

1. Inspection and Maintenance

	Danger
Mandatory	- The equipment must be inspected every day. If the equipment is not inspected and maintained, errors and malfunctions may not be discovered which could lead to accidents. - Before inspection, perform the following steps. (1) Shut off all input power to the inverter. (2) Wait at least ten minutes and check to make sure that the charge lamp is no longer lit. (3) Use a tester that can measure DC voltages (800V DC or more), and check that the voltage to the DC main circuits (across PA-PC) does not exceed 45V. Performing an inspection without carrying out these steps first could lead to electric shock.

Be sure to inspect the inverter regularly and periodically to prevent it from breaking down because of the environment of use, such as temperature, humidity, dust and vibration, or deterioration of its components with aging.

1.1 Regular inspection

Since electronic parts are susceptible to heat, install the inverter in a cool, well-ventilated and dust-free place. This is essential for increasing the service life. The purpose of regular inspections is to maintain the correct environment of use and to find any sign of failure or malfunction by comparing current operation data with past operation records.

Subject of inspection	Inspection procedure			Criteria for judgement
	Inspection item	Inspection cycle	Inspection method	
1. Indoor environment	1) Dust, temperature and gas 2) Drop of water or other liquid 3) Room temperature	Occasionally Occasionally Occasionally	1) Visual check, check by means of a thermometer, smell check 2) Visual check 3) Check by means of a thermometer	1) Improve the environment if it is found to be unfavorable. 2) Check for any trace of water condensation. 3) Max. temperature: 60°C
2. Units and components	1) Vibration and noise	Occasionally	Tactile check of the cabinet	Is something unusual is found, open the door and check the transformer, reactors, contactors, relays, cooling fan, etc., inside. If necessary, stop the operation.
3. Operation data (output side)	1) Load current 2) Voltage (*) 3) Temperature	Occasionally Occasionally Occasionally	Moving-iron type AC ammeter Rectifier type AC voltmeter Thermometer	To be within the rated current, voltage and temperature. No significant difference from data collected in a normal state.

*) The voltage measured may slightly vary from voltmeter to voltmeter. When measuring the voltage, always take readings from the same circuit tester or voltmeter.

Check points

1. Something unusual in the installation environment.
2. Something unusual in the cooling system.
3. Unusual vibration or noise.
4. Overheating or discoloration.
5. Unusual.
6. Unusual motor vibration, noise or overheating.
7. Adhesion or accumulation of foreign substances (conductive substances).

Cautions about cleaning

To clean the inverter, wipe dirt off only its surface with a soft cloth but do not try to remove dirt or stains from any other part. If stubborn stains persist, remove them by wiping gently with a cloth dampened with neutral detergent or ethanol. Never use any of the chemicals in the table below; the use of any of them may damage or peel the coating away from moulded parts (such as plastic covers and units) of the inverter.

Acetone	Ethylene chloride	Tetrachloroethane
Benzen	Ethyl acetate	Trichloroethylene
Chloroform	Glycerin	Xylene

1.2 Periodical inspection

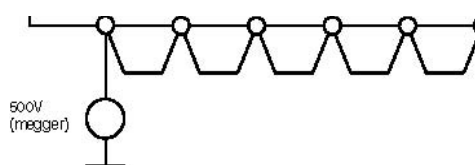
Make a periodical inspection at intervals of 3 or 6 months depending on the operating conditions.

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Prohibited	• Never replace any part. This could be a cause of electric shock, fire and bodily injury. To replace parts, call the local sales agency.

Check items

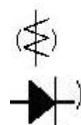
1. Check to see if all screwed terminals are tightened firmly. If any screw is found loose, tighten it again with a screwdriver.
2. Check to see if all caulked terminals are fixed properly. Check them visually to see that there is no trace of overheating around any of them.
3. Check all cables and wires for damage. Check them visually.
4. Remove dirt and dust. With a vacuum cleaner, remove dirt and dust. When cleaning, clean the vents and the printed circuit boards. Always keep them clean to prevent an accident due to dirt or dust.
5. If no power is supplied to the inverter for a long time, the performance of its capacity electrolytic capacitor declines. When leaving the inverter unused for a long time, supply it with electricity once every two years, for 5 hours or more each, to recover the performance of the capacity electrolytic capacitor. And also check the function of the inverter. It is advisable not to supply the commercial power directly to the inverter but to gradually increase the power supply voltage with a transformer, etc.
6. If the need arises, conduct an insulation test on the main circuit terminal board only, using a 500V insulation tester. Never conduct an insulation test on control terminals other than terminals on the printed circuit board or on control terminals. When testing the motor for insulation performance, separate it from the inverter in advance by disconnecting the cables from the inverter output terminals U, V and W. When conducting an insulation test on peripheral circuits other than the motor circuit, disconnect all cables from the inverter so that no voltage is applied to the inverter during the test.

