

Valve Positioners

SRD991 Intelligent Valve Positioner



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DESCRIPTION

The SRD991 Intelligent Valve Positioner technology includes a multi-lingual full-text graphic LCD and is available with most communication protocols. It offers friction monitoring, enhanced diagnostics for valve condition recording and many more features.

Use this document as a guide for quick startup. For more detailed information, see the positioner User Manual and Product Data Sheet, available on our website at www.badgermeter.com.

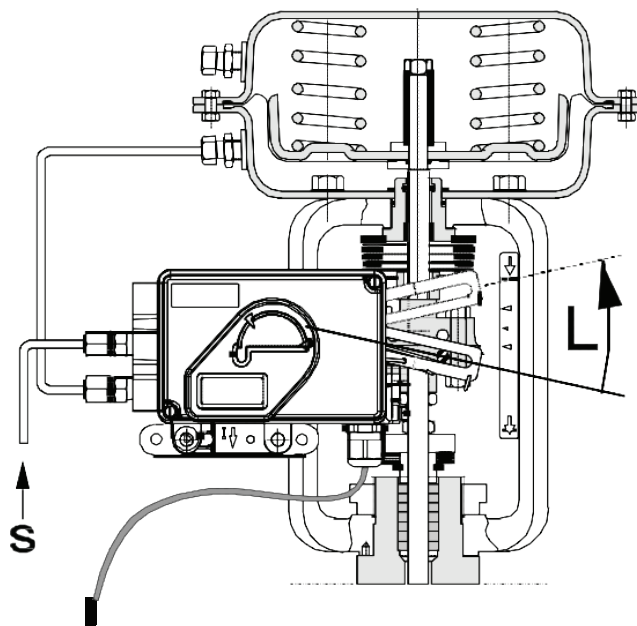


Figure 1: SRD991

MOUNTING TO ACTUATORS

During installation, the flat side of the spindle **9** on the back of the positioner must always point towards the arrow **26**. The working angle around this position is $\pm 45^\circ$.

