MB DOOR DRIVER

DOOR CONTROL SYSTEM

User Manual

Version: 2.0

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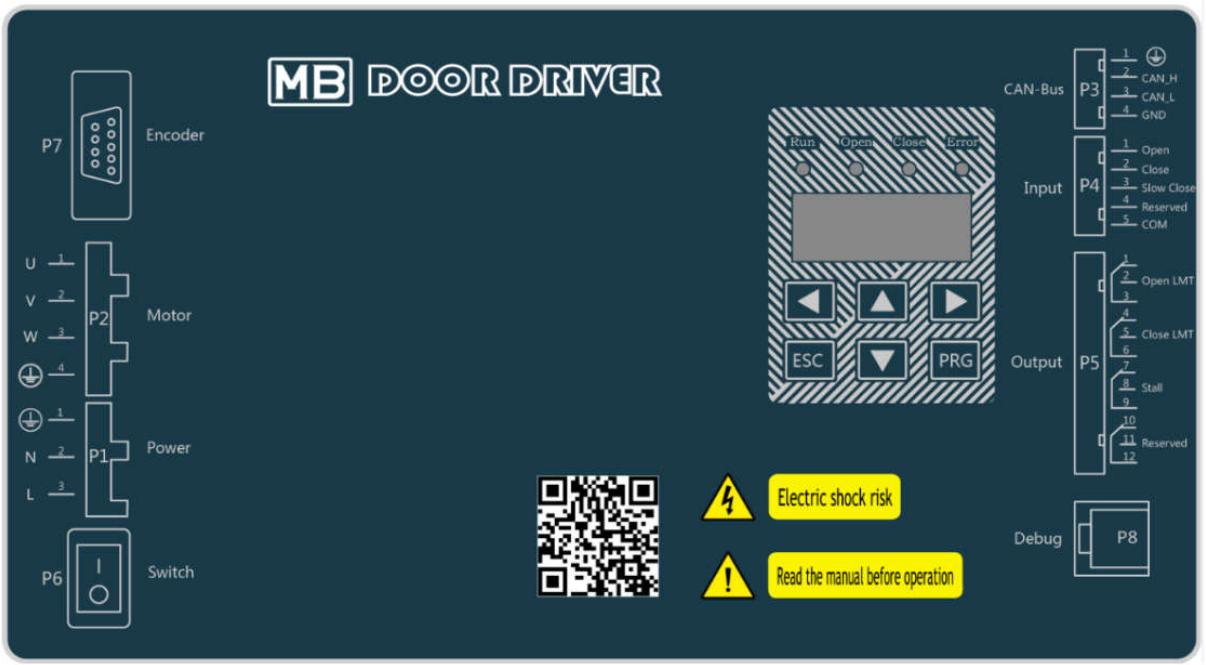
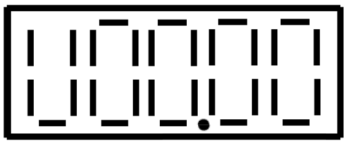
1. Connection Diagram



P1: SUPLLY	**P2: MOTOR INPUT**	**P3: CAN-Bus CONNECTION**
1. Earth 2. Notr (220 VAC) 3. Phase(220 VAC)	1. U 2. V 3. W 4. Soil	Not used.
P4: INPUT SIGNALS	**P5: OUTPUT SIGNALS**	**P6: ON-OFF BUTTON**
1. OPEN SIGNAL 2. CLOSE SIGNAL 3. SLOW CLOSE SIGNAL 4. RESERVED 5. COM (0 VDC) **– WARNING: For "Door Commands Use" isolated contacts in control panel. Never apply any external voltage to "5. COM" terminal.**	1. Opened Limit (NC) 2. OpenedLimit (NO) 3. Opened Limit COM (-24 VDC) 4. Closed Limit (NC) 5. Closed Limit (NO) 6. Closed Limit COM (-24 VDC) 7. Obstruction (NC) 8. Obstruction (NO) 9. Obstruction COM (-24 VDC) 10. Prog. Output (NC) 11. Prog. Output (NO) 12. Prog. Output COM (-24 VDC)	1 - On 0 - Off
P7: ENCODER	**P8: DEBUG**	
Encoder input is made.	Not used.	

