SRD998 Intelligent Positioner with HART Communication

The intelligent positioner SRD998 is designed to operate pneumatic valve actuators and can be operated from control systems (e.g. the Foxboro I/A Series System and Foxboro Evo™), controllers or PC-based configuration and operation tools such as the FDT/DTMs VALcare™. The positioner is available with HART 7 communication protocol. The extra large multi-lingual full text graphical-LCD, in conjunction with the rotary selector, allows a comfortable and easy local configuration and operation. For installations in contact with explosive atmospheres certificates are available.

MAIN FEATURES

Intelligent

- Auto-start with self-calibration
- Self diagnostics, status- and diagnostic messages
- DTM for valve diagnostics and predictive maintenance
- Easy local operation with the rotary selector
- Extra large multi-lingual full text graphical LCD
- With HART 7 communication
- Stroke 8 to 260 mm (0.3 to 10.2 in) with standard lever; larger stroke with special lever

- Angle range up to 95 ° (up to 120 ° on request)
- Mounting onto any linear or rotary actuator
- Supply air pressure up to 10 bar (145 psig)
- Single or double acting
- Protection class IP 66
- Explosion protection: Intrinsic Safety according to ATEX / IECEx, INMETRO, NEPSI, PESO, CNS, EAC

Equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising from the use of this material.
Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

<table>
<thead>
<tr>
<th>DANGER</th>
<th>Indicates a hazardous situation which, if not avoided, will result in death or serious injury.</th>
</tr>
</thead>
<tbody>
<tr>
<td>WARNING</td>
<td>Indicates a hazardous situation which, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.</td>
</tr>
<tr>
<td>NOTICE</td>
<td>NOTICE is used to address practices not related to physical injury.</td>
</tr>
</tbody>
</table>

Please Note

Electrical equipment should be installed, operated, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.
Thanks to the modular concept of the SRD998, the positioner can be optimally adapted to the application. In addition to connection manifolds with various threads, mounting kits for each drive and extensive accessories, these also include integrated pneumatic amplifiers in various performance classes.

Pneumatic amplifiers
Depending on the actuator, a single- or double-acting pneumatic amplifier is used
(The use of double-acting pneumatics for single-acting actuators is not recommended).
Codes BxS: single acting
Codes CxS: double acting

Single-acting pneumatics have versions B0S, B1S and B2S that differ in air flow, see page 5.
For the double-acting pneumatics, there are the versions C0S, C2S and C3S, which differ in the air performance, see page 5.

For drives with increased air output, a correspondingly powerful supply air station is required, see next page.
### TECHNICAL DATA

#### Supply

**Supply air pressure**
- B0S, C0S .................. 1.4 to 6 bar (20 to 87 psig)
- B1S, B2S .................. 1.4 to 10 bar (20 to 145 psig)
- C2S, C3S .................. 1.4 to 10 bar (20 to 145 psig)

**Output to actuator** ........ 0 to ~100 % of supply air pressure (up to 5.5 bar at 6 bar supply air pressure)

**Air supply** ............... according to ISO 8573-1
- Solid particle size and density class 2
- Oil rate ....................... class 3
- Pressure dew point 10 K under ambient temperature

The use of a **filter regulator** for the air supply of positioner is strongly recommended. It reduces the air pressure to the actuator’s maximum pressure, keeps it constant, and filters the air.

For the pneumatics with standard flow (B0S, B1S, C0S) we recommend the FRS02, FRS03, or FRS923 filter regulator. When using other brands a filter grade of 30 µm or better shall be supported.

For the pneumatics with high flow (B2S, C2S, C3S) we recommend the High Flow Filter Regulator FRS04 or FRS05 with a filter grade of 5 µm. When using other brands a filter grade of 5 µm shall be supported.

#### Output to actuator

0 to ~100 % of supply air pressure (up to 5.5 bar at 6 bar supply air pressure)

**Supply**

- B0S, C0S .................. 1.4 to 6 bar (20 to 87 psig)
- B1S, B2S .................. 1.4 to 10 bar (20 to 145 psig)
- C2S, C3S .................. 1.4 to 10 bar (20 to 145 psig)

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#### Travel range

**Stroke range** .............. 8 to 260 mm (0.3 to 10.2 in)
with standard feedback levers; special levers on request

**Rotation angle range** ........... up to 95 ° angle
(up to 120 ° on request)

#### Response characteristic

1) 2)

**Sensitivity** ................. < 0.1 % of travel span

**Non-linearity (terminal based adjustment)** .......... < 0.6 % of travel span

**Hysteresis** ................... < 0.3 % of travel span

**Supply air dependence** ...... < 0.1 % / 1 bar (15 psi)

**Temperature effect** ............ < 0.3 % / 10 K

Mechanical vibration effect acc. IEC 60068-2-6 (2007) for 10 to 500 Hz up to 2 g

For Pneumatics B0S, ........... < ±0.25% up to 80 Hz and 1 g
   < ±0.25% up to 70 Hz and 2 g

For Pneumatics B1S, B2S < ±0.25% up to 70 Hz and 1 g
   < ±0.25% up to 50 Hz and 2 g

For Pneumatics C0S ......... < ±0.25 % up to 400 Hz and 1 g
   < ±0.25 % up to 70 Hz and 2 g

For Pneumatics C2S, C3S < ±0.25 % up to 55 Hz and 2 g

In case of high vibrations, we recommend using remote mounting solution.

