



# HITACHI

## L100-M Series Inverter Quick Reference Guide

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- Single-phase Input      100V Class



Hitachi Industrial Equipment Systems Co., Ltd.

Manual No. NB5741XD • December 2003



**Caution:** Be sure to read the L100 Inverter Manual and follow its Cautions and Warnings for the initial product installation. This Quick Reference Guide is intended for reference use by experienced users in servicing existing installations.

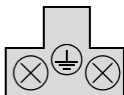
## Power Circuit Terminals

**-002NFE/NFU, -004NFE/NFU, -005NFE**

Jumper

|     |    |      |      |      |      |
|-----|----|------|------|------|------|
| (/) | +1 | +    | -    |      |      |
| L1  | L2 | N/L3 | U/T1 | V/T2 | W/T3 |

Chassis Ground

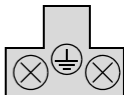


**-007 to 022NFE/NFU, -037LFU, 004 to 040HFE/HFU**

Jumper

|     |    |    |      |      |      |      |
|-----|----|----|------|------|------|------|
| (/) | +1 | +  | -    |      |      |      |
|     | L1 | L2 | N/L3 | U/T1 | V/T2 | W/T3 |

Chassis Ground

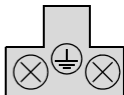


**-055LFU, -075LFU, 055HFE/HFU, 075HFE/HFU**

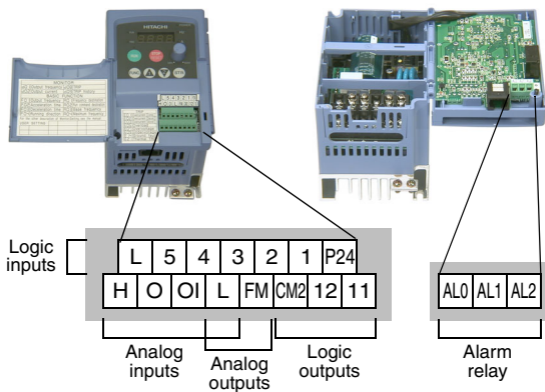
Jumper

|     |    |      |      |      |      |
|-----|----|------|------|------|------|
| (/) | +1 | +    | -    |      |      |
| L1  | L2 | N/L3 | U/T1 | V/T2 | W/T3 |

