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.

⚠ Warning

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

⚠ Caution

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

Safety information

⚠ 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.

Table of Contents

1 About the Product 5

2 Product Specification Details 5

3 Items Included 6

4 Product Name 6

5 Overview and Installation 7

5.1 Overview 7

5.2 Installing the H100 extension IO Module 8

5.3 Signal (Control) Cable Specifications 10

5.4 Installation Considerations 10

5.5 LED Status and Switch Settings 11

5.5.1 LED Status 11

5.5.2 Switch Symbols and Descriptions 12

5.6 Terminal Block Wiring Diagram 13

5.7 Control Terminal Block Wiring Diagram 13

5.7.1 NPN (Sink mode) 14

5.7.2 PNP (Source Mode) 14

6 Learning to Perform Basic Operations 16

6.1 Basic Features for H100 extension I/O 16

6.2 Setting Frequency Reference 17

6.2.1 Setting a Frequency Reference using Input Voltage (V3) 17

6.2.2 Setting a Reference Frequency using Input Current (I3) 22

6.3 Analog Output 24

6.3.1 Voltage and Current Analog Output 24

6.4 Digital Output 26
6.4.1 Multifunction Output Terminal and Relay Settings 26
6.4.2 Fault Trip Output using Multifunction Output Terminal and Relay 33
6.4.3 Multifunction Output Terminal Delay Time Settings 34
6.5 Setting Multistep Frequency 36
6.6 Multistep Acc/Dec Time Configuration 37
6.7 Stopping the Acc/Dec Operation 39
6.8 Multifunction Input Terminal Control 39

7 Keypad Parameters for the Extension I/O Module 41

8 Product Warranty 57

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.

2 Product Specification Details

Refer to the following table for detailed product specifications.

Items		Terminal	Description	Switch
Digital Input	PNP	P8	• 2 Channels available • Multifunction input • Operate switch (SW1) to select PNP/NPN mode.	[Switch 1] PNP/ NPN selection
	NPN	P9		
Digital Output (Relay)		A6	• 3 Channels available, Form A contact • Multifunction relay output contact (AC 250 V< 5 A, DC 30 V< 5 A).	
		C6		
		A7		
		C7		
		A8		
		C8		
Analog Input	Voltage	V3	• 1 Channel available • Operate switch (SW2) to select voltage or current. Voltage Unipolar: 0–10 V (Max. 12 V) input 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.	[Switch 2] Voltage (V3)/ Current (I3) Selection
	Current			
Analog Output	Voltage	AO3	• 1 Channel available Select output frequency, output current, output voltage, or DC voltage. • Operate switch (SW3) to select voltage or	[Switch 3] Voltage (VO3)/

Items		Terminal	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	Current (IO3) selection
CM Terminal		CM	• 2 Channels available • Common ground terminal for analog inputs/outputs	
Compatible Inverter series			• H100 series inverters	

3 Items Included

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

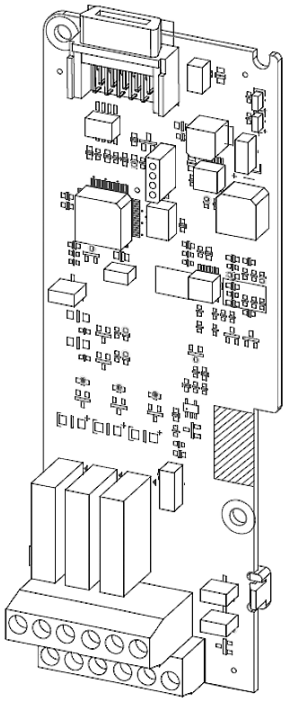
4 Product Name

EIOE-H100

5 Overview and Installation

5.1 Overview

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

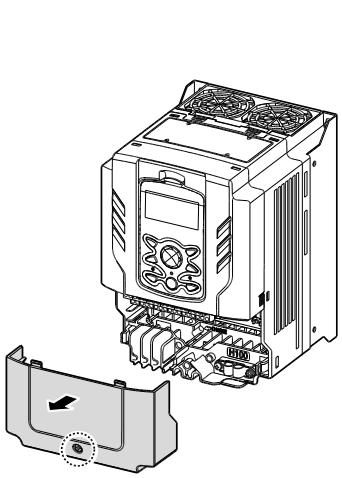


5.2 Installing the H100 extension IO Module

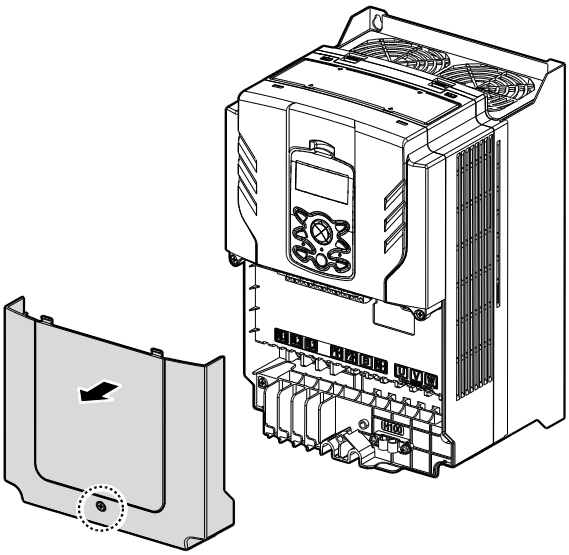
Follow the instructions below to properly install the H100 extension IO module.

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.