**Note for single / double acting operation**

For optimal control performance, the use of **double acting** positioners onto single acting actuators is not recommended.

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![Air Flow Output in NL/h](image-url)

1) Data measured according to VDI/VDE 2177 and IEC 61514-2
2) With 90 ° angle, rotary actuator
Pneumatic Performance - Air flow

<table>
<thead>
<tr>
<th>Air flow at Air Input / output:</th>
<th>1.4 bar</th>
<th>3 bar</th>
<th>6 bar</th>
<th>8 bar</th>
<th>10 bar</th>
</tr>
</thead>
</table>

Pneumatic Code **B0S** (single acting - Standard Flow, Standard Pneumatic)
- to pressurize actuator: 4000, 7000, 14000 Nl/h
- to vent actuator: 2700, 5000, 10000 Nl/h

Pneumatic Code **B1S** (single acting - Standard Flow, High Performance Pneumatic)
- to pressurize actuator: 14000 Nl/h
- to vent actuator: 14000 Nl/h

Pneumatic Code **B2S** (single acting - High Flow, High Performance Pneumatic) Cv 0.58
- to pressurize actuator: 20800, 40650 Nl/h
- to vent actuator: Nl/h

Pneumatic Code **C0S** (double acting - Standard Flow, Standard Pneumatic)
- to pressurize actuator: 3500, 5000, 10000 Nl/h
- to vent actuator: 2500, 3750, 7500 Nl/h

Pneumatic Code **C2S** (double acting - High Flow, High Performance Pneumatic)
- to pressurize actuator: 14000 Nl/h
- to vent actuator: 14000 Nl/h

Pneumatic Code **C3S** (double acting - Very High Flow, High Performance Pneumatic) Cv 0.85
- to pressurize actuator: 52000 Nl/h
- to vent actuator: 52000 Nl/h

Pneumatic Performance - Air consumption

<table>
<thead>
<tr>
<th>Pneumatic Code:</th>
<th>Input signal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>B0S</strong> (single acting - Standard Flow)</td>
<td>0 %</td>
</tr>
<tr>
<td><strong>B0S</strong> (single acting - Standard Flow)</td>
<td>100 %</td>
</tr>
<tr>
<td><strong>B1S</strong> (single acting - Standard Flow, High Performance Pneumatic)</td>
<td>&lt;800</td>
</tr>
<tr>
<td><strong>B2S</strong> (single acting - High Flow, High Performance Pneumatic)</td>
<td>&lt;800</td>
</tr>
<tr>
<td><strong>C0S</strong> (double acting - Standard Flow)</td>
<td>0 %</td>
</tr>
<tr>
<td><strong>C0S</strong> (double acting - Standard Flow)</td>
<td>50 %</td>
</tr>
<tr>
<td><strong>C0S</strong> (double acting - Standard Flow)</td>
<td>100 %</td>
</tr>
<tr>
<td><strong>C2S</strong> (double acting - High Flow, High Performance Pneumatic)</td>
<td>&lt;800</td>
</tr>
<tr>
<td><strong>C3S</strong> (double acting - Very High Flow, High Performance Pneumatic)</td>
<td>&lt;800</td>
</tr>
</tbody>
</table>

1) Measured according ANSI / ISA-75.13.01-2013
BOOSTERS for increased air flow

**Volume Booster Series** (to order as accessory)
For large actuators or to reduce action time, a volume booster may be necessary.

**VBS200 / VBS201**
Volume boosters with Cv1.4 and pneumatic connection 1/2”
Optional with exhaust collector, or Silencer
*VBS201 directly flanged to the positioner, optional with Silencer*

For more information please consult PSS EVE0602.

**VBS300 / VBS310**
Volume boosters with Cv 7 and pneumatic connection 1”
for remote mounting
VBS300 in Aluminum, VBS310 in Stainless Steel 316

For more information please consult PSS EVE0603.
FUNCTIONAL SPECIFICATIONS

Features

Automatic start-up ............. (Autostart functionality)
Automatic determination of the mechanical end positions of the valve (initial value and final value), IP motor parameters, direction of action of the spring, and control parameters. The control parameters are optimized dynamically during this routine.
This procedure makes a perfect adjustment and optimization to the actuator possible without additional manual settings! Several Autostart modes are available (details see on next pages).

