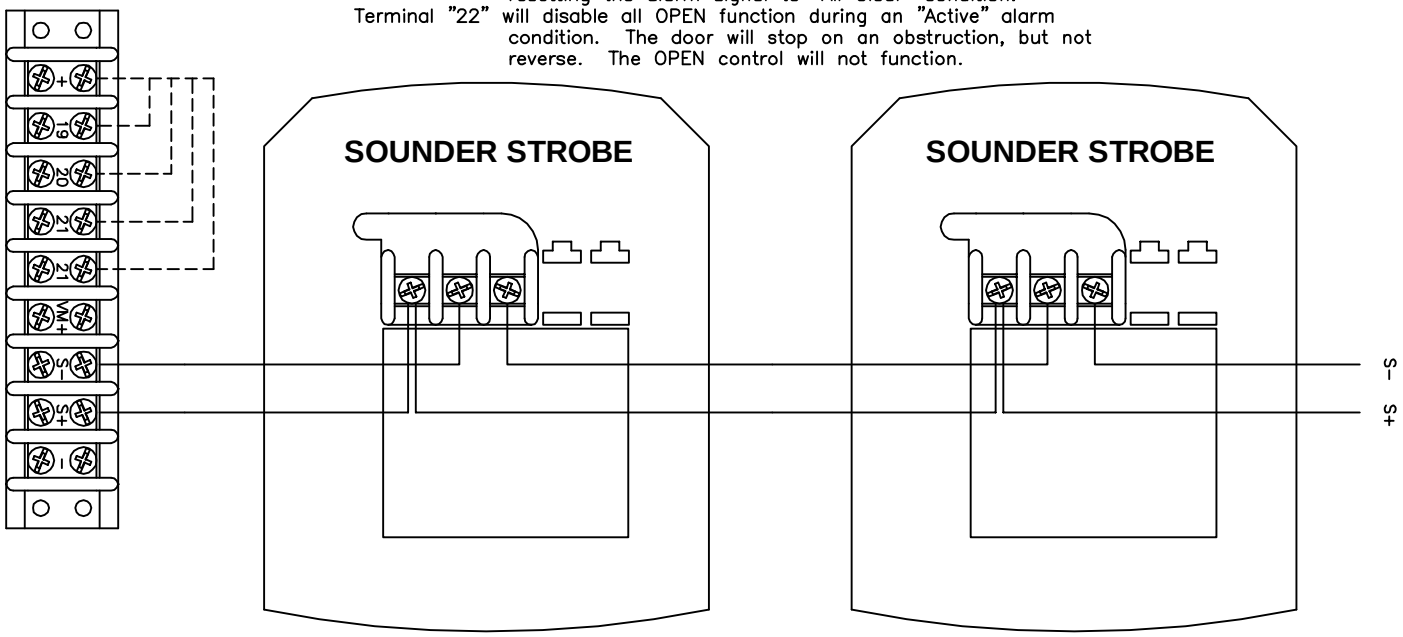
Jumper From Terminal "+" to:

Terminal "19" will reduce alarm delay From 10 Seconds to 0 Seconds

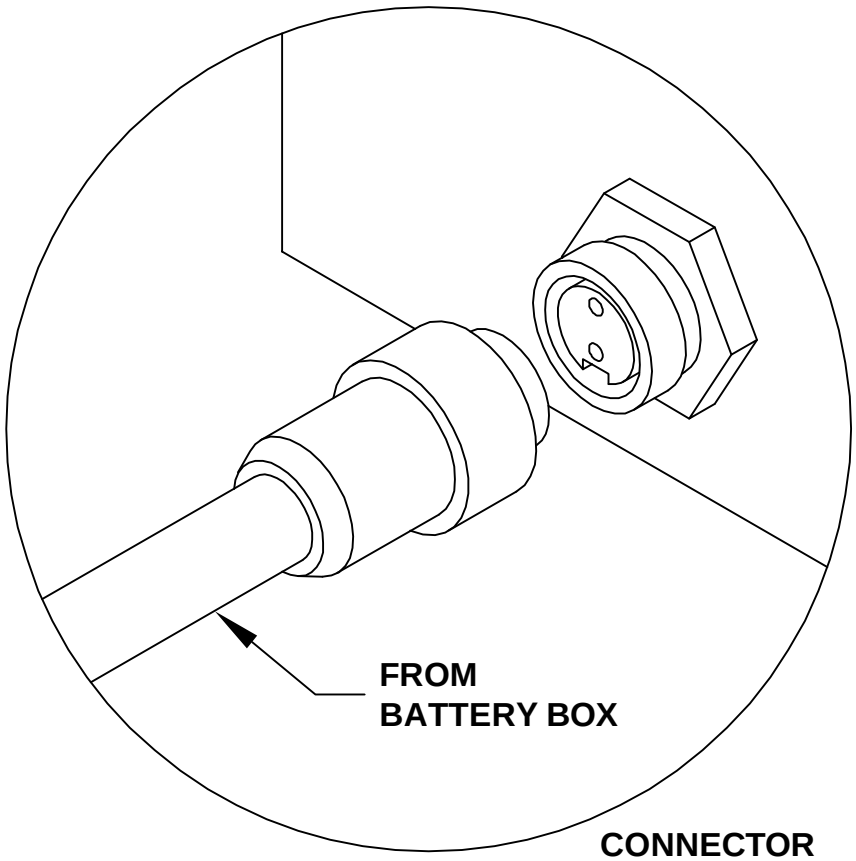
Terminal "20" will activate sounder strobes whenever door is moving instead of only when closing as a result of an active alarm condition (Use white Strobes when this option is selected)

