TOSHIBA

E6580719

TOSVERT VF-A5 Option

Parameter Writer Instruction Manual

toshiba inverter PWA5 - 001 manual

PWA5 - 001

Notice

1. Make sure that this instruction manual is delivered to the end user of the Parameter Writer.
2. Read this manual before connecting or operating the Parameter Writer. Keep the manual nearby for future reference.

Ver. 100

Introduction

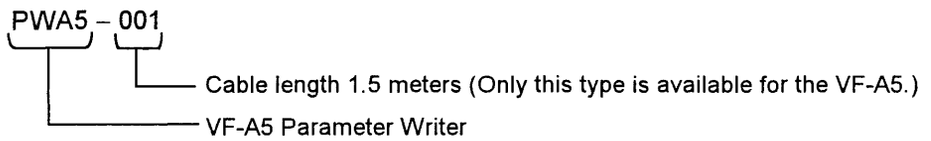
Thank you for purchasing the "Parameter Writer" for the Toshiba high-performance inverter TOSVERT VF-A5.

This Parameter Writer has the following functions.

1) Copy function handy for setting data in multiple inverters.
2) Compare function to confirm the copy results.
3) Edit function to edit the parameters.

Always read this manual before using the "Parameter Writer" to ensure correct use of this Parameter Writer's outstanding functions.
This manual must be kept by the "Parameter Writer" user, and used for future maintenance and inspections.

[Explanation of Parameter Writer type]



[Precautions for using Parameter Writer]

1) Copying to differing inverter types (capacities)

   When using this Parameter Writer for different inverter types, some specific parameters will not be copied. This Parameter Writer can be used with inverter versions (G-UE uCPU) u 110 (version 110) and above. Only the COPY function can be used with versions u 110 and below. If the compare function or edit function is used with versions u 110 and below OLd will appear, and the function will be inhibited. (Refer to Chapter 4 on page 13.)

2) Holding power during parameter copying

   If the inverter's power is turned OFF or if the Parameter Writer's cable is disconnected while copying the parameters, the data will not be written in correctly to the end. Do not turn the power OFF or disconnect the cable when the Parameter Writer display (LED) is changing.

3) Prohibition of use during inverter operation

   Do not connect the Parameter Writer's cable while the inverter is running. The inverter will stop once, etc. Operation of the Parameter Writer while the inverter is running is prohibited, and is indicated with the error display (rUnE). Thus, always use the Parameter Writer while the inverter is stopped.

4) Cautions against impacts (dropping)

   If external impact (dropping, etc.) is applied on this Parameter Writer, a contact defect, etc., may occur in the operation panel connector. Take special care when handling.

5) Guaranteed limit on data saving

   This Parameter Writer uses an EEPROM to save the data. Thus, the guaranteed limit for writing data to the Parameter Writer's memory with the copy function (COPY) is 10,000 times. The data can be saved for up to ten years.

Contents

1. Outline of Functions

This Parameter Writer has four memories (A to D) to save all of the parameter data for four units (four types). Data can be copied and compared between the inverter and Parameter Writer memory, or between each memory of the Parameter Writer.

