Elevator Systems Inc.

VVVF TRACTION ELEVATOR CONTROLLER

MODEL VF2KX

OPERATION MANUAL

MANUAL #D21.3001.B01 10/1/2014

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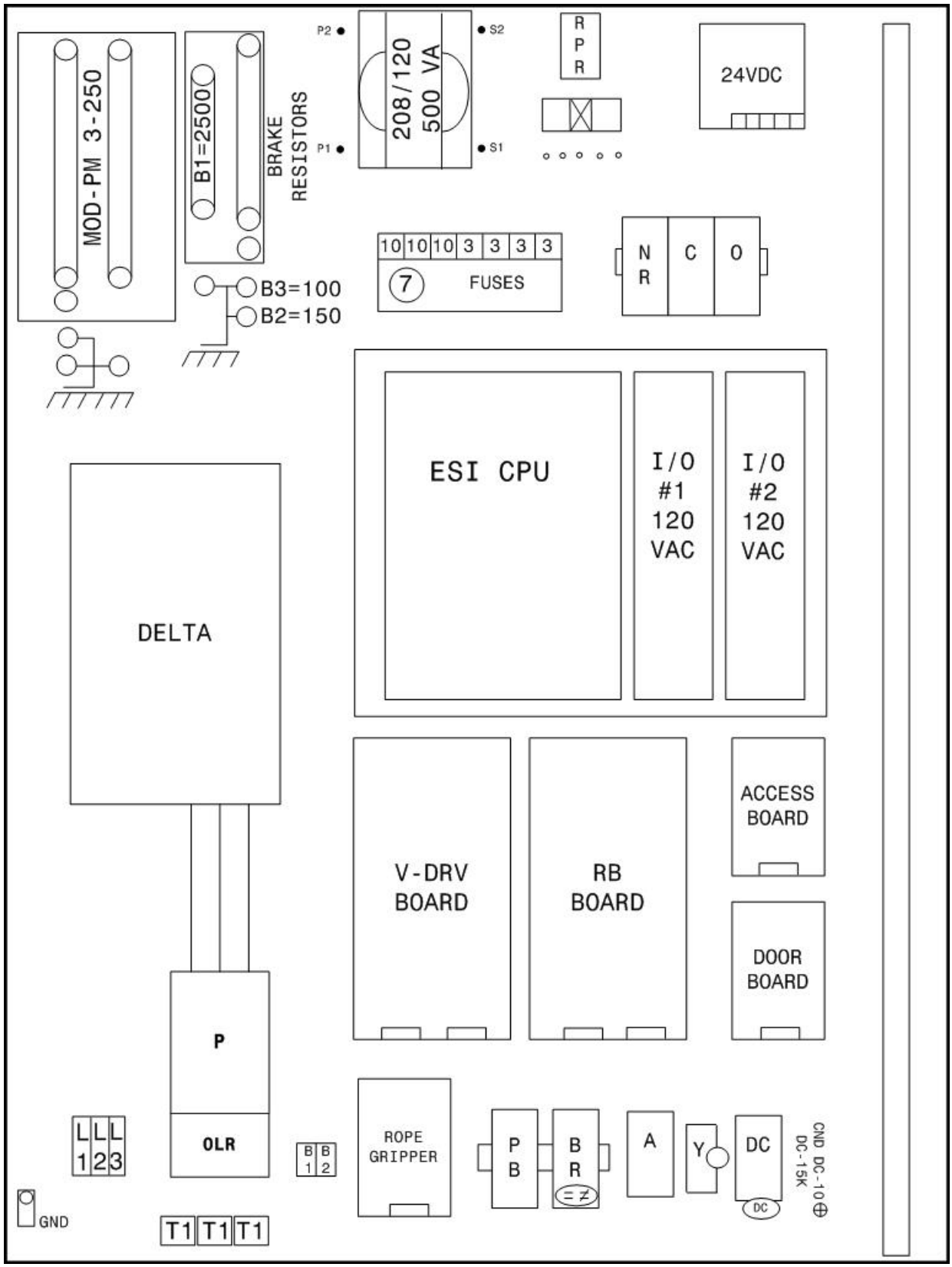
STANDARD VFPC2K CONTROLLER LAYOUT



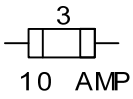
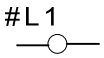
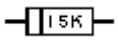
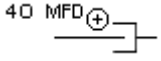
CONVENTIONS

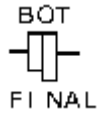
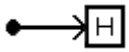
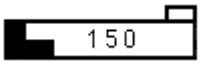
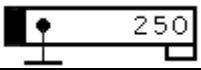
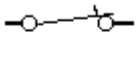
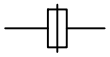
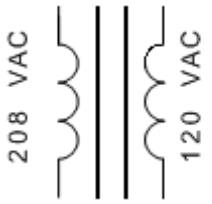
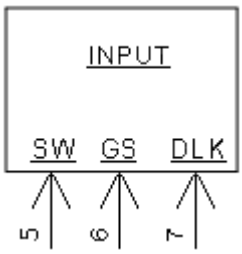
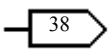
This manual uses the following terms and conventions to indicate parts of the controller and operation:

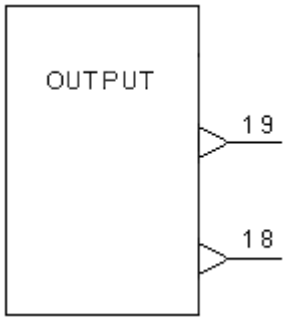
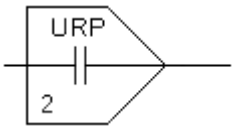
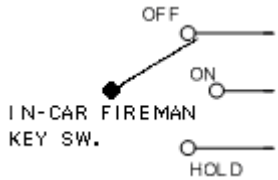
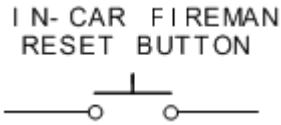
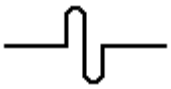
- CPU – The electronic controller board and all of it's associated expansion boards.
- Energized – Power is applied to the relay coil, and the relay has operated.
- De-energized – Power is not applied to the relay coil, and the relay is at rest.
- Activated – A signal is applied to the input terminal on the CPU or CPU expansion board.
- De-activated – A signal is not applied to the input terminal on the CPU or CPU expansion board.
- Symbol – a letter or letter number code referring to a relay or terminal.
  Example: PX
- Symbol number/number – A contact pair on a relay
  Example: PX 1/7
- Symbol{number} – An input / output on the CPU board.
  Example: A{1}
- Symbol{number-number} – An input / output on an expansion board. The first number indicates which I/O board, the second indicates the terminal.
  Example: 1C{1-13}
- #symbol - A terminal on the connection terminal strip.
  Example: #OF1
- #symbol to #symbol – Indicates an external electrical connection between two terminals.
  Example: #27 to #28

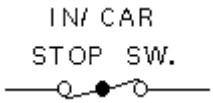
LEGEND

Table 1 outlines the symbols used in the ESI Drawings. Please refer to this table whenever you have any questions regarding symbols on the ESI Drawings.

Symbol	Symbol Name	Notes
	**Fuse**	Top Number represents the fuse number. Bottom Number represents the Amperage.
	**Terminal**	The Lettering (beginning with#) represents the terminal name.
	**Normally Open Contact (Contactor)**	The Lettering represents the Contactor Name (i.e. P) and the Number represents the Contact Number (i.e. 1)
	**Normally Closed Contact (Contactor)**	The Lettering represents the Contactor Name (i.e. P) and the Number represents the Contact Number (i.e. 6)
	**Normally Open Contact (Relay)**	The Lettering represents the Relay Name (i.e. Z) and the Numbers represents the Relay Terminals (i.e. 1 and 7)
	**Normally Closed Contact (Relay)**	The Lettering represents the Relay Name (i.e. I) and the Numbers represents the Relay Terminals (i.e. 5 and 8)
	**Relay Coil**	The Lettering represents the Relay Name (i.e. TC). The small circle to the right of the Relay represents the Right Terminal of the Coil.
	**Resistor**	The Lettering represents the resistor value (i.e. 15kΩ)
	**Capacitor**	The Lettering represents the capacitance value (i.e. 40µF)
	**Diode**	

	**Switch**	The Lettering represents the name of the switch (i.e. BOT FINAL). NOTE: *Switch shown in Closed Position.*
	**Region**	This symbol is used to refer to a different area on the drawing (i.e. Area Labeled H)
	**Resistor**	The Lettering represents the resistor value (i.e. 150Ω)
	**Resistor (Tapped)**	The Lettering represents the resistor value (i.e. 250Ω)
	**Switch**	The Lettering represents the name of the switch (i.e. PIT SWITCH). NOTE: *Switch shown in Closed Position.*
	**Switch**	The Lettering represents the name of the switch (i.e. GOVERNOR SWITCH). NOTE: *Switch shown in Closed Position.*
	**Transformer**	The Lettering on the Left Side represents the Primary Voltage (i.e. 208VAC) and the Lettering on the Right Side represents the Secondary Voltage (i.e. 120VAC).
	**Switch**	The Lettering represents the name of the switch (i.e. FX). NOTE: *Switch shown in Open Position.*
	**CPU Inputs**	The Lettering represents the Input name (i.e. SW, GS, and DLK). The Numbers represent the Input location. (i.e. SW = IN 5, GS = IN 6, DLK = IN 7).
	**CPU Inputs**	The Lettering represents the Input name (i.e. 38