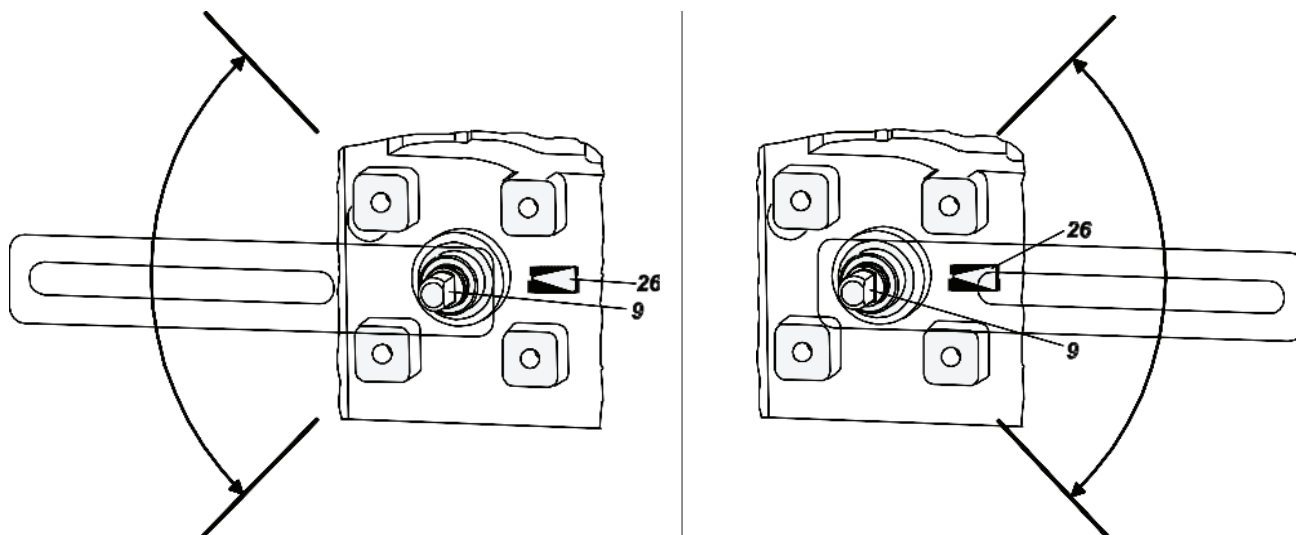


Figure 2: Actuator orientation

Mounting to Linear Actuators

NAMUR Mounting, Left Side

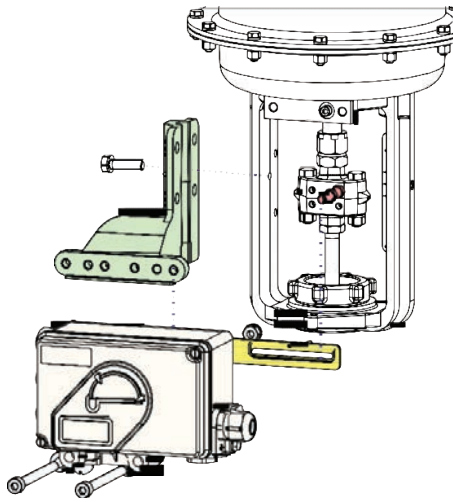


Figure 3: NAMUR mounting, left side

NAMUR Mounting, Right Side

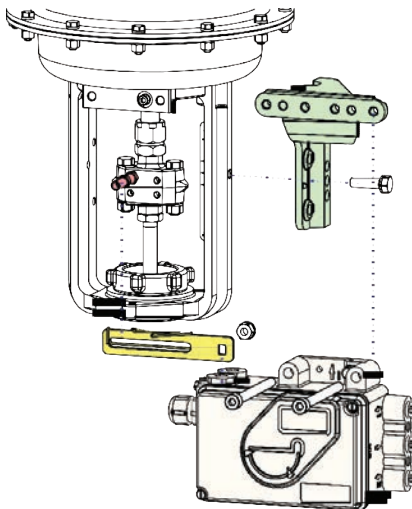


Figure 4: NAMUR mounting, right side

Feedback Lever for Linear Actuators

The carrier bolt **B** is in the slot of the feedback lever **A** and the compensating spring **F** touches the carrier bolt.

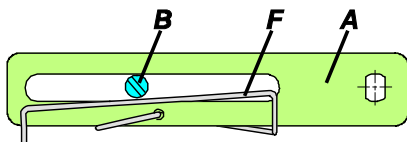


Figure 5: Feedback lever

1 threaded sleeve 2 Stud 3 coupling piece

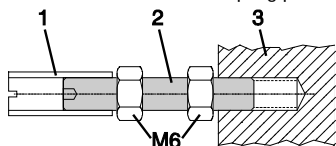


Figure 6: Carrier bolt B

Mounting to Rotary Actuators

- Do not tighten set screw **4** against the thread of spindle **9**.
- When in use, the flat side of the spindle **9** must move 0 ↔ 100% in front of the arrow **26**.
- When the product temperature rises, the drive shaft **1** increases in length. Therefore, the rotary adapter **3** must be mounted so there is approximately 1 mm (0.04 in.) of clearance between the drive shaft **1** and the rotary adapter **3**. The clearance is achieved by placing an appropriate number of washers **5** on the feedback spindle **9** before attaching the rotary adapter. Two washers should result in a clearance of 1 mm.

