Moving. Holding. Switching. Regulating.

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Ready for a live demonstration of our self-regulating proportional solenoid?

No problem — Please contact us for an appointment!

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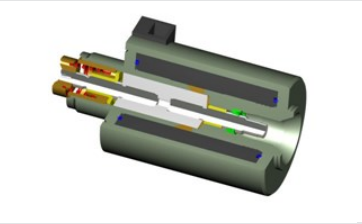
Schramme

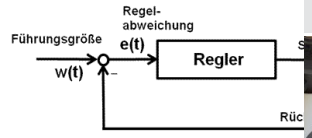
iMag

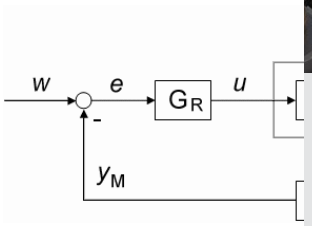
Autonomous self-regulating proportional solenoid

Proportional solenoids ar
customer requirements.
actually in charge of the
the feedback control.



Proportional regulating means reaching a sure position based on a setpoint. Depending on the application, this can be achieved by an open or closed control loop.





And is your imagination being inspired?

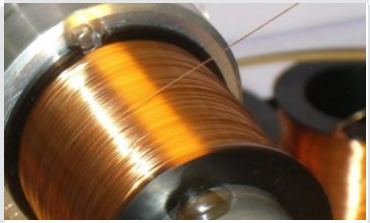
Your imagination — Our solution

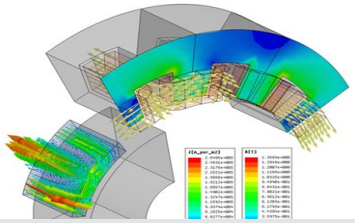
In mobile hydraulics, vehicle hydraulics, pneumatic systems of commercial vehicles, mechanical engineering, medical engineering, and many further applications.

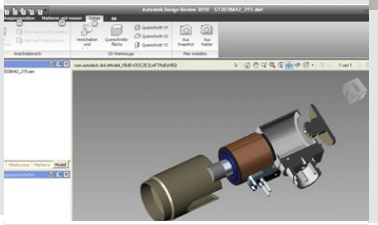
- High accuracy
- Sensorless position detection
- Sensorless position control
- Protection against thermal overload with error message in case of mechanical blockage
- High dynamics
- Nominal-voltage fluctuations are compensated to the greatest extent
- Smaller sized magnets for operating-point control
- Setpoint signal according to customer specs
- Continuous positioning without bucking or jerking
- Position control against spring force or magnets acting in opposite direction

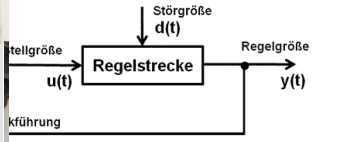
Self-regulating proportional solenoid?

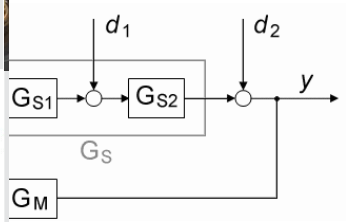
e developed precisely to
Until now, the user was
control loop design and

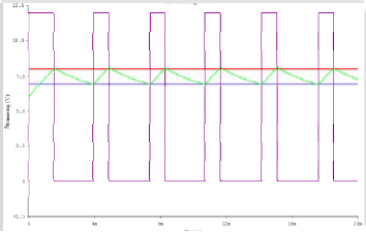


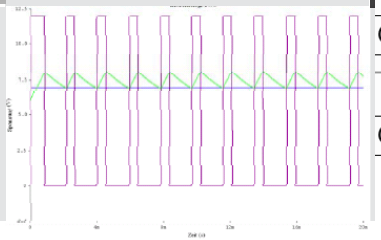












Many applications demand proportional feedback control. The proportional feedback control of electromagnets requires a lot of know-how. For closed control loops, apart from PWM power output stages, additional components such as position sensors and control electronics are also needed.