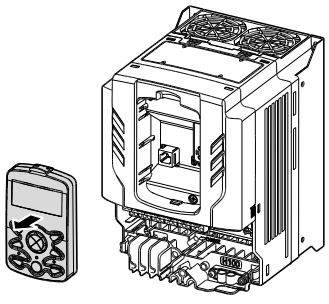


0.75–30 kW Models

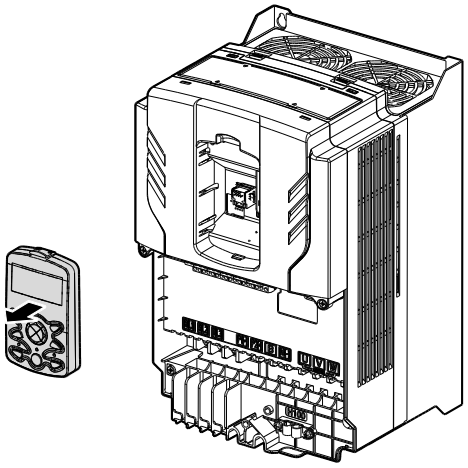


37–90 kW Models

3. Remove the keypad from the inverter body.

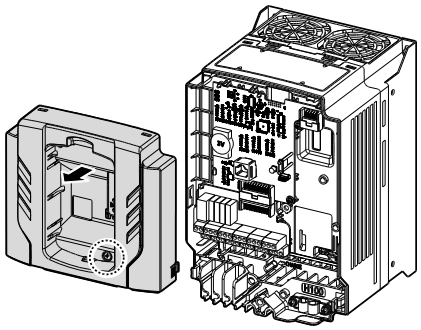


0.75–30 kW Models

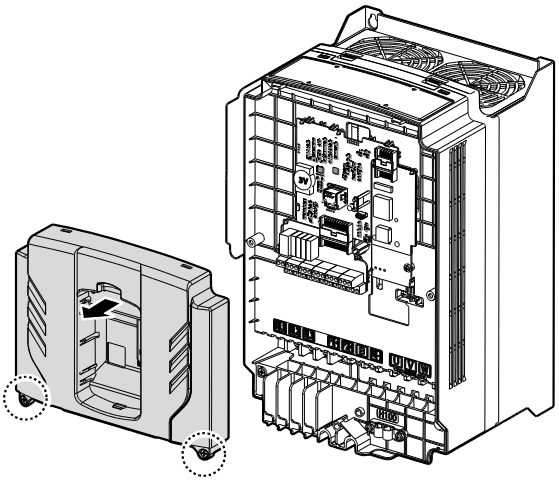


37–90 kW Models

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

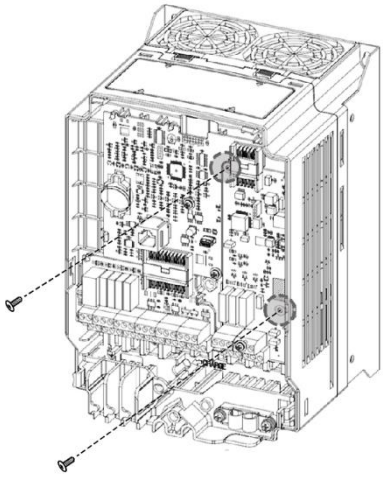


0.75–30 kW Models



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^2	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 ℃–50 ℃ (40 ℃ and above, 2.5% / ℃ Current Derating search. 50 ℃ 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^2)
Air Pressure	70 –106 kPa

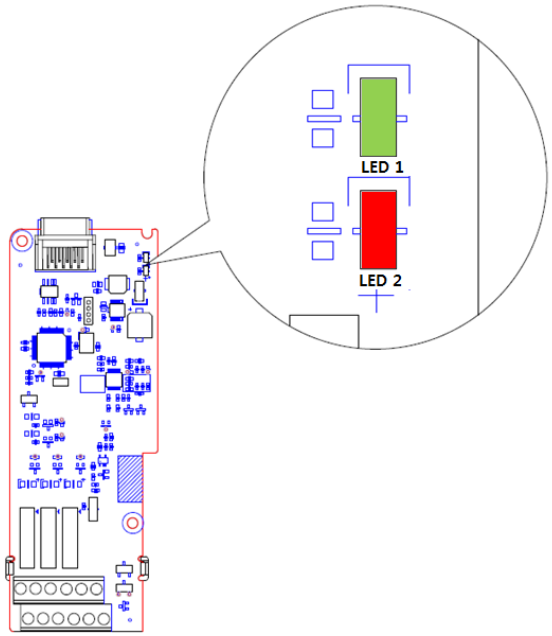
⚠ Caution

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.

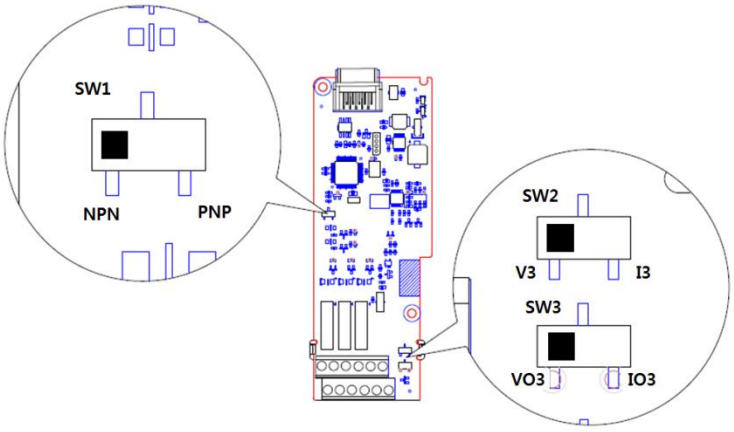


Status	LED 1	LED 2
LED Test Operation	LED is on for one second when power is on.	LED is on for one second when power is on.
Normal	Flashing	Off
	ON→OFF every second	-
Inverter Connection Error	Off	Off
Inverter Version Error	Synchronous flashing[1]	Synchronous Flashing[1]
	On→Off every second	On→Off every second
	Alternately Flashing2	Alternately Flashing[2]

Status	LED 1	LED 2
H/W Interface Error 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.

