

SRD991 Intelligent Positioner with HART, PROFIBUS-PA, FOUNDATION Fieldbus H1 or without Communication



The intelligent positioner SRD991 is designed to operate pneumatic valve actuators and can be operated from control systems, controllers or PC-based configuration- and operation tools such as the FDT/DTMs VALcare™ or Valve Monitor. The positioner is available with different communication protocols. The multi-lingual full text graphical-LCD, in conjunction with the 3 push buttons, allows a local configuration and operation. For installations in contact with explosive atmospheres, certificates are available.

DEVICE FEATURES

Intelligent

- ▶ Auto-start with self-calibration
- ▶ Self diagnostics, status and diagnostic messages
- ▶ Local operation with three key pads
- ▶ Multi-Lingual full text graphical LCD
- ▶ VALcare™ or Valve Monitor DTM for valve diagnostics and predictive maintenance

With communication

- ▶ HART, FOUNDATION Fieldbus H1, PROFIBUS-PA
- ▶ Configuration by means of local keys, handheld terminal (HART), PC with FDT-DTM or Digital Control Systems

Without communication

- ▶ Input signal 4 to 20 mA

COMMON FEATURES

- ▶ Stroke 8 to 260mm(0.3 to 10.2 in) with standard lever; larger stroke with special lever
- ▶ Angle range up to 95° (up to 300° as option)
- ▶ Supply air pressure up to 6 bar (90 psig), with spool valve up to 7 bar (105 psig)
- ▶ Single or double-acting
- ▶ Mounting on linear actuators according to NAMUR – IEC 60534-6-1 – VDI/VDE 3847
- ▶ Mounting on rotary actuators according to NAMUR VDI/VDE 3845 or IEC 60534-6-2
- ▶ Protection class IP 66 and NEMA 4X
- ▶ Approved for SIL applications
- ▶ Explosion protection: Intrinsic safety according to ATEX / IECEx, FM, CSA, INMETRO, NEPSI, 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.

OVERVIEW

The SRD991 consists of a basic device with a digital controller that supports different communication protocols (or also simply 4-20 mA input). Into this basic device, additional equipment can be built such as plug-in cards for electrical input/output signals, position feedback and pressure sensors.

The pneumatic part is available in different versions (single / double acting or spool valve). For very large actuators, boosters with increased air capacity can be flanged on. Also, different manifolds for connection of gauges can be flanged on. For the pneumatic screw connections, there are different threads in the housing and adapters.

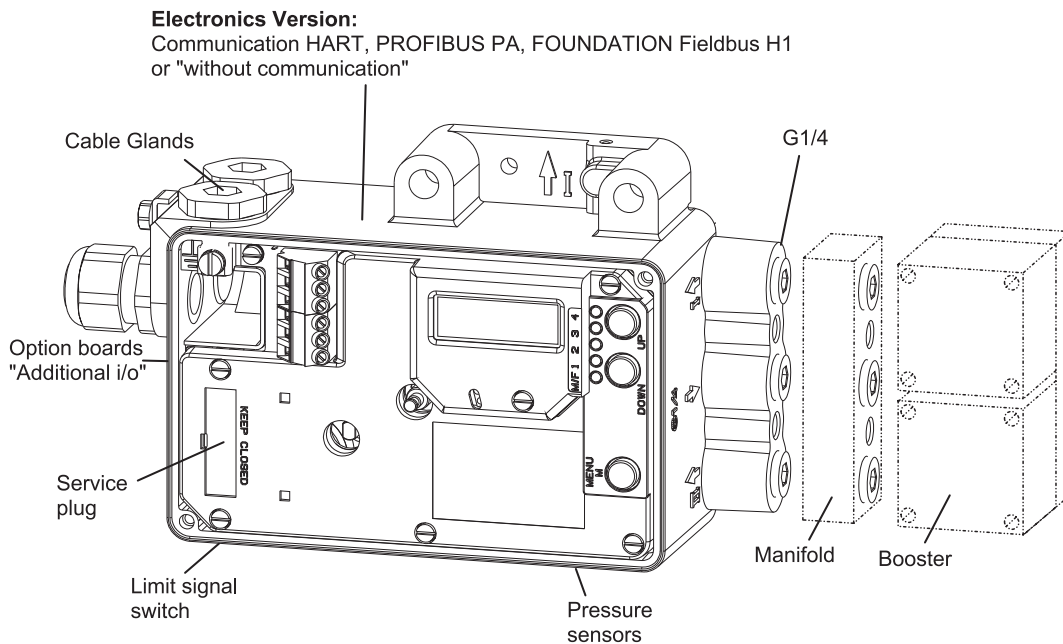
For use in hazardous areas, there are approvals according to ATEX / IECEx, FM, CSA, EAC, NEPSI, etc.

