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# Extension I/O

### LSLV-H100

#### **User's Manual**



### A Safety Instructions

- Use this board after read Safety Instruction of this manual carefully before using and follow the instructions exactly.
- Please hand this user manual to end user and trouble shooting manager
- After read this manual, keep it at handy for future reference.
- 사용 전에 '안전상의 주의사항'을 반드시 읽고 정확하게 사용하여 주십시오.
- 본 설명서는 제품을 사용하는 사람이 항상 볼 수 있는 곳에 잘 보관하십시오.



### **Safety Information**

Carefully read and follow all safety instructions in this manual to avoid unsafe operating conditions, property damage, personal injury, or death. Please keep this manual for future reference.

#### Safety symbols in this manual

#### 🛕 Danger

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

#### \Lambda Warning

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

#### ① Caution

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

#### Safety information

#### ① Caution

- ESD (Electrostatic discharge) from the human body may damage sensitive electronic components on the PCB. Therefore, be extremely careful not to touch the PCB or the components on the PCB with bare hands while you work on the I/O PCB.
- Turn off the power to the inverter before making wiring connections. Otherwise, malfunctions including faulty network communication may occur.
- When installing the option board, ensure that the option board is properly connected to the connector on the inverter. Faulty connections may damage the inverter or the option board.
- Check the parameter units before settings the function codes. Wrong units may lead to faulty network communication.



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### **1** About the Product

The H100 extension IO module is used to extend the digital and analog input/output function terminals for the LSLV-H100 series inverters.

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### **2** Product Specification Details

Refer to the following table for detailed product specifications.

Items Termina		Termina I	Description	Switch
Divital	PNP	P8	2 Channels available	[Switch 1]
Digital Input NPN		P9	<ul> <li>Multifunction input</li> <li>Operate switch (SW1) to select PNP/NPN mode.</li> </ul>	PNP/ NPN selection
		A6		
		C6		
Digital Outp	out	A7	3 Channels available, Form A contact	
(Relay)		C7	Multifunction relay output contact     (AC 250 V< 5 A, DC 30 V< 5 A)	
		A8		
		C8		
	Voltage		<ul> <li>1 Channel available</li> <li>Operate switch (SW2) to select voltage or current.</li> <li>Voltage</li> <li>Unipolar: 0–10 V (Max. 12 V) input</li> </ul>	[Switch 2] Voltage
Analog Input Current		V3	Sets the frequency based on the voltage supplied to the terminal. Current Input current: 4-20 mA (Max. 0~24 mA) Sets the frequency based on the current supplied to the terminal.	(V3)/ Current (I3) Selection
Analog Output	Voltage	AO3	<ul> <li>1 Channel available Select output frequency, output current, output voltage, or DC voltage.</li> <li>Operate switch (SW3) to select voltage or</li> </ul>	[Switch 3] Voltage (VO3)/ Current

Items Termina		Termina I	Description	Switch
	Current		current Output voltage: 0–10 V Maximum output voltage/current: 12 V/10 mA Output current: 0–20 mA Maximum output current: 24 mA	(IO3) selection
CM Termina	al	СМ	<ul> <li>2 Channels available</li> <li>Common ground terminal for analog inputs/outputs</li> </ul>	
Compatible Inverter series			<ul> <li>H100 series inverters</li> </ul>	

### 3 Items Included

- 1 x H100 extension IO PCB module
- 1 x H100 extension IO module user manual
- 2 x screws

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Plastic components

### 4 Product Name

EIOE-H100

### **5** Overview and Installation

### 5.1 Overview

Refer to the following illustration for the H100 extension IO module layout.



### 5.2 Installing the H100 extension IO Module

Follow the instructions below to properly install the H100 extension IO module.

- 1. Turn off the inverter and make sure that the DC link voltage has dropped to a safe level.
- 2. Loosen the screw on the power cover then remove the power cover.



0.75-30 kW Models

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37-90 kW Models

3. Remove the keypad from the inverter body.



0.75-30 kW Models



37-90 kW Models



4. Loosen the screws securing the front cover. Then, remove the front cover by lifting it. The main PCB is exposed.



0.75–30 kW Models

37-90 kW Models

5. Place the H100 extension I/O PCB module on the expansion slot and fasten it with the screws included in the box.



6. Reattach the front cover, the power cover, and the keypad back onto the inverter body.

#### Caution

Ensure that the inverter is turned off and that the DC link voltage has dropped to a safe level before opening the terminal cover and installing (or removing) the H100 extension IO module.

#### Note

Use the keypad to check the software version and the keypad installation options.

\*\*Use the keypad at [CNF-10] to check if the inverter's S/W version is higher than 0.11.

### **5.3 Signal (Control) Cable Specifications**

Terminal	Wire Thickness 1)			
	mm <sup>2</sup>	AWG		
P8~P9/CM/V3(I3)	0.33-1.25	16-22		
AO3	0.33-2.0	14-22		
A6/C6/A7/C7/A8/C8	0.33-2.0	14-22		

1) Use STP (shielded twisted-pair) cables for signal wiring.

### 5.4 Installation Considerations

Refer to the following table for the operating conditions, and find an appropriate installation location accordingly.

Items	Description
Ambient Temperature*	-10 $^{\circ}$ C-50 $^{\circ}$ C (40 $^{\circ}$ C and above, 2.5% / $^{\circ}$ C Current Derating search. 50 $^{\circ}$ C 75% of the rated current of the drive if possible)
Ambient Humidity	90% relative humidity (no condensation)
Storage Temperature	- 4–149 °F (-20–65 ℃)
Environmental Factors	An environment free from corrosive or flammable gases, oil residue or dust
Altitude/Vibration	Lower than 3,280 ft (1,000 m) above sea level/less than 1.0 G (9.8 m/sec <sup>2</sup> )
Air Pressure	70 –106 kPa

#### Caution

Do not allow the ambient temperature to exceed the allowable range while operating the inverter.

### 5.5 LED Status and Switch Settings

#### 5.5.1 LED Status

The H100 extension IO module has two LED indicators. Remove the front cover to check the LED status.



Status	LED 1	LED 2
LED Test Operation	LED is on for one second when power is on.	LED is on for one second when power is on.
Normal	Flashing	Off
normai	ON→OFF every second	-
Inverter Connection Error	Off	Off
Invertor Version Error	Synchronous flashing <sup>1</sup>	Synchronous Flashing <sup>1</sup>
	On→Off every second	On→Off every second
H/W Interface Error	Alternately Flashing2	Alternately Flashing <sup>2</sup>
between Inverter and Option Module	On→Off every second	On→Off every second

- 1. LED 1 and LED 2 flash simultaneously.
- 2. LED 1 and LED 2 flash alternately.

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### 5.5.2 Switch Symbols and Descriptions



Switch	Description	Factory Default
SW1	NPN/PNP mode selection switch (Left: NPN, Right: PNP)	Left: NPN
SW2	V3/I3 mode selection switch (Left: V3, Right: I3)	Left: V3
SW3	VO3/IO3 mode selection switch (Left: VO3, Right: IO3)	Left: VO3

### 5.6 Terminal Block Wiring Diagram

Following illustration describes the wiring of the H100 extension IO module. Ensure the inverter's specifications meet requirements to connect the H100 extension IO module. Refer to the detailed description to complete installation. Refer to **5.3 Signal(Control) Cable Specifications** on page 9 for detailed information.