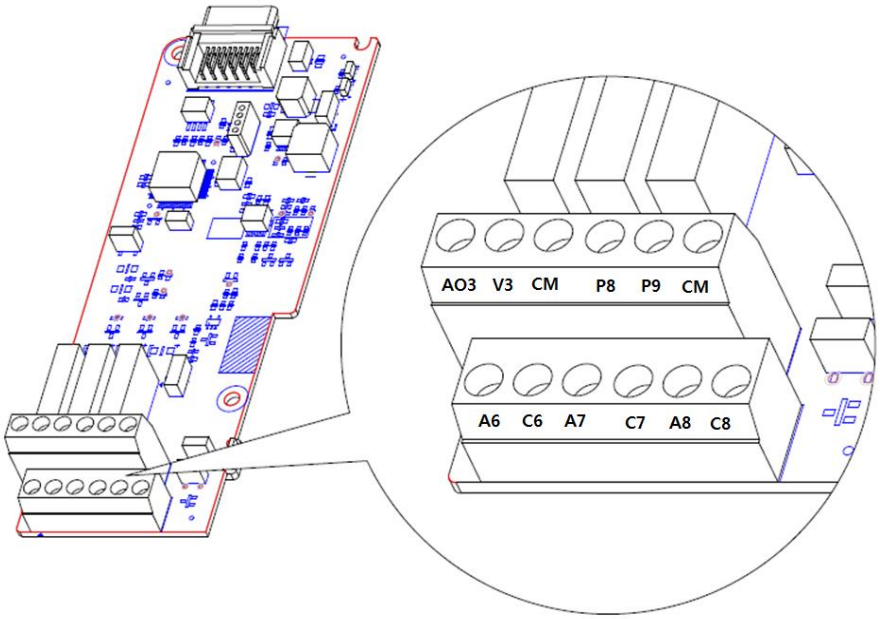
5.5.2 Switch Symbols and Descriptions



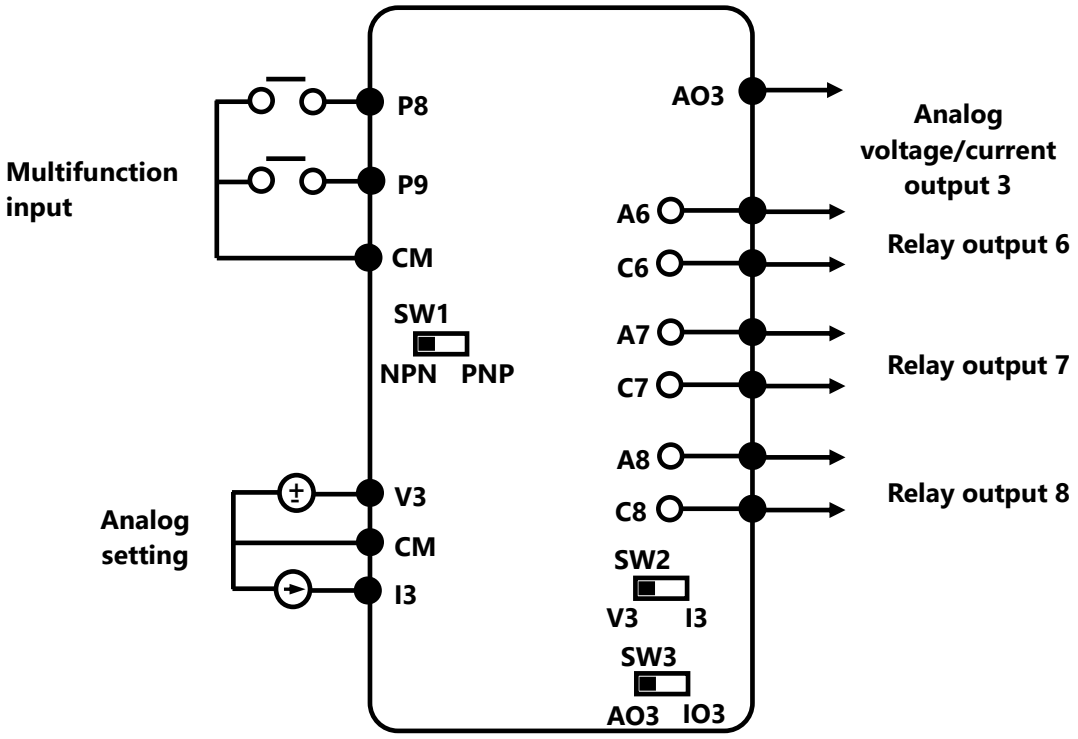
Switch	Description	Factory Default
SW1	NPN/PNP mode selection switch (Left: NPN, Right: PNP)	Left: NPN
SW2	V3/I3 mode selection switch (Left: V3, Right: I3)	Left: V3
SW3	VO3/IO3 mode selection switch (Left: VO3, Right: IO3)	Left: VO3

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 10 for detailed information.

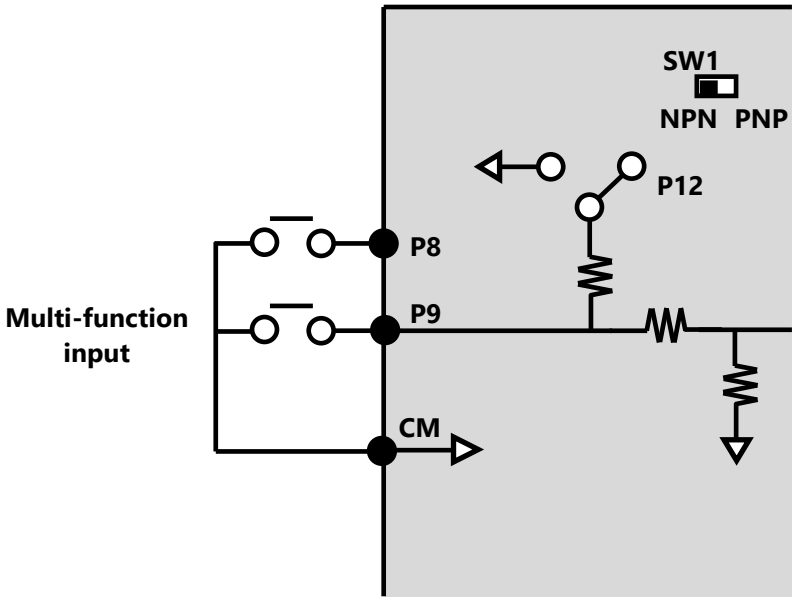


5.7 Control Terminal Block Wiring Diagram



5.7.1 NPN (Sink mode)

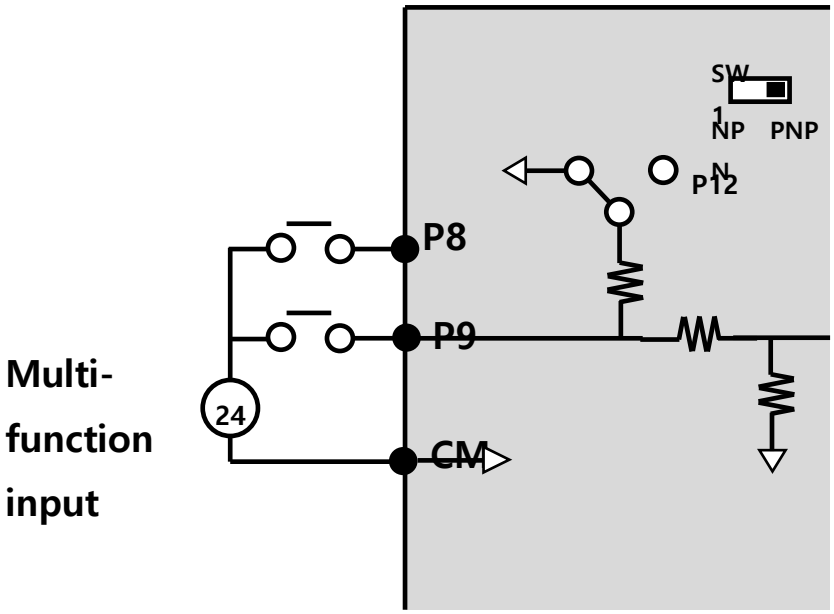
Select NPN using the PNP/NPN selection switch (SW1). Note that the factory default setting is NPN mode. CM is the common ground terminal for all analog inputs at the terminal, and P24 is the 24 V internal power source.