Direct Mounting

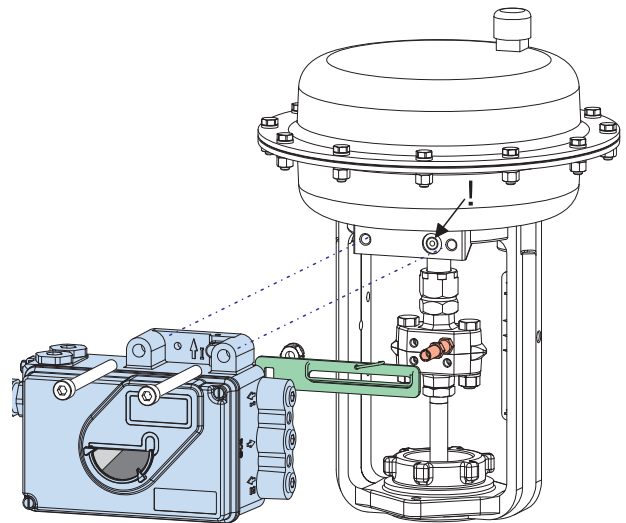


Figure 7: Direct mount diagram

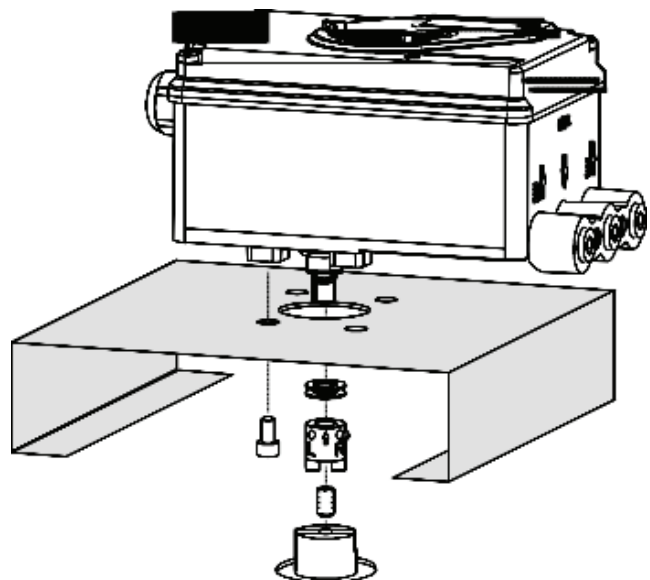


Figure 8: Direct mount assembly

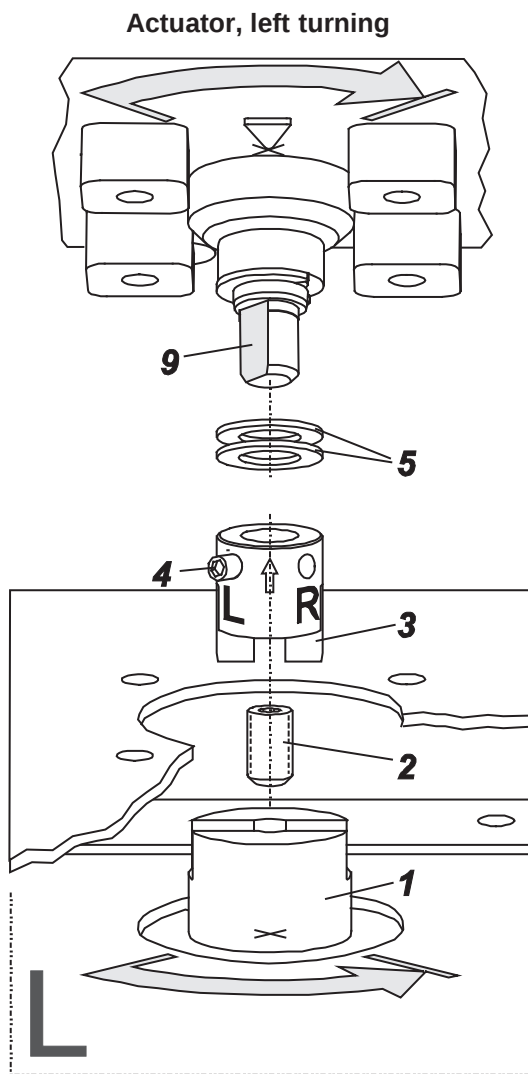


Figure 9: Left turning actuator

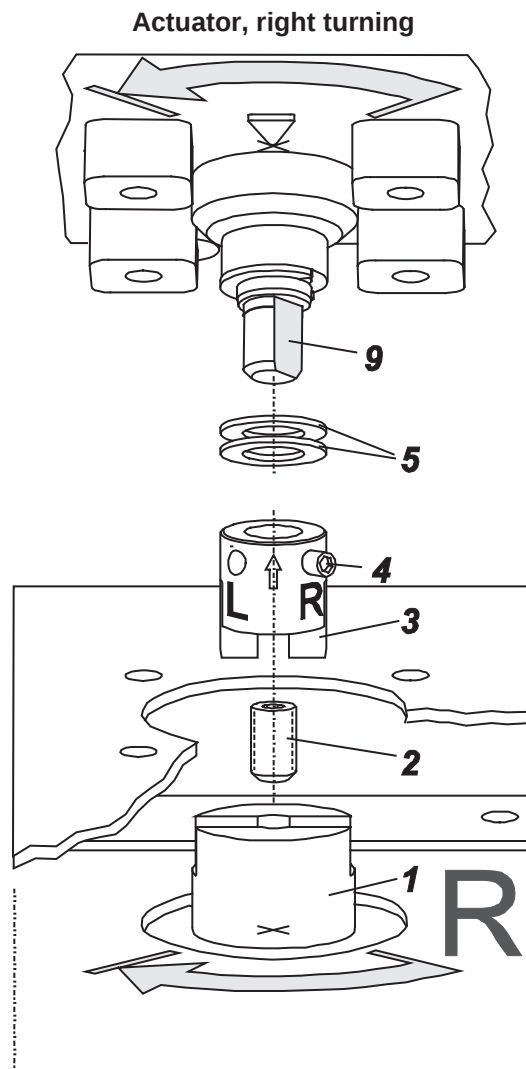


Figure 10: Right turning actuator

CONNECTIONS

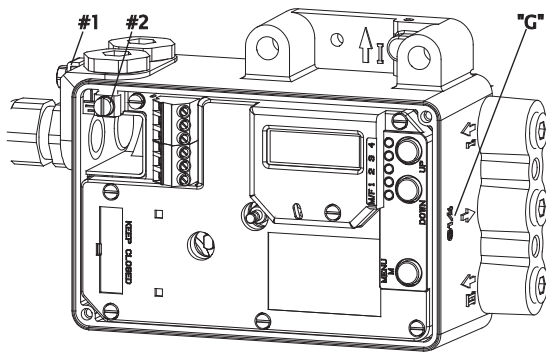


Figure 11: Connections diagram

Check before mounting fittings and cable glands that the threads are matching, otherwise housing can be damaged. The letter "G" on the housings marks that the pneumatic connections are in G1/4 (otherwise NPT).

Ground

Connect earth cable to screw **1** or screw **2** (in the electrical connection compartment).

Pneumatic Connections

Air supply: 1.4...6 bar (but not more than the maximum pressure of the actuator), free of oil, dust and water.

