

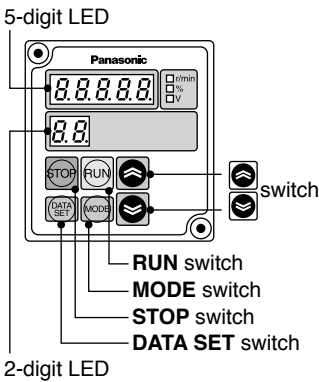


How to use Digital key pad (option)













Name of each part and how to setup

• What can be done by Digital key pad







- Monitoring of rotation speed (actual speed) and load factor, etc. (Rotation speed can be displayed being multiplied by the factor set by parameter **47** and **48**.)
- Display detail of trip, and trip history. Trip reset by pressing  and .
- Parameter setting, initialization, and copying function.
- Start and stop of motor by **RUN**, **STOP** switch (Setting of parameter “**30** Run command selection” is required.)



• Name of each part

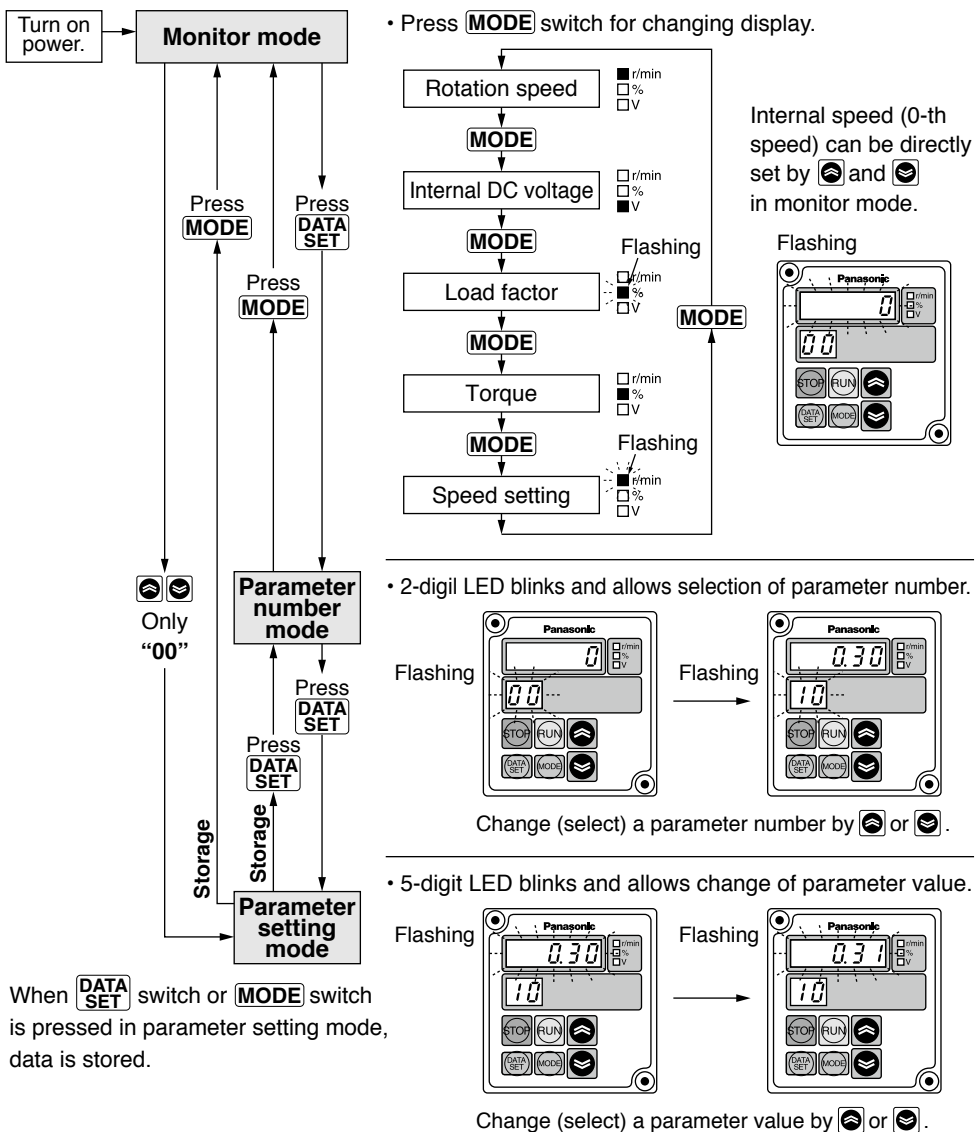
5-digit LED	Displays rotation speed (actual speed), commanded speed, trip history, setting of parameter, and the like.
2-digit LED	Displays the number of parameter (in editing parameter). Displays the rotation direction in operation. Displays  when the motor is stopped. (CCW as viewed from the output shaft of motor ...  and CW... ) Rotation direction of gear head output shaft may be reversed for some gear reduction ratio when gear head is incorporated. Please refer to the table of the permissible axis torque (P.20).
 switch	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 of power supply) → Load factor → Torque → Commanded speed → Rotation speed (actual speed) → ...* * When you press this switch in the parameter setting mode, setting is stored.
 switch	This switch is for changing parameter number mode and parameter setting mode, and for saved parameter setting.
 switch	This switch enables selection of parameter, and setting and changing of contents. When the motor is tripped, pressing  and  at the same time enables reset of trip.
 switch	This switch is for instruction of operation. (Only when “ 30 Run command selection” is ) <ul style="list-style-type: none">• See “33 I1/I2 function selection” (2) on P.38 for rotation direction.• Disconnecting the Digital key pad while operating with RUN switch will stop the operation.
 switch	This switch is for instruction of stopping. (Only when “ 30 Run command selection” is )