### 5.7 Control Terminal Block Wiring Diagram

#### 5.7.1 NPN (Sink mode)

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Select NPN using the PNP/NPN selection switch (SW1). Note that the factory default setting is NPN mode. CM is the common ground terminal for all analog inputs at the terminal, and P24 is the 24 V internal power source.



#### 5.7.2 PNP (Source Mode)

Select PNP using the PNP/NPN selection switch (SW1). Note that the factory default setting



is NPN mode. CM is the common ground terminal for all analog inputs at the terminal, and P24 is the 24 V internal power source. If you are using an external 24 V power source, build a circuit that connects the external source (-) and the CM terminal.



#### ① Caution

- Power source for a PNP configuration: VHI=3.25 [V], VLO=1.75 [V]
- Power source for an NPN configuration: Do not use LED switches with built-in resistors with the extension IO

### 6 Learning to Perform Basic Operations

### 6.1 Basic Features for H100 extension I/O

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Basic Tasks	Example
Frequency reference source configuration for the terminal block (input voltage)	Configures the inverter to allow input voltages at the terminal block (V3) and setup or modify an operation frequency reference.
Frequency reference source configuration for the terminal block (input current)	Configures the inverter to allow input currents at the terminal block (I3) and to setup or modify an operation frequency reference.
Multistep speed (frequency) configuration	Configures multistep frequency operations by receiving an input at the terminals defined for each step frequency.
Multistage Acc/Dec time configuration using the multifunction terminal	Configures multistage acceleration and deceleration times for a motor based on defined parameters for the multifunction terminals.
Acc/Dec stop command	Stops the current acceleration or deceleration and controls motor operation at a constant speed. Multifunction terminals must be configured for this command.
Multifunction input terminal control configuration	Enables the user to improve the responsiveness of the multi- function input terminals.

### 6.2 Setting Frequency Reference

Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
				0	KeyPad-1		
				1	KeyPad-2		
			2	V1			
DRV 07 Frequency reference source	4V25126Int 48Field	4	V2	0 <u>-</u> ≃11			
		5	12				
		6	Int 485		-		
		Field Bus					
			9	Pulse			
			10	V3			
			11	13			

#### 6.2.1 Setting a Frequency Reference using Input Voltage (V3)

You can set and modify a frequency reference using the input voltage at the V3 terminal after selecting the voltage input at SW2. Use voltage inputs ranging from 0–10 V (unipolar) for forward only operation.

#### Setting a Frequency Reference for 0–10 V Input

Set DRV-07 (Freq Ref Src) to "10 (V3)". Use a voltage output from an external source or use the voltage output from the VR terminal to provide inputs to V3. Refer to the diagram below for the wiring required for each application.



[External source application]



Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
DRV	07	Frequency reference source	Freq Ref Src	10	V3	0-11	-
IN	01	Frequency at maximum analog input	Freq at 100%	Maxi frequ	mum iency	Initial frequency– Max. Frequency	Hz
	01	V3 input monitor	V3 Monitor[V]	0.00		0.00-12.00	V
	02	V3 input filter time constant	V3 Filter	10		0-10,000	msec
	03	V3 minimum input voltage	V3 volt x1	0.00		0.00-10.00	V
	04	V3 output at minimum voltage (%)	V3 Perc y1	0.00		0.00-100.00	%
	05	V3 maximum input voltage	V3 Volt x2	10.00		0.00-12.00	V
	06	V3 output at maximum voltage (%)	V3 Perc y2	100.	00	0.00-100.00	%
	07	Rotation direction options	V3 Inverting	0	No	0-1	-
	08	Quantizing level	V3 Quantizing	0.04		0.00*, 0.04- 10.00	%

\* Quantizing is disabled if '0' is selected.

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#### ■ 0–10 V Input Voltage Setting Details

Code	Description
[IN-01] Freq at 100%	This sets the frequency reference to the maximum input voltage when a potentiometer is connected to the control terminal block. A frequency set with code IN-01 becomes the maximum frequency only if the value set in code APO-04 (or APO-06) is 100 (%).
	<ul> <li>Set code IN-01 to "40.00" and use default values for codes APO-01–APO-08. The motor will run at 40.00 Hz when a 10 V input is provided at V3.</li> </ul>
	<ul> <li>Set code APO-06 to "50.00" and use default values for codes IN-01, APO-01– APO-08. The motor will run at 30.00 Hz (50% of the default maximum frequency–60 Hz) when a 10 V input is provided at V3.</li> </ul>
[APO-01] V3 Monitor[V]	Configures the inverter to monitor the input voltage at V3.

Code	Description
[APO-02] V3 Filter	V3 Filter is a low-pass filter and may be used when there are large variations between reference frequencies. The filter passes only the clean input signal. Variations can be mitigated by increasing the time constant, but this requires an increased response time. The t (time) value indicates the time required for the frequency to reach 63% of the reference, when external input voltages are provided in multiple steps. V3 input from external source Frequency reference 100% 63% V3 Filter(t)
[APO-03] V3 volt x1 ~ [APO-06] V3 Perc y2	These parameters are used to configure the gradient level and offset values of the output frequency, based on the input voltage. Frequency reference [APO-06] [APO-04] [APO-04] [APO-03] [APO-05] V3 input
[APO-07] V3 Inverting	This inverts the input value set at V3. Set this code to "1 (Yes)" if you need the motor to run in the opposite direction from the current rotation.

Code	Description				
	Quantizing may be used when the noise level of the analog input (V3 terminal) signal is high. The input signal's height (value) is quantized regularly to output a frequency. Quantizing is useful if you are operating a noise-sensitive system, because it suppresses any signal noise. However, quantizing will diminish system sensitivity. (The resulting power of the output frequency will decrease based on the analog input).				
	Parameter values for quantizing are a percentage based on the maximum input. Therefore, if the value is set to 1% of the analog maximum input (60 Hz), the output frequency will increase or decrease by 0.6 Hz per 0.1 V difference.				
	When the analog input is increased, an increase of the input equal to 75% of the set value will change the output frequency, and then the frequency will increase according to the set value. Likewise, when the analog input decreases, a decrease of the input equal to 75% of the set value will make an initial change to the output frequency.				
[APO-08] V3 Quantizing	The low-pass filter reduces noise, but decreases the responsiveness. Variations (noise) can be mitigated by increasing the time constant, but this requires an increased response time. When the input signal is delayed, pulsation (ripple) may occur to the output frequency.				
	Output frequency (Hz)				
	60.00 59.4 1.2 0.6 0.025 0.1 0.2 9.925 10 0.025 0.1 0.2 9.925 10 0.075 0.175 9.975				

#### 6.2.2 Setting a Reference Frequency using Input Current (I3)

You can set and modify a frequency reference using the input current at the I3 terminal after selecting current input at SW2. Set DRV-07 (Freq Ref Src) to "11 (I3)" and apply 4–20 mA input current.