2. Using the Keypad

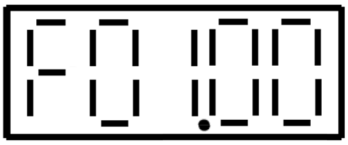
2.1. Functional Parameter Settings



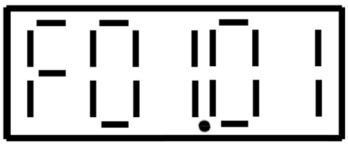
When the door card is energized, “U00.00” is displayed on the main screen.

Press the down arrow button once and the word “UL” appears on the screen.

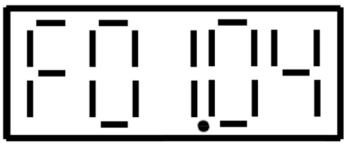
Press the PRG button once and “0” appears on the screen.



Press the PRG key once again and the function menu is entered. “F01.00” appears on the screen.

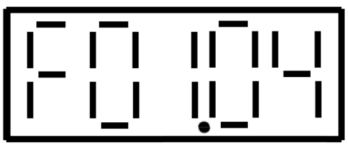


You can switch between parameters one by one by **pressing the up or down arrow buttons**. For example; When the “F01.00” phrase is on the screen, by **pressing to the up arrow button once**, we reach the “F01.01” parameter.

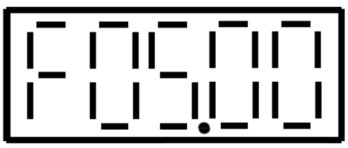


Proceed by **pressing the up or down arrow buttons** until the function whose parameter value we want to change appears on the screen. When the function we need to change appears on the screen, the function is entered by **pressing the PRG key.**

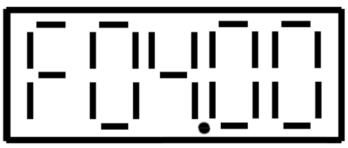
When the function is entered, the registered parameter value appears on the screen. After the desired parameter **is set with the up or down arrow button**, the function is saved by **pressing the PRG button**.



If the difference is too much with the number of the next function, you can **switch quickly by pressing the right or left arrow buttons**.

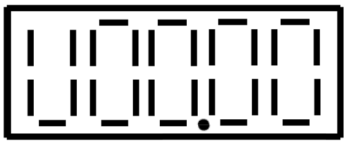


For example; When **the left arrow key is pressed once**, the parameter F05.00 appears on the screen.

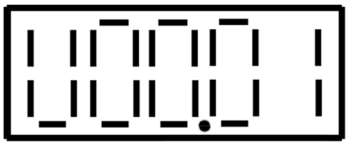


If you press **the left arrow key is pressed again**, the parameter F04.00 appears on the screen.

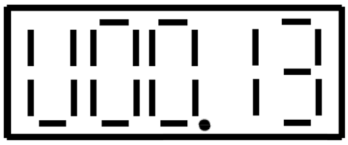
2.2. Reviewing Indicator Parameters



When the door card is energized, “U00.00” is displayed on the main screen.

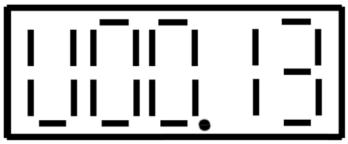


You can switch between parameters one by one by pressing **the up arrow button .** For example; When the “U00.00” phrase is on the screen, **by pressing to the up arrow button once,** we come to the “U00.01” parameter.

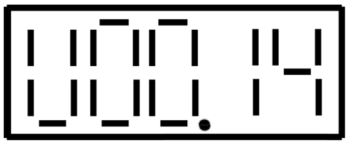


Proceed by **pressing the up or down arrow keys** until the indicator parameter we want to examine appears on the screen . When the indicator parameter we want to examine appears on the screen, the indicator is entered by **pressing the PRG button.**

For example; **When “U00.13” is on the screen**, you will see the first recorded error code when you press **the PRG button once** .



You can return to the indicator parameters menu by **pressing the ESC button once**.



You can switch between indicator parameters one by one by **pressing the up or down arrow buttons .**

3. Parameters to be Set Before Auto-adjustment and Auto-adjustment Process

Please do the auto-adjustment process in order as following steps;

1. Be sure that encoder (P7), motor (P2) and power supply (P1) is connected correctly.

ATTENTION: Input signals (P4) or Output signals (P5) must be **disconnected**.

2. Take the elevator to the half floor and make sure that the car door does not hit (touch) anything when it makes the full opening and closing movement.

