12.2 SERVOPACK

12.2.1 LED Indication (7-segment) for Troubleshooting

Table 12.2 LED Indication for Troubleshooting

LED	Detection	Lighting Condition	Probable Cause	Corrective Action
$l.$	Over-current	Goes ON when power is supplied to the control circuit.	• Defective control circuit board (1 PWB).	• Replace the SERVOPACK.
		Goes ON when power is supplied to the main circuit and servo power is turned ON. • MCCB does not trip.	• Defective current feedback circuit. • Defective main circuit transistor module. • Motor grounding	• Replace the SERVOPACK. • Correct grounding.
		Goes ON when power is supplied to the main circuit and servo power is turned ON. • MCCB does not trip.	• Defective motor grounding • Defective main circuit transistor module.	• Replace the motor. • Replace the SERVOPACK.
		Goes ON when power is supplied to the main circuit.	• Defective main circuit transistor module.	• Replace the SERVOPACK.
		Goes ON when the motor accelerates or decelerates.	• Incomplete (1 PWB) VR8 adjustment.	• Replace the SERVOPACK.
$2.$	Circuit protector tripped	Goes ON when power is supplied to the control circuit.	• Defective control circuit board (1 PWB).	• Replace the SERVOPACK.
		Goes ON when power is supplied to the main circuit.	• Defective main circuit thyristor-diode module.	• Replace the SERVOPACK.
			• MCCB trips.	
		Goes ON during operation.	• Defective main circuit of SERVOPACK (Do not turn ON again.)	
$3.$	Regenerative trouble	Goes ON when power is supplied to the control circuit.	• Defective control circuit board. (1 PWB).	• Replace the SERVOPACK.
		Goes ON approximate 0.5 to 1 second after power is supplied to the main circuit.	• Defective regenerative transistor.	• Replace the SERVOPACK.
			• Regenerative resistor disconnection. • No regenerative resistor connection (SR60BB)	• Check and replace the regenerative resistor. (Replace the SERVOPACK.)
$4.$	Over-voltage	Goes ON when the motor accelerates or decelerates.	• Load inertia J_L (GD^2) is too large.	• Check the inertia of the machine with the value converted to the motor shaft.
			• Defective regenerative circuit.	• Replace the SERVOPACK.
$5.$	Over-speed	When the reference is input, the motor runs fast and $5.$ goes ON.	• Motor connection error. • Optical encoder connection error.	• Correct the motor connection. • Check pulses in phases A, B, C, U, V and W on 2CN, and correct wiring.
			• The reference input voltage is too large.	• Decrease the reference input voltage.
$6.$	Voltage drop	Goes ON when power is supplied to the main circuit.	• Defective main circuit thyristor-diode module.	• Replace the SERVOPACK.
$7.$	Overload	Goes ON when power is supplied to the control circuit.	• Defective control circuit board (1 PWB).	• Replace the SERVOPACK.
		Goes ON during operation. • When power to the control circuit is turned OFF and then ON again, the operation starts.	• Operation with 105% to 130% or more of the rated load.	• Check and correct the load (may be overload).
$A.$	Heat sink overheat	Goes ON during operation. • When power to the control circuit is turned OFF and then ON again, $7.$ and $A.$ goes ON again. When reset later, the operation starts.	• Fan has stopped.	• Check the fan. (SR20, 30, 44, 60)
			• Temperature around the SERVOPACK exceeds 55℃.	• Decrease the temperature below 55°C (The heat sink may be overheated.)
		The motor rotates, but the torque is unavailable. When power to the control circuit is turned OFF and then ON again, the operation starts, but the torque is still unavailable.	• Motor circuit error connection, such as U→V, V→W, W→U or single-phase connection.	• Correct the connection.

12. 2. 1 LED Indication (7-segment) for Troubleshooting (Cont'd)

Table 12. 2   LED Indication for Troubleshooting (Cont'd)

LED	Detection	Lighting Condition	Probable Cause	Corrective Action
b.	A/D error	Goes ON when power is supplied to the control circuit.	• Defective control circuit board (1PWB).	• Replace the SERVOPACK.
□	CPU error	Goes ON during operation.	• Faulty internal elements.	• Resume after reset operation.
			• Defective internal elements.	• Replace the SERVOPACK.
F.	Open phase	Goes ON when power is supplied to the control circuit.	• Defective control circuit board (1 PWB).	• Replace the SERVOPACK.
		Goes ON when power is supplied to the main circuit.	• Poor connection to 3-phase power supply.	• Check and correct the connection.
C.	Overrun prevention	Goes ON when power is supplied to the control circuit.	• Defective control circuit board (1 PWB).	• Replace the SERVOPACK.
		The motor starts momentarily, then C goes ON.	• Motor connection error.	• Correct the motor connection.
			• Optical encoder connection error.	• Check and correct pulses in phases A, B, C, U, V and W with 2CN.

12. 2. 2 Examples of Troubleshooting for Defective Wiring or Parts

Table 12. 3   Example of Troubleshooting for Defective Wiring or Parts

Trouble	Check Items	What to do
MCCB trips immediately after Power ON and Servo ON.	• Main circuit wiring (such as the ground of motor)	• Correct the wiring.
The reference is input, but the motor does not run.	• Voltage across ⓡ, ⓢ, and ⓣ. • LED P and MP ON	• Check the AC power supply circuit.
	• Trouble LED OFF	• If LEDs are ON, check the cause.
	• Speed reference voltage • LED IN ON • P-CON, N-OT, P-OT, S-ON signal	• Adjust the speed setting potentiometer (supplied by the user).

12. 2. 3 Examples of Troubleshooting for Incomplete Adjustment

Table 12. 4   Examples of Troubleshooting for Incomplete Adjustment

Trouble	Cause	What to do
Motor rotates even if the speed reference voltage is 0 V.	Incomplete ZERO potentiometer adjustment.	Adjust VR3 ZERO correctly.
Motor vibrates or vibration frequency is too high, approx 200 to 300 Hz. (When vibration frequency equals commercial frequency.)	Speed loop gain is too high • Excessively long lead of SERVOPACK input circuit. • Noise interference due to bundling of signal line and power line.	Turn VR6 LOOP CCW to decrease the speed loop gain. • Decrease length of lead. • Separate input circuit line from power line or connect input circuit to low impedance less than several 100 ohms.
Motor speed overshoot is too large at starting or stopping.	• Speed loop gain is too high	• Turn LOOP CCW to decrease the speed loop gain.