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Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
DRV	07	Frequency reference source	Freq Ref Src	11	13	0~11	-
IN	01	Frequency at maximum analog input	Freq at 100%	Max Freq.		Start FreqMax Freq.	Hz
	10	13 input monitor	13 Monitor	0.00		0.00-24.00	mA
	11	13 input filter time constant	13 Filter	10		0-10,000	mA
	12	13 minimum input current	13 Curr x1	4.00		0.00-20.00	mA
	13	I3 output at minimum current (%)	I3 Perc y1	0.00		0.00 – 100.00	%
APO	14	13 maximum input current	13 Curr x2	20.00		0.00-24.00	mA
	15	I3 output at maximum current (%)	I3 Perc y2	100.00		0.00-100.00	%
	16	I3 rotation direction options	13 Inverting	0	No	0-1	-
	17	13 Quantizing level	I3 Quantizing	0.04		0.00*, 0.04- 10.00	%

Code	Description			
	Configures the frequency reference for operation at the maximum current (when APO-14 is set to 100%).			
[IN-01] Freq at 100%	<ul> <li>If IN-01 is set to 40.00 and the default settings are used for APO-10–APO-16, a 20 mA input to the V3 terminal will produce a frequency reference of 40.00Hz.</li> </ul>			
	<ul> <li>If APO-15 is set to 50.00 and the default settings are used for IN-01, APO-10– APO-16, a 20 mA input will produce a frequency reference of 30.00Hz.</li> </ul>			
[APO-10] I3 Monitor	Used to monitor input current at I3.			
[APO-11] I3 Filter	Configures the time for the operation frequency to reach 63% of target frequency based on the input current at I3.			
	Configures the gradient level and off-set value of the output frequency.			
[APO-12] I3 Curr x1 ~ [APO-15] I3 Perc y2	Frequency reference [APO-14] [APO-12] [APO-13] [APO-15] [3 input			

#### ■ Input Current (I3) Setting Details



### 6.3 Analog Output

An analog output terminal provides an output voltage of 0–10 V or 4–20 mA current.

#### 6.3.1 Voltage and Current Analog Output

The output size can be adjusted by selecting an output setting at the AO3 (Analog Output 3) terminal. Set the analog output terminal switch (SW3) to change the output type, voltage (VO3), and current (IO3).

Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
APO	30	Analog output 3	AO3 Mode	0	Frequency	0-15	-
	31	Analog output 3 gain	AO3 Gain	100.0		-1000.0- 1000.0	%
	32	Analog output 3 bias	AO3 Bias	0.0		-100.0-100.0	%
	33	Analog output 3 filter	AO3 Filter	5		0-10000	ms
	34	Analog constant output 3	AO3 Const %	0.0		0.0-100.0	%
	35	Analog output 3 monitor	AO3 Monitor	0.0		0.0-1000.0	%

#### Voltage and Current Analog Output Setting Details

Code	Description					
	Sel sett	Select a constant value for output. The following example for output voltage setting.				
	Se	tting	Function			
	0 Frequency Outputs an operation frequency as a standard. A is supplied based on the frequency set at DRV-20 Freq).		Outputs an operation frequency as a standard. A 10 V output is supplied based on the frequency set at DRV-20 (Max Freq).			
	1	Output Current	A 10 V output is supplied based on 200% of the inverter's rated current.			
[APO-30] AO3 Mode	2	Output Voltage	Sets the outputs based on the inverter output voltage. 10 V output is made from a set voltage in BAS-15 (Rated Volt). If 0 V is set in BAS-15, 200 V/400 V models output 10 V based on the actual input voltages (240 V and 480 V respectively).			
	3	DC Link Volt	Outputs inverter DC link voltage as a standard. Outputs 10 V when the DC link voltage is 410 V DC for 200 V models, and 820 V DC for 400 V models.			
	4	Torque	Outputs are based on the torque present. A 10 V output is supplied based on 250% of the motor's rated torque.			
	5	Output Power	Monitors output wattage. The maximum display voltage (10 V) is supplied based on 200% of the rated output voltage.			

Code	Des	Description			
	6	ldse	Outputs maximum voltage at 200% of the no-load current.		
	-		Outputs maximum voltage at 250% of the rated torque.		
	1	Iqse	Rated torque current = $\sqrt{\text{Rated current}^2 - \text{No} - \text{load current}^2}$		
	8	Target Freq	Outputs a set frequency as a standard. Outputs 10 V at the maximum frequency (DRV-20).		
	9	Ramp Freq	Outputs a frequency calculated using the Acc/Dec function as a standard. May vary with actual output frequency. Outputs 10 V.		
	12	PID Ref Value	Outputs a PID controller's command value as a standard. Outputs approximately 6.6 V at 100%.		
	13	PID Fdk Value	Outputs a PID controller's feedback volume as a standard. Outputs approximately 6.6 V at 100%.		
	14	PID Output	Outputs a PID controller's output value as a standard. Outputs approximately 10 V at 100%.		
	15	Constant	Outputs APO-34 (AO3 Const %) value as a standard.		
	Adj ope	usts output va rate as showr	lue and offset. If frequency is selected as an output item, it will below.		
[APO-31]	$A03 = \frac{Frequency}{MaxFreq} \times A03 \text{ Gain} + A03 \text{ Bias}$				
AO3 Gain	The graph below illustrates how the analog voltage output (AO3) changes depending on APO-31 (AO3 Gain) and APO-32 (AO3 Bias) values. The Y-axis is				
AO3 Bias	iten	l.			
For example, if the maxi the present output freque 50%.			e maximum frequency set at DRV-20 (Max Freq) is 60 Hz and t frequency is 30 Hz, then the x-axis value on the next graph is		



### 6.4 Digital Output

#### 6.4.1 Multifunction Output Terminal and Relay Settings

Group	Code	Name	LCD Display	Para Sett	ameter ing	Setting Range	Unit
OUT	30	Fault trip output mode	Trip Out Mode	010		-	bit
	31	Multifunction relay 1	Relay 1	23	Trip	-	-
	32	Multifunction relay 2	Relay 2	14	Run	-	-
	33	Multifunction relay 3	Relay 3	0	None	-	
	34	Multifunction relay 4	Relay 4	0	None	-	
	35	Multifunction relay 5	Relay 5	0	None	-	
	36	Multifunction output1	Q1 Define	0	None	-	-

Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
	37	Multifunction relay 6	Relay 6	0	None	-	
	38	Multifunction relay 7	Relay 7	0	None	-	
	39	Multifunction relay 8	Relay 8	0	None	-	
	53	Fault trip output on delay	TripOut On Dly	0.00	)	0.00-100.00	sec
	54	Fault trip output off delay	TripOut Off Dly	0.00		0.00-100.00	sec

Code	Description			
	Set	relay (Relay 1–8) c	output options.	
	Set	ting	Function	
	0	None	No output signal	
[OUT-31] Relay_1 ~ [OUT-39] Relay_8	1	FDT-1	Detects the inverter output frequency reaching the user- set frequency. Outputs a signal when the absolute value (set frequency–output frequency) is less than the detected frequency width, divided by 2. When the detected frequency width is 10 Hz, FDT-1 output is as shown in the graph below. 40Hz Frequency 20Hz reference 40Hz Frequency 15Hz 20Hz Q1 Run cmd	
	2	FDT-2	Outputs a signal when the user-set frequency and detected frequency (FDT Frequency) are equal and fulfills FDT-1 conditions at the same time. Absolute value (set frequency-detected frequency) is less than the detected frequency width, divided by 2 and FDT- 1. The detected frequency width is 10 Hz. When the detected frequency is set to 30 Hz, FDT-2 output is as shown in the graph below. Frequency 30Hz 50Hz reference 25Hz Frequency 1 1 Run cmd	
	3	FDT-3	Outputs a signal when the Absolute value (output frequency–operation frequency) is less than the detected frequency width, divided by 2. Detected frequency width is 10 Hz. When the detected frequency is set to 30 Hz, FDT-3 output is as shown in the graph below.	

