6L2 Series
CONTROLLER
OPERATIONS MANUAL
(2 thru 6 Stop Hydraulic Elevators)

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*** WARNING ***

The information in this manual is intended for the sole use of professional elevator technicians.

Electro-Mech Industries Inc. assumes no responsibility for injury, illness, damage to property, or death as a result of the use or misuse of any information contained in this manual.

Installation, maintenance, or repair of the elevator, must be performed by qualified, experienced, and trained elevator technicians. Technicians must have five years of hands-on experience with elevator equipment.

The procedures in this manual are to be used as a general guide for the elevator technician. Working in the elevator hoistway and on elevator equipment can be dangerous. All Safety Rules associated with installing elevator equipment must be followed at all times. Proper protective equipment must be used at all times during installation, maintenance and repair of the elevator equipment.

Read this manual carefully. Be thoroughly familiar with all parts and procedures before attempting any installation, maintenance or repair functions on this equipment. Failure to do so may cause damage to equipment, improper installation, unsafe operation, possible injury or death.

*** WARNING ***

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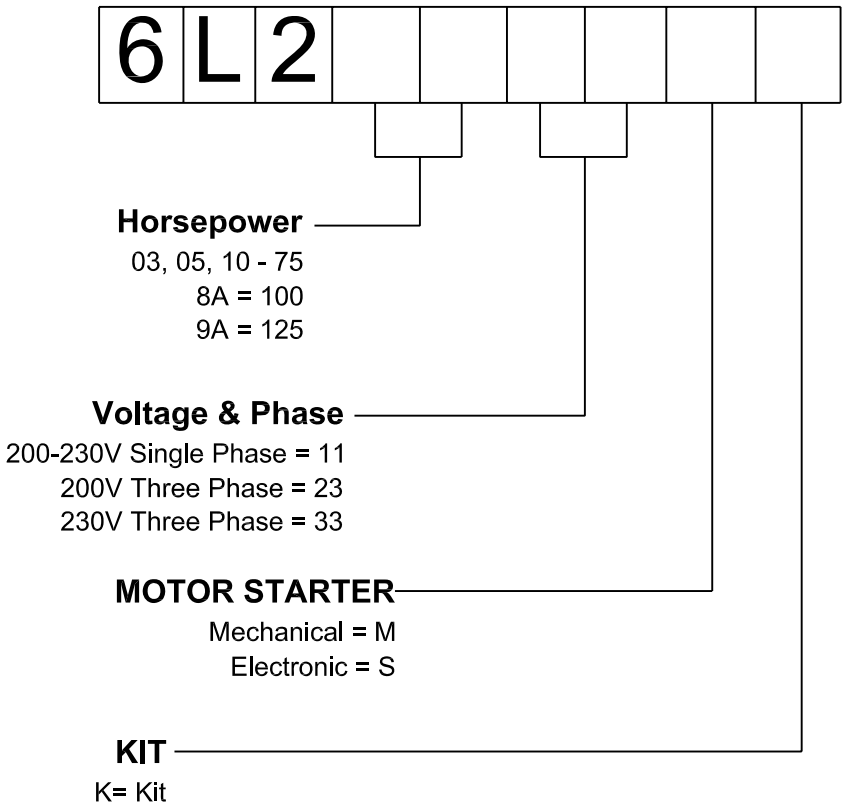
1-1) PART NUMBER DEFINITION



1-2) KIT CONTENTS:

The following items are included with the 6L2051XMK supply:

1 - 2-6 Stop Controller, P.N.: 6L2051XM
- Two 5HP Motor Starters with Overload
- Programming Tool

Note: 900VA UPS Supplied by Others

1 – Car Top Box, P.N.: CTBS6L
- Car Top Interface PCB
- Car Top Stop Switch
- Alarm Buzzer

1 – Selector Head, with the following Prewired Switches (P.N.: 6L2SELECTORK)
- Upper Terminal Limit
- Lower Terminal Limit

2 – Limit Switch Cams

1 – Communication Cable for Selector

1 – Set of Magnet for 6 Stops, Upper & Lower Hoistway Access (N.C. configuration)
- 6 – 11” Magnets
- 3 – 5.5” Magnets

Note: Additional magnet sets sold separately for Hoistway Access N.O. configuration

1-3) SUPPORT:

If you do experience a problem, or are not sure of the correct operation, please call the office for assistance. In most instances we can help resolve the situation quickly without extensive loss of time on the job site.

When assisting on a unit, it is more efficient to talk directly to the installation technician. This not only reduces the chance of miscommunication, it also reduces the time required for the technician to get the information he needs. When calling, always have the unit’s serial number and a P-Tool available.

We are available to accept your calls from 8:00 am to 5:00 pm, Central Time, Monday through Friday.

Electro-Mech Industries Inc.
Arlington Heights, Illinois
847-593-4900

1-4) GENERAL INFORMATION:

The 6L2 control system contains the following features:

- ETL Listed for LULA and Commercial Hydraulic Elevators. Certified to ASME A17.5
- 2 through 6 stop Applications
- Selective Collective or Single Automatic Operation
- Supports the following ancillary equipment:
  - Commercial Door operators (maximum of 2)
  - Car Directional Lantern
  - Car Position Indicator
  - Hall Position Indicators
  - Car Top Inspection Station
  - Hoistway Access Upper and Lower
- Phase I Fire Recall Operation
  - Selectable Designated Fire Floor and Door
  - Selectable Alternate Fire Floor and Door
  - Allows for four smoke alarm zones
    - Lobby
    - Alternate Floor
    - Machine Room
    - Hoistway
  - Phase I Recall Switch
- Phase II Fire Fighters Operation
  - Fire Fighters Stop Switch
- Red LED's on inputs
- Yellow LED's on outputs
- 110 vac coils on Contactors and Valves
- 20 event Fault Log feature
  - Log viewable on Programming Tool
- Parameters can be field modified
- Trip and Re-level counters
- Re-assignable floors (maximum 6 openings)
- Emergency Lowering capable (with required ancillary equipment)
- Temporary Run mode for use during installation and trouble shooting

1-5) SPECIAL OPERATIONS:

1. **Board Re-set:** Any time that the controller is powered up, or the star key on the P-Tool is pressed, the system will automatically go into a reset sequence. During this sequence, **if all of the required safety circuits are made** (normal run requirements), the Unit will descend at normal operation speed to the lowest terminal landing. The car will decelerate to leveling speed when selector signal "SDL" becomes active. The car will stop when selector signal "LD" deactivates. The reset is complete when selector signals "DZ" and "SDL" are on.

   - **Warning**: If you jump out key safety circuits and then the power is turned on, or the re-set key is pressed, the unit may move when not expected. This can create a hazardous situation that could cause injury or even death. **Do not jump out safety circuits**. Provisions have been made to run unit on Temporary Mode, which will be explained in this manual.

2. **Emergency Lowering during Power Failure:** Once the controller senses a loss of power, the emergency light output "EL" will activate. The elevator will proceed to the lowest terminal landing, the doors will open for one minute then close. The door open button will remain operational.
   - **Note 1:** Emergency Lowering will only operate if the required ancillary components are installed
   - **Note 2:** The "EL" output will remain active until normal power is restored or the back up power supply is exhausted.

3. **Run Timer:** If the FLOOR TO FLOOR TIMER times out, the unit will respond as follows:
   A. Running up in response to a call: the call is dropped and the unit will proceed to the lowest terminal landing.
   B. Running down in response to a call: unit will stop and shut down.
   C. Re-leveling: the unit will proceed to the lowest terminal landing.

   - **Note:** A reset must be performed to return the car to normal operation.

1-5) SPECIAL OPERATIONS: (continued)

4. **Power Doors:**

   A. When a door open command is given (DOR or DOF) and the door(s) does not fully open within 15 seconds, a door close command will be given and the door open cycle will repeat until the door fully opens. This event will be logged.

   B. Sequence is the same for closing.

   C. Door contact circuit monitoring per A17.1.2.26.5

5. **Floor Re-Assignments:**

   This feature allows for separate call(s) and door operation on pass through installations. The maximum number of openings is six. The best way to describe this feature is by the following example: Number of Stops = 4 with rear openings on floors 2 & 4. In the parameters: Number of Floors =4, Call 5 Assignment=2 and Call 6 Assignment=4.

   Floor 2 Rear: Car call would connect to “TC35”. All hoistway wiring would be connected to FL5 (J19). Parameter “FL5 DOOR=R”. When CC5 is activated the car will move to floor 2 and open the rear door only.

   Floor 4 Rear: Car call would connect to “TC36”. All hoistway wiring would be connected to FL6 (J28). Parameter “FL6 DOOR=R”. When CC6 is activated the car will move to floor 4 and open the rear door only.

1-6) GENERAL WIRING INFORMATION:

1. **Schematic Drawings:** These drawings show a system with all features and control options that are available on the 6L2 controller. Pages 1 and 2 are model specific. Pages 3 – 11 are common for the entire product offering.

   Appendix A of this manual is the schematic for the 3 – 10HP Single Phase models

2. **Hook up Drawings:** These drawings show a system with all features and control options that are available on the 6L2 controller and are included with every controller.

   Appendix B of this manual is the Hook Up Diagram for the 3 – 10HP Single Phase models

3. **Travel Cable Requirements:**
   57-18AWG conductors, 2-BLK & WHT 14AWG, 1-Twisted pair RED & WHT

4. **Hoistway Cable Specification:**
   18AWG Stranded conductors (16 strands / 30AWG; 300v Insulation)

   A. **Number of conductors per floor:**
   - Terminal floors = 5
   - Intermediate floors = 6
   - Where Hall Position Indicators are used, add 3 conductors.

5. **Connecting to the Controller:** The entry points for all field wiring should be determined and knockouts installed with the sub-panel removed from the enclosure. This eliminates the possibility of metal shavings dropping into the controls. If you do not remove the sub-panel, you must take adequate measures to protect it from metal shavings.

1-7) HOISTWAY SWITCH REQUIREMENTS:

1. **Pit Switch:** SPST, closed position to run
2. **High Speed Limit:** Closed to allow high-speed operation.
3. **Inspection Enable:** Closed to allow Inspection operation
4. **Inspection UP Limit:** Closed to allow UP travel while on Inspection
5. **Hoistway Access (UP & DN):** Keyed, DPDT, spring loaded to CTR off
6. **Terminal Limits (Upper & Lower):** Closed to allow movement in that direction. Both Upper and Lower terminal limits are provided as part of the kit.

1-8) INSPECTION STATION REQUIREMENTS:

1. **Inspection/Norm:** SPDT Toggle
2. **Enable:** N.O. Push button SPST
3. **UP:** N.O. Push button SPST
4. **DN:** N.O. Push button SPST

2-1) COMPONENT LAYOUT

The components shown are for units with mechanical motor starters. The range for these models is as follows:

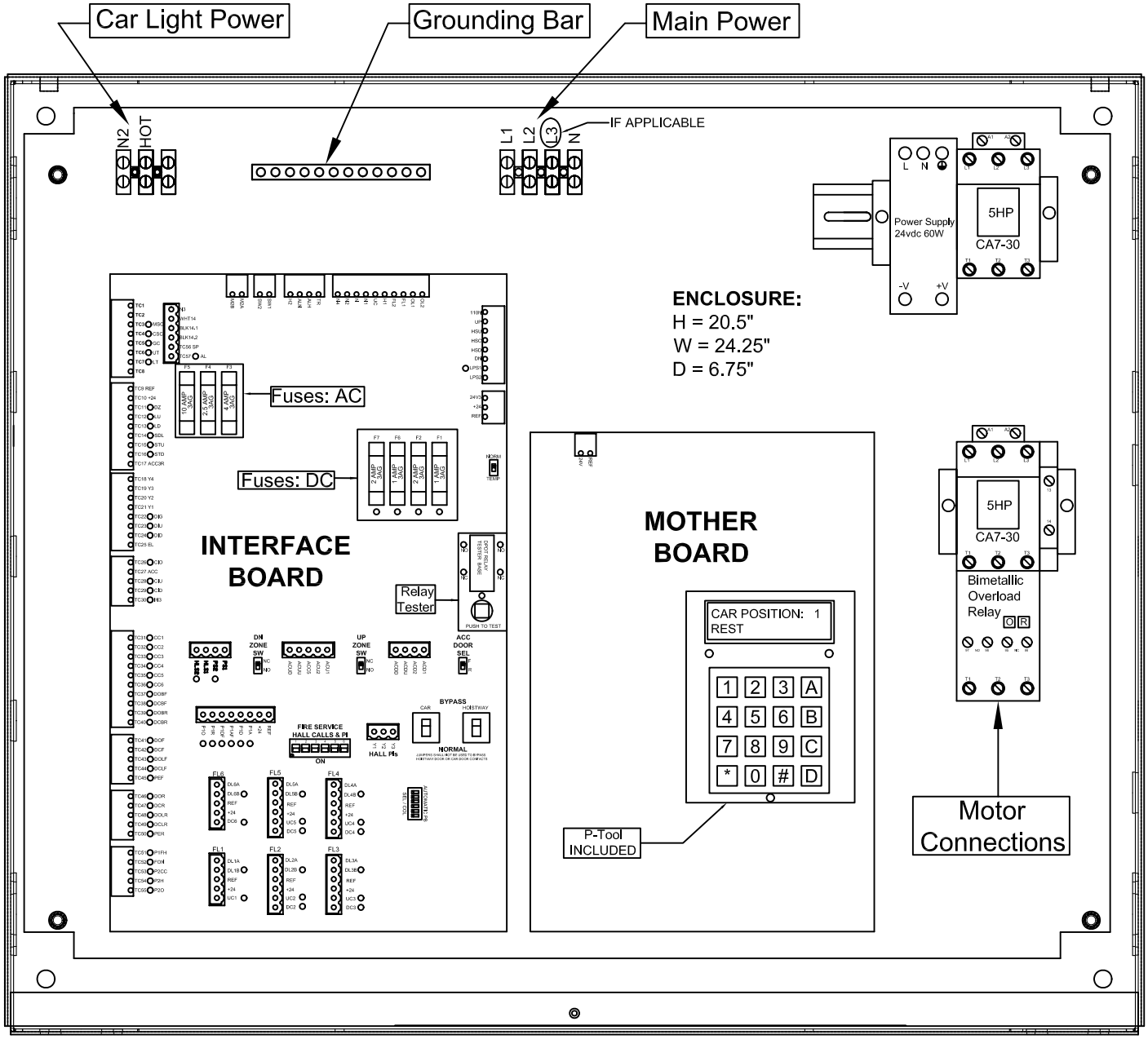
* Horsepower: 3 - 20
* Voltage: 208 - 230
* Phase: 1 or 3

Models exceeding this range will have a "Soft Starter" mounted in an auxiliary enclosure.

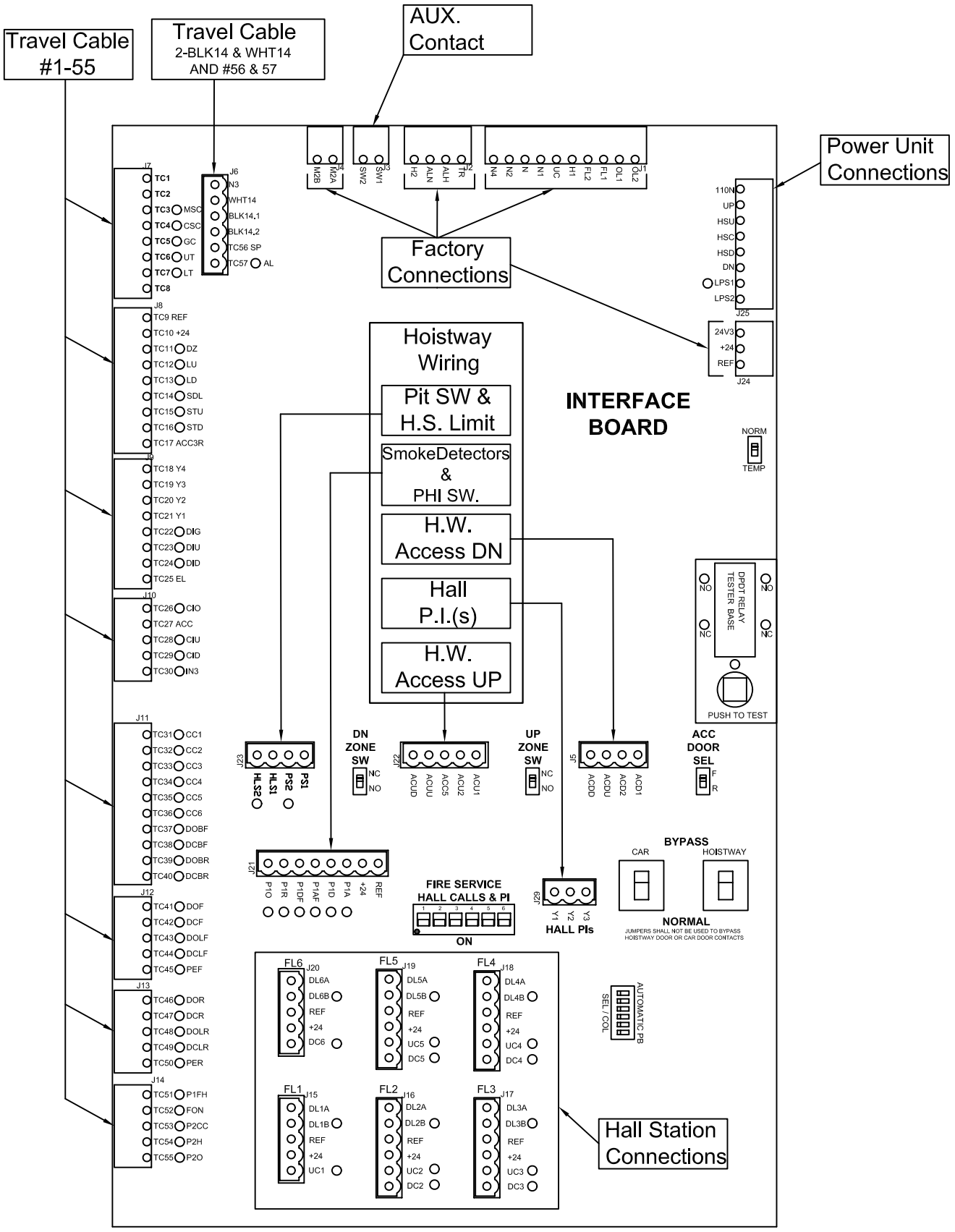
Note: 460V models will have a Step Down transformer mounted in an auxiliary enclosure.

The controller's enclosure dimensions are as follows:

* Height: 20.5"
* Width: 24.25"
* Depth: 6.75"

