

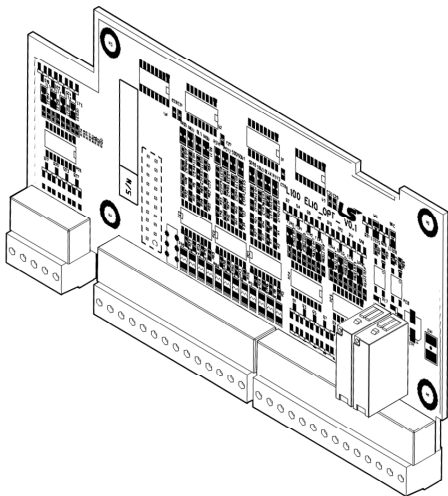
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ELIO(Elevator I/O) Add-on Module

LSLV-L100 series

User Manual



Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.

Safety Information

Read and follow all safety instructions in this manual precisely to avoid unsafe operating conditions, property damage, personal injury, or death.

Safety symbols in this manual

Danger

Indicates an imminently hazardous situation which, if not avoided, will result in severe injury or death.

Warning

Indicates a potentially hazardous situation which, if not avoided, could result in injury or death.

Caution

Indicates a potentially hazardous situation that, if not avoided, could result in minor injury or property damage.

Safety information

Thoroughly read this user manual to safely use the features provided by the L100 ELIO add-on module and keep the operating instructions handy for quick reference.

⚠ Caution

- Be careful not to damage the IC elements on the add-on module. Static charge may cause the product to malfunction.
- Ensure that the inverter is turned off before making changes to cable connections for encoder signals. Otherwise, the module may be damaged or abnormal operation may result.
- Correctly install the add-on module and ensure that it is firmly connected to the inverter. Otherwise, the module may be damaged or abnormal operation may result.

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1 Overview

The L100 ELIO add-on module, dedicated optional board for elevator applications, allows for more efficient elevator operations utilizing the L100 series inverters.

1.1 Operating environment

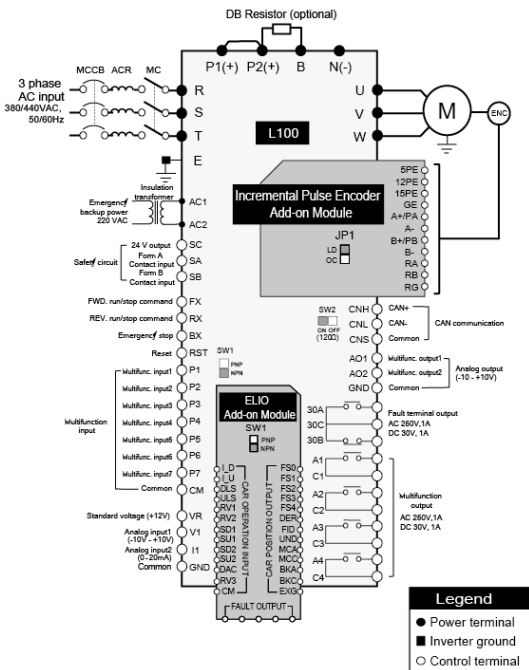
Item	Specifications
Operating temperature	14°F – 104°F (-10°C – 40°C)
Storage temperature	-4°F – 149°F (-20°C – 65°C)
Ambient humidity	95% relative humidity or less (no condensation)
Altitude/vibration	Less than 3,280 ft (1,000 m) above sea level / less than 9.8 m/s ² (1 G)
Environment factors	An environment free from corrosive or flammable gases, oil residue, and dust.

1.2 Hardware specifications

Item	Specifications
Installation type	Installed and fixed to the connector on the left side of the inverter's control board.
Power	24 VDC
Digital input signal	Car operation input signal 12 EA, photocoupler insulation input signal
Digital output and terminal output signal	Car position output signal, insulation open collector output signal 8 EA, Form A contact output 2 EA
Fault output signal	Fault output signal 4 EA, Insulation open collector output signal

1.3 Terminal diagram

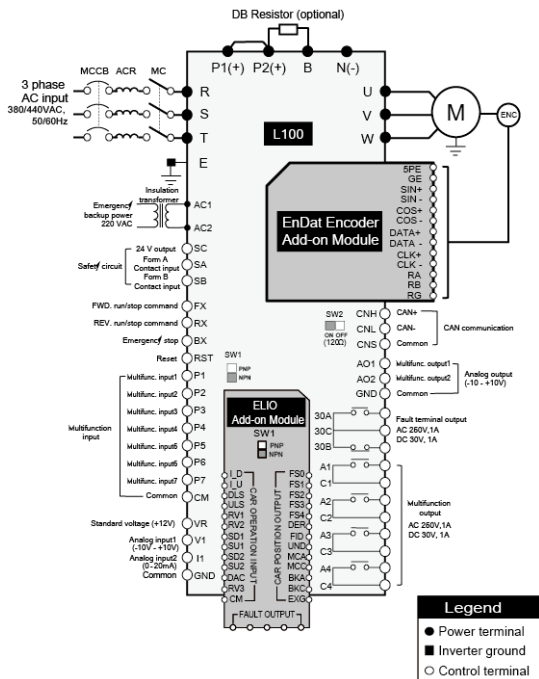
1.3.1 Combining ELIO with the Inc Pulse Encoder add-on module



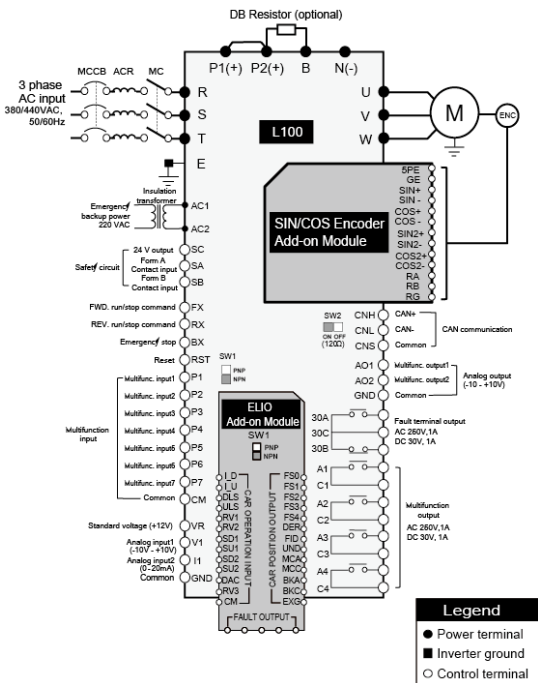
Note

Multifunction input terminals P1 – P7 are automatically set when the configuration for elevator applications is used.

1.3.2 Combining ELIO with the Endat Encoder add-on module



1.3.3 Combining ELIO with the SIN/COS add-on module

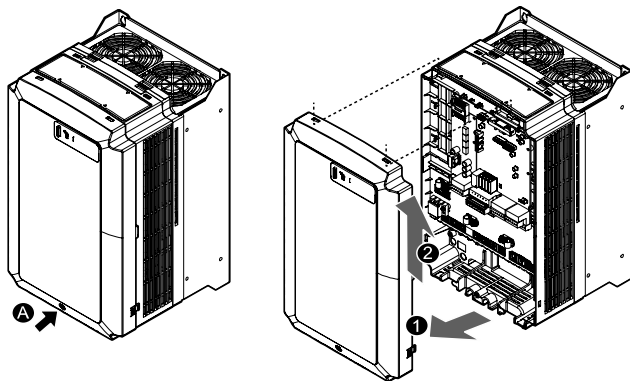


2 Installation and cable connection

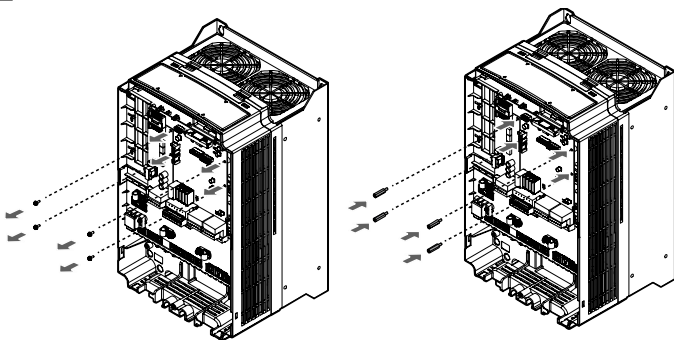
Refer to the following information to install the ELIO add-on module to the control board inside the L100 inverter and connect the power and signal cables to the terminal block.

2.1 Installing the ELIO add-on module

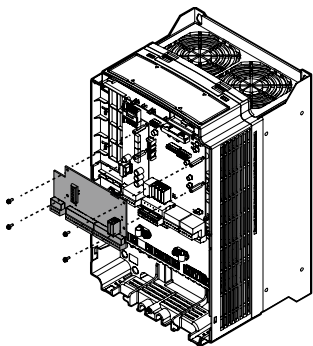
- 1 Loosen the fix screw at the bottom of the front cover (A) and remove the front cover from the L100 inverter by pulling the bottom part of the cover (1) and lifting it (2).



- 2 Refer to the following figure to replace the four M3 screws on the inverter's control board with the four M3 x 18 brass studs.



- 3 Properly install the ELIO add-on module after aligning its connectors to those on the inverter's control board, then secure it to the brass studs by installing the four M₃ x 8 fix bolts (torque: 12 kgf-cm).

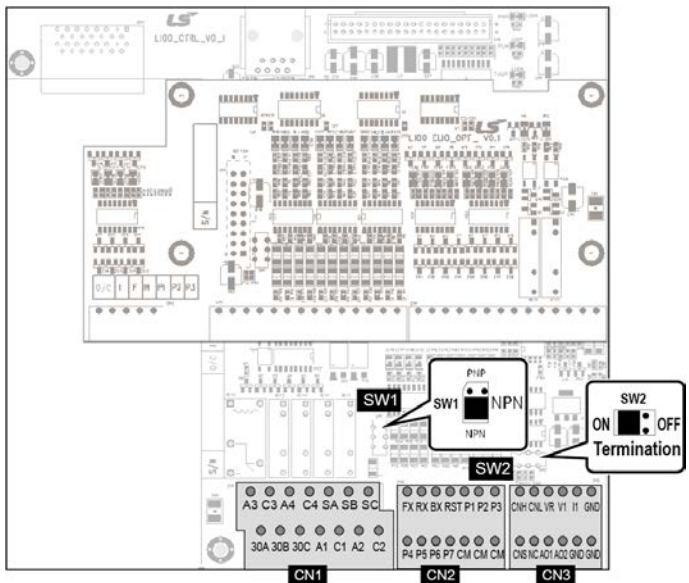


2.2 Terminal block layout and functions

Refer to the following information to properly connect the power and signal cables after installing the add-on modules to the inverter.

2.2.1 L100 inverter

Control board terminal block layout



- CN₁

A ₃	C ₃	A ₄	C ₄	SA	SB	SC
30A	30B	30C	A ₁	C ₁	A ₂	C ₂

- CN₂

FX	RX	BX	RST	P ₁	P ₂	P ₃
P ₄	P ₅	P ₆	P ₇	CM	CM	CM

- CN₃

CHN	CNL	VR	V ₁	I ₁	GND
CNS	NC	AO ₁	AO ₂	GND	GND

- SW₁

PNP/NPN input mode switch for terminal inputs P₁ – P₇

- SW₂

Network termination switch (termination resistor)

Terminal block functions

Item	Indication	Name	Description
Terminal input	FX	Forward operation / stop command	Turned ON when connected to the CM terminal in NPN input mode
	RX	Reverse operation / stop command	Stops when both FX and RX are simultaneously turned ON or OFF.
	BX	Emergency stop	Turned ON when connected to the CM terminal in NPN input mode. Free-run stop and decelerating stop are available. Fault signal is not output.
	RST	Fault reset	Turn it ON after resolving the cause of the fault to reset the fault.

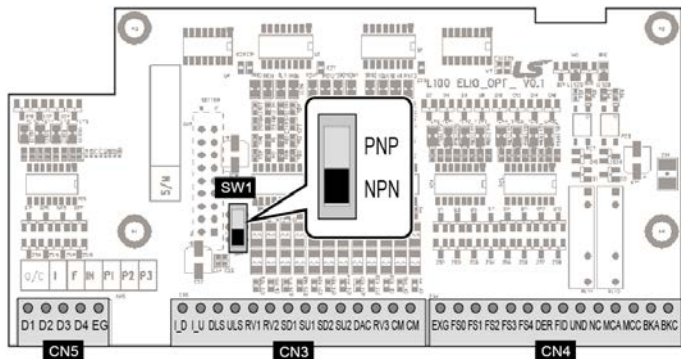
Item	Indication	Name	Description
	P1	Multifunction input terminal	<p>When elevator mode is selected, the following nine functions become available in addition to the conventional inverter functions.</p> <ul style="list-style-type: none"> ● Manual operation mode 0, 1 (MM0, MM1) ● High speed operation command (ATO) ● Floor height measurement command (FHM) ● Battery operation command (BAT) ● Brake terminal input (BRC) ● Contactor terminal input (MCC) ● High speed2 operation ● Initial pole estimation (only available with PM motor) <p>When elevator mode is selected, the multifunction input terminals are set as follows: P1 (MM0), P2 (MM1), P3 (ATO), P4 (FHM), P5 (BAT), P6 (BRC), P7 (MCC)</p>
	P2		
	P3		
	P4		
	P5		
	P6		
	P7		
	CM	COMMON	<ul style="list-style-type: none"> ● Turned ON when each terminal input is connected to CM terminal in NPN input mode. ● Turned ON when external 24 V power is supplied to each terminal input in PNP input mode.
Switch	SW1	PNP/NPN input mode	Select PNP/NPN input mode for the terminal inputs above.
Communication	CNH	CAN High	CAN communication High signal
	CNL	CAN Low	CAN communication Low signal
	CNS	COMMON	CAN communication COMMON
Analog input	VR	Analog power	Standard voltage when a potentiometer is used (+ 12V): 10kΩ

Item	Indication	Name	Description
	V1	Voltage input	<ul style="list-style-type: none"> Voltage input (-10 → 10V, 10 → -10V, 0 → 10V, 10 → 0V) Select one of the following functions: (speed reference, torque bias)
	I1	Current input	<ul style="list-style-type: none"> Current input (0 → 20 mA, 20 → 0 mA) Used for the speed reference.
	GND	COMMON	COMMON terminal for analog input
Analog output	AO1	Analog output 1	<ul style="list-style-type: none"> -10V – +10V output Select one of the following functions: (Motor speed, speed reference, torque distribution current, magnetic flux command, magnetic flux current, inverter output current, inverter output voltage, motor temperature, DC voltage)
	AO2	Analog output 2	
	GND	COMMON	COMMON terminal for analog output
Terminal Output	A1	Multifunction terminal output 1	Select one of the following functions: (Zero speed search, speed search (with polarity), speed search (w/o polarity), Speed reached, identical speed, torque search, torque limit, motor overheat signal, inverter overheat signal, low voltage, inverter operation signal, inverter regeneration signal, inverter ready, timer output, base floor / nearest floor operation mode status ⁽¹⁾ , base floor / nearest floor operation complete ⁽¹⁾ , elevator-related fault signal ⁽¹⁾)
	C1		
	A2	Multifunction terminal output 1	
	C2		
	A3	Multifunction terminal output 1	
	C3		
	A4	Multifunction terminal output 1	
	C4		
	30A	Fault signal(Form A)	
30B	Fault signal(Form B)		
30C	COMMON	Common terminal for output contacts A and B.	