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.



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

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

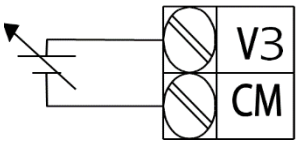
Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
DRV	07	Frequency reference source	Freq Ref Src	0	KeyPad-1	0–11	-
				1	KeyPad-2		
				2	V1		
				4	V2		
				5	I2		
				6	Int 485		
				8	Field Bus		
				9	Pulse		
				10	V3		
				11	I3		

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.

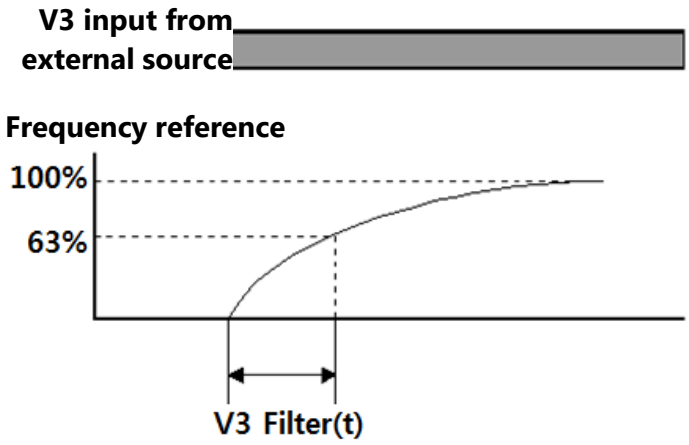


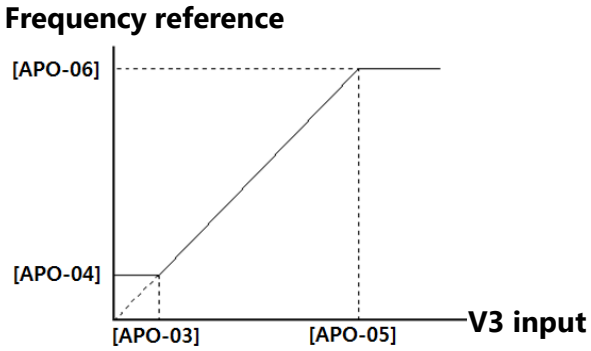
[External source application]

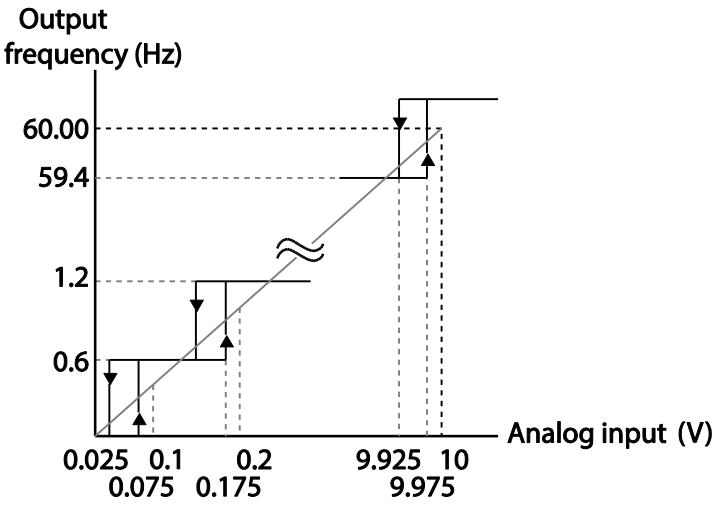
Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
DRV	07	Frequency reference source	Freq Ref Src	10	V3	0-11	-
IN	01	Frequency at maximum analog input	Freq at 100%	Maximum frequency		Initial frequency–Max. Frequency	Hz
APO	01	V3 input monitor	V3 Monitor[V]	0.00		0.00-12.00	V
	02	V3 input 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.

■ 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 (%). • 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. • 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.
[APO-01] V3 Monitor[V]	Configures the inverter to monitor the input voltage at V3.
[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. 

Code	Description
[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. 
[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.

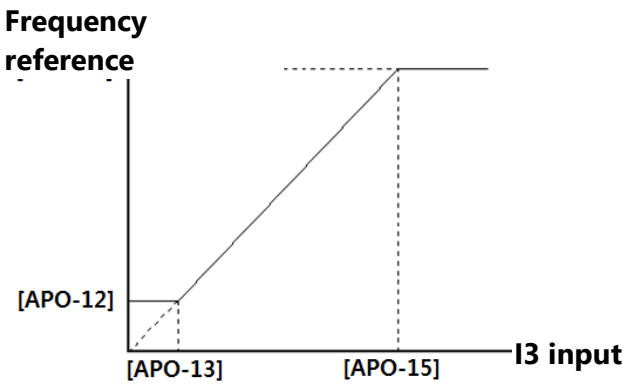
Code	Description
[APO-08] V3 Quantizing	Quantizing may be used when the noise level of the analog input (V3 terminal) signal is high. The input signal's height (value) is quantized regularly to output a frequency. Quantizing is useful if you are operating a noise-sensitive system, because it suppresses 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. 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. 

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.

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

■ Input Current (I3) Setting Details

Code	Description
[IN-01] Freq at 100%	Configures the frequency reference for operation at the maximum current (when APO-14 is set to 100%). • 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. • 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.
[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.
[APO-12] I3 Curr x1 ~ [APO-15] I3 Perc y2	Configures the gradient level and off-set value of the output frequency. 