Operation and Configuration

The local LCD enables a fast and easy configuration as well as clear diagnostic messages.
Local................................. with local rotary selector
Display................................. multi lingual graphic LCD

The positioner contains the following menu languages:
• English • German • French • Chinese • Portuguese • Spanish • Polish • Korean • Swedish • Italian • Russian
To monitor the high performance of the positioner, we offer several diagnostic utilities:

### Diagnostic Utilities

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic Diagnostics</th>
<th>Advanced Diagnostics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration data surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Input current adjustment surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>A/D converter surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Position value surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Connection to I/P converter surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Potentiometer surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Angle adjustment surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Surveillance of reaching the set point in a specific time</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Temperature limit min or max surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Autostart surveillance</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Custom Characterization</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Auto diagnostic</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Alarm Management</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Alarm Output for Switching (with Option board)</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Status List acc. NE107</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Position History</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Response History</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Step Response Analyze</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

### Manual local and remote settings:
- **Actuator mode**: linear or rotary actuator
- **Linear valve**: left or right mounted
- **Rotary actuator**: opening clockwise or counter-clockwise
- **Valve characteristic**: linear, equal percentage, inverse-equal percentage or custom (22 points)
- **Valve action**: opens or closes with increasing set point
- **Split range**: free upper and lower values
- **Travel limits**: free upper and lower values
- **Cutoffs**: free upper and lower values
- **Stroke range**: configurable
- **Temperature unit**: configurable (°C or °F)
- **Autostart**: - Endpoints
  - Standard Autostart
  - Enhanced Autostart
  - Smooth response
  - Fast response
- **Control parameters**: Determined during Autostart.
- **Manual adjustment of**: P-gain, I-time, D-time, T63-time, and dead band
- **Manual operation**: Manual input of set point to drive the valve in steps of 12.5 % or 1 %
- **Pneumatic test**: Function to test the pneumatic output
- **LCD orientation**: Standard, and upside down

### Software supported configurations:
- By means of Hand Held Terminal (HART)
- PC by means of VALcare DTM Software
- I/A Series System, Foxboro Evo and other DCSs

### Issue handling
In case of Single Acting, Safety position at:
- Air supply loss: pressure y1 = zero
- Electric power loss: pressure y1 = zero
- Electronics issue: pressure y1 = zero

In case of Double Acting or spool valve amplifier, safety position at:
- Air supply loss: pressure y1 = zero; y2 = zero
- Electric power loss: pressure y1 = zero; y2 = full air supply pressure
- Electronics issue: pressure y1 = zero; y2 = full air supply pressure
PHYSICAL SPECIFICATIONS (common data for all versions)

Mounting

Attachment to stroke actuators
- for casting yoke
  acc. to IEC 534-6 (NAMUR) with attachment kit EBZG –H
  or –H1
- for pillar yoke
  acc. to IEC 534-6 (NAMUR) with attachment kit EBZG –K
  or –K1

Stroke range with feedback lever:
- standard (EBZG-A) 8 to 70 mm / 0.31 to 2.76 in
- extended (EBZG-B) 60 to 120 mm / 2.36 to 4.72 in
- extended (EBZG-A1) 110 to 260 mm / 4.33 to 10.24 in
Larger stroke ranges can be realized with special levers.

Attachment to rotary actuators acc. to VDI/VDE 3845
with attachment kit ............ EBZG –R
- Further attachment kits see ModelCodes page 15/16
- Mounting orientation see attachment dimensions starting from page 17

Materials
Housing and covers ........... Aluminum Alloy No. 230 (GD-AlSi12) Polyester Powder coated
Sealings between covers ......silicone elastomer and silicone core with Ag/Cu particles
LCD Window .................. Polycarbonate, U.V. stabilized
External Screws .............. Stainless Steel V2A 1.4301
Motherboard .................. Coated with protective resin
All moving parts of feedback system (e.g. shaft) ............... 1.4306 / 1.4571 / 1.4104
Attachment kits .............. V4A 1.4401 or (depending upon version)
  (GD-AlSi12) finished with DD varnish
Mounting bracket ............. Aluminum Alloy No. 230 (GD-AlSi12)
Pneumatic diaphragms ....... VMQ, PVMQ (Silicone Elastomer, suitable for use in the paint industry)
  (depending upon version)

Weight
With pneumatic B0S......... approx. 2.1 kg (4.7 lbs)
B2S ................... approx. 2.2 kg (4.9 lbs)
C0S ................... approx. 2.3 kg (5.1 lbs)
C3S ................... approx. 2.2 kg (4.9 lbs)

Pneumatic connection
NAMUR mounting............. G 1/4 or 1/4-18 NPT via manifold

Electrical Connection
Line entry .................... 1 cable gland M20 x1.5,
  1/2-14 NPT (with Adapter AD-)
Cable diameter ............. 6 to 12 mm (0.24 to 0.47 in)
Screw terminals ............ 2 terminals for input
Wire cross section .......... 0.3 to 2.5 mm² (AWG 22-14)
max torque 0.6 Nm