	**CPU Outputs**	The Numbers represent the Output Number on the CPU (i.e. Drawing is showing Outputs 18 and 19).
	**Dry Contact Outputs**	The Lettering represents the Dry Contact Output name. The Number represents the Output Number (i.e. Dry Contact Output URP, Output number 2).
	**Key Switch**	The Lettering represent the Switch Name (i.e. IN CAR FIREMAN KEY SW) and the Pole Names (i.e. OFF, ON and HOLD). *Three position key switch pictured.*
	**Push Button**	The Lettering represents the Button Name (i.e. IN CAR FIREMAN RESET BUTTON).
	**Overload**	Current Sensing Portion of the Overload Protection.
	**Light**	The Lettering represents the name of the Light (i.e. UP).
	**Buzzer**	The Lettering represents the name of the Buzzer (i.e. Door Delay Buzzer).
	**Hall Lantern**	
	**Board Connector**	The Lettering represents the connector name (i.e. J1). The number represents the Pin (i.e. 5).

	**Variable Timer Delay**	
	**Switch**	The Lettering represents the name of the switch (i.e. IN CAR STOP SWITCH). NOTE: *Switch shown in Closed Position.*

CONTROLLER COMPONENT OVERVIEW

The controller is designed for maximum reliability with minimum maintenance. A unique and robust CPU, coupled with a series of forced guided relays,D provide all the functionality necessary to run the elevator. The CPU unit provides the control logic. The safety circuits are controlled by both the CPU and relay structure for maximum reliability and redundancy in all modes of operation. A Delta, Magnetek, KEB, Yaskawa or Mitsubishi Drive Unit controls the motor and provides motor overload and fault protection. All relays have an internal indicator light (a board mounted LED for board mounted relays) that illuminates when power is provided to the relay coil. This allows the status of all relays to be verified quickly. In addition, the CPU module has red indicator lights for each input, green indicator lights for each output, and a 4 line display to indicate system status. A reverse phase relay on the board provides reverse phase protection to the controller.

Every controller has three toggle switches. These are: test mode, hall button disconnect and automatic/inspection. There are also three push button inputs on every controller: controller inspection down, enable and up. There are also two slide switches: Car Door Bypass and Hatch Door Bypass. A vertical terminal strip provides all interconnecting to the elevator's equipment.

The relays, Inputs and Outputs names and functions are described in the following tables:

Relay Names:

RELAY NAME	FUNCTION	TYPE	LOCATION
B	Delay Pilot	2 Pole Safety	BRD_DRV_V
D	Run Down	6 Pole Safety	BRD_DRV_V
DEN	Drive Brake Enable	2 Pole Safety	BRD_DRV_V
DU	Down or Up run	2 Pole Safety	BRD_DRV_V
HM	HSM High speed	2 Pole Safety	BRD_DRV_V
HMX	HSM High speed pilot	2 Pole Safety	BRD_DRV_V
HS	High speed	2 Pole Safety	BRD_DRV_V
PX	Run	2 Pole Safety	BRD_DRV_V
U	Run Up	6 Pole Safety	BRD_DRV_V
I / IX	Inspection – energized on automatic	2 Pole Safety	RB Board
IC1 / IC2	In car inspection – energized on in car insp.	2 Pole Safety	RB Board
ID	Inspection Down	2 Pole Safety	RB Board
IU	Inspection Up	2 Pole Safety	RB Board
LFI	Lobby Fire Light	2 Pole Safety	RB Board
CT	Cycle Test	4 Pole KUH	RB Board
SWB	Stop switch bypass	2 Pole Safety	RB Board
SWB2	Stop switch bypass Redundant	2 Pole Safety	RB Board
DL	Door Locks	2 Pole Safety	Door Board
GS	Gate Switch	2 Pole Safety	Door Board
VC	Leveling	2 Pole Safety	Door Board

Z	Door Zone	2 Pole Safety	Door Board
ACC	Access	6 Pole Safety	Access Board
ACX	Access Aux. Relay	6 Pole Safety	Access Board
BAC	Access Bottom Control	6 Pole Safety	Access Board
TAC	Access Top Control	6 Pole Safety	Access Board

SYSTEM INPUTS

Main CPU Board Inputs:

Bottom Row:

INPUT	Symbol	FUNCTION
1	ON	120 VAC power on
2	TC	Top Car Inspection (when de-activated)
3	IC	In Car Inspection (when de-activated)
4	ACC	Access
5	I	Controller Inspection (when de-activated)
6	ID	Inspection Down
7	IU	Inspection Up
8	SAF	All Safeties Closed
9	SW	Stop Switch Closed
10		SPARE
11	GS	Gate Switch
12	DL	Hatch Door Lock
13	84	Door Zone
14	DRV	Doors/Gate/Inspection
15	OV	Voltage On
16	!ER	Drive Error (when de-activated)
17	52	Bottom Slowdown Limit
18	53	Top Slowdown Limit
19	GOV	Governor Switch
20	!RG	Rope Gripper circuit open (when de-activated)
21		

Top Row

INPUT	Symbol	FUNCTION
23	28	Door Open Button
24	28E	Door Electric Eye
25	28S	Door Safety Edge
26	29	Door Quick Close Input, car button 2nd poles wired in parallel
27	47	Door Close Limit
28	48	Door Open Limit
29	50	Independent Service Key Switch
30	81	Down Level Unit
31	82	Up Level Unit
32	85	Down Stepping
33	86	Up Stepping
34	87	Fire Floor Detected
35		SPARE
36	90	Smoke / Heat Detectors (Alternate Return)
37	92	Smoke / Heat Detectors (Prime Return)
38	92B	Machine Room Sensors / Heat Detectors (Prime Return)
39	93	Fire Control Lobby Switch (RESET)
40	94	Fire Control Lobby Switch (ON)
41	95	Fire Control Car Switch (ON)
42	96	Fire Control Car Switch (CANCEL)
43	99	Fire Control Car Switch (HOLD)
44	100	Fire Control Car Switch (OFF)
45	90B	Machine Room Smoke / Heat Detectors (Alternate Return)

Aux Input Board : To the right of LCD display

INPUT	Symbol	FUNCTION
AUX Board	P1	Proving Input 1
AUX Board	P2	Proving Input 2
AUX Board	P3	Proving Input 3
AUX Board	TST	Test Switch Input
AUX Board	GB	Car Door Bypass
AUX Board	DBY	Hoistway Door Bypass

I/O #1 Expansion Board Inputs:

1	1H	First Floor Hall Call
2	2D	Second Floor Down Hall Call
3	2U	Second Floor Up Hall Call
4	3D	Third Floor Down Hall Call
5	3U	Third Floor Up Hall Call
6	4D	Fourth Floor Down Hall Call
7	4U	Fourth Floor Up Hall Call
8		SPARE
9	1K	First Floor Key Switch
10	2K	Second Floor Key Switch
11	3K	Third Floor Key Switch
12	4K	Fourth Floor Key Switch
13	1C	First Floor Car Call
14	2C	Second Floor Car Call
15	3C	Third Floor Car Call
16	4C	Fourth Floor Car Call

SYSTEM OUTPUTS

Main CPU Board Outputs:

Bottom Row:

OUTPUT	Symbol	FUNCTION
1	CT	Cycle Test
2	RG1	Rope Gripper or HSM Pilot & RG2
3	SWB	Stop Switch Bypass Pilot
4	VC	Leveling Pilot
5	RG2	Rope Gripper
6	HSP	High Speed Pilot
7	OX	Door Open Pilot
8	CX	Door Close Pilot
9	NR	Nudging Pilot
10	URP	Up Run Pilot
11	DRP	Down Run Pilot

Top Row:

OUTPUT	Symbol	FUNCTION
12	21	Down Directional Light
13	23	Up Directional Light
14	61	Stop / Pass Gong
15	97	Fire Control Light
16	97B	Fire Buzzer
17	LFI	LFI Pilot
18	DG	Down Car Travel Lantern
19	UG	Up Car Travel Lantern
20	BP	Brake Pilot
21	DEN	Drive Enable

Transistor Outputs

OUTPUT	Symbol	FUNCTION
22	RES	Drive Reset
23	SP1	Leveling Speed
24	SP2	Inspection Speed

I/O #1 Expansion Board Outputs:

1	1HA	First Floor Hall Call Acknowledge
2	2DA	Second Floor Down Hall Call Acknowledge
3	2UA	Second Floor Up Hall Call Acknowledge
4	3DA	Third Floor Down Hall Call Acknowledge
5	3UA	Third Floor Up Hall Call Acknowledge
6	4DA	Fourth Floor Down Hall Call Acknowledge
7	4UA	Fourth Floor Up Hall Call Acknowledge
8		SPARE
9	1I	First Floor Indicator
10	2I	Second Floor Indicator
11	3I	Third Floor Indicator
12	4I	Fourth Floor Indicator
13	1A	First Floor Car Call Acknowledge
14	2A	Second Floor Car Call Acknowledge
15	3A	Third Floor Car Call Acknowledge
16	4A	Fourth Floor Car Call Acknowledge

LCD Keypad Description:

A 20 * 4 character backlit LCD with a 5 position keypad makes up the integrated user interface

On all of Elevator Systems ESI-C Elevator control systems.

