

Chapter 5 Troubleshooting and maintenance

5.1 Error display and corrective action

5.1.1 Manual Reset and Auto-Reset

Faults which can not be recovered manually			
Display	content	Cause	Corrective action
-oV-	Voltage too high when stopped	Detection circuit malfunction	Return the inverter
-oU-			
-LV-	Voltage too low when stopped	1. Power voltage too low 2. Pre-charge resistor or fuse burnt out. 3. Detection circuit malfunction	1. Check if the power voltage is correct 2. Replace the pre-charge resistor or the fuse 3. Return the inverter
-LU-			
-oH-	The inverter is overheated when stopped	1. Detection circuit malfunction 2. Ambient temperature too high or bad ventilation	Return the inverter improve ventilation conditions
-oH-			
CtEr	Current Sensor detection error	Current sensor error or circuit malfunction	Return the inverter
[CtEr			
EPr	EEPROM problem	Faulty EEPROM	Replace EEPROM
[EPr			
Cot	Communication error	Communications disruption	Check the wiring
[Cot			
Faults which can be recovered manually and automatically			
Display	content	Cause	Corrective action
oC-A	Over-current at acceleration	1. Acceleration time too short 2. The capacity of the motor exceeds the capacity of the inverter 3. Short circuit between the motor coil and the case 4. Short circuit between motor wiring and ground 5. IGBT module damaged	1. Set a longer acceleration time 2. Replace inverter with one that has the same rating as that of the motor 3. Check the motor 4. Check the wiring 5. Replace the IGBT module
[oC-A			
oC-C	Over-current at fixed speed	1. Transient load change 2. Transient power change	1. Increase the capacity of the inverter 2. Install inductor on the power supply input side
[oC-C			
oC-d	Over-current at deceleration	The preset deceleration time is too short.	Set a longer deceleration time
[oC-d			
oC-S	Over current at start	1. Short circuit between the motor coil and the case 2. Short circuit between motor coil and ground 3. IGBT module damaged	1. Inspect the motor 2. Inspect the wiring 3. Replace the transistor module
[oC-S			

oV-C	Excessive Voltage during operation/ deceleration	1.Deceleration time setting too short or excessive load inertia 2.Power voltage varies widely (fluctuates)	1.Set a longer deceleration time 2.Add a brake resistor or brake module 3.Add a reactor at the power input side
ou-C			
Faults which can be recovered manually but not automatically			
Display	content	Cause	Corrective action
oC	Over-current during stop	Detection circuit malfunction	Return the inverter for repair
oC			
oL1	Motor overload	loading too large	Increase the Motor capacity
oL1			
oL2	Inverter overload	Excessive Load	Increase the inverter capacity
oL2			
LV-C	Voltage too low during operation	1.Power voltage too low 2.Power voltage varies widely (fluctuates)	1.Improve power quality 2.Add a reactor at the power input side
LU-C			

5.1.2 Keypad Operation Error Instruction

Display	content	Cause	Corrective action
LoC	1.Parameter already locked 2.Motor direction locked 3.Parameter password (13-07) enabled	1.Attempt to modify frequency parameter while 13-06>0. 2.Attempt to reverse direction when 11- 00=1。 3.Parameter (13 - 07) enabled, set the correct password will show LOC.	1.Adjust 13-06 2.Adjust 11-00
LoC			
Err1	Keypad operation error	1.Press ▲ or ▼ while 00-05/00-06>0 or running at preset speed. 2.Attempt to modify the Parameter.Can not be modified during operation (refer to the parameter list)	1.The ▲ or ▼ is available for modifying the parameter only when 00-05/00-06=0 2.Modify the parameter in STOP mode.
Err1			
Err2	Parameter setting error	1.00-13 is within the range of (11-08 ±11-11) or (11-09 ±11-11) or (11-10 ±11-11) 2.00- 12 ≤ 00-13	1.Modify 11-08~11-10 or 11-11 Set 00-12>00-13
Err2			
Err5	Modification of parameter is not available in communication	1.Control command sent during communication. 2.Attempt to modify the function 09-02~ 09-05 during communication	1.Issue enable command before communication 2.Set parameters 09-02~ 09-05 function before communication
Err5			
Err6	Communication failed	1.Wiring error 2.Communication parameter setting error. 3.Incorrect communication protocol	1.Check hardware and wiring 2.Check Functions(09-00~ 09- 05).
Err6			

Err7	Parameter conflict	1. Attempt to modify the function 13-00/13-08. 2. Voltage and current detection circuit is abnormal.	If reset is not possible, please Return the inverter.
Err7			

