MONXT-OMNI Door Operator

INSTALLATION MANUAL

DOC-0167N

REV B

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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 also the intent of this manual to give comprehensive installation procedures for the MONXT-OMNI Operator and not the installation of door headers, tracks, hangers, etc.

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

When properly installed, G.A.L. door operators will give many years of trouble-free service.

COMMENTS

All G.A.L. 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

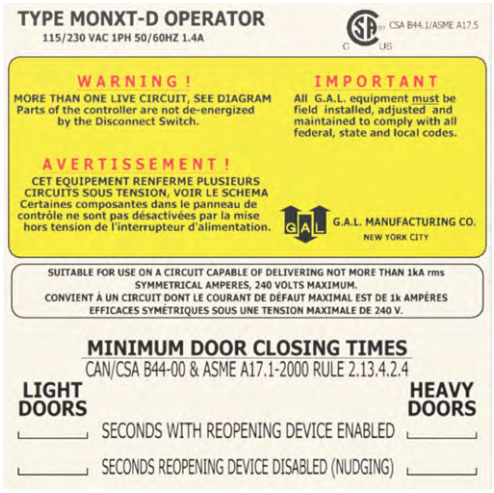
All equipment must be installed, adjusted, tested, and maintained to comply with all Federal, State/Provincial, and Local codes.

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.

Turning on the operator, check that the car door is plumb, free and moves easily without binding. Check the attached standard measurement sheets and install the operator according to the measurements supplied.

Because the MONXT-OMNI is designed to fit most door openings, an oversized drive belt is provided. Portable snips or other cutting tools are required to cut the steel core drive belt to the proper size.

Contact G.A.L. if the following label is missing from the door operator.



SAMPLE Door operator label

CONTENTS

CONTENTS *continued*

1. INSTALLATION

1.1 INTRODUCTION TO THE MONXT-OMNI LINEAR DOOR OPERATOR

When delivered, the **MONXT-OMNI** linear door operator is adjustable to most door openings. The door operator includes a 340-Watt (1/2-hp) pancake motor and drive. Per Figure 1, the kit includes a motor tensioner/idler, drive enclosure, telescopic channel, and adjustable belt. The **MONXT-OMNI** is designed for use with existing car door hanger assemblies.

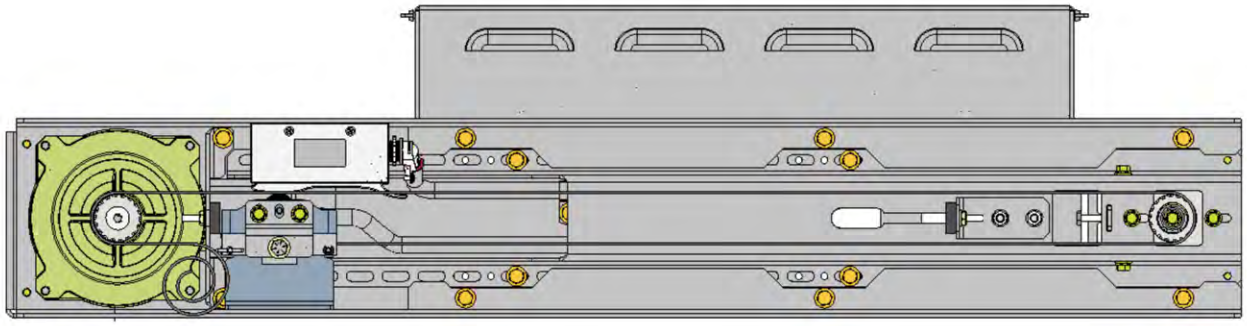


Figure 1: The MONXT-OMNI Linear Door Operator, Left Hand

1.2 BOLTS & TORQUE

During installation of the MONXT please use the torque specifications listed below. Some connections require special fastening conditions. Table 1 displays the general torque specifications.

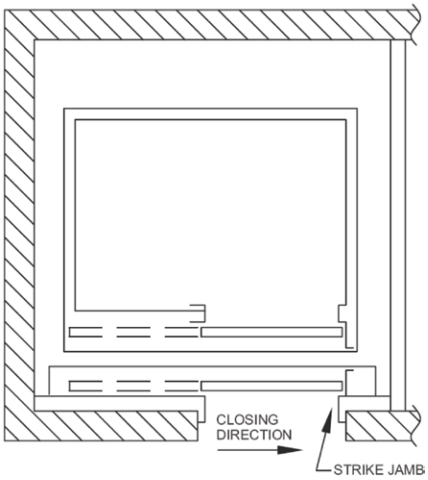
Table 1: General Torque Requirements

GENERAL TORQUE SPECIFICATIONS FOR SCREWS & BOLTS	
Bolt/Screw Type	Recommended Torque (ft-lbs)
#6	0.75
#8	1.53
#10	1.75
1/4-20 UNC	7
5/16-18 UNC	13
3/8-16 UNC	23
1/2-13 UNC	41

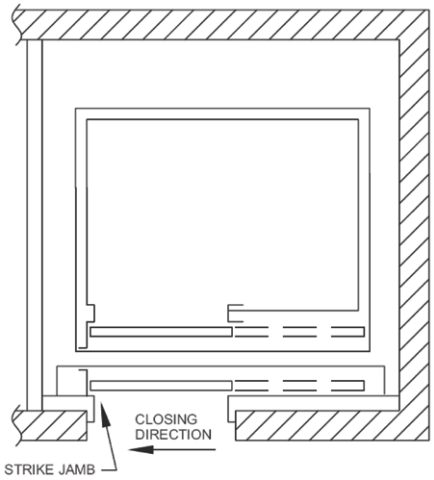
All bolt calculations use a torque coefficient between bolt and receptacle. It is a function of the materials' frictional characteristics, which are based on surface finish, coatings and so on. All bolt torques listed here were calculated with a K-Factor of 0.20 which is a typical dry steel bolt connection. No lubricants should be used on any bolt connection unless otherwise specified.

1.3 DETERMINING THE HAND OF THE DOOR

To determine the hand of the door, stand in the lobby facing the elevator door(s). If the door closes to the Left, it is a Left-hand door. If the door closes to the Right, it is a Right-hand door. The figures below illustrate the door hand.



Right Hand Door



Left Hand Door

1.4 SETTING UP THE MONXT-OMNI FOR THE CORRECT DOOR HAND

The MONXT-OMNI is designed to be able to drive a Left Hand or Right-Hand door using a single unit. It's shipped non-handed from the factory and must be set up for the correct hand in field. The hand is determined by which side the motor is on when installing the drive box and gate switch. A left-hand door opening will have the motor on the left-hand side and vice versa for the right hand. Most of the images in this manual are for a left-hand installation. A right-hand installation is symmetrically opposite.

Remove the main assembly of the MONXT-OMNI from the box and orient it to the correct door hand.

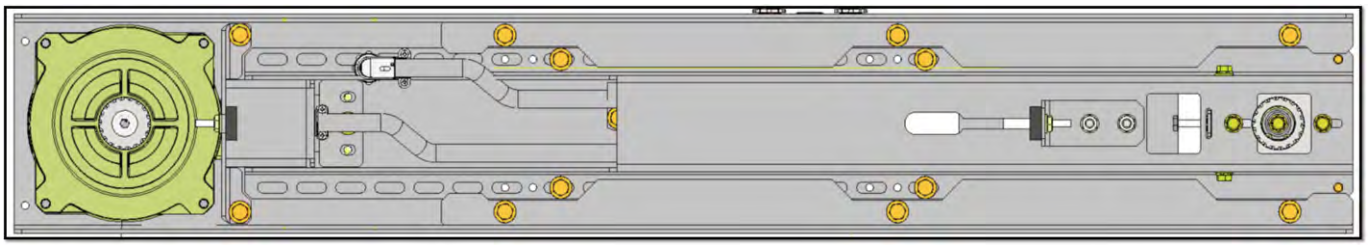


Figure 2: MONXT-OMNI Arranged for a LEFT HAND DOOR

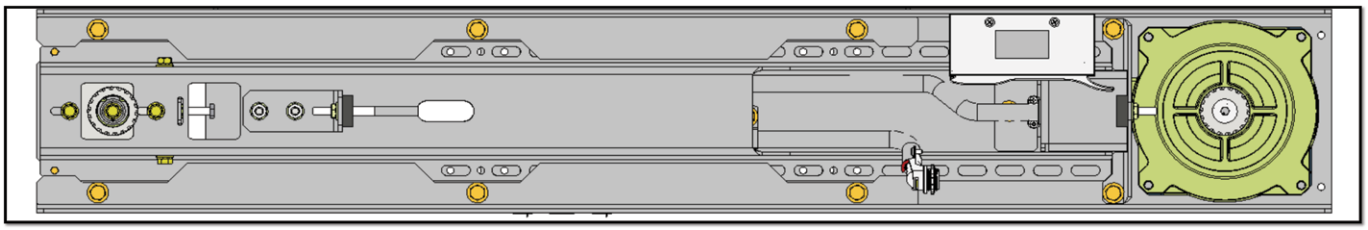


Figure 3: MONXT-OMNI Arranged for a RIGHT HAND DOOR

Remove the lid from the drive box and secure it to the top of the main channel using (4) 8-32 screws.

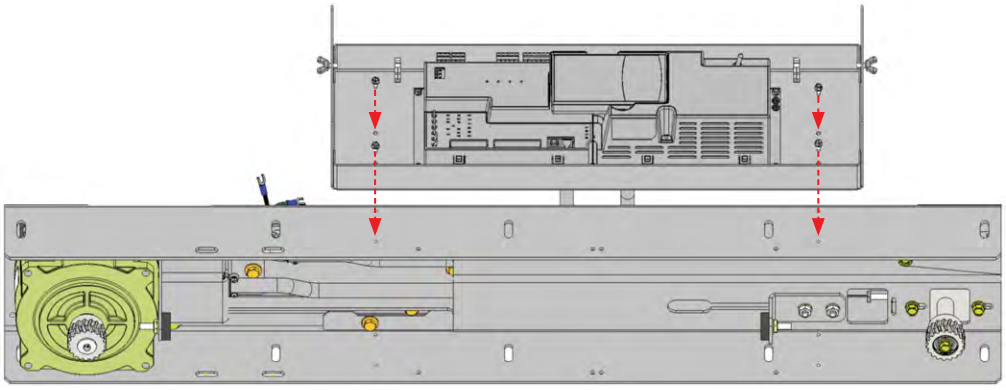


Figure 4: Mounting the Control Box

On the underside of the drive box **loosen** but **do not remove** the (2) 8-32 screws. Secure the plate with attached conduit to the limit box. See Section 4.7 for the Wiring Diagram.

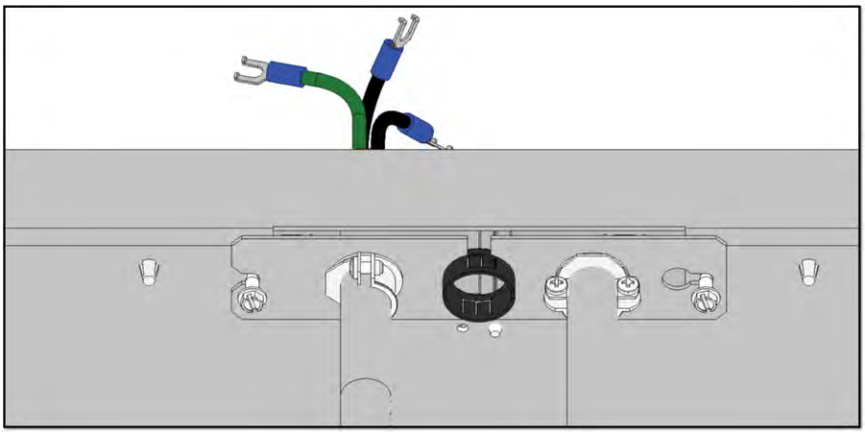


Figure 5: Connecting the Motor Conduit to the Drive Box

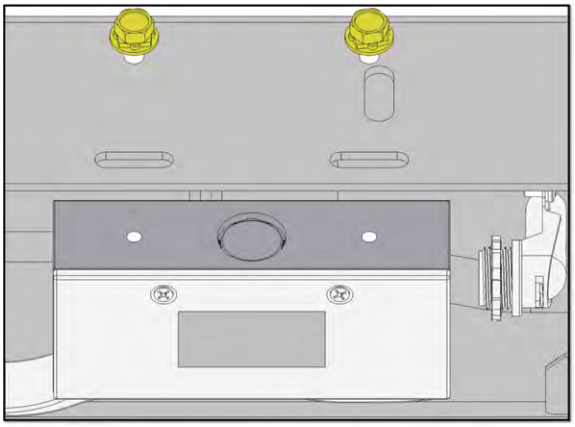


Figure 6: Connecting the Gate Switch

Attach the gate switch to the top of the main channel using (2) 1/4-20 bolts and connect the conduit to the gate switch.

1.5 EXTENDING AND SECURING THE MONXT-OMNI

Position the operator horizontally so that the motor pulley is clear of any obstructions on the face of the door. This ensures the door plate will be clear of any existing clutch when fully assembled as seen in Figure 7.

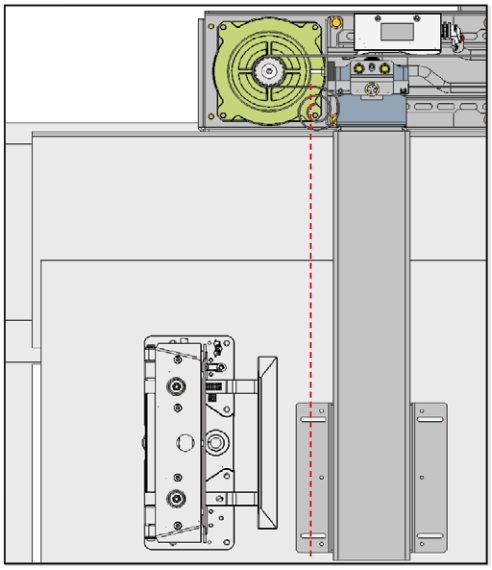


Figure 7: Locating the Mounting Position for the Main Channel

The main channel can be secured to the header using (5) 5/16-18 bolts.

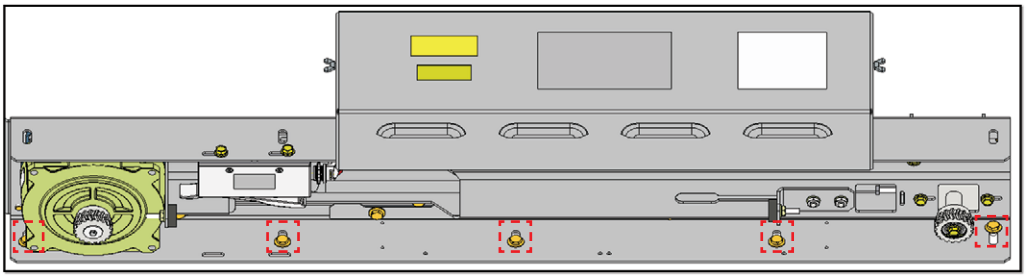
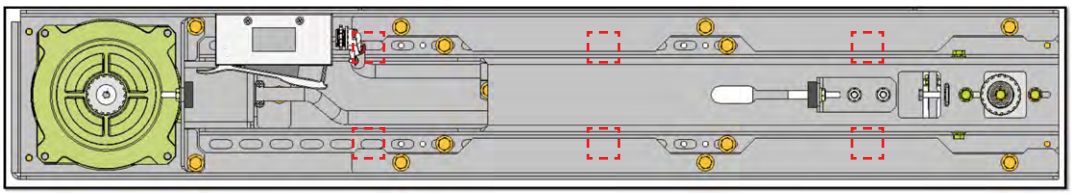


Figure 8: MONXT-OMNI Mounting Bolt Locations

An alternative mounting method using back support brackets can be used; it is described at the end of this section.



Remove the (4) 5/16-18 bolts holding the sub channel to the main channel.

Figure 9: Collapsed MONXT-OMNI Operator

Note: You will have to loosen the (2) 5/16-18 bolts on the back support bracket attached to the sub channel. DO NOT lose any of these bolts, they will be required to secure the sub channel after all adjustments are done.

Slide the sub channel out so that the distance between the end stops is:

4 1/2" + Door Opening + Door Lap

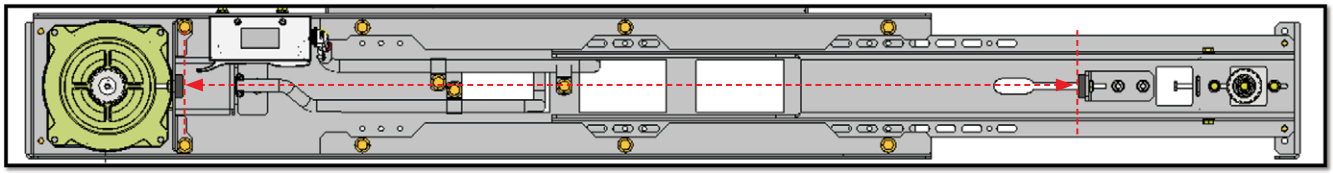


Figure 10: Extended MONXT-OMNI Operator

Secure the sub channel back to the main channel using the 5/16-18 bolts that were removed earlier.

An alternative method to securing the OMNI is the triangle shaped back support brackets. (4) brackets are provided and all use 5/16-18 hardware.