Note (1) This function can be configured only in elevator mode when the ELIO add-on module has been installed.

2.2.2 ELIO add-on module

Exterior and terminal block layout



- CN3

I_D	I_U	DLS	ULS	RV1	RV2	SU1	SD1	SD2	SU2	DAC	RV3	CM	CM
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	----

- CN4

EXG	FS0	FS1	FS2	FS3	FS4	DER	FID	UND	NC	MCA	MCB	BRA	BRB
-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----

- CN5

D1	D2	D3	D4	EG
----	----	----	----	----

- SW1

PNP/NPN input mode switch for terminal inputs P1 – P7.

Terminal block functions

Item	Indication	Name	Description
Elevator terminal input	I_D	Downside inductor signal	Downside inductor signal for detecting car position
	I_U	Upside inductor signal	Upside inductor signal for detecting car position
	DLS	Down Limit Switch	Car descent limit switch. Descending of a car is prohibited when the switch is turned on.
	ULS	Up Limit Switch	Car ascent limit switch. The car is prohibited from ascending when the switch is turned on.
	RV1	Reserved	
	RV2	Reserved	
	SD1	Downside Deceleration Switch 1	1st Deceleration Switch for forced deceleration while descending
	SU1	Upside Deceleration Switch 1	1st Deceleration Switch for forced deceleration while ascending
	SD2	Downside Deceleration Switch 2	2nd Deceleration Switch for forced deceleration while descending
	SU2	Upside Deceleration Switch 2	2nd Deceleration Switch for forced deceleration while ascending
	DAC	Deceleration approval signal	Deceleration approval signal for the controller
	RV3	Reserved	
CM	COMMON	Turned ON when each terminal input is connected to CM (24G).	

Item	Indication	Name	Description
Elevator terminal output	EXG	COMMON	Common ground for each terminal output.
	FS0	Requested floor for stop / current floor bit 0	Data format for requested floor for stop / current floor (Floors 1 – 32) Bit4 Bit3 Bit2 Bit1 Bit0 FS4 FS3 FS2 FS1 FS0 Floor 1: OFF OFF OFF OFF OFF Floor 32: ON ON ON ON ON
	FS1	Requested floor for stop / current floor bit 1	
	FS2	Requested floor for stop / current floor bit 2	
	FS3	Requested floor for stop / current floor bit 3	
	FS4	Requested floor for stop / current floor bit 4	
	DER	Signal for requesting deceleration approval	
	FID	Floor identification signal	ON: Requested floor for a stop (previous floor), OFF: Current floor
	UND	Deceleration signal	Turns ON when the motor is decelerating.
	MCA/MCC	Contact operation relay Form A contact	Operates the contactor for shutting down the inverter output.
BKA/BKC	Brake operation relay Form A contact	Operates the traction machine brake.	

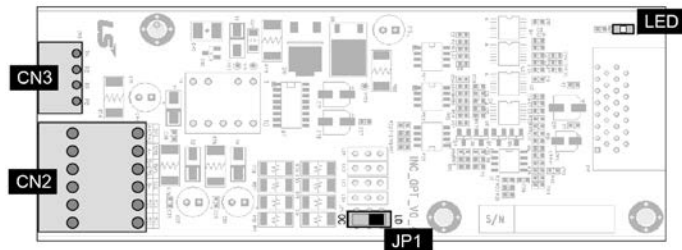
Item	Indication	Name	Description																																																		
Fault output	D1	Fault information BITo (LSB)	<p>Outputs 4-bit fault data when the inverter is malfunctioning. Elevator faults have priority in the output over inverter faults.</p> <p>Set one of the multifunction outputs AX1 –AX4 to “E/L Fault” to distinguish elevator faults from inverter faults. When a fault occurs, it is an elevator fault if the multifunction terminal set to “E/L Fault” is ON; it is an inverter fault if the multifunction terminal set to “E/L Fault” is OFF.</p> <p><Output codes for elevator faults></p> <table border="1"> <thead> <tr> <th>Fault</th> <th>D4</th> <th>D3</th> <th>D2</th> <th>D1</th> </tr> </thead> <tbody> <tr> <td>No Fault</td> <td>OF F</td> <td>OF F</td> <td>OF F</td> <td>OF F</td> </tr> <tr> <td>FHM RUN Fail</td> <td>OF F</td> <td>OF F</td> <td>OF F</td> <td>ON</td> </tr> <tr> <td>Flr Data Fail</td> <td>OF F</td> <td>OF F</td> <td>ON</td> <td>OF F</td> </tr> <tr> <td>ChkSum Err</td> <td>OF F</td> <td>OF F</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>NotRdy (E/L)</td> <td>OF F</td> <td>ON</td> <td>OF F</td> <td>OF F</td> </tr> <tr> <td>Decel</td> <td>OF F</td> <td>ON</td> <td>OF F</td> <td>ON</td> </tr> <tr> <td>Acc/Dec</td> <td>OF F</td> <td>ON</td> <td>ON</td> <td>OF F</td> </tr> <tr> <td>SDS Error</td> <td>OF F</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> <tr> <td>IND Reversed</td> <td>ON</td> <td>OF F</td> <td>OF F</td> <td>OF F</td> </tr> </tbody> </table>	Fault	D4	D3	D2	D1	No Fault	OF F	OF F	OF F	OF F	FHM RUN Fail	OF F	OF F	OF F	ON	Flr Data Fail	OF F	OF F	ON	OF F	ChkSum Err	OF F	OF F	ON	ON	NotRdy (E/L)	OF F	ON	OF F	OF F	Decel	OF F	ON	OF F	ON	Acc/Dec	OF F	ON	ON	OF F	SDS Error	OF F	ON	ON	ON	IND Reversed	ON	OF F	OF F	OF F
	Fault	D4	D3	D2	D1																																																
No Fault	OF F	OF F	OF F	OF F																																																	
FHM RUN Fail	OF F	OF F	OF F	ON																																																	
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Decel	OF F	ON	OF F	ON																																																	
Acc/Dec	OF F	ON	ON	OF F																																																	
SDS Error	OF F	ON	ON	ON																																																	
IND Reversed	ON	OF F	OF F	OF F																																																	
	D2	Fault data BIT 1																																																			

Item	Indication	Name	Description				
	D3	Fault data BIT 2	Indicator Fail	ON	OF F	OF F	ON
			CmdSrc	ON	OF F	ON	OF F
			NotRdy (FHM)	ON	OF F	ON	ON
			<Output codes for inverter faults>				
			Fault	D4	D3	D2	D1
			No Fault	OF F	OF F	OF F	OF F
			Arm Short	OF F	OF F	OF F	ON
			FAN Error	OF F	OF F	ON	OF F
			Ground Fault	OF F	OF F	ON	ON
	Over Current	OF F	ON	OF F	OF F		
	Over Voltage	OF F	ON	OF F	ON		
	D4	Fault data BIT 3(MSB)	Encoder Err	OF F	ON	ON	OF F
			Low Voltage Low Voltage2	OF F	ON	ON	ON
			Inv OverHeat	ON	OF F	OF F	OF F
			E-Thermal Over Load	ON	OF F	OF F	ON

Item	Indication	Name	Description				
			Input PO	ON	OF F	ON	OF F
			Output PO	ON	OF F	ON	ON
			Ext.Trip-B	ON	OF F	ON	ON
			Inv.OLT	ON	ON	OF F	OF F
			Mag Det Err	ON	ON	OF F	ON
			InvThem OP	ON	ON	ON	OF F
			Over Speed Spd Dev Err	ON	ON	ON	ON
	EG	COMMON	Common ground for open collector outputs for faults.				

2.2.3 Incremental Pulse Encoder add-on module

Exterior and terminal block layout



- CN2

5PE	12PE	15PE	GE	GE	GE
A+[PA]	A-	B+[PB]	B-	GE	GE

- CN3

RA	RG	RB	RG
----	----	----	----

- JP1

Line Drive/Open Collector (LD/OC) selector switch

- LED

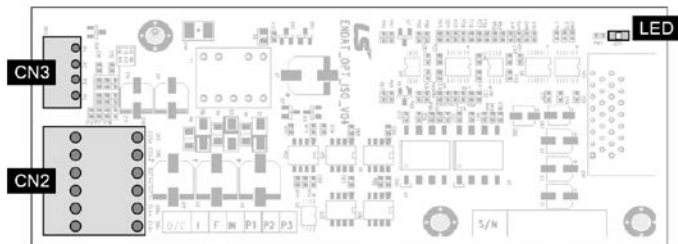
Status	Indication
Normal	Flashes in 1 second intervals.
Abnormal configuration	Flashes in 0.5 second intervals.

Terminal block functions

Item	Indication	Name	Description	
Encoder signal	Input pulse (CN ₂)	5PE	+5V power	+5V line drive power for encoder
		12PE	+12V power	+12V open collector power for encoder
		15PE	+15V power	+15V open collector power for encoder
		GE	Ground	Ground for encoder power
		A+ [PA]/ A-	Encoder phase A signal	For a line drive encoder, connect output signal cables for phases A+ and A-. Open collector (or complementary) encoders utilize A+[PA] signals and GE.
		B+ [PB]/ B-	Encoder phase B signal	For a line drive encoder, connect output signal cables for phases B+ and B-. Open collector (or complementary) encoders utilize B+[PB] signals and GE.
	Output pulse (CN ₃)	RA	Encoder phase A return signal	Terminal for encoder phase A return signal
		RB	Encoder phase B return signal	Terminal for encoder phase B return signal
		RG	Ground	Ground for encoder return signals

2.2.4 EnDat Encoder add-on module

Exterior and terminal block layout



- CN2

5PE	5PE	GE	GE	SIN+	SIN-
COS+	COS-	DATA+	DATA-	CLK+	CLK-

- CN3

RA	RG	RB	RG
----	----	----	----

- LED

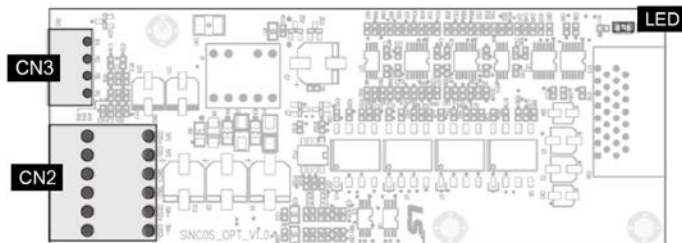
Status	Indication
Normal	Flashes in 1 second intervals.
Abnormal configuration	Flashes in 0.5 second intervals.

Terminal block functions

Item	Indication		Name	Description
EnDat Encoder input (CN ₂)	5PE		Encoder power	+5V encoder power
	GE			0V
	SIN+	SIN-	Encoder SIN signal	Encoder's SIN+/SIN- signal
	COS+	COS-	Encoder COS signal	Encoder's COS+/COS- signal
EnDat Communication (CN ₂)	DATA+	DATA-	Encoder data	Data input and output signals for receiving pole position data from the EnDat encoder. Used in ECN ₄₁₃ and ECN ₁₃₁₃ encoders.
	CLK+	CLK-	Encoder clock	Clock signal for receiving data from the EnDat encoder. Used in ECN ₄₁₃ and ECN ₁₃₁₃ encoders.
Encoder output (CN ₃)	RA		Encoder output phase A	Encoder A/B phase output signal Open collector output
	RB		Encoder output phase B	
	RG		Common output terminal	

2.2.5 SIN/COS Encoder add-on module

Exterior and terminal block layout



- CN2

5PE	5PE	GE	GE	SIN+	SIN-
COS+	COS-	SIN2+	SIN2-	COS2+	COS2-

- CN3

RA	RG	RB	RG
----	----	----	----

- LED

Status	Indication
Normal	Flashes in 1 second intervals.
Abnormal configuration	Flashes in 0.5 second intervals.

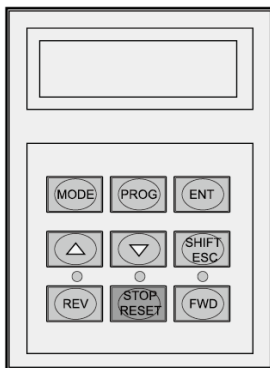
Terminal block functions

Item	Indication		Name	Description
SIN/COS Encoder input (CN ₂)	5PE		Encoder power	+5V encoder power
	GE			0V
	SIN+	SIN-	Encoder SIN signal	Encoder's SIN+/SIN- signal
	COS+	COS-	Encoder COS signal	Encoder's COS+/COS- signal
	SIN ₂ +	SIN ₂ -	Encoder SIN ₂ signal	Encoder's SIN ₂ +/SIN ₂ - signal
	COS ₂ +	COS ₂ -	Encoder COS ₂ signal	Encoder's COS ₂ +/COS ₂ - signal
Encoder output (CN ₃)	RA		Encoder output phase A	Encoder A/B phase output signal Open collector output
	RB		Encoder output phase B	
	RG		Common output terminal	

3 Pre-operation procedures and operation

3.1 Changing to elevator mode

After installing the ELIO add-on module, an I/O module dedicated to elevator applications, set PAR_o8 (Application) to "Elevator". As shown in the following figure, the home screen of the LCD keypad will change to display elevator mode. Refer to the User Manual provided with the L100 series inverter for the key functions of the keypad.



- 1 Go to PAR_o8. (PAR_o8 parameter can be configured only when the ELIO add-on module has been installed).

PAR▶ Application
08 General Use

- 2 Press the [PROG] key. "General Use" will be displayed with a cursor (■).

```
CON▶ Application
02 General Use■
```

- 3 Press the [▲(Up)] key to change to "Elevator" mode.

```
CON▶ Application
02 Elevator■
```

- 4 Press the [ENT] key to set the mode (Elevator mode).

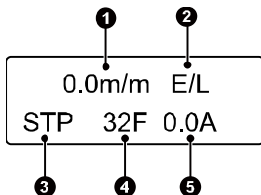
```
CON▶ Application
02 Elevator
```

Note

Some basic parameters for elevator operation will be automatically configured when you change the operation mode to elevator mode.

3.2 Elevator mode keypad display

Home screen



The figure above shows the “Initial screen of display group” or “Home screen”. The home screen is displayed when you press the SHIFT/ESC key on the keypad. Each item on the screen displays information related to elevator operation as follows.

Item	Name	Function
1	Elevator position and speed (Can be set with E/L_58)	<ul style="list-style-type: none"> ● m/m: Car speed per minute, m/s: Car speed per second ● rpm: Actual rotation speed of the motor ● mm: Current position of the car ● Motor's output torque (%), limit switch input status, remaining distance when the 1st inductor has been detected.
2	Elevator operation mode	<ul style="list-style-type: none"> ● E/L: Automatic operation mode ● MAN: Manual operation mode ● FHM: Floor height measuring mode ● N/A: Operation mode not defined (not operable).
3	Current operating direction of the car	<ul style="list-style-type: none"> ● UP: Car is ascending. ● DN: Car is descending. ● STP: Car is stopped.
4	Current floor (F)	Displays the current floor.
5	Inverter output current (A)	Displays the volume of current supplied to the motor at the moment.