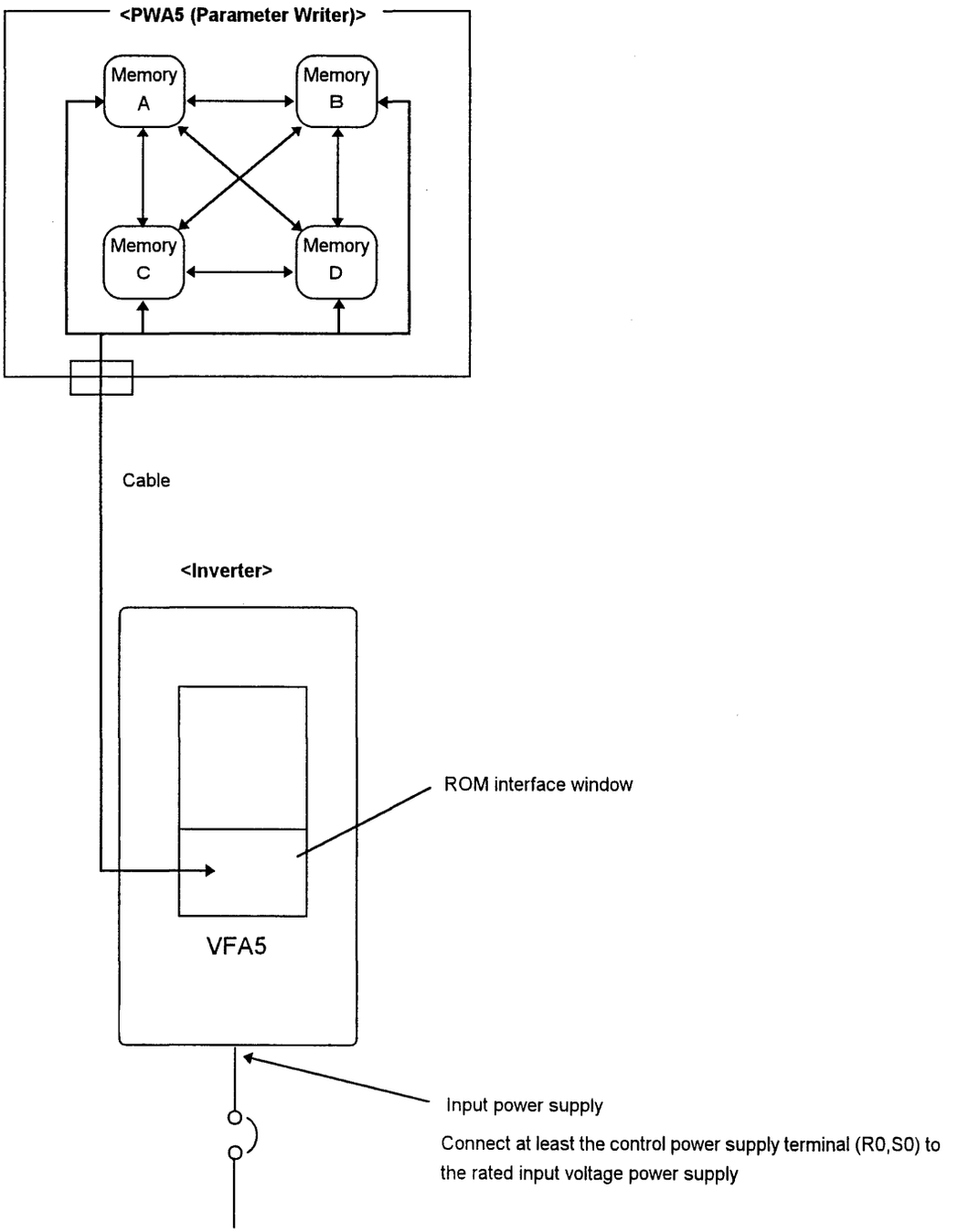


Fig. 1-1 System configuration diagram

This Parameter Writer has the following five functions.

1) Copy function [COPY]
   Data can be copied between the inverter and the Parameter Writer memories (A to D). (Inverter ⇔ Parameter Writer, or Parameter Writer memory A ⇔ B, etc.)
2) Compare function [CONP]
   Data can be compared between the inverter and the Parameter Writer memories (A to D). By using this function, the copy results can be confirmed.
3) Edit function [Ed It]
   The data in the inverter and the Parameter Writer memories (A to D) can be edited.
4) Environment function [Pr-Ot , nANE]
   This function is used to set the Parameter Writer's environment. The memory data can be protected from the copy function and edit function. A user device name, having up to three characters, can be assigned to the Parameter Writer memories A to D, to make identification easy.
5) Simple copy function
   The copy function can be used between the inverter and Parameter Writer with simple key operations.

