

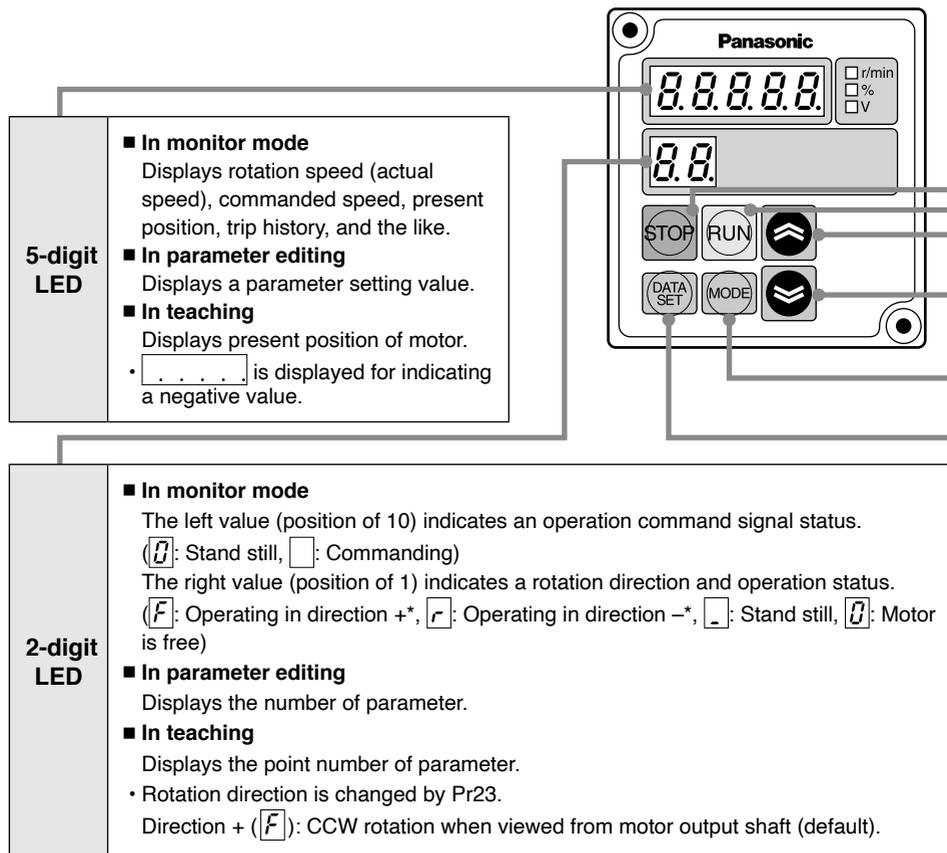
How to use Digital key pad (option)

Function of Digital key pad

- Monitoring of rotation speed (actual speed) and load factor, etc.
- Display detail of trip, and trip history. Trip reset by pressing and .
- Parameter setting, initialization, and copying function.
- Teaching function (Target point (positioning point) can be set by actually starting the motor.)
 - When using Digital key pad, the Digital key pad connection cable (DV0P383**/option) is required.

Using the Digital key pad

- When power is turned on, rotation speed (actual speed) r/min is displayed in monitor mode (changeable by Pr7A).
- Displayed value is an index. Do not use the Digital key pad for a measuring instrument.



