

4. Keypad Panel

The keypad panel has various functions for specifying operations such as keypad operation (frequency setting, run/stop command), confirming and changing function data, confirming status, and copying. Review the use of each function before commencing running.

The keypad panel can also be removed or inserted during running. However, if the keypad panel is removed during a keypad panel operation (e.g., run/stop, frequency setting), the inverter stops and outputs an alarm.

4-1 Appearance of Keypad Panel



LED monitor:

Four-digit 7-segment display

Used to display various items of monitored data such as setting frequency, output frequency and alarm code.

Auxiliary information indication for LED monitor:

Selected units or multiple of the monitored data (on the LED monitor) are displayed on the top line of the LCD monitor. The ■ symbol indicates selected units or multiple number. The symbol ▲ indicates there is an upper screen not currently displayed.

LCD monitor:

Used to display such various items of information as operation status and function data. An operation guide message, which can be scrolled, is displayed at the bottom of the LCD monitor.

This LCD monitor has a backlight feature which turns on when the control power is applied or any keypad key is pressed, and stays on approximately 5 minutes after the last key stroke.

Indication on LCD monitor:

Displays one of the following operation status:

FWD: Forward operation REV: Reverse operation
STOP: Stop

Displays the selected operation mode:

REM: Terminal block LOC: Keypad panel
COMM: Communication terminal
JOG: Jogging mode

The symbol ▼ indicates there is a lower screen not currently displayed.

RUN LED :

Indicates that an operation command was input by pressing the FWD or REV key.

Control keys (valid during keypad panel operation):

Used for inverter run and stop

- FWD** : Forward operation command
- REV** : Reverse operation command
- STOP** : Stop command

Operation keys:

Used for screen switching, data change, frequency setting, etc.

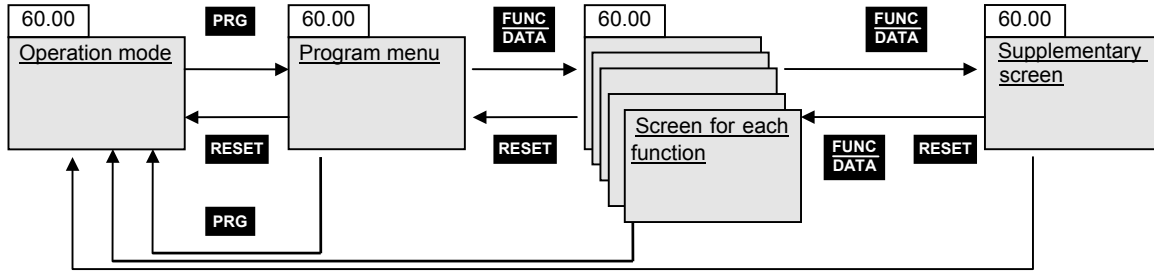
Table 4-1-1 Functions of operation keys

Operation key	Main function
PRG	Used to switch the current screen to the menu screen or switch to the initial screen in the operation/trip mode.
FUNC DATA	Used to switch the LED monitor or to determine the entered frequency, function code, or data.
▲ , ▼	Used to change data, move the cursor up or down, or scroll the screen
SHIFT >>	Used to move the cursor horizontally at data change. When this key is pressed with the up or down key, the cursor moves to the next function block.
RESET	Used to cancel current input data and switch the displayed screen. If an alarm occurs, this key is used to reset the trip status (valid only when the alarm mode initial screen is displayed).
STOP + ▲	Used to switch normal operation mode to jogging operation mode or vice versa. The selected mode is displayed on the LCD monitor.
STOP + RESET	Switches operation mode (from keypad panel operation mode to terminal block operation mode or reverse). When these keys are operated, function F01 data is also switched from 0 to 1 or from 1 to 0. The selected mode is displayed on the LCD indicator.

4-2 Keypad Panel Operation System (LCD screen, Level Structure)

4-2-1 Normal operation

The keypad panel operation system (screen transition, level structure) is structured as follows:



4-2-2 Alarm occurrence

If an alarm is activated, operation is changed from normal keypad panel operation to an alarm mode operation. The alarm mode screen appears and alarm information is displayed.

The program menu, function screens, and supplementary screens remain unchanged as during normal operation, though the switching method from program menu to alarm mode is limited to **PRG**.