Chassis Ground



# Control Circuit Terminals

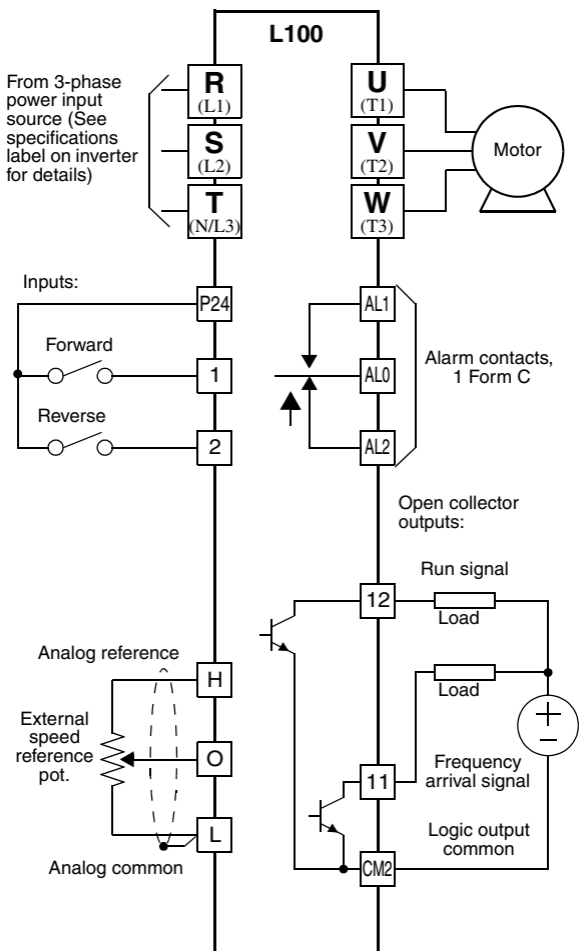


| Terminal Name  | Description                                      | Ratings and Notes  |
|----------------|--|--|
| P24            | +24V for logic inputs                            | 24VDC supply, 30 mA max. (Notes: Do not use for network power<br>Do not short to terminal L)       |
| 1, 2, 3, 4, 5  | Intelligent (programmable) discrete logic inputs | 27VDC max. (use P24 or an external supply referenced to terminal L), 4.7k $\Omega$ input impedance |
| 11, 12         | Discrete logic outputs                           | 50 mA max. ON current, 27 VDC max. OFF voltage   |
| L (top row)    | GND for logic inputs                             | Sum of input 1 to 5 currents (Note: Do not ground)   |
| CM2            | Common for logic outputs                         | 100 mA max for sum of terminals 11 and 12 currents   |
| FM             | PWM output                                       | 0 to 10VDC, 1 mA max., 50% duty cycle  |
| L (bottom row) | Common for analog inputs                         | Sum of OI, O, and H currents (return)  |
| OI             | Analog input, current                            | 4 to 19.6 mA range, 20 mA nominal  |

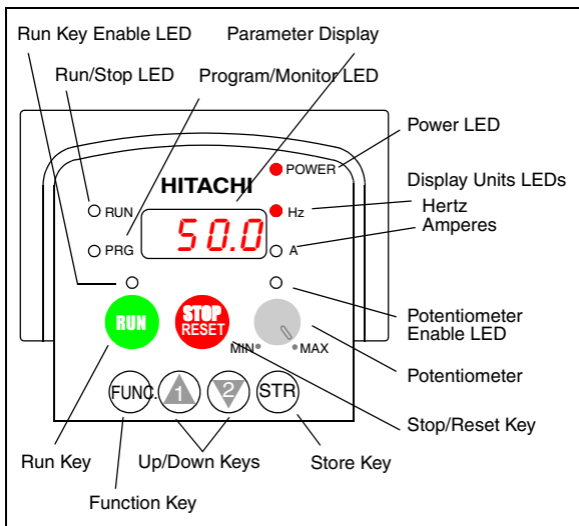
| Terminal Name | Description                               | Ratings and Notes  |
|---------------|---|--|
| O             | Analog input, voltage                     | 0 to 9.6 VDC range, 10VDC nominal, 12VDC max., input impedance 10 k $\Omega$   |
| H             | +10V analog reference                     | 10VDC nominal, 10 mA max.  |
| AL0           | Relay common contact                      | Contact rating<br>Max resistive load = 250VAC, 2.5A; 30VDC 3A;<br>Max inductive load = 250VAC, 0.2A; 30VDC 0.7A<br>Minimum load = 5VDC 100mA, 100VAC, 10mA |
| AL1           | Relay contact, normally closed during RUN |  |
| AL2           | Relay contact, normally open during RUN   |  |

# Basic Wiring Diagram

The following wiring diagram shows the power and motor connections for basic operation. The optional signal input wiring supports external Fwd and Rev Run command, and a speed potentiometer.



# Inverter Keypad Operation

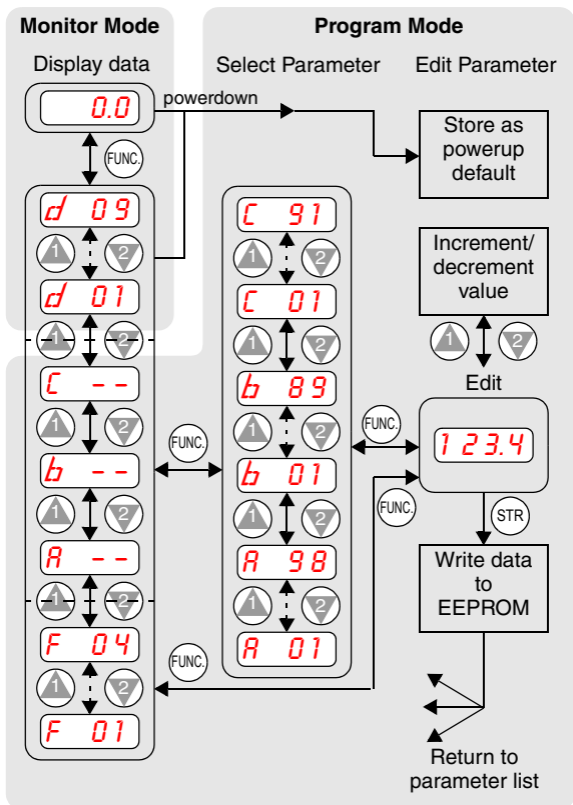


- **Run/Stop LED** – ON when the inverter output is ON and the motor is developing torque, and OFF when the inverter output is OFF (Stop Mode).
- **Program/Monitor LED** – ON when the inverter is ready for parameter editing (Program Mode). It is OFF when the parameter display is monitoring data (Monitor Mode).
- **Run Key Enable LED** – ON when the inverter is ready to respond to the Run key, OFF when the Run key is disabled.
- **Run Key** – Press this key to run the motor (the Run Enable LED must be ON first). Parameter F\_04, Keypad Run Key Routing, determines whether the Run key generates a Run FWD or Run REV command.
- **Stop/Reset Key** – Press this key to stop the motor when it is running (uses the programmed deceleration rate). This key will also reset an alarm which has tripped.