3. Move the door to the half-open position by your hand.

4. Turn on MB Door Driver by using the On/Off button (P6).

5. Set the parameters given below according to the door direction.

PARAMETERS TO BE SET BEFORE AUTO-ADJUSMENT					
LEFT		**CENTRAL**		**RIGHT**	
Func. No:	**Value**	**Func. No:**	**Value**	**Func. No:**	**Value**
F01.04	1	**F01.04**	1	**F01.04**	0
F01.08	1	**F01.08**	1	**F01.08**	1
F05.02	1	**F03.11**	10.0	**F05.02**	1
F05.04	1	**F05.02**	1	**F05.04**	1
		F05.04	1		

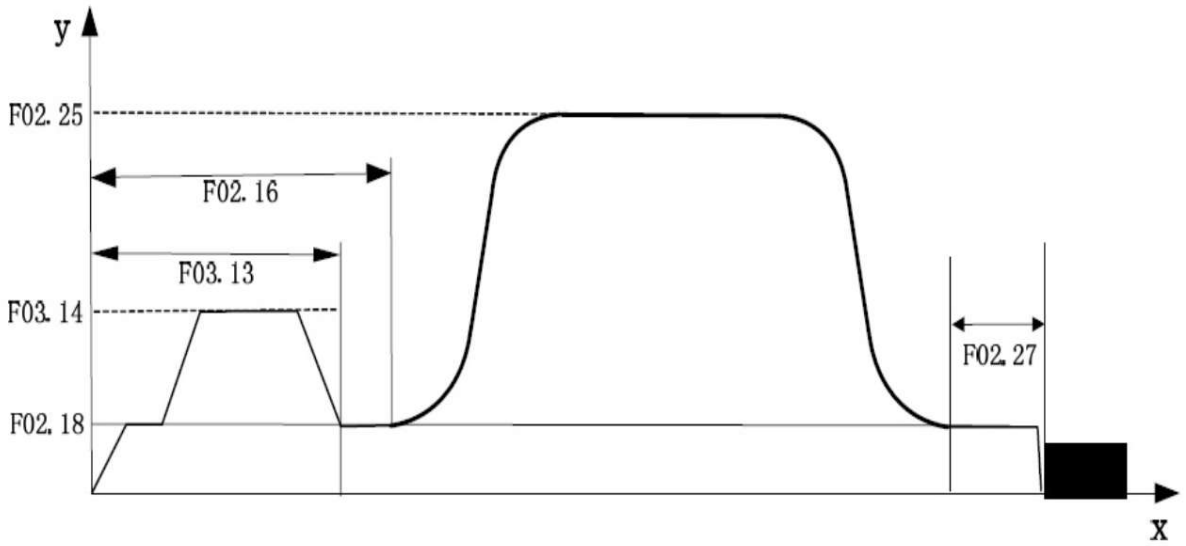
6. After the above parameter adjustments are set**, the F02.02 function is set to "1"** and the auto-adjustment process is started by **pressing the PRG button.**

ATTENTION: When the lift is at middle floor, during the auto-adjustment process **lock of CDL must be opened by hand.**

4. Comfort Curves in the Opening and Closing Directions

4.1. Door Opening Direction Movement

func. Code	Function Name	Parameter Range	Factory Setting
F02.18	Door Opening Slow Speed (m/s)	0~1,000	0.030
F02.16	Opening Acceleration Slow Speed Travel Distance (mm)	0~100.0	40.0
F03.13	Skate Opening-Closing Zone Distance (mm)	0~100.0	45.0
F03.14	Skate Opening-Closing Speed (m/s)	0~1,000	0.087
F02.25	Door Opening Reference Speed (%)	0~100	55
F02.27	Opening Deceleration Slow Speed Travel Distance (mm)	0~100.0	1.0
F03.18	Maximum Torque at Opening (%)	0.0~150.0	100.0