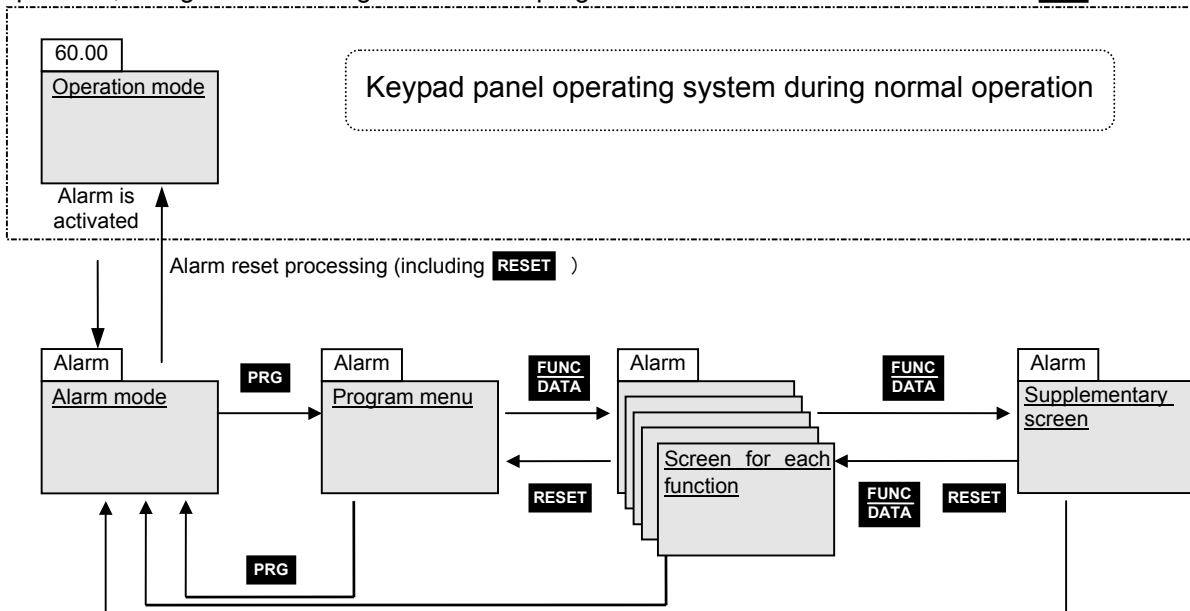


Table 4-2-1 Overview of contents displayed for each level

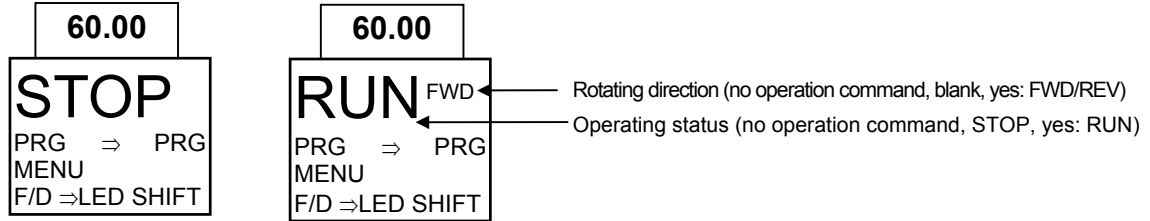
No.	Level name	Content																														
1	Operating mode	This screen is for normal operation. Frequency setting by keypad panel and the LED monitor switching are possible only when this screen is displayed.																														
2	Program menu	<p>Each function of the keypad panel is displayed in menu form and can be selected. Selecting the desired function from the list and pressing FUNC DATA displays the screen of the selected function. The following functions are available as keypad panel functions (menus).</p> <table border="1"> <thead> <tr> <th>No.</th> <th>Menu name</th> <th>Outline</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>DATA SET</td> <td>The code and name of the function are displayed. Selecting a function displays a data setting screen for checking, or modifying data.</td> </tr> <tr> <td>2</td> <td>DATA CHECK</td> <td>The code and name of the function are displayed. Select a function to display a screen for checking data. Modifying data is possible as described above by going to the data setting screen.</td> </tr> <tr> <td>3</td> <td>OPR MNTR</td> <td>Can check various data on the operating status.</td> </tr> <tr> <td>4</td> <td>I/O CHECK</td> <td>Can check the status of analog and digital input/output for the inverter and options as an I/O checker.</td> </tr> <tr> <td>5</td> <td>MAINTENANC</td> <td>Can check inverter status, life expectancy, communication error status, and ROM version information as maintenance information.</td> </tr> <tr> <td>6</td> <td>LOAD FCTR</td> <td>Can measure maximum and average current and average breaking force in load rate measurement.</td> </tr> <tr> <td>7</td> <td>ALM INF</td> <td>Can check the operating status and input/output status at the latest alarm occurrence.</td> </tr> <tr> <td>8</td> <td>ALM CAUSE</td> <td>Can check the latest alarm or simultaneously occurred alarms and alarm history. Selecting the alarm and pressing FUNC DATA, displays the contents of alarm as troubleshooting.</td> </tr> <tr> <td>9</td> <td>DATA COPY</td> <td>Places the function of one inverter in memory for copying to another inverter.</td> </tr> </tbody> </table>	No.	Menu name	Outline	1	DATA SET	The code and name of the function are displayed. Selecting a function displays a data setting screen for checking, or modifying data.	2	DATA CHECK	The code and name of the function are displayed. Select a function to display a screen for checking data. Modifying data is possible as described above by going to the data setting screen.	3	OPR MNTR	Can check various data on the operating status.	4	I/O CHECK	Can check the status of analog and digital input/output for the inverter and options as an I/O checker.	5	MAINTENANC	Can check inverter status, life expectancy, communication error status, and ROM version information as maintenance information.	6	LOAD FCTR	Can measure maximum and average current and average breaking force in load rate measurement.	7	ALM INF	Can check the operating status and input/output status at the latest alarm occurrence.	8	ALM CAUSE	Can check the latest alarm or simultaneously occurred alarms and alarm history. Selecting the alarm and pressing FUNC DATA , displays the contents of alarm as troubleshooting.	9	DATA COPY	Places the function of one inverter in memory for copying to another inverter.
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3	Screen for each function	The function screen selected on the program menu appears, hence completing the function.																														
4	Supplementary screen	Functions not completed (e.g., modifying function data, displaying alarm factors) on individual function screens are displayed on the supplementary screen.																														

4-3 Operating Keypad Panel

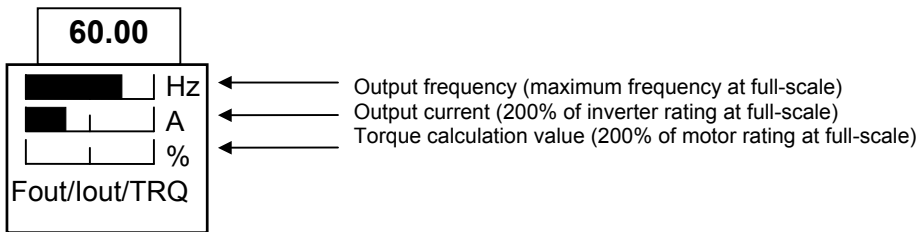
4-3-1 Operation Mode

The screen for normal inverter operation includes a screen for displaying inverter operating status and an operation guide and a screen for graphically displaying the operating status in the form of a bar graph. Switching between both screens is possible using the E45 function.

1) Operation guide (E45=0)



2) Bar graph (E45=1)

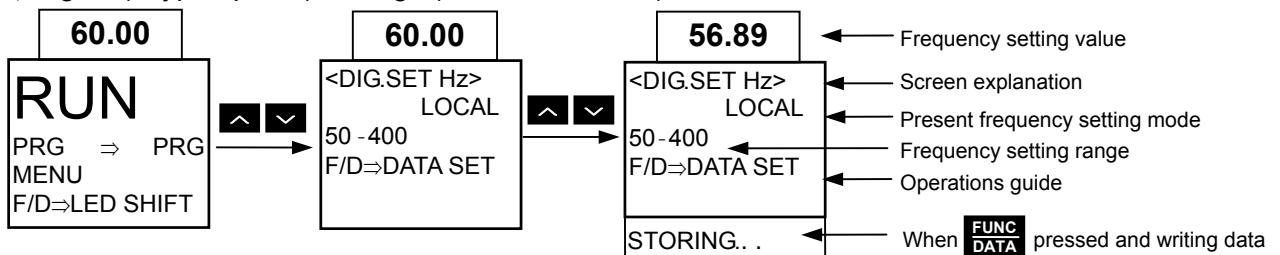


4-3-2 Setting digital frequency

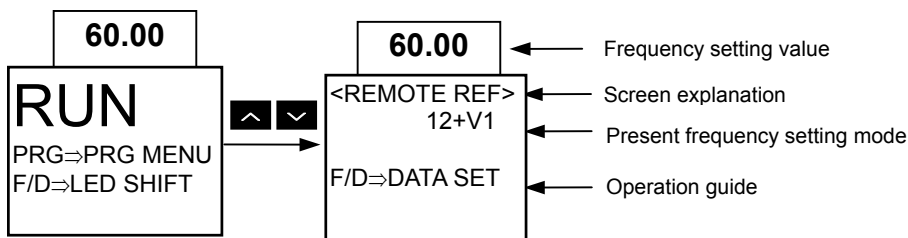
On the operation mode screen, press **▲** or **▼** to display the set frequency on the LED. Data is initially incremented and decremented in the smallest possible unit. Holding down **▲** or **▼** increases or decreases the speed of increment or decrement. The digit to change data can be selected using **SHIFT >>** and then data can be set directly. To save the frequency settings, press **FUNC DATA**. Press **RESET** and **PRG** to return to the operation mode.

