MOVFR³ Door Operator



INSTALLATION & ADJUSTMENT MANUAL

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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 Note

All equipment must be installed, adjusted, tested, and maintained to comply with all Federal, State, and Local codes. See section 8.5, page 29 in this manual for Kinetic Energy and closing force requirements. Before mounting the operator, check that the car door is plumb, free, and moves easily without binding. Check the attached standard measurements sheets in Section 7. Install the operator according to these measurements.

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, tracks, hangers, etc. 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, G.A.L. operators will provide many years of trouble-free service.

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CONTENTS

| COMMENTS | 1 |
|---|----|
| IMPORTANT NOTE | 1 |
| FOREWORD | 1 |
| MOVFR ³ MECHANICAL ADJUSTMENTS | 4 |
| 1. MOVFR ³ OPERATORS | 5 |
| 2. DETERMINING THE HAND OF THE DOOR | 6 |
| 3. MOUNTING THE OPERATOR | 7 |
| 4. PRE-ADJUSTMENT TIP | 8 |
| 5. ADJUSTING SIDE SLIDE DOORS - SINGLE SPEED AND TWO SPEED | 9 |
| 5.1. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOOR CLOSED | 9 |
| 5.2. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOOR OPEN | 10 |
| 6. ADJUSTING CENTER PARTING CAR DOORS | 11 |
| 6.1. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOOR CLOSED | 11 |
| 6.2. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOORS OPEN | 12 |
| 7. OPERATOR DATA TABLES FOR SIDE SLIDE AND CENTER PARTING DOORS | 13 |
| MOVFR ³ ELECTRICAL ADJUSTMENTS | 16 |
| 8. ELECTRICAL ADJUSTMENTS | 17 |
| 8.1. OVERVIEW | 17 |
| 8.2. THE NEXUS DRIVE | 17 |
| 8.3. INITIAL SETUP | 24 |
| 8.4. THE NEXUS PARAMETER UNIT | 25 |
| 8.5. PARAMETER ADJUSTMENTS | 29 |
| 8.6. SPEED PROFILES OF THE MOVFR ³ | 31 |
| 8.7. HEAVY DOOR APPLICATION | 32 |
| 8.8 DOOR STALL FORCE MEASUREMENT | 33 |
| 8.9 HOW TO REPLACE THE DRIVE | 34 |
| 9. PARAMETER LIST | 35 |
| 10. TROUBLESHOOTING GUIDE | 41 |





MOVER MECHANICAL ADJUSTMENTS







1. MOVFR³ OPERATORS

The MOVFR³ door operator utilizes a 1/2 HP AC motor. The controls include the AC motor, encoder, and VVVF drive. The illustrations on this page show the three different versions available (Left-Hand, Right-Hand and Center-Parting) and the clearance envelopes.







2. DETERMINING THE HAND OF THE DOOR

G.A.L. door operators are available for left and right-hand doors (center parting doors use a variation of the left-hand operator). To determine the hand of the door, stand in the lobby facing the elevator doors. 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.

To swap hands in the field, see

https://www.gal.com/wp-content/uploads/2019/05/MOVFR_Hand_Swap_Procedures.pdf



Left Hand Door

Right Hand Door





3. MOUNTING THE OPERATOR

As with all G.A.L. operators, it is important to have the proper mechanical set up. Before continuing, check that doors are hung properly and glide freely with no binding. The spring closer should also be set so that the hoistway door will close fully on its own. The door operator should be mounted in the proper position with the drive arm plumb and the drive links and pivots set according to the data tables, which can be found at https://www.gal.com/products/door-equipment/operators/. Slight differences are acceptable.

Install the isolation pads:

Isolation pads for the operator base are provided to minimize noise and vibration transmission into the cab. These pads must be adhered to the operator base before mounting it to the car top.

Set the header plumb:

Place the operator over the pre-tapped holes in the header assembly. Set the base flush with the face of the header assembly and tighten the front bolts only. Move the operator base and header until the header is perfectly plumb. Temporarily clamp the rear of the base to the operator support to prevent any further movement of the header.

Side opening doors:

With the header assembly correctly installed, the vertical centerline of the operator drive pulley should be 9 3/4" from daylight for a door opening of 22" to 44" and 14 3/4" for a door opening of 45" to 48" (see Figure 2).

Center parting doors:

With the header assembly correctly installed, the center of the door opening lines up with the center of the header track. The center of the operator drive pulley should also line up with center of the opening (see Figure 5).

Determining the position of the front edge of the door operator base:

Mount the drive arms to the drive arm support brackets on the header assembly for center parting doors and to the drive arm support bracket for side slide doors. The mounting brackets are slotted for fine adjustment later, if needed. At this time, position the arms in the center of the bracket and tighten it.

Attach the clutch assembly to the drive door linkage, and then attach the clutch to the drive door using the pre-tapped holes or key-slots on the door panel. Tighten the clutch assembly to the drive door. Attach the other door (for center parting doors) to its linkage and tighten the door bracket to the center of the slots.

Attach the connecting linkage(s) to the drive pulley, making sure that when the word "CLOSED" is on top, the doors will be closed. Tighten the linkage(s) to drive pulley.

Raise or lower the rear operator support bracket mounted to the cab to vertically level the operator drive pulley. This helps to prevent binds in the opening and closing.

Check that the operator arms hang free and are not forced to or away from the operator drive pulley. Slide the operator forward or backward, if necessary. Turn the drive pulley by hand, making sure that the drive arms and connecting links are made in parallel planes to the door and track. If necessary, slide the operator base forward or backward.

Proper positioning of the operator is critical to the life of the arm bearings. Bending of the drive arms will place stress on the bearings, reducing their operating life.

Once the operator base is in correct position, drill the holes to permanently fasten the rear of the operator and tighten all mounting bolts.





4. PRE-ADJUSTMENT TIP

BEFORE PROCEEDING TO THE ADJUSTMENT SECTIONS, READ THE FOLLOWING TIPS (REFER TO FIGURE 1)

Note: The stop rollers are factory set and should not be adjusted. Make sure that in both directions the operator stops against the stop roller and the operator links and bearings are not under stress.

For easier setup during installation do not mount door restricting components until operator adjustments are made. Think of the drive pulley crank arm(s) and the connecting link(s) as each having its own function.

The crank arm determines the total door travel. The further the arm is away from the drive pulley centerline, the further the door travels.

The connecting link determines the door position. The longer the arm, the further the door is from the jamb.

Example:

The door opening is 42" but the door travels only 40" as stopped by the open and close stop rollers.

To correct the under travel, when in the full open position extend the connecting link from the drive pulley to move the door half way to the desired open position and retighten bolts. Then close the operator onto the close stop roller, loosen the crank arm bolts, position the door in the closed position (1 1/4" past daylight) and tighten. This will lengthen the crank arm dimension, increasing the travel.

Open the door onto the open stop roller and check the door position. If the door is not in the proper open position, repeat the above steps until correct positions are reached and then ensure all the bolts are properly tightened.

Remember the stop rollers are factory set and should not be adjusted. Make sure that in both directions the operator stops against the stop roller and the operator links and bearings are not under stress.



Figure 1: Drive pulley and connecting link assembly.





5. ADJUSTING SIDE SLIDE DOORS -SINGLE SPEED AND TWO SPEED

5.1. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOOR CLOSED

The door closed is the most important position. Always end adjustments by checking this position. With the door closed and overlaps checked, the car doors should not be closed against a bumper or the strike jamb. Clearance of 1/16" is recommended. Mark the door position on the header for easier reference and repeating.

Mount the operator arms per appropriate template. To adjust, ensure the operator is closed against the stop and loosen the connecting link and crank arm bolts. Position the door to the closed position and re-tighten all bolts. If necessary, move the bolts to new holes.



Referring to Figure 2, with the door fully closed, the crank arm should be a few degrees above the horizontal and the clutch link about 20 degrees above the horizontal. This setting will help prevent slamming, yet still allow manual opening of the doors when the car is stopped at a landing during a power failure.







5.2. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOOR OPEN

While opening and closing the door, please move the door manually. Check for binding to ensure maximum bearing life.

Referring to Figure 3, the best door opening operation occurs when the crank arm and the connecting link are roughly in a straight line (this holds the doors open against the force of the spring or reel closer). The clutch link is about horizontal and the car door is flush with the return jamb.

If the door does not open flush with the return jamb, adjust the connecting link to bring the door half way to the correct position. Then close the door and adjust the crank arm for door closed position (see previous section). Reopen door and check opening. Repeat as necessary.









6. ADJUSTING CENTER PARTING CAR DOORS

We recommend adjusting the driven car door so that it over travels the center of the opening by 1/2". This will allow the car door to match the hoistway door and jambs when fully open (if a double clutch system is used, center the doors). The car doors should not be closed hard against each other. Mark the door position on the header for easier reference and repeating.

NOTE: Center parting doors should be set up as two separate operations. First, set up the left (clutch side) door and then the right (driven side) door. The door closed is the most important position. Always end adjustments by checking this position.



Figure 4: Clutch alignment.

6.1. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOOR CLOSED

Do not have pressure on the meeting car doors. Otherwise, it will place unwanted stress on the arms and bearings.

Mount the operator arms per appropriate template. To adjust, ensure the operator is closed against the stop and loosen the connecting link and crank arm bolts. Position the door being adjusted in the closed position and re-tighten all bolts. If necessary, move the bolts to new holes.