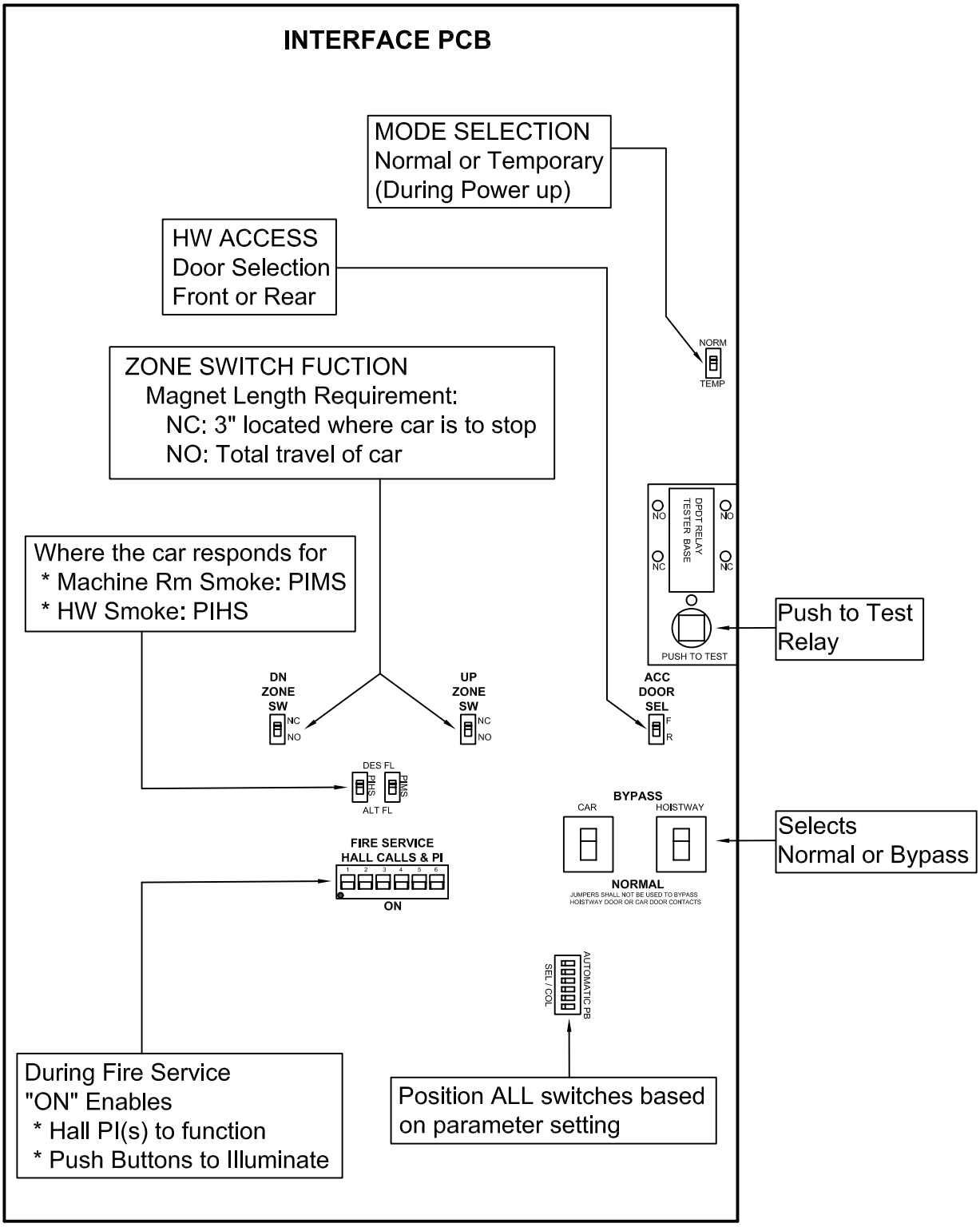


2-2) TERMINAL LOCATIONS

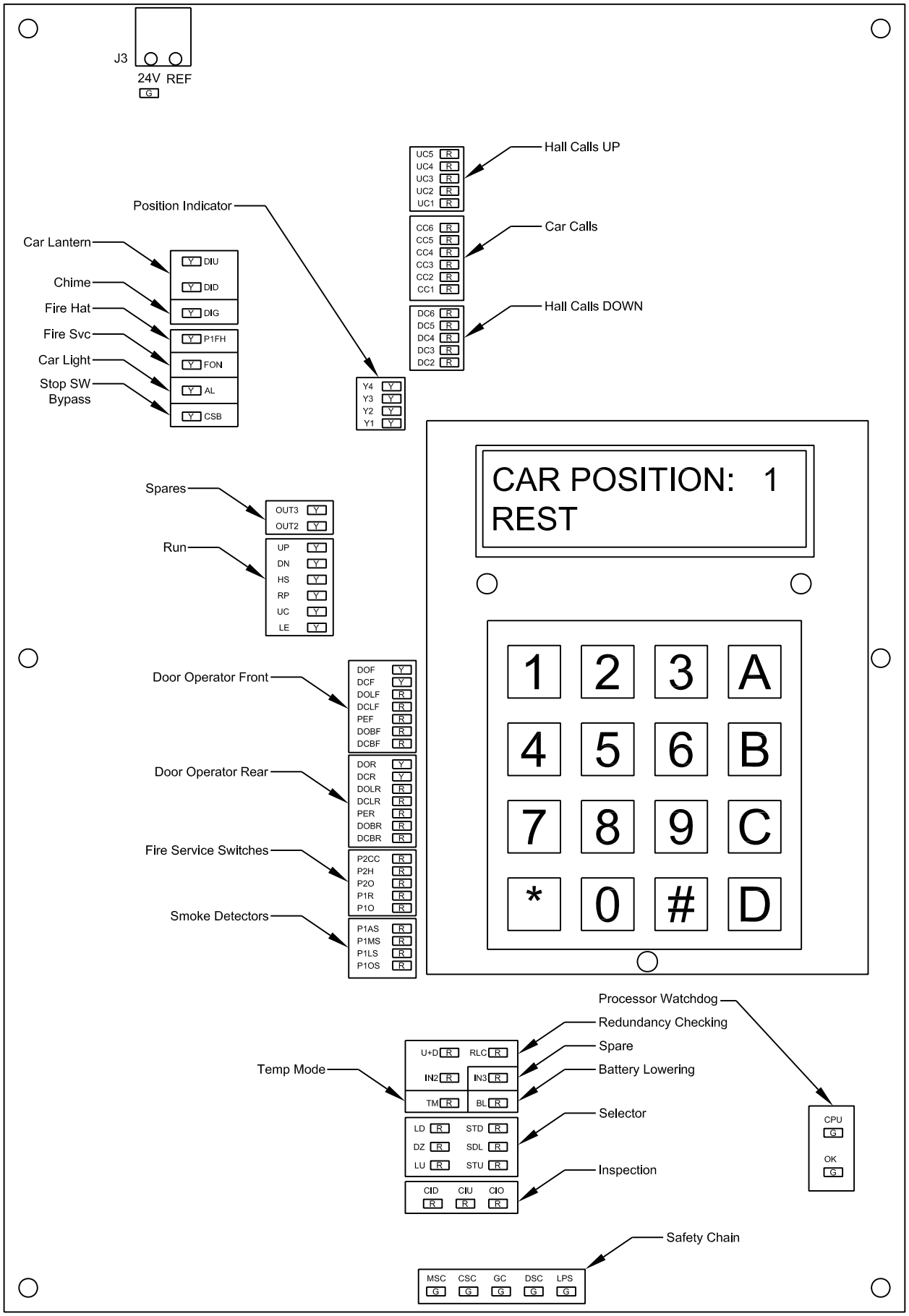


2-3) SWITCH CONFIGURATIONS

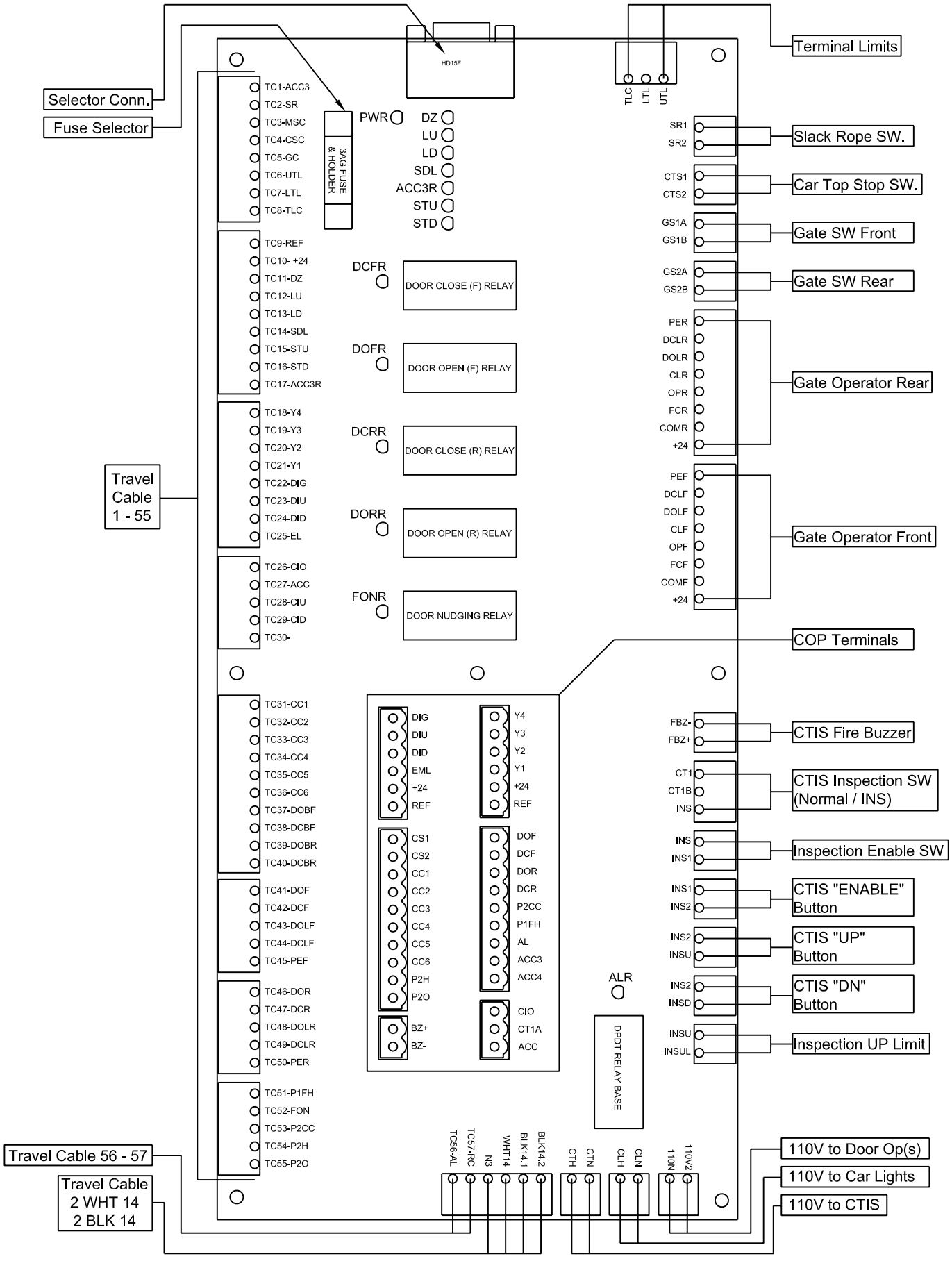
INTERFACE BOARD



2-4) LED Locations Logic Board



3-1) CAR TOP TERMINAL LOCATIONS



4) ANCILLARY EQUIPMENT (by Others) REQUIREMENTS

4-1) Uninterruptible Power Supply (UPS): 110V 900VA

4-2) Door Operator(s):
Input Voltage: 110vac
Signalization: Dry contact for Open, Close & Nudge
Open/Close Limits: Normally closed

4-3) Photo Eye or Safety Edge: Dry contact, Normally Closed when not obstructed

4-4) Smoke Detectors Output: Dry contact, Normally Open when not active.

4-5) Car Directional Lantern UP / DN: 24vdc 50ma (max.). Active Low

4-6) Car Passing Chime: 24vdc 50ma (max.). Active Low

4-7) Position Indicators (Car & Hall):
Input Voltage: 24vdc
Signalization: Binary, 24vdc Active HIGH (Y1=LSB)
Note: PI LEDs on Logic Board activate when signal is LOW

0=0vdc
1=24vdc

Floor	Y1	Y2	Y3
1	1	0	0
2	0	1	0
3	1	1	0
4	0	0	1
5	1	0	1
6	0	1	1

Truth Table

An additional output (Y4) is provided for the car PI for special messages to be displayed. Y4 is always LOW unless any of the following conditions are present:

Truth Table

0=0vdc
1=24vdc

CONDITION	Y1	Y2	Y3	Y4
Low Oil	1	0	0	1
Battery Lowering	0	0	0	1
Inspection	0	1	0	1
Service Interval	1	1	0	1

5-1) PROGRAMMING TOOL FUNCTIONS

The Programming Tool can be used to:

> View the status of the Elevator

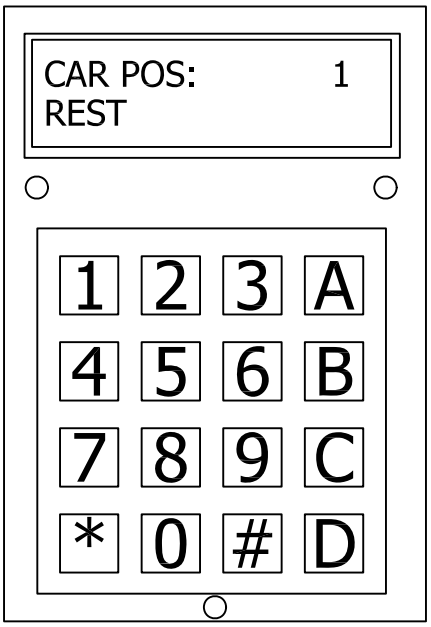
> Change parameter settings

> View and clear the Fault Log

> View and clear the Counters

Note: When using the P-Tool in the program mode, the Elevator will not respond to Calls

Note: You can not enter the Program mode if the unit is running. The unit must be "at rest".



NORMAL DISPLAY:
TOP LINE = CAR POSITION
BOTTOM LINE = CAR STATUS

HOT KEY FUNCTIONS:
(*) - RESET
(A) - VIEW MENU

MENU OPTIONS:
1-NORMAL: DISPLAYS THE CAR'S POSITION AND STATUS
2-PROGRAM: ALLOWS YOU TO EDIT SYSTEM PARAMETERS
3-LOG: VIEW THE LAST 20 EVENTS
4-COUNT: THREE COUNTERS ARE PROVIDED. TOTAL, TRIP AND RE-LEVEL

5-2) PROGRAM MODE

CAR POS: 1 REST	PRESS (A) TO VIEW THE MENU
(1) NORM (2) PROG (3) LOG (4) COUNTER	PRESS (2) TO VIEW OR CHANGE PROGRAMMING
PASSWORD THEN # PROG: _	TYPE IN THE PASSWORD THEN PRESS THE (#) KEY
NO FLOORS (6)	TYPE IN THE DESIRED NUMBER OF FLOORS AND PRESS #
FLR1 DOOR (1) (1)F (2)R (3)F+R	TYPE IN THE NUMBER REPRESENTING THE FLOOR 1 DOOR AND PRESS #
FLR2 DOOR (1) (1)F (2)R (3)F+R	TYPE IN THE NUMBER REPRESENTING THE FLOOR 2 DOOR AND PRESS #
FLR3 DOOR (1) (1)F (2)R (3)F+R	TYPE IN THE NUMBER REPRESENTING THE FLOOR 3 DOOR AND PRESS #
FLR4 DOOR (1) (1)F (2)R (3)F+R	TYPE IN THE NUMBER REPRESENTING THE FLOOR 4 DOOR AND PRESS #
FLR5 DOOR (1) (1)F (2)R (3)F+R	TYPE IN THE NUMBER REPRESENTING THE FLOOR 5 DOOR AND PRESS #
FLR6 DOOR (1) (1)F (2)R (3)F+R	TYPE IN THE NUMBER REPRESENTING THE FLOOR 6 DOOR AND PRESS #
CSC DOORS OPEN (1)N (2)Y (2)	DOOR(S) OPEN WHEN THE IN CAR STOP SWITCH IS OPEN

5-2) PROGRAM MODE (continued)

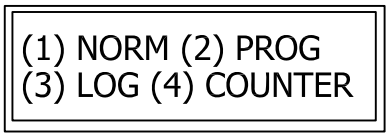
PH II Car Bypass (1)N (2)Y (1)	TYPE IN THE NUMBER REPRESENTING THE DESIRED SELECTION AND PRESS # IF THIS OPTION IS SET TO YES, THEN THE CAR STOP BYPASS WILL STAY ON WHEN PHASE II FIRE SERVICE IS INITIATED.
PH I Bypass (1)N (2)Y (2)	TYPE IN THE NUMBER REPRESENTING THE DESIRED SELECTION AND PRESS # IF THIS OPTION IS SET TO YES, THEN THE P1R INPUT WILL BYPASS ANY SMOKE SENSORS INSTEAD OF ONLY RESETTING THE FIRE SERVICE WHEN ALL SENSORS ARE OFF.
MAIN FLOOR IN FIRE (1)	TYPE IN THE MAIN FIRE FLOOR AND PRESS #
MAIN FIRE DOOR (1)F (2)R (1)	TYPE IN THE NUMBER REPRESENTING THE MAIN FIRE DOOR AND PRESS #
ALTERNATE FLOOR IN FIRE (2)	TYPE IN THE ALT. FIRE FLOOR AND PRESS #
ALT. FIRE DOOR (1)F (2)R (1)	TYPE IN THE NUMBER REPRESENTING THE ALT. FIRE DOOR AND PRESS #
HOMING FLOOR (1)	TYPE IN THE FLOOR WHICH THE CAR SHOULD HOME TO AND PRESS #
HOMING TIMER (00) MINUTE	TYPE IN THE TIME BEFORE THE CAR SHOULD HOME AND PRESS # (ADJUSTABLE FROM 01 - 10 MINUTES | 00 = DISABLED)
COL (1) SAP (2) (1)	SELECT THE OPERATION MODE AND PRESS # 1 = SELECTIVE COLLECTIVE 2 = SINGLE AUTOMATIC PUSHBUTTON
FLOOR TO FLOOR TIMER (45) SEC	TYPE IN THE FLOOR TO FLOOR TIMER AND PRESS # (ADJUSTABLE FROM 10 - 99 SECONDS)
GATE OPEN TIMER (05) SEC	TYPE IN THE TIME FOR THE DOORS TO HOLD OPEN UPON ARRIVAL TO A FLOOR AND PRESS # (ADJUSTABLE 05 - 60 SECONDS)
GATE RE-OPEN TIMER (10) SEC	TYPE IN THE TIME FOR THE DOORS TO HOLD OPEN IN RESPONSE TO A RE-OPEN COMMAND AND PRESS # (ADJUSTABLE 05 - 60 SECONDS)

5-2) PROGRAM MODE (continued)

CALL 3 ASSIGNMENT (3)	TYPE IN THE FLOOR NUMBER WHICH THE CAR WILL RUN TO WHEN THIS CALL IS PLACED. THE FLOOR 3 DOOR SETTINGS WILL APPLY WHEN THIS IS USED. (THIS PARAMETER DOES NOT SHOW UP WHEN THE "NO FLOORS" >= 3)
CALL 4 ASSIGNMENT (4)	TYPE IN THE FLOOR NUMBER WHICH THE CAR WILL RUN TO WHEN THIS CALL IS PLACED. THE FLOOR 4 DOOR SETTINGS WILL APPLY WHEN THIS IS USED. (THIS PARAMETER DOES NOT SHOW UP WHEN THE "NO FLOORS" >= 4)
CALL 5 ASSIGNMENT (5)	TYPE IN THE FLOOR NUMBER WHICH THE CAR WILL RUN TO WHEN THIS CALL IS PLACED. THE FLOOR 5 DOOR SETTINGS WILL APPLY WHEN THIS IS USED. (THIS PARAMETER DOES NOT SHOW UP WHEN THE "NO FLOORS" >= 5)
CALL 6 ASSIGNMENT (6)	TYPE IN THE FLOOR NUMBER WHICH THE CAR WILL RUN TO WHEN THIS CALL IS PLACED. THE FLOOR 6 DOOR SETTINGS WILL APPLY WHEN THIS IS USED. (THIS PARAMETER DOES NOT SHOW UP WHEN THE "NO FLOORS" = 6)
SOFT STOP DELAY X0.01 Sec (000)	TYPE IN THE TIME AND PRESS # TO SET THE TIME THAT THE MOTOR WILL CONTINUE TO RUN AFTER THE UP COIL DROPS OUT. ALLOWS CAR TO STOP HIGHER IN THE DEAD ZONE. (ADJUSTABLE 0-200 X10ms : 000= DISABLED)
H.S. INSPECTION (1) N (2) Y (1)	TYPE IN 1 AND PRESS # TO MOVE AT LOW SPEED DURING INSPECTION TYPE IN 2 AND PRESS # TO MOVE AT HIGH SPEED DURING INSPECTION
RETIRING CAM (1)N (2)Y (1)	TYPE IN THE NUMBER AND PRESS # TO SET THE NUMBER OF TRIPS BEFORE THE ELEVATOR IS DISABLED (ADJUSTABLE 0 - 999 X10 | 0 = DISABLED) THIS FEATURE WILL BE DISABLED AFTER THREE ACTIVATIONS.
Service Interval Counter X10 (000)	TYPE IN THE NUMBER AND PRESS # TO SET THE NUMBER OF TRIPS BEFORE THE SPECIAL CODE IS SENT TO THE POSITION INDICATOR (REFER TO SEC 4) (ADJUSTABLE 0 - 200 X10 | 0 = DISABLED)
Service Interval Timer (000) Days	TYPE IN THE NUMBER AND PRESS # TO SET THE NUMBER OF DAYS BEFORE THE SPECIAL CODE IS SENT TO THE POSITION INDICATOR (REFER TO SEC 4) (ADJUSTABLE 0 - 365 | 0 = DISABLED)
AUTO SHUTDOWN COUNTER X10 (000)	TYPE IN THE NUMBER AND PRESS # TO SET THE NUMBER OF TRIPS BEFORE THE ELEVATOR IS DISABLED (ADJUSTABLE 0 - 200 X10 | 0 = DISABLED) THIS FEATURE WILL BE DISABLED AFTER THREE ACTIVATIONS.
CHANGE PASSWORD (1) Y (2) N (2)	TYPE IN 1 AND PRESS # TO KEEP THE PASSWORD TYPE IN 2 AND PRESS # TO CHANGE THE PASSWORD

5-3) FAULT LOG MODE

PRESS (A) TO VIEW THE MENU



PRESS (3) TO VIEW THE LOG

THE FIRST LINE IS A DESCRIPTION OF THE EVENT
2U=EVENT OCCURED AT 2ND FL WHILE TRAVELING UP
L= LAST EVENT

(C) VIEWS PREVIOUS EVENT UNTIL "NO EVENTS" IS SEEN

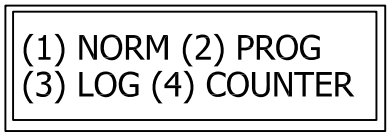
ONCE IN LOG MODE:

THE LOG STORES 20 EVENTS IN A LAST IN FIRST OUT FORMAT.

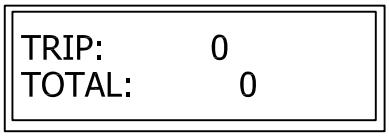
(A) TO RETURN TO MAIN MENU
(B) TO VIEW LATER EVENT
(C) TO VIEW EARLIER EVENT
(D) TO CLEAR LOG
NOTE: PASSWORD REQUIRED TO CLEAR LOG
(*) TO PERFORM RESET

5-4) VIEW & CLEAR COUNTERS

PRESS (A) TO VIEW THE MENU



PRESS (4) TO VIEW COUNTERS



THE "TRIP" AND "TOTAL" RUN COUNTERS ARE DISPLAYED

(C) TO VIEW UP LEVELING COUNTER

ONCE IN COUNTER MODE:

THE SYSTEM HAS THREE COUNTERS.

TRIP: INCREMENTS EACH TIME THE CAR RUNS IN RESPONSE TO A CALL (RESETABLE).

TOTAL: SAME AS TRIP BUT NOT RESETABLE

UP LEVELING: INCREMENTS EACH TIME THE CAR MOVES UP WITHOUT A CALL (RESETABLE)

(A) TO RETURN TO MAIN MENU
(B) TO VIEW PREVIOUS COUNTER
(C) TO VIEW NEXT COUNTER
(D) TO CLEAR COUNTERS
NOTE: PASSWORD REQUIRED TO CLEAR COUNTERS
(*) TO PERFORM RESET

5-5) PARAMETER SETTINGS

Parameter	Board Default	Job Settings	Notes
Password:	12345		
Number of Floors	6		
Floor 1 Door	F		
Floor 2 Door	F		
Floor 3 Door	F		
Floor 4 Door	F		
Floor 5 Door	F		
Floor 6 Door	F		
CSC Doors Open	YES		
PH II Car Bypass	NO		
PH I Bypass	YES		
Main Floor in Fire	1		
Main Fire Door	F		
Alternate Floor in Fire	2		
Alternate Fire Door	F		
COL / SAP	COL		
Floor to Floor Timer	45		
Gate Open Timer	5		
Gate Re-Open Timer	10		
Call 3 Assignment	3		
Call 4 Assignment	4		
Call 5 Assignment	5		
Call 6 Assignment	6		
Soft Stop Delay	0		
H.S. Inspection	NO		
Retiring Cam	NO		
Service Interval Counter (X10)	0		
Service Interval Timer (Days)	0		
AutoShutdown Counter	0		
Change Password	NO		

6-1 SELECTOR DESCRIPTION OF OPERATION

The 6L2 Controller requires up to seven selector inputs for operation:

LU = Level Up	STU = Step UP
LD = Level Down	STD = Step Down
DZ = Door Zone	ACC3R = Hoistway Access Zone
SDL= Slow Down Limit	

The inputs are 24VDC active HIGH; meaning that +24VDC must be present at the appropriate controller terminal to turn on the input.

Inputs **STU** and **STD** are only used for high-speed (>75 ft./min.) installations.

