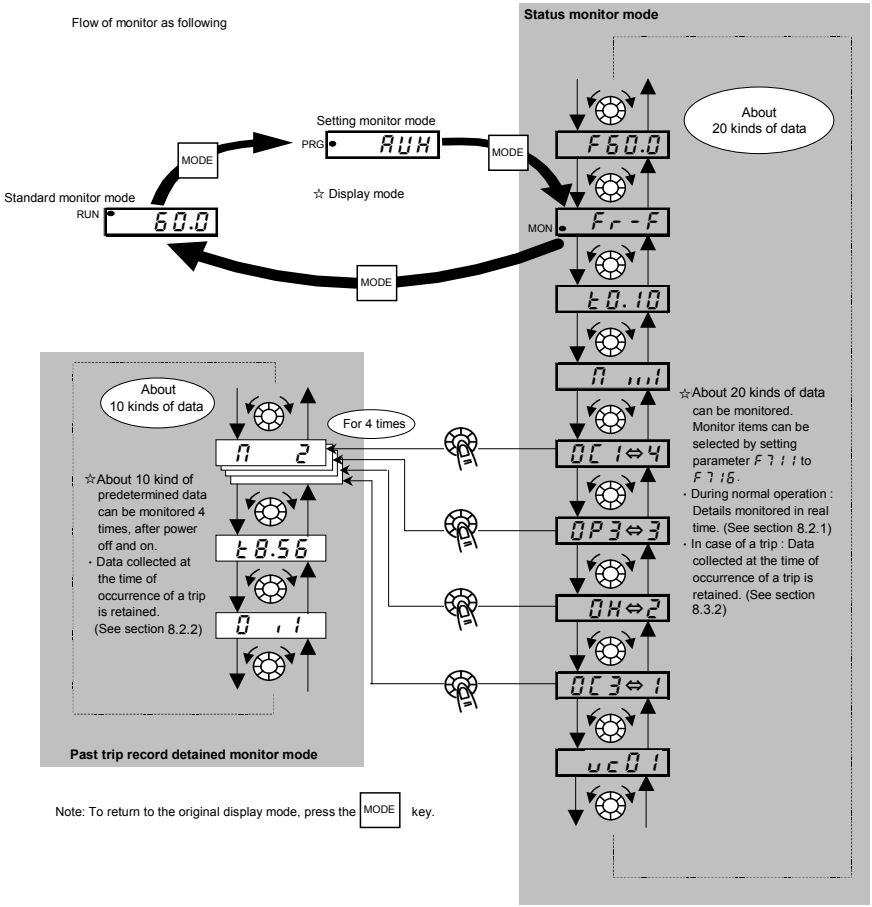
8. Monitoring the operation status

8.1 Flow of status monitor mode



8.2 Status monitor mode

8.2.1 Status monitor under normal conditions

In this mode, you can monitor the operation status of the inverter.

To display the operation status during normal operation:

Press MODE key twice.

Setting procedure (eg. operation at 60Hz)

	Item displayed	Panel operated	LED display	Communication No.	Description
	Operation frequency *		60.0		The operation frequency is displayed (Operation at 60Hz). (When standard monitor display selection F710 is set at 0 [operation frequency])
	Parameter setting mode	MODE	AUH		The first basic parameter "AUH" (history function) is displayed.
	Direction of rotation	MODE	Fr-F	FE01	The direction of rotation is displayed. (Fr-F: forward run, Fr-r: reverse run)
Note 1	Operation frequency command *		F60.0	FE02	The operation frequency command value (Hz/free unit) is displayed. (In case of F711=2)
Note 2	Load current *		C 80	FE03	The inverter output current (load current) (%/A) is displayed. (In case of F712=1)
Note 3	Input voltage *		Y100	FE04	The inverter input (DC) voltage (%/V) is displayed. (In case of F713=3)
	Output voltage *		P100	FE05	The inverter output voltage (%/V) is displayed. (In case of F714=4)
	Inverter load factor *		L 70	FE27	The inverter load factor (%) is displayed. (In case of F715=27)
	Operation frequency *		o60.0	FD00	The operation frequency (Hz/free unit) is displayed. (In case of F716=0)

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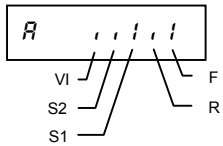
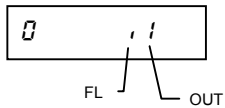
* Monitor items can be selected by setting parameters F710 to F716, (F720).

