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Inspire the Next

Application Note:

SJ series type P1 – Troubleshooting

Please also refer to the
SJ series type P1 User's Manual

AN231012-1 Rev A

Hitachi Industrial Equipment & Solutions America, LLC

Chapter 18 Tips/FAQ/Troubleshooting

18

Contents

18.1 What This Chapter Explains

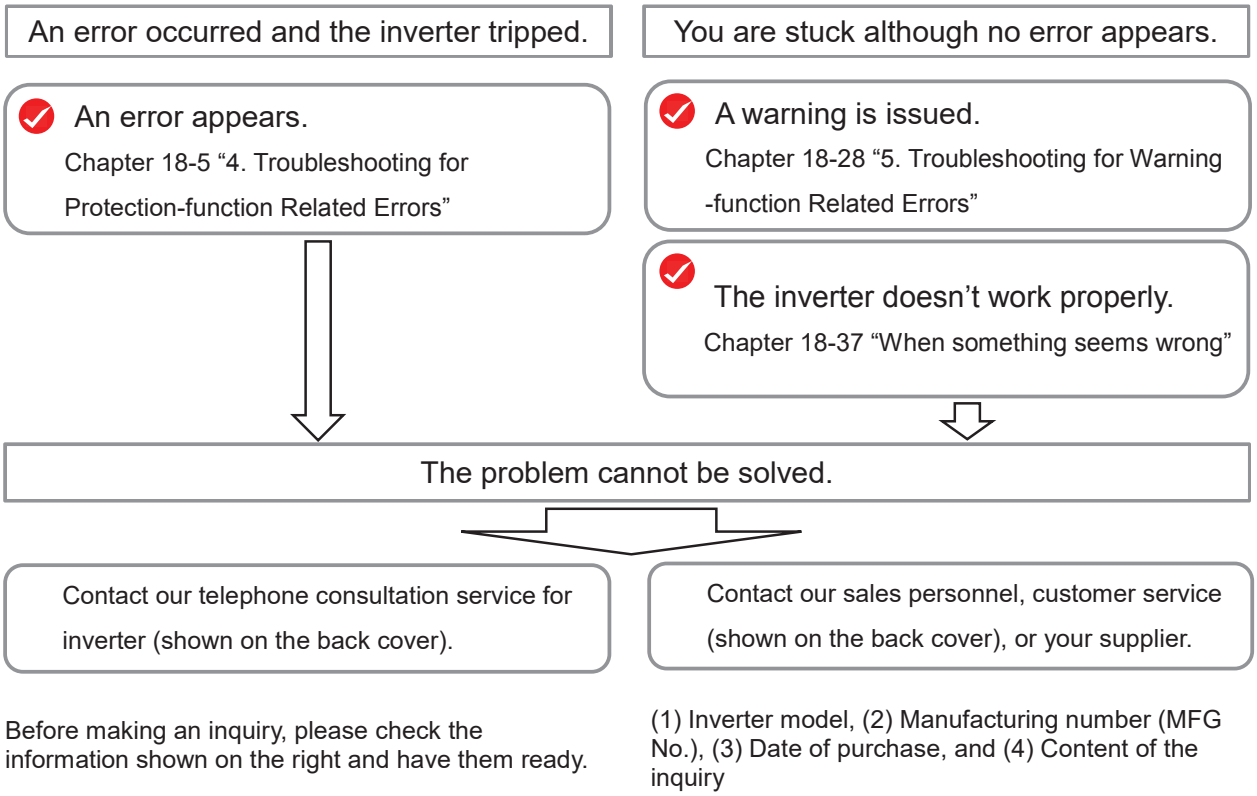
This chapter provides troubleshooting information for protection-function related errors, warning-function related warnings, and “When something seems wrong”.

Symbol	Meanings
Q	General and troubleshooting questions
A	Key points for a solution
!	Notes
▼	Confirmation of procedures

!

- Read this chapter first when the inverter doesn’t operate as intended or a problem occurred. Address these issues according to the circumstances by referring to the next and subsequent sections.

18.2 Self Diagnosis of Problems



Before making an inquiry, please check the information shown on the right and have them ready.

(1) Inverter model, (2) Manufacturing number (MFG No.), (3) Date of purchase, and (4) Content of the inquiry

18.3 Checking Error Information

18.3.1 Checking trip information

Q

- The inverter generated an error and tripped. You want to see the information of the moment the error occurred.

A

- Up to 10 trips in the past is displayed as the trip history.
- The latest trip history is displayed on the trip monitor 1.

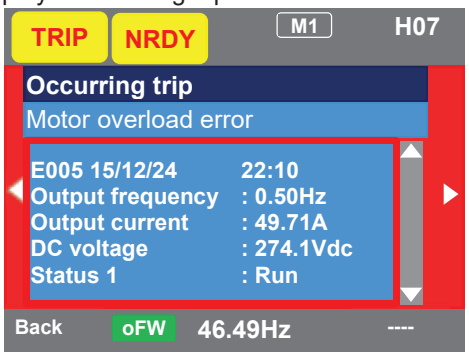
- The following data items are displayed on the monitor:

1) Error factor for trip
2) Output frequency (Hz) at trip
3) Output current (A) at trip
4) Main circuit DC voltage (V) at trip
5) Operation state at trip
6) Cumulative inverter operating time (h) before trip
7) Cumulative inverter power-on time (h) before trip

!

- The information of the moment of error occurrence may not be fetched properly if the inverter is forcibly turned OFF by its hardware.
- Values of respective data items may be reset to 0 when an error occurred and the inverter entered the trip condition.
- For a ground fault or a momentary overcurrent event, the current may be recorded in a value lower than the actual value.
- The trip monitor and the trip count monitor can be cleared by initialization of the trip history.

■Display of occurring trip

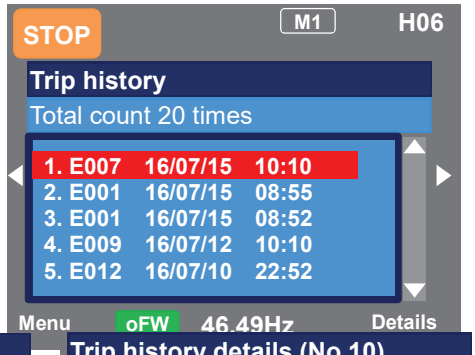


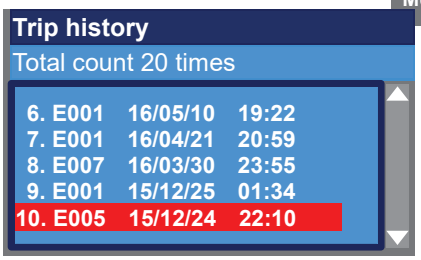
■Parameter

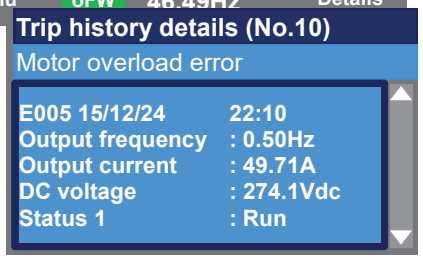
Item	Parameter	Data	Description
Trip monitor 1 to 10	Detailed monitor	See above data items.	On the parameter monitor, you can view data items 1) to 7) in sequence by UP/DOWN keys.
Trip count monitor	Detailed monitor	0 - 65535 (Counts)	Trip count data is stored in the inverter.

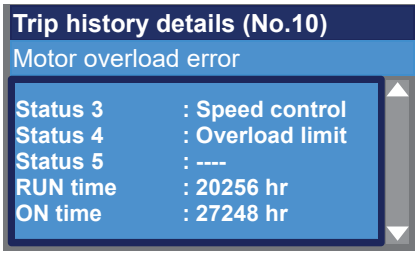
■"Detailed monitor" for checking the history

- You can look through the history with the arrow keys.









18.3.2 Checking retry information

Q

- Want to see the information of the moment of error occurrence because a retry was executed after the inverter generated the error.

A

- The last 9 retry histories are displayed.
- The latest retry history is displayed on the retry monitor 1.
- The following data items are displayed on the monitor:

1) Error factor for retry
2) Output frequency (Hz) at retry
3) Output current (A) at retry
4) Main circuit DC voltage (V) at retry
5) Operation state at retry
6) Cumulative inverter operating time (h) before retry
7) Cumulative inverter power-on time (h) before retry

!

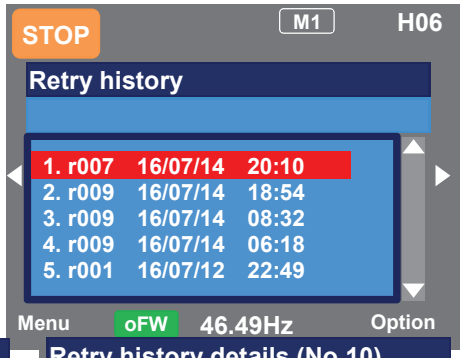
- While a retry is underway, the inverter tries to continue running. For a trip after a retry, the trip information is recorded on the trip history.
- The information of the moment of error occurrence may not be fetched properly if the inverter is forcibly turned OFF by its hardware.
- For a momentary overcurrent event, the current may be recorded in a value lower than the actual value.