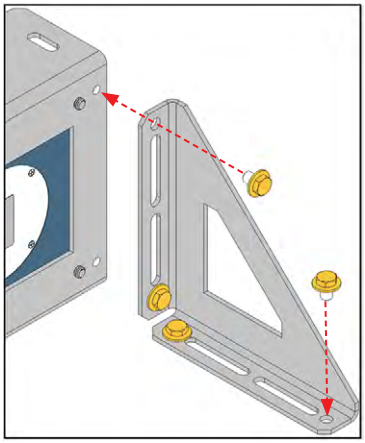


Figure 11: Back Bracket Mounting

There are (3) locations to mount the end brackets on the main channel and (1) location at the end of the sub channel at openings smaller than 42". For larger openings (2) additional mounting points exist on the back of the sub channel. Brackets can be mounted here, instead of on the main channel for more support.

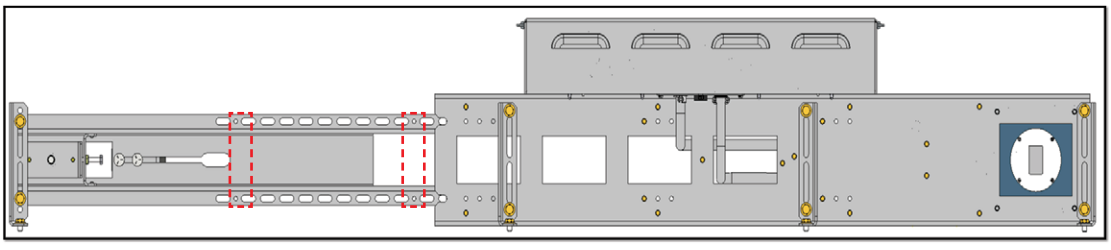


Figure 12: Back Bracket Locations

2. MECHANICAL SETUP

2.1 BELT SETUP

The drive belt comes with excess length for most door openings.

After determining the appropriate length for the specific door opening as outlined below, the excess can be cut.

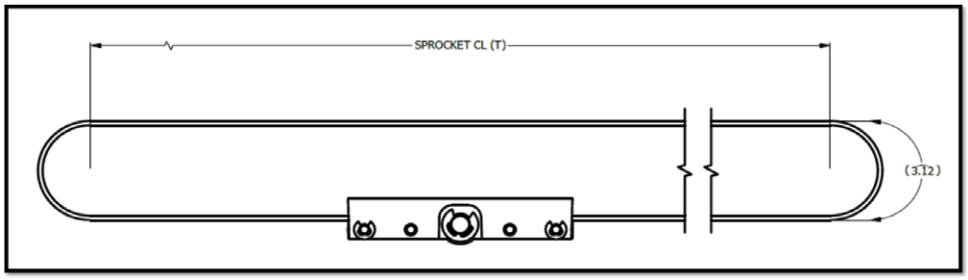


Figure 13: Drive Belt and Belt Clamp Assembly

The flat length of the belt can be determined by wrapping the drive belt around the motor and idler pulleys and marking where the belt should be cut.

The flat length of the belt will be approximately: **(2 x Sprocket CL distance) + 6"**

Cut the belt and secure the cut side to the belt clamp using the quick release T-pin.

Note: Always make sure to double check that the marked belt length is long enough around to wrap around the sprockets BEFORE cutting the belt.

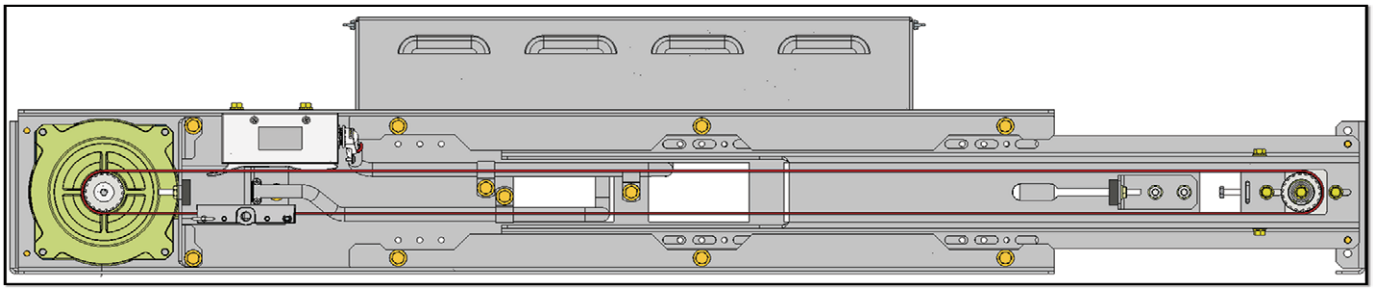


Figure 14: MONXT-OMNI with Installed Drive Belt

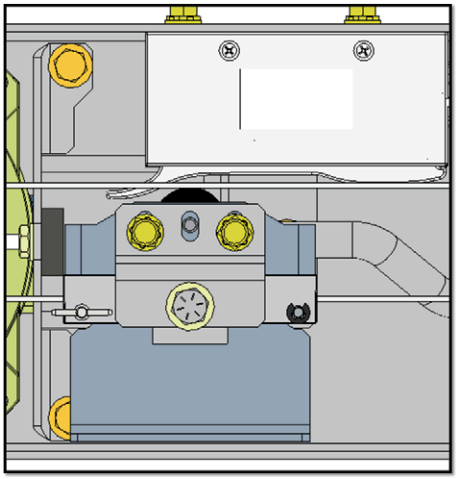


Figure 15: Assembled Belt Clamp and Brackets

2.2 TENSIONING THE BELT

CAUTION: A misaligned belt can cause the belt to wear prematurely or jump teeth during operation.

Loosen the tensioner assembly slightly, loosening the (2) ¼-20 bolts on the face of the sub channel, so the tensioner assembly can slide left or right, as displayed in Figure 16.

Tighten the tensioner adjustment screw, pushing the tensioner away from the motor assembly to moderately increase tension on the drive belt.

Then retighten the (2) ¼-20 bolts on the assembly face.

The belt tension should be such that you can squeeze the upper and lower sides of the belt together using moderate pressure. **(Note: While a loose belt can jump teeth, an overly tightened belt can be noisy.)**

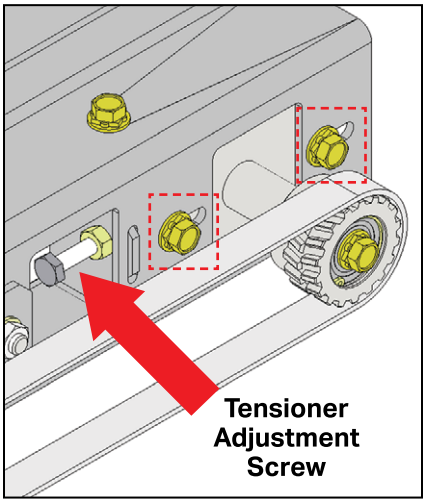


Figure 16: Tensioner Pulley and Adjustment

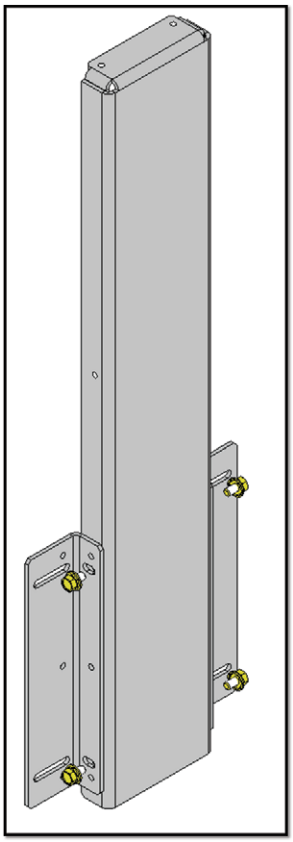


Figure 17: Assembled Door Bracket

2.3 DRIVE BRACKET ASSEMBLY

Attach the angle brackets to the door channel with (4) ¼-20 bolts.

Note: Leave the connection loose, further adjustment of the angle bracket position may be necessary to mount to the door.

Attach the belt clamp assembly to the door channel assembly and the door channel assembly to the door.

Note: If the door bracket angles won't become flush to the door, both the angles and door bracket can be reversed as seen below in Figure 18.

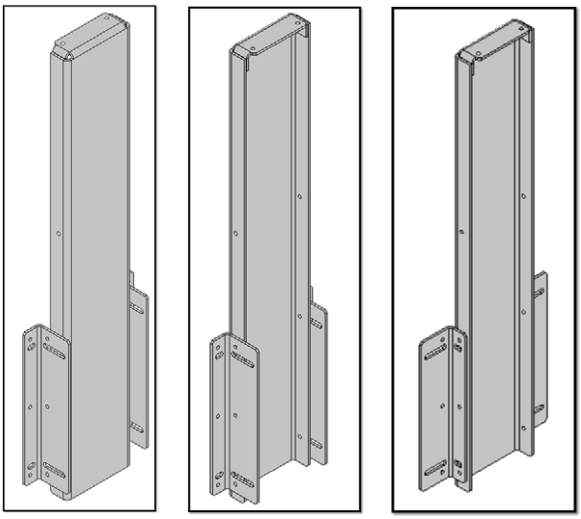


Figure 18: Alternate Door Bracket Assemblies

3. KINETIC ENERGY CODE

3.1 KINETIC ENERGY AND ASME A17.1 2000 FOR ELEVATOR DOOR SYSTEMS

*****This section is for reference only. The MONXT Linear Operator automatically calculates the Kinetic Energy requirements and sets the speed to meet code according to door weights and openings*****

Requirement 2.13.4.2.4 of ASME A17.1 2000 states that a data tag must be attached to the door operator or car crosshead. If you are in a jurisdiction that has adopted the 2000 code, you need to read and understand this requirement, and all related requirements. (See attached)

The code requires the data tag to show:

- The minimum code closing time for the door system that will result in average kinetic energy of less than 7.37 ft-lbs.
- The minimum code closing time for the door system when in nudging mode, that will result in average kinetic energy of less than 2.5 ft-lbs.

Data tables available on G.A.L.'s website provide customers with the information necessary to comply with these requirements. If you use all G.A.L. equipment, and follow all G.A.L. instructions, these sheets will give you the minimum code closing time for all the normal door configurations, sizes, and operator models available.

3.2 CODE CLOSING DISTANCE / TIME

For side opening doors, the code closing distance starts 2" from the jamb and goes to 2" from full close (Door Opening – 4").

For center opening doors, the code closing distance starts 1" from the jamb and goes to 1" from full close (Door Opening – 4").

3.3 AVERAGE KINETIC ENERGY (7.37 FT LBS)

This is the requirement for which the times shown on the data tables were calculated. G.A.L.'s calculations include the rotational inertia of the motor and door operator. The calculations include any rigidly connected equipment there, and they also accommodate all hangers, rollers, clutches, closers, releases, and any normal reopening devices.

3.4 ACTUAL (PEAK) KINETIC ENERGY (17 FT LBS)

Using G.A.L. equipment and following G.A.L. instructions, you will not exceed the requirement for actual (peak) KE.

3.5 NUDGING KINETIC ENERGY (2.5 FT LBS)

When you find the minimum code closing time for your application and double it, you will have a safe time margin to use for the requirement under nudging. (Note – this is a very conservative time, if you want to close your door more quickly while in nudging, call G.A.L. for an absolute minimum.)

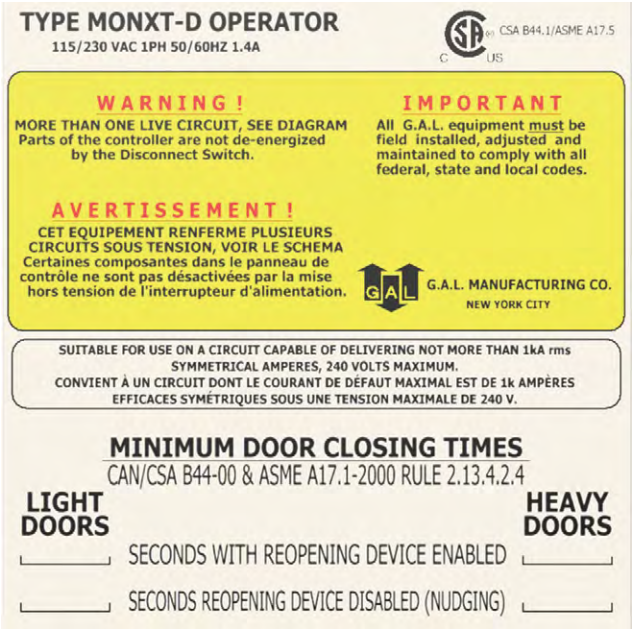
3.6 2.13.4.2.4 DATA PLATE

A data plate conforming to 2.16.3.3 shall be attached to the power door operator or to the car crosshead and shall contain the following information:

(a) minimum door closing time in seconds for the doors to travel the code zone distance as specified in 2.13.4.2.2 corresponding to the kinetic energy limits specified in 2.13.4.2.1(b)(2);

(b) minimum door closing time in seconds for the doors to travel the Code zone distance as specified in 2.13.4.2.2 corresponding to the kinetic energy limits specified in 2.13.4.2.1(c)(2), if applicable [see 2.27.3.1.6(e)];

(c) where heavier hoist-way doors are used at certain floors, the minimum door closing time in seconds corresponding to the kinetic energy limits specified in 2.13.4.2.1(b)(2) and 2.13.4.2.1(c)(2), if applicable, for the corresponding floors shall be included on the data plate.



SAMPLE: Data Plate

3.7 2.13.4.2.1 KINETIC ENERGY

(a) Where the hoist-way door and the car door/gate are closed in such a manner that stopping either one manually will stop both, the kinetic energy of the closing door system shall be based upon the sum of the hoist-way and the car door weights, as well as all parts rigidly connected thereto, including the rotational inertia effects of the door operator and the connecting transmission to the door panels.

(b) Where a reopening device conforming to 2.13.5 is used, the closing door system shall conform to the following requirements:

(1) The kinetic energy computed for the actual closing speed at any point in the Code zone distance defined by 2.13.4.2.2 shall not exceed 23 J (17 ft-lbf); and

(2) The kinetic energy computed for the average closing speed as determined in accordance with 2.13.4.2.2 shall not exceed 10 J (7.37 ft-lbf).

(c) Where a reopening device is not used, or has been rendered inoperative (see 2.13.5), the closing door system shall conform to the following requirements:

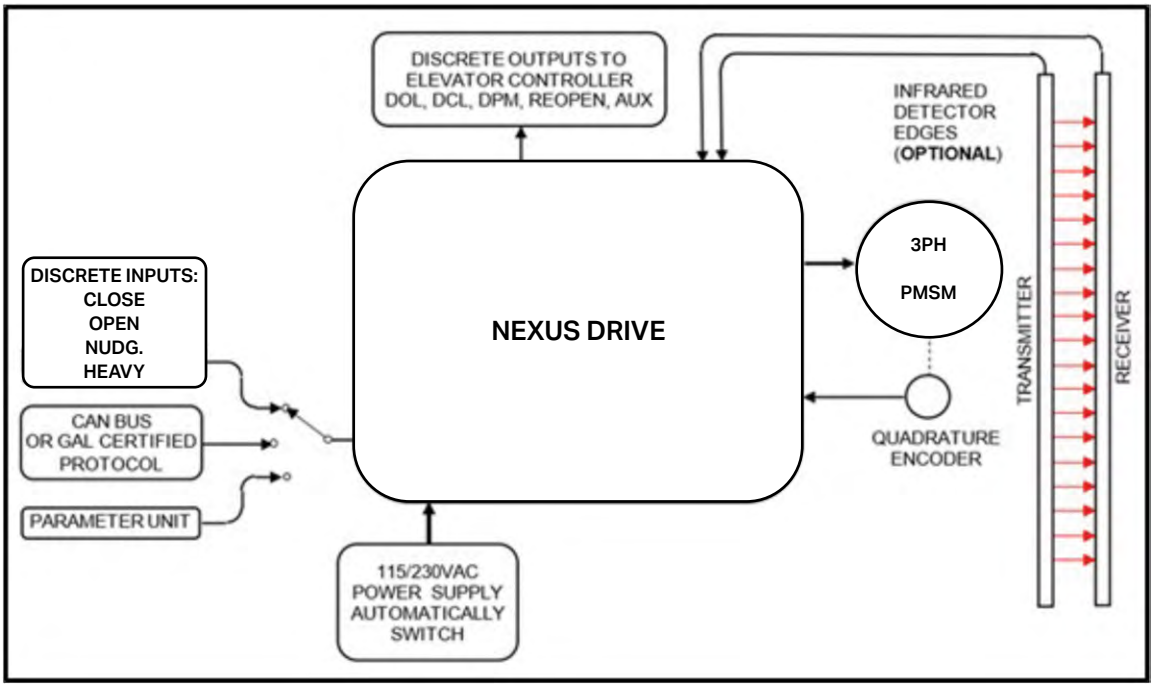
(1) The kinetic energy computed for the actual closing speed at any point in the code zone distance defined by 2.13.4.2.2 shall not exceed 8 J (6 ft-lbf).

(2) The kinetic energy computed for the average closing speed within the code zone distance (see 2.13.4.2.2), or in any exposed opening width, including the last increment of door travel, shall not exceed 3.5 J (2.5 ft-lbf).