For notes, see page H-8.

(Continued)

	Item displayed	Panel operated	LED display	Communication No.	Description
Note 4	Input terminal		A ,,1,1	FE06	The ON/OFF status of each of the control signal input terminals (F, R, S1, S2, VI) is displayed in bits. ON: 1 OFF: , 
Note 5	Output terminal		0 ,1	FE07	The ON/OFF status of each of the control signal output terminals (RY, OUT and FL) is displayed in bits. ON: 1 OFF: , 
	Logic input terminals setting		L-51	FD31	Logic setting by F127 is displayed. L-50: Source logic L-51: Sink logic
	CPU1 version		u101	FE08	The version of the CPU1 is displayed.
Note 6	CPU2 version		uc01	FE73	The version of the CPU2 is displayed.
Note 6	Past trip 1		0C3⇔1	FE10	Past trip 1 (displayed alternately)
Note 6	Past trip 2		0H⇔2	FE11	Past trip 2 (displayed alternately)
	Past trip 3		0P3⇔3	FE12	Past trip 3 (displayed alternately)
Note 6	Past trip 4		nErr⇔4	FE13	Past trip 4 (displayed alternately)

(Continued overleaf)

For notes, see page H-8.

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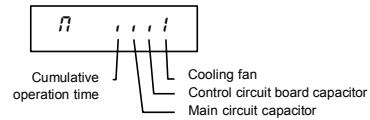
(Continued)

	Item displayed	Panel operated	LED display	Communication No.	Description
Note 7	Parts replacement alarm information		n ,,,1	FE79	The ON/OFF status of each of the cooling fan, circuit board capacitor, main circuit capacitor of parts replacement alarm or cumulative operation time are displayed in bits. ON: 1 OFF: , 
Note 8	Cumulative operation time		t0.10	FE14	The cumulative operation time is displayed. (0.01=1 hour, 1.00=100 hours)
	Default display mode	MODE	60.0		The operation frequency is displayed (Operation at 60Hz).

8.2.2 Display of detailed information on a past trip

Details on a past trip (of trips 1 to 4) can be displayed, as shown in the table below, by pressing the center of the setting dial when the trip record is selected in the status monitor mode.

Unlike the "Display of detailed trip information at the occurrence of a trip" in 8.3.2, details on a past trip can be displayed, even after the inverter is turned off or reset.

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	Item displayed	Panel operated	LED display	Description
Note 9	Past trip 1		OC 1 ⇔ 1	Past trip 1 (displayed alternately)
	Continuous trips		n 2	For OCA, OCL, and Err5, the number of times (maximum of 31) the same trip occurred in succession is displayed (unit: times). Detailed information is recorded at the beginning and ending numbers.
Note 1	Operation frequency		o60.0	The operation frequency when the trip occurred is displayed.
	Direction of rotation		Fr-F	The direction of rotation when the trip occurred is displayed. (Fr-F: Forward run, Fr-r: Reverse run)
	Operation frequency command		F80.0	The operation command value when the trip occurred is displayed.
Note 2	Load current		C 150	The inverter output current when the trip occurred is displayed. (%/A)
Note 3	Input voltage		V 120	The inverter input voltage (DC) when the trip occurred is displayed. (%/V).

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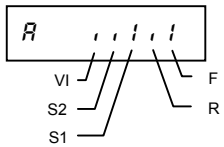
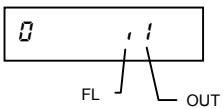
For notes, see page H-8.