3.3 Changing parameter groups

When you select elevator mode, E/L (elevator) group will be added after COM (communication) group.

Group	Display	Description
Display group	DIS	Displays motor speed, control mode, torque, inverter output current, user selections, fault status, user group options, etc.
Parameter group	PAR	Used for initializing, reading, writing, locking parameter values or motor-related constants, setting the password and performing auto tuning.
Digital Input/Output group	DIO	Used to configure digital input and output parameters.
Analog Input/Output group	AIO	Used to configure analog input and output parameters.
Function group	FUN	Used to set reference frequency, source of operation and stop commands, acceleration and deceleration times and patterns, carrier frequency, and the E-thermal (overheating protection) function.
Control group	CON	Used to set parameters related to control mode, ASR PI Gain, Process PID Gain, draw control options, droop control constants, torque control constants, and parameters related to V/F operation.
E/L group	E/L	Used to set parameters related to elevator speed patterns and parameters for controlling positions.
Protection group	PRT	Used to set inverter protection functions.
Communication group	COM	Used to set parameters related to CAN and 485 communication.
User group	USR	Used to define, store, and recall custom macros.

Refer to “6. Detailed operation by the function groups” of the User Manual provided with the L100series inverter for detailed information about each group other than the E/L group.

3.4 Setting motor parameters

You can allow the elevator to provide advanced ride quality by setting the motor parameters in the following order and fine-tuning the parameter values with **auto tuning**.

Keypad display	Description
PAR▶ Motor Select 09 kW	Set the motor capacity. The default value is identical to the inverter's rated capacity. If your motor's capacity is not on the list, select "User Define" and manually set the motor capacity at PAR_10.
PAR▶ UserMotorSel 10 kW	If you selected "User Define" at PAR_09, manually set the motor capacity at PAR_10. ≡ (PAR_10 is displayed only when you have selected "User Define" at PAR_09)
PAR▶ Enc Pulse 24 □□□□	Set the number of pulses for the encoder installed in the motor.
PAR▶ Sync Speed 14 rpm	Set the synchronous speed of the motor. Note The synchronous speed is not the rated speed on the rating plate.
PAR▶ Rated Volt 15 V	Set the rated voltage of the motor. (Voltage on the motor's rating plate)
PAR▶ Pole number 16 □	Set the number of poles for the motor.
PAR▶ Efficiency 17 %	Set the efficiency of the motor. Use the default value if the motor efficiency is not listed on the rating plate.
PAR▶ Rated-Slip 18 rpm	Set the rated slip of the motor. (Rated slip of a motor = synchronous motor speed – rated motor speed)
PAR▶ Rated-Curr 19 A	Set the rated current for the motor.

3.5 Auto tuning

Auto tuning allows for automatic detection of factors that play important roles in vector control, such as stator resistance, stator inductance, flux current, and the time constance of the motor's 2nd circuit, without actually running the motor to provide precise control characteristics.

3.5.1 Preparation

Turn off the brake on the traction machine and fix the motor's axis so it does not move.

Auto tuning procedures

Keypad display	Description	Tuning time
PAR▶ AutoTuneType 31 StandStill	Make sure to select "Standstill" as the auto tuning type.	-
PAR▶ IM Auto Tune 41 ALL1	Auto tuning begins immediately if you select "ALL1" as the auto tuning type.	-
PAR▶ IM Auto Tune 41 Rs Tuning	Detects the motor's stator resistance without rotating the motor.	20–30 (seconds)
PAR▶ IM Auto Tune 41 sL Tuning	Detects the motor's leakage inductance without rotating the motor.	90–150 (seconds)
PAR▶ IM Auto Tune 41 If/Tr/Ls Tuning	Detects the motor's flux current, time constance of the second circuit, and inductance of the first circuit without rotating the motor, by supplying a direct current pulse to the motor.	40–70 (seconds)
PAR▶ IM Auto Tune 41 None	"None" will be displayed if the parameter values have been successfully detected. "Error" will be displayed if the parameter	Total elapsed time 2.5–5 (minutes)

Keypad display	Description	Tuning time
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> PAR ▶ IM Auto Tune 41 □□ Error </div>	values could not be detected. If an error occurs, check to ensure that the motor and encoder parameters have been correctly set and run the procedures above once again. Contact the retailer or LS ELECTRIC customer service center if "□□ Error" message is displayed again.	

3.5.2 Setting the elevator specifications (for 1500 rpm, 120 m/min, 32 floor)

1) Set the number of stops

Set the total number of stops where the sensing plates have been installed, which includes the number of basement floors (not the highest floor number).

E/L ▶ Floor Number
 02 32F

2) Set the car speed of the elevator

E/L ▶ Car Speed
 03 120m/m

3) Set the rated speed of the elevator

Set the motor speed for when the elevator car is operated at the rated speed set at E/L_03. The inverter calculates the distance with the set values at E/L_03 and E/L_04. Therefore, parameter values for E/L_03 and E/L_04 must be precisely set.

Refer to “3.7 Floor height measuring operation” for details. You must perform another floor height measuring operation after making any changes to the set values at E/L_03 and E/L_04. Because the inverter internally controls motor speed in rpm (lengths in mm are converted to rpm values), you must increase the E/L_04 parameter value to increase the car speed.

E/L ▶ Motor Speed
04 1500rpm

3.5.3 Setting operation mode and multifunction I/O

When elevator mode operation is in use, the following operation modes may be set via multifunction I/O terminals: high speed operation, manual operation, and floor height measuring operation.

By default, multifunction input terminal functions are set as “Not Used”. When you set PAR_08 to “Elevator”, multifunction input terminals P1–P4 are automatically set for MM0/P1, MM1/P2, ATO/P3, and FHM/P4 functions, which are for deciding the elevator’s operation mode.

However, the automatic setting change will not take place if the multifunction input terminals DIO_01–DIO_04 have been already set to

any other values than “Not Used”.

DIO ► P1 define
01 Manual Spd-L

DIO ► P2 define
02 Manual Spd-H

DIO ► P3 define
03 HighSpeed Run

DIO ► P4 define
04 FHM Run

After setting the multifunction input terminals according to the examples above, the operation mode is defined as in the following table, based on the inputs at terminals P1 – P4. If two different operation mode inputs have been simultaneously provided, only one of the two inputs that is detected first will be accepted.

If an input for floor height measuring operation is provided during a manual operation, the operation mode will change to floor height measuring mode.

If the signals have not been provided after defining the multifunction input terminals, or if the multifunction input terminals have not been defined after the cable connection, “N/A” will be displayed on the keypad, the STOP/RESET indicator will flash red, and operation will not be available even when an operation command has been provided.

Signal status (1: On, 0: Off)				Operation mode	Keypad display
P1	P2	P3	P4		
1	0	0	0	Manual operation	MAN
0	1	0	0	Manual operation	MAN
1	1	0	0	Manual operation	MAN
0	0	1	0	High speed operation	E/L

Signal status (1: On, 0: Off)				Operation mode	Keypad display
P1	P2	P3	P4		
0	0	0	1	Floor height measuring operation	FHM
0	0	0	0	No mode	N/A

High-speed and floor height measuring operation signals via multifunction terminals P1 – P7 must be provided before the start of operation prior to the Up/Down operation commands, and the terminal input signals must be stopped after the up/down operation commands have been completed.

The elevator car may abruptly stop or the measuring operation may fail if high-speed or floor height measuring operation signals are stopped while an up/down operation is still in progress. In the meantime, one of the multifunction auxiliary relay terminal outputs (AX1, AX2, AX3, or AX4) should be set to "RUN", as in the following examples, for the ON/OFF signal operation of the traction machine brake.

DIO ► AX1 define
11 Run

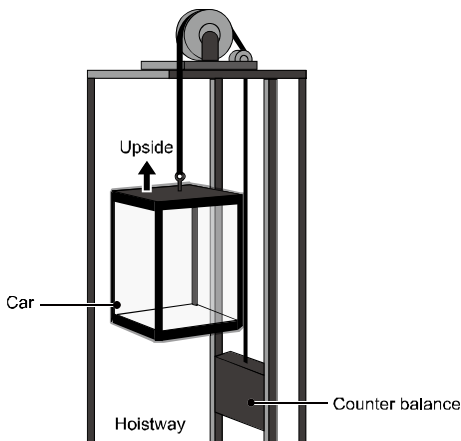
or

DIO ► AX2 define
12 Run

3.6 Verifying encoder operation via low-speed manual operation

3.6.1 Definition of UP operation

As shown in the figure, UP operation refers to an operation that allows the elevator car to ascend in the hoistway. On the keypad, UP operation is indicated when the forward operation command terminal input (FX) is turned on.



3.6.2 Parameter settings for controlling terminal operation

(Ex. Low-speed manual operation at 15m/min)

Check the settings in the following table before starting low-speed manual operation. Also, check the multifunction terminal input in the DIS group while in manual operation mode (Refer to “4. Display group” for details).

Multifunction input terminal on control board	Elevator mode definition	Multifunction input function setting	Input from the control	DIS_03 Terminal input status
P1	MM0	Manual Spd-L	One of the two terminals must be turned “ON”	00001000000 (When P1 is ON, P2 is OFF)
P2	MM1	Manual Spd-H		

- 1 Go to FUN group. Run/stop command by terminal input is selected. (On the keypad, “Err-CmdSrc” is indicated and operation becomes unavailable).

FUN ▶ Run/Stop Src
 01 Terminal 1

- 2 Select speed reference by keypad input.

FUN ▶ Spd Ref Sel
 02 Keypad1

- 3 Go to E/L group and set the manual operation speed. (Speed reference when P1 is ON and P2 is OFF).

E/L ▶ Manual Spd1
 22 15.0m/m

3.6.3 Operation to UP/DOWN directions

Low-speed manual operation

- On the initial DIS group screen, ensure that the motor speed is "15 m/m" and the operating direction is "UP", while pressing the [UP] button for low-speed manual operation in the control board. The floor will be indicated as "—F" if the operation is not set for a floor measuring operation.

15.0m/m	MAN
UP -- F	4.6A

- On the initial DIS group screen, ensure that the motor speed is "15 m/m (not -15 m/m)" and the operating direction is "DN", while pressing the [DOWN] button for low-speed manual operation in the control board.

15.0m/m	MAN
DN -- F	4.6A

During low-speed manual operation by terminal input, encoder or motor cable connection malfunctions will result in the following operation.

Operation command	Car Operating direction	Speed indication on keypad	Torque indication on keypad ^(*)	Operating status
FWD	UP direction	+15.0 m/m	More than -10%	Normal operation
REV	DOWN direction	-15.0 m/m	More than -10%	
FWD	UP direction	-4.5 - 10.5 m/m	150%	Encoder cable connection is wrong
REV	DOWN direction	4.5 - 10.5 m/m	-150%	
FWD	DOWN direction	-4.5 - -10.5 m/m	150%	Motor cable connection is wrong
REV	UP direction	4.5 - 10.5 m/m	-150%	

Operation command	Car Operating direction	Speed indication on keypad	Torque indication on keypad ⁽¹⁾	Operating status
FWD	DOWN direction	+15.0 m/m	More than +10%	Encoder and motor cable connections are wrong
REV	UP direction	-15.0 m/m	More than +10%	

Note (1) Torque indication is based on low-speed manual operation without a load. Speed and torque cannot be displayed simultaneously. Set E/L_58 to "Trq Output" to display torque.

Check the encoder's cable connection for correct phase order and switch phases A and B if they are reversed.

- Check the encoder's output cable connections to the motor and switch two of the three phases if they are misconnected. For example, switch the connection for phases U and W of the U, V, and W phases.
- If the encoder fault check time has been set at PRT_11, the encoder and motor cable connection faults are detected as encoder errors.
- If the indications for operation direction on the keypad (UP/DOWN) are reversed, check the FX and RX input signal cables for misconnection. If the indications for operation direction on the keypad (UP/DOWN) are correct but the actual operation directions appear reversed, change the motor direction setting at E/L_05. Adjust the setting to ensure that the UP direction operation is performed when the FX input terminal is "ON".
- If UP operation is not available while DOWN operation is normal, check the braking resistor for the cable connection and resistance value. If "0.0 m/m" is constantly displayed for the operation speed, check the encoder cable connections and multifunction terminal settings again.

- When providing ULS/DLS signal input to the inverter, be careful about the settings at E/L_39 because Up operation will not be available while the ULS signal is input, and DOWN operation will not be available while the DLS signal is input (see floor height measuring operation).
- When stopping the manual operation, deceleration time must be adjusted if severe vibration occurs with abrupt deceleration or if over voltage fault occurs. Adjust the setting value at E/L_31 (ManZeroDec T) to around 1.0 second.

E/L ▶ ManZeroDec T
31 1.0 sec

3.7 Floor height measuring operation

1) Check the cable connection and switch settings

Check to ensure that the switches for inverter operation and forced deceleration in the hoistway have been connected to the ELIO add-on module. Most limit switches in the hoistway use Form B contacts. Check the switches for the contact types and set E/L_39 accordingly.

The setting values at E/L_39 are for the ELIO add-on module, I_D, I_U, DLS, and ULS on CN3 connector (from left to right). Set each value to "0" for Form A, and "1" for Form B contact. The following is an example of E/L_39 settings when ULS/DLS and SD1/SU1 switches operate in Form B contacts.

E/L ▶ ELIO In Neg
39 001100110000

2) Set limit switch conditions

If the floor height measuring must start when the DLS is ON and end when ULS is ON, set the floor height measuring conditions at E/L_61 to "DLS ON/SD1-ON". For such an operation, the DLS/ULS signals must also be connected to the inverter.

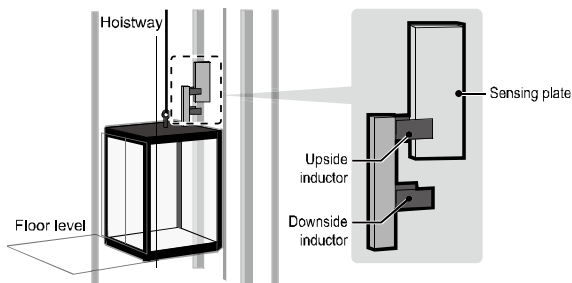
E/L ► FHM Start
61 DLS ON/SD1-ON

3) Check the input signals

Ensure that the inductor, forced deceleration switch, and ULS/DLS signals are correctly input, while manually operating the car. Ensure that the forced deceleration switch signals are correctly provided. Automatic deceleration will not be performed when the car arrives at the top floor if the forced deceleration switch at the top floor fails to provide signal input to the inverter.

4) Adjust the car position to meet the start conditions

In manual operation mode, move the car to the base floor to satisfy the start condition set at E/L_61. If E/L_61 is set to "ID-OFF/IU-ON", the car will be stopped with the upside inductor placed within the sensing plate and the downside inductor outside of the sensing plate. If E/L_61 is set to "DLS ON/SD1-ON", manually move the car until the DLS signal is turned ON.



5) Check the parameter setting for the number of floors

Ensure that the floor number setting at E/L_02 matches the total number of all floors.