Referring to Figure 5, with the doors fully closed, the connecting links should be about 1 1/2" from the horizontal centerline of the pulley. The clutch link should be at about 20 degrees above the horizontal as shown. This setting will help prevent slamming, yet still allow manual opening of the doors when the car is stopped at a landing during a power failure.



Figure 5: Center parting car doors in the fully closed position.





6.2. CRANK ARM AND CLUTCH LINK POSITIONS WITH DOORS OPEN

While opening and closing the door, please move the door manually. Check for binding to ensure maximum bearing life.

As with side slide doors, the best door opening operation occurs when the crank arm and the connecting link are roughly in a straight line (this holds the doors open against the force of the spring or reel closer). The clutch actuating link should be about horizontal when the car door is flush with the return jamb.

If the door does not open flush with the return jamb, adjust the connecting link to bring the door half way to the correct position. Then close the door and adjust the crank arm for door closed position (see previous section). Reopen door and check opening. Repeat as necessary.

Referring to Figure 6, with the doors fully open, the connecting links should be about 1 1/2" apart. The clutch link should be no more than 10 degrees above the horizontal.



Figure 6: Center parting car door in the fully open position.





7. OPERATOR DATA TABLES FOR SIDE SLIDE AND CENTER PARTING DOORS















| <i>Note: Additional available at gal.</i> | | B | | | 16 ¹ / ₂ SPACE REQUIRED FOR OPER. | | | | | |
|---|------------------------------------|------------------|-----------------------|---------|---|-----------|--------------------------------|------------------------------|------------------|----------|
| | G | | - 1 OFFSET | | - J | | | 50-59 30-49 DOOR OPNG. | 17 15 N | |
| | / | Í | | | D. | | I I M | | | |
| | | | | - 1 | - | | <u>I</u> | | | |
| 59 | 73 | 8 3 | 35 | 8 | 29 1 | 15 | 14 1 | 19 | 7 3 | 34 |
| 58 | 75 | 8 1 6 | 35] | 8 | 29 1 | 15 | 14 1/2 | 19 | 7 3 | 34 |
| 57 | 71 | 7 15 | 35] | 8 | 29 1 | 15 | 14 1/2 | 19 | $7\frac{3}{4}$ | 34 |
| 56 | 73 | 7 13 | 35 3 | 8 | 29 1 | 15 | 14 1 | 19 | 7 34 | 34 |
| 55 | 7] | 7 11 | 35 1 | 8 | 29] | 15 | 14 1 /2 | 19 | 7 3 | 34 |
| 54 | 6 7 16 | 7 1 | 34 | 8 | 29] | 15 | 13 | 19 | 8 <u>1</u> | 33 |
| 53 | 6 <u>5</u> 16 | 7 3 | 34 <u>3</u> | 8 | 29 <u>1</u> | 15 | 13 | 19 | 8 <u>1</u> | 33 |
| 52 | 6 3 16 | 7 1 | 34 <u>5</u> | 8 | 29 <u>1</u> | 15 | 13 | 19 | 8 <u>1</u> | 33 |
| 51 | 6 1 6 | 7 | 34 7 16 | 8 | 29] | 15 | 13 | 19 | 8 <u>1</u> | 33 |
| 50 | 5 15 | 7 | 34 <mark>9</mark> | 8 | 29] | 15 | 13 | 19 | 8 <u>1</u> | 33 |
| 49 | 5 15 | 6 🛔 | 29 8 | 6 | 25] | 12 | 11 1/2 | 15 | 8 🛔 | 29 |
| 48 | 5 13 | 6 🛔 | 29 3 | 6 | 25 1 | 12 | 11 1/2 | 15 | 8 1/4 | 29 |
| 47 | 5 11 | 6 | 29 <mark>7</mark> | 6 | 25 <u>1</u> | 12 | 11 12 | 15 | 8 1/4 | 29 |
| 46 | 5 9 16 | 578 | 30 | 6 | 25 <u>1</u> | 12 | 11 12 | 15 | 8 1 | 29 |
| 45 | 5 7 5 7 6 | 5 3 | 30 1 | 6 | 25 <u>1</u> | 12 | 11 1/2 | 15 | 8 1/2 | 29 |
| 44 | 5 <u>5</u> | 55 | 29] | 6 | 25 <u>1</u> | 12 | 11 1 | 15 | 858 | 28 1/2 |
| 43 | 5 <u>3</u> 16 | 5 <u>1</u> | 29 1 | 6 | 25 1 | 12 | 11 ¹ / ₂ | 15 | 85 | 28 1/4 |
| 42 | 5 1 6 | 58 | 29 3 | 6 | 25 1 | 12 | 11 12 | 15 | 85 | 28 1 |
| 41 | 4 18 | 51 | 29] | 6 | 25] | 12 | 11 1/2 | 15 | 8 8 | 28 1 |
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MOVFR3 ELECTRICAL ADJUSTMENTS







8. ELECTRICAL ADJUSTMENTS

8.1. OVERVIEW

The block diagram and simplified control algorithm of the MOVFR³ Operator are illustrated below:



Figure 7: Block diagram of the MOVFR³ Operator.

8.2. THE NEXUS DRIVE

The MOVFR³ is powered by the NEXUS Drive, which is capable of driving a Harmonic IM Motor Operator, a Linear IM Motor Operator, and a Linear PM Motor Operator.



Figure 8: The anatomy of the NEXUS Drive.





8.2.1. Toggle switches

Six toggle switches are provided for users to adjust the NEXUS Drive and MOVFR³ Operator. These switches can perform the following functions:

- Learning the door width
- Tuning
- Troubleshooting
- Operating the doors in manual mode
- Verifying the operation of the door

See the Table below for a description of the function of each switch:



Figure 9: NEXUS Toggle Switches

| SWITCH LABEL | POSITION | FUNCTION |
|-------------------|----------|--|
| RUN/ | RUN | Allows the operator to run in normal operation. |
| SETUP | SETUP | Allows users to adjust certain Parameters that cannot be changed during operation. Puts the drive into STOP mode, and no power will be delivered to the motor. |
| ΑΠΤΟ/ | AUTO | Allows the operator to run in normal operation. |
| MAN. | MAN. | Allows opening and closing the door by means of the OPEN/CLOSE, NUDG., NARROW, and HEAVY toggle switches. |
| OPEN/ | OPEN | Opens the door when the AUTO/MAN. switch is in the MAN. position. |
| CLOSE | CLOSE | Closes the door when the AUTO/MAN. switch is in the MAN. position. |
| NUDG. | NUDG. | Allows closing the door at a reduced speed (Nudging speed). To test the Nudging speed in Manual mode, flip the RUN/SETUP to the RUN position & AUTO/MAN. to the MAN. position. The CLOSE/OPEN and NUDG. switches must be pressed to the CLOSE and NUDG. positions. |
| NARROW/ TUNING | NARROW | If toggle is in NARROW position, allows operator to work in conjunction with OPEN/CLOSE and NUDG. switches if RUN/SETUP switch is set to RUN position and AUTO/MAN. is set to MAN. position. |
| | TUNING | Used to learn the door width during setup. See Easy Tuning section on page |
| HEAVY/ RESET | HEAVY | If toggle is in HEAVY position, allows operator to work in conjunction with OPEN/CLOSE and NUDG. switches if RUN/SETUP switch is set to RUN position and AUTO/MAN. is set to MAN. position. |
| | 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. |





8.2.2. 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.



8.2.3. 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 MOVFR³. Therefore, these LEDs must be lit to indicate that the elevator controller sent commands. In AUTO mode, the MOVFR³ will only monitor input signals from the elevator controller, not from toggle switches.



CLOSE OPEN NUDG. HEAVY

Figure 11: Input connection Methods 1 & 2.



19

8.2.4. 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.



Figure 12: NEXUS output terminals.

| LED LABEL | MEANING | FUNCTION |
|-----------|-------------------------------|--|
| 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. DPM position can be modified by adjusting Parameter 66. |
| REOPEN | Door 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 Parameter 148 DETECTOR EDGES: controlled by Parameter 202 |
| DCL | Door Close Limit | After learning the door width, NEXUS will assign the DCL output signal at the fully closed position of the door. |
| DOL | Door Open Limit | After learning the door width, NEXUS will assign the DOL output signal at the fully open position of the door. |





8.2.5. Encoder connection

The encoder is connected to the NEXUS drive with a DB9 to RJ12 adapter.



8.2.6. CANbus

If Controller Area Network (CAN) Protocol (only used for GALaxy Controllers) is employed to communicate with the MOVFR, a CANbus Module MOVFE-0009N must be used. The CANbus card comes pre-installed on all NEXUS Drives to CAN communication with the controller.

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.



Figure 14: CANBUS wire terminals (left) and module, MOVFE-0009N (right).





8.2.7. Infrared Detector Edges

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 NEXUS Drive. The procedure below will assist users to plug-and-play GAL Certified Infrared Detector Edges with the NEXUS Drive.

If the edge detectors are not connected to the NEXUS Drive, set Par. 202 = 0 to disable.

NOTE: Connectors labeled [OV | LCSE |+V are interchangeable.

