

# 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

|  |           |
|--|-----------|
| <b>1 About the Product</b>                                   | <b>4</b>  |
| <b>2 Product Specification Details</b>                       | <b>4</b>  |
| <b>3 Items Included</b>                                      | <b>5</b>  |
| <b>4 Product Name</b>  | <b>5</b>  |
| <b>5 Overview and Installation</b>                           | <b>6</b>  |
| 5.1 Overview   | 6         |
| 5.2 Installing the H100 extension IO Module                  | 7         |
| 5.3 Signal (Control) Cable Specifications                    | 9         |
| 5.4 Installation Considerations                              | 9         |
| 5.5 LED Status and Switch Settings                           | 10        |
| 5.5.1 LED Status   | 10        |
| 5.5.2 Switch Symbols and Descriptions                        | 11        |
| 5.6 Terminal Block Wiring Diagram                            | 12        |
| 5.7 Control Terminal Block Wiring Diagram                    | 12        |
| 5.7.1 NPN (Sink mode)  | 13        |
| 5.7.2 PNP (Source Mode)                                      | 13        |
| <b>6 Learning to Perform Basic Operations</b>                | <b>15</b> |
| 6.1 Basic Features for H100 extension I/O                    | 15        |
| 6.2 Setting Frequency Reference                              | 16        |
| 6.2.1 Setting a Frequency Reference using Input Voltage (V3) | 16        |
| 6.2.2 Setting a Reference Frequency using Input Current (I3) | 20        |
| 6.3 Analog Output  | 22        |

|   |           |
|---|-----------|
| 6.3.1 Voltage and Current Analog Output .....                               | 22        |
| 6.4 Digital Output.....   | 24        |
| 6.4.1 Multifunction Output Terminal and Relay Settings.....                 | 24        |
| 6.4.2 Fault Trip Output using Multifunction Output Terminal and Relay ..... | 31        |
| 6.4.3 Multifunction Output Terminal Delay Time Settings.....                | 32        |
| 6.5 Setting Multistep Frequency .....                                       | 34        |
| 6.6 Multistep Acc/Dec Time Configuration.....                               | 35        |
| 6.7 Stopping the Acc/Dec Operation .....                                    | 37        |
| 6.8 Multifunction Input Terminal Control.....                               | 37        |
| <b>7 Keypad Parameters for the Extension I/O Module .....</b>               | <b>39</b> |
| <b>8 Product Warranty .....</b>   | <b>56</b> |

# 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  | [Switch 1]<br>PNP/ NPN selection                         |
|                        | NPN     | P9       | • Multifunction input<br>• Operate switch (SW1) to select PNP/NPN mode.   |  |
| Digital Output (Relay) |         | A6       | <ul style="list-style-type: none"> <li>3 Channels available, Form A contact</li> <li>Multifunction relay output contact (AC 250 V &lt; 5 A, DC 30 V &lt; 5 A).</li> </ul>   |  |
|                        |         | C6       |   |  |
|                        |         | A7       |   |  |
|                        |         | C7       |   |  |
|                        |         | A8       |   |  |
|                        |         | C8       |   |  |
| Analog Input           | Voltage | V3       | <ul style="list-style-type: none"> <li>1 Channel available</li> <li>Operate switch (SW2) to select voltage or current.</li> </ul> Voltage<br>Unipolar: 0–10 V (Max. 12 V) input<br>Sets the frequency based on the voltage supplied to the terminal.<br>Current<br>Input current: 4–20 mA (Max. 0~24 mA)<br>Sets the frequency based on the current supplied to the terminal. | [Switch 2]<br>Voltage (V3)/<br>Current (I3)<br>Selection |
|                        | Current |          |   |  |
| Analog Output          | Voltage | AO3      | <ul style="list-style-type: none"> <li>1 Channel available</li> <li>Select output frequency, output current, output voltage, or DC voltage.</li> <li>Operate switch (SW3) to select voltage or</li> </ul>   | [Switch 3]<br>Voltage (VO3)/                             |

| Items                      |         | Terminal | Description   | Switch                  |
|----------------------------|---------|----------|---|-------------------------|
|                            | Current |          | current<br>Output voltage: 0–10 V<br>Maximum output voltage/current: 12 V/10 mA<br>Output current: 0–20 mA<br>Maximum output current: 24 mA | Current (IO3) selection |
| CM Terminal                |         | CM       | <ul style="list-style-type: none"> <li>• 2 Channels available</li> <li>• Common ground terminal for analog inputs/outputs</li> </ul>        |                         |
| Compatible Inverter series |         |          | <ul style="list-style-type: none"> <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
- Plastic components