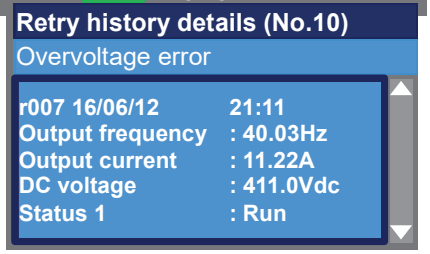
■Parameter

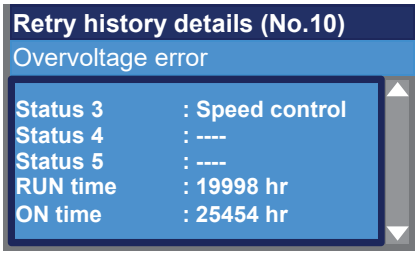
Item	Parameter	Data	Description
Retry monitor 1 to 10	Detailed monitor 2	See above data items.	On the parameter monitor, you can view data items 1) to 7) in sequence by UP/DOWN keys.

■"Detailed monitor 2" for checking the history

- You can look through the history with the arrow keys.







18.4. Troubleshooting for Protection-function Related Errors

- You need to take a measure according to the error number and the type of error.
  Refer to the explanation pages shown in the table below.

Error No.	Error Name	Explanation Page
E001	Overcurrent error	18-7
E005	Motor overload error *2)	18-8
E006	Braking resistor overload error	18-9
E007	Overvoltage error	18-10
E008	Memory error	18-11
E009	Undervoltage error	18-12
E010	Current detector error *1)	18-13
E011	CPU error *1)	18-13
E012	External trip error	18-14
E013	USP error	18-14
E014	Ground fault error *1)	18-15
E015	Incoming overvoltage error	18-15
E016	Instantaneous power failure error	18-16
E019	Temperature detector error *1)	18-16
E020	Cooling fan rotation speed reduction temperature error *1)	18-17
E021	Temperature error	18-17
E024	Input open-phase error	18-18
E030	IGBT error	18-18
E034	Output open-phase error	18-19

*1) When a serious fault error occurred, it cannot be released by a reset operation.
*2) When a controller overload error occurred, or a motor overload error occurred in the condition that [bC112] had been set to 00, the inverter does not accept a reset input for 10 s. Wait for a while before performing a reset operation.

Error No.	Error Name	Explanation Page
E035	Thermistor error	18-19
E036	Brake error	18-20
E038	Low-speed range overload error	18-20
E039	Controller overload error *2)	18-21
E040	Operator keypad disconnection error	18-22
E041	RS485 communication error	18-22
E042	RTC error	18-23
E043	EzSQ illegal instruction error	18-23
E044	EzSQ nest count error	18-24
E045	Executive instruction error	18-24
E050	EzSQ user-assigned error 0	18-25
E051	EzSQ user-assigned error 1	18-25
E052	EzSQ user-assigned error 2	18-25
E053	EzSQ user-assigned error 3	18-25
E054	EzSQ user-assigned error 4	18-25
E055	EzSQ user-assigned error 5	18-25
E056	EzSQ user-assigned error 6	18-25
E057	EzSQ user-assigned error 7	18-25
E058	EzSQ user-assigned error 8	18-25
E059	EzSQ user-assigned error 9	18-25

Error No.	Error Name	Explanation Page
E060	Option 1 error 0	18-25
E061	Option 1 error 1	18-25
E062	Option 1 error 2	18-25
E063	Option 1 error 3	18-25
E064	Option 1 error 4	18-25
E065	Option 1 error 5	18-25
E066	Option 1 error 6	18-25
E067	Option 1 error 7	18-25
E068	Option 1 error 8	18-25
E069	Option 1 error 9	18-25
E070	Option 2 error 0	18-26
E071	Option 2 error 1	18-26
E072	Option 2 error 2	18-26
E073	Option 2 error 3	18-26
E074	Option 2 error 4	18-26
E075	Option 2 error 5	18-26
E076	Option 2 error 6	18-26
E077	Option 2 error 7	18-26
E078	Option 2 error 8	18-26
E079	Option 2 error 9	18-26
E080	Option 3 error 0	18-26
E081	Option 3 error 1	18-26
E082	Option 3 error 2	18-26
E083	Option 3 error 3	18-26
E084	Option 3 error 4	18-26
E085	Option 3 error 5	18-26
E086	Option 3 error 6	18-26
E087	Option 3 error 7	18-26
E088	Option 3 error 8	18-26
E089	Option 3 error 9	18-26

Error No.	Error Name	Explanation Page
E090	STO shutoff error	18-27
E091	STO internal error	18-27
E092	STO path 1 error	18-27
E093	STO path 2 error	18-27
E094	FS option internal error	18-27
E095	FS option path 1 error	18-27
E096	FS option path 2 error	18-27
E097	FS option connection error	18-27
E100	Encoder disconnection error	18-27
E104	Position control range error	18-27
E105	Speed deviation error	18-27
E106	Position deviation error	18-27
E107	Over-speed error	18-27
E110	Contactor error	18-27
E112	FB option connection error	18-27

E001 Overcurrent error

A large current flowing in the inverter results in a failure. To prevent this, the inverter turns OFF its output. By setting the parameter, you can perform retries for a fixed number of times without generating an error. Overcurrent level can be set in the [bb160].

E001

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred abruptly during operation.	• A steep load change occurred.	• [bA120] Overcurrent suppression function and [bA122] Overload limit function are effective to suppress overcurrent. • When the vector control is used, the situation may be improved by adjusting the response to control in [HA115].
	• Hunting of motor	• The situation may be improved by setting the IM motor capacity in [Hb102], the number of IM poles in [Hb103], or the auto-tuning selection in [HA-01]. • The situation may be improved by adjusting stabilization control gain in [HA110].
Error occurred during acceleration.	• Insufficient acceleration time • Insufficient acceleration torque • Load inertia is large. • Friction torque is large.	• Setting longer acceleration time in [FA-10] can ease the insufficient acceleration torque. • When acceleration torque is required, the situation may be improved by adjusting the boost function in [Hb141], or by operating the inverter and making adjustments with control method in [AA121]. • Re-examination of load condition may improve the situation.
Error occurred during deceleration.	• Insufficient deceleration time • Insufficient regenerative torque • Load inertia is large.	• Setting longer deceleration time in [FA-12] can ease the insufficient regenerative torque. • When regenerative torque is required, the situation may be improved by adjusting the boost function in [Hb141], or by operating the inverter and making adjustments with control method in [AA121].
Error occurred right after an operation command input.	• A ground fault has occurred. • Output line is short-circuited or in open phase. • Output element failure	• The inverter may be broken if the error persists even when the power of inverter only is turned ON again after the power was turned OFF and the output line to the motor was removed. • If the issue is solved when the output line to the motor is removed, you need to check the wiring and/or motor.
	• Motor is locked. • Load inertia is large.	• Error may occur when the motor rotation is locked. • The situation may be improved by taking a measure for the case “Error occurred during acceleration”.
Error occurred right after power was turned ON.	• Output element failure • Current detector failure	• Failure output element or current detector may be the cause. An investigation and repair are required.
Error occurred after long hours of use.	• System environment changes	• The situation may be improved by reducing the motor load, or performing a system maintenance (e.g., cleaning the fan to be driven and removing clogging in the duct).
	• Aging deterioration	• If the issue is not solved by reduction of the load and system maintenance, aging deterioration of a life-limited component may be the cause. A repair is required.

E005 Motor overload error

The built-in electronic thermal function monitors the output current of the inverter and when a motor overload is detected, the inverter turns OFF its output. The inverter trips according to the setting of the motor electronic thermal function.
When a motor overload error occurred, the inverter does not accept a reset input for 10 seconds.

E005

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after a fixed period of operation.	• Operation under heavy load condition has continued.	• Re-examination of operation condition or correction of load condition may improve the situation.
	• Thermal level is set high.	• When the motor thermal level setting in [bC110] is not appropriate, re-examination of the setting may improve the situation.
Error occurred during acceleration.	• Insufficient acceleration torque • Load inertia is large. • Friction torque is large.	• Setting longer acceleration time in [FA-10] can ease the insufficient acceleration torque. • When acceleration torque is required, the situation may be improved by adjusting the boost function in [Hb141], or by operating the inverter and making adjustments with control method in [AA121].
	• A function to suppress overcurrent is at work.	• A factor for overcurrent may have been occurred. Re-examination of acceleration time or load condition is required.
Error occurred during deceleration.	• Load inertia is large.	• Setting longer deceleration time in [FA-12] can ease the insufficient regenerative torque. • When regenerative torque is required, the situation may be improved by adjusting the boost function in [Hb141], or by operating the inverter and adjusting with control method in [AA121]. • Re-examination of load condition may improve the situation.
	• A function to suppress overvoltage is at work.	• Current may increase as a result of suppressing overvoltage. Re-examination of deceleration time or load condition in [FA-12] is required.
Error occurred after long hours of use.	• System environment changes	• The situation may be improved by reducing the motor load, or performing a system maintenance (e.g., cleaning the fan to be driven and removing clogging in the duct).
	• Aging deterioration	• If the issue is not solved by reduction of the load and system maintenance, aging deterioration of a life-limited component may be the cause. A repair is required.

