MOVFE 2500

HARMONIC & LINEAR DOOR OPERATORS ELECTRICAL MANUAL

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ELECTRICAL 2500 - 3069

FOREWORD

It is the intent of this manual to give the reader certain key points of information critical to the proper installation of the door operator. It is not intended to give comprehensive installation procedures nor does it cover the installation of door headers, track, hangers, etcetera.

It is hoped that the procedures presented in this manual will reduce the installation and adjustment time and result in a smooth, long lasting door operation.

When properly installed, GAL door operators will give many years of trouble free service.

COMMENTS:

All GAL door operators are factory adjusted and tested for the actual job requirements. When installed correctly, they may require minor adjustments to suit actual job conditions.

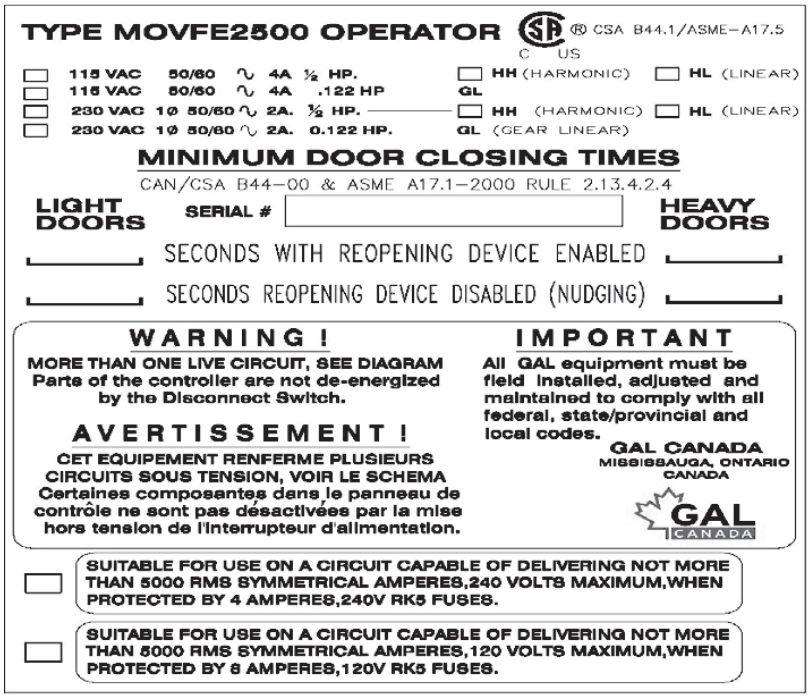
IMPORTANT NOTES:

All equipment must be installed, adjusted, tested and maintained to comply with all Federal, State/Provincial, and Local codes.

Kinetic Energy and Stall Force must be adjusted to comply with ASME, A17.1, Rule 112.4/5, and CSA/B44, Rule 2.13.4/5.

Before mounting the operator, check that the car door is plumb, free and moves easily without bind. Check the attached standard measurement sheets. Install the operator according to the measurements supplied.

Contact GAL if the following label is missing from the door operator.



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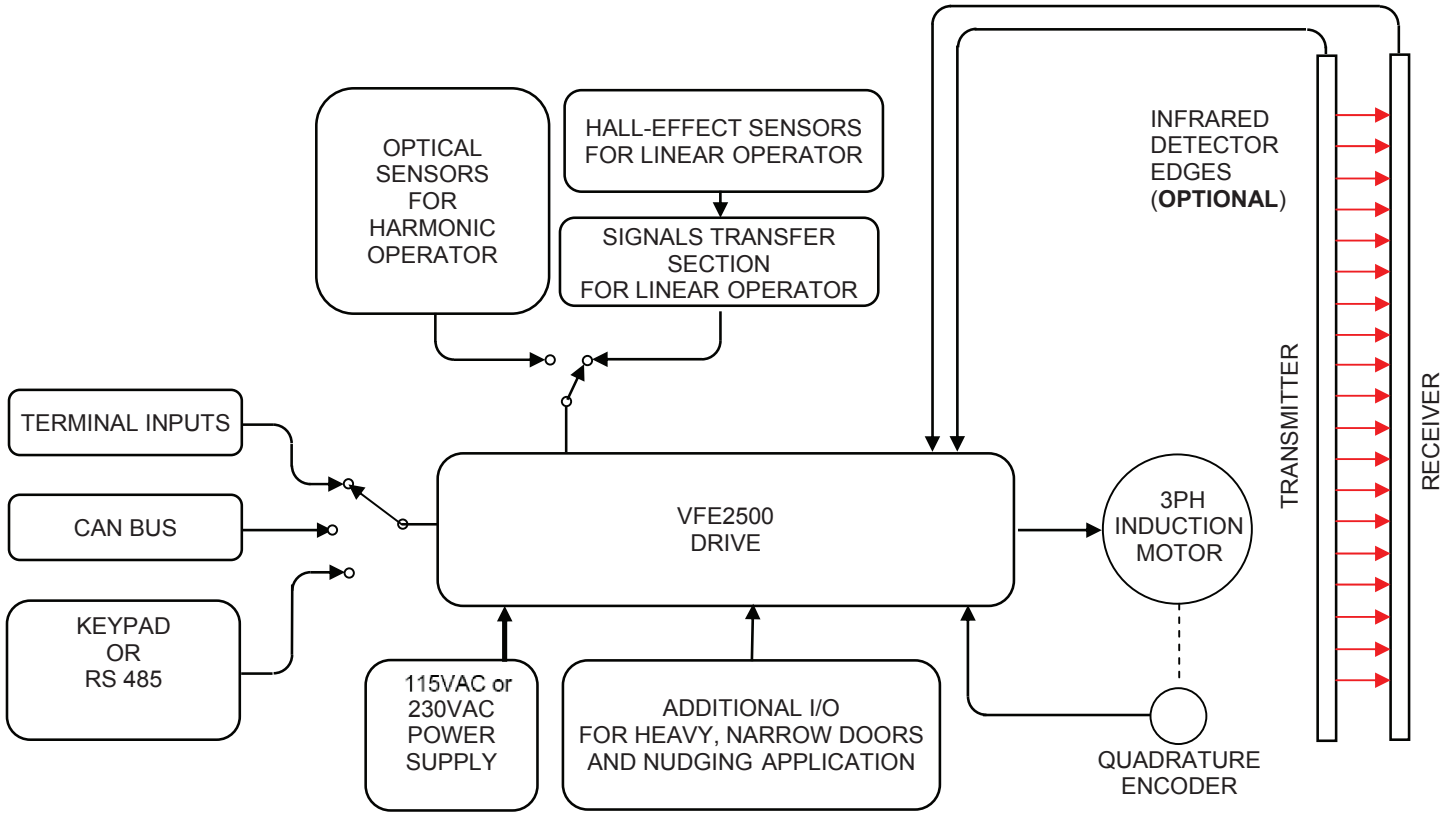
OVERVIEW:

The general block diagram of the VFE2500 is in the illustration below:

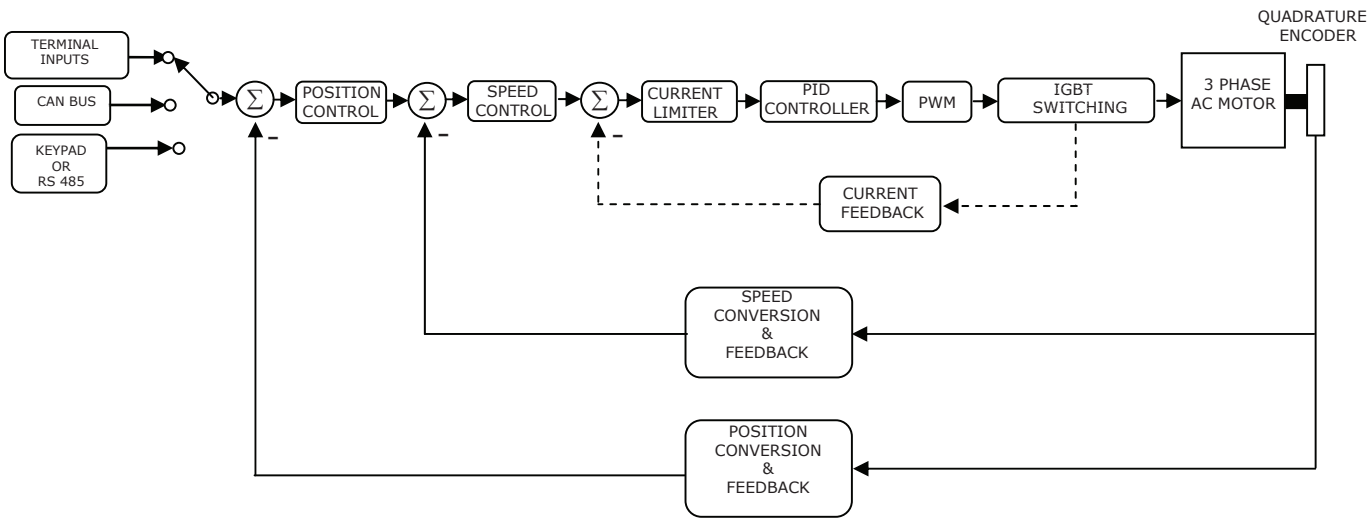


The VFE2500 door operator has the following features:

DOUBLE FEEDBACK SYSTEM FOR SMOOTH PERFORMANCE:

- Distance and velocity closed-loop system
- Once the door-width is learned, VFE2500 will optimize control of the elevator door(s)
- Parameters sets are provided to maximize the performance of the system

Following is a simplified control diagram of the VFE2500.



SAFETY STANDARDS:

- CSA Certified. B44.1/ASME- A17.5
- Complies with the following CE and IEEE safety standards of EN61000-4-2, EN61000-4-3 EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, and IEEE STD C62.45-1992
- EMC conformity report is available

A POWERFUL SYSTEM:

- 230VAC and 115VAC power supply versions are available
- Variable voltage, variable frequency (VVVF) drive
- A ½ HP AC motor is used to accommodate for most of door loads, friction, and wind pressure

HARMONIC AND LINEAR MODELS ARE AVAILABLE:

- Three models of VFE2500 are currently available:
  - VFE2500-HH : Heavy duty Harmonic model
  - VFE2500-GL : Light duty Linear model
  - VFE2500-HL : Heavy duty Linear model

NON-CONTACT SENSORS:

- Optical sensors and Hall-effect sensors for final limits, door protection monitor, and narrower door limit.

CONVENIENCE INDICATORS:

- Light Emitting Diodes (LEDs) on the main board are used to indicate status of all important functions:
  Door open, close, nudging, heavier, narrower input signals,
  Door open, and close directions,
  Open, and close slowdown,
  Obstruction detection signal,
  Stall reverse,
  Frequency failure,
  DOL, DCL, AUX (Narrower door), and DPM (Door Protection Monitor)* output signals,
  Door-width learning completion.

UNIVERSAL INPUTS AND OUTPUTS:

- Universal inputs accept control signals in form of contacts or signal voltages; from 24-230V AC or DC.
- Output contacts, rated at 10Amp, 230VAC, include:
  Door Close Limit (DCL),
  Door Open Limit (DOL),
  Re-Open (RE-OPEN),
  Door Protection Monitor (DPM),
  Auxiliary/Narrower Door (AUX),
  Edges Timeout (ET)
- All input modules, output relays, and connectors are pluggable for easy replacement.

KEYPAD (PARAMETER UNIT):

- Keypad programming with LCD display is available to adjust, monitor, copy, change parameters, upload parameter sets, and to learn the door width distances.
- Default parameter sets are ready for all ECI operator models.
- Different parameter sets for heavier door and narrower door are available for proper adjustments to comply with codes.
- The ability to copy (read) and download (write) parameter sets enables reduced setting time on similar door operators.

TOGGLE SWITCHES FOR MANUAL TESTING:

- Toggle switches are provided for manual operation, diagnostics, and operational verification regardless of the control wiring to the elevator controller

OVER-TORQUE AND OVER-SPEED DETECTIONS:

- Over-torque and over-speed detection and restriction are parameterized for easy adjustment to comply with codes

PLUG-AND-PLAY INFRARED DETECTOR EDGES:

- Both NPN and PNP infrared detector edges can be connected directly to the VFE2500 simplifying electrical wiring and eliminating the need for an extra power supply

SPECIAL FEATURES ADDED:

- Combined VVVF drive and main board makes the VFE2500 drive easily interchangeable from one model or job to another
- Additional I/O for special applications of:
  Heavier door, Narrower door, Detector edges timeout for Nudging application, Buzzer output for alarm before Nudging speed is applied

RELIABLE AND HIGH RESOLUTION FEEDBACK:

- High resolution encoder and galvanic isolation techniques are used to deliver smooth, and reliable operation.
- Hardware and software encoder loss detections are employed to prevent run-away conditions that could otherwise result in a closed-loop control system. This combination of hardware and software provides an ultimate protection for human life

SERIAL COMMUNICATION TO VFE2500:

- CAN (Controlled Area Network) or other communication protocols can be used to communicate with VFE2500 serially.
- CAN bus counter and analyzer are built in to monitor the CAN bus activities.

TROUBLESHOOTING ASSISTANCE DISPLAY:

- The Faults display will explain to users the possible causes and shows the remedies for each fault code.

MINIMUM CODE DISTANCE CLOSING TIME TABLES:

- The minimum code distance closing time tables are available on the LCD keypad.

ACTUAL DISPLAY OF THE CLOSING TIME:

- The actual code distance of the closing time is displayed to assist users in complying with codes.

AUTO FALLBACK TO SLOW MODE IF SENSORS OR ENCODER FAIL:

- If DOL, DCL, AUX, or DPM sensor fails, or if the encoder fails, the VFE2500 door operator will continue to operate in slow scanning mode until repairs are completed

*: Door Protection Monitor is used in the Fault Monitor, which is a door lock and gate switch protection device. Its purpose is to meet the ASME A17.1 RULE 210.15 and CAN/CSA-B44-M90 RULE 3.12.1.5. The Fault Monitor device can be purchased separately through ECI.

ELECTRICAL COMPONENTS OF THE VFE2500:

1. Toggle switches:

Six toggle switches are provided to run the door operator in manual mode. However, users can also use these switches to troubleshoot and verify the operation.

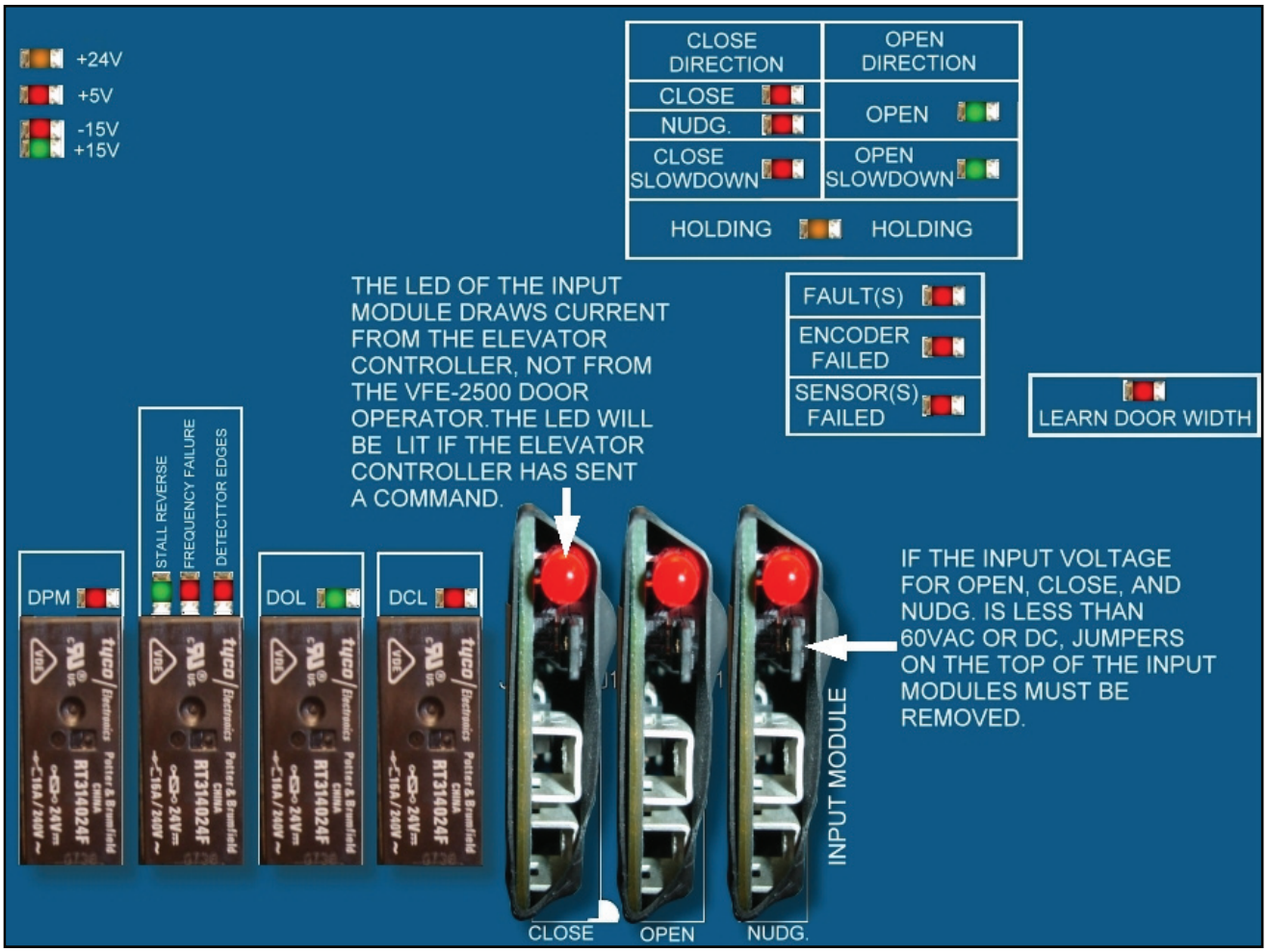
Order No.	Label	Meaning	Remarks
1	RUN/SETUP	Run or Cam Setup	**RUN:** The RUN position is for normal operation. **SETUP:** The SETUP position allows users to adjust the optical cams of the Harmonic model, or the hall-effect sensors of the Linear model. These are DOL, AUX, DPM, and DCL sensors . Crucial parameters can only be adjusted in STOP mode. The SETUP position will put the drive into the STOP mode, and no power will be delivered to the motor.
2	AUTO/MAN.	Auto or Manual	**AUTO:** The AUTO position is for normal operation. **MAN.:** The MAN. position allows opening and closing the door by means of the OPEN/CLOSE switch.
3	CLOSE/OPEN	Close or Open	When the AUTO/MAN. switch is in the MAN. position, if the CLOSE/OPEN switch is pressed in the OPEN or CLOSE positions, it will Open or Close the door respectively.
4	NUDG.	Nudging	NUDG. switch allows closing the door at a reduced speed (Nudging speed). To test the Nudging speed in Manual mode, the AUTO/MAN. switch must be in the MAN. position and the CLOSE/OPEN and NUDG. switches must be pressed to the CLOSE and NUDG. positions.
5	NARROW	Narrower Door	When the AUTO/MAN. switch is in the MAN. position, if the NARROW switch is pressed in the NARROW position, it will work in conjunction with the OPEN/CLOSE, and NUDG. switches to Open, Close, or Nudge the door.
6	HEAVY/RESET	Heavier Door or Reset	**HEAVY:** When the AUTO/MAN. switch is in the MAN. position, if the HEAVY/RESET switch is pressed in the HEAVY position, it will work in conjunction with the OPEN/CLOSE, NUDG. switches to Open, Close, or Nudge the heavier door. RESET: The RESET position allows manual reset of faults of the drive, if faults have occurred. Otherwise, pressing the RESET side has no effect.

2. LED indicators:

A red LED is provided on each of the input modules (Open, Close, or Nudge). Heavy and Narrow inputs are optional and require an additional I/O board, which will be provided on request to carry out the Heavier and Narrower door functions.

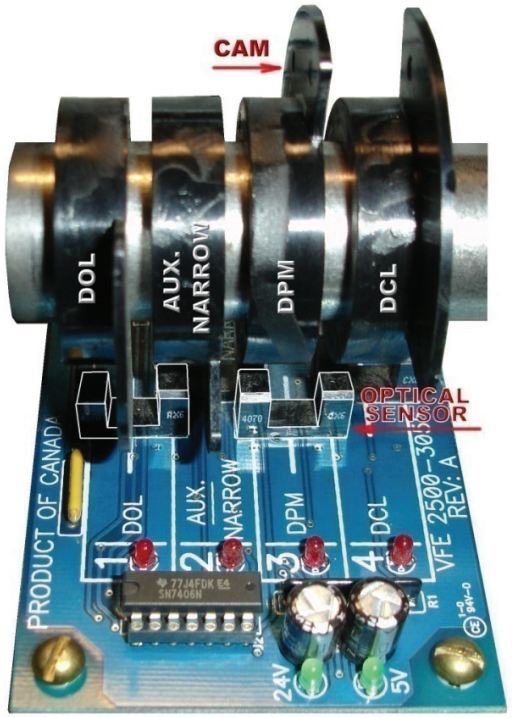
Note that if the input signals voltage is 60V or less, the jumpers on each input module must be removed.

There are 20 more LEDs, on the main board, to indicate the completion of the door width learning, the directions, the final limit positions, nudging, holding, dynamic slowdown distances, input signals, output signals, and voltage levels. The illustration below identifies those LEDs.



3. Optical Sensors for Harmonic Model:

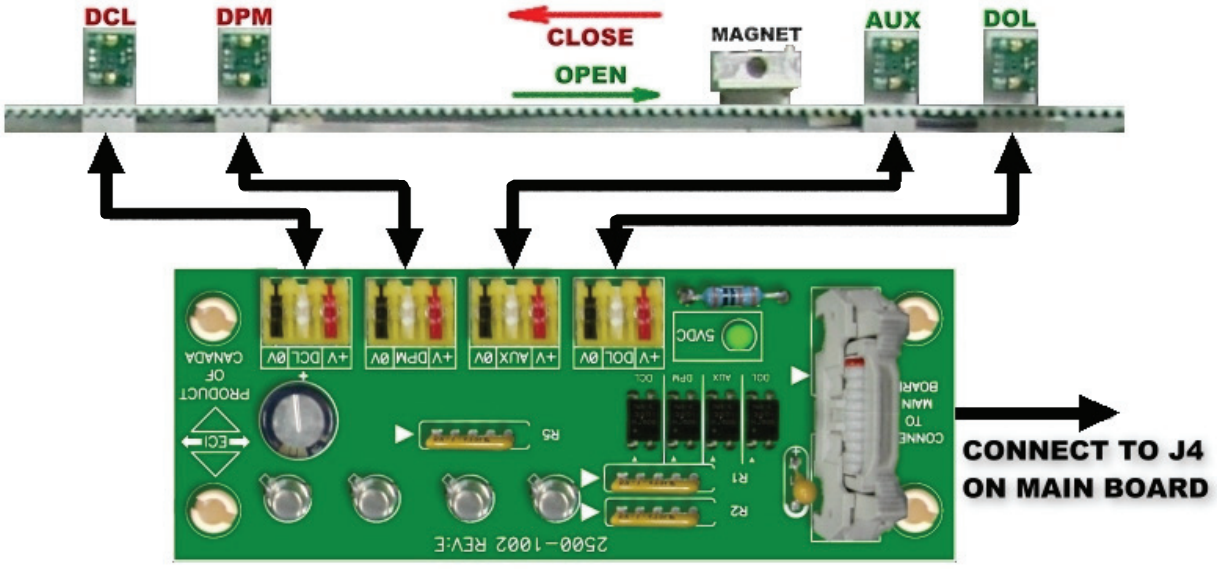
For the harmonic model, there are 4 optical cams to set the final limits, door protection monitor, and an AUX. cam for the narrower door. The Optical cam board, 2500-3056, carries the optical sensors, and the table below describes the functions of those sensors.



Number on Figure	Label	Remarks
1	DOL	Door Open Limit. The VFE2500 utilizes the DOL limit signal for door width learning. After the door width learning process is completed, VFE2500 utilizes the DOL limit as HOME position whenever power is restored after an interrupt.
2	AUX NARROWER	Set Par. 199=0 to use the AUX/NARROWER sensor as the DOL input of the narrower door. Set par. 199 = 1 to deselect the AUX/NARROWER sensor.
3	DPM	DPM: Door Protection Monitor. The DPM cam triggers the DPM Relay and activates ½ inch before the Gate switch makes.
4	DCL	Door Close Limit. The VFE2500 utilizes the DCL limit signal for door width learning. After the door width learning process is completed, VFE2500 also utilizes the DCL limit as HOME position whenever power is restored after an interrupt.

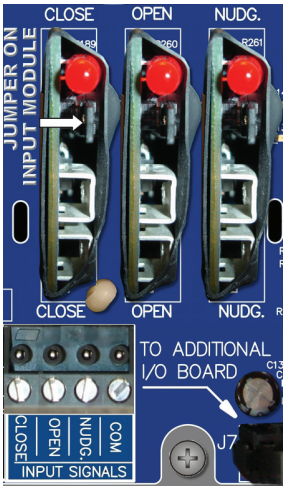
4. Hall-effect Sensors for Linear Model:

For the linear model, there are 4 hall-effect sensors to set the final limits, door protection monitor, and an AUX. sensor for the narrower door. These hall-effect sensors have the same functions as in the harmonic operator, as shown in the table above. They are connected to the signals transfer board and arranged as follows:



5. Inputs:

Three input modules are provided to receive OPEN, CLOSE, and NUDGE commands from the elevator controller. These *universal input* modules receive control signals either in form of contacts or signal voltages; from 24-230V AC or DC. Jumpers on the input modules must be removed if the input signal voltage is 60V or less. LEDs of the input modules draw currents from the elevator controller, not from the VFE2500. Therefore, when these LEDs are lit, they indicate that the elevator controller has sent commands.



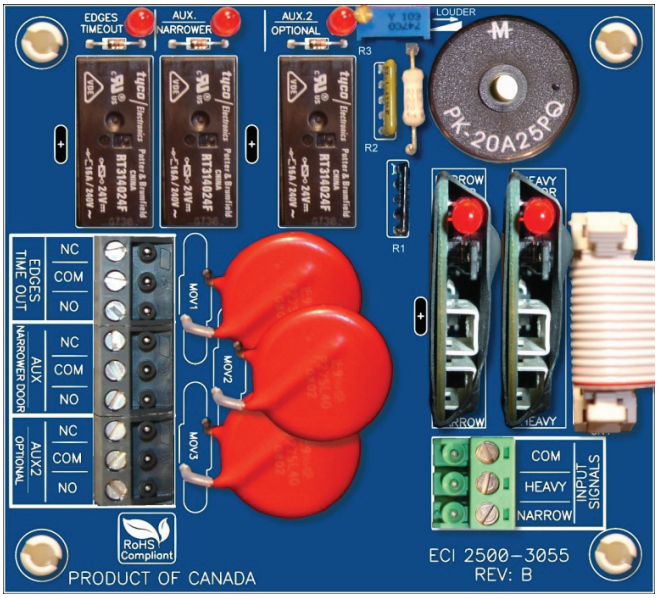
In automatic mode, the VFE2500 will only accept input signals from the elevator controller. In other words, open, close or, (nudge + close) LEDs must be on to have the door operator open, close, and nudge respectively.

6. Outputs:

Four relays are provided to output DPM, RE-OPEN, DOL, and DCL signals to the elevator controller in the form of contacts. The relay contacts are rated at 10Amp, 250VAC maximum and 100mA, 12VAC minimum.

Label	Meaning	Remarks
DCL	Door Close Limit	Door Close Limit
DOL	Door Open Limit	Door Open Limit
REOPEN	Re-open	This output is used to flag the elevator controller that the door(s) need to be reopened. The reopen output DOES NOT reopen the door directly. The signal to reopen the door(s) must come from the elevator controller. Re-open relay is triggered by any one of the following detections: - Stall Reverse; controlled by Par. 148. - Frequency Failure; controlled by Par. 136. - Detector Edges; controlled by Par. 202, SW8, and Enable IC U5.
DPM	Door Protection Monitor	DPM is designed to work with the Fault Monitor (FM). FM is a patented door lock and gate switch protection device. Its purpose is to meet the ASME A17.1 RULE 210.15 and CAN/CSA-B44-M90 RULE 3.12.1.5. The setting position of DPM is ½ inch before the gate switch makes.

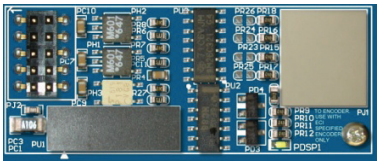
7. Additional I/O Board:



Additional I/O board, 2500-3055, is optional. If used, this board will be connected to the connector J7 of the main board 2500-3050. The additional features of this board are:

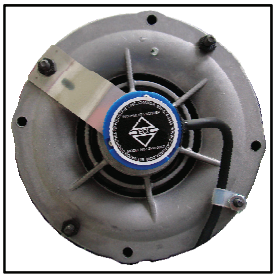
- Inputs for the Heavier, and Narrower doors. Elevator controller must provide command signals to the Heavy and Narrow inputs to use the functions of the parameters sets of the Heavier and Narrower doors. Set Par. 199 = 0 if Narrower door is used.
- Edges Timeout: Once the infrared detector edge is obstructed, and after a delay set by Par. 197, the Edges Timeout relay will be activated and held for an interval of time set by Par. 206. Should the edges timeout relay be used for Nudging application, it must be subject to the elevator fire service codes.
- DOL of the narrower door is selectable between the Regular output DOL on the main board or the AUX/NARROWER output on the Additional I/O board. Set Par. 204 = 1 if only the regular DOL output is used. Set Par. 204 = 0 if both the AUX/NARROWER output and regular DOL output are used.
- AUX2 relay is provided as a spare output and is controlled by Par. 68. If the door position is less than the value set in Par. 68, the AUX2 relay will be activated.
- Buzzer: once the infrared detector edge is obstructed, and after a delay set by Par. 198, the output of the Buzzer will be activated. Buzzer operation is controlled by Par. 205.
  Par. 205 = 0 : Disable
  Par. 205 = 1 : Enable in Continuous mode
  Par. 205 = 2 : Enable in Pulsating mode
  The Buzzer volume control is on the board. Turn the Pot. R3 clockwise for louder sound.

8. Encoder card:



The optical galvanic isolation encoder card is a means to interface between the encoder and The MCU (Micro Controller Unit). This total isolation helps enhance the reliability and safety of the feedback system.
RJ12 mating gold-plated connectors are also used to maximize the conductivity between the encoder and MCU.

9. Encoder:



Model:2500-3057

Model:2500-3072-R/L

Two different types of encoder are used in VFE2500 door operators. Model 2500-3057 encoder is used for the straight motor. Model 2500-3058 encoder is used for the geared motor. These encoders are utilized to provide distance and velocity feedback.

To verify encoder direction:

Press the VOLT PULSE key, run the door in manual mode or physically move the door by hand, and watch the LCD display. If the door closes and the count decreases, or the door opens and the count increases, then the encoder direction is correct. Otherwise, change parameter 42 from 1 to 2 or vice versa. The table below provides the default values of par. 42.

DEFAULT VALUE FOR THE ENCODER DIRECTION OF PAR. 42								
HARMONIC			LINEAR					
			STRAIGHT			GEARED		
LEFT	RIGHT	CENTER	LEFT	RIGHT	CENTER	LEFT	RIGHT	CENTER
2	1	2	1	2	1	1	1	2

10. LEARN DOOR WIDTH LED:

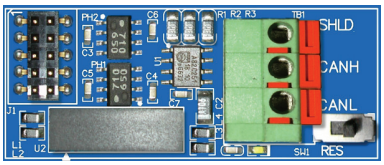
The "LEARN DOOR WIDTH" LED is an indicator to show the status of the door width learning process.

To learn the Door Width:

Set Par. 63=1. Use Manual mode to run the door from DOL to DCL or vice versa. Follow the prompts on the LCD display. The "LEARN DOOR WIDTH" LED will flash and turn off when the learning process is completed. Par. 63 will reset itself to Zero.

See Parameter Adjustment section for more details.

11. CAN Bus card:



The optical galvanic isolation CAN bus card is one of the methods to interface between and the elevator controller and the VFE2500. This total isolation helps increase the reliability of the CAN bus.

To enable CAN Bus operation:

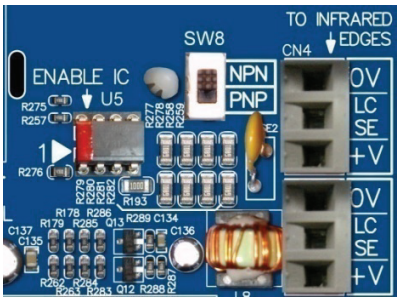
Flip the RUN| SETUP switch to SETUP. Set Par. 11 = 5.

Flip the RUN| SETUP switch to RUN. Flip the AUTO|MAN to AUTO to run VFE2500 with the CAN Bus.

Other communication protocols are also available upon request. However, an agreement between ECI and the requesting party must be made prior to the implementation of the communication protocols.

Contact ECI for more details in CAN or other protocols.

12. Infrared Detector Edges Connection Ports:



To simplify connections between infrared detector edges and the elevator controller, ECI offers *ECI Certified Infrared Detector Edges.* These infrared detector edges can be connected directly to the VFE2500. The procedure below will assist users to plug and play *ECI Certified Infrared Detector Edges* with the VFE2500.

NPN or PNP output:

The info of NPN or PNP output should be obtained prior to installation. Read the label on the tube or the detector edges' manual to know the output type of the infrared detector edges. It is either NPN or PNP. Set the selector switch SW8 accordingly. If the info of NPN or PNP is unavailable, then, use a trial and error method. *Assume that the edges' output is NPN for the 1st trial.*

To set up ECI certified infrared detector edges:

Set Par. 202 = 1 for NPN type. Set Par. 202 = 2 for PNP type.

Set par. 202 = 0 to disable or should detector edges are **not connected** to the VFE2500.

Make sure the ENABLE CHIP is inserted into the socket U5 on the VFE2500 as shown.

Connect the *ECI Certified Infrared Edges* to connectors CN4 **and/or** CN5.

Note! Connectors CN4 and CN5 are interchangeable.

Make sure the REOPEN circuit is connected to the REOPEN output contacts as shown in section 6.

Test the detector edges:
- Obstruct the infrared detector edges. The DETECTOR EDGES LED, near the Re-Open relay, should be ON.
- The REOPEN relay should be activated to send the REOPEN flag to the elevator controller.
- The elevator controller will send the Door Open command signal to the VFE2500 to REOPEN the door. The LED of the Open Input module should be ON.

If the detector edges function does not work.
- Check the manual for correct connections between edges and the VFE2500.
- Check for 24VDC between 0V and +V on either CN4 or CN5.
- Repeat testing the detector edges.

If it still does not work. Then,
-Jump **0V** to LCSE on either CN4 or CN5 connector for NPN type.
-Jump **+V** to LCSE on either CN4 or CN5 connector for PNP type
- The DETECTOR EDGES LED should be OFF.
- The RE-OPEN Relay should be activated.

Otherwise, the problem is in the VFE2500.

If the above step works as described, turning ON the detector edges LED, then the problem is in detector edges.

If the infrared detector edges have intermittent problems:
- Check continuity of the TX and RX cables of the infrared detector edges.
- If the cables are good, but the problem still exists, then check the Earth Ground connection to the edges.
- Lower the Carrier Frequency in Par. 1 gradually until problems are resolved.

Note! The lower carrier frequency will create more audible noise.