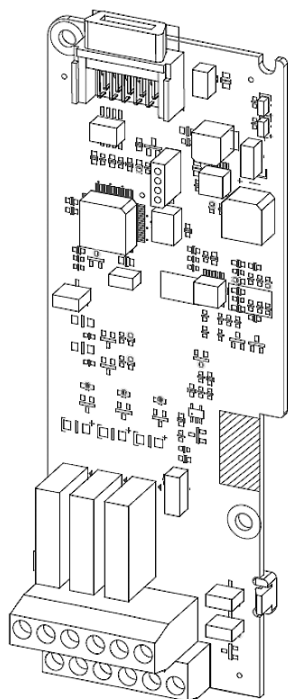
### 4 Product Name

EIOE-H100

## 5 Overview and Installation

### 5.1 Overview

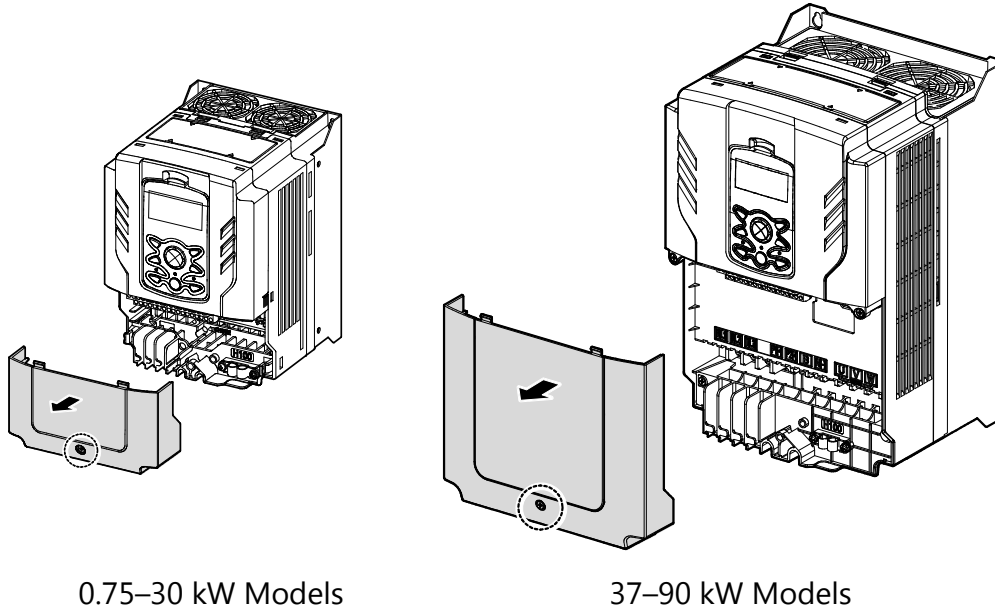
Refer to the following illustration for the H100 extension IO module layout.



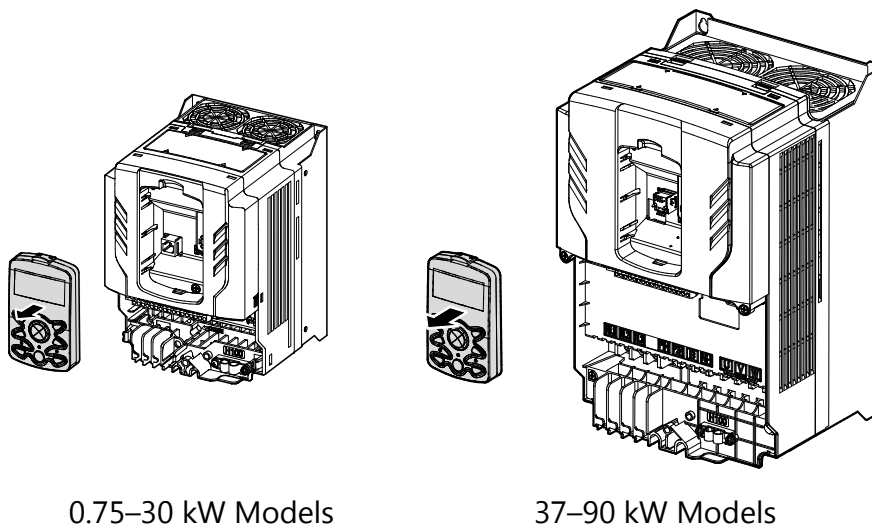
## 5.2 Installing the H100 extension IO Module

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

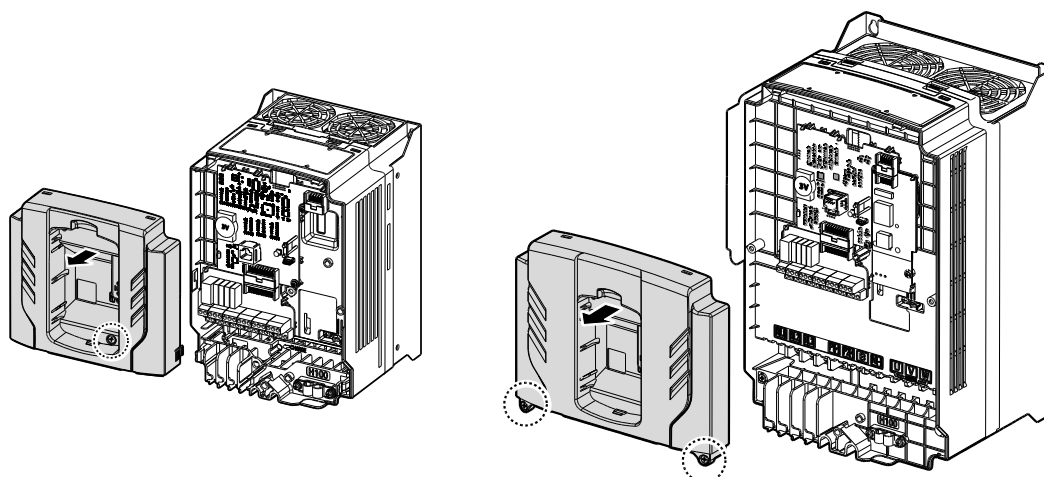
1. Turn off the inverter and make sure that the DC link voltage has dropped to a safe level.
2. Loosen the screw on the power cover then remove the power cover.



3. Remove the keypad from the inverter body.



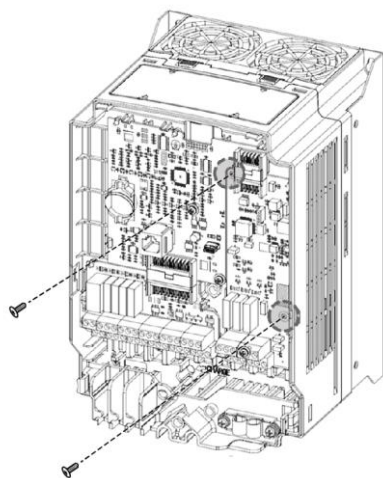
4. Loosen the screws securing the front cover. Then, remove the front cover by lifting it. The main PCB is exposed.