(continued, next page...)

- **Potentiometer** – Allows an operator to directly set the motor speed when the potentiometer is enabled for output frequency control.
- **Potentiometer Enable LED** – ON when the potentiometer is enabled for value entry.
- **Parameter Display** – A 4-digit, 7-segment display for parameters and function codes.
- **Display Units: Hertz/Amperes** – One of these LEDs will be ON to indicate the units associated with the parameter display.
- **Power LED** – ON when the power input to the inverter is ON.
- **Function Key** – This key is used to navigate through the lists of parameters and functions for setting and monitoring parameter values.
- **Up/Down Keys** – Use these keys alternately to move up or down the lists of parameter and functions shown in the display, and to increment/decrement values.
- **Store Key** – When the unit is in Program Mode and the operator has edited a parameter value, press the Store key to write the new value to the EEPROM.

# Keypad Navigation Map





## Powerup Test

The Powerup Test procedure uses minimal parameter settings to run the motor. The procedure describes two alternative methods for commanding the inverter: *via the inverter keypad*, or *via the logic terminals*.

- Check power input and motor output wiring (see page 4 diagram).
- If using logic terminals for testing, verify correct wiring on [P24], [FW], [H], [O], and [L] (bottom row) per the diagram on page 4.
- Reverse [RV] input wiring (defaults to terminal [2]) is optional.

| Step | Description                         | Via Keypad  | Via Logic Terminals                     |
|------|-------------------------------------|---|---|
| 1    | Set speed command source setting    | A_01 = 00<br>(keypad pot.)                                | A_01 = 01,<br>[H–O–L] input             |
| 2    | Set Run FW command source           | A_02 = 02<br>(Run key)                                    | A_02 = 01,<br>[FW] input                |
| 3    | Set Run REV command source          | —   | C_02 = 01,<br>[RV] input                |
| 4    | Set motor base freq.                | A_03 = 60   |   |
| 5    | Set keypad display to monitor freq. | Access D_01, press Func key, display will show <b>0.0</b> |   |
|      | Perform safety check                | Disconnect load from motor                                |   |
| 6    |                                     | Turn keypad pot. to MIN position                          | Ensure voltage on [O]—[L] terminals= 0V |
| 7    | Run Forward command                 | Press Run key   | Turn ON the [FW] terminal               |
| 8    | Increase speed                      | Rotate keypad pot. CW dir.                                | Increase voltage at [O]                 |
| 9    | Decrease speed                      | Rotate keypad pot. CCW dir.                               | Decrease voltage at [O]                 |
| 10   | Stop motor                          | Press Stop key  | Turn OFF the [FW] terminal              |
| 11   | Run Reverse command (optional)      | —   | Turn ON the [RV] terminal               |
| 12   | Stop motor                          | —   | Turn OFF the [RV] terminal              |

## Error Codes

The L100 series inverters will trip on over-current, over-voltage, and under-voltage to protect the inverter. The motor output turns OFF, allowing the motor to free-run to a stop. Press the Stop/Reset key to reset the inverter and clear the error.