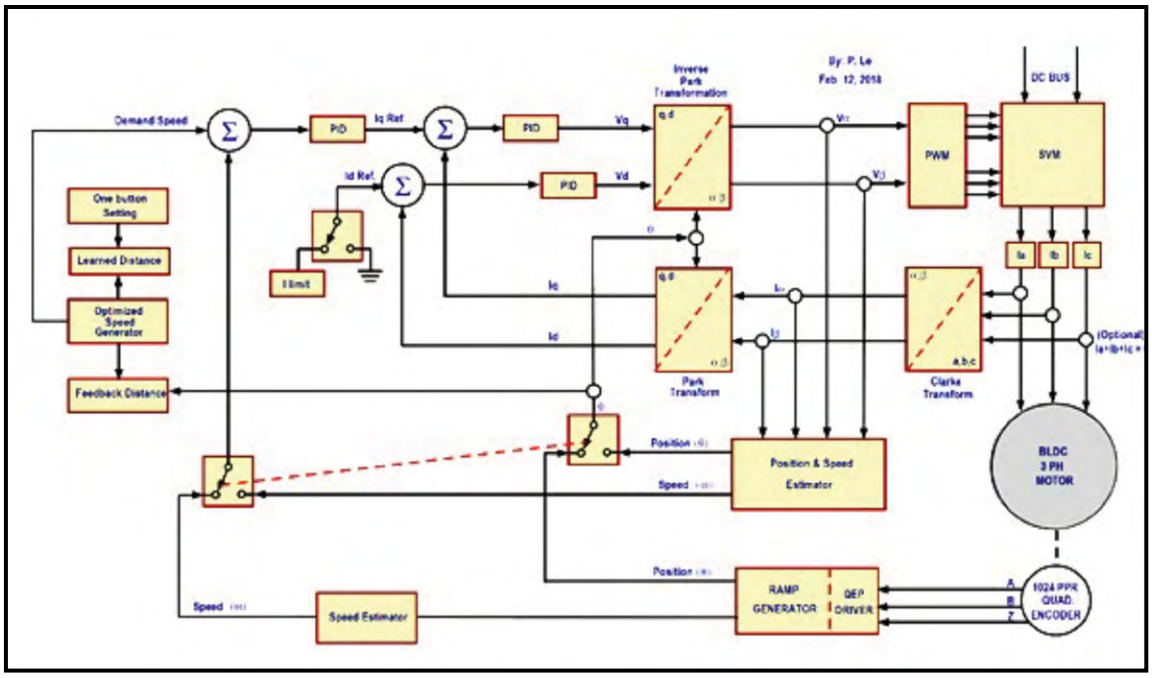
4. ELECTRICAL INSTALLATION

4.1 OVERVIEW

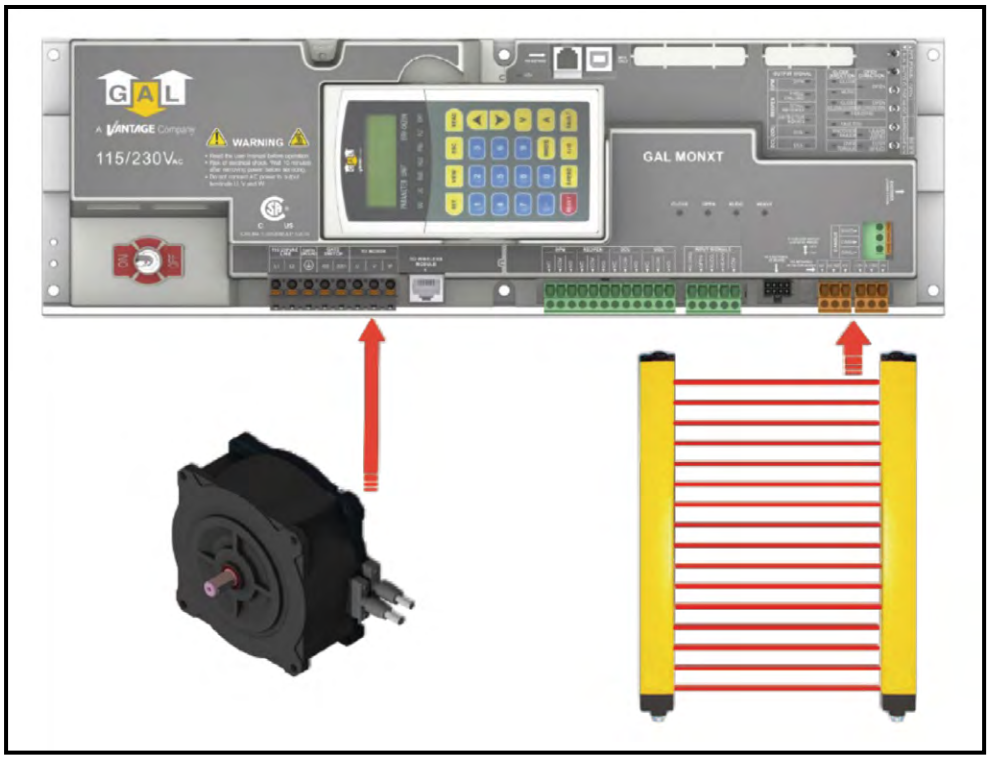
The block diagram of the Linear MONXT is illustrated below:



Below is a simplified control algorithm diagram of the MONXT.



The MONXT door operator has the following features:



DOUBLE FEEDBACK SYSTEM FOR SMOOTH PERFORMANCE:

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

SAFETY STANDARDS:

- CSA Certified. B44.1/ASME- A17.5
- Complies with the following CE and IEEE safety standards of the followings:
- Walkie Talkie Test: 15cm from the Drive with 4w 153.05 MHz & 464.5Mhz
- EN61000-4-2: Electro-Static-Discharge Immunity Test.
- EN61000-4-3: Radiated Susceptibility Test
- EN61000-4-4: Electrical Fast Transient (EFT)/Burst Immunity Test
- EN61000-4-5: Surge Test (Bi Wave)
- EN61000-4-6: Conducted Susceptibility Test
- EN61000-4-8: Power Frequency Magnetic Field Immunity Test
- IEEE STD C62.45-2002: Surge Test (Ring Wave)
- EMC conformity report is available

A POWERFUL SYSTEM:

- Automatically switching between 230VAC and 115VAC power supply input.

SENSORLESS:

- Signals of DCL, DOL, DPM, & AUX are decoded from Encoder. No sensors needed.

CONVENIENCE INDICATORS:

- Light Emitting Diodes (LEDs), on the mainboard, are used to indicate the status of all important functions:
  Door Open/Close, Nudging, Heavier/Narrower Input Signals, Door Open/Close Directions, Open/Close Slowdown, The Obstruction Detection Signal, Stall Reverse, Frequency Failure, DOL, DCL, AUX (Narrower Door), and DPM (Door Protection Monitor) * Signals, Door-Width Learning Completion.

UNIVERSAL INPUTS AND OUTPUTS:

- Universal inputs accept control signals in the form of contacts or signal voltages.
  24-230V AC or DC.
- Output contacts rated at 10Amp, 230VAC, and they are:
  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.
- The default parameter sets are ready for all operator models.
- Different parameter sets for the heavier door and narrower door are available for proper adjustments to comply with codes.
- The feature of copying (reading) and downloading (writing) parameter sets are implemented to reduce the setup 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 MONXT.

SERIAL COMMUNICATION TO MONXT:

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

TROUBLESHOOTING ASSISTANCE DISPLAY:

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

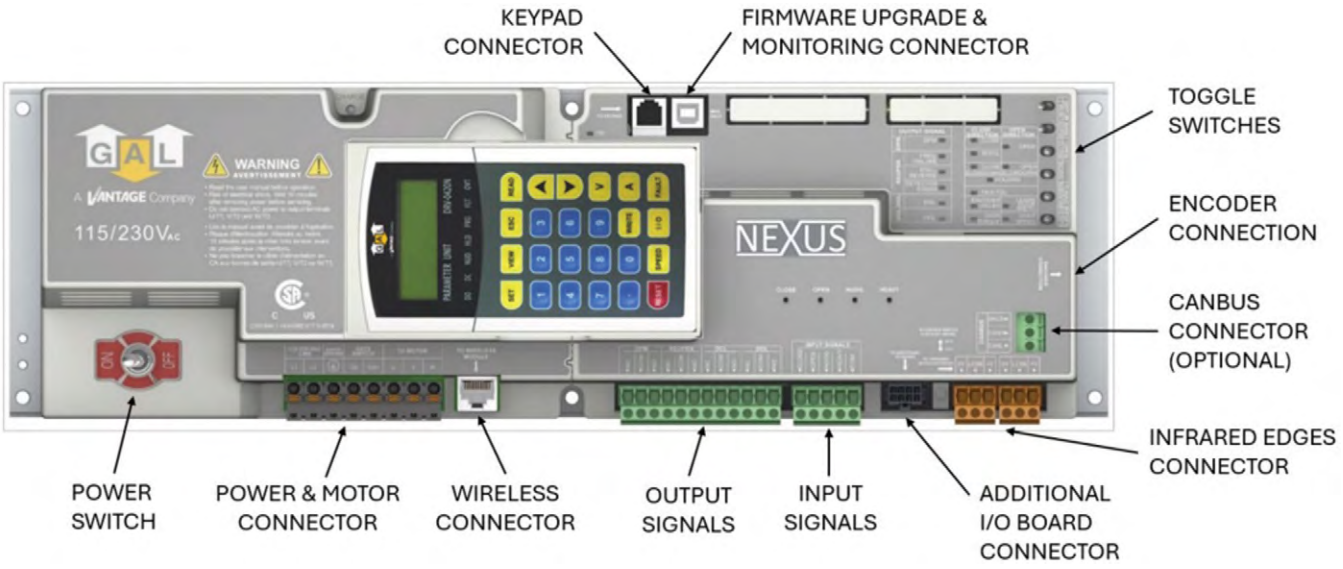
DISPLAY THE CLOSING TIME:

- The Code Distance closing time is displayed to assist users in complying with codes.

AUTO FALLBACK TO SLOW MODE IF SENSORS OR ENCODER FAIL:

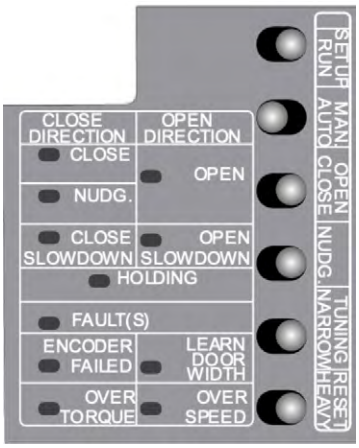
- If the encoder failed, the MONXT door operator will continue to operate in slow-scanning mode until the repair is completed.
- Door Protection Monitor (DPM) is used as an input for the FM-0018N, which is a door lock and gate switch protection device. Its purpose is to meet the ASME A17.1 RULE 210.15 and CAN/CSA-B44-M90 RULE 3.12.1.5.
- Fault Monitor device can be purchased separately via GAL.

4.2 ELECTRICAL COMPONENTS OF THE MONXT



4.2.1 TOGGLE SWITCHES

Six toggle switches are provided for users to Tune, Troubleshoot, Operate in Manual Mode, and Verify the operational functions of the door.

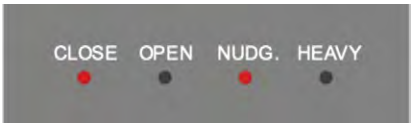


SEQ. NO	LABEL	REMARKS
1	RUN/SETUP (Run or Setup)	**RUN:** The RUN position is for normal operation. **SETUP:** The SETUP position allows users to adjust certain crucial Parameters that cannot be changed during operation. The SETUP position will put the drive into the STOP mode, and no power will be delivered to the motor.
2	AUTO/MAN. (Automatic 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 NUDG., NARROW, and HEAVY toggle switches.
3	CLOSE/OPEN (Close or Open)	When the RUN/SETUP Sw is in RUN & AUTO/MAN. Sw 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. Sw allows closing the door at a reduced speed (Nudging speed). To test the Nudging speed in Manual mode, the RUN/SETUP Sw is in RUN & the AUTO/MAN. Sw must be in the MAN. Position. The CLOSE/OPEN and NUDG. switches must be pressed to the CLOSE and NUDG. positions.
5	NARROW/TUNING (Narrower Door or Tuning)	When the RUN/SETUP Sw is in RUN & the AUTO/MAN. Sw 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. See details of the Tuning provided in the Manual.
6	HEAVY/RESET (Heavier Door or Reset)	**HEAVY:** When the RUN/SETUP Sw is in RUN & the AUTO/MAN. Sw 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 a manual reset of faults if faults have occurred in the drive. Otherwise, pressing the RESET side has no effect.

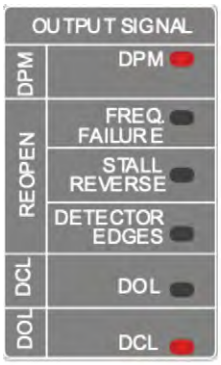
4.2.2 LED INDICATORS

A red LED is provided on each of the input modules (Open, Close, Nudge., or Heavy). There are more LEDs on the mainboard, to indicate the completion of the door tuning, the directions, the final limit positions, nudging, holding, dynamic slowdown distances, input signals, output signals, and voltage levels as shown below.

LED 1



LED 2



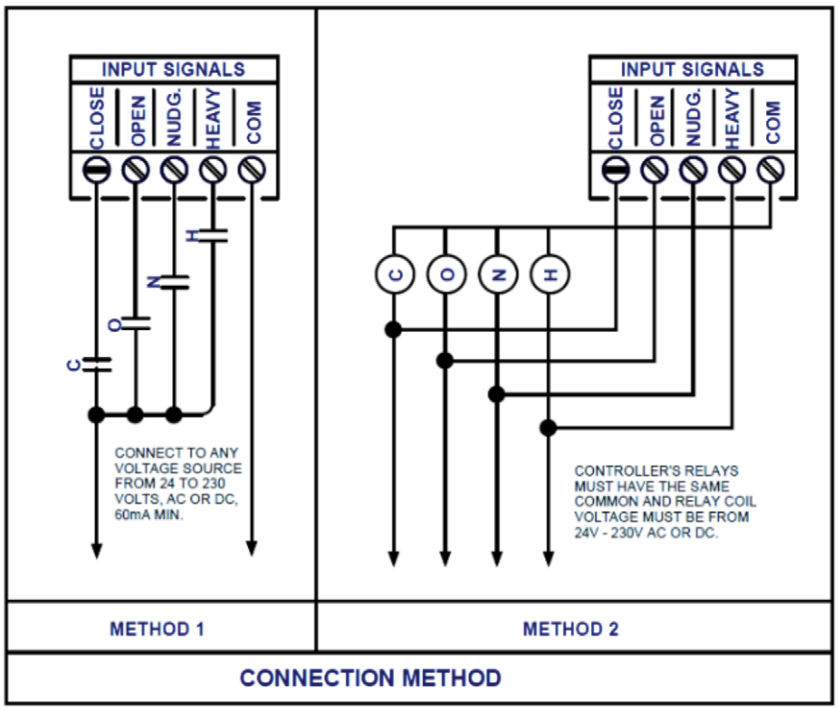
LED 3

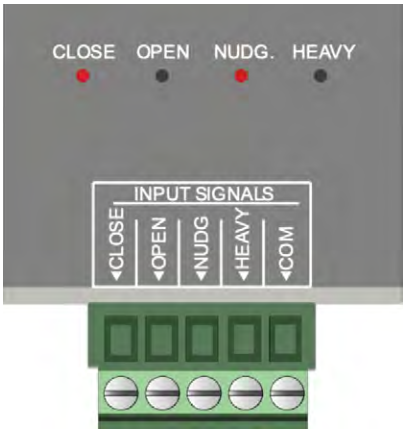
LABEL	REMARKS
DOL	DOL: Door Open Limit. After Initial Tuning, MONXT will assign the DOL output signal at the fully open position of the door. Par. 81
AUX NARROWER	Set Par. 199=0 to use the NARROWER position (Par. 67) as the DOL input of the Narrower door. Set par. 199 = 1 to deselect the NARROWER position (Par. 67) as the DOL input of the Narrower door.
DPM	DPM: Door Protection Monitor, the DPM cam triggers the DPM Relay and activates ½ inch before the Gate switch makes. Par. 66
DCL	DCL: Door Close Limit. After Initial Tuning, MONXT will assign the DOL output signal at the fully open position of the door. Par. 139

4.2.3 INPUTS

Four inputs are provided to interface with OPEN, CLOSE, NUDGE, and HEAVY commands from the elevator controller.

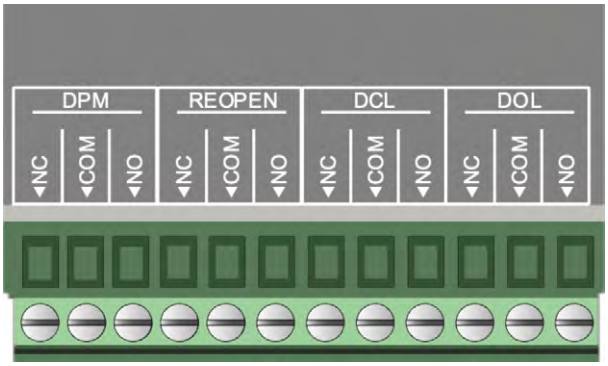
These universal inputs accept control signals either in the form of dry contacts or signal voltages from 24-230V AC or DC. LEDs of the input modules draw currents from the elevator controller, not from the MONXT. Therefore, these LEDs must be lit to indicate that the elevator controller sent commands. In AUTO mode, the MONXT will only monitor input signals from the elevator controller, not from toggle switches.





