

13 Maintenance



WARNING

Hazardous voltage are present in this electrical equipment during operation.

A hazardous voltage may be present at the signalling relays in the customer installation.

Non-observance of the safety instructions can result in death, severe personal injury or substantial property damage.

When carrying out maintenance work on this converter, please read all safety instructions included in this section and attached to the product itself.



- Maintenance work on the converter may be carried out only by qualified personnel who are thoroughly familiar with all safety notices in this manual and with the installation, operating and maintenance instructions.
- Before carrying out visual checks and maintenance work, ensure that the AC power supply is disconnected and locked out and that the converter is grounded. Before the AC supply is disconnected, both converters and motors are at hazardous voltage levels. Even when the converter contactor is open, hazardous voltages are still present.
- The snubber capacitors might still be carrying hazardous voltage after isolation from the supply. For this reason, the converter must not be opened for at least two minutes after switch-off.

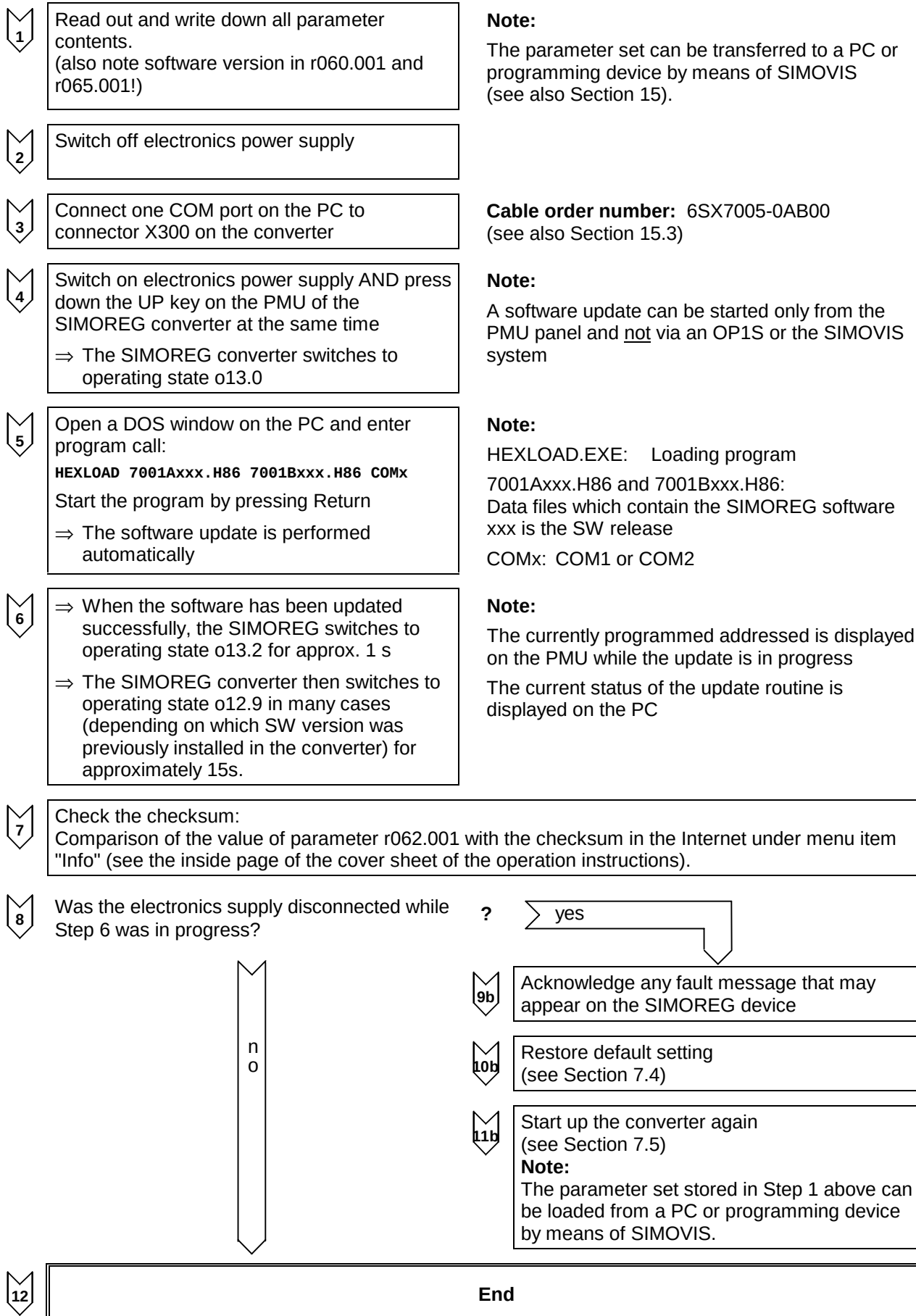
Only spare parts authorized by the manufacturer may be used.