The device can be configured locally by means of push buttons and LCD / LED, or with PC + EDC82 Modem connected to the service plug of the SRD991. By means of communication, the device can be configured remotely via FDT/DTM.

For more information about the attachment kits for all common valves and actuators, see TI EVE0011 A.

For high temperature or high vibration application, we recommend mounting the SRD991 remotely and not directly on the valve. For this, use the RMU998. Refer to PSS EVE0118 for specifications.

Figure 1. Positioner SRD991 Electronics Version



To ensure the high performance of the positioner, see Advanced Diagnostics and Premium Diagnostics utilities as shown in Table 1.

Table 1. Advanced Diagnostics and Premium Diagnostics Utilities

	Premium Diagnostics	Advanced Diagnostics
Autostart	Yes	Yes
Custom Characterization	Yes	Yes
Auto diagnostic	Yes	Yes
Alarm Management	Yes	Yes
Alarm Output for Switching (with Option board)	Yes	Yes
Status List according to NE107	Yes	Yes
Position History	Yes	Yes
Response History	Yes	Yes
On Line Friction	Yes	
Stepping Signature	Yes	
Ramping Signature	Yes	
Sensitivity Signature	Yes	
Valve Signature	Yes	
PST (Partial Stroke Test)	Yes	
PST Predictive Maintenance	Yes	

Additional equipment, built into the basic device:

Option Board 2 Binary Inputs or	B	2 external switches (supplied by SRD) release a control function in the SRD, e.g. "close valve" (configurable)
Option Board 2 Binary Inputs/Outputs or	E	2 channels, each configurable as an input or output (to be supplied externally)
Option Board Position Feedback	F	1 output 4-20 mA (to be supplied externally) gives stroke / angle of rotation, 1 alarm output becomes active with a configurable event
Limit switch	T,U, R,V	Supplies NAMUR signals when exceeding or falling below of two limit values. Inductive sensors, independent of the controller, in normal or safety version or three-wire, or micro switches
	D	Entry for remote potentiometer of external potentiometer unit
Pressure sensors		2 sensors measure the pressure of supply air and output y1 for Premium Diagnostics ; the values are passed on via communication
LCD		Full text graphic LCD in 3 languages

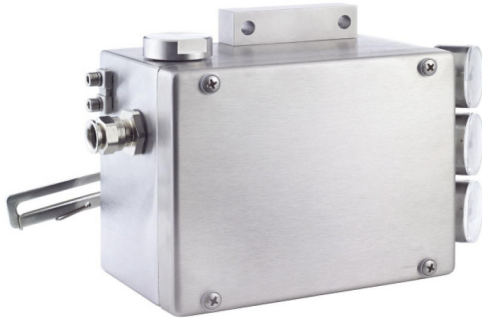
For more information about Manifolds and Boosters Accessories, see "MODEL CODES ATTACHMENT KITS".

SPECIAL VERSIONS OF SRD991

SRD991 Stainless Steel Housing

The SRD991 Stainless Steel Housing is ordered with model code SRD991-xxxxxxx-Zxxx.