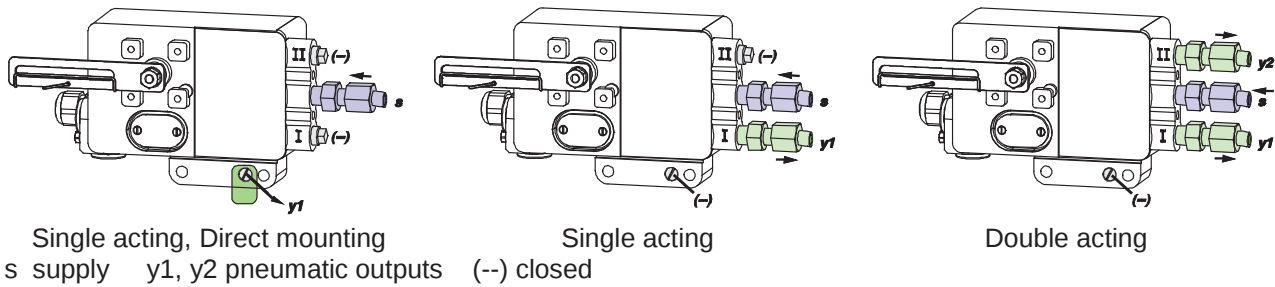
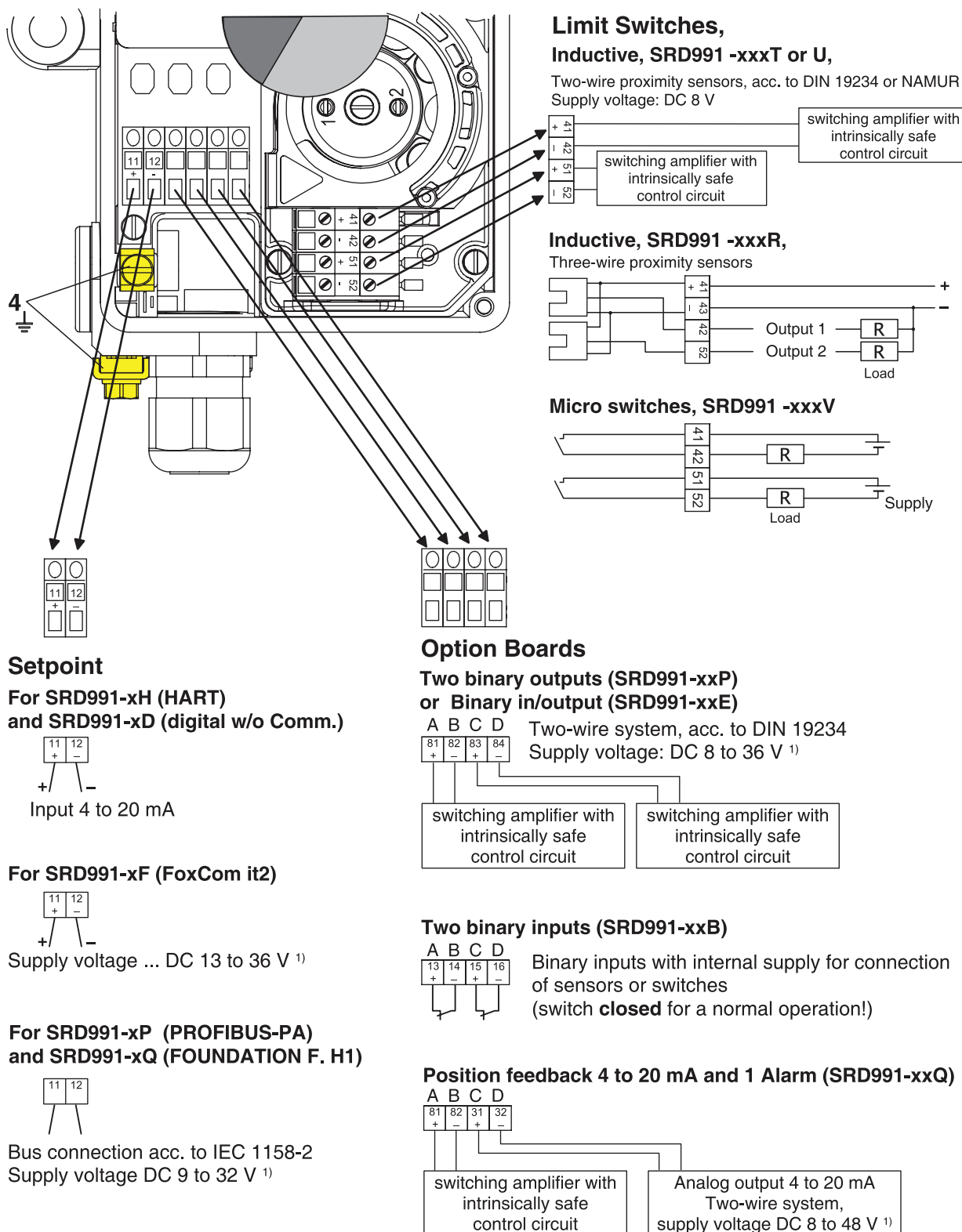


Figure 12: Pneumatic connections

Electrical Connections

Observe all safety requirements listed in the "SRD991 Intelligent Positioner User Manual".



1) For intrinsically safe circuits please refer to certificate / data plate for max. operating voltages etc.

STARTUP (SETTING BY MEANS OF LOCAL KEYS AND LCD / LEDS)

After mounting the positioner on the actuator, air and electrical input connected, you can start the SRD. The SRD991 can be adjusted by means of a local keypad and LCD / LED display.

⚠ CAUTION

DO NOT TOUCH BEHIND THE POSITIONER HOUSING WHILE OPERATING THE KEYS! DANGER OF INJURIES!

Description of display

Process variable

87.5 %
Valve position

Process variable and diagnostics

87.5 %
Valve position
Ctrl diff error

At configuration: Main menu

SRD Main Menu
1 Mounting
2 Autostart
3 Valve Action

At configuration the selected item is displayed with dark background.
Further menus with (UP) key.