The converter must be thoroughly protected against the ingress of dirt so as to prevent voltage flashovers and this irreparable damage. Dust and foreign bodies, and especially contamination drawn in through the cooling air flow, must be carefully removed at regular intervals depending on the degree of pollution, but at least once every 12 months. The converter must be cleaned with dry, compressed air, max. 1 bar, or with a vacuum cleaner.

Please note the following with respect to converters with forced air cooling:

The fan bearings are designed for a service lifetime of 30000 hours. The fans should be replaced in plenty of time in order to maintain the availability of the thyristor sets.

13.1 Procedure for updating software



13.2 Replacement of components

13.2.1 Replacement of fan



WARNING

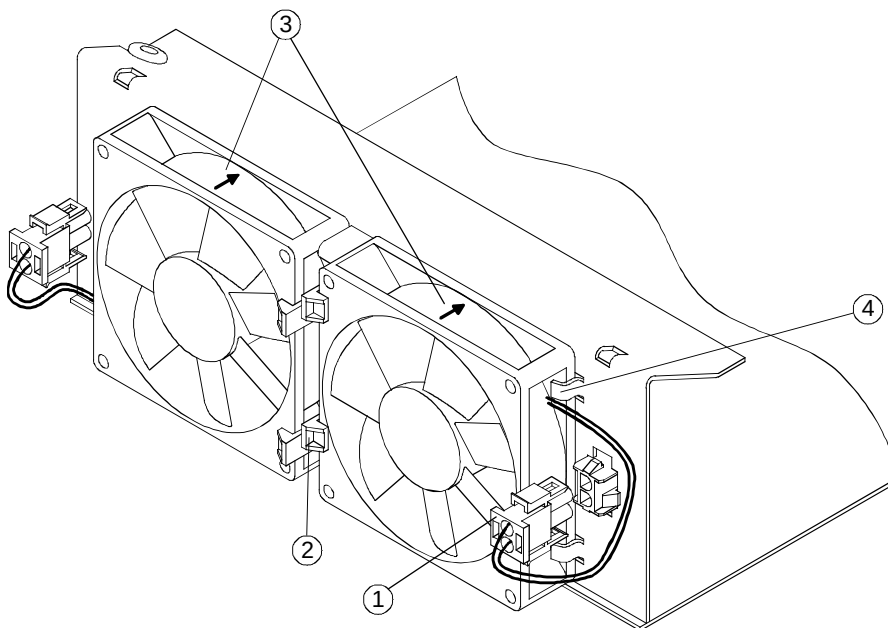
The converter fan may be replaced only by properly qualified personnel.



The snubber capacitors might still be carrying hazardous voltage after isolation from the supply. For this reason, the converter must not be opened for at least two minutes after switch-off.