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

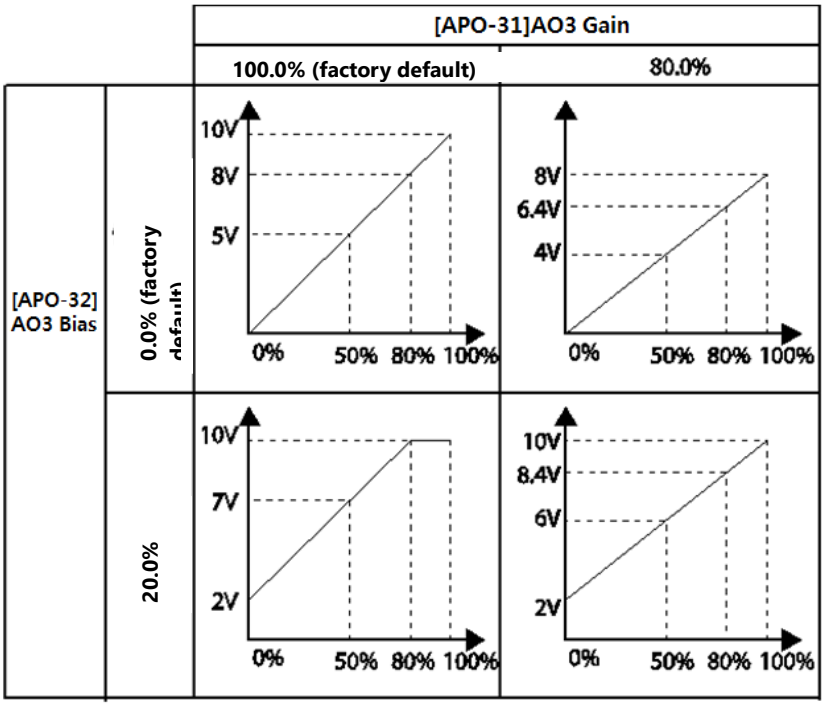
The output size can be adjusted by selecting an output setting at the AO3 (Analog Output 3) terminal. Set the analog output terminal switch (SW3) to change the output type, voltage (VO3), and current (IO3).

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**

<table>
<tr><th>Code</th><th>Description</th></tr>
<tr><td>[APO-30]
AO3 Mode</td><td>Select a constant value for output. The following example for output voltage setting.
<table>
<tr><th colspan="2">Setting</th><th>Function</th></tr>
<tr><td>0</td><td>Frequency</td><td>Outputs an operation frequency as a standard. A 10 V output is supplied based on the frequency set at DRV-20 (Max Freq).</td></tr>
<tr><td>1</td><td>Output Current</td><td>A 10 V output is supplied based on 200% of the inverter’s rated current.</td></tr>
<tr><td>2</td><td>Output Voltage</td><td>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).</td></tr>
<tr><td>3</td><td>DC Link Volt</td><td>Outputs inverter DC link voltage as a standard.</td></tr>
</table></td></tr>
</table>

Code	Description		
			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.
	6	Idse	Outputs maximum voltage at 200% of the no-load current.
	7	Iqse	Outputs maximum voltage at 250% of the rated torque. $\text{Rated torque current} = \sqrt{\text{Rated current}^2 - \text{No - load current}^2}$
	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.
[APO-31] AO3 Gain [APO-32] AO3 Bias	Adjusts output value and offset. If frequency is selected as an output item, it will operate as shown below. $$AO3 = \frac{Frequency}{MaxFreq} \times AO3\ Gain + AO3\ Bias$$ 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 the analog output voltage (0–10 V), and the X-axis is a % value of the output item. For example, if the maximum frequency set at DRV-20 (Max Freq) is 60 Hz and the present output frequency is 30 Hz, then the x-axis value on the next graph is 50%.		

Code	Description
	
[APO-33] AO3 Filter	Sets filter time constant on analog output.
[APO-34] A03 Const %	If the analog output at APO-30 (AO3 Mode) is set to "12 (Constant)", the analog voltage output is based on the set parameter values (0–100%).
[APO-35] AO3 Monitor	Monitors the analog output value. Displays the maximum output voltage as a percentage (%) with 10 V as the standard.

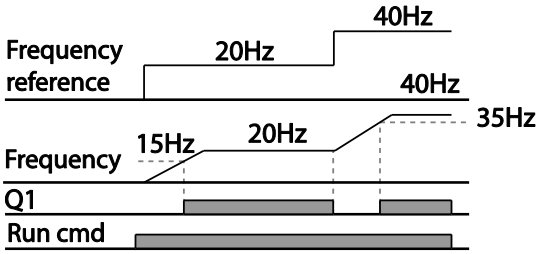
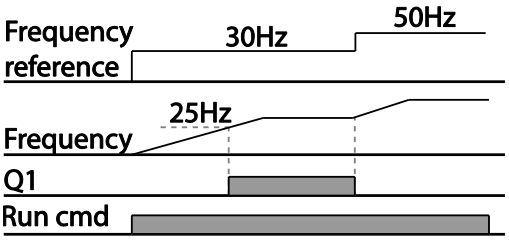
6.4 Digital Output

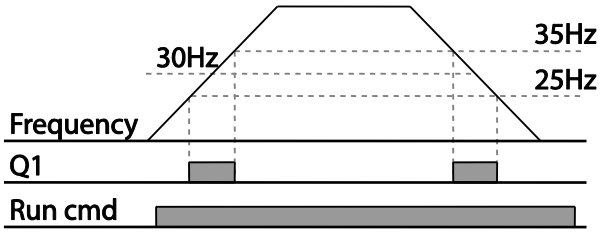
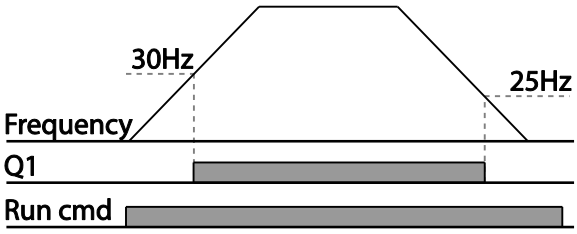
6.4.1 Multifunction Output Terminal and Relay Settings