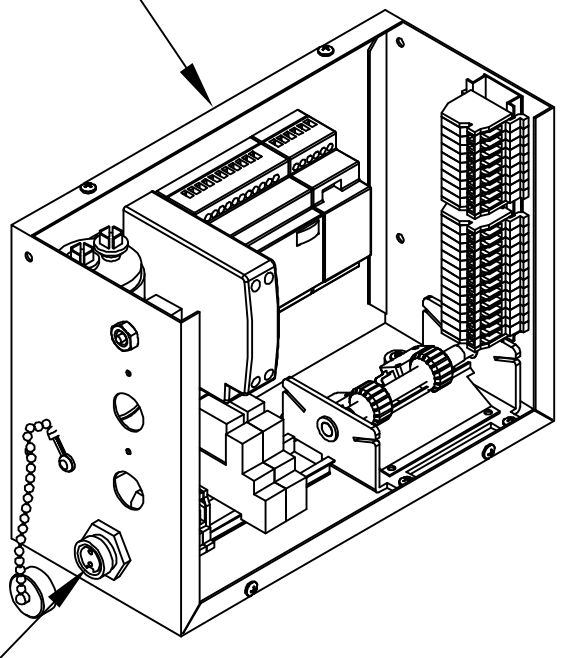
Terminal "21" will set the door to OPEN automatically upon clearing/ resetting the alarm signal to "All Clear" condition.

Terminal "22" will disable all OPEN function during an "Active" alarm condition. The door will stop on an obstruction, but not reverse. The OPEN control will not function.

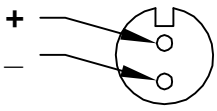


BATTERY BOX OPTION WIRING INSTRUCTIONS (OPTIONAL)