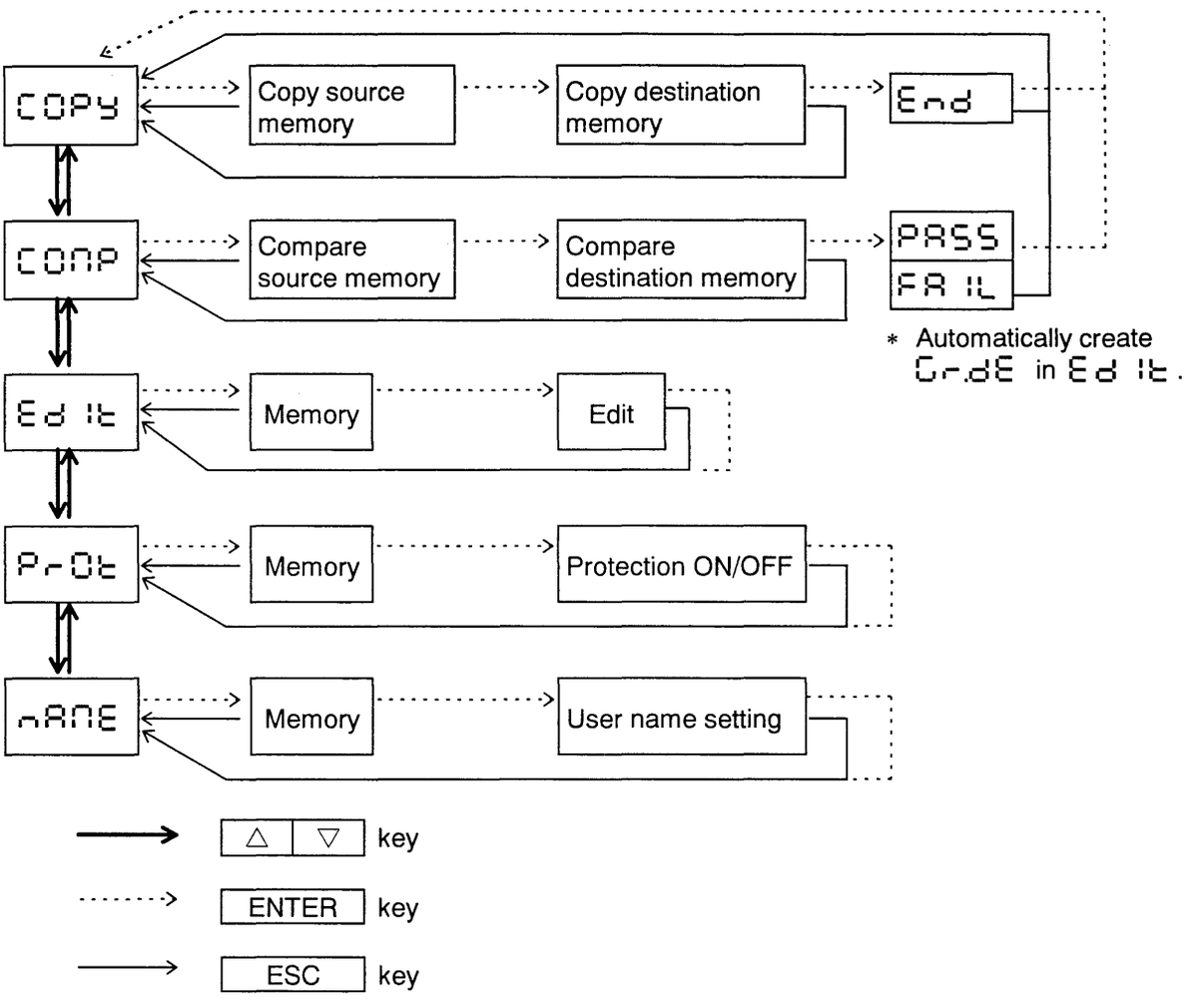


Fig. 1-2 Function configuration diagram

An example of setting the same data in multiple inverters is explained in this section, using the "simple copy function".

1) Connect the Parameter Writer to the inverter (copy source) in which the data has been set. The data will be copied (read out) to one of the Parameter Writer memories A to D using the simple copy function.
2) Connect the Parameter Writer to the inverter (copy destination) into which the data is to be set. Copy (write) the data from the Parameter Writer memory using copy function.
3) Using the compare function, confirm that all of the data has been written.
4) Repeat steps 2) and 3) with all of the inverters.

[Explanation of operation procedure]

(To simple copy (write) and compare the inverter data into memory A.)

Operation	LED display
Connect the Parameter Writer to the inverter (copy source). (Inverter → Parameter Writer copy)	
	COPY
A	↵ A
ENTER	↵ A→0 : 99→End
ENTER	End→COPY
Connect the Parameter Writer to the inverter (copy destination). (Parameter Writer → Inverter copy)	
A	↵ A
A	A ↵
ENTER	↵ A→0 : 99→PASS
ENTER	PASS→COPY

Operation	LED display
Inverter → Parameter Writer A memory comparison	
△ ▽ ENTER	COPY→CONP
△ ▽ ENTER	inv
△ ▽	A
ENTER	A→0 : 99→PASS
ENTER	PASS→COPY

By using the Parameter Writer in this manner, several inverters can be accurately set within a short time. The Parameter Writer has four built-in memories, so data for four inverters (four types) can be created. This allows data matching each inverter to be set.

2. Connecting and Starting Up

First, connect the Parameter Writer to the inverter with the following procedure.