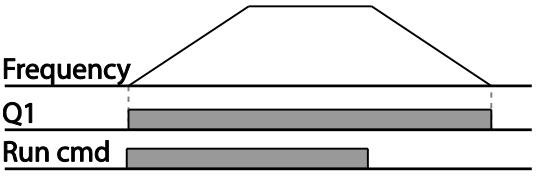
Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
OUT	30	Fault trip output mode	Trip Out Mode	010		-	bit
	31	Multifunction relay 1	Relay 1	23	Trip	-	-
	32	Multifunction relay 2	Relay 2	14	Run	-	-
	33	Multifunction relay 3	Relay 3	0	None	-	
	34	Multifunction relay 4	Relay 4	0	None	-	

Group	Code	Name	LCD Display	Parameter Setting		Setting Range	Unit
	35	Multifunction relay 5	Relay 5	0	None	-	
	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 Off Dly	0.00		0.00-100.00	sec

■ Multifunction Output Terminal and Relay Setting Details

<table>
<tr><th>Code</th><th colspan="3">Description</th></tr>
<tr><td rowspan="5">[OUT-31]
Relay_1
~
[OUT-39]
Relay_8</td><td colspan="3">Set relay (Relay 1–8) output options.</td></tr>
<tr><td colspan="2">Setting</td><td>Function</td></tr>
<tr><td>0</td><td>None</td><td>No output signal</td></tr>
<tr><td>1</td><td>FDT-1</td><td>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.
 
</td></tr>
<tr><td>2</td><td>FDT-2</td><td>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.
 
</td></tr>
<tr><td>3</td><td>FDT-3</td><td>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.</td></tr>
</table>

Code	Description		
			
	4	FDT-4	The output signal can be separately set for acceleration and deceleration conditions. • **In acceleration**: Operation frequency ≧ Detected frequency • **In deceleration**: Operation frequency > (Detected frequency–Detected frequency width/2) 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. 
	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.

Code	Description		
			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.
	14	Run	Outputs a signal when an operation command is entered and the inverter outputs voltage. No signal output during DC braking. 
	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	MMC	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.

Code	Description		
	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
	27	Fire Mode	Outputs a signal when Fire mode is operating.
	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	TO	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	Selects an output item for the multifunction output terminal (Q1) of the terminal block. Q1 stands for the open collector TR output.		
[OUT-41] DO Status	Used to check On/Off 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

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

Group	Code	Name	LCD Display	Parameter Setting		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	-	-
	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

■ **Fault Trip Output by Multifunction Output Terminal and Relay - Setting Details**

<table>
<tr><th>Code</th><th>Description</th></tr>
<tr><td>[OUT-30] Trip Out Mode</td><td>
The fault trip relay operates based on the fault trip output settings.
<table>
<tr><td>Item</td><td>bit on</td><td>bit off</td></tr>
<tr><td>Keypad display</td><td> </td><td> </td></tr>
</table>
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 relevant terminal and relay will operate. Depending on the fault trip type, terminal and relay operation can be configured as shown in the table below.
<table>
<tr><td colspan="3">Setting</td><td rowspan="2">Function</td></tr>
<tr><td>bit3</td><td>bit2</td><td>bit1</td></tr>
<tr><td></td><td></td><td>✓</td><td>Operates when low voltage fault trips occur</td></tr>
<tr><td></td><td>✓</td><td></td><td>Operates when fault trips other than low voltage occur</td></tr>
<tr><td>✓</td><td></td><td></td><td>Operates when auto restart fails (PRT-08–09)</td></tr>
</table>
</td></tr>
<tr><td>[OUT-31]Relay 1 ~[OUT-39] Relay 8</td><td>Set relay output (Relay 1–8).</td></tr>
<tr><td>[OUT-36] Q1 Define</td><td>Select output for multifunction output terminal (Q1). Q1 is open collector TR output.</td></tr>
</table>

6.4.3 Multifunction Output Terminal Delay Time Settings

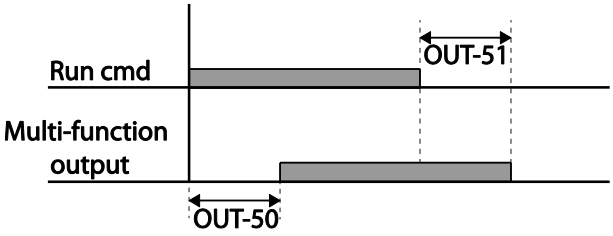
Set on-delay and off-delay times separately to control the output terminal and relay operation times. The delay time set at codes OUT-50–51 applies to multifunction output terminal (Q1) and relay, except when the multifunction output function is in fault trip mode.

Group	Code	Name	LCD Display	Parameter Setting	Setting Range	Unit
OUT	50	Multifunction output On delay	DO On Delay	0.00	0.00-100.00	sec
	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 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 multifunction output is initialized (off signal occurs), the relay turns off or multifunction output turns off after the time delay set at OUT-54.
[OUT-52]DO NC/NO Sel	Select the terminal type for the relay and multifunction output terminal. By setting 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 settings starting from the right bit.

Item	B terminal (Normal close)	A terminal (Normal open)
Keypad display		

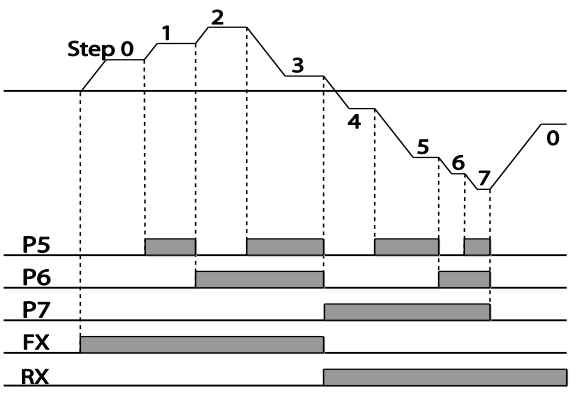


6.5 Setting Multistep Frequency

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	Parameter Setting		Setting Range	Unit
BAS	50~56	Multistep frequency 1–7	Step Freq-1~7	-		Start Freq-Max Freq	Hz
IN	65~73	Px terminal configuration	Px Define (Px: P1~P9)	7	Speed-L	0-52	-
				8	Speed-M		-
				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 multistep frequency 1–7.
[IN-65~73] Px Define	Choose the terminals to setup as multistep inputs, and then set the relevant codes (IN-65–73) to "7 (Speed-L)", "8 (Speed-M)", or "9 (Speed-H)". Provided that terminals P5, P6, and P7 have been respectively set to Speed-L, Speed-M and Speed-H, the following multistep operation will be available.  [An example of a multistep operation]