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 °C–50 °C (40 °C and above, 2.5% / °C Current Derating search. 50 °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 °C)   |
| 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  |

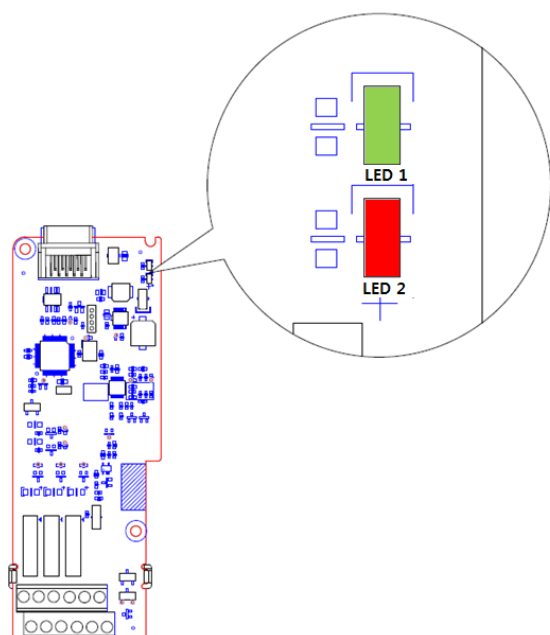
#### ⓘ Caution

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.

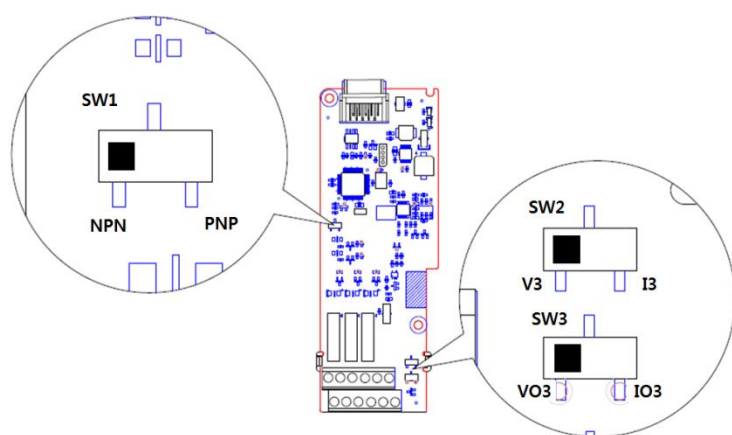


| Status                                   | LED 1                                      | LED 2                                      |
|--|--|--|
| LED Test Operation                       | LED is on for one second when power is on. | LED is on for one second when power is on. |
| Normal           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

| Status        | LED 1 | LED 2 |
|---------------|-------|-------|
| Option Module |       |       |

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

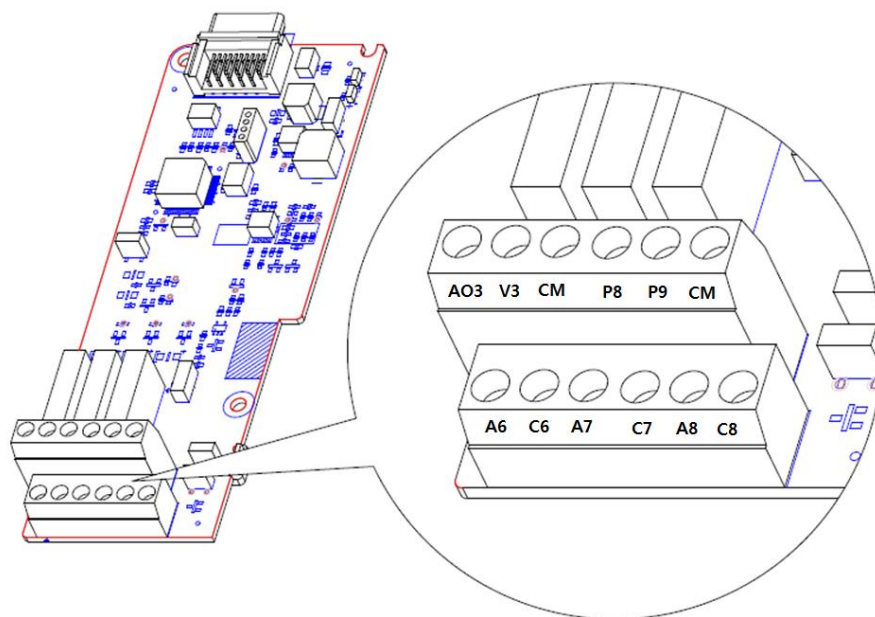
### 5.5.2 Switch Symbols and Descriptions



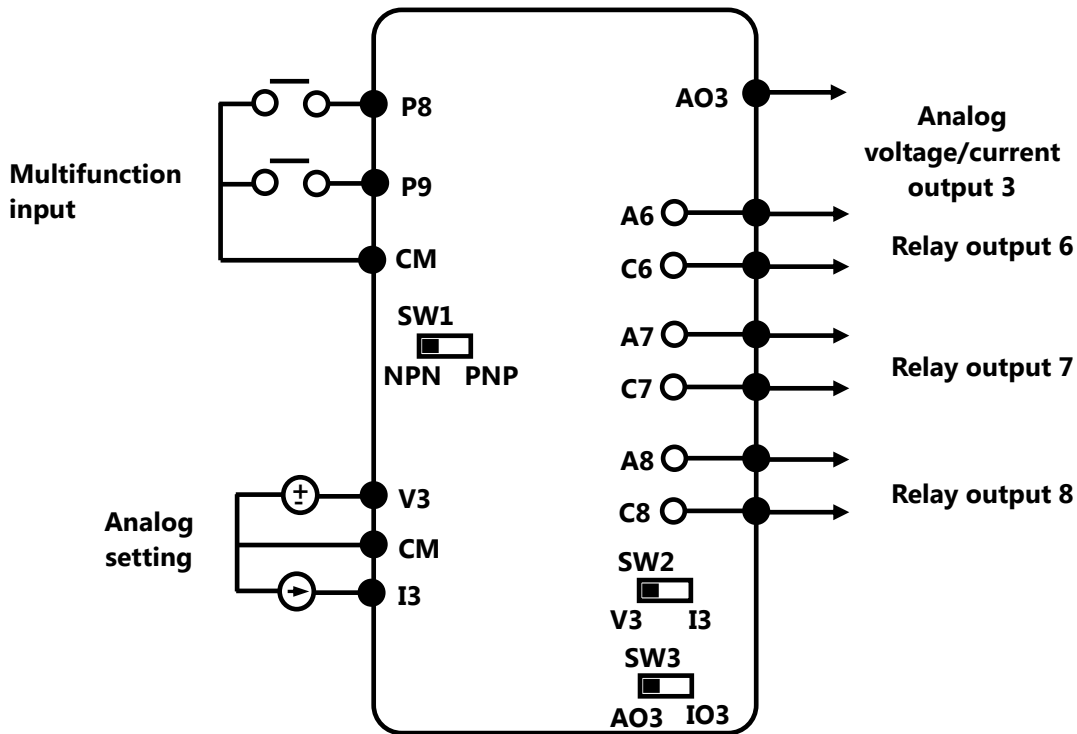
| Switch | Description   | Factory Default |
|--------|---|-----------------|
| SW1    | NPN/PNP mode selection switch (Left: NPN, Right: PNP) | Left: NPN       |
| SW2    | V3/I3 mode selection switch (Left: V3, Right: I3)     | Left: V3        |
| SW3    | VO3/IO3 mode selection switch (Left: VO3, 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 9 for detailed information.

