Position controller DC 03.. / DC 13.. / DC 23..

Highly compact digital position controller with pre-integrated output stage for controlling DC gear motors. Cascade-type control structure for the precision control of proportional and integral actuators. CAN bus technology dispenses with extensive wiring in favour of simple plug connectors.
If the control electronics are integrated in the actuator, wiring is completely featured ex works, i.e. a separate control cabinet is not required.

Technical features

- Highly compact digital position controller with integrated output stage and 16bit µprocessor.
- Software download via CAN bus or modem.
- Set-up operation integrated on the control card.
- Digital and analog input and output modules may be connected via SPI bus (serial processor interface).
- Temperature-monitored short circuit-proof output stage with 7 A output current.

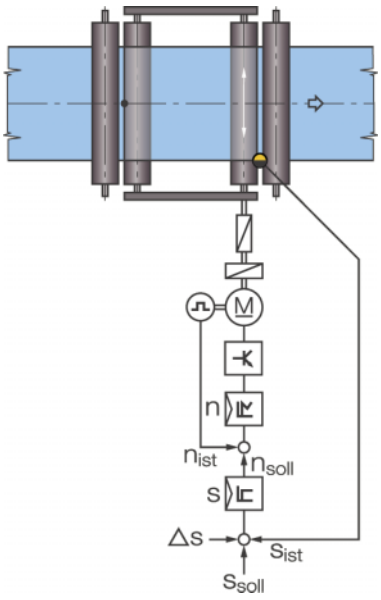
Software function modules

- Cascade-type control structure with position, speed and current controller integrated for proportional and integral actuators.
- Automatic sensor addressing assures problem-free sensor replacement.
- Web offsetting in $^{1}/_{10}$ mm and $^{1}/_{100}$ mm steps possible.
- Automatic reduction of the maximum positioning speed in the case of excessive guiding deviations, e.g. joints or web tears.
- On loss of line, automatic switching to edge sensor (emergency guiding)
- Brief motor current peak assures improved dynamics.
- Adaption of the control circuit to changing process variables e.g. web speed.
- Non-linear amplification characteristic curve for position controller. Additional stabilisation of the control circuit in the event of uneven web edges.
- Cycle and path-dependent oscillation of the web position set value possible.
- End position limiting and pre-warning for actuator may be set.

Function
Position controller RK 4004 is used to control DC gear motors with speed and position feedback. The cascade-type controller, comprising a position, speed and current controller assures the precision control of the integrated output stage.

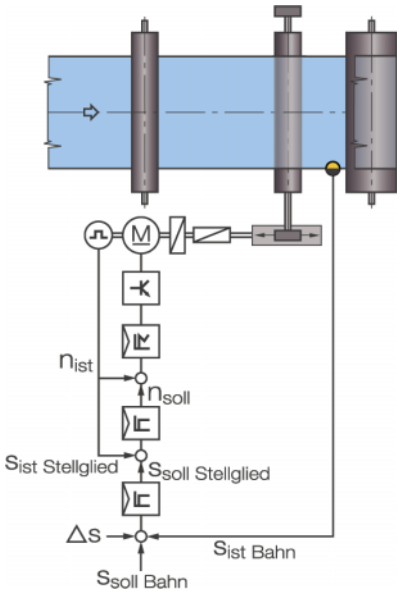
Implementation area
Controllers are implemented to control the position of moving webs or tools such as cutting devices. The various actuators may be divided into proportional and integral models. The appropriate control structure required may be set via parameters in a user-friendly fashion.

Control diagram for proportional actuators
Besides a position controller for the web, the cascade-type control structure for proportional actuators also features a speed and current controller for the actuator.