5.1.3 Special conditions

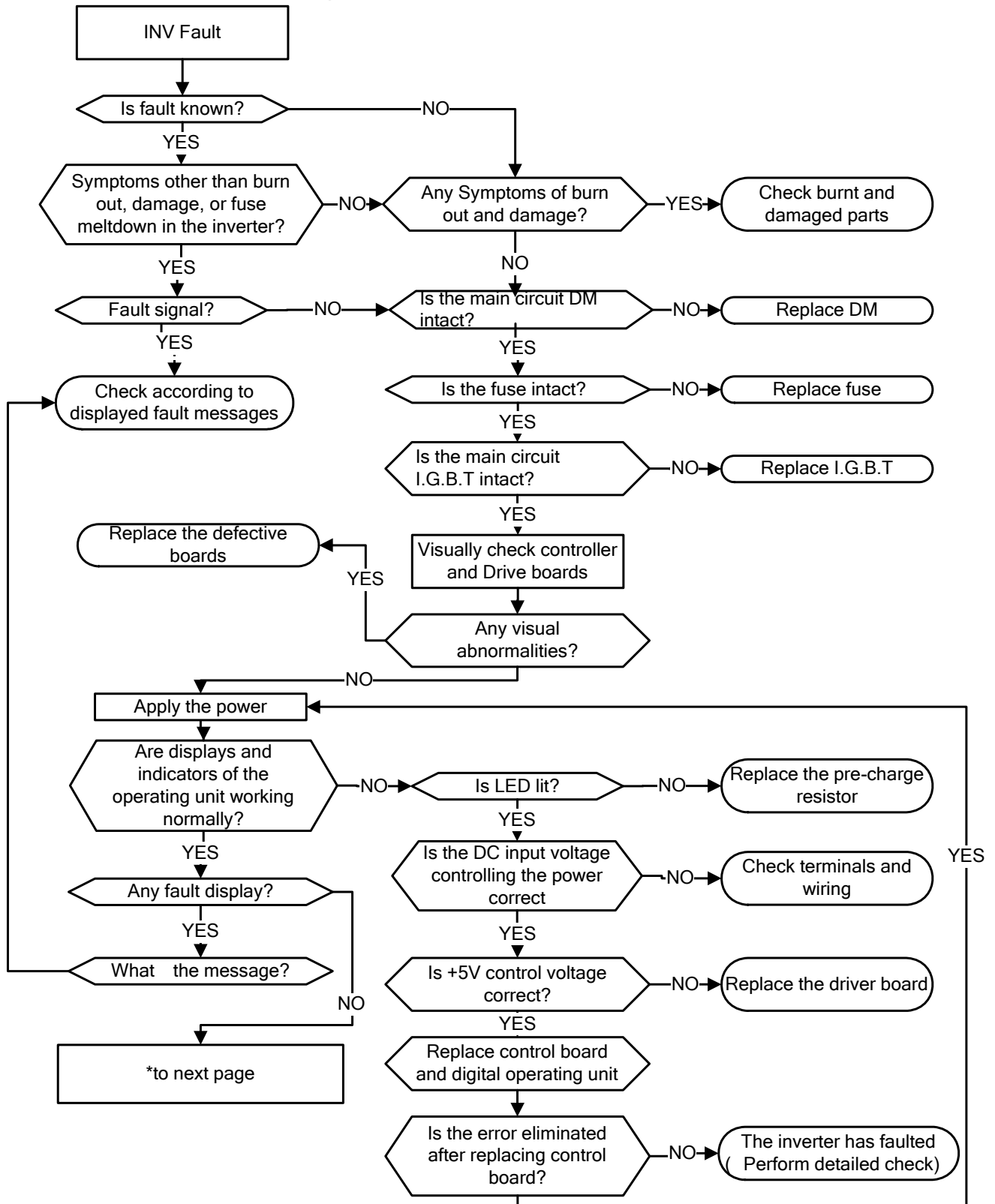
Display	Fault	Description
StP0 StP0	Zero speed at stop	Occurs when preset frequency <0.1Hz
StP1 StP1		
StP2 StP2	Keypad Stop Operated when inverter in external Control mode.	1. If the Stop key is pressed while the inverter is set to external control mode (00-02/00-03=1) then 'STP2' flashes after stop. 2. Release and re-activate the run contact to restart the inverter.
E.S. E.S.		
b.b. b.b.	External base block	The inverter stops immediately and then flashes b.b., when external base block is input by the multifunctional input terminals.
PdEr PdEr		
	PID feedback loss	PID feedback loss detect