6) Switch to floor height measuring mode

Then, provide ON signal to a multifunction input terminal defined for "FHM Run (floor height measuring operation)", or set E/L_62 to "Yes" to switch to floor height measuring operation mode.

E/L ▶ KeyPad FHM
62 Yes

- When switching to floor height measuring mode, if the car position does not satisfy the floor height measuring start condition set at E/L_61, or if the downside forced deceleration switch (SD1 on ELIO) is at the bottom of the hoistway, the "NotRdy" message will be displayed on the keypad's initial screen and the STOP/RESET LED (red) on the keypad will flash.
- Floor height measuring operation is not available in such a state. Switch to

manual operation mode, switch back to floor height measuring mode, and then try to operate again after satisfying the start condition set at E/L_61.

- Ensure that E/L 62 is set to “OFF” before switching to manual operation mode because the operation mode will be fixed to floor height measuring mode during manual operation if E/L_62 has been set to “Yes”.
- The car must be operated in manual mode because, in floor height measuring mode, the motor will not rotate when the DOWN (RX) signal is provided.

E/L ▶ 0.0m/m FHM
Err 1F NotRdy

7) Start floor height measuring

Start floor height measuring operation by providing forward operation (FX) and floor height measuring (FHM) operation signals to the inverter’s control terminal block. Then, maintain the UP operation signal until the car arrives at the top floor. In this state, operation speed of the car may be adjusted by providing signals to terminals defined for manual 0 (MM0) or manual 1 (MM1) operation. (Refer to “6.2.15. Setting car speeds 1 – 3 for manual operation” for details).

- If E/L_61 has been set to “ID-OFF/IU-ON”, the inverter automatically decelerates the car to zero when it arrives at the top floor and holds it there. In this state, stop the FX command to complete the floor height measuring operation. The car does not stop automatically if E/L_61 has been set to “DLS ON/SD1-ON”, and it stops when ULS signal input is provided. Stopping the FX command in this state completes the floor height measuring operation.

- Ensure that E/L 62 is set to "OFF" after completing the floor height measuring operation because the operation mode will be fixed to the floor height measuring mode regardless of the terminal input signals while E/L_62 is set to "Yes".
- If the upside/downside inductor signal cables are reversed on the ELIO add-on module inside the inverter, the operation stops as soon as the car leaves the base floor during the floor height measuring operation, and the following fault message will be displayed. In such a case, correctly change the inductor signal cable connections to the inverter. After changing the cable connections, switch to manual operation, move the car to satisfy the condition set at E/L_61, and then perform the floor height measuring operation again.

DIS ► Faults
05 Ind Reserved

- After starting the floor height measuring operation, when the car leaves the base floor, the following fault message will be displayed if both the upside and downside inductor signals for sensing plate detection are not simultaneously provided. If this happens, adjust the position of the inductors. After adjusting the positions, switch to manual operation, move the car to the state described in the previous page, and perform the floor height measuring operation again.

DIS ► Faults
05 IND'TOR Fail

- If the floor height measuring operation fails, the floor indication will not be correctly displayed on the initial screen of the keypad (--F). The fault message may not be displayed even when the floor height measuring operation failed if

the operation mode has been switched to manual mode following the operation because the fault may be automatically reset.

0.0m/m FHM
STP -- F 0.0A

- The following indication will be displayed on the keypad after a successful floor height measuring operation. The current floor will be the top floor (E/L_o2). The E/L_o2 indicates the total number of floors including both the floors below and above the ground level.

0.0m/m FHM
STP 32F 0.0A

Fault messages and causes

- When the car arrives at the top floor, a fault message will be displayed upon stopping the Fx command if the number of sensing plate detections by the upside/downside inductors is less than the setting value at E/L_o2, or if the measured floor height data is faulty.

Keypad display	Cause
DIS ► Faults 05 FHM Run Fail	The number of sensing plate detections does not match the setting at E/L_o2 (Max. stop floors).
DIS ► Faults 05 Flr Data Fail	The measured floor height data is faulty.

- If the floor height measuring fails, troubleshoot the faults by checking the sensing plates for correct installation and verifying inductor signals for interference by noise or faulty inductors. Then, switch to manual operation

mode, move the car to the base floor, and resume floor height measuring operation.

- When the floor height measuring operation fails, the fault message will be displayed on the initial screen unless the [STOP/RESET] has been pressed. Press the [MODE] key instead of the [SHIFT/ESC] key to go to the initial screen when the fault message is displayed.

Keypad display	Cause
0.0m/m FHM Err -- F Fcount	The number of sensing plate detections does not match the setting at E/L_o2 (Max. stop floors / FHM Run Fail fault).
DIS ► Faults 05 FHM Run Fail	
0.0m/m FHM Err -- F Fdata	The height of a certain floor is shorter than the previous floor's height or if the height is excessively short. (Flr Data Fail fault occurs if the height is less than 1000 mm).
DIS ► Faults 05 Flr Data Fail	

- If the floor height measuring is successful, the floor height data for each floor and the floor height data checksum will be stored on the inverter's internal memory. Then, when the inverter is turned on, a fault message will be displayed as shown in the following figure if the checksum calculated with the stored floor height data and the previously stored checksum do not match. If this happens, you must perform the floor height measuring operation again.

DIS ► Faults
 05 Checksum Err

8) View the result of floor height measuring operation.

After a successful floor height measuring operation, you can view the height of each floor measured in millimeters at E/L_60.

- 1 Go to E/L_60 and press the [PROG] key.

E/L ▶ Show FirPosi
60 1F

- 2 Press [UP]/[DOWN] Keys to increase/decrease the floor number.

E/L ▶ POSI 0mm
60 1F

The height of each floor will be displayed as the floor number changes.

E/L ▶ POSI 45000mm
60 16F

- 3 Press the [MODE] or [ENT] key to exit.

E/L ▶ POSI 3000mm
60 2F

9) View the installation position for forced deceleration switches (SD₁, SU₁)

During floor height measuring operation, measure the installation location of the forced deceleration switch (SD₁) at the base floor based on the bottom level. Likewise, measure the top of the installation position of the forced deceleration switch (SU₁) on the top floor based on the top floor

level.

You can view the measurements by setting DIS_01 – DIS_03 to “SDSD1 Posi” or “SDSU1 Posi”.

DIS ▶ SDSD1 Posi
01 1200.0 mm

DIS ▶ SDSU1 Posi
01 1200.0 mm

3.8 High-speed automatic operation

High-speed automatic operation becomes available after the floor height measuring operation has been successfully completed. During the floor height measuring operation, the car stops when it arrives at the top floor, when the upside inductor (IND_U) has passed the top floor’s sensing plate.

However, if the start condition for high-speed operation at E/L_50 has been set to “Inductor ON”, the car does not respond to a call because the upside inductor (IND_U) is placed outside the sensing plate on the top floor. Therefore, before you can start high-speed manual operation, you must move the car down in manual mode to activate both the upside/downside inductors by placing them within the sensing plate.

3.8.1 Adjusting the speed control gain and torque limit

If the deviance from the floor level is large when the car stops at a floor, or if the ride is uncomfortable during acceleration or deceleration, adjust the speed control gain and torque limit values. The speed control gain becomes greater as ASR P Gain₁ at CON_03 is set higher, and smaller as ASR I Gain₁ at CON_04 is set lower. To adjust the torque limit, set Pos Trq

Lmt (CON_34), Neg Trq Lmt (CON_35), and Reg Trq Lmt (CON_36) to 150–200% depending on the size of the load and the comfortability of the ride. If you need to apply different gains for starting/stopping and constant speed operations (for example, to set low-speed gain to high and high-speed gain to low), use the gain switching feature to adjust the comfortability of ride (Refer to section 6.5.4).

3.8.2 Setting overload trip level and time

To protect the motor from overload, set the OLT Level (PRT_23) to 150–190% (approximately 10% smaller than the torque limit), and set the OLT Time (PRT_24) to “60” seconds.

3.8.3 Adjusting comfortability at car start

High-speed manual operation is performed in the order of repetitive round trips to 1, 2, and 3 floors, and trips between the top and base floors to verify the comfortability of the ride when it is starting, stopping, and during constant speed operations. Especially at the start, if an abrupt drop is observed due to the static friction at the traction machine, set E/L_51 to “U-curve” and increase the time set at E/L_o8.

E/L ▶ AccStartType
51 U-Curve

E/L ▶ Acc Start T
08 2.00 Sec

If the abrupt drop is still present after adjusting the settings at E/L_51 and E/L_o8, adjust the settings at E/L_52 – E/L_54 for the optimal comfortability of the ride.

E/L ▶ StartUpAccel 52 0.01m/s2	E/L ▶ StartUpAcc. T 53 0.50 Sec	E/L ▶ StartUp Wait 54 0.20 Sec
--------------------------------------	---------------------------------------	--------------------------------------

Recommended range of adjustment: (0.01 – 0.03 m/s²) / (0.3 – 0.8 sec) / (0.2 – 0.4 sec)

3.8.4 Adjusting the acceleration and deceleration speed, the time before and after acceleration and deceleration, and verifying floor height

The rated acceleration and deceleration speed, the time before and after acceleration and deceleration at E/L_o6 – E/L_o11 are the setting values appropriate for an operation speed of 60 m/m. If the car's rated speed is slower than 60 m/m, and if the car's rated speed is 30 m/m, specifically, the rated acceleration speed (E/L_o6) and acceleration speed (E/L_o7) must be set to smaller than the default value ("0.5").

Set one of DIS_o1 – DIS_o3 to "MinSpdAcc (minimum speed for acceleration)" and "MinSpdDec (minimum speed for deceleration)" to view the setting values and check the rated speed of the car (E/L_o3).

The "MinSpd Acc" indicates the minimum speed required for the ramps before and after the acceleration set with E/L_o6, E/L_o8, and E/L_o9. This is also the speed required for the S curve operation that will last for the times set at E/L_o8 and E/L_o9 for ensuring smooth ride quality. Therefore, the setting value at E/L_o3 must be larger than this value to ensure a single floor operation without an operation shock.

Likewise, set DIS_o1 – DIS_o3 to check the "Min.FlrDist (smallest floor-to-

floor distance after floor height measuring)” value and ensure that the “Min.RunDist (shortest high-speed operation distance without shock)” setting is appropriate for the floor distance.

DIS ▶ Min. Spd Acc
01 30 . 0 m/m

DIS ▶ Min. Run Dist
01 1400 m/m

3.8.5 Base floor / Nearest floor operation

If high-speed operation fails with the car stopped between floors due to a trouble such as power interruption, the inverter moves the car to the nearest floor to evacuate the passengers before moving the car to the base floor, resetting the information about the higher floors that may have been affected by the incident, and resuming high-speed operation.

You can also move the car in manual mode to a near floor or to the base floor. However, the base floor / nearest floor operation allows you to move the car to the nearest floor or to the base floor and automatically decelerate the car to zero at the target floor simply by setting the mode and providing a command.

The base floor / nearest floor operation is available only during high-speed operation. After setting multifunction inputs P₁ – P₇ to “Base Floor Run” / “Near Floor Run”, while the car is stopped in high-speed operation mode, you can turn on the multifunction terminal to switch to the base floor or nearest floor operation mode, then provide a run command to perform base floor or nearest floor operation to the direction of the run command (Down command performs top floor operation). After starting operation, the high-speed operation and base floor / nearest floor operation signals

must be maintained until the end of the operation.

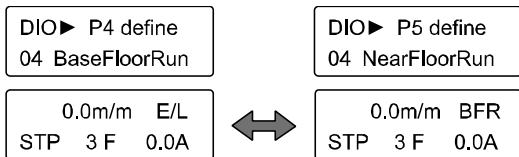
To move the car to the nearest floor, provide the nearest floor operation signal via the multifunction terminal input in high-speed operation mode, then, provide an UP or DOWN run command toward in the direction nearer to the floor. The inverter moves the car to the nearest floor and decelerates to zero after the time set at E/L_55 when the upside or downside inductor signal is first detected. Then, you can stop the run command to end the nearest floor operation.

After the car has stopped at the nearest floor, stop the nearest floor operation signal in high-speed operation mode before moving the car to the base floor to reset the stored floor information. Then, provide the base floor operation signal and provide a Down command (Up command send the car to the top floor). The inverter moves the car to the base floor and decelerates to zero after the time set at E/L_55 when all of forced deceleration switch, upside, and downside inductor signals are detected (see figure on the next page).

Then, you can stop the base floor operation signal and run command to end base floor operation. During this process, the current position of the car and the floor information are updated using the forced deceleration switch and the upside/downside inductor signals.

The following table lists multifunction input P1 – P5 for DIO_01 – DIO_05 settings and operation modes according to the input status. To perform base floor/nearest floor operation, an input for high-speed operation must be provided. During base floor operation, "E/L" and "BFR" indications are displaced alternately. During nearest floor operation, the "E/L" and "NFR"

indications are displaced alternately.



Multifunction input terminal setting for DIO group

Code	Multifunction input terminal	Set value	Description
DIO_01	P1	Manual Spd-L	manual operation speed 0
DIO_02	P2	Manual Spd-H	manual operation speed 1
DIO_03	P3	HighSpeedRun	high-speed operation
DIO_04	P4	BaseFloor Run	Base floor operation
DIO_05	P5	NearFloor Run	Nearest floor operation

Multifunction input operation mode

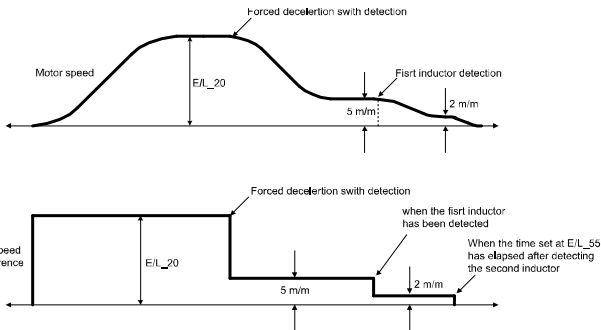
Operation mode indication	Multifunction input status (1: ON, 0: OFF)				
	P1	P2	P3	P4	P5
N/A	0	0	0	0	0
MAN	1	0	0	0	0
MAN	0	1	0	0	0
MAN	1	1	0	0	0
E/L	0	0	1	0	0
BFR (Base floor operation)	0	0	1	1	0
NFR (Nearest floor operation)	0	0	1	0	1

The acceleration and deceleration speeds during base floor operation are identical to those in manual operation mode. The synchronous motor's

reference speed changes according to the limit switch input as shown in the figure. And the actual speed of the car will follow the reference speed according to the acceleration and deceleration speed.

The reference speed until the car reaches the forced deceleration switch is set at E/L_20. The car speed changes to 5 m/m when it reaches the forced deceleration switch, to 2 m/m when it detects one inductor signal, then the reference speed becomes "0" after the time set at E/L_55 has passed. The reference speed of 5 m/m and 2 m/m after the car reaches the inductor cannot be changed.

The acceleration and deceleration speeds during nearest floor operation are also identical to those in manual operation mode. During base floor operation, the change of reference speed is similar to that of base floor operation. However, the car operates at 5 m/m as soon as the operation starts, without the operation at the speed set at E/L_20, then it operates at 2 m/m when it detects the first inductor signal, then when it detects the second inductor signal, the reference speed becomes "0" after the time set at E/L_55 has passed. As with the bottom floor operation, the reference speeds cannot be changed.