Figure 2. SRD991 Stainless Steel Housing



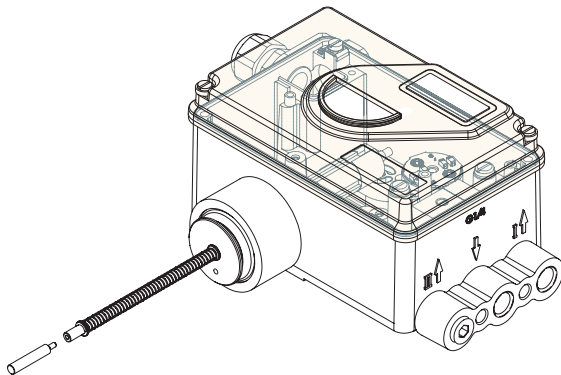
Refer to TI EVE0105 INOX for specifications. See DIMENSIONS INOX SRD991 in stainless steel housing.

SRD991 for Top Mounting onto small actuators

This version is designed for direct mounting on top of small actuators without yoke - solution for actuators up to 50 mm stroke.

Instead of the rotary potentiometer, a linear pot is used that feeds back the actual position of the actuator.

Figure 3. SRD991 for Top Mounting



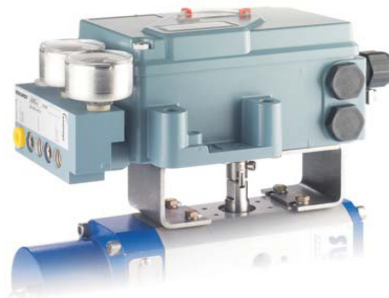
The Model Code of this basic device is SRD991-..... -W. The adapter part is dependent on the manufacturer and type of actuator and can be ordered under the code EBZG-TMxx.

Refer to TI EVE0105 TM for specifications.

You can contact Global Customer Support for information on the list of available adapter parts.

SRD991 designated for PST (Partial Stroke Test for Emergency Shut Down)

Final control elements in Emergency Shutdown (ESD) applications such as ON-OFF-, Blow Down and Venting valves remain in one position over a long time without any mechanical movement. These valves can show a tendency to get stuck and as a result might not operate upon demand. This can have a severe impact on the functionality of a Safety System and could result in an adverse condition to the operating personnel, plant equipment and the environment. The Partial Stroke Test (PST) allows operators a tool to identify the troubleshooting function of ESD valves. The test can be executed via the FDT-DTM based configuration diagnostic tool VALcare™/Valve Monitor.



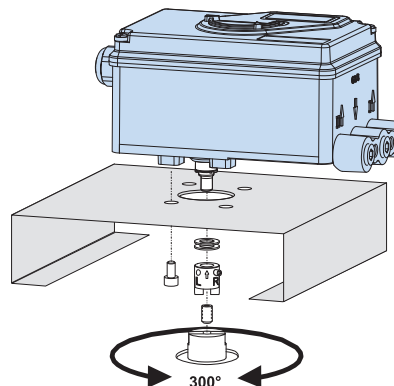
Refer to TI EVE0105 PST for more information.

SRD991 for Actuator with Rotation up to 300°

This version of the SRD991 is designed to be mounted by means of standard attachment kit (like the EBZG-R) onto rotary actuator with rotation up to 300°. This special version is made of a standard SRD991 with special gears. To be ordered under Options -J.

Refer to TI EVE0105 LR for more information.

Figure 4. SRD991 for actuator with rotation up to 300°



FUNCTIONAL SPECIFICATIONS (COMMON DATA FOR ALL VERSIONS)

Travel Range

Stroke range	8 to 260mm(0.3 to 10.2 in) with standard feedback levers; You can contact Global Customer Support for further assistance on special levers.
Rotation angle range	up to 95° without mechanical stop; up to 300° with Option -J.

