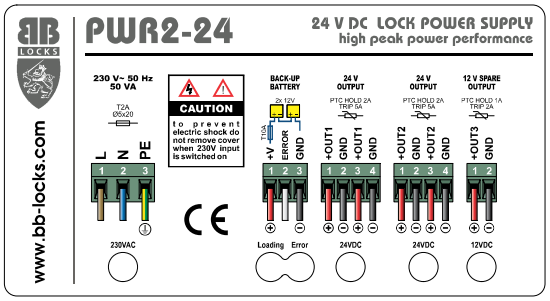
ELECTRO-MECHANICAL LOCKS - POWER SUPPLY

Article nr:
PWR2-24

Connection diagram:



1. General

This is a 1-phase 230Vac power supply specifically designed for powering electromagnetic locks. The latter have a relatively low consumption, but high peak currents can occur during switching. This power supply can provide these, even when several locks are activated simultaneously.

A maximum of 4x A1/G1 or 2x B1/S5 locks can be connected. A separate connection is provided for each lock. They are protected with self-resetting PTC fuses.

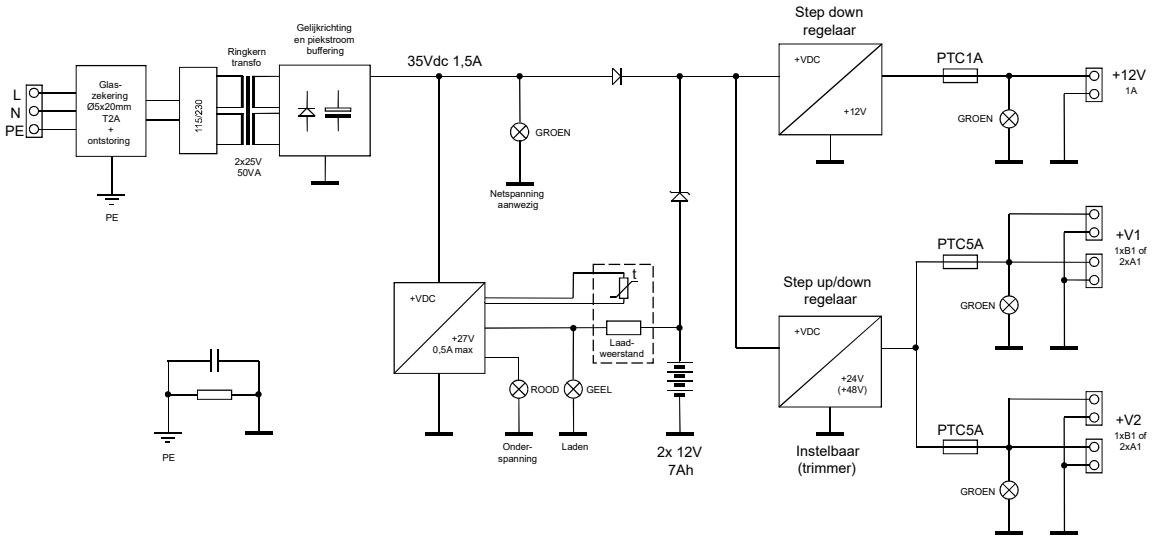
This standard 24Vdc version of the power supply is intended for locks with power cables up to 25m. In case of larger distances the voltage drop on the cable will be too large and the voltage reaching the lock will be insufficient. There is also a 12Vdc auxiliary voltage for access control systems or for external logic such as relay circuits.

There is also a built-in battery charger for applications where autonomy is required. This requires the installation of 2 optional 12V 7Ah batteries (the internal voltage stabilizer also regulates upwards).

Green indicator LEDs are present for each fused supply voltage. The charge status of the batteries is indicated by a yellow LED and a red LED.

2. Specifications

- Class 1 metal DIN rail module with ground terminal.
- Galvanic isolation via a toroidal transformer with a continuous power of 50VA.
- Input voltage standard 230Vac 50 / 60Hz (115Vac is also available). This is protected with a slow Ø5x20mm 2A fuse.
- **Output voltage 24Vdc 2A continuous, 9A peak.**
- These output voltages can be adjusted with a trimmer (inside the metal housing).
- The outputs are equipped with self-resetting PTC fuses per connector.
- **Auxiliary output voltage 12Vdc 1A**, fitted with a PTC fuse.
- **Built-in battery charger** for 2 rechargeable gel batteries of 12V 7Ah.
- Green indicator LEDs for the supply voltages, a yellow LED for charging function and a red LED for undervoltage of the batteries.
- Pluggable PCB terminals; screw connection with tension sleeve.



1. Block diagram and operation

The 230Vac input circuit is based on a 50VA toroidal transformer of which both 115Vac windings are connected in series. If desired, this can be supplied in a 115Vac version where they are then in parallel. EMC interference is primarily done by a common-mode inductor in combination with an R / C snubber network.

On the secondary side of the transformer there is a standard rectifier bridge with electrolytic buffer capacitors. The latter are dimensioned large enough to provide the activation current for four A1/G1 locks or two B1/S5 locks.

The optional batteries are charged to a standby voltage of 13.5V per battery via current limiting resistors. These are temperature monitored with an NTC that interrupts charging. During charging, the yellow LED lights up. If a battery is defective, for example a defective cell, this is indicated by a red LED. The battery voltage is then lower than 10.5V per battery.

The voltage of the buffer capacitors, or the voltage of the batteries (when mains voltage is switched off), comes via diodes on a distribution rail that supplies both controllers. One of them is a step-down regulator that makes the 12Vdc auxiliary voltage. This is connected to the corresponding connector via a self-resetting fuse. When the voltage is present, a green LED lights up. The large controller is a step-up / down type. This is necessary to obtain the 24Vdc output voltage from the 24V batteries. This power supply can supply high currents for the activation peak of the locks for a short time. The control IC works digitally and achieves a high efficiency, so no additional heatsinks are required. In normal operation, cooling with the ground surfaces of the printed circuit board is sufficient. The output voltage of the main power supply is supplied via 2 self-resetting fuses on connectors for 4 locks. A green LED is provided for each fuse.

2. Connections

All connections on the power module are equipped with pluggable PCB connectors. The wires are screwed in the connector with tension sleeve. As a result, the screw does not turn directly on the wires, but compresses them. This lowers the transition resistance in the clamp and avoids damage to the wires.

The 230Vac input has a pitch of 5.08mm for increased insulation voltage. All secondary voltages have connectors with a pitch of 3.5mm.

For connections with flexible wires (with multiple fibers), the ends must be soldered or preferably using ferrules (electrical installation legislation). It is advisable to use a wire diameter of 0.75mm² or more, among other things for the mechanical strength. At the mains voltage, the fuse of the mains supply must be adapted to this wire cross-section (e.g. maximum 6A at 0.75mm²). With the cables to the locks it is even necessary to use a minimum of 1.5mm² for distances up to 25m between power supply and lock (see BB25LSZH cable).

The GND terminals of all secondary voltages are common. Earthing is mandatory on metal-enclosed modules to avoid electric shock. The ground wire must have at least the same cross-section as the current-carrying conductors. Power supplies and locks can be grounded separately or to one star point, but closed ground loops are not recommended.

The cabling to the batteries requires special attention because of the high short-circuit currents that occur when the connection wires are damaged. Although there is an internal fuse, it is good practice to put an extra fuse in the wiring close to the battery pack terminal.