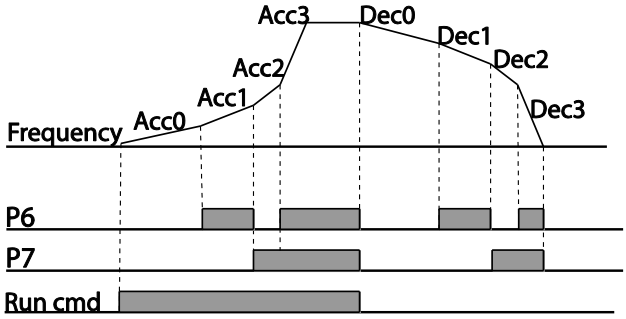
Code	Description
	<table><tr><td>Speed</td><td>Fx/Rx</td><td>P7</td><td>P6</td><td>P5</td></tr><tr><td>0</td><td>✓</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1</td><td>✓</td><td>-</td><td>-</td><td>✓</td></tr><tr><td>2</td><td>✓</td><td>-</td><td>✓</td><td>-</td></tr><tr><td>3</td><td>✓</td><td>-</td><td>✓</td><td>✓</td></tr><tr><td>4</td><td>✓</td><td>✓</td><td>-</td><td>-</td></tr><tr><td>5</td><td>✓</td><td>✓</td><td>-</td><td>✓</td></tr><tr><td>6</td><td>✓</td><td>✓</td><td>✓</td><td>-</td></tr><tr><td>7</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr></table>
[IN-89] InCheck Time	Set a time interval for the inverter to check for additional terminal block inputs after receiving an input signal. After adjusting IN-89 to 100 ms and an input signal is received at P6, the inverter will search for inputs at other terminals for 100 ms, before proceeding to acceleration or deceleration based on the configuration at P6.

6.6 Multistep Acc/Dec Time Configuration

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	Parameter Setting		Setting Range	Unit
DRV	03	Acceleration time	Acc Time	20.0		0.0-600.0	sec
	04	Deceleration time	Dec Time	30.0		0.0-600.0	sec
BAS	70-83	Multistep acceleration/Deceleration time1–7	Acc Time 1-7	x.xx		0.0-600.0	sec
			Dec Time 1-7	x.xx		0.0-600.0	sec
IN	65-73	Px terminal configuration	Px Define (Px: P1-P9)	11	XCEL-L	0-52	-
				12	XCEL-M		
				13	XCEL-H		
	89	Multistep command delay time	In Check Time	1		1-5000	ms

■ Acc/Dec Time Setup via Multifunction Terminals – Setting

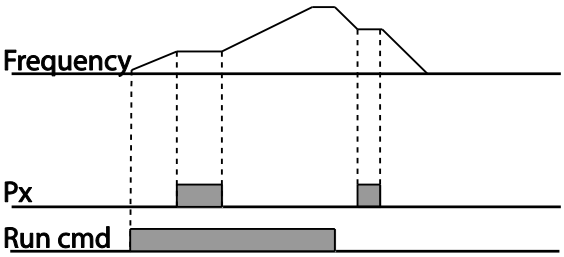
<table>
<tr><th>Code</th><th>Description</th></tr>
<tr><td>[BAS-70-82]
Acc Time 1-7</td><td>Set multistep acceleration time1–7.</td></tr>
<tr><td>[BAS-71-83]
Dec Time 1-7</td><td>Set multistep deceleration time1–7.</td></tr>
<tr><td>[IN-65~73]
Px Define (P1~P9)</td><td>Choose and configure the terminals to use for multistep Acc/Dec time inputs
<table>
<tr><th colspan="2">Configuration</th><th>Description</th></tr>
<tr><td>11</td><td>XCEL-L</td><td>Acc/Dec command-L</td></tr>
<tr><td>12</td><td>XCEL-M</td><td>Acc/Dec command-M</td></tr>
<tr><td>13</td><td>XCEL-H</td><td>Acc/Dec command-H</td></tr>
</table>
Acc/Dec commands are recognized as binary code inputs and will control the acceleration and deceleration based on parameter values set with BAS-70–82 and BAS-71–83.
For example, if the P6 and P7 terminals are set as XCEL-L and XCEL-M respectively, the following operation will be available.
 

<table>
<tr><th>Acc/Dec time</th><th>P7</th><th>P6</th></tr>
<tr><td>0</td><td>-</td><td>-</td></tr>
<tr><td>1</td><td>-</td><td>✓</td></tr>
<tr><td>2</td><td>✓</td><td>-</td></tr>
<tr><td>3</td><td>✓</td><td>✓</td></tr>
</table>
[Multifunction terminal P6, P7 configuration]</td></tr>
<tr><td>[IN-89]
In Check Time</td><td>Sets the time for the inverter to check for other terminal block inputs. If IN-89 is set to 100 ms and a signal is supplied to the P6 terminal, the inverter searches for other inputs over the next 100 ms. When the time expires, the Acc/Dec time will be set based on the input received at P6.</td></tr>
</table>

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	Parameter Setting		Setting Range	Unit
IN	65-73	Px terminal configuration	Px Define(Px: P1-P9)	14	XCEL Stop	0-55	-



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.

Group	Code	Name	LCD Display	Parameter Setting	Setting Range	Unit
IN	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
	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).

■ Multifunction Input Terminal Control Setting Details

<table>
<tr><th>Code</th><th>Description</th></tr>
<tr><td>[IN-85]
DI On Delay
[IN-86]
DI Off Delay</td><td>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.</td></tr>
<tr><td>[IN-87]
DI NC/NO Sel</td><td>Select terminal contact types for each input terminal. The position of the indicator light corresponds to the segment that is on, as shown in the table below. With the 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 that the terminal is configured as a Form B contact terminal (Normally Closed) contact. Terminals are numbered P1–P9, from right to left.
<table>
<tr><td>Type</td><td>Form B contact terminal status (Normally Closed)</td><td>Form A contact terminal status (Normally Open)</td></tr>
<tr><td>Keypad</td><td> </td><td> </td></tr>
</table></td></tr>
<tr><td>[IN-90]
DI Status</td><td>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 top 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 to left
<table>
<tr><td>Type</td><td>Form A contact terminal setting (On)</td><td>Form A contact terminal setting (Off)</td></tr>
<tr><td>Keypad</td><td> </td><td> </td></tr>
</table></td></tr>
</table>