8.2.7.1. Output Type: NPN or PNP

The edge detector output type should be obtained prior to installation. If the type is not known, read the label on the cover tube or the detector edges' manual to determine if the detector edges are NPN or PNP. Set the selector switch accordingly.

Figure 15: Detector edge terminals and NPN/PNP switch.

NPN/PNP Switch

If the output type is unavailable, use the trial-and-error method described below:

- 1. Assume that the edges' output is NPN for the 1st trial.
- 2. Set Par. 202 = 1 for NPN type and ensure that the NPN/PNP switch is set to NPN. See Figure 15 above.
- **3.** Cycle the doors and break the light curtain to trigger a Re-Open signal. The DETECTOR EDGES LED should be on. See Figures 16 & 17.
- 4. If the doors reopen, success! If not, continue to step 5. NOTE: Make sure the REOPEN output contact is connected to the elevator controller.
- 5. Set Par. 202 = 2 for PNP type and flip the NPN/PNP switch to PNP.
- 6. Cycle the doors and break the light curtain to trigger a Re-Open signal. The doors should REOPEN.

8.2.7.2. Testing Detector Edges

Perform the following procedure to test the functionality of the detector edges:

- 1. Set the RUN/SETUP switch to RUN and the MAN/AUTO switch to AUTO. Allow the doors to close.
- 2. As the doors close, obstruct the infrared light curtain to trigger the detector edge. The DETECTOR EDGES LED should be on. See Figures 16 & 17.
- **3.** The REOPEN relay should be activated to send the REOPEN signal to the elevator controller.
- 4. The elevator controller will send the DOOR OPEN command signal to the NEXUS DRIVE to REOPEN the door. THE LED of the OPEN Input module should be on.





Figure 17





8.2.7.3. Troubleshooting Detector Edges

If the Detector Edges are not working, try these steps:

- Check the manual for correct connections between the edges and the NEXUS Drive.
- Check for 24VDC between the 0V and +V on either CN2 or CN3
- Repeat the test procedure outlined in Section 8.2.7.2.

If the Detector Edges still not work, try the following:

- 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 REOPEN Relay should be activated. If not, the problem is in the NEXUS Drive.

If the above step works as described, the problem is in the Detector Edges.

If the infrared Detector Edges have intermittent problems:

- Check the continuity of the TX and RX cables of the infrared detector edges.
- If the cables are good but the problem persists, check the ground connection to the edges.
- Users may need to lower the Carrier Frequency in Par. 1 gradually until the problem is resolved.
- **NOTE:** Lowering the carrier frequency may create more audible noise in the motor.

8.2.7.4. The Advantages of Using GAL Certified Detector Edges

- Users do not need to use an extra power supply for the detector edges.
- The REOPEN relay used for the infrared detector edges has two (2) more safety features to reopen the door. They are over-speed and over-torque detections.

8.2.7.5. Identifying GAL Certified Detector Edges and Connections

| GAL CERTIFIED INFRARED DETECTOR EDGE CONNECTION | | | | | | | | | | | | | |
|---|--------------------|------------|------------|-----------------|------------|------------|-----------------|------------------------|--|--|--|--|--|
| GAL P/N | Manufacturer | | тх | | | RX | | | REMARKS | | | | |
| | | V+ | LCSE | 0V | V+ | LCSE | 0V | IX & RX | | | | | |
| 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 | | | | |





Figure 18: Detector edge terminals.



8.3. INITIAL SETUP

GAL has performed the initial wiring prior to shipping the MOVFR³ to users. The following procedure is described below to guide users through the initial setup process.

- **1. Connect main power** to the NEXUS Drive. The drive can accept 115 or 230 Vac ±10%
- **2. Motor/Encoder Connection:** Verify that the motor and encoder connections are still secured after shipment and installation. Motor power connections are shown on right in Figure 19. The encoder connection is shown on page 21 in Figure 13.





3. Interlock/Edge Detector: Check that the door interlock or gate switch is wired into terminals GS and GS1 (Shown in Figure 19 above. (To the right of the ground connection.) If detector edges are used, verify the connections shown in Figure 19.



5. Easy Tuning® Method:

4. Power on:

- 1. Manually close the door until it is *fully closed.*
- 2. Set the RUN/SETUP toggle to SETUP
- 3. Set the MAN/AUTO toggle to MAN
- 4. Set Par. 63 = 1.
- 5. Flip the TUNING/NARROW toggle towards TUNING
- 6. Follow the prompts on the parameter unit. Use the keypad or arrow keys to adjust the value. Press WRITE to enter and move to the next prompt.
 - Select Motor and Operator Type
 - MOVFR³/MOVFE = Induction Motor (IM)
 - MONXT/OMNI = Permanent Magnet (PM)
 - Enter door speed
 - Enter door weight (in lbs)
 - Enter door opening size (in inches)

The LEARN DOOR WIDTH LED should be flashing during the tuning process. It will turn off after tuning is complete.

During 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".



Figure 20: NEXUS toggles and LEDs.



8.4. THE NEXUS PARAMETER UNIT

The parameter unit is a tool to assist users in the following tasks:

- Easy Tuning
- Changing speed values, acceleration, deceleration, torque, maximum closing speed, carrier frequency, and stall reverse limit.
- Downloading (copying/reading) and uploading (writing) programs to and from the drives.
- Monitoring currents, voltages, speeds, inputs, outputs, faults, and encoder directions.
- Resetting the drive in the event of a drive fault.

8.4.1. Parameter Unit Navigation

8.4.1.1. How to change a parameter:





Wait for the Completed Signal from the Display

8.4.1.2. How to read (COPY All Parameters) from the drive:

Note 1: The Parameter Unit is capable of storing four Sets of Default Parameters and one set of Working Parameters. To Copy a Default Set of Parameters into the Working Set Parameters, see **item 8** of **Section 8.4.1.6**.

Note 2: To Transfer data from one drive to another, users must first READ (COPY) from the First Drive.

Press set . Press 🔺 .

Press READ . Wait for the Completed Signal from the Display.

8.4.1.3. How to write (DOWNLOAD All Parameters) to the drive:

Set SETUP/RUN switch to SETUP.

Press set . Press 🔺

Press WRITE . Wait for the Completed Signal from the Display.





Figure 21: NEXUS Parameter Unit



| CLOSING | PARAM | ETER # | DANCE | DEFAULT VALUE | | | | |
|-------------------|-------|--------|--------|---------------|------|------|------|--|
| | DEC | | KANGE | C/P | | S/0 | | |
| | REG. | | | REG. | HVY. | REG. | HVY. | |
| HOLDING TORQUE | 137 | 152 | 0-100 | 82.4 | 82.4 | 82.4 | 82.4 | |
| HOLDING SPEED | 138 | 153 | 0-180 | 5.1 | 5.1 | 5.1 | 5.1 | |
| HIGH SPEED HSC | 141 | 156 | 0-180 | 24.3 | 24.3 | 24.3 | 24.3 | |
| FINAL SPEED FSC | 142 | 157 | 0-180 | 5.3 | 2.8 | 11.5 | 2.8 | |
| NUDGING SPD | 144 | 159 | 0-180 | 20 | 20 | 20 | 20 | |
| ACCELERATION TIME | 145 | 160 | .1-100 | 1.5 | 1.5 | 1.5 | 1.5 | |
| DECELERATION TIME | 146 | 161 | .1-100 | 3 | 3 | 3 | 3 | |
| STALL REV. FORCE | 148 | 163 | 0-150 | 72 | 52 | 72 | 52 | |

8.4.1.4 Default settings for the MOVFR³ NEXUS Drive:

| ODENING | PARAM | ETER # | DANCE | DEFAULT VALUE | | | | |
|--------------------|-------|--------|--------|---------------|------|------|------|--|
| OPENING | DEC | HVY | KANGE | C | /P | S/0 | | |
| | REG. | | | REG. | HVY. | REG. | HVY. | |
| QUICK STOP ON REV. | 78 | 92 | 0-200 | 180 | 180 | 180 | 180 | |
| SLOW START SSO | 82 | 96 | 0-180 | 11.3 | 11.3 | 11.3 | 11.3 | |
| HIGH SPEED HSO | 84 | 98 | 0-180 | 47 | 47 | 47 | 47 | |
| FINAL SPEED FSO | 85 | 99 | 0-180 | 17.8 | 2.8 | 17.8 | 2.8 | |
| ACCELERATION TIME | 87 | 101 | .1-100 | 1.7 | 1.7 | 1.7 | 1.7 | |
| DECELERATION TIME | 88 | 102 | .1-100 | 1.7 | 1.7 | 1.7 | 1.7 | |