Configuration and operation with push buttons and LCD:

An already configured device may show the following display:

87.5 %
Valve position

For configuration press (M) and main menu appears.

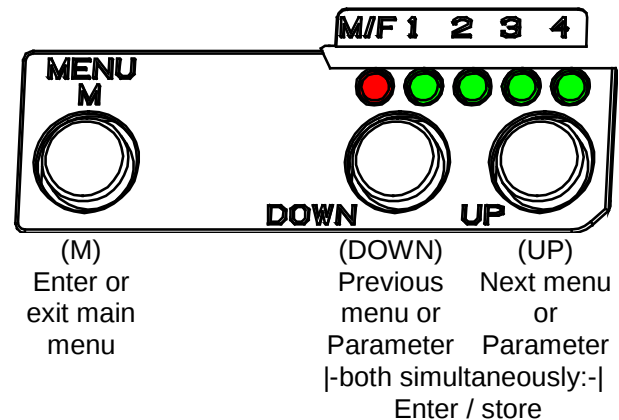
If the SRD wasn't configured yet, the Main menu*) appears automatically after power-up:

SRD Main Menu
1 Mounting
2 Autostart
3 Valve Action

In menu 1 you can select the type of mounting.

*) On delivery the menu language in the display is English. The menu language can be changed over to another stored language. For this select 9.8.2 [german] or 9.8.3 [as ordered] and confirm with keys (UP)+(DOWN) (simultaneously). Leave menu by repeated pressing of (M) key.

Push buttons



Press keys **(UP)+(DOWN)** simultaneously to enter menu 'Type of mounting'. Select the 'Type of mounting' by pressing **(UP)** or **(DOWN)**.

1 Mounting
1.1 Lin left
1.2 Lin right
1.3 rot cclockw

(Further menus with **(UP)** key.)

Press keys **(UP)+(DOWN)** simultaneously to confirm and save.
The SRD moves back to menu level 1 and is in main menu again.

SRD Main Menu
1 Mounting
2 Autostart
3 Valve Action

To enter next menu (= menu 2, AUTOSTART)
press **(UP)** once.

SRD Main Menu
1 Mounting
2 Autostart
3 Valve Action

Press keys **(UP)+(DOWN)** simultaneously to enter menu 'Autostart'. Select Full or Short autostart* by pressing **(UP)** or **(DOWN)**.

2 Autostart
2.1 Endpoints
2.2 Standard
2.3 Enhanced

Different Autostart options are available:

2.1 Endpoints

Determines only the mechanical stops of actuator/valve

2.2 Standard

Autostart recommended for standard application.

2.3 Enhanced

Enhanced Autostart. Optimized control behaviour compared to Standard Autostart.

2.4 Smooth resp.

Extended Autostart. Dampened control behaviour for e.g. smaller actuators.

2.5 Fast resp.

Extended Autostart. Undampened control behaviour for e.g. larger actuators.

Press keys **(UP)+(DOWN)** simultaneously to confirm and to launch Autostart.

The automatic adaptation to the valve is composed of a sequence of steps, explained on the LCD.