E006 Braking resistor overload error

E006

When the use rate of inverter's braking resistor operation circuit (BRD) exceeds the use rate set beforehand in [bA-60], the inverter turns OFF its output.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during deceleration.	• Insufficient deceleration time • Load inertia is large. • Capacity of braking resistor is small.	• Setting longer deceleration time in [FA-12] may improve the situation that the motor is rapidly decelerated. If deceleration time cannot be shortened, choice of resistor must be re-examined.
Error occurred during operation.	• Continuous regenerative operation • Capacity of braking resistor is small.	• The resistor may not be able to fully consume the power because the regenerative power returned from the motor is high. Load condition or choice of resistor must be re-examined.
	• Rotated by external force.	• The resistor may not be able to fully consume the power because the fan is rotated by a strong wind, or because the regenerative power returned from the motor increases when loads are lowered by a crane or the like. Load condition or choice of resistor must be re-examined.
Error occurred during repetitive operations.	• Repetition cycle of operation is high.	• Reduction of repetition cycle of operation may improve the situation. Adjustment of deceleration time in [FA-12] and re-examination of choice of resistor may also improve the situation.

E007 Overvoltage error

Too high P-N voltage results in a failure. To prevent this, the inverter turns OFF its output. When P-N voltage exceeds approx. 410Vdc (200V class) or approx. 820Vdc (400V class), the output is turned OFF. By setting the parameter, you can perform retries for a fixed number of times without generating an error.

E007

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during deceleration.	• Insufficient deceleration time • Load inertia is large.	• Setting longer deceleration time in [FA-12] may improve the situation that the motor is rapidly decelerated. If deceleration time cannot be shortened, you need to re-examine load condition, enable overvoltage suppression function in [bA140] and [bA146], or use a braking resistor, braking unit, or regenerative converter.
Error occurred during operation.	• Load inertia is large.	• If load inertia is large, high regenerative power returns from the motor; hence an overvoltage is likely to occur. You need to re-examine load condition, enable overvoltage suppression function in [bA140] and [bA146], or use a braking resistor, braking unit, or regenerative converter.
	• Rotated by external force (fan, crane).	• An overvoltage is likely to occur if motor rotation speed exceeds the output frequency (rotation speed) of inverter. You need to re-examine load condition, enable overvoltage suppression function in [bA140] and [bA146], or use a braking resistor, braking unit, or regenerative converter.
Error occurred during stop.	• Abnormality of PS voltage	• Power supply voltage may be raised or fluctuated. Re-examination of power supply environment or use of an AC reactor may improve the situation.
Error occurred during drooping control	• Mutual interference caused by 2 inverters trying to control motors strictly.	• When 2 motors driving a same shaft are controlled by 2 inverters, both the inverters attempt to generate torques, which may result in control divergence. The situation may be improved by setting one of the inverters to P control. See "12.11.3 Perform Drooping Control".

E008 Memory error

E008

If the built-in memory has problems, the inverter turns OFF its output. CPU error may be issued instead.

The inverter recovers by re-turning ON the power; however, you need to check that there is no problem in parameters. The data which has been backed up on the operator keypad beforehand may be restored.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred some time after the power was turned ON.	• Noise is mixed.	• A physical countermeasure such as placing a shielding plate may be required to avoid external noises.
Power has been unintentionally turned OFF before.	• Power-off during memory access	• You need to restore the data by using the data which has been backed up on the operator keypad beforehand. If the data cannot be restored, initialization is required. See “12.2.2 Initialization of inverter”. If the data cannot be restored by initialization, a repair is required.

E009 Undervoltage error

E009

A decrease of the main power supply of inverter results in a circuit breakage. To prevent this, the inverter turns OFF its output. When P-N voltage falls below approx. 160Vdc (200V class) or approx. 320VDC (400V class), the output is turned OFF. By setting the parameter, you can perform retries for a fixed number of times without generating an error. Furthermore, undervoltage error during stop can be disabled by setting.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
There was a power failure.	• PS voltage decreased.	• If the internal power supply hasn't been fully turned OFF, it is possible to re-start the inverter after the power supply is recovered, by setting the retry function while it is still on.
Error occurred with the start of operation.	• PS voltage decreased. • PS capacity is insufficient.	• When power supply voltage decreases or power supply capacity is insufficient, re-examination of power supply environment is required.
The inverter doesn't start.	• PS voltage is insufficient.	• Perform power supplying in accordance with the inverter voltage class.
Error occurred after long hours of use.	• System environment changes • Capacitor deterioration • Circuit failure	• If an undervoltage occurs frequently, the inverter may have reached its end of life or be broken down. A repair is required.

E010 Current detector error

If the built-in current detector has problems, the inverter turns OFF its output.

E010

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after power was turned ON.	• Current detector circuit is broken.	• If the error recurs after a reset operation, the current detector circuit may be broken down. A repair is required.
	• A noise source is nearby.	• When there is a noise source nearby, the situation may be improved by taking a noise countermeasure such as keeping the noise source away or placing a shielding plate.
Error occurred after long hours of use.	• Current detector circuit is broken.	• If the error recurs after a reset operation, the current detector circuit may be broken down. A repair is required.

E011 CPU error

When a malfunction or problem occurs in the built-in CPU, the inverter turns OFF its output and then displays the error.

If the inverter doesn't recover by re-turning ON the power, the CPU is likely to be broken.

E011

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred abruptly.	• The internal CPU is broken.	• The inverter may recover by a reset operation, re-turning ON the power, or initialization operation. When the inverter recovered, an initialization must be executed. • If the inverter doesn't recover, the CPU may be broken down. A repair is required.
	• A noise source is nearby.	• Where there is a noise source nearby, the situation may be improved by taking a noise countermeasure such as keeping the noise source away or placing a shielding plate.
Error occurred during data writing.	• Data is inconsistent.	• The inverter may recover by a reset operation, re-turning ON the power, or initialization operation. When the inverter recovered, an initialization must be executed. See "12.2.2 Initialization of inverter".

E012 External trip error

When the inverter accepted a signal commanded by an external device or equipment, the inverter turns OFF its output. (When external trip function is selected.)

E012

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred unintentionally.	• Terminal logics are reversed. • Wiring is wrong.	• You need to check the state of operations related to external devices or external equipment, and re-examine the assignment of external trip terminal to the inverter input terminal, the setting of a/b contact, the external trip command via communication, etc. • A/b contact of terminal can be changed by inverter setting.

E013 USP error

This error occurs if an operation command has been input to the inverter when the power supply is turned ON. Operation command detection is carried out for 1 second after the power supply is turned ON. (When USP function is selected.)

E013

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred unintentionally.	• Operation command was entered too early.	• Re-examination of the sequence to enter operation command is required. You need to wait for 2 seconds or longer to enter operation command after turning ON the power supply.
	• Operation command isn't released.	• You need to release an operation command when turning ON the power supply.
	• You tried to operate with commands other than terminal commands.	• When USP is enabled, commands of the operator keypad and communication commands are treated as errors. You need to wait for 2 seconds or longer to enter operation command after turning ON the power supply.

E014 Ground fault error

E014

This is a function to protect the inverter by the detection of ground faults between the inverter output and the motor at power-on.

The function doesn't work when there is a voltage induced in the motor due to idling or when the inverter trips.

When the control circuit power (R0, T0, or 24V power supply) has been turned ON prior to the main circuit power R, S, or T, the function is activated at the time the main circuit power is turned ON.

Setting the ground fault detection selection [bb-64] to 00 disables the ground fault function. Setting it to 01 enables the function.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred as the power supply was turned ON.	• Ground faults of wires or the motor • Motor insulation deterioration	• Turn OFF the power, remove the wires connected to the motor, and then check the motor and the wires. A ground fault may have been occurred. • Turning ON the power supply in a ground fault state results in a failure. Do not turn ON the power when you check the motor and motor wires.

E015 Incoming overvoltage error

E015

This error occurs if high incoming voltage level is held for 100 seconds continuously while the inverter output is stopped when incoming overvoltage level [bb-61] is set to 01. It occurs when the P-N voltage exceeds the voltage level set in the incoming overvoltage level selection [bb-62] due to incoming voltage.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after power was turned ON.	• Incoming voltage is high.	• Re-examination of the power supply environment is required.
Error occurred after long hours of use.	• Power supply has become unstable.	• The power supply environment may have been changed due to facility replacement or the like. Re-examination of the power supply environment is required.

E016 Instantaneous power failure error

E016

At the time of an instantaneous power failure, the inverter turns OFF its output. If the power failure continues, the event is regarded as a normal power-off.

Decrease in the main power R, S, or T generates this error. Decrease in the voltage of control circuit power supply R0 or T0 doesn't generate the error if the J51 connector has been removed and the R0 and T0 are input via a separate system.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after long hours of use.	• PS voltage decreased.	• If the power is turned OFF due to an external factor such as power failure, the inverter can be restarted by using the retry function when the power is restored.
	• There was a contact fault in circuit breaker.	• Failure of magnetic contactor or earth-leakage breaker may be the cause. Although the inverter may recover, a repair is required.
Error occurred with the start of operation.	• PS voltage decreased.	• If an instantaneous power failure hasn't occurred, insufficient capacity of power supply may be the cause. Re-examination of the power supply environment is required.