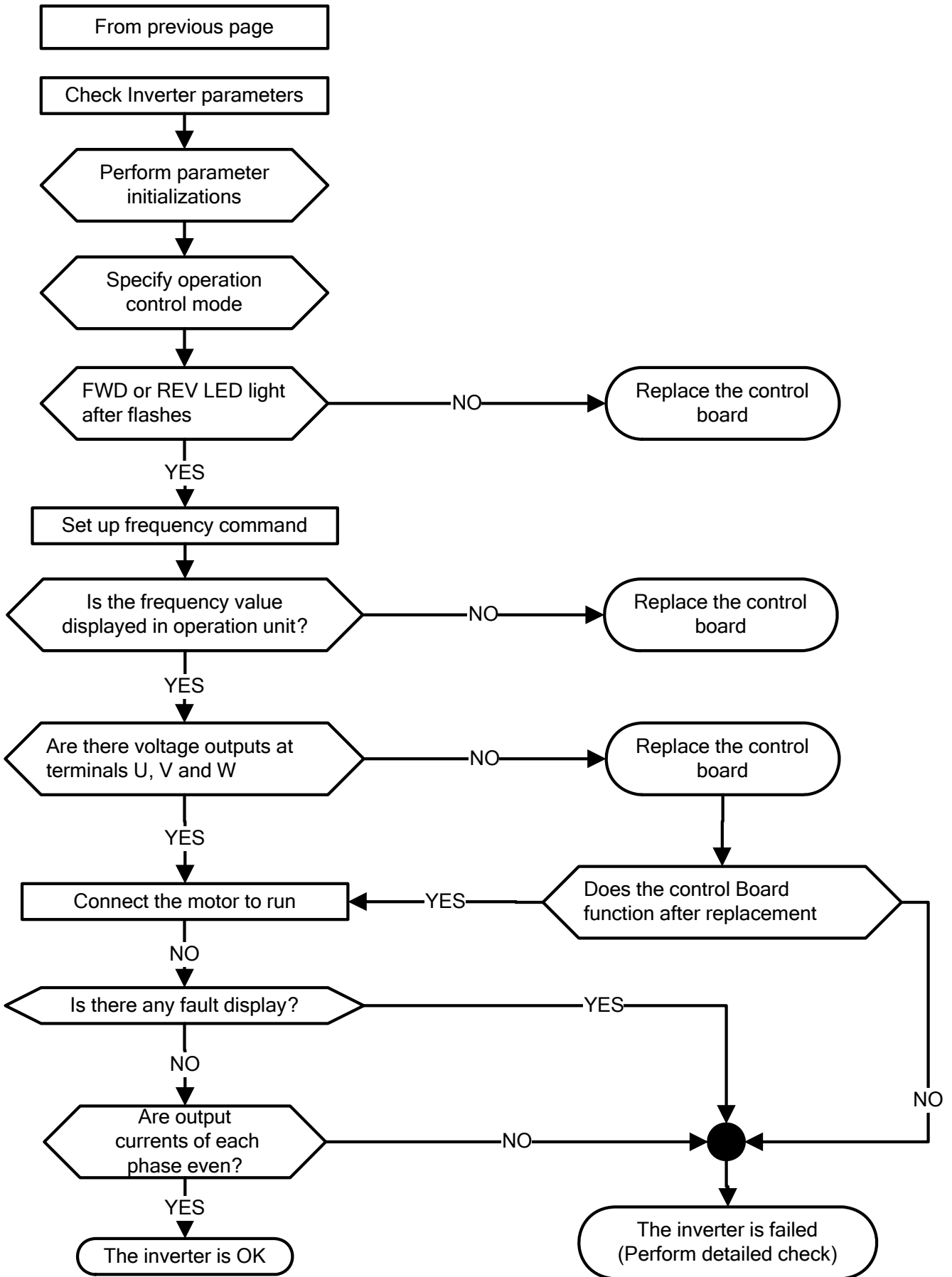
5.2 General troubleshooting

Status	Checking point	Remedy
Motor runs in wrong direction	Is the wiring for the output terminals correct?	Wiring must match U, V, and W terminals of the motor.
	Is the wiring for forward and reverse signals correct?	Check for correct wiring.
The motor speed can not be regulated.	Is the wiring for the analog frequency inputs correct?	Check for correct wiring.
	Is the setting of operation mode correct?	Check the operation mode of the operator.
	Is the load too excessive?	Reduce the load.
Motor running speed too high or too low	Check the motor specifications (poles, voltage...) correct?	Confirm the motor specifications.
	Is the gear ratio correct?	Confirm the gear ratio.
	Is the setting of the highest output frequency correct?	Confirm the highest output frequency
Motor speed varies unusually	Is the load too excessive?	Reduce the load.
	Does the load vary excessively?	1. Minimize the variation of the load. 2. Increase capacities of the inverter and the motor.
	Is the input power erratic or is there a phase loss ?	1. Add an AC reactor at the power input side if using single-phase power. 2. Check wiring if using three-phase power
Motor can not run	Is the power connected to the correct L1, L2, and L3 terminals? is the charging indicator lit ?	1 Is the power applied? 2. Turn the power OFF and then ON again. 3. Make sure the power voltage is correct. 4. Make sure screws are secured firmly.
	Is there voltage across the output terminals T1, T2, and T3?	Turn the power OFF and then ON again.
	Is overload causing the motor to stall?	Reduce the load so the motor will run.
	Are there any abnormalities in the inverter?	See error descriptions to check wiring and correct if necessary.
	Is there a forward or reverse run command ?	
	Has the analog frequency signal been input?	1. Is analog frequency input signal wiring correct? 2. Is voltage of frequency input correct?
	Is the operation mode setting correct?	Operate through the digital keypad