The challenge and task:
A self-regulating proportional solenoid

> Setpoint signal = Precise self-regulating stroke

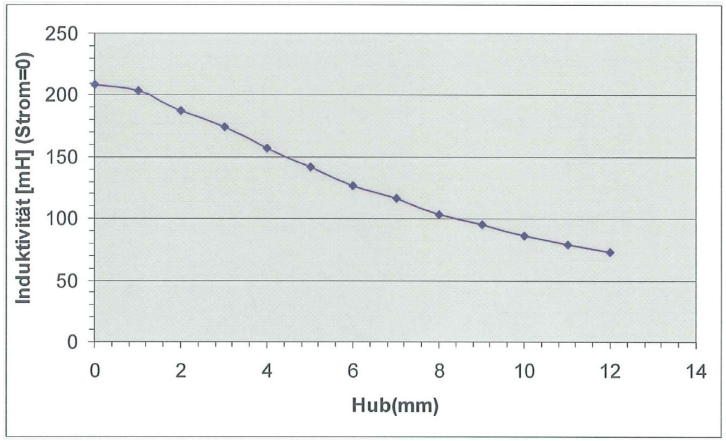
> No external sensor or control electronics

> No external current control through pulse width modulation (PWM)

> Steady regulation in case of unstable nominal voltage

> Steady regulation in case of inconsistent counter-force, such as from springs, friction, debris, pressure fluctuation, etc.

iMag - Series example - How it works



Depending on its positio[6]
changing inductance. Wh[ional excess
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can be exactly determi[
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[electronics

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A common application is the proportional feedback control of hydraulic valves. Our GP8036 proportional solenoid is a frequently used proportional solenoid for controlling sliding valves.

For good feedback control, the proportional solenoid requires a horizontal to lightly declining characteristic curve (see Figure 1). In this case with a control stroke of 2 mm.

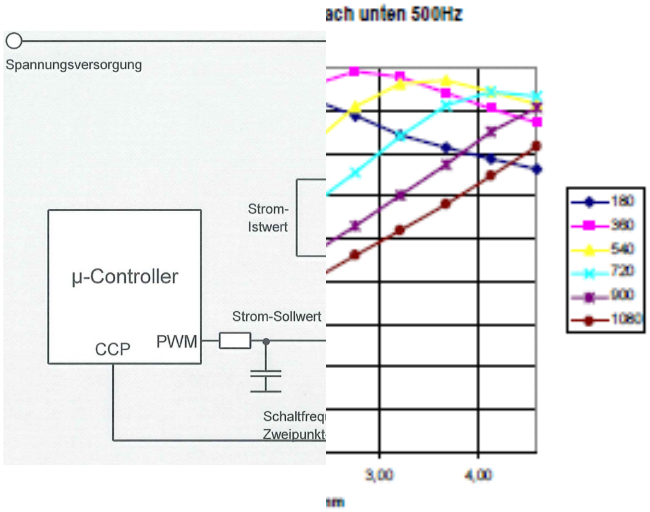
With help of the microprocessor-controlled power electronics (Figure 2), a "sensor signal" is output, which is analog to the control current and the corresponding path as shown in Figure 3.

The regulator evaluates the setpoint position and the sensor signal within milliseconds and continuously readjusts. Even malfunctions caused through sudden counterforces, e.g., pressure fluctuations or fluctuations in the supply voltage are immediately compensated.

With use of an intelligent two-position current controller, the proportional solenoid can reach its set position with an accuracy of 1% of the control stroke.

Depending on customer application, the setpoint signal can be communicated via

> an analog interface (U or I)
> a CAN-open protocol
> a RS232 interface.



