4. Fault display and troubleshooting

4.1 General

The Inverter have the protective and warning self-diagnostic functions. If fault occurs, the fault code is displayed on the digital operator. The fault contact output (RA-RB-RC or R1A-R1B-R1C, DO1, DO2 or R2A-R2C) operates, and the inverter shut off to stop the motor. If warning occurs, the digital operator will display the warning code. However, the fault-contact output does not operate. (except some certain cases, see page on ‘Warning and Self-Diagnosis Functions’). The digital operator will return to its previous status when the above warning is clear.

- When a fault has occurred, refer to the following table to identify and to clear the cause of the fault.
- Use one of the following methods to reset the fault after restarting the inverter.

1. Stop the inverter.
2. Switch the fault reset input at terminal ④ signal or press the RESET key on the digital operator.
3. Turn off the main circuit power supply and turn on again.

4.2 Error Message and Troubleshooting

(A) Protective Function

LCD Display (English)	Fault Contents	Fault Contact Output
Fault DC Volt. Low	The main circuit DC voltage becomes lower than the low voltage detection level (Cn-39).	Operation
Fault Over Current	The inverter output current becomes approx. 200% and above the inverter rated current.	Operation
Fault Ground Fault	A ground fault occurs at the inverter output side and the ground-fault current exceeds approx. 50% of the inverter rated current.	Operation
Fault Over Voltage	The main circuit DC voltage becomes excessive because of regeneration energy caused by motor decelerating.	Operation
Fault Over Heat	The temperature of the cooling fin reaches the detection level.	Operation
Fault Motor Over Load	Motor overload is detected by the electronic thermal relay. (motor protection)	Operation
Fault Inverter Over Load	The electronic thermal sensor detects inverter overload while the output current exceeds 112% of rated value. (inverter protection)	Operation
Fault Over Torque	Over torque is detected while the output current is larger than or equal to the setting of Cn-26. (machine protection)	Operation
Fault Ext. Fault3	External fault signal ③	Operation
Fault Ext. Fault5	External fault signal ⑤	
Fault Ext. Fault6	External fault signal ⑥	
Fault Ext. Fault7	External fault signal ⑦	
Fault Ext. Fault8	External fault signal ⑧	
Fault Inverter EEPROM	EEPROM fault	Operation
	EEPROM (BCC, no.) is bad.	
Fault Inverter A/D	A/D converter (inside the CPU) fault	
Fault PG Over Sp.	Excessive PG speed fault	Operation
Fault PG Open	PG is open-circuit	Operation
Fault Sp.Deviat Over	Excessive speed deviation	Operation
Fault RS-485 Interrupt	MODBUS Communication fault occurs .The inverter remains operating.	operation

	Error Causes	Action to Be Taken
	• Power capacity is too small. • Voltage drop due to wiring resistance. • A motor of large capacity connected to the same power system has been started. • Defective electromagnetic contractor.	• Check the source voltage and wiring. • Check the power capacity and power system.
	• Extremely rapid accel. • Short-circuit or ground- fault at the inverter output side. • Motor of a capacity greater than the inverter rating has been started. • High-speed motor and pulse motor has been started.	• Extend the accel. time. • Check the load wiring.
	• Motor dielectric strength is insufficient. • Load wiring is not proper.	• Check the motor wiring impedance and the load wiring.
	• Insufficient deceleration time. • High input voltage compared to motor rated voltage.	• Extend the accel. time. • Use a braking resistor.
	• Defective cooling fan. • Ambient temperature rise • Clogged filter.	• Check for the fan, filter and the ambient temperature.
	• Overload, low speed operation or extended accel. time. • Improper V-f characteristic setting	• Measure the temperature rise of the motor. • Decrease the output load. • Set proper V/f characteristic.
	• Improper rated current (Cn-09) setting	• Set proper V/f characteristic. • Set proper rated current (Cn-09) • If inverter is reset repetitively before fault removed, the inverter may be damaged.
	• Machine errors or overload	• Check the use of the machine. • Set a higher protection level (Cn-32).
	• Fault input of external signal ③, ⑤, ⑥, ⑦ and ⑧.	• Identify the fault signal using Un-11.
	• Disturbance of external noise • Excessive impact or vibration	• Reset EEPROM by running Sn-03. • Replace the control board if the fault can't be cleared.
	• Improper setting of ASR parameter or over-speed protection level.	• Check the parameters of ASR and the protection level.
	• The PG wiring is not properly connected or open-circuit.	• Check the PG wiring.
	• Improper setting of ASR parameter or speed deviation level.	• Check parameters of ASR and speed deviation level.
	• External noise • Excessive vibration or impact Communication wire • Not properly contacted	• Check the parameter setting, including Sn-01, Sn-02. • Check if the comm. wire is not properly contacted. • Restart, if fault remains, please contact to us.