### Basic Error Codes

| Error Code               | Name                                       | Probable Cause(s)  |
|--------------------------|--|--|
| <i>E01</i>               | Over current event while at constant speed | <ul style="list-style-type: none"><li>• Inverter output was short-circuited</li><li>• Motor shaft is locked</li><li>• Load is too heavy</li><li>• A dual-voltage motor is wired incorrectly</li></ul> Note: The L100 will over current trip at nominally 200% of rated current |
| <i>E02</i>               | Over current event during deceleration     |  |
| <i>E03</i>               | Over current event during acceleration     |  |
| <i>E04</i>               | Over current event for other conditions    | <ul style="list-style-type: none"><li>• DC braking power(A_54) set too high</li><li>• Current transformer / noise error</li></ul>  |
| <i>E05</i>               | Overload protection                        | <ul style="list-style-type: none"><li>• Motor overload is detected by the electronic thermal function</li></ul>  |
| <i>E07</i>               | Over voltage protection                    | <ul style="list-style-type: none"><li>• DC bus voltage exceeds a threshold, due to regenerative energy from motor</li></ul>  |
| <i>E08</i>               | EEPROM error                               | <ul style="list-style-type: none"><li>• Built-in EEPROM memory experienced noise, high temperature, etc.</li></ul>   |
| <i>E09</i>               | Under-voltage error                        | <ul style="list-style-type: none"><li>• DC bus voltage decreased enough to cause a control circuit fault</li></ul>   |
| <i>E11</i><br><i>E22</i> | CPU error                                  | <ul style="list-style-type: none"><li>• Built-in CPU had internal error</li></ul>  |
| <i>E12</i>               | External trip                              | <ul style="list-style-type: none"><li>• [EXT] input signal detected</li></ul>  |
| <i>E13</i>               | USP (Unattended Start Protection)          | <ul style="list-style-type: none"><li>• When (USP) was enabled, an error occurred when power was applied while a Run signal was present</li></ul>  |
| <i>E14</i>               | Ground fault                               | <ul style="list-style-type: none"><li>• A ground fault was detected between the inverter output and the motor. This feature protects the inverter, and does not protect humans.</li></ul>  |
| <i>E15</i>               | Input over-voltage                         | <ul style="list-style-type: none"><li>• Input voltage was higher than the specified value, 60 sec. after powerup</li></ul>   |
| <i>E21</i>               | Inverter thermal trip                      | <ul style="list-style-type: none"><li>• Inverter internal temperature is above the threshold</li></ul>   |



















| Error Code | Name  | Probable Cause(s)  |
|------------|---|--|
| <b>E35</b> | Thermistor                                    | <ul style="list-style-type: none"> <li>Thermistor input, [THM] and [L], is over the temp. threshold</li> </ul>   |
| <b>---</b> | Under-voltage (brown-out) with output shutoff | <ul style="list-style-type: none"> <li>Low input voltage caused the inverter to turn OFF the motor output and try to restart. If unsuccessful, a trip occurs.</li> </ul> |

## Error Trip Conditions

Use function code D\_08 to access the error trip conditions for the current error as shown in the table below. Use the Up and Down arrow keys to scroll through the trip condition parameters.

| Step                                 | Display   |
|--------------------------------------|---|
| 1. Access D_08                       | <b>d 08</b>   |
| 2. Press Function Key                | If no error:<br><br><b>---</b>  |
|                                      | If error exists:<br><b>EXX</b><br>(error code)  |
| 3. Press Up/Dn key (if error exists) | Output frequency at trip point:<br><b>10.0</b><br><br>Motor current at trip point:<br><b>0.025</b><br><br>DC bus voltage at trip point:<br><b>189.8</b> |

## Restoring Factory Default Settings

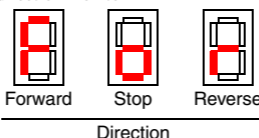
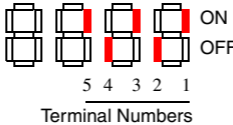
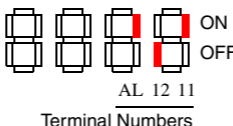
| Action   | Display         | Function/Parameter   |
|--|-----------------|--|
| Press  ,  or  as needed.                              | b --            | “B” Group selected   |
| Press  .  | b 01            | First “B” Group parameter                                  |
| Press/hold  until...  | b 85            | Country code for initialization selected                   |
| Press  . If setting is correct, then skip next step.  | 02              | 00 = Japan<br>01 = Europe<br>02 = United States            |
| To change country code, press  or  to set;  to store. |                 |  |
| Press  .  | b 85            | Country code for initialization selected                   |
| Press  .  | b 84            | Initialization function selected                           |
| Press  .   | 00              | 0 = disable initialization, clear trip history only        |
| Press  .  | 01              | 1 = enable initialization                                  |
| Press  .  | b 84            | Initialization now enabled to restore all defaults         |
| Press/hold  ,  , and  . Do not release yet.      | b 84            | First part of key sequence                                 |
| Press/hold  (STOP) for 3 seconds, then release.   | d 00            | Final part of special sequence, “D_00” is flashing         |
| Now release the all keys together, only after “D_00” display begins blinking.  | EU<br>USA<br>JP | Default parameter country code shown during initialization |
| Initialization is complete.  | d 01            | Function code for output frequency monitor shown           |



