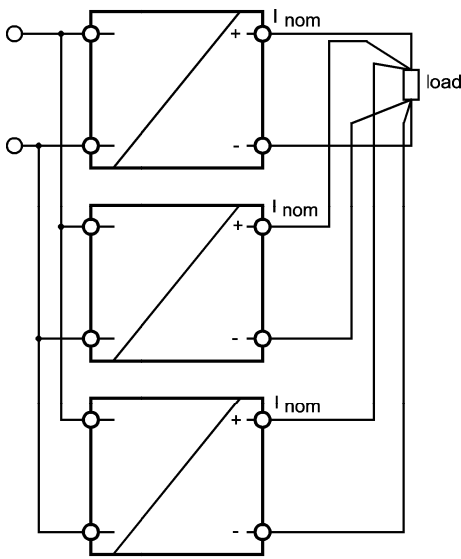
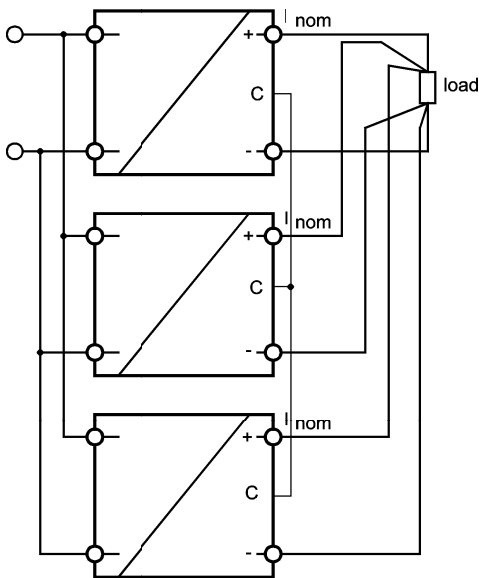


## Parallel Connection for Higher Power



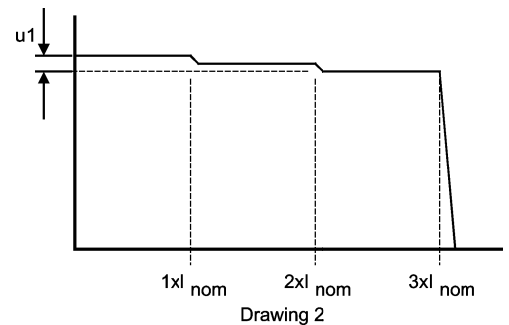
Drawing 1



Drawing 3

In order to increase the output power/current, as many identical units as possible can be parallel connected (see Drawing 1). However, the following should be taken into consideration:

As the output voltages of the units always differ slightly, the unit with the highest voltage should carry the load until the current limit comes into operation and the output voltage decreases (constant current mode) down to the value of the next unit, which then takes over the additional current requirement (see Drawing 2). As the current limit is normally factory set at 105 - 110% nominal, the units with higher output voltages would constantly operate in overload condition. Therefore it is absolutely necessary to set the current limit to  $\leq 100\%$  nominal in the parallel connected units. The output voltages should be adjusted as close as possible to each other in order to minimize the voltage tolerance (U1 in Drawing 2). This adjustment should then be made when the outputs are loaded 10 - 20% nominal.



Drawing 2

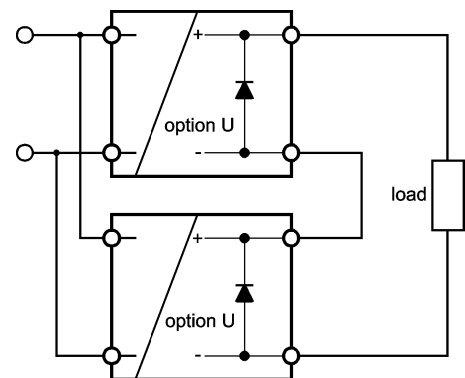
A secure operation (output voltage U1 within tolerance) can only be guaranteed if the combined load is higher than  $n - 1 I_{nom}$  ( $n$  = number of paralleled units). If the common load becomes less, then the unloaded unit will go out of regulation and its output voltage is reduced. Before the unit can carry a load again it must first go back into normal operation, which may cause a break down of common output voltage for a short time. This can be avoided by using option E, R, C, Ci.

All Powertronic units can be fitted with active current sharing (Option C). The paralleled units are interconnected with an additional wire (see Drawing 3). This causes the output voltages of the individual units to vary up to 2% or 1,5V (whichever is lower) in order to achieve a 5% accurate load sharing between the units. The individual voltages must have been set at  $\leq 1\%$  or 0,1V to each other at 10 - 20% nominal load. A connected unit not supplying an output voltage may reduce the load voltage up to 8%. Option Ci eliminates this effect by removing the current sharing signal of this unit.

## Serial Connection for Higher Voltage

This mode of operation can be used without any problems, but the following points should be considered:

1. The output ripple of the individual units may add up to a higher absolute value (relatively it remains the same).
2. The total output voltage should not exceed the safety / isolation limits of the individual units.
3. Should one unit fail, its output will then be loaded by the other units with wrong polarity. Therefore, all the outputs should be protected by a cross diode. This diode can be included in our units (Option U) - see Drawing 4.



Drawing 4