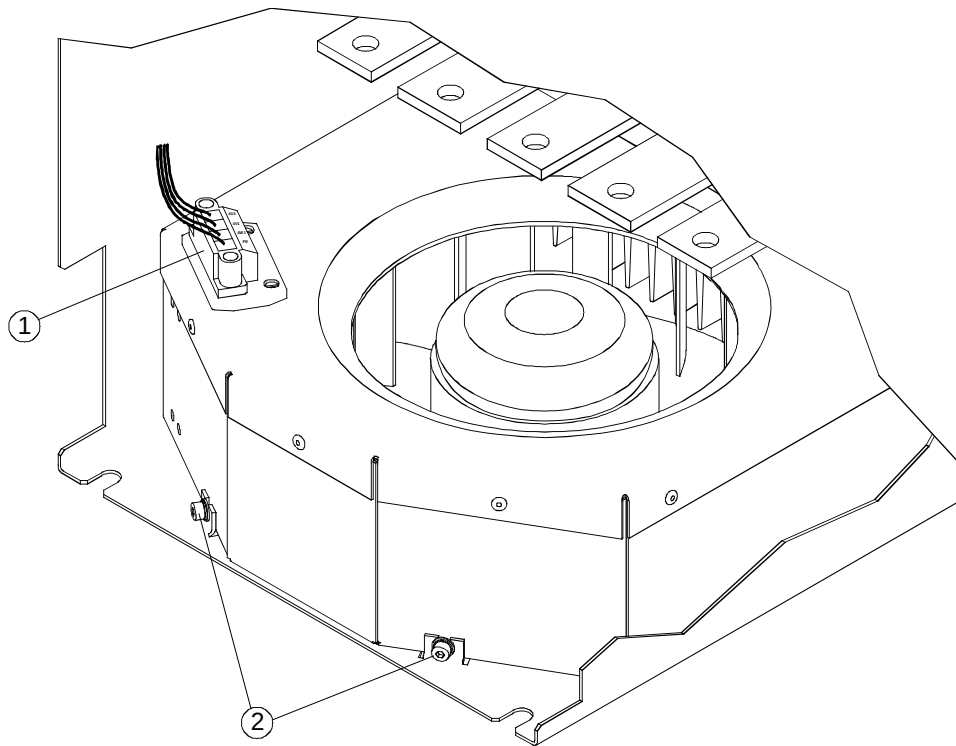
Non-observance of the safety instructions can result in death, severe personal injury or substantial property damage.

Replacement of fan on 210A to 280A converters



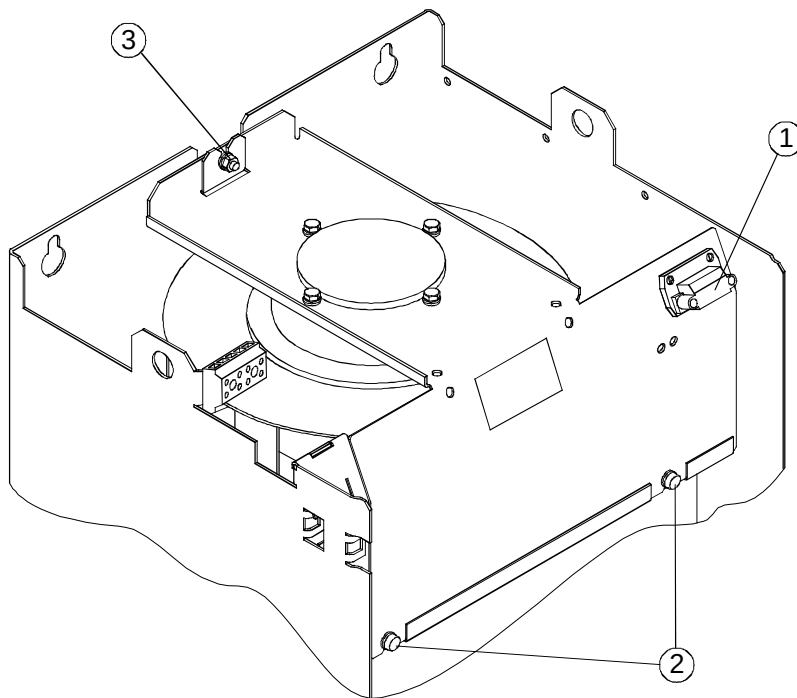
The two fans are mounted on the underside of the converter.

- Remove connector ①.
- Release the two retaining clips ② on the fan and swing fan out downwards.
- When mounting the fan make sure it is in the correct mounting position (blowing direction upward, see arrow ③ on the fan housing).
- Insert the fan into lugs ④ and push upwards until it engages in retaining clips ②.
- Insert connector ① again.

Replacement of fan on 400A to 850A converters

The fan is mounted on the underside of the converter.

- Remove connector ① .
- Use a T20 screwdriver to undo the two Torx screws ② .
- Lift the fan using the fixing straps and pull out downwards.
- Install the new fan in the reverse order.

