SRD960 Universal Positioner

These instructions are to be used as a guide for quick start-up. For more detailed information please refer to the standard documents “Master Instructions” and “Product Specification Sheet”. These can be found on our Website.

1. MOUNTING TO ACTUATORS

Mounting adapters

Be sure to have the right mounting adapter.

Option N:
NAMUR mounting, according to IEC 534-6
Direct mounting to FoxPak and FoxTop actuators
Rotary actuators, according to VDI/VDE 3845

Option R:
Rotary actuators, according to VDI/VDE 3845

Option T:
Integrated mounting with air connections on rear
Rotary actuators, according to VDI/VDE 3845

Option D:
NAMUR mounting, according to VDI/VDE 3847
Rotary actuators, according to VDI/VDE 3845

MOUNTING TO ACTUATORS

During operation 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 ±45°.
MOUNTING TO LINEAR ACTUATORS

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.

MONTAGE SUR SERVOMOTEURS ROTATIFS

• Do not tighten grub 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 that approx. 1 mm (0.04 in.) of clearance results between the drive shaft 1 and the rotary adapter 3. This 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.
2. CONNECTIONS

Check before mounting fittings and cable glands if threads are matching, otherwise housing can be damaged. Type of thread is marked at housing.

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

**PNEUMATIC CONNECTIONS**

Air supply (s): 1.4 to 6 bar (but not more than the max. pressure of actuator), free of oil, dust and water!
3. ELECTRICAL CONNECTIONS

3.1 Setpoint

3.1.1 SRD960-xD (Intelligent w/o comm.)
SRD960-xH (HART)
SRD960-xA (Analog)

3.1.2 SRD960-xF (FoxCom digital)

3.1.3 SRD960-xP (PROFIBUS PA)
SRD960-xQ (FIELDBUS FF)

3.2 Limit Switch

3.2.1 SRD960-xxxT or U
Two-wire proximity sensors, Acc. to DIN 19234 or NAMUR

3.2.2 SRD960-xxxR

3.2.3 SRD960-xxxV
Warning: For connection of micro switches please refer to MI (Master Instruction) and respect the safety requirements described in document EX EVE0001.

3.3 Additional i/o

3.3.1 Two binary outputs (SRD960-xxP)
Two-wire system, acc. to DIN 19234 or switched output

3.3.2 Two binary inputs (SRD960-xxB)
Binary inputs with internal supply for connection of sensors or switches (switch closed for a normal operation!)

3.3.3 Position feedback 4 to 20 mA and 1 Alarm (SRD960-xxQ)
Analog output 4 to 20 mA and Binary output
Two-wire system acc. to DIN 19234 or switched.

3.3.4 Two binary in-/outputs (SRD960-xxE)
Two-wire system acc. to DIN 19234 or switched in-/output.
4. **START UP** (Setting by means of local keys and LCD / LEDs)

After mounting the positioner on the actuator, air and electrical input connected, you can start-up the SRD. The SRD960 can be adjusted by means of a local key-pad and LCD / LED display.

**Attention:** Do not touch behind the positioner housing while operating the keys! DANGER OF INJURIES!

### Description of display LCD

**Process variable**

<table>
<thead>
<tr>
<th>87.5 %</th>
<th>Valve position</th>
</tr>
</thead>
</table>

**Process variable and diagnostics**

<table>
<thead>
<tr>
<th>87.5 %</th>
<th>Valve position</th>
<th>Ctrl diff error</th>
</tr>
</thead>
</table>

At configuration: Main Menu

<table>
<thead>
<tr>
<th>SRD Main Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Mounting</td>
</tr>
<tr>
<td>2  Autostart</td>
</tr>
<tr>
<td>3  Valve Action</td>
</tr>
</tbody>
</table>

At configuration the selected item is displayed with dark background. Further Menus with (+) key.

### Configuration and operation with push buttons ...

**An already configurated device may show the following display:**

<table>
<thead>
<tr>
<th>87.5 %</th>
<th>Valve position</th>
</tr>
</thead>
</table>

**For configuration press (○) and Main Menu appears.**

**If the SRD wasn’t configurated yet, the Main Menu*) appears automatically after power-up:**

<table>
<thead>
<tr>
<th>SRD Main Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>1  Mounting</td>
</tr>
<tr>
<td>2  Autostart</td>
</tr>
<tr>
<td>3  Valve Action</td>
</tr>
</tbody>
</table>

In Menu 1 you can select the type of mounting

**An already configurated device is IN OPERATION after power up, and all LEDs are off.**

An already configurated device may show the following display:

<table>
<thead>
<tr>
<th>M</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

**For configuration press (○), and LEDs ‘M/F’ and ‘1’ flash (= Menu 1 is offered).**

**If the SRD wasn’t configurated yet, Menu 1 is offered automatically after power-up:**

<table>
<thead>
<tr>
<th>M</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

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.

