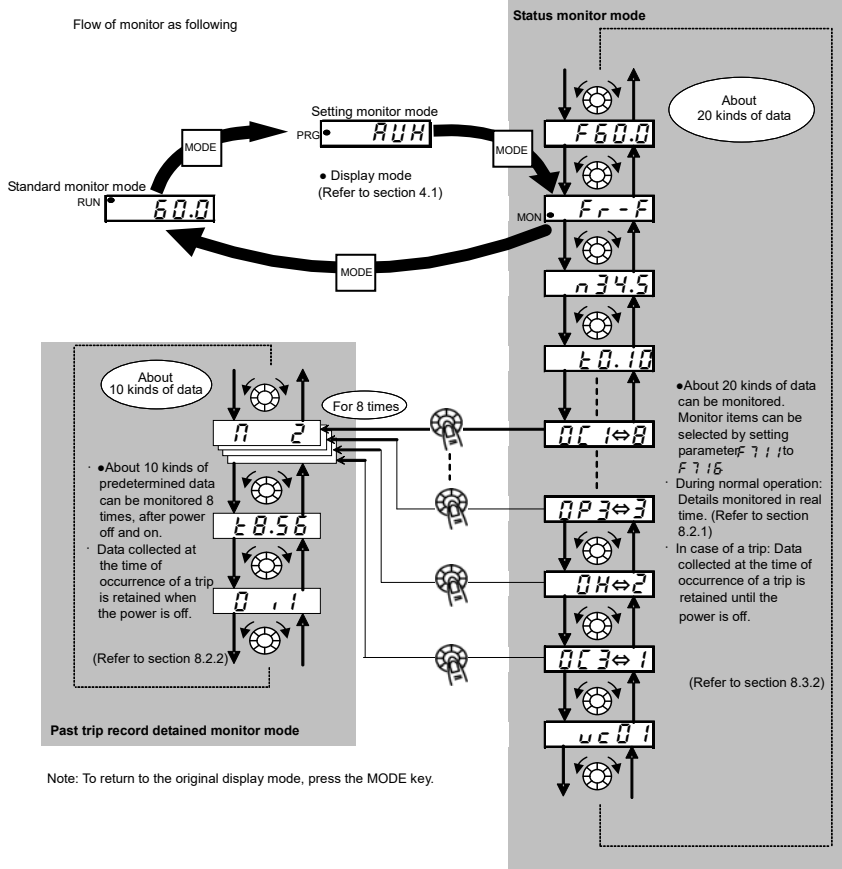


8. Monitoring the operation status

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 the MODE key twice.

Setting procedure (eg. operation at 60Hz)

	Item displayed	Panel operated	LED display	Communication No.	Description
	Output frequency *		60.0		The output frequency is displayed (Operation at 60Hz). (When standard monitor display selection F710 is set at 0 [output frequency])
	Parameter setting mode	MODE	RUH		The first basic parameter "RUH" (history function) is displayed.
	Direction of rotation	MODE	F r - F	FE01	The direction of rotation is displayed. (F r - F : forward run, F r - r : reverse run)
Note 1	Frequency command value *		F 60.0	FE02	The frequency command value (Hz/free unit) is displayed. (In case of F 7 1 1 = 2)
Note 2	Output current *		0 80	FC02	The inverter output current (load current) (%A) is displayed. (In case of F 7 1 2 = 1)
Note 2 Note 3	Input voltage *		4 100	FC05	The inverter Input voltage (DC detection) (%V) is displayed. (In case of F 7 1 3 = 3)
Note 2	Output voltage *		P 100	FC08	The inverter output voltage (%V) is displayed. (In case of F 7 1 4 = 4)
	Input power *		h 12.3	FC06	The inverter input power (kW) is displayed. (In case of F 7 1 5 = 5)
	Output power *		H 11.8	FC07	The inverter output power (kW) is displayed. (In case of F 7 1 6 = 6)
	Inverter load factor *		L 70	FE27	The inverter load factor (%) is displayed. (In case of F 7 1 7 = 2 7)
	Output frequency *		o 60.0	FE00	The output frequency (Hz/free unit) is displayed. (In case of F 7 1 8 = 0)

* Monitor items can be selected by setting parameters F 7 10 to F 7 18. (F 7 20). Refer to Note 12.