4.2.4 OUTPUTS

There are four relay outputs DPM, RE-OPEN, DOL, and DCL signals 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 needs to be reopened. The reopen output DOES NOT reopen the door directly. The signal to reopen the door must come from the elevator controller. Re-open relay is triggered by one of the following detections: - Stall Reverse; controlled by Par. 148. - Frequency Failure; controlled by Par. 136. - Detector Edges; controlled by Par. 202.
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.

4.2.5 ENCODER CONNECTION

The optical galvanic isolation encoder is connected to the NEXUS drive with DB9 shielded connectors.

Figure 26: Encoder Connection

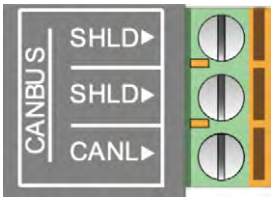
4.2.6 CAN BUS CONNECTION PORT

The CAN bus card is one of the methods to interface between the elevator controller and the MONXT.

TO ENABLE CAN BUS:

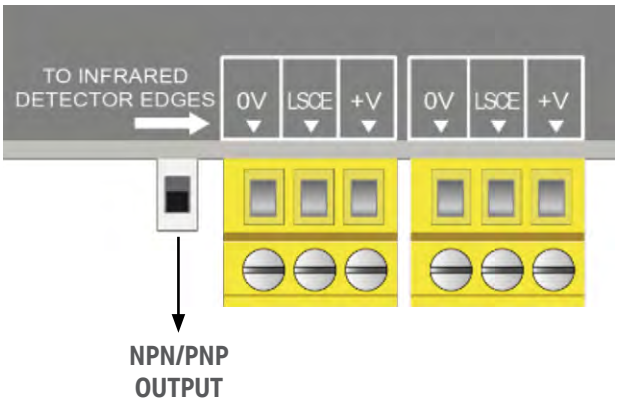
1. Set the RUN/ SETUP switch to SETUP.
2. Set Par. 11 = 5.
3. Set the RUN/ SETUP switch to RUN.
4. Set the AUTO/MAN to AUTO.

Other communication protocols are also available upon request. However, an agreement between GAL and the requesting party must be made prior to the implementation of the communication protocols. Contact GAL for more details on CAN or other protocols.



4.2.7 INFRARED DETECTOR EDGES CONNECTION PORTS

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



NPN or PNP output:
The info of NPN or PNP output should be obtained prior to installation. Read the label on the cover 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 accordingly. If the info of NPN or PNP is unavailable, then, use the trial-and-error method. *Assume that the edges' output is NPN for the 1st trial.*
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 MONXT.
Connect the GAL Certified Infrared Edges to connectors that labeled [0V | LCSE |+V]
Note! Connectors that labeled [0V | LCSE |+V are interchangeable.

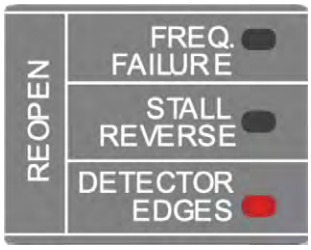
Make sure the REOPEN output contact is connected to the elevator controller.

Test the detector edges:

- Obstruct the infrared detector edges. The DETECTOR EDGES LED should be ON.
- The REOPEN relay should be activated to send the REOPEN signal to the elevator controller.
- The elevator controller will send the Door Open command signal to the MONXT 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 MONXT.
- 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 NEXUS drive.

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

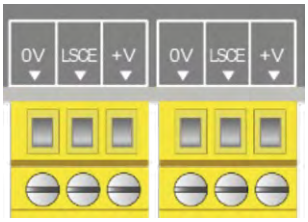
If the infrared detector edges have intermittent problems:

- 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 True Earth Ground connection to the edges.
- Users may need to lower the Carrier Frequency in Par. 1 gradually until problems are resolved.

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

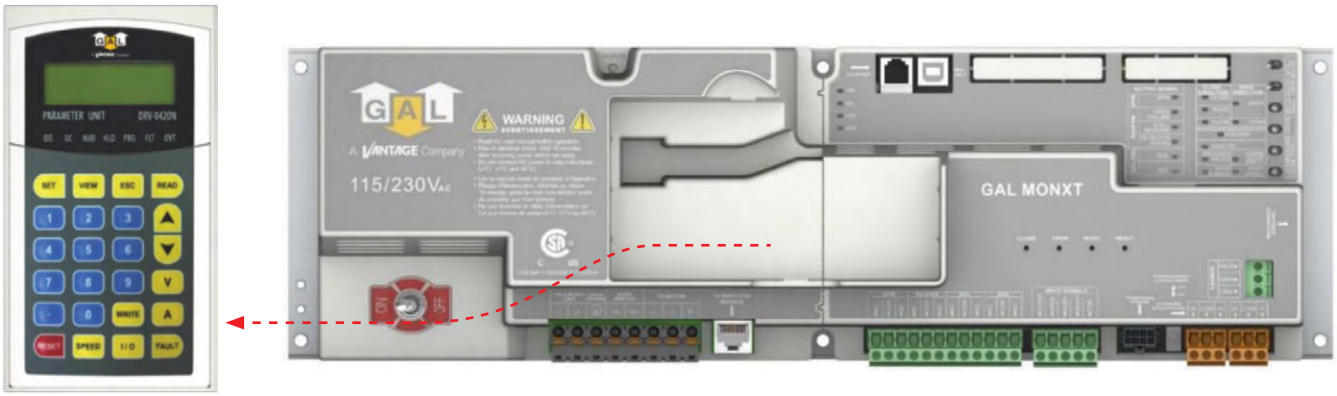
The major advantages of connecting GAL certified infrared detector edges via MONXT are:

- Users do not need to use an extra power supply for the detector edges.
- The REOPEN relay that is used for the infrared detector edges interface also has 2 more safety features to reopen the door. They are over-speed and over-torque detections.
- The table below assists users to identify the colors and numbers of each wire from infrared detector edges to the MONXT door operator.



GAL CERTIFIED INFRARED DETECTOR EDGE CONNECTION									
GAL P/N	MFG.	TX			RX				REMARKS
		V+	LCSE	0V	V+	LCSE	0V		
DPTT-0004N	TRITRONICS	RED	WHITE	ORANGE				NONE	2D
DPFS-1004N	FORMULA SYSTEMS	BLUE 1	BROWN 2	GREEN YELLOW	BLUE 1	BROWN 2	GREEN YELLOW	NONE	2D
DPFS-0015N	FORMULA SYSTEMS	BLACK 1	NONE	GREEN YELLOW	BLACK 1	BLACK 3	GREEN YELLOW	BLACK #2 OF TX & RX	BLACK #3 OF TX IS NOT USED. 3D EDGE
DPSG-0008N	GAL SCANGUARD	BROWN	NONE	BLUE	BROWN	BLACK	BLUE		2D
(•): Connect an additional wire from 0V to a true EARTH GROUND.									

4.2.8 PARAMETER UNIT



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

- Easy Tuning
- Changing accelerations, decelerations, speeds, torques, and all pertinent parameters of peripheral devices. See the default 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 if the drive faults.

4.2.9 NEXUS DRIVE

The power connector is featured as follows:

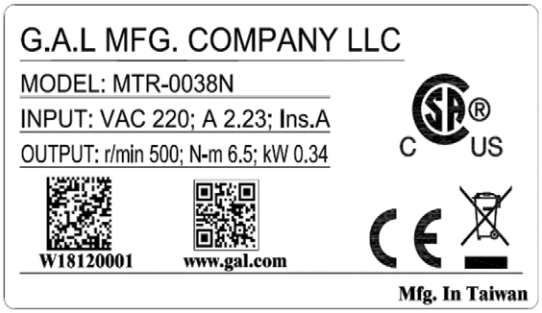
- Single-phase input power supply between L1 & L2 terminals.
- **Note!** 200-230VAC, 50/60Hz, and Apparent Power with minimum 500VA are required.
- Earth ground.
- **Note!** A True Earth Ground is required.
- Interlock terminals: GS & GS1.
- **Note!** GS & GS1 are only convenience terminals. They have no internal connection to the MONXT.

3-phase PMSM high torque 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 NEXUS drive.

4.2.10 MOTOR

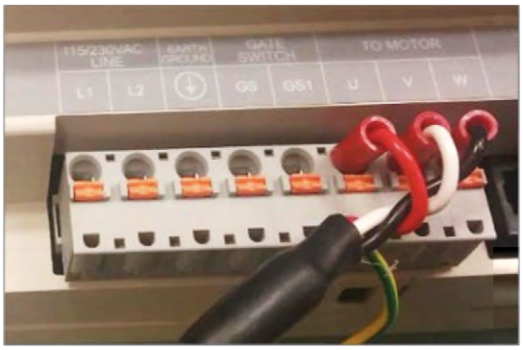
340W 3-Phase 230V PMSM is used for MONXT door operators.



4.3 INITIAL SETUP

GAL has done the initial wiring prior to shipping the MONXT to users. However, the following procedure is described here to complete the initial setup process.

1. **Connect to main power:** Wire power into terminals marked L1, L2, and ground.



2. **Motor/Encoder Connections:** Check that the motor and encoder are connected from GAL. Motor power wires are shown in the picture on previous page. The encoder connection is shown in Figure 26.

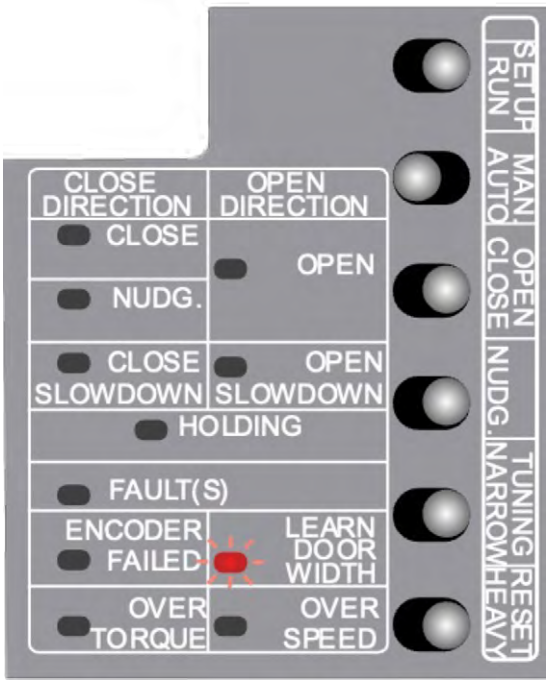
3. **Interlock/Edge Detector:** Check that the door interlock is wired into terminals GS and GS1 and the detector edges (if used) are connected\

4. **Power on:**

5. **Easy Tuning® Method:**

TUNING FROM DRIVE:

1. Manually Close the Door until it is ***fully closed.***
2. Set RUN/SETUP toggle to SETUP.
3. Set MAN/AUTO toggle to MAN.
4. Set Par. 63 = 1
5. Flip the TUNING/NARROW toggle towards TUNING.
6. Follow prompts on parameter unit. Use the keypad or arrow keys to adjust the value. Press WRITE to enter and to move to the next prompt.
    - Select Motor and Operator Type
    - Enter door speed
    - Enter door opening size (in inches)
    - Enter door weight (in lbs)



The LEARN DOOR WIDTH should be flashing during tuning. It will turn OFF after the Tuning is complete.

During the learning the following sequence of events will occur:

1. The doors will open slightly and then close, Parameter unit will display "Door Dir Learned"
2. Next, the doors will open fully and the parameter unit will display "Open Limit Learned". Then the doors will close and display "close Limit Learned"
3. The door will close and then open/close two more times, after which the parameter unit will display "Door Learn Complete".

4.4 PARAMETER UNIT

1. How to change parameter values:

Press **SET** Enter a parameter number

Press **READ** Enter a new value. Press **WRITE**

2. How to read (copy) a parameter set from a drive:

Press **SET** Press ▲ Press **READ**

3. How to write (download) a parameter set to a drive:

Press **SET** Press ▲ Press **WRITE**

4. How to choose the operating source:

Set Par. 11 = 1 for Parallel discrete operation. Set Par. 11 = 5 for the Serial CAN bus operation.

5. How to verify can bus operation:

Press **VIEW** Press ▲ or ▼ until item #9 Disp. Group is reached.

Press **READ** Press ▲ or ▼ until CAN TX Counter

D30, or CAN RX Counter D31 is reached. If counters are increasing, then the CAN bus is functioning.

Default parameters:

INSTRUCTION FOR LINEAR MONXT 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 PARAMETERS: Press SET, Enter Parameter Number, Press READ, Enter New Value, Press WRITE.				
TUNING WITH KEYPAD: Manually Close the Door, Turn the Power SW ON, Set RUN/SETUP SW to SETUP. Set MAN/AUTO SW to MAN, Set Par. 63=1, Press the toggle SW to TUNING, then Release. Wait for the Display shows Tuning Completed				
CLOSING	**Pr#**	**RANGE**	**DEFAULT VALUE**	
			C/P	**S/O**
MAX. CLOSE SPEED	185	0-66Hz	18Hz	18Hz
CLOSE OBSTRUCT LIMIT FORCE (TORQUE LIMIT)	136	0-54%	38%	38%
HOLDING TORQUE	137	0-100%	79.9%	79.9%
HOLDING SPEED	138	0-180%	7.6%	7.6%
HOLDING BEGINS	139	0-100%	6%	6%
HIGH SPEED CLOSE (HSC)	141	0-180%	21.8%	21.8%
FINAL SPEED CLOSE (FSC)	142	0-180%	2.5%	2.5%
FSC BEGINS	143	0-100%	14%	6%
NUDGING SPEED	144	0-180%	12.9%	12.9%
ACCELERATION TIME	145	0.1-100s	1.5s	1.5s
DECELERATION TIME	146	0.1-100s	8.0s	3.0s
STALL REVERSE FORCE	148	0-150%	52%	52%

OPENING	Pr#	RANGE	DEFAULT VALUE	
			C/P	S/O
QUICK STOP ON REVERSE	78	0-200%	180%	180%
HOLDING TORQUE	79	0-100%	92.9%	92.9%
HOLDING SPEED	80	0-180%	7.6%	7.6%
HOLDING BEGINS	81	0-100%	100%	100%
SLOW SPEED OPEN (SDO)	82	0-180%	5.1%	5.1%
FSO BEGINS	83	0-100%	10%	5%
HIGH SPEED OPEN (HSO)	84	0-180%	42.3%	42.3%
FINAL SPEED OPEN (FSO)	85	0-180%	2.5%	2.5%
FSO BEGINS	86	0-100%	93%	95%
ACCELERATION TIME	87	0.1-100s	1.7s	1.7s
DECELERATION TIME	88	0.1-100s	1.7s	1.7s

COMMON	Pr#	RANGE	DEFAULT VALUE	
			C/P & L	S/O
CARRY FREQUENCY	1	2-15Hz	10Hz	10Hz
OPERATOR SOURCE	11	0-6	**1:** External Terminals **3:** RS-485 Communication **5:** CAN Bus **6:** Bluetooth	
SCAN SPEED	61	0.1-8.63Hz	6Hz	6Hz
BASIC TUNING SPEED RATE	58	50-100%	77%	77%
EDGES TIMEOUT DELAY TIME	197	0-180s	15s	15s
EDGES TIMEOUT HOLDING TIME	206	0-180s	5s	5s
BUZZER DELAY TIME	198	0-180s	10s	10s
MOTOR OVERLOAD CURRENT	217	0-8.7A	5.3A	5.3A
BUZZER MODE	205	0-2	**0: DISABLE** 1: CONTINUOUS 2: PULSATING	
DETECTOR EDGES MODE	202	0-2	**0: DISABLE** 1: NPN 2: PNP	
NARROW DOOR DOL	208	0-1	**0: USE BOTH DOL & AUX** 1: USE DOL	
REOPEN RELAY MODE	207	0-1	**0: EDGES TIMEOUT RELAY is independent of REOPEN RELAY** 1: EDGES TIMEOUT RELAY is dependent from REOPEN RELAY	
CAN NODE NUMBER	246	7-8	**7 FOR FRONT DOOR.** **8 FOR REAR DOOR.**	
AUTO-LEARNING	63	0-1	**0: DISABLE** 1: ENABLE	

Convenience keys:

Press V to display output voltage and pulse count.

Press I/O to display input and output signals.

Press FAULT and ▼ or ▲ to view all recent faults.

Press A to display output current.

Press RESET to reset the drive if the drive faults.

View key:

The VIEW key helps users navigate through the Parameter Unit.

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:

1. V/I/Hz – Displays Voltage (V), Current(A), Command Frequency (Hz), Actual Frequency (Hz)
2. I/O – Inputs & Outputs Monitoring
3. Faults – Most recent drive faults
4. Counters – Cycle count of drive
5. User List –
6. Max Clo Speed – Closing speed in Hz.
7. Max Clo Force – Closing force in % of maximum.
8. GAL Defaults –
9. Disp Group –
10. CLO/OPN Time – Open and close times of doors; total time and code time.
11. CAN Analyzer – Troubleshoot CAN communication.