(Note) Before an insulation test, always disconnect all cables from the main circuit terminal board and test the inverter separately from other equipment.



7. Never test the inverter for pressure. A pressure test may cause damage to its components.
8. Voltage and temperature check
Recommended voltmeter: Input side ... Moving-iron type voltmeter

Output side ... Rectifier type voltmeter



It will be very helpful for detecting a defect if you always measure and record the ambient before, during and after the operation.

Replacement of expendable parts

The inverter is composed of a large number of electronic parts including semiconductor devices. The following parts deteriorate with the passage of time because of their composition or physical properties. The use of aged or deteriorated parts leads to degradation in the performance or a breakdown of the inverter. To avoid such trouble, the inverter should be checked periodically.

Note) generally, the life of a part depends on the ambient temperature and the conditions of use. The life spans listed below are applicable to parts when used under normal environmental conditions.

1) Cooling fan the fan, which cools down heat-generating parts, has a service life of about 30,000 hours (about 2 or 3 years of continuous operation). The fan also needs to be replaced if it makes a noise or vibrates abnormally.

2) Smoothing capacitor

- Main circuit.
The smoothing capacitors applied to this inverter in the main circuit DC section are film type capacitors. Those lifetimes in design, value is 15 years, but it is recommended to replace them after it is used for about 10 years under normal conditions. Since the smoothing capacitors are mounted on a printed circuit board, it needs to be replaced together with the circuit board.
- Control circuit.
The smoothing aluminium electrolytic capacitor degrades in performance because of ripple current, etc. The lifetime in design value is 15 years, but it is recommended to replace them after it is used for about 10 years under normal conditions. Since the smoothing capacitors are mounted on a printed circuit board, it needs to be replaced together with the circuit board.
<Criteria for appearance check>
 - Absence of liquid leak
 - Absence of case damp aged

Note: The operation time is helpful for roughly determining the time of replacement. For the replacement of parts, contact your nearest Schneider Electric distributor. For safety's sake, never replace any part on your own. (Parts replacement alarms can be known by monitor and alarm output, if it is set. Refer to section 6.17.14).

Standard replacement cycles of principal parts

As guides, the table below lists part replacement cycles that were estimated based on the assumption that the inverter would be used in a normal use environment under normal conditions (ambient temperature, ventilation conditions, and energizing time). The replacement cycle of each part does not mean its service life but the number of years over which its failure rate does not increase significantly.

Part name	Standard replacement cycle	Replacement mode and others
Cooling fan	2 to 3 years	Replacement with a new one
Main circuit smoothing electrolytic capacitor	10 years	Replacement with a new one
Relay and contactor	-	Whether to replace or not depends on the check results
Aluminum electrolytic capacitor mounted on a printed circuit board	10 years	Replace with a new circuit board

Note) the life of a part greatly varies depending on the environment of use.

1.3 Keeping the drive in the storage

Take the following precautions when keeping the inverter in storage temporarily or for a long period of time.

- 1 Store the inverter in a well-ventilated place away from heat, damp, dust and metal powder.
- 2 If the printed circuit board in your inverter has an anti-static cover (black cover), do not leave it detached from the circuit board during storage. The cover must be detached before turning on the inverter.
- 3 If no power is supplied to the inverter for a long time, the performance of its capacity electrolytic capacitor declines. When leaving the inverter unused for a long time, supply it with electricity once every two years, for 5 hours or more each, to recover the performance of the capacity electrolytic capacitor. And also check the function of the inverter. It is advisable not to supply the commercial power directly to the inverter but to gradually increase the power supply voltage with a transformer, etc.