The major advantages of connecting ECI certified infrared detector edges via VFE2500 are:

- Eliminates an extra power supply for the detector edges, resulting is less mounting, less wiring, and fewer components to fail.
- The REOPEN relay that is used for infrared detector edges interface provides 2 more safety features to reopen the door: Over-speed and over-torque detections.
- When the VFE2500 door operator and the interface circuit with the infrared detector edges are provided by ECI. ECI can provide the best technical support.
- ECI provides users with an Additional I/O board to assist customers with Nudging feature. This additional I/O board only works with ECI Certified Infrared Edges

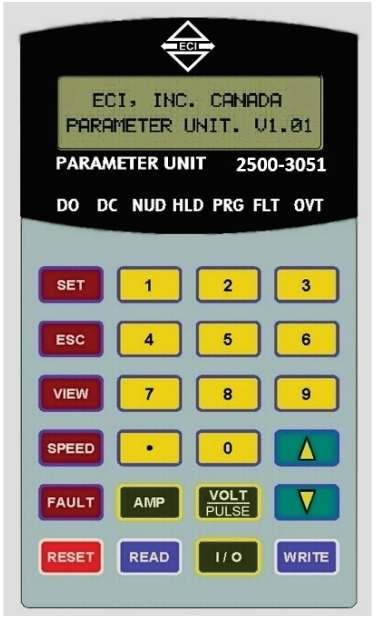
The table below assists users to identify the colors, numbers of each wire from infrared detector edges to the VFE -2500 door operator.

ECI CERTIFIED INFRARED DETECTOR EDGES WIRE COLORS								
ECI P/N	MFG.	TX(CN5)			RX(CN4)			CONNECTION BETWEEN TX & RX
		V+	LCSE	0V	V+	LCSE	0V	
906-3021	JANUS E40 32	RED		BLACK	RED	BLUE	BLACK GREEN	NONE
906-3020	TRITRONICS	RED	WHITE	ORANGE				NONE
906-3030	FORMULA SYSTEMS	BLUE 1	BROWN 2	GREEN YELLOW	BLUE 1	BROWN 2	GREEN YELLOW	NONE
FORMULA SYSTEM	VERSION 2	BROWN	GREEN YELLOW	BLUE	BROWN	GREEN YELLOW	BLUE	NONE

♦: Connect an additional wire from 0V to a true EARTH GROUND.

ECI Certified Infrared Edges and Enable IC U5 are available through ECI, Inc.

13. Parameter Unit: Parameter Unit not included, if required part # 2500-3051



The Parameter Unit is a tool that plugs into the VFE2500 drive and permits changing values of relevant parameters.

Parameter unit is also needed for door width learning, monitoring, troubleshooting, storing, copying (reading), and downloading (writing) reference sets of parameters, to the VFE2500 drive.

See PARAMETER UNIT section for more details.

14. VFE2500 drive:

VFE2500 drive is an integral part of the VFE2500 system.
Velocity and distance feedbacks are combined to deliver precise and smooth stops at DOL or DCL every time

VFE2500 drive provides the connections for:

- Single phase input power supply between L1 & L2 terminals. **Note!** 200-230VAC or 115VAC, 50/60Hz, and minimum 500VA are required.

- Earth ground
  Note! A True Earth Ground is required.

- Convenience Gate switch terminals: GS & GS1. **Note!** GS & GS1 are only convenience terminals. They have no internal connection to the VFE2500.

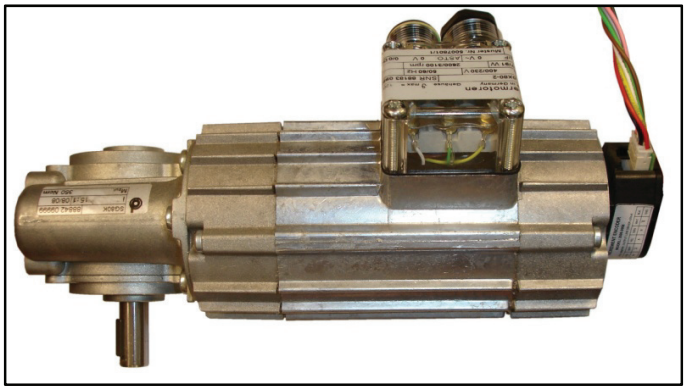
- 3-phase induction motor on U, V, W terminals.

The connector is a pluggable type to ease the connection and swapping the drive. The RJ12 mating connector for the parameter unit is located on the VFE2500 drive.

The International Ground Symbol is the True Earth Ground that is connected to the system. A connector and a green screw, size 8/32 x 3/8, are provided by ECI as shown. Use position 22-14 of the crimping tool to crimp the wire into the connector and use the green screw to screw the ground connector to the chassis of the VFE2500 door operator. The following materials are recommended:
A minimum # 14 AWG conductor size for Ground wire.
Crimping tool made by SARGENT/USA.

15.Motors:

½ HP 3-Phase 230V Induction Motor



91W 3-Phase 230V Induction Motor

Two different types of motor are used in the VFE2500 systems.

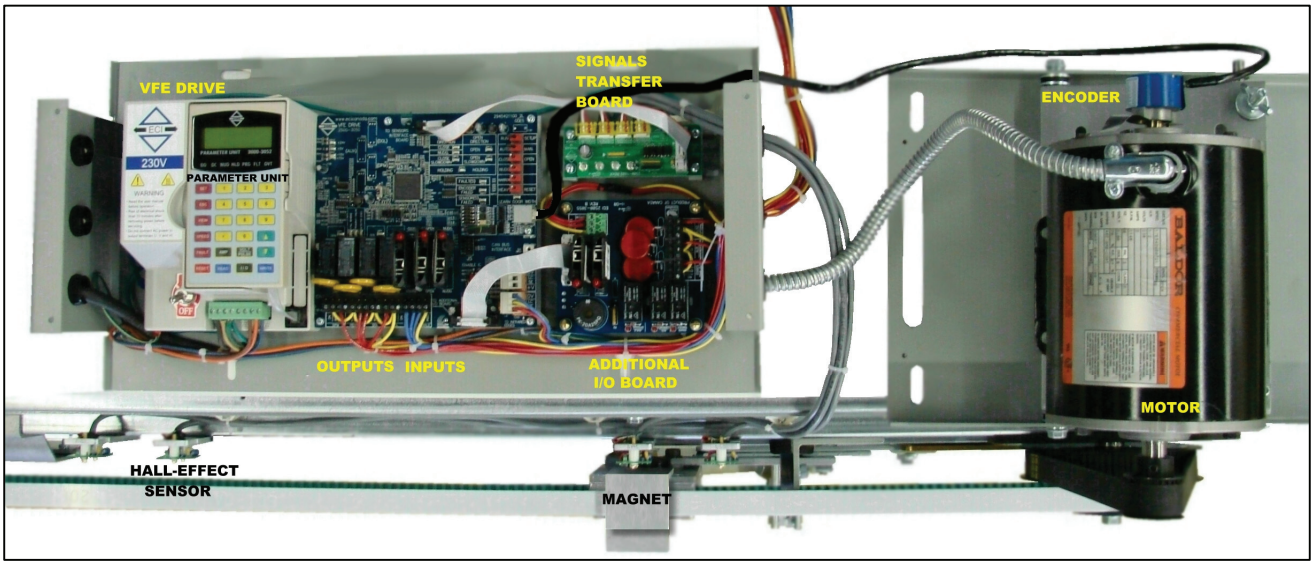
- ½ HP 3-Phase 230V induction motor is used for the Harmonic and Heavy Duty Linear models.
- 91W 3-Phase 230V induction geared motor is used for Light Duty Linear model.

16.VFE2500 MODELS:

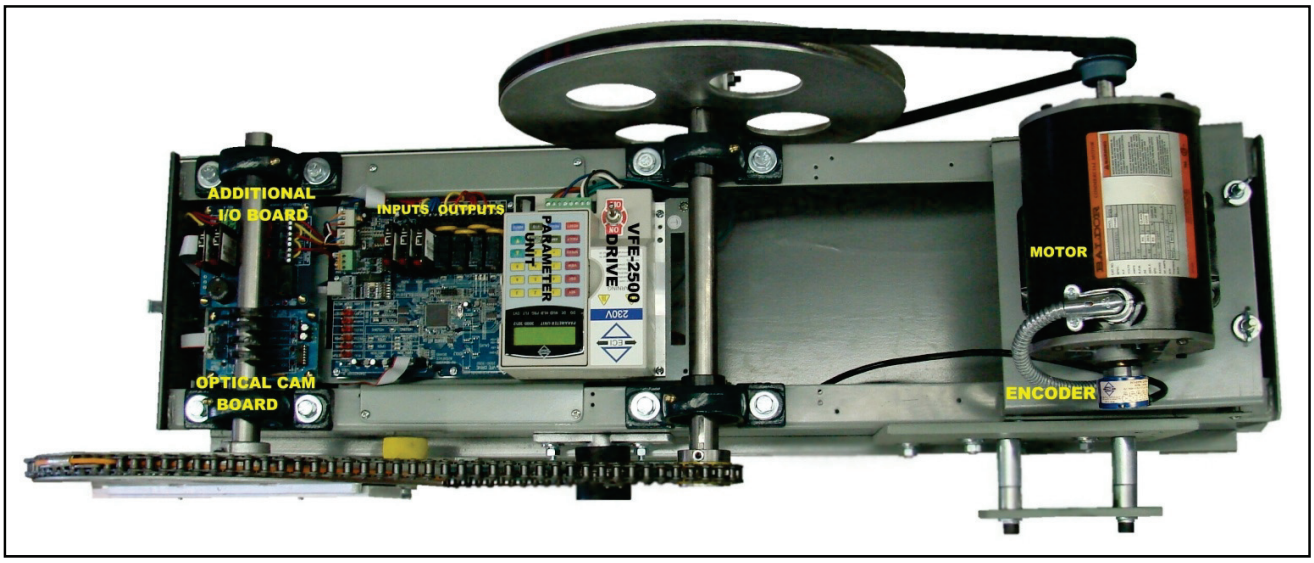
Three models of VFE2500 system are available:

- VFE2500-HH: Heavy Duty Harmonic model.
- VFE2500-GL: Light Duty Linear model.
- VFE2500-HL : Heavy Duty Linear model.

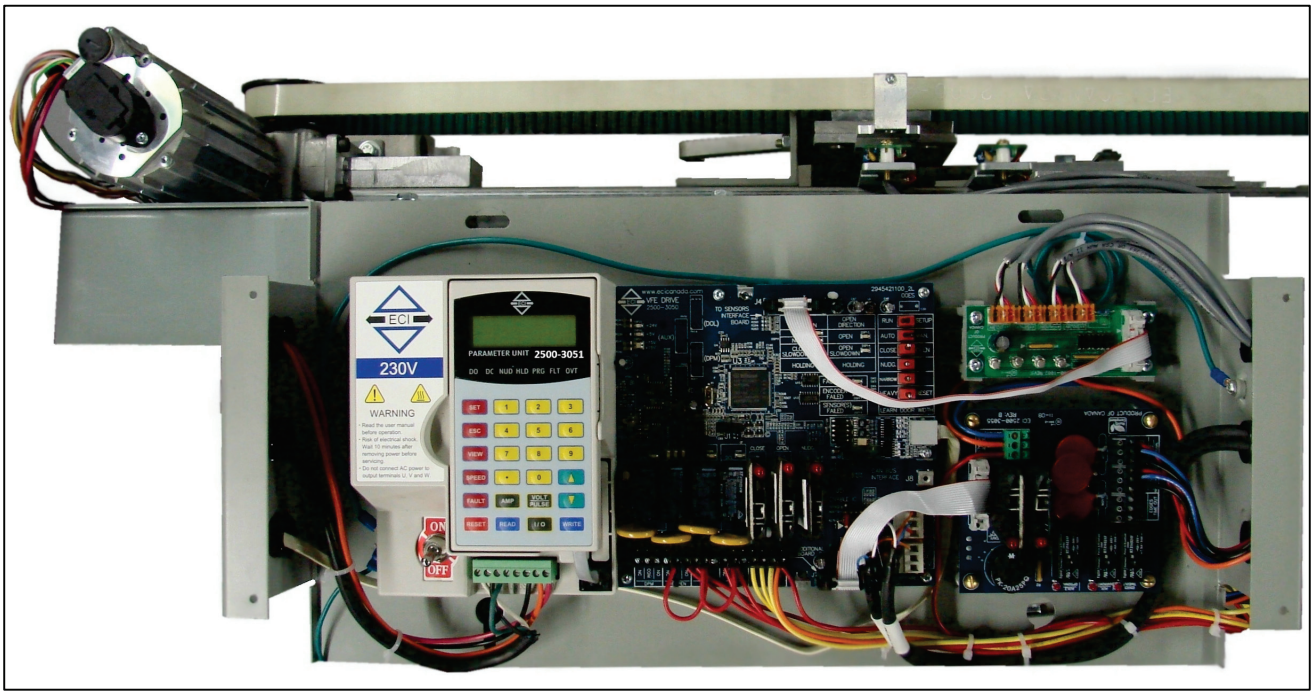
Left hand, right hand, center parting versions are available for each model.



MOVFE2500 Heavy Duty Linear Model
Parameter Unit not included, if required part # 2500-3051



MOVFE2500 Heavy Duty Harmonic Model
Parameter Unit not included, if required part # 2500-3051



MOVFE2500 Light Duty Linear Model
Parameter Unit not included, if required part # 2500-3051

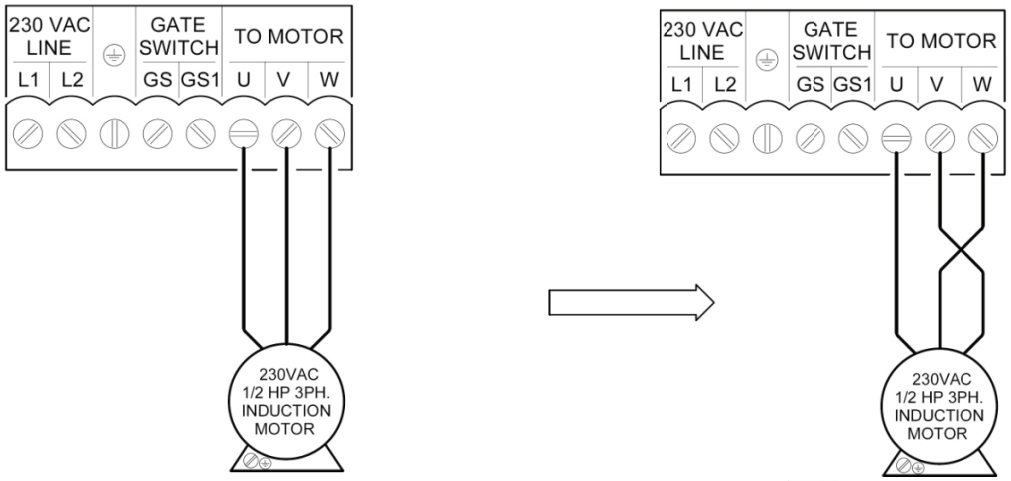
INITIAL SETUP:

ECI has done the initial setup prior to shipping the VFE2500 to users. However, the following initial procedure is helpful for users, if needed.
This initial procedure is to assure the following:

- The motor is in the correct direction.
- The encoder is in the correct direction.
- The correct default parameter set is downloaded (written) to the VFE2500 drive.
- The door width is learned.
- The operation source is selected.

1. **Turn Power ON**

2. **Motor direction:** Run the door in Manual mode. If door closes and opens in the correct direction then go to 3. Otherwise, swap any 2 of motor wires as shown, then test again.
   Note: Do the same procedure, to correct the motor direction, when is using 115VAC drive.



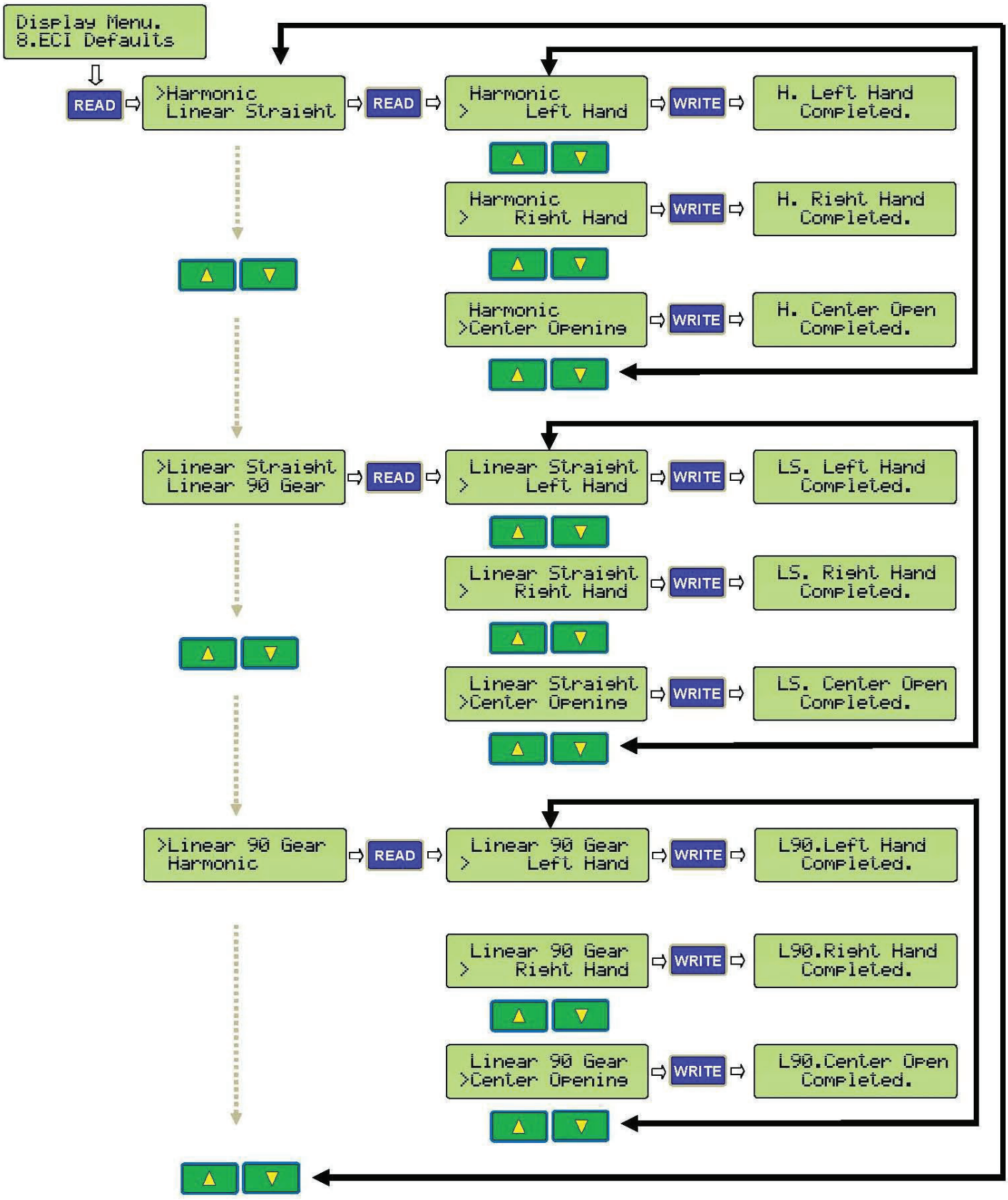
3. **Encoder direction:** On the Parameter unit, press the VOLT PULSE key and run the door in Manual mode again.

   In the close direction, the display should show

and the pulse count should decrease. Or,
   in the open direction, the display should show

and the pulse count should increase.
   If not, change par. 42 from 1 to 2 or vice versa and go to 5.

4. **Download an GAL default parameter set:** Follow steps of the illustration below to download (write) a correct default parameter set to the MOVFE2500 drive then go to 6.

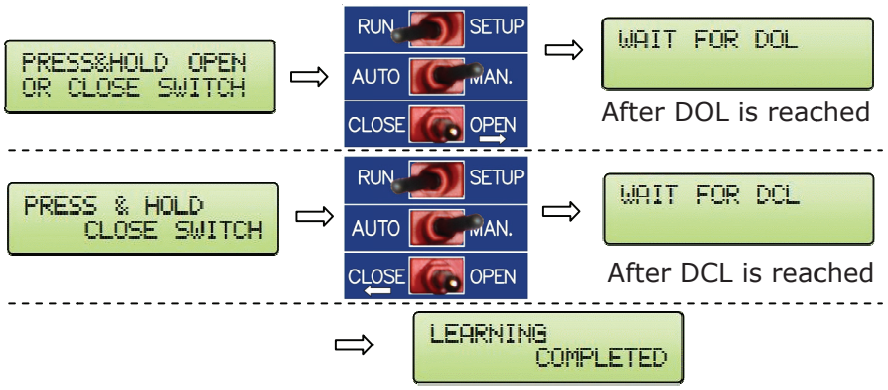


5. **Learn the door width:**

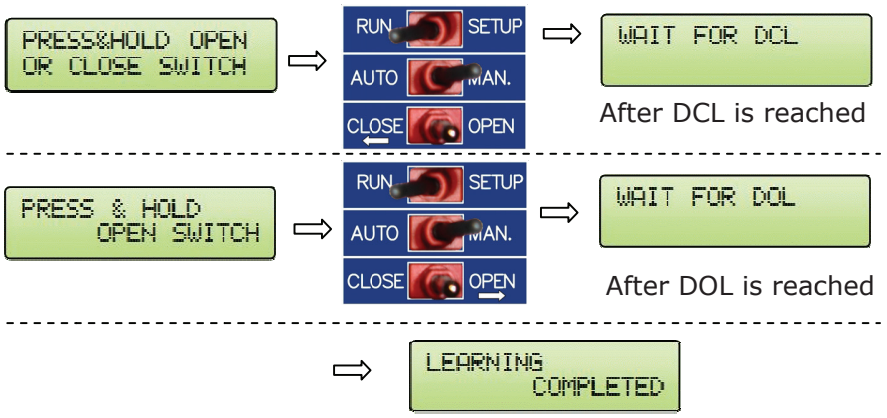
Flip the RUN|SETUP switch to SETUP.
Set Par. **63 = 1.**
Flip the RUN|SETUP switch to RUN.
Use Manual mode to run the door from DOL to DCL, or vice versa.

Follow the prompts on the LCD display. LEARN DOOR WIDTH LED will flash and turn off when the learning process is completed.
Par. 63 will sets itself back to Zero
Followings are 3 possible cases:

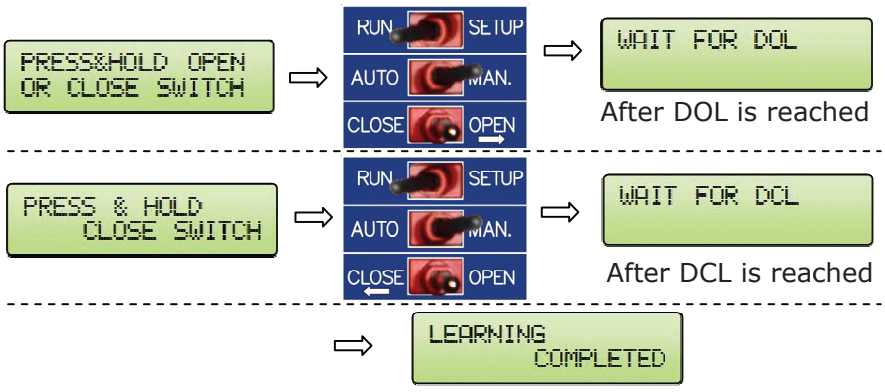
5.1 If the door is **between DOL and DCL** before learning mode, the prompts will be:
If the CLOSE/OPEN switch is pressed in the OPEN side, the prompts will be:



5.2 If the door is **fully OPENED**, DOL is reached before learning mode, the prompts will be:

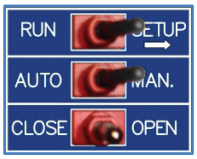


5.3 If the door is **fully CLOSED**, DCL is reached before learning mode, the prompts will be:



6. **Set the operation source:**

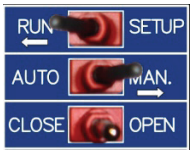
Flip the 1st toggle switch to SETUP.



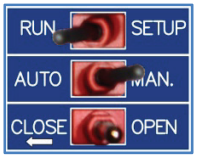
Set par. 11 = 1 for Terminals operation.

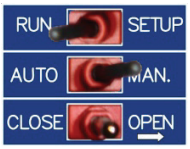
Set par. 11 = 5 for CAN bus operation.

Flip the 1st toggle switch to RUN.



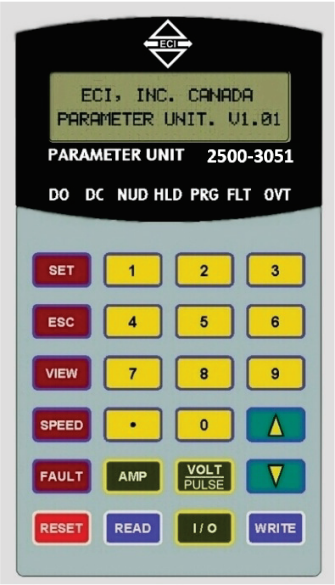
Flip the 2nd switch to MAN to run the door in manual mode.





Flip the 2nd switch to AUTO to run the door in automatic mode.

PARAMETER UNIT: Parameter Unit not included, if required part # 2500-3051



The Parameter Unit is a tool to assist users in the following tasks:

- Learning the door widths of the regular door and narrower door.
- Changing accelerations, decelerations, speeds, torques, and all pertinent parameters of peripheral devices. See the defaults parameters table for more details.
- Downloading (copying, reading), uploading (writing) to and from the drive.
- Storing all default sets of parameters and a reference working set of parameters.
- Monitoring currents, voltages, inputs, outputs, faults, encoder directions, closing time.
- Resetting the drive.

The followings will describe in depth about the parameter unit:

1. HOW TO CHANGE PARAMETERS

Press SET. Enter a parameter number

Press READ. Enter a new value. Press WRITE. Wait for the Completed signal from the LCD display.

2. HOW TO READ (COPY) FROM A DRIVE

Press SET. Press ▲.

Press READ. Wait for the Completed signal from the LCD display.

3. HOW TO WRITE (DOWNLOAD) TO A DRIVE

Press SET. Press ▲.

Press WRITE. Wait for the Completed signal from the LCD display.

4. HOW TO VERIFY ENCODER DIRECTION

Press VOLT PULSE. Run the door in Manual mode using the toggle switches.

If the door **Closes** and the counter **Decreases**, or the door **Opens** and the counter **Increases**, then the encoder Direction is Correct. Otherwise, change parameter 42.

5. HOW TO LEARN THE DOOR WIDTH

Flip the RUN|SETUP switch to SETUP. Set Par. **63 = 1.**
Flip the RUN|SETUP switch to RUN. Use Manual mode to run the door from DOL to DCL, or vice versa.

Follow the prompts on the LCD display. LEARN DOOR WIDTH
LED will flash and turn off when the learning process is completed.
Par. 63 will sets itself back to Zero.
See Parameter Adjustments section, in the Manual, for more details.

6. DEFAULT PARAMETERS

CLOSING	Pr.#	RANGE	DEFAULT VALUE					
			HARMONIC		LINEAR			
					STRAIGHT		GEARED	
			C/P	S/O	C/P	S/O	C/P	S/O
MAX. CLOSE SPEED	136	0-60	30	30	30	30	30	30
HOLDING TORQUE	137	0-3	0.6	0.6	0.6	0.6	0.2	0.2
HOLDING SPEED	138	0-400	2	2	2	2	2	2
HOLDING BEGINS	139	0-100	3	3	2	2	2	2
CLOSE TORQUE ▲	140	0-400	243	173	270	270	100	120
HIGH SPD (HSC)	141	0-400	25	19	25	20	25	20
FINAL SPD (FSC)	142	0-400	5	5	3	2	4	5
FSC BEGINS	143	0-100	6	10	5	5	5	10
NUDGING SPD	144	0-400	15	9	10	15	15	15
ACCEL. TIME	145	0-360	4	6	6	6	6	2
DECEL. TIME	146	0-360	8	10	15	20	10	4
STALL REV. FORCE	148	0-4.5	1.6	2.0	1.4	1.4	0.6	0.9

OPENING	Pr.#	RANGE	DEFAULT VALUE					
			HARMONIC		LINEAR			
					STRAIGHT		GEARED	
			C/P	S/O	C/P	S/O	C/P	S/O
QUICK STOP ON REV.	78	0-4.5	1.2	1.4	2.0	2.0	1.2	1.2
HOLDING TORQUE	79	0-3	0.6	0.6	0.6	0.6	0.2	0.2
HOLDING SPEED	80	0-400	2	2	2	2	2	2
HOLDING BEGINS	81	0-100	99	99	99	99	99	99
SLOW SPD (SSO)	82	0-400	5	5	3	5	3	5
CLUTCH ENG. DIST.	83	0-100	12	12	12	12	12	12
HIGH SPD (HSO)	84	0-400	31	45	45	45	45	50
FINAL SPD (FSO)	85	0-400	7	7	3	5	3	5
FSO BEGINS	86	0-100	95	95	98	98	90	95
ACCEL. TIME	87	0-360	6	4	6	4	4	2
DECEL. TIME	88	0-360	12	14	12	12	12	4
OPEN TORQUE ▲	89	0-400	120	120	80	80	80	100

▲ : TO LOWER TORQUE, INCREASE THE VALUE.

COMMON	Pr.#	RANGE	DEFAULT VALUE								
			HARMONIC			LINEAR					
						STRAIGHT			GEARED		
SELECTION OF THE HAND OF THE DOOR L= LEFT R=RIGHT C/P=CENTER PARTING	42	1-2	L 2	R 1	C/P 2	L 1	R 2	C/P 1	L 1	R 1	C/P 2
CARRIER FREQ.	1	0-15	12								
SCAN FREQ.	61	0-400	9								
LEARNING FREQ.	62	0-400	9								
EDGES DELAY TIME	197	0-180	15								
EDGES HOLD TIME	206	0-180	5								
BUZZER DELAY TIME	198	0-180	10								
OVERLOAD	217	0-6	2.5								
BUZZER MODE	205	0-2	0: DISABLE 1: CONTINUOUS 2: PULSE								
DET. EDGES MODE	202	0-2	0: DISABLE 1: NPN 2: PNP								
NARROWER DOOR	199	0-1	0: YES 1: NO								
NARROWER DOOR DOL	204	0-1	0: USE BOTH DOL & AUX 1: USE DOL								
RE-OPEN RELAY MODE	207	0-1	0: MAINTAIN 1: DISABLE WHEN EDGES RELAY ON								
CLUTCH DISTANCE UNIT	76	0-1	0: PERCENT 1: PULSES								
CODE DIST. REG / HVY	69	0-65535	1" FOR S/O, OR 2" FOR C/P FROM DCL								
CODE DIST. NARROW	70	0-65535	1" FOR S/O, OR 2" FOR C/P FROM DCL								
CAN NODE ID	246	7-8	FRONT DOOR = 7 REAR DOOR = 8								
DOORWIDTH LEARNING	63	0-1	0: DISABLE 1: ENABLE								

7. CONVENIENCE KEYS

Press SPEED to display speeds in Hz.

Press I/O to display input and output signals.

Press FAULT to display recent faults.

Press ▲ or ▼ to view all recent faults.

Press AMP to display currents.

Press RESET to reset the drive.

8. THE VIEW KEY

The VIEW key will help users navigate through the Parameter Unit seamlessly.

Press VIEW then press ▲ or ▼ to navigate all items under the VIEW section.

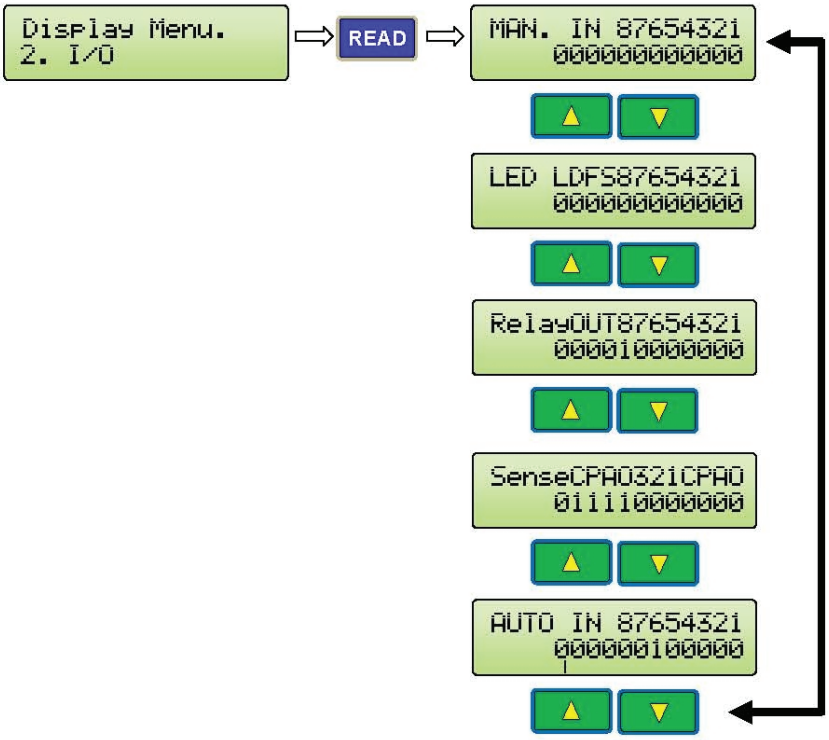
Once the desired item is found, press READ to view an item.

Press ESC at any time to get back to the previous display.