MODE : Used to change LCD Display Mode.

↓ : To Scroll Down through various display screens and to adjust parameter settings.

↑ : To Scroll Up through various display screens and to adjust parameter settings.

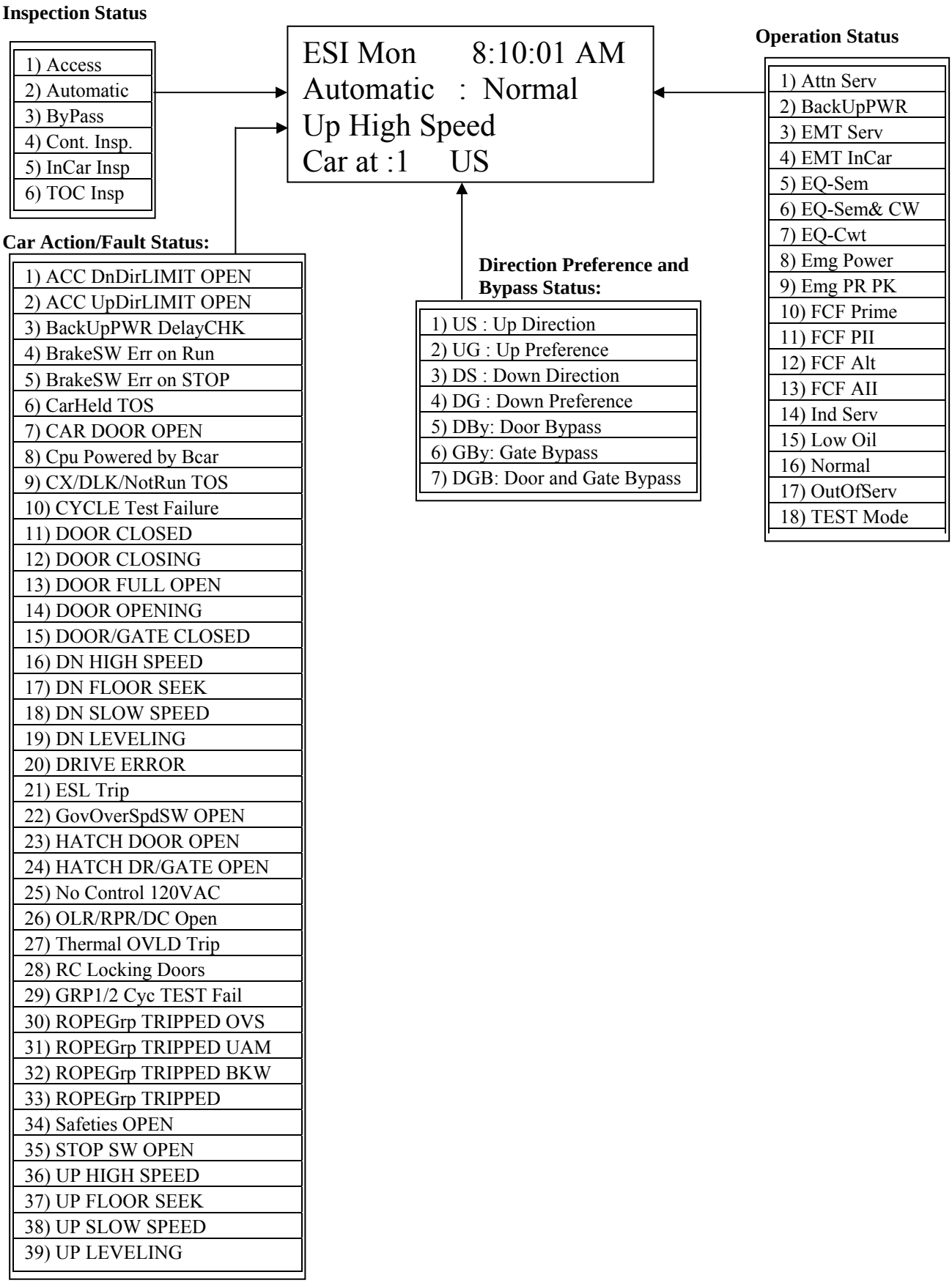
CLR : To Clear current parameter editing and to force a drive reset without time delay

SET : Used to enter parameter settings and adjust operational information.

Display Modes:

1. ESI Mon : Main Screen for monitoring current status of elevator
2. Job Info : Contains Controller Serial Number and Job address
3. View I/O : Use arrow to scroll through all system inputs and outputs
4. Internal Flags : View Internal flags status
5. Event Log : Scroll through events with time/date stamp
6. Place Car Call : To place car calls into system
7. Place Hall Call : To place hall calls into system
8. Parameters : Scroll through to edit desired parameter
9. Setup : Scroll through various setup options
10. Mem View : View ROM,RAM & EE2 memory
11. System Info : Software version information
12. Future1 :
13. Future2 :

MAIN CPU MONITOR LCD SCREEN



Inspection Status:

1) Access	: On TOP or BOTTOM ACCESS
2) Automatic	: On Automatic Operation
3) ByPass	: Illegal Condition Car Door and/or Hoistway Door Bypass switch is up when not on TOC/InCar Isnp
4) Cont Insp	: On controller inspection
5) InCar Insp	: On InCar Inspection
6) TOC Insp	: On Top of Car Inspection

Operation Status:

1) Attn Serv	: On attendant Service, CPU input "#70" high
2) BackUpPWR	: On UPS Backup Power, relay PF de-energized, CPU input 16 high
3) EMT Serv	: On Emergency Medical Team Service
4) EMT InCar	: On Emergency Medical Team Service in Car
5) EQ-Sem	: Earth Quake-Seismic Trip only
6) EQ-Sem&CW	: Earth Quake-Seismic & Counter Weight Trip
7) EQ-Cwt	: Earth Quake Counter Weight Trip only
8) Emg Power	: On Back-up Power
9) Emg PR PK	: On Back-up Power and Auto returning
10) FCF Prime	: Fire Control Phase I Prime Return
11) FCF PII	: Fire Control Phase II Prime Return
12) FCF Alt	: Fire Control Phase I Alt Return
13) FCF AII	: Fire Control Phase II Alt Return
14) Ind Serv	: On Independent Service, Input "#50" is high
15) Low Oil	: Low Oil Trip due to the car traveling UP for more than (Para 48) secs, default 45 sec. Toggle to Inspection to clear
16) Normal	: Controller is operating Normally
17) OutOfServ	: Car is Out Of Service

Direction Preference and Bypass Status:

1) US	: Up Direction
2) UG	: Up Preference
3) DS	: Down Direction
4) DG	: Down Preference
5) Dby	: Hatch Door Bypassed via slide switch on RB board
6) Gby	: Gate Switch Bypassed via slide switch on RB board
7) DGB	: Both the Hatch Door and Gate Switch are Bypassed by slide switches on the RB board

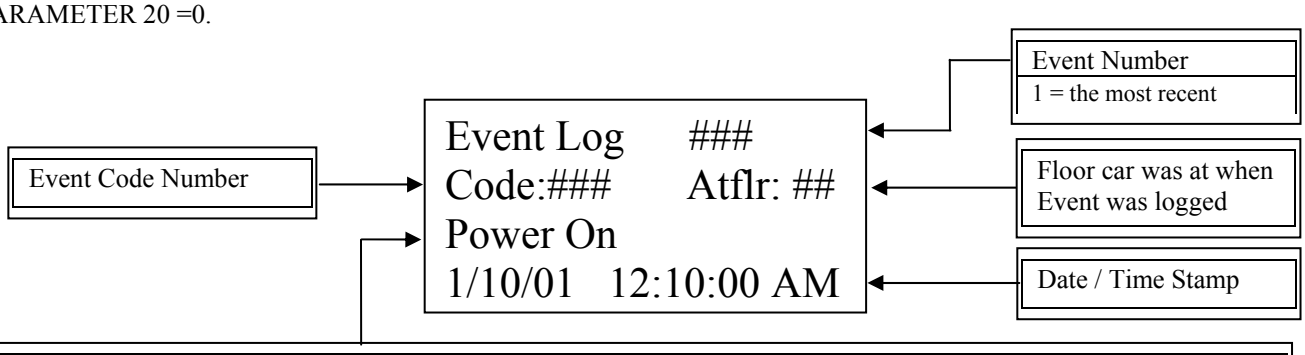
Car Action/Fault Status:

1) ACC DnDirLIMIT OPEN	: Top Access down travel has been limited by the encoder count, only up travel possible
2) ACC UpDirLIMIT OPEN	: Bot Access up travel has been limited by the encoder count, only down travel possible
3) BackUpPWR DelayCHK	: Delay before going on Back Up Power
4) BrakeSW Err on Run	: Brake Switch did no open on run . Toggle to Inspection to clear
5) BrakeSW Err on STOP	: Brake Switch did not close on stop . Toggle to Inspection to clear
6) CarHeld TOS	: Car held, Timed Out of Service
7) CAR DOOR OPEN	: Doors are open
8) Cpu Powered by Bcar	: Acar lost power, Bcar is providing power to the A CPU and hall call/FCF feeds
9) CX/DLK/NotRun TOS	: Car timed out of service Door contacts did not make up on close or the Door Close Limt did not open
10) CYCLE Test Failure	: The P1, P2 and P3 inputs failed to turn on in the proper sequence
11) DOOR CLOSED	: The Door Close Limt is low, and the Open Limit is high.
12) DOOR CLOSING	: Door close output signal (CX) is high
13) DOOR FULL OPEN	: The Door Close Limt is high, and the Open Limit is low
14) DOOR OPENING	: Door open output signal (OX) is high
15) DOOR/GATE CLOSED	: Input DO is High on jobs with manual or power freight doors & gates
16) DN HIGH SPEED	: Car is running in the Down direction and relay HSP is energized
17) DN FLOOR SEEK	: Running in the Down direction, seeking the next door zone
18) DN SLOW SPEED	: Car is running in the Down direction. HSP is out. Looking for the next leveling magnet
19) DN LEVELING	: Car is running Down with #81 & #84 ON, when #81 goes low the car will stop
20) DRIVE ERROR	: Error signal from drive. Check drive fault history for error codes
21) ESL Trip	: Car did not slow down sufficiently before breaking the inner slow down limit. Toggle inspection to reset this fault
22) GovOverSpdSW OPEN	: Governor over speed switch is open. Input “OVS” is low
23) HATCH DOOR OPEN	: Input “DO” is low on jobs with swing hatch doors
24) HATCH DR/GATE OPEN	: Input “DO” is low on jobs with manual or power freight doors
25) No Control 120VAC	: CPU input 1 is low
26) OLR/RPR/DC Open	: Input “OV” cpu input 15 is not on when car is trying to run. DC relay must be energized. Check Overload is not tripped and the Reverse Phase Relay is on
27) Thermal OVLD Trip	: The motor heat sensor , input “TOL” , is open
28) RC Locking Doors	: “RC” output is on.
29) GRP1/2 Cyc TEST Fail	: Rope Gripper control relays did not complete their cycle test, (200 fpm or less) input “!RG” did not cycle properly (more than 200 fpm) input “!RG1” or “!RG2” did not cycle properly
30) ROPEGrp TRIPPED OVS	: Rope Gripper Tripped, governor tripped
31) ROPEGrp TRIPPED UAM	: Rope Gripper Tripped, moved out of door zone with both the gate and the hatch doors open
32) ROPEGrp TRIPPED BKW	: Rope Gripper Tripped, brake switch still open on stop
33) ROPEGrp TRIPPED	: Rope Gripper Tripped, on power up
34) Safeties OPEN	: “GOV input high”, but the “SAF” input low
35) STOP SW OPEN	: “SAF input high”, but the “SW” input low
36) UP HIGH SPEED	: Car is running in the Up direction and relay HSP is energized
37) UP FLOOR SEEK	: Running in the Up direction, seeking the next door zone
38) UP SLOW SPEED	: Car is running in the UP direction. HSP is out. Looking for the next leveling magnet
39) UP LEVELING	: Car is running in UP with #82 & #84 ON, when #82 goes low the car will stop

EVENT LOG

To view Event Log, press MODE until EVENT LOG screen comes up. Use up and down arrows to scroll through the events.

To reset the event log, set PARAMETER 20=3,then press mode until the SETUP/UTILITIES screen comes up. Press up and down arrows to scroll to the CLEAR EVENT LOG screen. Press SET. Press SET again to reset EVENT LOG. Set PARAMETER 20 =0.



Event Description:	
1. Power On	: Power was turned on
2. Event Log Cleared	: Date and time when the event log was last cleared
3. On to Inspection	: The Elevator was put onto inspection service
4. Normal Automatic	: The Elevator went back to normal automatic service
5. InCar SW Opened	: The in car stop sw was opened
6. reserved	:
7. VF Drive Error	: The VVVF drive tripped. Look at drive fault history for error codes
8. Independent Service	: The car was placed onto independent service
9. FCF Phase One	: The elevator responded to fire control
10. FCF Phase Two	: The elevator was placed onto phase II fire service
11. reserved	:
12. reserved	:
13. Low Oil Time Out	: Low Oil Trip due to the car traveling UP for more than (Para 48) secs, default 45 sec.
14. Emerg Power	: The elevator was placed onto emergency power operation
15. BackUp Power	: The elevator switched over to UPS/BackUp power
16. Attendant Service	: The car was placed onto attendant service
17. Thermal OVLD Trip	: The motor Thermal OVLD Trip “TOL” opened.
18. SAF opened	: The safeties, input “SAF” opened
19. Gov OVS opened	: The governor sw, input “OVS” opened
20. OVERspeed Trip	: The Car exceeded the OVERspeed Trip Speed, set in parameter 185
27. RopeGrp/EmBrkTrp_OVS	: Rope Gripper/ Emergency Brake Trip due to the governor switch opening
28. RopeGrp/EmBrkTrp_UAM	: Rope Gripper/ Emergency Brake Trip due to unattended motion
29. RopeGrp/EmBrkTrp_BKSW	: Rope Gripper/ Emergency Brake Trip due to the brake switch not closing on a stop
31. HSstopDL	: A high speed stop occurred due to the hatch door contacts opening in flight
32. HSstopGS	: A high speed stop occurred due to the car door contact opening in flight

View and Edit Parameters

To View and edit parameters:

1. Use ↓/↑ keys to scroll to desired parameter.
2. Press **SET** to place into edit mode. The equal sign "=" will blink.
3. Use ↓/↑ keys to change parameter setting.
2. Press **SET** to save changes. The equal sign "=" will stop blinking.
3. If **CLR** is pressed prior to saving changes the previous value will be restored.
5. **NOTE:** Parameter #20 must be set to 3 to enable edit mode.

PRE POWER CHECK OUT

Prior to shipment, the controller is given a series of thorough tests to ensure proper operation. However, it is possible that components could have loosened or been damaged during shipment. Therefore, before applying power, it is a good idea to check the following:

- Check for loose components.
- Check that no components were bent in shipping
- Check all rectifier connections are tight and not shorted
- Make sure all plug in relays are fully inserted and seated.
- Check that all CPU terminal strips fully inserted
- Make sure all toggle switches are in the down position.
- CONFIRM input power supply. The input power supply specifications are printed near the terminals.

INITIAL POWER TURN ON

CAUTION: High Voltage can cause serious and fatal injury. Extreme caution should be exercised when working on or near this controller. Only qualified personnel should attempt to start-up or troubleshoot this controller.

Check the voltage across terminals #L1, #L2 and #L3. Verify that the voltage reading is what the controller is built for. The RPR should be lit. If the RPR is not lit then reverse the #L1 and #L2 wires. Typically, voltage across the Primary side of the control transformer should be 208VAC and the voltage across the Secondary side of the transformer should be 120VAC. The Secondary side of the transformer ties into the RB board where power is routed to different parts of the controller.

Verify the following terminal pairs should have 120VAC present:

- #27 - #60
- #32 - #60 (with CT Relay energized)
- #91 - #60

With 120vac or 24vac signals verify the following terminal pairs have the proper voltage present:

- #31 - #60 (note this maybe 24vac if ack lts are setup for 24vac)
- #30 - #60 (with Hall Button Switch ON, note this maybe 24vac if ack lts are setup for 24vac)

With 24 VDC signals verify the following terminal pairs have 24vdc which is feed from PS #2:

- #31 - #22
- #30 - #22 (with Hall Button Switch ON)

With ESI DPI's only verify the following terminal pairs have 24vdc which is feed from PS #2:

- #1L - #2L

If all voltages are within range and all safety circuits are properly wired, running the car on Top of Car Inspection should be done first. See the sequence of operation for a full description of this procedure.

*** On power up, if the LCD screen shows "Rope Gripper Tripped", follow the instructions in the rope gripper section to clear this message. On controllers with Delta B+, Delta VE, or KEB drives follow the AUTO-TUNE instructions that follow.**

Delta B+ AUTO-TUNE PROCEDURE

Assuming that the car has been running on Inspection or Automatic with all doors, gate switch and all safety circuits properly installed, with or without ENCODER installed.