Ambient conditions
Operating conditions ........ acc. to IEC 654-1
The device can be operated at a class Dx location.
Ambient temperature
Operation 1) .................... –40 to 80 °C (–40 to 176 °F)
Transport and storage .... –40 to 80 °C (–40 to 176 °F)
If the device is exposed to sunlight and the temperature may rise above 80 °C / 176 °F, we recommend a sun shade.
Storage conditions
acc. to IEC 60721-3-1........... 1K5; 1B1; 1C2; 1S3; 1M2
Indicators
LCD (visible) 2) ............... –25 to 70 °C (–13 to 158 °F)
Relative humidity ............. up to 100 %
Protection class
acc. to IEC 60529 ............. IP 66
acc. to NEMA .................. Type 4X

Electromagnetic compatibility EMC
Operating conditions ........... industrial environment
Immunity according to
EN 61326 .................... fulfilled
IEC 61326 .................... fulfilled
EN 61000-6-2 ................. fulfilled

Emission according to
EN 61326
Class A and Class B ........ fulfilled
EN 61000-6-4 ................. fulfilled
EN 55011 Group 1, Class A and Class B .... fulfilled
NAMUR recommendation
EMV NE21 .................... fulfilled

SAFETY REQUIREMENTS

CE label
Electromagnetic Compatibility ............... 2014 / 30 / EC
Low-voltage regulation ........ not applicable
See also Declaration of Conformity.

Safety
According to EN 61010-1 (or IEC 1010-1) ................. Safety class III
Overvoltage Category I
External fuses ................. Limitation of power supplies for fire protection shall be observed acc. to EN 61010-1, appendix F (or IEC 1010-1).

1) Details see Certificates of Conformity.
2) Below –20°C the LCD reacts only slowly;
   above +70°C the background becomes dark
   (no damage when back into –20 to +70 °C range)
Electrical classification \(^1\)\(^2\)

See Certificates of Conformity EX EVE0108 A

**Intrinsically Safe according to ATEX / IEC Ex**

Code A1, A2, or A3

A1 = II 2 G Ex ia IIC T4/T6 Gb / II 1 D Ex ia IIIC T100 °C Da

or

A2 = II 2 G Ex ib IIC T4/T6 Gb / II 2 D Ex ib IIIC T100 °C Db

or

A3 = II 3 G Ex ic IIC T4/T6 Gc / II 3 D Ex ic IIIC T100 °C Dc

For use in hazardous areas in certified safe circuits with the following maximum values:

<table>
<thead>
<tr>
<th>Pi</th>
<th>(U_i)</th>
<th>(i_i)</th>
<th>(\text{T}4)</th>
<th>(\text{T}6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>900 mW</td>
<td>30 V</td>
<td>130 mA</td>
<td>(-40^\circ \text{C} \text{ to } 80^\circ \text{C})</td>
<td>(-40^\circ \text{C} \text{ to } 80^\circ \text{C})</td>
</tr>
<tr>
<td>660 mW</td>
<td>28.1 V</td>
<td>130 mA</td>
<td>(-40^\circ \text{C} \text{ to } 80^\circ \text{C})</td>
<td>(-40^\circ \text{C} \text{ to } 44^\circ \text{C})</td>
</tr>
<tr>
<td>630 mW</td>
<td>25.7 V</td>
<td>130 mA</td>
<td>(-40^\circ \text{C} \text{ to } 80^\circ \text{C})</td>
<td>(-40^\circ \text{C} \text{ to } 46^\circ \text{C})</td>
</tr>
<tr>
<td>590 mW</td>
<td>25.3 V</td>
<td>130 mA</td>
<td>(-40^\circ \text{C} \text{ to } 80^\circ \text{C})</td>
<td>(-40^\circ \text{C} \text{ to } 48^\circ \text{C})</td>
</tr>
<tr>
<td>510 mW</td>
<td>26 V</td>
<td>130 mA</td>
<td>(-40^\circ \text{C} \text{ to } 80^\circ \text{C})</td>
<td>(-40^\circ \text{C} \text{ to } 52^\circ \text{C})</td>
</tr>
</tbody>
</table>

\(L_i = < 10 \mu \text{H}\)

\(C_i = < 2.5 \text{ nF}\)

IP degree acc. to IEC 60529 .. IP 66

Other electrical certifications in progress

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1) With appropriate order only
2) National requirements shall be observed
**SRD998 with HART communication**

**SRD998-Hxxxx**

- Signal Input: Two wire system
- Reverse polarity protection: standard feature
- Signal range: 4 to 20 mA
- Operating range: 3.6 to 21.5 mA
- Input voltage: DC 12 to 36 V (1) (unloaded)
  - min 12 V at 4 mA
  - min 8.4 V at 20 mA
- Load: 420 Ohms, 8.4 V at 20 mA
- Communication signal: HART 7, 1200 Baud, FSK (Frequency Shift Key) modulated on 4 to 20 mA 0.5 Vpp at 1 kOhm load
- Signal range: 4 to 20 mA
- Operating range: 3.6 to 21.5 mA
- Input voltage: DC 12 to 36 V
- Load: 420 Ohms, 8.4 V at 20 mA
- Communication signal: HART 7, 1200 Baud, FSK (Frequency Shift Key) modulated on 4 to 20 mA 0.5 Vpp at 1 kOhm load

Input impedance $Z_{i}$ ....... $Z = 320$ Ohms for ac voltage 0.5 to 10 kHz with < 3 dB non-linearity.