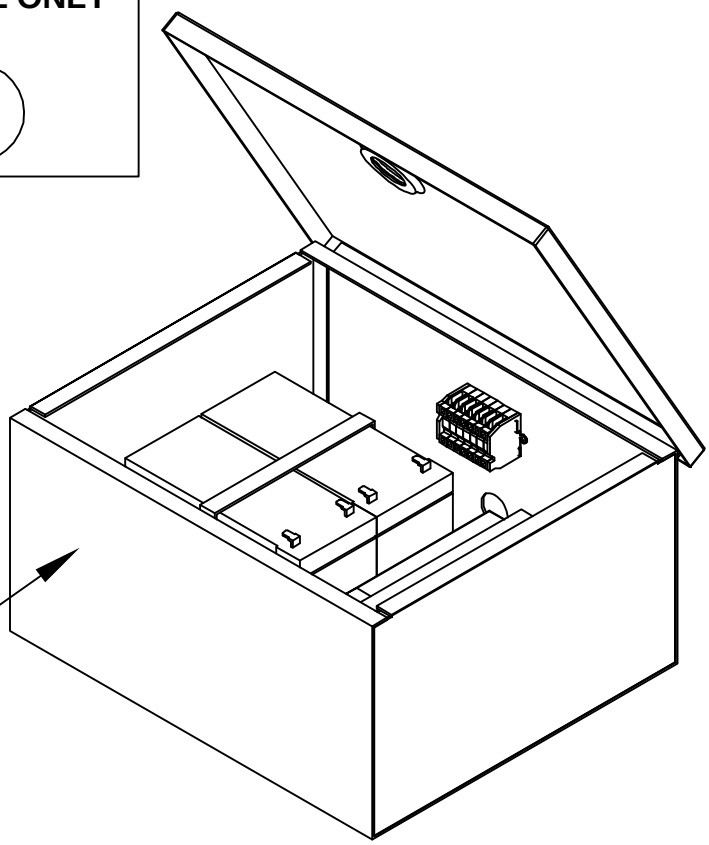




LOW VOLTAGE ONLY
24VDC 0.6 A

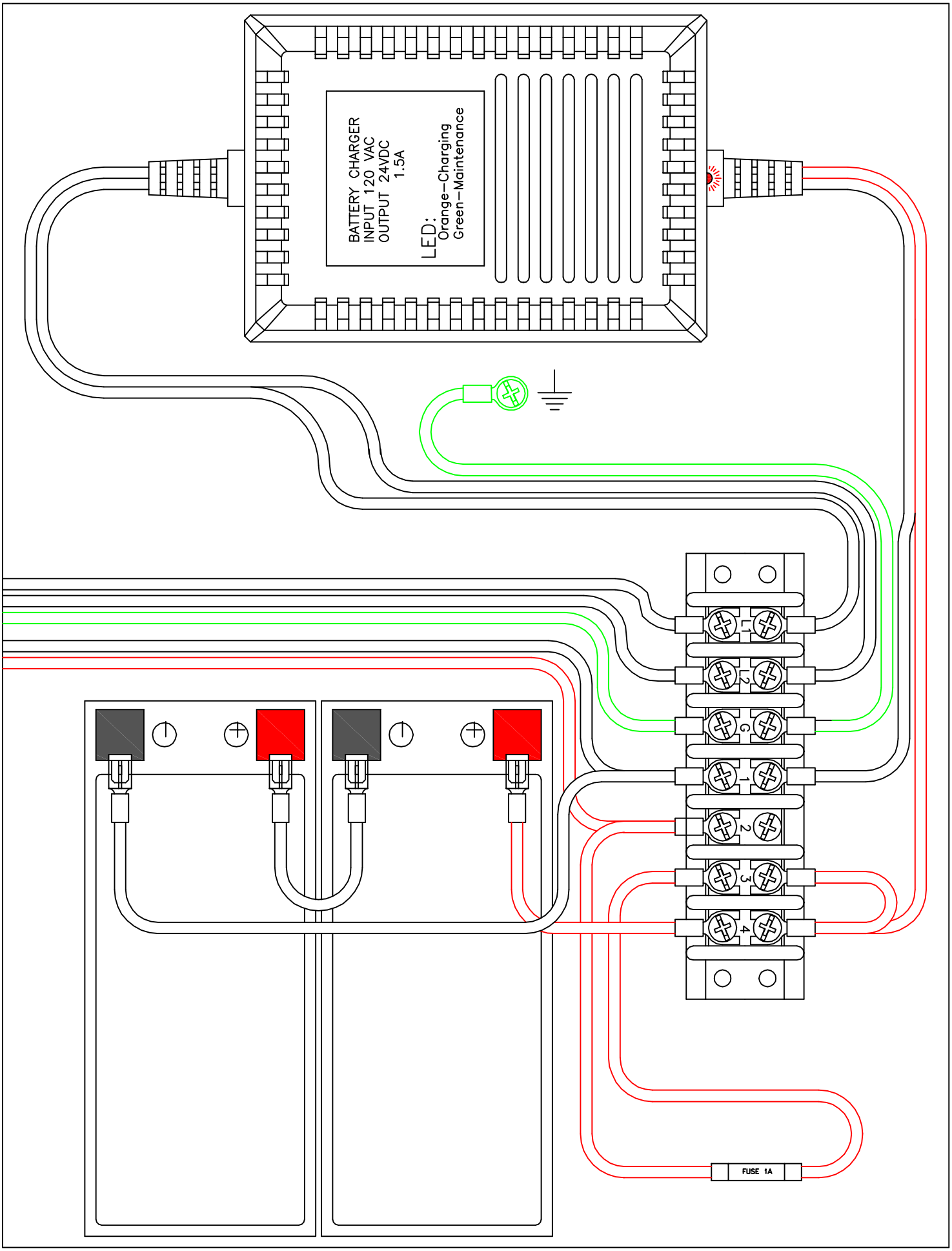


NOTE: BATTERY BOX WILL NOT OPERATE MOTOR. IT WILL KEEP CIRCUITS AND BRAKE ENERGIZED IN THE EVENT OF POWER LOSS. IT WILL MONITOR ALARM SYSTEM AND CLOSE DOOR IF ACTIVE ALARM CONDITION IS DETECTED, THE CLOSE BUTTON IS DEPRESSED, OR THE BATTERIES HAVE BECOME DEPLETED OR UNIT HAS BEEN WITHOUT POWER FOR 12 HOURS OR MORE.