To precisely stop the car at the floor height level during base floor or nearest floor operation, appropriately adjust the setting at E/L_55 , which is the delay time until the speed reference becomes "0" after the car meets two inductors. Be careful not to set the time at E/L_55 too long because it may cause the car to miss the floor height level.

4 Display group (DIS)

4.1 Setting user defined functions (DIS_01 – 03)

You can set user defined functions 1, 2, and 3 to display one of the items listed in the following table.

If the ELIO add-on module dedicated for elevator applications has been installed to the inverter, the following additional items become available when PAR_o8 of CON group (inverter application options) is set to "Elevator".

Function code	Keypad display	Function name	Unit	Description
DIS_01 – DIS_03	CarSpeed	Rated car speed per minute	m/min	Car's moving speed per minute
	CarSpeed	Rated speed of the car per second	m/sec	Car's moving speed per second
	Car Position	Car's current position	mm	Car's current position in millimeters
	ELIO IN	ELIO input signal		Signals for inductors, hoistway limit switches, and permission for deceleration Input ON/OFF status: 1-Enabled, 0-Disabled LSB MSB I_D I_U DLS ULS RV1 RV2 SD1 SU1 SD2 SU2 DAC RV3
	Limit S/W In	Limit switch status		The switch On/OFF state is indicated according to the ELIO input contact setting at E/L_39 (Form A or Form B). "1": S/W ON, "0": S/W OFF. Bit indications are identical to those for ELIO IN settings.
ELIO Out	ELIO output signal		Displays floor information (current floor, previous floor), floor identification, deceleration request, in	

				deceleration, contactor operation, and brake signal ON/OFF status.										
				LSB										MSB
				FS0	FS1	FS2	FS3	FS4	DER	FID	UND	MC	BR	
Tuning Dist	Remaining distance at inductor operation	mm		Remaining distance when the 1st inductor (UP: IN_U, Down: IN_D) operated.										
Cur Floor	Current floor	F		The floor number where the car is currently at										
Adv Floor	A floor where the car can stop (previous stop)	F		The floor number where the car can stop										
Remain Dist	Remaining distance to the floor level	mm		Displays the remaining distance to the level of the target floor after deceleration has started.										
SDS1 Speed	1st SDSD,U car speed	m/m		SDSD1 (- value), SDSU1 (+ value) Car speed per minute is displayed when operated.										
SDS2 Speed	2nd SDSD,U car speed	m/m		SDSD2 (- value), SDSU2 (+ value) Car speed per minute is displayed when operated.										
SDS3 Speed	3rd SDSD,U car speed	m/m		SDSD3, SDSU3 Car speed per minute is displayed when operated (will be available soon).										
Min.FlrDist	Minimum floor height	mm		Displays the shortest floor height of the building.										
Min.RunDist	Minimum run distance required.	mm		Distance required for the ramps before and after acceleration.										
DecelDist	Rated deceleration distance	mm		Distance required for deceleration to the level position										
Min.SpdAcc	Minimum speed for completing acceleration	m/m		Minimum speed required for the ramps before and after acceleration										
Min.SpdDec	Minimum speed for starting	m/m		Minimum speed required for the ramps before and after deceleration										

		deceleration		
Dec.End Dist		Distant required after deceleration	mm	Distance required for the ramp after deceleration
SDSD1 Dist	1st SDS Dist	1st SDS position	mm	Distance between the base level and the installation position for SDS1
SDSU1 Dist	1st SDSU Dist	1st SDSU position	mm	Distance between the top level and the installation position for SDSU1
SDSD2 Dist	2nd SDS Dist	2nd SDS position	mm	Distance between the base level and the installation position for SDS2
SDSU2 Dist	2nd SDSU Dist	2nd SDSU position	mm	Distance between the top level and the installation position for SDSU2
SDSD3 Dist	3rd SDS Dist	3rd SDS position	mm	Distance between the base level and the installation position for SDS3 (will be available soon)
SDSU3 Dist	3rd SDSU Dist	3rd SDSU position	mm	Distance between the top level and the installation position for SDSU3 (will be available soon)

4.2 Setting fault status display (DIS_05)

This function displays the current trip status, history of the two previous faults, and the number of previous faults. Also, it allows you to reset (clear) the stored fault history. You can switch between the functions by pressing the [SHIFT/ESC] key after selecting DIS_05.

Function code	Keypad display	Function name	Description
DIS_05	Faults	Trip status display	When the inverter is operating normally, "No Fault" is displayed. If a trip fault occurs, the relevant fault information is displayed (see "[3] Fault display").
	Last Fault1	Displays the previous fault	Refer to the troubleshooting information for the inverter.
	Last Fault2	Displays the fault	

Function code	Keypad display	Function name	Description
		before the previous fault.	
	Fault Count	Total number of faults	Displays the total number of faults after a previous fault reset.
	Fault Clear	Clears the number of faults.	Initializes the total number of faults to "0".

You can press the [PROG], [▲(Up)] and [▼(Down)] keys to view the fault information, speed reference before the fault, speed feedback, output frequency/current/voltage, torque current and the actual torque, DC voltage, input/output terminal status, operation status, and the time of operation before pressing the [RESET] key.

Press the [ENT] key to go back to the previous screen. The fault information will be saved as Last Fault₁ [previous fault history] when you press the [RESET] key. Refer to "Chapter 8 Troubleshooting" for detailed information about utilizing the DIS_05 functions.

No	Trip type	Keypad display	No	Trip type	Keypad display
1	IGBT short circuit	Arm Short	17	Inverter thermal open	Inv THR Open
2	Ground fault	Ground Fault	18	Motor speed failure	Over Speed
3	Over current	OCT	19	Floor height failure ⁽¹⁾	Flr/FHM Data
4	Over voltage	Over Voltage	20	Forced deceleration switch failure ⁽²⁾	SDS Error
5	FAN failure	FAN Error	21	A3 safety error	A3 Safety
6	Fault during a battery operation	BatRun Fault	22	LV2 safety error	Low Voltage 2
7	Encoder failure	Encoder Err	23	Safety failure A	SAFETY A
8	Low voltage	Low Voltage	24	Safety failure B	SAFETY B
9	Heatsink failure	Inv OverHeat	25	Speed deviation detection failure	Spd Dev Err
10	E-thermal failure	E-Thermal	26	ADC failure	ADC Error
11	Overload trip fault	Over Load	27	Pole detection failure	Mag Det Err
12	Hardware failure	HW-Diag	28	EnDat add-on module failure	EnDat Error
13	External trip input B	Ext-B Trip	29	Dater saving error	EEP Error
14	Output phase open	Output PO	30	CPU Error	CPU Error
15	Inverter overload	Inv OLT	31	ADC offset failure	ADC Offset
16	Input phase open failure	Input PO	32	Pole detection failure	Mag Det Err

Note (1) This failure is detected only in elevator application mode.

Note

If multiple faults occur simultaneously, faults with higher priority are displayed on the keypad. Other faults may be viewed in the fault information.

As you can see in the table of faults, elevator application faults displayed with DIS_05 are faults with high priority: floor height-related faults and forced deceleration switch faults. Other faults than those listed in the table are displayed at the bottom-left corner of the Home screen (not on DIS_05 screen) as "Err", and the detailed information is provided at the bottom-right corner.

0.0m/m	E/L
Err	1 F CmdSrc

Floor height-related faults and forced deceleration switch faults may be viewed on both the Home and DIS_05 screens.

Faults that are detected only in elevator application mode are as follows.

Protection function	Keypad display	Description
Floor height measuring failed	FHM Run Fail	<ul style="list-style-type: none"> After floor height measuring operation, the number of sensing plate detection by the upside/downside inductors do not match the number of stops (E/L_02). (Saved at E/L_21). During an initialization, the setting value at E/L_21 is not "the maximum floor height (E/L_02) * 10 + 1". "Fcount" is displayed on the home screen (it can also be viewed at DIS_05).
Floor height data fault	Fir Data Fail	<ul style="list-style-type: none"> There is a floor with negative (-) height among the all floors, from the base to the top. If two adjacent floors have heights less than 2000 mm, or if there is a floor that is higher than the next floor among all floors, from the base to the top. "Fdata" is displayed on the home screen (it can also be viewed at DIS_05).
Floor height data checksum error	Chksum Err	<ul style="list-style-type: none"> After a floor height measuring operation, floor height data for each floor and floor data checksum are saved on EEPROM. Checksum error occurs if the data and its checksum do not match. Checksum error is automatically detected at initialization or before starting an automatic operation. "CHKSUM" is displayed on the home screen (it can also be viewed at DIS_05).

Protection function	Keypad display	Description
High-speed automatic operation start condition error	NotRdy	<ul style="list-style-type: none"> • If start condition for high-speed automatic operation (E/L_50) is set to "Inductor ON", an error occurs if both the upside/downside inductors are not placed with the sensing plate. • This error is displayed only on the home screen.
Deceleration error	Decel	<ul style="list-style-type: none"> • If the run command (FX/RX) does not stop for a set time after a deceleration, a deceleration error occurs. • This error is displayed only on the home screen.
Speed pattern control error	Acc/Dec	<ul style="list-style-type: none"> • If a speed pattern is not completed within the set time after operation has started, a speed pattern control error occurs. • This error is displayed only on the home screen.
Forced deceleration switch error	SDS Error	<ul style="list-style-type: none"> • When SDS-D1 and SDS-U1 (or SDS-D1 and SDS-D2) signals are detected at the same time. • At the base (or top) floor, if SDS-D1 (SDS-U1) input cannot be detected, or SDS-U1 (SDS-D1) input has been detected. • If SDS-D1 (SDS-U1) input has been detected but the car is not at the base (top) floor. • "SDS" is displayed on the home screen (it can also be viewed at DIS_05).
Upside/downside inductors inductor has been reversed.	Ind Reversed	<ul style="list-style-type: none"> • After floor height measuring has started, this error occurs if the downside inductor signal is not detected when the upside inductor leaves the sensing plate. • Immediately after the floor height measuring, "IND Reversed" is displayed at • DIS_05. However, it will be indicated as a floor height measuring error (FHM Run Fail) after turning off the inverter and turning it back on.

Protection function	Keypad display	Description
Inductor fault	Ind'tor Fail	<ul style="list-style-type: none"> After floor height measuring has started, this error occurs if the upside inductor signal is not detected when the downside inductor meets the sensing plate (when both inductors cannot detect the sensing plate simultaneously). Immediately after the floor height measuring, "IND'TOR FAIL" is displayed at DIS_05. However, it will be indicated as floor height measuring error (FHM Run Fail) after turning off the inverter and turning it back on.
Run command source fault	CmdSrc	<ul style="list-style-type: none"> In elevator application mode, operations are available only via terminal block inputs. This error occurs if the source of RUN/STOP command (FUN_01) has been set to "Keypad". This fault will be automatically released when FUN_01 is set to "Terminal".
Floor height measuring cannot be started	NotRdy	<ul style="list-style-type: none"> In floor height measuring mode, this error occurs if the start condition set at E/L_61 is not met. The same indication as the high-speed automatic operation error is displayed (although the operation modes are different).

5 Digital I/O group (DIO)

5.1 Setting multifunction inputs (DIO_01 – 07)

If the ELIO add-on module dedicated for elevator applications has been installed to the inverter, the following additional items become available for functions DIO_01 – DIO_07 (define multifunction inputs P1 - P7) when PAR_08 of CON group (inverter application options) is set to "Elevator".

Function code	Keypad display	Function name	Functions
DIO_01 – DIO_07	Manual Spd-L	Low-speed manual operation command bit 0	Combinations of low-speed manual operation command bits 0 and 1 may be used for selecting one of the three low-speed manual operation speeds.
	Manual Spd-H	Low-speed manual operation command bit 1	
	HighSpeed Run	High-speed manual operation command	Select the high-speed manual operation command
	FHM Run	Floor height measuring operation command	Select the floor height measuring operation command
	BaseFloor Run	Base floor operation command	In high-speed automatic operation mode, you can move the car to the base floor and adjust the positions if the elevator stops due to a power interruption or an emergency stop.
	NearFloor Run	Nearest floor operation command	In high-speed automatic operation mode, you can move the car to the nearest floor and evacuate the passengers if the elevator stops due to a power interruption or an emergency stop.

Function code	Keypad display	Function name	Functions
	Motor M/C State	Output contactor terminal input	If a contactor has been installed between the inverter and the motor, do not operate the inverter if the terminal input cannot be turned on after setting it as a Form A contact input to verify the contactor operation.
	CarBrake State	Terminal input for brake operation	Do not operate the inverter if the terminal input cannot be turned on after setting it for operating a brake relay or the brake itself.
	MagDet Run ⁽¹⁾	Initial magnetic pole detection	Initial magnetic pole detection will be performed when the multifunction input is On.
	2ndAutoRun	Secondary speed reference for automatic operation	If the multifunction input set in high-speed manual operation mode is On, the inverter operates with the speed reference set at E/L_67 (2ndAutoSpd), instead of the speed reference set at E/L_04 (Motor Speed).

(1) This function does not work if PAR_23 (Enc Type) has been set to "Endat" or "Sincos_1387".

5.2 Setting multifunction outputs (DIO_11 – 14)

If the ELIO add-on module dedicated for elevator applications has been installed to the inverter, the following additional items become available for functions DIO_11 – DIO_14 (define multifunction outputs AX1 – AX4) when PAR_o8 of CON group (inverter application options) is set to “Elevator”.

Function code	Keypad display	Function name	Functions
DIO_11 – DIO_14	BFR/NFR Mode	Base floor/Nearest floor operation status	The terminal is On if the current operation is in base floor mode or nearest floor operation mode.
	BFR/NFR End	Base floor/Nearest floor operation ended	The terminal is On when a base floor or nearest floor operation has ended (when the car has arrived to the target floor).
	E/L Fault	Elevator-related errors.	The terminal is On when an elevator-related fault has occurred.