Replacement of fan on 900A to 1200A converters

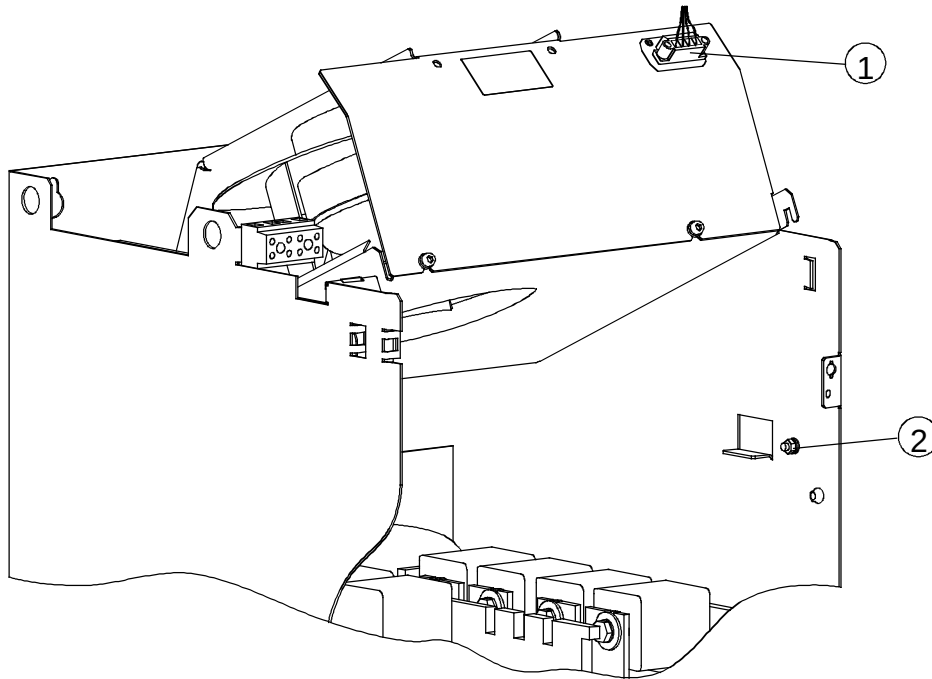
The fan is mounted on top of the converter.

- Remove connector ① .
- Undo the M6 Torx screws ②.
- Undo the M6 hexagonal nuts ③.
- Pull fan upwards out of its guideway and then forwards to remove. Take care to protect the field module mounted on the left (risk of mechanical damage!).
- Install the new fan in the reverse order.

Replacement of fan on 1500A to 2000A converters**WARNING**

When dismantling the fan-mounting box, please remember that it weighs 12 kg.

Non-observance of this warning can result in severe personal injury or substantial property damage.



The fan is mounted on top of the converter.

- Remove connector ① .
- Undo the M6 hexagonal nut M6 ② .
- Swing fan upwards and pull it out towards you, taking care to protect the field module mounted on the left against any mechanical damage!
- Install the new fan in the reverse order.

13.2.2 Replacement of PCBs



WARNING



PCBs may be replaced only by properly qualified personnel.

PCBs must not be removed or inserted when the power supply is connected.

Non-observance of the safety instructions can result in death, severe personal injury or substantial property damage.