E019 Temperature detector error

E019

This error occurs if there is a problem in the temperature detector circuit such as disconnection.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after use.	• The temperature detector circuit is disconnected or broken down.	• The temperature detector circuit is broken down. A repair is required.

E020 Temperature error Cooling fan rotation speed reduction error

E020

If the temperature of inverter gets high due to deterioration of cooling ability resulted from decrease in fan rotation speed, the inverter turns OFF its output. Refer to E021 also.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Cooling fan stopped.	• A foreign object is stuck.	• If there is a foreign object stuck in the fan, the inverter may recover by removing it.
	• It is the end of cooling fan life.	• The cooling fan needs to be replaced.
The cooling fan is working.	• Cooling fan is approaching the end of its life.	• The cooling ability has been deteriorated. The cooling fan needs to be replaced.

E021 Temperature error

E021

When the temperature of inverter gets high, the inverter turns OFF its output.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during operation.	• Carrier frequency is high.	• The higher the carrier frequency is, the more the temperature inside the inverter tends to increase. Lower the carrier frequency setting.
	• There is clogging in the fin.	• The cooling ability is deteriorated. Cleaning the fin may improve the situation.
	• Used in high temperature environment. • Cooling of the surroundings is insufficient..	• Enhancing the use environment or cooling environment may improve the situation.
	• The formal installation condition is not satisfied.	• Improper installation of the inverter may results in the inverter failure. Install the inverter properly in accordance with the instruction manual.
Error occurred during stop.	• The temperature detector circuit broke down.	• The temperature detector circuit is broken down if the error is generated consecutively even after a reset. A repair is required.

E024 Input open-phase error

E024

When [bb-65] input phase loss selection is set to 01, when a missing phase is detected in input line, the inverter turns OFF its output.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after power was turned ON.	• An input line or the motor has a loose connection or is disconnected.	• You need to turn OFF the power supply and check the input lines and the wiring condition of breaker. This error may also occur due to PS voltage defect, contact defect, screw tightening failure, etc.
	• Single-phase input is used.	• For input lines, use three-phase connection.
Error occurred after long hours of use.	• An input line or breaker has a loose connection or is disconnected.	• The situation may be improved by mending loose connections due to loosening of screws or the breaker problems.

E030 IGBT error

E030

At the time of an instantaneous overcurrent or the main element failure, the inverter turns OFF its output to protect the main element.

Overcurrent error may be issued instead.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred right after the operation started.	• A ground fault has occurred. • Output line is short-circuited.	• After the power is turned OFF, you need to check the wires connected to the motor, motor disconnection, and the like. If the error occurs after removal of the motor wires, the inverter is broken down. It needs to be repaired.
	• Motor rotation is locked.	• A large current may flow when the motor rotation is locked during operation. The cause needs to be removed.
	• Output element is broken down.	• If output element is broken down, it needs to be repaired.
Error occurred right after power was turned ON.	• Output element is broken down.	• If output element is broken down, it needs to be repaired.
Error occurred during operation.	• Motor rotation is locked.	• A large current may flow when the motor rotation is locked during operation. The cause needs to be removed.

E034 Output open-phase error

E034

When the output phase loss selection [bb-66] is set to 01, when a loose connection or disconnection of output line, disconnection inside the motor, etc. is detected, the inverter turns OFF its output. Detection of phase loss state is executed in the section between 5Hz to 100Hz.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred right after the operation started.	• An output line or the motor has a loose connection or is disconnected.	• You need to turn OFF the power supply and check the output lines and the wiring condition of motor. This error can also occur due to motor insulation breakdown or screw tightening failure.
	• Single-phase output is used.	• For output lines, use three-phase connection.
Error occurred after long hours of operation.	• An output line or the motor has a loose connection or is disconnected.	• You need to turn OFF the power supply and check the output lines and the wiring condition of motor. If there is a loosened screw, the situation may be improved by re-tightening the screw.

E035 Thermistor error

E035

If an abnormal temperature is observed during detection of resistor level change in an external thermistor, the inverter turns OFF its output. (When thermistor function is enabled.)

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Motor is heated.	• The motor hasn't been cooled sufficiently.	• The cooling environment needs to be improved.
	• Heavy load has been applied for a long time.	• The motor's driving environment needs to be re-examined.
Motor is not heated.	• Inadequate thermistor function setting	• Re-examination of the thermistor function setting may improve the situation.
	• The thermistor is broken down.	• The thermistor needs to be repaired.
	• Malfunction due to noise	• The situation may be improved by taking a noise countermeasure such as wiring separation.

E036 Brake error

This error occurs when the inverter can not detect whether the brake check signal is ON or OFF during waiting time after the inverter has output a brake releasing signal. (When brake function is enabled.)

E036

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after operation.	• Disconnection of signal line.	• Check the wiring of brake check signal and whether the signal is ON or OFF.
	• Brake function setting	• The situation may be improved by re-examination of brake check waiting time or input terminal logics according to the sequence of the signal.

E038 Low-speed range overload error

This error occurs to protect the main element if the inverter has output at a low frequency of 0.2Hz or below.

When such a low frequency is detected by the built-in electronic thermal function, the inverter turns OFF its output.

E038

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during output at low speed.	• The motor load is heavy.	• Load at low-speed range needs to be reduced. If the error occurs frequently, you need to select an inverter with a capacity large enough for the motor.

E039 Controller (inverter) overload error

E039

The built-in electronic thermal function monitors the output current of the inverter (controller) and when inverter overload is detected, the inverter turns OFF its output.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after a fixed period of operation.	• Operation under heavy load condition has continued.	• Re-examination of operation condition or correction of load condition may improve the situation.
Error occurred during acceleration.	• Insufficient acceleration torque • Load inertia is large. • Friction torque is large.	• Setting longer acceleration time in [FA-10] can ease the insufficient acceleration torque. • When acceleration torque is required, the situation may be improved by adjusting the boost function in [Hb141], or by operating the inverter and making adjustments with control method in [AA121].
	• A function to suppress overcurrent is at work.	• A factor for overcurrent may have been occurred. Re-examination of acceleration time or load condition is required.
Error occurred during deceleration.	• Load inertia is large.	• Insufficient rotation regeneration torque can be eased by setting longer deceleration time in [FA-12]. • When regenerative torque is required, the situation may be improved by adjusting the boost function in [Hb141], or by operating the inverter and adjusting with control method in [AA121]. • Re-examination of load condition may improve the situation.
	• A function to suppress overvoltage is at work.	• Current may increase as a result of suppressing overvoltage. Re-examination of deceleration time or load condition is required.
Error occurred after long hours of use.	• System environment changes	• The situation may be improved by reducing the motor load, or performing a system maintenance (e.g., cleaning the fan to be driven and removing clogging in the duct).
	• Aging deterioration	• If the issue is not solved by reduction of the load and system maintenance, aging deterioration of a life-limited component may be the cause. A repair is required.

E040 Operator keypad communication error

E040

The inverter displays this error when timeout occurs because of a malfunction due to noises, loose connection or disconnection of circuit for communication with the operator keypad.

This error function can be enabled and disabled by setting of the operation selection at disconnection of operator keypad [UA-20].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after communication is started.	• Loose connection • Disconnection	• Check the wiring to see whether the connection is properly made.
	• Noise is mixed.	• The situation may be improved by taking a noise countermeasure such as wiring separation.

E041 RS485 communication error

E041

The inverter displays this error only when timeout occurs because of a malfunction due to noises, loose connection or disconnection of circuit for RS485 communication (such as Modbus-RTU).

This error function can be enabled and disabled by setting of the communication error selection [CF-05].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred after communication is started.	• Loose connection • Disconnection	• Check the wiring to see whether or not the connection is properly made.
	• Noise is mixed.	• The situation may be improved by taking a noise countermeasure such as wiring separation.

E042 RTC error

The error is generated if the data of RTC incorporated in the operator keypad is returned to the initial data.

E042

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred at power-on.	• A battery in the operator runs out.	• Replacement of the battery and setting of the date solve the issue. The error occurs when the power supply is turned ON with a dead battery.

E043 EzSQ illegal instruction error

This error is output when an invalid instruction is detected in operation of a program which is downloaded to the inverter while the programing function EzSQ is used.

The error is also output if the program is put into action in the condition that the program hasn't been written.

E043

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when the program was about to put into action.	• Writing error due to noise	• There is a possibility of EzSQ program writing error and if there is a noise source nearby, the situation may be improved by taking a noise countermeasure such as keeping the noise source away and writing the program.
	• Program hasn't been entered.	• EzSQ program needs to be written in the factory default setting condition and after initialization. Write in the program.

E044 EzSQ nest count error

This error is output when the nesting frequency of a subroutine, "for" statement, "next" statement, etc. on a program exceeds 8 times while the programing function EzSQ is used.

E044

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when the program was put into action.	• Program structure is too complicated.	• The program has deep nesting of a subroutine, "for" statement, "next" statement, etc., with its nesting frequency exceeding 8 times. Improvement of the program structure is required.