C/P = Center Parting Door

S/O = Side Opening Door

REG. = Regular Doors

HVY. = Heavy Doors





8.4.1.5. Convenience keys:

| Press speed to che | eck the Speed in Hz | | |
|--------------------|-------------------------|--|-----------------------------------|
| | Example: | Output Frequency HSC 19Hz | |
| Press 110 to che | eck Input & Output Sig | gnals. | |
| Inputs: | | | |
| Z: (Reserved) | C: Door Close | O: Door Open | |
| R: Reset | V: Heavy Door | L: Control Bit I | - |
| M: Control Bit M | H: Control Bit H | | |
| Outputs: | | | |
| S: Over Speed | T: Over Torque | F: Fault | |
| | Example: | Z C O R V L M H S T F 0 1 0 0 0 1 0 0 0 0 0 | |
| Press FAULT to che | eck the recent Faults. | | - |
| Press 🔻 or 🔺 | to view all the Faults | | |
| | Example: | Present Fault Under Voltage | |
| Press v to che | eck the Output Voltag | Je. | |
| | Example: | Output Voltage 132.00v | |
| Press A to che | eck the Output Curre | nt. | |
| | Example: | Output Current .0.78A | |
| Press RESET to Res | et the Drive. | | |
| | | | |
| 8.4.1.6. The 🚾 | w keys: | | |
| Press the view ke | y will allow users to v | riew, change, and re | eset to G.A.L. Default parameters |
| Press 🔺 or 🔻 | to navigate through | all the items in the | e VIEW section. |
| Press view to view | w an item. At any time | e, Press Esc to g | et back to the Previous Display. |





- 1. V/I/H Displays the Output Voltage, Output Current, Command Speed, and Actual Speed.
- 2. I/O Displays the Input and Output Signals
 ZCORVLMH STF 1= Activate 0= Deactivate
 (See the Convenience keys in Section 8.4.1.5)
- 3. Faults. (See the Convenience keys in Section 8.4.1.5)

| Press 🔺 or 💙 to View all the Fai |
|----------------------------------|
|----------------------------------|

4. Counters. There are 2 Counters.

Counter 1 will count up to 9,999 times. Counter 2 will count up to 60,000 times. When Counter 1 reaches 9999, Counter 2 will increase 1 The total count will be 600,000,000 times.

- Press 🔺 or 🔻 to View Counter 1 or Counter 2.
- 5. User List.

The User List includes all the Default settings for the MOVFR drive in Section 8.4.1.4.

Press READ , Press 🔺 or 💙 to view all the Parameters in the User List.

NOTE: Users can also change the Value of Parameters in this stage by doing the following:

Press READ , Enter the new value, then Press

Press **ESC** to get back to the Previous Display.

6. Max. cl. Speed

- Press **READ** to view the Maximum Closing Speed.
- Press **ESC** to get back to the Previous Display.

7. Max. cl. Force

- Press **READ** to view the Maximum Closing Force.
- Press **Esc** to get back to the Previous Display.

8. GAL Defaults

Press READ , Press 🔺 or 💙 to pick one of the four sets of Parameters

Standard C/P (Center Parting) Standard S/O (Side Opening) Waterproof C/P (Center Parting) Waterproof S/O (Side Opening) Set RUN/CAM SETUP switch to CAM SETUP

Press write to copy the chosen set of Parameters to the Working Set of Parameters





8.4.1.7. LED indicators:

There are 7 LEDs on the Parameter Unit. DO, DC, NUD, HLD, PRG, FLT, OVT. DO=Door Open, DC=Door Close, NUD=Nudging, HLD=Holding, PRG=Programming Mode, FLT=Fault, OVT=Over Torque. These LEDs indicate the present status of the MOVFR.

8.5. PARAMETER ADJUSTMENTS

CAUTION! All equipment must be installed and adjusted to meet Federal, State/Provincial, and Local Codes.

NOTE 1: The closing Kinetic Energy is affected by the speed and the mass of the door. The closing Kinetic Energy must not exceed Code Limits. For more details about the Kinetic Energy of the G.A.L door operators, go to the section of **Kinetic Energy & G.A.L. Door Operators** of the link:

https://www.gal.com/wp-content/uploads/2019/05/overview.pdf

NOTE 2: The Closing Torque is affected by the Torque adjustment. **The Closing Torque must not exceed Code Limits.**

NOTE 3: Whenever changing any value in the Closing Direction Parameters, the door should be rechecked to meet the Code requirement.

A. Closing sequence:

MAXIMUM CLOSE SPEED (Par. 141): This Parameter is the Limit of the Closing speed. The Default value of this Parameter is 30Hz. If the Closing speed is higher than 30Hz, the Drive will turn on the Frequency Failure (FF) output and activate the Reopen Relay. Users should bear in mind that the Reopen Relay Contact, once activated, will send the re-open signal to the Main Controller ONLY and will wait for the OPEN signal from the Main Controller to Reopen the door. MOVFR will NOT reopen the door by itself.

HOLDING TORQUE (Par. 137): The Holding Torque is activated when the door reaches DOL or DCL. **HOLDING SPEED** (Par. 138): The Holding Speed is activated when the door reaches DOL or DCL.

NOTE: The reason to apply the Holding Power when the door is fully closed or fully open is to prevent the door from drifting or rolling back.

CAUTION! The Holding power should be less than 15W to prevent the motor from unnecessary heating, which would reduce its life.

HIGH SPEED CLOSE – HSC (Par. 141): This is the highest speed for the overall Closing sequence. A higher value produces the faster speed.

FINAL SPEED CLOSE – FSC (Par. 142): This is the Final Closing Speed. It should be set reasonably low so that when the DCL (Door Close Limit) and the Close Stop Roller are reached without slamming or bouncing.

FINAL SPEED CLOSE START (Par. 143): This is the point in the door travel where the door enters Final Speed Close. The parameter is set as a percentage of the total door travel and defaults to 6% for SS and 14% for CP. Meaning that for side slides, the final 6% of door travel is performed in Final Speed Close. Increase the parameter to extend the duration that the door travels in Final Speed Close.

NUDGING SPEED (Par. 144): Nudging Speed is the reduced speed that is equal or less than 60% of the max. HSC. Nudging Speed only happens when DC (Door Close) and NUDG. (Nudging) input signals take place simultaneously.





CLOSE ACCELERATION TIME (Par. 145): A higher value produces a slower acceleration rate for smoother operation. A lower value produces a faster acceleration rate for faster opening times.

CLOSE DECELERATION TIME (Par. 146): Close Deceleration should be set so that the FSC is reached prior to the DCL and the Close Stop Roller position without bouncing.

STALL REVERSE FORCE (Par. 148): The Default value of this Parameter is 1.5Amp. Whenever the current is above this value, the Drive will send a signal to turn on the STALL REVERSE LED and activate the REOPEN Relay. The range for this Parameter is 0-2Amp. If nuisance activation takes place, the value of this Parameter should be increased slightly.

OVERLOAD (Par. 136): This is the Maximum Limit of the Motor Current. If the Motor Current exceeds this Limit, the Drive will be shutdown, generate the OVER CURRENT FAULT, and turn on the FAULT LED. Recycling the Power to MOVFR or pressing the RESET key of the Parameter Unit to Reset the Fault. However, a thorough inspection should be done before Resetting the Fault.

B. Opening Sequence:

QUICK STOP ON REVERSE (Par. 78): Parameter 78 determines how quick the closing door is stopped when a reopen signal is activated. The range of Parameter 78 is from 0 to 6Amp. The lower value setting will produce a longer time to stop before the door can reopen. When the reopen signal is applied, the door should not move more than 2 inches before it reopens.

SLOW START OPEN – SSO (Par. 82): When the door starts to open, the value of Par. 82 is the speed at which the clutch engages the interlock rollers to unlock the hoistway door. A slower speed produces a smoother and quieter unlock.

HIGH SPEED OPEN – HSO (Par. 84): This is the highest speed for the overall opening sequence. The higher value produces a faster speed.

MEDIUM SPEED OPEN – MSO (Par. 84): This speed is used for a fast reopening in the final 1/3 to 1/4 of the opening. When properly adjusted, this speed has little or no effect during the full reopening cycle because the doors will decelerate through MSO zone. Virtually the doors will decelerate from HSO to FSO.

FINAL SPEED OPEN – FSO (Par. 85): This is the Final Opening Speed. It should be set reasonably low so that the DOL (Door Open Limit) and the Open Stop Roller are reached without slamming or bouncing.

OPEN ACCELERATION TIME (Par. 87): A higher value produces a slower acceleration rate for smoother operation. A lower value produces a faster acceleration rate for faster opening times.

OPEN DECELERATION TIME (Par. 88): Open Deceleration should be set so that the FSC is reached prior to the DCL and the Close Stop Roller position without bouncing.

C. Carrier frequency:

CARRIER FREQUENCY (Par. 1): The nominal frequency of the carrier wave is set by Parameter 1. The Default value is 10KHz. The MOVFR Drive is compliant with the CE regulation. However, if adjacent electronics, with poor EMI immunity, are affected by EMI of the MOVFR, users can lower the value of this Parameter to reduce the EMI level. The trade-off is the lower carrier frequency, the more audible noise will be produced by the motor.





8.6. THE NEXUS DRIVE



Figure 22: Open Cycle Speed Profile



Figure 23: Close Cycle Speed Profile





8.7. HEAVY DOOR APPLICATION

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 MOVFR³ will resolve this issue. When the HEAVY input is activated, the MOVFR³ 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 MOVFR³. 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 pressy 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. 91-102, and Par. 152-164.



Figure 24: Heavy door input location (indicated).



8.8. 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 Figure 25 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.