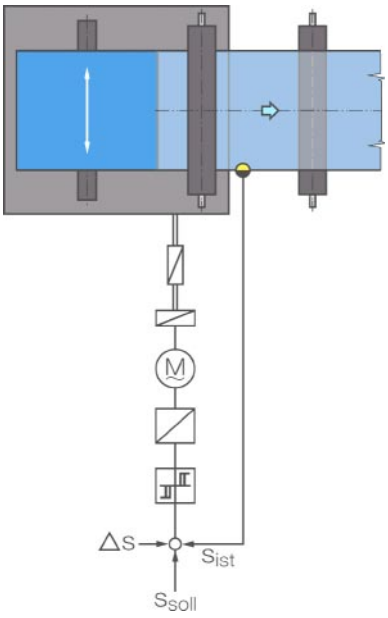
Proportional actuators
- pivoting frames
- steering rollers
- turn rods
- reel stations
- lateral displacement rollers
- tool follow-up devices

Control diagram for integral actuators
Besides a position controller for the web, the cascade-type control structure for integral actuators also features a position, speed and current controller for the actuator.



Integral actuators
- pivoting rollers
- segmented guider rollers
- edge spreaders
- width spreading devices

Control diagram for proportional actuators with three-step controllers



Proportionale actuators
- reel stations with three phase a.c. drives
- turn rods with three phase a.c. drvies

Input module (analog)
AK 4002
Input module with two analog inputs of +/-10 V (9 bit)and +/-12 DC sensor supply voltage.

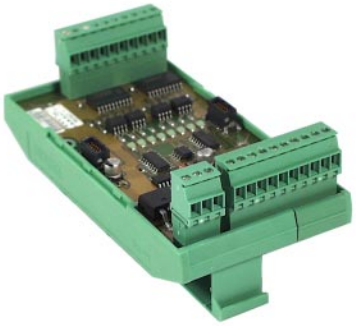
Sensors with analog output voltage may thus be operated on the digital controller.

Input module (analog)
AK 4014
Input module with four inputs of 0 - 10 V (12 bit) and +10V DC sensor supply voltage.

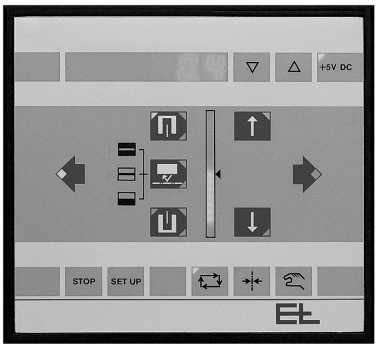
Sensors or path sensors may thus be operated on the digital controller.

Input and output module
LK 4203
Module featuring eight digital inputs and outputs.

For all necessary binary signals for controlling the position controller.



Command device RT 4019
Low-cost command device for controlling an actuator.



Command station DO 2000
Multifunction command station with text display for controlling actuators and support beams. Integrated function keys for guiding type, motor-driven support beam, oscillation and multifunction operation.

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Selection table position controller without command

Type	RK 4004	AK 4002	LK 4203	AK 4014
DC 0310				
DC 0311				
DC 0340				
DC 0341				
DC 0360				
DC 0361				

Selection table position controller with command

Type	RK 4004	AK 4002	LK 4203	RT 4019	DO 2000
DC 1310					
DC 1340					
DC 2340					
DC 2341					

Technical data

Position controller DC

Operating voltage	
Nominal value	24 V DC
Nominal range (incl. ripple)	20 – 30 V DC
Power input	
Without motor/without sensors	4.8 W
With motor (maximum)	180 W
Power input	
Without motor/without sensors	0.2 A
With motor (maximum)	7.2 A
Output voltage	
On motor terminal	+/- 22 V PWM (pulse width-modulated)
Output current maximum	7 A
Protection class	
Controller module	IP 00
Controller module in housing	IP 54
Housing size	300x150x80 mm
Ambient temperature	0 to 50 ° C
Storage temperature	-20 to +70 ° C

CAN bus

CAN bus level	+5 V (potential-free)
CAN baud rate	250 kbaud

Noise level digital inputs on RK 4004

Terminal X 4.1 / 4.4 / 4.7 / 20.2 / 3.2	
Low „0“	0 to 3 V DC
High „1“	10 to 30 V DC
Incremental encoder frequency	maximum 5 kHz

Digital output terminal 20.4 on RK 4004

Output current	maximum 0.1 A
PNP	

Sensor connector X5/X6 on RK 4004

Output voltage	24 V DC
Output current	maximum 0.5 A

Technical modifications subject to modification without notice