Reset Logic Sequence:

Every time the system is powered up or the " * " key on the P-Tool is pressed, the elevator will function as follows:

- The car will travel down the hoistway at high speed to the Lower Terminal Floor (LTF).
- When **SDL** is activated the car will decelerate to leveling speed.
- The car will stop when **LD** deactivates
- Reset is complete when the car is at the LTF with **DZ** and **SDL** on.

➢ **NOTE:** When running from the LTF, **SDL** must deactivate before **LD** deactivates.

UP Travel Logic Sequence:

- When an UP call is registered, the "UP", "RP" and "HS" computer outputs will be activated.
- Car speed <75 ft./min.: Each time **LU** is activated the internal floor counter will increment one level
- Car speed >75 ft./min.: Each time **STU** is activated the internal floor counter will increment one level
- When the internal floor counter increments to the landing where the call is registered, the "HS" computer output will deactivate and the car will continue up the hoistway at leveling speed.
- The car stops after it is running in leveling speed when **LU** turns off while **DZ** remains on**.** The UP and RP computer outputs deactivate.

DOWN Travel Logic Sequence:

- When a DOWN call is registered, the "DN", "RP" and "HS" computer outputs will be activated.
- Car speed <75 ft./min.: Each time **LD** is activated the internal floor counter will increment one level
- Car speed >75 ft./min.: Each time **STD** is activated the internal floor counter will increment one level
- When the internal floor counter increments to the landing where the call is registered, the "HS" computer output will deactivate and the car will continue up the hoistway at leveling speed.
- The car stops after it is running in leveling speed when **LD** turns off while **DZ** remains on**.** The UP and RP computer outputs deactivate.

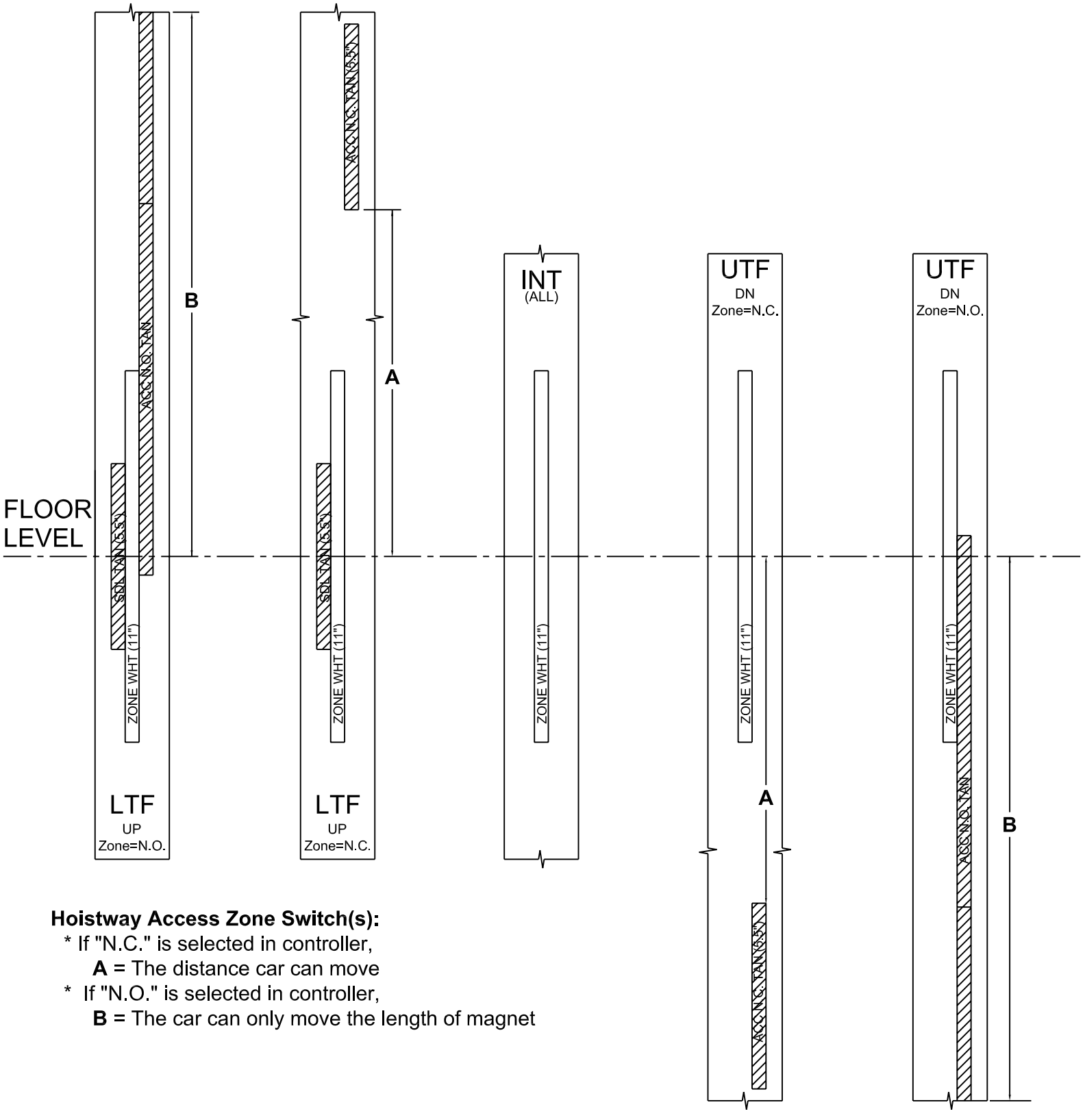
Re-leveling:

After the car has stopped at floor level in response to a call, the car will re-level up when **UL** and **DZ** are on together, and will stop when **LU** is off. The car will re-level down if **DL** and **DZ** are on together, and will stop when **DL** is off.

Hoistway Access Zone:

- The ACC3R selector output defines the upper and lower hoistway access zones.
- When ACC3R is active, relay ACC3 (in the controller) is activated
- The settings of the "DN ZONE SW" and "UP ZONE SW" within the controller determine the length and location of the Hoistway Access Zone magnet.

6-2) MAGNET CONFIGURATION (Contract Speed <75 ft./min.)

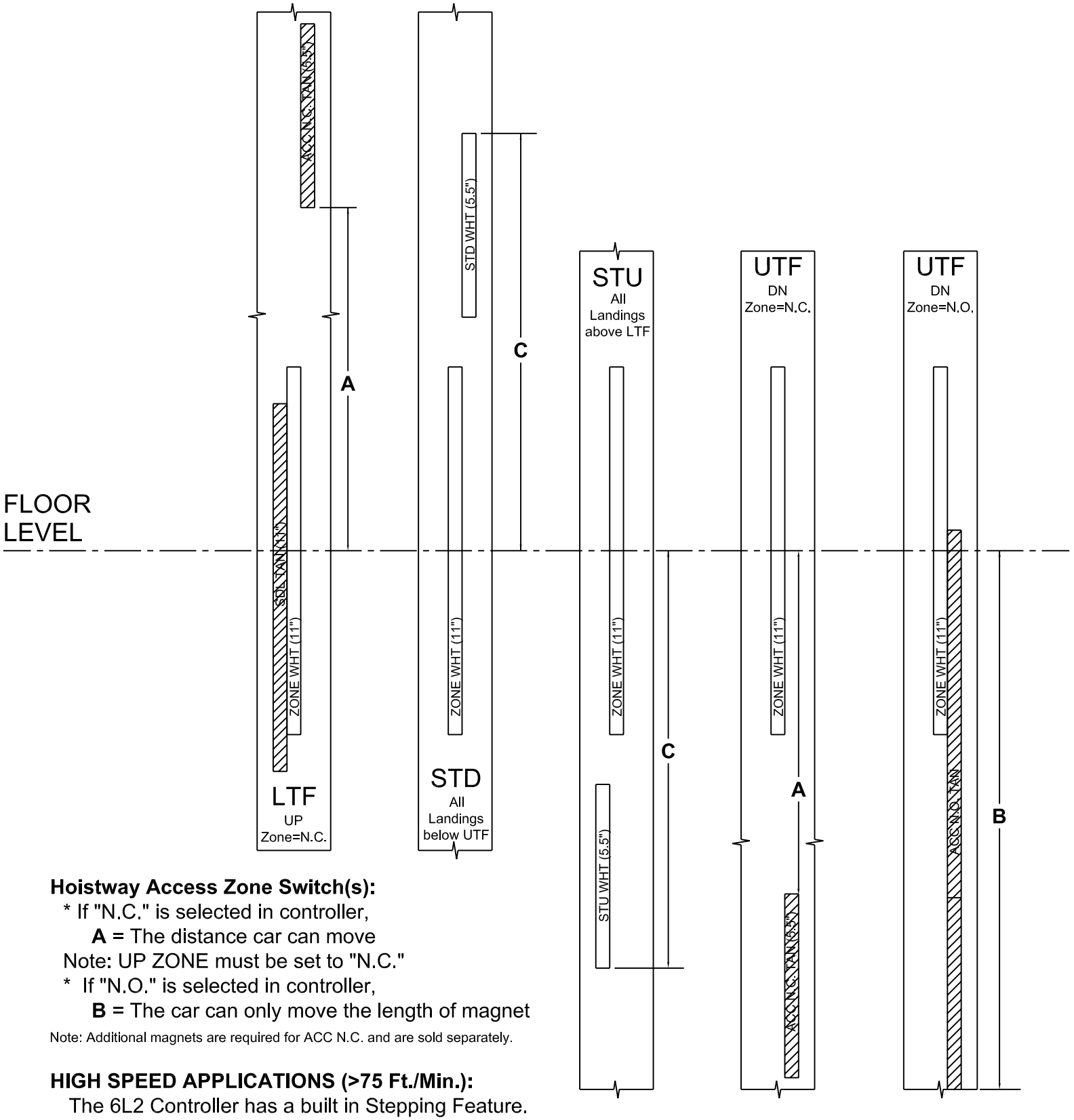


Hoistway Access Zone Switch(s):

* If "N.C." is selected in controller,
  A = The distance car can move
* If "N.O." is selected in controller,
  B = The car can only move the length of magnet

Note: Additional magnets are required for ACC N.C. and are sold separately.

6-3) MAGNET CONFIGURATION (Contract Speed >75 ft./min.)



Hoistway Access Zone Switch(s):

* If "N.C." is selected in controller,
  A = The distance car can move

Note: UP ZONE must be set to "N.C."

* If "N.O." is selected in controller,
  B = The car can only move the length of magnet

Note: Additional magnets are required for ACC N.C. and are sold separately.

HIGH SPEED APPLICATIONS (>75 Ft./Min.):

The 6L2 Controller has a built in Stepping Feature.

* STEP UP: WHITE (5.5") Left Lane
* STEP DN: WHITE (5.5") Right Lane

Note 1: Follow Valve mfg. recommendations for the slow down distance "C"
Note 2: Additional magnets are required for stepping and are sold separately.

6-4) SELECTOR SEQUENCE REQUIREMENTS

RUNNING UP						
CAR LOCATION	**DZ**	**LU**	**LD**	**SDL**	**STU**	**STD**
@ FL 1	X			X		
	X		X	X		
	X		X	O		
	O		X			
ALL OFF			O			
H.S. App only					X/O	X/O
		X				
	X	X				
@ FL2	X	O				
	X		X			
	O		X			
ALL OFF			O			
H.S. App only					X/O	X/O
		X				
	X	X				
@ FL 3	X	O				
	X		X			
	O		X			
ALL OFF			O			
H.S. App only					X/O	X/O
		X				
	X	X				
@ FL 4	X	O				
	X		X			
	O		X			
ALL OFF			O			
H.S. App only					X/O	X/O
		X				
	X	X				
@ FL 5	X	O				
	X		X			
	O		X			
ALL OFF			O			
H.S. App only					X/O	X/O
		X				
	X	X				
@ FL 6	X	O				

RUNNING DOWN						
CAR LOCATION	**DZ**	**LU**	**LD**	**SDL**	**STU**	**STD**
@ FL 6	X					
	X	X				
	O	X				
ALL OFF		O				
H.S. App only					X/O	X/O
			X			
	X		X			
@ FL 5	X		O			
	X	X				
	O	X				
ALL OFF		O				
H.S. App only					X/O	X/O
			X			
	X		X			
@ FL 4	X		O			
	X	X				
	O	X				
ALL OFF		O				
H.S. App only					X/O	X/O
			X			
	X		X			
@ FL 3	X		O			
	X	X				
	O	X				
ALL OFF		O				
H.S. App only					X/O	X/O
			X			
	X		X			
@ FL 2	X		O			
	X	X				
	O	X				
ALL OFF		O				
H.S. App only					X/O	X/O
			X			
	X		X			
	X		X	X		
@ FL 1	X		O	X		

X= LED ON
O= LED HAS TURNED OFF
X/O= PULSE FOR H.S. STEPPING

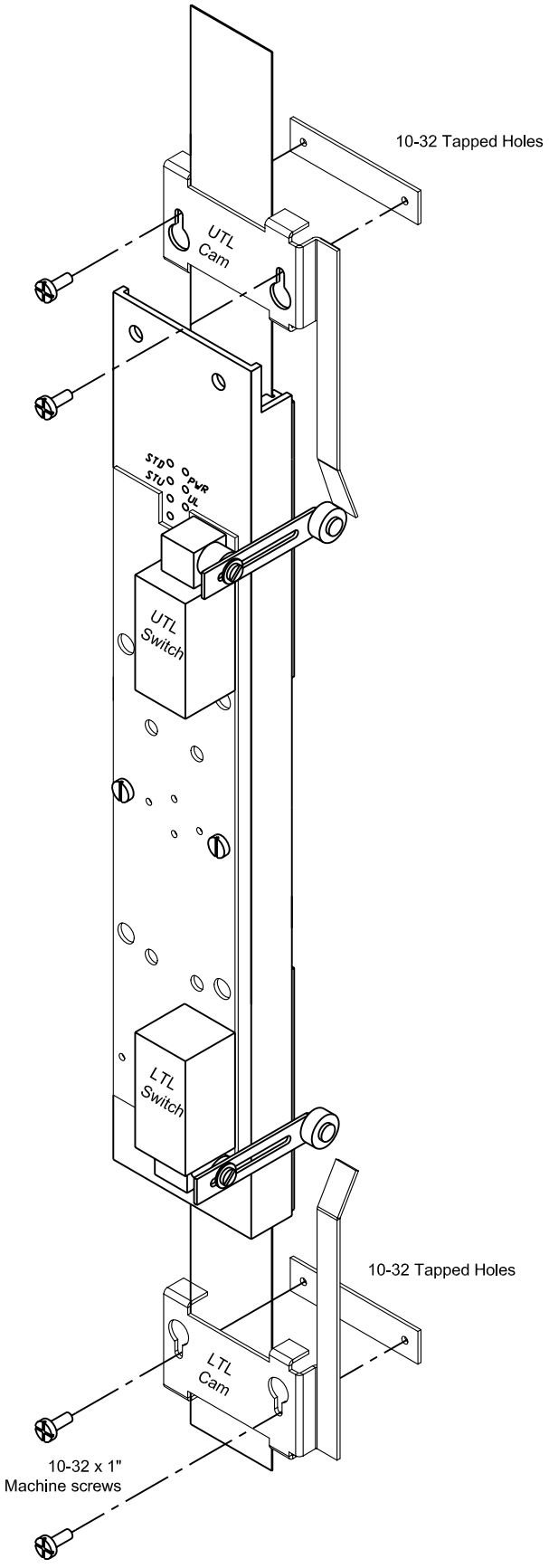
6-5) LIMIT SWITCH INSTALLATION

Misc. Hardware Contents:

1- Left handed Cam & Securing Plate
1- Right handed Cam & Securing Plate
4- 10-32 Screws

Installation Procedure:

1. Rotate Switch arms 90 degrees towards back of Selector Head
2. Secure LTL Cam to 2" tape using 10-32 Screws
3. Secure UTL Cam to 2" tape using 10-32 Screws
4. Connect wire harness to Car Top Box



Wire Color Codes & CTB Connections:

CTB Term.	Wire Color	Funtion
UTL	RED	UPPER TERM. LIMIT
LTL	YEL	LOWER TERM. LIMIT
TLC	BLK	TERM. LIMIT COMMON

Note: Length of all wires is 6 feet

7-1) SMOKE DETECTOR CONNECTIONS:

The 6L2 controller series can accommodate four “Smoke Alarm Zones”. It is acceptable to connect multiple smoke detectors to a given terminal.

Connection:

Controller Interface PCB Terminal strip J21.

For the location of J21, refer to Section 2-2 of this manual.

Terminal	Location	Alarm Zone	Function
PIA	J21.6	LOBBY	Recalls elevator to Alternate Fire Floor
PID	J21.5	OTHER	Recalls elevator to Main Fire Floor
PIAF	J21.4	HOISTWAY and/or MACHINE ROOM	Recalls elevator to Alternate Fire Floor. The “Fire Hat” flashes
PIDF	J21.3	HOISTWAY and/or MACHINE ROOM	Recalls elevator to Main Fire Floor. The “Fire Hat” flashes

Smoke Detector Requirements:

- Input Power: 24vdc and REF are provided on terminal strip J21

  If the input power is other than 24vdc, power must be provided from another source.

- Output: Dry contact, Normally Open when not active.
  - Alarm Dry Contact A: +24, Terminal J21.7
  - Alarm Dry Contact B: To respective controller terminal

7-2) PHASE I: EMERGENCY RECALL OPERATION

The 6L2 Controllers' Fire service operation has been designed to conform to ASME A17.1-2013
The following charts have been derived from the "Acceptance Checklist for Firefighters' Service" A17.2-2013

	Phase I Initiated While Running in Normal Operation: **When several calls are placed from the car or hall. While the car is running, place the Phase I switch in the "ON" position. The car will respond as follows:**	A17.1-2013
1.1	The car stops at the next landing without opening the doors, then proceeds to the designated floor	
1.2	The in car stop switch becomes inoperative as soon as the Phase I switch is activated	
1.3	Hall call register lights and directional lanterns are extinguished and inoperative	
1.4	Only Car and designated landing position and direction indicator still operational	
1.5	The in car door open button is rendered inoperative as soon as car moves away from landing	
1.6	Car call buttons are inoperative	
1.7	The car returns to the designated floor and parks with doors open	
1.8	The visual and audible signals operate. Audible signal stays on until the car reaches the designated floor and visual signal stays on until the car is returned to automatic operation	

	Phase I Initiated With the car at rest with the Doors Open **With the Phase I switch to the "OFF" position, run the car to any floor. With the doors open, have the Phase I switch turned to the "ON" position. The car will respond as follows:**	A17.1-2013
2.1	Door reopening devices sensitive to smoke or flame are inoperative immediately	
2.2	Output "FON" actives to close door at nudging speed	
2.3	The in car stop switch is inoperative as soon as the car moves away from the landing	
2.4	The in car door open button remains operative as the doors are closing	

	In Car Stop Switch And Doors Closing **With the Phase I switch to the "OFF" position, run the car to any floor. Activate the In Car Stop Switch. With the doors open, place the Phase I switch to the "ON" position. Return the In Car Stop switch to the "RUN" position.**	A17.1-2013
3.1	The doors close and the car moves to the designated level	

	Fire Alarm Initiating Device(s) and Operation	A17.1-2013
4.1	Activate smoke "PID" (which recalls to designated level), the elevator commences Phase I operation and the car returns to the designated level	
4.2	Activatation of smoke "PIA" (which recalls to alternate level), the elevator commences Phase I operation and the car returns to the alternate level	
4.3	If multiple smoke detectors are activated, the car will only respond to the first alarm input.	
4.4	To reset operation initiated from fire alarm system, the fire alarm signal must be reset, then the Phase I switch must be cycled to "RESET" momentarily then to "OFF"	
4.5	Activate smoke "PIAF" (Machine Room and/or Hoistway), Phase I is initiated and the car returns to the alternate level and the visual signal activates intermittently.	
4.6	Activate smoke "PIDF" (Machine Room and/or Hoistway), Phase I is initiated and the car returns to the designated level and the visual signal activates intermittently.	

	Alternate Recall Level **With the car at the alternate level, on Phase I emergency recall operation and the doors open (by means of an Alternate floor Smoke).**	A17.1-2013
5.1	Place the Phase I switch to the "ON" position. The car returns to designated landing and parks with the doors open.	

7-3) PHASE II: IN-CAR EMERGENCY OPERATION

The 6L2 Controllers' Fire service operation has been designed to conform to ASME A17.1-2013
The following charts have been derived from the "Acceptance Checklist for Firefighters' Service" A17.2-2013

	Phase II Operation **With Phase I activated and the car at the designated or alternate landing, place the Phase II key switch in the "ON" position. The car will operate as follows:**	**A17.1-2013**
6.1	The elevator can be operated only from the car buttons and will not respond to corridor calls.	
6.2	Car and designated landing Position Indicators along with the car direction indicators will funtion. Other landing Position Indicators are inoperative.	
6.3	Open doors can be closed only by continuous pressure on door close button. If released before the door is fully closed, doors will reopen.	
6.4	Closed doors can only be opened by continuous pressure on the door open button. If released before the door is fully opened, the door will close.	
6.5	If two entrances can be opened and closed at the same landing, separate door open and close buttons must be provided for each entrance.	
6.6	All door reopening devices are inoperative - (except the DOB): Full speed closing is permitted.	
6.7	Call cancel button when activated with the car running, will cancel the call and cause the car to stop at the next available landing.	
6.8	Call cancel button when activated with the car at rest, will cancel the call.	
6.10	Operation of the stop switch in the firefighters' operation panel while the car is running cancels all calls and stops the car. The car does not move except for leveling operation, until the firefighters' stop switch is made and a car call is registered.	

	Phase II Switch in "HOLD" Position	**A17.1-2013**
7.1	Placing the Phase II switch in the "HOLD" position. The car remains at the landing and the door close button is inoperative.	
7.2	The car call buttons are inoperative.	

	Phase II Switch in "OFF" Position and Doors Closing **With the elevator away from the designated level, Phase I in effect, placing the Phase II switch in the "OFF" position the car will operate as follows:**	**A17.1-2013**
8.1	Doors close automatically	
8.2	Car reverts to a Phase I type return on completion of doors closing and reverts to Phase I when doors open at the recall landing.	
8.3	Door reopening device inoperative and full speed closing permitted.	
8.4	Door open button operative.	
8.5	If Phase II switch turned to "ON" or "HOLD" before door is closed, it will reopen.	
8.6	With car stopped and doors closed, or in motion and Phase II switch is turned to "OFF" position, car returns to recall level and remains in Phase II until doors are fully open.	