Cable capacity and inductance see HART standard specifications (e.g. C < 100 nF).

Impedance of other devices at the input (parallel or serial) shall be within HART spec.

Applications without communication require not to exceeding input capacitance parallel to the input not higher than 5 µF.

Start-up time: approx. 3 sec

Interruption time without power down . . . typ. 8 ms (2)

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**Configuration**

The SRD998 can be configured via HART by any host system whatever is a PC with a HART Modem, Hand Held Terminal or a DCS.

**LOCAL** (by means of rotary selector and LCD display)

See page 6

**DTM (Device Type Manager)**

We are a leading company in term of FDT-DTM technology


Therefore we provide a DTM fully certified for its interoperability and with the state-of-the-art presentation and diagnostics features.

The DTM can be downloaded from our homepage.

**DD (Device Description) and EDD (Enhanced Device Description)**

In case the host system is not supporting the FDT-DTM technology, you can download the DD and/or EDD from our homepage.

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**Configuration Diagram**

[Diagram showing configuration and parameters]

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1) On request we can specify higher voltage limits
2) Worst case conditions 4-20 mA, I/p-output with max. current
FUNCTIONAL DESIGNATIONS

1 Cable gland
1a Adapter, e.g. 1/2”-14 NPT
3 Screw terminals (11 / 12) for input (w)
4 Ground connection (inner and outer)
5 Output I (y1)
6 Air supply (s)
7 Output II (y2)
8 Direct attachment hole for output I (y1)
9 Feedback shaft
10 Connection manifold for attachment to stroke actuators

11 Connection base for attachment to rotary actuators
15 Rotary selector for select Menu, and press to confirm
16 LCD with true text in many languages
20 Cover for electrical connection compartment
21 Air vent, dust and water protected
22 Data label
26 Arrow is perpendicular to shaft 9 at angle 0 degree (to center the coupling and feedback lever at mounting)
29 Service only
30 Connecting manifold, G 1/4 or 1/4 NPT
31 Component O-ring with filter, for air supply
## MODEL CODES SRD998

### Intelligent Positioner   SRD998 –

#### Communication
- HART ........................................... H
- Profibus PA ................................ (a) ........................................................................ P
- FOUNDATION Fieldbus H1 ................. (a) .......................................................... Q

#### Diagnostics Performance
- Basic Diagnostics ................................ BD
- Advanced Diagnostics ........................ AD
- Premium Diagnostics ................................. (a) .................................................. PD
- Partial Stroke Testing & Shutdown ........ (a) ...................................................... SA
- Partial Stroke Testing & SOV Monitoring (a) ................................................ SB

#### Electrical In-Out Option
- No In-Out Option ........................................ 0
- Universal In-Out Option ........................... (a) .................................................. 1

#### Version
- Single acting ........................................ B
- Double acting ........................................ C

#### Pneumatic Performance
- Standard Pneumatic (max 6 bar air supply) ........................................... 0
- Standard Flow – High Performance Pneumatic (10 bar max air supply) ............. 1
- High Flow – High Performance Pneumatic (10 bar max air supply) ...................... 2
- Very High Flow – High Performance Pneumatic (CV 1 – 10 bar max air supply) ........... 3

#### Fail in case of lost of power
- Fail safe ................................................. S
- Fail freeze ............................................. (a) .................................................. F

#### Housing
- Aluminum ......................................................... 1
- SST (316) ......................................................... 2
- Aluminum Ex d .............................................. (a) ............................................. 3
- SST (316) Ex d ..................................................... (a) ............................................. 4

#### Mounting
- Standard ......................................................... S
- For direct mounting .............................................. T
- For VDI/VDE 3847 ............................................. (a) ............................................. U
- For remote mounting of positioner with side mounting potentiometer unit ........ V
- For remote mounting of positioner with top mounting potentiometer unit ........... W
- For remote mounting of positioner w/o potentiometer unit (order pot. separately) .. Y

#### Pneumatic Connection
- 1/4 NPT ................................................................. A
- 1/4 G ................................................................. B
- 1/4 NPT with tapped exhaust... (a) ...................................................... C
- 1/4 G with tapped exhaust... (a) ...................................................... D