(B). Warning and Self-Diagnosis Functions

LCD Display (English)	Fault Contents	Fault Contact Output
(blinking) Alarm DC Volt. Low	The main circuit DC voltage becomes lower than the lower under-voltage level before the motor starts.	No operation
(blinking) Alarm Over Voltage	The main circuit DC voltage becomes higher than the lower under-voltage level before the motor starts.	No operation
(blinking) Alarm Over Heat	The thermal protection contact is input to the external terminal.	No operation
(blinking) Alarm Over Torque	Over torque is detected while the output current is larger than or equal to the setting of Cn-26. However, the Sn-12 has been set such that the inverter continue to run and disregard the over-torque warning.	No operation
—	Stall prevention operates while acceleration.	No operation
	Stall prevention operates while running	
	Stall prevention operates while deceleration.	
(blinking) Alarm External Fault	Forward and reverse rotation commands are simultaneously detected for a period of time exceeding 500ms. (The inverter is stopped according to the stop method preset by Sn-04.)	No operation
(blinking) Alarm RS-485 Interrupt	MODBUS Communication fault occurs. The inverter remains operating.	No operation
Comm. Fault	Transmission fault of digital operator	No operation
(blinking) Alarm B.B.	External B.B. signal (terminal ③) is input (The inverter stops and the motors stops without braking)	No operation
Alarm Input Error	Improper inverter capacity (Sn-01) setting.	No operation
	Improper setting of multi-function input signal (Sn-25, 26, 27 and 28).	No operation
	Improper setting of V/F characteristic (Cn-02~08)	No operation
	Improper setting of Cn-18, Cn-19	No operation
(blinking) Alarm Over Speed	Excessive speed (operation remains)	No operation
(blinking) Alarm PG Open	PG Open-circuit (operation remains)	No operation
Alarm Sp.Deviat Over	Excessive speed deviation (operation remains)	No operation
Load Fail	Error during upload and download (operation remains)	No operation
EEPROM Fault	Operator EEPROM error.	No operation
Upload Error	Data incorrect during Communication from the operator to the inverter.	No operation
Download Error	Data incorrect during Communication from the inverter to the operator.	No operation
Alarm Auto Tun-Error	Motor parameter autotuning error	No operation
WARN Inverter over load (Blink)	Inverter over load RESET, internal timer operates (to protect inverter)	No action

	Error Causes	Action to Be Taken
	• Input voltage drop	• Measure the main circuit DC voltage, if the voltage is lower allowance level, regulate the input voltage.
	• Input voltage rise	• Measure the main circuit DC voltage, if the voltage is higher than allowance level, regulate the input voltage.
	• Overload • Cooling fan fault. Ambient temperature rises. • Clogged filter.	• Check for the fan, filter and the ambient temperature.
	• Machine error or overload	• Check the use of the machine. • Set a higher protection level (Cn-32).
	• Insufficient Accel./Decel. Time • Overload • Excessive load impact occurs while operating	• Increase Accel./Decel. Time. • Check the load.
	• Operation sequence error • 3-wire/2-wire selection error	• Check the circuit of system • Check the setting of system parameters Sn-25, 26, 27, and 28.
	• External noise • Excessive vibration or impact on Communication wire • Not properly contacted	• Check the parameter setting, including Sn-01, Sn-02. • Check if the comm. wire is not properly contacted. • Restart, if fault remains, please contact to us.
	• Comm. between digital operator and inverter has not been established after system starts for 5 seconds. • Communication is established after system starts, but transmission fault occurs for 2 seconds.	• Re-plug the connector of the digital operators. • Replace the control board.
	• External B.B. signal is input.	• After external BB signal is removed, execute the speed search of the inverter.
	• Inverter KVA setting error.	• Set proper KVA value. Be aware of the difference of 220V and 440V
	• The value of Sn-25~Sn-28 is not in ascending order (Ex. Sn-25= 05, Sn-28= 02, those are improper setting). • Set speed search command of 21 and 22 simultaneously.	• Set these values by order (the value of Sn-25 must be smaller than those of Sn-26, 27, 28) • Command 21 and 22 can not be set on two multi-function-input contacts simultaneously.
	• The values of Cn-02~Cn-08 do not satisfy $F_{max} \geq F_A \geq F_B \geq F_{min}$.	• Change the settings.
	• Upper limit and lower limit setting is incorrect.	• Change the settings.
	• Improper ASR parameter setting or over-torque protection level.	• Check the ASR parameter and over-torque protection level.
	• The circuit of PG is not properly connected or open-circuit.	• Check the wiring of PG.
	• Improper ASR parameter setting or over-torque protection level.	• Check the ASR parameter and over-torque protection level.
	• Bad communication during operator and inverter. • The connector is not properly connected.	• Check if the connector is not properly connected.
	• Operator EEPROM error.	• Disable load function of operator. • Replace the operator.
	• Incorrect inverter data format • Communication noise.	• Download the data to the operator again. • Check if the connector is not properly connected.
	• Communication noise	• Check if the connector is not properly connected.
	• Inverter capacity and motor rating are not properly matched. • The wiring between inverter and motor is disconnected. • Motor load unbalance.	• Correct the inverter/motor capacity ratio, wiring cable and motor load.
	• inverter over load reset in 5 minutes	• after reset inverter overload, under stop mode, supply power for 5 min, warn will auto released.