If keypad panel settings are not selected, the present frequency setting mode appears on the LCD. When selecting the PID function, PID command can be set with a process value. (Refer to technical documentation for details).

1) Digital (keypad panel) settings (F01=0 or C30=0)



2) Other than digital setting



4-3-3 Switching the LED monitor

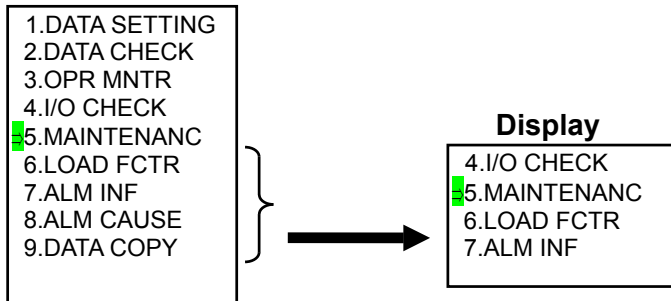
On the normal operation, press **FUNC DATA** to switch to LED monitor display.

When power is turned on, the monitor contents set by the function (E43) are displayed on the LED.

E43	When stopping		When running (E44 = 0,1)	Unit	Remarks
	(E44 = 0)	(E44 = 1)			
0	Setting frequency	Output frequency 1 (before slip compensation)	Hz		
1	Setting frequency	Output frequency 2 (after slip compensation)			
2	Setting frequency	Setting frequency			
3	Output current	Output current	A		
4	Output voltage (specified value)	Output voltage (specified value)	V		
5	Synchronous speed setting value	Synchronous speed	r/min.		For 4 digits or more, the last digits are cut, with x10, x100 marked on the indicator.
6	Line speed setting value	Line speed	m/min.		
7	Load rotation speed setting value	Load rotation speed	r/min.		
8	Torque calculation value	Torque calculation value	%		± indication
9	Power consumption	Power consumption	kW		
10	PID setting value	PID setting value	–		Displayed only when PID is effective in PID operation selection.
11	PID remote setting value	PID remote setting value	–		
12	PID feedback value	PID feedback value	–		

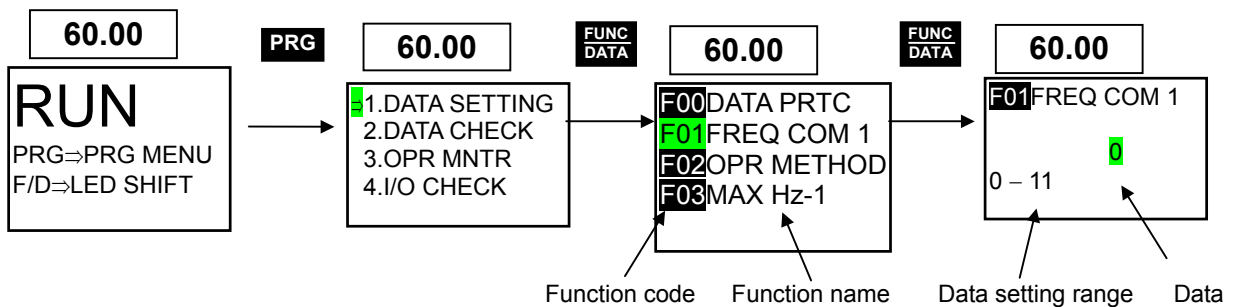
4-3-4 Menu screen

The “Program menu” screen is shown below. Only four items can be displayed simultaneously. Move the cursor with **▲** or **▼** to select an item, then press **FUNC DATA** to display the next screen.



4-3-5 Setting function data

On the “program menu” screen, select “**1. Data Setting**” then the “Function Select” screen appears with function codes and names on it. Select the desired function.



The function code consists of alphanumeric characters. Unique alphabetical letters are assigned for each function group.

Table 4-3-1

Function code	Function	Remarks
F00 - F42	Fundamental Functions	
E01 - E47	Extension Terminal Functions	
C01 - C33	Control Functions of Frequency	
P01 - P09	Motor Parameters	
H03 - H39	High Performance Functions	
A01 - A18	Alternative Motor Parameters	
U01 - U61	User Functions	
o01 - o55	Optional Functions	Can be selected only with an option connected

To scroll "Function Select" screen rapidly, use **>>** + **▲** or **>>** + **▼** to move the screen in a unit grouped by alphabet.



Select the desired function and press **FUNC DATA** to switch to the "data setting" screen.

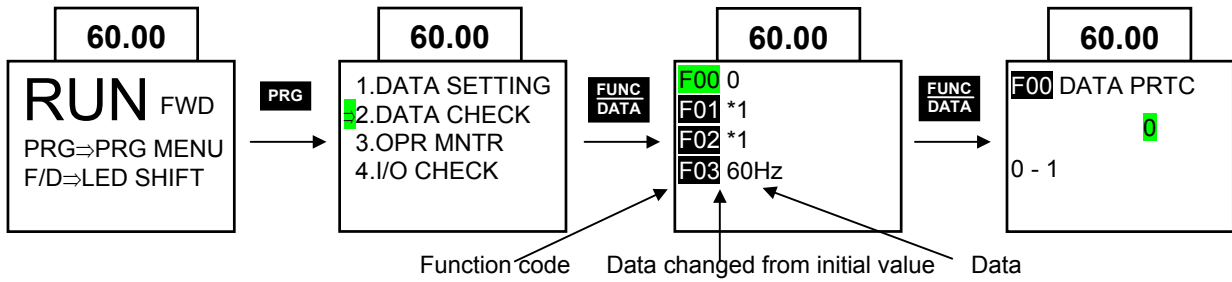
On the "data setting" screen, the data values on the LCD can be increased or decreased in the smallest possible unit by pressing **▲** or **▼**. Holding down **▲** or **▼** expands the rate of change, thereby enabling values to be modified more rapidly. Otherwise, select the digit to be modified using **>>**, then set data directly. When data is modified, the value before modification will be displayed at the same time for reference purpose. To save the data, press **FUNC DATA**. Pressing **RESET** cancels the changes made and returns to the "Function Select" screen. The modified data will be effective in inverter operation after the data is saved by **FUNC DATA**. The inverter operation does not change only if data is modified. When data setting is disabled in the case of "Data protected" or "Data setting invalid during inverter running," make necessary changes. Data cannot be modified for the following reasons :