Supply

Supply air pressure	1.4 to 6 bar (20 to 90 psig)
with spool valve (a)	1.4 to 7 bar (20 to 105 psig)
Output to actuator	<ul style="list-style-type: none"> ▶ 0 to ~100% of supply air pressure (up to 5.5 bar at 6 bar supply air pressure) ▶ with spool valve heavy duty (b): 4 to 10 bar
Air supply	according to ISO 8573-1 <ul style="list-style-type: none"> ▶ Solid particle size and density: class 2 ▶ Oil rate: class 3 ▶ Pressure dew point 10 K under ambient temperature

- a. Spool valve is the type of amplifier used in device SRD991-Cxxxx-S
- b. Spool valve heavy duty is the amplifier used in stainless steel version SRD991 - Cxx... - SZK

The use of filter regulator for air supply of positioner is strongly recommended. It reduces the air pressure to actuator's maximum pressure and keeps it constant. For supply with Natural Gas instead of compressed air, refer to TI EVE0105 G.

Air Output I_n/h (scfh)

At max. deviation, single and double acting:

Supply air pressure bar (psig)	1.4 (20)	3 (45)	6 (90)
Standard Amplifier	2700 (95)	5000 (177)	7500 (265)
with Spool Valve (a)	6000 (211)	12000 (423)	18000 (636)

- a. Spool valve is the type of amplifier used in device SRD991-Cxxxx-S.

Heavy duty spool valve⁽¹⁾ is able to deliver up to 55,000 In/h at 10 bar. Refer to TI EVE0105 INOX.

NOTE

Do not use boosters in connection with Spool valve.

1. Spool valve heavy duty is the amplifier used in stainless steel version SRD991 - Cxx... - SZK.

Air Consumption (Steady State) I_p/h (scfh)

Supply air pressure	1.4 (20)	3 (45)	6 (90)
single acting	80 (2.8)	130 (4.6)	220 (7.8)
double acting	130 (4.6)	230 (8.1)	430 (15.2)
Spool Valve	100 (3.5)	240 (8.5)	500 (17.7)

Response Characteristic⁽²⁾ (3)

Sensitivity	< 0.1% of travel span
Non-linearity (terminal based adjustment)	< 0.4% 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 10 to 60 Hz up to 0.14 mm, 60 to 500 Hz up to 2 g	< 0.25% of travel span

Volume Booster Series (to order as accessory)

For large actuators or to reduce action time, a volume booster may be necessary.

VBS200 / VBS201 / VBS202 / VBS203 / VBS204

- ▶ Volume booster with Cv 2 and pneumatic connection 1/2"
- ▶ VBS200 for remote mounting
- ▶ VBS201 for direct side mounting to positioner
- ▶ VBS202 for mounting according to VDI/VDE 3845
- ▶ VBS203 for mounting to actuators according to NAMUR NE04 and with flange interface for positioners according to VDI/VDE 3847
- ▶ VBS204 for mounting according to VDI/VDE 3845 double acting

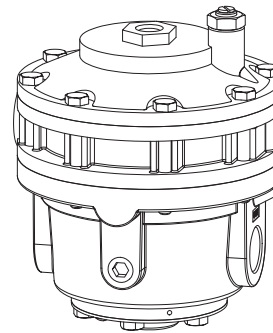
For more information, refer to PSS EVE0602.

VBS300 / VBS310

Volume boosters with Cv7 and pneumatic connection 1" for remote mounting

VBS300 in Aluminum, VBS310 in Stainless Steel 316. For more information, see PSS EVE0603.

Figure 5. Volume boosters with Cv 5

**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 is an adjustment and optimization to the actuator possible without additional manual settings. Several autostart modes are available.

Options

- ▶ Built-in independent inductive limit switches
- ▶ Pressure sensors for monitoring of air supply and output pressure I (y1)
- ▶ Additional inputs / outputs:
 - ▶ Position feedback 4-20 mA + binary alarm output, to be supplied external
 - ▶ 2 binary outputs (position alarms)
 - ▶ 2 binary inputs, to be supplied external
 - ▶ 2 contact inputs, internal supplied
 - ▶ 2 binary input / outputs, to be supplied external

2. Data measured according to VDI/VDE 2177.

3. With stroke 30 mm and lever length 90 mm.

Operation and Configuration

The local LCD enables configuration as well as diagnostics.