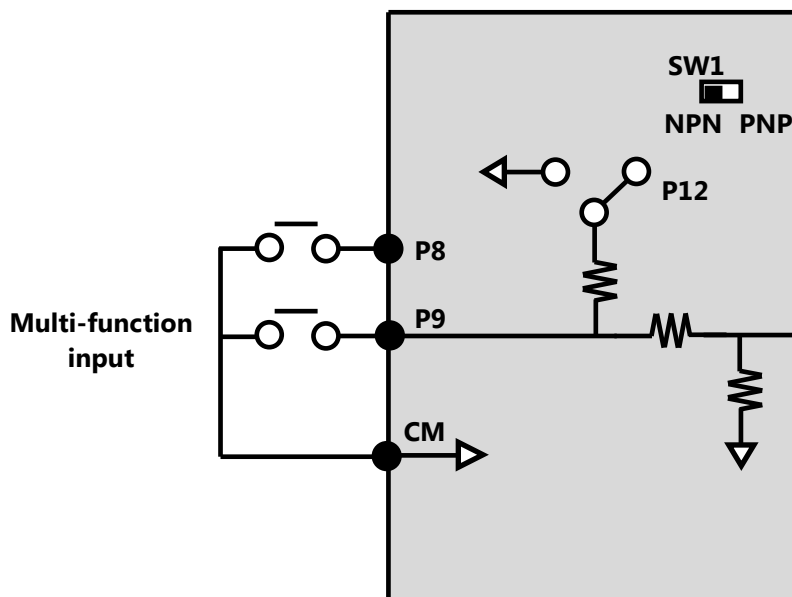


## 5.7 Control Terminal Block Wiring Diagram



### 5.7.1 NPN (Sink mode)

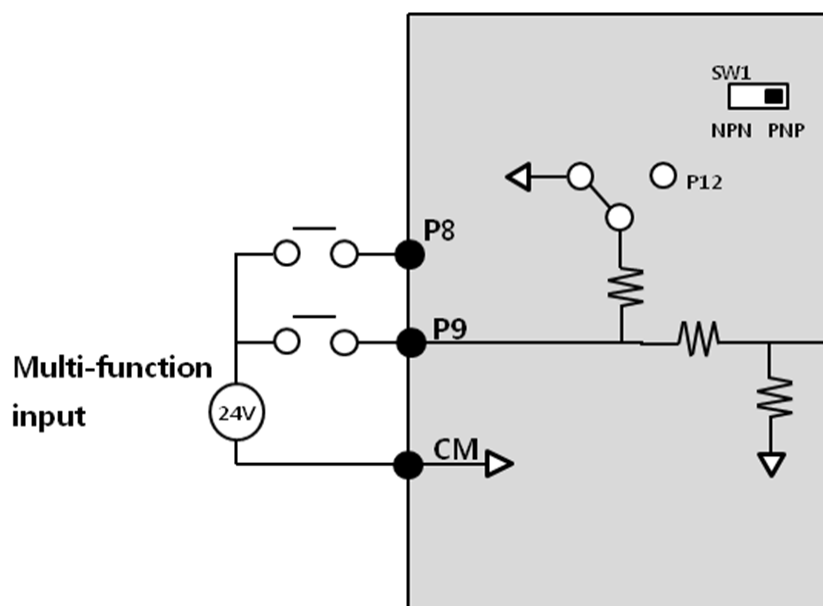
Select NPN using the PNP/NPN selection switch (SW1). Note that the factory default setting is NPN mode. CM is the common ground terminal for all analog inputs at the terminal, and P24 is the 24 V internal power source.



### 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:  $V_{HI}=3.25$  [V],  $V_{LO}=1.75$  [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 multifunction input terminals.  |

## 6.2 Setting Frequency Reference

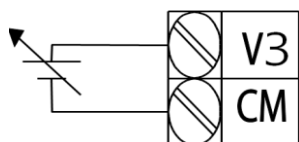
| Group | Code | Name                       | LCD Display  | Parameter Setting |           | Setting Range | Unit |
|-------|------|----------------------------|--------------|-------------------|-----------|---------------|------|
| DRV   | 07   | Frequency reference source | Freq Ref Src | 0                 | 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]


