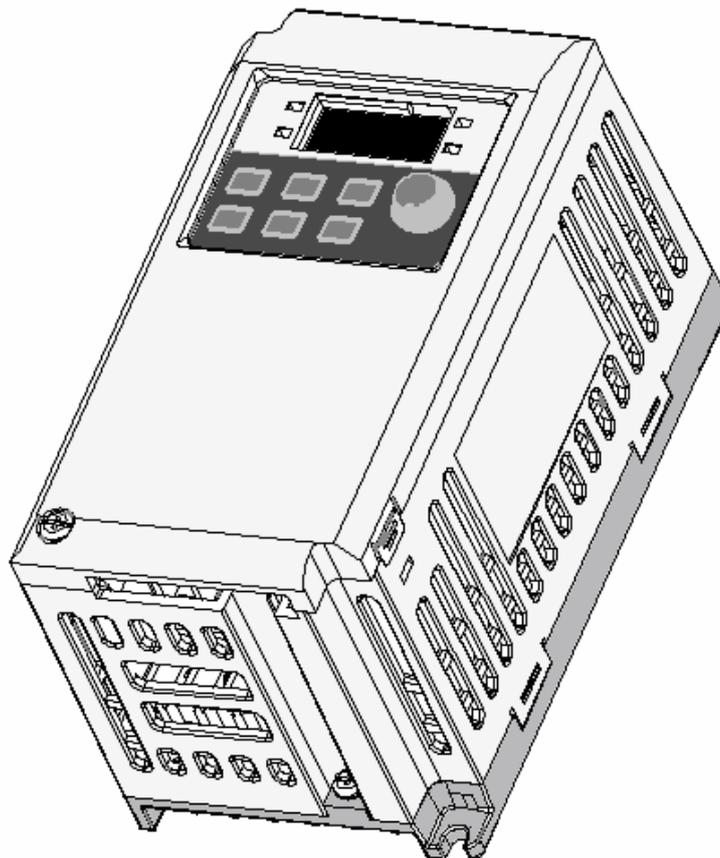


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SV-iE5 User Manual

0.1~0.4kW (200V)



Safety Instructions

- Read this manual carefully before installing, wiring, operating, servicing or inspecting this equipment.
- Keep this manual within easy reach for quick reference.

13. Troubleshooting and Maintenance

13.1 Protective Functions



Caution

When a fault occurs, the cause must be corrected before the fault can be cleared. If protective function keeps active, the inverter should restart after clearing the cause(s). Or, it may lead to reduction in product life and damage to the equipment.

● Protection of Inverter output current and input voltage

Fault display	Protective function	Description
	Overcurrent	The inverter turns off its output when the output current of the inverter flows more than 200% of the inverter rated current
	Ground fault current	The inverter turns off its output when a ground fault occurs on the output as long as the function is active.
	Ground fault current	The inverter turns off its output when unbalanced output current occurs due to abnormal situation such as ground fault during run and one of U,V,W gets overcurrent.
	Inverter Overload	The inverter turns off its output when the output current of the inverter flows more than the rated level (150% for 1 minute).
	Overload trip	The inverter turns off its output if the output current of the inverter more than the motor rated current(P25) flows.
	Inverter overheat	The inverter turns off its output if the heat sink overheats due to a damaged cooling fan.
	Condenser overload	Inverter output is blocked when one of 3 phases gets opened or main condenser is outworn, resulting in excessive DC voltage variation. Detection time varies depending on inverter output current.
	Output Phase loss	The inverter turns off its output when the one or more of the output (U, V, W) phase is open. The inverter detects the output current to check the phase loss of the output.
	Over voltage	The inverter turns off its output if the DC voltage of the main circuit increases higher than 400 V when the motor decelerates. This fault can also occur due to a surge voltage generated at the power supply system.
	Low voltage	The inverter turns off its output if the DC voltage is below 180V because of insufficient voltage input torque.

●Protection of abnormal internal circuit and external signal

Fault display	Protective function	Description
	Parameter save error	Displayed when user-setting parameters fail to be entered into memory.
	Inverter hardware fault	Displayed when an error occurs in CPU operation and internal OS program. The fault may not be relieved simply by STOP/RST key of the loader or reset terminal. Retry after completely turning off the inverter and the display of the loader is fully disappeared.
	Instant cut off	Used for the emergency stop of the inverter. The inverter instantly turns off the output when the EST terminal is turned on. Note The inverter starts to regular operation when turning off the EST terminal while FX or RX terminal is ON.
	External fault A contact input	When multi-function input terminal (P66~P70) is set to 18, external fault signal input: A (Normal Open Contact), the inverter turns off the output.
	External fault B contact input	When multi-function input terminal (P66 ~ P70) is set to 19, external fault signal input: B (Normal Close Contact), the inverter turns off the output.
	When the frequency command is lost	When inverter operation is set via Analog input (0-10V or 0-20mA input) or option (RS-485) and no signal is applied, operation is done according to the method set in P81.

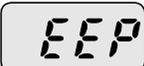
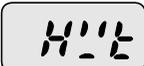
13.2 Fault Remedy

 **Caution**

If any trouble occurs due to overcurrent, make sure to restart after eliminating the causes because power semiconductor element inside the inverter may be broken.