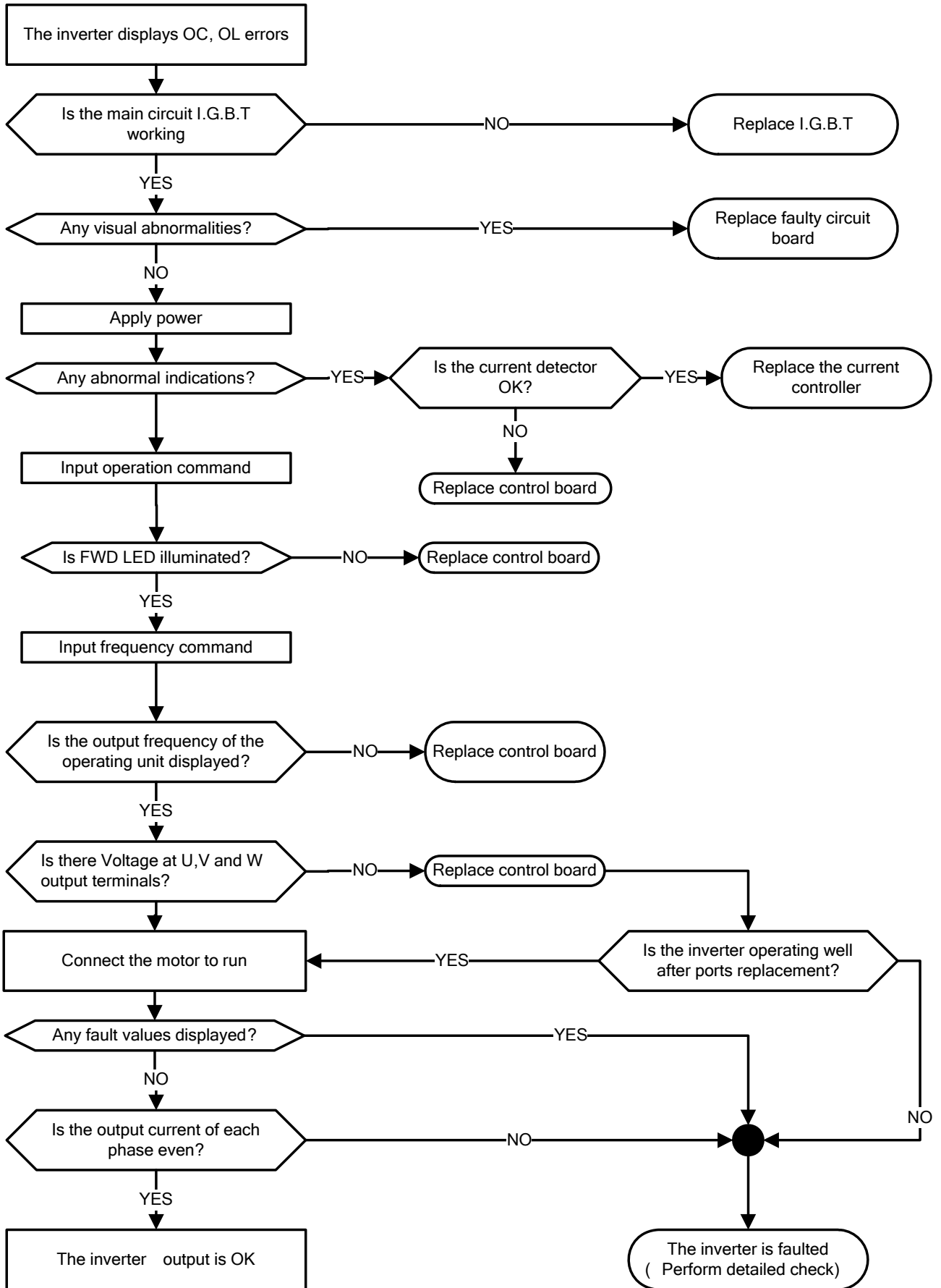
5.3 Troubleshooting of Inverter

5.3.1 Quick troubleshooting of Inverter

