

LVD

Low Voltage Battery Disconnect for DC Uninterruptible Power Supply Systems

Uninterruptible power supply system **continues to supply DC output power during a loss of input AC power**. This system is created with an AC/DC power supply, an external back-up battery and an additional electronic board. **If the AC power is present** the power supply feeds the supplied device and the back-up battery is charged with a charging current at the same time.

After input AC power outage the device is powered from the battery. There is no voltage outage on the DC output of the power supply system, because the **transition from AC/DC power supply to battery power is continuous and without any interruption**. If the battery voltage decreases below the certain minimum value the battery must be disconnected from the powered device, because for deep discharge the life of the battery decreases substantially and the battery can be even damaged.

There is possible to use the offered **Low Voltage Battery Disconnect LVD** for the automatic disconnection of the battery.

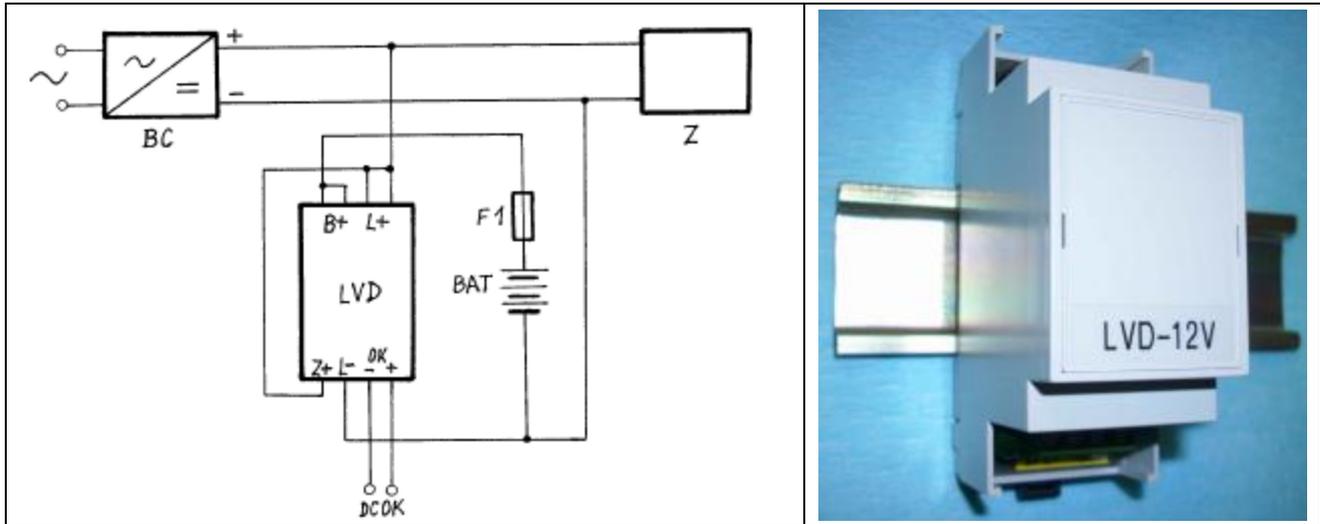
The main parameters of the Low Voltage Battery Disconnect LVD are in the following table:

Type	Nominal voltage	Connect voltage / *	Disconnect voltage / *	Maximum contact current /**	Dimensions W x H x D (mm) /***
LVD-12V	12V	11.0V	10.6V	10A	36 x 90 x 59
LVD-24V	24V	21.1V	20.5V	10A	36 x 90 x 59
LVD-36V	36V	33.5V	32.4V	9A	36 x 90 x 59
LVD-48V	48V	43.6V	42.2V	8A	36 x 90 x 59

Notes:

- /* above listed values of the disconnect voltage correspond to the **standard values** set by producer. There is possible to set other value in the range up to $\pm 10\%$ of the standard setting on a request. Connect voltage values are put together with the set disconnect voltage value.
- / ** lasting current. There is possible to connect **external relay** to LVD for higher current requirement.
- /*** LVD is built-in a plastic cover with **mechanism for DIN-Rail mount**.
- LVD is equipped with a **indication green LED**. When the LED is on, the contact of LVD is connected.
- LVD is equipped with a **isolated contact** (optocoupler with NPN transistor with open collector, max. voltage 60VDC, max. current 50mA). When the transistor is switched-on, the contact of LVD is connected.
- LVD is equipped with a **push button for starting the system from the battery** when the AC power is not present.
- **Operating temperature range** of LVD: $-25\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$

LVD Low Voltage Battery Disconnect makes possible to realize a simple DC Uninterruptible Power Supply Systems in accordance with the following figure:



LEGEND: LVD=Low Voltage Battery Disconnect, BC=power supply/battery charger, Z=powered device (load), BAT=battery, F1=fuse, DCOK=DCOK signal

Requirements for the component of the DC Uninterruptible Power Supply Systems

Power Supply BC: considering the power supply is used for both powering the load and at the same time for charging the battery there is suitable using a battery charger with the rectangular constant current-constant voltage charging characteristic curve. **Recommended type of the battery is maintenance-free sealed gel lead-acid battery.** There is possible to use for example the battery chargers based on DNR series power supplies on DIN-Rail - the battery chargers are commonly offered with the nominal voltage 12V, 24V and 48V in the power range from 18W to 960W.

Output power of the power supply / battery charger to be chosen in accordance with the maximum load current consumption and requested minimum time for battery recharging after previous AC power outage.

Battery BAT: the **nominal voltage** is determined with the nominal voltage of the powered device (load). The **battery capacity** to be chosen in accordance with the requested back-up time after AC power outage.

LVD application

- In the basic application the **inner relay built-in LVD is used** for disconnection of the battery (see the above table for the maximum contact current).
- For the greater current there is possible to use LVD for control of the **external powerful relay**.
- There is possible to use LVD as an **external relay for STANDBY UPSDC** (based on DNR series of power supplies and battery chargers).
- Besides there is possible to use LVD for the **signalization and indication** of the voltage state of a DC power bus.