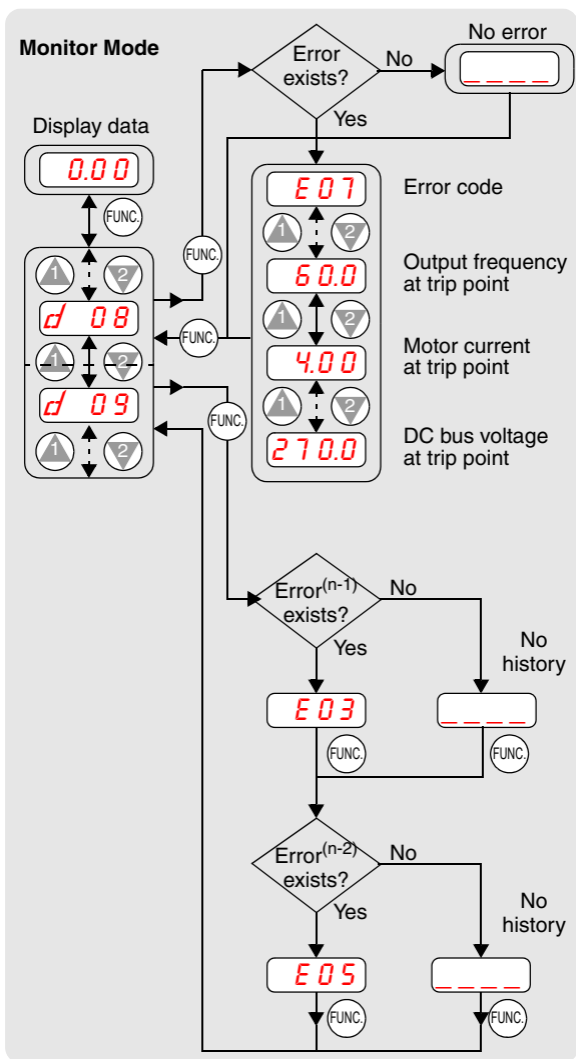
**Note:** After initializing the inverter, use the Powerup Test on page 8 to get the motor running again.

## Parameter Tables

### “D” Group: Monitoring Functions

| Func. Code | Name / Description   | Units        |
|------------|--|--------------|
| D_01       | Output frequency monitor   | Hz           |
| D_02       | Output current monitor   | A            |
| D_03       | Rotation direction monitor<br><br>Forward      Stop      Reverse<br><hr style="width: 50%; margin: 0 auto;"/> Direction | —            |
| D_04       | Process variable (PV), PID feedback monitor  | %            |
| D_05       | Intelligent input terminal status<br><br>5 4 3 2 1<br>Terminal Numbers  | —            |
| D_06       | Intelligent output terminal status<br><br>AL 12 11<br>Terminal Numbers  | —            |
| D_07       | Scaled output frequency monitor<br>(output frequency x B_86 scale factor)  | User-defined |
| D_08       | Trip event monitor   | —            |
| D_09       | Trip history monitor   | —            |

# Trip History Navigation Map



Parameter tables for user-settable functions follow these conventions:

- Some parameters specify an option code. Where applicable, the options codes will be in a bulleted list in the Name/Description column.
- The default values apply to all models unless otherwise noted for each parameter... –FE (Europe) / –FU (U.S.) / –FR (Japan).
- Some parameters cannot be edited during Run Mode, and certain Software Lock settings (B\_31) can prohibit all edits. If in doubt, place the inverter in Stop Mode or consult the inverter manual for details.

## “F” Group: Main Profile Parameters

| Func. Code | Name / Description   | Default Value | Set Value |
|------------|--|---------------|-----------|
| F_01       | Output frequency setting   | 0.0           |           |
| F_02       | Acceleration (1) time setting  | 10.0          |           |
| F_03       | Deceleration (1) time setting  | 10.0          |           |
| F_04       | Keypad Run key routing<br>• 00 Forward                      • 01 Reverse | 00            |           |