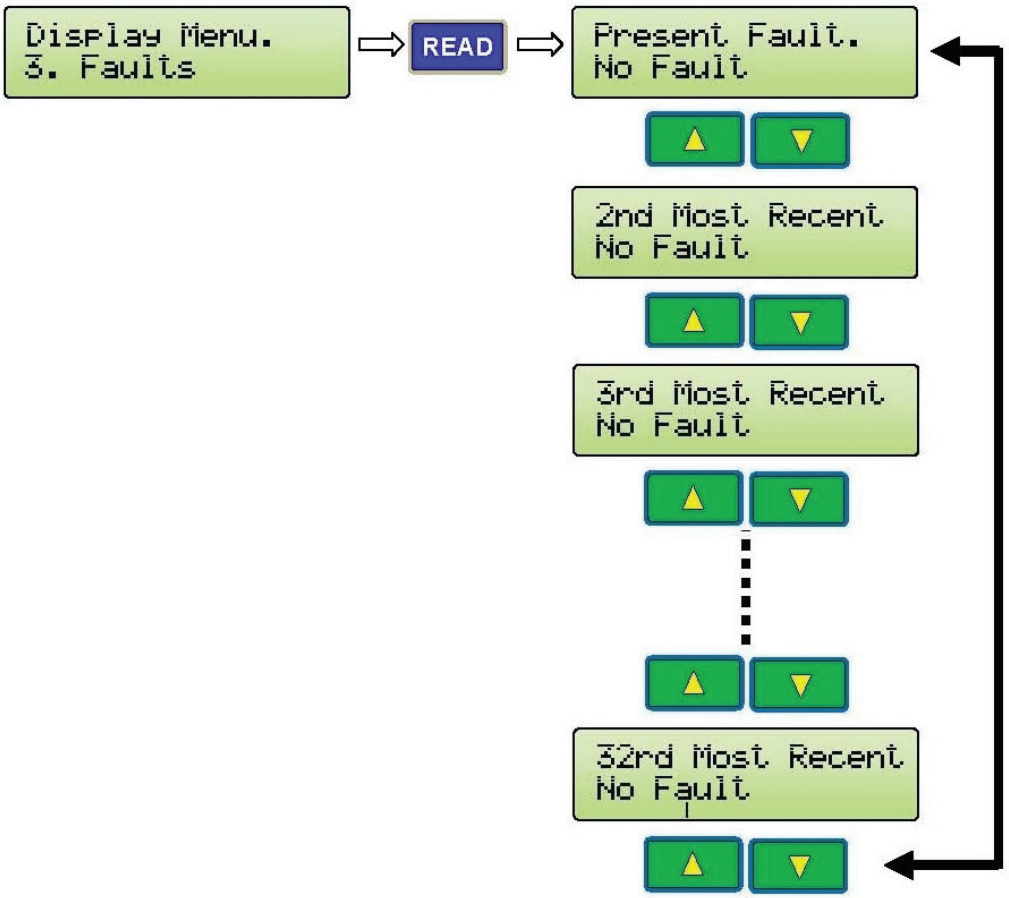
The following items are under the VIEW key:

VOLTAGE, CURRENT, COMMAND FREQUENCY AND ACTUAL FREQUENCY (Hz)

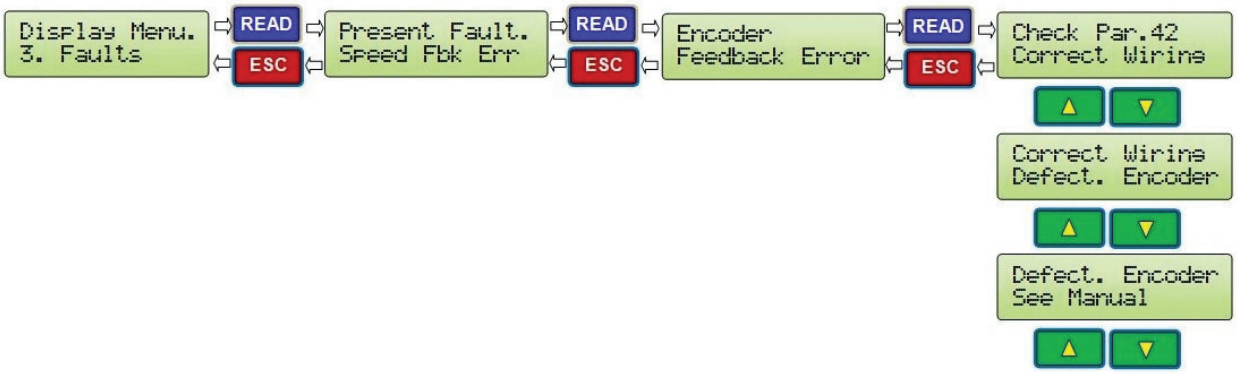
INPUTS & OUTPUTS MONITORING (See Parameters List for explanation of each bit)



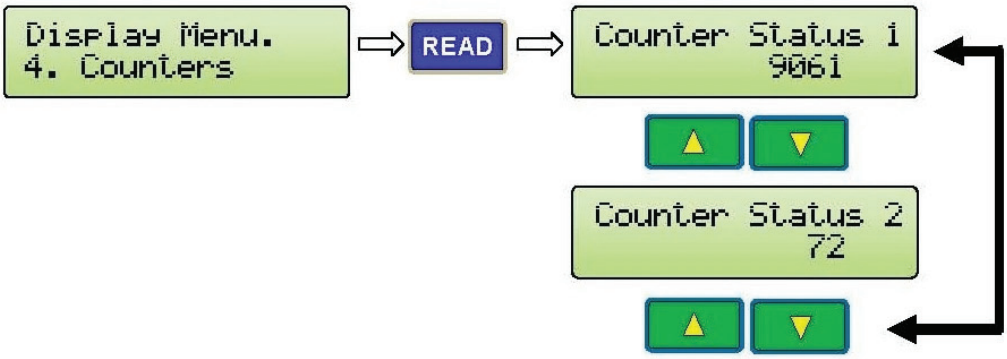
FAULTS



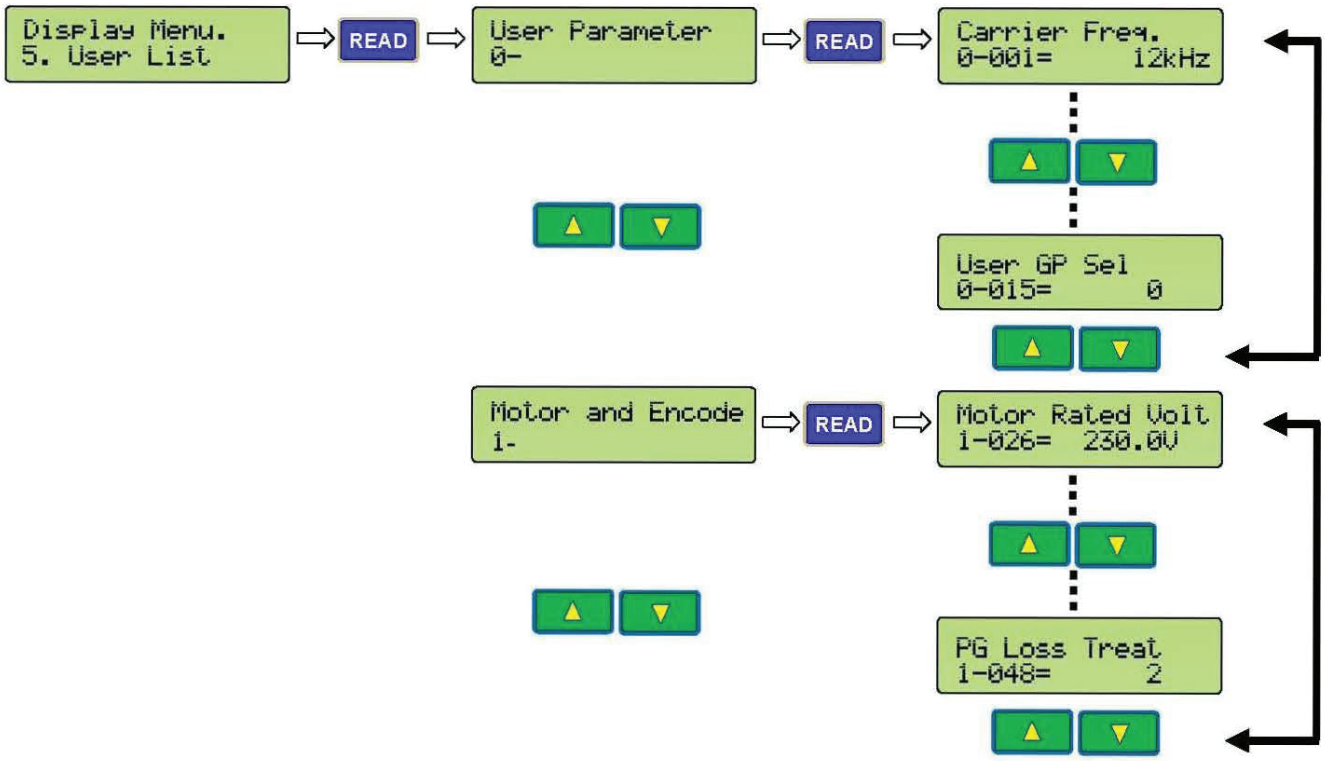
AN EXAMPLE OF FAULTS DISPLAY

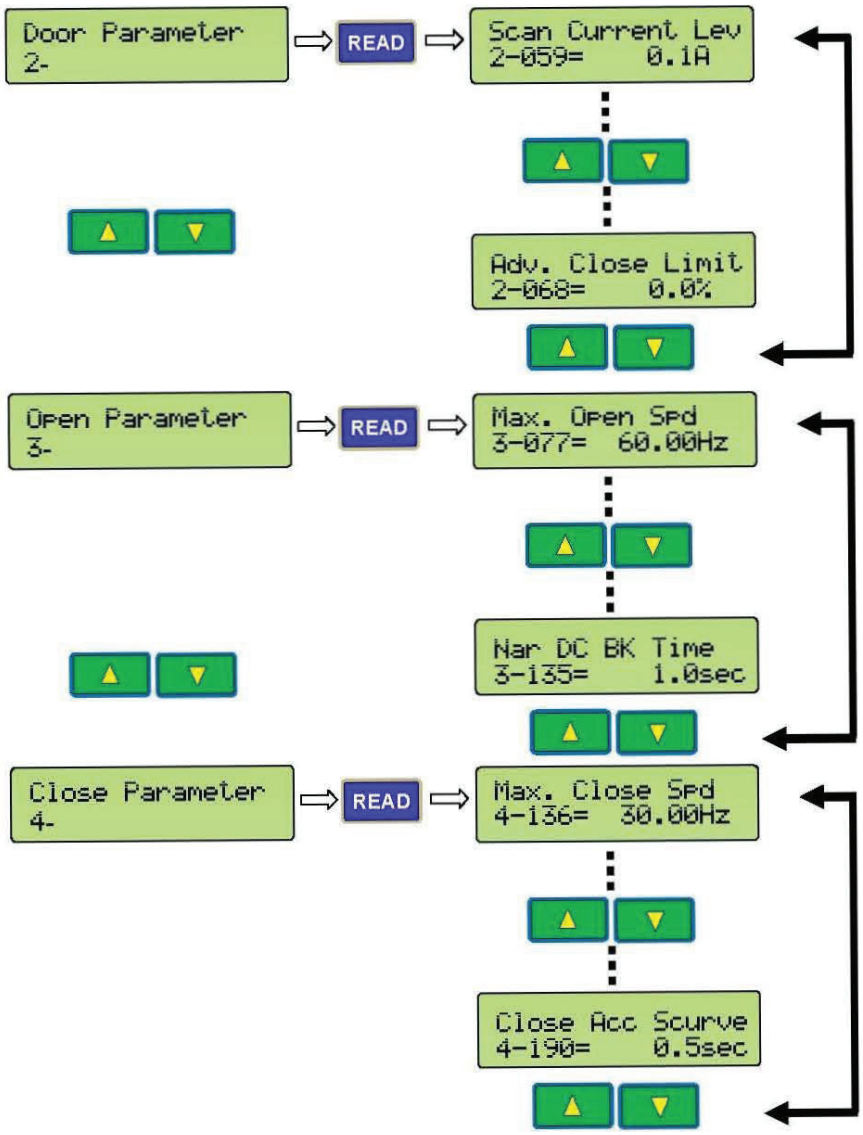


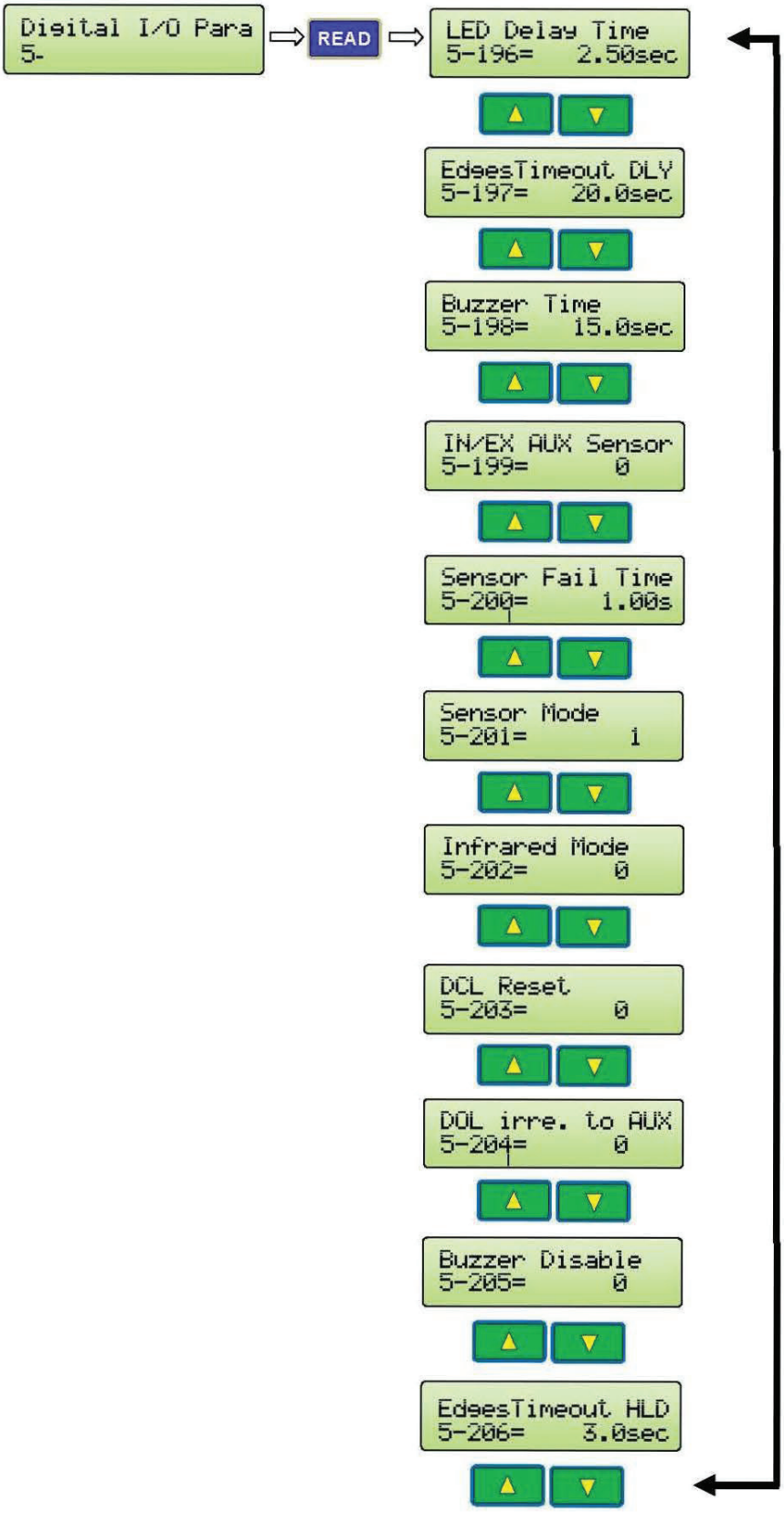
COUNTERS

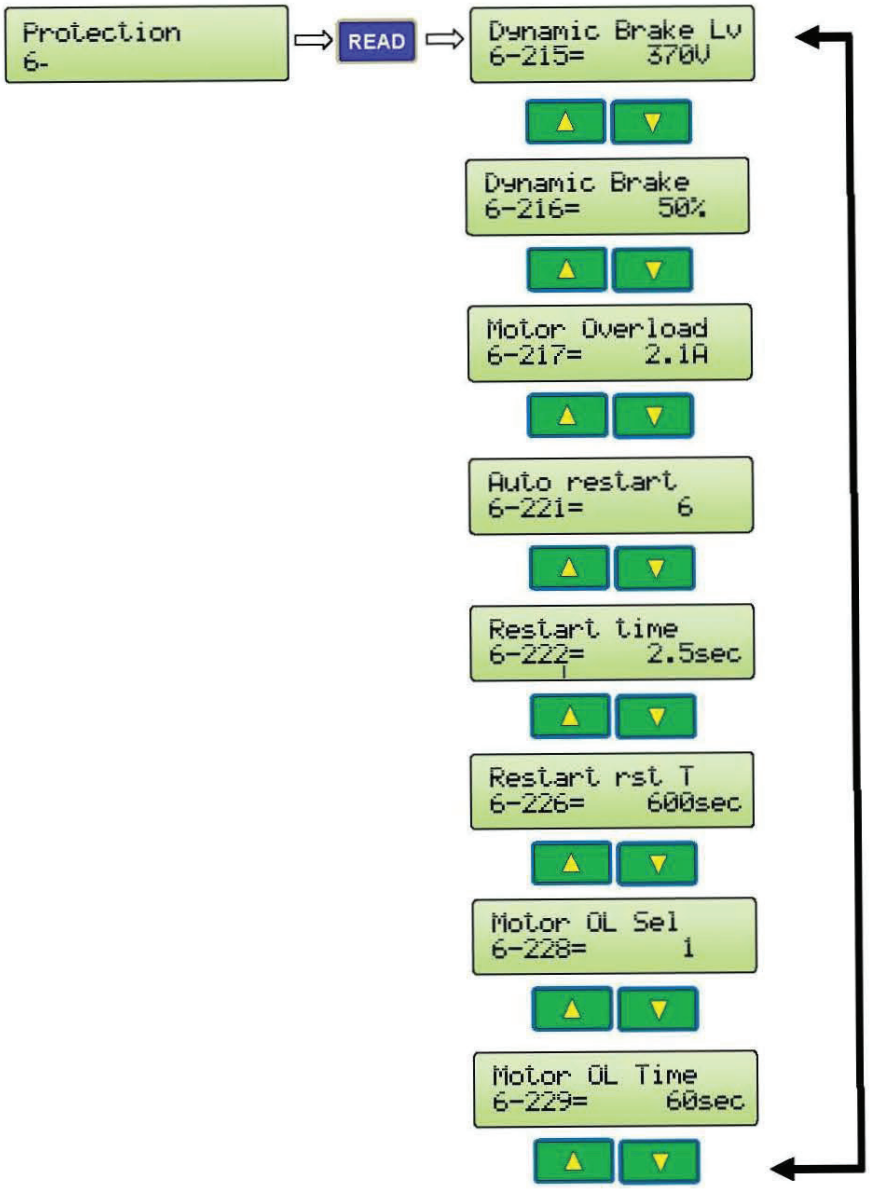


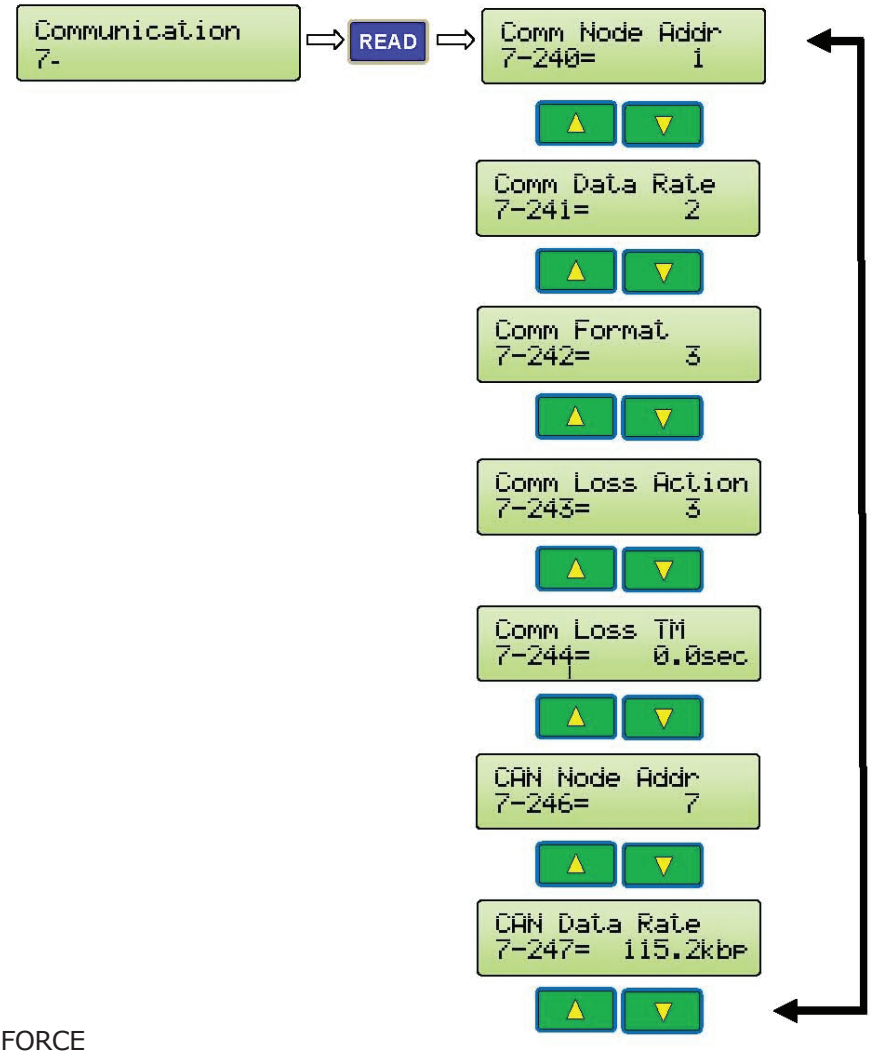
USER LIST


Display Menu.
5. User List
READ
User Parameter
0-
READ
Carrier Freq.
0-001= 12kHz
User GP Sel
0-015= 0
Motor and Encode
1-
READ
Motor Rated Volt
1-026= 230.0V
PG Loss Treat
1-048= 2

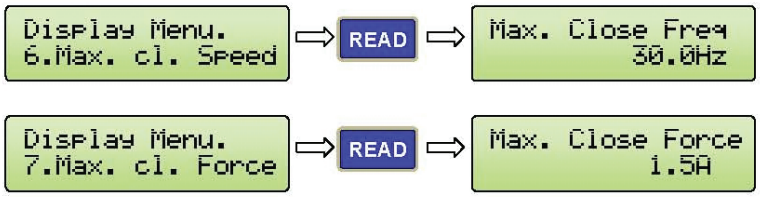

Door Parameter
2-
READ
Scan Current Lev
2-059= 0.1A
Adv. Close Limit
2-068= 0.0%
Open Parameter
3-
READ
Max. Open Spd
3-077= 60.00Hz
Nar DC BK Time
3-135= 1.0sec
Close Parameter
4-
READ
Max. Close Spd
4-136= 30.00Hz
Close Acc Scurve
4-190= 0.5sec


Digital I/O Para
5-
READ
LED Delay Time
5-196= 2.50sec
EdgesTimeout DLY
5-197= 20.0sec
Buzzer Time
5-198= 15.0sec
IN/EX AUX Sensor
5-199= 0
Sensor Fail Time
5-200= 1.00s
Sensor Mode
5-201= 1
Infrared Mode
5-202= 0
DCL Reset
5-203= 0
DOL irre. to AUX
5-204= 0
Buzzer Disable
5-205= 0
EdgesTimeout HLD
5-206= 3.0sec

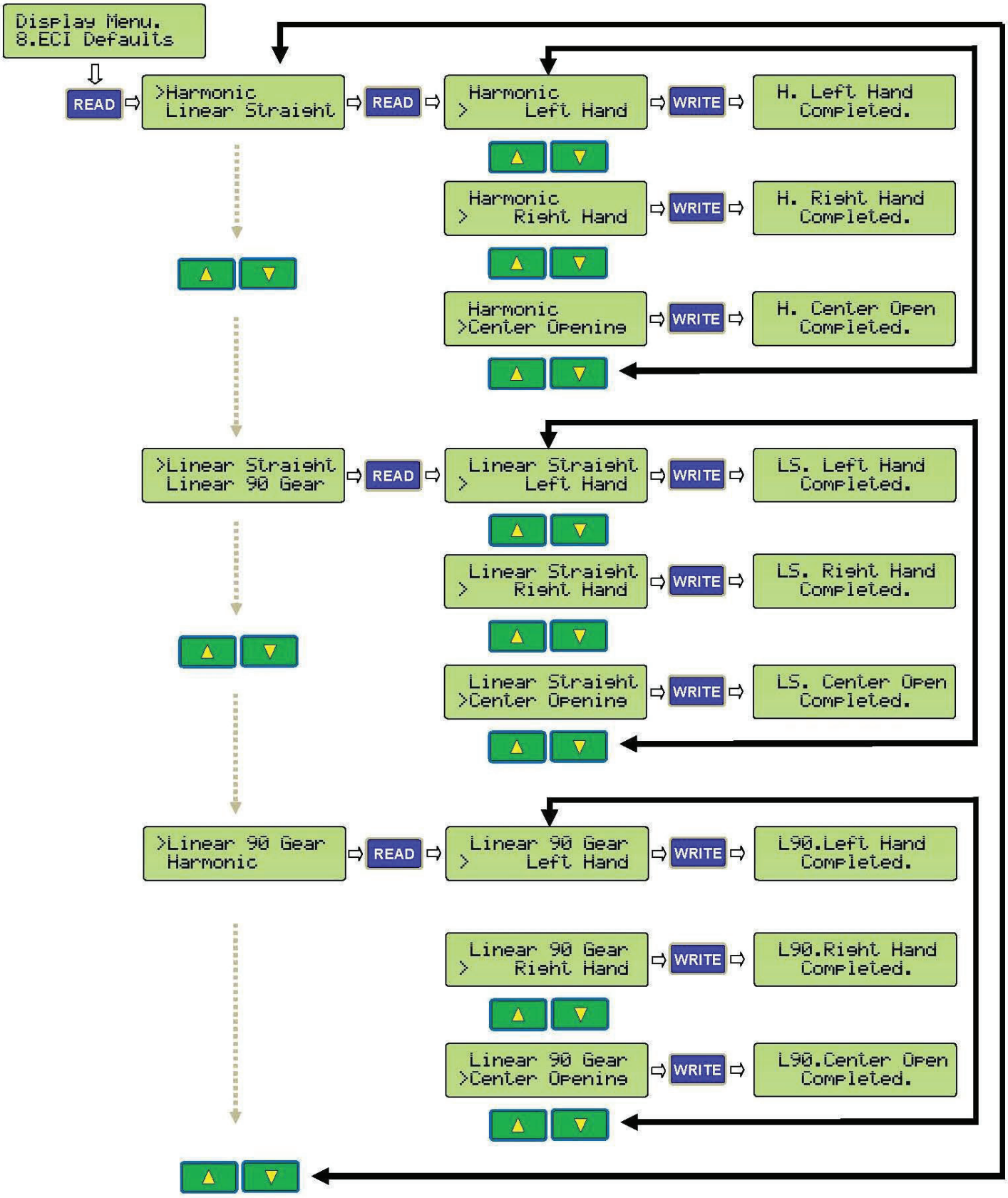

Protection
6-
READ
Dynamic Brake Lv
6-215= 370V
Dynamic Brake
6-216= 50%
Motor Overload
6-217= 2.1A
Auto restart
6-221= 6
Restart time
6-222= 2.5sec
Restart rst T
6-226= 600sec
Motor OL Sel
6-228= 1
Motor OL Time
6-229= 60sec



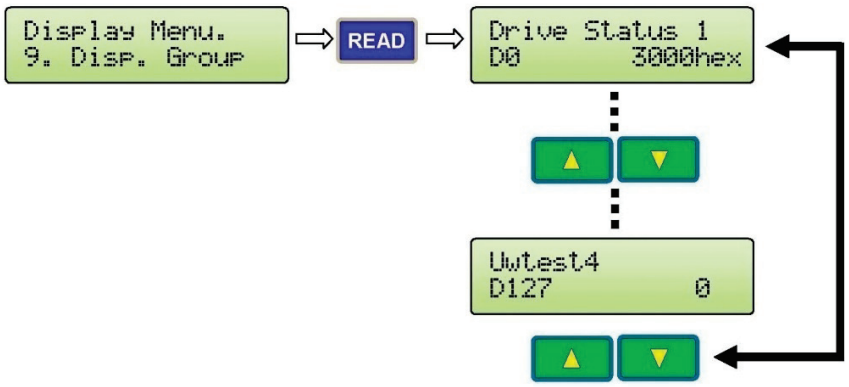
MAXIMUM CLOSE SPEED AND FORCE



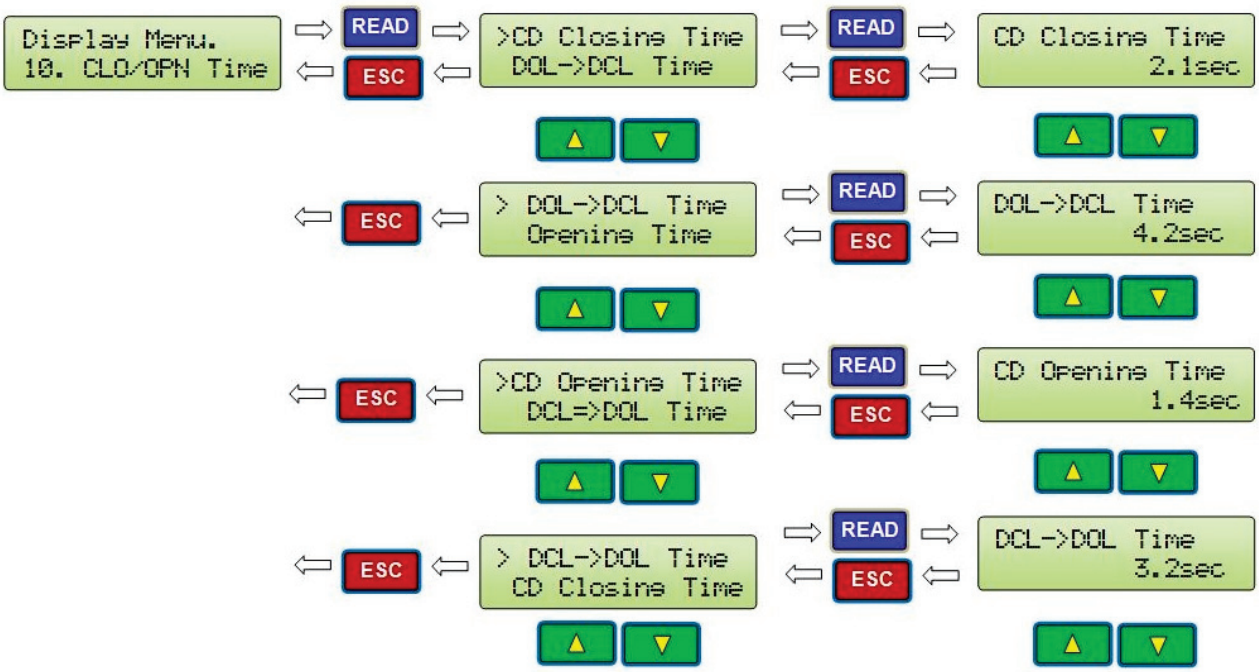
ECI DEFAULT PARAMETER SETS



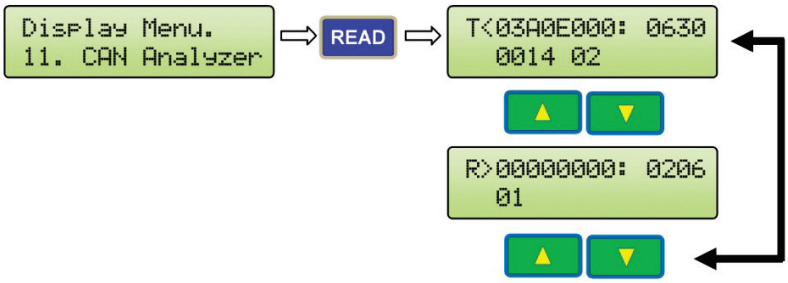
DISPLAY GROUPS FOR MONITORING AND TROUBLESHOOTING



CODE DISTANCE CLOSING TIME DISPLAY



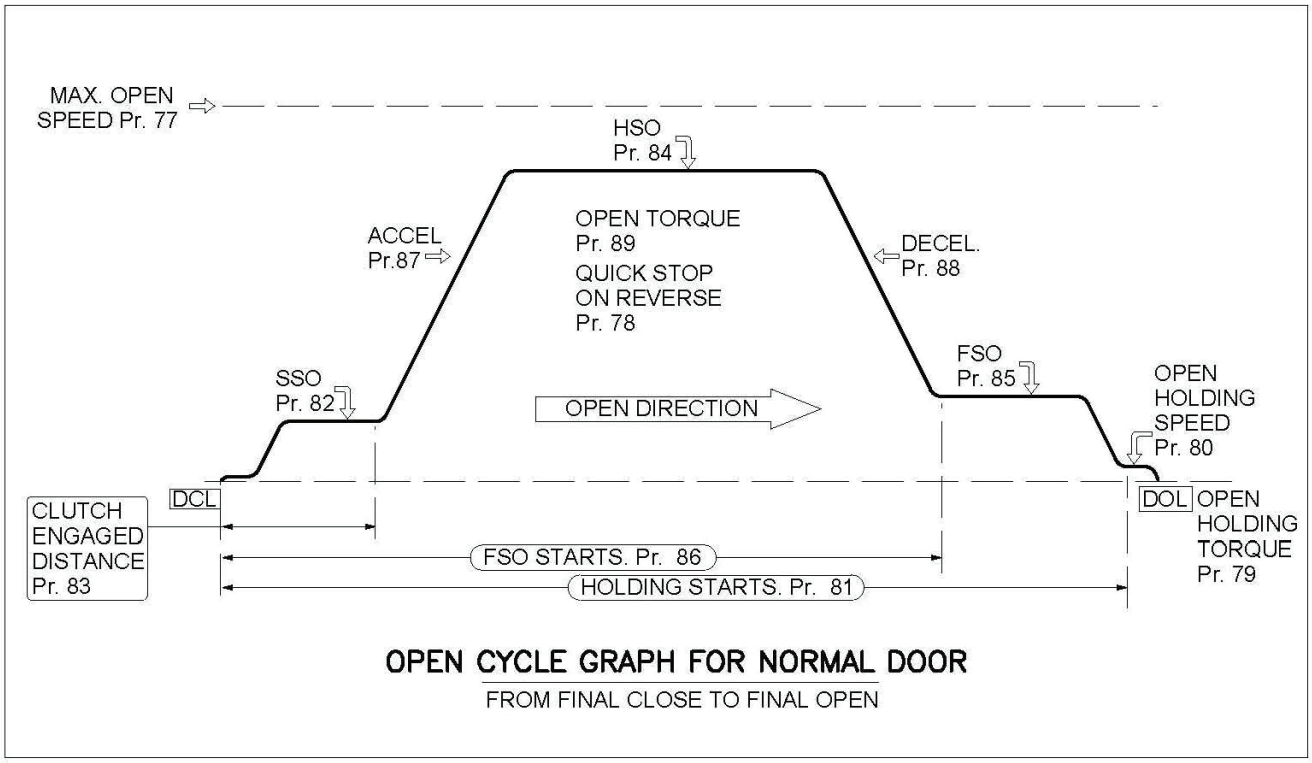
CAN ANALYZER (AN EXAMPLE)



9. LED INDICATORS

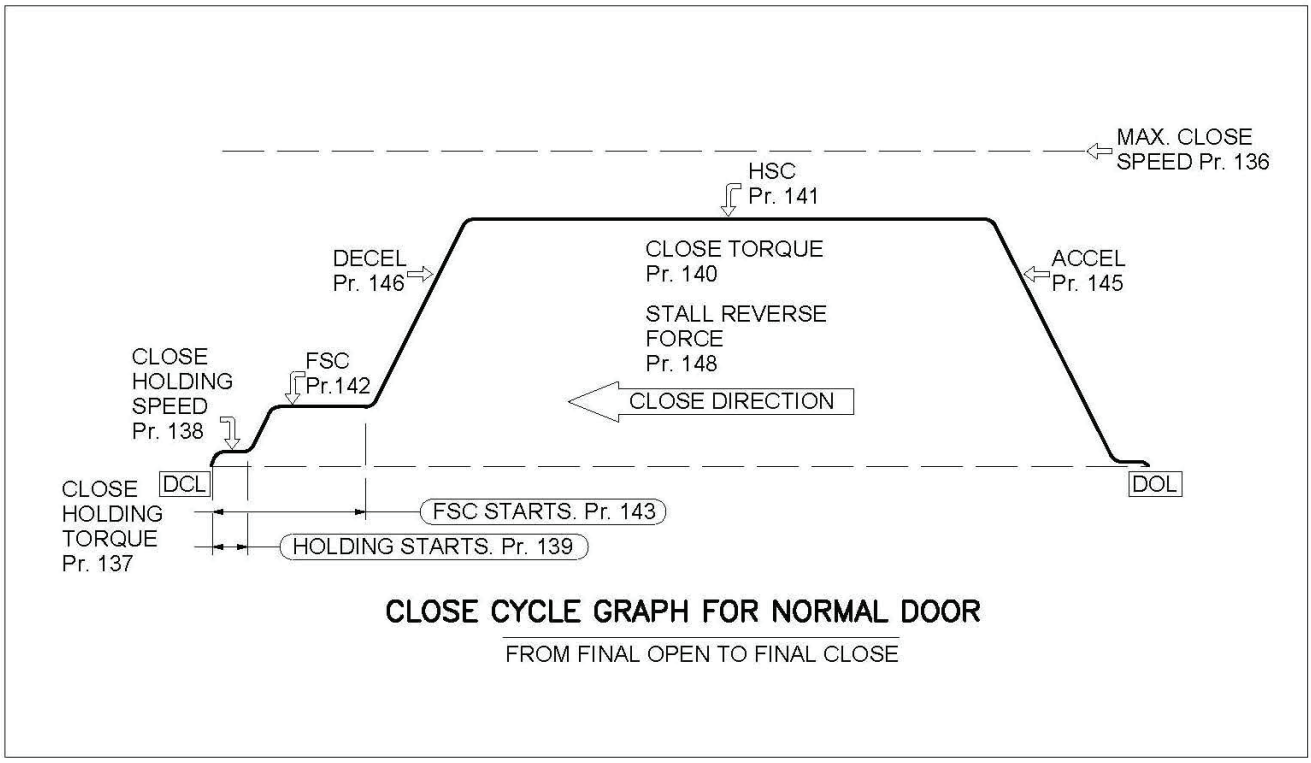
There are 7 LEDs on the Parameter Unit. DO, DC, NUD, HLD, PRG, FLT, and OVT. They have the following meanings:
DO= Door Open. DC= Door Close.
NUDG.=Nudging HLD= Holding.
PRG= Programming Mode FLT= Fault
OVT= Over Torque.