1) Turn the inverter power (control power, main circuit power) OFF. Confirm that all of the operation panel LEDs have gone out.
2) Remove the window at the lower section of the inverter's operation panel.
3) Connect the dedicated cable enclosed with the Parameter Writer to the Parameter Writer and the RS-232-C communication connector on the inverter unit. Make sure that excessive force is not applied on the connector.

This completes the connection.

Next, turn ON the inverter power. The Parameter Writer will start up automatically, and the LED display will light.

Precautions for connecting and starting up

(1) Do not use the Parameter Writer while the inverter is running.

(2) Make sure that the inverter is stopped (the inverter operation panel display is 0.0 or OFF) when connecting or disconnecting the Parameter Writer connection connector. If the cable is connected/disconnected while the inverter is running, the inverter will be reset (the inverter will stop temporarily). To ensure the stopped state, turn the inverter power OFF before connecting or disconnecting the cable.

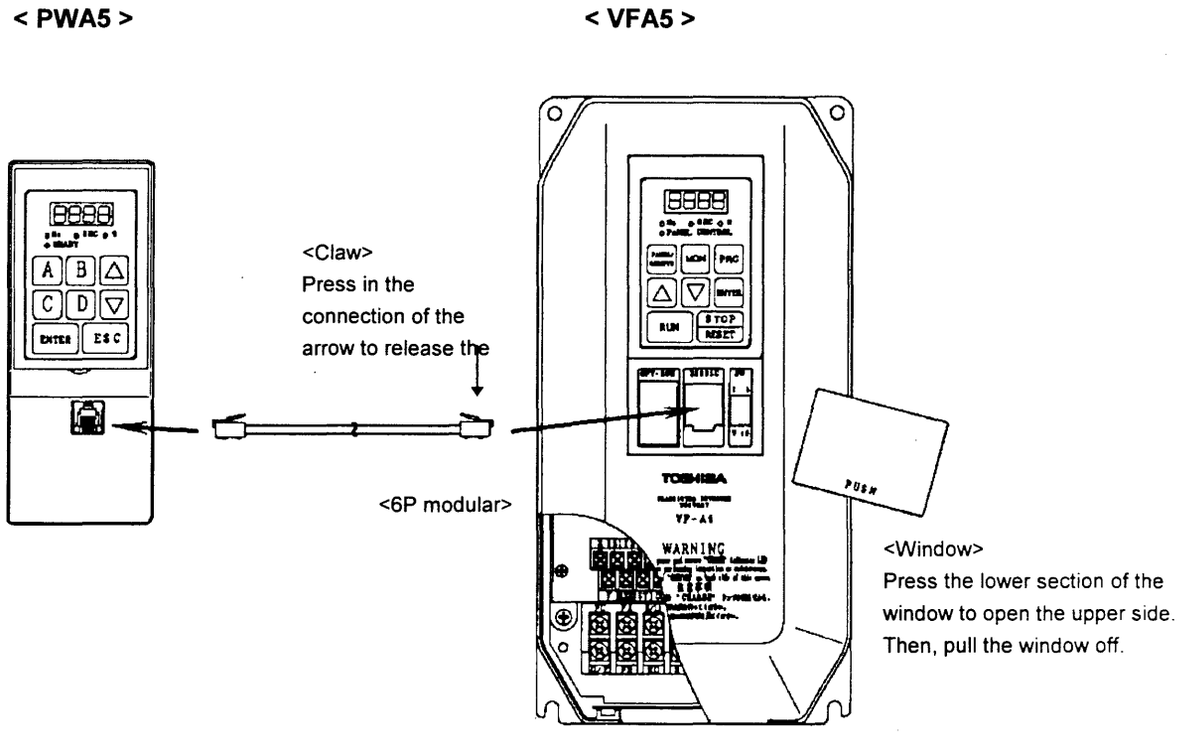


Fig. 2 Parameter Writer and inverter connection

3. Explanation of Each Function

3-1 Operation panel (for Parameter Writer)