Protective function	Cause	Remedy
 Overcurrent	<ul style="list-style-type: none"> ● Accel/Decel time is too short compared to the inertia of the load(GD^2). ● Load is greater than the inverter rating. ● Inverter output is issued when the motor is free running. ● Output short circuit or ground fault has occurred. ● Mechanical brake of the motor is operating too fast. 	<ul style="list-style-type: none"> ☞ Increase the Accel/Decel time. ☞ Replace the inverter with appropriate capacity. ☞ Resume operation after stopping the motor or use P36 (Speed search). ☞ Check output wiring. ☞ Check the mechanical brake.
  Ground fault current	<ul style="list-style-type: none"> ● Ground fault has occurred at the output wiring of the inverter. ● The insulation of the motor is damaged due to heat. 	<ul style="list-style-type: none"> ☞ Check the wiring of the output terminal. ☞ Replace the motor.
 Inverter overload	<ul style="list-style-type: none"> ● Load is greater than the inverter rating. ● Torque boost scale is set too large. 	<ul style="list-style-type: none"> ☞ Upgrade the capacity of motor and inverter or reduce the load weight. ☞ Reduce torque boost scale.
 Overload trip		
 Inverter overheat	<ul style="list-style-type: none"> ● Cooling system has faults. ● Ambient temperature is too high. 	<ul style="list-style-type: none"> ☞ Check for alien substances clogged in the heat sink. ☞ Keep ambient temperature under 40°C.
 Condenser overload	<ul style="list-style-type: none"> ● 3-Phase product may have one phase lost. ● Internal condenser was outworn. 	<ul style="list-style-type: none"> ☞ Check whether wiring of input power or inter-phase voltage is abnormal. ☞ It's almost time to replace or it may happen when it is used in hot temperature for a long while. Contact after-sales service.

● Fault Remedy

Protective function	Cause	Remedy
 Output Phase loss	<ul style="list-style-type: none"> ● Faulty contact of magnetic switch at output ● Faulty output wiring 	<ul style="list-style-type: none"> ☞ Make connection of magnetic switch at output of the inverter securely. ☞ Check output wiring.
 Over voltage	<ul style="list-style-type: none"> ● Decel time is too short compared to the inertia of the load(GD^2). ● Regenerative load is at the inverter output. ● Line voltage is too high. 	<ul style="list-style-type: none"> ☞ Increase the Decel time. ☞ Check whether line voltage exceeds its rating.
 Low voltage	<ul style="list-style-type: none"> ● Line voltage is low. ● Load larger than line capacity is connected to line (ex: welding machine, motor's direct input) ● Faulty magnetic switch at the input side of the inverter. 	<ul style="list-style-type: none"> ☞ Check whether line voltage is below its rating. ☞ Check the incoming AC line. Adjust the line capacity corresponding to the load. ☞ Change a magnetic switch.
 External fault A contact input	<ul style="list-style-type: none"> ● The multi function terminals(P66 ~ P70) set to "18 (External fault-A)" or "19 (External trip signal input : fault-B)" in P66~P70 in PG Group is ON. 	<ul style="list-style-type: none"> ☞ Eliminate the cause of fault at circuit connected to external fault terminal or cause of external fault input.
 External fault B contact input		
	<ul style="list-style-type: none"> ● No frequency command is applied to AI terminal. ● Communication command is cuts off 	<ul style="list-style-type: none"> ☞ Check the wiring of AI and frequency reference level. ☞ In case of a program set to periodically update frequency, check the communication line or operation of master device.
  Parameter save error Hardware fault		<ul style="list-style-type: none"> ☞ Contact your local LSIS sales representative. ☞ EEP message occurs when first allowing power after upgrading software due to A/S service. At the moment, turn it off and retry.

13.3 Precautions for maintenance

 **Warning**

- Make sure to remove the input power while performing maintenance.
- Make sure to perform maintenance after checking the DC link capacitor has discharged. The bus capacitors in the inverter main circuit can still be charged even after the power is turned off. Check the voltage between terminal P or P1 and N using a tester before proceeding.
- SV-iE5 series inverter has ESD (Electrostatic Discharge) sensitive components. Take protective measures against ESD before touching them for inspection or installation.
- Do not change any inner parts and connectors. Never modify the inverter.

13.4 Checklist

- Daily inspections
 - ▶ Proper installation environment
 - ▶ Cooling system fault
 - ▶ Unusual vibration and noise
 - ▶ Unusual overheating and discoloration
- Periodic inspection
 - ▶ Do screws and bolts become loose or rust due to the environment?
- ☞ Tighten or replace them.
 - ▶ Alien substances are clogged in the cooling system?
- ☞ Eliminate them by using compressed air.
 - ▶ Check the rotating condition of the cooling fan, the condition of capacitors and the connections with the magnetic contactor
- ☞ Replace them if there are any abnormalities.

13.5 Parts Replacement

The inverter consists of many electronic parts such as semiconductor devices. The following parts may deteriorate with age because of their structures or physical characteristics, leading to reduced performance or failure of the inverter. For preventive maintenance, the parts must be changed periodically.

Part name	Change period(year)	Description
DC link condenser	4	Exchange
Control smoothing condenser	4	Exchange
Relay	-	Determined after inspection