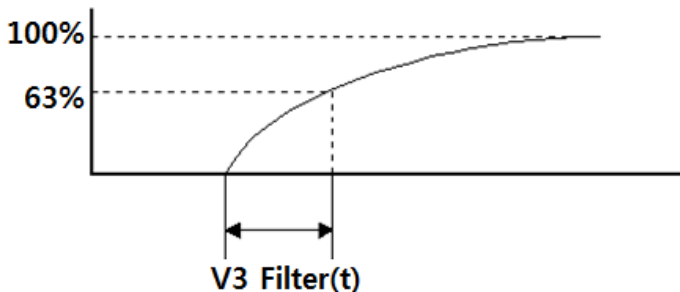
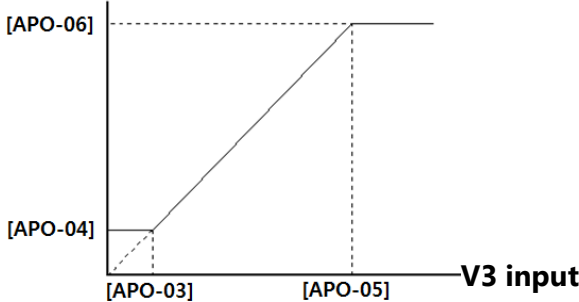


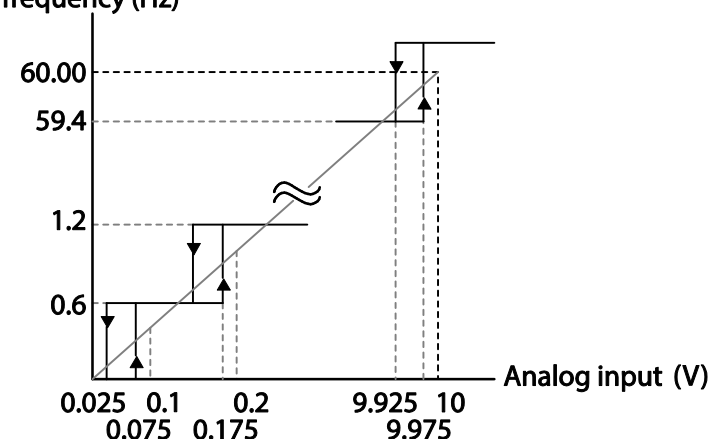
| Group | Code | Name                              | LCD Display   | Parameter Setting |    | Setting Range                    | Unit |
|-------|------|-----------------------------------|---------------|-------------------|----|----------------------------------|------|
| DRV   | 07   | Frequency reference 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]<br>Freq at 100% | <p>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 (%).</p> <ul style="list-style-type: none"> <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> <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> |

| Code  | Description  |
|---|--|
| [APO-01]<br>V3 Monitor[V]                             | Configures the inverter to monitor the input voltage at V3.  |
| [APO-02]<br>V3 Filter                                 | <p>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.</p> <p>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.</p> <p><b>V3 input from external source</b> </p> <p><b>Frequency reference</b></p>  <p><b>V3 Filter(t)</b></p> |
| [APO-03]<br>V3 volt x1<br>~<br>[APO-06]<br>V3 Perc y2 | <p>These parameters are used to configure the gradient level and offset values of the output frequency, based on the input voltage.</p> <p><b>Frequency reference</b></p>  <p><b>V3 input</b></p>   |
| [APO-07]<br>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  |
|---|--|
| <p>[APO-08]</p> <p>V3</p> <p>Quantizing</p> | <p>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).</p> <p>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.</p> <p>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.</p> <p>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.</p> <p><b>Output frequency (Hz)</b></p>  <p><b>Analog input (V)</b></p> |

## 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]<br>Freq at 100%                               | <p>Configures the frequency reference for operation at the maximum current (when APO-14 is set to 100%).</p> <ul style="list-style-type: none"> <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> <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]<br>I3 Monitor                                | Used to monitor input current at I3.   |
| [APO-11]<br>I3 Filter                                 | Configures the time for the operation frequency to reach 63% of target frequency based on the input current at I3.   |
| [APO-12]<br>I3 Curr x1<br>~<br>[APO-15]<br>I3 Perc y2 | <p>Configures the gradient level and off-set value of the output frequency.</p> <p><b>Frequency reference</b></p>  |

## 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   |                |  |
|----------------------|---|----------------|--|
| [APO-30]<br>AO3 Mode | Select a constant value for output. The following example for output voltage setting. |                |  |
|                      | Setting   |                | Function   |
|                      | 0   | Frequency      | 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.   |
|                      | 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.<br>Outputs 10 V when the DC link voltage is 410 V DC for 200 V models, and 820 V DC for 400 V models.  |

| Code                 | Description   |               |  |
|----------------------|---|---------------|--|
|                      | 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.<br>$\text{Rated torque current} = \sqrt{\text{Rated current}^2 - \text{No-load current}^2}$ |
|                      | 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]<br>AO3 Gain | Adjusts output value and offset. If frequency is selected as an output item, it will operate as shown below.  |               |  |
|                      | $AO3 = \frac{\text{Frequency}}{\text{MaxFreq}} \times AO3 \text{ Gain} + AO3 \text{ Bias}$  |               |  |
| [APO-32]<br>AO3 Bias | <p>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.</p> <p>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%.</p> |               |  |

| Code                    | Description   |                          |       |  |  |  |  |                          |       |                      |                        |  |  |       |  |  |
|-------------------------|---|--------------------------|-------|--|--|--|--|--------------------------|-------|----------------------|------------------------|--|--|-------|--|--|
|                         | <table><tr><th colspan="4">[APO-31]AO3 Gain</th></tr><tr><th colspan="2"></th><th>100.0% (factory default)</th><th>80.0%</th></tr><tr><td rowspan="2">[APO-32]<br/>AO3 Bias</td><td>0.0% (factory default)</td><td></td><td></td></tr><tr><td>20.0%</td><td></td><td></td></tr></table> | [APO-31]AO3 Gain         |       |  |  |  |  | 100.0% (factory default) | 80.0% | [APO-32]<br>AO3 Bias | 0.0% (factory default) |  |  | 20.0% |  |  |
| [APO-31]AO3 Gain        |   |                          |       |  |  |  |  |                          |       |                      |                        |  |  |       |  |  |
|                         |   | 100.0% (factory default) | 80.0% |  |  |  |  |                          |       |                      |                        |  |  |       |  |  |
| [APO-32]<br>AO3 Bias    | 0.0% (factory default)  |                          |       |  |  |  |  |                          |       |                      |                        |  |  |       |  |  |
|                         | 20.0%   |                          |       |  |  |  |  |                          |       |                      |                        |  |  |       |  |  |
| [APO-33]<br>AO3 Filter  | Sets filter time constant on analog output.   |                          |       |  |  |  |  |                          |       |                      |                        |  |  |       |  |  |
| [APO-34]<br>AO3 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]<br>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