	<p>When switch is pressed, the setting change warning (CAU) is displayed, and the motor is stopped and tripped.</p>
	<ul style="list-style-type: none"> ■ In monitor mode When this switch is pressed for about 4 seconds, system shifts to teaching mode. ■ In teaching When homing is not completed, homing operation is executed by pressing this switch for about 4 seconds in teaching mode.
	<ul style="list-style-type: none"> ■ In monitor mode Trip reset can be executed by pressing and at the same time. ■ In parameter editing This switch allows selection of parameter, and setting and changing of details. Parameter changes continuously while this switch is held down. ■ In teaching When homing is completed, teaching operation (motor drive) is enabled by the switch and .
	<ul style="list-style-type: none"> ■ In monitor mode Switch for changing monitor mode. Whenever this switch is pressed, the mode changes in this sequence: Rotation speed (actual speed) → Internal DC voltage (voltage of smoothing capacitor in power supply) → Load factor → Torque → Commanded speed → Present position (lower 5 digits) → Present position (shaft rotation number) → Rotation speed (actual speed) → ■ In parameter editing, and in teaching System shifts to monitor mode. (Setting is not saved in EEPROM.)
	<ul style="list-style-type: none"> ■ In monitor mode System shifts to parameter number mode. ■ In parameter editing This switch is for changing parameter number mode and parameter setting mode, and for saving parameter setting in EEPROM. ■ In teaching This switch is for changing point number mode and teaching mode, and for saving setting in EEPROM (nonvolatile memory built in the amplifier).

How to use Digital key pad (option)

Description of various modes

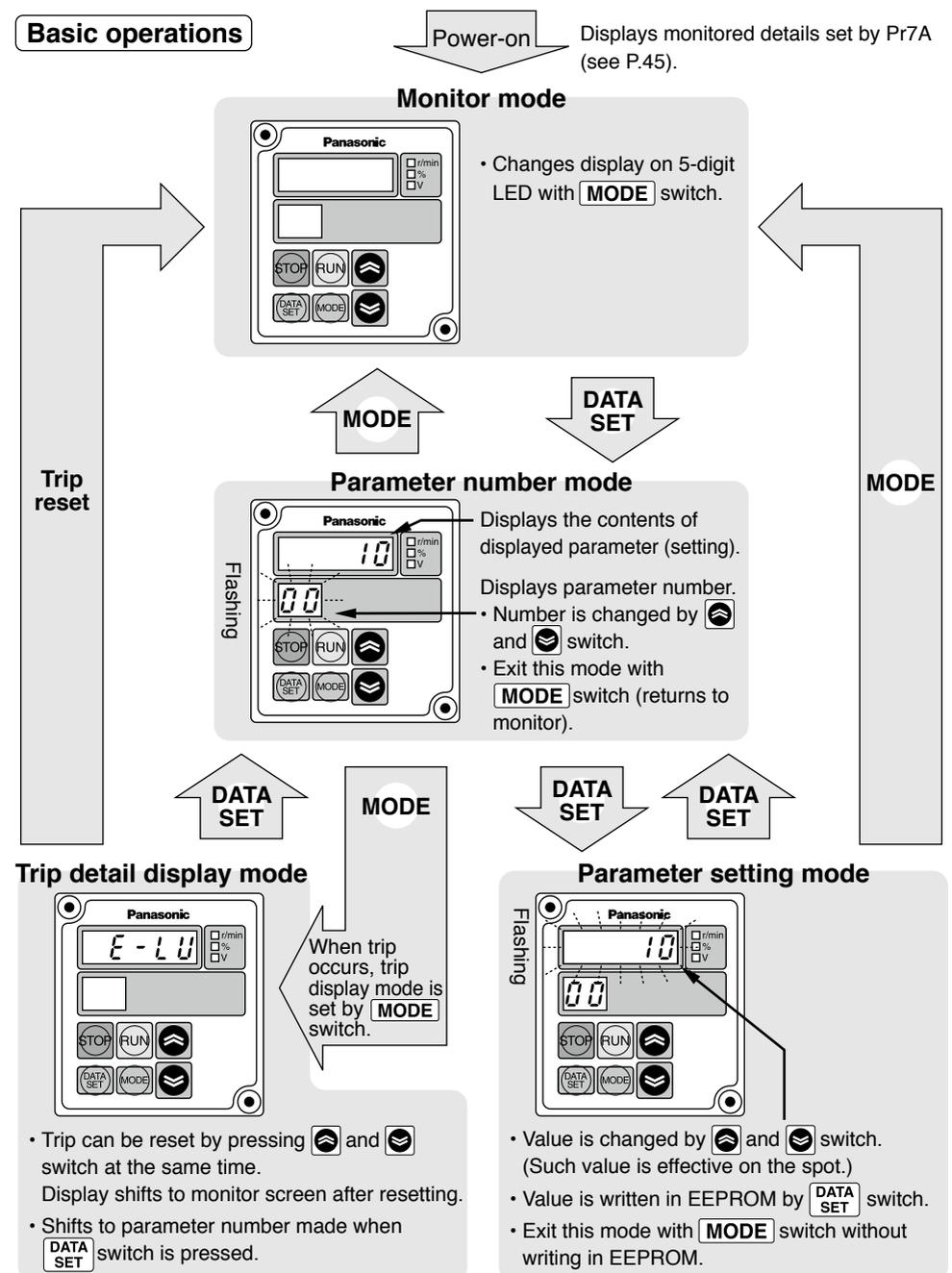
