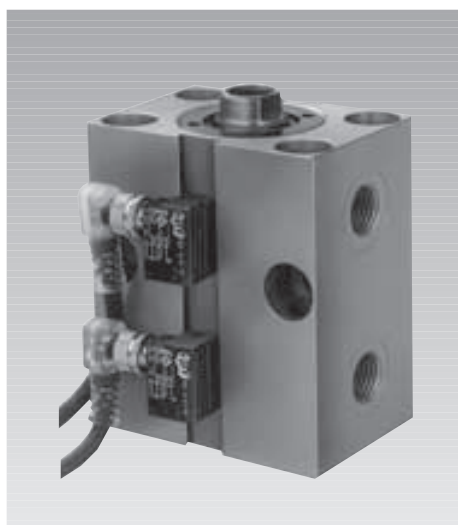
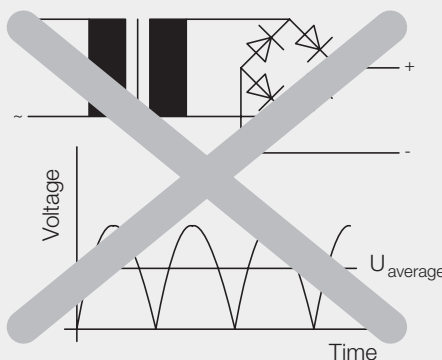




Voltage Supply for Position Controls



Wrong:



Right:

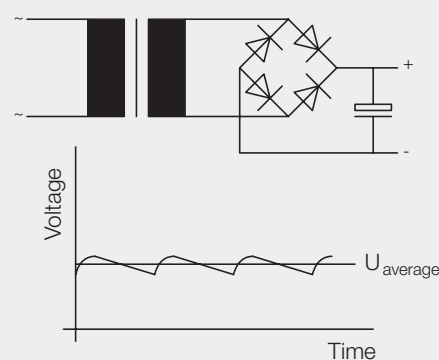


Figure 1: Generation of supply voltage

Application

Block cylinders with aluminium housing can be equipped with adjustable position controls in order to monitor clamping and unclamping in automated installations. The position controls work electronically. Compared with traditional reed switches they offer the following advantages:

- Indifference to shock and vibration
- Bounce-free output signal
- Only one switching point
- Wear resistant
- Protected against reverse battery
- Protected against short circuits

Technical characteristics of magnetic sensors

Voltage	10 ... 30 V DC
Residual ripple	max. 10%
Max. adm. current	200 mA up to 50 °C 150 mA up to 75 °C 100 mA up to 100 °C
Operating temperature	max. 100 °C
Current consumption	< 15 mA

Due to their electronic functioning and their very small design, there are minimum demands on the voltage supply of the position controls, as they are standard for proximity switches and other electronic systems. Concerning this matter you will find some information in the following.

Demands on voltage supply

Frequently a simple two-phase bridge connection is used, as it is often used for contactor or relay control. Such a connection is not suitable for voltage supply of position controls!

In figure 1 the progression of the output voltage of such a connection is represented over time. You can recognize that the voltage obtains temporarily the zero point. An electronic system could not function correctly in this case. In addition, you see that the peak values of the voltage exceed considerably their mean value. The electronic can be destroyed by too high peak spikes.

Usually voltmeters or multimeters measure the mean value of the voltage. The peak value is increased approx. by factor 1.5.

A measure of quality of a d.c. voltage is the residual ripple. An ideal d.c. voltage, as it is generated by a battery, has a residual ripple of 0%, the above described two-phase bridge connection obtains a residual ripple of 48%. 10% is admissible!

The residual ripple can be improved by topping a sufficiently-designed capacitor. This is called "smoothing" of the voltage. But thereby the mean value of the d.c. voltage is increased.

Therefore it is recommended to provide a "smoothed" voltage supply when planning an installation. For later smoothing of the voltage the following **voltage regulator component** is suitable: **Part-no. 3829-126** (Data sheet B 1.555).

Spikes

A danger for position controls are elements with high inductivity, which are operated with the same voltage supply as the position controls. Such elements, as e.g. solenoid valves, contactors and motors can generate high and high-energy peak spikes, which are transmitted by the voltage supply to the position controls.

Therefore critical elements have to be screened. For this purpose recovery diodes or RC-networks are indicated, which are mounted directly at the sources of interference. An alternative solution is the separated voltage supply for position controls and critical consumers.