- Local : with local key pads
- Display : Multi-lingual Graphic LCD, some versions with 5 LEDs

The positioner in the version with LCD contains three different menu languages. Standard menu languages:

- ▶ English
- ▶ German

Freely selectable third language:

- ▶ French
- ▶ Portuguese
- ▶ Spanish
- ▶ Italian
- ▶ Swedish

The third menu language has to be selected and specified with the order, otherwise standard: French. The third, freely selectable menu language can be modified to another language by means of the VALcare™ DTM. (4)

The additional languages can be downloaded from the Schneider Electric website.

Diagnostics

In the field:

- ▶ Status and Diagnostic messages via LCD

Via VALcare™ or Valve Monitor DTM(5):

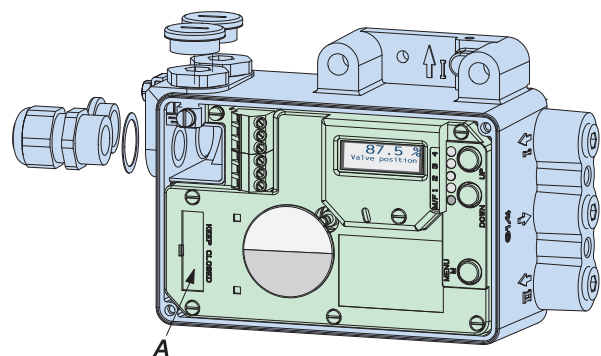
- ▶ Service Management for planning and scheduling of service intervals
- ▶ Histograms for displaying the position- and response history over time
- ▶ Partial Stroke Test for the functional inspection of safety related actuators
- ▶ Hours in operation, cycle counter and travel sum of the actuator are determined
- ▶ Surveillance of loop current
- ▶ Shows condition of device:
 - ▶ Potentiometer
 - ▶ IP Motor

- ▶ Exceeding range of actuator (possible indication for wear of plug or seat)
- ▶ Remaining control deviation (possible indication for jammed actuator, blocked valve stem or plug, insufficient air capacity/supply air pressure/positioning pressure)
- ▶ If equipped with pressure sensors (optional):
 - ▶ Monitoring of the stem friction
 - Histograms for displaying the friction-history over time
 - Surveillance of air supply and output pressure, each with display of physical value
- ▶ Additional diagnostical possibilities in control operation by means of external sensors (optional). See also the VALcare™ Documentation.

Service Plug

All basic devices are equipped with a service plug **A** at the front side. There via RS232 interface a PC with VALcare (DTM) can be connected via modem EDC82 (galv. separated, not Ex).

For information about EDC82 modem, refer to TI EVE0102 Y.



4. With the versions "Intelligent without communication" this is only possible with modem EDC82

5. For the SRD991 without communication the use of the service plug is necessary to have access at the diagnostic with DTM.

Manual Local and Remote Settings

Actuator mode ▶ Linear valve ▶ Rotary actuator	linear or rotary actuator ▶ left or right mounted ▶ opening clockwise or counter-clockwise
Characteristic of setpoint	linear, equal percentage, invers-equal percentage or custom (22 points)
Valve function	opens or closes with increasing setpoint
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
Working range	freely adjustable (for indication on LCD)
Manual adjustment of	P-gain, I-time, T63-time and dead band
Manual operation	Manual input of setpoint to drive the valve in steps of 12.5% or 1%
Pneumatic test	Function to test the pneumatic output
Workshop	input and angle calibration
LCD language	dependent on version
LCD orientation	dependent on version
PROFIBUS-PA	Bus address
FOUNDATION Fieldbus	Simulation Switch from Link Master to Basic Field Device

Software Supported Configurations:

- ▶ By means of Hand Held Terminal (HART)
- ▶ PC by means of VALcare Software

Failure Handling

In case of Single Acting, Safety position at

Air supply failure	pressure y1 = zero
Electric power failure	pressure y1 = zero
Failure of electronics	pressure y1 = zero