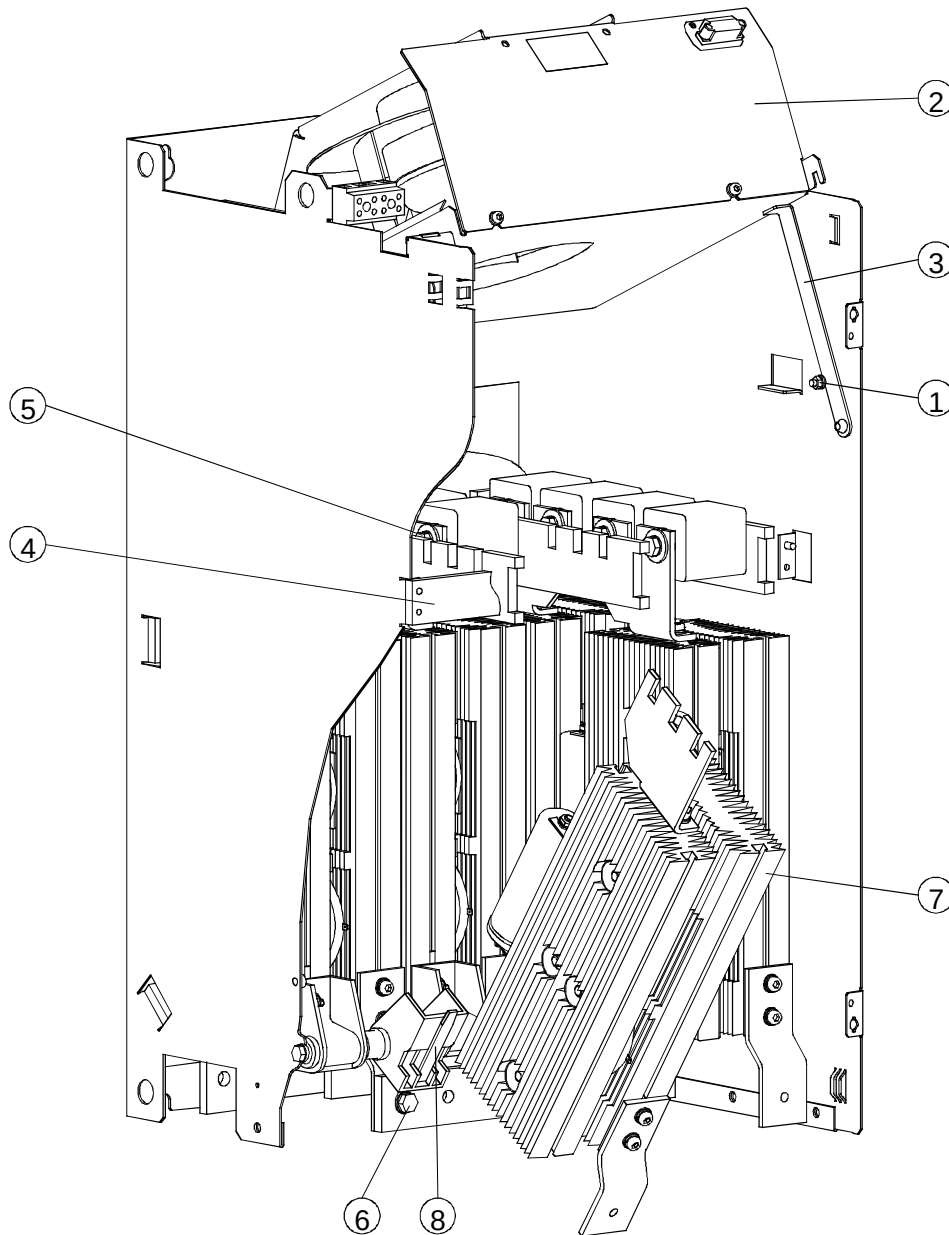
CAUTION

PCBs contains electrostatically sensitive devices. Before touching a PCB, the person carrying out the work must himself be electrostatically discharged. The simplest way of doing this is to touch an electrically conductive earthed object, e.g. socket outlet earth contact.

13.2.3 Replacement of thyristor modules in converters up to 1200A

The thyristor modules are mounted by means of self-tapping screws. When a module is replaced, the support surfaces on the heatsink must be cleaned and a new layer of thermo-lubricant applied to the thyristor module. To fix the modules always used screws with a metric thread of the same length as the original screws and fixing elements (washer and spring lock washer). When screwing the modules to the busbars and boards, also use screws with a metric thread and the same length as the original screws and fixing elements (washer and spring lock washer).

13.2.4 Replacement of fuses and thyristor assemblies on converters of 1500A and above



- Undo the M6 hexagonal nut ① .
- Swing the fan ② upwards and hold in place with support rail ③ .
- Remove the brace ④ with the attached protective cover by undoing the 2 M6 hexagon-head screws.
- Remove fuses ⑤ by undoing the 2 hexagon-head screws on each (M10 or M12 depending on converter model).
- Undo the M10 hexagon-head screw ⑥ and swing thyristor assembly ⑦ out towards you.
- Undo assembly locking mechanism (M6 hexagonal nut) ⑧ , then pull out thyristor assembly ⑦ upwards at an angle.
- Install the new components in the reverse order.

Caution: The fuse mounting screws are of different lengths!