Monitor mode	<p>Displays rotation speed (actual speed), commanded speed, internal DC voltage, load factor, torque, and present position on 5-digit LED. This mode is set when power is turned on.</p> <p>Control changes to this mode when MODE switch is pressed in parameter number mode, parameter setting mode, point number mode, and point setting mode.</p>
Parameter number mode	<p>Displays a parameter number (00 to 7F) in flashing.</p> <p>Control changes to this mode when DATA SET switch is pressed in parameter number mode.</p> <p>Parameter number can be changed and selected by and switch.</p>
Parameter setting mode	<p>Displays the detail of parameter (setting) in flashing.</p> <p>Control changes to this mode when DATA SET switch is pressed in monitor mode.</p> <p>Change setting by and switch.</p> <p>When DATA SET switch is pressed after change of setting, it is saved in EEPROM.</p>
Point number mode	<p>Displays a parameter number (01 to 04) in flashing.</p> <p>Control shifts to this mode when RUN switch is pressed for 4 seconds in monitor mode.</p> <p>Point number can be changed and selected by and switch.</p>
Teaching mode	<p>Displays the present position of motor (distance from home) in flashing.</p> <p>(If homing is not completed, - - - - is displayed.)</p> <ul style="list-style-type: none"> When present position is greater than 99999, is displayed. When present position is smaller than -99999, is displayed. <p>Ex. 1) When present position is 123456, only lower 4 digits are displayed.</p> <p>Ex. 2) When present position is -20, is displayed.</p> <p>Control shifts to this mode when DATA SET switch is pressed in point number mode.</p> <p>When or switch is pressed after completion of homing, the motor can be operated.</p> <p>If homing is not completed yet, homing operation is started when RUN switch is pressed for 4 seconds.</p> <p>When DATA SET switch is pressed, the present position is set in parameter as a point setting, and saved in EEPROM</p>