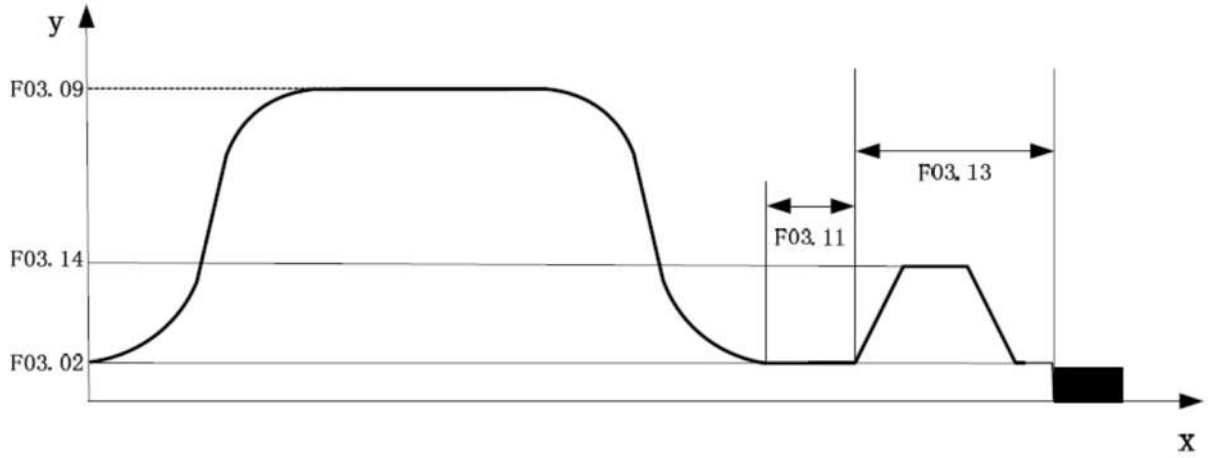


X: Distance (mm)

y: Speed (m/s)

4.2. Door Closing Direction Movement

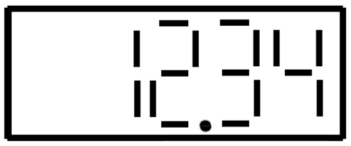
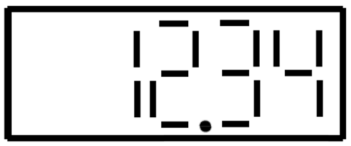
Func. Code	Function Name	Parameter Range	Factory Setting
F03.09	Door Closing Reference Speed (%)	0~100	45
F03.14	Skate Opening-Closing Speed (m/s)	0~1,000	0.087
F03.02	Door Closing Slow Speed (m/s)	0~1,000	0.020
F03.11	Closing Deceleration Slow Speed Travel Distance (mm)	0~100.0	0.0
F03.13	Skate Opening-Closing Zone Distance (mm)	0~100.0	45.0
F03.23	Maximum Torque at Closing (%)	0.0~150.0	70.0



X: Distance (mm)

y: Speed (m/s)

5. Display Parameters

Indicator Code	Indicator Name	Explanation
U00.00	Encoder Pulse	0 ~ 4096 values.
U00.01	Speed (m/s)	Indicates the speed of the door.
U00.02	Output Current (A)	It shows the current value at the door card output.
U00.03	DC Bus Voltage (V)	Indicates the communication voltage value.
U00.04	MotorTemperature (°C)	Displays the instantaneous motor temperature.
U00.05	Coolant Temperature (°C)	Indicates the coolant temperature.
U00.06	Software Version	Shows the software version installed on the card.
U00.07	Door Position (mm)	It shows the instantaneous opening distance according to the door closed position.
U00.08	Input Terminals Status	 It shows the currently active one of the input terminals. Next to the incoming signal number **"." (dot)** appears. In this example, "CLOSE SIGNAL" is received on the door card, so **"." (dot)** is appearing next to **2**. **1:** Door Open Signal **2:** Door Close Signal **3:** Slow Close Signal **4:** Reserved Input Signal
U00.09	Output Terminals Status	 It shows the currently active one of the output terminals. Next to the output signal **"." (dot)** appears. In this example, "DOOR CLOSED SIGNAL" is coming from the door card, so **"." (dot)** is appearing next to **2**. **1:** Door Open Signal **2:** Door Close Signal **3:** Jam Signal **4:** Reserved Output Signal
U00.10	Clear Opening (mm)	It shows the travel distance registered to the door card.
U00.11	Number of Cycles (High)	Indicates the number of door cycles.
U00.12	Number of Cycles (Low)	Indicates the number of door cycles.
U00.13	First Error Record	It shows the first error code given by the door card.
U00.14	Second Error Log	It shows the second error code given by the door card.
U00.15	Third Error Log	Indicates the third error code issued by the door card.
U00.16	Reserved	
...	...	...
U00.31	Reserved	