| Code  | Description                           |   |
|---|---------------------------------------|---|
| [OUT-31]<br>Relay_1<br>~<br>[OUT-39]<br>Relay_8 | Set relay (Relay 1–8) output options. |   |
|   | Setting                               | Function  |
|   | 0                                     | None  |
|   | 1                                     | <p>FDT-1</p> <p>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.</p> <p>When the detected frequency width is 10 Hz, FDT-1 output is as shown in the graph below.</p>   |
|   | 2                                     | <p>FDT-2</p> <p>Outputs a signal when the user-set frequency and detected frequency (FDT Frequency) are equal and fulfills FDT-1 conditions at the same time.</p> <p>Absolute value (set frequency–detected frequency) is less than the detected frequency width, divided by 2 and FDT-1.</p> <p>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.</p> |
|   | 3                                     | <p>FDT-3</p> <p>Outputs a signal when the Absolute value (output frequency–operation frequency) is less than the detected frequency width, divided by 2.</p> <p>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.</p>  |

| Code | Description  |  |
|------|--------------|--|
|      |              | <p>Frequency</p> <p>Q1</p> <p>Run cmd</p>  |
| 4    | FDT-4        | <p>The output signal can be separately set for acceleration and deceleration conditions.</p> <ul style="list-style-type: none"> <li>• <b>In acceleration:</b> Operation frequency <math>\geq</math> Detected frequency</li> <li>• <b>In deceleration:</b> Operation frequency <math>&gt;</math> (Detected frequency–Detected frequency width/2)</li> </ul> <p>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.</p> <p>Frequency</p> <p>Q1</p> <p>Run cmd</p> |
| 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           | <p>Outputs a signal when an operation command is entered and the inverter outputs voltage.<br/>No signal output during DC braking.</p> <p><b>Frequency</b></p> <p><b>Q1</b></p> <p><b>Run cmd</b></p>                  |
| 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  | <p>Outputs a signal during an inverter speed search operation.<br/>Refer to 5.27 Speed Search Operation in the H100 inverter manual for details.</p>   |
| 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          | <p>Outputs a signal after a fault trip.<br/>Refer to 5.45 Multi-function Output On/Off Control in the H100 inverter manual for details.</p>  |

| 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.<br>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]<br>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]<br>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

| Code | Description |
|------|-------------|
|------|-------------|

| Code                                 | Description  |      |   |   |
|--------------------------------------|--|------|---|---|
| [OUT-30] Trip Out Mode               | The fault trip relay operates based on the fault trip output settings.   |      |   |   |
|                                      | Item   |      | bit on  | bit off   |
|                                      | Keypad display   |      |  |  |
|                                      | 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. |      |   |   |
|                                      | Setting  |      |   | Function  |
|                                      | bit3   | bit2 | bit1  |   |
|                                      |  |      | ✓   | Operates when low voltage fault trips occur   |
|                                      |  | ✓    |   | Operates when fault trips other than low voltage occur                              |
|                                      | ✓  |      | Operates when auto restart fails (PRT-08–09)                                      |   |
| [OUT-31]Relay 1<br>~[OUT-39] Relay 8 | Set relay output (Relay 1–8).  |      |   |   |
| [OUT-36] Q1 Define                   | Select output for multifunction output terminal (Q1). Q1 is open collector TR output.  |      |   |   |







### 6.4.3 Multifunction Output Terminal Delay Time Settings

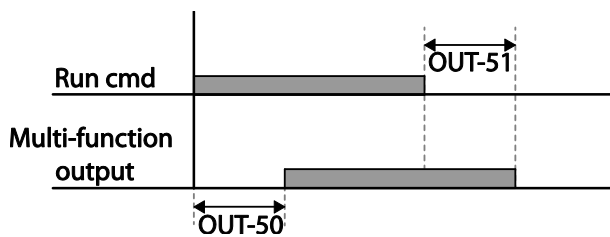
Set on-delay and off-delay times separately to control the output terminal and relay operation times. The delay time set at codes OUT-50–51 applies to multifunction output terminal (Q1) and relay, except when the multifunction output function is in fault trip mode.

| 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. |  |                           |                          |                |   |  |
|                      | <table><tr><td>Item</td><td>B terminal (Normal close)</td><td>A terminal (Normal open)</td></tr><tr><td>Keypad display</td><td></td><td></td></tr></table>                           | Item   | B terminal (Normal close) | A terminal (Normal open) | Keypad display |  |  |
|                      | Item  | B terminal (Normal close)  | A terminal (Normal open)  |                          |                |   |  |
| Keypad display       |    |  |                           |                          |                |   |  |
|                      |   |  |                           |                          |                |   |  |