Figure 26: Force measurement locations for side and center parting doors



8.9. HOW TO REPLACE THE DRIVE

- **1.** Before disconnecting the drive from power, copy the parameters from the old drive by following the directions in Section 8.4.1.2.
- 2. Disconnect the door operator power from the machine room.
- **3.** Flip the POWER SWITCH to the OFF position. Wait a few minutes for the drive's internal capacitors to completely discharge.
- 4. Disconnect the POWER & MOTOR CONNECTOR from the drive. The terminal block can be easily pried up from the drive. The wires should not be disconnected individually.
- **5.** Disconnect the OUTPUT SIGNAL, INPUT SIGNAL, and INFRARED EDGES CONNECTOR terminal blocks from the drive. Again, the wires should not have to be disconnected individually.
- 6. If used, disconnect the CANBUS CONNECTOR wires from the drive.
- 7. Disconnect the ENCODER CONNECTOR from the drive, including the RJ12 adapter.
- 8. Remove the GROUND SCREWS from the drive.
- 9. Remove the MOUNTING SCREWS from the drive and set the old drive aside.
- 10. Install the new drive in place of the old drive and secure it using the MOUNTING SCREWS.
- 11. Secure the ground screws and ground wires to the new drive.
- 12. Connect the ENCODER to the new drive.
- 13. If used, connect the CANBUS wires to the new drive.
- 14. Connect the OUTPUT SIGNAL, INPUT SIGNAL, INFRARED EDGES CONNECTOR, and POWER & MOTOR CONNECTOR terminal blocks to the new drive.
- 15. Flip AUTO/MAN toggle to MAN and flip the POWER SWITCH to the ON position.
- 16. Using the parameter unit, write the parameters to the drive as described in Section 8.4.1.3.
- **17.** Use the OPEN/CLOSE toggle to manually cycle the doors. If doors operate as expected, flip AUTO/MAN toggle to AUTO and perform a car call test to verify the elevator is working properly.



Figure 27: The NEXUS Drive with removeable connections and wire terminal blocks indicated.





9. PARAMETER LIST

User Parameters:

| | | | | DEF/ | AULT | | LCD Text | |
|-----|------------------------------|-------|-----|------|------|---|-------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 0 | Stop Mode | 3 | 0 | 3 | 3 | 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 | 2~15 kHz | Carry Freq. | kHz |
| 2 | Parameter Reset | 9999 | 0 | 0 | 0 | 06: Clear all fault record 08: Keypad lock 10: Reset all Parameters | Parameter Reset | |
| 10 | Auto Voltage Regulation | 2 | 0 | 0 | 0 | 0: AVR function enable 1: AVR function disable 2: AVR function disable for decel. | AVR Function | |
| 11 | Operate Source | 6 | 0 | 1 | 1 | 1: External terminals. 3: RS-485 communication. 5. CAN Bus 6. Bluetooth | Start Source | |
| 15 | User Group Read Selection | 65535 | 0 | 0 | 0 | 1206 : for GAL (ALL PARAMETER) | User Group selection | |





Motor and Encoder Parameters:

| | | | | DEF/ | AULT | | LCD Text | |
|-----|------------------------------|--------|-------|-------|-------|---|------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 26 | Maximum Output Voltage | 240.0 | 0.0 | 220.0 | 220.0 | 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 | 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 | 0~100.0% of Pr.26 | Min. Voltage | % |
| 29 | Min Output Freq. | 120.00 | 0.00 | 0.00 | 0.00 | 0.00 to 120.00 Hz, should be lower than Pr.27 | Min. Output Spd | Hz |
| 30 | PM Motor Auto-Tuning | 2 | 0 | 0 | 0 | 00: Disable 01: Auto-tuning for PM motor parameters 02: Auto-tuning for PG offset angle without load | PM Auto tuning | |
| 31 | PM Motor Rated Current | 4.20 | 0.70 | 2.23 | 2.23 | FLA*5% ~ FLA*120% (FLA=3.0A) | PM Rated Current | А |
| 32 | PM Motor Rated Power | 655.35 | 0.00 | 0.34 | 0.34 | Read automatically by setting Pr.31 | PM Rated Power | Kw |
| 33 | PM Motor Rated Speed | 65535 | 0 | 500 | 500 | Read automatically by setting Pr.31 | PM Rated Speed | rpm |
| 34 | PM Motor Pole Number | 96 | 2 | 16 | 16 | 02~96 | Poles of PM | pol |
| 35 | PM Motor Rs | 655.35 | 0.00 | 4.21 | 4.21 | 0.00~655.35 Ω | PM Rs | ohm |
| 36 | PM Offset Angle | 360.0 | 0.0 | 90.0 | 90.0 | 0.0~360.0 deg | PM Offset Angle | deg |
| 37 | IM Motor Auto-Tuning | 2 | 0 | 0 | 0 | 0: No function 1: Rolling test 2: Static test | IM Auto tuning | |
| 38 | IM Motor Rated Current | 4.20 | 0.70 | 2.30 | 2.30 | FLA*5% ~ FLA*120% (FLA=3.0A) | IM Rated Current | А |
| 39 | IM Motor No-Load Current | pr.38 | 0.00 | 0.88 | 0.88 | 40% of pr.38 | IM NL Current | А |
| 40 | IM Motor Rated Power | 655.35 | 0.00 | 0.37 | 0.37 | IM Rated Power | Kw | |
| 41 | IM Motor Rated Speed | 65535 | 0 | 1140 | 1140 | IM Rated Speed | rpm | |
| 42 | IM Motor Pole Number | 48 | 2 | 6 | 6 | 02 ~ 48 | Poles of IM | pol |
| 43 | IM Motor Rs | 65.535 | 0.000 | 8.765 | 8.765 | 0.00~65.535 Ω | IM Rs | ohm |
| 44 | Encoder Pulses | 25000 | 0 | 500 | 500 | 0~25000 | Pulse per rev. | pls |
| 45 | Encoder fbk Input Setting | 2 | 0 | 1 | 1 | 00: Disable 01: Forward / Counterclockwise rotation 02: Reverse / Clockwise rotation | Encoder Input | |
| 46 | PG fbk Speed Deviation Level | 79.99 | 0.00 | 69.00 | 69.00 | 0.00 ~ 79.99 Hz | Fbk Deviation | Hz |
| 47 | Spd fbk Error Detect Time | 10.0 | 0.0 | 0.3 | 0.3 | 0.0 ~ 10.0 sec | Fbk Error Time | sec |
| 48 | Sensorless Enable for PM | 2 | 0 | 0 | 0 | 0: Fault and stop 1: Fault and auto-reset for keeping operation 2: Fault and auto-reset for keeping opera- tion. Auto recover if PG is detected | Sensorless Enable | |
| 49 | Door Width (Inch) | 65535 | 0 | 48 | 48 | 0~65535 inch | Door Width (inch) | u |
| 50 | Door Weight | 1200 | 200 | 225 | 225 | 200 ~ 1500 lbs | Door Weight | lbs |
| 51 | Door Speed | 3 | 1 | 1 | 1 | 1: 1 Speed 2: 2 Speed 3: 3 Speed | Door Speed | |
| 52 | Door Type | 6 | 1 | 1 | 2 | 1: Harmonic C/P + IM 2: Harmonic S/O + IM 3: Linear C/P + PM 4: Linear S/O + PM 5: Linear C/P + IM 6: Linear S/O + IM | Door Type | |





Door Parameters:

| | | | | DEF/ | AULT | | LCD Text | |
|-----|--|--------|------|-------|-------|--|-------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 58 | Basic Tuning Speed Rate | 100.0 | 50.0 | 77.0 | 77.0 | 50.0 ~ 100.0% | Btun Speed Rate | % |
| 59 | Stall Current Level of Learning | 200.0 | 0.0 | 75.0 | 75.0 | 0.0~200.0% | Learning Current Lev | % |
| 60 | Close Average Kinetic Energy (Smart Tuning) | 10.00 | 3.00 | 6.00 | 6.00 | 3.00 ~ 10.00 J (For Smart tuning) | Clos ave-kinetic | J |
| 61 | Scan Freq. | 8.63 | 0.10 | 6.00 | 6.00 | 0.10 ~ 8.63Hz, should be lower than Pr.144 & Pr.159 | Scan Spd | Hz |
| 62 | Learning Freq. | 120.00 | 0.10 | 15.00 | 15.00 | 0.1 ~ 120.00Hz | Learning Spd | Hz |
| 63 | Auto-Learning | 1 | 0 | 0 | 0 | 0: disable 1: enable | Learning Mode | |
| 64 | Regular Door Width | 65535 | 0 | 8800 | 8800 | 0~65535pulse | Regular Width | pls |
| 66 | Advance DPM | 100.0 | 0.0 | 15.0 | 15.0 | 0~100.0% | Advance DPM | % |
| 69 | Code Distance Reg/Heavy | 65535 | 0 | 8488 | 8488 | 1" FOR S/O. 2" FOR C/P FROM DCL | Code width reg. | |
| 73 | Stall Current Level of Scan | 200.0 | 0.0 | 75.0 | 75.0 | 0.0 ~ 200.0% | Scan Current Lev. H | % |