	Removal From Phase II **The elevator can be removed from Phase II only when**	**A17.1-2013**
9.1	Phase II switch in "OFF" position at designated level and doors open.	
9.2	Phase II switch in "OFF" position and Phase I in effect.	

7-4) PHASE I and II: MISCELLANEOUS OPERATIONS

	Power Disconnects Open (Controller turned OFF then ON)	A17.1-2013
10.1	With the elevator Phase I switch in the ON position, the elevator will not move and remains on Phase I.	
10.2.a	With the elevator on Phase II, the elevator will not move and remains on Phase II with the doors in their last state.	
10.3.a	A car on Phase I due to a smoke detector, the elevator will not move and remains on Phase I at the appropriate landing	
10.4	A car on Phase II and the key position is changed while the power is off. The car will revert to the operation of the key setting when the power is restored.	
10.5	A car on Phase II with the key in the HOLD position will not move, except for releveling. Door shall open if not fully closed.	
10.6	A car on Phase II with the key in the ON position and doors in mid travel will not move, except for releveling. Door will not move unless a door open or close button is pressed.	

	Inspection and Hoistway Access Operation	
	While operating from top of car, then the Phase I switch placed in the "ON" position. The car will respond as follows:	**A17.1-2013**
11.1	An audible signal sounds.	
11.2	The elevator will remain under the control of the car top, in-car and machine room inspection operating device.	
11.3	The elevator will remain under the control of the hoistway access switch.	

	Low Oil & Battery Lowering Operation	A17.1-2013
12.1	Where the car is ABOVE the recall level and is responding to low oil protection and then Phase I activated, the car descends to the designated level.	
12.2	Where the car is BELOW the recall level and is responding to low oil protection and then Phase I activated, the car descends to the next available landing, opens doors and recloses within 15 sec and the door open button remains operative.	
12.3	Where the car is ABOVE the recall level responding to battery lowering and then Phase I activated, the car descends to the designated level.	
12.4	Where the car is BELOW the recall level responding to battery lowering and then Phase I activated, the car descends to the next available landing, opens doors and recloses within 15 sec and the door open button remains operative.	
12.5	While on Phase I recall operation, then low oil protection is activated with the car below the recall level, the car stops and descends to the next available landing, the doors open and reclose within 15 sec and the door open button remains operative.	
12.6	While on Phase I recall operation, then battery lowering is activated with the car above the recall level, the car will return to the recall level and complete Phase I recall.	
12.7	While on Phase I recall operation, then battery lowering is activated with the car below the recall level, the car stops, descends to the next available landing, the doors open and reclose within 15 sec and the door open button remains operative.	
12.8	With the car on Phase II operation, then low oil protection is activated, traveling car stops, cancels the call, and the visual signal in the car illuminates intermittently. The car will only respond to calls below its location.	
12.9	With the car on Phase II operation, then battery lowering is activated, traveling car stops, cancels the call, and the visual signal in the car illuminates intermittently. The car will only respond to calls below its location.	

8) TOP OF CAR INSPECTION

Initiating Inspection Mode:

- Place the car top inspection switch in the INSPECTION position.
- To run up, press and hold the inspection enable and up buttons. Release to stop.
- To run down, press and hold the inspection enable and down buttons. Release to stop.

Note: All safety circuits must be closed to operate on inspection mode. Gate and door contacts must also be closed, unless the bypass switches are activated (see section 9)

Returning to Automatic Operation:

- Hold the hoistway door open.
- Place the cartop inspection switch to the NORMAL position.
- Exit from the car top.
- Close hoistway door.
- Place a Hall call.
    - The call will not latch
    - The car will run down to the lowest terminal floor to re-establish position.
- Verify car is in Automatic operation by placing the Hall call again.
    - The call will latch
    - The car will respond to the call

9) CAR AND HOISTWAY DOOR CONTACT BYPASS SWITCHES

The controller is provided with two slide switches that, when activated, will prepare the controller for inspection operation and bypass the associated door contacts. The car will not run by any means other than the car top inspection station with either or both switches in the BYPASS position.

These switches allow the technician to run the elevator on inspection with doors open or with faulty door contacts. While the ability to run with doors open can aid in servicing and troubleshooting, it can also allow dangerous conditions to occur. Make certain no unauthorized persons are in the car or near any hoistway entrances when using the bypass switches.

To bypass door contacts, simply slide the appropriate switch to the BYPASS position. The car top inspection controls will work regardless of the status of the contacts. To resume automatic operation, return the switches to the NORMAL position

10) HOISTWAY ACCESS

Some jurisdictions require electrical access to the hoistway for inspection instead of (or in addition to) mechanical door release. The controller supports upper and lower hoistway access.

10-1) Top of Car Access:

- Ride car to the upper most landing.
- Place the car operating panel Access switch to ON position,
  - The door will open and stay open
  - Exit the car
- Turn the (upper) hoistway access keyswitch to DOWN,
  - The car will run down with the doors open
  - Hold the hoistway door open
- Release the switch to stop the car; with the access zone set up correctly, the car will stop automatically when the roof of the car is approximately level with the landing sill.
- Access the car top as required.
- Place the car top inspection switch in the INSPECTION position.
- The door will close on the first inspection run command.

Note: If using cartop inspection, remember to return it to NORMAL when finished.

To return to automatic operation:

- Open hoistway door at upper most landing.
- Place the car top inspection switch in the NORMAL position.
- Exit car top,
  - Hold hoistway door open
- Turn the (upper) hoistway access keyswitch to UP,
  - The car will run up.
  - Stop the car level with the landing
- Open gate manually,
  - Enter the car
- Place the car operating panel Access switch to OFF position.
- Place a car call,
  - The call will not latch
  - The door will close
  - The car will run down to the lowest terminal floor to re-establish position.
- Verify car is in Automatic operation by placing another car call.
  - The call will latch
  - The car will respond to the call

10-2) Pit Access

- Ride car to the lower landing.
- Place the car operating panel Access switch to ON position,
  - The door will open and stay open
  - Exit the car
- Turn the (lower) hoistway access keyswitch to UP,
  - The car will run up with the doors open
  - Hold the hoistway door open
- Release the switch to stop the car; with the access zone set up correctly, the car will stop automatically when the toe guard is approximately level with the head jamb.
- Access the pit as required.

To return to automatic operation:

- Exit the pit,
  - Hold hoistway door open
- Turn the (lower) hoistway access keyswitch to DOWN,
  - The car will run down.
  - Stop the car level with the landing
- Enter the car.
- Place the car operating panel Access switch to OFF position.
- Place a car call to the lowest floor,
  - The call will not latch
  - The door will close
  - The car will move if necessary to floor level.
- Verify car is in Automatic operation by placing car call to another floor,
  - The call will latch
  - The car will respond to the call

11) PRE-POWER CHECK OUT:

Prior to shipment, the controller is given a series of thorough tests to ensure proper factory connections and controller operation. However, it is possible that components could have loosened or were damaged during shipment. It is good practice to check the following:

- Loose Components
- Damaged Components
- All factory connections are tight and not shorted
- All Terminal strips and relays are fully inserted and seated
- All fuses fully inserted and seated

12) INITIAL POWER UP

1) Verify the following:

- Nothing has been connected to the controller
- The UPS receptacle has nothing plugged into it
- The incoming power source
  - Line 1 to Line 2 = 208/230 VAC 60hz
  - Line 2 to Neutral = 120 VAC 60hz

2) Make the following Connections:

- Ground the controller cabinet
- Auxiliary contact from Disconnect to SW1 and SW2
- Line 1 of incoming power to L1
- Line 2 of incoming power to L2
- Incoming Neutral to N

3) Close Disconnect

a. Verify 208-230VAC at the following terminals:

- FL1 – FL2
- OL1 – FL2

b. Verify 120VAC at the following terminals:

- FL2 – N (Terminal J1.8)

4) Connect the provided UPS plug and receptacle together and verify:

a. Verify 120VAC at the following terminals:

- H2 – N2
- TR – N2

b. Verify 24VDC at the following terminals:

- +24 – REF

13) CONTROLLER INITIALIZATION

Upon power up the controller will operate in the mode with the highest priority.

- Priority 1: Temp (presence of input TM)
- Priority 2: INSPECTION (absence of input CIO)
- Priority 3: FIRE SERVICE (latches in the event of main power disconnection)
- Priority 4: AUTOMATIC
  - Before the car can accept calls, the internal selector must be initialized. This occurs by the car running down to the lowest terminal floor. See 1-5.1 “Board Re-set”

14) TEMPORARY RUN MODE:

*****WARNING*****

The "INITIAL POWER UP" procedures as described in Section 12 must be completed before proceeding.

The purpose for this mode of operation is to allow the installer to move the platform up or down during the installation process. During this mode of operation safety chain inputs MSC, LPS, GC, HDC and HDL will be disregarded.

The following jumpers are required:

- From PS1 to ACU2
- From TC6 to TC7
- From TC7 to TC8

Temporary run mode will be initiated as follows:

- Mode selection switch to "TEMP", then power up

The platform will travel UP SLOW by continuous activation of the following:

- Input CIU at TC28 (to +24v)

The platform will travel DOWN SLOW by continuous activation of the following:

- Input CID at TC29 (to +24v)

The platform will travel in HIGH SPEED in either direction by continuous activation of the following:

- Jumper between HSL1 and HSL2

To return to normal operation move the Mode Selection switch to NORM.

NOTE: At this point the P-Tool will display: INSPECTION

15-1) PRE-OPERATIONAL SAFETY CHECKS

This process will confirm that all field wiring has been installed correctly and that the safety circuits function as expected. The critical LED(s) to observe are RED and located throughout the Interface board. These LEDs are designated as follows: **MSC, CSC, GC, LTL, UTL and DL6B**

1. Remove all jumpers used during construction
2. Power up controller in "TEMP" mode
3. Confirm P-Tool displays "TEMP MODE"
4. Confirm that car gate and hoistway doors are closed.
5. Confirm that the "In Car Stop Switch" is in the RUN position
6. The critical LEDs MUST be ON (MSC, CSC, GC, LTL, UTL and DL6B).

   Note: Other LEDs may be ON as well but are disregarded for these tests

7. Cycle each of the following applicable switches and confirm that all critical LEDs to turn OFF when the switch is opened and back ON when the switch is closed: Pit Sw., Safety Slack Sw., Car Top Stop.

   Note: Close all switches and confirm all critical LEDs are ON.

8. Manually open a hoistway door. Result: DL6B, UTL and LTL turn OFF.
9. Close hoistway door. Result: DL6B, UTL and LTL turn ON
10. Open the car gate. Result: GC, LTL, UTL and DL6B turn OFF
11. Close the car gate. Result: GC, LTL, UTL and DL6B turn ON
12. Place "IN CAR STOP" to "STOP" position. Result: CSC, GC, LTL, UTL and DL6B turn OFF
13. Place "IN CAR STOP" to "RUN" position. Result: CSC, GC, LTL, UTL and DL6B turn ON

15-2) TEMPORARY MODE RUNNING TESTS

1. Run the car DOWN until the Lower Terminal Limit opens (LTL at TC7).
   a. The Logic board LEDs will indicate "Running Down" but the car must stop.
2. Install a temporary jumper between TC7 to TC8, LTL activates. Run car down to Pit.
   a. LPS must deactivate.
   b. Safety Slack Switch must open
   c. Remove the Temporary Jumper
3. Run the car UP until the Upper Terminal Limit opens (UTL at TC6).
   a. The Logic board LEDs will indicate "Running UP" but the car must stop.
4. Confirm Selector signal sequence: Refer to Section 5-3 for the required selector sequence. Confirm sequence from lower terminal floor to upper terminal floor in both directions.

   - **Note: Jumper between HSL1 and HSL2 is required for High Speed operation in Temp Mode.**

15-3) PROGRAM JOB SPECIFIC PARAMETERS

1. While in "TEMP MODE"
   a. Press the "A" button on the P-Tool to view the main menu
   b. Press the "2" button on the P-Tool to enter programming
      - Read and understand the function of each parameter as described in Section 5-2
   c. Record job parameter on "Parameter Log Sheet" Section 5-5
2. After all job specific parameters have been entered:
   a. Clear the LOG
3. Reset Elevator

16) MAINTENANCE TEST PROCEDURES

Note: Refer to sec 14 to run the car in TEMP MODE.

1. UP RUNBY (Temp Mode)

- Run the car UP until the Upper Terminal Limit opens (UTL at TC6).
  Expected Result: The Logic board LEDs will continue to indicate the car is running up but the car must have come to a stop.
- Install a temporary jumper between TC6 to TC8, UTL activates. Run car UP.
  Expected Result: The car will come to a stop on the piston stop ring.
  The control valve must relieve excess pressure.

2A. DOWN RUNBY (Temp Mode)

- Run the car DOWN until the Lower Terminal Limit opens (LTL at TC7).
  Expected Result: The Logic board LEDs will continue to indicate the car is running down but the car must have come to a stop.

2A. SAFETY SLACK SWITCH

- Install a temporary jumper between TC7 to TC8, LTL activates. Run car down to Pit.
  Expected Result: Safety Slack Switch must open. MSC at TC3 will turn OFF
- Install a temporary jumper between TC2 to TC3, MSC activates.
  Run car up and manually reset Safety Slack Switch.

3A. DOOR CONTACT MONITOR 2.26.5(a)

- With the car door not closed (DCLF and/or DCLR are ON)
- Jump MSC (at TC3) to GC (at TC5) or GC (at TC5) to ACU2 (J22.4)
- Attempt to place a call
  Expected Result: The car should not respond

3B. DOOR CONTACT MONITOR 2.26.5(b)

- With the car door fully opened (DOLF and/or DOLR are OFF)
- Jump MSC (at TC3) to GC (at TC5) or GC (at TC5) to ACU2 (J22.4)
  Expected Result: The door should not close by any means (call, DC timer, DC button)

4. DOOR CONTACT BYPASS

- Move “HOISTWAY” Bypass slide switch to BYPASS position and place a call.
  Expected Result: The call should not be accepted; car should not relevel
- Move “CAR” Bypass slide switch to BYPASS position and place a call.
  Expected Result: The call should not be accepted; car should not relevel
- Move “HOISTWAY” Bypass slide switch to NORMAL position and place a call.
  Expected Result: The call should not be accepted; car should not relevel
- Move “CAR” Bypass slide switch to NORMAL position and place a call.
  Expected Result: The call should be accepted; re-leveling should be active

5. LOW PRESSURE (Automatic Operation)

- Car at an upper floor with doors closed then disconnect Low Pressure switch (LPS OFF)
  Expected Result: P-Tool displays “Low Pressure”
- Attempt to reopen doors with hall or car call at the current landing
  Expected Result: The door should not open. DOB should function
- Place car and hall calls to lower floors
  Expected Result: Calls will not be accepted.
- Reconnect Low Pressure switch (LPS ON)
  Expected Result: Car returns to normal operation

6. ANTI-CREEP (Automatic Operation)

- Open manual lowering on control valve, close manual lowering once motor starts
- Test with both car and hoistway doors closed and open (GC & DL6B are OFF)
  Expected Result: The motor starts when LU at TC12 activates.
  The motor stops when LU de-activates.

17-1) RELAY INFORMATION

All Relays used within the 6L2 series controller have the same technical specifications as follows:

Parameter	Value
Coil Voltage	24vdc
Contact Rating	8A @ 250vac/30vdc (Res.)
Contact Form	DPDT

Original Equipment:

Manufacturer	IDEC
Part Number	RJ2S-C-D24

Location: Interface PCB		Drawing Location (Page/Coordinates)		
Name	**Function**	**Coil**	**Contact (a)**	**Contact (b)**
ACC	Hoistway Access	P7/B2	P3/C7	P10/B4
ACC2	Hoistway Access 2	P7/B6	P3/C2	N/A
ACC3	Hoistway Access 3 (Zone)	P6/C4	P7/D6	P7/D6
CSB	In Car Stop Bypass	P3/B6	P3/C3	N/A
DN	Down Direction	P4/B6	P2/B7	P2/B8
DNX	Down Direction Aux	P4/B5	P4/C4	P2/C2
DZ	Door Zone	P6/C2	P3/C3	N/A
EL	Emergency Light	P5/A6	P6/D7	N/A
FOC	Fire Service	P8/C1	P9/G3	N/A
HS	High Speed	P4/B8	P2/B6	P2/B8
LE	Re-level Enable	P3/B2	P3/C4	P2/C2
OK	CPU Watchdog	P3/B6	P4/C4	N/A
RP	Run Pilot	P4/B7	P2/B4	P2/C2
TR	Relay Tester	P5/B3	P5/B3	P5/B3
UC	Up Contactor	P4/B2	P2/D4	N/A
UP	Up Direction	P4/B4	P2/B5	P2/B6
UPX	Up Direction Aux.	P4/B4	P4/C63	P2/B2

Location: Car Top PCB		Drawing Location (Page/Coordinates)		
Name	**Function**	**Coil**	**Contact (a)**	**Contact (b)**
ALR	Car Light (Timed)	P5/E1	P5/E6	N/A
DCF	Door Close Front	P10/E3	P10/E2	N/A
DCR	Door Close Rear	P10/E5	P10/E6	N/A
DOF	Door Open Front	P10/E3	P10/E3	N/A
DOR	Door Open Rear	P10/E4	P10/E7	N/A
FON	Fire Service	P8/F1	P10/E3	P10/E7
RC	Retiring Cam	P2/F3	P2/E2	N/A

17-2.1) FACTORY CONNECTIONS

Interface Terminal #	Symbol	Function	Dwg PG/LOC
J1.1	OL2	Motor overload	P1/F2
J1.2	OL1	Motor overload	P1/F2
J1.3	FL1	Line 1 in	P1/F3
J1.4	FL2	Line 2 in	P1/F3
J1.5	H1	Hot to UPS Receptical	P1/F5
J1.7	N1	Neutral to UPS Receptical	P1/F5
J1.8	N	Neutral in	P1/F4
J1.9	N2	Neutral to UPS Plug	P1/F6
J1.10	N4	Motor Contactor Coil Neutral	P2/E4
J2.1	TR	Hot to 24V power supply	P1/F6
J24.3	24V3	24V to Mother Board	P1/F7
J24.2	+24	24vdc IN	P1/F8
J24.1	REF	0vdc IN	P1/F8
J4.1	M2A	M2 contactor aux for contact checking	P2/E1
J4.2	M2B	M2 contactor aux for contact checking	P2/E1
J1.6	UC	Motor contactor Coil Hot	P2/E4
J2.4	H2	Hot to UPS Plug	P1/F5
J2.2	ALH	Car light Hot IN	P5/D8
J2.3	ALN	Car light Neutral in	P5/D7

17-2.2) INCOMING POWER

Sub Panel	Interface Terminal #	Symbol	Function	Dwg location
Screw	N/A	L1	Line 1 From Disconnect	P1/F3
Screw	N/A	L2	Line 2 From Disconnect	P1/F3
Screw	N/A	N	Neutral From Disconnect	P1/F3
Screw	N/A	GND	Ground From Disconnect	P1/F4
N/A	J3.1	SW1	Disconnect aux contact	P1/F3
N/A	J3.2	SW2	Disconnect aux contact	P1/F3
Screw	N/A	HOT	HOT from Cab Light Disconnect	P5/E8
Screw	N/A	N2	Neutral From Cab Light Disconnect	P5/E7

17-2.3) POWER UNIT

Component	Interface Terminal #	Symbol	Function	Dwg location
Overload	N/A	T1	Motor Lead(s) for L1	P1/G1
Overload	N/A	T2	Motor Lead(s) for L2	P1/G1
Overload	N/A	T3	Motor Lead(s) for L3 (3ph only)	P1/G1
N/A	J25.1	LPS1	Low Pressure Switch	P3/D3
N/A	J25.2	LPS2	Low Pressure Switch	P3/D3
N/A	J25.3	DN	Valve Coil: Down	P2/E8
N/A	J25.4	HSD	Valve Coil: H.S. Down	P2/E7
N/A	J25.5	HSC	Valve Coil: H.S. UP & Down	P2/E7
N/A	J25.6	HSU	Valve Coil: H.S. UP	P2/E6
N/A	J25.7	UP	Valve Coil: UP	P2/E6
N/A	J25.8	110N	Neutral for Valve Coils	P2/E4

17-2.4) TRAVEL CORD

Interface Terminal #	Cartop Terminal #	Symbol	Function	Dwg location
J7.1	J7.1	TC1 / ACC3	To COP access enable	P3/DE1
J7.2	J7.2	TC2 / SR1	Hoistway safety circuit	P3/DE2
J7.3	J7.3	TC3 / MSC	Master safety chain	P3/DE3
J7.4	J7.4	TC4 / CSC	Car safety circuit	P3/DE4
J7.5	J7.5	TC5 / GC	Gate contacts	P3/DE4
J7.6	J7.6	TC6 / UTL	Upper terminal limit	P4/D5
J7.7	J7.7	TC7 / LTL	Lower terminal limit	P4/D6
J7.8	J7.8	TC8 / TLC	Terminal limit common	P4/D6
J8.1	J8.1	TC9 / REF	0vdc for Car Top & COP	P6/D1
J8.2	J8.2	TC10 / +24	24vdc for Car Top & COP	P6/D1
J8.3	J8.3	TC11 / DZ	Selector Signal: Door Zone	P6/D2
J8.4	J8.4	TC12 / LU	Selector Signal: Level Up	P6/D2
J8.5	J8.5	TC13 / LD	Selector Signal: Level Down	P6/D3
J8.6	J8.6	TC14 / SDL	Selector Signal: Slow down limit	P6/D3
J8.7	J8.7	TC15 / STU	Selector Signal: Step Up	P6/D3
J8.8	J8.8	TC16 / STD	Selector Signal: Step Down	P6/D4
J8.9	J8.9	TC17 ACC3R	Selector Signal: Access Zone	P6/D4
J9.1	J9.1	TC18 / Y4	Position indicator	P6/D4
J9.2	J9.2	TC19 / Y3	Position indicator	P6/5
J9.3	J9.3	TC20 / Y2	Position indicator	P6/D5
J9.4	J9.4	TC21 / Y1	Position indicator	P6/D6

