

1. SAFETY PRECAUTIONS

1.1. GENERAL ASPECTS

The equipment must to be operated by qualified personnel only.

There is a need to know that an inappropriate use can result in an accident. To avoid this, before operating, maintaining or repairing the genset, it is important to follow all of these steps.



Perform all the safety inspection and checking operations detailed in this manual, before starting up the genset.

⚠ If an unsafe genset working condition is observed, please shut off and do not start-up the equipment. Then proceed to disconnect the negative terminal of the battery until the safety conditions are restored.

The genset installation and the nature and sizing of the electrical loads is the installer's responsibility and the final Customer. Please, be sure all the work is done according to the local regulations.

1.2. GENERAL CAUTIONS FOR HANDLING AND TRANSPORTATION



The loading, unloading and displacement of the genset should be done by skilled personnel, and under certain conditions of safety.

Make sure that the floor can support the equipment weight.

When lifting the genset, make sure the fuel tank is empty.

Disconnect the battery negative terminal to avoid unexpected start-ups or short circuits.

In case of using a crane, use the lifting eyebolts to lift the group.

In case of using a forklift truck, introduce the forklift toes inside the omegas for lifting. If it's not possible, make sure every toe stays at the same horizontal distance of the lifting eyebolts axis.

1.3. GENERAL CAUTIONS IN THE MAINTENANCE

1.3.1. MECHANICAL RISKS

A working genset has moving parts that can provoke injuries if they are touched.



Always avoid contact with moving parts of the equipment. Make sure all the guards are correctly fitted. Do not remove guards if the genset is about to work, unless the task is done by a qualified and authorized personnel.

Loose fitting clothing, long hair, pendants, etc. can get caught in machinery and equipment causing accidents and injuries.

Before working in moving parts of the equipment, be sure an unexpected start-up is not possible.

Before realizing electrical or mechanical fixings, disconnect the negative terminal of the battery to prevent unexpected turns of the starter.

Whenever possible, keep doors of enclosed gensets closed and blocked.

Use gloves, safety shoes, safety eyewear and head protection when service parts of the genset.

Internal combustion engines work at high temperatures. Avoid touching engine surfaces when it is working, especially in the exhaust manifold, turbo and exhaust piping in general.

Please, keep in mind that after certain working time, fluids like oil and coolant reach high temperatures. Avoid direct skin contact with these hot fluids.

1.3.2. ELECTRICAL RISKS



If the group has a TT or TN connection installed, it is very important to connect the group to a reliable earth ground when installing. This is decisive for the electrical protections to work effectively. Otherwise, there is a risk of electrocution when coming into contact with the metal parts of the equipment.

⚠ Never expose or operate an open genset to water or rain.

⚠ Never operate the equipment when your hands are wet.

If the genset catches fire, use fire extinguishers Class BC o ABC. Never use water to try to put out a fire in the immediate area of electrical equipment.

Avoid the contact with electrical terminals and other unseated electrically living components.

In case of going to assist for a person injured by electrocution, proceed as follows:

⚠ First open the main breaker of the circuit that provoked the accident. Do not touch the victim with direct skin until the power source is shutted off.

If this is not possible, move the wire away from the victim using isolating objects, like wooden sticks, ropes, etc. without touching the victim with direct skin.

Check the vital signs and apply cardiopulmonary resuscitation techniques if necessary.

Cover the wounds with preferably sterile bandage (the entrance and exit openings, caused by electricity).

Move the victim to a medical care centre, although the injuries appear to be small.
Sometimes late alterations could appear.

1.3.3. FIRE AND EXPLOSION



Generator set fuel is a potentially hazardous substance, which can lead to an explosion. Make sure not to fill the fuel tank completely, especially if it will be exposed to the sun or sources of intense heat. Do not expose or spill fuel on sources of intense heat.



Lubricating oil emit fumes that can become flammable above a certain temperature. Do not expose lubricating oil to sparks or flames.



Starting batteries work with chemical reactions. The resulting vapours are flammable. Avoid the accumulation of vapours in confined or poorly ventilated spaces.

When batteries work in poor conditions, they may cause explosion during the charging process. Make sure the electrolyte level is good, keep them clean and replace them every two years.

It is necessary to dispose of fire extinguishers close of the genset, class BC or ABC. Make sure they are fully charged and checked.



The genset operation must be carried out by trained and authorized personnel.

The site of the genset installation should have sufficient ventilation to provide a natural draught and avoid for air recirculation and accumulation of toxic fumes.

The genset environment and the site floor must remain clean and free of dirt, in order to keep from spreading in case of fire. Dirt can be absorbed by the fan and get caught on the radiator, clogging the air flow and causing over temperature failure.

1.3.4. CHEMICAL RISKS



Avoid direct skin contact with fuel, oil and coolant. In the case of ingestion, do not induce vomiting. Call local number for medical emergencies and describe the situation. If your clothing gets contaminated with these fluids, take a soapy shower and wear clean clothes.

Avoid entirely direct skin contact with batteries electrolyte. This fluid involves corrosive hazard and direct contact causes burns. In case of direct contact, remove contaminated clothing as fast as possible. Quickly wash your affected skin with large amounts of soap and water for at least 15 minutes.

If the electrolyte comes in contact with your eyes, rinse them open for at least 15 minutes with water and then consult your doctor. In case of accidental ingestion, drink large amounts of water, preferably with bicarbonate, and go to your local hospital or emergency room as soon as possible.



Be careful not to inhale vapours produced by the chemical reaction of the battery if you think they remained concentrated in a small enclosure.

1.3.5. NOISE

△ It is very important having earplugs or a headset to wear to help block out the noise from a working genset, in order to prevent hearing damages.



Open gensets, without soundproofed enclosures, generate noise levels that may exceed 105dB.

A prolonged exposure to noise levels exceeding 85dB may result dangerous and lead to hearing deficits.

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