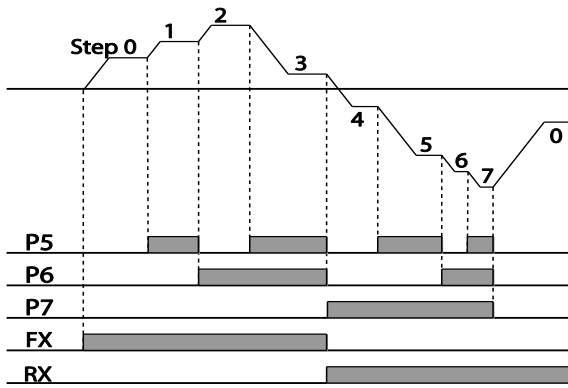


## 6.5 Setting Multistep Frequency

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-<br>Max Freq | Hz   |
| IN    | 65~73 | Px terminal configuration    | Px Define<br>(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]<br>Step Freq-1~7 | Configure multistep frequency 1~7.  |
| [IN-65~73]<br>Px Define      | <p>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)".</p> <p>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.</p>  <p>[An example of a multistep operation]</p> |

| Code                    | Description  |       |    |    |    |
|-------------------------|--|-------|----|----|----|
|                         | Speed  | Fx/Rx | P7 | P6 | P5 |
|                         | 0  | ✓     | -  | -  | -  |
|                         | 1  | ✓     | -  | -  | ✓  |
|                         | 2  | ✓     | -  | ✓  | -  |
|                         | 3  | ✓     | -  | ✓  | ✓  |
|                         | 4  | ✓     | ✓  | -  | -  |
|                         | 5  | ✓     | ✓  | -  | ✓  |
|                         | 6  | ✓     | ✓  | ✓  | -  |
|                         | 7  | ✓     | ✓  | ✓  | ✓  |
| [IN-89]<br>InCheck Time | Set a time interval for the inverter to check for additional terminal block inputs after receiving an input signal.<br>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   |

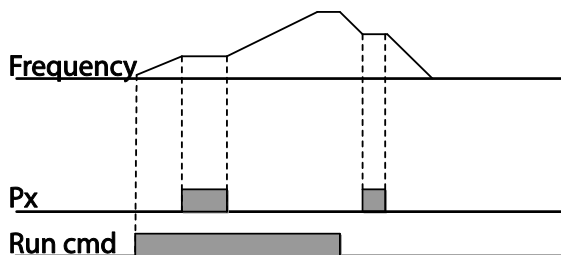
## ■ Acc/Dec Time Setup via Multifunction Terminals – Setting

| Code  | Description   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|---|---|---------------|-------------------|-------------|----|--------|-------------------|----|--------|-------------------|----|--------|-------------------|---|---|---|
| [BAS-70-82]<br>Acc Time 1-7                   | Set multistep acceleration time1-7.   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| [BAS-71-83]<br>Dec Time 1-7                   | Set multistep deceleration time1-7.   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| [IN-65~73]<br>Px Define (P1~P9)               | 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>                               | Configuration |                   | Description | 11 | XCEL-L | Acc/Dec command-L | 12 | XCEL-M | Acc/Dec command-M | 13 | XCEL-H | Acc/Dec command-H |   |   |   |
|   | Configuration   |               | Description       |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   | 11  | XCEL-L        | Acc/Dec command-L |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   | 12  | XCEL-M        | Acc/Dec command-M |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   | 13  | XCEL-H        | Acc/Dec command-H |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   | 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>   |               | Acc/Dec time      | P7          | P6 | 0      | -                 | -  | 1      | -                 | ✓  | 2      | ✓                 | - | 3 | ✓ |
| Acc/Dec time                                  | P7  | P6            |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| 0   | -   | -             |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| 1   | -   | ✓             |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| 2   | ✓   | -             |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| 3   | ✓   | ✓             |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| [Multifunction terminal P6, P7 configuration] |   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   |   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   |   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
|   |   |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |
| [IN-89]<br>In Check Time                      | 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. |               |                   |             |    |        |                   |    |        |                   |    |        |                   |   |   |   |

## 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<br>0000~1 1111<br>1111 | -    |
|       | 90   | Multifunction input terminal status     | DI Status    | 0 0000 0000*      | 0 0000<br>0000~1 1111<br>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

| Code  | Description   |  |  |  |        |   |  |
|---|---|--|--|--|--------|---|--|
| [IN-85]<br>DI On Delay<br>[IN-86]<br>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]<br>DI NC/NO Sel                           | 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>  | Type   | Form B contact terminal status (Normally Closed) | Form A contact terminal status (Normally Open) | Keypad |   |   |
|   | Type  | Form B contact terminal status (Normally Closed)                                     | Form A contact terminal status (Normally Open)   |  |        |   |  |
| Keypad  |   |   |  |  |        |   |  |
|   |   |  |  |  |        |   |  |
| [IN-90]<br>DI Status                              | 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>   | Type   | Form A contact terminal setting (On)             | Form A contact terminal setting (Off)          | Keypad |  |  |
|   | Type  | Form A contact terminal setting (On)   | Form A contact terminal setting (Off)            |  |        |   |  |
| Keypad  |    |  |  |  |        |   |  |
|   |   |  |  |  |        |   |  |

## 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.  |
| CNF-40 |               | Parameter Init | 0             | $\Delta$  | 0 No   |
|        |               |                |               |           | 1 All Grp  |
|        |               |                |               |           | 2 DRV Grp  |
|        |               |                |               |           | 3 BAS Grp  |
|        |               |                |               |           | 4 ADV Grp  |
|        |               |                |               |           | 5 CON Grp  |
|        |               |                |               |           | 6 IN Grp   |
|        |               |                |               |           | 7 OUT Grp  |
|        |               |                |               |           | 8 COM Grp  |
|        |               |                |               |           | 9 PID Grp  |
|        |               |                |               |           | 10 EPI Grp   |
|        |               |                |               |           | 11 AP1 Grp   |
|        |               |                |               |           | 12 AP2 Grp   |
|        |               |                |               |           | 13 AP3 Grp   |
|        |               |                |               |           | 14 PRT Grp   |
|        |               |                |               |           | 15 M2 Grp  |
|        |               |                |               |           | 16 APO Grp   |
| COM-06 |               | FBus S/W Ver   | -             |           | Displays the version when the H100 extension IO module is connected. |
| DRV-07 | 0h1107        | Freq Ref Src   | 0             | $\Delta$  | 0 Keypad-01  |
|        |               |                |               |           | 1 Keypad-02  |
|        |               |                |               |           | 2 V1   |
|        |               |                |               |           | 3 Reserved   |
|        |               |                |               |           | 4 V2   |

