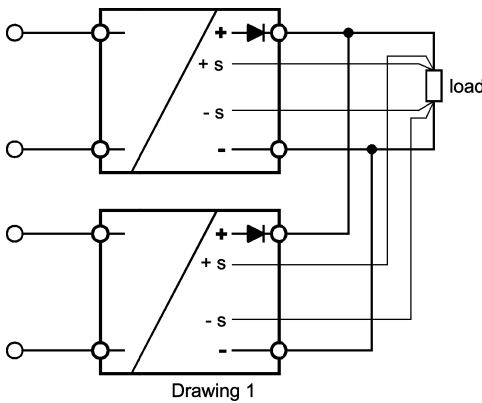


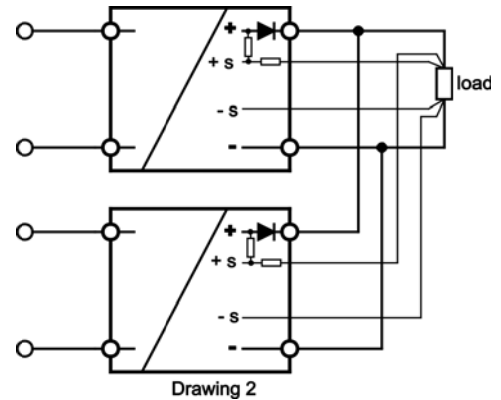
## Redundant Operation for Safety Purposes



The redundant operation assures a continuous safe operation of the load if one or more DC/DC or AC/DC supplies fail. Basically this is a parallel operation, but some additional points must be considered.

The most important point is the installation of a decoupling diode in each unit (see Drawing 1), which assures that a defective unit will not be an additional ballast or make a short circuit. In order to compensate the voltage drop across the decoupling diode, sense lines s must be used. This creates another problem: units with lower adjusted output voltages get the information through their sense lines, that their output voltage is too high.

This slows down their primary switching pulses to a stop and can possibly cause a complete block. To avoid this reaction in our units when the Options E and R are included, the sense lines are connected with an additional resistor to the anode of the decoupling diode. In this way, a part of the units own output voltage flows through the sense signal (see Drawing 2) and assures a safe starting and operation under all circumstances. The regulation accuracy is hereby reduced to 2% or 1V (whichever is less).



## Normal Operation

The output voltages of the individual units are adjusted to each other as accurately as possible (<1% or 0,1V) at a load with a minimum of 10% nominal value. This automatically achieves a 15-30% accurate load sharing between the units. A load sharing with 5% accuracy is possible if an active current sharing is installed -see Option C and also refer to the description "Parallel Operation".

## Priority Operation

The units are supplied by two or more sources with given priority. The output voltage of the unit with priority is set higher (>0,6VDC) than the next following output. This assures that the lower output, and therefore also the respective source, is only loaded if the unit with a higher output fails.

## Change-over Operation

The priority of the individual units is controlled externally. By changing the resistance of the sense lines, the output voltage is changed simultaneously.

- a **static** through external switch or key elements.
- b **dynamic** by external electronic controls, which change the priority automatically, e.g. every minute. In this way the full load capability of each units is also tested.

## General Instructions for Parallel and Redundant Operation

When using redundant or parallel operation, the following points must be taken care of:

1. The output voltages of the individual units must be adjusted  $\leq 1\%$  to each other. During this adjustment, the output must be loaded with 10 to 20% of the nominal current. (applicable only with redundant- normal operation)
2. The current limits of the individual units must be set at 100% max. of the nominal current.
3. The paralleled power wires (+/-ve) should be connected to one connection point.

Under the above conditions, a 15 to 30% load sharing between the units will be achieved.