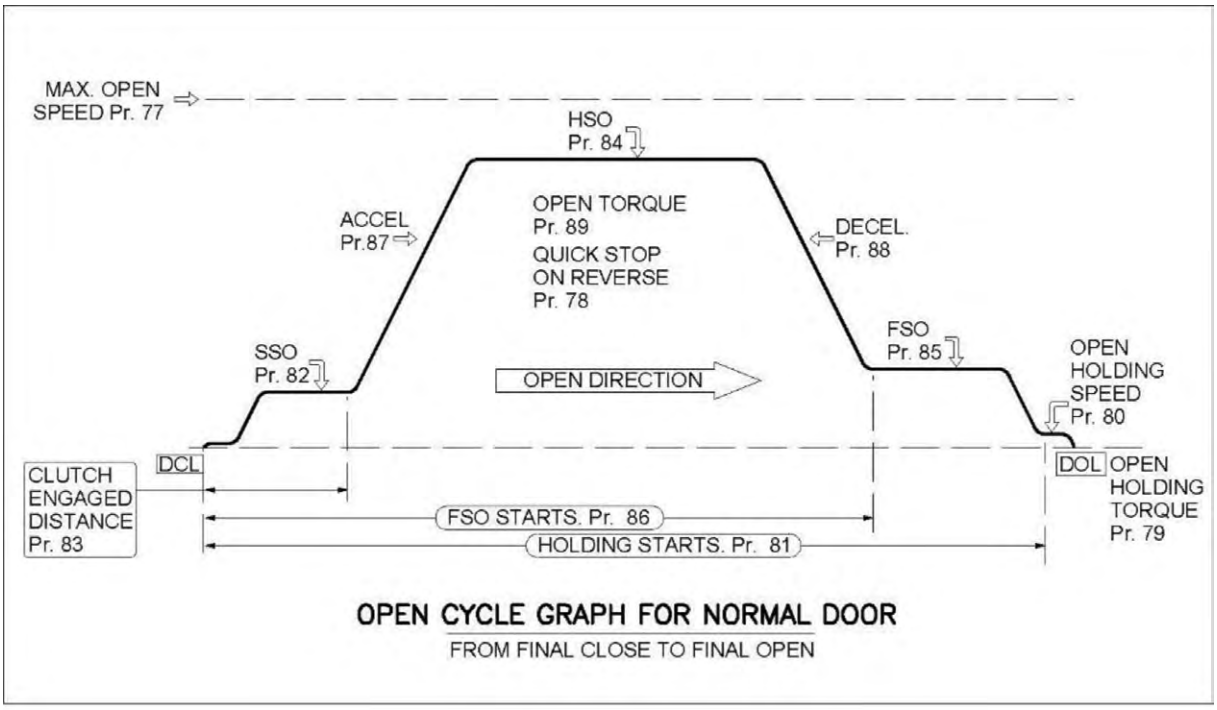
LED INDICATORS

There are 7 LEDs on the Parameter Unit. DO, DC, NUDG, 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