7 Keypad Parameters for the Extension I/O Module

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.
DRV-07	0h1107	Freq Ref Src	0	Δ	0 Keypad-01
					1 Keypad-02
					2 V1
					3 Reserved
					4 V2
					5 I2
					6 Int 485
					7 FieldBus
					8 Reserved
					9 Pulse
					10 V3
					11 I3
BAS-01	0h1201	Aux Ref Src	0	Δ	0 None
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13 I3
BAS-05	0h1205	Freq 2nd Src	0	O	0 Keypad-01
					1 Keypad-02
					2 V1
					3 Reserved
					4 V2
					5 I2
					6 Int 485
					7 FieldBus
					8 Reserved
					9 Pulse
					10 V3
					11 I3
ADV-66	0h1342	OnOff Ctrl Src	0	O	0 None
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					13 I3
IN-72	0h1548	P8 Define	0	Δ	0 None
					1 Fx
					2 Rx
					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

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					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
					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
IN-73	0h1549	P9 Define	0	Δ	0 None

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					1 Fx
					2 Rx
					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

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					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
					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
OUT-37	0h1625	Relay6	0	O	0 None
					1 FDT-1
					2 FDT-2
					3 FDT-3

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					4 FDT-4
					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

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					33 Damper Control
					34 CAP. Warning
					35 Fan Exchange
					36 AUTO State
					37 HAND State
					38 TO
					39 Except Date
					40 KEB Operating
OUT-38	0h1626	Relay7	0	O	0 None
					1 FDT-1
					2 FDT-2
					3 FDT-3
					4 FDT-4
					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

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					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
OUT-39	0h1627	Relay8	0	O	0 None
					1 FDT-1
					2 FDT-2
					3 FDT-3
					4 FDT-4
					5 Over Load
					6 IOL
					7 Under Load
					8 Fan Warning
					9 Stall
					10 Over Voltage

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					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
					36 AUTO State
					37 HAND State
					38 TO
					39 Except Date

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					40 KEB Operating
PID-10	0h180A	PID Ref 1 Src	0	Δ	0 Keypad
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Int 485
					6 FieldBus
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11 I3
PID-12	0h180C	PID Ref1AuxSrc	0	Δ	0 None
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13 I3
PID-15	0h180F	PID Ref2AuxSrc	0	Δ	0 Keypad
					1 V1
					2 Reserved

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					3 V2
					4 I2
					5 Int 485
					6 FieldBus
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11 I3
PID-17	0h1811	PID Ref2AuxSrc	0	Δ	0 None
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13 I3
PID-20	0h1814	PID Fdb Source	0	Δ	0 V1
					1 Reserved
					2 V2
					3 I2
					4 Int 485
					5 FieldBus

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					6 Reserved
					7 Pulse
					8 EPID1 Output
					9 EPID1 Fdb Val
					10 V3
					11 I3
PID-21	0h1815	PID Fdb AuxSrc	0	Δ	0 None
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Reserved
					6 Pulse
					7 Int 485
					8 FieldBus
					9 Reserved
					10 EPID1 Output
					11 EPID1 Fdb Val
					12 V3
					13 I3
EPI-06	0h1906	EPID1 Ref Src	0	Δ	0 Keypad
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Int 485
					6 FieldBus
					7 Reserved
					8 Pulse

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					9 EPID1 Output
					10 V3
					11 I3
EPI-08	0h1908	EPID1 Fdb Src	0	O	0 V1
					1 Reserved
					2 V2
					3 I2
					4 Int 485
					5 FieldBus
					6 Reserved
					7 Pulse
					8 EPID1 Output
					9 EPID1 Fdb Val
					10 V3
					11 I3
EPI-36	0h1924	EPID2 Ref Src	0	Δ	0 Keypad
					1 V1
					2 Reserved
					3 V2
					4 I2
					5 Int 485
					6 FieldBus
					7 Reserved
					8 Pulse
					9 EPID1 Output
					10 V3
					11 I3
EPI-38	0h1926	EPID2 Fdb Src	0	O	0 V1
					1 Reserved

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
					2 V2
					3 I2
					4 Int 485
					5 FieldBus
					6 Reserved
					7 Pulse
					8 EPID1 Output
					9 EPID1 Fdb Val
					10 V3
					11 I3
APO-00		Jump Code	30	O	-
APO-01		V3 Monitor	-	X	-
APO-02		V3 Filter	10	O	0~10000 msec
APO-03		V3 Volt x1	0.00	O	0.00~10.00 V
APO-04		V3 Perc Y1	0.00	O	0.00~100.00 %
APO-05		V3 Volt x2	10.00	O	0.00~12.00 V
APO-06		V3 Perc Y2	100.00	O	0.00~100.00 %
APO-07		V3 Inverting	0	O	0 No
					1 Yes
APO-08		V3 Quantizing	0.04	O	0.04~10.00 %
APO-10		I3 Monitor	-	O	-
APO-11		I3 Filter	10	O	0~10000 msec
APO-12		I3 Curr x1	4.00	O	0.00~20.00 mA
APO-13		I3 Perc Y1	0.00	O	0.00~100.00 %
APO-14		I3 Curr x2	20.00	O	0.00~24.00 mA
APO-15		I3 Perc Y2	100.00	O	0.00~100.00 %
APO-16		I3 Inverting	0	O	0 No
					1 Yes
APO-17		I3 Quantizing	0.04	O	0.04~10.00 %

Code	Comm. Address	LCD Display	Initial Value	Property*	Setting Rang
APO-30		AO3 Mode	0	O	0 Frequency
					1 Output Current
					2 Output Voltage
					3 DC Link Voltage
					4 Output Power
					5 Reserved
					6 Reserved
					7 Target Freq
					8 Ramp Freq
					9 PID Ref Value
					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	O	-1000.0~1000.0 %
APO-32		AO3 Bias	0.0	O	-100.0~100.0 %
APO-33		AO3 Filter	5	O	0~10000 msec
APO-34		AO3 Const %	0.0	O	0.0~100.0 %
APO-35		AO3 Monitor	0.0	X	-

* O/X: Write-enabled during operation

** 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.

8 Product Warranty

Warranty Information

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

Product Name	H100 Extension I/O	Date of Installation	
Model Name	H100 Ext I/O	Warranty Period	
Customer Info	Name (or company)		
	Address		
	Contact Info.		
Retailer Info	Name		
	Address		
	Contact info.		

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 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 resulting 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