#### Multifunction Output Terminal and Relay Setting Details

Code	Desc	Description			
			35Hz 30Hz 25Hz Q1 Run cmd		
			The output signal can be separately set for acceleration and deceleration conditions.		
			<ul> <li>In acceleration: Operation frequency ≥ Detected frequency</li> <li>In deceleration: Operation frequency &gt; (Detected</li> </ul>		
	4	FDT-4	The detected frequency width is 10 Hz. When the detected frequency is set to 30 Hz, FDT-4 output is as shown in the graph below.		
			30Hz 25Hz Frequency Q1 Run cmd		
	5	Over Load	Outputs a signal at motor overload.		
	6	IOL	Outputs a signal when the inverter input current exceeds the rated current and a protective function is activated to prevent damage to the inverter, based on inverse proportional characteristics.		
	7	Under Load	Outputs a signal when a load fault warning occurs.		
	8	Fan Warning	Outputs a signal when a fan fault warning occurs.		
	9	Stall	Outputs a signal when a motor overloads and stalls.		
	10	Over Voltage	Outputs a signal when the inverter DC link voltage rises above the protective operation voltage.		
	11	Low Voltage	Outputs a signal when the inverter DC link voltage drops below the low voltage protective level.		
	12	Over Heat	Outputs signal when the inverter overheats.		
	13	Lost Command	Outputs a signal when there is a loss of analog input terminal and RS-485 communication command at the terminal block. Outputs a signal when communication power is present		
	_		and an I/O expansion card is installed. It also outputs a signal when losing analog input and communication power commands.		



Code	Desc	Description			
	14	Run	Outputs a signal when an operation command is entered and the inverter outputs voltage. No signal output during DC braking. Frequency Q1 Run cmd		
	15	Stop	Outputs a signal at operation command off, and when there is no inverter output voltage.		
	16	Steady	Outputs a signal in steady operation.		
	17	Inverter Line	Outputs a signal while the motor is driven by the inverter line.		
	18	Comm Line	Outputs a signal when multifunction input terminal (switching) is used. Refer to 5.31 Supply Power Transition in the H100 inverter manual for details.		
	19	Speed Search	Outputs a signal during an inverter speed search operation. Refer to 5.27 Speed Search Operation in the H100 inverter manual for details.		
	20	Ready	Outputs a signal when the inverter is in standby mode and is ready to receive external operation commands.		
	21	ММС	Used as a multimotor control function. By configuring the relay output and the multifunction output to MMC and configuring AP1-40–AP1-92, it can conduct the necessary operations for the multimotor control function.		
	22	Timer Out	A timer function to operate terminal output after a certain time by using the multifunction terminal block input. Refer to 5.43 Timer Settings in the H100 inverter manual for details.		
	23	Trip	Outputs a signal after a fault trip. Refer to 5.45 Multi-function Output On/Off Control in the H100 inverter manual for details.		
	24	Lost Keypad	Outputs a signal when a fault trip occurs.		
	25	DB Warn %ED	Refer to 6.2.5 Dynamic Braking (DB) Resistor Configuration in the H100 inverter manual for details.		
	26	On/Off Control	Outputs a signal using an analog input value as a standard. Refer to 5.45 Multi-function Output On/Off Control in the H100 inverter manual for details		
	27	Fire Mode	Outputs a signal when Fire mode is operating.		

Code	Des	cription	
	28	Pipe Break	Outputs a signal when a pipe is broken.
	29	Damper Err	Outputs a signal when a damper open signal is not entered. Refer to 5.10 Damper Operation in the H100 inverter manual for details.
	30	Lubrication	Outputs a signal when a lubrication function is operating.
	31	Pump Clean	Outputs a signal when a pump cleaning function is operating.
	32	Level Detect	Outputs a signal when an LDT trip occurs.
	33	Damper Control	Outputs a signal when a damper open signal is set at IN- 65–71 multifunction terminals and the run command is on.
	34 CAP.Warning		Outputs a signal when value of PRT-85 is lower than the value of PRT-86 (CAP life cycle examination do not operate properly).
	35	Fan Exchange	Outputs a signal when a fan needs to be replaced.
	36	AUTO State	Outputs a signal in AUTO mode.
	37	HAND State	Outputs a signal in HAND mode.
	38	то	Outputs a signal at pulse output.
	39	Except Date	Outputs a signal when operating the exception day schedule.
	40	KEB Operating	Outputs a signal at KEB operation.
[OUT-36] Q1 Define	Sele bloc	ects an output item k. Q1 stands for th	for the multifunction output terminal (Q1) of the terminal e open collector TR output.
[OUT-41] DO Status	Use	d to check On/Off s	state of the D0 by each bit.

#### Caution

- The FDT-1 and FDT-2 functions are related to the inverter's frequency settings. If the inverter
  enters standby mode due to pressing the Off key during auto mode operation, the FDT-1 and
  FDT-2 function operation may be different because the set frequency of the inverter is
  different compared to the set frequency of the auto mode.
- If monitoring signals such as "Under load" or "LDT" are configured at multifunction output terminals, signal outputs are maintained unless certain conditions defined for signal cutoff are met.

## 6.4.2 Fault Trip Output using Multifunction Output Terminal and Relay

Γ

The inverter can output a fault trip state using the multifunction output terminal (Q1) and relay (Relay1).

Group	Code	Name	LCD Display	Para Sett	ameter ing	Setting Range	Unit
	30	Fault trip output mode	Trip Out Mode	010		-	bit
	31	Multifunction relay 1	Relay 1	23	Trip	-	-
	32	Multifunction relay 2	Relay 2	14	Run	-	-
	33	Multifunction relay 3	Relay 3	0	None	-	
	34	Multifunction relay 4	Relay 4	0	None	-	
	35	Multifunction relay 5	Relay 5	0	None	-	
OUT	36	Multifunction output1	Q1 Define	0	None	-	-
	37	Multifunction relay 6	Relay 6	0	None	-	
	38	Multifunction relay 7	Relay 7	0	None	-	
	39	Multifunction relay 8	Relay 8	0	None	-	
	53	Fault trip output on delay	TripOut On Dly	0.00		0.00-100.00	sec
	54	Fault trip output off delay	TripOut <mark>Off Dly</mark>	0.00	)	0.00-100.00	sec

Code	Descrip	otion					
	The fau	lt trip re	elay oper	rates based on the fault trip output settings.			
	Item			bit on	bit off		
	Keypad display						
[OUT-30] Trip Out Mode	Select a codes ( termina and rela	Select a fault trip output terminal/relay and select "29 (Trip Mode)" at codes OUT- 31–33. When a fault trip occurs in the inverter, the relevan rerminal and relay will operate. Depending on the fault trip type, termin and relay operation can be configured as shown in the table below.					
Mode	Setting			Function			
	bit3	bit2	bit1				
			$\checkmark$	Operates when low volt	age fault trips occur		
		✓		Operates when fault trip voltage occur	os other than low		
	✓			Operates when auto res	start fails (PRT-08–09)		
[OUT-31]Relay 1 ~[OUT-39] Relay 8	Set rela	iy outpu	ıt (Relay	1–8).			
[OUT-36] Q1 Define	Select o TR outp	output fo	or multifu	unction output terminal (	Q1). Q1 is open collector		

#### Fault Trip Output by Multifunction Output Terminal and Relay - Setting Details

#### 6.4.3 Multifunction Output Terminal Delay Time Settings

Set on-delay and off-delay times separately to control the output terminal and relay operation times. The delay time set at codes OUT-50–51 applies to multifunction output terminal (Q1) and relay, except when the multifunction output function is in fault trip mode.