E045 EzSQ executive instruction error

During operation of a program which is downloaded to the inverter while the programing function EzSQ is used, if execution of the program is turned OFF due to an error, the inverter generates E045 error.

E045

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when the program was put into action.	• Program flow is inadequate.	• This error is output if there is no nest starting statement such as "for" at the point when “goto” statement refers to, or if a nest ending statement such as "next” precedes the nest starting statement. Check the structure of "for" statement and "next" statement and make amendments as needed.
	• There is a problem in the data.	• There may be an overflow, underflow, or division by zero in four arithmetic operations. Check the result of operations and amend the operations as needed.
		• This error is output if a non-existing parameter is referred to or a setting is made beyond the setting range in “chg param” or “mon param” instruction. Check the content of instruction and make amendments as needed.

E050 to E059 EzSQ user-assigned errors 0 to 9

E050~ E059

The inverter generates these errors when the corresponding user-assigned tripping programs are executed during operation of a program which is downloaded to the inverter while the programing function EzSQ is used.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when the program was put into action.	• The program has an error instruction.	• If a user-assigned error occurs unintentionally, check the content of trip instruction of the program and make amendments as needed.

E060 to E069 Option 1 errors 0 to 9

E060~ E069

Errors occurring in an option mounted in the option slot 1 (to the observer's left) are detected.

For details, refer to the instruction manual provided together with the option mounted.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when an option is mounted.	• The option isn't securely mounted.	• The option may not be securely mounted. Check the mounting state.
	• The option is used in the wrong way.	• The type of error varies depending on options. For details, refer to the instruction manuals provided together with the respective options.

E070 to E079
Option 2 errors 0 to 9

Errors occurring in an option mounted in the option slot 2 (to the observer's center) are detected.

For details, refer to the instruction manual provided together with the option mounted.

E070~ E079

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when an option is mounted.	• The option isn't securely mounted.	• The option may not be securely mounted. Check the mounting state.
	• The option is used in the wrong way.	• The type of error varies depending on options. For details, refer to the instruction manuals provided together with the respective options.

E080 to E089
Option 3 errors 0 to 9

Errors occurring in an option mounted in the option slot 3 (to the observer's right) are detected.

For details, refer to the instruction manual provided together with the option mounted.

E080~ E089

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred when an option is mounted.	• The option isn't securely mounted.	• The option may not be securely mounted. Check the mounting state.
	• The option is used in the wrong way.	• The type of error varies depending on options. For details, refer to the instruction manuals provided together with the respective options.

E090 to E096 STO path error FS option error

E090~ E096

This error is output when there is a problem in functional safety circuit path.

For details of E090 to E093, refer to the separate-volume "Functional Safety Guide". For details of E094 to E096, refer to the instruction manual provided together with the option P1-FS

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
The safety function is used.	• The safety function system has problems.	• Refer to the separate-volume “Functional Safety Guide” and “P1-FS Functional Safety Guide”.

E100 Encoder disconnection error

E100

This is an error related to feedback options.

For E100 (encoder disconnection error), see the P1-FB user’s guide.

E104 Position control range error

E104

When the current position counter exceeds the position control ranges for normal/reverse rotation in the setting of [AE-52] position range (normal) or [AE-54] position range (reverse), the inverter turns OFF its output and displays the error.

Related pages found herein: 12-17-26

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during operation.	• Recheck the setting of electronic gear.	• Re-examination of operation condition or correction of load condition may improve the situation.
	• A slip occurs due to improper encoder setting.	• Check the encoder mounting state. If any, re-examine factors for slipping.
	• Improper encoder setting	• Check the setting of encoder constant and the like.
	• Improper electronic gear setting	• Recheck the setting of electronic gear.

E105 Speed deviation error

E105

When the deviation between the frequency command and the feedback speed exceeds the [bb-83] speed deviation error detection level setting, the inverter judges it as an error. If “01: Error" is specified for [bb-82] Operation for speed deviation error, the inverter turns ON the output terminal function 041 [DSE] with a speed deviation error, turns OFF the inverter output, and displays this error.

Related pages found herein: 12-16-11

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during operation.	• Recheck the setting of electronic gear.	• Re-examination of operation condition or correction of load condition may improve the situation.
	• A slip occurs due to improper encoder setting.	• Check the encoder mounting state. If any, re-examine factors for slipping.
	• Improper encoder setting	• Check the setting of encoder constant and the like.
	• Improper electronic gear setting	• Recheck the setting of electronic gear.

E106 Position deviation error

E106

When the [bb-87] abnormal position deviation time passes with the deviation of the position feedback against the position command exceeding the [bb-86] abnormal position deviation detection level, it is determined to be abnormal. When the behavior of the abnormal position deviation [bb-85] has been set to 01, the output terminal [PDD] is turned ON, the output is turned OFF, and the error is displayed.

Related pages found herein: 12-17-18

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during operation.	• Recheck the setting of electronic gear.	• Re-examination of operation condition or correction of load condition may improve the situation.
	• A slip occurs due to improper encoder setting.	• Check the encoder mounting state. If any, re-examine factors for slipping.
	• Improper encoder setting	• Check the setting of encoder constant and the like.
	• Improper electronic gear setting	• Recheck the setting of electronic gear.

E107 Over-speed error

E107

When the speed has exceeded [bb-80] Over-speed error detection level and [bb-81] Over-speed error detection time has elapsed, the output is turned OFF and the error is displayed.

Related pages found herein: 12-16-12

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Error occurred during operation.	• Recheck the setting of electronic gear.	• Re-examination of operation condition or correction of load condition may improve the situation.
	• Improper encoder setting	• Check the setting of encoder constant and the like.
	• Improper electronic gear setting	• Recheck the setting of electronic gear.

E110 Contactor error

When an error occurs in the contactor sequence, the output is turned OFF.

Related pages found herein: 12-17-10

E110

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
[COK] was not turned ON within the contactor check time at start-up.	• Wiring defect	• Check the setting and wiring of intelligent input.
	• Contactor response defect	• Check the operation of contactor including its response time.
[COK] was not turned OFF within the contactor check time at stop.	• Wiring defect	• Check the setting and wiring of intelligent input.
	• Contactor response defect	• Check the operation of contactor including its response time.

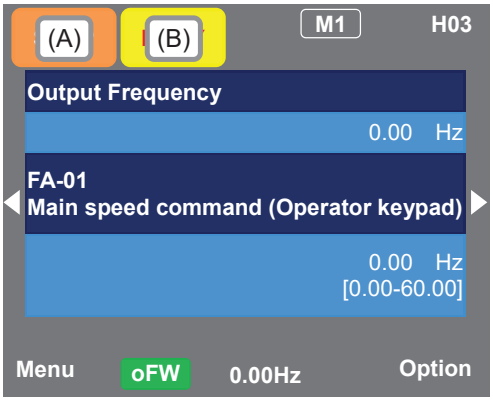
E112 Feedback option connection error

This is an error related to feedback options.
For E112 (FB option connection error), see the P1-FB user's guide.

E112

18.5. Troubleshooting for Warning-function Related Errors

18.5.1 Checking the warning display



Indication (A) Main Operating status display

No.	Indication	Description
A1	RUN FW	Icon shown during normal rotation operation. Some parameters cannot be changed while the inverter is running.
A2	RUN RV	Icon shown during reverse rotation operation. Some parameters cannot be changed while the inverter is running.
A3	RUN 0Hz	Icon shown during outputting under a zero-Hz command. It is also shown while DB, FOC, SON function is working. Some parameters cannot be changed while the inverter is running.
A4	TRIP	Icon shown when an error occurred and the inverter is in trip state. Releasable errors can be released by a reset operation. ⇒ 18.3.1 Checking trip information
A5	WARN	Icon shown when a setting inconsistency exists. Eliminate the inconsistency. ⇒ 18.5.2 Checking setting inconsistencies
A6	STOP	Icon shown while the inverter is forced stop by the following functions although operation command is entered. • An operation command was entered under 0Hz frequency command. • Operation command was entered from a source other than the operation keypad and the operation was stopped with STOP key on the operation keypad. • The inverter stops by instantaneous power failure non-stop function. RUN lamp flashes during this.
A7	STOP	Inverter is stopped because no operation command is given. The inverter cannot be operated if the stop terminal functions such as [RS] and [FRS] or the STO function is ON.

(Notes)
• When A6: STOP (in red) is indicated...
⇒ If the value shown in the indication (F): frequency command is 0.00Hz, the frequency command is 0Hz. Check whether a frequency command is entered or not.
⇒ For example, if the operation was stopped with STOP key while the inverter had been operated with [FW] terminal, turn OFF the [FW] terminal and then ON again to restart the operation.