Table 4-3-2

Display	Reason for no modification	Release method
LINK ACTIVE	Currently writing from RS-485/link option to Function is being made.	Send a cancel command of function writing from RS-485. Stops a "Write" operation from the link.
NO SIGNAL(WE)	The edit enabling command function is selected using a general-purpose input terminal.	Among functions E01 to E09, turn the terminal of data 19 (edit enabling command selection) ON.
DATA PRTCTD	Data protection is selected for function F00.	Change function F00 to 0.
INV RUNNING	An attempt is made to change a function that cannot be changed during inverter operation.	Stop inverter operation.
FWD/REV ON	An attempt is made to change a function that cannot be changed with the FWD/REV command on.	Turn FWD/REV command off.

4-3-6 Checking function data

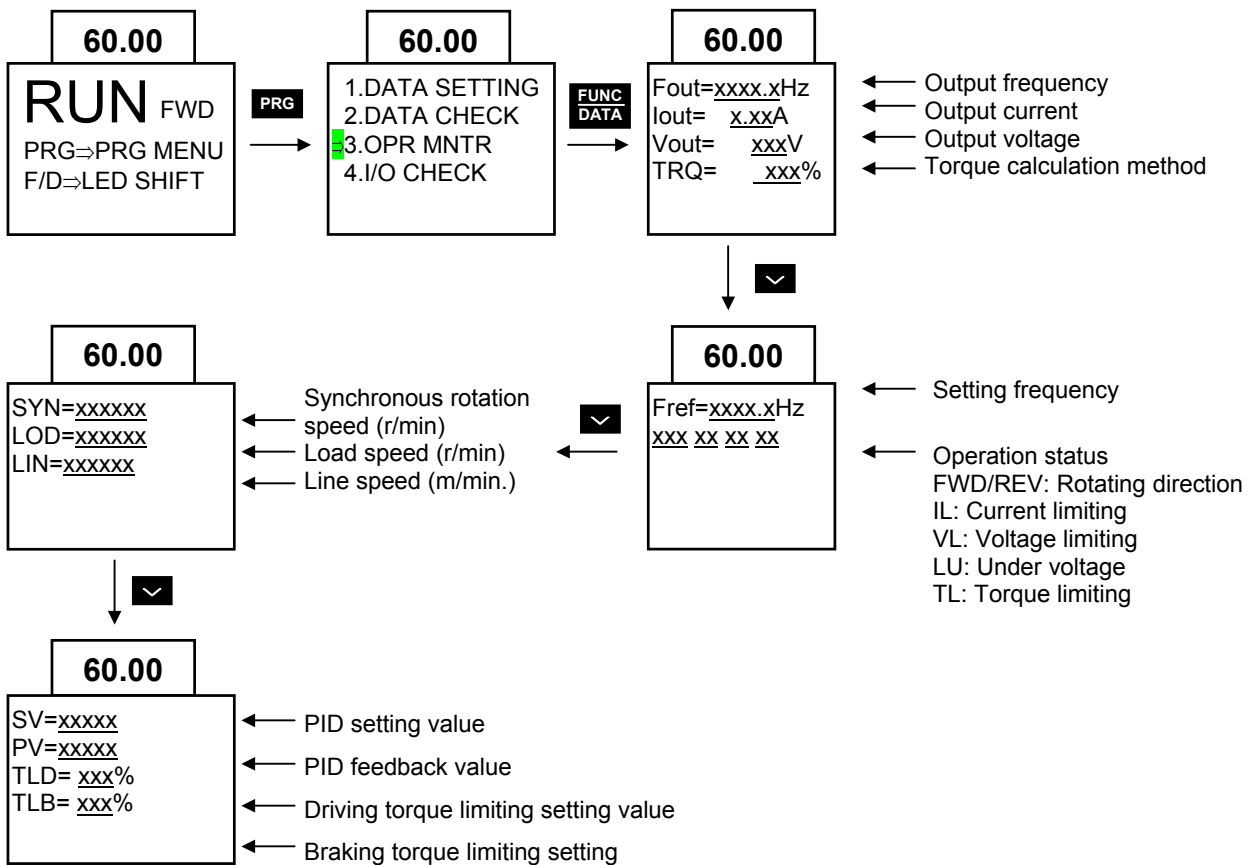
On the "Program menu" screen, select **"2. DATA CHECK"**. The "Function Select" screen then appears with function codes and names.



Select the desired function and press **FUNC DATA** to check the function data. By pressing **FUNC DATA**, the screen switches to the "Data setting" screen, to modify data.

