

Equalizer/Activar System installation and commissioning

This document explains how to install an Equalizer/Activar system and how to make sure that the installation is correct and the system is working properly.

Warning the installation of electric equipment must be done according to the local electric safety code and by authorized personal.

System installation:

What do we need to connect?

- Earth
- Neutral
- 3 phases of voltage
- 3 phases of currents from the mains CT's

The phase order is very important We need to take make sure that Phase 1 of the voltage is connected to Phase 1 of the system and the same Phase 1 of the current to the Phase 1 current CT terminal. The same applies to Phase 2 and 3.

The phase angle between each phase needs to be 120° and there must not be shift between the voltages and the currents (i.e. phase 1 of voltage to phase 1 of voltage and phase 2 of current to phase 1 of current in the connection terminals of the system)

System commissioning:

1. Make sure that the system is disconnected from the network (no voltages in the system).
2. Test with a multi tester that there is no short circuit between all phases neutral and earth.
3. Connect the system to the network.
4. Perform site installation
 - confirm that the parameters were setup correctly

Most parameters (with the exception of the mains CT ratio) are already configured correctly before they leave the factory, but it is the commissioning performer responsibility to check that they are correct.

- Set the correct ratio of the mains CT's

The mains CT ratio is usually unknown before hand and must be configured as part of the commissioning process

- Finish the site installation process.

5. Go to Mains voltage screen and verify that the voltages are correct.

6. Go to Mains Line currents screen – pull one by one the yellow tongues that short circuit the terminals of the mains CT's. Verify that the measured currents are correct.

7. Go to Caps line currents screen and verify that all currents are zero (if not there is probably shorted SCR).

8. Go to Mains KW phase meters and check if all phases are positive (except in the case of generators compensation) if they are not positive the CT's polarity will have to be changed (by software means) in the site installation.

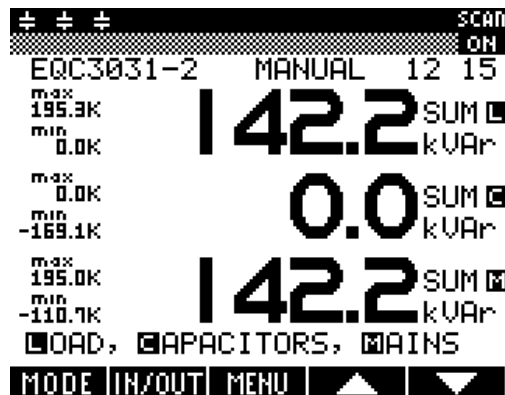
9. Go to System Information → Group status and verify that the system test was OK

10. Check that the capacitors are measured correctly:

- Go to Caps KVAR meters screen
- While the cabinet is closed Connect one group manually (do it with two hands and be ready to disconnect the group if anything is wrong or if hearing strong noise)
- The KVAR value of the different phases should be approximately the same.

11. Perform LCM test.

- Go to L C M Total KVAR meters screen (All groups are disconnected now).
- The Caps KVAR should be zero



- The Load KVAR should be equal to the Mains KVAR and both should be positive (in any case that the load is inductive)
- While the cabinet is closed Connect one group manually (do it with two hands and be ready to disconnect the group if anything is wrong or if hearing strong noise)
- The Caps KVAR should show the step size with a **minus sign** (the smallest group size) (if not negative in old system perform system test (or site installation) in new systems change Cap CT's Polarity)
- The Load should stay almost the same with positive sign (rise a little due to the voltage rise because of capacitors connection)
- The Mains should be equal approximately to the Load + Caps
- Mains = Load + Caps in the example below $38.7 \approx 144.9 + (-106.3)$



12. If one or more of the results is not as expected the system is not connected or configured correctly (Refer to commissioning trouble shooting document)
13. If all values are as expected and the system has only one set of internal CT's we can now set the system to work in Automatic Mode. If the system has more than one Set of internal CT's, press IN-OUT-IN-OUT..... The groups will connect one after the other (FIFO) make sure that you receive the expected values as described above. If all is as expected you can set the system to Automatic Mode.