#### Gauges
- Without gauge ................................................. 0
- With 2 standard gauges for single acting ................................................ (b) ........ 1
- With 2 Nickel plated gauges connection for single acting ......................... (b) ........ 2
- With 3 standard gauges for double acting ................................................. (c) ........ 3
- With 3 Nickel plated gauges connection for double acting ....................... (c) ........ 4

#### Electrical Connection
- M20x1.5 ............................................................ 7
- 1/2 NPT (made with an adaptor) ..................................................... 8

(continued on next page)
### Electrical Certification

<table>
<thead>
<tr>
<th>Certification Type</th>
<th>Model Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX / IEC Ex: II 2G Ex ia IIC T4/T6 Gb, II 1D Ex ia IIIC T100 °C Da</td>
<td>A1</td>
</tr>
<tr>
<td>ATEX / IEC Ex: II 2G Ex ib IIC T4/T6 Gb, II 2D Ex ib IIIC T100 °C Db</td>
<td>A2</td>
</tr>
<tr>
<td>ATEX / IEC Ex: II 3G Ex ic IIC T4/T6 Gc, II 3D Ex ic IIIC T100 °C Dc</td>
<td>A3</td>
</tr>
<tr>
<td>INMETRO: Ex ia IIC T4/T6 Gb, Ex ia IIIC T100 °C Da, IP66</td>
<td>B1</td>
</tr>
<tr>
<td>INMETRO: Ex ib IIC T4/T6 Gb, Ex ib IIIC T100 °C Db, IP66</td>
<td>B2</td>
</tr>
<tr>
<td>INMETRO: Ex ic IIC T4/T6 Gc, Ex ic IIIC T100 °C Dc, IP66</td>
<td>B3</td>
</tr>
<tr>
<td>NEPSI: Ex ia IIC T4/T6 Ga, Ex ia D20 T100 Da, IP66</td>
<td>N1</td>
</tr>
<tr>
<td>NEPSI: Ex ib IIC T4/T6 Gb, Ex ib D21 T100 Db, IP66</td>
<td>N2</td>
</tr>
<tr>
<td>NEPSI: Ex ic IIC T4/T6 Gc, Ex ic D22 T100 Dc, IP66</td>
<td>N3</td>
</tr>
<tr>
<td>FM certification</td>
<td>F1</td>
</tr>
<tr>
<td>CSA certification</td>
<td>C1</td>
</tr>
<tr>
<td>CSA certification</td>
<td>C2</td>
</tr>
<tr>
<td>CSA certification</td>
<td>C3</td>
</tr>
<tr>
<td>FM certification</td>
<td>F2</td>
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<tr>
<td>CSA certification</td>
<td>C1</td>
</tr>
<tr>
<td>CSA certification</td>
<td>C2</td>
</tr>
<tr>
<td>CSA certification</td>
<td>C3</td>
</tr>
<tr>
<td>EAC: 1 Ex ia IIC T4/T6 Gb X, Ex ia IIIC T100° C Da</td>
<td>G1</td>
</tr>
<tr>
<td>EAC: 1 Ex ib IIC T4/T6 Gb X, Ex ib IIIC T100° C Db</td>
<td>G2</td>
</tr>
<tr>
<td>EAC: 2 Ex ic IIC T4/T6 Gc X, Ex ic IIIC T100° C Dc</td>
<td>G3</td>
</tr>
<tr>
<td>KOSHA certification</td>
<td>K1</td>
</tr>
<tr>
<td>KOSHA certification</td>
<td>K2</td>
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<tr>
<td>KOSHA certification</td>
<td>K3</td>
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<tr>
<td>TIIS certification</td>
<td>J1</td>
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<td>TIIS certification</td>
<td>J2</td>
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<td>TIIS certification</td>
<td>J3</td>
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<tr>
<td>CNS certification</td>
<td>J1</td>
</tr>
<tr>
<td>PESO certification</td>
<td>J2</td>
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<tr>
<td>KOSHA certification</td>
<td>J3</td>
</tr>
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<td>J3</td>
</tr>
<tr>
<td>CNS certification</td>
<td>J1</td>
</tr>
<tr>
<td>PESO certification</td>
<td>J2</td>
</tr>
</tbody>
</table>

### Options

- Positioner suitable for use of natural gas instead of air supply (a)................................................................... -S
- Positioner free of copper and its alloys (a)........................................................................................................ -C
- Approved for SIL2 / SIL3 application (a)............................................................................................................... -Q
- Stainless Steel Label, fixed with wire ......................................................................................................................... -L
- Positioner with ECEP (a).................................................................................................................................................. -X

(a) Not released
(b) Only to be ordered with single acting model code Version B
(c) Only to be ordered with double acting model code Version C

1) The SRD998 has the CNS certificate for usage in Taiwan
2) The SRD998 has the PESO certificate for usage in India
**Accessories, for all basic devices**

**Code 1, single**  
Connection manifold for single acting positioner with pressure gauges for supply air s and output y

**Code 3, double**  
Connection manifold for double acting positioner with pressure gauges for supply air s, outputs y1, and y2