Group	Code	Name	LCD Display	Parameter Setting	Setting Range	Unit
	50	Multifunction output On delay	DO On Delay	0.00	0.00- 100.00	sec
OUT	51	Multifunction output Off delay	DO Off Delay	0.00	0.00- 100.00	sec
	52	Select multifunction output terminal	DO NC/NO Sel	0 0000 0000*	0 0000 0000~ 1 1111 1111	bit

#### Output Terminal Delay Time Setting Details

Code	Description					
[OUT-50]DO On Delay	When a relay op the relay turns c OUT-50.	When a relay operation signal (operation set in OUT 31–35, 36, 37-39) occurs, the relay turns on or the multifunction output operates after the time delay set at OUT-50.				
[OUT-51]DO Off Delay	When relay or n off or multifuncti	nultifunction output is initialize on output turns off after the ti	d (off signal occurs), the relay turns me delay set at OUT-54.			
[OUT-52]DO	Select the terminal type for the relay and multifunction output terminal. By the relevant bit to "0", it will operate the Form A contact terminal (Normally Open). Setting it to "1" will operate the Form B contact terminal (Normally Closed). Shown below in the table are Relay 1–5, Q1 and Relay 6-8 settin starting from the right bit.					
NC/NO Sei	Item	B terminal (Normal close)	A terminal (Normal open)			
	Keypad display					
Run cmd	t	DUT-51				
Multi-function output						
	UT-50					

### 6.5 Setting Multistep Frequency

Multistep operations can be carried out by assigning different speeds (or frequencies) to the Px terminals. Step 0 uses the frequency reference source set at IN-72 (P8 Define) and IN-73 (P9 Define). Px terminal parameter values "7 (Speed-L)", "8 (Speed-M)" and "9 (Speed-H)" are recognized as binary commands and work in combination with Fx or Rx run commands. The inverter operates according to the frequencies set at BAS-50–56 (multistep frequency 1–7) and the binary command combinations.

Group	Code	Name	LCD Display	Para Setti	meter ng	Setting Range	Unit
BAS	50~56	Multistep frequency 1–7	Step Freq-1~7	-		Start Freq- Max Freq	Hz
		-73 Px terminal Px Define	7	Speed-L		-	
	65~73		PX Define	8	Speed-M	0-52	-
IN		ooringalation	(1 x. 1 1 1 3)	9	Speed-H		-
	89	Multistep command delay time	InCheck Time	1		1-5000	ms

#### Multistep Frequency Setting Details

Code	Description	_			
[BAS-50~56] Step Freq-1-7	Configure m	ultistep frequ	ency 1–7.		
[IN-65~73] Px Define	Choose the t codes (IN-65 Provided tha Speed-M and Step 0 1 	erminals to s -73) to "7 (S t terminals P d Speed-H, th 	etup as multi peed-L)", "8 ( 5, P6, and P7 he following r	step inputs, a (Speed-M)", o 7 have been i nultistep ope	and then set the relevant or "9 (Speed-H)". respectively set to Speed-L, ration will be available.
	Speed	Fx/Rx	P7	P6	P5
	0	✓	-	-	-
	1	✓	-	-	$\checkmark$

Code	Description						
	2	✓	-	✓	-		
	3	$\checkmark$	-	$\checkmark$	$\checkmark$		
	4	$\checkmark$	$\checkmark$	-	-		
	5	✓	✓	-	✓		
	6	✓	✓	✓	-		
	7	$\checkmark$	✓	$\checkmark$	✓		
[INI-80]	Set a time interval for the inverter to check for additional terminal block inputs after receiving an input signal.						
InCheck Time	After adjustir will search fo acceleration	ng IN-89 to 10 or inputs at of or decelerati	00 ms and ar her terminals on based on	n input signal s for 100 ms, the configura	is received a before proce ation at P6.	t P6, the inverter eding to	

### 6.6 Multistep Acc/Dec Time Configuration

Γ

Acc/Dec times can be configured via a multifunction terminal by setting the ACC (acceleration time) and DEC (deceleration time) codes in the DRV group.

Group	Code	Name	LCD Display	Para	meter Setting	Setting Range	Unit
עםח	03	Acceleration time	Acc Time	20.0		0.0-600.0	sec
DRV	04	Deceleration time	Dec Time	30.0		0.0-600.0	sec
		Multistep	Acc Time 1-7	x.xx		).0-600.0 ).0-600.0	sec
BAS	70-83	acceleration/Decele ration time1–7	Dec Time 1-7	x.xx		0.0-600.0	sec
			Du Dafina	11	XCEL-L		
	65-73	Px terminal configuration		12	XCEL-M	0-52	-
IN		ooninguration	(1 X. 1 1 - 1 - 3)	13	XCEL-H		
	89	Multistep command delay time	In Check Time	1		1-5000	ms

Code	Desc	ription					
[BAS-70-82] Acc Time 1-7	Set r	Set multistep acceleration time1–7.					
[BAS-71-83] Dec Time 1-7	Set r	Set multistep deceleration time1–7.					
	Choo input	Choose and configure the terminals to use for multistep Acc/Dec time inputs					
	Con	figuration	Description				
[IN-65~73] Px Define (P1~P9)	11	XCEL-L	Acc/Dec command-L				
	12	XCEL-M	Acc/Dec command-M				
	13	XCEL-H	Acc/Dec command-H				
	the a BAS For e respe <u>Frequ</u> <u>P6</u> <u>P7</u> <u>Run c</u>	Acc2 ency Acc0 md	eleration based on para -83. nd P7 terminals are set a g operation will be availa Pec0 Pec1 Pec2 Pec3 Pec3	meter values set with as XCEL-L and XCEL-M able.			
		Dec lime	-	-			
	1		-	- -			
	2		✓	-			
	3		✓	$\checkmark$			
	[Mult	ifunction terminal P	6, P7 configuration]	<u> </u>			
[IN-89] In Check Time	Sets 89 is searc Acc/l	the time for the inve set to 100 ms and a ches for other inputs Dec time will be set	erter to check for other te a signal is supplied to the s over the next 100 ms. \ based on the input recei	erminal block inputs. If IN- e P6 terminal, the inverter When the time expires, the ved at P6.			

#### ■ Acc/Dec Time Setup via Multifunction Terminals – Setting

### 6.7 Stopping the Acc/Dec Operation

Configure the multifunction input terminals to stop acceleration or deceleration and operate the inverter at a fixed frequency.

Group	Code	Name	LCD Display	Para	meter Setting	Setting Range	Unit
IN	65-73	Px terminal configuration	Px Define(Px: P1-P9)	14	XCEL Stop	0-55	-



Г

### 6.8 Multifunction Input Terminal Control

Filter time constants and the type of multifunction input terminals can be configured to improve the response of input terminals.

Grou p	Code	Name	LCD Display	Parameter Setting	Setting Range	Unit
	85	Multifunction input terminal On filter	DI On Delay	10	0-10,000	msec
	86	Multifunction input terminal Off filter	DI Off Delay	3	0-10,000	msec
IN	87	Multifunction input terminal selection	DI NC/NO Sel	0 0000 0000*	0 0000 0000~1 1111 1111	-
	90	Multifunction input terminal status	DI Status	0 0000 0000*	0 0000 0000~1 1111 1111	-

\* From the last bit to the first, the bits are for multipurpose input 1–9 (the last bit is for input 1, and the

first bit for input 7).