1. Put car on Inspection.
2. Check Motor Data Paramters:
   - 07-00 : Motor Rate Current as a precentage of drive
   - 07-01 : No Load Current as a precentage of drive
   - 07-04 : Number of Motor Poles
   - 07-08 : Motor rated slip freq (60 - (rpm * #poles/120))

2. Press MODE button on drive parameter unit, until reaching “A”, Ampere reading.
3. Run car UP and Down one floor and record Ampere values.
4. Change Parameter "07-05" to "1", Motor Tuning (Note: unlock unit by setting "00-02 to 0")
5. Remove Brake Lead # B1, Note Car Should still be on Inspection.
6. Using Controller Inspection Run Button, Run the Car Up. The Motor will not Rotate, but may make some sounds.
7. The Run Light will go on, Stop light off
8. When the Auto-Tune is complete, the run light will go off, the stop light will go on, Release Insp Up run, check parameter "07-05" it should be "0", if not retry.
9. Reconnect Brake Lead # B1

For OPEN Loop Setup

10. If an Encoder **is not** being used, change Parameter "00-09" to "2" (OpenLoop Vector)
11. Run the Car Up & Down. Note Ampere Reading, they should be Lower than before

For CLOSED Loop Setup

10. If an Encoder **is** being used, change Parameter "00-09" to "3" (ClosedLoop Vector)
11. Check Parameter: 10-10 = the Number of Pulses per Revolution of the Encoder (ie 1024, 2048)
    10-11 = 2 or 3 , encoder input direction setting

12. Run the car up and down, Note: F (freq command), H(Hz output), A (Ampere). The Hz output should vary from up and down, however the car speed should be the same up and down.
    If not change Parameter "10-11 to "3" and re-try running the car.
    Also, the amps should be lower than before.

Delta Vector Auto-Tune

Assuming that the car has been running on Inspection or Automatic with all doors, gate switch and all safety circuits properly installed and ENCODER installed and wired to the white terminals at the bottom of the controller.

1. Put car on Inspection.
2. Press MODE button on drive parameter unit, until reaching “A”, Ampere reading.
3. Run car UP and Down one floor and record Ampere values.
4. Put car on Inspection.
5. Press MODE until display reads "U": "r 0" OUTPUT RPM.
6. Run car UP and Down, write down values as shown on display. Note: Down should be a negative number. Up a positive number . If Down is positive and Up is negative, the encoder signals need to be reversed. Switch A and A! encoder wires. Rerun car and confirm that Down is negative and Up is positive.
7. Press MODE to read " H ", FREQUENCY COMMAND, run UP, DOWN values will be equal,
8. Change parameter "05-00" to "2 " Motor Auto Tuning. (Note: Unlock Unit By Setting 0-02 to "0")
9. Press MODE to return to "H " : " 0.00 " on display.
10. Remove Brake lead # B1, Note; car should still be on Inspection.
11. Using the controller Inspection Run Button, run the car Up. The motor will not rotate, but may make some sounds. The " RUN " led will go ON, and the "TUN" will flash on keypad when the Auto-tune is complete the RUN led will be OFF. Note: BR & DBE may Pulse during Auto-Tune.
12 .Read Parameter " 05-00 " it should be " 0 ", Auto-tuning is complete.
13. Change Parameter " 00-10 " to " 3 ", Vector Control + PG (closed loop).
14. Press MODE to " U ": "r 0".
15. Reconnect Brake lead # B1. Note: car should still be on Inspection.
16. Run car UP and Down, note values. while reading " U" both (RPM) directions should be Equal.
17. Press MODE to " H ". Run UP, DOWN, Note values they should be Unequal.
18. Press MODE to read "A" amps, run UP, Down, note values they should be lower then before.
19. Return car to Automatic, make several trips in both directions. The car should run fine.

MAGNETEK HPV-900 DRIVE OVERVIEW

The Magnetek HPV-900 drive is preset with the job parameters from the ESI Factory. There are only a few parameters that may need to be changed in the field. Please refer to the Magnetek HPV-900 Manual for directions on navigating the menus.

Menu: **Adjust Drive-A1**

- CONTRACT CAR SPD (FPM)
- CONTRACT MTR SPD (RPM)

Menu: **Adjust Multi-Step Ref-A3**

- SPEED COMMAND 1 (FPM) -Leveling Speed
- SPEED COMMAND 2 (FPM) -Inspection Speed
- SPEED COMMAND 4 (FPM) -One Floor Run Speed
- SPEED COMMAND 6 (FPM) -HSM Speed

Menu: **Adjust Motor-A5**

- RATED MTR POWER (HP)
- RATED MTR VOLTS (V)
- RATED EXCIT FREQ (Hz)
- RATED MOTORS CURRENT (A)
- MOTOR POLES
- RATED MTR SPEED (RPM)
- % NO LOAD CURR

The above values are job specific. They have been preset based on Engineering Data Sheets.

Visual feedback can be obtained from the HPV-900 drive.

MENU: **Elevator Data-D1**

- SPEED COMMAND
- SPEED REFERENCE
- SPEED FEEDBACK
- SPEED ERROR

Getting Started

Before the controller and the drive were shipped, the entire system was tested and run at the

factory. The drive ran a motor and confirmed to specifications before it was shipped. All drive parameters were then preset based on the information provided in the controller order form. Verify that the information given to the control manufacturer on the motor is correct. Verify that the parameters from the Magnetek HPV-900 Overview are set correctly.

The control system uses the internal speed algorithm of the Magnetek HPV-900 drive. Adjustments to the acceleration, deceleration and jerk rates are done through the drive.

Magnetek HPV-900 Drive-Speed Adjustment

Attempt to run the car by using the inspection up/down buttons on the controller. Hold the up button until the car starts to move. If the car runs in the down direction stop the car. Use the Magnetek HPV-900 programmer to access the following:

MENU: **Configure-Co**

- MOTOR ROTATION- Change the parameter from FORWARD to REVERSE.

On the ESI CPU, swap the Green and White wires on the Encoder Input Port.

Verify that the car runs in the right direction now (both up and down) and verify that the Count Screen is updating correctly as the car runs (number increases as the car runs up and decreases as the car runs down).

Go to MENU: **Adjust Drive-A1**

- CONTRACT CAR SPD (FPM) - Verify that this parameter is set to the rated contract speed of the car.
  This speed is defined in feet per minute.

- CONTRACT MTR SPD (RPM)- Adjust this parameter to the value that will make the car run at the inspection speed. Use a handheld tachometer to verify the actual car speed. This is not data from the nameplate. This parameter sets the speed at which the drive will run the motor when the car is demanded to run at contact speed. If the car is moving slower than the commanded speed, increase the value of CONTRACT MTR SPD. If the car is moving faster than the commanded speed, decrease the value of CONTRACT MTR SPD. Repeat the procedure until the car is moving at exactly the commanded speed. **NOTE: For this procedure, we are using Inspection Speed. The commanded speed is the speed found in MENU: Adjust Multi-Step Ref-A3 (SPEED COMMAND 2).

Run the car at contact speed (refer to MENU: **Adjust Multi-Step Ref-A3** (Speed Command 6) and verify with a handheld tachometer that the car is running at the correct speed.

Once this is complete you may move on to adjust the ESI Controller speed feedback.

ESI Controller - Speed Feedback Adjustment

The following steps must be completed before an accurate speed can be displayed by the ESI Controller.

1) Set PAR[20] = 3
2) Use the ^ to go to the Count Screen (ESI Mon - Page 2) and move the car. Verify that the velocity displayed matches the velocity displayed on the Magnetek HPV-900 drive (**Elevator Data**-D1 SPEED FEEDBACK) and also verify with a handheld tachometer.
3) If the velocity is not correct then edit PAR [87]. If the value displayed is greater than the actual speed then lower PAR [87]. If the value displayed is less than the actual speed then increase PAR [87].
4) Once the velocity on the ESI Controller, the Magnetek HPV-900 Drive and the handheld tachometer match, reboot the controller.

KEB DRIVE

*** SEE KEB QUICK- START GUIDE (V 3.00)**

ESI Learn Floor Trip

Before performing the ESI Learn Floor Trip, there are several parameters that must be verified.

PAR[20] – Unlock Parameters – *unlock system parameters set to 3*
PAR[81] – Slowdown Distance #1 – *slowdown distance in inches (one floor run)*
PAR[82] – Slowdown Distance #2 – *slowdown distance in inches (multi-floor run)*
PAR[85] – Level Magnet Length – *in inches*
PAR[86] – Contract Speed (fpm) – *top speed of car*
PAR[87] – Contract Motor (rpm) – *adjust to get correct speed reading*
PAR[88] – Learn Floor Heights – *should be zero except when performing the test =1*
PAR[91] – Encoder PPR – *1=1024 2=2048*

Prep Work

1) Auto Tune Drive if necessary
2) Reboot Controller.
3) Bring car to lowest landing.
4) Verify that Z relay is on, #81 and #82 are off.
5) Leave car in Automatic
6) Insp Speed to 25 fpm or 6 Hz.