---

**For VBS201:**  
LEX 426 602 037

**VBS300**  
Booster for remote mounting: (see extra PSS)

---

O ring with filter  
Sticker closes the unused output at single acting

---

**Connection manifold**  
**Code A:** 3x 1/4 NPT  
**Code B:** 3x 1/4 G

---

**Dimensions:**  
L x B x H = 80 x 80 x 97 mm

**Exhaust Adapter**  
to 1/2"
### MODEL CODES Accessories

#### Accessories for SRD998

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Filter Regulators</strong></td>
</tr>
<tr>
<td>Filter Regulator for -30°C to 70°C.</td>
</tr>
<tr>
<td>Stainless Steel (316) Filter Regulator</td>
</tr>
<tr>
<td>High Flow Filter Regulator 1/2 inch / Aluminum</td>
</tr>
<tr>
<td>High Flow Filter Regulator 1/2 inch / Stainless Steel.</td>
</tr>
<tr>
<td>Mounting Bracket for FRS02 or FRS03</td>
</tr>
<tr>
<td>Orientable Mounting Bracket for FRS02 or FRS03</td>
</tr>
<tr>
<td>Nipple for direct mounting Filter regulator 1/4 NPT both sides</td>
</tr>
<tr>
<td>Mounting Bracket for FRS04</td>
</tr>
<tr>
<td>Mounting Bracket for FRS05</td>
</tr>
<tr>
<td>Nipple 1/2 NPT (FRS04/05 side) to 1/4 NPT (SRD998 side) for direct piping</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication / Modem / DTM</strong></td>
</tr>
<tr>
<td>HART USB Modem (made by Ifak) with ATEX IS Certification</td>
</tr>
<tr>
<td>DTM for SRD Series for HART / FF / Profibus</td>
</tr>
<tr>
<td>Service Modem</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Booster Relay</strong> (in case of double acting, qty. shall be 2 pieces)</td>
</tr>
<tr>
<td>Remote version for any positioner</td>
</tr>
<tr>
<td>Integral volume booster for SRD991, SRD960, SRD998, and SRI990 (directly flanged to positioner)</td>
</tr>
<tr>
<td>Booster Cv7 - Alum Housing - Remote mounting</td>
</tr>
<tr>
<td>Booster Cv7 - SST Housing - Remote mounting</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lock-in Relays</strong></td>
</tr>
<tr>
<td>Lock In Relay, Single Acting, Aluminum Casing</td>
</tr>
<tr>
<td>Lock In Relay, Double Acting, Aluminum Casing</td>
</tr>
<tr>
<td>Lock In Relay, Single Acting, SST 316L Casing</td>
</tr>
<tr>
<td>Lock In Relay, Double Acting, SST 316L Casing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limit switch</strong></td>
</tr>
<tr>
<td>Mechanical Limit Switch weatherproof and plastic housing (TE Sensors XCKN2118P20)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable Gland</strong></td>
</tr>
<tr>
<td>Cable Gland, M20x1.5 Plastics, Color Gray/Black</td>
</tr>
<tr>
<td>Cable Gland, M20x1.5 Plastics, Color Blue</td>
</tr>
<tr>
<td>Cable Gland, M20x1.5 Plastics, Color White</td>
</tr>
<tr>
<td>Cable Gland, M20x1.5 Stainless Steel.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adapter</strong></td>
</tr>
<tr>
<td>Adapter (Brass With Nickel Coating) M20 x 1.5 To 1/2 - 14 NPT (Internal Thread)</td>
</tr>
<tr>
<td>Adapter (ss) M20x1.5 to 1/2-14 NPT (Internal Thread)</td>
</tr>
</tbody>
</table>

(a) Not released
## Model Codes Accessories

### Accessories for SRD998

<table>
<thead>
<tr>
<th>Attachment Kits</th>
<th>EBZG</th>
</tr>
</thead>
<tbody>
<tr>
<td>For diaphragm actuators with casting yoke acc. NAMUR (incl. standard Couple lever)</td>
<td>-H</td>
</tr>
<tr>
<td>For diaphragm actuators with pillar yoke acc. NAMUR (incl. standard Couple lever)</td>
<td>-K</td>
</tr>
<tr>
<td>For FoxTop / FoxPak</td>
<td>-E1</td>
</tr>
<tr>
<td>For mounting to rotary actuators acc. VDI/VDE 3845 (without bracket)</td>
<td>-R</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 80 mm / 3.15 in; B = 20 mm / 0.79 in)</td>
<td>-C1</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 80 mm / 3.15 in; B = 30 mm / 1.18 in)</td>
<td>-C2</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 130 mm / 5.12 in; B = 50 mm / 1.97 in)</td>
<td>-C3</td>
</tr>
<tr>
<td>Brackets VDI/VDE 3845 (A = 130 mm / 5.12 in; B = 30 mm / 1.18 in)</td>
<td>-C4</td>
</tr>
<tr>
<td>Universal Brackets VDI/VDE 3845 (A = 80 or 130 mm; B = 20 or 30 or 50 mm)</td>
<td>-C5</td>
</tr>
</tbody>
</table>