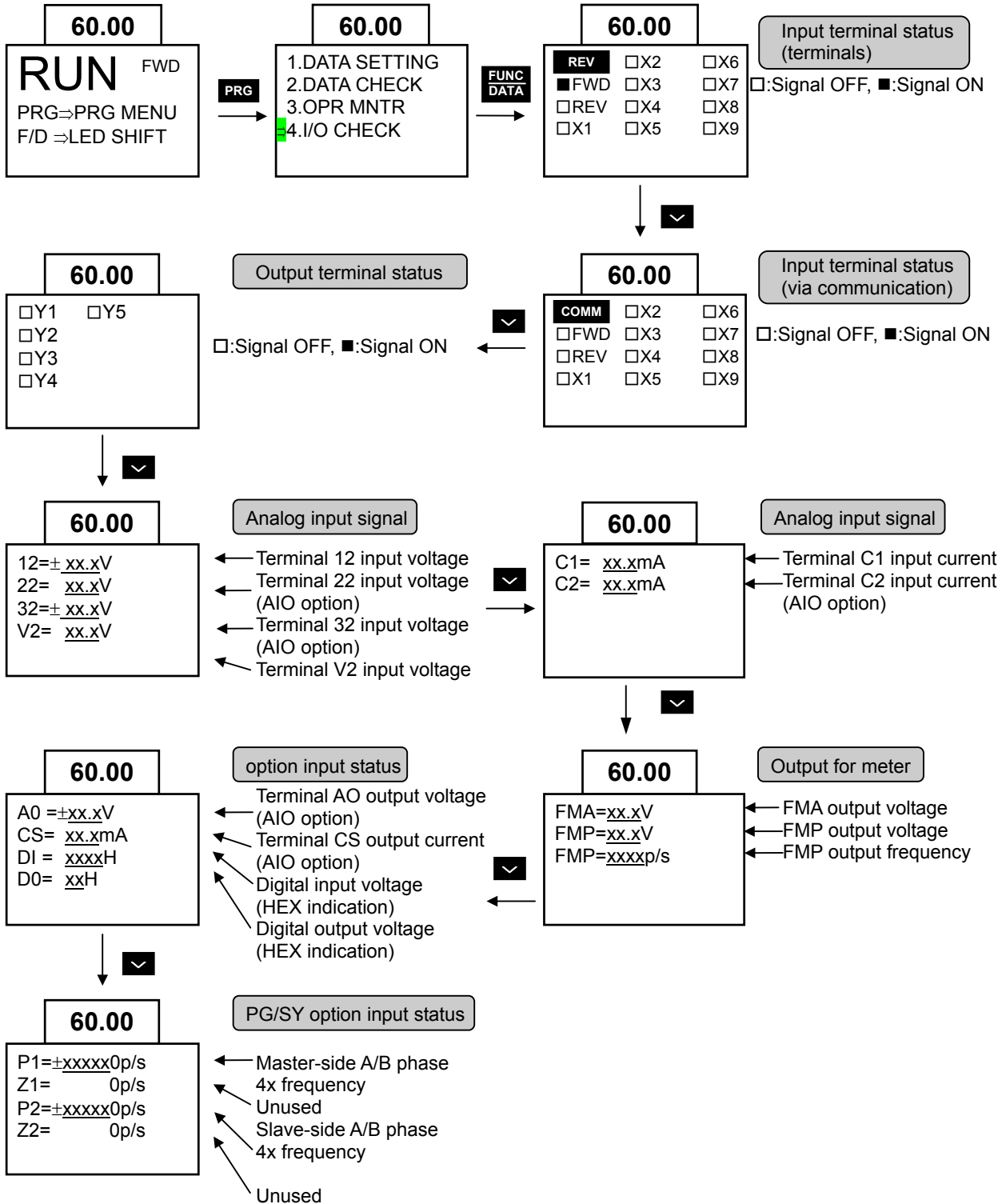
4-3-7 Monitoring operating status

On the "Program menu" screen, select **"3. OPR MNTR"** to display the present operating status of inverter. Use **▲** and **▼** to switch between the four operation monitor screens.



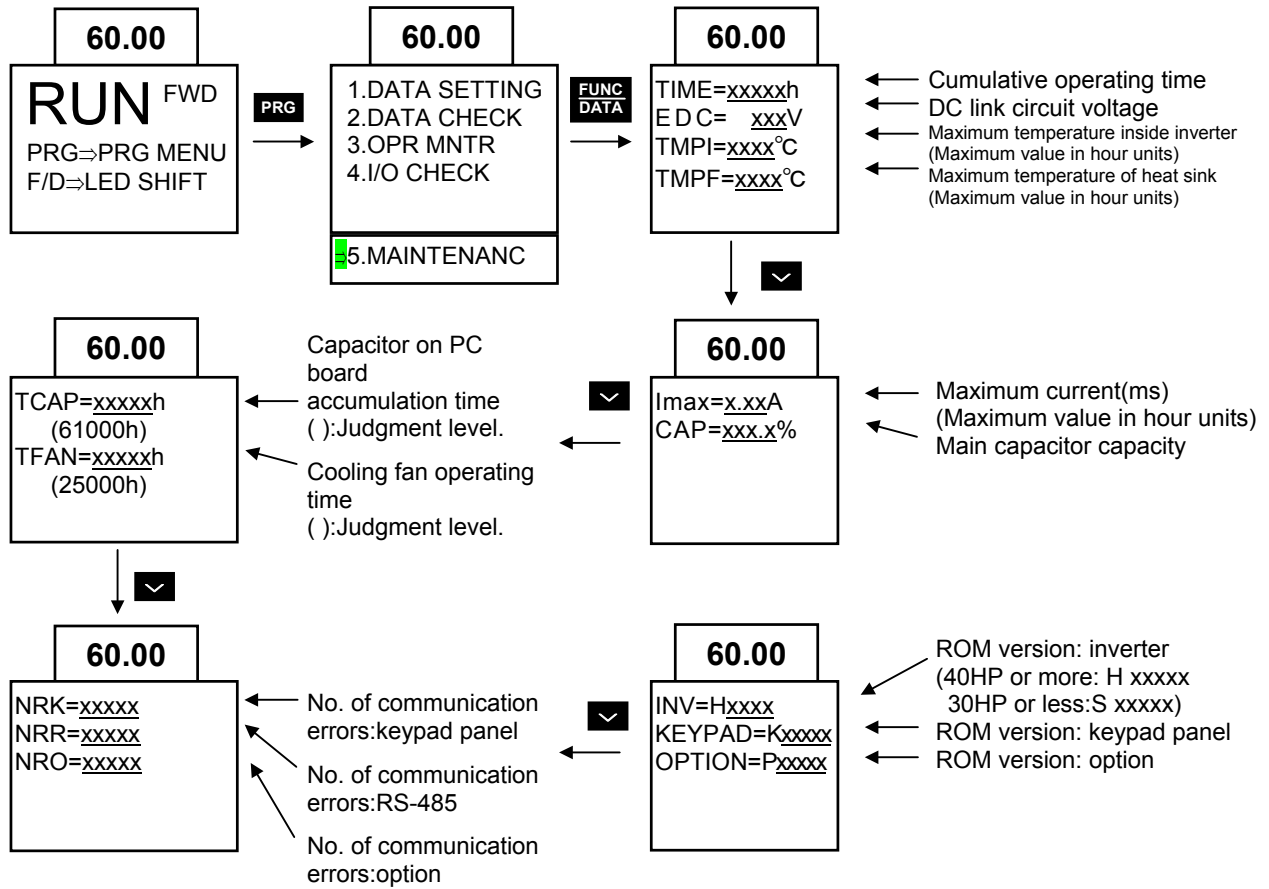
4-3-8 I/O check

On the "Program menu" screen, select "4. I/O Check" to display analog and digital input/output signal status for the inverter and options. Use **▲** and **▼** to switch between the eight screens of data.