Legend: ○ LED off, ● LED on, ● LED flash
... and LCD:
Press keys (√) to enter Menu ‘Type of mounting’. Select the ‘Type of mounting’ by pressing (+) or (-).

1 Mounting
1.1 Lin left
1.2 Lin right
1.3 rot cclockw

(Further Menus with (+) key.)

... and LED display:
Press keys (√) to enter Menu ‘Type of mounting’. Select the ‘Type of mounting’ by pressing (+) or (-).

<table>
<thead>
<tr>
<th>M</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Linear actuator, left-hand mounted
Linear actuator, right-hand mounted
Rotary, opening counter-clockwise
Rotary, opening clockwise

Press keys (√) 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 (+) once.

SRD Main Menu
1 Mounting
2 Autostart
3 Valve Action

To enter next Menu (= Menu 2, Autostart) press (+) once, and the LEDs ‘M’ and ‘2’ flash.

Press keys (√) to enter Menu ‘Autostart’.
Select the autostart by pressing (+) or (-).

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 (√) to confirm and to launch Autostart.

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

Following the last step the device is IN OPERATION
### Menustructure for SRD991/SRD960 with LCD

<table>
<thead>
<tr>
<th>Menu</th>
<th>Factory configuration</th>
<th>Description</th>
</tr>
</thead>
</table>
| Mounting | ✓ | Linear actuator, left-hand or direct mounting  
1.1 Lin left | Linear actuator, right-hand mounting  
1.2 Lin right | Rotary actuator, opening counter-clockwise  
1.3 Rot cclockw | Rotary actuator, opening clockwise  
1.4 Rot clockw |
| Autostart | Adaptation of the mechanical stops only | ✓ | Valve opens with increasing setpoint value  
3.1.1 Direct | Valve closes with increasing setpoint value  
3.1.2 Reverse | ✓ | Increasing Current with increasing valve position  
3.2.1 Direct | Decreasing Current with increasing valve position  
3.2.2 Reverse |
| Valve Action | | ✓ | Linear characteristic  
4.1 Linear | Equal percentage characteristic 1:50  
4.2 Eq Perc 1:50 | Inverse equal percentage characteristic 1:50 (quick opening)  
4.3 Quick open | Custom characteristic  
4.4 Customer |
| Limits/alarms | | Not locally available with LED versions of communication FF and Profinbus |  
5.1 Lower limit | Closing limit is set to input value  
5.1.1 Low % | 0 %: closing limit set to input value  
5.1.2 Cutoff low | 1 %: 0%-tight sealing point is set to input value  
5.1.3 Cutoff high | 100 %: 100%-tight sealing point is set to input value  
5.1.4 Upper limit | 100 %: opening limit is set to input value  
5.1.5 Split 0 % | Split range 0 %: input value corresponds to 0 %  
5.1.6 Split 100 % | Split range 100 %: input value corresponds to 100 %  
5.1.7 Lower alarm | -10 %: lower position alarm on output 1 is set to input value  
5.1.8 Upper alarm | 110 %: upper position alarm on output 2 is set to input value  
5.1.9 Valve 0% | 4 mA: configuration of rated-stroke of 0% at 4 mA  
5.1.10 Valve 100% | 20 mA: configuration of rated-stroke of 100% at 20 mA  
5.1.11 Stroke Range | x° / 20mm: configuration of nominal travel  
5.1.12 Stroke Range | SI: configuration of temperature and pressure unit SI or Anglo US |
| Parameters | | |  
6.1 Gain closing | 15 | P: Proportional gain for ‘close valve’  
6.1.1 P | 2 | P: Proportional gain for ‘open valve’  
6.2 Gain opening | 7.5 | I: Integration time for ‘close valve’  
6.2.1 I | 2.4 | I: Integration time for ‘open valve’  
6.3 Res time cl | 0.35 | T63: Setting time for ‘close valve’  
6.3.1 T63 | 0.35 | T63: Setting time for ‘open valve’  
6.5 Rate lim cl | 0.1 | Permitted neutral zone for control difference  
6.7 Control gap | 0.1 |
| Output | Manual setting of IP-Module for testing of pneumatic output | |  
7.1 Output | | |  
7.2 Setpoint | Manual setting of valve position | |  
8.1 12.5% Steps | Setpoint changes of 12.5% steps by using push buttons Up or Down  
8.1.1 Steps | Setpoint changes of 1% steps by using push buttons Up or Down  
8.3.1 PST | Start Partial Strok Test |
## Workbench

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 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 |

## Profibus PA - Bus Address

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 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) |

## FOUNDATION Fieldbus H1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
| 10.1 | Simulate   
   |   
   |   |   
   | Disabled   
   | ✓ Simulate disabled |
| Enabled   
   | Simulate enabled |
| 10.2 | Profile   
   |   
   |   |   
   | Link Master   
   | ✓ Link Master active |
| Basic Device   
   | Link Master de-activated |