(Continued)

	Item displayed	Panel operated	LED display	Description
	Output voltage		P100	The inverter output voltage when the trip occurred is displayed. (%/V)
Note 4	Input terminal		A ,,1,1	The ON/OFF statuses of the control input terminals (F, R, S1, S2, V I) are displayed in bits. ON: 1 OFF: , 
Note 5	Output terminal		0 ,1	The ON/OFF statuses of the control output terminals (OUT and FL) are displayed in bits. ON: 1 OFF: , 
Note 8	Cumulative operation time		t8.56	The cumulative operation time when the trip occurred is displayed. (0.01=1 hour, 1.00=100 hours)
	Past trip 1	MODE	OC 1 ⇔ 1	Press this key to return to past trip 1.

* The monitor value of a trip is not always recorded as the maximum value because of the time required for detection.

For notes, see page H-8.

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8.3 Display of trip information

8.3.1 Trip code display

If the inverter trips, an error code is displayed to suggest the cause. Since trip records are retained, information on each trip can be displayed anytime in the status monitor mode.

For trip code display, see section 13.1

☆ The monitor value of a trip is not always recorded as the maximum value because of the time required for detection.

8.3.2 Display of trip information at the occurrence of a trip

At the occurrence of a trip, the same information as that displayed in the mode described in 8.1.1, "Status monitor under normal conditions," can be displayed, as shown in the table below, if the inverter is not turned off or reset. To display trip information after turning off or resetting the inverter, follow the steps described in 8.1.2, "Display of detailed information on a past trip."

Example of call-up of trip information

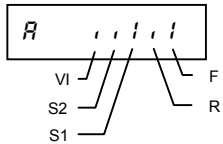
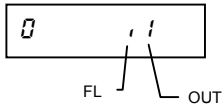
	Item displayed	Panel operated	LED display	Communication No.	Description
	Cause of trip		OP2		Status monitor mode (The code blinks if a trip occurs.) The motor coasts and comes to a stop (coast stop).
	Parameter setting mode	MODE	AUH		The first basic parameter "AUH" (history function) is displayed.
	Direction of rotation	MODE	Fr-F	FE01	The direction of rotation at the occurence of a trip is displayed. (Fr-F: forward run, Fr-r: reverser run).
Note 1	Operation frequency command *		F60.0	FE02	The operation frequency command value (Hz/free unit) at the occurrence of a trip is displayed. (In case of F711=2)
Note 2	Load current *		C130	FE03	The output power of the inverter at the occurrence of a trip (%/A) is displayed. (In case of F712=1)
Note 3	Input voltage *		V141	FE04	The inverter input (DC) voltage (%/V) at the occurrence of a trip is displayed. (In case of F713=3)
	Output voltage *		P100	FE05	The output voltage of the inverter at the occurrence of a trip (%/V) is displayed. (In case of F714=4)
	Inverter load factor *		L 70	FE27	The inverter load factor (%) at the occurrence of a trip is displayed. (In case of F715=27)
Note 1	Operation frequency *		o60.0	FE00	The inverter output frequency (Hz/free unit) at the occurrence of a trip is displayed. (In case of F716=0)

(Continued overleaf)

* Monitor items can be selected by settings parameters F710 to F716, (F720).

For notes, see page H-8.