Initialize Test

7) Set PAR[20] = 3
8) Set PAR[88] = 1

Begin Learn Floor Trip

9) On controllers with terminal #53M jump to #27
10) From the ESI MON screen use the up arrow to go to ESI MON-2 screen.
11) Place a car call to the top floor and allow the car to run to the top floor – Note that the car will run up and stop at the top floor. PAR[88] will reset to zero automatically upon stop.
12) Go to the Setup/Utilities Menu screen and use the up arrow to get to the View Floor Height Table. View the value of the floor counts and verify that all floors have a value that does not end in multiple zeros.

Verify Results

13) Run the car down one floor at a time.
14) Run the car up one floor at a time.
15) Run the car several floors at a time in the down direction.
16) Run the car several floors at a time in the up direction.
17) Make one floor runs into the Terminal Landings.
18) Make multi-floor runs into the Terminal Landings.
19) Set inspection speeds back to original settings.

ESL TEST

The ESL Test is to be performed before the car is placed in service.

Before the test begins ensure that the controller is in an intermediate floor (not a terminal landing). There are three (3) controller parameters involved with the ESL system. The parameters are:

- PAR[180] = ESL CHECK ENGAGE (0 = NO Check, 1 = Check)
- PAR[181] = ESL 1 RPM SPEED
- PAR[182] = ESL 2 RPM SPEED

NOTE: In order to enable the controller to allow you to change the values of these parameters, you must change the value of PAR [20] to 3.

Test Procedure

1. Verify that the Low Speed Slowdown Limits (52 and 53) are set at the appropriate distance from the terminal landings.
2. Verify that the High Speed Slowdown Limits (52M and 53M) are set at the appropriate distance from the terminal landings.
3. Set PAR [181] to the High Speed RPM value.
4. Set PAR [182] to the Low Speed RPM value.

NOTE: ESI uses a second set of safety parameters that could interfere with the ESL testing. Please ensure that steps 5 and 6 are taken so that the ESL test can be performed accurately.

5. Set PAR [81] to12. PAR [81] is the Slowdown Distance 1 Parameter.
6. Set PAR [82] to12. PAR [82] is the Slowdown Distance 2 Parameter.
7. Set PAR [83] to12. PAR [83] is the Slowdown Distance 3 Parameter if present.
8. Jump 52M so that it does not break when the car passes the switch.
9. Run the car into the bottom floor.
10. Upon reaching 52, the car will shut down and the ESI LCD display will show the status of the car as ESL Error.
11. Toggle the Controller Inspection Switch to clear the error.
12. Remove the jumper from 52M.
13. Move the car to the center of the hoist way.
14. Jump 53M so that it does not break when the car passes the switch.
15. Run the car into the top floor.
16. Upon reaching 53, the car will shut down and the ESI LCD display will show the status of the car as ESL Error.
17. Toggle the Controller Inspection Switch to clear the error.
18. Remove the jumper from 53M.
19. Reset PAR [82] and PAR [82] to the correct distance values.

OIL BUFFER TEST

Place car level at a floor mid shaft,
Place controller in test mode.
Jump out bottom slow down limits terminals #27 to #52, #52M.
Controllers with encoder positioning (Binary TS-89), remove encoder input to CPU(green connector lower left side of CPU).
Controllers with stepping TS-89 remove field wires on terminals #85 & #86.
Place car call to bottom floor.

NTS TEST

The NTS Test is to be performed before the car is placed in service.

Place car level at a floor in the middle of the shaft.
Unplug the encoder cable from the CPU (lower left corner of the CPU).
Or for controllers using DP/UP (stepping) disconnect field wires from terminals #85 and #86.
Disconnect field wires to terminals #81 and #82 (leveling).
Place a cal call for the lowest landing.
The car will slow down via the bottom slow down limit and stop on the bottom normal limits.
Place a car call for the top landing.
The car will slow down via the top slow down limit and stop on the normal limit.
Restore encoder cable.
Reconnect terminals #81, #82, and/or #85, #86.

ROPE GRIPPER TEST

1) trip the Governor connected to OVS1 and OVS2. Rope Gripper should trip(GOV overSp).
2) Remove wire from disc brake switch, if in use. Rope Gripper should trip(BrakeSW on Stop).
3) Jump out brake switch, if in use. Place controller on INDEPENDENT SERVICE. With two screw drivers push in relays BR and PB. The car should drift out of the door zone with the door open tripping the Rope Gripper(Rope Gripper trip UAM).

EARTH QUAKE RESET

After inputs “CWE” & “SEM’ are off, put car on controller inspection.
On controller keypad press MODE button until reaching, “EQCWT”.
Then press “CLR” button.
Return to automatic.
These instructions will appear on the clear cover of the CPU if EARTH QUAKE circuits are in place.

SEQUENCE OF OPERATION

Before we can run the controller the safety mechanisms must all be in place. Verify that the following safety circuits are closed.

- #OVS1 - #OVS2 : Governor Overspeed Sw (input **"OVS"** ON) *(if applicable)*
- #RGC1 - #RGC2 : Rope Gripper Contact *(if applicable)*
- #32 - #32A : Governor Trip Sw (NOTE: if governor has only one switch connect it to #OVS1-#OVS2, add jump #32-#32A)
- #32A - #33 : Final Limits
- #40 - #41 : Escape Hatch, Safety Sw, TOC Stop Sw (input **"SAF"** ON)
- #41 - #42 : InCar Stop Switch (input **"SW"** ON)
- #42 - #45 : Car Door Contact (input **"GS"** ON and relay **"GS"** ON)

Note: with Single Circuit Interlocks :

- #34 - #34A : Bottom Hatch Door Interlock
- #34A - #34D : Inter Floor Hatch Door Interlock
- #34D - #35 : Top Hatch Door Interlock (input **"DL"** ON and relay **"DL"** ON)

Note: with Double Circuit Locks :

- #34 - #34A : Bottom Hatch Door Contact
- #34A - #34D : Inter Floor Hatch Door Contacts
- #34D - #35 : Top Hatch Door Contact (input **"DO"** ON)
- #43 - #43A : Bottom Hatch Door Lock
- #43A - #43D : Inter Floor Hatch Door Locks
- #43D - #44 : Top Hatch Door Lock (input **"DL"** ON and relay **"DL"** ON)

- #37 to #39 - Bottom Normal Limit
- #38 to #39 - Top Normal Limit

TOP OF CAR INSPECTION

Relays that must be energized: RPR, DC and CT

Relays that must be de-energized: ACC, ACX, I, IX, IC1, and IC2. Input "TC" should be off.

Inputs that must be activated: ON, GOV, SAF, and SW.

In order to move the car on Top of Car Inspection, constant pressure must be applied to the buttons. The buttons will allow voltage to flow from terminals #TI to #IU or #TI to #ID. The car will move up and down by energizing the IU or ID relay and it's corresponding input.

CAUTION: Ensure that all personnel working on the elevator understand that the car will be moving during this procedure in both Up run and the Down run modes.

On power up, if the LCD screen shows "Rope Gripper Tripped", follow the instructions in the rope gripper section to clear this message. On controllers with Delta B+, Delta VE, or KEB drives follow the AUTO-TUNE instructions in this manual.

Top of Car Inspection UP RUN

Pressing the Top of Car UP RUN and Safety button (#TI to #IU) will send a signal to the controller (via input 7-IU) that up motion is requested. Relay IU will pick, feed voltage to input "DRV" via a N/Open contact and thru N/Open "DC" contacts to input "OV".

The CPU will turn ON four outputs. Output 10 "URP" energizing relay U. Output 20 "BP" energizing relay B. Output 21 "DEN" energizing relay DEN. Output 8 "CX" energizing relay C which will force the doors closed *("if applicable"*). The motor and brake will engage and the car will run up at inspection speed. The CPU display will read 'Up Slow Speed'. Releasing the switch will stop the car immediately.

Top of Car Inspection DOWN RUN

Pressing the Top of Car DOWN RUN and Safety button (#TI to #ID) will send a signal to the controller (via input 6-ID) that down motion is requested. Relay ID will pick, feed voltage to input "DRV" via a N/Open contact and thru N/Open "DC" contacts to input "OV".

The CPU will turn ON four outputs. Output 11 "DRP" energizing relay U. Output 20 "BP" energizing relay B. Output 21 "DEN" energizing relay DEN. Output 8 "CX" energizing relay C which will force the doors closed *("if applicable"*). The motor and brake will engage and the car will run down at inspection speed. The CPU display will read 'Down Slow Speed'. Releasing the switch will stop the car immediately.

IN CAR INSPECTION

Relays that must be energized: RPR, DC, CT, IC1 and IC2.

Relays that must be de-energized: ACC, ACX, I, and IX. Inputs "IC" AND "ACC" should be OFF.

Inputs that must be activated: ON, GOV, SAF, SW and TC.