Refer to page H-8 and 9 for notes.

(Continued overleaf)

(Continued)

	Item displayed	Panel operated	LED display	Communication No.	Description
Note 4	Input terminal		FE06	The ON/OFF status of each of the control signal input terminals (F, R, RES, S1, S2, S3, VIB, VIA) are displayed in bits. ON: \uparrow OFF: \downarrow
Note 5	Output terminal		0 . . .	FE07	The ON/OFF status of each of the control signal output terminals (RY-RC, OUT, FL) are displayed in bits. ON: \uparrow OFF: \downarrow
	CPU1 version		v 10 1	FE08	The version of the CPU1 is displayed.
	CPU2 version		v c 0 1	FE73	The version of the CPU2 is displayed.
	Inverter rated current		R 33.0	FE70	The inverter rated current (A) is displayed.
Note 6	Overload and region setting		C - E U	0998 0099	The inverter overload characteristic and region setting is displayed.
Note 7	Past trip 1		0 P 2 ⇔ 1	FE10	Past trip 1 (displayed alternately)
Note 7	Past trip 2		0 H ⇔ 2	FE11	Past trip 2 (displayed alternately)
Note 7	Past trip 3		0 P 3 ⇔ 3	FE12	Past trip 3 (displayed alternately)
Note 7	Past trip 4		0 L 1 ⇔ 4	FE13	Past trip 4 (displayed alternately)
Note 7	Past trip 5		0 L r ⇔ 5	FD10	Past trip 5 (displayed alternately)
Note 7	Past trip 6		0 C 1 ⇔ 6	FD11	Past trip 6 (displayed alternately)
Note 7	Past trip 7		0 C 2 ⇔ 7	FD12	Past trip 7 (displayed alternately)
Note 7	Past trip 8		n E r r ⇔ 8	FD13	Past trip 8 (displayed alternately)

Refer to page H-8 and 9 for notes.

(Continued overleaf)

(Continued)

Item displayed	Panel operated	LED display	Communication No.	Description
Communication Status		5L . . .	FD57	The status of signal transmission and reception of communication are displayed in bits. receiving or transmitting : / not receiving or not transmitting: .
Note 8 Parts replacement alarm information		n	FE79	The ON/OFF status of each of the cooling fan, circuit board capacitor, main circuit capacitor of parts replacement alarm, cumulative operation time or number of starting are displayed in bits.
Note 9 Cumulative operation time		t 10.1	FE14	The cumulative operation time is displayed. (0.10=10 hours, 1.00=100 hours)
Number of starting		n 34.5	FD32	Number of starting (10000 times)
Default display mode		60.0		The output 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 8) 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 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.

Item displayed	Panel operated	LED display	Description
Note 10 Past trip 1		001 → 1	Past trip 1 (displayed alternately)
Continuous trips		n 2	For 00A, 00L and Err 5 the number of times (maximum of 31) the same trip occurred in succession is displayed (unit: times). Detailed information is recorded at the latest value.