Indication (B) Warning status display

No.	Indication	Description
B1	LIM	Icon shown while the following functions are working. [dC-37] • Under overload limit. • Under torque limit. • Under overcurrent suppression. • Under overvoltage suppression. • Under upper/lower limit operation. • Under jump frequency operation. • Under minimum frequency limit.
B2	ALT	Icon shown while the following functions are working. [dC-38] • Overload advance notice • Motor thermal advance notice • Inverter thermal advance notice • Motor overheat advance notice
B3	RETRY	Icon shown during retry standby or restart standby. [dC-39]
B4	NRDY	The inverter cannot be operated even when the operation command is entered. [dC-40] • The main power is under insufficient voltage supply. • The inverter is operating only with 24V power supply. • Under reset operation. • The inverter is OFF as the [REN] terminal function is enabled.
B5	FAN	Icon shown in fan life advance notice state.
B6	C	Icon shown in on-board capacitor life advance notice state.
B7	F/C	Icon shown in fan life advance notice and on-board capacitor life advance notice state.
B8	(None)	A state other than those above.

(Notes)
• B1:LIM and B2:ALT are indicated when the current or internal voltage has increased. If an error is generated, re-examination of load or other factors is required.
• The above-mentioned indications are shown when the cooling fan or capacitor on the board is determined to have reached its product life.
• **You can see the detailed warning by pressing UP key on the three-lined monitor screen.**

■(STOP in red) appears.

Q

• (STOP in red) appears.

A

• See below.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
RUN key on the keypad was pressed. [FW] terminal was turned ON. Operation command was entered.	If LIM icon is lit, the command is below the minimum frequency and the following reasons are conceivable. • Operation command is entered but not frequency command. • Frequency command destination selection is wrong.	• Check that [FA-01] main speed command is not set to 0.00Hz. • Check whether the command is entered from the command destination indicated on the right of the main speed command [FA-01]. • Check [AA101] main speed command destination.
After STOP key on keypad is pressed, inverter doesn't operate with RUN key.	• STOP key on the operation keypad was pressed when the operation command had been entered from a source other than the operation keypad.	• Cancel the command entered to the operation command destination.
Instantaneous power failure occurred.	• The inverter stopped by the instantaneous power failure non-stop function [bA-30].	• To start operation, turn off the command entered to the operation command destination and turn on again.

■(WARN) appears.

Q

• (WARN) appears.

A

• See below.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
A setting was configured.	• There is an inconsistency in the parameter setting	• Refer to 18.5.2 "Checking setting inconsistencies".

■Icon 2 LIM monitor

Q

- The LIM icon is shown on the display.

A

- When LIM is shown, the inverter is in the following condition(s).
- You can see the status of LIM by pressing UP key on the three-lined monitor or on [dC-37].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Output current was high, and [dC-37] LIM was set to 01.	• [bA120] overcurrent suppression function was enabled and the current increased due to the load or other factors.	• Remove the factor for the increased load. (E.g., by cleaning a clogged channel, re-examining the load)
	• The current was increased by the high ratio of motor rotation during DC braking that was caused by the selection of [DB] terminal or [AF101] DC braking.	• Reduce the DC braking force in [AF105] or [AF108]. • For stopping, set longer time for [AF106] DC braking delay time at the time of the stop. • For retry operation at the start, set longer delay time according to the factors. [bb-26] [bb-29] [bb-31]
	• [FA-10] acceleration time is too short.	• Make the acceleration time longer in [FA-10].
Output current was high, and [dC-37] LIM was set to 02.	• [bA122] overload limit function or similar function was enabled and the current increased due to the load or other factors.	• Remove the factor for the increased load. (E.g., by cleaning a clogged channel, re-examining the load)
	• [bA122] overload limit function or similar function was enabled and [FA-10] acceleration time was too short.	• Make the acceleration time longer in [FA-10].
Error occurred during deceleration. [dC-37] LIM was set to 03.	• [bA140] overvoltage suppression function was enabled and P-N voltage increased due to regenerative load or the like.	• Remove the factor for the increased regenerative load. (E.g., by re-examining the state of the motor being rotated by external force, and by re-examining the load)
	• [bA122] overload limit function or similar function was enabled and [FA-12] deceleration time was too short.	• Make the deceleration time longer in [FA-12].
Error occurred during sudden acceleration. [dC-37] LIM was set to 03.	• [bA140] overvoltage suppression function was enabled and P-N voltage increased due to regenerative load or the like.	• Remove the factor for the increased regenerative load. (E.g., by re-examining the state of the motor being rotated by external force, and by re-examining the load)
Output current was high, and [dC-37] LIM was set to 04.	• [bA110] torque limit function or similar function was enabled and the current increased due to the load or other factors.	• Remove the factor for the increased load. (E.g., by cleaning a clogged channel, re-examining the load)
	• [bA110] torque limit function or similar function was enabled and [FA-10] acceleration time was too short.	• Make the acceleration time longer in [FA-10].
Error occurred during operation. [dC-37] LIM was set to 05.	• The normal limiting was performed according to the settings of [bA102] upper limiter, [bA103] lower limiter, and [AG101] and other jump frequencies.	• Re-examine the settings of the upper/lower limiter or jump frequencies if necessary.
Error occurred during operation. [dC-37] LIM was set to 06.	• The frequency command at below the minimum frequency [Hb130] has been input.	• Set the frequency command at the minimum frequency or higher in [FA-01].

■Icon 2 ALT monitor

Q

- The ALT icon is shown on the display.

A

- When ALT is shown, the inverter is in the following condition(s).
- You can see the status of ALT by pressing UP key on the three-lined monitor or on [dC-38].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Output current was high, and [dC-38] ALT was set to 01.	• The current increased due to load or other factors, exceeding the overload prewarning levels set in [CE106] or the similar parameter.	• Remove the factor for the increased load. (E.g., by cleaning a clogged channel) • Enable [bA122] overload limit function or similar function.
Output current was high, and [dC-38] ALT was set to 02.	• The electronic thermal function of motor was activated due to increase in current and the load exceeded the electronic thermal warning level (MTR) set in [CE-30].	• Remove the factor for the increased load. (E.g., by cleaning a clogged channel) • Re-examine the electric thermal settings in [bC110] or the similar parameter.
Output current was high, and [dC-38] ALT was set to 03.	• The electronic thermal function of inverter was activated due to increase in current and the load exceeded the electronic thermal warning level (CTL) set in [CE-31].	• Remove the factor for the increased load. (E.g., by cleaning a clogged channel)

■Icon 2 RETRY monitor

Q

- The RETRY icon is shown on the display.

A

- When RETRY is shown, the inverter is in the following condition(s).
- You can see the status of RETRY by pressing UP key on the three-lined monitor or on [dC-39].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Output was turned OFF and [dC-39] RETRY was set to 01.	• The inverter is in the waiting mode after a trip retry operation due to increased current or P-N voltage fluctuation.	• If the wait time become longer, the following delay time become shorter. [bb-26] [bb-29] [bb-31] • If this error is generated consecutively, make the wait time longer. [bb-26] [bb-29] [bb-31]
Output was turned OFF and [dC-39] RETRY was set to 02.	• The inverter is in the waiting mode before restart after power-off by [RS], [FRS], or [CS] terminal.	• If the wait time become longer, the following delay time become shorter. [bb-26]

■Icon 2 NRDY monitor

Q

- The NRDY icon is shown on the display.

A

- When NRDY is shown, the inverter is in the following condition(s).
- You can see the status of NRDY by pressing UP key on the three-lined monitor or on [dC-40].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
TRIP display was shown and [dC-40] NRDY was set to 01.	• There was an error factor, which caused the inverter to trip.	• Remove the error factor. Consult this chapter.
The CTRL icon was shown and [dC-40] NRDY was set to 02.	• The control power supply (R0, T0) has been input, whereas the main circuit power supply R-S-T hasn't been input.	• Check the input of main circuit power supply and examine the breaker, wiring, and so on.
The 24V icon was shown and [dC-40] NRDY was set to 02.	• Only 24V has been input to the backup power supply P+-P-.	• Check the input of main circuit power supply and the control power supply, and examine the breaker, wiring, and so on.
[dC-40] NRDY was set to 03.	• [RS] terminal is ON and the inverter is under reset operation.	• Check the wiring and operation state of [RS] terminal.
[dC-40] NRDY was set to 04.	• The STO circuit is turned OFF or broken.	• Check ST1/ST2 terminals.
[dC-40] NRDY was set to 05.	• The inverter is checking the internal circuit, operator keypad, options, etc.	• If this error is not released, check the operator keypad for contact failure or other problem.
[dC-40] NRDY was set to 06.	• There is an inconsistency in the setting	• Although [AA121] is set to 10 (Vector control with sensor), the option P1-FB is not attached. • Refer to 18.5.2 "Checking setting inconsistencies".
[dC-40] NRDY was set to 07.	• There is a sequence operation problem in the brake control.	• Check the setting and signal operation of [AF130] brake control or the similar parameter.
[dC-40] NRDY was set to 08.	• [FRS] terminal or [CS] terminal was turned ON. • [FRS] or [CS] command was entered from the communication.	• Check the signal operation of input terminal for [FRS] or [CS].
[dC-40] NRDY was set to 09.	• Operation command isn't permitted.	• The [REN] terminal has been assigned and is turned OFF.
	• Forced stop is being issued. (Deceleration stop behavior)	• STOP key was pressed when commands had been entered from a source other than the operation keypad.

18.5.2 Checking setting inconsistencies

Q

- A warning was generated. You want to identify the cause and troubleshoot the warning.