FOLLOW DIRECTIONS PROVIDED ON BATTERY BOX INSERT FOR BATTERY CHARGER CONNECTIONS

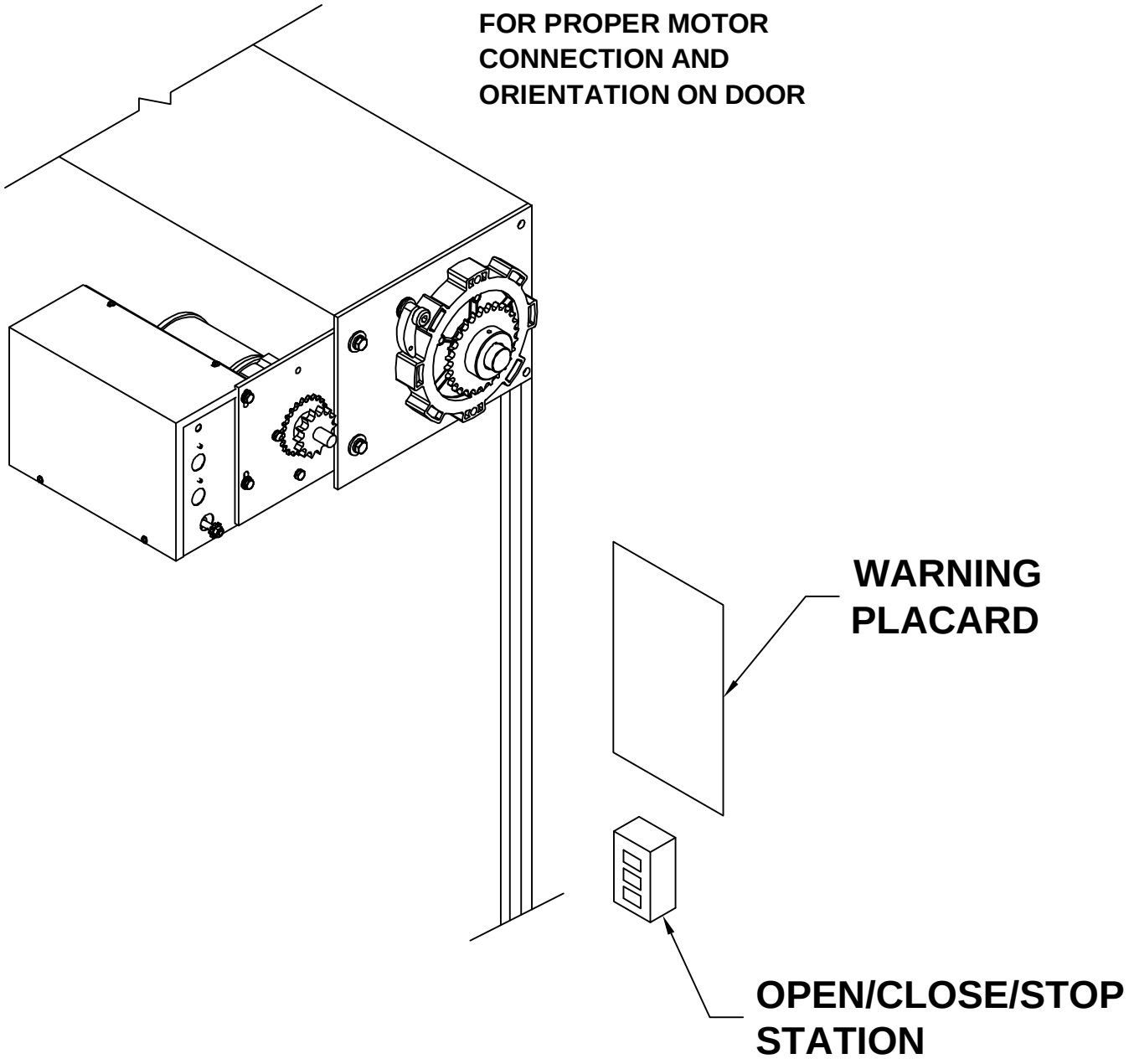
BATTERY BOX WIRING DIAGRAM



MOVING DOOR WARNING PLACARD

INSTALL MOVING DOOR WARNING PLACARD IN A CONSPICUOUS PLACE NEAR OPEN/CLOSE/STOP STATION AS INDICATED

PLEASE REFER TO DOOR INSTALLATION MANUAL FOR PROPER MOTOR CONNECTION AND ORIENTATION ON DOOR



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.*	X		X
Sprockets	Check set screw tightness	X		X
Fasteners	Check & tighten as required		X	
Bearings/Shafts	Check for wear & lubricate	X		X

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)**

- **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.**

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

ADDRESS ORDER TO:

COOKSON ROLLING DOORS
2417 S. 50TH AVE
PHOENIX, AZ. 85043
(602) 272-4244
ATTN: CUSTOMER SERVICE

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 components are free of dirt.

The Service Technician should familiarize himself/herself 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.

MOTOR OPERATOR MAINTENANCE

1. Check wire connections for tightness and wire insulation for defects or abrasions.
2. Check to see that all conduit connections are secure.
3. Check wires to safety edge or photo-eyes.
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, arcing 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
	DC Power Supply damaged	Replace
	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
	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	Motor leads are reversed	Interchange Purple and Orange wires (Q1 & Q2) Smart Relay
	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 units
	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.