6 Elevator group (E/L)

6.1 E/L group function table

Func. code	Comm. Addr.	Function name	Keypad display	Setting data			Setting change during a run ⁽⁶⁾	Page
				Range	Unit	Default		
E/L_00	-	Jump to function code	Jump Code	1-72		1	Yes	79
E/L_01		Speed reference pattern type	Spd RefType	0 (DecelRe q-D/B) 1 (DecelRe q-T/B)		0 (DecelRe q-D/B)	No	79
E/L_02		Number of floors	Floor Number	1-32	FLOOR	32	No	81
E/L_03		Rated car speed	Car Speed	30-420	m/m	60	No	81
E/L_04		Motor speed at rated car speed	Motor Speed	20.0-3600.0	rpm	1500	No	81
E/L_05		Direction of motor operation	UP Direction	0 (FX-CCW) 1 (FX-CW)		0 (FX-CCW)	No	82
E/L_06		Rated acceleration speed	Rated Accel	0.10-1.00	m/sec ²	0.50	No	82
E/L_07		Rated deceleratio	Rated Decel	0.10-1.00	m/sec ²	0.50	No	82

		n speed						
E/L_08		Acceleration start time	Acc Start T	0.50–2.50	sec	1.00	No	82
E/L_09		Acceleration end time	Acc End T	0.50–2.50	Sec	1.00	No	82
E/L_10		Deceleration start time	Dec Start T	0.50–2.50	sec	1.00	No	82
E/L_11		Deceleration end time	Dec End T	0.50–2.50	sec	1.00	No	82
E/L_12		Distance for compensation of communication delay	CommDlyDist	100–1000	mm	400	No	83
E/L_13		Adjustment for deceleration start distance	DecStart Adj	-10–100	mm	0	No	84
E/L_14		Motor excitation time	PreExtTime	100–10000	msec	300	No	84
E/L_15		Brake release time	Brake Time	0–10000	msec	300	No	85
E/L_16		Hold time at zero speed	HoldTime	0–10000	msec	300	No	85
E/L_17		Hold time for a restart	Restart Time	0.00–100.00	sec	1.00	No	85
E/L_18		Sensing plate length	Plate Length	E/L_19–1000.0	mm	200.0	Yes	87
E/L_19		Distance between position	InductorEdge	0.0–E/L_18	mm	20.0	Yes	87

		sensor and sensing plate at floor level						
E/L_20		Cars speed for floor height measuring	FHM/BFR Speed	0.0 – 60.0	m/m	15.0	No	88
E/L_21		Floor height measuring result	FHM DATA	0 – 321		0	Yes	88
E/L_22		Cars speed 1 for manual operation	Manual Spd1	0.0 – 60.0	m/m	15.0	No	90
E/L_23		Cars speed 2 for manual operation	Manual Spd2	0.0 – 60.0	m/m	10.0	No	90
E/L_24		Cars speed 3 for manual operation	Manual Spd3	0.0 – 60.0	m/m	3.0	No	90
E/L_25		Acceleration for manual operation	MAN Accel.	0.01 – 5.00	m/sec ²	0.25	No	91
E/L_26		Deceleration for manual operation	MAN Decel.	0.01 – 5.00	m/sec ²	0.25	No	91
E/L_27		Acceleration start time for manual operation	ManAccStartT	0.01 – 2.00	sec	0.50	No	91
E/L_28		Acceleration end time	Man AccEndT	0.01 – 2.00	sec	0.50	No	91

		for manual operation						
E/L_29		Deceleration start time for manual operation	ManDecStartT	0.01–2.00	sec	0.50	No	91
E/L_30		Deceleration end time for manual operation	Man DecEndT	0.01–2.00	sec	0.50	No	91
E/L_31		Deceleration time for manual operation	ManZero Dec T	0.00–600.00	sec	2.00	No	91
E/L_32		Minimum distance compensation	DistComp.Min	0.0–2×E/L_19	mm	0.0	No	93
E/L_33		Maximum distance compensation	DistComp.Max	0.0–100.0	mm	0.0	No	93
E/L_34		Distance compensation at floor level ⁽²⁾	DistComp.Lev	-E/L_19–E/L_19	mm	0	No	94
E/L_35		Carspeed for creep operation ⁽²⁾	Creep Speed	1.0–60.0	m/m	3.0	No	95
E/L_36		Creep speed distance ⁽²⁾	Creep Dist.	0–500	mm	50	No	95

E/L_37		Distance for ending position control and starting zero speed deceleration ⁽⁴⁾	D/B End Dist	0–E/L_19	mm	0	No	96
E/L_38		Zero speed deceleration time after position control ends ⁽⁴⁾	SpdZeroTime	0.01–10.00	sec	2.00	No	96
E/L_39		Reversed operation for ELIO input signal	ELIO In Neg	0000000 00000 – 11111111 1111	-	0000000 00000	No	97
E/L_40		Inductor input filter time	IND Filter	0–50	ms	5	No	98
E/L_41		SDS input filter time	SDS Filter	50–500	ms	250	No	98
E/L_42		Forced deceleration start speed for SDS-1 input	ForcedDecSpd	0.0–420.0	m/m	0.0	No	98
E/L_43		Deceleration for SDS-1 forced deceleration ⁽³⁾	ForcedDecel	0.01–1.50	m/sec ²	1.50	No	98
E/L_44		Creep speed for	ForcedCrpSpd	0.0–60.0	m/m	3.0	No	98

		forced deceleration ⁽³⁾						
E/L_45		Zero speed wait time for forced deceleration ⁽³⁾	Frcd.DecWait	0 – 10000	ms	300	No	98
E/L_46		Use SDS-2	Use FrcdDcl2	0 (No) 1 (Yes)		0 (No)	No	99
E/L_47		Forced deceleration start speed for SDS-2 input ⁽⁴⁾	Frcd.DecSpd2	0.0 – 420.0	m/m	0.0	No	99
E/L_48		Use SDS-3	Use FrcdDcl3	0 (No) 1 (Yes)		0 (No)	No	100
E/L_49		Forced deceleration start time for SDS-3 input ⁽⁵⁾	Frcd.DecSpd3	0.0 – 420.0	m/m	0.0	No	100
E/L_50		Start condition for high-speed automatic operation	HighSpdStart	0 (Inductor ON) 1 (Always)	-	0 (Inductor ON)	No	101
E/L_51		Acceleration start type	AccStartType	0 (Linear) 1 (U-Curve)	-	0 (Linear)	No	101
E/L_52		Startup acceleration compensati	StartupAccel	0.00 – 1.00	m/sec ²	0.00	No	102

		on						
E/L_53		Startup acceleration compensation time	StartupAccT	0.01 – 5.00	sec	0.50	No	102
E/L_54		Startup compensation wait time	StartupWait	0.00 – 5.00	sec	0.50	No	102
E/L_55		Wait time before stopping for base floor / nearest floor operation	BFR/NFR Wait	0.00 – 5.00	Sec	0.30	No	103
E/L_58		Select information to display on keypad	DisplaySel.	0 (Car Spd (m/m)) 1 (Car Spd (M/S)) 2 (Car Spd (RPM)) 3 (Car Position) 4 (Trq Output) 5 (Lmt.S/ W State) 6 (Tuning Dist)		0 (Car Spd (m/m))	Yes	104
E/L_59		Reset car position	Clear Posi.	0 (No) 1 (Yes)		0 (No)	No	105

E/L_60		Show floor position	Show FlrPosi	1–E/L_02	FLOOR	1	Yes	105
E/L_61		Set start condition for floor height measuring	FHM Start	ID-OFF/IU-ON DLS ON/SD1-ON	-	ID-OFF/IU-ON	No	106
E/L_62		Floor height measuring mode setting by keypad	KeyPad FHM	No Yes		No	No	107
E/L_63		Upside direction distance compensation by floor	UpDir Level	-E/L_19–E/L_19	mm	0	No	108
E/L_64		Downside direction distance compensation by floor	DnDir Level	-E/L_19–E/L_19	mm	0	No	108
E/L_67		Secondary speed reference for automatic operation	2ndAutoSpd	30–420	m/m	30	No	110
E/L_68		Secondary acceleration for automatic operation	2ndRatedAcc	0.1–1	m/s ²	0.5	No	110
E/L_69		Secondary deceleration	2ndRatedDec	0.1–1	m/s ²	0.5	No	110

		n for automatic operation						
E/L_70		Free run speed	Free Run Spd	1–20	m/m	2	No	111
E/L_71		MCon delay time	ELMConTime	100–5000	ms	1000	No	111
E/L_72		MCOff delay time	ELMCOffTime	100–50000	ms	1000	No	111

Note (1) Displayed only when E/L_01 is set to "DecelReq-D/B".

Note (2) Displayed only when E/L_01 is set to "DecelReq-T/B".

Note (3) Displayed only when E/L_42 or E/L_47 is set to a value other than "0".

Note (4) Displayed only when E/L_46 is set to "Yes".

Note (5) Displayed only when E/L_48 is set to "Yes".

Note (6) Setting change during inverter operation (Yes: Available, No: Not available)

6.2 E/L group functions

6.2.1 Jumping to a function code (E/L_00)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_00	Jump Code	Jump to function code	1-72	-	1

E/L_00 allows you to jump directly to a code (Ex. Jumping to E/L_03).

Press the [PROG] key, press the [SHIFT/ESC] / [▲ UP] / [▼ DOWN] keys to change the code number to "3", and then press the [ENT] key.

E/L ▶ Car Speed
 03 120m/m

After the jump, you can press the [▲ UP] / [▼ DOWN] keys to move to other codes.

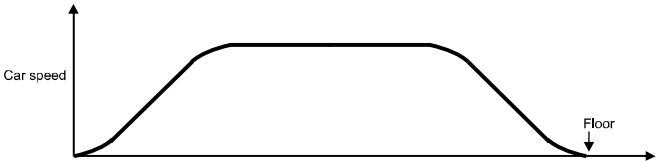
6.2.2 Selecting a speed reference pattern (E/L_01)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_01	Spd Ref Type	Speed reference pattern type	DecelReq-D/B DecelReq-T/B	-	DecelReq-D/B

As shown in the following figure, speed reference pattern types for elevator applications include a remaining distance-based floor level

stopping (DecelReq-D/B) pattern, which depends on a deceleration permission request before passing the floor where the car can be stopped, and a time-based floor level stopping (DecelReq-T/B) pattern.

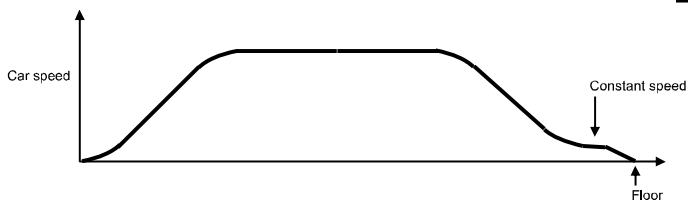
Remaining distance-based floor level stopping pattern based on a permission request for deceleration (DecelReq-D/B).



When the elevator starts operation, the position controller inside the inverter generates signals for stoppable floors (terminals FSo, FS₁, FS₂, FS₃, FS₄, and FID on the ELIO module). Immediately before such signals are updated, the inverter sends a signal to the operation controller requesting permission to stop (DER terminal on the ELIO module).

The operation controller receives the request signal and verifies if there is a call for a stop that matches the request. Then, it sends a deceleration permission signal to the inverter (DAC terminal on the ELIO module) if a match is found. When the inverter receives this signal, it prepares for deceleration and begins deceleration when the remaining distance to the target floor matches the deceleration start distance and adjusts the speed reference to stop the elevator at the target floor.

Time-based floor level stopping pattern based on a permission request for deceleration (DecelReq-T/B)



This type of speed pattern is almost identical to the previously explained “DecelReq-D/B” pattern, except that a constant speed zone may be configured before stopping the elevator, and the stopping is made based on time instead of distance.

6.2.3 Setting the number of floors and rated car and motor speeds (E/L_02 – E/L_04)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_02	Floor Number	Number of floors	1–32	Floor	32
E/L_03	Car Speed	Rated car speed	30–420	m/min	60
E/L_04	Motor Speed	Motor speed at rated car speed	20.0–3600.0	rpm	96.0

These functions allow you to set the number of floors, rated car speed, and motor speed at rated car speed. Enter the total number of all floors for the elevator to stop including the number of all overground and underground floors at E/L_02, and enter the motor speed at E/L_04 for when the car is moving at the rated car speed (E/L_03).

6.2.4 Setting the direction of motor operation (E/L_05)

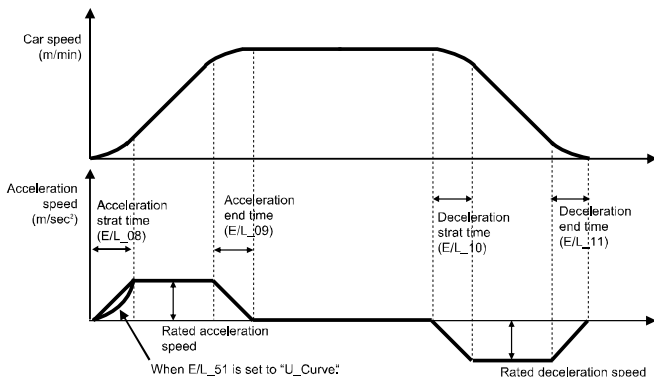
Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_05	UP Direction	Direction of motor operation	FX-CCW FX-CW	-	FX-CCW

This function is used to configure the forward operation (FX) of the motor. The default setting is configured to move up the elevator with counterclockwise (CCW) motor rotation. Set E/L_05 to "FX-CCW" to move up the elevator with counterclockwise (CCW) motor rotation. Set E/L_05 to "FX-CW" to move up the elevator with clockwise (CW) motor rotation.

6.2.5 Setting the acceleration and deceleration (E/L_06 – E/L_11)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_06	Rated Accel	Rated acceleration speed	0.10 – 1.00	m/sec ²	0.50
E/L_07	Rated Decel	Rated deceleration speed	0.10 – 1.00	m/sec ²	0.50
E/L_08	AccStartT	Acceleration start time	0.50 – 2.50	sec	1.00
E/L_09	AccEndT	Acceleration end time	0.50 – 2.50	sec	1.00
E/L_10	Dec Start T	Deceleration start time	0.50 – 2.50	sec	1.00
E/L_11	Dec End T	Deceleration end time	0.50 – 2.50	sec	1.00

These functions are used to set the acceleration and deceleration of the elevator.



As shown in the figure above, linear acceleration (solid line) is made when E/L_51 is set to "Linear", and curved acceleration (dotted line) is made when E/L_51 is set to "U-curve". The setting at E/L_51 is applied only to the starting section of the acceleration, and a linear acceleration will be made for the remaining section regardless of the setting at E/L_51.

6.2.6 Setting compensation for communication delay (E/L_12)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_12	CommDlyDist	Distance for compensation of communication delay	100-1000	mm	400

This function is used to compensate for travel that is made while the inverter receives the deceleration permission signal from the operation controller after sending the request for permission to decelerate. The compensation distance is used to calculate the floor where the call for a stop has been made.

6.2.7 Adjusting deceleration start distance (E/L_13)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_13	DecStartAdj	Adjustment for deceleration start distance	-10 – 20	mm	0

This function is used to fine-tune the deceleration start distance calculated by the inverter (distance from the start of deceleration to the target floor level) according to the speed controller characteristics and load size. The deceleration will start at the distance calculated by adding the distance set at E/L_13 to the deceleration start distance calculated by the inverter.

6.2.8 Setting motor excitation time (E/L_14)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_14	PreExctTime	PreExctTime	100 – 10000	msec	300

This function is used to set the time until the brake release signal for the traction machine is output via the BRA-BRB terminals on the ELIO module after an operation command (FX/RX) has been provided.

6.2.9 Setting brake release time (E/L_15)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_15	Brake Time	Brake release time	0–10000	msec	300

This function is used to set the time until the elevator speed reference is output after the brake release signal is output for the traction machine via the BRA-BRB terminals on the ELIO module following an operation command (FX/RX).