## “A” Group: Standard Functions

| Func. Code   | Name / Description  | Default Value<br>-FE / -FU /<br>-FR  | Set Value |
|--|---|--|-----------|
| A_01   | Frequency source setting<br>• 00 Keypad potentiometer<br>• 01 Control terminal<br>• 02 Function F_01 setting  | 01 / 01 / 00   |           |
| A_02   | Run command source setting<br>• 01 Input terminal FW or RV (assignable)<br>• 02 Run key on keypad, or digital operator  | 01 / 01 / 02   |           |
| A_03   | Base frequency setting  | 50.0 / 60.0 / 60.0   |           |
| A_04   | Maximum frequency setting   | 50.0 / 60.0 / 60.0   |           |
| A_11   | O/OI-L input active range start frequency   | 0.0  |           |
| A_12   | O/OI-L input active range end frequency   | 0.0  |           |
| A_13   | O/OI-L input active range start voltage   | 0  |           |
| A_14   | O/OI-L input active range end voltage   | 100  |           |
| A_15   | O/OI-L input start frequency enable<br>• 00 Use A_11 starting value)<br>• 01 Use 0 Hz   | 01   |           |
| A_16   | External frequency filter time constant   | 8  |           |
| A_20   | Multi-speed frequency setting   | 0  |           |
| A_21<br>A_22<br>A_23<br>A_24<br>A_25<br>A_26<br>A_27<br>A_28<br>A_29..<br>..A_35 | Multi-speed frequency settings  | 0 / 0 / 5<br>0 / 0 / 10<br>0 / 0 / 15<br>0 / 0 / 20<br>0 / 0 / 30<br>0 / 0 / 40<br>0 / 0 / 50<br>0 / 0 / 60<br>0 / 0 / 0 |           |
| A_38   | Jog frequency setting   | 1.0  |           |
| A_39   | Jog stop mode<br>• 00 Free-run stop, jogging disabled during motor run<br>• 01 Controlled deceleration, jogging disabled during motor run<br>• 02 DC braking to stop, jogging disabled during motor run | 00   |           |



| Func. Code           | Name / Description   | Default Value<br>-FE / -FU /<br>-FR | Set Value |
|----------------------|--|-------------------------------------|-----------|
| A_41                 | Torque boost method selection<br>• 00 Manual torque boost<br>• 01 Automatic torque boost                       | 00                                  |           |
| A_42                 | Manual torque boost value  | 11                                  |           |
| A_43                 | Manual torque boost frequency adjustment   | 10.0                                |           |
| A_44                 | V/f characteristic curve selection<br>• 00 V/f constant torque<br>• 01 V/f variable torque                     | 00                                  |           |
| A_45                 | V/f gain setting   | 100                                 |           |
| A_51                 | DC braking enable<br>• 00 Disable                      • 01 Enable   | 00                                  |           |
| A_52                 | DC braking frequency setting   | 0.5                                 |           |
| A_53                 | DC braking wait time   | 0.0                                 |           |
| A_54                 | DC braking force during deceleration   | 0                                   |           |
| A_55                 | DC braking time for deceleration   | 0.0                                 |           |
| A_61                 | Frequency upper limit setting  | 0.0                                 |           |
| A_62                 | Frequency lower limit setting  | 0.0                                 |           |
| A_63<br>A_65<br>A_67 | Jump (center) frequency setting  | 0.0                                 |           |
| A_64<br>A_66<br>A_68 | Jump (hysteresis) frequency width setting  | 0.5                                 |           |
| A_71                 | PID Enable<br>• 00 PID operation OFF<br>• 01 PID operation ON  | 00                                  |           |
| A_72                 | PID proportional gain  | 1.0                                 |           |
| A_73                 | PID integral time constant   | 1.0                                 |           |
| A_74                 | PID derivative time constant   | 0.0                                 |           |
| A_75                 | PV scale conversion  | 1.00                                |           |
| A_76                 | PV source setting<br>• 00 [OI] terminal (current input)<br>• 01 [O] terminal (voltage input)                   | 00                                  |           |
| A_81                 | AVR function select<br>• 00 AVR enabled              • 01 AVR disabled<br>• 02 AVR enabled except during decel | 02 / 00 / 02                        |           |

| <b>Func. Code</b> | <b>Name / Description</b>   | <b>Default Value<br/>-FE / -FU /<br/>-FR</b> | <b>Set Value</b> |
|-------------------|---|--|------------------|
| A_82              | AVR voltage select  | 230/230/200<br>400/460/400                   |                  |
| A_92              | Acceleration (2) time setting   | 15.0   |                  |
| A_93              | Deceleration (2) time setting   | 15.0   |                  |
| A_94              | Select method to switch to Acc2/Dec2 profile<br>• 00 2CH input from terminal<br>• 01 transition frequency | 00   |                  |
| A_95              | Acc1 to Acc2 frequency transition point   | 0.0  |                  |
| A_96              | Dec1 to Dec2 frequency transition point   | 0.0  |                  |
| A_97              | Acceleration curve selection<br>• 00 Linear                      • 01 S-curve                             | 00   |                  |
| A_98              | Deceleration curve selection<br>• 00 Linear                      • 01 S-curve                             | 00   |                  |