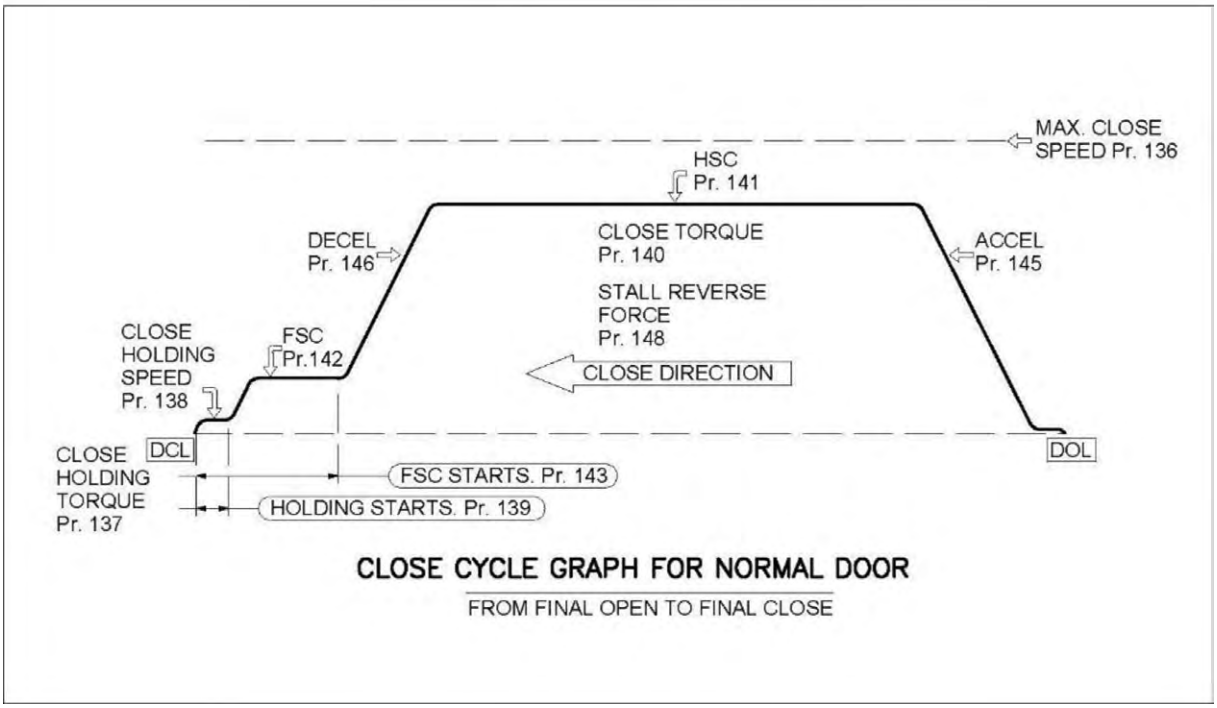
4.5 SPEED PROFILES OF MONXT

4.5.1 NORMAL DOOR



OPEN CYCLE GRAPH FOR NORMAL DOOR

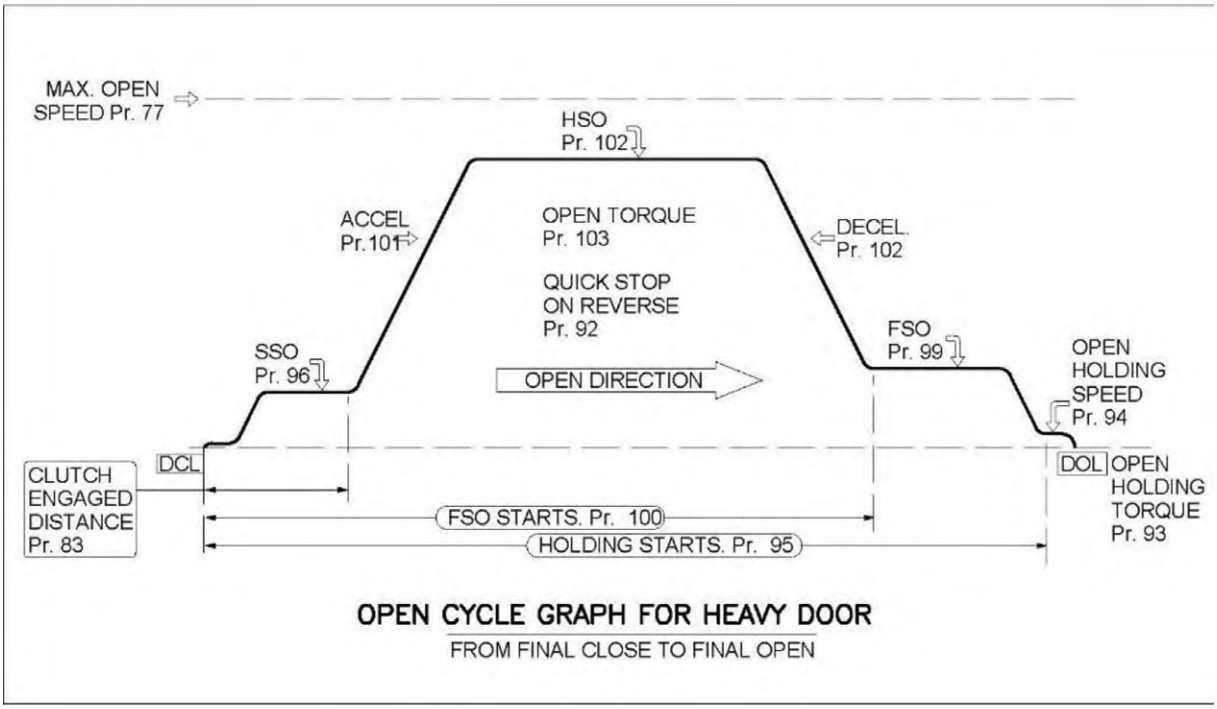
FROM FINAL CLOSE TO FINAL OPEN



CLOSE CYCLE GRAPH FOR NORMAL DOOR

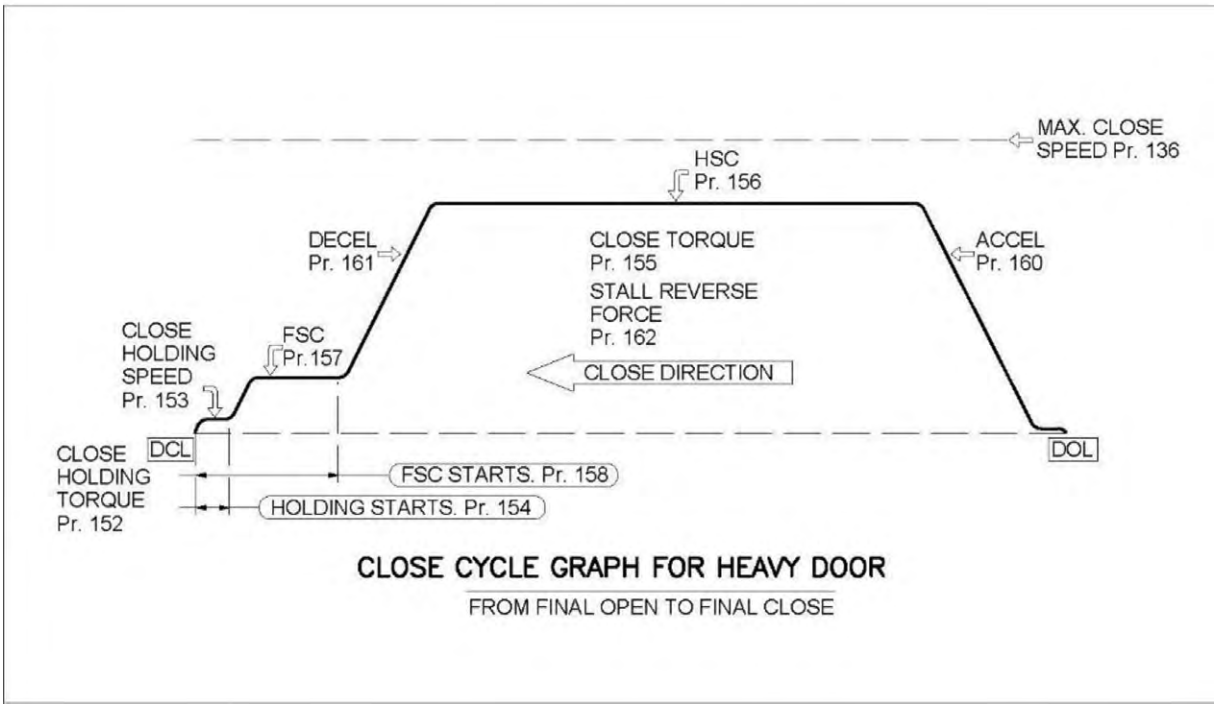
FROM FINAL OPEN TO FINAL CLOSE

4.5.2 HEAVY DOOR



OPEN CYCLE GRAPH FOR HEAVY DOOR

FROM FINAL CLOSE TO FINAL OPEN



CLOSE CYCLE GRAPH FOR HEAVY DOOR

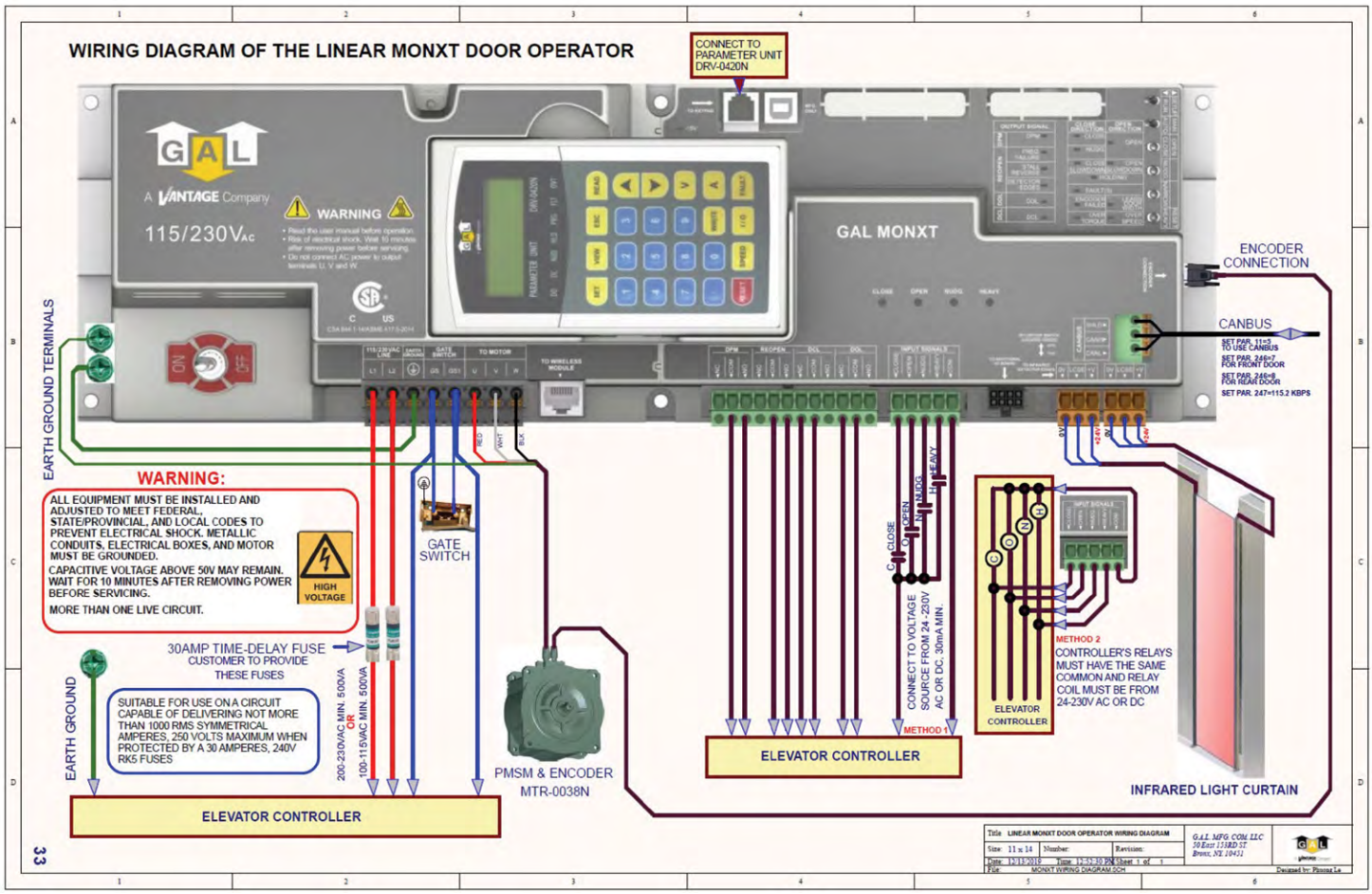
FROM FINAL OPEN TO FINAL CLOSE

4.6 MONXT PARAMETERS

MONXT Pr. No.	Functions ▫ : Regular ▫ : Heavy ▫ : Narrow	Max	Min	Default Linear Straight C/P	Default Linear Straight S/O	Read/Write	1: Available to set when running	Setting	LCD Text Description (16bit)	LCD Text Unit (4 bit)	LCD Text Change to % ?
GROUP 0 : USER PARAMETERS											
0	Stop mode	3	0	3	3	Read & Write	1	0: Free Run 1: 1st Open & Close Decel Time 2: 2nd Open & Close Decel Time 3: The Fast Decel Time	Stop Mode		
1	Carry Frequency	15	2	10	10	Read & Write	1	2~15 kHz	Carrier Freq.	kHz	
2	Parameter Reset	9999	0	0	0	Read & Write	0	06: Clear all fault record 08: Keypad lock 10: Reset all Parameters	Parameter Reset		
10	Auto Voltage Regulation	2	0	0	0	Read & Write	1	0: AVR function enable 1: AVR function disable 2: AVR function disable for decel.	AVR function		
11	Operate Source	6	0	1	1	Read & Write	1	1: External terminals. 3: RS-485 communication. 5. CAN Bus 6. Blue-tooth	Start Source		
15	User Group read selection	65535	0	0	0	Read & Write	1	6301: for GAL (ALL PARAMETER)	User Gp sel		
GROUP 1: MOTOR & ENCODER PARAMETERS											
26	Maximum output voltage	240.0	0.0	220.0	220.0	Read only	——	0.0V to 240.0V, should be higher than Pr.28	Motor Rated Volt	V	
27	Max Output Freq.	120.00	0.00	66.66	66.66	Read only	——	0.00 to 120.00 Hz, should be higher than Pr.29	Max. Speed	Hz	
28	MIN Output Voltage	100.0	0.0	0.0	0.0	Read only	——	0~100.0% of Pr.26	Min. Voltage	%	
29	Min Output Freq.	120.00	0.00	0.00	0.00	Read only	——	0.00 to 120.00 Hz, should be lower than Pr.27	Min. Output Spd	Hz	
32	Motor rated power	655.35	0.00	0.34	0.34	Read only	——	Read automatically by setting Pr.31	Motor Rated POW	Kw	
33	Motor Rated speed	65535	0	500	500	Read only	——	Read automatically by setting Pr.31	Motor Rated SPE	rpm	
34	Motor pole No.	96	2	16	16	Read only	——	02 to 96	Poles of motor	pol	
35	Motor Rs	655.35	0.00	4.21	4.21	Read only	——	0.00~655.35 Ω	R1 line to line	ohm	
36	Motor Inductance	6553.5	0.0	22.3	22.3	Read only	——	0.0~6553.5mH	Lq line to line	mH	
41	Encoder pulses	25000	0	1024	1024	Read only	——	0 ~ 25000	Pulse per rev.	pls	
49	Door Width (inch)	65535	0	48	48	Read only	——	0~65535 inch	Door Width(inch)	"	
50	Door Weight	1200	200	225	225	Read & Write	0	200 ~ 1200 lbs	Door Weight	lbs	
52	DOOR TYPE	5	1	2	2	Read & Write	0	1 – 1S SO 2 – 2S SO 3 – 3S SO 4 – 1S CO 5 – 2S CO	Door Type		
GROUP 2: DOOR PARAMETERS											
58	Basic Tuning Speed Rate	100.0	50.0	77.0	77.0	Read & Write	0	50.0 ~ 100.0%	Btun Speed Rate	%	
59	Stall Current Level of Learning	200.0	0.0	180.0	180.0	Read & Write	1	0.0~200.0%	Learning Current Lev	A	YES
60	Close average kinetic energy (Smart tuning)	10.00	3.00	6.00	6.00	Read & Write	0	3.00 ~ 10.00 J (For Smart tuning)	Clos ave-kinetic	J	
61	Scan Freq.	8.63	0.10	6.00	6.00	Read & Write	1	0.10 ~ 8.63Hz, should be lower than Par.144 & Par.159	Scan Spd	Hz	
62	Learning Freq.	120.00	0.10	5.00	5.00	Read & Write	1	0.1 ~ 120.00Hz	Learning Spd	Hz	
63	Auto-Learning	1	0	0	0	Read & Write	0	0: disable 1: enable	Learning Mode		
64	Regular Door Width	65535	0	8800	8800	Read & Write	0	0~65535 pulse	Regular Width	pls	
66	Advance DPM	100.0	0.0	7.5	7.5	Read & Write	1	0 ~ 100.0 %	Advance DPM	%	
69	CODE DISTANCE REG/HEAVY	65535	0	8488	8488	Read only	TBD.	1" FOR S/O. 2" FOR C/P FROM DCL	Code width reg.		
71	Motor direction	2	1	1	1	Read & Write	0	Ensure the direction of the Encoder is in sync with the Motor direction. This parameter can be learned automatically by easy tuning.	Hand Selection		
73	Stall Current Level of Scan	200.0	0.0	180.0	180.0	Read & Write	1	0.0 ~ 200.0%	Scan Current Lev. H	A	YES
GROUP 3: OPEN DIRECTION PARAMETERS											
76	Clutch Distance	576	320	320	320	Read & Write	0	320~576 pulse	CLUTCH Distance	pls	
77	ACC. Quick Stop Rev.	250.0	0.0	180.0	180.0	Read & Write	1	0.0 ~ 250.0% of Motor Rated Current	ACC. Quick Stp Rev.	%	YES
78	Quick Stop Rev.	200.0	0.0	180.0	180.0	Read & Write	1	0.0 ~ 200.0% of Motor Rated Current	Quick Stp Rev.	%	YES
79	Holding Torque	100.0	0.0	92.9	92.9	Read & Write	1	0.0~100.0% of 1.2 A	Open HLD Torque	%	YES
80	Holding Speed	180.0	0.0	7.6	7.6	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.144	Open HLD Spd	%	YES
81(95)	Holding Start	100.0	0.0	100.0	100.0	Read & Write	1	0 ~ 100.0 % of Door Width	Holding Start	%	
82(96)	Slow Speed Open	180.0	0.0	5.1	5.1	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.144	Slow Spd SSO	%	YES
83(97)	High Speed Open Start	100.0	0.0	10.0	5.0	Read & Write	1	0.0~100.0%	HSO Start	%	
84	High Speed Open	180.0	0.0	42.3	42.3	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.126, higher than Par.144	High Spd HSO	%	YES
85	Final Speed Open	180.0	0.0	2.5	2.5	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.144	Final Spd FSO	%	YES
86(100)	Final Speed Open Start	100.0	0.0	93.0	95.0	Read & Write	1	0 ~ 100.0 % of Door Width	FSO Start	%	
87	Open Acc. Time	100.0	0.1	1.7	1.7	Read & Write	1	0.1 ~ 100.0 sec	Open Acc. TM	sec	
88	Open Dec. Time	100.0	0.1	1.7	1.7	Read & Write	1	0.1 ~ 100.0 sec	Open Dec. TM	sec	
91	ACC. Quick Stop Rev.	250.0	0.0	180.0	180.0	Read & Write	1	0.0 ~ 250.0% of Motor Rated Current	Hvy HSO Start	%	YES

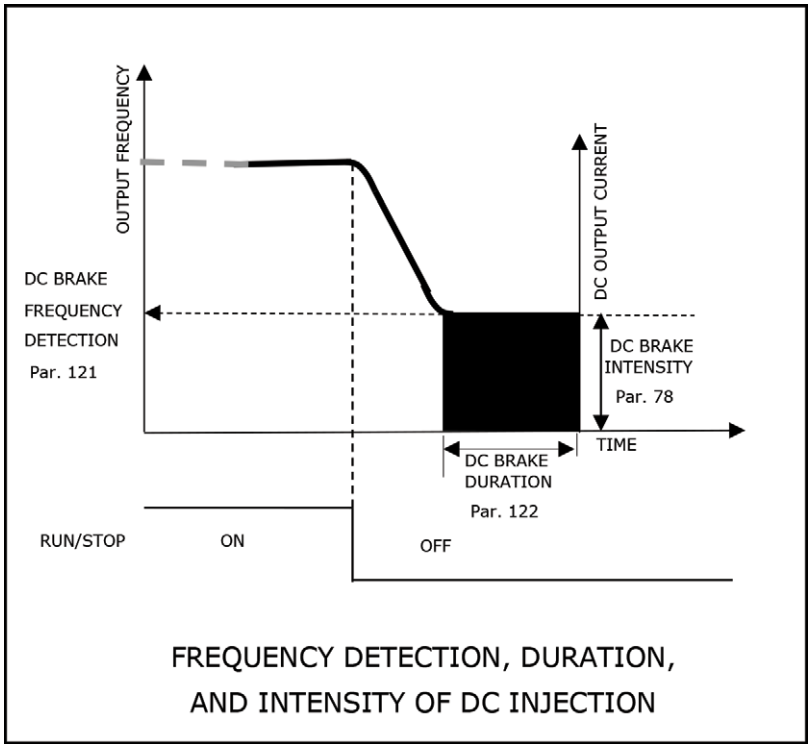
MONXT Pr. No.	Functions : Regular : Heavy : Narrow	Max	Min	Default Linear Straight C/P	Default Linear Straight S/O	Read/Write	1: Available to set when running	Setting	LCD Text Description (16bit)	LCD Text Unit (4 bit)	LCD Text Change to % ?
92	Quick Stop Rev.	200.0	0.0	180.0	180.0	Read & Write	1	0.0 ~ 200.0% of Motor Rated Current	Hvy Quick Rev.	%	YES
93	Holding Torque	100.0	0.0	92.9	92.9	Read & Write	1	0.0~100.0% of 1.2 A	Hvy Open HLD Tor	%	YES
94	Holding Speed	180.0	0.0	7.6	7.6	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.159	Hvy Open HLD Spd	%	YES
95(81)	Holding Start	100.0	0.0	100.0	100.0	Read only	——	0 ~ 100.0 % of Door Width	Hvy HLD Start	%	
96(82)	Slow Speed Open	180.0	0.0	5.1	5.1	Read only	——	0.0 ~ 180.0% of Par.27, should be lower than Par.159	Hvy Spd SSO	%	YES
97(83)	High Speed Open Start	100.0	0.0	5.0	5.0	Read only	——	0.0 ~ 100.0%	Hvy HSO Start	%	
98	High Speed Open	180.0	0.0	42.3	42.3	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.126, higher than Par.159	Hvy Spd HSO	%	YES
99	Final Speed Open	180.0	0.0	2.5	2.5	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.159	Hvy Spd FSO	%	YES
100(86)	Final Speed Open Start	100.0	0.0	95.0	95.0	Read only	——	0 ~ 100.0 % of Door Width	Hvy FSO Start	%	
101	Open Acc. Time	100.0	0.1	1.7	1.7	Read & Write	1	0.1 ~ 100.0 sec	Hvy Open Acc. TM	sec	
102	Open Dec. Time	100.0	0.1	1.7	1.7	Read & Write	1	0.1 ~ 100.0 sec	Hvy Open Dec. TM	sec	
126	Max. Open Speed	66.66	0.00	29.00	29.00	Read & Write	1	0.00 ~ 66.66Hz, should be lower than Par.27, higher than Par.84 & Par.98	Max. Open Spd	Hz	
127	Open Timeout	180.0	0.0	50.0	50.0	Read & Write	0	0.0 ~ 180.0 sec (0.0: disable)	Open Timeout	sec	
128	Open Lock Torq. 1	150.00	0.00	80.00	80.00	Read & Write	1	0.0 ~ 150.0% of Motor Rated Current	Open Lock Torq1	A	YES
129	Open Lock Torq. 2	150.00	0.00	80.00	80.00	Read & Write	1	0.0 ~ 150.0% of Motor Rated Current	Open Lock Torq2	A	YES
130	Open Holding Time	999.9	0.0	0.0	0.0	Read & Write	1	0.0 ~ 999.9 sec		sec	
131	Open Acc S-Curve	10.0	0.0	0.2	0.2	Read & Write	1	0 ~ 10.0 sec	Open Acc Scurve	sec	
132	Open Acc S-Curve2	10.0	0.0	0.2	0.2	Read & Write	1	0 ~ 10.0 sec	Open Acc Scurve2	sec	
GROUP 4: CLOSE DIRECTION PARAMETERS											
136	Close Obstruct limit Force	54.0	0.0	38.0	38.0	Read & Write	1	0.0 ~ 54.0% of Motor Rated Current	Clo Obstruct LIM	%	
137	Holding Torque	100.0	0.0	79.9	79.9	Read & Write	1	0.0~100.0% of 1.2 A	Close HLD Torq.	A	YES
138(153)	Holding Speed	180.0	0.0	7.6	7.6	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.144	Close HLD Spd	Hz	YES
139(154)	Holding Start	100.0	0.0	6.0	6.0	Read & Write	1	0 ~ 100.0 % of Door Width	Holding Start	%	
141	High Speed Close	180.0	0.0	21.8	21.8	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.185, higher than Par.144	High Spd HSC	Hz	YES
142	Final Speed Close	180.0	0.0	2.5	2.5	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.144	Final Spd FSC	Hz	YES
143(158)	Final Speed Close Start	100.0	0.0	14.0	6.0	Read & Write	1	0 ~ 100.0 % of Door Width	FSC Start	%	
144	Nudging Speed	180.0	0.0	12.95	12.95	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.141, higher than Par.61, Par.80, Par.82, Par.85, Par.138, Par.142 & Par.150	Nudging Spd	Hz	YES
145	Close Acc. Time	100.0	0.1	1.5	1.5	Read & Write	1	0.1 ~ 3600.0 sec	Close Acc. TM	sec	
146	Close Dec. Time	100.0	0.1	8.0	3.0	Read & Write	1	0.1 ~ 3600.0 sec	Close Dec. TM	sec	
147	ACC. Stall Rev. Force	200	100	120	120	Read & Write	1	100 ~ 200% of Motor Rated Current	Stall Rev Acc	A	YES
148	Stall Rev. Force	150.0	0.0	52.0	52.0	Read & Write	0	0.0 ~ 150.0% of Motor Rated Current	Stall Rev Normal	A	YES
149	Low Spd. Stall Rev. Force	150.0	0.0	52.0	52.0	Read & Write	1	0.0 ~ 150.0% of Motor Rated Current	Stall Rev Lo Spd.	A	YES
150	Slow Spd SSC	180.0	0.0	2.5	2.5	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.141	Slow Spd SSC	Hz	YES
151	HSC Start	100.0	0.0	0.0	0.0	Read & Write	1	0.0~100.0%	HSC Start	%	
152	Holding Torque	100.0	0.0	79.9	79.9	Read & Write	1	0.0~100.0% of 1.2 A	Hvy Clo HLD Torq	A	YES
153(138)	Holding Speed	180.0	0.0	7.6	7.6	Read only	——	0.0 ~ 180.0% of Par.27, should be lower than Par.159	Hvy Close HLD	Hz	YES
154(139)	Holding Start	100.0	0.0	6.0	6.0	Read only	——	0 ~ 100.0 % of Door Width	Hvy HLD Start	%	
156	High Speed Close	180.0	0.0	21.8	21.8	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.185, higher than Par.159	Hvy High HSC	Hz	YES
157	Final Speed Close	180.0	0.0	2.5	2.5	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.159	Hvy FSC	Hz	YES
158(143)	Final Speed Open Start	100.0	0.0	6.0	6.0	Read only	——	0 ~ 100.0 % of Door Width	Hvy FSC Start	%	
159	Nudging Speed	180.0	0.0	12.95	12.95	Read & Write	1	0.0 ~ 180.0% of Par.27, should be lower than Par.156, higher than Par.61, Par.94, Par.96, Par.99, Par.153, Par.157 & Par.150	Hvy Nudg Spd	Hz	YES
160	Close Acc. Time	100.0	0.1	1.5	1.5	Read & Write	1	0.1 ~ 100.0 sec	Hvy Clo. Acc.	sec	
161	Close Dec. Time	100.0	0.1	3.0	3.0	Read & Write	1	0.1 ~ 100.0 sec	Hvy Clo. Dec.	sec	
162	ACC. Stall Rev. Force	200	100	120	120	Read & Write	1	100 ~ 200% of Motor Rated Current	Hvy Stall Acc	A	YES
163	Stall Rev. Force	150.0	0.0	52.0	52.0	Read & Write	0	0.0 ~ 150.0% of Motor Rated Current	Hvy Stall Normal	A	YES
164	Low Spd. Stall Rev. Force	150.0	0.0	52.0	52.0	Read & Write	1	0.0 ~ 150.0% of Motor Rated Current	Hvy Stall Dec Lo Spd.	A	YES
181	Re-open detect time	10.00	0.00	0.05	0.05	Read & Write	1	0.00~10.00sec	Reopen detect T	sec	
182	Fast Dec. Time	10.0	0.1	0.1	0.1	Read & Write	1	0.1 ~ 10.0 sec	Fastest Dec. TM	sec	
185	Max. Close Speed	66.66	0.00	18.00	18.00	Read & Write	1	0.00 ~ 66.66Hz, should be lower than Par.27, higher than Par.141 & Par.156	Max. Close Spd	Hz	
186	Close Timeout	180.0	0.0	50.0	50.0	Read & Write	0	0.0 ~ 180.0 sec (0.0: disable)	Close Timeout	sec	
187	Close Lock Torq. 1	150.00	0.00	60.00	60.00	Read & Write	1	0.0 ~ 150.0% of Motor Rated Current	Close Lock Torq1	A	YES
188	Close Lock Torq. 2	150.00	0.00	60.00	60.00	Read & Write	1	0.0 ~ 150.0% of Motor Rated Current	Close Lock Torq1	A	YES
189	Close Holding Time	999.9	0.0	0.0	0.0	Read & Write	1	0.0 ~ 999.9 sec		sec	
190	Close Acc S-Curve	10.0	0.0	0.2	0.2	Read & Write	1	0 ~ 10.0 sec	Close Acc Scurve	sec	
191	Close Acc S-Curve 2	10.0	0.0	0.2	0.2	Read & Write	1	0 ~ 10.0 sec	Close Acc Scurve2	sec	
GROUP 5: DIGITAL I/O PARAMETERS											
196	LED Delay Time	10.00	0.00	3.00	3.00	Read & Write	1	0 ~ 10.00 sec	LED Delay Time	sec	
202	DETECTOR EDGES MODE	2	0	2	2	Read & Write	1	0: disable 1: NPN 2: PNP	DET. EDGES MODE		
203	DCL Reset	1	0	0	0	Read & Write	0	0: Enable door position reset in DCL 1: Disable door position reset in DCL	DCL Reset		