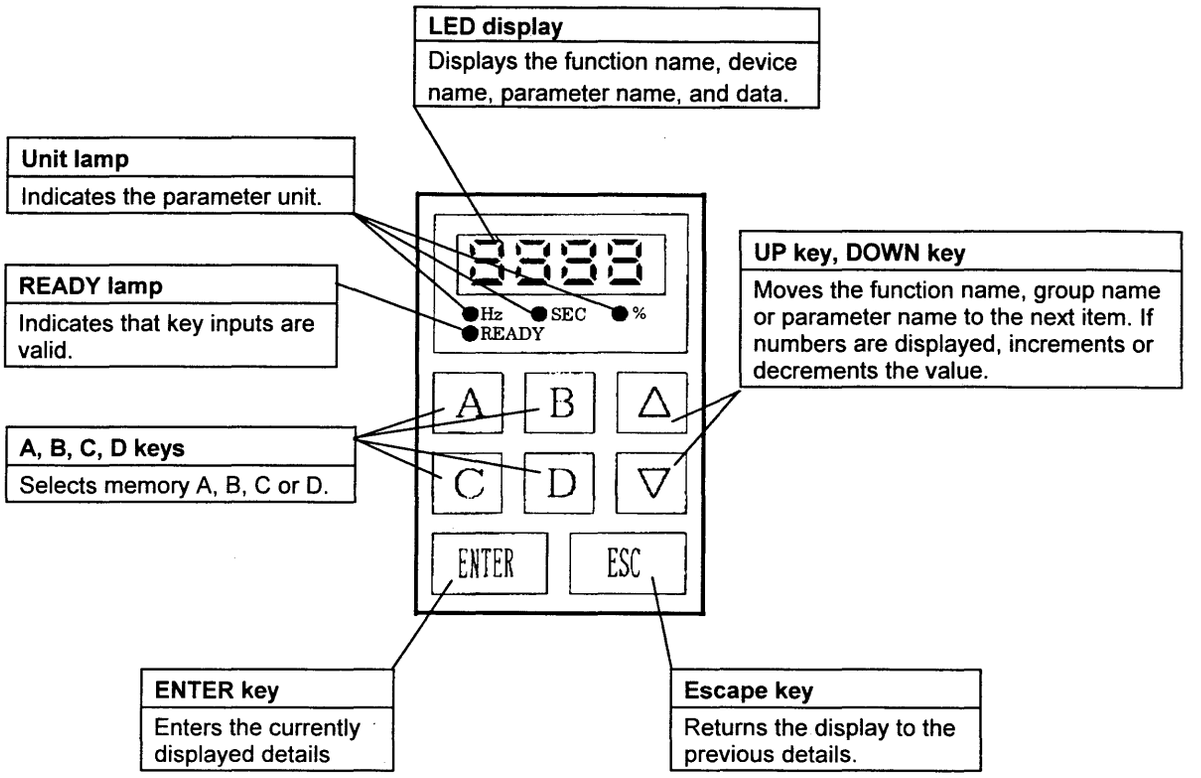


Fig. 3 Parameter Writer operation panel

3-2 Selecting functions

The Parameter Writer cannot be used or operated while the inverter is running. In this case, rUnE will appear on the Parameter Writer's LED display. Stop the inverter (0.0 or nOFF display on inverter operation panel) before starting.
Use the UP key (△) or DOWN key (▽) to display the function to be selected, and then press the enter key (ENTER) to select the function.

[Operation procedure and explanation of actions]
(In the state immediately after turning the power ON.)

Operation	LED display	Action
	In It → COPY	After the power is turned ON, the Parameter Writer is automatically initialized. Next, the function name will appear. The copy function will appear, and the READY lamp will light.
△ ▽	COPY → CONP	Set the display to CONP. (Compare function) (Function selection)
ENTER	CONP → InU	The compare function will be set, and the display will proceed to the next item.

☆ If ▽ is held down, COPY, CONP, Ed It, Pr-Ot, nANE will appear in order, and then will return to COPY. If ▽ is held down, the order will be reversed.

☆ If there is no data (initial state) in the Parameter Writer's memory (A, b, C, d), CONP will not appear.

☆ If an error trip occurs (if the cable is disconnected/connected during Parameter Writer operation, etc.), press the ESC key, confirm that CLr is displayed on the LED display, and then press the ENTER key.

3-3 Copy function [COPY]

When the copy function is selected, data can be copied in a batch between the inverter memory and two random memories of the Parameter Writer memories A to D.
The copy function is set and monitored as explained below.

[Operation procedure and explanation of actions]
(To copy (writer) the inverter data into memory A)

Operation	LED display	Action
△ ▽	COPY	Select the copy function on the function name display screen.
ENTER	COPY→ inv	When the function is set to the copy function, the display will change to the device name display state (no prefix symbol).
△ ▽ ENTER	inv	Select and set the copy source memory. The display changes to the device name display state (prefix symbol ↵).
△ ▽	↵ A	Select the data copy destination memory. (In this example, the memory A is selected.)
ENTER	↵ A→ 0 : 99→ End	Set the copy destination memory. The % lamp will light, and the data will be copied while displaying the copy progress. When the copying is completed, End will appear.
ENTER	End→ COPY	The display will change to the function name display state.

