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|--|--|---|
| <ul style="list-style-type: none"> <li>1 connection mains voltage*</li> <li>2 fuses for electronics</li> <li>3 connection limit switch and drive motor*</li> <li>4 fuse for drive motor</li> </ul> | <ul style="list-style-type: none"> <li>5a relays with status LEDs</li> <li>5b ditto, but changeable relays (24V DC only)</li> <li>6 coding switch for input and output section, direction of action and sensitivity</li> </ul> | <ul style="list-style-type: none"> <li>7 button for start of automatic travel adjustment</li> <li>8 status LED L1</li> <li>9 maintenance LED L2</li> <li>10 connection for service interface, external operating unit</li> <li>11 connection signal output</li> <li>12 connection for position signal *</li> <li>13 connection drive signal*</li> </ul> |
|--|--|---|
- \* =internal wiring

### Description

The positioner turns an incoming drive signal into the correct drive position by comparing the signal with the position feedback of a sensor which is installed in the drive and adjusting the drive with the up and down relays. There is a signal for travel feedback 0/4..20 mA / 0/2..10 V by default. Optionally, an additional contact relative to the actuator position is possible, e.g. to limit the valve stroke to a min. or max. opening degree.

The device is integrated in the actuator without operation and normally also maintenance-free. In case of special operating conditions (very frequent switching, unfavorable optimization), the relays can be replaced, e.g. in case of wear or stuck contacts (24V DC version only). All important basic settings for direction of action and sensitivity are specified by way of the coding switches. Communication with leading systems is also possible via bus adapter, e.g. for Profinet KFM item nr. 99spne., for data acquisition or remote maintenance purposes as well as for the execution of digital positioning commands.

The commission (if necessary, please refer page 3) consists merely of a check of the settings and a single operation of the calibration key. After this LED L1 will show if the automatic adjustment of the final positions is finished. Subsequently the device is ready for use.

### Predictive Maintenance:

For predictive maintenance of the actuator, a signal is output by LED L2 if the previous use of relays (switching operations) or of the spring assembly (approach of the end positions) requires a check of the drive.

The wear status of the actuator can be read with the PC software PKS at any time, as well as the history of setpoint, actual value and drive position which are saved in the integrated datalogger.

### Type list

Basic model with non- contact transmitter

Extras:

Special voltage (1=115 V AC, 2=24V AC, 8=24V DC), others on request

Additional contact (Relays, potential free NO contact 250V, 2A)

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**49sr7..1**

## Changeable relays (24V DC version only)

### Notes on the change

- Have qualified personnel disconnect the valve from live parts on all sides.
- Loosen the two retaining screws from the hood cover and remove the hood.
- Flip both retaining clips sideways and pull off relays by hand (position 5, see photo on page 1).
- Plug the new relays onto the relay sockets (note the orientation of the pin contacts to the relay socket).
- Snap the retaining clips onto the center of the relays.
- Put on the hood and fix it with the two retaining screws.

*Note: Proper function can only be guaranteed with relays that have been purchased or approved by KFM.*

## Option: additional contact

### Description

The version with additional contact contains an additional relay with potential free NO contact. This can be used to limit the valve stroke or as a signal contact. Direction of action and switching point are adjustable, optionally factory pre-set and wired.

### Commissioning

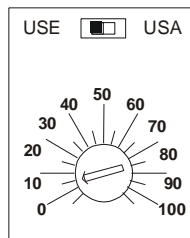
Before commissioning, the wiring (please refer below) as well as the required settings for direction of action and switching point have to be checked.

*Hint: Before activating the automatic stroke compensation, set the switching point of the additional contact to 0% (US A) or 100% (US E), otherwise the full setting range will not be passed through!*

### Settings

*Switching point:*

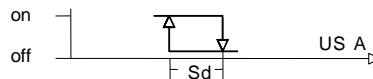
Adjustable 0 ... 100 %, referring to valve stroke



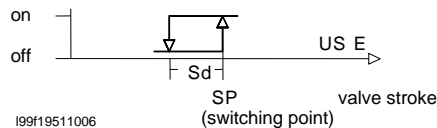
*Direction of action:*

Adjustable, alternative:

**US A:** relay turns off while increasing valve stroke



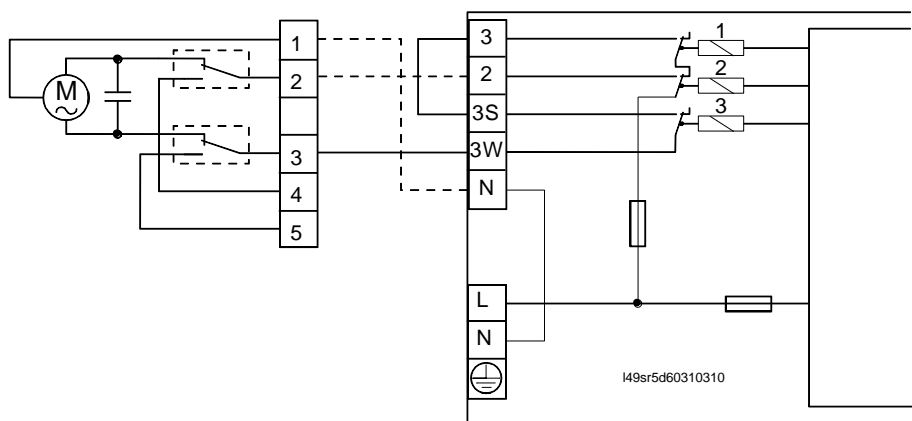
**US E:** relay turns on while increasing valve stroke



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### Wiring example for minimal stroke limitation of three-way valves

(straight passage closes at spindle in upper end position)



### Commissioning

*Hint: Motor control valves with positioner are configured at factory (and adjusted to the travel) according to the order specifications before delivery. If the parameterization is not changed, a new automatic adjustment is not necessary.*

*Check mechanical setting of the potentiometers in drive before commissioning !*

The settings of coding switches for input/output signal, operating range and direction of action have to be checked before commissioning.

Afterwards press the button for automatic travel adjustment for 5 seconds. The drive will go one after another to both end positions and sets itself up.

Two LEDs show the actual status of the relays. The entire adjustment process takes about 5 minutes.

The status LED flashes in 3-second intervals during the adjustment. As soon as the adjustment is completed, the LED lights up continuously.

Fast flashing (1 sec- intervals) signals an error at the measuring inputs (power / voltage).

Details can be shown by an additional operating device or via external KFM software e.g. PKS.

### Operating program PKS

With the KFM software PKS it is possible to read out the wear status of the actuator (switching cycles of the relays, number of operations up to the end position) and the memory of the integrated datalogger (history of actual values, set values and potentiometer positions). The datalogger information can be saved as \*.csv-file which is editable with e.g. Microsoft Excel.

### Operating display

*Status – LED L1 (green):*

Continuous	Normal operation
Flashing, 3s intervals	Adjustment in progress
Flashing, 1s intervals	Error at the measuring inputs

*Maintenance – LED L2 (depending on version yellow or red):*

Continous	Due to the previous use of the relays (switching cycles) or of the spring assembly (approach of the end positions), a revision is recommended.
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### Settings

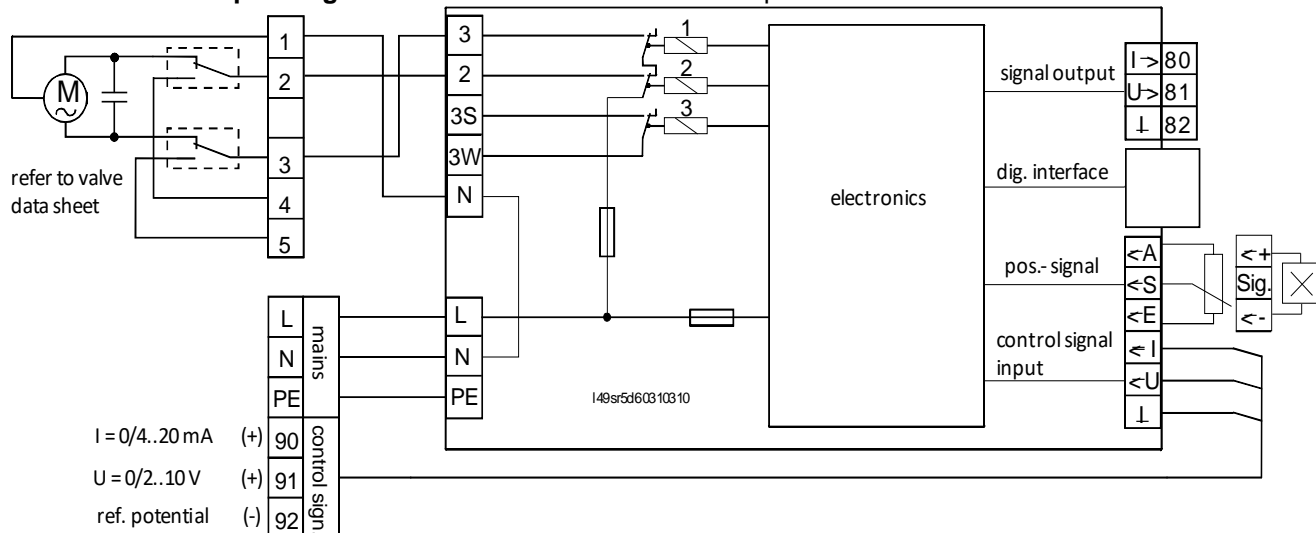
<u>Input range:</u>	<i>Position code switch 1 to 3:</i>
0...20mA / 0...10V	000
4...20mA / 2...10V*	100
0...10mA / 0...5V	010
4...12mA / 2...6V	110
10...20mA / 5...10V	011
12...20mA / 6...10V	111
<u>Response sensitivity :</u>	<i>Position code switch 4:</i>
normal*	1
insensitive	0
<u>Direction of action:</u>	<i>Position code switch 5:</i>
direct*	0 for three-way mixing valves (close- position above)
	1 for straight way valves or three-way diverting valves (close- position below)
inverse	1 for three-way mixing valves (close- position above)
	0 for straight way valves or three-way diverting valves (close- position below)
	<i>direct: increasing input signal opens (straight) passage</i>
	<i>inverse: increasing input signal closes (straight) passage.</i>
<u>Output range:</u>	<i>Position code switch 6:</i>
0...20mA / 0...10V	0
4...20mA / 2...10V*	1