SPEED PROFILES OF THE VFE2500 FOR NORMAL DOOR



OPEN CYCLE GRAPH FOR NORMAL DOOR

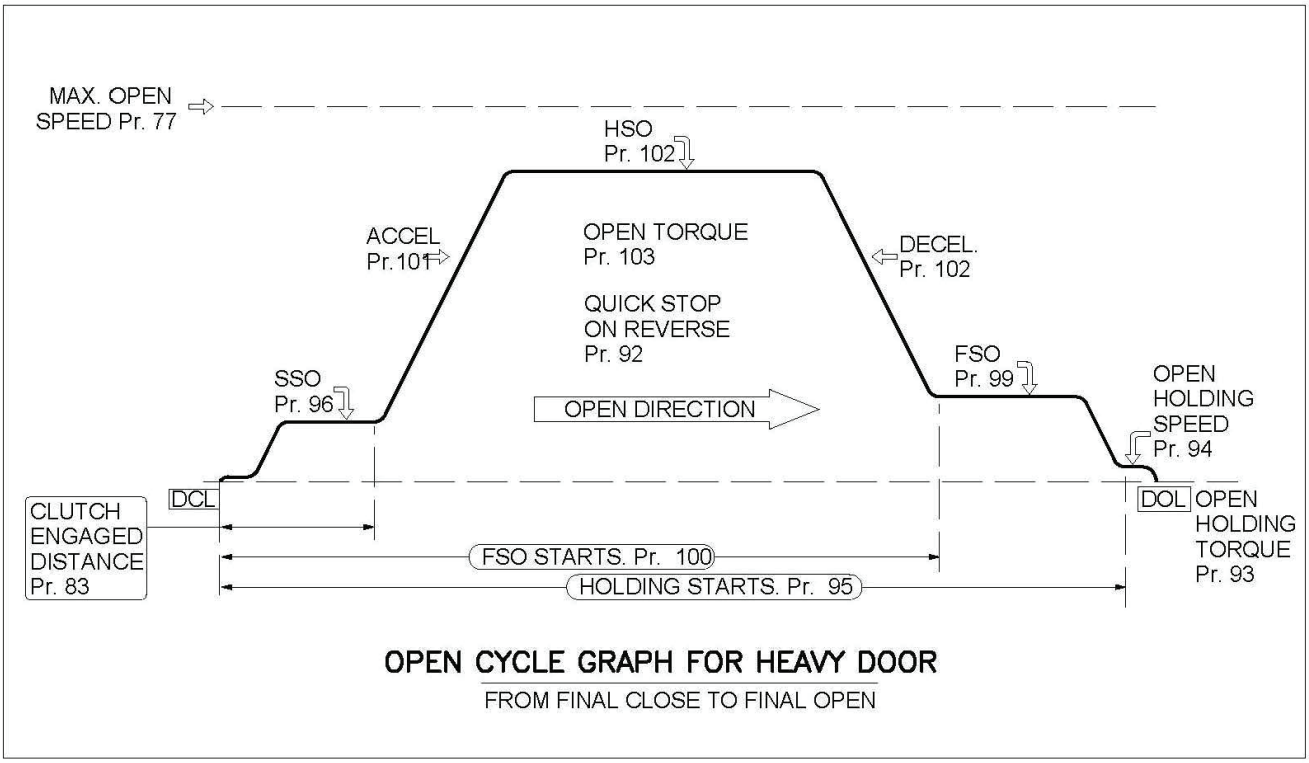
FROM FINAL CLOSE TO FINAL OPEN



CLOSE CYCLE GRAPH FOR NORMAL DOOR

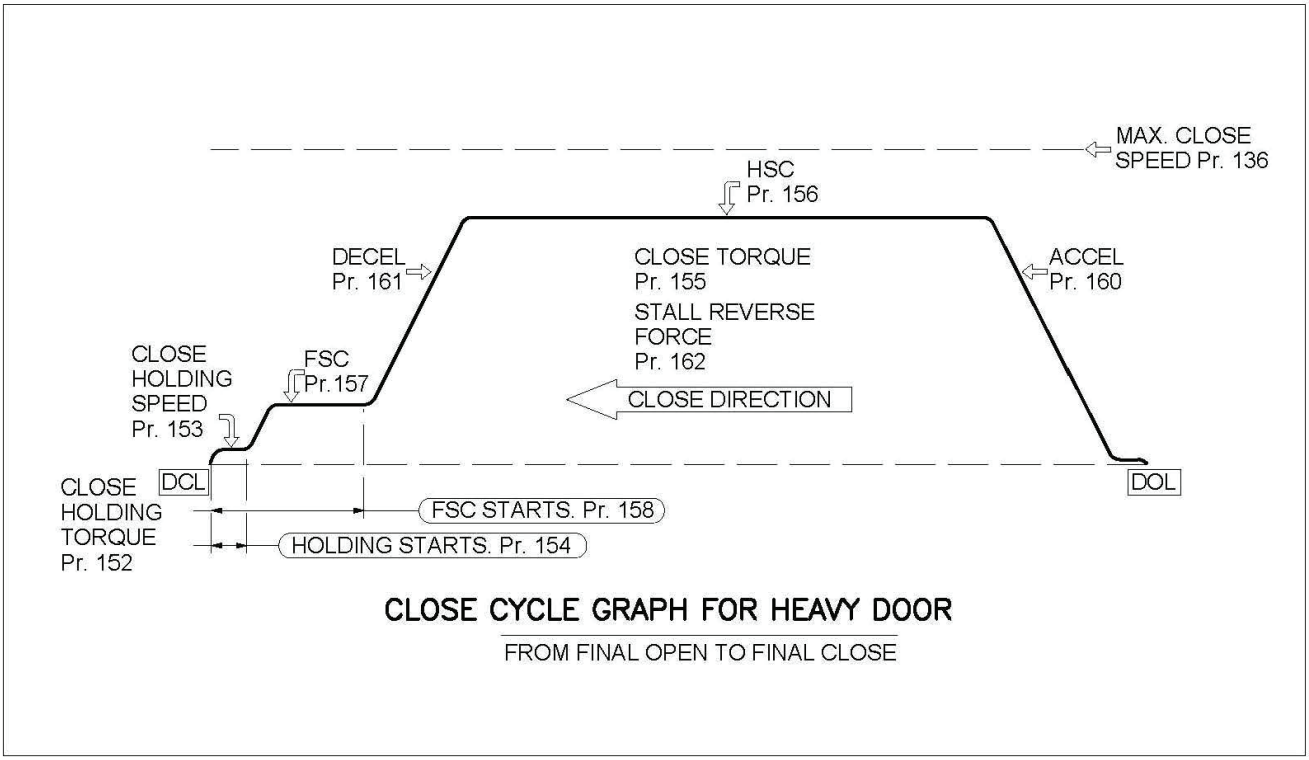
FROM FINAL OPEN TO FINAL CLOSE

SPEED PROFILES OF THE MOVFE2500 FOR HEAVY DOOR



OPEN CYCLE GRAPH FOR HEAVY DOOR

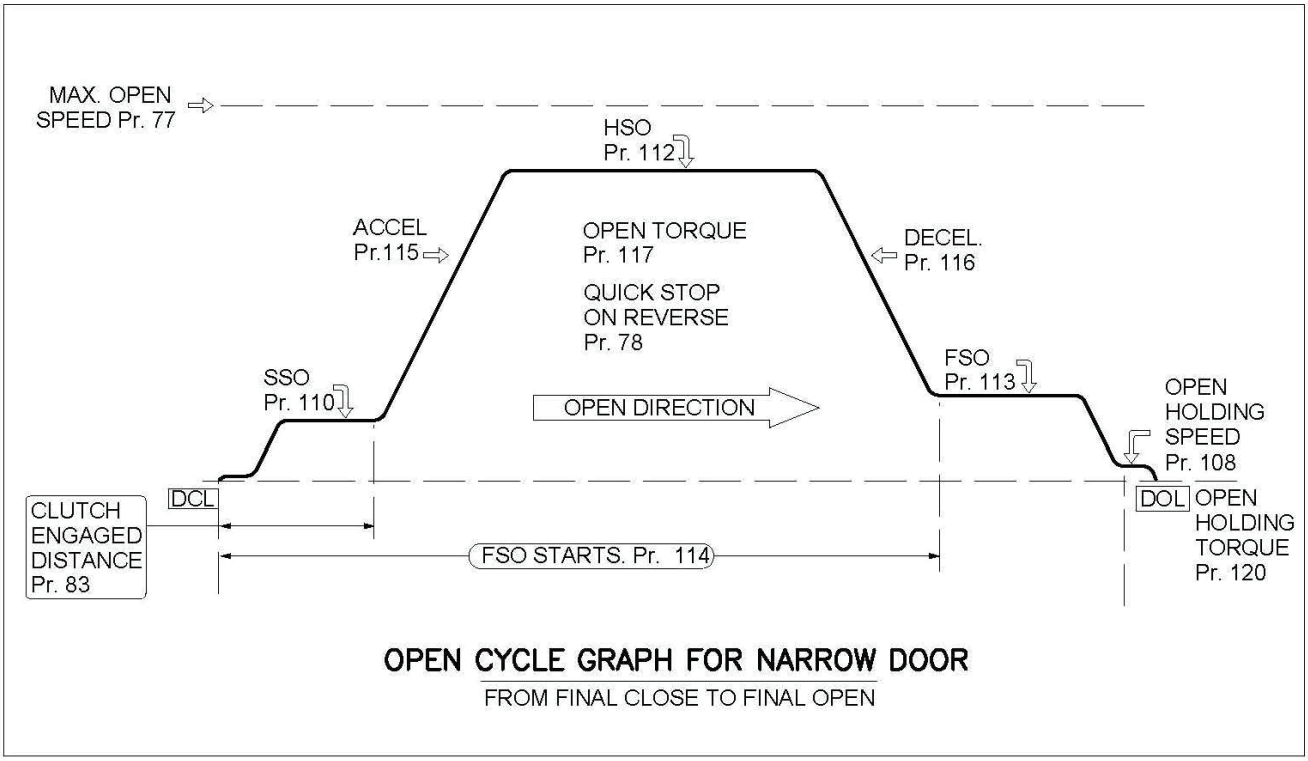
FROM FINAL CLOSE TO FINAL OPEN



CLOSE CYCLE GRAPH FOR HEAVY DOOR

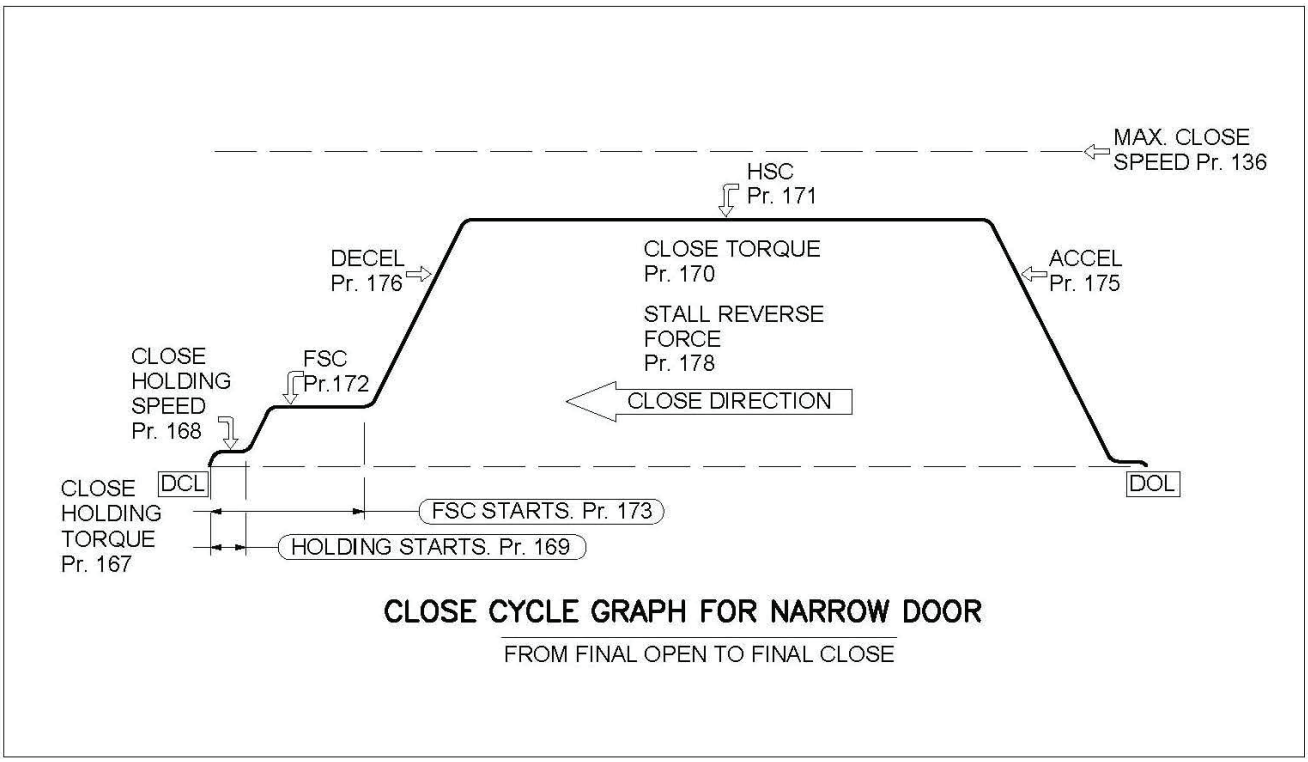
FROM FINAL OPEN TO FINAL CLOSE

SPEED PROFILES OF THE MOVFE2500 FOR NARROW DOOR



OPEN CYCLE GRAPH FOR NARROW DOOR

FROM FINAL CLOSE TO FINAL OPEN



CLOSE CYCLE GRAPH FOR NARROW DOOR

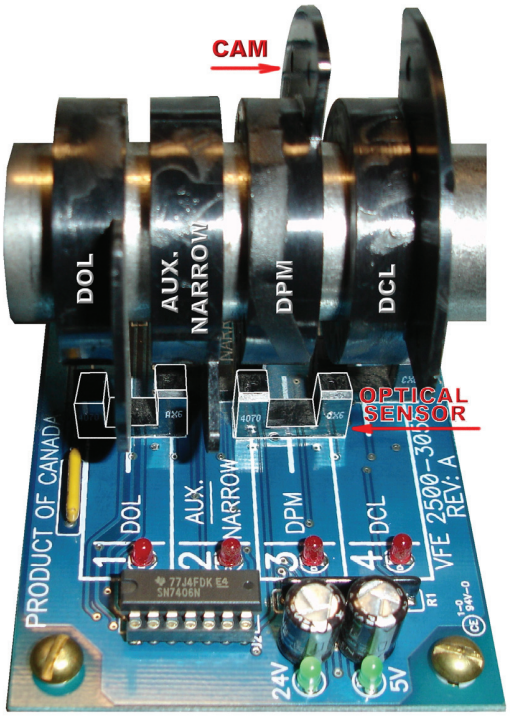
FROM FINAL OPEN TO FINAL CLOSE

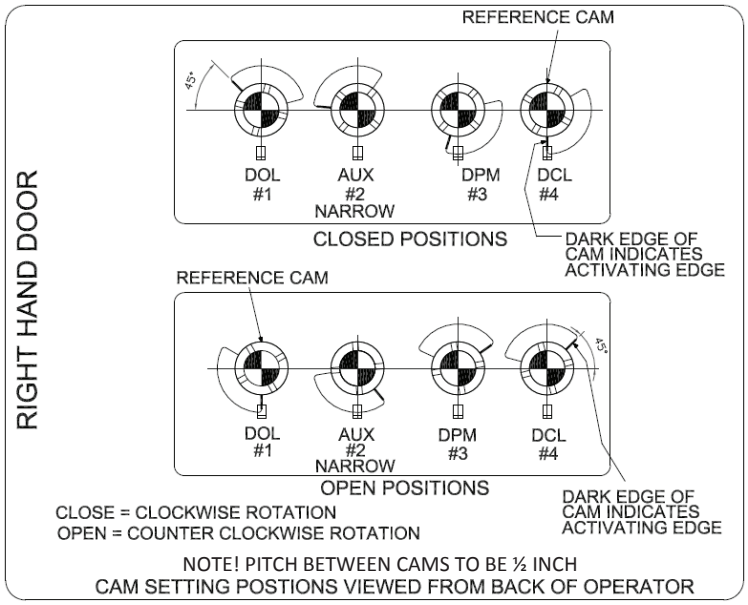
HALL-EFFECT SENSORS SETTING FOR LINEAR DOOR OPERATOR:

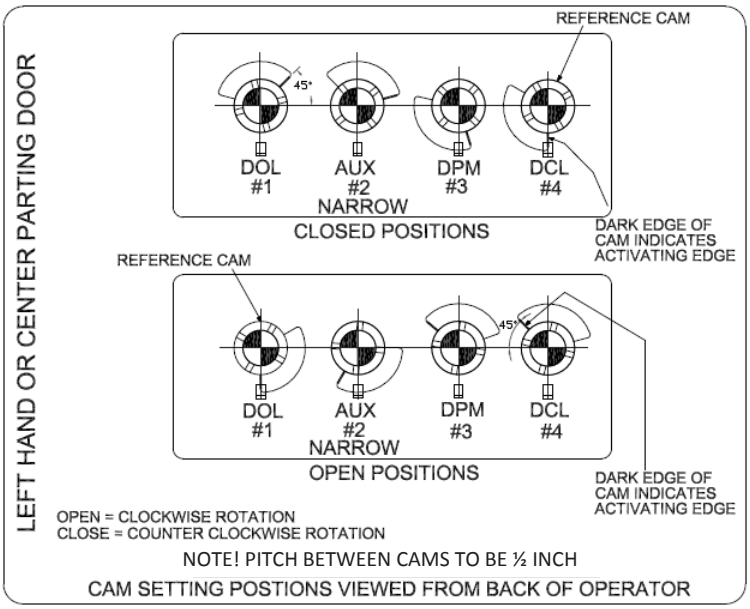
Last ¼ Inch	½ Inch before Gate Switch makes	Magnet & Magnet Carrier	Use as DOL of the Narrower door. Also can be used as a 2nd DOL. When not used, set Par. 199 = 1 to exclude this sensor.	Last ¼ Inch

OPTICAL SENSORS SETTING FOR HARMONIC DOOR OPERATOR:

Use the translational settings of the hall-effect sensors as reference for optical sensors.







PARAMETERS LIST FOR USERS

GROUP 0 : USER PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
1	Carrier Frequency	0-15	KHz	12KHz	Carrier Freq.	
2	Parameter Reset	0-9999		06: Clear all faults 08: Keypad locked	Parameter Reset	
12	Monitor Data Selection	0-65535	Hex	0000	Testpoint Sel	
15	User Group Read Selection	0-9999		0	User GP Sel	6301

GROUP 1: MOTOR & ENCODER PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
26	Maximum output voltage	255-0.1	V	230	Motor Rated Volt	Higher than Par. 126 & 185
27	Motor Rated Volt	400.00 – 50.00	Hz	60	Max. Speed	
28	MIN Output Voltage	25.0 – 0.0	%	4.0	Min. Voltage	Higher than Par. 126 & 185
29	Min Output Freq.	400.00 – 0.10	Hz	0.50	Min. Output Spd	Lower than Par. 127 & 186
31	Motor Rated Current	3.60-0.15	A	0.52A: Geared Motor 2.50A: Straight Motor	Motor Rated Curr	
32	Motor No-load Current	Par.31 - 0.00	A	0.38A: Geared Motor 1.40A: Straight Motor	No-load Current	
33	Number of Motor Poles	2-6	Pole	2: Geared Motor 6: Straight Motor	Poles of motor	
41	Encoder Pulses	4000-0	pls	500	Pulse per rev.	
42	Encoder feedback Setting	0-2		00: Disable 1: Forward / CCW 2: Reverse / CW	Encoder Input	
49	Enter Door Width here	65535	In	S/O: 30 inches C/P: 36 inches	Door Width(inch)	
50	Enter Door Weight here	65535	lbs	S/O: 225 lbs C/P: 275 lbs	Door Weight	

GROUP 1: MOTOR & ENCODER PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
51	Enter Single-Speed Or Two-Speed Here	0-1		0: Single Speed 1: Two Speed	Door Speed	
52	Door Type	0-5		Read Only Par. This Par. is changed by loading ECI's defaults. 0: Harmonic, S/O 1: Harmonic, C/P 2: Linear Straight, S/O 3: Linear Straight, C/P 4: Linear Gear, S/O 5: Linear Gear, C/P	Door Type	

GROUP 2: DOOR PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
61	Scan Frequency	0.00 - 400.00	Hz	9Hz	Scan Spd	
62	Learning Frequency	0.00 - 400.00	Hz	9Hz	Learning Spd	
63	Non-supervised Learning	0 -1		0: Disable 1: Enable	Learning Mode	
64	Regular Door Width	0-65535	Pulse	0-65535	Regular Width	
65	Narrow Door Width	0-65535	Pulse	0-65535	Narrow Width	

GROUP 3: OPEN DIRECTION PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
76	Clutch Engage Unit	1-0		0: % 1: pulses	CLUTCH Unit	Par. 83
77	Maximum Open Speed	0.00 - 400.00	Hz	60Hz	Max. Open Spd	
78	Quick Stop On Reverse	0 .0–4.5	A	1.2A: Harmonic C/P 1.4A: Harmonic S/O 2.0A: Linear Straight C/P 2.0A: Linear Straight S/O 1.2A: Linear Geared C/P 1.2A: Linear Geared S/O	Quick Stp Rev.	
79	Open Holding Torque	0.0-3.0	A	0.6A: Harmonic C/P 0.6A: Harmonic S/O 0.6A: Linear Straight C/P 0.6A: Linear Straight S/O 0.2A: Linear Geared C/P 0.2A: Linear Geared S/O	Open HLD Torque	
80	Open Holding Speed	0.00 – 400.00	Hz	2Hz	Open HLD Spd	
81	Open Holding Start	0.0 – 100	%	99%	Holding Start	
82	Slow Speed Open	0.00 – 400.00	Hz	5Hz: Harmonic C/P 5Hz: Harmonic S/O 3Hz: Linear Straight C/P 5Hz: Linear Straight S/O 3Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Slow Spd SSO	
83	Clutch Engaged Distance	0.0 – 100	%	Pre-determined %	Clutch Distance	
84	High Speed Open HSO	0.00 – 400.00	Hz	31Hz: Harmonic C/P 45Hz: Harmonic S/O 45Hz: Linear Straight C/P 45Hz: Linear Straight S/O 45Hz: Linear Geared C/P 50Hz: Linear Geared S/O	High Spd HSO	
85	Final Speed Open FSO	0.00 – 400.00	Hz	7Hz: Harmonic C/P 7Hz: Harmonic S/O 3Hz: Linear Straight C/P 5Hz: Linear Straight S/O 3Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Final Spd FSO	

GROUP 3: OPEN DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
86	Final Speed Open Start	0.0 – 100	%	95%: Harmonic C/P 95%: Harmonic S/O 98%: Linear Straight C/P 98%: Linear Straight S/O 90%: Linear Geared C/P 95%: Linear Geared S/O	FSO Start	
87	Open Acceleration Time	0.1 – 3600.0	sec	6sec: Harmonic C/P 4sec: Harmonic S/O 6sec: Linear Straight C/P 4sec: Linear Straight S/O 4sec: Linear Geared C/P 2sec: Linear Geared S/O	Open Acc. TM	
88	Open Deceleration Time	0.1 – 3600.0	sec	12sec: Harmonic C/P 14sec: Harmonic S/O 12sec: Linear Straight C/P 12sec: Linear Straight S/O 12sec: Linear Geared C/P 4sec: Linear Geared S/O	Open Dec. TM	
89	Open Torque	0.00 – 400.00	Hz	120Hz: Harmonic C/P 120z: Harmonic S/O 80Hz: Linear Straight C/P 80Hz: Linear Straight S/O 80Hz: Linear Geared C/P 100Hz: Linear Geared S/O	Open Torque	
90	Open Mid. Volt	0.0 – 100.0	%	4%	OPEN Mid. Volt	
91	Open Mid. Frequency	0.00 – 400.00	Hz	0.5Hz	OPEN Mid. Freq.	
92	Heavy Quick Stop On Reverse	0.0 – 4.5	A	1.2A: Harmonic C/P 1.4A: Harmonic S/O 2.0A: Linear Straight C/P 2.0A: Linear Straight S/O 1.2A: Linear Geared C/P 1.2A: Linear Geared S/O	Hvy Quick Rev.	
93	Heavy Holding Torque	0.0-3.0	A	0.6A: Harmonic C/P 0.6A: Harmonic S/O 0.6A: Linear Straight C/P 0.6A: Linear Straight S/O 0.2A: Linear Geared C/P 0.2A: Linear Geared S/O	Hvy Open HLD Tor	

GROUP 3: OPEN DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
94	Heavy Holding Speed	0.00 – 400.00	Hz	2Hz	Hvy Open HLD Spd	
95	Heavy Holding Start	0.0 – 100	%	99%	Hvy HLD Start	
96	Heavy Slow Speed Open	0.00 – 400.00	Hz	5Hz: Harmonic C/P 5Hz: Harmonic S/O 3Hz: Linear Straight C/P 5Hz: Linear Straight S/O 3Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Hvy Spd SSO	
98	Heavy High Speed Open	0.00 – 400.00	Hz	15Hz: Harmonic C/P 25Hz: Harmonic S/O 25Hz: Linear Straight C/P 25Hz: Linear Straight S/O 25Hz: Linear Geared C/P 20Hz: Linear Geared S/O	Hvy Spd HSO	
99	Heavy Final Speed Open	0.00 – 400.00	Hz	7Hz: Harmonic C/P 7Hz: Harmonic S/O 3Hz: Linear Straight C/P 5Hz: Linear Straight S/O 3Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Hvy Spd FSO	
100	Heavy Final Speed Start	0.0 – 100	%	95%: Harmonic C/P 95%: Harmonic S/O 98%: Linear Straight C/P 98%: Linear Straight S/O 90%: Linear Geared C/P 95%: Linear Geared S/O	Hvy FSO Start	
101	Heavy Open Acceleration Time	0.1 – 3600.0	sec	6sec: Harmonic C/P 4sec: Harmonic S/O 6sec: Linear Straight C/P 4sec: Linear Straight S/O 4sec: Linear Geared C/P 2sec: Linear Geared S/O	Hvy Open Acc.	
102	Heavy Open Deceleration Time	0.1 – 3600.0	sec	10sec: Harmonic C/P 12sec: Harmonic S/O 10sec: Linear Straight C/P 10sec: Linear Straight S/O 10sec: Linear Geared C/P 2sec: Linear Geared S/O	Hvy Open Dec.	

GROUP 3: OPEN DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
103	Heavy Open Torque	0.00 – 400.00	Hz	100Hz: Harmonic C/P 100z: Harmonic S/O 60Hz: Linear Straight C/P 60Hz: Linear Straight S/O 60Hz: Linear Geared C/P 80Hz: Linear Geared S/O	Hvy Open Torq. .	
104	Heavy Open Mid. Volt	0.0 – 100.0	%	5%	Hvy Open Mid. V.	
105	Heavy Open Mid. Frequency	0.00 – 400.00	Hz	0.5Hz	Hvy Open Mid. F	
106	Narrow Quick Stop On Reverse	0.0 – 4.5	A	1.2A: Harmonic C/P 1.4A: Harmonic S/O 2.0A: Linear Straight C/P 2.0A: Linear Straight S/O 1.2A: Linear Geared C/P 1.2A: Linear Geared S/O	Nar Quick Rev.	
107	Narrow Holding Torque	0.0-3.0	A	0.6A: Harmonic C/P 0.6A: Harmonic S/O 0.6A: Linear Straight C/P 0.6A: Linear Straight S/O 0.2A: Linear Geared C/P 0.2A: Linear Geared S/O	Nar Open HLD Tor	
108	Narrow Holding Speed	0.00 – 400.00	Hz	2Hz	Nar Open HLD Spd	
110	Narrow Slow Speed Open	0.00 – 400.00	Hz	5Hz: Harmonic C/P 5Hz: Harmonic S/O 3Hz: Linear Straight C/P 5Hz: Linear Straight S/O 3Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Nar SSO	
112	Narrow High Speed Open	0.00 – 400.00	Hz	25Hz: Harmonic C/P 35Hz: Harmonic S/O 35Hz: Linear Straight C/P 35Hz: Linear Straight S/O 35Hz: Linear Geared C/P 40Hz: Linear Geared S/O	Nar HSO	

GROUP 3: OPEN DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
113	Narrow Final Speed Open	0.00 – 400.00	Hz	7Hz: Harmonic C/P 7Hz: Harmonic S/O 3Hz: Linear Straight C/P 5Hz: Linear Straight S/O 3Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Nar FSO	
114	Narrow Final Speed Start	0.0 – 100	%	90%: Harmonic C/P 90%: Harmonic S/O 95%: Linear Straight C/P 95%: Linear Straight S/O 85%: Linear Geared C/P 90%: Linear Geared S/O	Nar FSO Start	
115	Narrow Open Acceleration Time	0.1 – 3600.0	sec	6sec: Harmonic C/P 4sec: Harmonic S/O 6sec: Linear Straight C/P 4sec: Linear Straight S/O 4sec: Linear Geared C/P 2sec: Linear Geared S/O	Nar Open Acc. TM	
116	Narrow Open Deceleration Time	0.1 – 3600.0	sec	12sec: Harmonic C/P 14sec: Harmonic S/O 12sec: Linear Straight C/P 12sec: Linear Straight S/O 12sec: Linear Geared C/P 4sec: Linear Geared S/O	Nar Open Dec. TM	
117	Narrow Open Torque	0.00 – 400.00	Hz	140Hz: Harmonic C/P 140z: Harmonic S/O 100Hz: Linear Straight C/P 100Hz: Linear Straight S/O 100Hz: Linear Geared C/P 120Hz: Linear Geared S/O	Nar Open Torq. .	
118	Narrow Open Mid. Volt	0.0 – 100.0	%	5%	Nar Open Mid. V.	
119	Narrow Open Mid. Frequency	0.00 – 400.00	Hz	0.5Hz	Nar Open Mid. F	

GROUP 3: OPEN DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
120	Narrow DOL Holding Torque	0.0 – 3.0	A	0.6A	Nar. HLD Torque	
121	DC Brake Frequency	0.00 – 400.00	Hz	60Hz	DC Brake Freq	
122	DC Brake Time	0.0 – 999.0	sec	1.0sec	DC Brake Time	
126	Holding Torque Filter	0.01 – 10.00	sec	0.20sec	Hold Torq. LPF	
127	Open Timeout	0.0 - 180.0	sec	0.0sec	Open Timeout	
128	Open Lock Torque. 1	0.0 – 4.5	A	0.0A	Open Lock Torq1	
129	Open Lock Torque. 2	0.0 – 4.5	A	0.0A	Open Lock Torq2	
130	Open Holding Time	0.0 – 999.9	sec	0.0sec	OPEN Hold Time	
131	Open Acceleration S-curve	0.0 – 10.0	sec	0.5sec	Open Acc Scurve	
132	Heavy DC Brake Frequency	0.00 – 400.00	Hz	60Hz	Hvy DC BK Freq	
133	Heavy DC Brake Time	0.0 – 999.9	sec	1sec	Hvy DC BK Time	
134	Narrow DC Brake Frequency	0.00 – 400.00	Hz	60Hz	Nar DC BK Freq	
135	Narrow DC Brake Time	0.0 – 999.9	sec	1sec	Hvy DC BK Time	

GROUP 4: CLOSE DIRECTION PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
136	Maximum Close Speed	0.00 – 400.00	Hz	30Hz	Max. Close Spd	
137	Close Holding Torque	0.0-3.0	A	0.6A: Harmonic C/P 0.6A: Harmonic S/O 0.6A: Linear Straight C/P 0.6A: Linear Straight S/O 0.2A: Linear Geared C/P 0.2A: Linear Geared S/O	Close HLD Torque	
138	Close Holding Speed	0.00 – 400.00	Hz	2Hz	Close HLD Spd	
139	Close Holding Start	0.0 – 100	%	3.0%: Harmonic C/P 3.0%: Harmonic S/O 2.0%: Linear Straight C/P 2.0%: Linear Straight S/O 2.0%: Linear Geared C/P 2.0%: Linear Geared S/O	Holding Start	
140	Close Torque	0.00 – 400.00	Hz	243Hz: Harmonic C/P 173Hz: Harmonic S/O 270Hz: Linear Straight C/P 270Hz: Linear Straight S/O 100Hz: Linear Geared C/P 120Hz: Linear Geared S/O	Close Torque	
141	High Speed Close HSC	0.00 – 400.00	Hz	25Hz: Harmonic C/P 19Hz: Harmonic S/O 25Hz: Linear Straight C/P 20Hz: Linear Straight S/O 25Hz: Linear Geared C/P 20Hz: Linear Geared S/O	High Spd HSC	
142	Final Speed Close FSC	0.00 – 400.00	Hz	5Hz: Harmonic C/P 5Hz: Harmonic S/O 3Hz: Linear Straight C/P 2Hz: Linear Straight S/O 4Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Final Spd FSC	
143	Final Speed Close Start	0.0 – 100	%	6%: Harmonic C/P 10%: Harmonic S/O 5%: Linear Straight C/P 5%: Linear Straight S/O 5%: Linear Geared C/P 10%: Linear Geared S/O	FSC Start	

GROUP 4: CLOSE DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
144	Nudging Speed	0.00 – 400.00	Hz	15Hz: Harmonic C/P 9Hz: Harmonic S/O 10Hz: Linear Straight C/P 15Hz: Linear Straight S/O 15Hz: Linear Geared C/P 15Hz: Linear Geared S/O	Nudging Spd	
145	Close Acceleration Time	0.1 – 3600.0	sec	4sec: Harmonic C/P 6sec: Harmonic S/O 6sec: Linear Straight C/P 6sec: Linear Straight S/O 6sec: Linear Geared C/P 2sec: Linear Geared S/O	Close Acc. TM	
146	Close Deceleration Time	0.1 – 3600.0	sec	8sec: Harmonic C/P 10sec: Harmonic S/O 15sec: Linear Straight C/P 20sec: Linear Straight S/O 10sec: Linear Geared C/P 4sec: Linear Geared S/O	Close Dec. TM	
148	Stall Reverse Force	0.0 – 4.5	A	1.6A: Harmonic C/P 2.0A: Harmonic S/O 1.4A: Linear Straight C/P 1.4A: Linear Straight S/O 0.6A: Linear Geared C/P 0.9A: Linear Geared S/O	Stall Rev Normal	
150	Close Mid. Volt	0.0 – 100.0	%	4%	Close Mid. Volt.	
151	Close Mid. Frequency	0.00 – 400.00	Hz	0.5Hz	Close Mid. Freq.	
152	Heavy Close Holding Torque	0.0-4.5	A	0.6A: Harmonic C/P 0.6A: Harmonic S/O 0.6A: Linear Straight C/P 0.6A: Linear Straight S/O 0.2A: Linear Geared C/P 0.2A: Linear Geared S/O	Hvy Clo HLD Torq	
153	Heavy Close Holding Speed	0.00 – 400.00	Hz	2Hz	Hvy Close HLD	

GROUP 4: CLOSE DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
154	Heavy Close Holding Start	0.0 – 100	%	3.0%: Harmonic C/P 3.0%: Harmonic S/O 2.0%: Linear Straight C/P 2.0%: Linear Straight S/O 2.0%: Linear Geared C/P 2.0%: Linear Geared S/O	Hvy HLD Start	
155	Heavy Close Torque	0.00 – 400.00	Hz	220Hz: Harmonic C/P 145Hz: Harmonic S/O 250Hz: Linear Straight C/P 250Hz: Linear Straight S/O 80Hz: Linear Geared C/P 100Hz: Linear Geared S/O	Hvy Close Torq.	
156	Heavy High Speed Close	0.00 – 400.00	Hz	13Hz: Harmonic C/P 10Hz: Harmonic S/O 12Hz: Linear Straight C/P 12Hz: Linear Straight S/O 12Hz: Linear Geared C/P 10Hz: Linear Geared S/O	Hvy High HSC	
157	Heavy Final Speed Close FSC	0.00 – 400.00	Hz	5Hz: Harmonic C/P 5Hz: Harmonic S/O 3Hz: Linear Straight C/P 2Hz: Linear Straight S/O 4Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Hvy FSC	
158	Heavy Final Speed Close Start	0.0 – 100	%	6%: Harmonic C/P 10%: Harmonic S/O 5%: Linear Straight C/P 5%: Linear Straight S/O 5%: Linear Geared C/P 10%: Linear Geared S/O	Hvy FSC Start	
159	Heavy Nudging Speed	0.00 – 400.00	Hz	10Hz: Harmonic C/P 10Hz: Harmonic S/O 10Hz: Linear Straight C/P 10Hz: Linear Straight S/O 10Hz: Linear Geared C/P 10Hz: Linear Geared S/O	Hvy Nudg Spd	
160	Heavy Close Acceleration Time	0.1 – 3600.0	sec	4sec: Harmonic C/P 6sec: Harmonic S/O 6sec: Linear Straight C/P 6sec: Linear Straight S/O 6sec: Linear Geared C/P 2sec: Linear Geared S/O	Hvy Clo. Acc.	