17-2.4) TRAVEL CORD Con't

Interface Terminal #	Cartop Terminal #	Symbol	Function	Dwg location
J9.5	J9.5	TC22 / DIG	Direction indicator gong	P6/D6
J9.6	J9.6	TC23 / DIU	Direction indicator up	P6/D6
J9.7	J9.7	TC24 / DID	Direction indicator down	P6/D7
J9.8	J9.8	TC25 / EL	Emergency light	P6/D7
J10.1	J10.1	TC26 / CIO	COP access & cartop inspection	P7/D1
J10.2	J10.2	TC27 / ACC	COP access sw access	P7/D2
J10.3	J10.3	TC28 / CIU	Inspection/access up	P7/D4
J10.4	J10.4	TC29 / CID	Inspection/access down	P7/D7
J10.5	J10.5	TC30 / N3	Spare input	P7/D8
J11.1	J11.1	TC31 / CC1	Car call 1	P8/D4
J11.2	J11.2	TC32 / CC2	Car call 2	P8/D4
J11.3	J11.3	TC33 / CC3	Car call 3	P8/D5
J11.4	J11.4	TC34 / CC4	Car call 4	P8/D5
J11.5	J11.5	TC35 / CC5	Car call 5	P8/D5
J11.6	J11.6	TC36 / CC6	Car call 6	P8/D6
J11.7	J11.7	TC37 / DOBF	Door open button front	P8/D3
J11.8	J11.8	TC38 / DCBF	Door close button front	P8/D2
J11.9	J11.9	TC39 / DOBR	Door open button rear	P8/D3
J11.10	J11.10	TC40 / DCBR	Door close button rear	P8/D3
J12.1	J12.1	TC41 / DOF	Door open front signal	P10/C3
J12.2	J12.2	TC42 / DCF	Door close front signal	P10/C3
J12.3	J12.3	TC43 / DOLF	Door open limit front	P10/C2
J12.4	J12.4	TC44 / DCLF	Door close limit front	P10/C2
J12.5	J12.5	TC45 / PEF	Photo eye front	P10/C1
J13.1	J13.1	TC46 / DOR	Door open rear signal	P10/C4
J13.2	J13.2	TC47 / DCR	Door close rear signal	P10/C5
J13.3	J13.3	TC48 / DOLR	Door open limit rear	P10/C6
J13.4	J13.4	TC49 / DCLR	Door close limit rear	P10/C6
J13.5	J13.5	TC50 / PER	Photo eye rear	P10/C5
J14.1	J14.1	TC51 / P1FH	PH1 illuminated signal (fire hat)	P8/D7
J14.2	J14.2	TC52 / FON	PH1 ON output	P8/D1
J14.3	J14.3	TC53 / P2CC	Phase 2 sw CALL CANCEL	P8/D6
J14.4	J14.4	TC54 / P2H	Phase 2 sw HOLD	P8/D7
J14.5	J14.5	TC55 / P2O	Phase 2 sw ON	P8/D7
J6.5	J6.2	TC56 / RC	Retiring cam relay	P2/E3
J6.6	J6.1	TC57 / AL	Car light relay (timed)	P5/D1
J6.2	J6.4	WHT14	Neutral – car light circuit	P5/D6
J6.3	J6.5	BLK14.1	HOT – car light circuit	P5/D6
J6.1	J6.3	N3	Neutral – control circuit	P10/C8
J6.4	J6.6	BLK14.2	HOT – control circuit	P10/C8

17-2.5) Car Operating Panel

Cartop Terminal #	Symbol	Function	Dwg location
J18.8	ACC3	COP access enable (COM2)	P3/E1
J18.9	ACC4	COP access enable (N.O.2)	P3/G4
J19.1	CIO	COP access enable (N.C.1)	P7/E1
J19.2	CT1A	COP access enable (COM1)	P7/G1
J19.3	ACC	COP access enable (N.O.1)	P7/E2
J15.1	CS1	In Car Stop SW	P3/F3
J15.2	CS2	In Car Stop SW	P3/F4
J17.1	Y4	Position indicator	P6/E4
J17.2	Y3	Position indicator	P6/E5
J17.3	Y2	Position indicator	P6/E5
J17.4	Y1	Position indicator	P6/E5
J17.5	+24	24vdc for PI	P6/G6
J17.6	REF	0vdc for PI	P6/G5
J16.1	DIG	Direction indicator gong	P6/E6
J16.2	DIU	Direction indicator up	P6/E6
J16.3	DID	Direction indicator down	P6/E7
J16.4	EL	Emergency light	P6/E7
J16.5	+24	24vdc aux.	P6/G1
J16.6	REF	0vdc aux.	P6/G1
J20.1	BZ+	Alarm (+)	P8/F1
J20.2	BZ-	Alarm (-)	P8/F2
J18.7	AL	Alarm PB	P8/F2
J18.2	DCF	Door Close Front PB	P8/F2
J18.1	DOF	Door Open Front PB	P8/F3
J18.4	DCR	Door Close Rear PB	P83/F3
J18.3	DOR	Door Open Rear PB	P8/F3
J15.3	CC1	Car Call 1	P8/F4
J15.4	CC2	Car Call 2	P8/F4
J15.5	CC3	Car Call 3	P8/F5
J15.6	CC4	Car Call 4	P8/F5
J15.7	CC5	Car Call 5	P8/F5
J15.8	CC6	Car Call 6	P8/F6
J15.9	P2H	Phase II Fire HOLD	P8/F7
J15.10	P2O	Phase II Fire ON	P8/F7
J18.5	P2CC	Call Cancel PB	P8/F6
J18.6	P1FH	Fire Hat Indicator	P8/F7

17-2.6) Car Top

Cartop Terminal #	Symbol	Function	Dwg location
J34.2	SR1	Safety Slack SW	P3/E3
J34.1	SR2	Safety Slack SW	P3/E3
J33.2	CTS1	Cartop Stop SW	P3/F3
J33.1	CTS2	Cartop Stop SW	P3/F3
J32.2	GS1A	Gate SW 1	P3/F5
J32.1	GS1B	Gate SW 1	P3/F5
J31.2	GS2A	Gate SW 2	P3/F5
J31.1	GS2B	Gate SW 2	P3/E5
J35.1	UTL	Upper terminal limit	P4/E5
J35.2	LTL	Lower terminal limit	P4/E6
J35.3	TLC	Terminal limit common	P4/E7
J28.1	FBZ+	Fire Buzzer (+)	P6/F8
J28.2	FBZ-	Fire Buzzer (-)	P6/F8
J26.3	CT1	CT INS SW (COM)	P7/G1
J26.2	CT1B	CT INS SW (NORM)	P7/G1
J26.1	INS	CT INS SW (INSPECT)	P7/G2
J25.2	INS	Inspection Enable SW	P7/G2
J25.1	INS1	Inspection Enable SW	P7/G3
J24.2	INS1	Inspection Enable PB	P7/G3
J24.1	INS2	Inspection Enable PB	P7/G4
J23.2	INS2	Inspection Up PB	P7/G4
J23.1	INSU	Inspection Up PB	P7/G4
J22.2	INS2	Inspection Down PB	P7/G5
J22.1	INSD	Inspection Down PB	P7/E7
J21.2	INSU	Inspection Up Limit	P7/F4
J21.1	INSUL	Inspection Up Limit	P7/E4
J30.8	PEF	Photo Eye Front	P10/D1
J30.7	DCLF	Door Close Limit Front	P10/D2
J30.6	DOLF	Door Open Limit Front	P10/D2
J30.5	CLF	Front Door Control Close	P10/F2
J30.4	OPF	Front Door Control Open	P10/F2
J30.3	FCF	Front Door Control Nudge	P10/F3
J30.2	COMF	Front Door Control Com.	P10/F3
J30.1	+24	24vdc for F. Door Limits & Photo Eye	P10/G1
J29.8	PER	Photo Eye Rear	P10/D5
J29.7	DCLR	Door Close Limit Rear	P10/D6
J29.6	DOLR	Door Open Limit Rear	P10/D6
J29.5	CLR	Rear Door Control Close	P10/F6
J29.4	OPR	Rear Door Control Open	P10/F7
J29.3	FCR	Rear Door Control Nudge	P10/F7
J29.2	COMR	Rear Door Control Com.	P10/F7
J29.1	+24	24vdc for R. Door Limits & Photo Eye	P10/G5
J39.2	110V2	110vac for Door Operator(s)	P10/H4
J39.1	110N	Neutral for Door Operator(s)	P10/H4
J37.1	CLH	Car Light Hot	P5/F6
J37.2	CLN	Car Light Neutral	P5/F7
J36.1	CTH	Car Top Light & Reciptical Hot	P5/F6
J36.2	CTN	Car Top Light & Reciptical Neutral	P5/F5

17-2.7.1) HALL BUTTONS / DOOR LOCKS

Interface Terminal #	Symbol	Function	Dwg location
J15.1	DL1A	1st floor doorlock	P3/D5
J15.2	DL1B	1st floor doorlock	P3/E5
J15.3	REF	0vdc for 1st Floor	P9/F4
J15.4	+24	24vdc for 1st Floor	P9/F3
J15.5	UC1	1st floor up hall call	P9/D4
J16.1	DL2A	2nd floor doorlock	P3/E5
J16.2	DL2B	2nd floor doorlock	P3/D6
J16.3	REF	0vdc for 2nd Floor	P8/F4
J16.4	+24	24vdc for 2nd Floor	P9/F4
J16.5	UC2	2nd floor up hall call	P9/D4
J16.6	DC2	2nd floor down hall call	P9/D5
J17.1	DL3A	3rd floor doorlock	P3/D6
J17.2	DL3B	3rd floor doorlock	P3/E6
J17.3	REF	0vdc for 3rd Floor	P9/F5
J17.4	+24	24vdc for 3rd Floor	P9/F5
J17.5	UC3	3rd floor up hall call	P9/D5
J17.6	DC3	3rd floor down hall call	P9/D6
J18.1	DL4A	4th floor doorlock	P3/E6
J18.2	DL4B	4th floor doorlock	P3/D6
J18.3	REF	0vdc for 4th Floor	P9/F6
J18.4	+24	24vdc for 4th Floor	P9/F6
J18.5	UC4	4th floor up hall call	P9/D6
J18.6	DC4	4th floor down hall call	P9/D6
J19.1	DL5A	5th floor doorlock	P3/D7
J19.2	DL5B	5th floor doorlock	P3/D7
J19.3	REF	0vdc for 5th Floor	P9/F7
J19.4	+24	24vdc for 5th Floor	P9/F7
J19.5	UC5	5th floor up hall call	P9/D7
J19.6	DC5	5th floor down hall call	P9/D7
J20.1	DL6A	6th floor doorlock	P3/D8
J20.2	DL6B	6th floor doorlock	P3/D8
J20.3	REF	0vdc for 6th Floor	P9/F8
J20.4	+24	24vdc for 6th Floor	P9/F8
J20.5	DC6	6th floor down hall call	P9/D8

17-2.7.2) OTHER HOISTWAY

Interface Terminal #	Symbol	Function	Dwg location
J21.1	P1O	Phase1 switch ON	P9/D1
J21.2	P1R	Phase 1 switch RESET	P9/D1
J21.3	P1A	Designated level lobby detector (recalls to alt level)	P9/D2
J21.4	P1D	Other level(s) lobby detector(s) (recalls to designated level)	P9/D2
J21.5	P1AF	MR/hoistway detectors – (recalls to alt level)	P9/D3
J21.6	P1DF	MR/hoistway detectors – (recalls to designated level)	P9/D3
J21.7	24V	24VDC	P9/G1
J21.8	REF	Reference (0VDC) Spare	P9/G1
J22.1	ACCUD	Upper hoistway access switches down	P7/D6
J22.2	ACCUU	Upper hoistway access switches up	P7/D5
J22.3	ACC5	Hoistway access switches feed	P7/D5
J22.4	ACU2	Upper hoistway access switch upper doorlock bypass	P3/D8
J22.5	ACU1	Upper hoistway access switch upper doorlock bypass	P3/D7
J23.1	HSL2	High speed limit	P4/D7
J23.2	HSL1	High speed limit	P4/D8
J23.3	PS2	Pit switch	P3/D1
J23.4	PS1	Pit switch	P3/D1
J29.1	Y1	Position indicator binary 1 for Hall PI(s)	P6/C5
J29.2	Y2	Position indicator binary 2 for Hall PI(s)	P6/C5
J29.3	Y3	Position indicator binary 3 for Hall PI(s)	P6/C5
J5.1	ACCLD	Lower hoistway access switch down	P7/D7
J5.2	ACCLU	Lower hoistway access switch up	P7/D6
J5.3	ACL2	Lower hoistway access switch lower doorlock bypass	P3/D5
J5.4	ACL1	Lower hoistway access switch lower doorlock bypass	P3/D5

17-3) GROUNDING THE SYSTEM

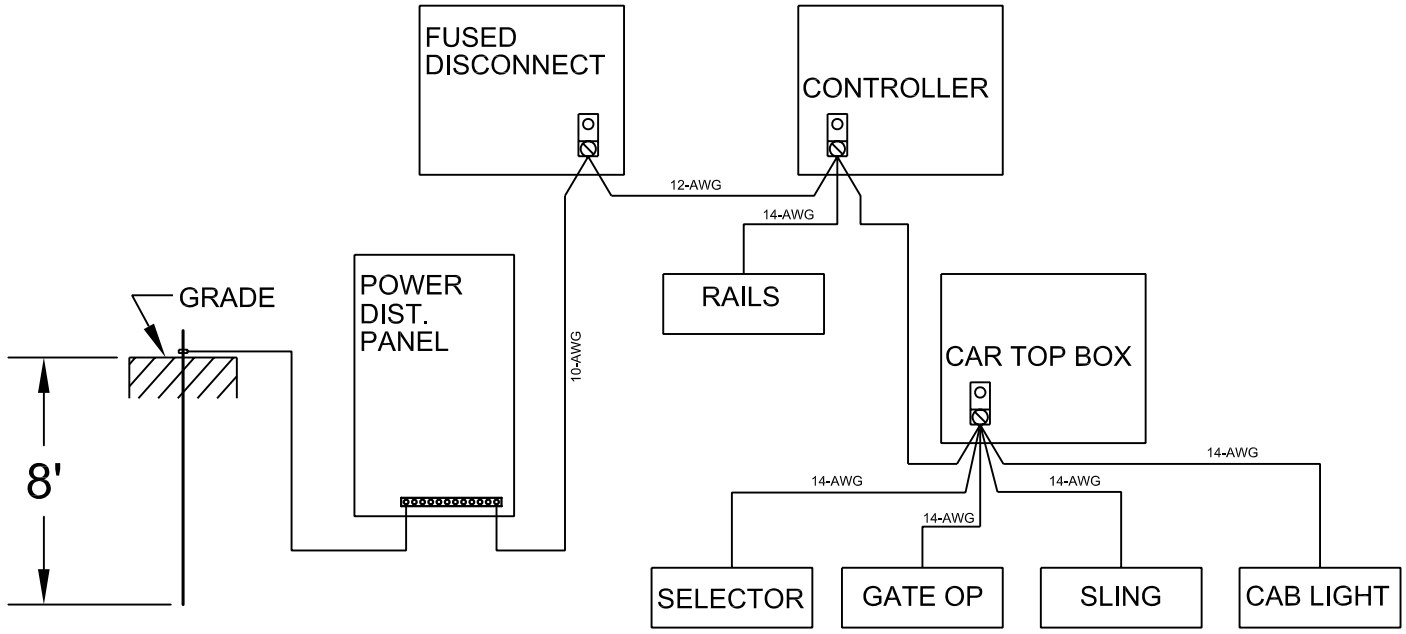
It is often reported that the elevator has stopped operating after a storm. The reason for this is transient currents. These transient currents are caused by any of the following:

* Improper grounding of the building
* Improper or nonexistent grounding of the elevator system

The following links are being provided for an in-depth explanation of grounding and bonding:

<https://www.engineereducators.com/docs/groundingandbonding2-2.pdf>
<http://www.pfeiffereng.com/Principals%20of%20Electrical%20Grounding.pdf>

The following is a representation of a properly Grounded / Bonded residential elevator system:



Note: All Ground wires must be stranded wire

LIGHTNING PROTECTION

There is no product available that will fully protect any electrical system from the effects of a lightning strike. Many field technicians have reported positive results when using a "Lightning Arrestor" with a "Surge Capacitor". These two components are to be connected directly to the elevator controller for maximum protection.

The combination that has been reported to have a positive effect is manufactured by Delta Lightning Arrestors, Inc. The part numbers are as follows:
Lightning Arrestor: LA302G
Surge Capacitor: CA302RG

17-4) MINIMIZING RE-LEVELING

Overview: The elevator should not re-level when a person steps into the cab.

Procedure:

1. Adjust valve to achieve your preferred ride quality
   (i.e. UP / DN acceleration, deceleration, leveling speeds and DN full speed)

2. Place Selector magnets in their approximate vertical location(s) on the selector tape.

3. Run car in normal mode in both directions
   a. Verify that car does not overshoot the floor. If this occurs further valve adjustment(s) is necessary

4. Move selector magnets to their final vertical position.
   a. Scribe a line on the selector tape at the bottom of the Zone magnet (11") at all floors.
   b. Verify that car stops at floor level at all floors in both directions.

   Note: At this point there is virtually no "dead zone". The slightest rope stretch due to loading or cooling of the oil will induce a re-level condition.

5. Cut ¾" off of the TOP of the Zone magnet (11") at every floor.

   Note: The car will now stop below the floor when running UP.

6. Using the P-Tool, go to programming parameter "SOFT STOP DELAY"
   a. Set this parameter to 10
   b. Cause a re-level by opening manual lowering on valve
   c. After relevel is complete, Increment this parameter by 10
   d. Repeat steps "b" & "c" until selector input "LD" comes on and the car levels back down to the floor, then proceed to step 6.e.
   e. Decrease this parameter by 5.
   f. Cause a re-level by opening manual lowering on valve, "LD" should not activate.
      - If LD still activates, decrease this parameter by 5.

18-1) IDENTIFYING THE SOFTWARE VERSION:

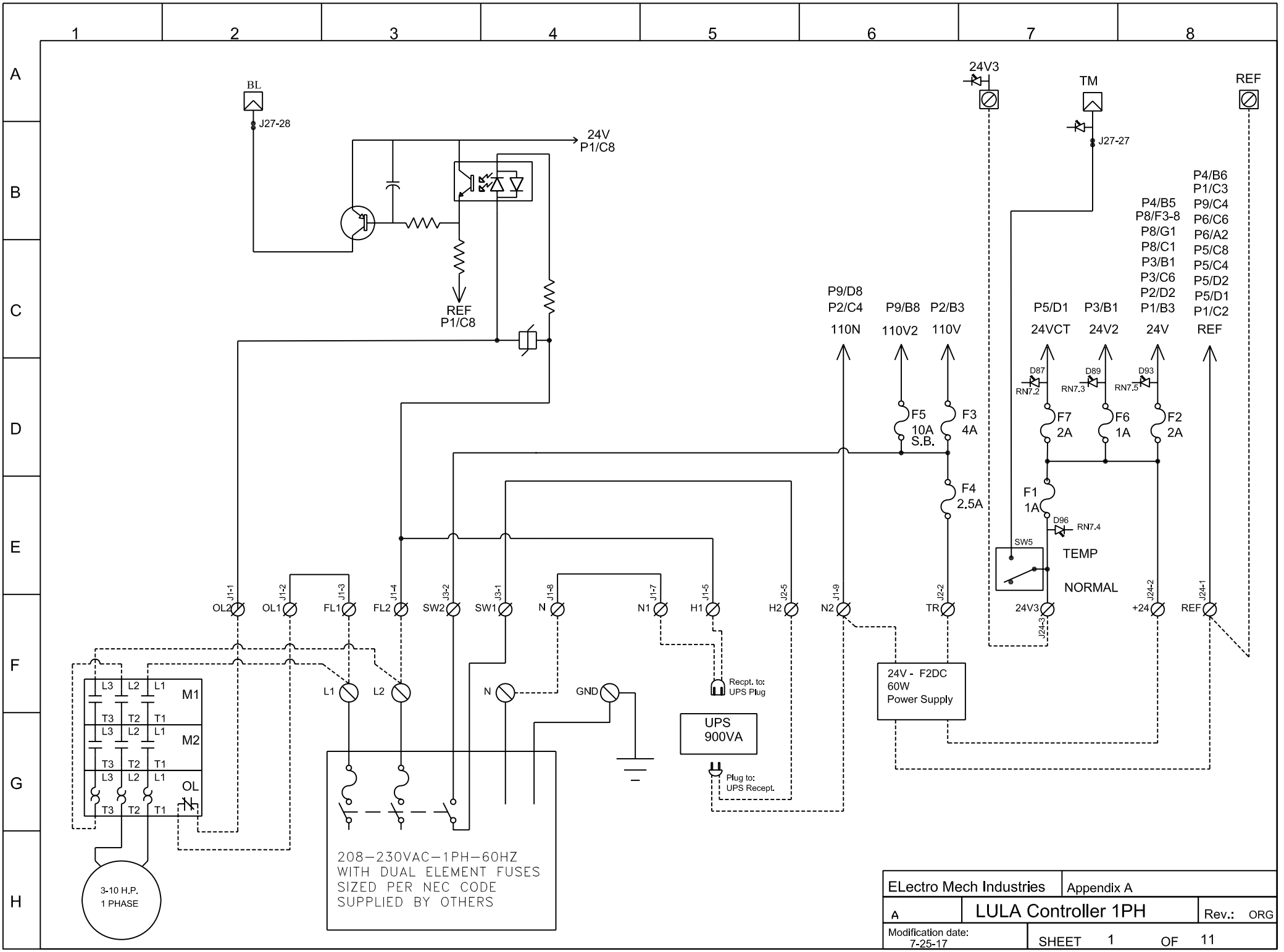
Periodically we enhance or add features to the operational software. If you call for assistance on a unit, you may be asked to identify the software on your unit.