4.7 WIRING DIAGRAM



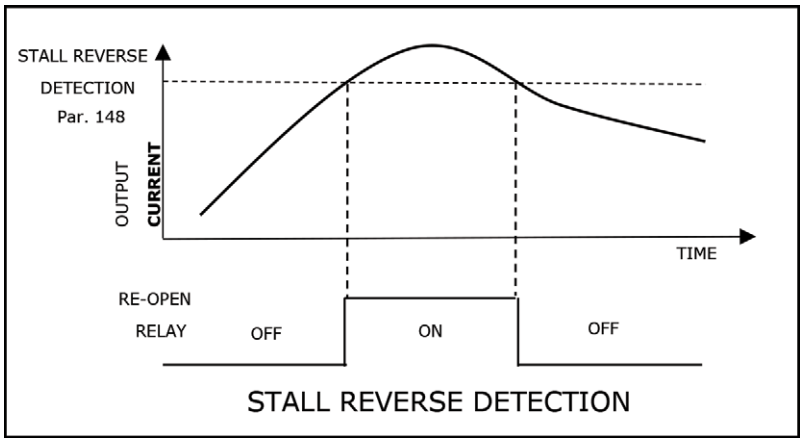
4.8 SUPPORTIVE GRAPHS

1. DC Injection



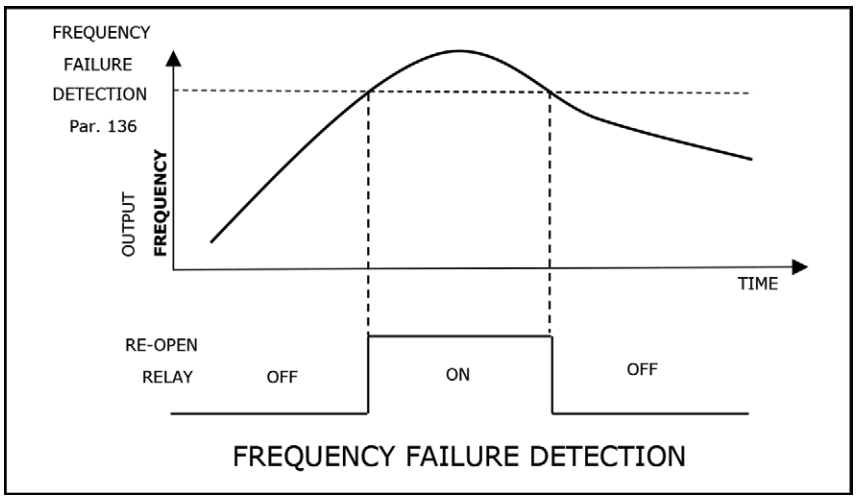
FREQUENCY DETECTION, DURATION, AND INTENSITY OF DC INJECTION

2. Stall Reverse Detection



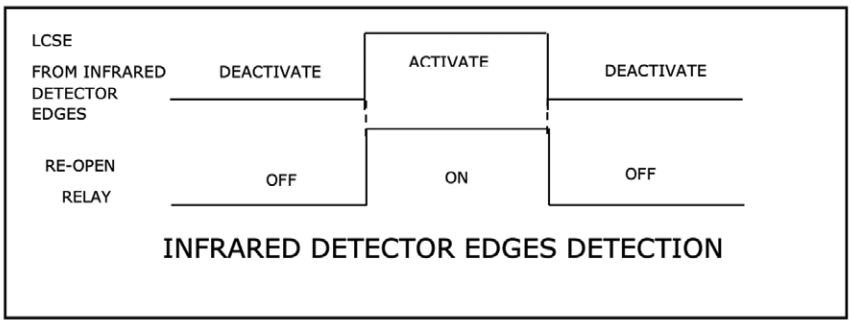
STALL REVERSE DETECTION

3. Frequency Failure Detection



FREQUENCY FAILURE DETECTION

4. Infrared Detector Edges Detection



INFRARED DETECTOR EDGES DETECTION

4.9 FAULT LIST AND ERROR CODES

Code	Error	Reset	Auto Reset	Record	Treatment	Troubleshooting	Reset Condition	Display on keypad			Simulation method		Remark
								Display text (16)	Reason Text (32)	Remedy Text (64)	Error simulation	Recovery	
1	Over-current	ˇ	ˇ	ˇ	Coast to Stop	1. Check the wiring of input power, motor, and ground. 2. Hardware failed, please return to GAL.	Current continues < 50% rated current for 5 sec	Over-current	Current > 300% Rated Current.	Heavy Load Wrong Accel. Wrong Torque Defective Drive	N/A	N/A	Rated Current =3.5A
2	Over-voltage				Coast to Stop	1. It might be caused by high regenerative voltage when changing run direction or decelerating speed in a short time. Please Increase deceleration time to decrease regenerative voltage. 2. Check if the input voltage spike without the rated drive input voltage range 3. Check for possible voltage transients.	Vbus < 385 volt (230V drive)	Overvoltage	DC Bus Voltage > 405VDC	Fast Decel. Sudden Load DB Res. Open High Transient	1. Couple with loading tool(ex: loading servo drive) 2. Parameter setting: pr00-09 = 4(CC01) pr00-08 = 0(CC01) pr00-13 = 2(CC01) pr00-15 = 66.66(CC01) 3. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to AUTO. 4. Decrease values of Par.88 and 161. 5. Press RUN (CC01) and wait for the operator running at a steady speed. 6. Press stop(CC01).	Press Reset	
3	Overheat				Coast to Stop	1. Ensure that the ambient temperature falls within the specified temperature range. 2. Make sure that the ventilation holes are not obstructed. 3. Remove any foreign objects from the heat sink and check for possible dirt in the heat sink. 4. Provide enough spacing for adequate ventilation.	Temperature < 100˚C	Overheat	Heatsink Temp. >100˚C	Ambient Temp. Heavy Load Excessive Use Heatsink Fins	N/A	N/A	
4	Drive Over Load	ˇ	ˇ	ˇ	Coast to Stop	1. Check whether the resistance of the door mechanism increases, resulting in larger opening and closing currents.	Current continues < 50% rated current for 5 sec	Drive Overload	Drive Current >150% for 60sec	Heavy Load Wrong Accel. Wrong Torque Wrong CED	1. Couple with loading tool(ex: loading servo drive) 2. Parameter setting: pr00-09 = 4(CC01) pr00-08 = 0(CC01) pr00-13 = 2(CC01) pr00-15 = 66.66(CC01) 3. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to AUTO. 4. Keep output current be higher than 150% rated current for 60 sec by adjusting the torque of loading tool.	1. Wait for 30.0 sec. 2. Press Reset	

Code	Error	Reset	Auto Reset	Record	Treatment	Troubleshooting	Reset Condition	Display on keypad			Simulation method		Remark
								Display text (16)	Reason Text (32)	Remedy Text (64)	Error simulation	Recovery	
10	Over-current during accel.				Coast to Stop	1. Increase acceleration time. 2. Check for possible poor insulation or shooting of UVW.	Current continues < 50% rated current for 5 sec	OC at Accel	Accel. Current > 300% Rated Current.	Heavy Load Wrong Accel. Wrong Torque Defective Drive	Short wires of UVW with Electromagnetic contactor **(NECESSARY!)** in acceleration status.	1. Recover wiring of UVW. 2. Press Reset.	
11	Over-current during decel.				Coast to Stop	1. Increase deceleration time 2. Check for possible poor insulation or shooting of UVW.	Current continues < 50% rated current for 5 sec	OC at Decel	Decel. Current > 300% Rated Current.	Heavy Load Wrong Torque Sudden Load Defective Drive	Short wires of UVW with Electromagnetic contactor **(NECESSARY!)** in deceleration status.	1. Recover wiring of UVW. 2. Press Reset.	
12	Over-current during steady-state operation	ˇ	ˇ	ˇ	Coast to Stop	1. Increase acceleration time 2. Check for possible poor insulation or shooting of UVW.	Current continues < 50% rated current for 5 sec	OC at steady	Steady Current >300% Rated Current.	Heavy Load Wrong Torque Sudden Load Defective Drive	Short wires of UVW with Electromagnetic contactor **(NECESSARY!)** in steady-speed status.	1. Recover wiring of UVW. 2. Press Reset.	
13	Ground fault	ˇ	ˇ	ˇ	Coast to Stop	1. Check the wiring connections between the drive and motor for possible short circuits, also to ground 2. Check whether the IGBT power module is damaged. 3. Check for possible poor insulation at the output	Current continues < 50% rated current for 5 sec	Ground fault	Current > 150% for 5 sec.	Defective IGBT Poor Insulation See Manual Defective Drive	N/A	N/A	
14	Under-voltage	ˇ			Coast to Stop	1. Check if input voltage is normal 2. Check for a possible sudden load.	Vbus > 228 volt (230V drive)	Under Voltage	DC Bus Voltage < 197.5VDC (230Vac)	L1&L2 Volt. Low Defect. DB Res. Abnormal Load See Manual	For 110VAC, change input power to 56VAC. For 220VAC, change input power to 139VAVC.	Recover input power.	
15	CPU READ failure	ˇ		ˇ	Coast to Stop	1. Power up again 2. Return to GAL	Immediately	EEPROM Read Fail	Return to GAL		1. Remove EEPROM from PCB board 2. Power ON	1. CPU Read EEPROM correctly	
26	Encoder loss error				Par.48 = 0: Coast to Stop Par.48 = 1: Warning & Scan mode (default) Par.48 = 2: Warning & Scan mode & Auto Recovery	Check the wiring of the PG feedback	PG detect pin recover	Encoder Loss	Encoder Loss	Encoder Cable Encoder Board See Manual Defective Drive	1. Par.48 = 0; 2. Set [SETUP/RUN] toggle switch to RUN; 3. Set [OPEN/CLOSE] toggle switch to OPEN; 4. Remove the PG line when running. *In most cases, PG Ref Loss will be triggered first.	1. Press Reset 2. Par.48 = 1 or 2 3. Power OFF 4. Connect the PG line	
28	Door open time- out	ˇ	ˇ	ˇ	Coast to Stop	1. Check that the Par.127 setting value is correct. 2. Check whether the door is stuck	Immediately	Open overtime	Open overtime	Machine Binding See Manual Defective Drive	1. Power ON 2. Open the door 3. Door open time > Par.127 setting value	1. Press Reset 2. Change Par.127 setting value	

Code	Error	Reset	Auto Reset	Record	Treatment	Troubleshooting	Reset Condition	Display on keypad			Simulation method		Remark
								Display text (16)	Reason Text (32)	Remedy Text (64)	Error simulation	Recovery	
36	Auto-learning Error				Coast to Stop	1. Check the wiring of the PG feedback 2. Check if motor capacity and parameters are correct or not 3. Try again	Immediately	Autotune Failure	Autotune Failure	Cable to Motor See Manual Defective Drive	1. Power ON 2. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to MAN. 3. Par.30 = 1 4. Set [OPEN/CLOSE] toggle switch to OPEN; 5. From RUN to SETUP during Auto- learning (Generate Stop command)	Press Reset	
37	Encoder fbk error				Coast to Stop	1. Check the wiring of the PG feedback	Recover in the door boundary	Speed Fbk Err	Encoder Feedback Error	Check Par.42 Correct Wiring Defect. Encoder See Manual	1. Power ON 2. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to MAN. 3. Par.42 = 0 4. Set[OPEN/CLOSE] toggle switch to OPEN;	1. Press Reset 2. Par.42 = 1	
43	PG fbk Over speed				Coast to Stop	1. Check the wiring of the PG feedback 2. Power up again	Immediately	PG fbk Over spd	Encoder Feedback Error	Encoder Cable Correct Wiring See Manual Defective Drive	1. Power ON 2. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to MAN. 3. Set Par.46 = 1Hz 4. Set [OPEN/CLOSE] toggle switch to OPEN;	Press Reset	
44	PG fbk deviation Error				Coast to Stop	1. Check the wiring of the PG feedback 2. Power up again	Immediately	PG fbk dev. Err	Encoder Feedback Error	Encoder Cable Correct Wiring See Manual Defective Drive	1. Power ON 2. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to MAN. 3. Set Par.48 = 0, Use CC01 Set Pr03-08=0.01 4. Set [OPEN/CLOSE] toggle switch to OPEN;	1. Press Reset 2. Set Par. 48 = 1	
47	Door Direction tune Failed	ˇ		ˇ	Coast to Stop	1. Check whether the door is stuck 2. Parameter reset, and try again	Immediately	DoorDir Error	Door Direction tune Failed	Learn again See Manual	1. Enter Easy-Tuning Procedures 2. From RUN to SETUP during Kinetic Auto- learning (Generate Stop command)	Press Reset	
49	Door width tune Failed	ˇ		ˇ	Coast to Stop	1. Check whether the door is stuck 2. Parameter reset, and try again	Immediately	DoorWidth Error	Door width tune Failed	Learn again See Manual	1. Enter Easy-Tuning Procedures 2. From RUN to SETUP during Kinetic Auto- learning (Generate Stop command)	Press Reset	
50	Potential Auto- learning Failure	ˇ		ˇ	Coast to Stop	1. Check whether the door is stuck 2. Parameter reset, and try again	Immediately	Potential Error	Potential Auto- learning Failure	Learn again See Manual	1. Enter Easy-Tuning Procedures 2. From RUN to SETUP during Kinetic Auto- learning (Generate Stop command)	Press Reset	
51	Kinetic Auto- learning Failure	ˇ		ˇ	Coast to Stop	1. Check whether the door is stuck 2. Parameter reset, and try again	Immediately	Kinetic Error	Kinetic Auto- learning Failure	Learn again See Manual	1. Enter Easy-Tuning Procedures 2. From RUN to SETUP during Kinetic Auto- learning (Generate Stop command)	Press Reset	
52	Door Auto- learning interruption	ˇ		ˇ	Coast to Stop	1. Check whether the door is stuck 2. Parameter reset, and try again	Immediately	Operate Error	Door Auto- learning interruption	Learn again See Manual	1. Enter Easy-Tuning Procedures 2. Press ESC during Easy tuning (Generate Stop command)	Press Reset	
53	Encoder loss error				Par.48 = 0: Coast to Stop Par.48 = 1: Warning & Scan mode (default) Par.48 = 2: Warning & Scan mode & Auto Recovery	Check the wiring of the PG feedback	PG detect pin recover	PG Ref Loss	Encoder Wiring Error	Correct Wiring Defect. Encoder See Manual	1. Par.48 = 0 2. Remove the PG line 3. Set [SETUP/RUN] toggle switch to RUN; Set [AUTO/MAN.] toggle switch to MAN.	1. Press Reset 2. Par.48 = 1 or 2 3. Power OFF 4. Connect the PG line	

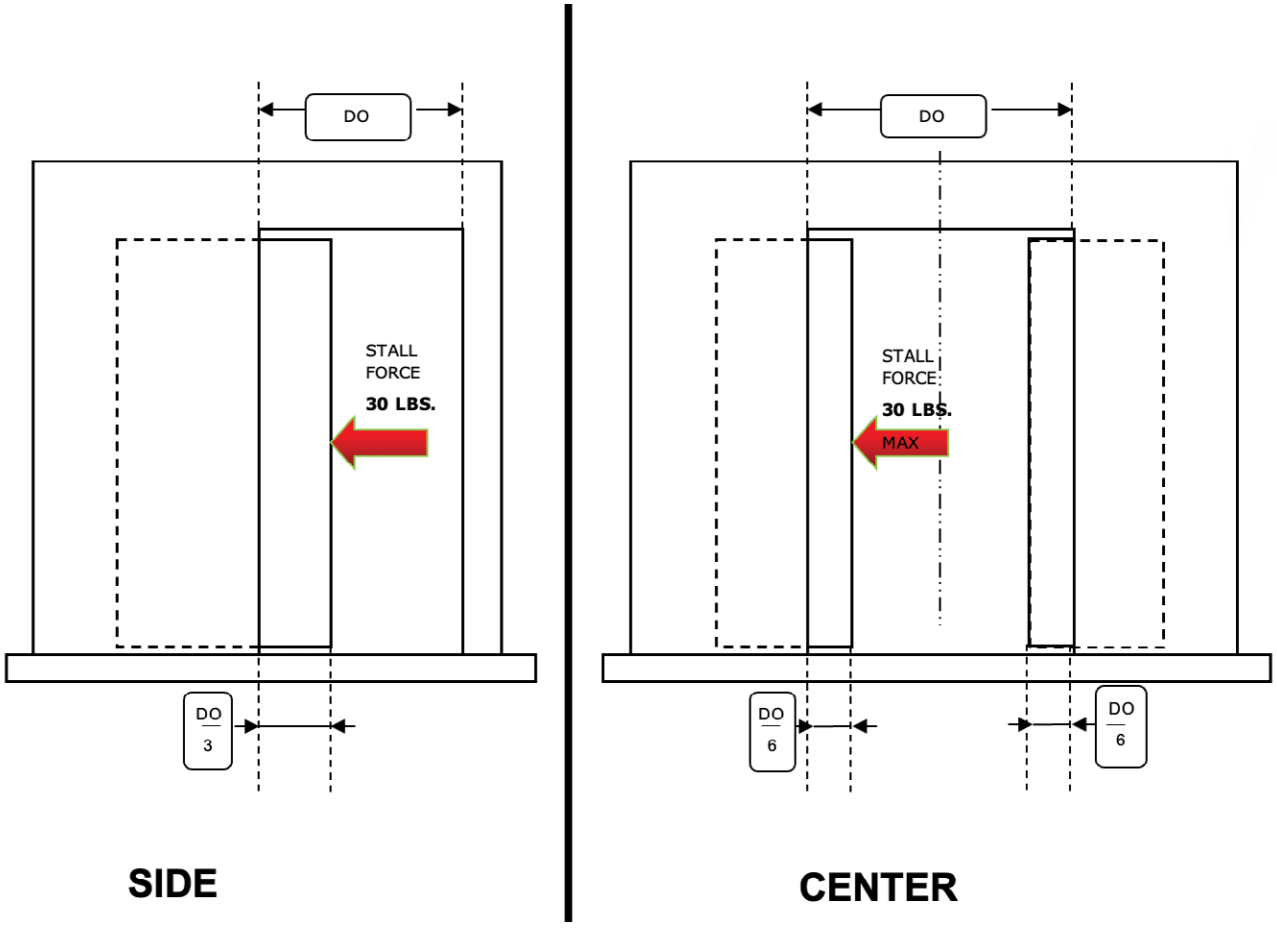
4.10 DOOR STALL FORCE MEASUREMENT

The most practical way to measure the stall force of the door 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 less than **30** Lbs to comply with ASME, A17.1, Rule 112.4/5, and CSA/B44, Rule 2.13.4/5.