GROUP 4: CLOSE DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
161	Heavy Close Deceleration Time	0.1 – 3600.0	sec	6sec: Harmonic C/P 8sec: Harmonic S/O 12sec: Linear Straight C/P 18sec: Linear Straight S/O 8sec: Linear Geared C/P 2sec: Linear Geared S/O	Hvy Clo. Dec.	
163	Heavy Stall Reverse Force	0.0 – 4.5	A	1.8A: Harmonic C/P 2.2A: Harmonic S/O 1.6A: Linear Straight C/P 1.6A: Linear Straight S/O 0.8A: Linear Geared C/P 1.1A: Linear Geared S/O	Hvy Stall Normal	
165	Heavy Close Mid. Volt	0.0 – 100.0	%	4%	Hvy Close Mid. V	
166	Heavy Close Mid. Frequency	0.00 – 400.00	Hz	0.5Hz	Hvy Close Mid. F	
167	Narrow Close Holding Torque	0.0-4.5	A	0.6A: Harmonic C/P 0.6A: Harmonic S/O 0.6A: Linear Straight C/P 0.6A: Linear Straight S/O 0.2A: Linear Geared C/P 0.2A: Linear Geared S/O	Nar Clo HLD Torq	
168	Narrow Close Holding Speed	0.00 – 400.00	Hz	2Hz	Nar Close HLD	
169	Narrow Close Holding Start	0.0 – 100	%	3.0%: Harmonic C/P 3.0%: Harmonic S/O 2.0%: Linear Straight C/P 2.0%: Linear Straight S/O 2.0%: Linear Geared C/P 2.0%: Linear Geared S/O	Nar HLD Start	
170	Narrow Close Torque	0.00 – 400.00	Hz	243Hz: Harmonic C/P 173Hz: Harmonic S/O 270Hz: Linear Straight C/P 270Hz: Linear Straight S/O 100Hz: Linear Geared C/P 120Hz: Linear Geared S/O	Nar Close Torq.	

GROUP 4: CLOSE DIRECTION PARAMETERS CONTINUED

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
171	Narrow High Speed Close	0.00 – 400.00	Hz	25Hz: Harmonic C/P 19Hz: Harmonic S/O 25Hz: Linear Straight C/P 20Hz: Linear Straight S/O 25Hz: Linear Geared C/P 20Hz: Linear Geared S/O	Nar HSC	
172	Narrow Final Speed Close	0.00 – 400.00	Hz	5Hz: Harmonic C/P 5Hz: Harmonic S/O 3Hz: Linear Straight C/P 2Hz: Linear Straight S/O 4Hz: Linear Geared C/P 5Hz: Linear Geared S/O	Nar FSC	
173	Narrow Final Speed Close Start	0.0 – 100	%	6%: Harmonic C/P 10%: Harmonic S/O 5%: Linear Straight C/P 5%: Linear Straight S/O 5%: Linear Geared C/P 10%: Linear Geared S/O	Nar FSC Start	
174	Narrow Nudging Speed	0.00 – 400.00	Hz	15Hz: Harmonic C/P 9Hz: Harmonic S/O 10Hz: Linear Straight C/P 15Hz: Linear Straight S/O 15Hz: Linear Geared C/P 15Hz: Linear Geared S/O	Nar Nudging Spd	
175	Narrow Close Acceleration Time	0.1 – 3600.0	sec	4sec: Harmonic C/P 6sec: Harmonic S/O 6sec: Linear Straight C/P 6sec: Linear Straight S/O 6sec: Linear Geared C/P 2sec: Linear Geared S/O	Nar Close Acc. TM	
176	Narrow Close Deceleration Time	0.1 – 3600.0	sec	8sec: Harmonic C/P 10sec: Harmonic S/O 15sec: Linear Straight C/P 20sec: Linear Straight S/O 10sec: Linear Geared C/P 4sec: Linear Geared S/O	Nar Close Dec. TM	
178	Stall Reverse Force	0.0 – 4.5	A	1.6A: Harmonic C/P 2.0A: Harmonic S/O 1.4A: Linear Straight C/P 1.4A: Linear Straight S/O 0.6A: Linear Geared C/P 0.9A: Linear Geared S/O	Nar Stall Normal	

GROUP 4: CLOSE DIRECTION PARAMETERS (CONTINUED)

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
180	Narrow Close Mid. Volt	0.0 – 100.0	%	4%	Nar Close Mid. V	
181	Narrow Close Mid. Frequency	0.00 – 400.00	Hz	0.5Hz	Nar Close Mid. F	
182	Fast Deceleration Time	0.1 – 3600.0	sec	1.0 sec	Fastest Dec. TM	
185	Holding Torque Filter	0.01 – 10.00	sec	0.20sec	Hold Torq. LPF	
186	Close Timeout	0.0 - 180.0	sec	0.0sec	Close Timeout	
187	Close Lock Torque. 1	0.0 – 4.5	A	0.0A	Close Lock Torq1	
188	Close Lock Torque. 2	0.0 – 4.5	A	0.0A	Close Lock Torq2	
189	Close Holding Time	0.0 – 999.9	sec	0.0sec	CLOSE Hold Time	
190	Close Acceleration S-curve	0.0 – 10.0	sec	0.5sec	Close Acc Scurve	

GROUP 5: DIGITAL I/O PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
196	LED Delay Time	0.00 – 10.00	sec	3.00sec (**Default**)	LED Delay Time	
197	Edges Timeout Delay Time	0.0 – 180.0	sec	15sec (**Default**)	EdgesTimeout DLY	
198	Buzzer Delay Time	0.0 – 180.0	sec	10sec (**Default**)	Buzzer Time	
199	Include/Exclude AUX Sensor	0 – 1		0: Include AUX Sensor 1: Exclude AUX Sensor (DF)	IN/EX AUX Sensor	
200	Sensor Failure Detect Time	0.0 – 3600.0	sec	5sec	Sensor Fail Time	
201	Sensor Mode	0 - 2		0: Sensor is external, Edge trigger (Linear) (**Default**) 1: Sensor is external, Level trigger (Harmonic) 2: Sensor is on board.	Sensor Mode	

GROUP 5: DIGITAL I/O PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
202	Infrared Output Type	0 – 2		0: Disable 1: NPN (active LOW) (**DF**) 2: PNP (active HIGH)	Infrared Type	
203	DCL Reset	0 - 1		0: Enable door position reset in DCL. (**Default**) 1: Disable door position reset in DCL.	DCL Reset	
204	DOL for Narrower Door	0 – 1		0: Use regular as DOL of Narrower Door DOL (**DF**) 1: Use AUX as DOL of Narrower Door DOL	DOL for Nar Door	
205	Buzzer Disable	0 – 1		0: Buzzer Disable (**DF**) 1: Buzzer Enable (Continue) 2: Buzzer Enable (ON – OFF)	Buzzer Disable	
206	Holding Time for Edges Timeout relay	0.0 – 180.0	sec	3sec (**Default**)	EdgesTimeout HLD	
207	Reopen Relay Mode	1 - 0		0: MAINTAIN 1: DISABLE WHEN EDGES RELAY ON	Reopen Relay MOD	
219	Nudging Torque	0 - 400	A	173	Nudging Torque	

GROUP 6: PROTECTION PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
216	DC Brake Duty	0 - 100	%	50%	Dynamic Brake	
217	Motor Overload Current	0.0 – 6.0	A	2.5A	Motor Overload	
221	Number of Retries after Faults	0 -10		6	No of Retries	
222	Retry Waiting Time	0.2 – 120.0	sec	2.5sec	Restart time	
226	Auto Reset Time Reset after Fault	9999 - 0	Sec	600	Restart rst T	
228	Motor Overload Selection	0 - 2		00: Standard Motor 01: Special Motor (**DF**) 02: Disabled	Motor OL Sel	
229	Motor Overload Time	30 - 600	sec	60sec	Motor OL Time	

	Overload Time					

GROUP 7: COMMUNICATION PARAMETERS

Par. No	Description	Range	Unit	Default Setting	Display	Related Par.
240	RS485 Node Number	1 -254		1	Comm Node Addr	
241	RS485 Baudrate	0 - 3		0: Baud rate 4800bps 1: Baud rate 9600bps 2: Baud rate 19200bps (**DF**) 3: Baud rate 38400bps	Comm Data Rate	
242	RS485 Modbus Protocol	0 – 5		0: 7,N,2 (Modbus, ASCII) 1: 7,E,1 (Modbus, ASCII) 2: 7,O,1 (Modbus, ASCII) 3: 8,N,1 (Modbus, RTU) (**DF**) 4: 8,E,1 (Modbus, RTU) 5: 8,O,1 (Modbus, RTU)	Comm Format	
243	RS485 Connection Loss	0 - 3		0: Warn and keep operating 1: Warn and ramp to stop 2: Warn and coast to stop 3: No warning and keep operating. **(Default)**	Comm Loss Action	
244	RS485 Connection Loss Time	0.0 – 60.0	sec	0.0sec	Comm Loss TM	
246	CAN Node Address	0 - 255		7	CAN Node Addr	
247	CAN Baudrate	0 - 65535	kbps	115.2Kbps	CAN Data Rate	

DISPLAY PARAMETERS

Par. No	Function	Display	Unit
D0	Drive Status 1 Bit 0 Reserved Bit 1 0： STOP，1：RUN Bit 2 Reserved Bit 3 0： CLOSE，1：OPEN Bit4~5 Reserved Bit 6 1： OVT Bit 7 1： FLT Bit 8~10 Reserved Bit 11 1： Factory Set Bit 12 Reserved Bit 13~15 100：NUD 000：HLD	Drive Status 1	hex
D1	Output Frequency	Output Freq	Hz

DISPLAY PARAMETERS (CONTINUED)

Par. No	Function	Display	Unit
D2	Commanded Frequency	Commanded Freq	Hz
D3	Output Current	Output Current	A
D4	Output Voltage	Output Voltage	V
D5	DC Bus Voltage	DC Bus Voltage	V
D6	Door Close Time	Door Close Time	sec
D7	Switch Input Status Bit0 0: SETUP 1:RUN Bit1 0:MAN 1:AUTO Bit2 OPEN Bit3 CLOSE Bit4 NUDG Bit5 NARROW Bit6 RESET Bit7 HEAVY	SW IN 87654321	
D8	Digital Input Status Bit0 CLOSE Bit1 OPEN Bit2 NUDG Bit3 NARROW Bit4 HEAVY Bit5 IR Bit6 SPARE-1 Bit7 SPARE-2	MI IN 87654321	
D9	Sensor Input Status Bit0 HALL-DOL Bit1 HALL-AUX Bit2 HALL-DPM Bit3 HALL-DCL Bit4 HALL-SPARE1 Bit5 HALL-SPARE2 Bit6 HALL-SPARE3 Bit7 OPTIC-DOL Bit8 OPTIC-AUX Bit9 OPTIC-DPM Bit10 OPTIC-DCL	SenseCPAO321CPAO	
D10	Counter Status 1 (unit: 1)	Counter Status 1	
D11	Counter Status 2 (unit: 10000)	Counter Status 2	
D12	Relay Output Status Bit0 EDGE Timeout Bit1 AUX Bit2 DPM Bit3 REOPEN Bit4 DOL Bit5 DCL Bit6 SPARE-1 Bit7 SPARE-2	RelayOUT87654321	

DISPLAY PARAMETERS (CONTINUED)

Par. No	Function	Display	Unit
D13	LED Output Status Bit0 CLOSE Bit1 NUDG Bit2 CLOSE SLOWDOWN Bit3 OPEN Bit4 OPEN SLOWDOWN Bit5 HOLDING Bit6 ENCODER FAILED Bit7 SENSORS FAILED Bit8 STALL REVERSE Bit9 FREQUENCY FALURE Bit10 DETECTOR EDGES Bit11 LEARN DOOR WIDTH	LED LDFS87654321	
D14	Max. Close Frequency	Max. Close Freq	Hz
D15	Max. Close Force	Max. Close Force	A
D16	Software Version	Control SW Ver	
D17	Drive Type	Drive Type	
D18	Warning Code	Warn Code	
D19	Memory Probe Display	Testpoint Data	
D20	NMI state	NMI State	
D21	Door Code Time	Reg. Code Time	sec
D22	Door Code Time for Nudging	Nudg. Code Time	sec
D23	Reserved		
D24	Heat sink Temperature	Heat Sink Temp.	oC
D25	Step of Speed	Step of Speed	
D26	Door Position (%)	Door Position	%
D27	Door Position (pls)	Door Position	pls
D28	Feedback Freq.	Feedback Freq	Hz
D29	PG & CKRO pin state	Encoder pin stat	
D30	CAN Transmit Counter	CAN TX Counter	
D31	CAN Receive Counter	CAN RX Counter	
D32	Encoder Direction	Encoder Dir.	
D33	Encoder Pulse	Encoder Pulses	
D34	AD Value of Iv	AD Value of Iv	

INSTRUCTIONS FOR THE VFE2500 PARAMETER UNIT

READ (COPY) FROM THE DRIVE: Press SET, Press UP Arrow, Press READ.
WRITE (DOWNLOAD) TO THE DRIVE: Press SET, Press UP Arrow, Press WRITE.
CHANGE PARMETERS: Press SET, Enter Parameter Number, Press READ, Enter New Value, Press WRITE.

LEARNING DOORWIDTH: Set DOL and DCL properly. Flip switch to SETUP.
Set Par. 63 = 1. Flip switch back to RUN. Flip next switch to MAN.
Follow prompts on LCD Display.

CLOSING	Pr.#	RANGE	DEFAULT VALUE HARMONIC C/P	HARMONIC S/O	LINEAR STRAIGHT C/P	LINEAR STRAIGHT S/O	LINEAR GEARED C/P	LINEAR GEARED S/O
MAX. CLOSE SPEED	136	0-60	30	30	30	30	30	30
HOLDING TORQUE	137	0-3	0.6	0.6	0.6	0.6	0.2	0.2
HOLDING SPEED	138	0-400	2	2	2	2	2	2
HOLDING BEGINS	139	0-100	3	3	2	2	2	2
CLOSE TORQUE ▲	140	0-400	243	173	270	270	100	120
HIGH SPD (HSC)	141	0-400	25	19	25	20	25	20
FINAL SPD (FSC)	142	0-400	5	5	3	2	4	5
FSC BEGINS	143	0-100	6	10	5	5	5	10
NUDGING SPD	144	0-400	15	9	10	15	15	15
ACCEL. TIME	145	0-360	4	6	6	6	6	2
DECEL. TIME	146	0-360	8	10	15	20	10	4
STALL REV. FORCE	148	0-4.5	1.6	2.0	1.4	1.4	0.6	0.9

OPENING	Pr.#	RANGE	DEFAULT VALUE HARMONIC C/P	HARMONIC S/O	LINEAR STRAIGHT C/P	LINEAR STRAIGHT S/O	LINEAR GEARED C/P	LINEAR GEARED S/O
QUICK STOP ON REV.	78	0-4.5	1.2	1.4	2.0	2.0	1.2	1.2
HOLDING TORQUE	79	0-3	0.6	0.6	0.6	0.6	0.2	0.2
HOLDING SPEED	80	0-400	2	2	2	2	2	2
HOLDING BEGINS	81	0-100	99	99	99	99	99	99
SLOW SPD (SSO)	82	0-400	5	5	3	5	3	5
CLUTCH ENG. DIST.	83	0-100	12	12	12	12	12	12
HIGH SPD (HSO)	84	0-400	31	45	45	45	45	50
FINAL SPD (FSO)	85	0-400	7	7	3	5	3	5
FSO BEGINS	86	0-100	95	95	98	98	90	95
ACCEL. TIME	87	0-360	6	4	6	4	4	2
DECEL. TIME	88	0-360	12	14	12	12	12	4
OPEN TORQUE ▲	89	0-400	120	120	80	80	80	100

▲ : TO LOWER TORQUE, INCREASE THE VALUE.

COMMON	Pr.#	RANGE	DEFAULT VALUE HARMONIC L/R/C/P	LINEAR STRAIGHT L/R/C/P	LINEAR GEARED L/R/C/P
SELECTION OF THE HAND OF THE DOOR L=LEFT, R=RIGHT C/P=CENTER PARTING	42	1-2	1 / 2	1 / 2	1 / 2
CARRIER FREQ.	1	0-15	12		
SCAN FREQ.	61	0-400	9		
LEARNING FREQ.	62	0-400	9		
EDGES DELAY TIME	197	0-180	15		
EDGES HOLD TIME	206	0-180	5		
BUZZER DELAY TIME	198	0-180	10		
OVERLOAD	217	0-6	2.5		
BUZZER MODE	205	0-2	0: DISABLE 1: CONTINUOUS 2: PULSE		
DET. EDGES MODE	202	0-2	0: DISABLE 1: NPN 2: PNP		
NARROWER DOOR	199	0-1	0: YES 1: NO		
NARROWER DOOR DOL	204	0-1	0: USE BOTH DOL & AUX 1: USE DOL		
RE-OPEN RELAY MODE	207	0-1	0: MAINTAIN 1: DISABLE WHEN EDGES RELAY ON		
CLUTCH DISTANCE UNIT	76	0-1	0: PERCENT 1: PULSES		
CODE DIST. REG / HVY	69	0-65535	1" FOR S/O, OR 2" FOR C/P FROM DCL		
CODE DIST. NARROW	70	0-65535	1" FOR S/O, OR 2" FOR C/P FROM DCL		
CAN NODE I.D	246	7-8	FRONT DOOR = 7 REAR DOOR = 8		
DOORWIDTH LEARNING	63	0-1	0: DISABLE 1: ENABLE		

EASY SETUP PROCEDURE

ECI HAS DONE THIS PROCEDURE BEFORE SHIPPING VFE2500 TO CUSTOMERS.
HOWEVER, THIS EASY SETUP PROVIDES USERS WITH HELPFUL STEPS, WHEN NEEDED.

1. TURN ON POWER AND RUN DOOR IN MANUAL MODE. IF DOOR CLOSES AND OPENS IN THE CORRECT DIRECTION, GO TO 2. IF NOT, SWAP ANY 2 OF MOTOR WIRES, CHECK AGAIN, THEN GO TO 2.
2. ON KEYPAD, HIT VOLT/PULSE KEY. RUN DOOR IN MANUAL MODE AGAIN. IN CLOSE DIRECTION, LCD SHOULD SHOW "CLOSE" AND PULSE COUNT SHOULD DECREASE. IF NOT, CHANGE PAR. 42. CHECK AGAIN, THEN GO TO 3.
3. USE THE PARAMETER UNIT TO UPLOAD APPROPRIATE ECI DEFAULT FOR THE DOOR OPERATOR, THEN GO TO 4.
4. FLIP FIRST TOGGLE SWITCH TO SETUP. SET PAR. 63 = 1. FLIP TOGGLE SWITCH TO RUN, RUN THE DOOR IN MANUAL MODE. FOLLOW INSTRUCTION ON LCD DISPLAY TO COMPLETE DOOR WIDTH LEARNING PROCESS. LEARN-DOOR-WIDTH LED WILL FLASH AND TURN OFF WHEN PROCESS IS COMPLETED. LCD DISPLAY WILL SHOW "LEARNING COMPLETED." PARAMETER 63 WILL RETURN TO ZERO BY ITSELF.
5. FLIP FIRST TOGGLE SWITCH TO SETUP. SET PAR. 11 = 1 FOR REGULAR OPERATION. SET PAR. 11 = 5 FOR CAN BUS OPERATION. FLIP TOGGLE SWITCH TO RUN.
6. TEST DOOR IN MANUAL MODE, AND TEST DOOR IN AUTOMATIC MODE. DONE!

CONNECT TO OPTICAL CAM BOARD FOR HARMONIC MODEL.
CONNECT TO SIGNAL TRANSFER BOARD FOR LINEAR MODEL.

J4 — 10-CONDUCTOR RIBBON CABLE — OR — 10-CONDUCTOR RIBBON CABLE

FOR LINEAR MODEL
SET PAR. 201 = 0
2500-1002 SIGNALS TRANSFER BOARD
2500-1001 HALL-EFFECT SENSOR BOARD
DOL AUX (SET PAR. 199=6 TO ENABLE AUX) DPM DCL

FOR HARMONIC MODEL
SET PAR. 201 = 1
OPTICAL CAM BOARD 2500-3056
DOL AUX NARROW DPM DCL
SET PAR. 199=0 TO ENABLE AUX

TOGGLE SWITCHES FOR MANUAL OPERATION.
RUN / SETUP
AUTO / MAN.
CLOSE / OPEN
NUDG.
NARROW
HEAVY / RESET
LEARN DOOR WIDTH
SET PAR. 63 =1 FOR DOOR WIDTH LEARNING

VFE2500 CLOSED LOOP DRIVE 2500-3050

HAMONIC MODEL: PAR. 42 = 2 FOR LH/CP, PAR. 42 = 1 FOR RH
LINEAR STRAIGHT MODEL: PAR. 42 = 1 FOR LH/CP, PAR. 42 = 2 FOR RH
LINEAR GEARED MODEL: PAR. 42 = 1 FOR RH/LH/CP
GALVANIC ISOLATION ENCODER CARD
INDICATOR
CONNECT TO ENCODER
6-CONDUCTOR CABLE FOR ENCODER

SET PAR. 11 = 5 TO USE CAN BUS
SET PAR. 246 = 7 FOR FRONT DOOR
SET PAR. 246 = 8 FOR REAR DOOR
DEFAULT BAUDRATE OF PAR. 247 = 115.2KBPS
GALVANIC ISOLATION CAN BUS CARD (OPTIONAL)
SHLD CANH CANL
INDICATOR
BUS TERMINATION SWITCH
CONNECT TO CAN BUS OF THE ELEVATOR CONTROLLER
6-CONDUCTOR CABLE FOR ENCODER

CLOSE LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS
OPEN LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS
NUDG. LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS
CLOSE OPEN NUDG.

DPM N.O. CONTACT MAKES 1/2 INCH BEFORE GATE SWITCH MAKES FOR FAULT MONITOR TO MEET ANSI A17.1 AND CAN/CSA-B44. DPM RELAY IS CONTROLLED BY DPM CAM OR DPM HALL EFFECT SENSOR.

REOPEN RELAY IS ACTIVATED BY ANY ONE OF THE FOLLOWING DETECTIONS:
1. STALL REVERSE; CONTROLLED BY PAR. 148.
2. FREQUENCY FAILURE; CONTROLLED BY PAR. 136
3. DETECTOR EDGES; CONTROLLED BY PAR. 202, SW 8, AND IC U5.

N.C. CONTACT OPENS WHEN DOOR REACHES FINAL CLOSE LIMIT. DCL RELAY IS CONTROLLED BY DCL CAM FOR HARMONIC MODEL. OR, BY DCL HALL-EFFECT SENSOR FOR LINEAR MODEL.

N.C. CONTACT OPENS WHEN DOOR REACHES THE FINAL OPEN LIMIT. DOL RELAY IS CONTROLLED BY DOL CAM FOR HARMONIC MODEL. OR, BY DOL HALL-EFFECT SENSOR FOR LINEAR MODEL.

ENABLE IC (SEE NOTE 2)
U5 DPPC 0001N
ENABLE IC ONLY WORKS WITH ECI CERTIFIED DETECTOR EDGES
SW8 NPN PNP
INFRARED DETECTOR EDGES OUTPUT TYPE SELECTOR SWITCH.
PAR. 202 =0 TO DISABLE
PAR. 202 =1 FOR NPN
PAR. 202 =2 FOR PNP
CN4 0V LC SE V+
CN5 0V LC SE V+
CONNECT TO ECI CERTIFIED INFRARED DETECTOR EDGES

ECI CERTIFIED INFRARED DETECTOR EDGES

ECI P/N	MFG.	TX (CN5) V+	TX (CN5) LC SE	TX (CN5) 0V	RX (CN4) V+	RX (CN4) LC SE	RX (CN4) 0V	CONNECTION BETWEEN TX & RX
906-3013	JANUS	RED	BLU	ORG ♦			ORG ♦	WHT - WHT
906-3020	TRITRONICS	RED	WHT	ORG				NONE
906-3030	FORMULA SYSTEMS	BLU 1	BRN 2	GRN YEL	BLU 1	BRN 2	GRN YEL	NONE

♦ :CONNECT 0V TO A TRUE EARTH GROUND

CONNECT TO ADDITIONAL I/O BOARD — J7 — 14-CONDUCTOR RIBBON CABLE — CONNECT TO J7 ON THE MAIN BOARD

BUZZER IS TRIGGERED BY INFRARED DETECTOR EDGES.
BUZZER — DELAY TIME FROM TRIGGERED POINT IS SET BY PAR. 198
PAR. 205 = 0 : DISABLE
205 = 1: CONT
205 = 2: PULSE
BUZZER VOLUME CONTROL
HEAVY LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS
NARROW LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS
COM HEAVY NARROW — INPUT SIGNALS

ADDITIONAL I/O BOARD 2500-3055 (OPTIONAL)

SPARE — USE PAR. 68 TO SET AUX2 RELAY. SEE MANUAL FOR DETAILS.
AUX. RELAY — SET PAR. 204=0 IF AUX. CONTACT AND REGULAR DOL ARE USED AS DOL OF THE NARROWER DOOR.
EDGES TIMEOUT RELAY — DELAY TIME FROM TRIGGERED POINT IS SET BY PAR. 197
EDGES TIMEOUT RELAY IS TRIGGERED BY INFRARED DETECTOR EDGES. SET PAR. 207 = 1 TO DISABLE REOPEN RELAY WHEN EDGES TIMEOUT ACTIVATED.

IF EDGES TIMEOUT OUTPUT IS USED FOR NUDGING FEATURE, IT MUST BE SUBJECTED TO ELEVATOR FIRE SERVICE CODES.

EDGES TIMEOUT | AUX. NARROWER DOOR | AUX2 OPTIONAL — NC COM NO

ELEVATOR CONTROLLER MUST PROVIDE COMMAND SIGNALS TO HEAVY AND/OR NARROW INPUT(S) TO USE HEAVY DOOR AND/OR NARROWER DOOR FUNCTION(S).

NOTES: 1. HEAVY LINES REPRESENT CONNECTIONS FROM ELEVATOR CONTROLLER TO DOOR OPERATOR PCB.
2. MAKE SURE THAT ENABLE IC IS INSERTED INTO SOCKET AS SHOWN.

GS & GS1 ARE ONLY CONVENIENCE TERMINALS FOR USERS. THEY HAVE NO CONNECTIONS TO VFE-2500 CIRCUITRY.

EARTH GROUND CONNECTION — ON / OFF — 230 VAC LINE L1 L2 — GATE SWITCH GS GS1 — TO MOTOR U V W

CONNECT TO ECI PARAMETER UNIT 2500-3051

DPM NC COM NO — REOPEN NC COM NO — DCL NC COM NO — DOL NC COM NO — INPUT SIGNALS CLOSE OPEN NUDG. COM

RELAY CONTACTS ARE RATED @ 10 AMP. 250VAC

TO ELEVATOR CONTROLLER (SEE NOTE 1)

CONTROLLER'S RELAYS MUST HAVE THE SAME COMMON AND RELAY COIL VOLTAGE MUST BE FROM 24V - 230V AC OR DC.

C O N — INPUT SIGNALS CLOSE OPEN NUDG. COM

CONNECT TO ANY VOLTAGE SOURCE FROM 24 TO 230 VOLTS, AC OR DC, 30mA MIN.

METHOD 1 | METHOD 2
CONNECTION METHODS
C = CLOSE O = OPEN N = NUDGING

WARNING:

ALL EQUIPMENT MUST BE INSTALLED AND ADJUSTED TO MEET FEDERAL, STATE / PROVINCIAL, AND LOCAL CODES. TO PREVENT ELECTRICAL SHOCK, METALLIC CONDUITS, ELECTRICAL BOXES, AND MOTOR MUST BE GROUNDED. WAIT FOR 10 MINUTES AFTER REMOVING POWER BEFORE SERVICING.

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 5000 RMS SYMMETRICAL AMPERES, 240 VOLTS MAXIMUM, WHEN PROTECTED BY 4 AMPERES, 240V RK5 FUSES.

DRIVE OVERLOAD FACTORY SET AT 2.5A

4 AMP. SLOW BLOW FUSES — GATE SWITCH

EARTH GROUND POLE ON ENCLOSURE — EARTH GROUND — 200 - 230 VAC 500VA MIN.

TO ELEVATOR CONTROLLER (SEE NOTE 1)

FOR THE LIGHT DUTY LINEAR MODEL, THE MOTOR WILL BE 230VAC 91W 3PH AND THE ENCODER IS AN UNDETACHABLE PART OF THE MOTOR, P/N: 2500-2016L/R

ENCODER 2500-3057

230VAC 1/2 HP 3PH. INDUCTION MOTOR

6-CONDUCTOR CABLE FOR ENCODER

MOVFE2500 CLOSED LOOP DOOR OPERATOR CONNECTION DIAGRAM

REV.	DATE	DESCRIPTION

GAL CANADA
6500 GOTTARDO CRT.
MISSISSAUGA, ONTARIO
L5T 2A2 CANADA
TEL: (905) 624-6565
FAX: (905) 624-4262

Doc. No: 2500-2001-S

INSTRUCTIONS FOR THE VFE2500 PARAMETER UNIT

READ (COPY) FROM THE DRIVE: Press SET, Press UP Arrow, Press READ.
WRITE (DOWNLOAD) TO THE DRIVE: Press SET, Press UP Arrow, Press WRITE.
CHANGE PARMETERS: Press SET, Enter Parameter Number, Press READ, Enter New Value, Press WRITE.

LEARNING DOORWIDTH: Set DOL and DCL properly. Flip switch to SETUP.
Set Par. 63 = 1. Flip switch back to RUN. Flip next switch to MAN.
Follow prompts on LCD Display.

CLOSING	Pr.#	RANGE	DEFAULT VALUE HARMONIC C/P	HARMONIC S/O	LINEAR STRAIGHT C/P	LINEAR STRAIGHT S/O	LINEAR GEARED C/P	LINEAR GEARED S/O
MAX. CLOSE SPEED	136	0-60	30	30	30	30	30	30
HOLDING TORQUE	137	0-3	0.6	0.6	0.6	0.6	0.2	0.2
HOLDING SPEED	138	0-400	2	2	2	2	2	2
HOLDING BEGINS	139	0-100	3	3	2	2	2	2
CLOSE TORQUE ▲	140	0-400	243	173	270	270	100	120
HIGH SPD (HSC)	141	0-400	25	19	25	20	25	20
FINAL SPD (FSC)	142	0-400	5	5	3	2	4	5
FSC BEGINS	143	0-100	6	10	5	5	5	10
NUDGING SPD	144	0-400	15	9	10	15	15	15
ACCEL. TIME	145	0-360	4	6	6	6	6	2
DECEL. TIME	146	0-360	8	10	15	20	10	4
STALL REV. FORCE	148	0-4.5	1.6	2.0	1.4	1.4	0.6	0.9

OPENING	Pr.#	RANGE	DEFAULT VALUE HARMONIC C/P	HARMONIC S/O	LINEAR STRAIGHT C/P	LINEAR STRAIGHT S/O	LINEAR GEARED C/P	LINEAR GEARED S/O
QUICK STOP ON REV.	78	0-4.5	1.2	1.4	2.0	2.0	1.2	1.2
HOLDING TORQUE	79	0-3	0.6	0.6	0.6	0.6	0.2	0.2
HOLDING SPEED	80	0-400	2	2	2	2	2	2
HOLDING BEGINS	81	0-100	99	99	99	99	99	99
SLOW SPD (SSO)	82	0-400	5	5	3	5	3	5
CLUTCH ENG. DIST.	83	0-100	12	12	12	12	12	12
HIGH SPD (HSO)	84	0-400	31	45	45	45	45	50
FINAL SPD (FSO)	85	0-400	7	7	3	5	3	5
FSO BEGINS	86	0-100	95	95	98	98	90	95
ACCEL. TIME	87	0-360	6	4	6	4	4	2
DECEL. TIME	88	0-360	12	14	12	12	12	4
OPEN TORQUE ▲	89	0-400	120	120	80	80	80	100

▲ : TO LOWER TORQUE, INCREASE THE VALUE.