	Item displayed	Panel operated	LED display	Description
	Output frequency		050.0	The output frequency when the trip occurred is displayed.
	Direction of rotation		F r - F	The direction of rotation when the trip occurred is displayed. (F r - F : Forward run, F r - r : Reverse run)
Note 1	Frequency command value *		F80.0	The frequency command value when the trip occurred is displayed.
Note 2	Output current		I 150	The inverter output current when the trip occurred is displayed. (%/A)
Note 2 Note 3	Input voltage		U 120	The inverter input voltage (DC detection) when the trip occurred is displayed. (%/V).
Note 2	Output voltage		P 100	The inverter output voltage when the trip occurred is displayed. (%/V)
Note 4	Input terminal		The ON/OFF status of each of the control signal input terminals (F, R, RES, S1, S2, S3, VIB, VIA) are displayed in bits. ON: OFF: .
Note 5	Output terminal		0 . . .	The ON/OFF status of each of the control signal output terminals (RY-RC, OUT, FL) are displayed in bits. ON: OFF: .
Note 9	Cumulative operation time		t 8.56	The cumulative operation time when the trip occurred is displayed. (0.10=10 hours, 1.00=100 hours)
	Past trip 1		0 C 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.

Refer to page H-8 and 9 for notes.

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.

Refer to section 13.1 for details about trip code display.











- 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 "8.2.1 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 "8.2.2 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		<i>OP2</i>		Status monitor mode (The code blinks if a trip occurs.) The motor coasts and comes to a stop (coast stop).
	Parameter setting mode		<i>RUH</i>		The first basic parameter " <i>RUH</i> " (history function) is displayed.
	Direction of rotation		<i>F_r-F</i>	FE01	The direction of rotation at the occurrence of a trip is displayed. (<i>F_r-F</i> : forward run, <i>F_r-r</i> : reverse run).
Note 1	Frequency command value *		<i>F60.0</i>	FE02	The frequency command value (Hz/free unit) at the occurrence of a trip is displayed. (In case of <i>F711=2</i>)
Note 2	Output current *		<i>130</i>	FC02	The output power of the inverter at the occurrence of a trip (%A) is displayed. (In case of <i>F712=1</i>)
Note 2 Note 3	Input voltage *		<i>441</i>	FC05	The inverter input voltage (DC detection) (%V) at the occurrence of a trip is displayed. (In case of <i>F713=3</i>)
Note 2	Output voltage *		<i>P100</i>	FC08	The output voltage of the inverter at the occurrence of a trip (%V) is displayed. (In case of <i>F714=4</i>)
	Input power *		<i>h12.3</i>	FC06	The inverter input power (kW) is displayed. (In case of <i>F715=5</i>)
	Output power *		<i>H11.8</i>	FC07	The inverter output power (kW) is displayed. (In case of <i>F716=6</i>)
	Inverter load factor *		<i>L70</i>	FE27	The inverter load factor (%) at the occurrence of a trip is displayed. (In case of <i>F717=27</i>)
	Output frequency *		<i>o60.0</i>	FE00	The inverter output frequency (Hz/free unit) at the occurrence of a trip is displayed. (In case of <i>F718=0</i>)

* Monitor items can be selected by settings parameters *F710* to *F718* (*F720*). Refer to Note 12.

Refer to page H-8 and 9 for notes.

(Continued overleaf)


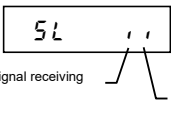

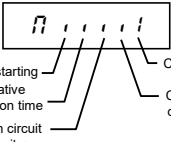



(Continued)

	Item displayed	Panel operated	LED display	Communication No.	Description
Note 4	Input terminal		FE06	The ON/OFF status of each of the control signal input terminals (F, R, RES, S1, S2, S3, VIB, VIA) are displayed in bits. ON: \uparrow OFF: \cdot
Note 5	Output terminal		0 . . .	FE07	The ON/OFF status of each of the control signal output terminals (RY-RC, OUT, FL) are displayed in bits. ON: \uparrow OFF: \cdot
	CPU1 version		u 10 1	FE08	The version of the CPU1 is displayed.
	CPU2 version		uc 0 1	FE73	The version of the CPU2 is displayed.
	Inverter rated current		A33.0	FE70	The inverter rated current (A) is displayed.
Note 6	Overload and region setting		E-EU	0998 0099	The inverter overload characteristic and region setting is displayed.
Note 7	Past trip 1		OP2 ⇔ 1	FE10	Past trip 1 (displayed alternately)
Note 7	Past trip 2		OH ⇔ 2	FE11	Past trip 2 (displayed alternately)
Note 7	Past trip 3		OP3 ⇔ 3	FE12	Past trip 3 (displayed alternately)
Note 7	Past trip 4		OL 1 ⇔ 4	FE13	Past trip 4 (displayed alternately)
Note 7	Past trip 5		OLr ⇔ 5	FD10	Past trip 5 (displayed alternately)
Note 7	Past trip 6		OL 1 ⇔ 6	FD11	Past trip 6 (displayed alternately)
Note 7	Past trip 7		OLC2 ⇔ 7	FD12	Past trip 7 (displayed alternately)
Note 7	Past trip 8		nErr ⇔ 8	FD13	Past trip 8 (displayed alternately)