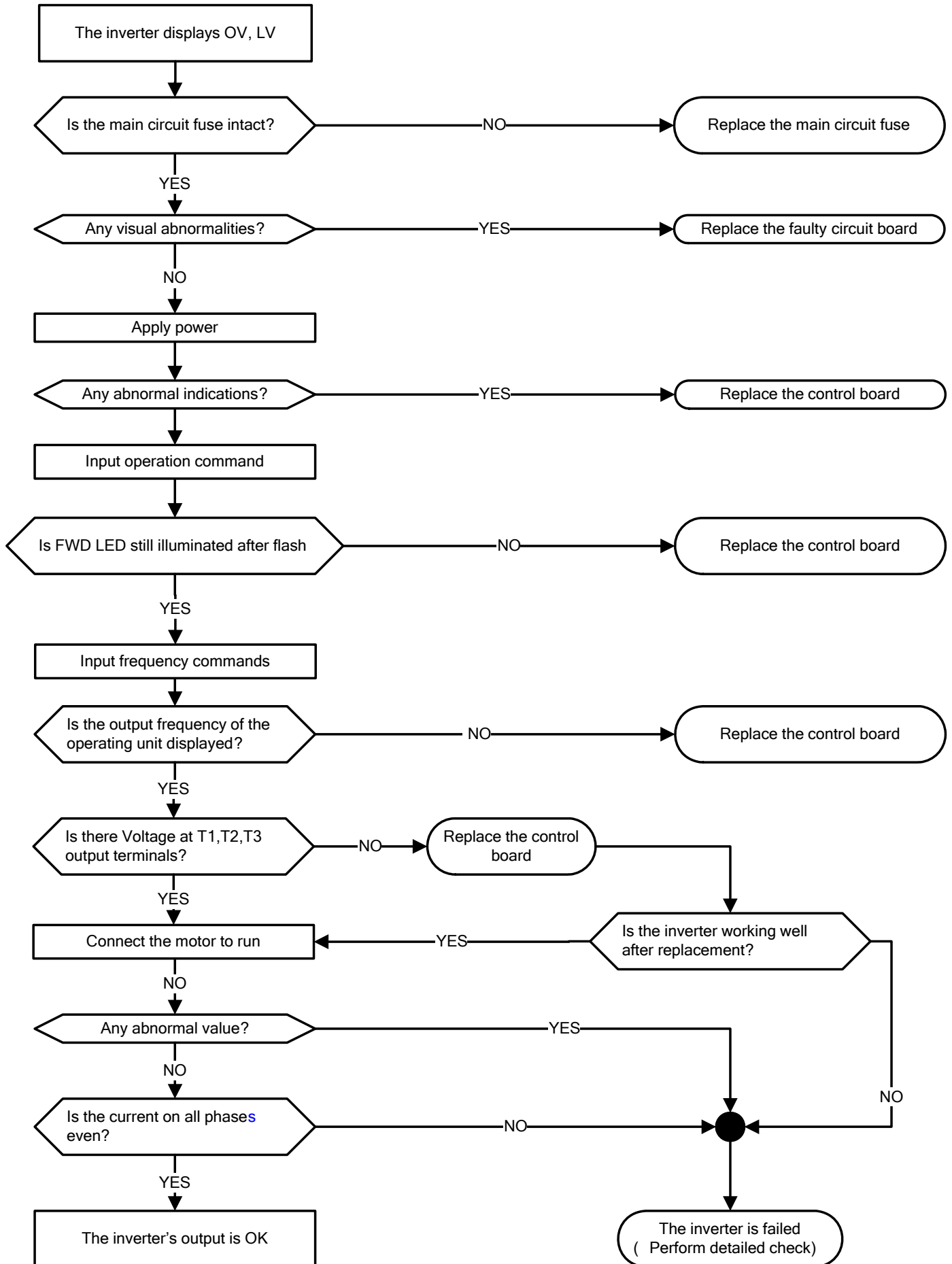




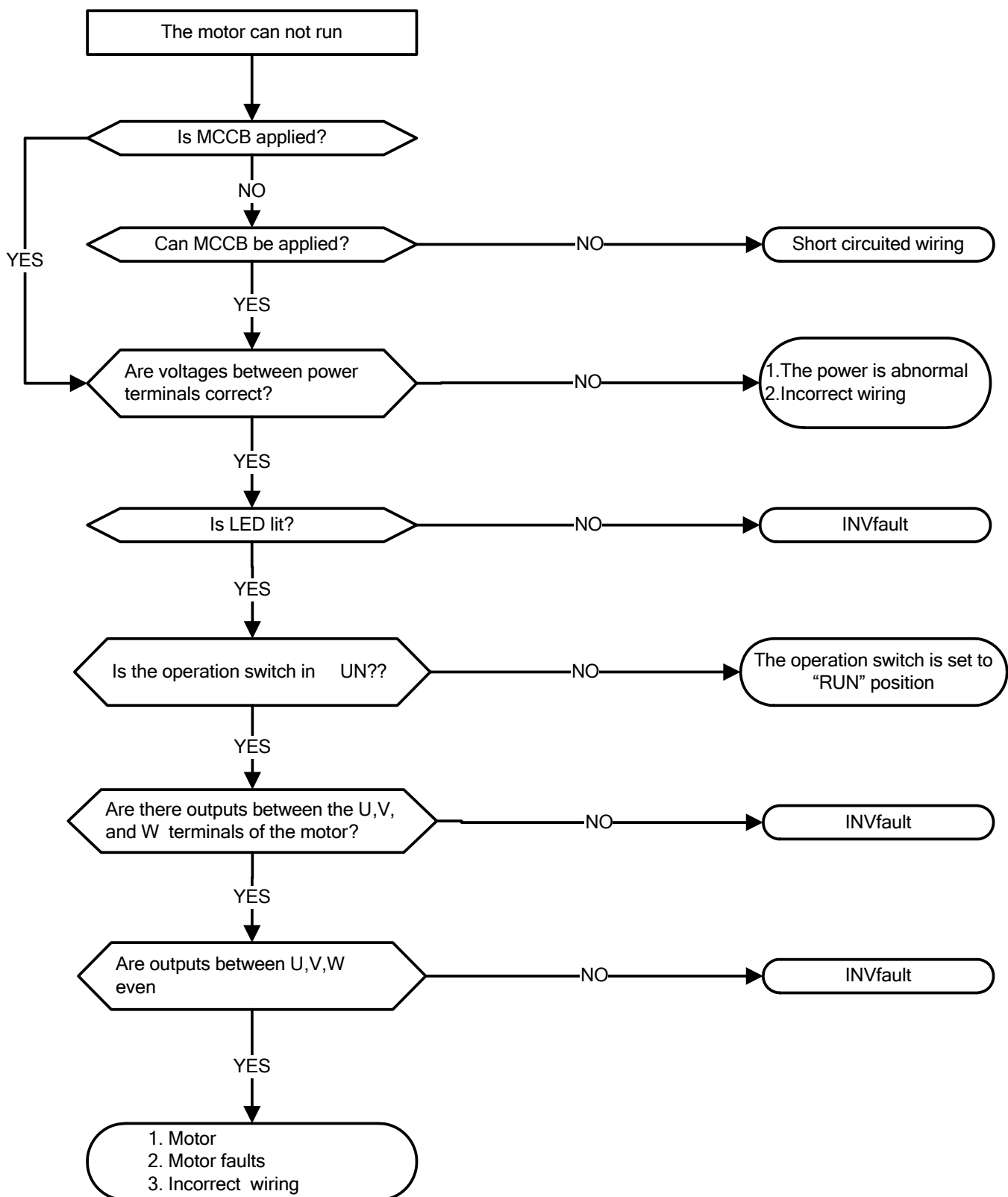
5.3.2 Troubleshooting for OC, OL error displays