In case of Double Acting or spool valve amplifier, safety position at

Air supply failure	pressure y1 = zero / y2 = zero
Electric power failure	pressure y1 = zero / y2 = full air supply pressure
Failure of electronics	pressure y1 = zero / y2 = full air supply pressure

For all types of amplifiers (with FF H1 or Profibus PA)

Failure of communication is recognized by configurable watch dog with response delay of 0.1 s to 24 h

Behavior	configurable as ▶ pressure y1 = zero or ▶ stop at last value or ▶ a configured value
Diagnostic report	via communication and local LCD
Historical status	is set if alarm was activated at any time (also just short alarms)
Reset	by acknowledging

Spool Valve Amplifier for Single and Double Acting Application

Spool valve amplifier as option for the SRD991 can be used with double acting actuator and also with single acting actuator.

In case of single acting application, one of the pneumatic output must be closed:

- ▶ If y1 is used, y2 is closed and failure handling for Electric power failure and Failure of electronics becomes y1=zero.
- ▶ If y2 is used, y1 is closed and failure handling for Electric power failure and Failure of electronics becomes y2=full air supply.

SPECIFICATIONS (COMMON DATA FOR ALL VERSIONS)

Mounting

Attachment to Stroke Actuators

- ▶ direct, FlowPak/FlowTop with attachment kit EBZG-E
- ▶ for casting yoke, according to IEC 60534-6 (NAMUR) with attachment kit EBZG-H or -H1
- ▶ for pillar yoke, according to IEC 60534-6 (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 realised with special levers.

Attachment to Rotary Actuators

According to VDI/VDE 3845 with attachment kit EBZG-R

- ▶ For further attachment kits, see “MODEL CODES ATTACHMENT KITS”.
- ▶ For mounting orientation, see attachment dimensions in “DIMENSIONS”.

Materials

Housing and covers	Aluminum (Alloy No. 230) finished with DD-varnish
All moving parts of	
feedback system	1.4306 / 1.4571 / 1.4104
Attachment kits	V4A or Aluminum, finished with DD varnish
(depending upon version)	(Alloy No. 230)
Mounting bracket	Aluminum (Alloy No. 230)
Pneumatic diaphragms	PVMQ (Silicone elastomer, suitable for use in the paint industry)

Weight

Single acting	approximately 1.7 kg (3.7 lbs)
Double acting	approximately 2.0 kg (4.4 lbs)

Pneumatic Connection

- ▶ NAMUR mounting: G 1/4 for pipe diameter 6 to 12 mm (0.24 to 0.47 in) for air supply and outputs y1, y2 to the actuator; 1/4-18NPT with additional connection manifold
- ▶ Direct mounting: Instead of the output y1, an air connection on the back with O-ring will be used (closed at NAMUR mounting).

Electrical Connection

Line entry	1 or 2 cable glands 1/2-14 NPT or M20 x1.5 (others with Adapter AD-...)
Cable diameter	6 to 12 mm(0.24 to 0.47 in)
Screw terminals	2 terminals for input, 4 terminals for additional inputs/outputs;
Tightening torque	min. 0.5 Nm, max. 0.6 Nm
Wire cross section	solid wire 0.5 to 6 mm ² stranded wire 0.5 to 4 mm ²
crimped wire	0.5 to 2.5 mm ² (AWG 21-14)
Test sockets	integrated in terminals, for options and communicator connection

Ambient Conditions

Operating conditions	According to IEC 60654-1, the device can be operated at a class Dx location
Ambient temperature (a)	▶ Operation (b): -40 to 80°C (-40 to 176°F) ▶ Transport and storage: -40 to 80°C (-40 to 176°F)
Storage conditions	According to IEC 60721-3-1: 1K5; 1B1; 1C2; 1S3; 1M2
Indicators	▶ LCD (visible) (c): -25 to 70°C (-13 to 158°F) ▶ LEDs (if present): -40 to 80°C(-40 to 176°F)