In order to move the car on In Car Inspection, constant pressure must be applied to the buttons. The buttons in the car station are used to control the car while on In Car Inspection. Voltage flow is controlled from #TI to #TC , and then to either #IC1 to #ICU (in order to run up) or #IC1 to #ICD (in order to run down).

The car will move up or down by energizing the IU or ID relay and it's corresponding input. The feed to relays IU and ID are also interrupted by NO contacts from IC1 and IC2 so these relays must be on to move while on In Car Inspection.

CAUTION: Ensure that all personnel working on the elevator understand that the car will be moving during this procedure in both Up run and the Down run modes.

HOISTWAY ACCESS

Relays that must be energized: RPR, DC, CT, ACC and ACX.

Relays that must be de-energized: I, IX, IC1, and IC2. Input "IC" should be OFF.

Inputs that must be activated: ON, GOV, SAF, SW, TC, and ACC.

In order to move the car on Access, constant pressure must be applied to the key switches. The key switches will allow voltage to flow from terminals #AC to either the ID relay or the IU relay via an ACC N/Open contact. Two other relays associated with Access are TAC and BAC. The TAC is energized by the Top Floor Access Key Switch, and the BAC is energized by the Bottom Floor Access Key Switch. The car will move up or down by energizing the IU or ID relay and it's corresponding input.

The GS N/Open contact is bypassed via "ACC" and either "BAC" or "TAC" N/Open contacts.
The Bottom Hatch Door is bypassed via "ACX" and "BAC" N/Open contacts. The Top Hatch Door is bypassed via "ACX" and "TAC" N/Open contacts.

CAUTION: Ensure that all personnel working on the elevator understand that the car will be moving during this procedure in both Up run and the Down run modes.

CONTROLLER INSPECTION

Relays that must be energized: RPR, DC, and CT.

Relays that must be de-energized: ACC, ACX, I, and IX. Inputs "ACC" and "IC" should be OFF

Inputs that must be activated: ON, GOV, SAF, SW and TC.

With the Top of Car and InCar Inspections switches closed and the controller inspection switch in the INSP position, the controller can be run via the controller inspection buttons. You may run the car by pressing Enable and either Up or Down. The car will run in run in inspection speed up or down. The LCD will display "Up Slow Speed" or "Dn Slow Speed". The car will move up or down by energizing the IU or ID relay and it's corresponding input.

CAUTION: Ensure that all personnel working on the elevator understand that the car will be moving during this procedure in both Up run and the Down run modes.

AUTOMATIC OPERATION

Relays that must be energized: RPR, DC, CT, I, and IX.

Inputs that must be activated: ON, GOV, SAF, SW, TC, IC, and I

Inputs that must NOT be activated: 28, 28E, 28S, 50, 90, 90B, 92, 92B, 95, 99

Set controller inspection switch to "Automatic", be sure top-of-car inspection and in-car inspection switches are closed.

When the controller is in automatic mode, the display will read "Automatic". If you do not see the word 'Automatic' on the display, the elevator is not in automatic mode. Automatic is the normal mode of operation for the elevator when it is in service.

Place the "TEST MODE" switch into the "TEST" position in order to run the car without Hall Calls enabled and without automatic door opening. The screen will read ":TEST Mode". Otherwise it should read ":Normal"

NOTE: If the controller is utilizing the EncoderCnt positioning system with a binary absolute floor encoding selector, a floor height learn trip must be done prior the running the car on automatic operation.

AUTOMATIC UP RUN

With the car level at the first floor, inputs "84" (input 13), "53" (input 18) and output "1I" (1-9) will be ON. Input "52" (input 17) Bottom SlowDown will be OFF. Pressing 2nd floor car button will activate input "2C"(1-14) and output "2A" (1-14) will acknowledge the call. If the doors are not closed, they will wait for the door close timer to expire. Pressing the Door Close Button (#27 to #24) will bypass the timer and close the doors. The hatch doors will close energizing relay DLK and input" DLK". The car door contacts will close energizing relay GS and input" GS". The car will start and begin to accelerate to high speed. As the car enters the second floor, the indicator lights will change from "1I"(1-9) to "2I"(1-10). The CPU will slow the car down by de-energizing output "HSP". The point of slow down will be either when input "86" falls out, or via the EncoderCnt positioning system. The car will decelerate into the floor. As the car enters the leveling zone, input "82"[31] will be activated by the up leveling unit (#27 to #82). Relay Z and input "84"[10] will energize via the door zone unit (#27 - #84). When the up leveling unit turns off, "82" will fall out bring the elevator to a stop.

AUTOMATIC DOWN RUN

This is the same as above. However in the down direction, the CPU will slow the car down by de-energizing output "HSP". The point of slow down will be either when input "85" falls out, or via the EncoderCnt positioning system. The car will decelerate into the floor. As the car enters the leveling zone, input "81"[30] will be activated by the down leveling unit (#27 to #81). Relay Z and input "84"[10] will energize via the door zone unit (#27 - #84). When the up leveling unit turns off, "81" will fall out bring the elevator to a stop.

DETAILED RUNNING RELAY SEQUENCE

N//Open contacts from either D or U will energize DU,DUX and PX. The main motor contactor P and contactor PB will been energized via PX and DUX. The DEN relay will give a run enable to the vvvf drive, which will turn on DBE output. The Brake contactor BR will then come in releasing the brake. Depending on direction of travel and request speed, the drive will accelerate the elevator to it's proper speed. When not on automatic, releasing the inspection buttons or access key switch will bring the car to an immediate stop. D or U, DEN and BR will drop right away. P and PB will fall out 250msec later. On automatic after the car has decelerated and entered the leveling zone. The car will be brought to zero speed and then BR, DEN, D/U and P will sequentially fall out bringing the car to a controlled stop.

CYCLE TEST

The Cycle Test is controlled by the cpu output "CTP"(output1). The "CTP" output controls the CT relay, whose N/Open contacts control the voltage feed to the Critical Circuits. The Cycle Test is sequenced at the end of every run. N/Closed contacts from the forced guide safety relays I, IX, IC1, IC2, SWB1, SWB2, ID, IU, GS, DL and VC feed proving input "P2". Relays BAC, TAC, ACC, ACX, HS and HMX feed input "P1". P, PB, BR, U, D, DU, DUX, PX, B, DBE feed input "P3". With the elevator at rest in automatic operation, inputs "P1" and "P3" are lit. When the car stops, the CT relay is cycled. All three proving should flash ON. This verifies that all forced safety relays are working

appropriately. Output "CTP" will then turn back on. "P3" will stay lit. "P1" and "P2" will light depending on the mode of operation. If the cycle test fails and all three proving input do not come ON, the CPU LCD screen will display "CYCLE Test Failure".

CT TROUBLE SHOOTING

If the cycles test fails. Proving inputs "P1","P2", and "P3" must be trouble shot. P1, P2 and P3 are feed through various relays and passes through fuse FR2. See sheet #1 area H-24.

If "P1" is not on, remove connector cover ACC on the RB Board (the board with the switches on it). Check for 120vac from terminal #60 to pin ACC[5]. Note, the triangle symbol next to connector indicates pin[1]. If not replace relay HS and/or HM. If present, check for 120vac from #60 to ACC[6]. If not replace ACCESS Board. If present, contact ESI for further assistance.

If "P2" does not come on, check to see that inputs "SAF", "SW", "DLK" and "GS" are not lit. If any are lit remove the CT relay. If SAF goes out replace the CT relay. If SAF does not go out when CT is removed look for 120vac entering the safety circuit from someplace other than the CT point at area A-1 on sheet #1. If all is ok, check to see if there is 120vac from #60 to connector FDB pin[6] on the RB board. If not try replacing relays I,IX,IC1,IC2,SWB,SWB2,ID and IU one at a time. You may use the LFI relay, as it is not part of the cycle test. When 120vac from #60 to connector FDB pin[6] on the RB board is present, check pin FDB[7] to #60 for 120vac. If not, try replacing relays DL,GS and VC one at a time. If present and "P2" is still out, contact ESI for further assistance.

If P3 is not on, check to see if there is 120 VAC from #60 to the BR 4 (aux contact on the right side, top of relay BR). If not, check the N/Closed contacts on P, PB, and BR feed from VF Drive board connector REL pin[5]. If present, check for 120vac from #60 to pin J1[6] on the RB board. If not present, substitute relays DU, DUX, DEN, PX, B and DBE one at a time until P3 comes on. Again, you may use the LFI relay, as it is not part of the cycle test. Be sure to replace LFI relay with a new one if needed. If 120vac is present at pin J1[6], contact ESI for further assistance.

DIRECTIONAL PREFERENCE

Direction preference is indicated by the state of the DG and UG flags on the ESI_Mon screen. On controller setup for master door operation the direction preference is maintained until the doors reach full close and the Door Close Limit input is OFF. All other controllers will clear direction preference after the Door Close / Rerun timer expires.