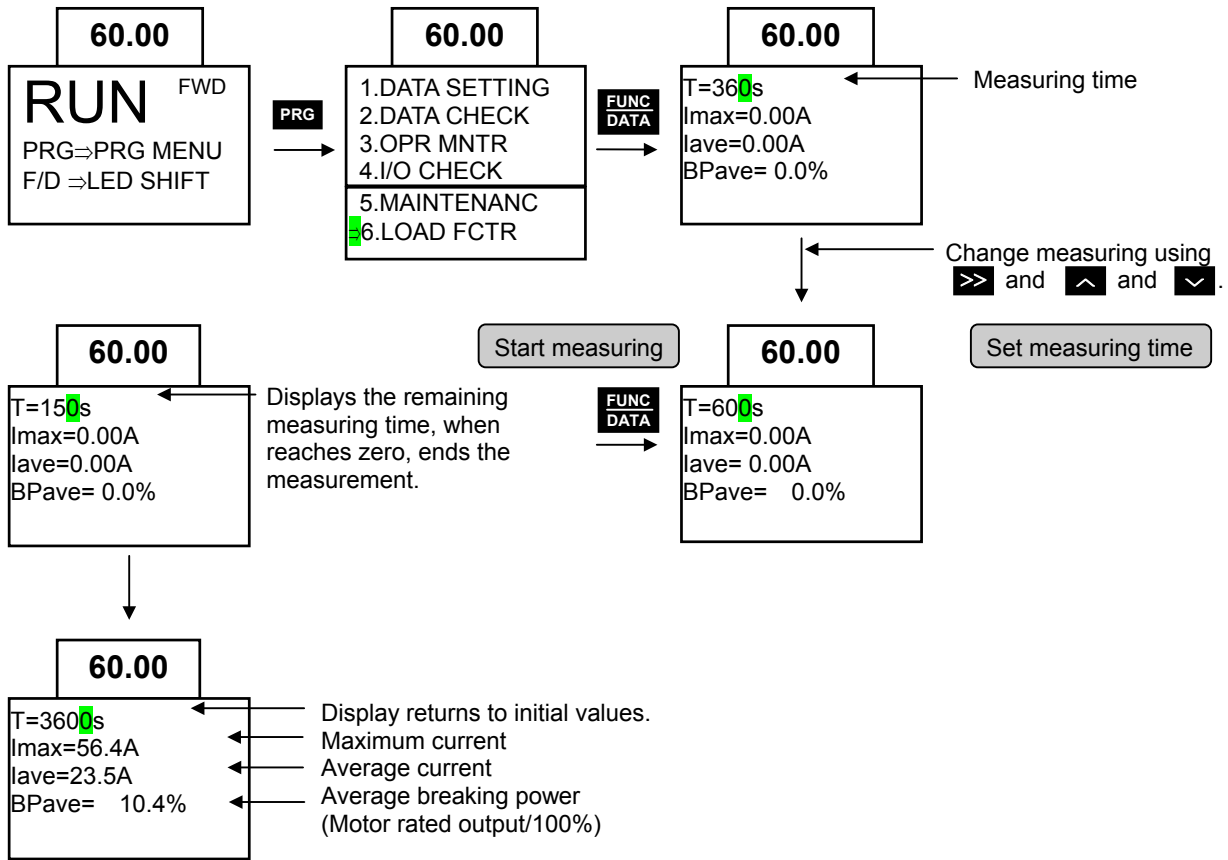
4-3-9 Maintenance information

On the "Program menu" screen, select "5. Maintenance" to display information necessary for maintenance and inspection. Use **▲** and **▼** to switch between the five screens of data.



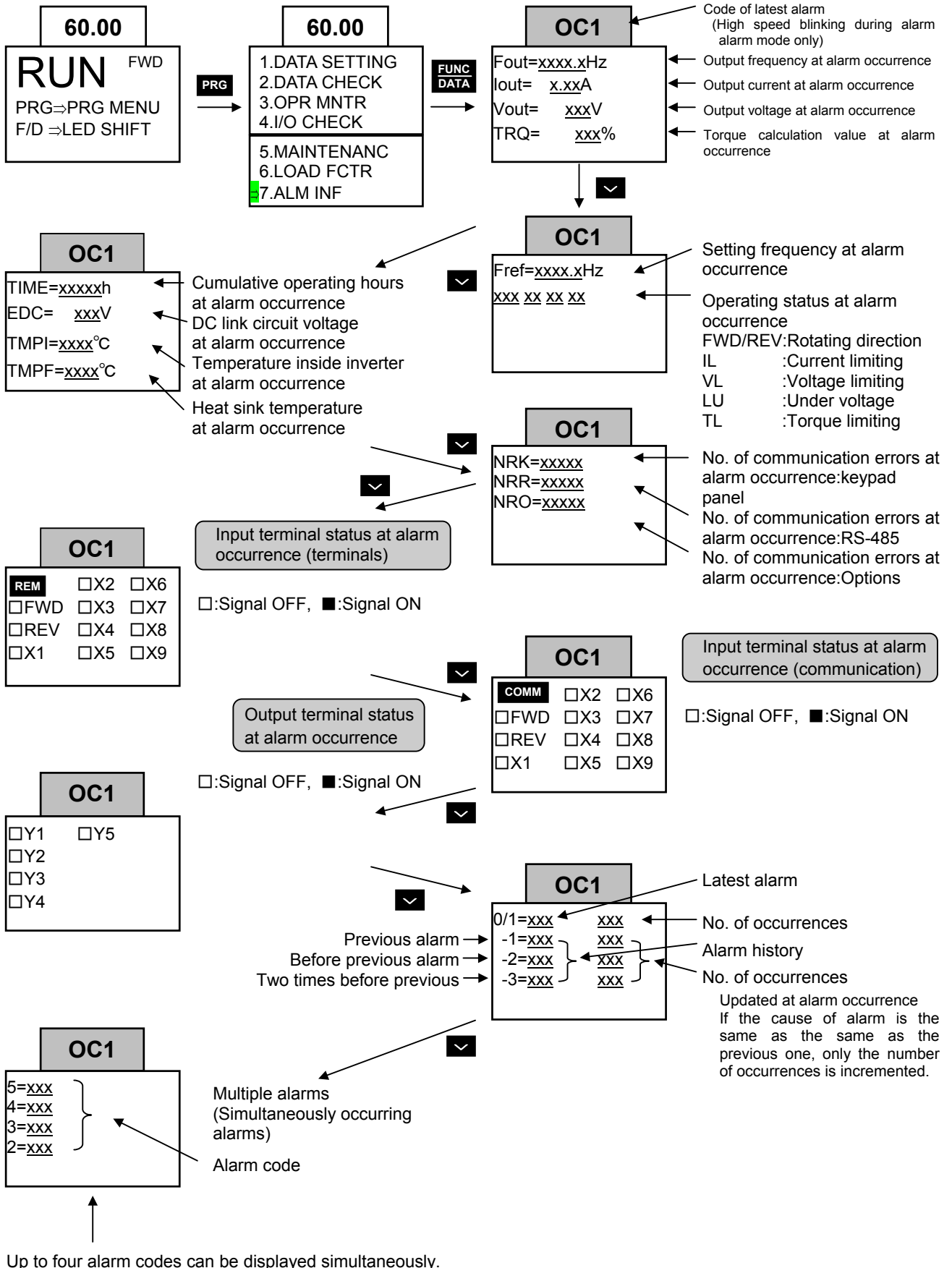
4-3-10 Load rate measurement

On the "Program menu" screen, select "6. Load Rate Measurement". On the "Load rate measurement" screen, the maximum current, average current, and average breaking power during the set measuring time are measured and displayed.