• Description


Monitor mode	Displays rotation speed (actual speed), setting speed, internal DC voltage, load factor, and torque on 5-digit LED. This mode is set when power is turned on. Control changes to this mode when MODE switch is pressed in parameter number mode, parameter setting mode.
Parameter number mode	Displays a parameter number (00 to F0) in blinking . Control changes to this mode when  switch is pressed in monitor mode. Parameter number can be changed and selected by  and  switch.
Parameter setting mode	Displays the detail of parameter (setting) in blinking . Change setting by  and  switch. When  switch or MODE switch is pressed after change of setting, it is saved in EEPROM.

- * Displays rotation speed r/min in normal monitor mode. Displays torque and load factor assuming the rated motor torque at 100%.
- * Display is just a guide. Do not use the Digital key pad for a measuring instrument.

Operating Instruction



- When  or  is pressed in monitor mode, detail of “00 Internal speed (0-th speed)” is displayed in blinking, and speed setting can be changed by  and .
- When “31 Speed command selection” is , the motor speed also changes following the speed setting if the motor is running.

Data is stored only when  switch is pressed. If the power is turned off without storage, setting data will return.

Test run (Digital key pad)

Inspection prior to test run/ Test run

Inspection prior to test run









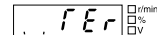



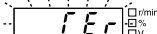


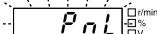

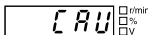


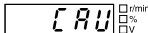

- (1) Make sure that all wiring is correct.
- (2) Make sure that input power supply conforms to rating.

Test run

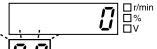

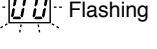

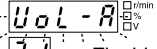
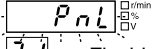
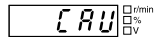


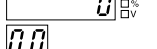
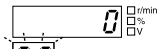

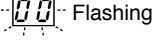

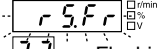
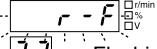
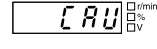


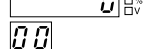
Test run procedure by the Digital key pad is as follows:


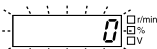

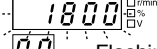
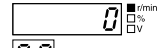
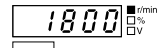


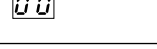
An example is introduced here where the motor runs CW at 1800 r/min with the Digital key pad.

- (1) Be sure to first perform the work below for safety.
Separate the motor from machine or equipment, and make sure that the motor alone can be operated.
- (2) Then turn on power and follow the step below for test run.

Description of operation	Digital key pad	
	Switch	LED display
[1] Turn on power		 
[2] Change of initial setting (Change the choice of operation instruction from I1/I2  to the Digital key pad  .)	Press 	  Flashing
	Press  several times to choose parameter 30.	  Flashing
	Press 	
	Press  to change parameter value.	  Flashing
	Store by 	  Flashing
[3] Trip reset	Setting change warning is issued because setting of operation instruction has been changed.	
	Press  and  at the same time.	 