<Information>

Present position is the distance from the home, indicated in pulses (288 pulses/rotation).

Operation of the Digital key pad

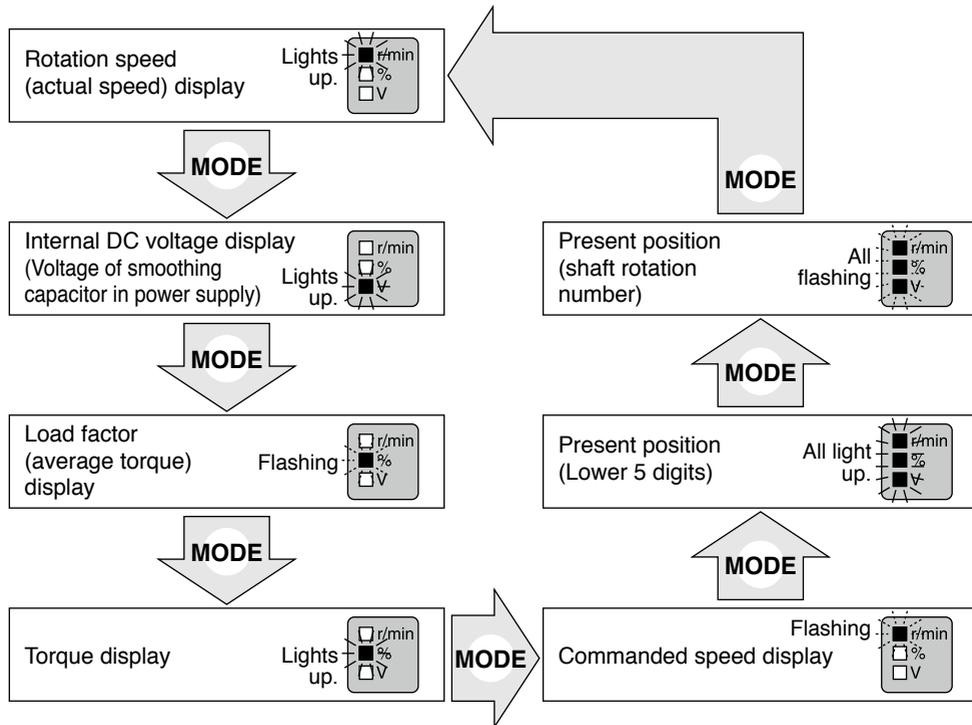
Basic operations



How to use Digital key pad (option)

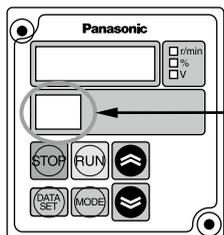
Monitor mode

Monitor display item can be changed after power is turned on and when monitor mode display is on. (See P.45 for setting of Pr7A.)



Display of present position

- When homing is not completed, is `- - - -` displayed.
 - When present position is greater than 99999, `~0000` is displayed.
 - When present position is smaller than -99999, `~.0000` is displayed.
- Ex. 1) When present position is 123456, only lower 4 digits `3456` are displayed.
- Ex. 2) When present position is -20, `. . . 20` is displayed.



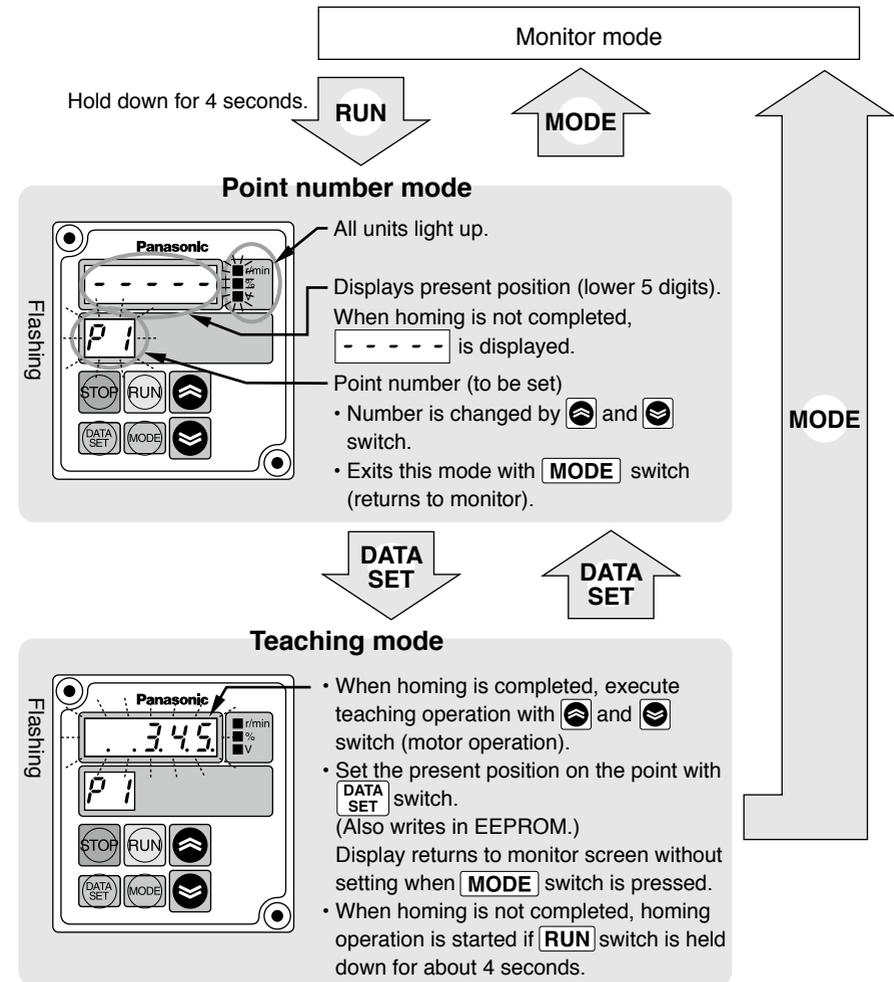
Left (position of 10)
 ... Displays command status.
 □: Stand still
 □: In Motion (BUSY)