\* = factory setting

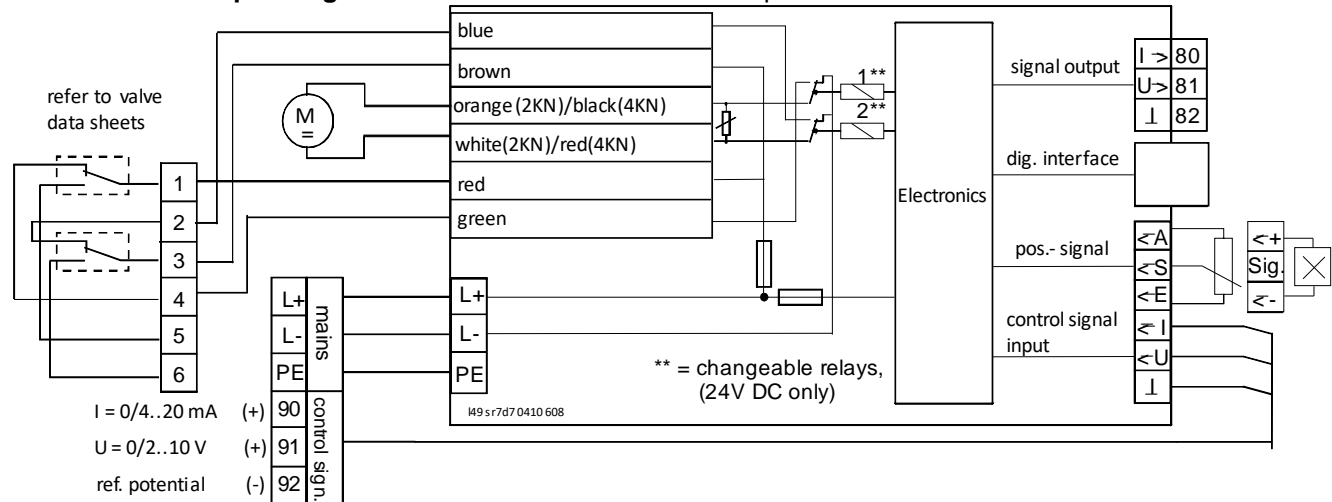
### Technical data:

Input (adjustable):	0...20mA / 0...10V 4...20mA / 2...10V 0...10mA / 0...5V 4...12mA / 2...6V 10...20mA / 5...10V 12...20mA / 6...10V
Response sensitivity:	switchable normal / reduced
Output:	up to 3 relays, max. 250V , 2 A (Fuse protection 24V DC: T 1,6A) 0/4...20mA for position feedback, load < 500 Ohm, 0/2...10 V, load > 500 Ohm
Direction of action:	adjustable: <i>direct</i> : increasing input signal opens (straight) passage <i>inverse</i> : increasing input signal closes (straight) passage
Operating display:	2 status LEDs for adjustment, normal operation, error and maintenance 2 (3) LEDs for function display relays 1 and 2 (3)
Mains connection:	230V +/- 10 %, 48...62Hz, approx. 3VA alternative 115V/24V AC or 24V DC, other voltages on request
Interface:	service interface KFM 2.0 RJ45 (socket)
Allowed ambient temperature:	0...60°C, nominal temperature 20°C

### Connection and operating scheme 230V / 115V / 24V AC\*: positioner 49sr7



### Connection and operating scheme 24V DC\*: positioner 49sr78



\* maximum version, some connections may not exist depending on version. Decisive for the delivered version is the connection diagram on the device.

*Hint: Control signals must be shielded, maximum cable length 30 meters.*