☆ When selecting the function or memory, the display can be changed with either ▽ (forward order) or △ (reverse order).

☆ When copying (writing) data to the inverter, after copying the data, the Parameter Writer will automatically reset the inverter. Do not turn OFF the inverter power until the reset is completed. (The data will not be transmitted correctly.)

☆ If a user device name is input in the Parameter Writer memory using the environment function, the user device name will appear instead of the device names A, b, C or d.

☆ If memory protection is set with the environment function, the Parameter Writer memories A to D cannot be set as the copy destination device. (They will not appear as the copy destination devices.) The copy target will always be from the Parameter Writer memory to the inverter memory.

☆ When copying the parameters to the inverter with COPY, the LED at the upper right of the inverter LED display will light.

Do not use the inverter's operation panel while operating the Parameter Writer.

3-4 Compare function [CONP]

When the compare function is selected, data can be compared in a batch between the inverter memory and two random memories of the Parameter Writer memories A to D.
The compare function is set and monitored as explained below.

[Operation procedure and explanation of actions]
(To compare memory A data and inverter data)

Operation	LED display	Action
△ ▽	CONP	Select the compare function on the function name display screen.
ENTER	CONP→ inv	When the function is set to the compare function, the display will change to the device name display state (no prefix symbol).
△ ▽	inv→ A	Select the compare source memory. (In this example, select memory A.)
ENTER	A→ r inv	Set the compare source memory. The display changes to the device name display state (prefix symbol r).
△ ▽	r inv	Select the compare destination memory. (In this example, the inverter memory inv is selected.)
ENTER	r inv→ 0 : 99→ PASS	Set the compare destination memory. The % lamp will light, and the data will be compared while displaying the comparison progress. When the comparison is completed, PASS will appear.
ENTER	PASS→ COPY	The display will change to the function name display state.

☆ When the data in the two memories match as a result of the comparison, PASS will appear. If the data does not match, FAIL will appear. When the data does not match, Cr.dE will automatically be created in the edit function Edit, so the incorrect data can be confirmed.

☆ When selecting the function or memory, the display can be changed with either ▽ (forward order) or △ (reverse order).

☆ If a user device name is input in the Parameter Writer memory using the environment function, the user device name will appear instead of the device names.

3-5 Edit function [Ed it]

With the edit function, the data in the inverter memory and in the Parameter Writer memories A to D can be edited, such as to change the parameter setting value for single inverter units.
The edit function is set and monitored as explained below.

[Operation procedure and explanation of actions]
(To edit parameter uL in memory C)

Operation	LED display	Action
△ ▽	Ed it	Select the edit function on the function name display screen.
ENTER	Ed it → inu	When the function is set to the edit function, the display will change to the device name display state (no prefix symbol).
△ ▽	inu → C	Select the memory to be edited. (In this example, select memory C .)
ENTER	C → Gr.U	Set the memory to be edited. The display changes parameter group display state.
△ ▽	Gr.F	Select the parameter group. (In this example, set Gr.F .)
ENTER	Gr.F → FH	Set the parameter group. The display will change to the parameter name display state.
△ ▽	FH → uL	Select the parameter name. (In this example, set uL .)
ENTER	uL → 60.0	Set the parameter name. The display will change to the data display state.
△ ▽	60.0 → 80.0	Change the data.
ENTER	80.0 ←→ uL	Save the data. The parameter name and data will appear alternately. The state will move to the parameter name display state.

☆ Gr.dE will compare the data in the two memories, and will display only the parameters that differ when the memory is edited. If there are no differing parameters, Gr.dE will not be created.

☆ The Parameter Writer will automatically reset the inverter after editing the data only when the inverter memory has been edited. Do not turn the inverter power OFF until the reset has been completed.

☆ If a user device name is input in the Parameter Writer memory using the environment function, the user device name will appear instead of the device names A, b, C or d.

☆ If memory protection is set with the environment function, the Parameter Writer memories A to D cannot be edited.

☆ To return the function name (Ed it , etc.) from the parameter name display, press the ESC key.

☆ When the memory protection function (refer to 3-5) is set, the parameter settings cannot be changed. If changes are attempted, Pr.Ot will appear.

3-6 Environment function

3-6-1 Memory protection function [Pr0t]

When the memory protection function is used, the memory data cannot be edited or copied, by that protecting the memory. (This function can be set independently for each memory (A, b, C or d).)
The memory protection function is set and monitored as explained below.