6.2.10 Setting hold time at zero speed (E/L_16)

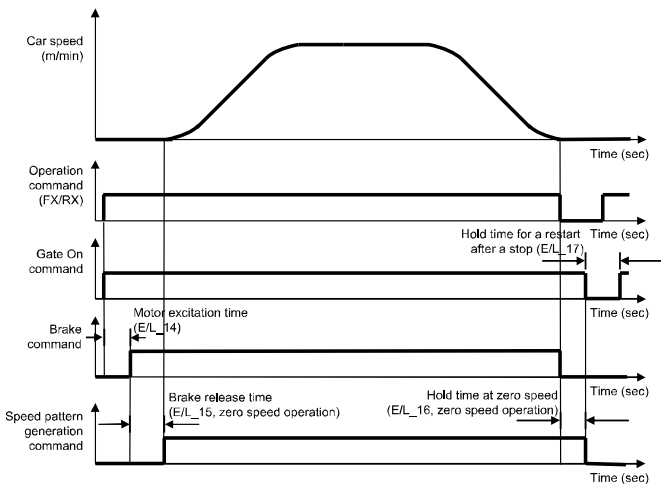
Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_16	Hold Time	Hold time at zero speed	0–10000	msec	300

This function is used to set the time for the elevator's car to maintain zero speed after reaching it. In general, there is a delay between the brake release following stopped operation signal and the actual operation of the traction machine brake. Without the zero speed hold torque output for the set time, the elevator's car will move up or down depending on the size of the load.

6.2.11 Setting hold time for a restart (E/L_17)

This function is used to set the time it takes until the car resumes operation after a stop. The minimum setting value is 1 second.

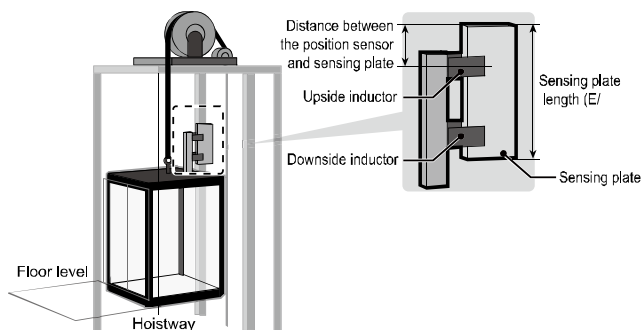
Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_14	PreExctTime	Motor excitation time	100 – 10000	msec	300
E/L_15	BrakeTime	Brake release time	0 – 10000	msec	300
E/L_16	HoldTime	Hold time at zero speed	0 – 10000	msec	300
E/L_17	RestartTime	Hold time for a restart	0.00 – 100.00	sec	1.00



6.2.12 Setting sensing plate length and distance between position sensor and sensing plate at floor level (E/L_18, E/L_19)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_18	Plate Length	Sensing plate length	E/L_19 – 1000.0	mm	200.0
E/L_19	InductorEdge	Distance between the position sensor and the sensing plate at floor-height level	0.0 – E/L_18	mm	20.0

During floor height measuring operation, the lengths of the sensing plates installed in the hoistway and the distance between the position sensors and sensing plates at each floor level are measured, as well as the floor heights. The measurement data is automatically saved when floor height measuring operation is successfully completed. The measurement data automatically saved after a floor height measuring operation must not be manually edited.



6.2.13 Setting car speed for floor height measuring (E/L_20)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_20	FHM/BFR Speed	Car speed for floor height measuring operation	0.0 – 60.0	m/m	15.0

During floor height measuring operation, the speed of the car is defined in meters per minutes (m/m). However, if a multifunction input terminal defined for manual operation is ON during a floor height measuring operation, the car speed set at one of the E/L_22 – E/L_24 functions will be used instead of the car speed set at E/L_21. The car speed set at E/L_20 is also used for base floor operation.

6.2.14 Viewing floor height measuring result (E/L_21)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_21	FHM DATA	Floor height measuring result	0 – 321		0

This function displays result of a floor height measuring operation. The first two digits indicate the number of floors obtained from the floor height measuring, and the last digit indicates the result of the operation: "0 (Failed)" or "1 (Success)". For example, if "321" has been displayed after a floor height measuring operation of a 32-floor building, the first two digits ("32") indicate the number of floors, and the last digit ("1") indicates the successful completion of the floor height measuring operation. The measurement data automatically saved after a floor height measuring

operation must not be manually edited.

6.2.15 Setting car speeds 1 – 3 for manual operation (E/L_22 – E/L_24)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_22	Manual Spd1	Car speed 1 for manual operation	0.0 – 60.0	m/m	15.0
E/L_23	Manual Spd2	Car speed 2 for manual operation	0.0 – 60.0	m/m	10.0
E/L_24	Manual Spd3	Car speed 3 for manual operation	0.0 – 60.0	m/m	3.0

These functions are used to utilize combinations of multifunction input terminals MM0/P1 and MM1/P2 by configuring various types of manual operations required for elevator applications, such as operations for elevator's maintenance, evacuation, and floor height measuring.

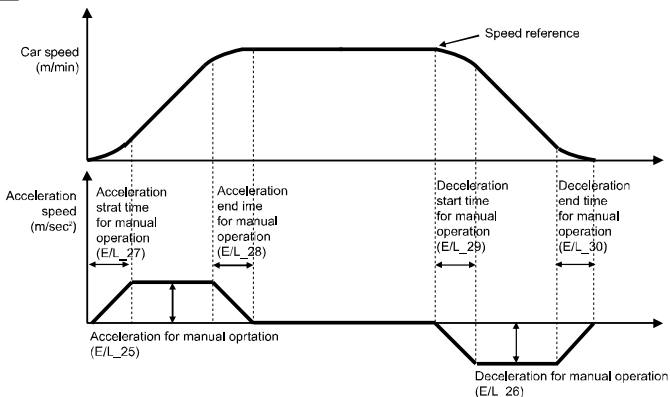
If multifunction input terminals P1 (MM0) and P2 (MM1) have been respectively set to "Man Speed-L" and "Man Speed-M", the speed reference during manual operation is as follows (1: ON, 0: OFF).

Terminal status (1: On, 0: Off)		Set speed
P1 (MM0)	P2 (MM1)	
0	0	N/A(1)
1	0	E/L_22
0	1	E/L_23
1	1	E/L_24

During manual operation, zero speed deceleration is performed if both P1 (MM0) and P2 (MM1) terminals are OFF at the same time. Not applicable when the car is stopped.

6.2.16 Setting acceleration and deceleration for manual operation (E/L_25 – E/L_31)

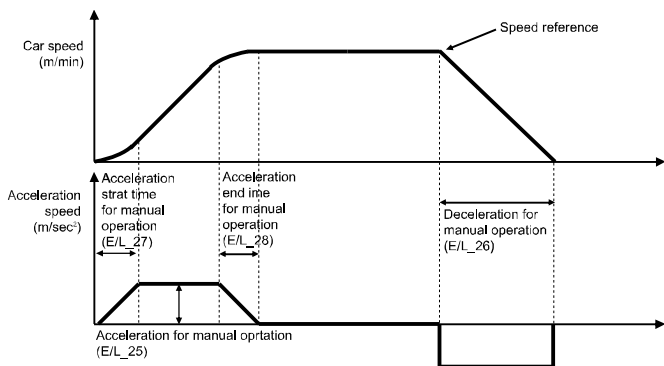
Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_25	MANAccel.	Acceleration for manual operation	0.01 – 5.00	m/sec ²	0.50
E/L_26	MANDecel.	Deceleration for manual operation	0.01 – 5.00	m/sec ²	0.50
E/L_27	ManAccStartT	manual operation Acceleration start time for manual operation	0.01 – 2.00	sec	0.50
E/L_28	Man AccEndT	manual operation Acceleration end time for manual operation	0.01 – 2.00	sec	0.50
E/L_29	ManDecStartT	manual operation Deceleration start time for manual operation	0.01 – 2.00	sec	0.50
E/L_30	Man DecEndT	manual operation Deceleration end time for manual operation	0.01 – 2.00	sec	0.50



E/L_26, E/L_29, and E/L_30 define the deceleration conditions to perform an S-curve deceleration for maintaining comfortability of the ride when a deceleration results from the change of multifunction inputs for manual operation to a different speed reference (for example, 15 m/m \rightarrow 3 m/m).

The deceleration time at E/L_31 is used for a linear deceleration to zero speed when the run command is stopped while the multifunction inputs for manual operation are maintained. The type of deceleration is used for quick deceleration when ride comfort is not important.

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_31	ManZeroDec T	Deceleration time for manual operation	0.00 – 2.00	sec	0.00



6.2.17 Setting maximum and minimum distance compensation (E/L_32, E/L_33)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_32	DistComp.Min	Minimum distance compensation	0 – 2×E/L_18	mm	0
E/L_33	DistComp.Max	Maximum distance compensation	0 – 100	mm	0

These functions are used to perform a compensation operation for making up for the rope slip that occurs when the inductor above the car leaves the sensing plate during high-speed operation. The amount of compensation varies depending on the car speed. Therefore, the minimum and maximum values need to be set to provide appropriate compensation for the car speed. The setting value for E/L_32 is automatically set by default

after a floor height measuring operation. If the floor height is greater or if the slip is severe, adjust the setting at E/L_33 by a few millimeters.

6.2.18 Setting distance compensation at floor level (E/L_34)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_34	DistComp.L ev	Distance compensation at floor level	-E/L_19– E/L_19	mm	0

This function is used to compensate up for the current position when the car starts decelerating and reaches the floor level after the inductor has detected the sensing plate. The setting at E/L_34 is applied to all floors, regardless of the direction of operation. Therefore, it must be used when there are errors when the car reaches floor levels. If the car stops after the floor level, set it to a positive (+) value. If the car stops before the floor level, set it to a negative (-) value.

When there are floor level deviations, set E/L_34 to a small value (default: "0") first. Then, if there are other floors with different deviations, set E/L_63 and E/L_64 functions to correct them.

6.2.19 Setting car speed for creep operation (E/L_35)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_35	Creep Speed	Car speed for creep operation	1.0–60.0	m/m	3.0

Set this function to define the car speed for creep operation before it stops at the floor level if E/L_01 is set to “DecelReq-T/B (car stops at floor level after traveling at a specific speed)”.

6.2.20 Setting creep speed distance (E/L_36)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_36	Creep Dist.	Creep speed distance	0–500	mm	50

Set this function to define the distance for the car to travel before it stops at the floor level if E/L_01 is set to “DecelReq-T/B (car stops at floor level after traveling at a specific speed)”.

6.2.21 Setting distance for ending position control and starting zero speed deceleration at floor level (E/L_37, E/L_38)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_37	D/B End Dist	Distance for ending position control and starting zero speed deceleration at floor level	0–E/L_19	mm	0
E/L_38	SpdZero Time	Zero speed deceleration time after position control ends	0.01–10.00	sec	2.00

Set E/L_37 to define the distance for ending position control before the car stops at the floor level and set E/L_38 to define the deceleration time to zero speed after position control ends.

If E/L_37 is set to "0", the car decelerates based on the remaining distance to the floor level. If E/L_37 is set to any other value than "0", the car decelerates based on the remaining time to the floor level when it reaches the set distance from the floor level.

Even if E/L_37 is set to "0", the speed reference automatically becomes "0" when the time set at E/L_38 has been passed after all sensors have been detected for stopping at the floor level. Therefore, be careful not to set E/L_38 to an excessively small value if E/L_37 has been set to "0".

6.2.22 Setting reversed operation for ELIO input signal (E/L_39)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_39	ELIO IN Neg	Reversed operation for ELIO input signal	000000000000 -111111111111	-	000000000000

The input terminals on the ELIO module are Form A contacts (normally open). Therefore, signals must be reversed by setting the first bit of E/L_39 setting to "1" if the inductors or limit switches for deceleration are using Form B contact (normally closed). However, the deceleration approval (DAC) cannot be operated with Form B contact signals even after setting the relevant bit to "1". After setting E/L_39 to work with Form B contacts, be careful when initializing the inverter settings. The setting will be reverted for operation with Form A contacts.

Each bit of the E/L_39 setting directly matches the input terminal on the ELIO module. Setting a bit to "1" will allow the terminal to work with Form B contact signals.

MSB											LSB
I_D	I_U	DLS	ULS	RV1	RV2	SD1	SU1	SD2	SU2	DAC	RV3

6.2.23 Setting filter times for inductor and SDS inputs (E/L_40, E/L_41)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_40	IND Filter	Inductor input filter time	0–50	ms	5
E/L_41	SDS Filter	SDS input filter time	50–500	ms	250

If input signals to the ELIO module (from inductors, SD₁, SU₁, SD₂, SU₂, etc.) are affected by electronic interference noise, set these functions to adjust the filtering time for proper car operation.

6.2.24 Setting forced deceleration parameters (E/L_42 – E/L_45)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_42	ForcedDecSpd	Forced deceleration start speed for SDS-1 input	0.0–420.0	m/m	0.0
E/L_43	ForcedDecel	Deceleration for SDS-1 forced deceleration	0.01–5.00	m/sec ²	1.50
E/L_44	ForcedCrpSpd	Creep speed for forced deceleration	0.0–60.0	m/m	3.0
E/L_45	Frcd.DecWait	Zero speed wait time for forced deceleration	0–E/L_16	msec	300

These functions are used to configure the settings for SDS-D1 and SDS-U1,

which are limit switches for forced deceleration installed at the base floor inside the hoistway.

When the car approaches the base floor, if the car speed at the moment the limit switches are operated is greater than the set value at E/L_42 (Forced deceleration start speed for SDS-1 input), the car will be forcefully decelerated according to the set value at E/L_43 (Deceleration for SDS-1 forced deceleration) and operated at the speed set at E/L_44 (Creep speed for forced deceleration) until the upside/downside inductors are detected, then the car will be stopped after the time set at E/L_45 (Zero speed wait time for forced deceleration) has elapsed.

E/L_43 and E/L_44 functions are displayed only if E/L_42 or E/L_47 is set to any other value than "0". The settings at E/L_43, E/L_44, and E/L_45 also apply to settings for SDS-D2 and SDS-U2.

6.2.25 Setting secondary SDS input and configuring its forced deceleration parameter (E/L_46, E/L_47)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_46	Use FrcdDclz	Use SDS-2	NO/Yes	-	No
E/L_47	ForcedDecSpd	Forced deceleration start speed for SDS-2 input	0.0 – 420.0	m/m	0.0

These functions are used to set whether the SDS-D2 and SDS-U2 limit switch inputs will be used and to set the forced deceleration start speed when the limit switches are operated. E/L_47 is displayed only when

E/L_46 is set to “Yes”.

Around the base floor, if the car speed at the moment when the SDS-D2 or SDS-U2 limit switches are operated is greater than the set value at E/L_47 (Forced deceleration start speed for SDS-2 input), the car will be forcefully decelerated according to the set value at E/L_43 (Deceleration for SDS-1 forced deceleration) and operated at the speed set at E/L_44 (Creep speed for forced deceleration), then the car will be stopped after the time set at E/L_45 (Zero speed wait time for forced deceleration) has elapsed.

6.2.26 Setting tertiary SDS input and configuring its forced deceleration parameter (E/L_48, E/L_49)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_48	Use FrcdDcl3	Use SDS-3	NO/Yes	-	No
E/L_49	Frcd.DecSpd3	Forced deceleration start speed for SDS-3 input	0.0–420.0	m/m	0.0

These functions are used to set whether the SDS-D3 and SDS-U3 limit switch inputs will be used and set the forced deceleration start speed when the limit switches are operated. E/L_49 is displayed only when E/L_48 is set to “Yes”.