A

- You need to take a measure according to the warning number and the type of warning. Refer to the table below.
- The induction motor (IM) control and synchronous motor (permanent magnetic motor) (SM (PMM)) control can be switched in [AA121].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Warning was generated - 102	(First Max. frequency) < (first upper limiter) IM: [Hb105] < [bA102] SM (PMM): [Hd105] < [bA102]	• Increase the Max. frequency [Hb105]/[Hd105]. • Decrease the upper limiter [bA102].
Warning was generated - 103	(First Max. frequency) < (first lower limiter) IM: [Hb105] < [bA103] SM (PMM): [Hd105] < [bA103]	• Increase the Max. frequency [Hb105]/[Hd105]. • Decrease the lower limiter [bA103].
Warning was generated - 106	(First Max. frequency) < (first main speed command) IM: [Hb105] < [Ab110] SM (PMM): [Hd105] < [Ab110]	• Increase the Max. frequency [Hb105]/[Hd105]. • Decrease the main speed command [Ab110].
Warning was generated - 107	(First Max. frequency) < (first auxiliary speed command) IM: [Hb105] < [AA104] SM (PMM): [Hd105] < [AA104]	• Increase the Max. frequency [Hb105]/[Hd105]. • Decrease the auxiliary speed command [AA104].
Warning was generated - 202	(Second Max. frequency) < (second upper limiter) IM: [Hb205] < [bA202] SM (PMM): [Hd205] < [bA202]	• Increase the Max. frequency [Hb205]/[Hd205]. • Decrease the upper limiter [bA202].
Warning was generated - 203	(Second Max. frequency) < (second lower limiter) IM: [Hb205] < [bA203] SM (PMM): [Hd205] < [bA203]	• Increase the Max. frequency [Hb105]/[Hd105]. • Decrease the lower limiter [bA103].
Warning was generated - 206	(Second Max. frequency) < (second main speed command) IM: [Hb205] < [Ab210] SM (PMM): [Hd205] < [Ab210]	• Increase the Max. frequency [Hb205]/[Hd205]. • Decrease the main speed command [Ab210].
Warning was generated - 207	(Second Max. frequency) < (second auxiliary speed command) IM: [Hb205] < [AA204] SM (PMM): [Hd205] < [AA204]	• Increase the Max. frequency [Hb205]/[Hd205]. • Decrease the auxiliary speed command [AA204].

18.5.3 Checking display messages

Q

- A message was appeared on the operator keypad VOP. You want to know the meaning of error.

A

- A message appears in an event like communication error, insufficient voltage, or result of auto-tuning.
- Even when there is an error, you can exit the error screen with the XX key; however, you still need to remove the error factor separately.

Message ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Warning xxxxxxxxxxxxxx Press the XX key.	• Warning of setting inconsistency was generated. There is inconsistency of setting shown in the warning message.	• The warning will be canceled by amending the indicated parameter setting.
Auto-tuning (non-revolving) completed. xxxxxxxxxxxxxx Press the XX key.	• Non-revolving auto-tuning process is finished.	• See "12.3.3 Auto-tuning of motor".
Auto-tuning (revolving) completed. xxxxxxxxxxxxxx Press the XX key.	• Revolving auto-tuning process is finished.	• See "12.3.3 Auto-tuning of motor".
Auto-tuning failed. Re-examine the setting and wiring. Press the XX key.	• Revolving auto-tuning process is disturbed and not finished.	• See "12.3.3 Auto-tuning of motor" for troubleshooting.
Initializing... Please wait.	• The inverter is being initialized.	• The initialization completion screen will appear after a while.
Clearing history... Please wait.	• The inverter is being initialized.	• The history clearance completion screen will appear after a while.
Initialization completed !! Target:#:xxxxxxxxxxx Selection of initial values (Ub-02) xxxxxxxxxxxx Load type selection Ub-03 xxxxxxxxxxxx Press the XX key.	• The initialization is completed.	• Press XX key to exit the initialization completion screen.
History clearance completed !! Trip history cleared. Press the XX key.	• The history clearance is completed.	• Press XX key to exit the history clearance completion screen.

Message ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Operation command is limited. Please check operation command.	• Operation command of command direction is limited by the setting of [AA114] operation direction limit. • The rotation direction is reversed from the command direction limited according to the setting of [AA114] operation direction limit because the frequency command is turned negative due to calculation of main speed or auxiliary speed.	• Check the setting of [AA114] operation direction limit. • Check the terminal command FW/RW and the command direction of communication command. • Check whether the calculated frequency command is negative or not.
Resetting. Inverter is being reset. Press the XX key.	• [RS] terminal is ON. • Trip reset was performed. (The screen is transited automatically at trip reset.)	• The inverter is in the condition that [RS] terminal is ON. Re-examine the state of input terminal.
Retrying. Retrying and restarting. Press the XX key.	• The inverter is waiting for restart. (This mode is released after the set wait time has elapsed.) • The inverter may not start if the incoming voltage is low.	• If the wait time for restart is long, the message will continue to be indicated. See "12.14 Changing the Start Mode". • If the incoming voltage is low, check the input voltage.
Main circuit under instantaneous power failure. Power of main circuit is turned OFF. Press the XX key.	• The main circuit power supply (R, S, T) is turned OFF due to lightning strikes, power supply environment, or other factors.	• Check the state of input power supply. • The inverter will recover when the power supply returns.
Main circuit under insufficient voltage. Please check the main circuit power. Press the XX key.	• The control circuit power supply (R0, T0) has been input, whereas the main circuit power supply (R, S, T) has been cut.	• Check the state of input power supply. • The inverter will recover when the power supply of main circuit returns.
POWER OFF POWER OFF Press the XX key.	• The power supply to the inverter is turned OFF.	• Check the state of input power supply. • The inverter will recover when the power supply returns.
Control power under insufficient voltage. Please check the control power supply. Press the XX key.	• The control circuit power supply (R0, T0) is turned OFF.	• Check the state of input power supply. • The inverter will recover when the power supply of control circuit returns.

Message ▶	Estimated cause(s) ▶	Exemplar measures to be taken
Power feeding by external 24Vdc. Only external 24Vdc is feeding power. Press the XX key.	• The inverter is operating only with 24V power supply input to P+ and P- terminals.	• If the input power supply is input, check its state.
Changing load type... Please wait.	• The load type of inverter is being changed.	• The load type change completion screen will appear after a while.
Load type change completion !! Load type selection Ub-03 Rated current value changed. Check current-related parameters. Press the XX key.	• The load type change is completed.	• Press XX key to exit the load type change completion screen.

18.6 When Something Seems Wrong

Q

- There is something wrong.
- The inverter doesn't work as intended.
- You are stuck although no error appears in the inverter.

A

- Frequently asked questions are listed below.
- Consult this chapter to solve your problem.
- If the problem still persists, please use the contact information shown on the back cover.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S1: Operator keypad doesn't turn ON (the POWER lamp on the operator keypad VOP is not lit.)	• The power supply is not turned ON.	• Check that the power supply which satisfies the specification is turned ON. • When different powers are supplied to the control power supplies R0 and T0, and to P+ and P- terminals, check that R0, T0, or 24V power supply is turned ON.
	• Operator keypad is about to come off.	• The issue will be solved by remounting the operator keypad.
	• The J51 connector is disconnected.	• The J51 connector supplies power to the control power supplies R0 and T0 from the main power supplies R, S, and T. Keep the connector connected if you do not supply power to the control power supply with a different system.
	• The power supply input path is disconnected. • 200V power is supplied to R0 and T0 for 400V class.	• The breaker or wires may be disconnected. You need to re-examine the wiring. • When different power is supplied to the control power supplies R0 and T0, you also need to re-examine R0 and T0.
S2: Operator keypad doesn't turn ON (the POWER lamp on the operator keypad VOP is lit.)	• Operator keypad is in the automatic extinction mode.	• The screen is lit by pressing a key on the operator keypad. • The automatic extinction function can be disabled in the operator keypad system setting.
	• The brightness of operator keypad display is set to low.	• The brightness of the display is adjustable by changing the light control setting in the operator keypad system setting.
	• Operator keypad is about to come off.	• The issue will be solved by remounting the operator keypad. (Check the RJ45 connector.)
	• The liquid crystal has reached the end of its life.	• Replacement of the operator keypad is required.

* Also, see “18.5.1 Checking the warning display”.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S3: The motor doesn’t rotate although an operation command was entered.	• The inverter is tripping.	• When the inverter trips due to an error, you need to remove the error factor and reset the inverter. • See “18.5. Troubleshooting for Protection-function Related Errors” in this chapter.
	• A warning is issued.	• If a warning is issued, you need to eliminate the data inconsistency. • See “18.4. Troubleshooting for Warning-function Related Errors” in this chapter.
	• The operation command isn’t entered.	• The operation command destination may be wrong, or the operation command may not be accepted. ⇒ Proceed to S4.
	• The frequency command destination isn’t entered.	• The frequency command destination may be wrong, or the frequency command may be 0. ⇒ Proceed to S5.
	• A shutoff function is at work.	• The function safety terminal, terminal function [RS], or [FRS] terminal may be enabled, or [ROK] terminal may be disabled. ⇒ Proceed to S6.
	• A limit function is at work.	• The command direction may be limited by the rotation direction limit function. ⇒ Proceed to S7.
	• Motor is locked.	• If the motor shaft is locked by something which hinders the brake or the motor revolution (e.g., clogging), the cause needs to be removed.
	• Wiring or the like is disconnected.	• Check for abnormalities such as disconnection of the output line to the motor or disconnection within the motor.