[Operation procedure and explanation of actions]
(To protect data in memory D)

Operation	LED display	Action
△ ▽	Pr0t	Select the environment function on the function name display screen.
ENTER	Pr0t → A	Set the function to the memory protection function. The display will change to the device name display state.
△ ▽	A → d	Select the memory to be protected. (In this example, select memory d.)
ENTER	d → OFF	Set the memory to be protected. The display will change to the ON/OFF display state.
△ ▽	OFF → On	Select ON or OFF. ON : Edit disabled OFF : Edit enabled
ENTER	On → Pr0t	Save the ON or OFF state. The display will change to the function display state.

☆ If the memory protection function is set to ON, the memories A to D in the Parameter Writer cannot be edited. The memory protection function cannot be set for the inverter memory.

☆ If the memory protection function is set to ON, copying that uses the memories A to D in the Parameter Writer as the copy destination cannot be carried out. Only copying that uses the memories A to D as the copy source and the inverter memory as the copy destination can be carried out.

☆ If editing is attempted on a memory for which the memory protection function is set, the protection will activate. Pr0t will appear on the LED display, and the writing will be prohibited.

3-6-2 User device name setting function [nAME]

By using the user device name setting function, a random device name can be set for the Parameter Writer's memory. (The device name can be set independently for memories A, b, C or d.)
This is a handy function for using multiple data separately.
The user device name setting function is set and monitored as explained below.

[Operation procedure and explanation of actions]
(To set memory B to the name USr)

Operation	LED display	Action
△ ▽	nAME	Select the environment function on the function name display screen.
ENTER	nAME → A	Set the function to the user device name setting function. The display will change to the device name display state.
△ ▽	A → b	Select the device. (In this example, select memory b.)
ENTER	b → _ _ b	Set the device. The display will change to the user device name display state.
△ ▽	USr	Change the user device name. Select each character with the △ ▽ keys, and set with the ENTER key. (Refer to the Appendix Character Code Table.)
ENTER	USr → nAME	Save the user device name. The display will change to the function display state.

☆ Up to three characters can be set for the device name.

☆ The device name input changes in the order of A, b...y, 0, 1...9, r, -, _ from the left digit when the ▽ key is pressed.

☆ To cancel the user device name, input the original device name.

3-7 Simple copy function

By using the simple copy function, data can be copied between the Parameter Writer memory and inverter with simple key operations. (Copying between memories is not possible.)
The simple copy function is set and monitored as explained below.

[Operation procedure and explanation of actions]
(To simple copy the data in memory A to the inverter)

Operation	LED display	Action
△ ▽	COPy	Select the copy function on the function name display screen.
A	COPy→A ⌐	Press the copy origin memory. (In this example, select memory A.)
ENTER	A ⌐ →0 : 99→End	The simple copy will start. The % LED display will light, and the data will be copied while displaying the copy progress. When the copying is completed, End will appear.
ENTER	End→COPy	The display will change to the function name display state.

(To simple copy the data in the inverter to memory A)

Operation	LED display	Action
△ ▽	COPy	Select the copy function on the function name display screen.
A	COPy→A ⌐	Press the copy destination memory.
A	A ⌐ →⌐ A	Press the copy destination memory again. The copy origin/copy destination will appear. (⌐ : inverter/ A: memory A)
ENTER	⌐ A→0 : 99→End	The simple copy will start. The % LED display will light, and the data will be copied while displaying the copy progress. When the copying is completed, End will appear.
ENTER	End→COPy	The display will change to the function name display state.

☆ If the operation is mistaken, press the ESC key. The state will return to the previous item.

☆ When copying (writing) data to the inverter, after copying the data, the Parameter Writer will automatically reset the inverter. Do not turn OFF the inverter power until the reset is completed.

☆ If a user device name is input in the Parameter Writer memory using the environment function, the user device name will appear instead of the device names A, b, C or d.

<Example : When user device name is USr >
USr⌐ (Copy source : memory USr /copy destination: inverter)
⌐USr (Copy source : inverter/ copy destination: memory USr)

4. Precautions for Version 100 to 102 Inverters

Note that the following operation limits will apply to the version 100 to 102 (hereinafter old version) inverters.

Copy function

When using the old version :

Copying from old version to old version ..... Copy possible
Copying from old version to new version..... Copy not possible (OLd display)
Copying from new version to old version..... Copy not possible (OLd display)

Copying is not possible between versions 100 to 102 and version 110 and above.
If copying is attempted, the message OLd will appear, and the Parameter Writer will not start.