Around the base floor, if the car speed at the moment when the SDS-D3 or SDS-U3 limit switches are operated is greater than the set value at E/L_49 (Forced deceleration start speed for SDS-3 input), the car will be forcefully decelerated according to the set value at E/L_43 (Deceleration for SDS-1

forced deceleration) and operated at the speed set at E/L_44 (Creep speed for forced deceleration), then the car will be stopped after the time set at E/L_45 (Zero speed wait time for forced deceleration) has elapsed.

6.2.27 Setting start condition for high-speed automatic operation (E/L_50)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_50	HighSpdStart	Start condition for high-speed automatic operation	Inductor ON Always	-	Inductor ON

Set E/L_50 to "Inductor ON" to allow the car to start (inverter to be operated) only while both the upside/downside inductors are sensing the sensing plate. Set it to "Always" to allow the car to start regardless of the inductor status.

6.2.28 Setting acceleration start type for highspeed automatic operation (E/L_51)

Set E/L_51 to select the acceleration type for high-speed operation. You can select either "Linear" or "U-Curve". The U-curve acceleration may be used to improve ride comfort when the car has poor ride quality.

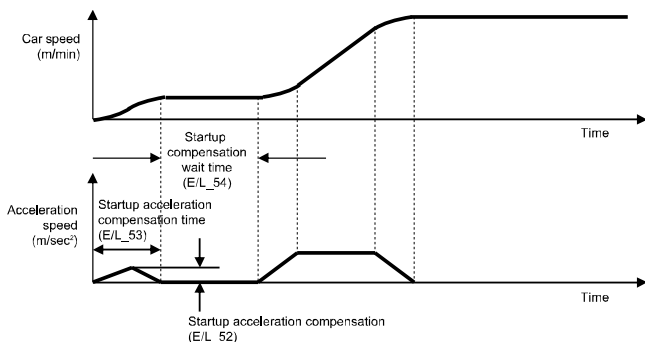
Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_51	AccStartType	Acceleration start type for high-speed automatic	Linear U-Curve	-	Linear

Function code	Keypad display	Function name	Setting range	Unit	Default
		operation			

6.2.29 Setting compensation for startup acceleration (E/L_52 – E/L_54)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_52	StartupAccel	Startup acceleration compensation	0.01 – 1.00	m/sec ²	0.00
E/L_53	StartupAccT	Startup acceleration compensation time	0.01 – 5.00	sec	0.01
E/L_54	StartupWait	Startup compensation wait time	0.00 – 5.00	sec	0.50

Set these functions to improve ride comfort when the car has poor ride quality of ride due to abrupt ascents or descents during high-speed automatic operation. Try different settings and repeat testing until you find the optimal values.



6.2.30 Setting wait time before base floor/nearest floor operation (E/L_55)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_55	BFR/NFR Wait	Wait time before stopping for base floor/nearest floor operation	0.00–5.00	sec	0.30

Set E/L_55 to set the time until the car is decelerated and stopped after the upside and downside inductors are operated and the speed reference has been changed to "0" when it approaches the base floor level during a base floor operation. If the car stops past the floor height level during a base floor or nearest floor operation, decrease the setting value. If the car stops before the floor height level, increase the setting value.

6.2.31 Selecting information to display on keypad (E/L_58)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_58	Display Sel.	Current car speed per minute	Car Speed (m/m)	m/m	Car Speed (m/m)
		Current car speed per second	Car Speed (m/s)	m/s	
		Motor speed	Motor Speed	rpm	
		Current car position	Car Position	mm	
		Motor output torque	Trq Output	%	
		Limit switch status>Note)	Lmt.S/W State	l--S-- S2--	
		Remaining distance when the 1st inductor is operated	Tuning Dist	mm	

See section 2.2 for the elevator operation mode display on the keypad.

You can select the information that is displayed in the middle of the first line on the keypad after setting the application type at CON_02 to "Elevator". If you set E/L_58 to "Limit S/W State", the limit switch's activation status (On/Off) will be displayed based on the signal reversal settings at E/L_39.

Note) Limit switch status details

Ex). When the elevator car is stopped at the base level - IND_UP, IND_DN, SDS₁, SDS₂ ON (-: OFF, ○: ON)

Inductor	Down	Up	SDS ₁	Down	Up	SDS ₂	Down	Up
I	○	○	S	○	-	S ₂	○	-

6.2.32 Resetting car position (E/L_59)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_59	Clear Posi.	Reset car position	No Yes	-	No

This function may be used to manually reset the current car position to “0 mm”. The current position becomes the base level, and the current floor will be indicated as floor 1.

6.2.33 Showing floor position (E/L_60)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_60	Show FlrPosi	Show floor position	1–E/L_02	FLOOR R	1

This function may be used to show the floor height for each floor after a successful floor height measuring operation. Be careful because initializing the E/L group parameters with PAR_01 or changing floor numbers with E/L_02 will reset all floor height data to “0”.

6.2.34 Setting start condition for floor height measuring (E/L_61)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_61	FHM Start	Set start condition for floor height measuring	ID-OFF/IU-ON DLS ON/SD1-ON	-	ID-OFF/IU-ON

This function may be used for a system that requires an independent floor height measuring operation, separate from in inverter which has upper-level controller, if the floor height measuring operation must start when the DLS is detected and stop when ULS is detected.

You can set E/L_61 to "DLS ON/SD1-ON" to perform floor height measuring on the elevator system and the inverter simultaneously (the inverter itself does not required DLS or ULS signals for floor height measuring).

If you set E/L_61 to "DLS ON/SD1-ON", the DLS and ULS signals must be provided to the inverter.

If you set E/L_61 to "ID-OFF/IU-ON", the inverter automatically decelerates to zero speed when the car reaches the top floor and the upper position sensor (IU) leaves the sensing plate. However, if you set E/L_61 to "DLS-ON/IU-ON", the inverter operates without deceleration until the ULS is detected.

Do not change the E/L_61 setting unless the upper controller performs calculations for deciding elevator positions.

6.2.35 Enabling floor height measuring mode setting by keypad (E/L_62)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_62	Keypad FHM	Floor height measuring mode setting by keypad	No Yes	-	No

Set E/L_61 to "Yes" to change the operation mode to "floor height measuring mode" regardless of the multifunction input terminal status. You can set E/L_62 to "Yes" after manually moving the car to a position that satisfies the condition set at E/L_61 in manual operation mode, to switch directly to floor height measuring mode without additional signal inputs.

Remember to set E/L_62 back to "No" after the floor height measuring operation because the floor height measuring mode will be maintained until you change the setting. Also, downside operation does not work in floor height measuring mode. Therefore, if floor height measuring fails, you must manually move the car to the base floor after setting E/L_62 to "No", then operate floor height measuring again.

6.2.36 Setting upside/downside distance compensation by floor (E/L_63, E/L_64)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_63	UpDir Level	Upside direction distance compensation by floor	-E/L_19– E/L_19	mm	0
E/L_64	DnDir Level	Downside direction distance compensation by floor	-E/L_19– E/L_19	mm	0

You can set the distance compensation value for when the car stops at a floor level at E/L_34, but this compensation value will be applied to all floors. On the other hand, you can set the floor level compensation value for upside operation by floors with E/L_63, and set the floor level compensation value for downside operation by floors with E/L_64.

As with E/L_34, if the car stops past the floor height level, set it to a negative (-) value. If the car stops before the floor height level, set it to a positive (+) value. Instructions for defining the compensation distance for each floor is as follows. Be careful because initializing the E/L group parameters with PAR_01 or changing floor numbers with E/L_02 will reset all compensation values for each floor at E/_63 and E/L_64 to "0".

Keypad display	Instruction
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> E/L ▶ Up 2F Level 63 0mm ■ </div>	<p>Press the [PROG] key and the floor you want to set the compensation for will be displayed at the top, and the compensation value will be displayed at the bottom with a flashing cursor. Press the [▲], [▼] keys to adjust the compensation value for the floor, then press the [ENT] key to save it.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> E/L ▶ Up 5F Level 63 0mm ■ </div>	<p>Press the [PROG] key again to change the floor. Press the [▲], [▼] keys to change the floor at the top of the display, and the current compensation value for the floor will be displayed at the bottom. Press the [PROG] key again when the floor you want to set the compensation for is displayed.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> E/L ▶ Up 5F Level 63 2mm ■ </div>	<p>The compensation value will be displayed at the bottom with a flashing cursor. Press the [▲],[▼] keys to adjust the compensation value for the floor, then press the [ENT] key to save it.</p>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> E/L ▶ Up 5F Level 63 2mm </div>	<p>To view the current compensation value for each floor, press the [PROG] key twice on the initial screen (cursor does not flash), then press the [▲]/[▼] keys to change floors. The current compensation value will be displayed at the bottom for each floor.</p>

6.2.37 Setting secondary speed reference for automatic operation (E/L_67)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_67	2ndAutoSpd	Secondary speed reference for automatic operation	30–E/L_03	m/m	30

In elevator systems for tall buildings, automatic operation speed reference may be additionally set for short-distance operation for one or two floors. After setting E/L_67 to "2ndAutoSpd", the elevator will be operated with the secondary speed reference for automatic operation when the multifunction input for "2ndAutoRun" is On. when the multifunction input signal for "2ndAutoRun" is Off, the elevator will be operated with the speed reference set at E/L_03.

6.2.38 Setting secondary acceleration and deceleration for automatic operation (E/L_68, E/L_69)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_68	2nd RatedAcc	Secondary acceleration for automatic operation	0.1–1	m/s ²	0.5
E/L_69	2nd RatedDec	Secondary deceleration for automatic operation	0.1–1	m/s ²	0.5

When the elevator is operated with the secondary speed reference, E/L_68 is used to set the acceleration speed for the elevator to reach the secondary speed reference

When the elevator is operated with the secondary speed reference, E/L_69 is used to set the deceleration speed for the elevator to reach the zero speed.

6.2.39 Setting free run speed (E/L_70)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_70	Free Run Spd	Free run speed	1–20	mm	2

When the elevator is operated again following a stop, the operation will be allowed only if the elevator speed is at or below the speed set at E/L_70 (Free run speed).

6.2.40 Setting MC On/Off delay times (E/L_71, E/L_72)

Function code	Keypad display	Function name	Setting range	Unit	Default
E/L_71	ELMCOOn Time	MCOOn delay time	100–5000	ms	1000
E/L_72	ELMCOOffTime	MCOOff delay time	100–50000	ms	1000

If a magnetic contactor (MC) has been installed between the inverter and the motor, the current will be applied to the motor after the time set at E/L_71 (MC On delay time) has elapsed when the run command signal is On, to protect the CMOS elements inside the inverter.

If a magnetic contactor (MC) has been installed between the inverter and

the motor, the current to the motor will be cut off after the time set at E/L_72 (MCOFF delay time) has elapsed when the run command signal is On, to protect the CMOS elements inside the inverter.

Product warranty

Fill in this warranty information form and keep this page for future reference or when warranty service may be required.

Product Name	LS ELECTRIC L100 ELIO Add-on Module	Date of Installation	
Model	XSIN-L100	Warranty Period	
Customer Information	Name/Business name		
	Address		
	Telephone		
Sales Office	Name/Business name		
	Address		
	Telephone		

Warranty period

The product warranty covers product malfunctions, under normal operating conditions, for 12 months from the date of installation. If the date of installation is unknown, the product warranty is valid for 18 months from the date of manufacture. Please note that the product warranty terms may vary depending on the purchase or installation contracts.

Warranty Service Information

During the product warranty period, warranty service (free of charge) is provided for product malfunctions caused under normal operating conditions. For warranty service, contact an official LS Electric agent or service center.

Non-Warranty Service

A service fee will be incurred for malfunctions in the following cases:

- intentional abuse or negligence
- power supply problems or from other appliances being connected to the product
- acts of nature (fire, flood, earthquake, gas accidents, etc).
- modifications or repair by unauthorized persons
- missing authentic LS ELECTRIC rating plates
- expired warranty period

Visit Our Website

Visit us at <http://www.ls-electric.com> for detailed service information.



www.ls-electric.com

LS ELECTRIC Co., Ltd.

■ Headquarter

LS-ro 1270(Hogye-dong) Dongan-gu, Anyang-si, Gyeonggi-Do, 14119, Korea

■ Seoul Office

LS Yongsan Tower, 92, Hangang-daero, Yongsan-gu, Seoul, 04386, Korea

Tel: 82-2-2034-4033, 4888, 4703 Fax: 82-2-2034-4588

E-mail: automation@ls-electric.com

■ Overseas Subsidiaries

• LS ELECTRIC Japan Co., Ltd. (Tokyo, Japan)

Tel: 81-3-6268-8241 E-Mail: jschuna@lselectric.biz

• LS ELECTRIC (Dalian) Co., Ltd. (Dalian, China)

Tel: 86-411-8730-6495 E-Mail: jheo@lselectric.com.cn

• LS ELECTRIC (Wuxi) Co., Ltd. (Wuxi, China)

Tel: 86-510-6851-6666 E-Mail: sblee@lselectric.co.kr

• LS ELECTRIC Vietnam Co., Ltd.

Tel: 84-93-631-4099 E-Mail: jhchoi4@lselectric.biz (Hanoi)

Tel: 84-28-3823-7890 E-Mail: sjbaik@lselectric.biz (Hochiminh)

• LS ELECTRIC Middle East FZE (Dubai, U.A.E.)

Tel: 971-4-886-5360 E-Mail: salesme@lselectric.biz

• LS ELECTRIC Europe B.V. (Hoofddorp, Netherlands)

Tel: 31-20-654-1424 E-Mail: europartner@lselectric.biz

• LS ELECTRIC America Inc. (Chicago, USA)

Tel: 1-800-891-2941 E-Mail: sales.us@lselectricamerica.com

■ Overseas Branches

• LS ELECTRIC Tokyo Office (Japan)

Tel: 81-3-6268-8241 E-Mail: jschuna@lselectric.biz

• LS ELECTRIC Beijing Office (China)

Tel: 86-10-5095-1631 E-Mail: khpaek@lselectric.com.cn

• LS ELECTRIC Shanghai Office (China)

Tel: 86-21-5237-9977 E-Mail: tsjun@lselectric.com.cn

• LS ELECTRIC Guangzhou Office (China)

Tel: 86-20-3818-2883 E-Mail: chenxs@lselectric.com.cn

• LS ELECTRIC Chengdu Office (China)

Tel: 86-28-8670-3201 E-Mail: yangcf@lselectric.com.cn

• LS ELECTRIC Qingdao Office (China)

Tel: 86-532-8501-2065 E-Mail: wangzy@lselectric.com.cn

• LS ELECTRIC Nanjing Office (China)

Tel: 86-25-8467-0005 E-Mail: ylong@lselectric.com.cn

• LS ELECTRIC Bangkok Office (Thailand)

Tel: 66-90-950-9683 E-Mail: sjeet@lselectric.biz

• LS ELECTRIC Jakarta Office (Indonesia)

Tel: 62-21-2933-7614 E-Mail: diroh@lselectric.biz

• LS ELECTRIC Moscow Office (Russia)

Tel: 7-499-682-6130 E-Mail: jpark1@lselectric.biz

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