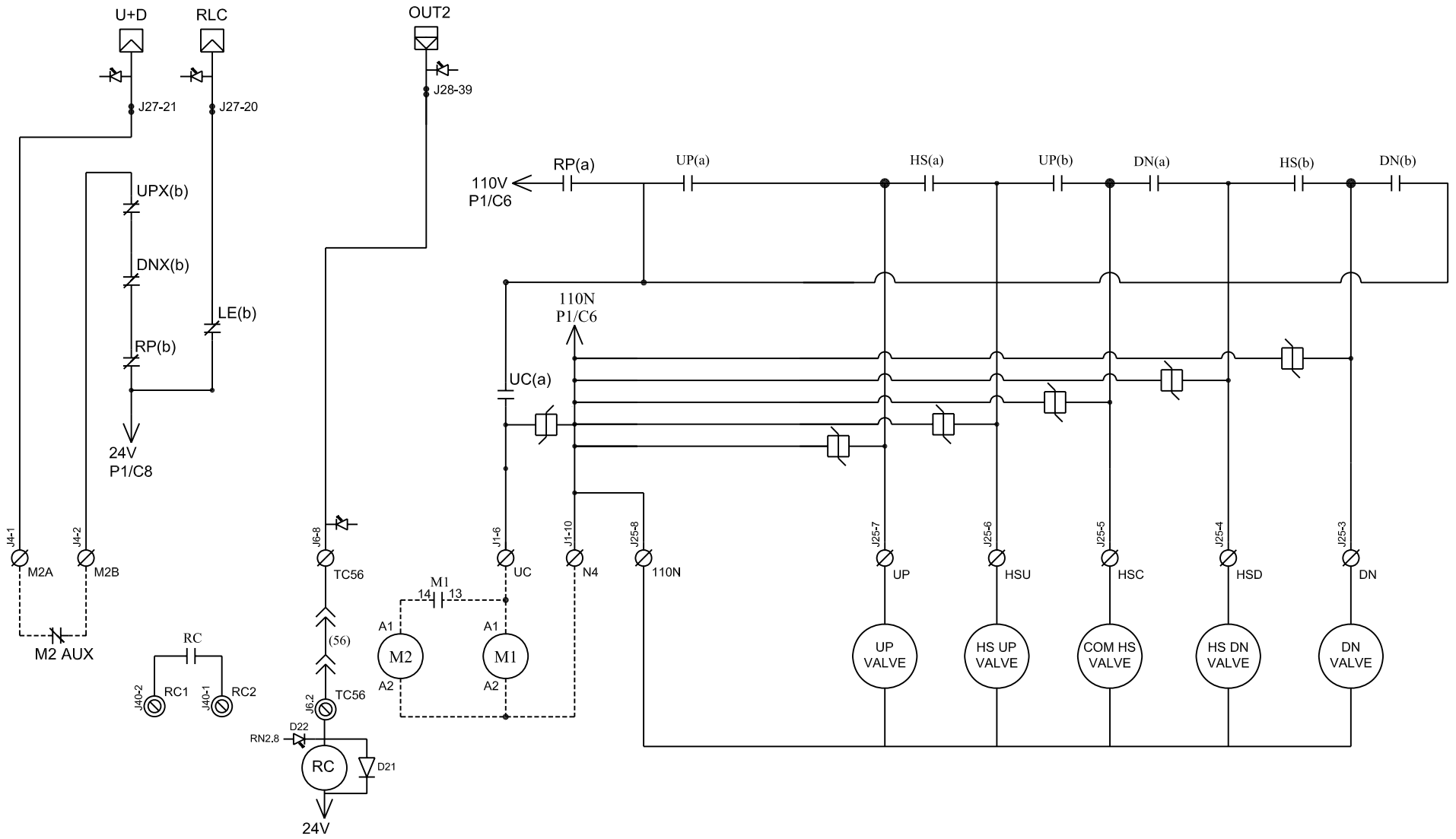
There are two ways to indentify your software:

1. The software version is written on the 28 pin PIC.
2. Perform a reset by pressing the star key and read the version that shows on the upper right side of the display. You will see a “V” followed by an identifier (1.3, 1.4 etc.)

18-2) SOFTWARE ENHANCEMENTS:

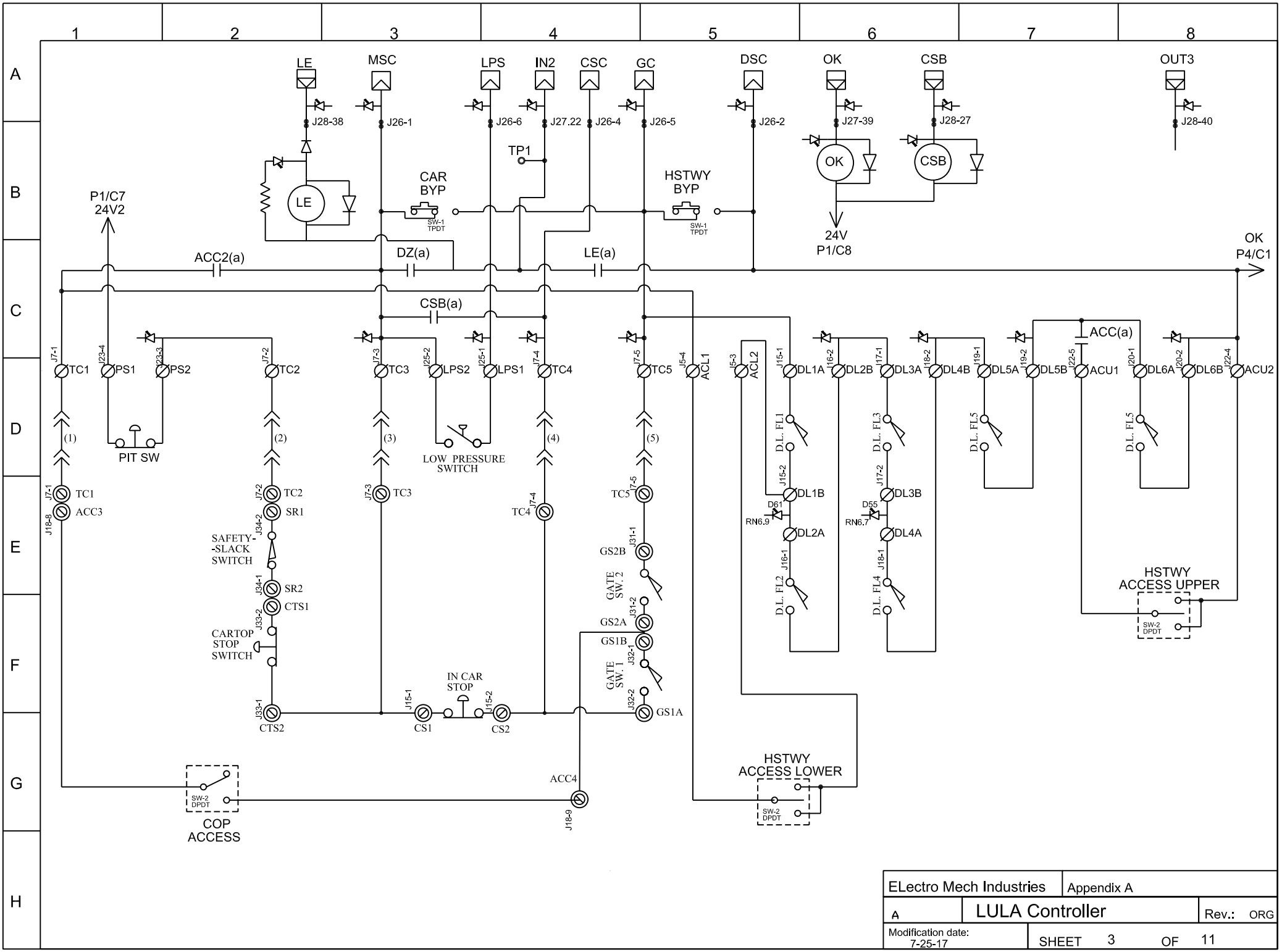
Ver 1: Original software dated _____


BL
J27-28
24V
P1/C8
REF
P1/C8
24V3
TM
J27-27
REF
P4/B6
P1/C3
P9/C4
P6/C6
P6/A2
P5/C8
P5/C4
P5/D2
P5/D1
P1/C2
P4/B5
P8/F3-8
P8/G1
P8/C1
P3/B1
P3/C6
P2/D2
P1/B3
P9/D8
P2/C4
110N
P9/B8
110V2
P2/B3
110V
P5/D1
24VCT
P3/B1
24V2
24V
REF
D87
RN7.2
D89
RN7.3
D93
RN7.5
F5
10A
S.B.
F3
4A
F7
2A
F6
1A
F2
2A
F4
2.5A
F1
1A
D96
RN7.4
SW5
TEMP
NORMAL
J1-1
OL2
J1-2
OL1
J1-3
FL1
J1-4
FL2
J3-2
SW2
J3-1
SW1
J1-8
N
J1-7
N1
J1-5
H1
J2-5
H2
J1-9
N2
J2-2
TR
24V3
J24-3
J24-2
+24
J24-1
REF
L3
L2
L1
M1
T3
T2
T1
M2
OL
3-10 H.P.
1 PHASE
L1
L2
N
GND
Recpt. to:
UPS Plug
UPS
900VA
Plug to:
UPS Recept.
24V - F2DC
60W
Power Supply
208–230VAC–1PH–60HZ
WITH DUAL ELEMENT FUSES
SIZED PER NEC CODE
SUPPLIED BY OTHERS
ELectro Mech Industries
Appendix A
A
LULA Controller 1PH
Rev.: ORG
Modification date:
7-25-17
SHEET 1 OF 11

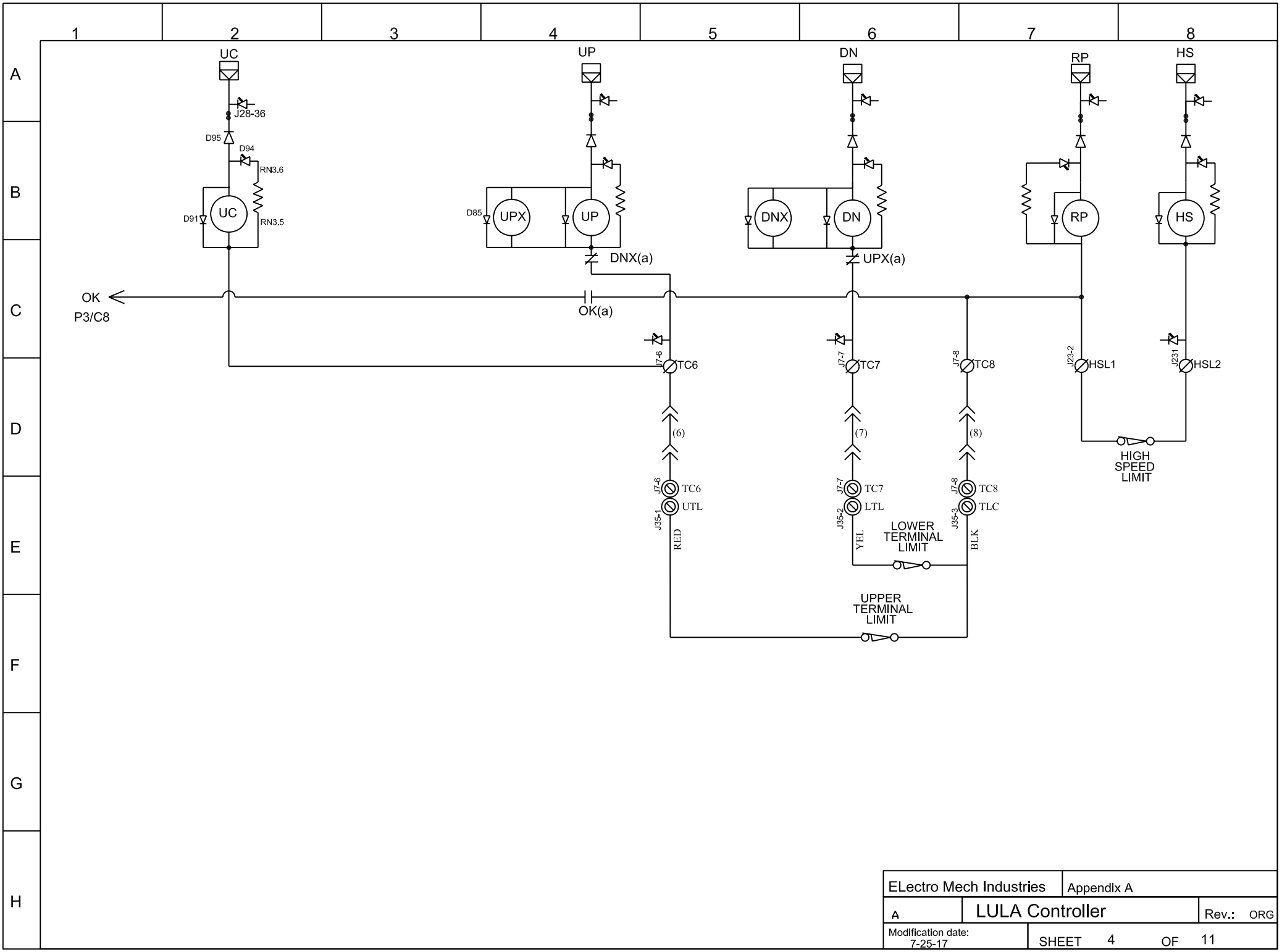


Controller	Blain EV	CEMCO	GMV	MINI MAX
UP	A	NONE	VMPS	US
UP HS	B	ULS	NONE	NONE
COM HS	NONE	NONE	VML	HS
DN HS	C	DMS	NONE	NONE
DN	D	DLS	VMD	DL

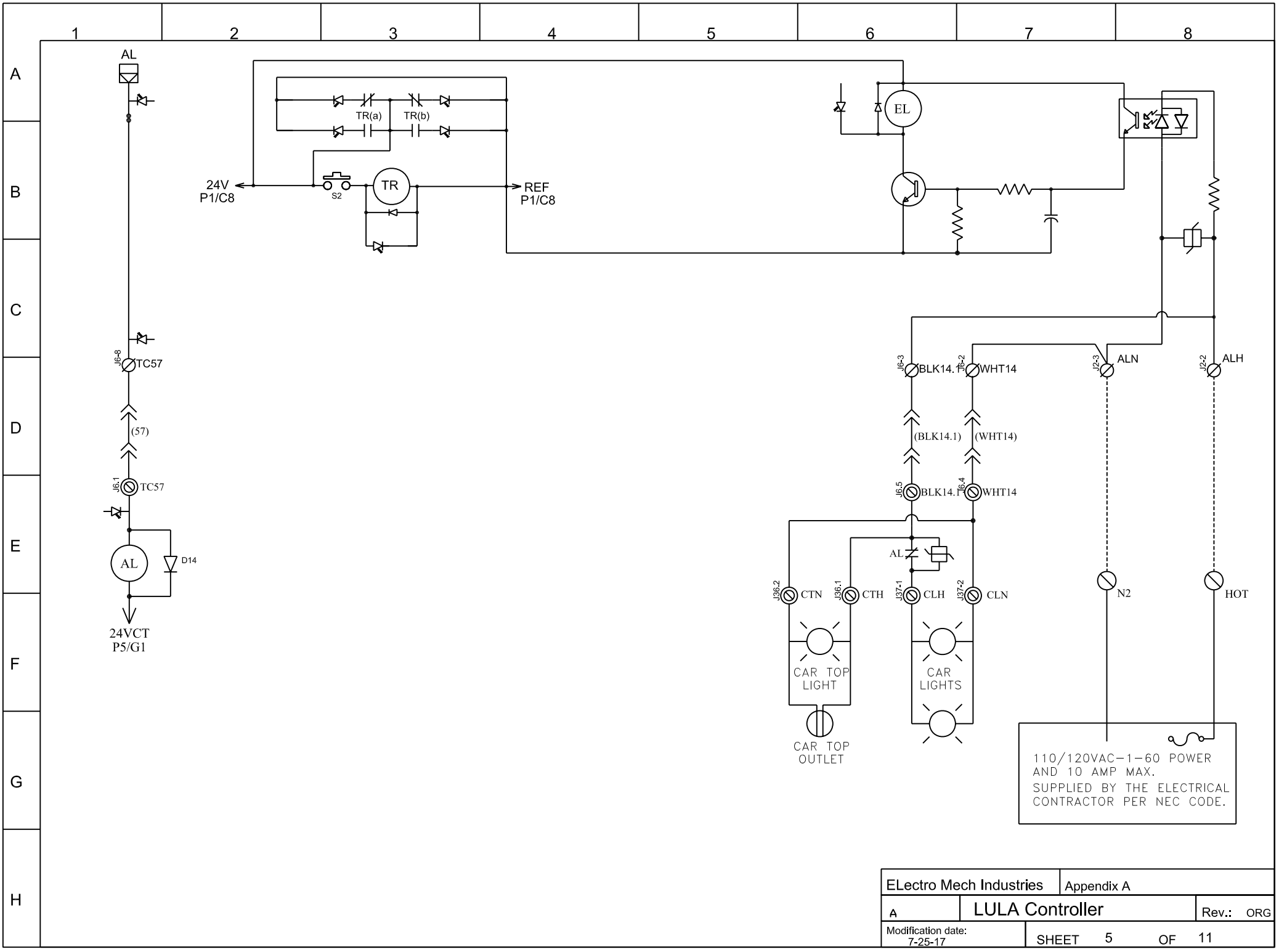
ELectro Mech Industries	Appendix A	
A	LULA Controller 1PH	Rev.: ORG
Modification date: 7-25-17	SHEET 2 OF 11	



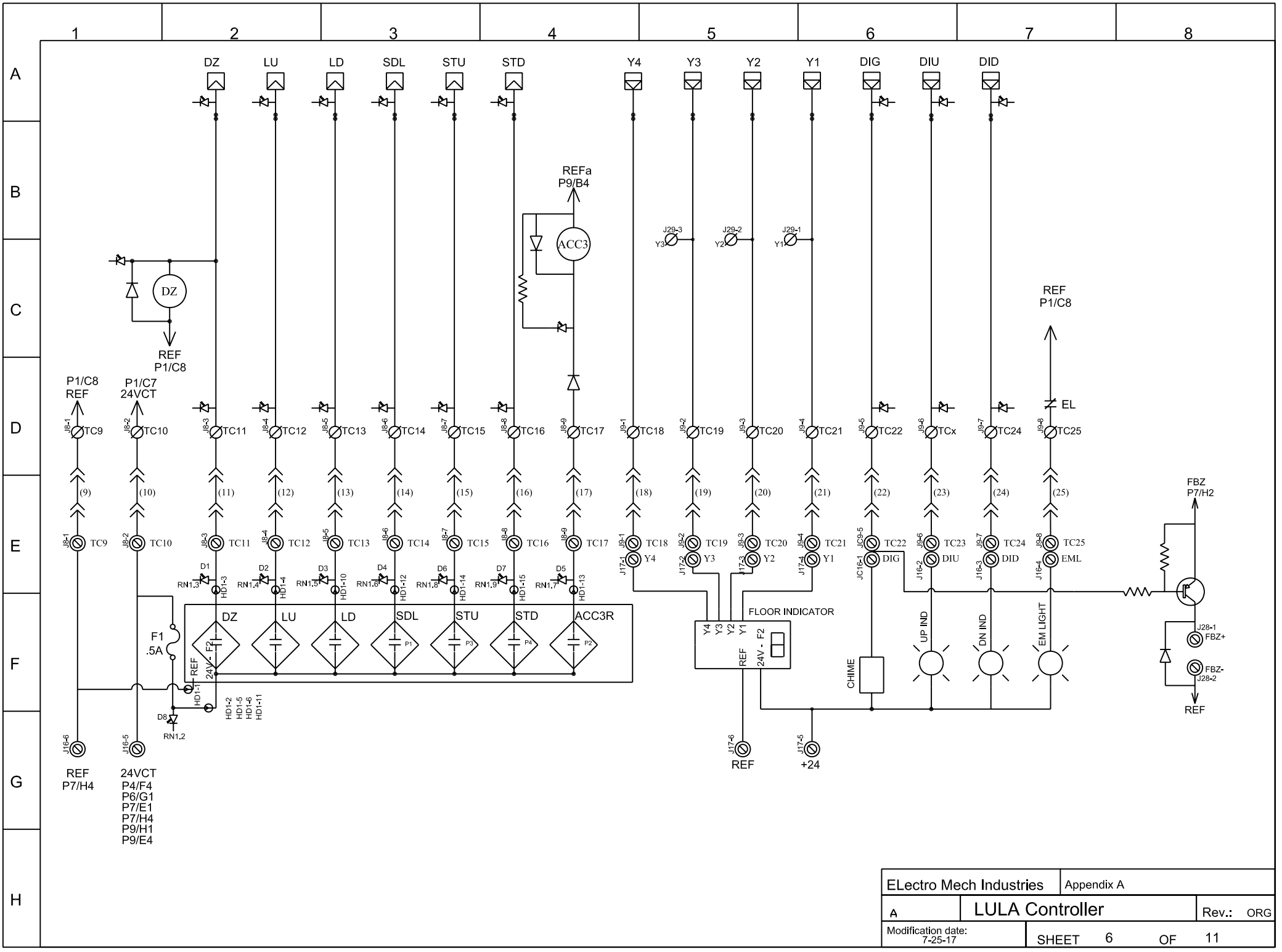
ELectro Mech Industries	Appendix A	
A	LULA Controller	Rev.: ORG
Modification date: 7-25-17	SHEET 3 OF 11	