COMMON	Pr.#	RANGE	DEFAULT VALUE HARMONIC L/2	HARMONIC R 1	HARMONIC C/P 2	LINEAR STRAIGHT L/2	LINEAR STRAIGHT R 1	LINEAR STRAIGHT C/P 2	LINEAR GEARED L/2	LINEAR GEARED R 1	LINEAR GEARED C/P 2
SELECTION OF THE HAND OF THE DOOR L=LEFT, R=RIGHT C/P=CENTER PARTING	42	1-2									
CARRIER FREQ.	1	0-15	12								
SCAN FREQ.	61	0-400	9								
LEARNING FREQ.	62	0-400	9								
EDGES DELAY TIME	197	0-180	15								
EDGES HOLD TIME	206	0-180	5								
BUZZER DELAY TIME	198	0-180	10								
OVERLOAD	217	0-6	2.5								
BUZZER MODE	205	0-2	0: DISABLE 1: CONTINUOUS 2: PULSE								
DET. EDGES MODE	202	0-2	0: DISABLE 1: NPN 2: PNP								
NARROWER DOOR	199	0-1	0: YES 1: NO								
NARROWER DOOR DOL	204	0-1	0: USE BOTH DOL & AUX 1: USE DOL								
RE-OPEN RELAY MODE	207	0-1	0: MAINTAIN 1: DISABLE WHEN EDGES RELAY ON								
CLUTCH DISTANCE UNIT	76	0-1	0: PERCENT 1: PULSES								
CODE DIST. REG / HVY	69	0-65535	1" FOR S/O, OR 2" FOR C/P FROM DCL								
CODE DIST. NARROW	70	0-65535	1" FOR S/O, OR 2" FOR C/P FROM DCL								
CAN NODE I D	246	7-8	FRONT DOOR = 7 REAR DOOR = 8								
DOORWIDTH LEARNING	63	0-1	0: DISABLE 1: ENABLE								

EASY SETUP PROCEDURE

ECI HAS DONE THIS PROCEDURE BEFORE SHIPPING VFE2500 TO CUSTOMERS.
HOWEVER, THIS EASY SETUP PROVIDES USERS WITH HELPFUL STEPS, WHEN NEEDED.

1. TURN ON POWER AND RUN DOOR IN MANUAL MODE. IF DOOR CLOSES AND OPENS IN THE CORRECT DIRECTION, GO TO 2. IF NOT, SWAP ANY 2 OF MOTOR WIRES, CHECK AGAIN, THEN GO TO 2.
2. ON KEYPAD, HIT VOLT/PULSE KEY. RUN DOOR IN MANUAL MODE AGAIN. IN CLOSE DIRECTION, LCD SHOULD SHOW "CLOSE" AND PULSE COUNT SHOULD DECREASE. IF NOT, CHANGE PAR. 42. CHECK AGAIN, THEN GO TO 3.
3. USE THE PARAMETER UNIT TO UPLOAD APPROPRIATE ECI DEFAULT FOR THE DOOR OPERATOR, THEN GO TO 4.
4. FLIP FIRST TOGGLE SWITCH TO SETUP. SET PAR. 63 = 1. FLIP TOGGLE SWITCH TO RUN, RUN THE DOOR IN MANUAL MODE. FOLLOW INSTRUCTION ON LCD DISPLAY TO COMPLETE DOOR WIDTH LEARNING PROCESS. LEARN-DOOR-WIDTH LED WILL FLASH AND TURN OFF WHEN PROCESS IS COMPLETED. LCD DISPLAY WILL SHOW "LEARNING COMPLETED." PARAMETER 63 WILL RETURN TO ZERO BY ITSELF.
5. FLIP FIRST TOGGLE SWITCH TO SETUP. SET PAR. 11 = 1 FOR REGULAR OPERATION. SET PAR. 11 = 5 FOR CAN BUS OPERATION. FLIP TOGGLE SWITCH TO RUN.
6. TEST DOOR IN MANUAL MODE, AND TEST DOOR IN AUTOMATIC MODE. DONE!

CONNECT TO OPTICAL CAM BOARD FOR HARMONIC MODEL.
CONNECT TO SIGNAL TRANSFER BOARD FOR LINEAR MODEL.

J4 — 10-CONDUCTOR RIBBON CABLE — OR — 10-CONDUCTOR RIBBON CABLE

FOR LINEAR MODEL
SET PAR. 201 = 0
2500-1002 SIGNALS TRANSFER BOARD
2500-1001 HALL-EFFECT SENSOR BOARD
DOL AUX (SET PAR. 199=0 TO ENABLE AUX) DPM DCL

FOR HARMONIC MODEL
SET PAR. 201 = 1
OPTICAL CAM BOARD 2500-3056
DOL AUX NARROW DPM DCL
SET PAR. 199=0 TO ENABE AUX

TOGGLE SWITCHES FOR MANUAL OPERATION.
RUN / SETUP
AUTO / MAN.
CLOSE / OPEN
NUDG.
NARROW
HEAVY / RESET
LEARN DOOR WIDTH
SET PAR. 63 =1 FOR DOOR WIDTH LEARNING

VFE2500 CLOSED LOOP DRIVE 2500-3050-1

CLOSE LED — DPM N.O. CONTACT MAKES 1/2 INCH BEFORE GATE SWITCH MAKES FOR FAULT MONITOR TO MEET ANSI A17.1 AND CAN/CSA-B44. DPM RELAY IS CONTROLLED BY DPM CAM OR DPM HALL EFFECT SENSOR.
OPEN LED — REOPEN RELAY IS ACTIVATED BY ANY ONE OF THE FOLLOWING DETECTIONS: 1. STALL REVERSE; CONTROLLED BY PAR. 148. 2. FREQUENCY FAILURE; CONTROLLED BY PAR. 136 3. DETECTOR EDGES; CONTROLLED BY PAR. 202, SW 8, AND IC U5.
NUDG. LED — N.C. CONTACT OPENS WHEN DOOR REACHES FINAL CLOSE LIMIT. DCL RELAY IS CONTROLLED BY DCL CAM FOR HARMONIC MODEL. OR, BY DCL HALL-EFFECT SENSOR FOR LINEAR MODEL.
N.C. CONTACT OPENS WHEN DOOR REACHES THE FINAL OPEN LIMIT. DOL RELAY IS CONTROLLED BY DOL CAM FOR HARMONIC MODEL. OR, BY DOL HALL-EFFECT SENSOR FOR LINEAR MODEL.

REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS

CLOSE OPEN NUDG.

HAMONIC MODEL: PAR. 42 = 2 FOR LH/CP, PAR. 42 = 1 FOR RH
LINEAR STRAIGHT MODEL: PAR. 42 = 1 FOR LH/CP, PAR. 42 = 2 FOR RH
LINEAR GEARED MODEL: PAR. 42 = 1 FOR RH/LH/CP
GALVANIC ISOLATION ENCODER CARD — INDICATOR — CONNECT TO ENCODER

SET PAR. 11 = 5 TO USE CAN BUS
SET PAR. 246 = 7 FOR FRONT DOOR.
SET PAR. 246 = 8 FOR REAR DOOR
DEFAULT BAUDRATE OF PAR. 247 = 115.2KBPS
GALVANIC ISOLATION CAN BUS CARD (OPTIONAL) — INDICATOR — BUS TERMINATION SWITCH — SHLD CANH CANL — CONNECT TO CAN BUS OF THE ELEVATOR CONTROLLER

6-CONDUCTOR CABLE FOR ENCODER

ENABLE IC (SEE NOTE 2)
U5 DPPC 0001N
ENABLE IC ONLY WORKS WITH ECI CERTIFIED DETECTOR EDGES
SW8 NPN PNP
INFRARED DETECTOR EDGES OUTPUT TYPE SELECTOR SWITCH. PAR. 202 =0 TO DISABLE PAR. 202 =1 FOR NPN PAR. 202 =2 FOR PNP
CN4 0V LC SE V+
CN5 0V LC SE V+
CONNECT TO ECI CERTIFIED INFRARED DETECTOR EDGES

ECI CERTIFIED INFRARED DETECTOR EDGES

ECI P/N	MFG.	TX (CN5) V+	TX (CN5) LC SE	TX (CN5) 0V	RX (CN4) V+	RX (CN4) LC SE	RX (CN4) 0V	CONNECTION BETWEEN TX & RX
906-3013	JANUS	RED	BLU	ORG			ORG	WHT - WHT
906-3020	TRITRONICS	RED	WHT	ORG				NONE
906-3030	FORMULA SYSTEMS	BLU 1	BRN 2	GRN YEL	BLU 1	BRN 2	GRN YEL	NONE

◆ :CONNECT 0V TO A TRUE EARTH GROUND

GS & GS1 ARE ONLY CONVENIENCE TERMINALS FOR USERS. THEY HAVE NO CONNECTIONS TO VFE-2500 CIRCUITRY.
CONNECT TO ECI PARAMETER UNIT 2500-3051
EARTH GROUND CONNECTION — ON / OFF — 115 VAC LINE L1 L2 — GATE SWITCH GS GS1 — TO MOTOR U V W
DPM NC COM NO — REOPEN NC COM NO — DCL NC COM NO — DOL NC COM NO — INPUT SIGNALS CLOSE OPEN NUDG. COM
CONNECT TO ADDITIONAL I/O BOARD — J7 — 14-CONDUCTOR RIBBON CABLE — CONNECT TO J7 ON THE MAIN BOARD

RELAY CONTACTS ARE RATED @ 10 AMP. 250VAC
TO ELEVATOR CONTROLLER (SEE NOTE 1)

BUZZER — DELAY TIME FROM TRIGGERED POINT IS SET BY PAR. 198 PAR. 205 = 0 : DISABLE 205 = 1: CONT 205 = 2: PULSE
BUZZER IS TRIGGERED BY INFRARED DETECTOR EDGES.
HEAVY LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS — HEAVY
NARROW LED — REMOVE THIS JUMPER IF INPUT SIGNAL VOLTAGE IS 60V OR LESS — NARROW
COM HEAVY NARROW — INPUT SIGNALS

CONTROLLER'S RELAYS MUST HAVE THE SAME COMMON AND RELAY COIL VOLTAGE MUST BE FROM 24V - 230V AC OR DC.
C O N — INPUT SIGNALS CLOSE OPEN NUDG. COM

BUZZER VOLUME CONTROL

ADDITIONAL I/O BOARD 2500-3055 (OPTIONAL)

AUX2 SPARE — SPARE — USE PAR. 68 TO SET AUX2 RELAY. SEE MANUAL FOR DETAILS.

AUX. NARROWER DOOR — AUX. RELAY — SET PAR. 204=0 IF AUX. CONTACT AND REGULAR DOL ARE USED AS DOL OF THE NARROWER DOOR.

EDGES TIMEOUT — EDGES TIMEOUT RELAY — DELAY TIME FROM TRIGGERED POINT IS SET BY PAR. 197

IF EDGES TIMEOUT OUTPUT IS USED FOR NUDGING FEATURE, IT MUST BE SUBJECTED TO ELEVATOR FIRE SERVICE CODES.

EDGES TIMEOUT NC COM NO — AUX. NARROWER DOOR NC COM NO — AUX2 OPTIONAL NC COM NO

ELEVATOR CONTROLLER MUST PROVIDE COMMAND SIGNALS TO HEAVY AND/OR NARROW INPUT(S) TO USE HEAVY DOOR AND/OR NARROWER DOOR FUNCTION(S).

EDGES TIMEOUT RELAY IS TRIGGERED BY INFRARED DETECTOR EDGES. SET PAR. 207 = 1 TO DISABLE REOPEN RELAY WHEN EDGES TIMEOUT ACTIVATED.

8 AMP. SLOW BLOW FUSES
GATE SWITCH
EARTH GROUND POLE ON ENCLOSURE
EARTH GROUND
115 VAC 500VA MIN.
TO ELEVATOR CONTROLLER (SEE NOTE 1)
FOR THE LIGHT DUTY LINEAR MODEL, THE MOTOR WILL BE 230VAC 91W 3PH AND THE ENCODER IS AN UNDETACHABLE PART OF THE MOTOR, P/N: 2500-2016-L/R
ENCODER 2500-3057
230VAC 1/2 HP 3PH. INDUCTION MOTOR

WARNING:

ALL EQUIPMENT MUST BE INSTALLED AND ADJUSTED TO MEET FEDERAL, STATE / PROVINCIAL, AND LOCAL CODES. TO PREVENT ELECTRICAL SHOCK, METALLIC CONDUITS, ELECTRICAL BOXES, AND MOTOR MUST BE GROUNDED. WAIT FOR 10 MINUTES AFTER REMOVING POWER BEFORE SERVICING.

SUITABLE FOR USE ON A CIRCUIT CAPABLE OF DELIVERING NOT MORE THAN 5000 RMS SYMMETRICAL AMPERES, 120 VOLTS MAXIMUM, WHEN PROTECTED BY 8 AMPERES, 120V RK5 FUSES.

DRIVE OVERLOAD FACTORY SET AT 2.5A

CONNECT TO ANY VOLTAGE SOURCE FROM 24 TO 230 VOLTS, AC OR DC, 30mA MIN.

METHOD 1 — METHOD 2
CONNECTION METHODS
C = CLOSE O = OPEN N = NUDGING

NOTES: 1. HEAVY LINES REPRESENT CONNECTIONS FROM ELEVATOR CONTROLLER TO DOOR OPERATOR PCB.
2. MAKE SURE THAT ENABLE IC IS INSERTED INTO SOCKET AS SHOWN.

6-CONDUCTOR CABLE FOR ENCODER

MOVFE2500 CLOSED LOOP DOOR OPERATOR CONNECTION DIAGRAM

REV.	DATE	DESCRIPTIO115

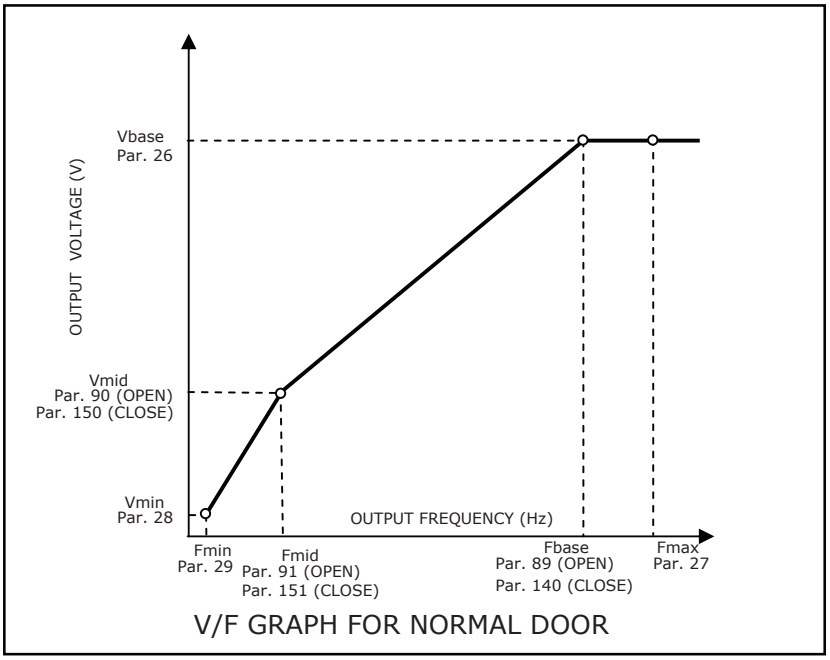
GAL CANADA
6500 GOTTARDO CRT.
MISSISSAUGA, ONTARIO
L5T 2A2 CANADA
TEL: (905) 624-6565
FAX: (905) 624-4262

Doc. No: 2500-2001-S-1

51

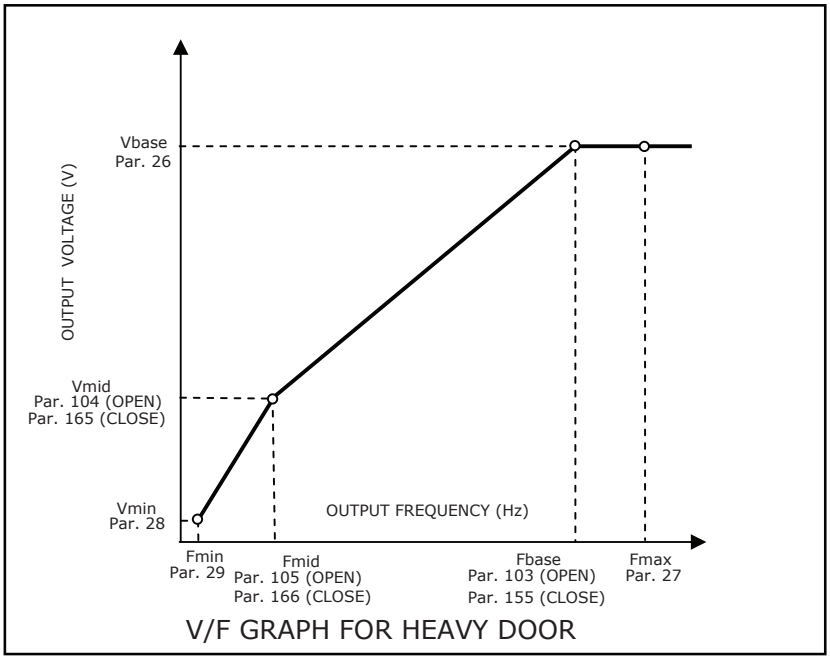
SUPPORTIVE GRAPHS

1. V/F CURVE FOR NORMAL DOOR



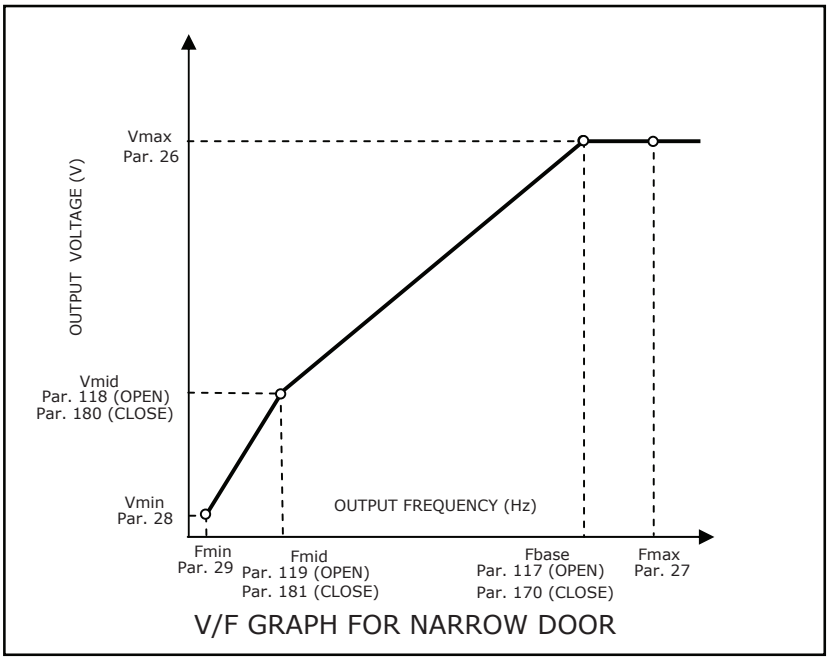
V/F GRAPH FOR NORMAL DOOR

2. V/F CURVE FOR HEAVY DOOR



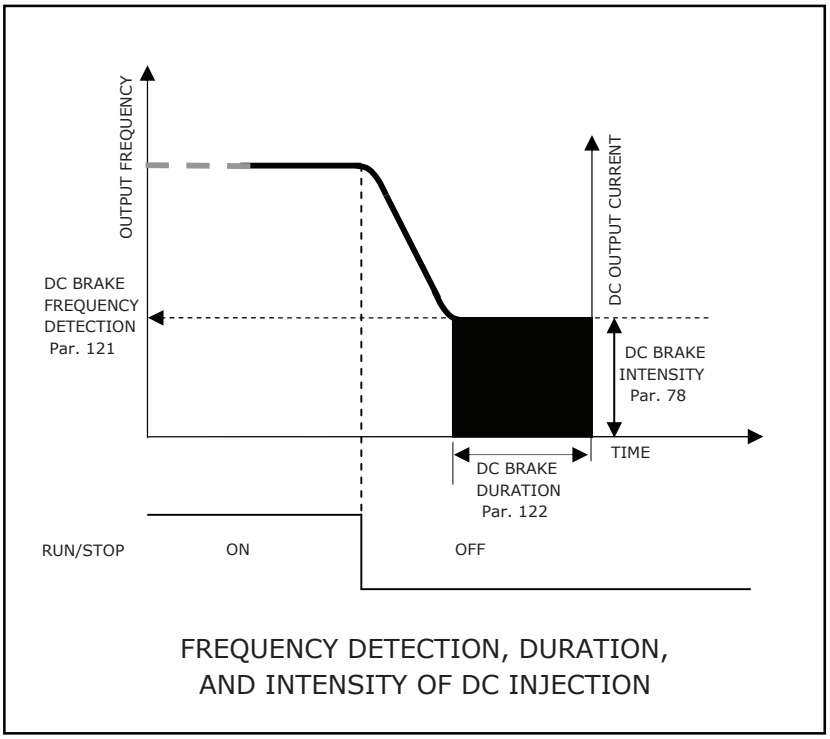
V/F GRAPH FOR HEAVY DOOR

3. V/F CURVE FOR NARROW DOOR



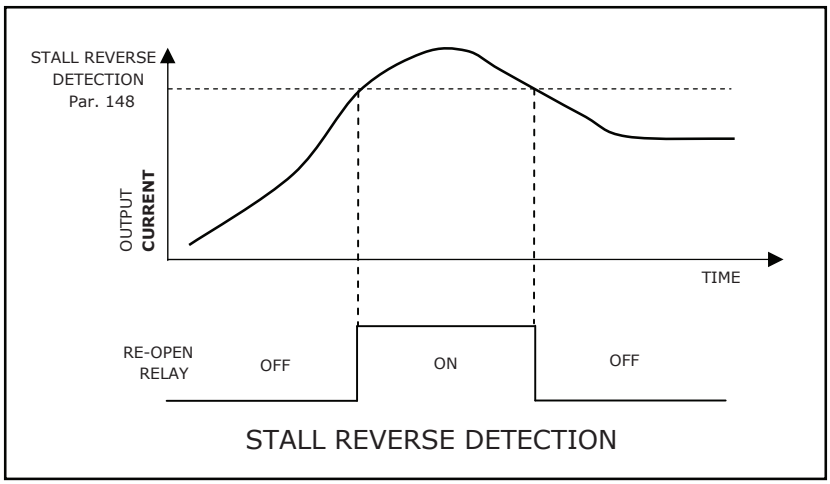
V/F GRAPH FOR NARROW DOOR

4. DC INJECTION



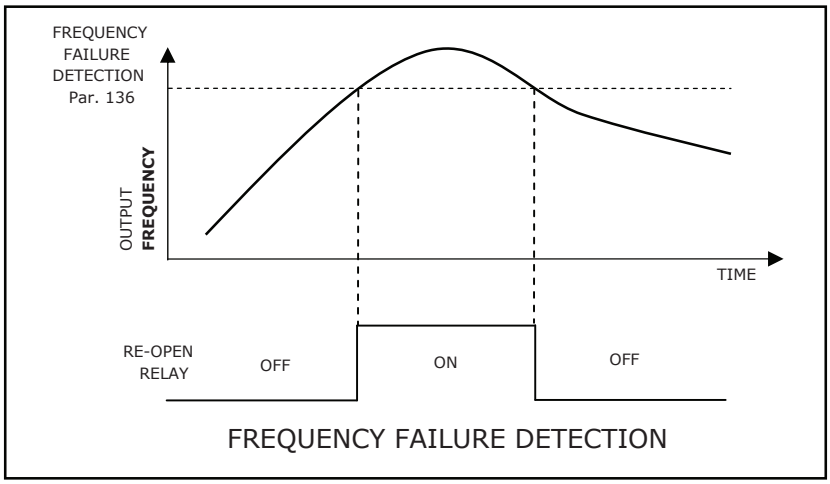
FREQUENCY DETECTION, DURATION,
AND INTENSITY OF DC INJECTION

5. STALL REVERSE DETECTION



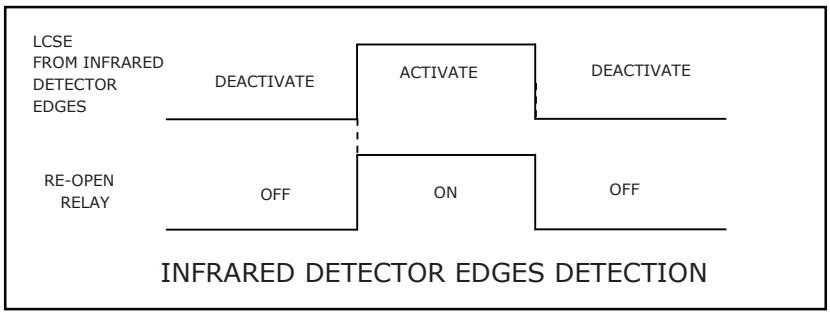
STALL REVERSE DETECTION

6. FREQUENCY FAILURE DETECTION



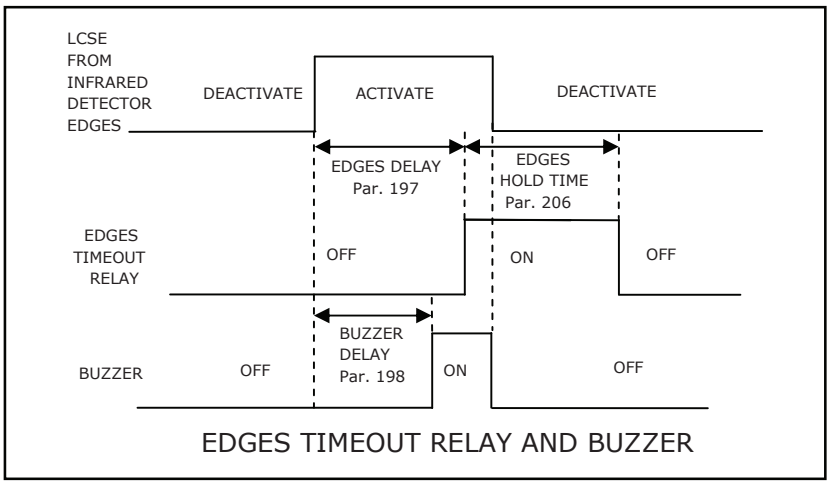
FREQUENCY FAILURE DETECTION

7. INFRARED DETECTOR EDGES DETECTION



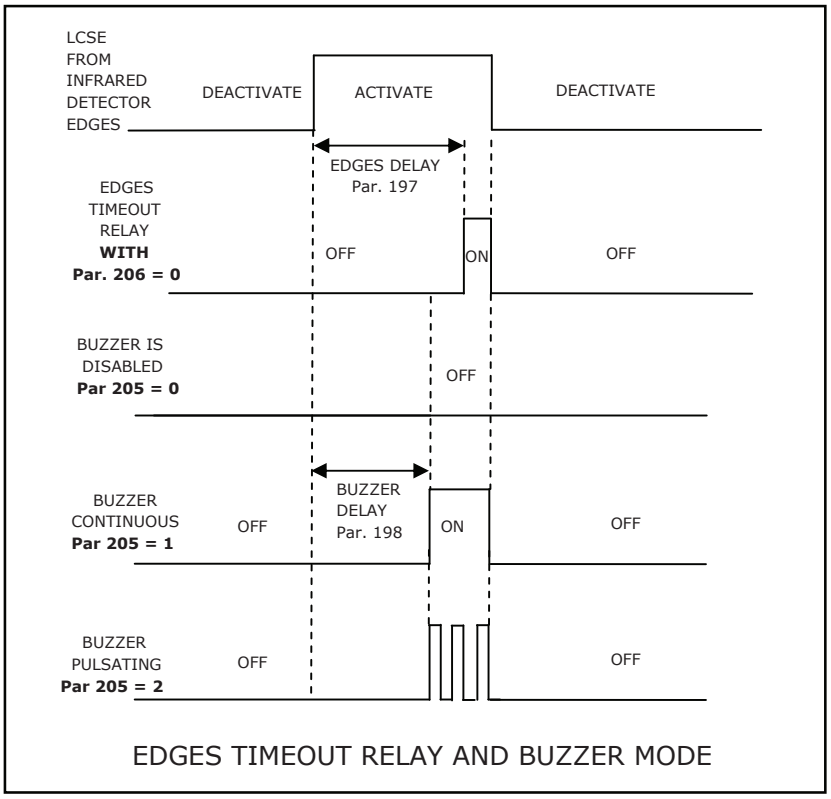
INFRARED DETECTOR EDGES DETECTION

8. EDGES TIMEOUT RELAY AND BUZZER TIMING



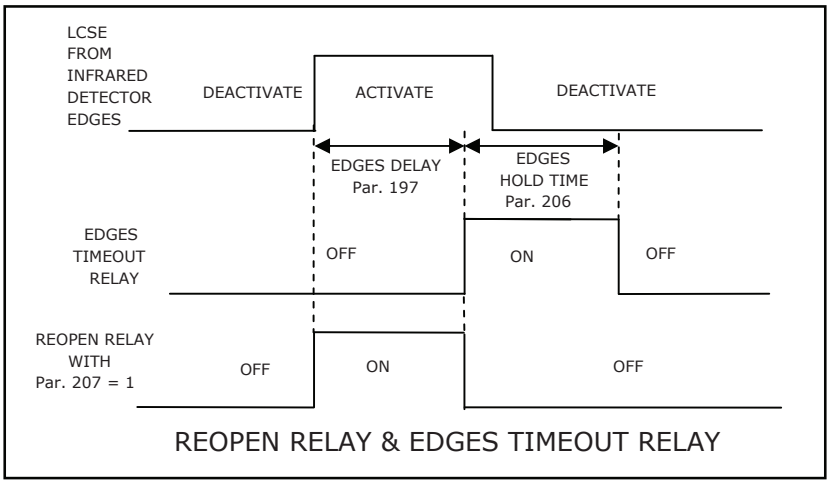
EDGES TIMEOUT RELAY AND BUZZER

9. EDGES TIMEOUT RELAY AND BUZZER MODES



EDGES TIMEOUT RELAY AND BUZZER MODE

10. INTERACTION BETWEEN REOPEN RELAY AND EDGES TIMEOUT RELAY



REOPEN RELAY & EDGES TIMEOUT RELAY

FAULTS LIST

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Over-current	Over-current	Yes	Yes	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	1. Check the wiring connections to U, V, W for possible short circuits. 2. Check the wiring connections between the AC motor drive and motor for possible short circuits, also to ground. 3. Check for loose contacts between AC motor drive and motor. 4. Increase the acceleration time. 5. Check for possible excessive loading conditions at the motor. 6. If there are still any abnormal conditions when operating the AC motor drive after a short-circuit is removed and the other points above are checked, it should be sent back to manufacturer.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Over-voltage	Over-voltage	Yes	Yes	Yes	Coast to Stop	DC-bus must be less than 385V for 230V Drive
Remedy	1. Check if the input voltage is over the rated voltage of the 2500-3050 drive input voltage range. 2. Check for possible voltage transients. 3. DC-bus over-voltage may also be caused by motor regeneration. 4. Increase the deceleration time . 5. Check whether the required braking power is within the specified limits. 6. Check for proper earth ground wire.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Over heat	Over heat	Yes	Yes	Yes	Coast to Stop	Heatsink temperature must be less than 161°F (71.6°C)
Remedy	1. Ensure that the ambient temperature falls within the specified temperature range. 2. Remove any foreign objects from the heatsink and check for possible dirty heat sink fins.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Drive Overload	Drive Overload	Yes	Yes	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	1. Check whether the motor is overloaded. 2. Reduce torque					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Motor Overload	Motor Overload	Yes	Yes	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	1. Reduce the motor load 2. Check, remove any foreign objects preventing the motor from moving. 3. Repair defective mechanical system.					

FAULTS LIST (CONTINUED)

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Hardware Failure	Hardware protection failure	No	No	Yes	Coast to Stop	
Remedy	Return to ECI					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
OC at Accel	Over current during Acceleration	Yes	Yes	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	1. Short-circuit at motor output: Check for possible poor insulation at the output lines. 2. Torque boost too high: Decrease the torque compensation setting in Pr.33. 3. Acceleration Time too short: Increase the Acceleration Time.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
OC at Decel	Over current during Deceleration	Yes	Yes	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	1. Short-circuit at motor output: Check for possible poor insulation at the output line. 2. Deceleration Time too short: Increase the Deceleration Time.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
OC At Steady	Over current during steady state operation	Yes	Yes	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	1. Short-circuit at motor output: Check for possible poor insulation at the output line. 2. Sudden increase in motor loading: Check for possible motor stall.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Ground Fault	Short to ground	No	No	Yes	Coast to Stop	Continuous current must be less than 50% of rated current for 5 seconds
Remedy	When one of the output terminals is grounded, short circuit current is more than 1.5A, the AC motor drive power module may be damaged. 1. Check whether the IGBT power module is damaged. 2. Check for possible poor insulation at the output line. NOTE! The short circuit protection is provided for AC motor drive protection, not for protection of the user.					

FAULTS LIST (CONTINUED)

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
EEPROM Read Fail	CPU Read Failure	Yes	No	Yes	Coast to Stop	Immediately
Remedy	Return to factory					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Parameter Chksum	CPU WRITE Failure	Yes	No	Yes	Coast to Stop	Immediately
Remedy	Return to factory					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Comm Loss	Comm. Time out	Yes	No	Yes	Disable Coast to Stop Ram to Stop Warning	Immediately
Remedy	1. Check the RS485 connection between the AC motor drive and RS485 master for loose wires and wiring to correct pins. 2. Check if the communication protocol, address, transmission speed, etc. are properly set. 3. Use the correct checksum calculation.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Autotune Failure	Auto-learning Error	Yes	No	Yes	Coast to Stop	Immediately
Remedy	1. Check the cable between drive and motor 2. Retry again					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Encoder Loss	Encoder Loss Error	Yes	Yes	Yes	Coast to Stop Ramp to Stop Warning & Scan Speed	Detect the correct signals of the Encoder
Remedy	Check the wiring of the encoder					

FAULTS LIST (CONTINUED)

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
Encoder Fbk Error	Encoder Direction Error	Yes	Yes	Yes	Coast to Stop Ramp to Stop Warning & Scan Speed	Movement direction is in agreement with the encoder direction defined by the drive.
Remedy	1. Check value of Par. 41. 2. Check if the wiring of the Encoder is correct.					

