

Some additional configuration values can be altered when a bypass is connected:

**Voltage limits:** When a load is fed by a mains supply that has permanent distortions, the voltage limits can be changed to more suitable values, percentagewise, in order to avoid repeatedly switching. The limits for undervoltage can be altered to -10% and -15%, the overvoltage limits can be set to +10%, +15% and +20%.

It is recommended to alter the values only with relatively insensitive loads attached, electrical machines or heaters, respectively. For sensitive loads like computers or measuring equipment, running the system in On-Line mode would be the more suitable option, since the output voltage of the inverters is generated and stabilized by processors. This only applies when having a distorted mains sine, though.

By sending trigger pulses to the inverters, the bypass processor synchronizes mains and inverter voltage. In some cases this might take several seconds. Anyhow, if the bypass processor detects a failure condition, it switches over to the second voltage at any given time, even in asynchronous mode, to assure uninterrupted load feed. As soon as the processor detects the original voltage to be within the limits again, it synchronizes both voltages before the load is switched back.

The controller has an additional signal connector located on the front panel, showing the state of the system (OnLine, OffLine, Power Good). The "normal-open" and "normal-closed" contacts are potential free.

The display on the front panel reads, besides the system state, two additional values. The first one is the total output power, the second one can be configured to any of the measured values.

The controller has a built-in, battery buffered real time system clock. All system events are saved together with date and time into non-volatile memory. System events are defined as alarms, system startup or shutdown or configuration alterations. The maximum number of events to be stored is 256. Since the memory works in FIFO scheme, after reaching the maximum, the memory pointer will be reset to the first location again and thus overwrite the first value, and so on.

All events and states can be checked and recalled at any given time, either on display or via RS-232 interface. Furthermore, the controller can be configured to report all events in real time, meaning immediately, to a pre-defined phone number via connected modem. Also, the controller is able to send event packets once per day, as opposed to real time. The time for the controller to automatically dial up the management unit can be configured, to be able to receive calls only at times of low network traffic.

The controller can be reset to factory defaults either via menu or terminal.

## LavaLINE®

### ByPass

The bypass module is built as a semiconductor switch with active electronic control circuitry and two thyristor modules.

In case of a controller failure the bypass adopts the monitoring of the mains and assures the power supply of the connected load.

Additionally, it is equipped with an overtemperature and fan failure detection, which leads to an automatic shutdown of the system by reporting the failure to the controller module.

In order to be able to change a mains fuse easily in case of a failure, the bypass module has no built-in fuse.

This way the fuse can be located on a fuse strip. The external fusing has another advantage: the small housing of the bypass module in 2HE (50A) or 3HE (120A) and only 201mm depth.

## LavaLINE®

### Inverter

The inverter modules are available in 2kVA and 4kVA output power versions, enabling to provide a maximum of up to 48kVA totally. They feature a high efficiency and a low impedance power stage.

This is achieved by the concept described below:

- The DC and AC filters act against disturbances from or to the outside.
- The softstart module controls power consumption on startup and prevents transient currents.
- The DC/DC converter generates a galvanic separated voltage of app. 370 VDC from the filtered input voltage.
- The DC intermediate circuit acts as a temporary power buffer and provides the values for power measurement and the active 100Hz ripple reduction.
- The IGBT full bridge converts the intermediate circuit voltage to sinewave AC voltage. The IGBTs are provided with high frequent, pulse width modulated switching signals by the processor.
- The control circuit checks the static and dynamic behaviour of the inverter, i.e. load matching and offset adjustment.
- Only at synchronous phase position and same amplitude, the output relais enables the output.
- The LED bar on the front panel reads the output power of the inverter. Each LED corresponds to 25% nominal load.

#### Parallel connection of modules

All inverters are connected with one another by CAT5 cables. Each inverter has its own address to identify itself on the bus to the controller. The two digit seven segment indicator on the front panel reads the current address of the particular inverter module.

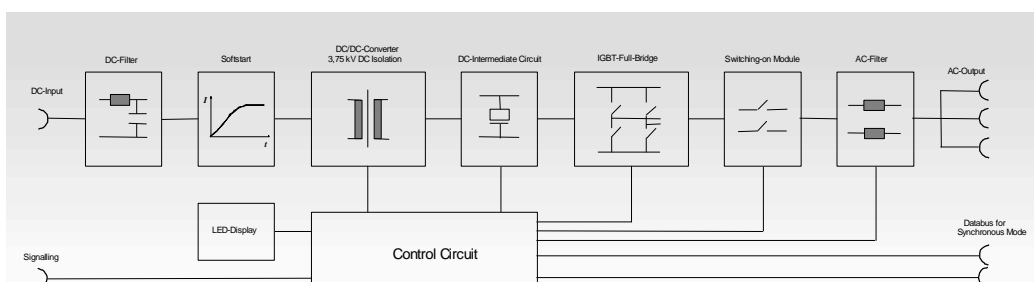


Diagram 1.2:  
Block diagram  
of the inverter