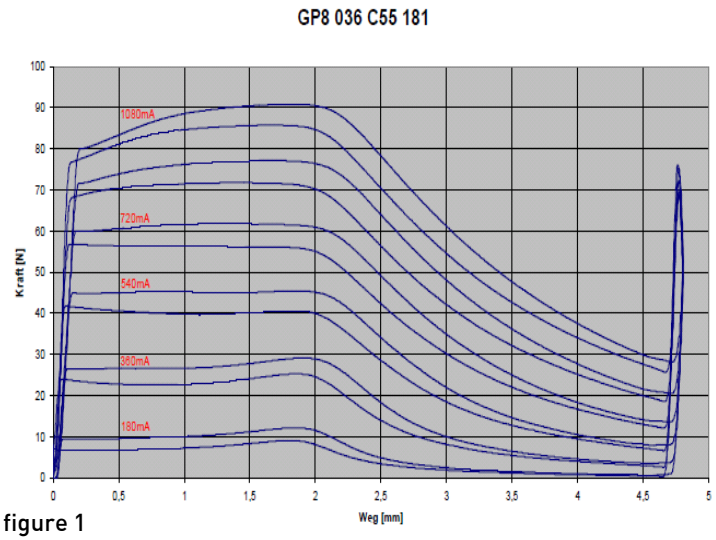


figure 1

Figure 1:
Proportional solenoid GP803
Standard stroke 2 mm, addit
stroke 2.5 mm for 3/x valves

Figure 2:
Wiring diagram of the power

Figure 3:
Definite sensor signal depen
trol current

n, an electromagnet has a
en the actuating signal is
ng signal, the actual position
ned via the measured in-

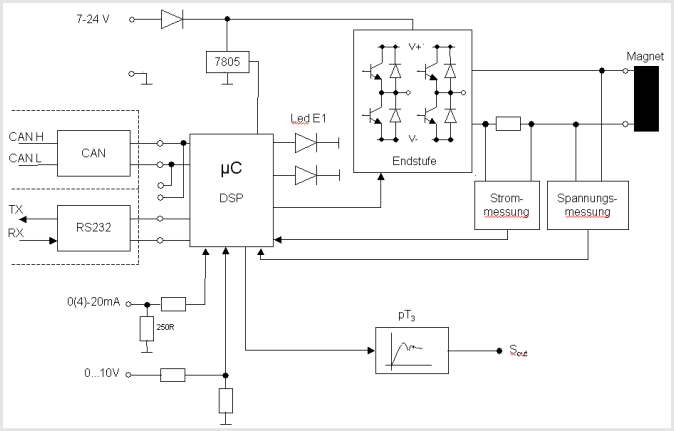


figure 2

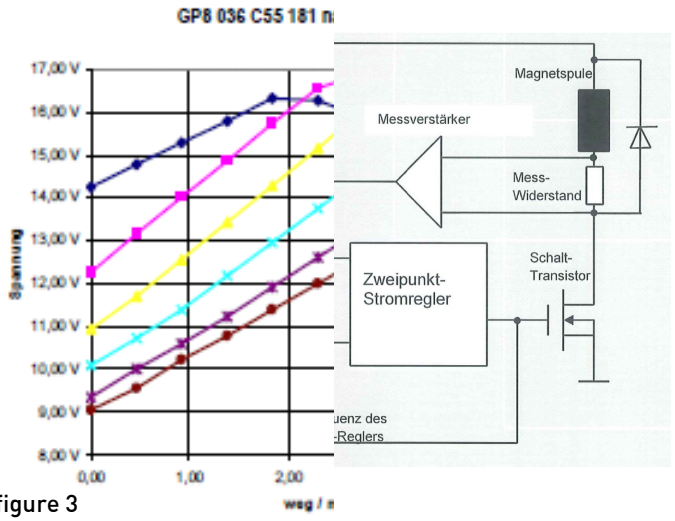


figure 3

iMag - intelligent Magnet - The solution

Sensorless stroke detection and autonomous feedback control

- Power electronics in the size of a DIN connector
- The magnet is the sensor: Inductance change as the reliable position signal
- Closed control loop in the magnet
- Accuracy approx. 1% of the control stroke
- **Total cost** savings of up to 50%, no development and design costs, no external PWM control and programming, no external position sensor, less cable