Communication Parameters:

| | | | | DEF/ | AULT | | LCD Text | |
|-----|-------------------------------------|--------|-----|------|--|---|------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 240 | RS485 Node Number (ADDR) | 254 | 1 | 1 | 1 | 1~254 | Comm Node Addr | |
| 241 | RS485 Baudrate (BPS) | 3 | 0 | 1 | 1 0: Baud rate 4800bps 1: Baud rate 9600bps 2: Baud rate 19200bps 3: Baud rate 38400bps | | Comm Data Rate | |
| 242 | RS485 Modbus Protocol (PROTOCOL) | 5 | 0 | 3 | 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 | | Comm Format | |
| 243 | RS485 Connection Loss | 3 | 0 | 3 | 3 | 0: Warn and keep operating 1: Warn and ramp to stop 2: Warn and coast to stop 3: No warning and keep operating | Comm Loss Action | |
| 244 | RS485 Connection Loss Time | 60.0 | 0.0 | 2.0 | 2.0 | 0.0 ~ 60.0 sec (0.0: Disable) | Comm Loss TM | sec |
| 246 | CAN Node Number (CAN ADDR) | 255 | 0 | 7 | 7 | 0~255 | CAN Node Addr | |
| 247 | CAN Baudrate (CAN BPS) | 6553.5 | 0 | 0 | 0 | 0 ~ 6553.5kbps | CAN Data Rate | kbp |





Opening Parameters:

| | | | | DEF | AULT | | LCD Text | |
|---------|----------------------------|--------|------|-------|-------|--|------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 76 | Clutch Distance | 576 | 320 | 320 | 320 | 320~576pulse | CLUTCH Distance | pls |
| 77 | ACC. Quick Stop Rev. | 250.0 | 0.0 | 180.0 | 180.0 | 0.0 ~ 250.0% of Motor Rated Current | ACC. Quick Stp Rev. | % |
| 78 | Quick Stop Rev. | 200.0 | 0.0 | 180.0 | 180.0 | 0.0 ~ 200.0% of Motor Rated Current | Quick Stp Rev. | % |
| 79 | Holding Torque | 100.0 | 0.0 | 95.8 | 95.8 | 0.0~100.0% of 1.2 A | Open HLD Torque | % |
| 80 | Holding Speed | 180.0 | 0.0 | 8.5 | 8.5 | 0.0 ~ 180.0% of Par.27, should be lower than Par.144 | Open HLD Spd | % |
| 81(95) | Holding Start | 100.0 | 0.0 | 97.0 | 97.0 | 0 ~ 100.0 % of Door Width | Holding Start | % |
| 82(96) | Slow Speed Open | 180.0 | 0.0 | 11.3 | 11.3 | 0.0 ~ 180.0% of Par.27, should be lower than Par.144 | Slow Spd SSO | % |
| 83(97) | High Speed Open Start | 100.0 | 0.0 | 5.0 | 5.0 | 0.0~100.0% | HSO Start | % |
| 84 | High Speed Open | 180.0 | 0.0 | 47.0 | 47.0 | 0.0 ~ 180.0% of Par.27, should be lower than Par.126, higher than Par.144 | High Spd HSO | % |
| 85 | Final Speed Open | 180.0 | 0.0 | 17.8 | 17.8 | 0.0 ~ 180.0% of Par.27, should be lower than Par.144 | Final Spd FSO | % |
| 86(100) | Final Speed Open Start | 100.0 | 0.0 | 95.0 | 95.0 | 0 ~ 100.0 % of Door Width | FSO Start | % |
| 87 | Open Acc. Time | 100.0 | 0.1 | 1.7 | 1.7 | 0.1 ~ 100.0 sec | Open Acc. TM | sec |
| 88 | Open Dec. Time | 100.0 | 0.1 | 1.7 | 1.7 | 0.1 ~ 100.0 sec | Open Dec. TM | sec |
| 91 | Hvy ACC. Quick Stop Rev. | 250.0 | 0.0 | 180.0 | 180.0 | 0.0 ~ 250.0% of Motor Rated Current | Hvy HSO Start | % |
| 92 | Hvy Quick Stop Rev. | 200.0 | 0.0 | 180.0 | 180.0 | 0.0 ~ 200.0% of Motor Rated Current | Hvy Quick Rev. | % |
| 93 | Hvy Holding Torque | 100.0 | 0.0 | 95.8 | 95.8 | 0.0~100.0% of 1.2 A | Hvy Open HLD Tor | % |
| 94 | Hvy Holding Speed | 180.0 | 0.0 | 8.5 | 8.5 | 0.0 ~ 180.0% of Par.27, should be lower than Par.159 | Hvy Open HLD Spd | % |
| 95(81) | Hvy Holding Start | 100.0 | 0.0 | 97.0 | 97.0 | 0 ~ 100.0 % of Door Width | Hvy HLD Start | % |
| 96(82) | Hvy Slow Speed Open | 180.0 | 0.0 | 11.3 | 11.3 | 0.0 ~ 180.0% of Par.27, should be lower than Par.159 | Hvy Spd SSO | % |
| 97(83) | Hvy High Speed Open Start | 100.0 | 0.0 | 5.0 | 5.0 | 0.0 ~ 100.0% | Hvy HSO Start | % |
| 98 | Hvy High Speed Open | 180.0 | 0.0 | 47.0 | 47.0 | 0.0 ~ 180.0% of Par.27, should be lower than Par.126, higher than Par.159 | Hvy Spd HSO | % |
| 99 | Hvy Final Speed Open | 180.0 | 0.0 | 2.8 | 2.8 | 0.0 ~ 180.0% of Par.27, should be lower than Par.159 | Hvy Spd FSO | % |
| 100(86) | Hvy Final Speed Open Start | 100.0 | 0.0 | 95.0 | 95.0 | 0 ~ 100.0 % of Door Width | Hvy FSO Start | % |
| 101 | Hvy Open Acc. Time | 100.0 | 0.1 | 1.7 | 1.7 | 0.1 ~ 100.0 sec | Hvy Open Acc. TM | sec |
| 102 | Hvy Open Dec. Time | 100.0 | 0.1 | 1.7 | 1.7 | 0.1 ~ 100.0 sec | Hvy Open Dec. TM | sec |
| 126 | Max. Open Speed | 66.66 | 0.00 | 50.00 | 50.00 | 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 | 0.0 | 0.0 | 0.0 ~ 180.0 sec (0.0: disable) | Open Timeout | sec |
| 128 | Open Lock Torq. 1 | 150.00 | 0.00 | 80.00 | 80.00 | 0.0 ~ 150.0% of Motor Rated Current | Open Lock Torq1 | % |
| 129 | Open Lock Torq. 2 | 150.00 | 0.00 | 80.00 | 80.00 | 0.0 ~ 150.0% of Motor Rated Current | Open Lock Torq2 | % |
| 130 | Open Holding Time | 999.9 | 0.0 | 0.0 | 0.0 | 0.0 ~ 999.9 sec | sec | |
| 131 | Open Acc S-Curve | 10.0 | 0.0 | 0.4 | 0.4 | 0 ~ 10.0 sec | Open Acc Scurve | sec |
| 132 | Open Acc S-Curve2 | 10.0 | 0.0 | 0.4 | 0.4 | 0 ~ 10.0 sec | Open Acc Scurve2 | sec |





Closing Parameters:

| | | | | DEFAULT | | | LCD Text | |
|----------|----------------------------------|--------|------|---------|-------|--|--------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 136 | Close Obstruct Limit Force | 54.0 | 0.0 | 38.0 | 38.0 | 0.0 ~ 54.0% of Motor Rated Current | Clo Obstruct LIM | % |
| 137 | Holding Torque | 100.0 | 0.0 | 82.4 | 82.4 | 0.0~100.0% of 1.2 A | Close HLD Torq. | % |
| 138(153) | Holding Speed | 180.0 | 0.0 | 5.1 | 5.1 | 0.0 ~ 180.0% of Par.27, should be lower than Par.144 | Close HLD Spd | Hz |
| 139(154) | Holding Start | 100.0 | 0.0 | 6.0 | 6.0 | 0 ~ 100.0 % of Door Width | Holding Start | % |
| 141 | High Speed Close | 180.0 | 0.0 | 24.3 | 24.3 | 0.0 ~ 180.0% of Par.27, should be lower than Par.185, hgiher than Par.144 | High Spd HSC | % |
| 142 | Final Speed Close | 180.0 | 0.0 | 5.3 | 11.5 | 0.0 ~ 180.0% of Par.27, should be lower than Par.144 | Final Spd FSC | % |
| 143(158) | Final Speed Close Start | 100.0 | 0.0 | 6.0 | 6.0 | 0 ~ 100.0 % of Door Width | FSC Start | % |
| 144 | Nudging Speed | 180.0 | 0.0 | 20.00 | 20.00 | 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 | % |
| 145 | Close Acc. Time | 100.0 | 0.1 | 1.5 | 1.5 | 0.1 ~ 3600.0 sec | Close Acc. TM | sec |
| 146 | Close Dec. Time | 100.0 | 0.1 | 3.0 | 3.0 | 0.1 ~ 3600.0 sec | Close Dec. TM | sec |
| 147 | Acc. Stall Rev. Force | 200 | 100 | 120 | 120 | 100 ~ 200% of Motor Rated Current | Stall Rev Acc | % |
| 148 | Stall Rev. Force | 150.0 | 0.0 | 72.0 | 72.0 | 0.0 ~ 150.0% of Motor Rated Current | Stall Rev Normal | % |
| 149 | Low Spd. Stall Rev. Force | 150.0 | 0.0 | 72.0 | 72.0 | 0.0 ~ 150.0% of Motor Rated Current | Stall Rev Lo Spd. | % |
| 150 | Slow Spd SSC | 180.0 | 0.0 | 2.8 | 2.8 | 0.0 ~ 180.0% of Par.27, should be lower than Pr.141 | Slow Spd SSC | % |
| 151 | HSC Start | 100.0 | 0.0 | 0.0 | 0.0 | 0.0~100.0% | HSC Start | % |
| 152 | Hvy Holding Torque | 100.0 | 0.0 | 82.4 | 82.4 | 0.0~100.0% of 1.2 A | Hvy Clo HLD Torq. | Α |
| 153(138) | Hvy Holding Speed | 180.0 | 0.0 | 5.1 | 5.1 | 0.0 ~ 180.0% of Par.27, should be lower than Par.159 | Hvy Close HLD | % |
| 154(139) | Hvy Holding Start | 100.0 | 0.0 | 6.0 | 6.0 | 0 ~ 100.0 % of Door Width | Hvy HLD Start | % |
| 156 | Hvy High Speed Close | 180.0 | 0.0 | 24.3 | 24.3 | 0.0 ~ 180.0% of Par.27, should be lower than Par.185, hgiher than Par.159 | Hvy High HSC | % |
| 157 | Hvy Final Speed Close | 180.0 | 0.0 | 2.8 | 2.8 | 0.0 ~ 180.0% of Par.27, should be lower than Par.159 | Hvy FSC | % |
| 158(143) | Hvy Final Speed Open Start | 100.0 | 0.0 | 6.0 | 6.0 | 0 ~ 100.0 % of Door Width | Hvy FSC Start | % |
| 159 | Hvy Nudging Speed | 180.0 | 0.0 | 20.00 | 20.00 | 0.0 ~ 180.0% of Par.27, should be lower than Pr.156, higher than Par.61, Par.94, Par.96, Par.99, Par.153, Par.157 & Par.150 | Hvy Nudg Spd | % |
| 160 | Hvy Close Acc. Time | 100.0 | 0.1 | 1.5 | 1.5 | 0.1 ~ 100.0 sec | Hvy Clo. Acc. | sec |
| 161 | Hvy Close Dec. Time | 100.0 | 0.1 | 3.0 | 3.0 | 0.1 ~ 100.0 sec | Hvy Clo. Dec. | sec |
| 162 | Hvy ACC. Stall Rev. Force | 200 | 100 | 120 | 120 | 100 ~ 200% of Motor Rated Current | Hvy Stall Acc | % |
| 163 | Hvy Stall Rev. Force | 150.0 | 0.0 | 52.0 | 52.0 | 0.0 ~ 150.0% of Motor Rated Current | Hvy Stall Normal | % |
| 164 | Hvy Low Spd. Stall Rev. Force | 150.0 | 0.0 | 52.0 | 52.0 | 0.0 ~ 150.0% of Motor Rated Current | Hvy Stall Dec Lo Spd. | % |
| 181 | Re-Open Detect Time | 10.00 | 0.00 | 0.05 | 0.05 | 0.00~10.00sec | Reopen detect T | sec |
| 182 | Fast Dec. Time | 10.0 | 0.1 | 0.1 | 0.1 | 0.1 ~ 10.0 sec | Fastest Dec. TM | sec |
| 185 | Max. Close Speed | 66.66 | 0.00 | 18.00 | 18.00 | 0.00 ~ 66.66Hz, should be lower than Par.27, higer than Par.141 & Par.156 | Max. Close Spd | Hz |
| 186 | Close Timeout | 180.0 | 0.0 | 0.0 | 0.0 | 0.0 ~ 180.0 sec (0.0: disable) | Close Timeout | sec |
| 187 | Close Lock Torq. 1 | 150.00 | 0.00 | 60.00 | 60.00 | 0.0 ~ 150.0% of Motor Rated Current | Close Lock Torq1 | % |
| 188 | Close Lock Torq. 2 | 150.00 | 0.00 | 60.00 | 60.00 | 0.0 ~ 150.0% of Motor Rated Current | Close Lock Torq1 | % |
| 189 | Close Holding Time | 999.9 | 0.0 | 0.0 | 0.0 | 0.0 ~ 999.9 sec | Close Hold Time | sec |
| 190 | Close Acc S-Curve | 10.0 | 0.0 | 0.4 | 0.4 | 0 ~ 10.0 sec | Close Acc Scurve | sec |
| 191 | Close Acc S-Curve 2 | 10.0 | 0.0 | 0.4 | 0.4 | 0~10.0 sec | Close Acc Scurve2 | sec |





Digital Input/Output Parameters:

| | | | | DEF | AULT | | LCD Text | |
|-----|--------------------------------------|-------|------|------|------|---|------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| | | | | 1 | 1 | Bit0 0: Reopen when EE triggered | | |
| | | | | 1 | 1 | Bit1 0: Reopen when obstruct | | |
| 195 | Function Bit | 65535 | 0 | 0 | 0 | Bit2 1: No S-Curve when reopen | Function Bit | |
| | | | | 0 | 0 | Bit3 1: DEMO | | |
| | | | | 1 | 1 | Bit4: 1: Standby mode | | |
| 196 | LED Delay Time | 10.00 | 0.00 | 3.00 | 3.00 | 0 ~ 10.00 sec | LED Delay Time | sec |
| 197 | Edges Timeout Delay Time | 180.0 | 0.0 | 15.0 | 15.0 | 0 ~ 180.0 sec | EdgesTimeout DLY | sec |
| 198 | Buzzer Delay Time | 180.0 | 0.0 | 10.0 | 10.0 | 0 ~ 180.0 sec | Buzzer Time | sec |
| 202 | Detector Edges Mode | 2 | 0 | 2 | 2 | 0: disable 1: NPN 2: PNP | Det. Edges Mode | |
| 203 | DCL Reset | 1 | 0 | 0 | 0 | 0: Enable door position reset in DCL 1: Disable door position reset in DCL | DCL Reset | |
| 204 | DOL Mode | 1 | 0 | 1 | 1 | 0: DOL is relevant to AUX 1: DOL is irrelevant to AUX | DOL irre. to AUX | |
| 205 | Buzzer Mode | 2 | 0 | 1 | 1 | 0: Buzzer Disable 1: Buzzer Enable (Continue) 2: Buzzer Enable (Discontinue) | Buzzer Mode | |
| 206 | Edges Timeout Holding Time | 180.0 | 0.0 | 5.0 | 5.0 | 0 ~ 180.0 sec | Edges Timeout HLD | sec |
| 207 | Reopen Relay Mode | 1 | 0 | 0 | 0 | 0: EDGES TIMEOUT RELAY is independent from RE-OPEN RELAY 1: EDGES TIMEOUT RELAY is dependent from RE-OPEN RELAY | Reopen Relay MOD | |
| 208 | Motor Over-Temperature Protection | 1 | 0 | 0 | 0 | 0: Enable the protection function when the motor is overheated 1: Disable the protection function when the motor is overheated | Motor OH protection | |
| 210 | Deme Hold Time | 99.99 | 0.00 | 2.00 | 2.00 | 0~99.99sec | Deme Hold Time | sec |

Protection Parameters:

| | | | | DEF | AULT | | LCD Text | |
|-----|--|-------|-----|------|------|---|------------------------|-----------------|
| PAR | FUNCTIONS | MAX | MIN | C/P | I/O | SETTING | Description (16bit) | Unit (4 bit) |
| 215 | Software Braking Level | 430 | 350 | 380 | 380 | 350 ~ 430 V | Dynamic Brake Lv | V |
| 216 | DC Brake Duty | 100 | 0 | 50 | 50 | 0~100% | Dynamic Brake | % |
| 217 | Motor Overload Current | 8.7 | 0.0 | 5.3 | 5.3 | 0~8.7 A | Motor Overload | А |
| 221 | Number of Retries | 10 | 0 | 10 | 10 | 0~10 | Auto restart | |
| 222 | Retry Waiting Time | 120.0 | 0.1 | 60.0 | 60.0 | 0.1 ~ 120.0 sec | Restart time | sec |
| 228 | Electronic Thermal Overload Selection | 2 | 0 | 2 | 2 | 00: Standard Motor 01: Special Motor 02: Disabled | Motor OL Sel | |
| 229 | Electronic Thermal Characteristic | 600 | 30 | 60 | 60 | 30 ~ 600 sec | Motor OL Time | sec |