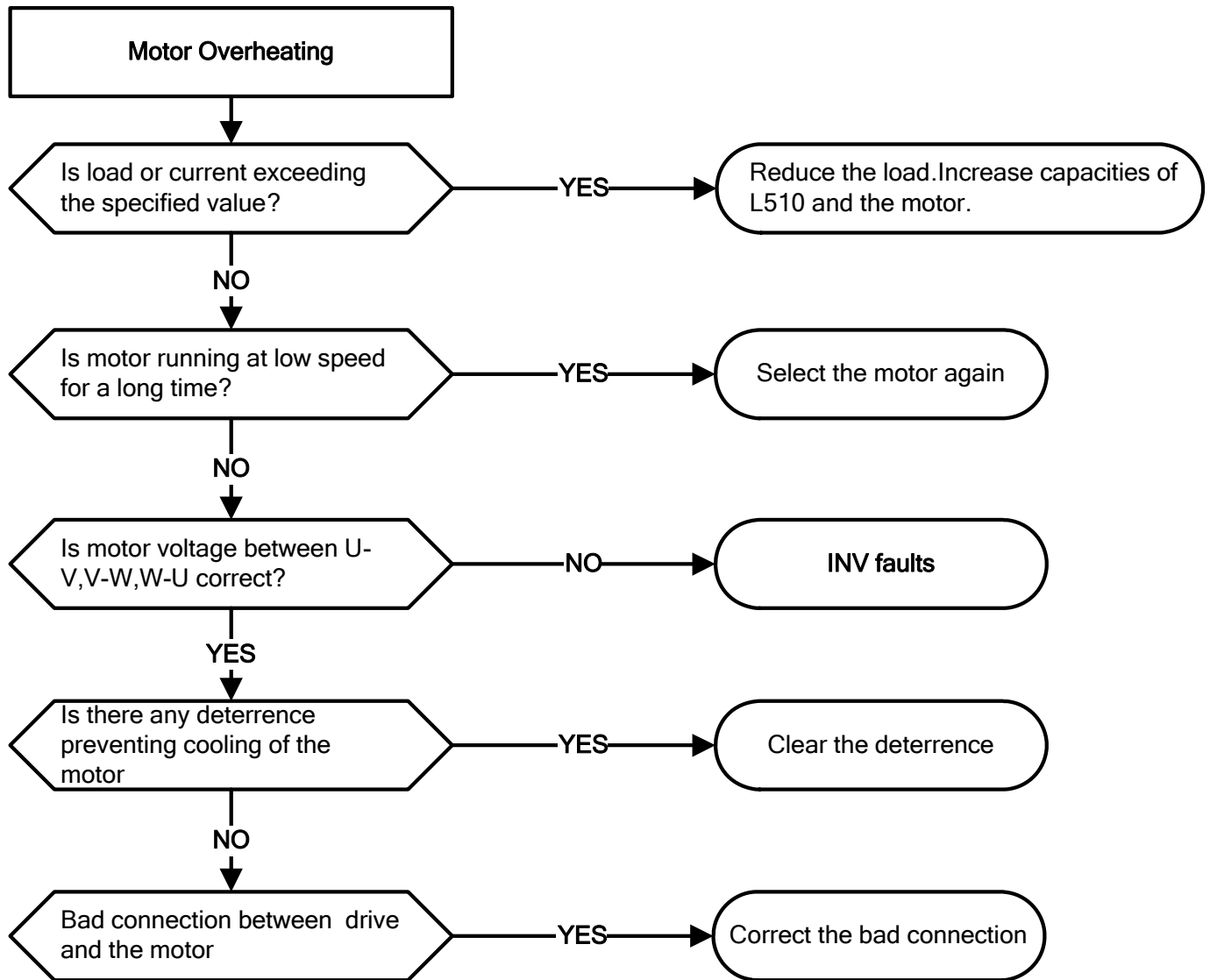
5.3.3 Troubleshooting for OV, LV error



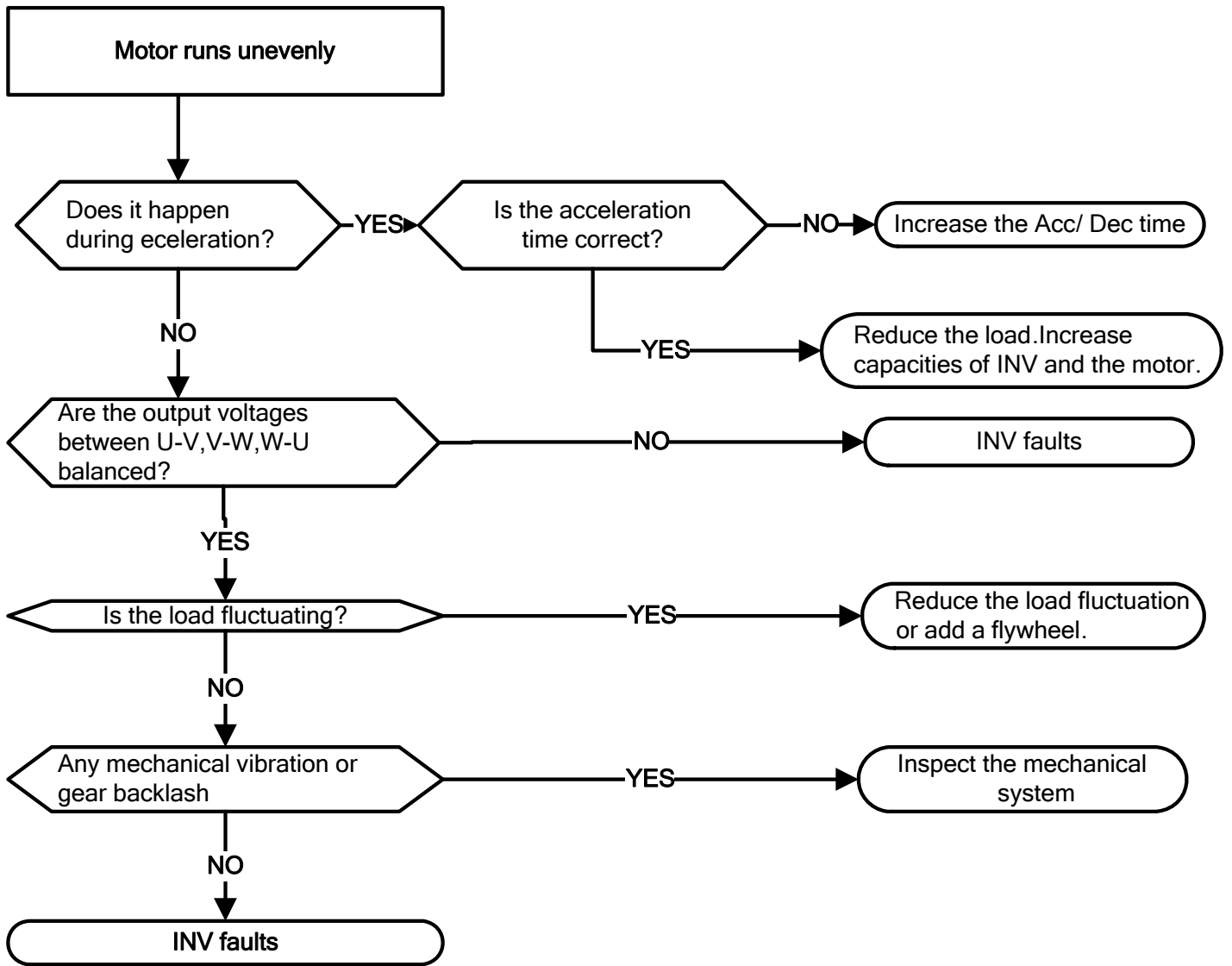
5.3.4 The motor can not run



5.3.5 Motor Overheating



5.3.6 Motor runs unbalanced



5.4 Routine and periodic inspection

To ensure stable and safe operations, check and maintain the inverter at regular intervals.

Use the check list below to carry out inspection.

Disconnect power and wait for 5 minutes and until the “Charge” indicator goes off before it is asfe to do any inspection.

Items	Details	Checking period		Methods	Criteria	Remedies
		Daily	1Year			
Environment						
Ambient conditions around the machine	Confirm the temperature and humidity at the machine	◎		Measure with thermometer and hygrometer	Temperature: -10 ~40°C (14~120°F) Humidity: Below 95%RH	Improve the ambient or relocate the drive to a better area.
	Are there inflammable materials in the vicinity?	◎		Visual check	Keep area clear	
Installation and grounding of	Any unusual vibration from the machine	◎		Visual, hearing check	Keep area clear	Secure screws

