

12V / 5V DC-DC converter Z51-GW20

Ordering data

Designation	Type	Item no.
12V / 5V DC-DC converter	Z51-GW20	150 501 03 AX



- **Supply of 5V consumers with 5V/2.5A (5V/1.6A at an input-side supply through a 12V power supply unit)**
- **Adjustable output voltage: 5.0V ... 5.5V**
- **Top-hat rail module**
- **Type of protection: I M2 Ex ib I**

Application

The 12V / 5V DC-DC converter of type Z51-GW20 is used to supply power to a Z51 automation station, which includes e.g. a central module of type Z51-ZM20 or Z51-ZM20-1.

On the input side, one or two intrinsically safe power supply units (NG3-12ib) feed the converter with a 12V nominal voltage. If only one 12V supply unit is used, a max. output current of approx. 1.6A can be tapped.

When using two 12V power supply units, the max. output current is 2.5A. The output short-circuit current is set to 2.7A.

The DC-DC converter generates a controlled 5V supply directly in the Z51 automation station near the consumer Z51-ZM20 and thus does not need extended supply lines, which avoids the associated voltage drops between 5V power supply unit and consumer.

A potentiometer on the Z51-GW20 allows the user adjustment of the output voltage in the range from 5.0V to 5.5V.

The existence of the input voltages and the output voltage is indicated through 3 LEDs.

The 12V / 5V DC-DC converter is installed in a robust sheet steel enclosure and suited for mounting on 35mm top-hat rails by means of a bracket.

Configuration

The 12V / 5V DC-DC converter of type Z51-GW20 consists of a robust sheet steel enclosure, and in its bottom section, a pcb is installed which is equipped with the electronic components. This pcb is embedded in sealing compound.

The LEDs for the indications, the input and output connecting terminals as well as a potentiometer for adjusting the output voltage protrude from this sealing compound.

The connecting terminals are marked with self-adhesive plastic labels which are fixed to the sealing compound surface.

The power transistors of the output current and voltage control are mounted on a holder which is made from aluminium and attached onto the pcb. The top side of the holder protrudes from the sealing compound. It carries a profile heat sink which dissipates the heat loss to the ambient air.

The marking of the 12V / 5V DC-DC converter is given on a nameplate made from self-adhesive plastic film on a side wall of the sheet steel enclosure.

Functioning

One (or two) intrinsically safe power supply circuit(s) (12V nominal voltage) are connected to terminal pairs

KL100/* and KL101/*. Series diodes protect the supply inputs against reverse polarity.

A downstream installed, internal filter stage ensures the suppression of interference voltages (EMV).

LED H100 (or H101 for the second input) indicates the existence of the input voltage.

An associated current limiting circuit at each of the inputs enables to adjust and limit the current consumption of the relevant input to 1.1 A.

This prevents that one power supply unit is operated in the short-circuit range, while the other one operates in the no-load or partial load range.

The power transistors of the current limiting stages are mounted on an internal cooling plate which dissipates the heat loss to the exterior via its close thermal coupling with the enclosure side wall.

In case of persistent overload conditions, the power supply is switched off (reversibly) by two thermal switches which are also mounted on the cooling plate.

In case of failure of the thermal switches, two integrated thermal links irreversibly switch off the power supply.

An integrated DC-DC converter (switching converter) converts the 12V supply voltage into an internal 6V voltage with minimal loss.

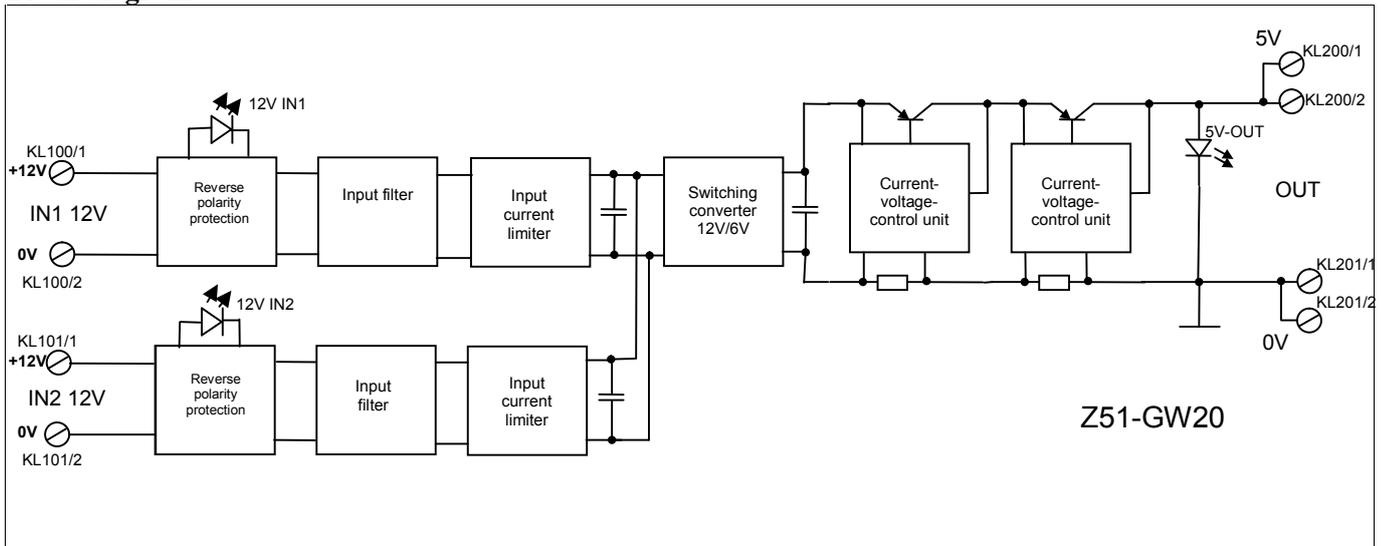
A voltage monitoring stage monitors this output voltage and will only switch it through to the 5V output (terminals KL200/* / KL201/*), if it has exceeded a value of 5.5V. The switching through is performed with a time delay. If the output voltage of the DC-DC converter falls short of the value of 5.4V, e.g. due to overload, the output voltage will be switched off with no delay. Down-