## “B” Group: Fine-tuning Functions

| <b>Func. Code</b> | <b>Name / Description</b>  | <b>Default Value<br/>-FE / -FU /<br/>-FR</b> | <b>Set Value</b> |
|-------------------|--|--|------------------|
| B_01              | Selection of automatic restart mode<br>• 00 Alarm output after trip, automatic restart disabled<br>• 01 Restart at 0Hz<br>• 02 Resume operation after frequency matching<br>• 03 Resume previous freq. after freq. matching, then decelerate to stop and display trip info | 00   |                  |
| B_02              | Allowable under-voltage power failure time   | 1.0  |                  |
| B_03              | Retry wait time before motor restart   | 1.0  |                  |

| Func. Code | Name / Description   | Default Value<br>-FE / -FU /<br>-FR | Set Value |
|------------|--|-------------------------------------|-----------|
| B_12       | Level of electronic thermal setting  | Rated current of each inverter      |           |
| B_13       | Electronic thermal characteristic<br>• 00 Reduced torque • 01 Const. torque  | 01 / 01 / 00                        |           |
| B_21       | Overload restriction operation mode<br>• 00 Disabled<br>• 01 Enabled for accel and constant speed<br>• 02 Enabled for constant speed only  | 01                                  |           |
| B_22       | Overload restriction setting   | Rated current x 1.25                |           |
| B_23       | Deceleration rate at overload restriction  | 1.0                                 |           |
| B_31       | Software lock mode selection<br>• 00 Low-level access, [SFT] blocks edits<br>• 01 Low-level access, [SFT] blocks edits (except F_01 and Multi-speed parameters)<br>• 02 No access to edits<br>• 03 No access to edits except F_01 and Multi-speed parameters | 01                                  |           |
| B_32       | Reactive current setting<br>Note: For Japanese (-FR) versions, only -055LFR, -055HFR, -075LFR, and -075HFR models support this function.   | 58% rated current                   |           |
| B_81       | [FM] terminal analog meter adjustment  | 80                                  |           |
| B_82       | Start frequency adjustment   | 0.5                                 |           |
| B_83       | Carrier frequency setting  | 5.0 / 5.0 / 12.0                    |           |
| B_84       | Initialization mode (parameters or trip history)<br>• 00 Trip history clear<br>• 01 Parameter initialization   | 00                                  |           |
| B_85       | Country code for initialization<br>• 00 Japan version • 01 Europe version<br>• 02 US version   | 01 / 02 / 00                        |           |
| B_86       | Frequency scaling conversion factor  | 1.0                                 |           |
| B_87       | STOP key enable<br>• 00 Enable • 01 Disable  | 00                                  |           |

| Func. Code | Name / Description   | Default Value<br>-FE / -FU /<br>-FR | Set Value |
|------------|--|-------------------------------------|-----------|
| B_88       | Restart mode after FRS <ul style="list-style-type: none"> <li>• 00 Restart from 0Hz</li> <li>• 01 Restart from frequency detected from actual speed of motor</li> </ul>  | 00                                  |           |
| B_89       | Data select for digital operator OPE-J <ul style="list-style-type: none"> <li>• 01 Output frequency (D_01)</li> <li>• 02 Output current (D_02)</li> <li>• 03 Motor direction (D_03)</li> <li>• 04 PID PV feedback (D_04)</li> <li>• 05 Input states for input terminals (D_05)</li> <li>• 06 Output states for output terminals (D_06)</li> <li>• 07 Scaled output frequency (D_07)</li> </ul> | 01                                  |           |