4-3-11 Alarm information

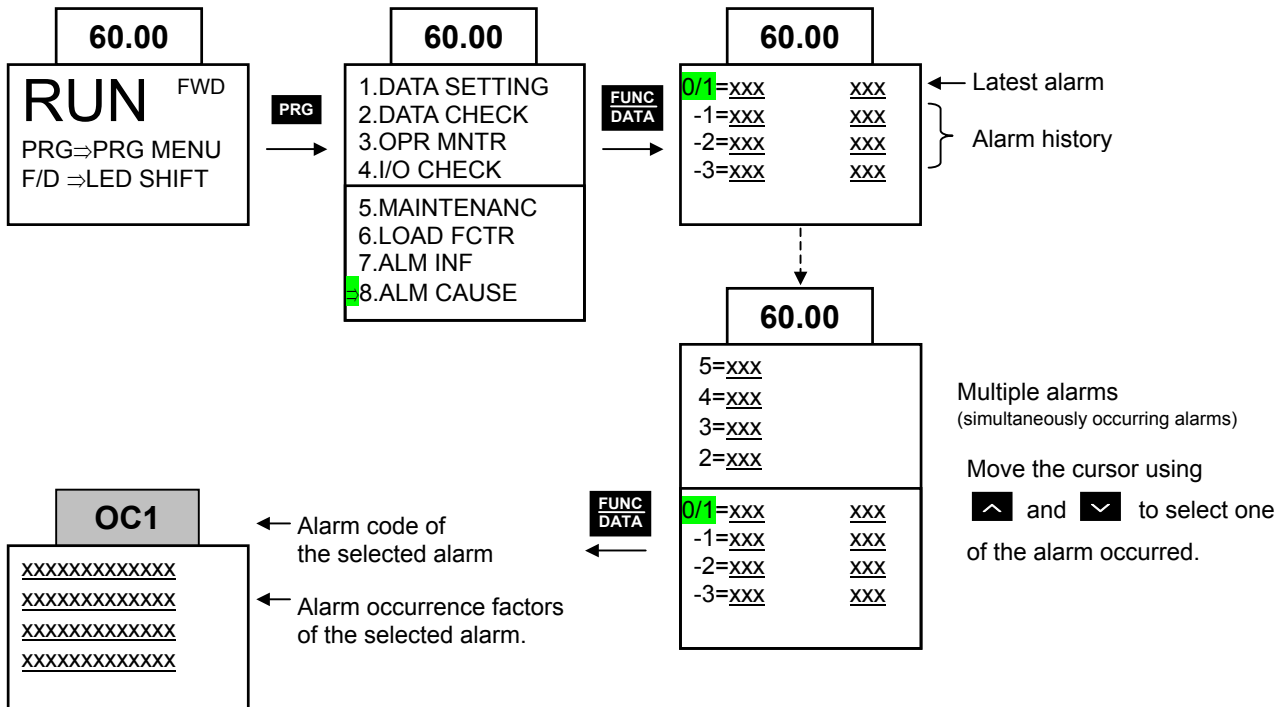
On the "Program menu" screen, select "7. Alarm Information". Various operating data when the latest alarm occurred is displayed. Use and to switch between the nine screens of alarm information data.



4-3-12 Alarm history and factors

On the "Program menu" screen, select "8.Alarm Factors" to display the alarm history.

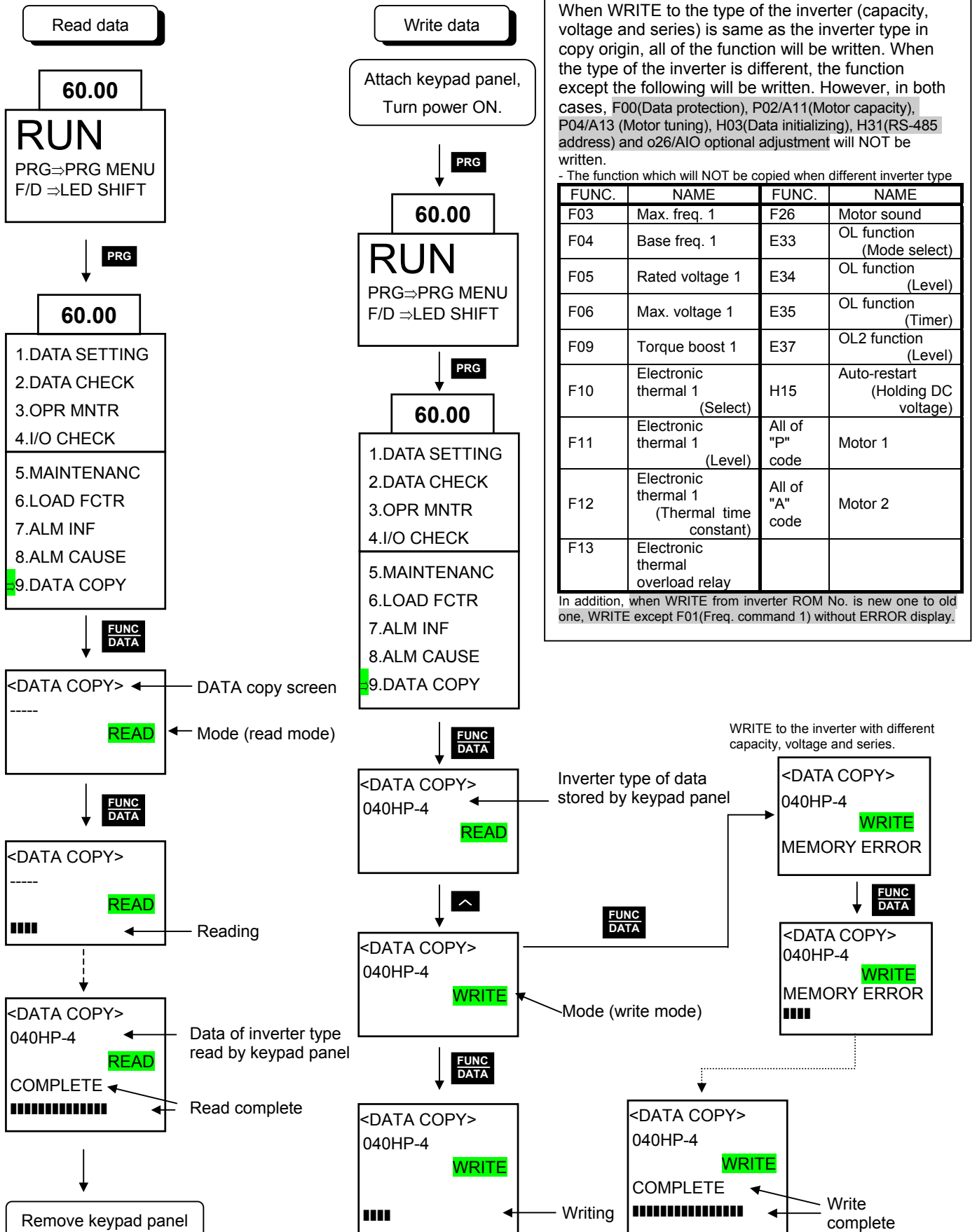
Press **FUNC DATA** to display troubleshooting information for the alarm selected.