Occurrence ►	Estimated cause(s) ►	Exemplar measures to be taken
S4: Operation command destination or operation command is wrong.	• Even though the operation command is entered, the motor does not drive.	• If the LED for RUN on the operator keypad is lit or the operation display appears, the operation command has been entered normally. There is another factor for why the motor is not driven. ⇒ Return to S3.
	• The operation command destination and the operation command input are not the same.	• Check the operation command destination. Check [AA111] and the terminal function. See “12.5 Select a operation command.” for details.
	• You want to make operation from the operator keypad but had made the different setting.	• Confirm that “oFW” or “oRV” is shown on the operator keypad. If it is not shown, then confirm that the operation command selection [AA111] is set to 02 RUN key on operator keypad. If it is shown, the terminal function needs to be checked.
	• You want to make operation from the [FW] terminal but had made the different setting.	• Set the operation command selection [AA111] to 00 [FW/RV] terminal. If RUN is not shown when the [FW] terminal is turned ON, other terminal functions need to be checked.
	• There is a cause other than the operation command.	• If the operator keypad doesn’t show RUN, a shutoff function or the main power supply may not be turned ON. • There is another factor for why the motor is not driven. ⇒ Return to S3.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S5: Frequency command destination or frequency command is wrong.	• Frequency command is 0. • [dA-04] has been 0.	• The frequency command destination may be wrong, or the setting of the command destination or the input voltage of frequency setter may be 0. Set the value other than 0 for the setting destination.
	• Frequency command destination is wrong.	• Check the frequency command destination. Check [AA101] and the terminal function. See “12.4 Select a frequency command.” for details.
	• You want to set the frequency command but [FA-01] has been 0.	• Set the operation command selection [AA101] to 02: Key on operator keypad, and then change the setting of [Ab110].
	• [FA-01] has been 0 even though the frequency setter is operated.	• Connect the main speed selection [AA101] according to the analog input to be used, and operate the frequency setter.
	• [FA-01] is not 0, and there is a cause other than the frequency command.	• If data appears in [FA-01], the frequency command is normal. • There is another factor for why the motor is not driven. ⇒ Return to S3.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S6: A shutoff function is at work.	• The main power supply is not turned ON.	• When the power supply is separated to R, S, T and R0, T0 (J51 connector section), the inverter can not be operated if the R, S, T, side power is down. The power supply check is required.
	• [RS] terminal is ON.	• If the [RS] terminal is ON, the inverter enters the reset mode and does not accept operation commands. The [RS] terminal needs to be turned OFF.
	• [FRS] terminal is ON.	• If the [FRS] terminal is ON, the inverter enters the free-run stop mode and does not accept operation commands. The [FRS] terminal needs to be turned OFF.
	• [CS] terminal is ON.	• If the [CS] terminal is ON, the inverter enters the mode switched to commercial power supply shutoff and does not accept operation commands. Check the commercial
	• The [ROK] terminal has been assigned and is turned OFF.	• When the [ROK] terminal is used, if the terminal function is OFF, the inverter does not accept operation commands. Check the operation permission signal.
	• STO terminal is not wired or is in OFF state.	• If you do not use the function of STO terminal, you need to attach a short-circuit wire to it.
	• The inverter is tripping.	• When the inverter is tripping, it does not accept operation commands. Identify the factors for trip.
	• Shutoff functions are not on.	• If shutoff functions are not on and the motor is not driven, there is another factor. ⇒ Return to S3.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S7: A limit function is at work.	• The operation permission signal has been assigned to the input terminal function and the signal is turned OFF.	• When the operation permission signal has been assigned, the operation permission signal needs to be turned ON.
	• The command is given to the direction the operation is limited.	• Check the operation command direction limit.
	• Both [FW] terminal and [RV] terminals are turned ON by operation command from input terminal.	• If both [FW] terminal and [RV] terminal are turned ON, input inconsistency is generated and the inverter stops. Use only either one of them to operate the inverter.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S8: Motor speed doesn't rise.	• The overload limit function is at work.	• The overload limit function suppresses the current by dropping the frequency when the output current exceeds the overload limit level. • Raising the setting level may improve the situation.
	• The frequency command is limited.	• If the upper limiter and the maximum frequency is set to low level, the situation will be improved by setting them to higher level. To limit frequencies, use the upper limiter function instead of the maximum frequency.
	• The frequency command is low.	• The command becomes lower when a more prioritized frequency command such as for jogging or multi-speed command is entered. Re-examination of the terminal function and frequency command destination are required.
	• Acceleration time is long.	• If the acceleration time is set long, acceleration becomes slow. Set the acceleration time short.

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S9: The parameter you are looking for is not shown.	• The display limit has been set.	• Display limit function may be working. Cancel the display limit selection [UA-10].
	• The display is fixed.	• Operation on the operator keypad isn't accepted if the input terminal function 102 [DISP] is ON. Turn OFF the terminal.
S10: Keypad operator cannot be operated.	• The display is fixed.	• Operation on the operator keypad isn't accepted if the input terminal function 102 [DISP] is ON. Turn OFF the terminal.
S11: Setting cannot be made.	• Inverter is running.	• Some parameters cannot be changed while the inverter is running. If that is the case, turn OFF the inverter once.
S12: Motor rotates in a reverse direction.	• The wires connected to the motor are in wrong phase sequence.	• Swapping two phases of wires connected to the motor changes the direction of rotation.
	• When the RUN key on the operator keypad is used, the rotation direction setting is wrong.	• [AA-12] RUN key direction needs to be switched.
	• When the 3-wire function is used, the input of input terminal function F/R is reversed.	• Check the logic of 3-wire normal rotation / reverse rotation terminal (018[F/R]).
S13: Noises of motor and machines are noisy.	• Carrier frequency is set low.	• Raise the carrier frequency setting [bb101]. However, this may increase noise generated in the inverter and leakage currents from the inverter. In addition, derating is required to the output current depending on the models.
	• The revolution frequency of motor and the natural frequency of machines resonate.	• Change the set frequency. If a resonance occurs during acceleration/deceleration, avoid the resonance frequency in settings of the frequency jump functions [AG101] to [AG106].

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S14: Output frequency becomes unstable.	• Inadequate parameters are used.	• Find out the basic parameter settings for motor and set them accordingly.
	• Load fluctuates significantly.	• Re-examination of capacity of both motor and inverter may be required.
	• PS voltage fluctuates.	• Use of the optional reactor ALI or DCL, or a noise filter on the input side to minimize the power fluctuation may improve the situation.
S15: Torque is not generated.	• V/f control is used.	• Use torque boost, sensorless vector control, or other control instead.
	• The inverter is used for lowering.	• Use a braking resistor or regenerative braking unit if the torque is not sufficient for regenerative operation.
	• The load is too heavy.	• Re-examination of capacity of both motor and inverter may be required.
S16: Operator keypad disconnection error is issued.	• Operation selection at disconnection of operator is inappropriate.	• Set the operation selection at disconnection of operator to 02 (Ignore).

Occurrence ▶	Estimated cause(s) ▶	Exemplar measures to be taken
S17: Operation/setting of Modbus communication cannot be made.	• Changes made to communication parameters haven't been reflected.	• If you changed [CF-01] to [CF-38], turn OFF the control power supply and restart.
	• The operation command selection is not set to RS485.	• Check that operation command selection [AA111] is set to 03 (RS485).
	• The frequency command selection is not set to RS485.	• Check that the main speed command selection [AA111] is set to 03 (RS485).
	• The communication speed setting is wrong.	• Set the correct value in [CF-01], then turn OFF the control power supply and restart.
	• Station numbers are wrongly set or overlapping each other.	• Set the correct value in [CF-02], then turn OFF the control power supply and restart.
	• The communication parity setting is wrong.	• Set the correct value in [CF-03], then turn OFF the control power supply and restart.
	• The communication stop bit setting is wrong.	• Set the correct value in [CF-04], then turn OFF the control power supply and restart.
	• Wiring is wrong,	• Connect wires properly to the SP and SN terminals on the control circuit terminal block.
S18: The earth leakage circuit breaker is activated as the inverter is operated.	• Leakage currents in the inverter are large.	• Lower the carrier frequency [bb101]. • Raise the sensitivity current in the earth leakage circuit breaker, or replace the breaker with the one with higher sensitivity current.
S19: DC braking is disabled.	• The DC braking force is not set.	• Set DC braking force at the time of the stop [AF105] and DC braking force at the start [AF108].
	• The DC braking time is not set.	• Set DC braking time at the time of the stop [AF106] and DC braking time at the start [AF109].
S20: TV and radio have noises near the inverter.	• Radiation noise from the inverter	• Locate the inverter wires as far as possible from a TV and radio. • Install ZCL to the main power supply input and output of the inverter.