Compare function and edit function

If the compare function and edit function are attempted with the old version, the message OLd will appear, and the functions will not start.
These functions are valid only with the new version inverter.

5. Precautions for Writing to Inverter

Prohibition of use during inverter operation

Never user the Parameter Writer while the inverter is running. Do not connect the Parameter Writer's cable to the inverter while the inverter is running. The inverter will stop once, etc.

Mismatch of inverter types

Do not write inverter data (read with the copy function (COPY)) to an inverter having a different format.
If the data is written to a differing inverter format, the following data will not be read in due to safety measures. The data will be the original data.

ub, ub2	Voltage boost
uLu 1, uLu2	Base frequency
Pb	PBR control
Pbr	PBR resistance value
PbCP	PBR capacity
nEP	No. of motor poles
nEC	Motor rated capacity
nEt	Motor type
nEu	Motor rated voltage
nEF	Motor rated frequency
nEr	Motor rated speed
nEtn	Automatic tuning
nE IH	Moment of inertia load
ACC, dEC	Acceleration/deceleration
CF	Carrier frequency

Data not writeable to inverter

The following data cannot be written to the inverter.

Status monitor mode
Cumulative operating time
Past trips

Parameter	
rr In	RR input bias gain setting
Iu In	IV input bias gain setting
rE In	RX input bias gain setting
uEEP	EEPROM version

Specially compatible inverters

The special data set by Toshiba will also be copied with the COPY function (refer to page 7).

Option ROM version

If the parameter information is copied using the Parameter Writer's copy function, use is possible with the following combinations shown with a "○". (○: Usable, ×: Not usable)
If copying of data with a "×" combination is attempted, the inverter could trip, or the motor could rotate abnormally. Thus, always return to the standard default settings (tYP = 3).

			Copy destination					
Copy source	Main unit CPU ROM		V110 ~ V113			V120		
		Option ROM	None	V200 ~V204	V205 ~V299	None	V200 ~V204	V205 ~V299
	V110 ~ V113	None	○	×	×	**Note 2**	×	×
		V200 ~ V204	×	**Note 1**	×	×	**Note 2**	×
		V205 ~ V299	×	×	○	×	×	**Note 2**
	V120	None	×	×	×	○	×	×
		V200 ~ V204	×	×	×	×	**Note 1**	×
		V205 ~ V299	×	×	×	×	×	○

Note 1 : Copying is possible only if the copy destination's option ROM version (Or.Ut , or-0n) is above the copy source's option ROM version.
Note 2 : The carrier frequency (Or.SC CF) adjustment range will be the copy source value.
Note 3 : For option ROM version not listed above, as a principle, copying is possible only between the same versions.

Appendix

Memory messages

Display	Details
inv	Inverter memory
A	Memory A in Parameter Writer
b	Memory B in Parameter Writer
C	Memory C in Parameter Writer
d	Memory D in Parameter Writer

Function messages

Display	Function	Ref. Page
COPY	Copy function	7
COMP	Compare function	8
Edit	Edit function	9
Prot	Memory protection function	11
nAME	User device name setting function	12

Status messages

Display	Details
In it	Initializing
End	Normally completed
FAIL	Data comparison results mismatch
PASS	Data comparison results match
Old	Old inverter version

Error messages

Display	Details	Remedy
rUnE	Inverter is running	Stop the inverter.
rAME	RAM error	There is an error in the Parameter Writer's RAM. Repairs are required.
rOME	ROM error	There is an error in the Parameter Writer's ROM. Repairs are required.
EEPE	Memory error	There is an error in the Parameter Writer's Memory. Repairs are required.
Err5	Communication error	An error occurred in the communication between the Parameter Writer and inverter. Check the connection. and repeat the operation.
CPUE	CPU error	There is an error in the inverter's CPU. Repairs are required.

☆ Error resetting method: Press the [ESC] key, confirm that CLr is displayed, and then press the [ENTER] key.

Character Code Table (Numbers)

0	1	2	3	4	5	6	7	8	9	-	/	-	SPACE
0	1	2	3	4	5	6	7	8	9	-	⸝	-	

Character Code Table (Alphabet)

Aa	Bb	Cc	Dd	Ee	Ff	Gg	Hh	Ii	Jj	Kk	Ll	Mm	Nn
A	b	C	d	E	F	G	H	I	J	-	L	n	n

Oo	Pp	Qq	Rr	Ss	Tt	Uu	Vv	Ww	Xx	Yy	Zz
o	P	q	r	S	t	U	u	-	-	y	-