## “C” Group: Intelligent Terminal Functions

| Func. Code | Name / Description        |  | Default Value<br>-FE / -FU /<br>-FR | Set Value |
|------------|---------------------------|--|-------------------------------------|-----------|
| C_01       | Terminal [1] function     | Fifteen option codes available (see page 21)   | 00                                  |           |
| C_02       | Terminal [2] function     |  | 01                                  |           |
| C_03       | Terminal [3] function     |  | 02 / 16 / 02                        |           |
| C_04       | Terminal [4] function     |  | 03 / 13 / 03                        |           |
| C_05       | Terminal [5] function     |  | 18                                  |           |
| C_11       | Terminal [1] active state | <ul style="list-style-type: none"> <li>• 00 Normally open [NO]</li> <li>• 01 Normally closed [NC]</li> </ul> | 00                                  |           |
| C_12       | Terminal [2] active state |  | 00                                  |           |
| C_13       | Terminal [3] active state |  | 00                                  |           |
| C_14       | Terminal [4] active state |  | 00 / 01 / 00                        |           |
| C_15       | Terminal [5] active state |  | 00                                  |           |

| Func. Code | Name / Description   |  | Default Value<br>-FE / -FU /<br>-FR | Set Value |
|------------|--|--|-------------------------------------|-----------|
| C_21       | Terminal [11] function   | Six option codes available (see page 22)   | 01                                  |           |
| C_22       | Terminal [12] function   |  | 00                                  |           |
| C_23       | [FM] signal selection  | Three option codes available (see page 22)   | 00                                  |           |
| C_31       | Terminal [11] active state (-FU)                                       | <ul style="list-style-type: none"> <li>• 00 Normally open (NO)</li> <li>• 01 Normally closed (NC)</li> </ul> | — / 00 / —                          |           |
|            | Reserved (-FE / -FR)   |  | 00 / — / 00                         |           |
| C_32       | Terminal [12] active state (-FU)                                       |  | — / 00 / —                          |           |
|            | Terminal [11] active state (-FE / -FR)                                 |  | 00 / — / 00                         |           |
| C_33       | Alarm relay terminal active state                                      |  | 01                                  |           |
| C_41       | Overload level setting   |  | Rated current of each inverter      |           |
| C_42       | Frequency arrival setting for accel                                    |  | 0.0                                 |           |
| C_43       | Arrival frequency setting for decel                                    |  | 0.0                                 |           |
| C_44       | PID deviation level setting  |  | 3.0                                 |           |
| C_91       | Debug mode enable<br>• 00 Display                      • 01 No display |  | 00                                  |           |

## Intelligent Input Terminal Listing

| Symbol | Code | Input Terminal Name               |
|--------|------|-----------------------------------|
| FWD    | 00   | Forward Run/Stop                  |
| RV     | 01   | Reverse Run/Stop                  |
| CF1    | 02   | Multi-speed select, Bit 0 (LSB)   |
| CF2    | 03   | Multi-speed select, Bit 1         |
| CF3    | 04   | Multi-speed select, Bit 2         |
| CF4    | 05   | Multi-speed select, Bit 3 (LSB)   |
| JG     | 06   | Jogging                           |
| 2CH    | 09   | 2-stage accel and decel           |
| FRS    | 11   | Free-run stop                     |
| EXT    | 12   | External trip                     |
| USP    | 13   | Unattended start protection       |
| SFT    | 15   | Software lock                     |
| AT     | 16   | Analog input voltage/current sel. |
| RS     | 18   | Reset inverter                    |
| PTC    | 19   | PTC thermistor thermal protection |

## Intelligent Output Terminal Listing

| Symbol | Code | Input Terminal Name                   |
|--------|------|---------------------------------------|
| RUN    | 00   | Run signal                            |
| FA1    | 01   | Freq. arrival type 1 – constant speed |
| FA2    | 02   | Freq. arrival type 2 – over-frequency |
| OL     | 03   | Overload advance notice signal        |
| OD     | 04   | Output deviation for PID control      |
| AL     | 05   | Alarm signal                          |

## Analog Input Configuration

The following tables show the parameter settings required for various analog input signal types.

| [AT]                                 | External Frequency Command Input      |
|--------------------------------------|---------------------------------------|
| OFF                                  | [O] — [L]                             |
| ON                                   | [OI] — [L]                            |
| (not assigned to any input terminal) | Summation of [O] — [L] and [OI] — [L] |

## Analog Output Function Listing

The following table shows all three functions available for assignment to the analog output terminal:

- Terminal [FM], option set by C\_23

| Option Code | Function Name            | Description  | Corresponding Signal Range |
|-------------|--------------------------|--|----------------------------|
| 00          | Output frequency         | Actual motor speed, represented by PWM signal                                | 0 to max. freq. in Hz      |
| 01          | Output current           | Motor current (% of maximum rated output current), represented by PWM signal | 0 to 200%                  |
| 02          | Digital output frequency | Output frequency   | 0 to max. freq. in Hz      |

**Notes:**