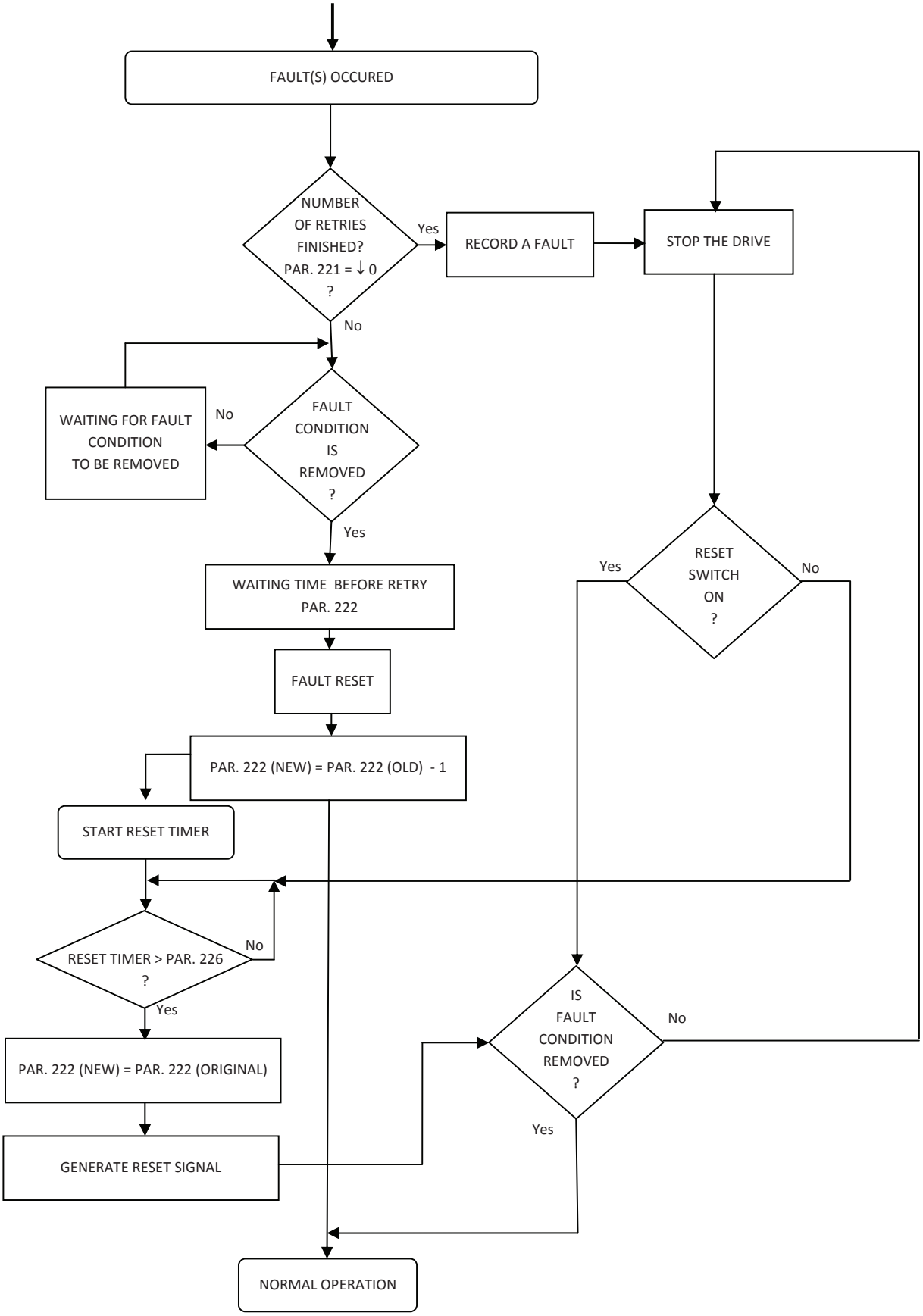
Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
AUX Sensor Fail	AUX Error	Yes	Yes	Yes	Warning & Scan Speed	Recover if the signal is detected appropriately
Remedy	1. Check the AUX sensor 2. Check the wirings of the AUX sensor. 3. Check the Magnet for the Linear model. 4. Check the Cam for the Harmonic model.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
DPM Sensor Fail	DPM Error	Yes	Yes	Yes	Warning & Scan Speed	Recover if the signal is detected appropriately
Remedy	1. Check the DPM sensor 2. Check the wirings of DPM sensor. 3. Check the Magnet for the Linear model. 4. Check the Cam for the Harmonic model.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
DOL Sensor Fail	DOL Error	Yes	Yes	Yes	Warning & Scan Speed	Recover if the signal is detected appropriately
Remedy	1. Check the DOL sensor 2. Check the wirings of the DOL sensor. 3. Check the Magnet for the Linear model. 4. Check the Cam for the Harmonic model.					

Fault Display	Meaning	Reset	Auto Reset	Record	Drive Response	Reset Condition
DCL Sensor Fail	DCL Error	Yes	Yes	Yes	Warning & Scan Speed	Recover if the signal is detected appropriately
Remedy	1. Check the DCL sensor 2. Check the wirings of the DCL sensor. 3. Check the Magnet for the Linear model. 4. Check the Cam for the Harmonic model.					

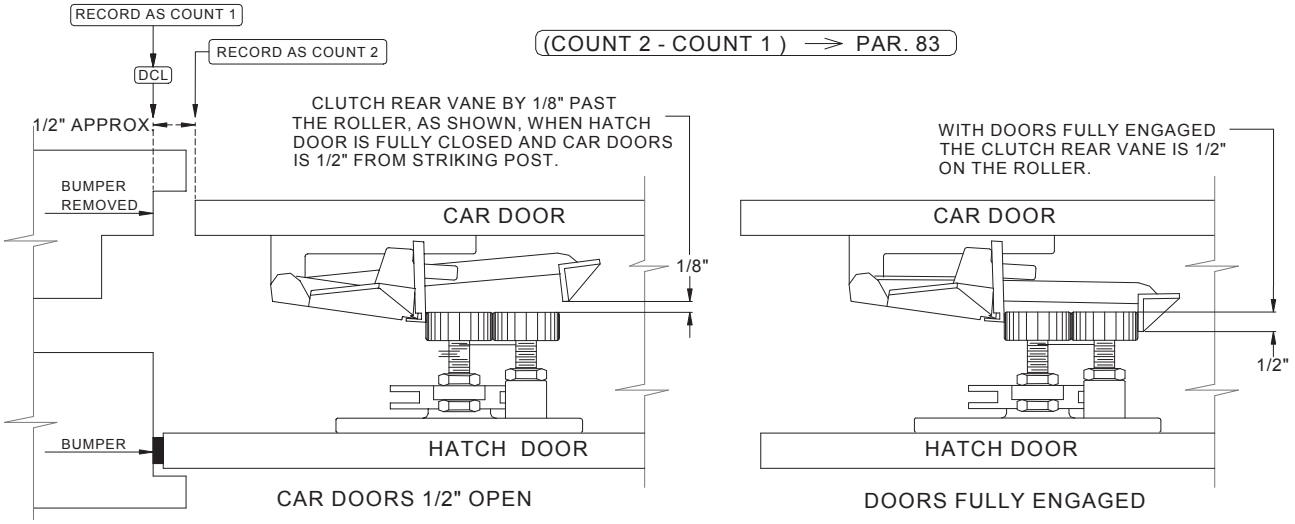
FAULTS RESET HANDLING FLOWCHART



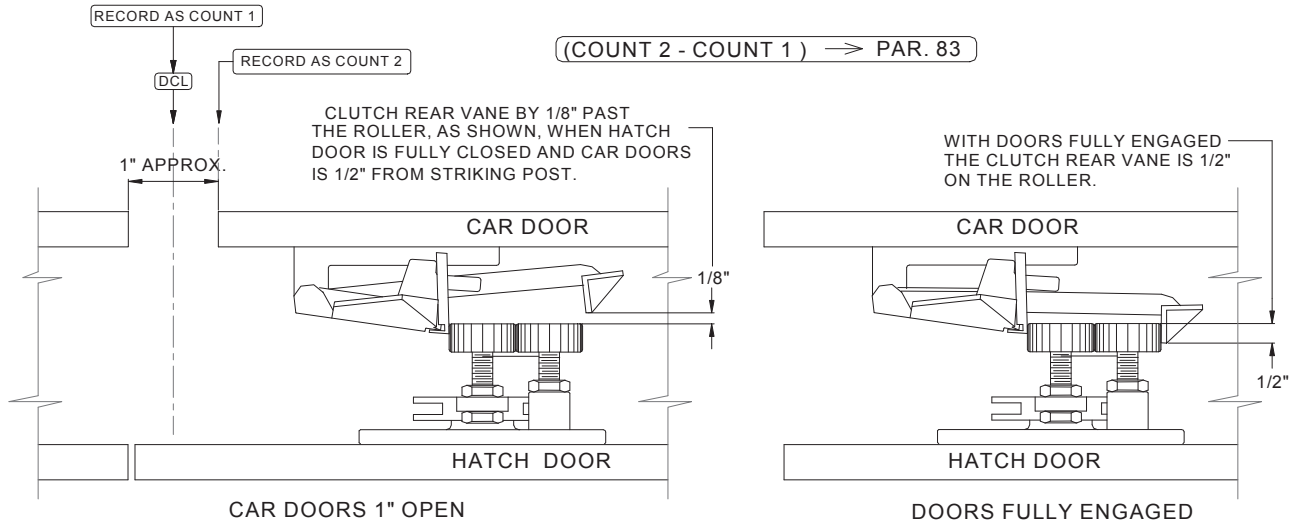
CLUTCH ENGAGED DISTANCE SETUP

To set the Clutch Engaged Distance (CED), flip the 1st switch to SETUP. Press the VOLT PULSE key. Physically move the door to the fully closed position. Record the count as Count1. Move the door in the Open direction until the mechanical clutch is fully engaged and the zone lock device is fully cleared. Record the count as Count2. Subtract Count1 from Count2. Set Par. 76 =1. Enter the difference, Count2 minus Count1, of the Count into Par. 83. Set Par. 76 = 0 so that Par. 83 can be displayed in percentage, instead of pulses. The clutch engaged distance setup will help smooth the open cycle and prevent fuses from blowing.

SIDE OPENING DOOR



CENTER PARTING DOOR

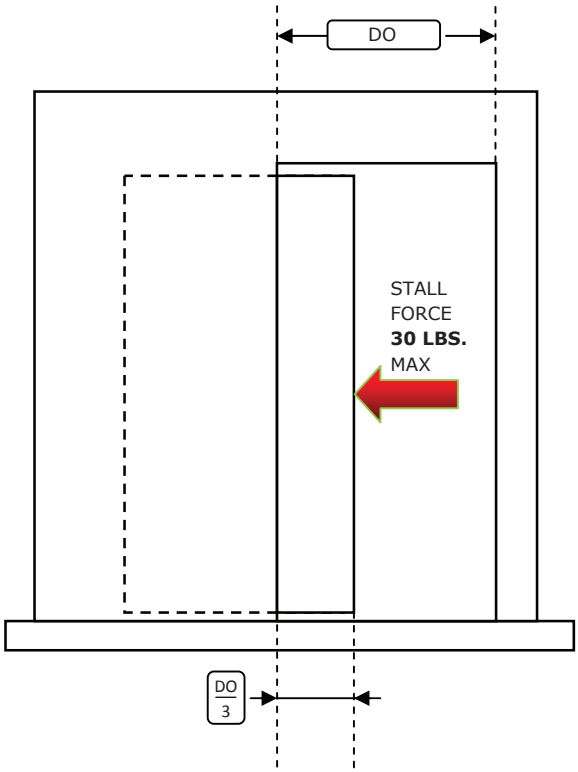


DOOR STALL FORCE MEASUREMENT

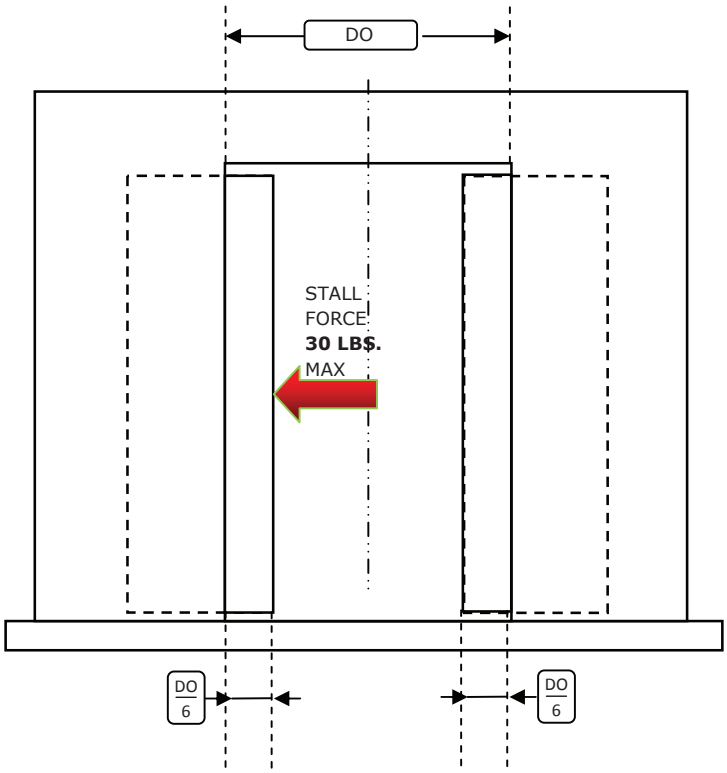
The most practical way to measure the approximate magnitude of the door stall force is to use a spring gauge as shown in the picture below. Stall force is the static force to prevent the door from further moving.

Stop the door anywhere from one-third to two-thirds of the door travel. Press the spring gauge against the door, remove the stop. Hold the spring gauge until the door stands still, and take the reading. The stall force must be smaller than **30** lbs to comply with ASME, A17.1, Rule 112.4/5, and CSA/B44, Rule 2.13.4/5.

SPRING GAUGE



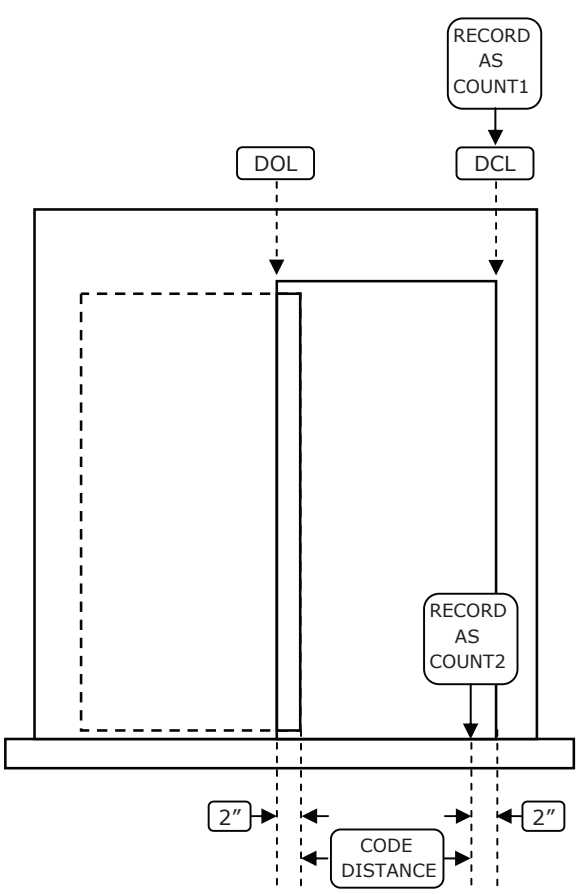
SIDE OPENING



CENTER PARTING

CODE DISTANCE CLOSING TIME SETUP (ACTUAL VALUE)

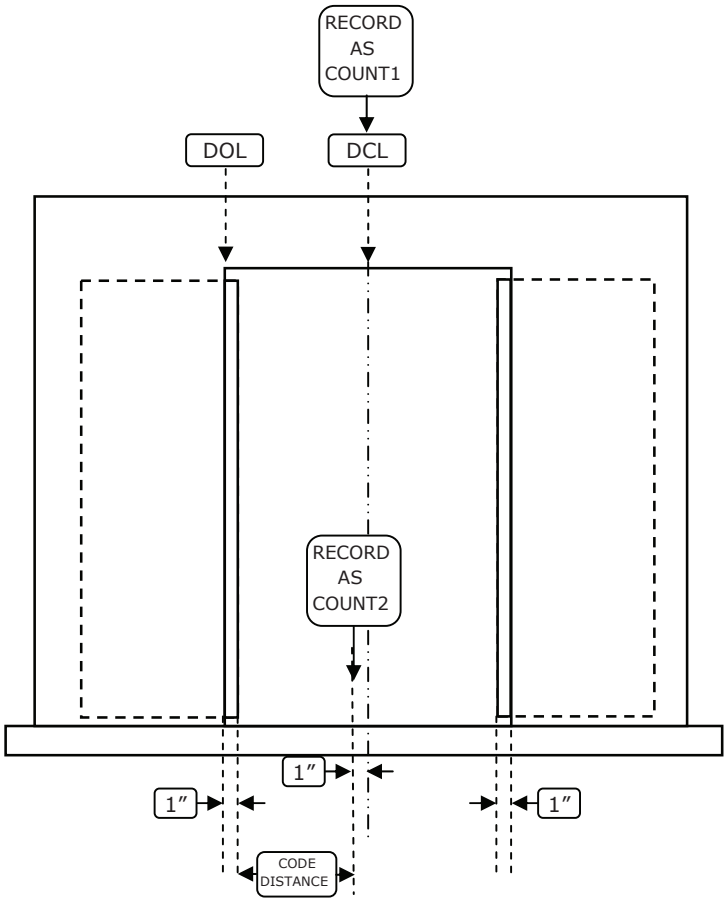
To measure the Code Distance Closing Time, flip the 1st switch to SETUP. Press the key VOLT PULSE. Physically move the door to the fully closed position. Record the count as Count1. Move the door in the Open direction, away from DCL, 1 inch for Center Parting doors, 2 inches for a Side Opening door. Record the count as Count2. Subtract Count1 from Count2. Enter the difference, Count2 minus Count1, of the Count into Par. 69. Do the same procedure and enter the difference of the count into Par. 70 for the Narrower door, if used. The display of the Code Distance Closing Time is in the sub-item #10 under the VIEW key as described in the Parameter Unit section of this manual.



FOR NORMAL/HEAVY DOOR
(COUNT2 –COUNT1**)** ➔ PAR. 69

FOR NARROW DOOR
(COUNT2 –COUNT1**)** ➔ PAR. 70

SIDE OPENING



FOR NORMAL/HEAVY DOOR
(COUNT2 –COUNT1**)** ➔ PAR. 69

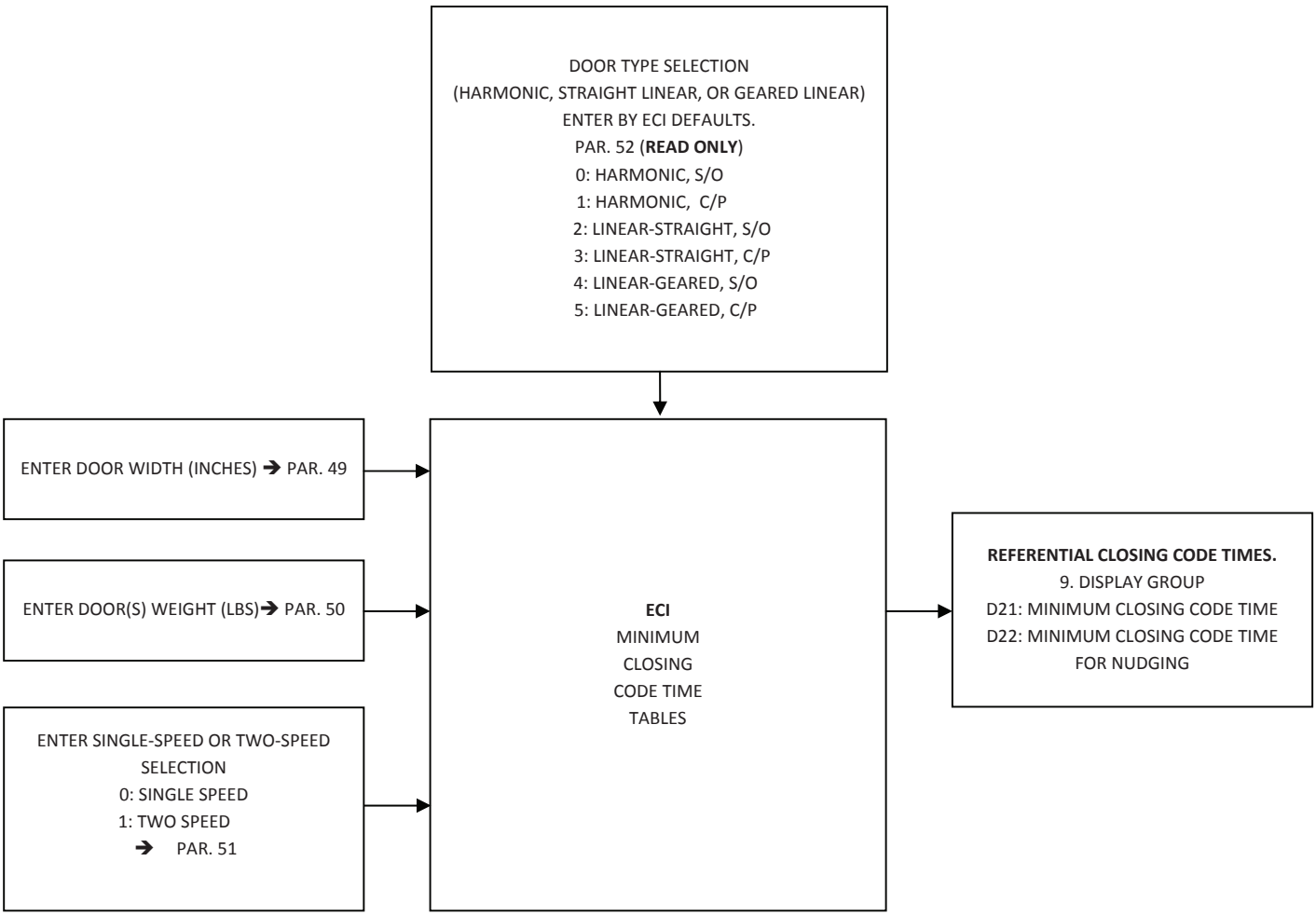
FOR NARROW DOOR
(COUNT2 –COUNT1**)** ➔ PAR. 70

CENTER PARTING

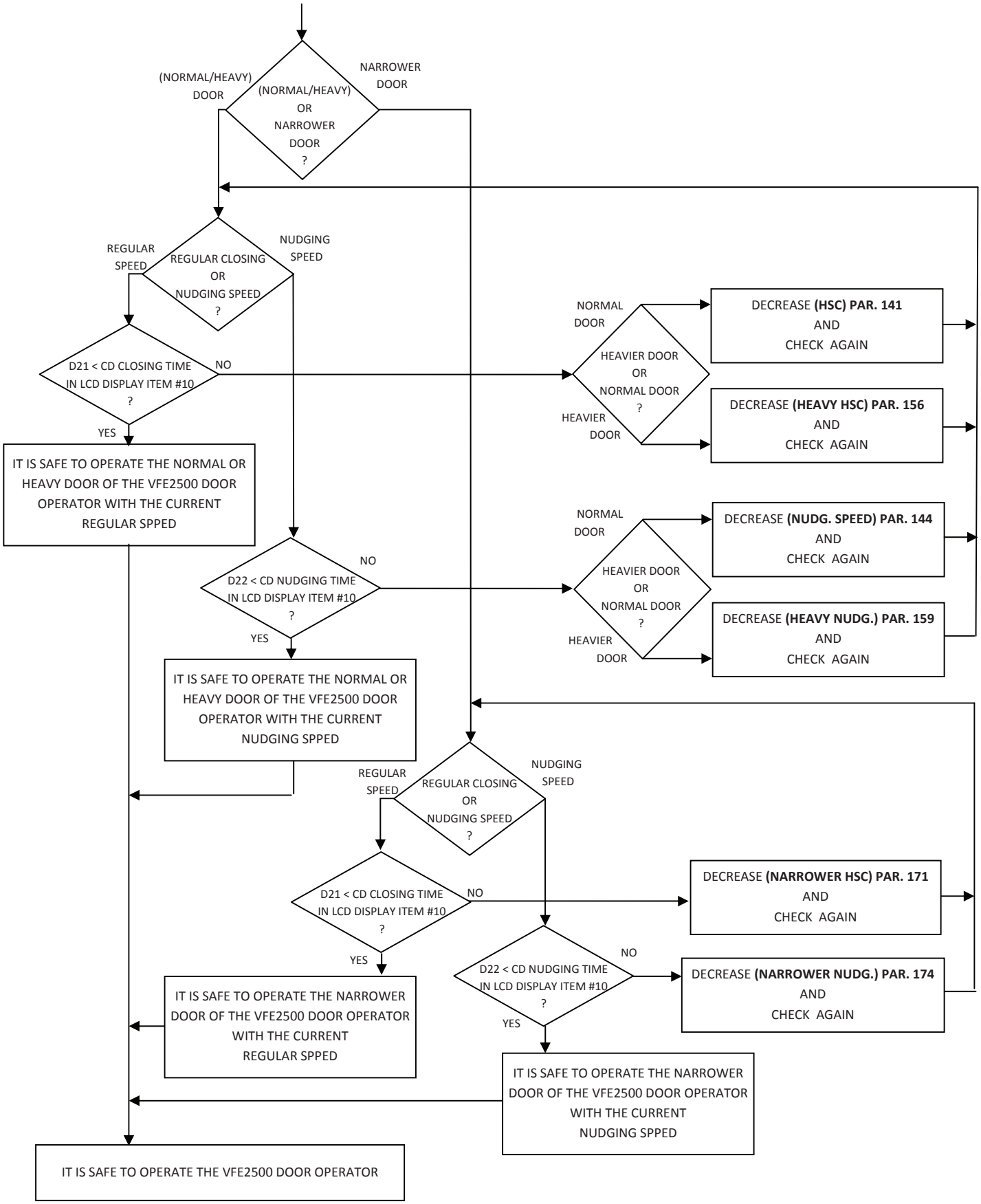
NOTES:

MINIMUM CLOSING CODE TIME (ECI REFERENTIAL VALUE)

Minimum closing code times are obtainable from the LCD keypad by entering the followings:



CHECKING PROCEDURE FOR THE CLOSING CODE TIMES.



INTERFACING BETWEEN ECI CERTIFIED INFRARED LIGHT CURTAIN AND VFE2500 (OPTIONAL)

Understanding the RE-OPEN relay:

The RE-OPEN relay can be activated by any of the following detections:

1st. Over Torque - Controlled by Par. 148

2nd. Over Speed - Controlled by Par. 136

3rd. Obstruction of the Infrared Detector Edges - Controlled by Par. 202, SW8 and Enable Chip U5.

Over Torque and Over Speed Detections are the standard features of the VFE2500. Therefore, ECI recommends that customers connect the Infrared Detector Edges directly to the VFE2500, instead of connecting the Infrared Detector Edges to their own power supplies. By doing this, customers eliminate an extra power supply, resulting in less mounting, less wiring, fewer components to fail, and most importantly in case of the Edges failure, the Over Torque detection will reopen the door as a safety redundancy.

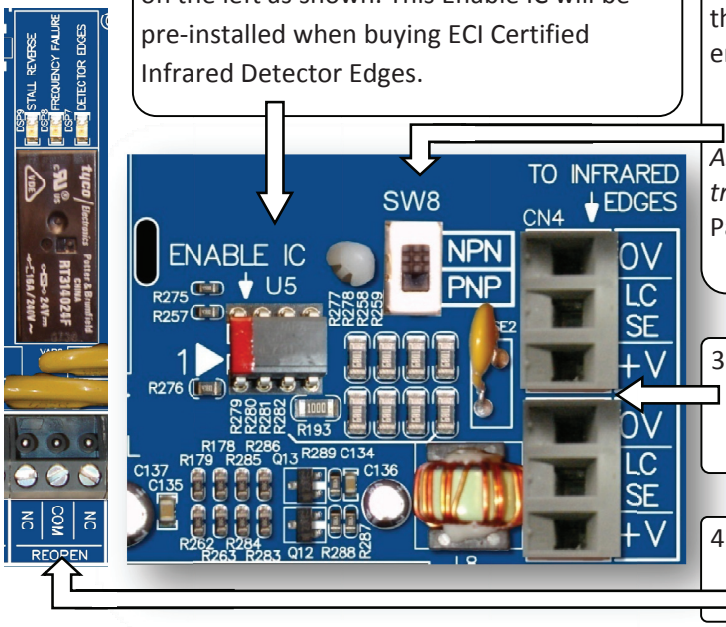
ECI Certified Infrared Detector Edges will always come with the matching connectors CN4 & CN5 to fit the VFE2500, and work with the 24VDC power supply. To ensure a seamless interface, customers need to order the Infrared Detector Edges via ECI. Different infrared detector edges may also be connected to the VFE2500. However, users have to order the enable chip, matching connectors CN5 & CN5, and check with ECI for the availability of the related instructions.

How to interface between the Infrared Detector Edges and VFE2500:

1. Insert the Enable Chip into the Socket U5. The RED mark must be positioned in the Pin 1 on the left as shown. This Enable IC will be pre-installed when buying ECI Certified Infrared Detector Edges.

2. Read the label on the packaging or the manual of the detector edges to find out the output type. It is either NPN or PNP. Set the selector switch SW8 accordingly. If the info of NPN or PNP is unavailable, then use a trial and error method.

Assume that the output of the edges is NPN for the 1st trial. Set Par. 202 =1 for NPN, Set Par. 202 = 2 for PNP. Set Par. 202 = 0 to disable or not used.



3. Connect the *ECI Certified Infrared Detector Edges* to connectors CN4 **and/or** CN5. ***Note!*** *Connectors CN4 and CN5 are interchangeable.*

4. Make sure the RE-OPEN circuit is connected to the RE-OPEN contacts.

Test the Infrared Detector Edges:

- Obstruct the Infrared Detector Edges. The DETECTOR EDGES LED should be **ON**.
- The RE-OPEN relay should be **activated** to send the RE-OPEN signal to the elevator controller.
- The elevator controller will send the Door Open command signal back to the VFE- 2500 to OPEN the door. The LED of the Open Input module should be **ON**.

If the Infrared Detector Edges function does not work:

- Check the table below for correct connections between edges and the VFE2500.

ECI CERTIFIED INFRARED DETECTOR EDGES WIRE COLORS								
ECI P/N	MFG.	TX (CN5)			RX (CN4)			CONNECTION BETWEEN TX & RX
		V+	LCSE	0V	V+	LCSE	0V	
906-3013	JANUS	RED	BLUE	ORG (◆)			ORG (◆)	WHT - WHT
906-3020	TRITRONICS	RED	WHT	ORG				NONE
906-3030	FORMULA SYSTEMS	BLU 1	BRN 1	GRN YEL	BLU 1	BRN 1	GRN YEL	NONE
906-3030	FORMULA SYSTEMS SECOND VERSION	BROWN	GREEN YELLOW	BLUE	BROWN	GREEN YELLOW	BLUE	NONE

(◆) : Connect an additional wire from 0V to a true EARTH GROUND.

- Check for 24VDC between 0V and +V on either CN4 & CN5.
- Test the Infrared Detector Edges again

If it still does not work. Then,

- Jump 0V to LCSE on either CN4 or CN5 connector for NPN type.
- Jump +V to LCSE on either CN4 or CN5 connector for PNP type
- The DETECTOR EDGES LED should be **ON**.
- The RE-OPEN Relay should be **activated.**

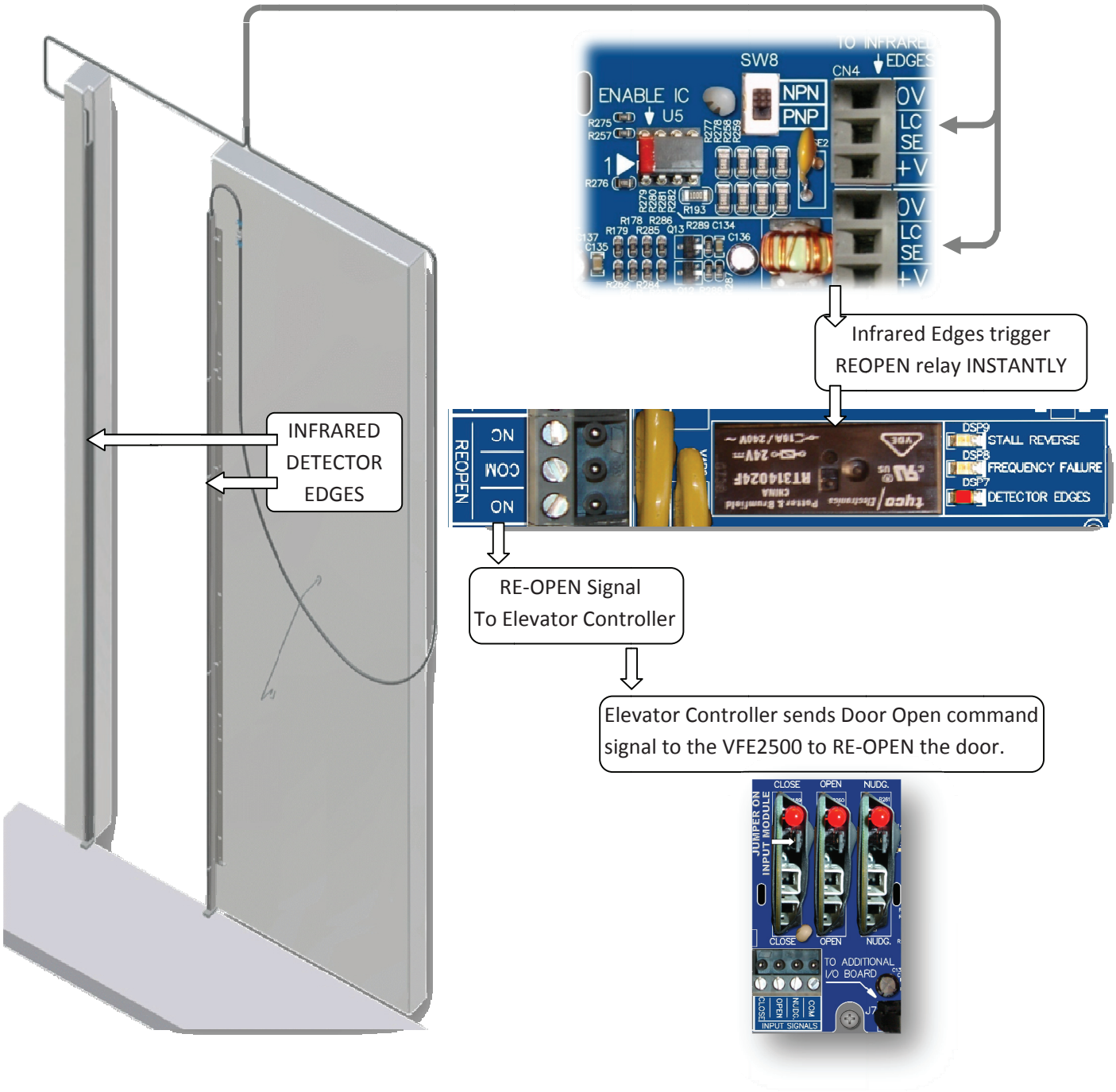
If the above tests work as described, turning ON the detector edges LED, then the problem is in the Infrared Detector Edges. Otherwise, the problem is in the VFE2500.