Refer to page H-8 and 9 for notes.

(Continued overleaf)

(Continued)

Item displayed	Panel operated	LED display	Communication No.	Description
Communication Status		5 L . . .	FD57	The status of signal transmission and reception of communication are displayed in bits.  RX: signal receiving TX: signal transmitting receiving or transmitting : : not receiving or not transmitting : ,
Note 8 Parts replacement alarm information		n	FE79	The ON/OFF status of each of the cooling fan, circuit board capacitor, main circuit capacitor of parts replacement alarm, cumulative operation time or number of starting are displayed in bits. ON: : OFF: ,  Number of starting Cumulative operation time Main circuit capacitor Cooling fan Control circuit board capacitor
Note 9 Cumulative operation time		t 10 . 1	FE14	The cumulative operation time is displayed. (0.10=10 hours, 1.00=100 hours)
Number of starting		n 3 4 . 5	FD32	Number of starting (10000 times)
Default display mode		0 P 2		The cause of the trip is displayed.

Note 1: The characters to the left disappear at 100 Hz or more. (Ex: 120 Hz is 1 2 0 . 0)

Note 2: You can switch between % and A (ampere)/V (volt), using the parameter F 7 0 ! (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.

Note 4: < VIA bar > F 1 0 9 = 3, 4 (Contact input): activated ON/OFF depend on VIA terminal input.

F 1 0 9 = 0 to 2 (Analog input): always OFF.

< VIB bar > F 1 0 9 = 1 to 4 (Contact input): activated ON/OFF depend on VIB terminal input.

F 1 0 9 = 0 (Analog input): always OFF.

< S2 bar > F 1 4 6 = 0 (Contact input): activated ON/OFF depend on S2 terminal input.

F 1 4 6 = 1 (Pulse train input): always OFF.

< S3 bar > F 1 4 7 = 0 (Contact input): activated ON/OFF depend on S3 terminal input.

F 1 4 7 = 1 (PTC input): always OFF.

Note 5: < OUT bar > F 6 6 9 = 0 (Logic output): activated ON/OFF depend on OUT terminal output.

F 6 6 9 = 1 (Pulse train output): always OFF.

Note 6: Overload characteristic of inverter and region setting are displayed on the monitor as follows;

□-xx : $RUL=1$ (Constant torque characteristic) is selected.

□-xx : $RUL=2$ (Variable torque characteristic) is selected.

x-EU : Setup menu is selected to EU.

x-R5 : Setup menu is selected to R5 IR.

x-U5 : Setup menu is selected to U5 R.

x-UP : Setup menu is selected to UP.

Note 7: Past trip records are displayed in the following sequence: 1 (latest trip record) ⇔2⇔3⇔4⇔5⇔6⇔7⇔8 (oldest trip record). If no trip occurred in the past, the message "n E r r" will be displayed. Details on past trip record 1 to 8 can be displayed by pressing the center of the setting dial when past trip 1 to 8 is displayed. Refer to section 8.2.2 for details.