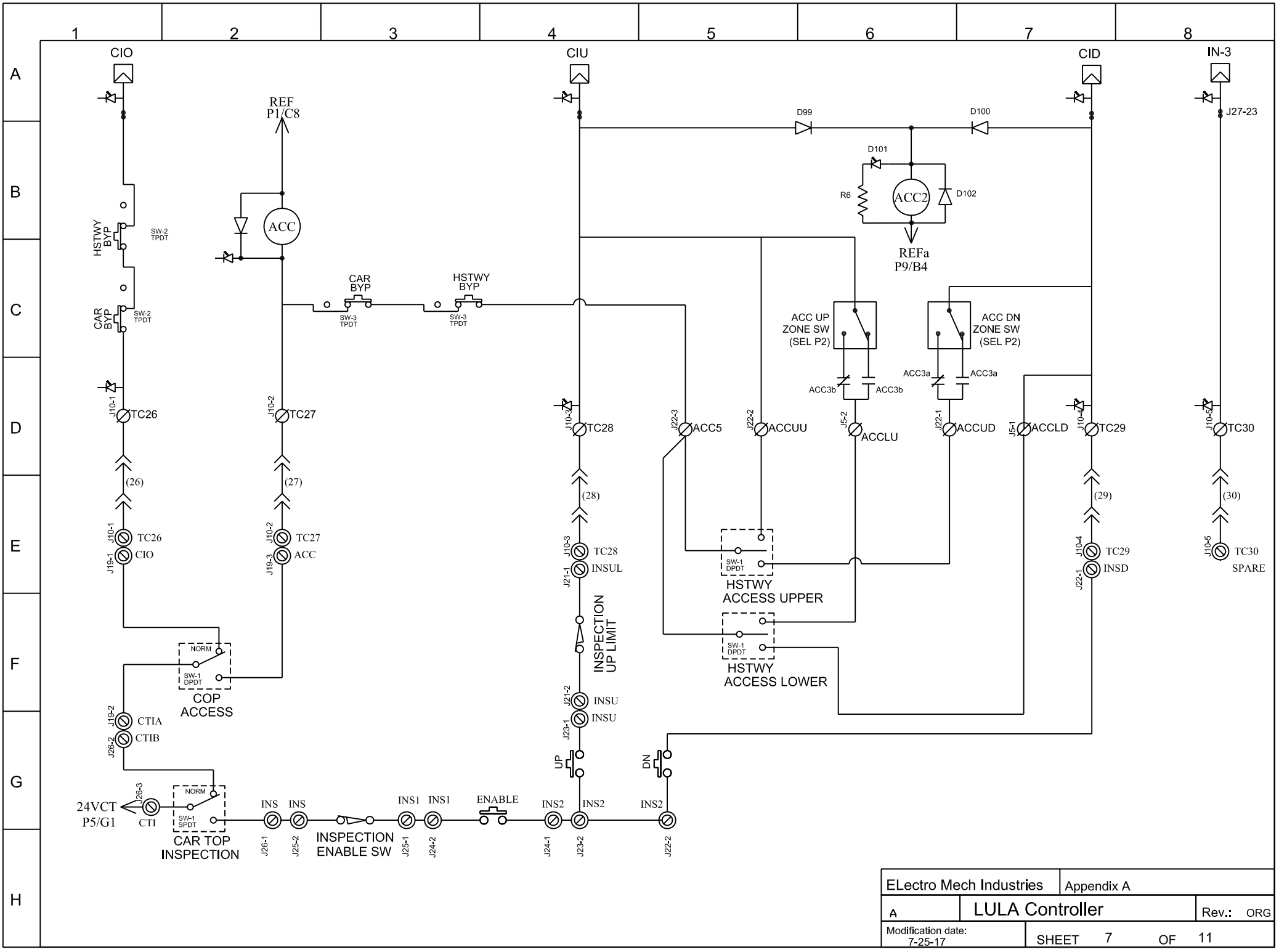
ELectro Mech Industries	Appendix A	
A	LULA Controller	Rev.: ORG
Modification date: 7-25-17	SHEET 4 OF 11	



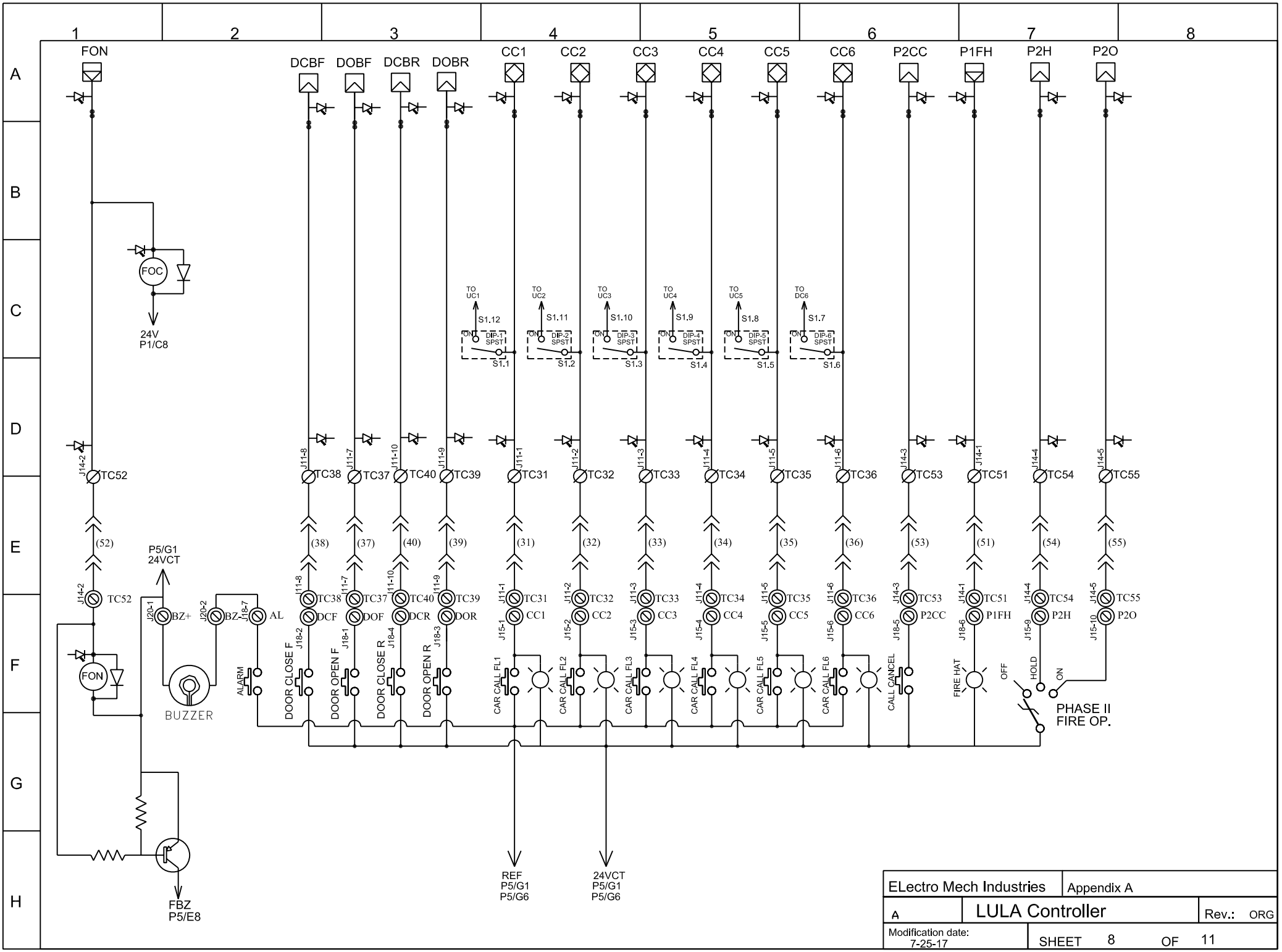
ELectro Mech Industries	Appendix A	
A	LULA Controller	Rev.: ORG
Modification date: 7-25-17	SHEET 5 OF 11	



ELectro Mech Industries	Appendix A	
A	LULA Controller	Rev.: ORG
Modification date: 7-25-17	SHEET 6 OF 11	



ELectro Mech Industries	Appendix A	
A	LULA Controller	Rev.: ORG
Modification date: 7-25-17	SHEET 7 OF 11	


1
2
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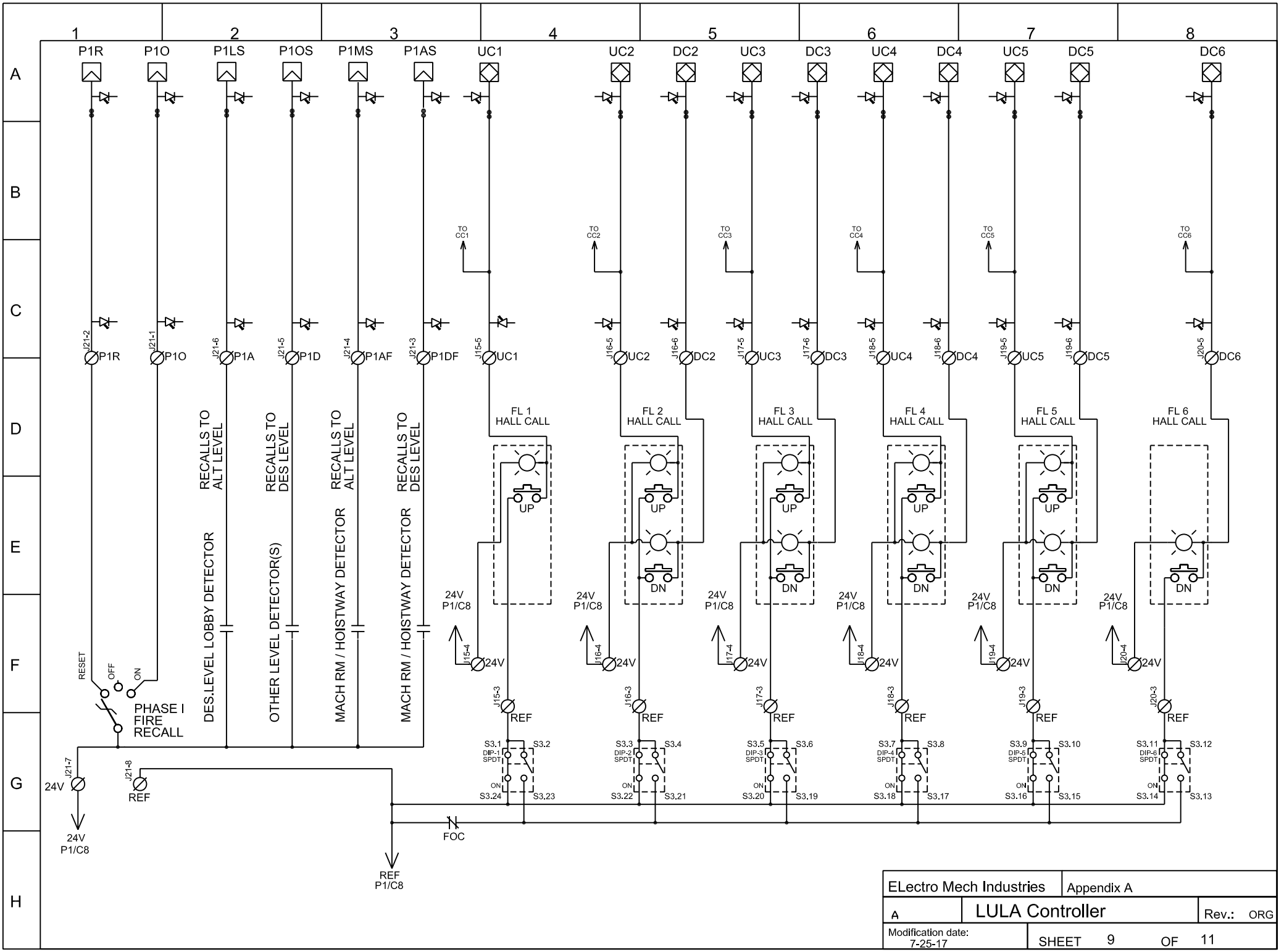
6
7
8
A
B
C
D
E
F
G
H
FON
DCBF
DOBF
DCBR
DOBR
CC1
CC2
CC3
CC4
CC5
CC6
P2CC
P1FH
P2H
P2O
FOC
24V
P1/C8
TO UC1
TO UC2
TO UC3
TO UC4
TO UC5
TO DC6
S1.12
S1.11
S1.10
S1.9
S1.8
S1.7
DIP-1 SPST
DIP-2 SPST
DIP-3 SPST
DIP-4 SPST
DIP-5 SPST
DIP-6 SPST
ON
S1.1
S1.2
S1.3
S1.4
S1.5
S1.6
J14-2
TC52
J11-8
TC38
J11-7
TC37
J11-10
TC40
J11-9
TC39
J11-1
TC31
J11-2
TC32
J11-3
TC33
J11-4
TC34
J11-5
TC35
J11-6
TC36
J14-3
TC53
J14-1
TC51
J14-4
TC54
J14-5
TC55
(52)
(38)
(37)
(40)
(39)
(31)
(32)
(33)
(34)
(35)
(36)
(53)
(51)
(54)
(55)
P5/G1
24VCT
J20-1
BZ+
J20-2
BZ-
J18-7
AL
DCF
DOF
DCR
DOR
CC1
CC2
CC3
CC4
CC5
CC6
P2CC
P1FH
P2H
P2O
J18-2
J18-1
J18-4
J18-3
J15-1
J15-2
J15-3
J15-4
J15-5
J15-6
J18-5
J18-6
J15-9
J15-10
FON
BUZZER
ALARM
DOOR CLOSE F
DOOR OPEN F
DOOR CLOSE R
DOOR OPEN R
CAR CALL FL1
CAR CALL FL2
CAR CALL FL3
CAR CALL FL4
CAR CALL FL5
CAR CALL FL6
CALL CANCEL
FIRE HAT
OFF
HOLD
ON
PHASE II
FIRE OP.
FBZ
P5/E8
REF
P5/G1
P5/G6
24VCT
P5/G1
P5/G6
ELectro Mech Industries
Appendix A
A
LULA Controller
Rev.: ORG
Modification date:
7-25-17
SHEET 8 OF 11


1
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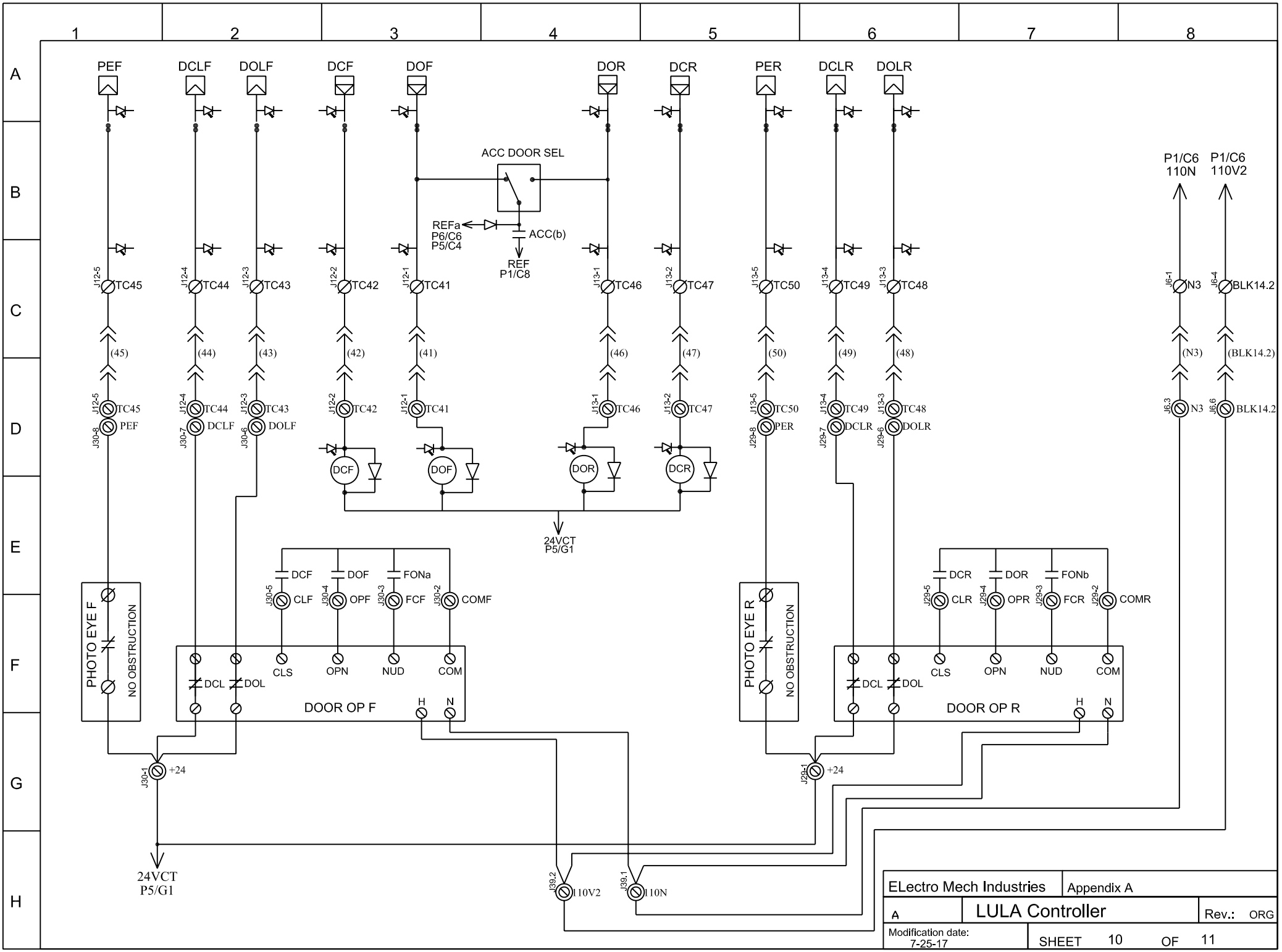
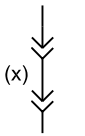
A
B
C
D
E
F
G
H
P1R
P1O
P1LS
P1OS
P1MS
P1AS
UC1
UC2
DC2
UC3
DC3
UC4
DC4
UC5
DC5
DC6
TO CC1
TO CC2
TO CC3
TO CC4
TO CC5
TO CC6
J21-2 P1R
J21-1 P1O
J21-6 P1A
J21-5 P1D
J21-4 P1AF
J21-3 P1DF
J15-5 UC1
J16-5 UC2
J16-6 DC2
J17-5 UC3
J17-6 DC3
J18-5 UC4
J18-6 DC4
J19-5 UC5
J19-6 DC5
J20-5 DC6
RECALLS TO ALT LEVEL
RECALLS TO DES LEVEL
RECALLS TO ALT LEVEL
RECALLS TO DES LEVEL
DES.LEVEL LOBBY DETECTOR
OTHER LEVEL DETECTOR(S)
MACH RM / HOISTWAY DETECTOR
MACH RM / HOISTWAY DETECTOR
FL 1 HALL CALL
FL 2 HALL CALL
FL 3 HALL CALL
FL 4 HALL CALL
FL 5 HALL CALL
FL 6 HALL CALL
UP
DN
24V P1/C8
J15-4 24V
J16-4 24V
J17-4 24V
J18-4 24V
J19-4 24V
J20-4 24V
J15-3 REF
J16-3 REF
J17-3 REF
J18-3 REF
J19-3 REF
J20-3 REF
S3.1 S3.2 DIP-1 SPDT ON S3.24 S3.23
S3.3 S3.4 DIP-2 SPDT ON S3.22 S3.21
S3.5 S3.6 DIP-3 SPDT ON S3.20 S3.19
S3.7 S3.8 DIP-4 SPDT ON S3.18 S3.17
S3.9 S3.10 DIP-5 SPDT ON S3.16 S3.15
S3.11 S3.12 DIP-6 SPDT ON S3.14 S3.13
RESET
OFF
ON
PHASE I FIRE RECALL
J21-7 24V
J21-8 REF
24V P1/C8
REF P1/C8
FOC
ELectro Mech Industries
Appendix A
A
LULA Controller
Rev.: ORG
Modification date: 7-25-17
SHEET 9 OF 11


PEF
DCLF
DOLF
DCF
DOF
DOR
DCR
PER
DCLR
DOLR
ACC DOOR SEL
REFa
P6/C6
P5/C4
ACC(b)
REF
P1/C8
P1/C6
110N
P1/C6
110V2
J12-5 TC45
J12-4 TC44
J12-3 TC43
J12-2 TC42
J12-1 TC41
J13-1 TC46
J13-2 TC47
J13-5 TC50
J13-4 TC49
J13-3 TC48
J6-1 N3
J6-4 BLK14.2
(45)
(44)
(43)
(42)
(41)
(46)
(47)
(50)
(49)
(48)
(N3)
(BLK14.2)
J30-8 PEF
J30-7 DCLF
J30-6 DOLF
J29-8 PER
J29-7 DCLR
J29-6 DOLR
J6-3 N3
J6-6 BLK14.2
DCF
DOF
DOR
DCR
24VCT
P5/G1
DCF
DOF
FONa
DCR
DOR
FONb
J30-5 CLF
J30-4 OPF
J30-3 FCF
J30-2 COMF
J29-5 CLR
J29-4 OPR
J29-3 FCR
J29-2 COMR
PHOTO EYE F
NO OBSTRUCTION
DCL
DOL
CLS
OPN
NUD
COM
DOOR OP F
H
N
PHOTO EYE R
NO OBSTRUCTION
DOOR OP R
J30-1 +24
J29-1 +24
24VCT
P5/G1
J39-2 110V2
J39-1 110N
ELectro Mech Industries
Appendix A
A
LULA Controller
Rev.: ORG
Modification date:
7-25-17
SHEET 10 OF 11

P1.G7 - PAGE ONE, AREA G7



TRAVELING CABLE
(x) = Cable #

COMPUTER BOARD POWER TERMINAL

COMPUTER BOARD INPUT

COMPUTER BOARD OUTPUT

COMPUTER BOARD TERMINAL, BIDERECTIONAL

COIL ON RELAY

N.O. RELAY CONTACT

N.C. RELAY CONTACT

CONTROLLER SCREW TERMINAL

INTERFACE TERMINAL

CAR TOP BOX TERMINAL

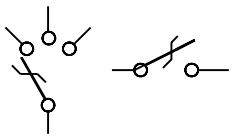
TOGGLE SWITCH

EMERGENCY SWITCH

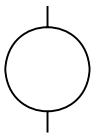
N.C. PRESSURE SWITCH

PUSHBUTTON

Slide Switch xPDT



KEYSWITCH



VALVE COIL

N.C. LIMIT SWITCH

HALL EFFECT SENSOR

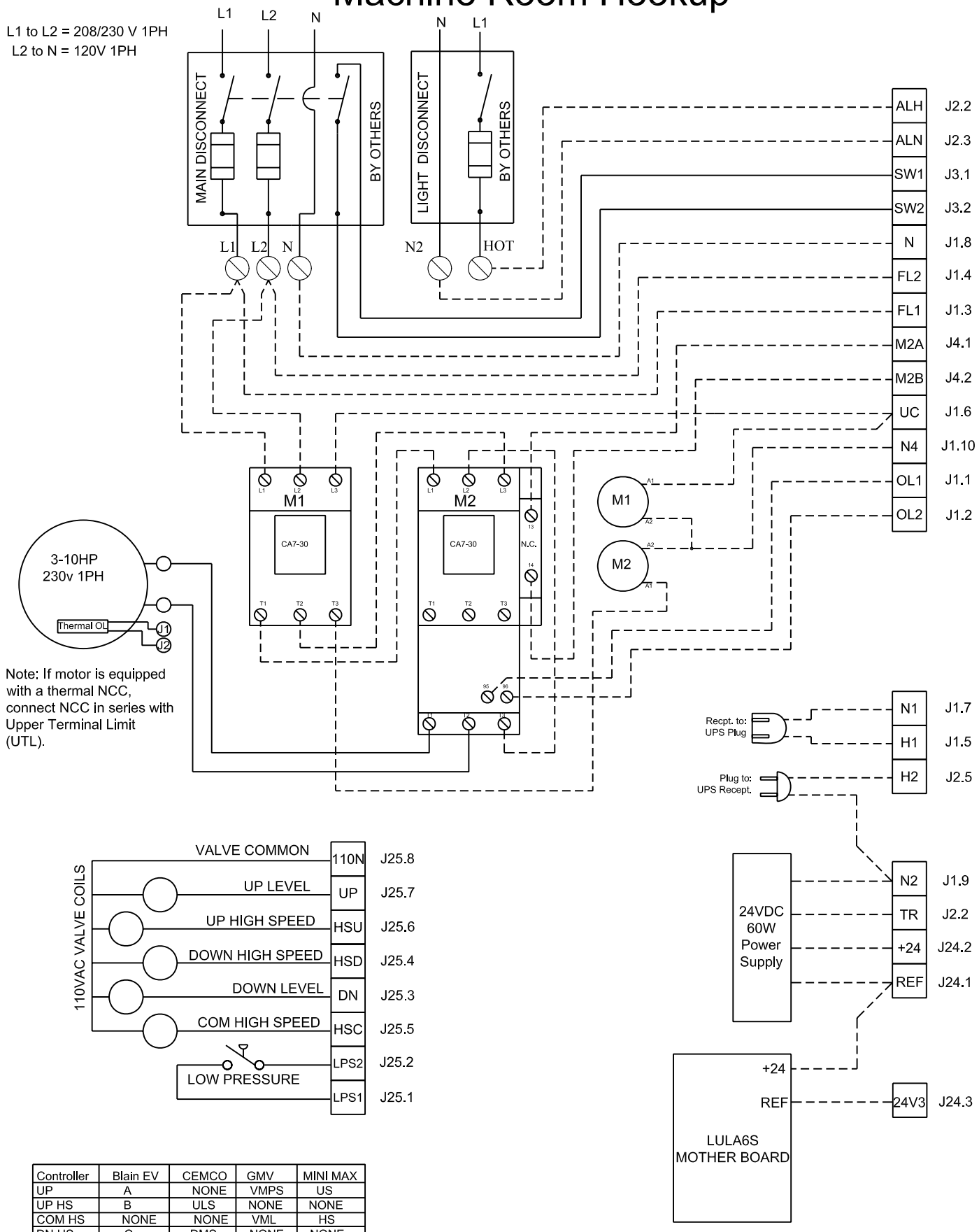
HOISTWAY CONNECTED WIRE

FACTORY CONNECTED WIRE

SELECTOR DB15F

ELectro Mech Industries	Appendix A	
A	LULA Controller	Rev.: ORG
Modification date: 7-25-17	SHEET 11 OF 11	