If the Infrared Detector Edges have intermittent problems:

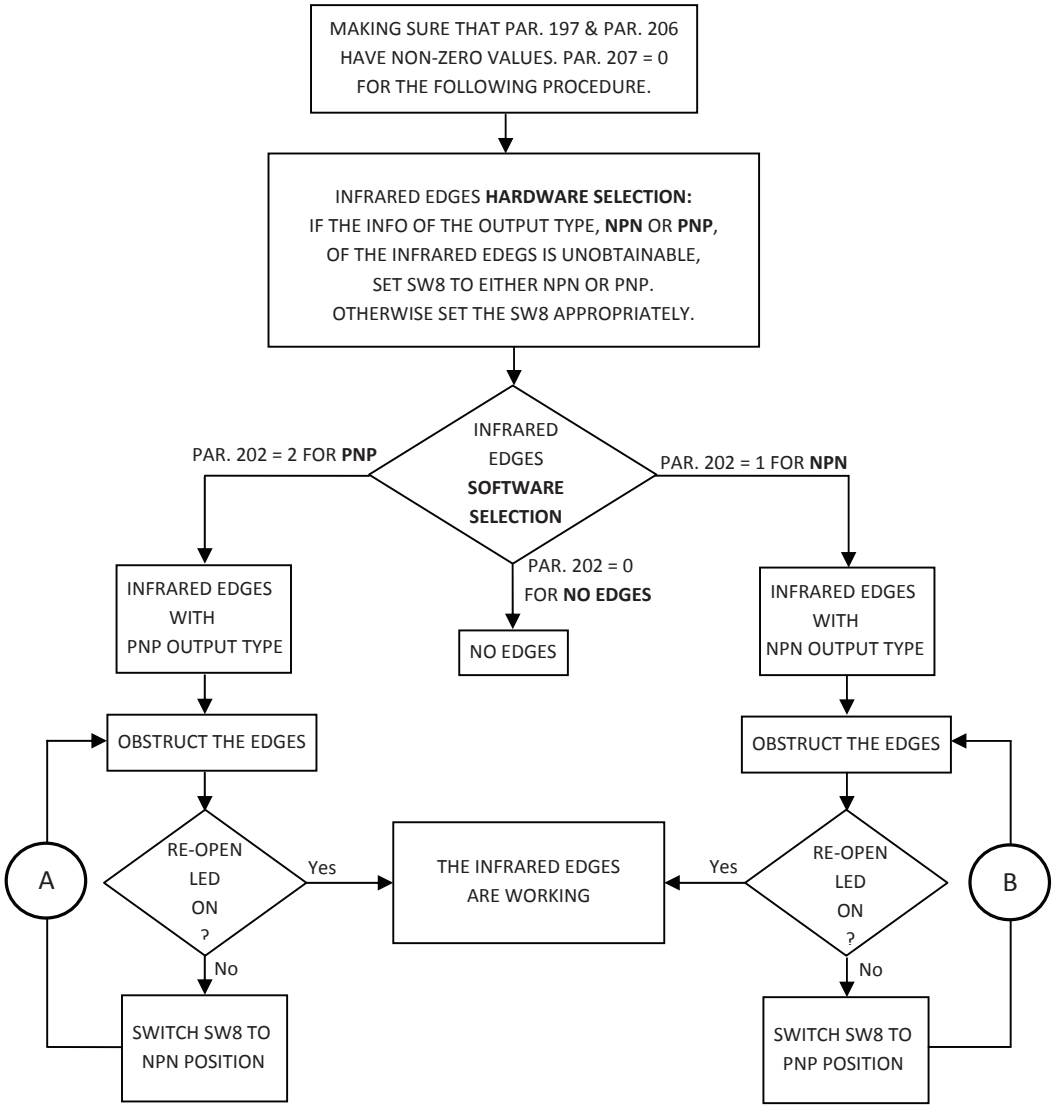
- Check continuity of the TX and RX cables of the detector edges.
- If the cables are good, but the problem still exists, then check the **Earth Ground** connection to the edges.
- Lower the Carrier Frequency in Par. 1 gradually until problems are resolved.

Note! *The lower carrier frequency will create more audible noise from the motor.*

Infrared Detector Edges connection



INFRARED DETECTOR EDGES APPLICATION FLOWCHART



NOTE! IF LOOP A OR B IS REPEATED THREE TIMES BUT THE RE-OPEN LED IS NOT TURNED ON WHEN THE EDGES ARE OBSTRUCTED.
THEN PROBLEM COULD BE EITHER THE DETECTOR EDGES OR THE DRIVE.

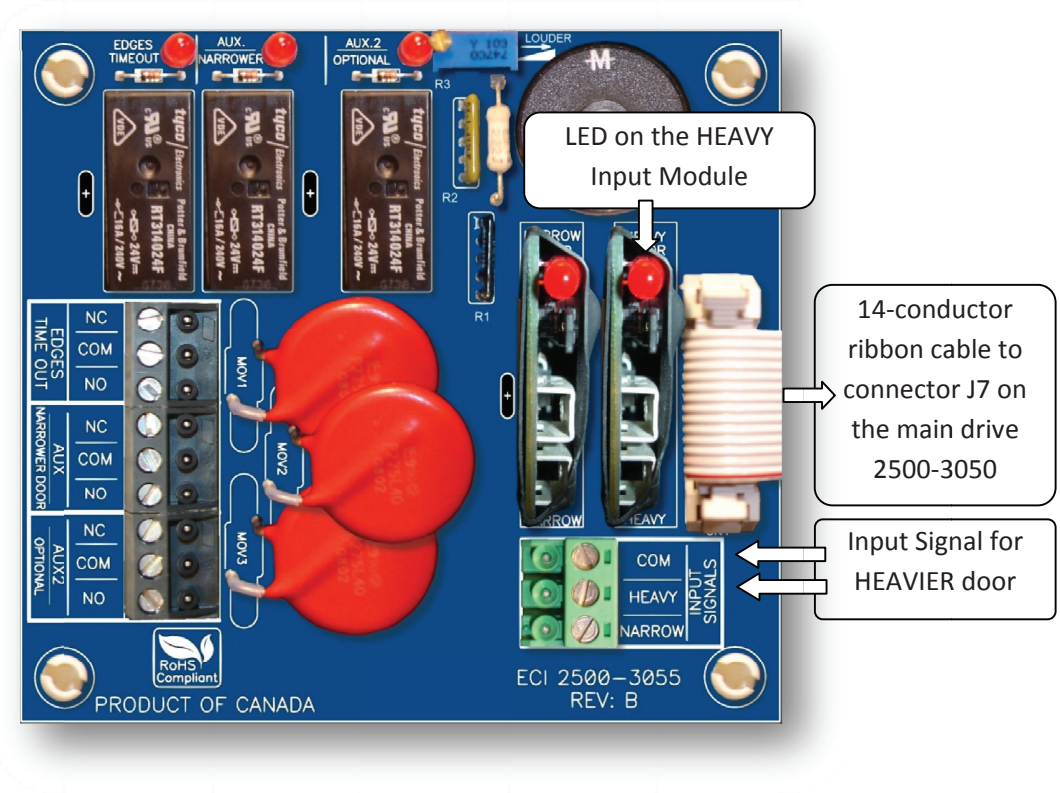
HEAVY DOOR APPLICATION (OPTIONAL)

In the same elevator, the door operator may operate two different hoist-way doors with one door heavier than the other. As a result, the settings of Torque and Speed of one door may not be applicable for the other. More importantly, it may be a code violation issue due to the constraint of Kinetic energy and the Torque allowance.

The HEAVY input of the VFE-2500 will resolve this issue. When the HEAVY input is activated, the VFE2500 will operate with a different set of parameters for the heavier door.

In order to gain the access to the HEAVY set of parameters, users need to order an Additional I/O board, 2500-3055. The HEAVY input is a *universal input* module which accepts the control signal either in the form of contacts or signal voltages; from 24 - 230V AC or DC. The jumper of the input card must be removed if the input signal voltage is 60V or less. The LED of the input module draws current from the elevator controller, not from the VFE2500. Therefore, the LED will light up to indicate that the elevator controller has sent the HEAVY command.

See the parameters list for more details.
For the heavier door, the related parameters are: Par. 92-105, and Par. 152-163.



NARROWER DOOR APPLICATION (OPTIONAL)

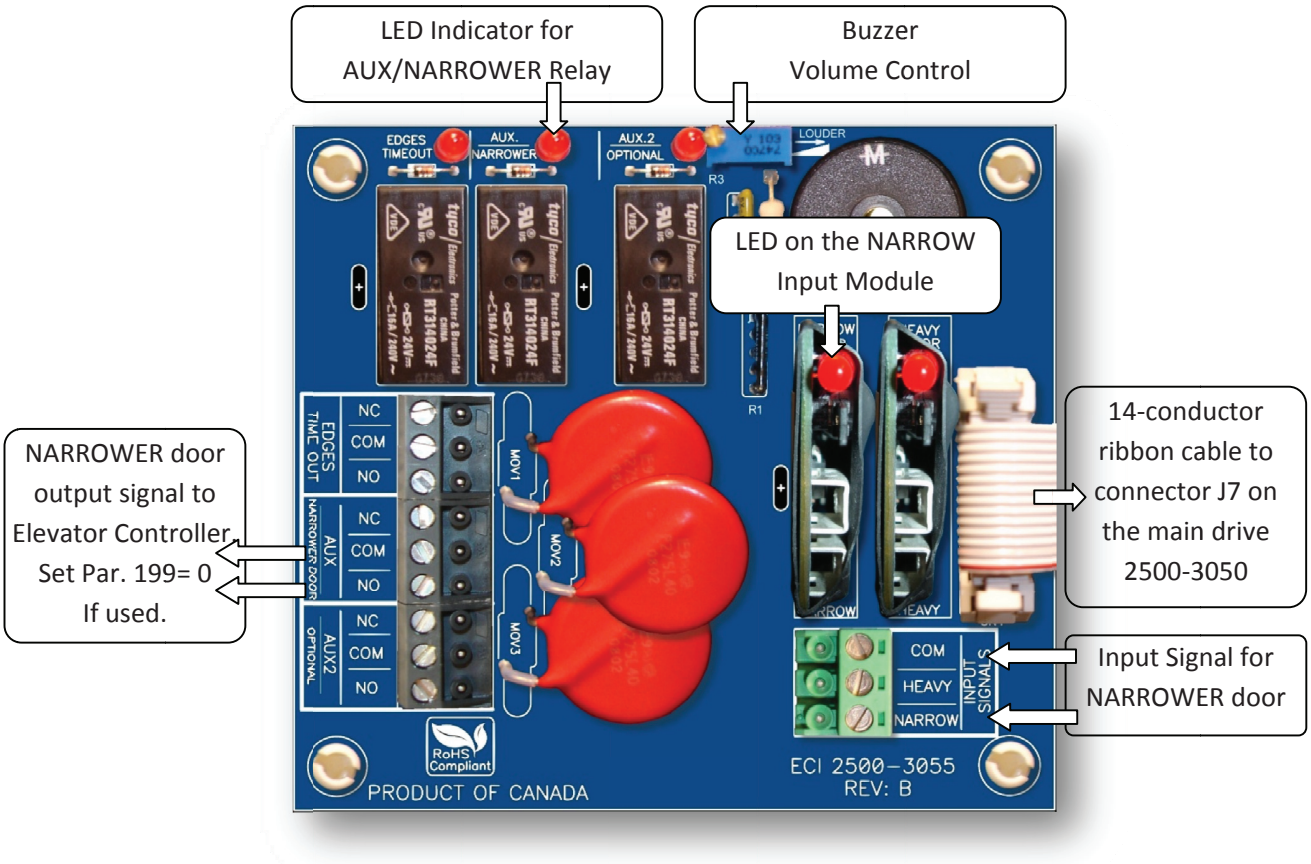
In the same elevator, the door operator may operate two different hoist-way doors with one door narrower than the other. As a result, the settings of Torque, Speed, and the Mechanical Door Open Limit (DOL) of one door may not be applicable for the other. More importantly, it may be a code violation issue due to the constraint of Kinetic energy and the Torque allowance.

The NARROW input of the VFE-2500 will resolve this issue. When the NARROW input is activated, the VFE-2500 will operate with a different set of parameters for the narrower door.

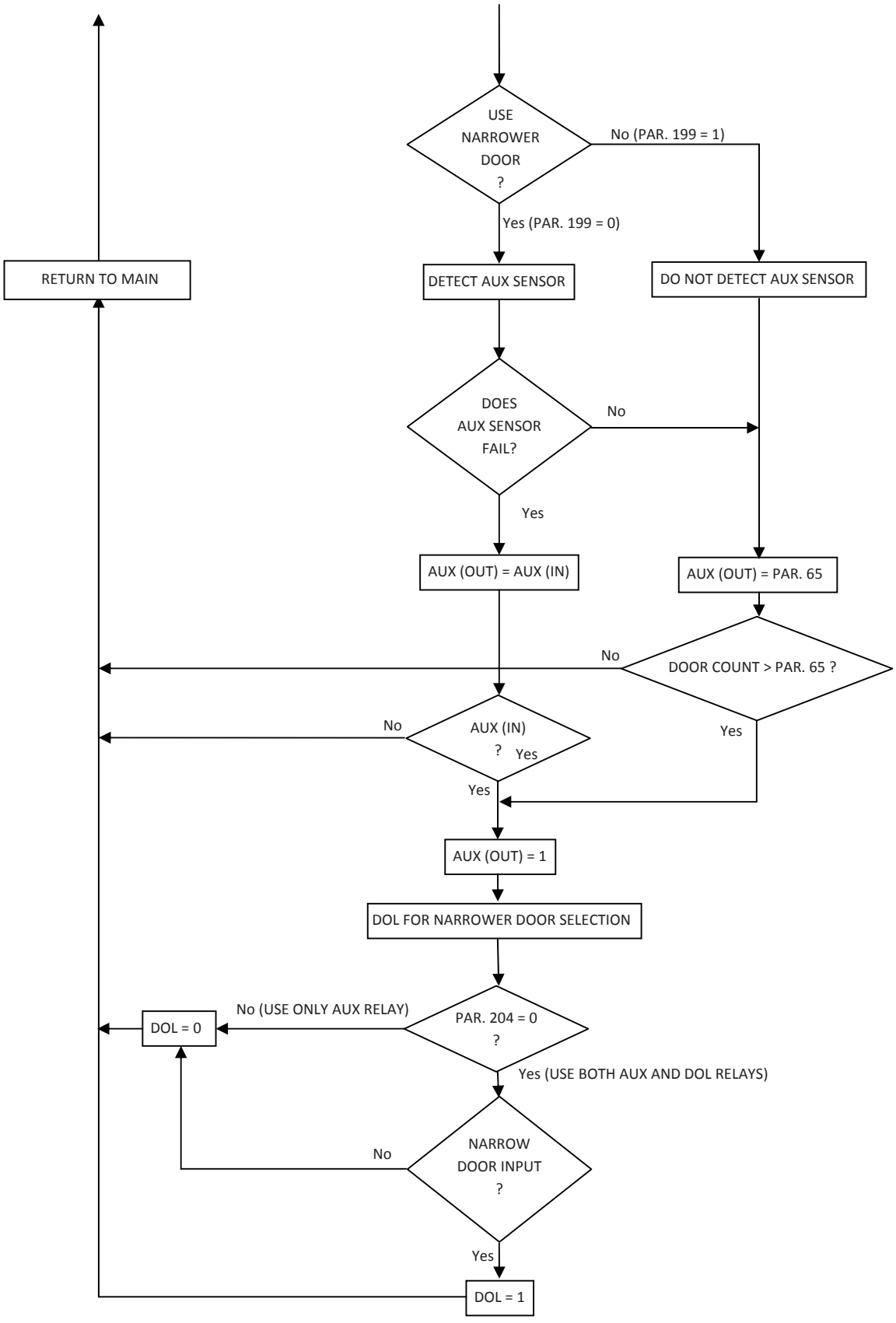
In order to gain the access to the NARROW set of parameters, users need to order an Additional I/O board, 2500-3055. The NARROW input is a *universal input* module which accepts the control signal either in the form of contacts or signal voltages; from 24 - 230V AC or DC. The jumper of the input card must be removed if the input signal voltage is 60V or less. The LED of the input module draws current from the elevator controller, not from the VFE-2500. Therefore, this LED of the NARROW input module will light up to indicate that the elevator controller has sent the NARROW command.

The NARROW door function can only be used when Par. 199 = 0, and the AUX/NARROWER sensor is set properly at the DOL position of the narrower door. After the completion of the door width learning of the regular door, the firmware will also memorize the position of the AUX/NARROWER sensor, which is the DOL of the narrower door. The actual output of the DOL for the narrower door can be either the AUX or regular DOL relay contacts (Par. 204 = 1), or only the regular DOL relay contacts (Par. 204 = 0).

See the parameters list for more details.
For the narrower door, the related parameters are: Par. 106-117, Par. 167-178, and Par. 199.



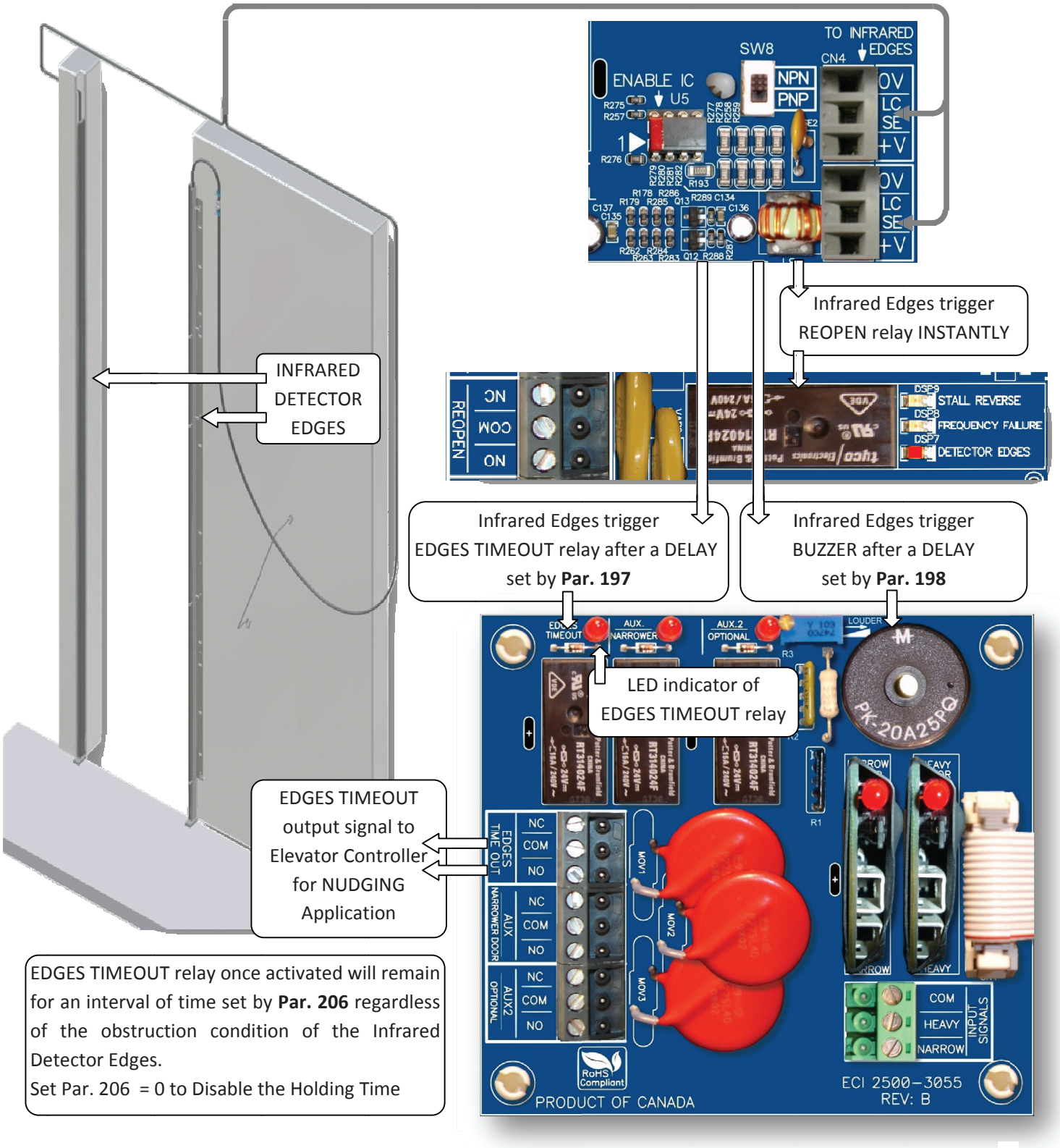
NARROWER DOOR APPLICATION FLOWCHART (OPTIONAL)



NUDGING APPLICATION (OPTIONAL)

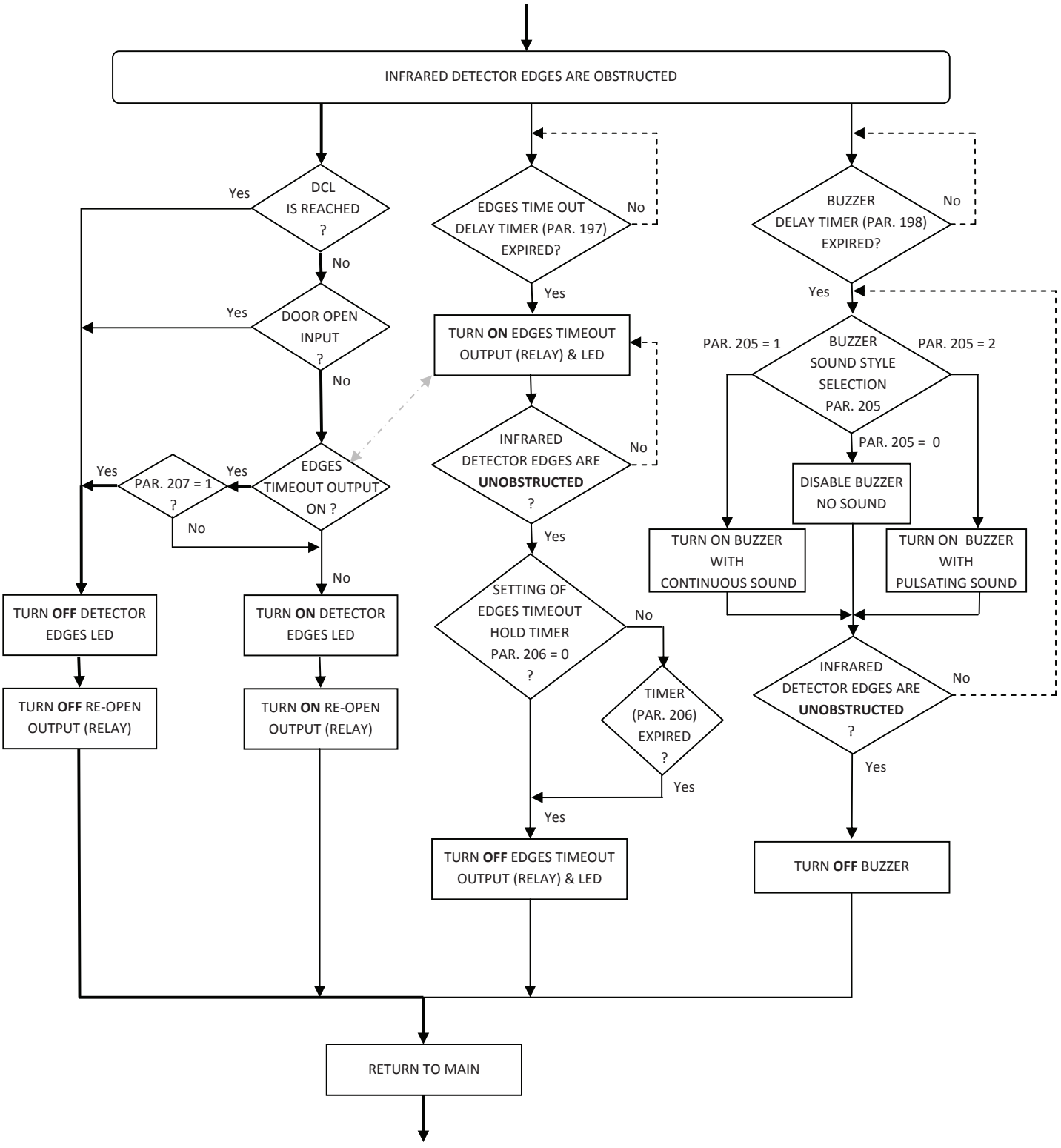
For the NUDGING application, users need to order an Additional board, 2500-3055. The obstruction of the Infrared Detector Edges will trigger the EDGES TIME OUT relay after a DELAY set by Par. 197, and the BUZZER after a DELAY set by Par. 198. The illustration below shows the mechanism of the EDGES TIME OUT relay and the BUZZER.

NOTE: NUDGING feature is subject to the Fire Service Codes.



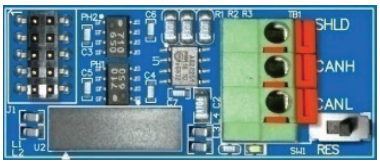
NUDGING APPLICATION FLOWCHART

Note! Nudging application is subject to the Fire Service Codes, if applicable.

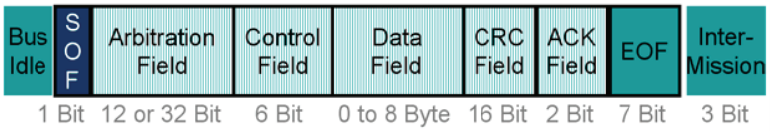


SERIAL COMMUNICATION

CAN Bus is currently used to communicate between the elevator controller and the VFE2500.



To setup CAN bus communication,
Flip the 1st switch to SETUP. Set Par.15 = 6301 (password).
Set Par. 11 = 5 to use the CAN bus. Otherwise, set Par. 11 = 1.
Set Par. 246 = 7 for Front Door. Set Par. 246 = 8 for Rear Door.
Return to Automatic Operation by flipping the AUTO/MAN switch To AUTO. The Baudrate, max. 1Mbit, for CAN bus can be set by Par. 247. The default value for Par. 247 is 115.2kbps.
Set Par. 15 = 0
Following is the CAN frame:



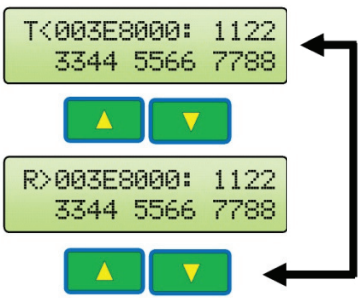
The mapping below shows CAN frame on the Keypad LCD display where, "I" represents for Arbitration Field and "D" represents for Data Field. The DLC , Data Length Code, is decided by the Control Field.

R	»	I_{31-28}	I_{27-24}	I_{23-20}	I_{19-16}	I_{15-12}	I_{11-8}	I_{7-4}	I_{3-0}	:		D_{1H}	D_{1L}	D_{2H}	D_{2L}
		D_{3H}	D_{3L}	D_{4H}	D_{4L}		D_{5H}	D_{5L}	D_{6H}	D_{6L}		D_{7H}	D_{7L}	D_{8H}	D_{8L}

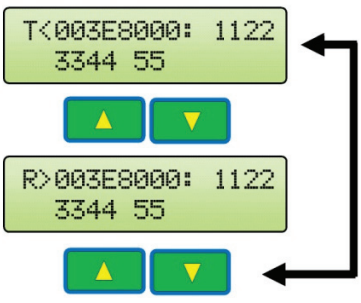
T	«	I_{31-28}	I_{27-24}	I_{23-20}	I_{19-16}	I_{15-12}	I_{11-8}	I_{7-4}	I_{3-0}	:		D_{1H}	D_{1L}	D_{2H}	D_{2L}
		D_{3H}	D_{3L}	D_{4H}	D_{4L}		D_{5H}	D_{5L}	D_{6H}	D_{6L}		D_{7H}	D_{7L}	D_{8H}	D_{8L}

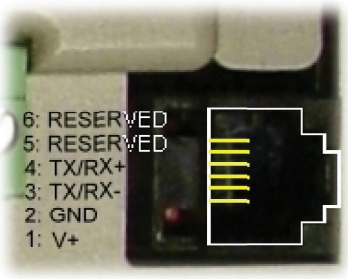
Examples:

DLC = 8



DLC=5





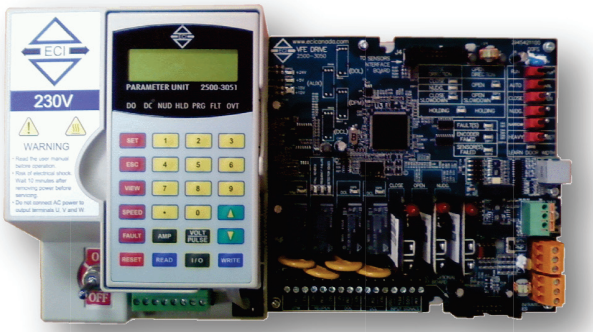
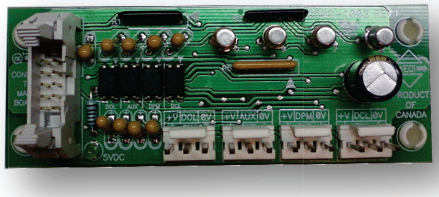
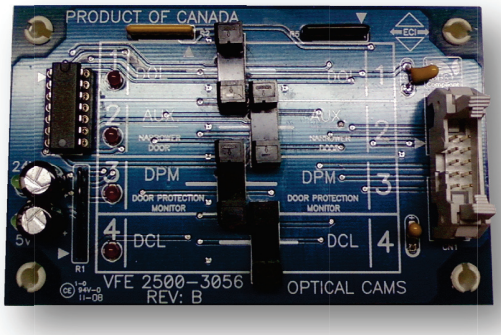
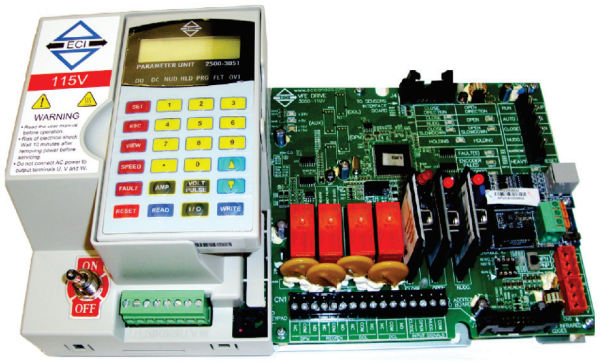
The RJ-11 jack for the parameter unit can also be used for RS-485 serial interfacing. Modbus protocol is currently available for this port.

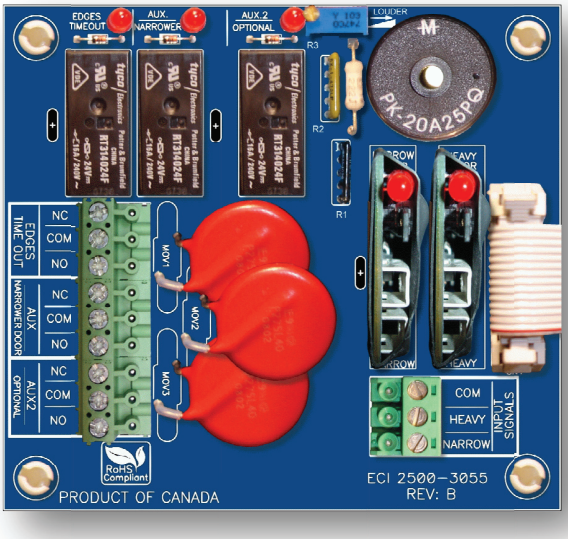
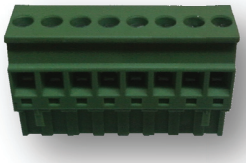
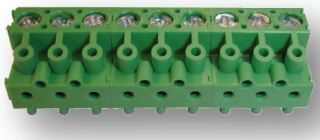
Other communication protocols are available upon request. An agreement between ECI and the requesting party must be made prior to the implementation of communication. Contact ECI for more details on CAN and other protocols.

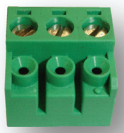
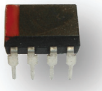
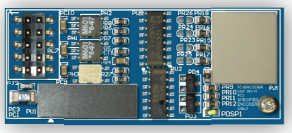
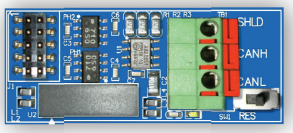
PARTS LIST

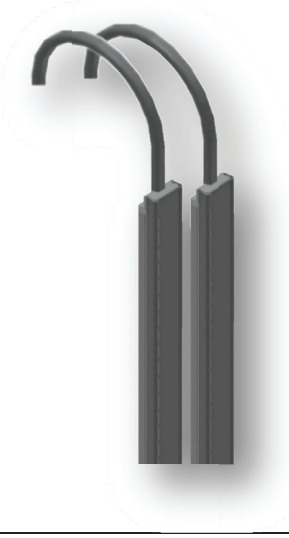
The following parts can be purchased from ECI.

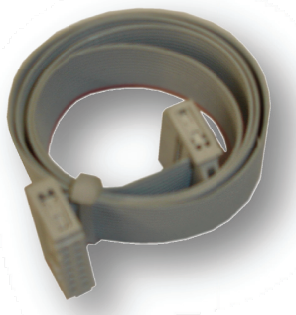
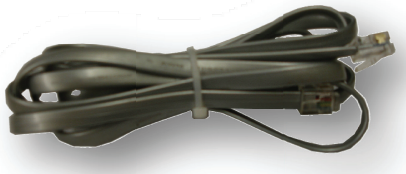
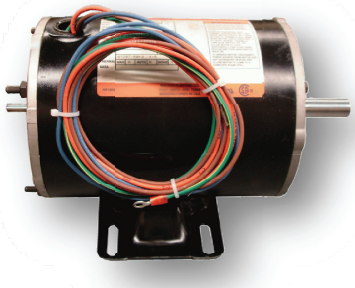
Note: ECI reserves the right to replace any items in this list at any time without notice.

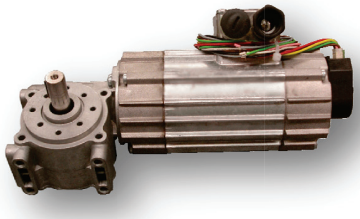
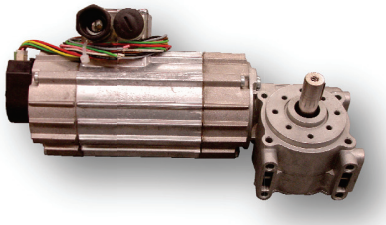
Description	Picture	ECI Part No.	Remarks
PCB, VFE2500 close-looped drive - 230VAC		2500-3050	
PCB, Signal transfer board for linear model		2500-1002	
PCB, Optical cam board		2500-3056	
PCB, VFE2500 close-looped drive - 115VAC		2500-3050-1	

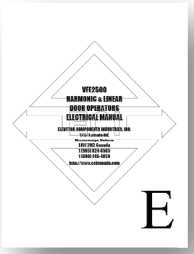
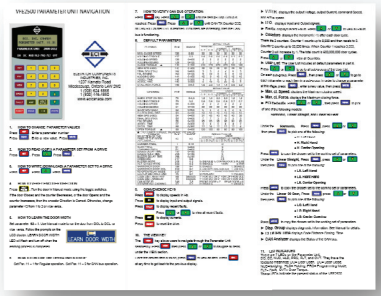
PCB, Additional I/O board		2500-3055	
Connector, Power connector (Green color)		2500-3082	
Connector, 16-position inputs and outputs connector		2500-3081	CN1
Connector, 3-position infrared detector edges connector		895-7013	CN4 , CN5
Connector, 3-position connector for the hall-effect sensor PCB		2500-5004	
Connector, 9-position connector for output signals of the additional I/O PCB		2500-3078	

Connector, 3-pos connector for heavy and narrow door input		2500-3077	
IC, Enable IC		2500-3076	U5
Relay, 24VDC coil voltage, 10Amp, 250VAC relay		2500-2011	
Module, Galvanic isolation encoder module		2500-1003	
Module, Galvanic Isolation can bus module		2500-1005	
Module, Universal input module		2500-3061	
Encoder for ½ HP AC motor		2500-2020	

Edges, Janus infrared detector edges		906-3013	
Edges, Tritronics infrared detector edges		906-3020	
Edges, Formula Systems infrared detector edges		906-3030	

Cable, 14-pin ribbon cable for the additional I/O board		2500-3073-1	
Cable, 10-pin ribbon cable for the signal transfer board		2500-3073-1	
Cable, 7 ft Cable for Parameter Unit		2500-2026	
Cable, 7 ½ in Cable for Parameter Unit		2500-2026-1	
Fuse, 4-Amp Slow Blow fuse		2500-3070	
Motor, 3-Phase 230VAC 1/3HP Induction Motor		2500-2014	

Motor, 91W 3-phase 230VAC Geared Motor – Left hand		2500-2016-L	
Motor, 91W 3-phase 230VAC Geared Motor – Right hand		2500-2016-R	
Transformer, 500VA 110/220		2500-2017	
Cam, Plastic Cam		2500-1010	
Parameter Unit		2500-3051	
Stall Force Gauge, Spring gauge for stall force measurement		2500-3068	

Manual, Hard copy of the VFE2500 electrical manual		2500-3069	
Quick setup brochure		2500-3066	
Bracket, Hall-effect sensor		2500-5019	

Cover, Plastic cover for the VFE2500 drive		2500-3052	

Cover, Plastic cover for the VFE2500 drive		2500-3052-1	

NOTES:

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