Code	Description					
[IN-85] DI On Delay [IN-86] DI Off Delay	When the terminal receives an input, it is recognized as On or Off if the input terminal's status is not changed during the set time.					
[IN-87]	Select terminal light correspond the bottom seg contact termina that the termina contact. Termin	Select terminal contact types for each input terminal. The position of the indicator ight corresponds to the segment that is on, as shown in the table below. With he bottom segment on, it indicates that the terminal is configured as a Form A contact terminal (Normally Open) contact. With the top segment on, it indicates hat the terminal is configured as a Form B contact terminal (Normally Closed) contact. Terminals are numbered P1–P9, from right to left.				
DI NC/NO Sel	Туре	Form B contact terminal status (Normally Closed)	Form A contact terminal status (Normally Open)			
	Keypad					
[IN-90]	Display the configuration of each contact. When a segment is configured as a Form A contact terminal, using DRV-87, the On condition is indicated by the to segment turning on. The Off condition is indicated when the bottom segment is turned on. When contacts are configured as Form B contact terminals, the segment lights behave conversely. Terminals are numbered P1–P9, from right left					
DI Status	Туре	Form A contact terminal setting (On)	Form A contact terminal setting (Off)			
	Keypad					

#### Multifunction Input Terminal Control Setting Details

### 7 Keypad Parameters for the Extension I/O Module

Γ

Keypad Parameters for the extension I/O module can only be used when using the extension I/O module.

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
CNF-30		Option-1 Type	-		Displays "Ext IO 1" when the H100 extension IO module is connected.
COM-06		FBus S/W Ver	-		Displays the version when the H100 extension IO module is connected.
					0 Keypad-01
					1 Keypad-02
					2 V1
					3 Reserved
					4 V2
	061107	Freq Ref Src	0	Δ	5 12
DKV-U7	011107		0		6 Int 485
					7 FieldBus
					8 Reserved
					9 Pulse
					10 V3
					11  3
					0 None
					1 V1
					2 Reserved
					3 V2
					4 12
	061201	Aux Dof Sro	0		5 Reserved
DA3-01	011201	Aux Rei Sic	0		6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					12 V3
					13  3
					0 Keypad-01
					1 Keypad-02
					2 V1
					3 Reserved
					4 V2
	061205	Fred and Sre			5 12
BAS-05	011205	Freq Znd Src	0	0	6 Int 485
					7 FieldBus
					8 Reserved
					9 Pulse
					10 V3
					11  3
					0 None
					1 V1
					2 Reserved
					3 V2
					4 12
					5 Reserved
	064242	On Off Ctrl Stra	0		6 Pulse
AD V-00	011342		0	0	7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13  3
					0 None
IN-72	0h1548	P8 Define	0	Δ	1 Fx
					2 Rx

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					3 RST
					4 External Trip
					5 Bx
					6 JOG
					7 Speed-L
					8 Speed-M
					9 Speed-H
					10 Reserved
					11 XCEL-L
					12 XCEL-M
					13 XCEL-H
					14 XCEL-STOP
					15 RUN Enable
					16 3-Wire
					17 2nd Source
					18 Exchange
					19 Up
					20 Down
					21 Reserved
					22 U/D Clear
					23 Analog Hold
					24 I-Term Clear
					25 PID Openloop
					26 PID Gain 2
					27 PID Ref Change
					28 2nd Motor
					29 Interlock 1
					30 Interlock 2
					31 Interlock 3
					32 Interlock 4
					33 Interlock 5

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					34 Pre Excite
					35 Timer In
					36 Reserved
					37 dis Aux Ref
					38 FDW Jog
					39 REV JOG
					40 Fire Mode
					14 EPID1 Run
					42 EPID1 ITermClr
					43 Time Event En
					44 Pre Heat
					45 Damper Open
					46 Pump Clean
					47 EPID2 Run
					48 EPID2 ITermClr
					49 Sleep Wake Chg
					50 PID Step Ref L
					51 PID Step Ref M
					52 PID Step Ref H
					53 Interlock 6
					54 Interlock 7
					55 Interlock 8
					0 None
					1 Fx
					2 Rx
					3 RST
IN-73	0h1549	P9 Define	0	Δ	4 External Trip
					5 Bx
					6 JOG
					7 Speed-L
					8 Speed-M

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					9 Speed-H
					10 Reserved
					11 XCEL-L
					12 XCEL-M
					13 XCEL-H
					14 XCEL-STOP
					15 RUN Enable
					16 3-Wire
					17 2nd Source
					18 Exchange
					19 Up
					20 Down
					21 Reserved
					22 U/D Clear
					23 Analog Hold
					24 I-Term Clear
					25 PID Openloop
					26 PID Gain 2
					27 PID Ref Change
					28 2nd Motor
					29 Interlock 1
					30 Interlock 2
					31 Interlock 3
					32 Interlock 4
					33 Interlock 5
					34 Pre Excite
					35 Timer In
					36 Reserved
					37 dis Aux Ref
					38 FDW Jog
					39 REV JOG

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					40 Fire Mode
					14 EPID1 Run
					42 EPID1 ITermClr
					43 Time Event En
					44 Pre Heat
					45 Damper Open
					46 Pump Clean
					47 EPID2 Run
					48 EPID2 ITermClr
					49 Sleep Wake Chg
					50 PID Step Ref L
					51 PID Step Ref M
					52 PID Step Ref H
					53 Interlock 6
					54 Interlock 7
					55 Interlock 8
					0 None
					1 FDT-1
					2 FDT-2
					3 FDT-3
					4 FDT-4
					5 Over Load
					6 IOL
OUT-37	0h1625	Relay6	0	0	7 Under Load
					8 Fan Warning
					9 Stall
					10 Over Voltage
					11 Low Voltage
					12 Over Heat
					13 Lost Command
					14 Run

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					15 Stop
					16 Steady
					17 Inverter Line
					18 Comm Line
					19 Speed Search
					20 Ready
					21 MMC
					22 Timer Out
					23 Trip
					24 Lost Keypad
					25 DB Warn %ED
					26 On/Off Control
					27 Fire Mode
					28 Pipe Broken
					29 Damper Err
					30 Lubrication
					31 Pump Clean
					32 Level Detect
					33 Damper Control
					34 CAP. Warning
					35 Fan Exchange
					36 AUTO State
					37 HAND State
					38 TO
					39 Except Date
					40 KEB Operating
					0 None
		Relay7	0		1 FDT-1
OUT-38	0h1626			0	2 FDT-2
					3 FDT-3
					4 FDT-4

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					5 Over Load
					6 IOL
					7 Under Load
					8 Fan Warning
					9 Stall
					10 Over Voltage
					11 Low Voltage
					12 Over Heat
					13 Lost Command
					14 Run
					15 Stop
					16 Steady
					17 Inverter Line
					18 Comm Line
					19 Speed Search
					20 Ready
					21 MMC
					22 Timer Out
					23 Trip
					24 Lost Keypad
					25 DB Warn %ED
					26 On/Off Control
					27 Fire Mode
					28 Pipe Broken
					29 Damper Err
					30 Lubrication
					31 Pump Clean
					32 Level Detect
					33 Damper Control
					34 CAP. Warning
					35 Fan Exchange



Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					36 AUTO State
					37 HAND State
					38 TO
					39 Except Date
					40 KEB Operating
					0 None
					1 FDT-1
					2 FDT-2
					3 FDT-3
					4 FDT-4
				0	5 Over Load
	0h1627	Relay8			6 IOL
					7 Under Load
					8 Fan Warning
					9 Stall
			0		10 Over Voltage
					11 Low Voltage
					12 Over Heat
001-39					13 Lost Command
					14 Run
					15 Stop
					16 Steady
					17 Inverter Line
					18 Comm Line
					19 Speed Search
					20 Ready
					21 MMC
					22 Timer Out
					23 Trip
					24 Lost Keypad
					25 DB Warn %ED



Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					26 On/Off Control
					27 Fire Mode
					28 Pipe Broken
					29 Damper Err
					30 Lubrication
					31 Pump Clean
					32 Level Detect
					33 Damper Control
					34 CAP. Warning
					35 Fan Exchange
					36 AUTO State
					37 HAND State
					38 TO
					39 Except Date
					40 KEB Operating
					0 Keypad
					1 V1
					2 Reserved
					3 V2
					4 12
	061804		0	^	5 Int 485
110-10	UIIIOUA		0		6 FieldBus
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11  3
					0 None
	061000	PID	0		1 V1
PID-12	0h180C	Ref1AuxSrc	0	Δ	2 Reserved
					3 V2

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					4 12
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13  3
					0 Keypad
			0	Δ	1 V1
					2 Reserved
					3 V2
					4 12
		PID			5 Int 485
PID-15	UNIOUF	Ref2AuxSrc			6 FieldBus
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11  3
					0 None
					1 V1
					2 Reserved
					3 V2
PID-17	0h1811	PID Ref2AuxSrc	0	Δ	4 12
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13  3
					0 V1
		PID Fdb Source			1 Reserved
					2 V2
					3 12
					4 Int 485
20	0h1814		0	A	5 FieldBus
PID-20				Δ	6 Reserved
					7 Pulse
					8 EPID1 Output
					9 EPID1 Fdb Val
					10 V3
					11 I3
	0h1815	PID Fdb AuxSrc	0	Δ	0 None
					1 V1
					2 Reserved
					3 V2
					4 12
					5 Reserved
24					6 Pulse
PID-21					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13  3

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Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					0 Keypad
	054000	EPID1 Ref Src		Δ	1 V1
			0		2 Reserved
					3 V2
					4 12
					5 Int 485
	011900				6 FieldBus
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11  3
					0 V1
					1 Reserved
					2 V2
			0	0	3 12
					4 Int 485
	0h1908	EPID1 Fdb			5 FieldBus
EPI-00		Src			6 Reserved
					7 Pulse
					8 EPID1 Output
					9 EPID1 Fdb Val
					10 V3
					11  3
		EPID2 Ref Src	0	Δ	0 Keypad
EPI-36	0h1924				1 V1
					2 Reserved
					3 V2
					4 12
					5 Int 485
					6 FieldBus

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11 I3
					0 V1
		EPID2 Fdb Src	0		1 Reserved
	0h1926				2 V2
					3 12
					4 Int 485
				0	5 FieldBus
EP1-30					6 Reserved
					7 Pulse
					8 EPID1 Output
					9 EPID1 Fdb Val
					10 V3
					11 I3
APO-00		Jump Code	30	0	-
APO-01		V3 Monitor	-	Х	-
APO-02		V3 Filter	10	0	0~10000 msec
APO-03		V3 Volt x1	0.00	0	0.00~10.00 V
APO-04		V3 Perc Y1	0.00	0	0.00~100.00 %
APO-05		V3 Volt x2	10.00	0	0.00~12.00 V
APO-06		V3 Perc Y2	100.00	0	0.00~100.00 %
		V3 Inverting	0	0	0 No
APU-07					1 Yes
APO-08		V3 Quantizing	0.04	0	0.04~10.00 %
APO-10		13 Monitor	-	0	-
APO-11		13 Filter	10	0	0~10000 msec
APO-12		I3 Curr x1	4.00	0	0.00~20.00 mA
APO-13		I3 Perc Y1	0.00	0	0.00~100.00 %

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
APO-14		13 Curr x2	20.00	0	0.00~24.00 mA
APO-15		13 Perc Y2	100.00	0	0.00~100.00 %
		13 Invorting	0		0 No
AF0-10			0	0	1 Yes
APO-17		13 Quantizing	0.04	0	0.04~10.00 %
					0 Frequency
					1 Output Current
					2 Output Voltage
					3 DC Link Voltage
					4 Output Power
					5 Reserved
	AO3 Mode				6 Reserved
					7 Target Freq
				0	8 Ramp Freq
		AO3 Mode	0		9 PID Ref Value
AI 0-30					10 PID Fdb Value
					11 PID Output
					12 Constant
					13 EPID1 Output
					14 EPID1 Ref Val
					15 EPID1 Fdb Val
					16 EPID2 Output
					17 EPID2 Ref Val
					18 EPID2 Fdb Val
					19 PID Out Freq
APO-31		AO3 Gain	100.0	0	-1000.0~1000.0 %
APO-32		AO3 Bias	0.0	0	-100.0~100.0 %
APO-33		AO3 Filter	5	0	0~10000 msec
APO-34		AO3 Const %	0.0	0	0.0~100.0 %
APO-35		AO3 Monitor	0.0	Х	-

\* O/X: Write-enabled during operation

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\*\* Groups created for the H100 extension I/O may be used when the extension I/O is installed



and when displayed as read-only, based on settings or switch options.

\*\* Reset the related parameters after uninstalling the H100 extension I/O module. The parameter settings for the H100 extension I/O module are not automatically initialized when the module is removed.

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### 8 **Product Warranty**

#### 1. Warranty Period

The warranty period is 24 months from the date of manufacture.

#### 2. Scope of Warranty

1) The initial diagnosis of faults should be conducted by the user.

However, upon request, LS ELECTRIC or its representative(s) can undertake this task for a fee. If the cause of the fault is found to be the responsibility of LS ELECTRIC, this service will be free of charge.

- 2) This warranty only applies if the product is used under normal conditions according to the specifications and precautions described in the handling instructions, user manuals, catalogs, and caution labels.
- 3) During the warranty period, repairs shall be charged for the following cases:
  - (1) Replacement of consumable and life-limited parts (e.g. relays, fuses, electrolytic capacitors, batteries, fan, etc.)
  - (2) Failures or damage caused by improper storage, handling, negligence, or accidents by the user
  - (3) Failures resulting from the user's hardware or software design
  - (4) Failures caused by modifications made without LS ELECTRIC's consent (If modifications or repairs are not conducted by LS ELECTRIC or its representative(s), further repairs including paid services will be refused)
  - (5) Failures that could have been avoided if the user's equipment, in which the product is incorporated, had safety devices required by legal regulations or common industry standards
  - (6) Failures that could have been prevented if maintenance and replacement of consumable parts were performed normally according to the handling instructions or user manuals
  - (7) Failures and damage to the product caused due to the connected equipment or use of inappropriate consumables
  - (8) Failures caused by external factors such as fire, abnormal voltage, force majeure, and natural disasters such as earthquakes, lightning, salt damage, wind, flood damage, etc.
  - (9) Failures that cannot be predicted/solved by current scientific technology at the time of manufacture
  - (10) Other failures, damage, or defects recognized as the responsibility of the user.