| Code   | Comm. Address | LCD Display  | Initial Value | Property* | Setting Rang     |
|--------|---------------|--------------|---------------|-----------|------------------|
|        |               |              |               |           | 5 I2             |
|        |               |              |               |           | 6 Int 485        |
|        |               |              |               |           | 7 FieldBus       |
|        |               |              |               |           | 8 Reserved       |
|        |               |              |               |           | 9 Pulse          |
|        |               |              |               |           | 10 V3            |
|        |               |              |               |           | 11 I3            |
| BAS-01 | 0h1201        | Aux Ref Src  | 0             | $\Delta$  | 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            |
| 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       |



| Code   | Comm. Address | LCD Display    | Initial Value | Property* | Setting Rang    |
|--------|---------------|----------------|---------------|-----------|-----------------|
|        |               |                |               |           | 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 V3            |
|        |               |                |               |           | 8 I3            |
| IN-72  | 0h1548        | P8 Define      | 0             | $\Delta$  | 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   |

| Code | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang      |
|------|---------------|-------------|---------------|-----------|-------------------|
|      |               |             |               |           | 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        |
|      |               |             |               |           | 40 Fire Mode      |
|      |               |             |               |           | 14 EPID1 Run      |
|      |               |             |               |           | 42 EPID1 ITermClr |
|      |               |             |               |           | 43 Time Event En  |
|      |               |             |               |           | 44 Pre Heat       |

| Code  | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang      |
|-------|---------------|-------------|---------------|-----------|-------------------|
|       |               |             |               |           | 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             | $\Delta$  | 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     |

| Code | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang      |
|------|---------------|-------------|---------------|-----------|-------------------|
|      |               |             |               |           | 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        |
|      |               |             |               |           | 40 Fire Mode      |
|      |               |             |               |           | 14 EPID1 Run      |
|      |               |             |               |           | 42 EPID1 ITermClr |
|      |               |             |               |           | 43 Time Event En  |
|      |               |             |               |           | 44 Pre Heat       |
|      |               |             |               |           | 45 Damper Open    |
|      |               |             |               |           | 46 Pump Clean     |

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

| Code   | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang      |
|--------|---------------|-------------|---------------|-----------|-------------------|
|        |               |             |               |           | 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  |
|        |               |             |               |           | 41 Broken Belt    |
| 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      |

| Code | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang      |
|------|---------------|-------------|---------------|-----------|-------------------|
|      |               |             |               |           | 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   |
|      |               |             |               |           | 36 AUTO State     |

| Code   | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang     |
|--------|---------------|-------------|---------------|-----------|------------------|
|        |               |             |               |           | 37 HAND State    |
|        |               |             |               |           | 38 TO            |
|        |               |             |               |           | 39 Except Date   |
|        |               |             |               |           | 40 KEB Operating |
|        |               |             |               |           | 41 Broken Belt   |
| 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  |
|        |               |             |               |           | 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          |



| Code   | Comm. Address | LCD Display   | Initial Value | Property* | Setting Rang      |
|--------|---------------|---------------|---------------|-----------|-------------------|
|        |               |               |               |           | 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  |
|        |               |               |               |           | 41 Broken Belt    |
| 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             |

| Code   | Comm. Address | LCD Display       | Initial Value | Property* | Setting Rang     |
|--------|---------------|-------------------|---------------|-----------|------------------|
|        |               |                   |               |           | 11 I3            |
| PID-12 | 0h180C        | PID<br>Ref1AuxSrc | 0             | $\Delta$  | 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<br>Ref2AuxSrc | 0             | $\Delta$  | 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-17 | 0h1811        | PID<br>Ref2AuxSrc | 0             | $\Delta$  | 0 None           |
|        |               |                   |               |           | 1 V1             |
|        |               |                   |               |           | 2 Reserved       |

| Code   | Comm. Address | LCD Display    | Initial Value | Property* | Setting Rang     |
|--------|---------------|----------------|---------------|-----------|------------------|
|        |               |                |               |           | 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             | $\Delta$  | 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            |
| PID-21 | 0h1815        | PID Fdb AuxSrc | 0             | $\Delta$  | 0 None           |
|        |               |                |               |           | 1 V1             |
|        |               |                |               |           | 2 Reserved       |
|        |               |                |               |           | 3 V2             |
|        |               |                |               |           | 4 I2             |
|        |               |                |               |           | 5 Reserved       |

| Code   | Comm. Address | LCD Display   | Initial Value | Property* | Setting Rang     |
|--------|---------------|---------------|---------------|-----------|------------------|
|        |               |               |               |           | 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             | $\Delta$  | 0 Keypad         |
|        |               |               |               |           | 1 V1             |
|        |               |               |               |           | 2 Reserved       |
|        |               |               |               |           | 3 V2             |
|        |               |               |               |           | 4 I2             |
|        |               |               |               |           | 5 Int 485        |
|        |               |               |               |           | 6 FieldBus       |
|        |               |               |               |           | 7 Reserved       |
|        |               |               |               |           | 8 Pulse          |
|        |               |               |               |           | 9 V3             |
|        |               |               |               |           | 10 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 V3             |
|        |               |               |               |           | 9 I3             |

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

| Code   | Comm. Address | LCD Display   | Initial Value | Property* | Setting Rang      |
|--------|---------------|---------------|---------------|-----------|-------------------|
|        |               |               |               |           | 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 %      |
| 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  |

| Code   | Comm. Address | LCD Display | Initial Value | Property* | Setting Rang     |
|--------|---------------|-------------|---------------|-----------|------------------|
|        |               |             |               |           | 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 LSIS 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 LSIS rating plates
- expired warranty period

### **Visit Our Website**

Visit us at <http://www.lsis.com> for detailed service information.