Right (position of 1)
 ... Displays rotation direction.
 □: Running in - direction.
 □: Running in + direction.
 □: Stand still
 □: Motor is free.

Teaching function

This motor allows two target position setting methods, one of which is setting by parameter value, and the other is setting target position by actually operating the motor by use of teaching function.

In order to use teaching function, press **RUN** switch for 4 seconds or longer on the monitor mode display screen, then control shifts to point number mode of teaching function.



[Caution]

- In teaching mode, displayed present position is set as target position.
- Set the point coordinate setting to absolute travel. (Pr02, 0A, 12, and 1A).
 When the point coordinate setting is set to relative travel, stop position is different between teaching setting and actual operation.
- In point number mode and teaching mode, operation instruction by I/O or RS485 is not accepted.

How to use Digital key pad (option)

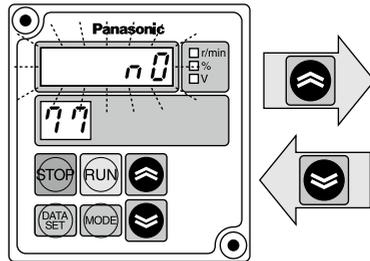
Parameter copy function

Parameter copy function (Digital key pad ↔ Brushless amplifier) can be used by Pr77.

• Initializing the data of the Digital key pad

EEPROM installed onboard the Digital key pad is initialized (data cleared).
When reading is disabled, or when data transfer fails during copying, execute “Data initialization of the Digital key pad”.
Normally, it is not required.

All flashing on display



• Reading parameters

Parameter of Brushless amplifier is read and saved in EEPROM of the Digital key pad.
Read parameter is retained even when the Digital key pad is separated from the Brushless amplifier.

• Writing parameters

Parameter information saved in the Digital key pad is written to the Brushless amplifier.
(Saved in EEPROM of Brushless amplifier)

<Information>

• Error in copying parameters

P.E r r 1: Data trouble was found during copying

→ Press **STOP** switch for clearing, and then copy the parameter again. If data trouble is still found, initialize the Digital key pad and try again.

P.E r r 2: Copy error

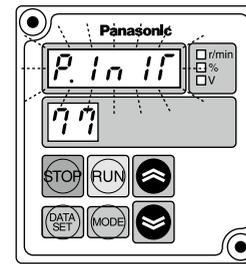
→ This error occurs in the attempt to copy data between products with different function. Press **STOP** switch to cancel the error.

Although parameters can be copied between the same models with different output, parameters should be copied between the same outputs in principle.

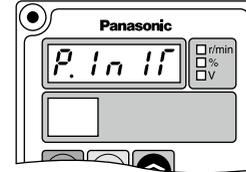
<Note>

Do not turn off power or disconnect the connection cable of Digital key pad during operation such as “Initializing data of Digital key pad”, “Reading parameter into Digital key pad”, “Writing parameter to brushless amplifier”, etc.

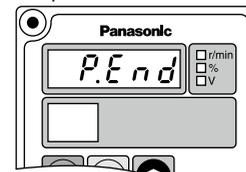
Data initialization of Digital key pad



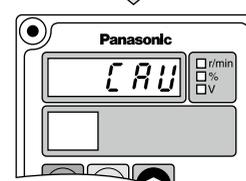
STOP + DATA SET
Hold down (for about 1 second).