6. Function Parameters

Func. Code	Function Name	Setting Range	Setting Sensitivity	Factory Setting
F01.00	Operating Mode	**0:** Keypad Mode **3:** CAN Mode **4:** DEMO Mode	1	0
F01.04	Door Direction	**0:** Right **1:** Left, Center	1	0
F01.05	Carrier Frequency (kHz)	5~15	1	15
F01.08	Auto-adjustment for Clear Opening	**0:** Inactive **1:** Active	1	1
F01.14	Factory settings	**0:** Inactive **1:** Active	1	0
F01.17	Motor Back EMF (V)	0~220	1	80
F01.18	Motor Avg. Voltage (V)	0~220	1	85
F01.19	Motor Avg. Current (A)	0~2.2	0.01	0.65
F01.20	Motor Avg. Frequency (Hz)	0~99.99	0.01	83.33
F01.21	Motor Avg. Speed (radius/min)	0~9999	1	500
F01.22	Number of Motor Poles (p)	0~50	1	20
F01.29	Motor D-Axis Inductance (mH)	0~9999	1	60
F01.30	Motor Q-Axis Inductance (mH)	0~9999	1	60
F01.31	Motor Stator Resistance (Ω)	0~9999	1	25
F02.02	Auto-adjusment Type	**0:** Inactive **1:** Door Width **2:** Magnetic Pole	1	0
F02.03	Door Width (mm)	0~6000.0	0.1	490.0
F02.07	Motor Pulley Diameter (mm)	0~200.0	0.1	25.4
F02.16	Opening Acceleration Slow Speed Travel Distance (mm)	0~100.0	0.1	40.0
F02.18	Door Opening Slow Speed (m/s)	0~1,000	0.001	0.030
F02.19	Door Opening Acceleration Time (sec)	0~10.0	0.1	2.0
F02.20	Door Reference Speed (m/s)	0~0.880	0.001	0.600
F02.22	Door Opening Deceleration Time (sec)	0~10.0	0.1	2.0
F02.25	Door Opening Reference Speed (%)	0~100	1	55
F02.27	Opening Deceleration Slow Speed Travel Distance (mm)	0~100.0	0.1	1.0
F03.02	Door Closing Slow Speed (m/s)	0~1,000	0.001	0.020
F03.03	Door Closing Acceleration Time (sec)	0~10.0	0.1	2.0
F03.06	Door Closing Deceleration Time (sec)	0~10.0	0.1	2.0
F03.09	Door Closing Reference Speed (%)	0~100	1	45
F03.11	Closing Deceleration Slow Speed Travel Distance (mm)	0~100.0	0.1	0
F03.13	Skate Opening-Closing Zone Distance (mm)	0~100.0	0.1	45.0
F03.14	Skate Opening-Closing Speed (m/s)	0~1,000	0.001	0.087
F03.17	Door Opening Torque (%)	0.0~100.0	0.1	55.0

F03.18	Maximum Torque at Opening (%)	0.0~150.0	0.1	100.0
F03.19	Door Open Torque (%)	0.0~100.0	0.1	45.0
F03.22	Door Closing Torque (%)	0.0~100.0	0.1	45.0
F03.23	Maximum Torque at Closing (%)	0.0~150.0	0.1	70.0
F03.25	Door Close Torque (%)	0.0~100.0	0.1	40.0
F04.23	Rotor Obstruction Signal at Opening	**0:** Inactive **1:** Active	1	0
F05.02	Rotor Obstruction Movement at Closing	**0:** Apply control unit command **1:** Open the door in obstruction	1	0
F05.04	Record Rotor Obstruction	**0:** Inactive **1:** Active	1	0
F05.05	Signal Reading Mode	**0:** Door free when there is no door signal **1:** The door closes when there is no door signal	1	0
F05.08	Abnormal Deceleration Time (sec)	0.0~20.0	0.1	0.5
F05.13	Entry to Encrypted Settings	0~9999	1	0

