

# Controller Replacement

## Recommended steps for controller replacement

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# 1 General information

## 1.1 Clarification of Notation

**Note:** *This type of paragraph calls the reader's attention to a notice or related theme.*

**IMPORTANT:** This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

**WARNING:** This type of paragraph highlights a procedure, adjustment etc., which can cause a damage or improper function of the equipment if not performed correctly and may not be clear at first sight.

**Example:** This type of paragraph contains information that is used to illustrate how a specific function works.

## 2 Recommended steps

### 2.1 Before connecting controller to the site

- Start the controller, upgrade the FW (if necessary) and write the configuration
- Turn off the controller and place it to the site

### 2.2 Before you power up a controller on the site

- Check wiring according to a drawing - all terminals' screws are tight enough
- Pay extra attention to wiring of voltage and current sensing
- Check controller's power supply voltage level and polarity
- Disconnect all binary outputs (controller's terminals as well as extension units)
- Connect all the communication lines, such as CAN1, CAN2, RS485, etc.
- Check the impedance between CAN-Hi & CAN-Lo which must be approximately 60 Ohms
  - » To achieve that, jumpers or external resistors must be in the right position

### 2.3 Power up a controller

- Turn on the controller power supply.
- Check all binary inputs, verify protection functions
- Check the emergency stop function
- Check analog inputs and their protections (sensor failure)
- Check binary outputs
- Check analog outputs
- In case of multi-controllers application:
  - » If this procedure is followed, after the power up all shared #setpoints will be shared from the site to the newly connected controller
  - » To check if the procedure was followed, Check #setpoints on newly connected controller + randomly chosen controllers on site (IM, IG, BTB, etc.)
  - » Check controllers' visibility on the CAN2 bus (the controller should see and should be seen by others – CAN16/32)
  - » Check grouping (the controller should see and should be seen by others – Reg16/32)
- Check setpoints and protection levels (mainly overvoltage, undervoltage, overfrequency, underfrequency)
- Switch off all breakers which protect devices supplied from generator voltage apart from controller voltage sensing and AVRI trans
- Connect back binary output terminals
- Check genset starting and stopping sequence
- Check the emergency stop button function, if a genset really stops eventually if appropriate breaker opens
- Check voltage and speed regulation (typically voltage regulation +/- 10% Unom, speed regulation +/- 5% from is suitable)
- Check breakers control (if needed firstly in the test position)

- Synchronization check
- Put the genset on the load (if possible, without synchronization at first - e.g. using load bank)
- Check power measurement - current consequently active power is supposed to be approximately the same in all three phases
- Setup protection based on local rules and standards