TopCon ReGen Power Supply System

1. General System Description

In order to provide both source power and the ability to sink full power, REGATRON proposes a unique three-component system:

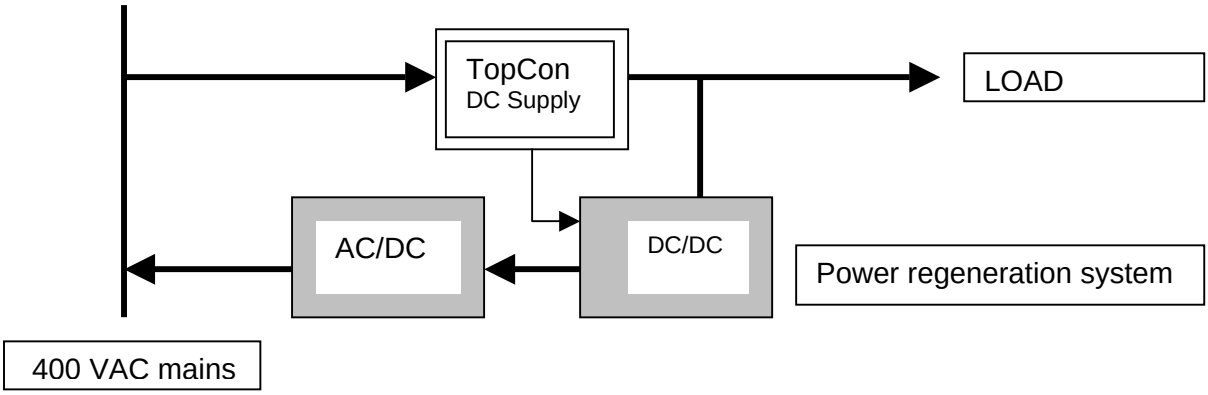

Figure 1 : System configuration

Power source: TopCon is a primary switched, high power / high dynamic power supply system with overall digital control and parameterisation and excellent static and dynamic data.

Power regeneration: In order to sink energy fed back from the load, REGATRON proposes the use of regenerative techniques instead of dissipating high amounts of energy in resistances.

The main advantages are :

- constant load current during the complete regeneration phase instead of decreasing current in a resistive dissipator

- easily adjustable load (braking) current level

- freely programmable overcurrent warning and trip-off levels

- feedback of nearly all regenerative energy to the mains with efficiencies of > 95%

- nearly no thermal loading of the experiment room

- unique “central control “ of regenerative process by multi-quadrant TopCon controller unit, therefore no unwanted interaction between supply and regenerative parts

As indicated in picture 1, the regenerative part consists of two separate units. The first unit is a current controlled DC/DC converter feeding the second DC/AC converter system with an always constant DC intermediate voltage. By this way, the DC/AC converter system works under ideal feed-back conditions independent of the load voltage level. The resulting AC-mains waveform is nearly sine shaped, containing only a few percents of harmonics.

Switchover from feeding to regenerative action will be performed in only 2-4 msec and is controlled – as explained above – only by the controller of the TopCon master unit. System response time for a step from 90% feeding to 90% regenerative current will be in the order of 15 msec.

5. Floating and fixed potential considerations

General :

In any case, all signal lines are of floating potential, non mains-related.

All **TopCon power supplies** outputs are fully isolated with respect to ground and the mains.

Through the **regeneration unit** a direct relationship to the mains exists. In a majority of applications, this fact does'nt confuse by no way. In cases where a complete load isolation from the mains is a demand, a conventional isolation transformer should be added at the 400 VAC terminals. The customer determines, whether an isolation is necessary or not.