Machine Room Hookup



Controller	Blain EV	CEMCO	GMV	MINI MAX
UP	A	NONE	VMPS	US
UP HS	B	ULS	NONE	NONE
COM HS	NONE	NONE	VML	HS
DN HS	C	DMS	NONE	NONE
DN	D	DLS	VMD	DL

FIELD CONNECTED WIRE

FACTORY CONNECTED WIRE

AL1 = INTERFACE BOARD TERMINAL

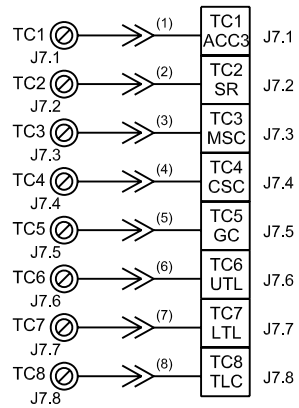
= CONTROLLER SCREW TERMINAL

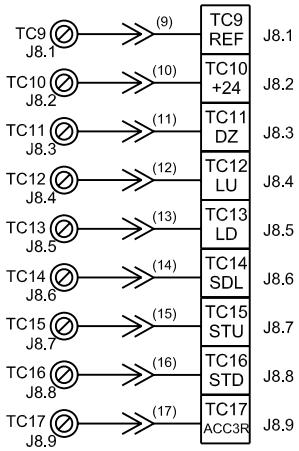
J10.2 = TERMINAL BLOCK 10, TERMINAL 2

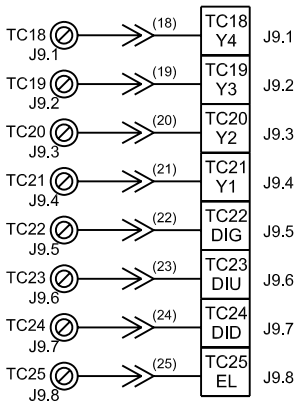
Hydro 3-10HP Dual Contactor (PN 6L2H)

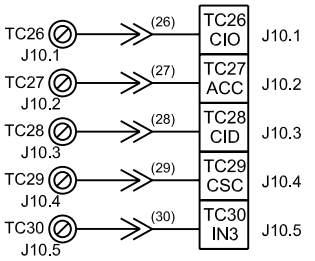
Electro-Mech Industries	Appendix B	
A	LULA controller MACHINE ROOM	Rev.:
Modification date: 1-24-17	SHEET 1 OF 5	

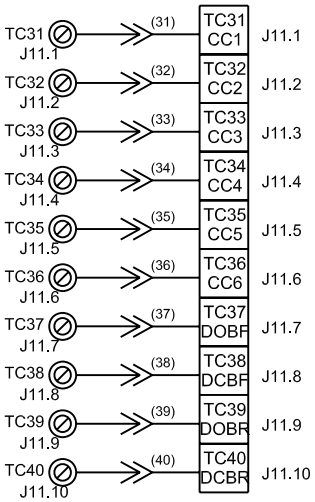
Travel Cable Hookup

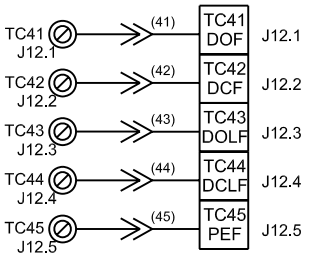


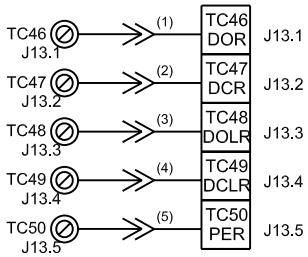


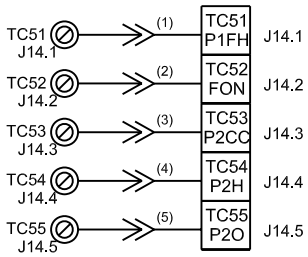


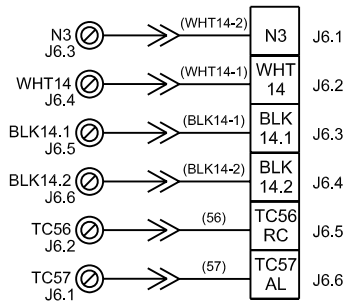












AL1 = INTERFACE BOARD TERMINAL

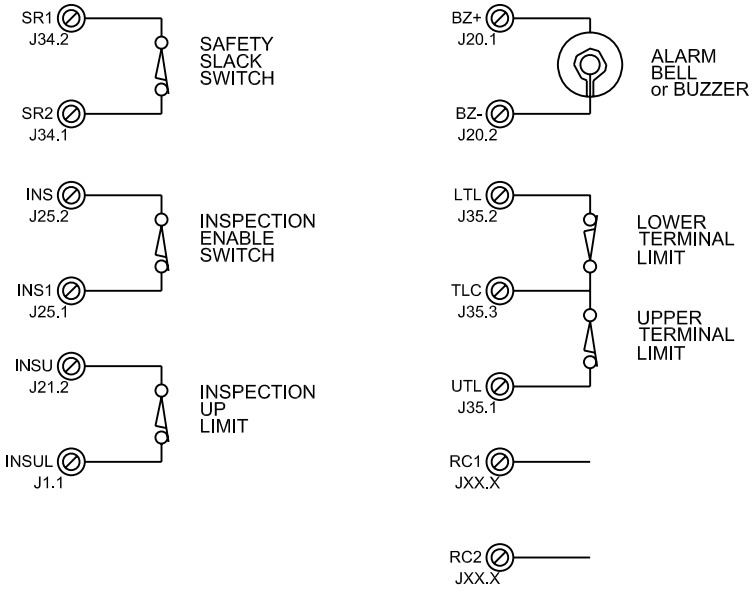
⊘ = EMI CAR TOP BOX TERMINAL

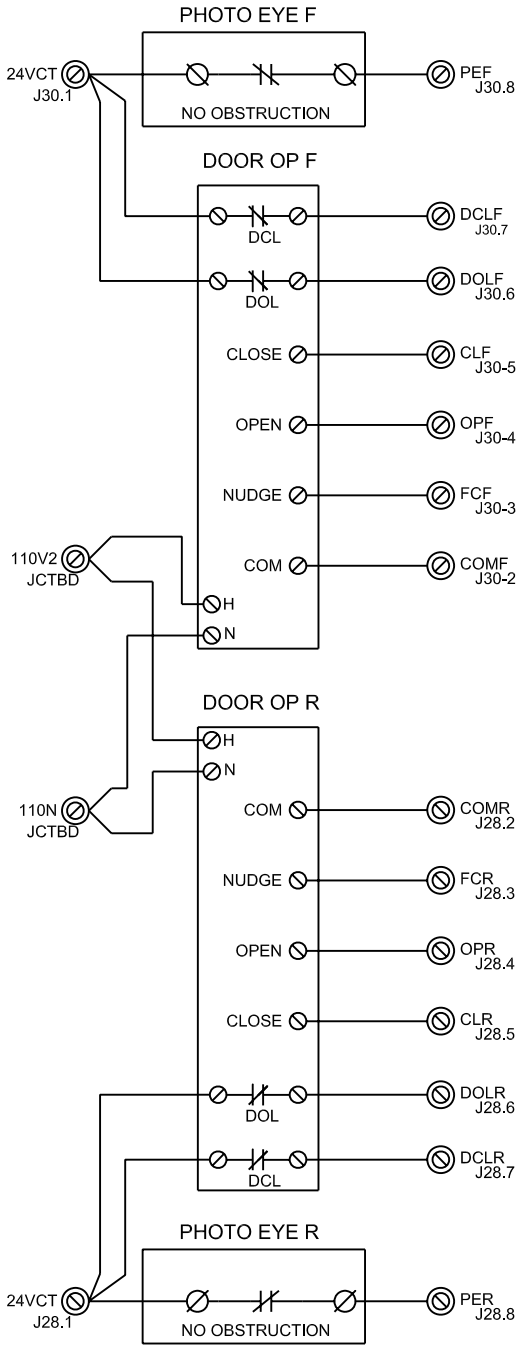
J10.2 = TERMINAL BLOCK 10, TERMINAL 2

PN: 6L2H

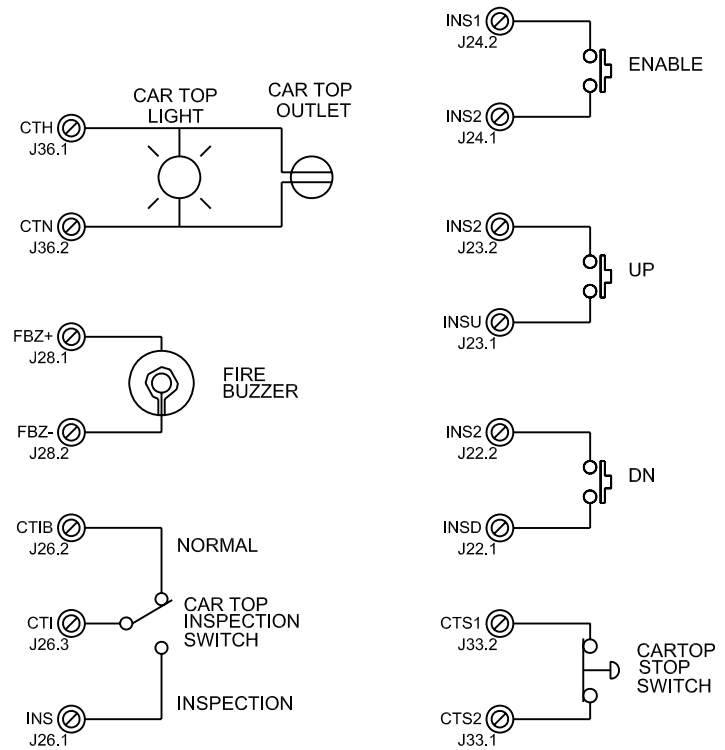
Electro-Mech Industries	Appendix B	
A	HOOK UP	Rev.: 1
Modification date: 1-27-17	SHEET 2	OF 5

Car Top Hookup

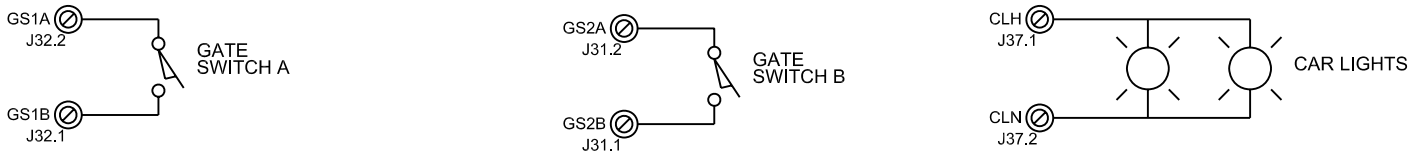




Car Top Inspection Station



Car Hookup



⊘ = EMI CAR TOP BOX TERMINAL

J10.2 = TERMINAL BLOCK 10, TERMINAL 2

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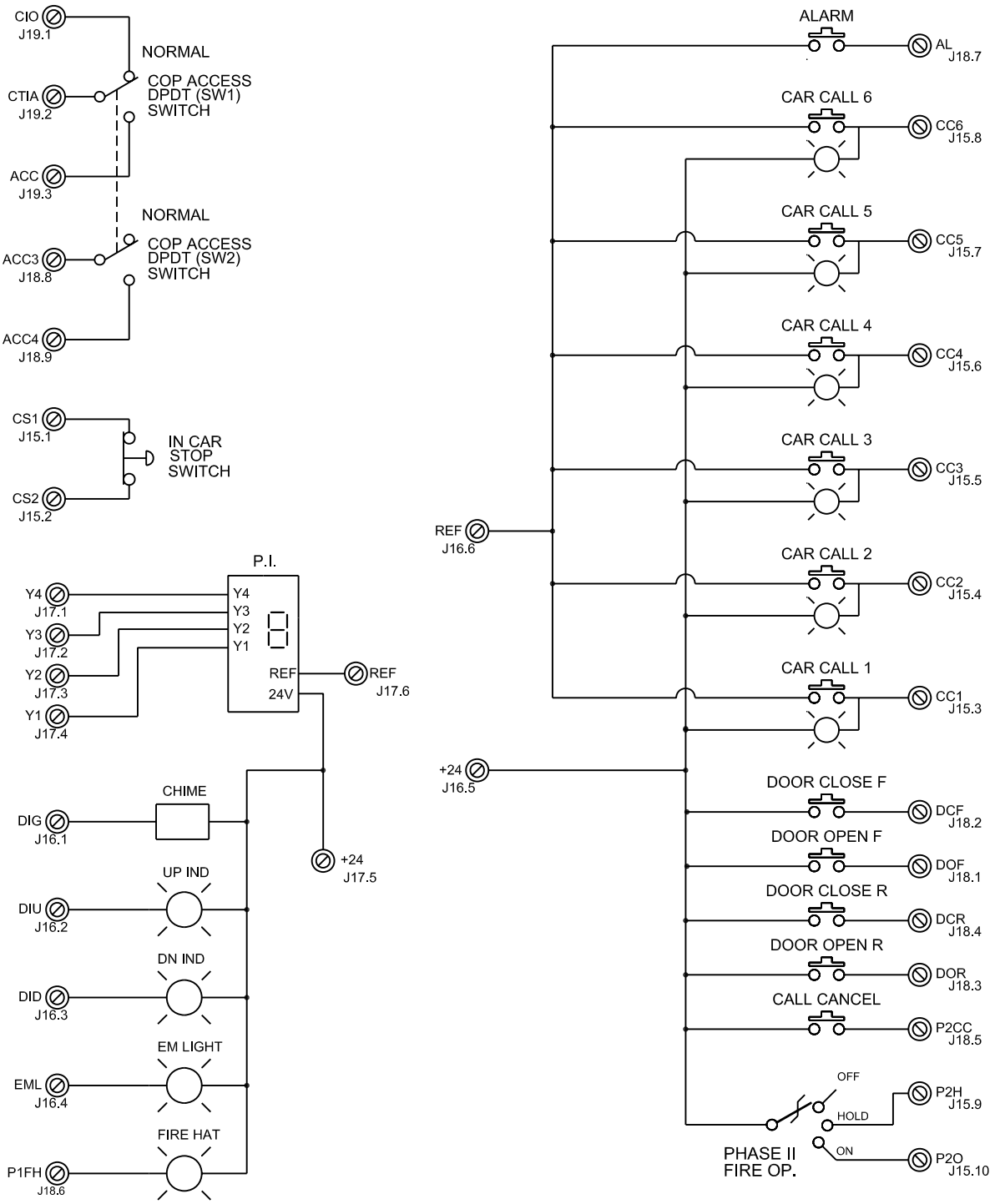
COP Hookup



⊘ = EMI CAR TOP BOX TERMINAL

J10.2 = TERMINAL BLOCK 10, TERMINAL 2

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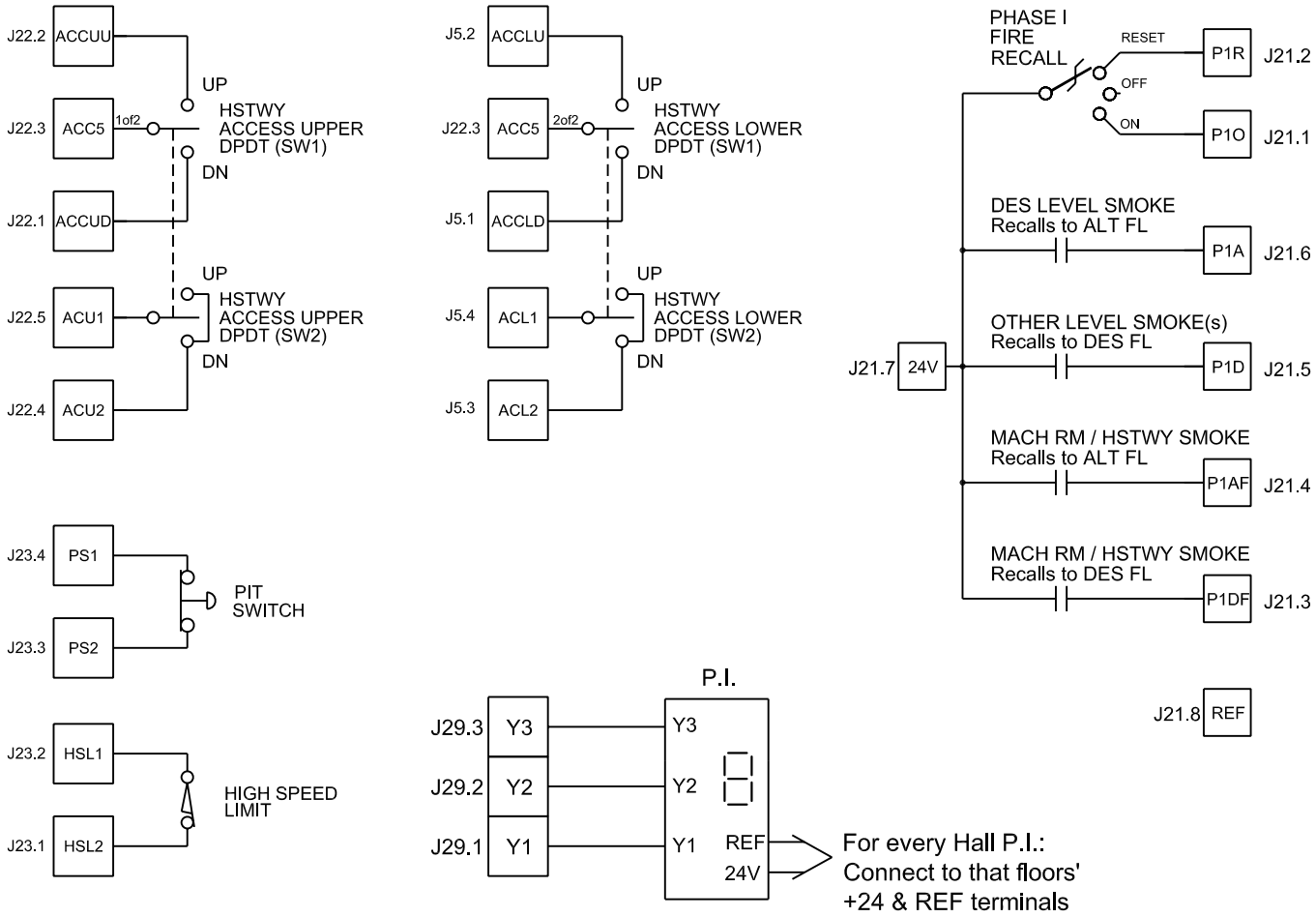
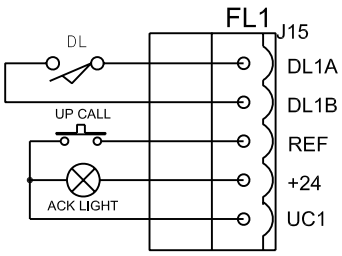
Hoistway Hookup



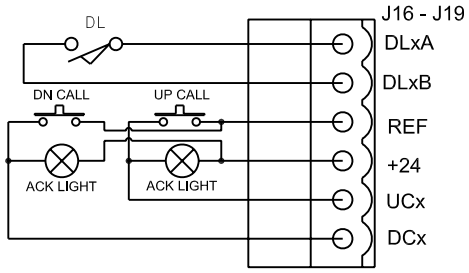
HALL STATION CONNECTIONS

LOWER TERMINAL FLOOR



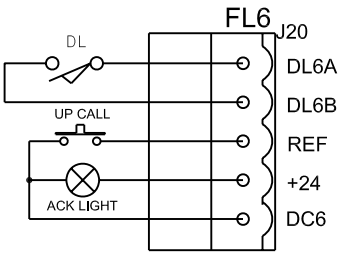
INTERMEDIATE FLOORS

FL2 - FL5



Notes:
1. If less than 6 stops, Jumper required from DLxA to DLxB for all intermidate floors not in use.
2. If using Automatic PB, connect hall call(s) to UCx

UPPER TERMINAL FLOOR



Notes:
1. The UTF MUST be connected to J20 Regardless as to the TTL number of Stops

AL1 = INTERFACE BOARD TERMINAL

J10.2 = TERMINAL BLOCK 10, TERMINAL 2

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