### Couple Lever | EBZG |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard (stroke max. 80 mm)</td>
<td>-A</td>
</tr>
<tr>
<td>Extended (stroke max. 260 mm)</td>
<td>-A1</td>
</tr>
<tr>
<td>Reduced (stroke &lt; 8 mm)</td>
<td>-A2</td>
</tr>
<tr>
<td>Fold feedback lever (stroke 8 to 70 mm)</td>
<td>-A3</td>
</tr>
<tr>
<td>Short stroke (stroke 8 to 35 mm)</td>
<td>-A4</td>
</tr>
<tr>
<td>Couple Lever Folded (stroke special)</td>
<td>-A5</td>
</tr>
<tr>
<td>Extended (stroke max. 120 mm)</td>
<td>-B</td>
</tr>
</tbody>
</table>

### Carrier Bolt | SRXG |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Carrier bolt extra short 23 mm</td>
<td>-A</td>
</tr>
<tr>
<td>Adjustable carrier bolt 20 to 37 mm</td>
<td>-B</td>
</tr>
<tr>
<td>Carrier bolt 38 mm</td>
<td>-C</td>
</tr>
<tr>
<td>Carrier bolt 47 mm</td>
<td>-D</td>
</tr>
<tr>
<td>Carrier bolt 57 mm</td>
<td>-E</td>
</tr>
<tr>
<td>Carrier bolt 65 mm</td>
<td>-F</td>
</tr>
<tr>
<td>Adjustable carrier bolt with fixing system for stem diameter up to 21 mm</td>
<td>-G</td>
</tr>
<tr>
<td>Adjustable carrier bolt with fixing system for stem diameter up to 34 mm</td>
<td>-H</td>
</tr>
<tr>
<td>Carrier Bolt 80 mm</td>
<td>-I</td>
</tr>
<tr>
<td>Adjustable carrier bolt for thread 3/8&quot;</td>
<td>-J</td>
</tr>
<tr>
<td>Adjustable carrier bolt for thread 5/16&quot;</td>
<td>-K</td>
</tr>
<tr>
<td>Extension for carrier bolt</td>
<td>-L</td>
</tr>
<tr>
<td>Adjustable carrier bolt with fixing system centered for stem diameter up to 64 mm</td>
<td>-M</td>
</tr>
<tr>
<td>Adjustable carrier bolt with fixing system centered for stem diameter up to 21 mm</td>
<td>-G1</td>
</tr>
<tr>
<td>Adjustable carrier bolt with fixing system centered with extension up to 80 mm for stem diameter up to 21 mm</td>
<td>-G2</td>
</tr>
</tbody>
</table>
MOUNTING TO LINEAR ACTUATORS
Attachment to stroke actuators acc. to IEC 534-6 (NAMUR), left hand

MOUNTING TO LINEAR ACTUATORS
Direct attachment to stroke actuators
MOUNTING TO LINEAR ACTUATORS
Attachment to stroke actuators acc. to IEC 534-6 (NAMUR), right hand,
Mounting Bracket **EBZG-K**: 

Compact stainless steel attachment kit with Mounting Bracket **EBZG-H6**: 
MOUNTING TO ROTARY ACTUATORS

Delivery of bracket by manufacturer of actuator
DIMENSIONS – Attachment to rotary actuators

Attachment diagram of bracket

Linking piece

DIMENSIONS – Attachment to rotary actuators

Attachment diagram of bracket

Linking piece

DIMENSIONS – Attachment to rotary actuators

Attachment diagram of bracket

Linking piece

DIMENSIONS – Attachment to rotary actuators

Attachment diagram of bracket

Linking piece

DIMENSIONS – Attachment to rotary actuators

Attachment diagram of bracket

Linking piece

DIMENSIONS – Attachment to rotary actuators

Attachment diagram of bracket

Linking piece
DIMENSIONS
Components of Attachment kits (samples)

**Feedback lever** Code EBZG-A for 8 to 70 mm travel

**Feedback lever** Code EBZG-B for 60 to 120 mm travel

**Feedback lever** FlowPak/FlowTop in Code EBZG-E

**Feedback lever** Code EBZG-A1 for 100 to 260 mm travel

**Carrier bolt** for connection to valve stem

**Mounting bracket** e.g. EBZG-H-K
DIMENSIONS with manifold

SRD998 DIMENSIONS
DIMENSIONS with gauges and manifold
TYPICAL MOUNTING  SRD998 with Remote Mounting Unit RMU998-V
TYPICAL MOUNTING  SRD998 with Booster VBS201, directly flanged to SRD998, with connection to an Exhaust collecting system