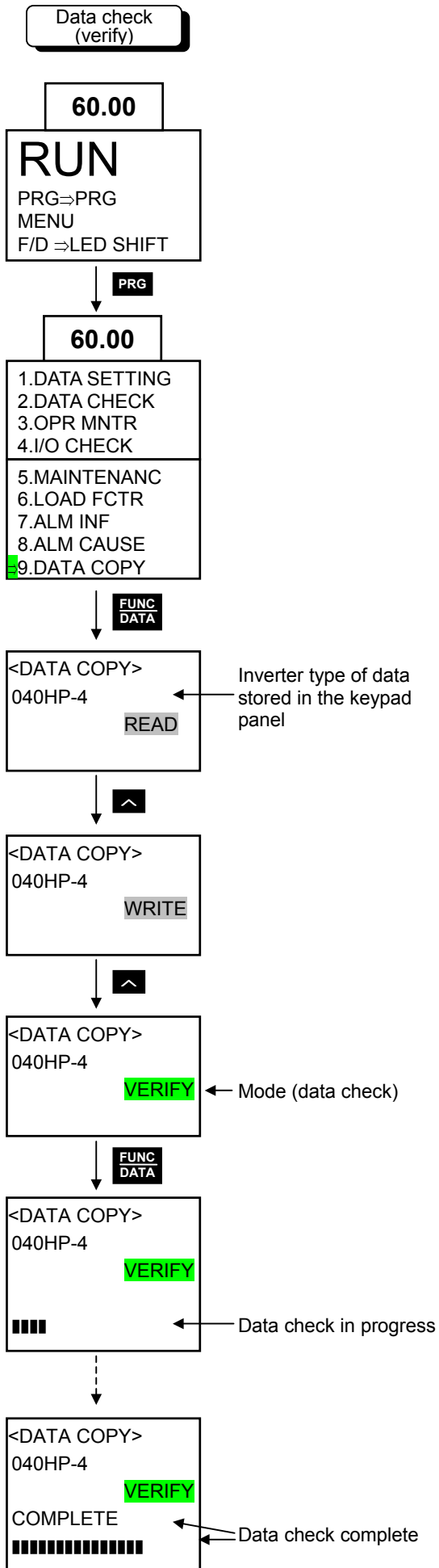


4-3-13 Data copy

On the "Program menu" screen, select **"9. Data Copy"** to display the data copy read screen. A copy operation is then performed in the following order; reading inverter function data, removing the keypad panel, attaching the keypad panel to another inverter, and writing the data to the inverter.

The "verify" feature also makes it possible to compare and check differences in the data stored in the keypad panel and the data stored in the inverter.



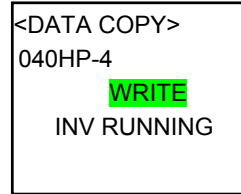


Error processing

1) Change disabled during operation

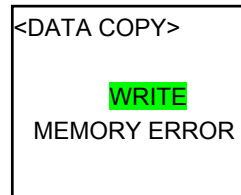
If a write operation is attempted during an inverter operation, or vice versa, the error message below will appear.

After stopping the inverter and pressing **RESET**, retry the write operation.



2) Memory error

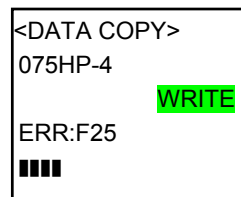
If a write operation is attempted while data has not been saved (i.e., no data) in the keypad panel data memory during the read mode, the following error message will appear:



3) Verify error

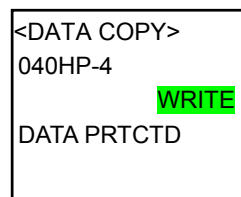
During a data check (verify) operation, if data stored in the keypad panel differs from data stored in the inverter, the following error message is displayed to indicate the function No. The data check is suspended.

To continue the data check and check for other mismatching data, press **FUNC DATA**. To stop the data check and switch to another operation, press **RESET**.





4) Data protection

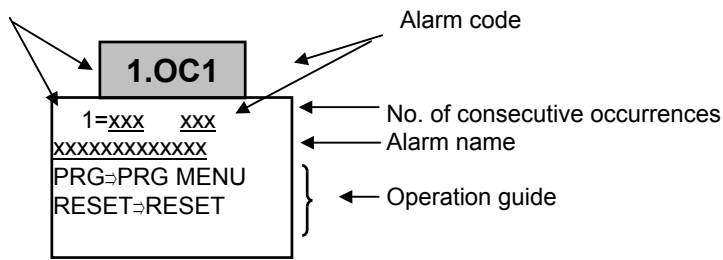
When WRITE to the inverter which is protected by "Data protection" function, the following error message will appear. After released the protection, write operation is attempted.





4-3-14 Alarm mode

If an alarm occurs, the "Alarm screen" indicating the alarm contents is displayed. Use  and  to display alarm history and multiple alarms (if more than two alarms occur simultaneously).

Alarm detection order



Alarm detection order

Operation method	LED display	LCD display	Description
 	5.	5	No. 5 alarm
	4.	4	No. 4 alarm
	3.	3	No. 3 alarm
	2.	2	No. 2 alarm
	1.	1	No. 1 alarm (more than two alarms occurred)
	Blank	0	Latest alarm (only one alarm occurred/alarm released)
	Blank	-1	Previous alarm history
	Blank	-2	Alarm history before previous alarm
	Blank	-3	Alarm history two times before previous alarm

Alarm code: See Table 6-1-1