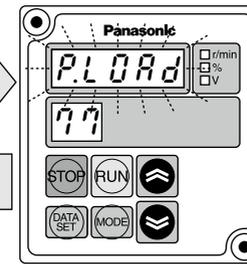
All flashing on display
For about 30 seconds
Process completed



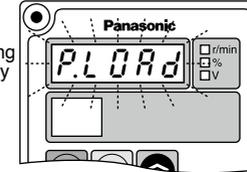
STOP



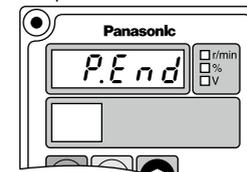
Parameter reading (Amplifier → Digital key pad)



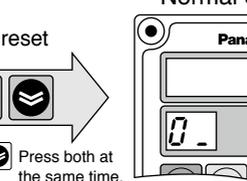
STOP + DATA SET
Hold down (for about 1 second).



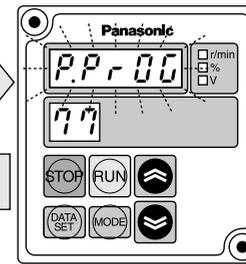
All flashing on display
For about 30 seconds
Process completed



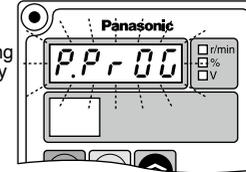
STOP



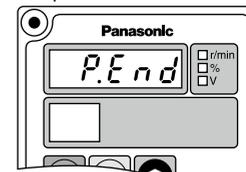
Parameter writing (Digital key pad → Amplifier)



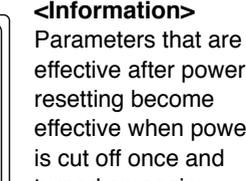
STOP + DATA SET
Hold down (for about 1 second).



All flashing on display
For about 10 seconds
Process completed



STOP



Trip reset
Press both at the same time.

Normal condition

<Information>
Parameters that are effective after power resetting become effective when power is cut off once and turned on again.

Test run

Inspection before Test run

- 1) Make sure that all wiring is correct.
- 2) Make sure that input power supply conforms to rating.

Test run

Procedure for test run using the Digital key pad is as follows:

Shown here is the case of running at 300r/min in direction CW or CCW by use of teaching function.

First execute the following work for safe operation.

- [1] Ensure that the motor alone can be operated.
- [2] Turn on power and follow the steps below for test run.

Description of operation	Operation panel	
	Switch	LED display
1. Turn on power		
2. Set the action Pr4E (Setting of teaching speed)	Press	Flashing
	Press and choose parameter 4E (teaching speed). (Initial setting: 50)	Flashing
	Press	Flashing
	Press change the teaching speed to 300.	Flashing
	Press	Flashing
3. Return to monitor mode.	Press	

Description of operation	Operation panel	
	Switch	LED display
4. Teaching operation	Press for 4 seconds	Flashing
	Press	Flashing
	When is pressed in this condition, the motor rotates in + direction* and 5-digit LED indicates position coordinates.	Flashing
	When is released, the motor stops. (LED display "5000" is an example, which shows the present position of the motor.)	Flashing
	When is pressed after the motor has stopped, the motor rotates in one direction.	Flashing
	When is released, the motor stops. (LED display ". . 355." indicates that the present position is -355.)	Flashing
5. Exit	When exiting the mode without setting data, press switch to return to monitor mode.	

Checkpoint in Test run

- [1] Check whether the motor rotates smoothly. Check for abnormal noise and vibration.
- [2] Check whether the motor is accelerated and decelerated smoothly.
- [3] Make sure that the direction of motor rotation is correct.

* Rotation direction + represents CCW on the motor shaft in default setting. (Can be changed by Pr23 coordinate system setting.)

Rotation direction of gear head output shaft may sometimes be reversed due to reduction gear ratio when gear head is installed.

(See the table of permissible shaft torque on P.29. Rotation direction is described.)