Following the last step the device is IN OPERATION.-

Menu Structure for SRD991/SRD960 with LCD

SRD Main Menu

Menu	Factory configuration	Description
1 Mounting		
1.1 Lin left	✓	Linear actuator, left-hand or direct mounting
1.2 Lin right		Linear actuator, right-hand mounting
1.3 Rot cclockw		Rotary actuator, opening counter-clockwise
1.4 Rot clockw		Rotary actuator, opening clockwise
2 Autostart		
2.1 Endpoints		Adaptation of the mechanical stops only
2.2 Standard		Autostart recommended for standard application
2.3 Extended		Enhanced Autostart. Optimized control behaviour compared to Standard Autostart
2.4 Smooth resp.		Extended Autostart. Dampened control behaviour for e.g. smaller actuators
2.5 Fast resp.		Extended Autostart. Undampened control behaviour for e.g. larger actuators
3 Valve Action		
3.1 SRD		
3.1.1 Direct	✓	Valve opens with increasing setpoint value
3.1.2 Reverse		Valve closes with increasing setpoint value
3.2 Feedback		
3.2.1 Direct	✓	Increasing Current with increasing valve position
3.2.2 Reverse		Decreasing Current with increasing valve position
4 Character		
4.1 Linear	✓	Linear characteristic
4.2 Eq Perc 1:50		Equal percentage characteristic 1:50
4.3 Quick open		Inverse equal percentage characteristic 1:50 (quick opening)
4.4 Customer		Custom characteristic
5 Limits/alarms		<i>Not locally available with LED versions of communication FF and Profibus</i>
5.1 Lower limit	0 %	Closing limit is set to input value
5.2 Cutoff low	1 %	0%-tight sealing point is set to input value
5.3 Cutoff high	100 %	100%-tight sealing point is set to input value
5.4 Upper limit	100 %	Opening limit is set to input value
5.5 Splitr 0 %	4 mA	Split range 0 %: input value corresponds to 0 %
5.6 Splitr 100 %	20 mA	Split range 100 %: input value corresponds to 100 %
5.7 Lower Alarm	-10 %	Lower position alarm on output 1 is set to input value
5.8 Upper Alarm	110 %	Upper position alarm on output 2 is set to input value
5.9 Valve 0%	4 mA	Configuration of rated-stroke of 0% at 4 mA
5.10 Valve 100%	20 mA	Configuration of rated-stroke of 100% at 20 mA
5.11 Stroke Range	x° / 20mm	Configuration of nominal travel
5.12 Units	SI	Configuration of temperature and pressure unit SI or Anglo US
6 Parameters		
6.1 Gain closing	15	P: Proportional gain for 'close valve'
6.2 Gain opening	2	P: Proportional gain for 'open valve'
6.3 Res time cl	7.5	I: Integration time for 'close valve'
6.4 Res time op	2.4	I: Integration time for 'open valve'
6.5 Rate lim cl	0.35	T63: Setting time for 'close valve'
6.6 Rate lim op	0.35	T63: Setting time for 'open valve'
6.7 Control gap	0.1	Permitted neutral zone for control difference
7 Output		Manual setting of IP-Module for testing of pneumatic output
8 Setpoint		Manual setting of valve position
8.1 12.5% Steps		Setpoint changes of 12.5% steps by using push buttons Up or Down
8.2 1% Steps		Setpoint changes of 1% steps by using push buttons Up or Down
8.3 Do PST		Start Partial Stroke Test

Continue on the next page...

9 Workbench			
9.1	Reset Config		Resetting of configuration to setting "ex factory"
9.2	Calib. 4 mA		Calibrate input current to 4 mA
9.3	Calib. 20 mA		Calibrate input current to 20 mA
9.4	Calib. -45°		Calibrate position measuring value to -45°
9.5	Calib. +45°		Calibrate position measuring value to +45°
9.6	Reset all 1		Resetting of configuration and Calibration (!) to "ex factory" setting for single-acting output
9.7	Reset all 2		Resetting of configuration and Calibration (!) to "ex factory" setting for double-acting output
9.8	Go Online		Setting position into mode Online
9.9	Menu Lang		
9.9.1	English	✓	Standard
9.9.2	Deutsch		Standard
9.9.3	Français		Preselected / Freely Defiable
9.10	LCD orient		
9.10.1	Normal	✓	Normal orientation of writing on LCD
9.10.2	Flipped		Reverse orientation of writing on LCD
9.11	Cal. Feedbk		Calibration of output current of position transmitter
9.11.1	Cal 4mA		Calibration of 0% at 4mA
9.11.2	Cal. 20mA		Calibration of 100% at 20mA
10 - not available - for HART			
10 Profibus PA - Bus Address			
10.1	Address LSB		Ratio from Dec. 0 / Hex 00 to Dec. 15 / Hex 0F
10.2	Address MSB		Ratio from Dec. 0 / Hex 00 to Dec. 112 / Hex 70
10.3	Address	126	Display of Bus Address from Dec. 1 to 127 (Hex 00 to 7F)
10 FOUNDATION Fieldbus H1			
10.1	Simulate		
	Disabled	✓	Simulate disabled
	Enabled		Simulate enabled
10.2	Profile		
	Link Master	✓	Link Master active
	Basic Device		Link Master de-activated

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