stream of the DC-DC converter output (6V) and the voltage monitoring stage, 2 current and voltage limiting stages (in-phase regulators) are connected which limit the output voltage to $U_0 = 5.5V$ and the output current to $I_0 = 2.7A$ (terminal pairs KL200/* / KL201/*). The limiting stages dissipate their heat loss to the exterior by means of profile heat sinks.

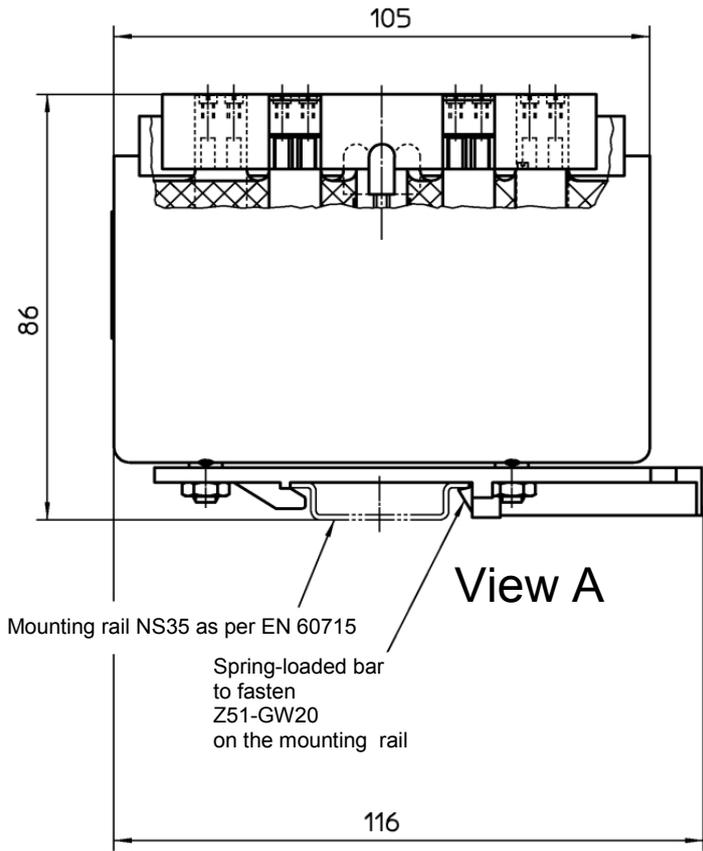
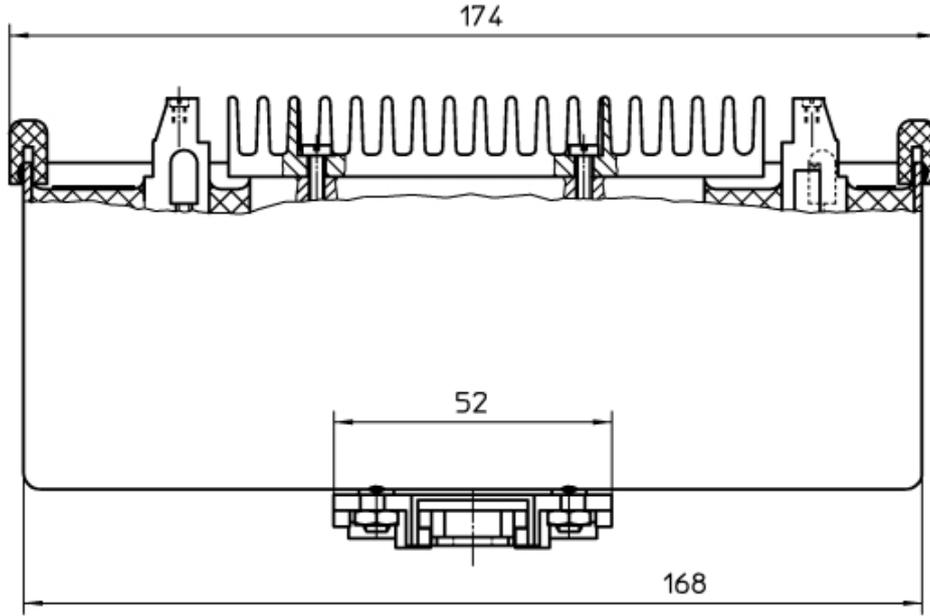
A potentiometer which is accessible from the exterior enables the downward adjustment of the output voltage from 5.5V to 5.0V. This potentiometer does not allow a voltage adjustment to values larger than 5.5V.

An LED (green) assigned to this output indicates the existence of the 5V output voltage.

Block diagram



Dimensional drawing



FHF Bergbautechnik GmbH & Co. KG
 Eintrachtstr. 95
 42551 Velbert



Tel: +49 (02051) 270 - 0
 Fax: +49 (02051) 270-366
 Email: info@fhf-bt.de
www.fhf-bt.de