7. Failure Analysis

Code	Explanation	Failure Analysis	Solution
17	Low Voltage	**1.** Appears when the door card is closing. **2.** Insufficient supply voltage.	**1.** Check your phase, neutral and earth connection. **2.** Make sure your supply voltage is between 180-264 VAC.
18	High Voltage	**1.** High supply voltage.	
19	IPM Overheat	**1.** The working ambient temperature is too high. **2.** There is mechanical friction or jamming.	**1.** Provide conditions that will cool the working environment. **2.** Provide mechanical adjustments to remove friction and jams.
21	Rotor Obstruction	**1.** There is mechanical friction or jamming. **2.** The pressure of the door towards the closing direction is high. **3.** Parameter settings are incompatible.	**1.** Provide mechanical adjustments to remove friction and jams. **2.** Check the tension of the landing door closing springs. **3.** Return to factory settings by setting parameter F01.14 to 1.
22	E2PROM Error	**1.** Control board has a component failure.	**1.** Contact technical service.
23	Auto-adjustment Error	**1.** There is a fault in the motor or encoder cable or plug connection. **2.** Parameter settings are not suitable. **3.** There is mechanical	**1.** Make sure that there are no disconnections in the motor and encoder cables and that their sockets are fully seated. **2.** Return to factory settings by setting parameter F01.14 to 1.

		friction or jamming. **4.** There is a fault in the encoder.	**3.** Provide mechanical adjustments to remove friction and jams. **4.** Replace the encoder.
Code	**Explanation**	**Failure Analysis**	**Solution Proposal**
24	Current Detection Error 1	**1.** There is a fault in the motor cable or plug connection. **2.** Control board component failure.	**1.** Check the motor cable, make sure the socket is fully seated. **2.** Contact technical service.
25	Current Detection Error 2	**1.** Control board has a component failure.	**1.** Contact technical service.
26	Motor Belt Error	**1.** The teeth of the motor belt have lost their properties or the belt is broken. **2.** Motor belt is too loose. **3.** Clear Opening is wider than programmed.	**1.** Replace the motor belt. **2.** Adjust the engine belt tension. **3.** Get auto-adjustment again.
27	Over Torque Error	**1.** High torque is required for on/off action. **2.** Torque parameters are insufficiently set.	**1.** Be sure that the door opens and closes easily. **2.** Return to factory settings by setting parameter F01.14 to 1.
28	Encoder Error	**1.** The encoder may not be working properly. **2.** The door card may not reads the encoder properly.	**1. Press the "PRG" key when "U00.00" on the main screen,** be sure the values change between 0 and 4096 as the motor pulley rotates. **2.** Test the board with another motor. If it gives error ERR028, contact technical service.
29	Heat Sensor Error	**1.** There may be a problem with the cables in the temperature sensor connection inside the door card.	**1.** Contact technical service.
31	IPM Error	**1.** Over voltage or over current is exist. **2.** Motor terminals are connected incorrectly or there is a short circuit between the U, V, W and Ground terminals. **3.** Leakage current is exist. **4.** The IPM is damaged.	**1.** Make sure the supply line of the door card is suitable. **2.** Check the motor connection. **3.** Make sure that there is no leakage current in the system and that the grounding is appropriate. **4.** Contact technical service.

49	Open Time Error	**1.** The door does not move freely in the opening direction. **2.** The auto-adjustment is wrong. **3.** Encoder is damaged or connection is wrong.	**1.** Provide mechanical adjustments to remove friction and jams. **2.** Return to factory settings by setting parameter F01.14 to 1 and get auto-adjustment again. **3.** Check the encoder.
50	Shutdown Time Error	**1.** The door does not move freely in the closing direction. **2.** The promotion is wrong. **3.** Encoder is damaged or connection is wrong.	**1.** Provide mechanical adjustments to remove friction and jams. **2.** Return to factory settings by setting parameter F01.14 to 1 and get demonstration again. **3.** Check the encoder.
Code	**Explanation**	**Failure Analysis**	**Solution Proposal**
52	Overspeed Protection	**1.** Parameter settings are incompatible. **2.** There is a fault in the motor or encoder cable or plug connection.	**1.** Return to factory settings by setting parameter F01.14 to 1 and get auto-adjustment again. **2.** Make sure that there are no disconnections in the motor and encoder cables and that their sockets are fully seated.
53	CAN Bus Communication Error	**1.** There is a fault in the CAN Bus communication line.	**1.** Check the CAN Bus communication cables.
55	Motor Overheating Error	**1.** The motor temperature has risen above the limits.	**1.** Power off the system and wait until the motor cools down.
56	Motor Temperature Sensor Error	**1.** An error has occurred in the motor's temperature sensor.	**1.** Contact technical service.
57	AI Learning Error	**1.** An error occurred during the AI self-learning.	**1.** Return to factory settings by setting parameter F01.14 to 1 and get get auto-adjustment again.
58	Skate Blocking Error	**1.** There is a mechanical error that prevents the normal movement of the skate .	**1.** Fix factors that hinder proper movement of the skate.