



During grid operation (Stand By Betrieb) the consumer are supplied via the choke by the grid. The necessary energy 200kVA bis 2.000kVA is stored in the flywheel.

The consumer-net frequency equals the grid frequency.

The synchronous machine holds the consumer voltage constant independent from grid conditions and takes over almost the whole reactive power load necessary for the consumer.

The Choke and the alternator act as a stabilizing voltage filter and supply the consumer with clean power. Both harmonics and asymmetries caused by the consumer are compensated or filtered to the grid. Distortion factor < 3%.

The power factor of grid input is near 1.

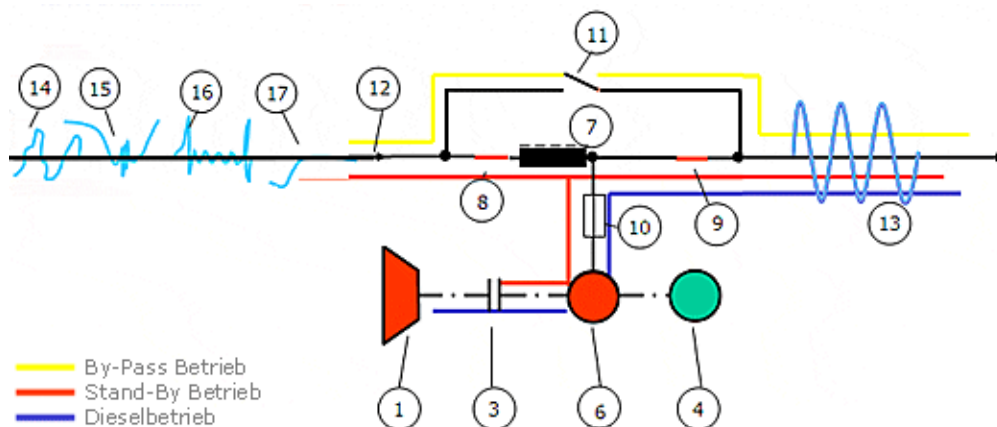
At grid loss the power switch opens and the UPS load is supplied without any interruption first by the kinetic energy of the KIN module. The diesel engine starts and the electromagnetic clutch closes and accelerates the diesel from a speed of app. 300 rpm up to nominal speed.

After having reached the nominal speed the system in diesel driven operation mode takes over the supply of the UPS load (Frequency drop <= 1%) and the recharge of the KIN-module.

After comeback of the grid the consumer are synchronized back to the grid, the clutch is opened and after a defined cooldown period the diesel engine is stopped. The cooling of the system is provided either by an Vorbaukühler or by a two-stage electric-driven fan cooler, depending on the operation condition.

To shut down the NBDK-UPS it is disconnected by means of a net-synchronized by-pass switch and let the diesel engine stop. Start up of the system in reverse order of the steps.

NBDK schematic diagram



- 1 Diesel engine
- 3 Electromagnetic clutch
- 6 Synchronous alternator

- 10 Alternator guards
- 11 By-Pass- Power switch
- 12 Grid supply

- 4** Kinetic module
- 7** Choke
- 8** Grid power switch
- 9** Consumer power switch

- 13** User output of UPS
- 14** Harmonic distortion
- 15** Voltage peaks
- 16** Voltage cut-offs
- 17** Interruptions