SPRING GAUGE



4.11 INTERFACING BETWEEN GAL CERTIFIED INFRARED LIGHT CURTAIN AND MONXT (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

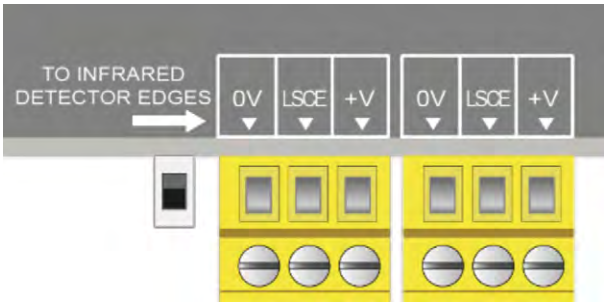
2nd. Over Speed - Controlled by Par. 136

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

Over Torque and Over Speed Detections are the standard features of the MONXT. Therefore, GAL recommends that customers connect the Infrared Detector Edges directly to the MONXT instead of connecting the Infrared Detector Edges to their own power supplies. By doing this, if the detector edges failed, the Over Torque detection will provide a reopen signal so that the main controller can send an OPEN command signal to open the door as a safety redundancy.

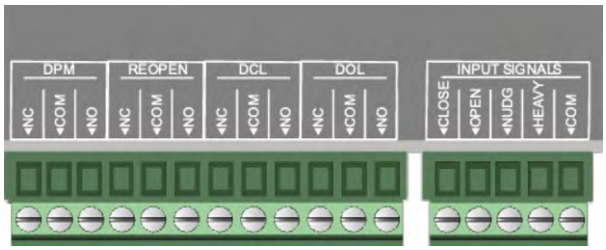
GAL Certified Infrared Detector Edges will always come with the matching connectors CN4 & CN5 to fit the MONXT, and work with the 24VDC power supply. To ensure a seamless interface, customers need to order the Infrared Detector Edges via GAL. Different infrared detector edges may also the to the MONXT. However, users must match connectors CN4 & CN5 electrically, and physically.

How to interface between the Infrared Detector Edges and MONXT:



1. 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 NPN/PNP 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.



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

3. 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 MONXT 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 MONXT.

GAL CERTIFIED INFRARED DETECTOR EDGES WIRE COLORS							
MFG.	**TX (CN5)** 			**RX (CN4)** 			**CONNECTION BETWEEN TX & RX**
	V+	**LCSE**	**0V**	**V+**	**LCSE**	**0V**	
JANUS	RED	BLUE	ORG (•)			ORG (•)	WHT - WHT
TRITRONICS	RED	WHT	ORG				NONE
FORMULA SYSTEMS	BLU 1	BRN 1	GREEN YELLOW	BLU 1	BRN 1	GREEN YELLOW	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 MONXT.

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.*

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.
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If the Infrared Detector Edges function does not work:

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

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	V+	**LCSE**	**0V**	**V+**	**LCSE**	**0V**	
JANUS	RED	BLUE	ORG (•)			ORG (•)	WHT - WHT
TRITRONICS	RED	WHT	ORG				NONE
FORMULA SYSTEMS	BLU 1	BRN 1	GREEN YELLOW	BLU 1	BRN 1	GREEN YELLOW	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,

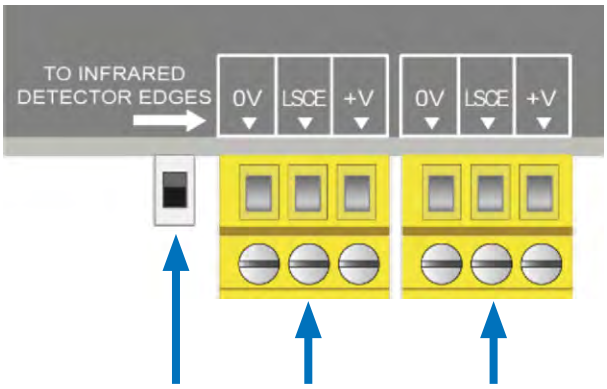
- Jump 0V to LCSE on either CN4 or CN5 connector for NPN type.
- Jump +V to LCSE on either CN4 or CN5 connector for PNP type
- The DETECTOR EDGES LED should be ON.
- The RE-OPEN Relay should be activated.

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 MONXT.

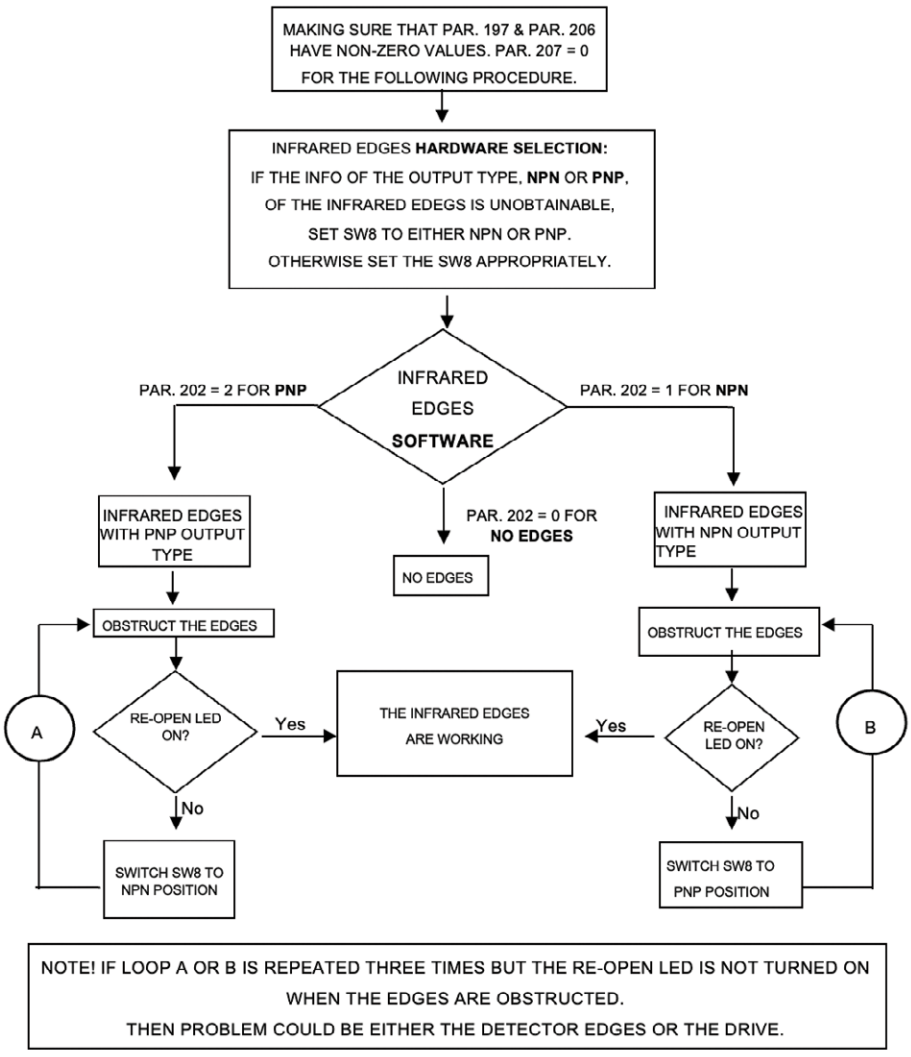
If the Infrared Detector Edges have intermittent problems:

- 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 APPLICATION FLOWCHART



4.12 HEAVY DOOR APPLICATION (OPTIONAL)

The same elevator may have two different hoist-way doors with one set being heavier than the others. Another scenario is the door may be under the high pressure of the ambient environment, i.e., wind pressure. 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.

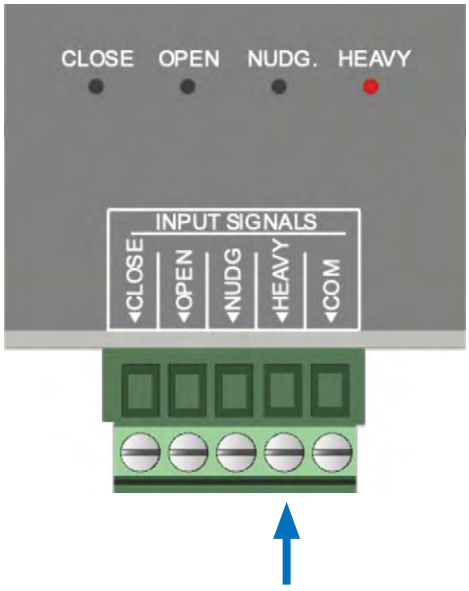
The HEAVY input of the MONXT will resolve this issue. When the HEAVY input is activated, the MONXT will operate with a different set of parameters to accommodate the heavier weight.

To gain access to the parameters of the HEAVY door, users need to provide a command signal to the HEAVY input as indicated below. The HEAVY input is a universal input module that accepts the control signal either in the form of contacts or voltages, 24 - 230V AC or DC. The LED of the input module draws current from the elevator controller, not from the MONXT. Therefore, the LED needs to light up to indicate that the elevator controller has sent the HEAVY command.

To learn a "Heavy Door" floor follow the procedure below:

1. Bring the car to the Heavy Door floor to be learned and align with hoistway roller release.
2. Manually Close the Door; Turn the Power SW ON if it is not already
3. Set RUN/SETUP toggle to SETUP
4. Set MAN/AUTO toggle to MAN
5. Momentarily press the HEAVY/RESET toggle towards HEAVY.
6. Hold TUNING/NARROW toggle towards TUNING for 3 seconds
7. Follow prompts on parameter unit

When the drive is given a Heavy Door input it will now use information learned at this floor. Heavy floors use their own parameter set which are Par. 92-105, and Par. 152-163.



4.13 SERIAL COMMUNICATION

GAL-CAN protocol is currently used to communicate between the elevator controller and the MONXT door operator.

To setup CAN bus communication,

Set the (RUN/SETUP) switch to SETUP.

Set the (AUTO/MAN) switch to MAN.

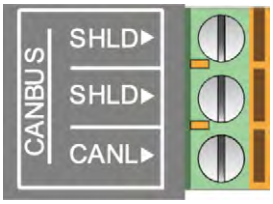
Set Par. 11 = 5 to use the CAN bus. Otherwise, set Par. 11 = 1.

Set Par. 246 = 7 for Front Door. Set Par. 246 = 8 for Rear Door.

Return to Automatic Operation by setting the (AUTO/MAN) switch

To AUTO. The Baudrate, max. 1Mbit, for CANbus, can be set by

Par. 247. The default value for Par. 247 is 115.2kbps.



CANbus Connector

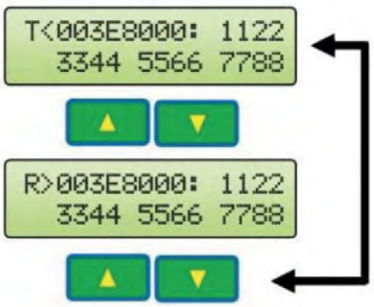
Following are the communication packets:

The mapping below shows the communication 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.

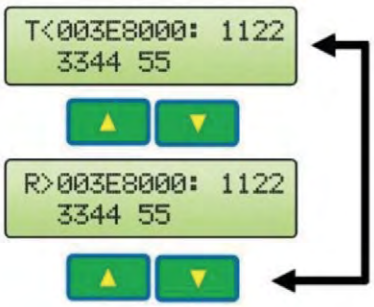
R	»	I_{31-28}	I_{27-24}	I_{23-20}	I_{19-16}	I_{15-12}	I_{11-8}	I_{7-4}	I_{3-0}	:		D_{1H}	D_{1L}	D_{2H}	D_{2L}
		D_{3H}	D_{3L}	D_{4H}	D_{4L}		D_{5H}	D_{5L}	D_{6H}	D_{6L}		D_{7H}	D_{7L}	D_{8H}	D_{8L}
T	«	I_{31-28}	I_{27-24}	I_{23-20}	I_{19-16}	I_{15-12}	I_{11-8}	I_{7-4}	I_{3-0}	:		D_{1H}	D_{1L}	D_{2H}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

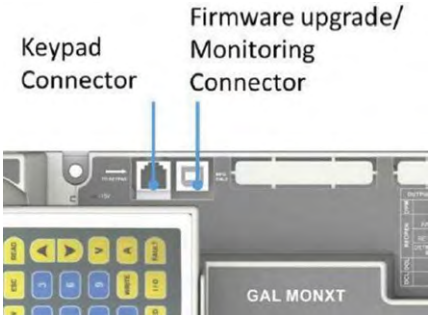
Examples:

DLC = 8



DLC = 5





RJ11 Connector

The RJ-11 connector for the Keypad can also be used for RS-485 serial interfacing. MODBUS protocol is available for this port.

Other communication protocols are available upon request. An agreement between GAL and the requesting party must be made prior to the implementation.

5. MAINTENANCE

5.1 MECHANICAL

Regular preventive maintenance is recommended depending on usage and environment. The following should be periodically checked for proper adjustment and operation.

5.1.1 DRIVE BELT

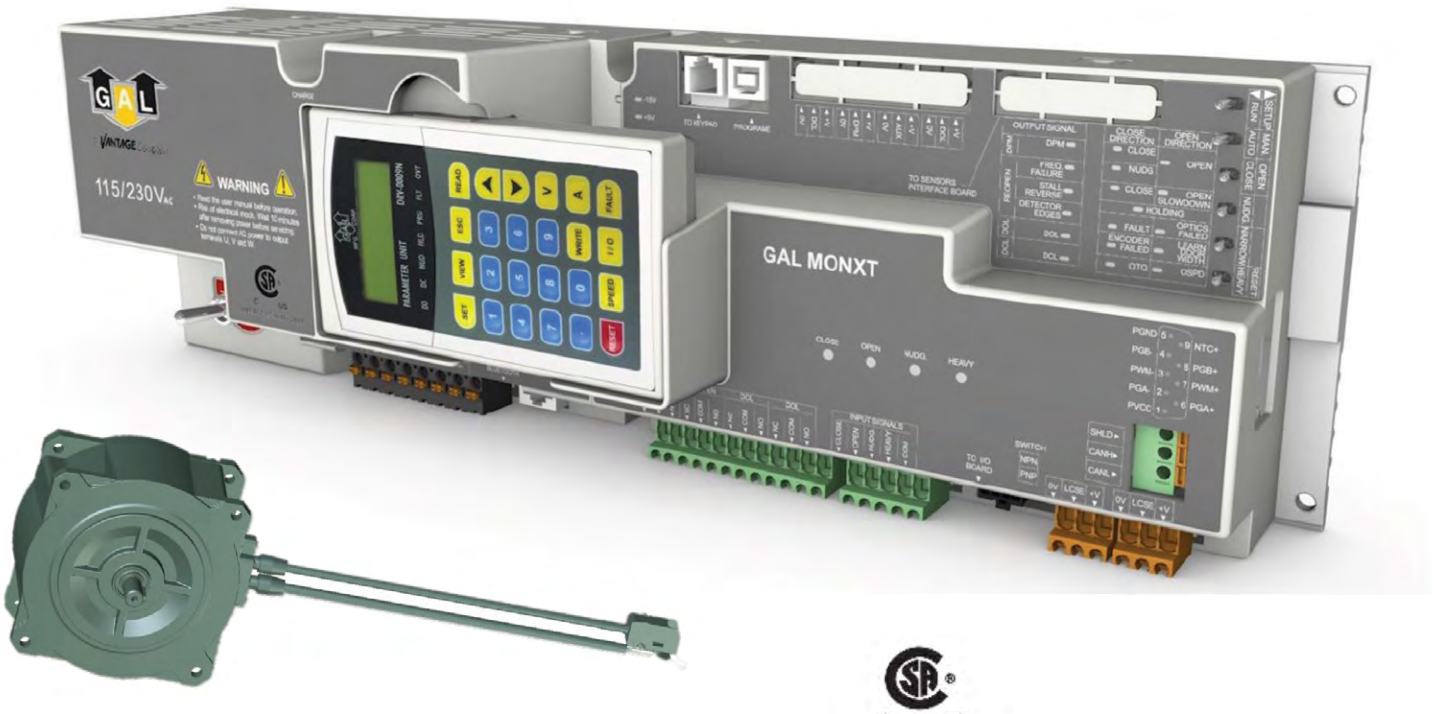
Improper belt tension may result in belt slippage, erratic door operation, or accelerated component wear. You can check for proper belt tension by trying to touch the upper and lower belt to each other at the center of the opening. The two halves should touch easily but there should not be slack in the belt. When the door opens or closes, the belt should not have a large amount of sag on the low-tension side. However, the chevron style belt does not require a lot of tension in order to remain in place. Too much tension will accelerate component wear.

5.1.2 FASTENERS

Although applying proper torque to fasteners during setup should prevent loosening over time, the fasteners might become loose under special circumstances. If this happens, tighten the fasteners per “Bolts and Torque” section (Page 6).

MONXT

LINEAR DOOR OPERATOR MANUAL



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