the inverter	Is the grounding resistance correct?		⊙	Measure the resistance with a multi-tester	200Vclass: below 100Ω	Improve the grounding
External terminals						
External terminals	Any loose parts?		⊙	Visual check Check with a screwdriver	Secure terminals and no rust	Secure or send back for repair
	Is the terminal base damaged?		⊙			
	Visual rust stains present?		⊙			
internal mounting screws of the inverter	Any unusual bends or breaks?		⊙	Visual check	No abnormalities	Replace or send back for repair
	Any damage to the wire insulation?		⊙			
voltage						
Input power voltage	Is the voltage of the main circuit correct?	⊙		Measure the voltage with a multi-tester	Voltage must conform with the spec.	Improve input voltage
Circuit boards and components						
Printed circuit board	Excessive conductive metal shavings or oil sludge		⊙	Visual check	No abnormalities	Clean or replace the circuit board
	Discolored, overheated, or burned parts		⊙			
Capacitor	Any unusual odor or leakage	⊙				
	Any deformity or protrusion	⊙				
Power component	Excessive dust or debris		⊙	Measure with a multi-tester	No short circuit or broken circuit in three phase output	Clean component
	Check resistance between each terminals		⊙			Replace power component or inverter
Peripheral device						
Rheostat	Whether something smells stench or insulator breaks		⊙	Nose, Visual check	No abnormalities	Replacement rheostat
	Whether rheostat wiring or connector are damaged		⊙	Visual check		
Electromagnetic Contactor	Check contacts and connections for any abnormality.	⊙		hearing check		
	Unusual vibration and noise?	⊙				Replacement Contactor
Reactor	Is there any abnormalities?	⊙		Visual check	Replacement Reactor	
Cooling System						
Cooling fan	Unusual vibration and noise		⊙	Visual or hearing check	No abnormalities	Replace the cooling fan
	Excessive dust or debris	⊙				Clean fan
Heat sink	Excessive dust or debris	⊙		Visual check		Clean up debris or dust
Ventilation Path	Is the ventilation path blocked?	⊙				Clean

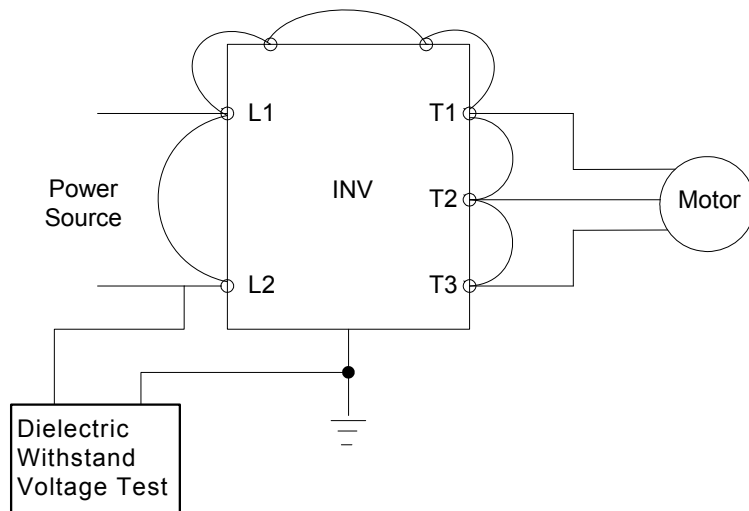
5.5 Maintenance

To ensure long-term reliability, follow the instructions below to perform regular inspection. Turn the power off and wait for the charge indicator (LED) to go out before inspection to avoid potential shock hazard from the charge stored in high-capacity capacitors.

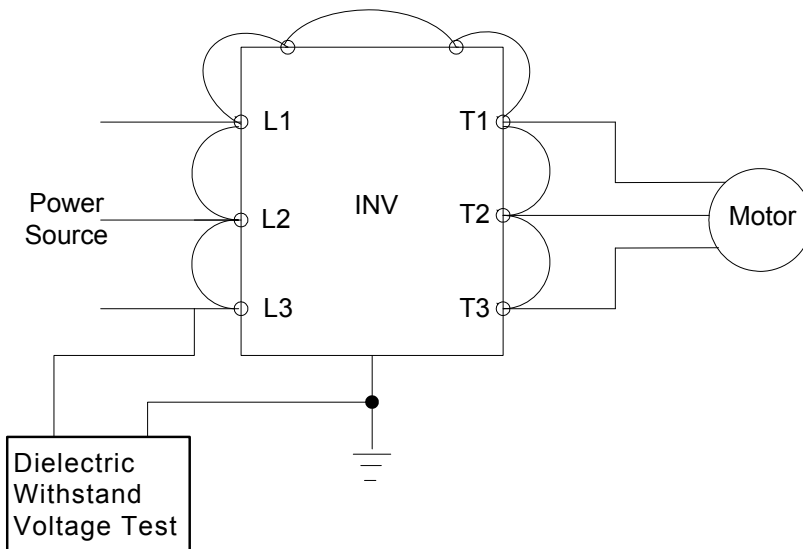
1. Maintenance Check List.

➤ Ensure that temperature and humidity around inverters is suitable, and there is good ventilation, also keep away from any sources of heat.
➤ Check the inside of the inverter, replace aged or damaged elements in time.
➤ Clean up the accumulation of any dust inside the inverter.
➤ Check and ensure that the ground connections are secure and correct.
➤ Terminal screws must be tight, especially the power input and output of the inverter.

2. Insulation test Method . Single Phase



Three Phase



Do not perform any insulation test on the control circuit.