DOOR OPERATION

On master door jobs, CPU outputs "CX", "OX", and "NR" control door operation. The door close button (#27 to #24) will close a fully open door immediately. The door open button (#27 to #28) will open the door. The Safety edge(#27 to #28S) as well as the DoorEgde/ElectricEye (#27 to #28E) will immediately open a closing door. The quick close button #27 to #29 is the second pole of each car button wired in parallel. When the car is not at the lobby, this input will cause the doors to close immediately. The computer is programmed to know which floor is the lobby, and will ignore the quick close feature whenever the elevator is on the lobby floor. If the lobby floor ever changes, the

computer simply needs to be reprogrammed to the new lobby floor, and operation of the quick close feature will work on the new lobby floor.

Door Nudging

Parameter 24 control the various mode of nudging control available. Depending on this setting, the door can be made to nudge close, sound the in/car buzzer or simply stay open all day long.

With input "28E" ON, setting parameter 24 to:
"1" : will let the doors stay open as long as input 28E is ON and not sound the buzzer.
"2" : will let the doors stay open as long as input 28E is ON and sound the buzzer.
"3" : will let the doors nudge close , and sound the buzzer. After the time set in parameter 45 expires the buzzer will sound. Then the door close timer will expire and the door will nudge close with both CX and NR energized.

INDEPENDENT SERVICE

Independent service is initiated by the key switch terminal #50. While on Independent Service all hall calls are disabled and the car responds to only car calls. The doors remain open until a car call is registered. Continuous pressure of a car call button or the door close button will close the doors. If the doors reach full close, the car will run to the selected floor. Releasing the button prior to running causes the doors to reopen and remain open.

ROPE GRIPPER

There are two types of rope gripper circuits.
Low speed, 200 fpm or less and high speed, above 200 fpm.

Low speed:
Power is applied to the rope gripper from terminals #RGP1 and #RGP2 through relays RG1 – RG4.
RG1 and RG2 N/Open contacts are in series, their coils are in parallel and energize from output 2.
RG3 and RG4 N/Open contacts are in series, their coils are in parallel and energize from output 5.
There are three things that will trip the rope gripper.

1) Governor Over Speed tripped.
2) Brake Switch Error on Stop.
3) Unattended Motion.

When the car is stopped or running, relays RG1/RG2 and RG3/RG4 are in. When the car stops, a rope gripper cycle test is preformed. RG1 will go out, input 20 will go high. RG3 will stay on so that power is maintained to the rope gripper. RG1 will go on and input 20 will go low. RG3 will go out, input 20 again will go high. RG1 will maintain power to the rope gripper. RG3 will go on and input 20 will go low, completing the rope gripper cycle test.

High speed:

Power is applied to the rope gripper from terminals #RGP1 and #RGP2 through relays RG1 – RG4. RG1 and RG2 N/Open contacts are in series, their coils are in parallel and energize from output 5. RG3 and RG4 N/Open contacts are in series, their coils are in parallel and energize from output 2. There are three things that will trip the rope gripper.

1) Governor Over Speed tripped.
2) Brake Switch Error on Stop.
3) Unattended Motion.

When the car is stopped relays RG1/RG2 and RG3/RG4 are in. When the car stops, a rope gripper cycle test is preformed. RG1 will go out, input 21 will go high. RG3 will stay on so that power is maintained to the rope gripper. RG1 will go on and input 21 will go low. RG3 will go out, input 26 will go high. RG1 will maintain power to the rope gripper. RG3 will go on and input 26 will go low, completing the rope gripper cycle test.

To Reset the Rope Gripper

To reset a tripped rope gripper *circuit* , the controller should be set to "controller inspection". Jump terminals #TI to #TC and #TC to #IC2. The CPU LCD screen should say "Cont Insp". Toggle the inspection-automatic switch, the CPU LCD screen should say "Automatic" and then "Cont Insp". This will reset the Rope Gripper.

DBE

Drive Brake Enable relays allows the brake to pick if the drive is ready to run.

LC error on Delta B Drive's

Low Current. When the Delta B+ drive detects current below 10% of the drive capacity the drive will stop and LC will be displayed on the drive screen.

PARAMETER LIST

Para#	Desc	Range	Default	Units	Access	
1	Top Floor	1 to 32			RD ONLY	
2	Bottom Floor	1 to TOPFLR-1			RD ONLY	
3	Selector Type	1 to 8 1 : Stepping of 85/86 2 : Direct Read ESI 3 : Stepping Cemco 4: Direct Read Cemco *5: #81/82* *6: 81/82 & 84* *7: Double 85/86* *8: Encoder Interface*			RD ONLY	
4	Controller Type	1 to 3 1 : VVVF 2 : HYD 3 : VV-MG			RD ONLY	
5	Door Type	1 to 3 1 : Master Door 2 : Car Door 3 : Manual D & G			RD ONLY	
6	Dir Lt Outputs	0 : Use 12 & 13 1 : Use 20 & 21			RD ONLY	
7	In Car Key Sws	0 to 5 0 : No In Car Key Sw 1 : 1st Flr Only = Inp 1-9 2 : All except lobby 3 : All Floors 4 : 2nd Flr Only = Inp 1-10 5 : Bot & Top Floor 6 : 1st & 2nd Floors 7 : Master Key Input[1-9]			RD ONLY	
8	Future					
9	Future					
10	Future					
11	Future					
12	Future					
13	Future					
14	Future					
15	Future					
16	Future					
17	Future					
18	Future					
19	Config CheckSUM				RD ONLY	
20	Write Enable	0-50 0: No Write 3: Write enabled	0			

Para#	Desc	Range	Default	Units	Access	
21	Operation	1 to 4 1 : Sel/Col 2 : Col at Lobby 3 : Collective 4 : SAPB	1			
22	Lobby Floor	1 to Top Flr	1			
23	Park Floor	0 to Top Flr 0 = No Parking	0			
24	Door Nudging Opt	1 to 3 1 : No Edge TimeOut 2 : Buzzer, No Close 3 : Buzz & Close	3			
25	Down Gong Double	0 : In Fixture 1 : ½ via ESI	0			
26	In Car Inspection	0 : Disabled 1 : Enabled	1			
27	CX in out of door Zone	0 : Disabled 1 : Enabled	0			
28						
29						
30						
31	FCF Code	1 to 4 1 : National P/A 2 : NYC 3 : Chicago	1			
32	Prime FCF Floor	1 to Top Flr	1			
33	Alt FCF Floor	1 to Top Flr	2			
34	Nudging on FCF I	0 = No 1 = Yes	1			
35	Future					
36	Future					
37	Future					
38	Future					
39	Future					
40	Future					
41	Car Call Door Time	2 to 30 Sec	6 sec			
42	Hall Call Door Time	2 to 30 Sec	10 sec			
43	Lobby Door Time	2 to 30 Sec	10 sec			
44	Re-Open Door Time	2 to 30 Sec	3 sec			
45	Edge Time Out	10 to 60 Sec	25 sec			
46	Park Delay Time	2 to 600 Sec	60 sec			
47	PI ShutDown Time	0 to 600 Sec 0 : For NO Shut Down	0 sec			
48	Low Oil Time	30 to 300 sec/floor	45 sec			
49	Ind/Att Disc Time	1 to 60 sec	15 sec			
50						

Para#	Desc	Range	Default	Units	Access	
51						
52						
53						
54						
55						
56						
57						
58						
59						
60	Remote Access Code	0 – 64000	12345			
61	OUTPUT #20 Options	0 to 4 0 : No Ouput 1 : Low Oil LT 2 : In Use Lt 3 : OS 4 : OsnoSWTPmem	0			
62	Reserved		0			
63	DG/UG on OL,Z,SD	0 – 2 0: On OL 1: On Z, Door Zone 2: On SD, SlowDown	0			
64	Door Hold = 28S	0 = No Door Hold Input 1 = Input25 = #28H	0			
65	Door Hold Door Time	3 – 600 sec	60sec			
67	'S' Button Enable for #61 S/P Buzzer	0: None #61 always works 1: Use INPUT[15] 2: Use INPUT[35]	0			
101 102	Floor 1 Marking Floor 2 Marking T H R U	1-60 1 = "1" to 32 = "32" 33 = "B" 34 = "B1" 35 = "B2" 36 = "B3" 37 = "C" 38 = "D" 39 = "G" 40 = "G1" 41 = "G2" 42 = "G3" 43 = "GF" 44 = "GR"	1 2			

Para#	Desc	Range	Default	Units	Access	
		45 = “L”				
		46 = “L1”				
		47 = “L2”				
		48 = “L3”				
		49 = “LL”				
		50 = “M”				
		51 = “P”				
		52 = “P1”				
		53 = “P2”				
		54 = “P3”				
		55 = “PH”				
		56 = “R”				
		57 = “S”				
		58 = “SB”				
132	Floor 32 Marking	59 = “T”	32			
141 thru 172	Flr 1 Call Disable thru Flr 32 Call Disable	0 : All Calls Enabled 1 : Car Calls Disabled 2 : ALL CALLs Disabled For a Particular Floor	0			
200	Reserved					

* THIS LIST DOES NOT CONTAIN ALL PARAMETERS