#### Headquarter

LS-ro 127(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: japan@ls-electric.com
- LS ELECTRIC (Dalian) Co., Ltd. (Dalian, China)
  Tel: 86-411-8730-6495 E-Mail: china.dalian@lselectric.com.cn
- LS ELECTRIC (Wuxi) Co., Ltd. (Wuxi, China) Tel: 86-510-6851-6666 E-Mail: china.wuxi@lselectric.com.cn
- LS ELECTRIC Middle East FZE (Dubai, U.A.E.)
  Tel: 971-4-886-5360 E-Mail: middleeast@ls-electric.com
- LS ELECTRIC Europe B.V. (Hoofddorp, Netherlands) Tel: 31-20-654-1424 E-Mail: europartner@ls-electric.com
- LS ELECTRIC America Inc. (Chicago, USA)
  Tel: 1-800-891-2941
  E-Mail: sales.us@lselectricamerica.com
- LS ELECTRIC Türkiye Co., Ltd.
  Tel: 90-212-806-1225 E-Mail: türkiye@ls-electric.com

#### Overseas Branches

- LS ELECTRIC Tokyo Office (Japan)
  - Tel: 81-3-6268-8241 E-Mail: tokyo@ls-electric.com
- LS ELECTRIC Beijing Office (China)
  Tel: 86-10-5095-1631 E-Mail: china.auto@lselectric.com.cn
- LS ELECTRIC Shanghai Office (China)
- Tel: 86-21-5237-9977 E-Mail: china.auto@lselectric.com.cn
- LS ELECTRIC Guangzhou Office (China)
  Tel: 86-20-3818-2883
  E-Mail: china.auto@lselectric.com.cn
- LS ELECTRIC Chengdu Office (China)
  Tel: 86-28-8670-3201 E-Mail: china.auto@lselectric.com.cn
- LS ELECTRIC Qingdao Office (China)
  Tel: 86-532-8501-2065 E-Mail: china.auto@lselectric.com.cn
- LS ELECTRIC Nanjing Office (China)
- Tel: 86-25-8467-0005 E-Mail: china.auto@lselectric.com.cn • LS ELECTRIC Bangkok Office (Thailand)
- Tel: 66-90-950-9683 E-Mail: thailand@ls-electric.com
   LS ELECTRIC Jakarta Office (Indonesia)
- LS ELECTRIC Jakarta Office (Intonesia) Tel: 62-21-2933-7614 E-Mail: indonesia@ls-electric.com
   LS ELECTRIC Moscow Office (Russia)
- Tel: 7-499-682-6130 E-Mail: info@lselectric-ru.com
   LS ELECTRIC America Western Office (Irvine, USA)
- Tel: 1-949-333-3140 E-Mail: america@ls-electric.com
- LS ELECTRIC Italy office (Italy) Tel: 39-030-8081-833 E-Mail: italia@ls-electric.com

### www.ls-electric.com

### LS ELECTRIC Co., Ltd.

고객센터 신속한 서비스, 든든한 기술지원	
전화. 1544 = 2080 홈페이지.	www.ls-electric.com

■ 서비스 지정적

토의 및 A/S

사용설명서의 사양은 지속적인 제품 개발 및 개선으로 인해 예고없이 변경될 수 있습니다.

본사 : 서울특	별시 용산구 한경	상대로 92 LS용산타워	
구입문의			
서울영업		TEL: (02)2034-4631, 470	4 FAX: (02)2034-4057
부산영업		TEL: (051)310-6855~60	FAX: (051)310-6851
대구영업		TEL: (053)603-7741~8	FAX: (053)603-7788
서부영업	(나주)	TEL: (062)510-1891~92	FAX: (062)526-3262
서부영업	(대전)	TEL: (042)820-4240~42	FAX: (042)820-4298
A/S 문의			
기술상담센터		TEL: (전국)1544-2080	FAX: (031)689-7290
서울/경기 Glo	bal 지원팀	TEL: (031)689-7112	FAX: (031)689-7113
천안 Global 저	지원팀	TEL: (041)550-8308~9	FAX: (041)554-3949
부산 Global 저	다원팀	TEL: (051)310-6922~3	FAX: (051)310-6851
대구 Global 저	지원팀	TEL: (053)603-7751~4	FAX: (053)603-7788
광주 Global 저	지원팀	TEL: (062)510-1885~6	FAX: (062)526-3262
교육 문의			
연수원		TEL: (043)268-2631~2	FAX: (043)268-4384
서울/경기교육	장	TEL: (031)689-7107	FAX: (031)689-7113
부산교육장		TEL: (051)310-6860	FAX: (051)310-6851
대구교육장		TEL: (053)603-7744	FAX: (053)603-7788
기술 문의			
기술상담센터		TEL: (전국)1544-2080	FAX: (031)689-7290
동현 산전	(안양)	TEL: (031)479-4785~6	FAX: (031)479-3787
신광 ENG	(부산)	TEL: (051)319-1051	FAX: (051)319-1052
에이엔디시스템	넼 (부산)	TEL: (051)319-0668	FAX: (051)319-0669
LS ELECTRIC	은 전 세계 주요	국가에 현지 서비스 파트너	너 사를 보유하고 있으며, 상세 사항은

[홈페이지 (www.ls-electric.com) 서비스센터 안내]를 참고하여 주십시오.

명 산전 (서울) TEL: (02)462-3053 FAX: (02)462-3054 TPI시스템 TEL: (02)895-4803~4 (서울) FAX: (02)6264-3545 우진산전 (의정부) TEL: (031)877-8273 FAX: (031)878-8279 신진시스템 (안산) TEL: (031)494-9607 FAX: (031)494-9608 드림시스템 (평택) TEL: (031)665-7520 FAX: (031)667-7520 (안양) 스마트산전 TEL: (031)430-4629 FAX: (031)430-4630 세아산전 (안양) TEL: (031)340-5228 FAX: (031)340-5229 성원M&S (인천) TEL: (032)588-3750 FAX: (032)588-3751 파란자동화 (천안) TEL: (041)554-8308 FAX: (041)554-8310 태영시스템 (대전) TEL: (042)670-7363 FAX: (042)670-7364 디에스산전 (청주) TEL: (043)237-4816 FAX: (043)237-4817 조은시스템 TEL: (051)319-3923 FAX: (051)319-3924 (부산) 산전테크 (부산) TEL: (051)319-1025 FAX: (051)319-1026 서진산전 TEL: (052)227-0335 (울산) FAX: (052)227-0337 대명시스템 (대구) TEL: (053)564-4370 FAX: (053)564-4371 제이엠산전 (포항) TEL: (054)284-6050 FAX: (054)284-6051 지이티시스템 (구미) TEL: (054)465-2304 FAX: (054)465-2315 제일시스템 (창원) TEL: (055)273-6778 FAX: (050)4005-6778 기림산전 (광주) TEL: (062)603-1551 FAX: (062)603-1550 지유시스템 (광주) TEL: (062)714-1765 FAX: (062)714-1766 코리아FA (익산) TEL: (063)838-8002 FAX: (063)838-8001 해외 서비스센터 - 중국사무소 Shanghai (상해) TEL: (8621)5237-9977 FAX: (8621)5237-7192 Beijing (북경) TEL: (8610)5095-1617 FAX: (8610)5095-1620 Guangzhou (광주) TEL: (8620)3818-2885 FAX: (8620)3818-2886 (성도) TEL: (8628)8670-3201 FAX: (8628)8670-3203 Chengdu (청도) TEL: (86532)8501-2065 FAX: (86532)8501-6057 Qinqdao

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