10. TROUBLESHOOTING GUIDE

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | | |
|------------------|--|--|---------------|--------|-------------------|---|--|--|--|--|
| Over-current | The Output current exceeds 300% of drive's rated current at stop | Yes | Yes | Yes | Coast to Stop | Continuous current must be less than 50% of drive's rated current for 5 seconds | | | | |
| Remedy | Verify the wiring of the control of Check if other fault codes occu | rify the wiring of the control circuit and the wiring/grounding of the main circuit to prevent interference neck if other fault codes occur after cycling the power. If yes, return to the factory for repair | | | | | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition |
|------------------|--|--|---|--|--|---|
| Over Voltage | DC Bus Voltage exceeds 405VDC | Yes | Yes | Yes | Coast to Stop | DC-bus must be less than 373.5VDC |
| Remedy | If the DC bus over-voltage occu Check if the input voltage is with Verify the wiring of the control of When the drive is at stop, check | rs due to th hin the rate frcuit and t | he regenera d drive inpu he wiring/g codes occ | ative voltage of m at voltage range, rounding of the n urs with 200-240 | notor inertia, incr and check for po nain circuit to pre IVAC input after o | ease the deceleration time ossible voltage spikes event interference cycling the power. If yes, return to the factory for repair |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | |
|------------------|--|-------|---------------|--------|-------------------|---|--|--|--|
| Over Heat | Heatsink temperature exceeds 100° (212°) | Yes | Yes | Yes | Coast to Stop | Heatsink temperature must be less than 95° (203°) | | | |
| Remedy | Ensure that the ambient temperature falls within the specified temperature range 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 | The Output current exceeds 150% of drive's rated current for 60 secs | Yes | Yes | Yes | Coast to Stop | Continuous current must be less than 50% of drive's rated current for 5 seconds |
| Remedy | 1. Check whether the motor is ove 2. Reduce torque | rloaded | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | | |
|------------------|--|------------|---------------|--------------------|-------------------|---|--|--|--|--|
| OC at Accel | The Output current exceeds 300% of drive's rated current at acceleration | Yes | Yes | Yes | Coast to Stop | Continuous current must be less than 50% of drive's rated current for 5 seconds | | | | |
| | 1. Check for possible poor insulation of the wiring between the U/V/W terminals and the motor | | | | | | | | | |
| | 2. Check the motor insulation valu | e with meg | ger. Replac | e the motor if the | insulation is po | or | | | | |
| Remedy | 3. Increase the acceleration time | | | | | | | | | |
| | 4. The ocA occurs due to the short circuit at the output side of the drive. Check for possible short circuits between the U/V/W terminals with the electric meter. If short-circuits exist, return to the factory for repair | | | | | | | | | |





| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition |
|------------------|--|-------------------------------|-------------------------------|--|---|---|
| OC at Decel | The Output current exceeds 300% of drive's rated current at deceleration | Yes | Yes | Yes | Coast to Stop | Continuous current must be less than 50% of drive's rated current for 5 seconds |
| Remedy | Check for possible poor insulat Check the motor insulation valu Decrease the deceleration time | ion of the w le with meg | viring betwe ger. Replac | een the U/V/W ter e the motor if the | rminals and the r e insulation is po | notor or |
| | The ocD occurs due to the short with the electric meter. If short | t circuit at circuits exis | the output : st. return to | side of the drive. the factory for re | Check for possil | ble short circuits between the U/V/W terminals |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition |
|------------------|--|--|---------------------------|---|--|---|
| OC at Steady | The Output current exceeds 300% of drive's rated current at steady state operation | Yes | Yes | Yes | Coast to Stop | Continuous current must be less than 50% of drive's rated current for 5 seconds |
| Remedy | Verify the wiring of the control c Check if other fault codes occur | ircuit and t ^r after cycli | he wiring/g ng the pow | rounding of the r er. If yes, return t | nain circuit to pre o the factory for | event interference repair |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | | |
|------------------|--|--------------|---------------|-------------------|--------------------|---|--|--|--|--|
| Ground Fault | Short to ground, and drive current is over than 150% Rated Current for 5 secs | No | No | Yes | Coast to Stop | Continuous current must be less than 50% of drive's rated current for 5 seconds | | | | |
| Domodu | 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 | | | | | | | | | |
| Reffieuy | 2. Check for possible poor insulation at the output line | | | | | | | | | |
| | NOTE! The short circuit protection | n is provide | d for AC m | otor drive protec | tion, not for prot | ection of the user | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | |
|------------------|---|-------|---------------|--------|-------------------|---|--|--|
| Under Voltage | 100~120VAC input: DC Bus Voltage is lower than 180VDC; 200~240VAC input: DC Bus Voltage is lower than 195VDC | Yes | Yes | Yes | Coast to Stop | 100~120VAC input: DC Bus Voltage is higher than 210VDC; 200~240VAC input: DC Bus Voltage is higher than 210VDC | | |
| Remedy | Adjust the input voltage to the power range of the drive | | | | | | | |

| 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 the factory for repair | | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | |
|------------------|---|-------|---------------|--------|-------------------|--------------------|--|--|
| Speed Fbk Err | Opposite encoder feedback direction | Yes | Yes | Yes | Coast to Stop | Resets immediately | | |
| Remedy | Set Encoder fbk input setting (Pr.45) from 1 to 0 or 0 to 1 | | | | | | | |





| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | |
|------------------|------------------------------------|-------|---------------|--------|-------------------|--|--|--|
| Encoder Loss | Encoder feedback loss when running | Yes | Yes | Yes | Coast to Stop | Resets immediately. After resetting: 1. If Pr48 = 2, the drive will continue running at low speed without encoder feedback (PM motor) 2. The drive will continue opening at low speed without encoder feedback. In this scenario, the drive will no longer provide DOL/DCL/DPM signals and will reject any commands from the controller (IM) | | |
| Remedy | Check the encoder feedback wiring | | | | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | |
|-------------------------|--|-------|---------------|--------|-------------------|--------------------|--|--|--|
| Encoder fbk Over spd | Encoder feedback stall | Yes | Yes | Yes | Coast to Stop | Resets immediately | | | |
| Remedy | Check the encoder feedback wiring Check if the door type (Pr.52) is selected correctly. If not, launch door-learning process (Pr.63 = 1) and ensure the correct door type is selected Reset to default. (Pr.02 = 10). launch door-learn process (Pr.63 = 1) and ensure the correct door type is selected | | | | | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition |
|-------------------------|---|--|--|--|--|--|
| Encoder fbk dev. Err | Encoder feedback stall | Yes | Yes | Yes | Coast to Stop | Resets immediately |
| Remedy | Check the encoder feedback w Check if the drive provide DOL/ door width Check if the drive provide DOL/ the gear during the door's open | iring DCL when t DCL when t ing and clo | the door is the door is sing motio | fully opened/clos fully opened/clos ns | sed. If not, launch sed. If not, verify | n door-learning process (Pr.63 = 1) again to correct the whether there is any slippage between the belt and |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | |
|---------------------|--|-------|---------------|--------|-------------------|---|--|--|
| Encoder Ref Loss | Encoder feedback loss (PM Motor), can be detected at stop | Yes | Yes | Yes | Coast to Stop | Resets immediately. If Pr48 = 2, the drive will keep running in low speed without the encoder feedback | | |
| Remedy | Check the encoder feedback wiring. | | | | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | |
|------------------|---|---------------|---------------|--------------------|-------------------|--------------------|--|--|--|
| Open Overtime | Door open time is over than Pr.127 | Yes | Yes | Yes | Coast to Stop | Resets immediately | | | |
| | 1. Check if the drive provide DOL/DCL when the door is fully opened/closed. If not, launch door-learn procedure (Pr.63 = 1) again to re-learn the door width | | | | | | | | |
| Remedy | 2. Check if the drive provide DOL/DCL when the door is fully opened/closed. If not, verify whether there is any slippage between the belt and the gear during the door's opening and closing motions. | | | | | | | | |
| | (Pr.127 is set to 0 by default. When | n Pr.127 is (|), the drive | will not detect th | e open time) | | | | |





| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | |
|------------------|--|--------------|---------------|-------------------|-------------------|---------------------|--|--|--|
| DoorDir Error | Wrong opening/closing direction during door-learning process | Yes | No | Yes | Coast to Stop | Resets immediately | | | |
| Remedy | 1. Ensure the door is fully closed before initiating the door-learning process | | | | | | | | |
| nomouj | Set Encoder fbk input setting (P | r.45) from 1 | to 0 or 0 to | o 1, launch door- | learning process | s (Pr.63 = 1) again | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | | |
|--------------------|--|-------------|---------------|-------------------|---------------------|--|--|--|--|
| DoorWidth Error | Different door widths for opening and closing were detected during the door-learning process. | Yes | No | Yes | Coast to Stop | Resets immediately | | | |
| | 1. Check if there is any slippage between the belt and the gear during door-learn process. If yes, decrease Pr.59, launch door-learn procedure (Pr.63 = 1) again | | | | | | | | |
| Remedy | 2. Check if the door is fully opened | d and close | d during do | oor-learning proc | ess. If not, increa | ase Pr.59, launch door-learn procedure (Pr.63 = 1) again | | | |
| | 3. Decrease the Learning Frequency (Pr.62) | | | | | | | | |
| | 4. Verify the door's mechanical ali | gnment and | d ensure co | nsistent movem | ent during door- | earning process | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | | |
|------------------|---|-------|---------------|--------|-------------------|--------------------|--|--|
| Operate Error | Press "ESC" during door-learning process | Yes | No | Yes | Coast to Stop | Resets immediately | | |
| Remedy | Cycle power and restart door learn process | | | | | | | |

| Fault Display | Meaning | Reset | Auto Reset | Record | Drive Response | Reset Condition | |
|---|---|-------|---------------|--------|---------------------------|--------------------|--|
| Drive imme- diately exits door-learn process | Something is preventing the drive from executing the learn function and the program immediately stops | Yes | No | Yes | No movement of door | Resets immediately | |
| Remedy | Check encoder connection. Is it plugged in? Verify light curtains are properly set up. Does the reopen light come on when curtain is broken? If yes, cycle power and retry door learn process. If error persists, disable the light curtains by setting Set Pr. 202 to 0. Cycle power, then retry door learn process. If successful, re-enable light curtains before putting car into service. | | | | | | |





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