(Continued)

	Item displayed	Panel operated	LED display	Communication No.	Description
Note 4	Input terminal		A ,,1,1	FE06	The ON/OFF statuses of the control input terminals (F, R, S1, S2, VI) are displayed in bits. ON: 1 OFF: , 
Note 5	Output terminal		0 ,1	FE07	The ON/OFF status of each of the control signal output terminals (OUT and FL) at the occurrence of a trip is displayed in bits. ON: 1 OFF: , 
	Logic input terminals setting		L-50	FD31	Logic setting by F127 is displayed. L-50: Source logic L-51: Sink logic
	CPU1 version		u101	FE08	The version of the CPU1 is displayed.
	CPU2 version		uc01	FE73	The version of the CPU2 is displayed.
Note 6	Past trip 1		OP2⇔1	FE10	Past trip 1 (displayed alternately)
Note 6	Past trip 2		OH⇔2	FE11	Past trip 2 (displayed alternately)
Note 6	Past trip 3		OP3⇔3	FE12	Past trip 3 (displayed alternately)
Note 6	Past trip 4		nErr⇔4	FE13	Past trip 4 (displayed alternately)

(Continued overleaf)

For notes, see page H-8.

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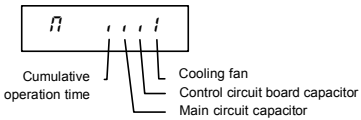
(Continued)

	Item displayed	Panel operated	LED display	Communication No.	Description
Note 7	Parts replacement alarm information		n ,,,1	FE79	The ON/OFF status of each of the cooling fan, circuit board capacitor, main circuit capacitor of parts replacement alarm or cumulative operation time are displayed in bits. ON: 1 OFF: 0 
Note 8	Cumulative operation time		t0.10	FE14	The cumulative operation time is displayed. (0.01=1 hour, 1.00=100 hours)
	Default display mode	MODE	OPE		The cause of the trip is displayed.

Note 1: The characters to the left disappear above 100 Hz. (Ex: 120 Hz is 120.0)

Note 2: You can switch between % and A (ampere)/V (volt), using the parameter F701 (current/voltage unit selection).

Note 3: The input (DC) voltage displayed is $1/\sqrt{2}$ times as large as the rectified d.c. input voltage. In case of 1ph-120, displayed value is 1/2 times in addition.

Note 4: If F109 = 2 (Logic input): VI bar is activated depend on VI terminal ON/OFF.
If F109 = 0, 1 or 3 (Voltage/current input): VI bar is always OFF.

Note 5: If F669 = 0 (Logic output): Out bar is activated depend on OUT terminal ON/OFF.
If F669 = 1 (Pulse train output): OUT bar is always OFF.

Note 6: Past trip records are displayed in the following sequence: 1 (latest trip record) ⇔2⇔3⇔4 (oldest trip record). If no trip occurred in the past, the message "nErr" will be displayed. Details on past trip record 1, 2, 3 or 4 can be displayed by pressing the center of the setting dial when past trip 1, 2, 3 or 4 is displayed. For more information, see 8.2.2.

Note 7: Parts replacement alarm is displayed based on the value calculated from the annual average ambient temperature, the ON time of the inverter, the operating time of the motor and the output current (load factor) specified using F634. Use this alarm as a guide only, since it is based on a rough estimation.

Note 8: The cumulative operation time increments only when the machine is in operation.

Note 9: If there is no trip record, nErr is displayed.

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☆ Of the items displayed on the monitor, the reference values of items expressed in percent are listed below.

- Load current: The current monitored is displayed. The unit can be switched to A (amperes).
- Input voltage: The voltage displayed is the voltage determined by converting the voltage measured in the DC section into an AC voltage. The reference value (100% value) is 200 volts for 240V models, 100 volts for 120V models. The unit can be switched to V (volts).
- Output voltage: The voltage displayed is the output command voltage. 100% reference value is 200V on both 120V and 240V models. This unit can be switched to V (volts).
- Torque current: The current required to generate torque is calculated from the load current by vector operations. The value thus calculated is displayed. The reference value (100% value) is the value at the time when the load current is 100%.
- Load factor of inverter: Depending on the PWM carrier frequency (F300) setting and so on, the actual rated current may become smaller than the rated output current indicated on the nameplate. With the actual rated current at that time (after a reduction) as 100%, the proportion of the load current to the rated current is indicated in percent. The load factor is also used to calculate the conditions for overload trip (OL1).