Test run (Digital key pad)

Description of operation	Digital key pad	
	Switch	LED display
[4] Change of initial setting 2 (Change the choice of speed instruction from analogue speed instruction input to “00 Internal speed (0-th speed)” to enable use of Digital key pad.)	Press DATA SET	
	Press  several times to choose parameter 31.	
	Press DATA SET	
	Press  to change parameter value.	
	Store by DATA SET .	
[5] Trip reset	Setting change warning is issued because setting of operation instruction has been changed.	
	Press  and  at the same time.	
[6] Choosing rotation direction* (This operation is not required for rotation forward [CCW].)	Press DATA SET	
	Press  choose several times to parameter 33.	
	Press DATA SET	
	Press  to change parameter value.	
	Store by DATA SET .	
[7] Trip reset	Setting change warning is issued because setting of operation instruction has been changed.	
	Press  and  at the same time.	

Description of operation	Digital key pad	
	Switch	LED display
[8] Speed setting	Press 	
	Press  to set a speed.	
[9] Reset to monitor mode.	Press MODE	
[10] Operation instruction	Press RUN	
		
[11] Stop instruction	Press STOP	
		
[12] Power OFF		

<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) Rotation direction and rotation speed of the motor are matched?

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

* Rotation direction can also be changed by use of “12”. See “33 I1/I2 function selection” (2) on P.45.

■ Setting is still stored when power is turned off. When operating the motor with Digital key pad only in trial run, either reset the setting or initialize parameters after completion of trial run. (Parameter 54)

Here, note that all parameters return to default when parameters are initialized.

How to copy parameter

1. Reading a parameter value from brushless amplifier to the Digital key pad.

• Once parameters are read into the console, their details are stored in the Digital key pad.

Description of operation	Digital key pad	
	Switch	LED display
[1] Turn on power		
[2] Call "57 parameter copy"	Press DATA SET Hold down to choose parameter 57.	→
[3] Choose reading a parameter into the Digital key pad.	Press DATA SET Press twice to choose .	→
[4] Read a parameter into the Digital key pad.	Press DATA SET for 1 second while holding down STOP .	→
[5] Wait about 30 seconds.		
[6] Reading of parameter into the Digital key pad completed	Press STOP	





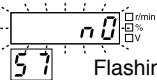
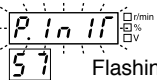


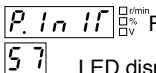
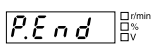

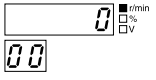
2. Copy a parameter value saved in the Digital key pad onto the brushless amplifier.

Description of operation	Digital key pad	
	Switch	LED display
Turn on power. Call "57 parameter copy". (Same operation as 1. [1] and [2])		
[1] Choose writing a parameter to the brushless amplifier.	Press DATA SET Press three times to choose .	→
[2] Write a parameter to the brushless amplifier.	Press DATA SET for 1 second while holding down STOP .	→
[3] Wait about 10 seconds.		
[4] Completion of writing a parameter from the Digital key pad to the brushless amplifier.		
[5] Reset to monitor mode.	Press and at the same time for clear trip.	
<p>Error while copying a parameter</p> <p> : Data is abnormal while copying. → Press STOP switch for clearing, and then copy data again. If data is still abnormal, initialize the Digital key pad and retry.</p> <p> : Copy error → This error occurs in an attempt to copy data between products of different function. Press STOP switch for clear. Parameters can be copied between the same models, but parameters should be copied between the same output in principle because gain setting is different.</p>		

How to copy parameter

3. Initializing of data of Digital key pad.

- When any trouble occurs during copying, it can be often solved by initializing the Digital key pad. (Stored data is cleared by initializing.)

Description of operation	Digital key pad	
	Switch	LED display
Turn on power and call “57 parameter copy”. (Same operation as 1. [1] and [2])		
[1]  Choose initialization of data of Digital key pad.	Press  Press  once and choose  .	 → 
[2] Initialization of Digital key pad.	Press  for 1 second while holding down  .	 → Continuous lighting LED display changes from flashing to continuous lighting during initializing operation.
[3] Wait about 30 seconds.		
[4] Initializing of data of Digital key pad completed	Press 	

- Do not turn off power or disconnect the cable of Digital key pad during operation such as "Reading a parameter from the brushless amplifier to the Digital key pad", "Copying a parameter value stored in the Digital key pad to the brushless amplifier", and "Initializing the data of Digital key pad".