Note 8: Parts replacement alarm is displayed based on the value calculated from the annual average ambient temperature specified using F 6 3 4, the ON time of the inverter, the operating time of the motor and the output current (load factor). Use this alarm as a guide only, since it is based on a rough estimation.

Note 9: The cumulative operation time increments only when the machine is in operation.

Note 10: If there is no trip record, n E r r is displayed.

Note 11: Of the items displayed on the monitor, the reference values of items expressed in percent are listed below.

- Output current: The current monitored is displayed in percentage. The value indicated on the nameplate is 100%. 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 200V (240V class), 400V (500V class). The unit can be switched to V (volts).
- Output voltage: The voltage displayed is the output command voltage. The reference value (100% value) is 200V (240V class), 400V (500V class). This unit can be switched to V (volts).
- Load factor of inverter: Depending on the PWM carrier frequency (F 3 0 0) 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 (UL I).

Note 12: Status monitor of * mark is displayed by F 7 1 0 to F 7 1 8 and F 7 2 0 setting. The left side character is as following table by each parameter setting number.

Parameter	Setting No.	LED display	Function	Unit	Communication No.
F 7 1 0 to F 7 1 8, F 7 2 0	0	o 5 0.0	Output frequency	Hz / free unit	FE00
	1	∟ 16.5	Output current *1	% / A	FC02
	2	F 5 0.0	Frequency command value	Hz / free unit	FE02
	3	y 1 0 0	Input voltage (DC detection) *1	% / V	FC05
	4	P 9 0	Output voltage (command value) *1	% / V	FC08
	5	h 3.0	Input power *1	kW	FC06
	6	H 2.8	Output power *1	kW	FC07
	7	q 8 0	Torque *1,*2	%	FC04
	9	∩ 6 0	Motor cumulative load factor	%	FE23
	10	∟ 8 0	Inverter cumulative load factor	%	FE24
	11	r 8 0	PBR (Braking resistor) cumulative load factor	%	FE25
	12	b 5 1.0	Stator frequency	Hz / free unit	FE15
	13	R 6 5	VIA input value	%	FE35
	14	b 4 5	VIB input value *2	%	FE36
	18	*3	Arbitrary code from communication	*3	*3
	20	∟ 3 5	VIC input value	%	FE37
	21	P 8 0 0	Pulse train input value	pps	FE56
	23	d 4 0.0	PID feedback value	Hz / free unit	FE22
	24	h 3 5 6	Integral input power	Depend on F 7 4 9	FE76
	25	H 3 4 8	Integral output power	Depend on F 7 4 9	FE77
	26	∩ 7 5	Motor load factor	%	FE26
	27	∟ 7 0	Inverter load factor	%	FE27
	28	R 3 3.0	Inverter rated current	A	FE70
	29	F 7 0	FM output value	%	FE40
	30	P 8 0 0	Pulse train output value	pps	FD40
	31	P 3 4.5	Cumulative power on time	100 hours	FE80
	32	F 2 8.6	Cumulative fan operation time	100 hours	FD41
	33	t 2 7.7	Cumulative operation time	100 hours	FD14
	34	n 8 9.0	Number of starting times	10000 times	FD32
	35	F 4 5.5	Forward number of starting times	10000 times	FD33
	36	r 4 3.5	Reverse number of starting times	10000 times	FD34
	37	R 2	Number of trip	times	FD35
	40	R 3 3.0	Inverter rated current (Carrier frequency corrected)	A	FD70
52	c 5 0.0	During stop : Frequency command value During operation : Output frequency	Hz / free unit	FE99	
53	r 8 0	PBR (Braking resistor) load factor	%	FD28	

- *1: These monitor values can be filtered by *F 746* setting.
- *2: If a negative value of signed signal is specified, the negative sign "-" is displayed. When the negative sign "-" is displayed, do not display "a", "b".
- *3: Data set with FA65-FA79 is displayed.
 - ⇒ For details, refer to Communication Function Instruction Manual(E6581913).