Relative humidity	Up to 100%
Protection class (d)	<ul style="list-style-type: none"> ▶ According to IEC 60529: <ul style="list-style-type: none"> ▶ IP66 is the rating for the SRD991 with window (and without Dust Zone 20 approvals) ▶ IP65 is the rating of the SRD991 without window (and with Dust Zone 20 approvals) ▶ According to ANSI/UL50: <ul style="list-style-type: none"> ▶ Type 4X

- a. If the device is exposed to sunlight and the temperature may rise above 80°C / 176°F, we recommend a sun shade.
- b. Details see Certificates of Conformity. With Limit Switches Code T only -20°C; With Limit Switches Code R only -25 to 70°C
- c. Below -20°C the LCD reacts only slowly; above 70°C the background becomes dark.
- d. Under service as directed.

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 (a)	2014/30/EU
Low-voltage regulation	Not applicable

- a. With PROFIBUS or FOUNDATION Fieldbus only, if shield of wiring is grounded on both sides.

Safety

According to EN 61010-1 (or IEC 1010-1)	Safety class III Overvoltage Category I
Internal fuses	only with PROFIBUS or FOUNDATION Fieldbus, but not replaceable
External fuses	Limitation of power supplies for fire protection is observed according to EN 61010-1, appendix F (or IEC 1010-1)

ELECTRICAL CLASSIFICATION⁽⁶⁾⁽⁷⁾

See Certificates of Conformity, EX EVE0105 A.

Type of Protection “Intrinsically Safe” ATEX / IECEx

Marking	Ex ia IIC T4 Gb Ex ia IIC T6 Gb
Temperature classes	
Version with HART communication and "without communication"	T4 with explosion protection code EA4
Version with communications HART, FOUNDATION Fieldbus and PROFIBUS-PA:	T4 / T6 with explosion protection code EAA
Certificate of Conformity	IECEX EPS 16.0034 EPS 16 ATEX 1083

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

Profibus / Fieldbus		HART / no HART communication and 4-20mA	
Ui	24 V DC	Ui	30 V DC
Ii	380 mA	Ii	130 mA
Pi	5.32 W	Pi	0.9 W
Ci (a)	1.3 nF	Ci	1.3 nF
Li (b)	5 µH	Li	5 µH

- a. Ci: effective inner capacity
b. Li: effective inner inductivity

The supply connections have an inner capacity of max. 5.3 nF opposite the ground.

Ambient temperature ranges:

- Temperature class T4: -40°C to 80°C
Temperature class T6: -40°C to 55°C

Explosion Protection Zone 2 / 22

Installation of the SRD991 in potentially explosive atmospheres for Zone 2 / 22 (explosion protection II 3 G/D Ex ic Gc/Dc).

The Intelligent Positioner SRD991 in protection level intrinsic safety "ic" (II 3 G/D Ex ic Gc/Dc) can also be operated in potentially hazardous areas of Zone 2 / 22.

6. With appropriate order only.
7. National requirements must be observed.

Explosion Protection Zone 20

Ex II 1D Ex ia IIIC T 100°C Da

Electrical Data

Supply circuit in type of protection Intrinsic Safety Ex ia.

The positioner type SRD991 fulfills the requirements of explosion protection for the Equipment Group II and Category 1D in type of protection Intrinsic safety for dust with a maximum surface temperature of 100°C.

FM

IS / I, II, III / 1 / ABCDEFG / T4 Ta = 80°C,
T6 Ta = 55°C Entity; Type 4X; DOKZ 534 396 049
NI / I / 2 / ABCD; S / II, III / 2 / FG / T4 Ta = 80°C,
T6 Ta = 55°C; Type 4X

CSA

PROCESS CONTROL EQUIPMENT-Intrinsically Safe, Entity - For Hazardous Locations

Class I, Groups, A, B, C and D; Class II, Groups E, F and G; Class III:

Ex ia IIC T4/T6 IP65:

SRD 991 HART/4-20mA/Profibus/Fieldbus-abcdefgh-j

Positioner: 12-36 V dc, 4-20 mA, Intrinsically safe when installed as per submitter's Dwg DOKZ 534 396 067 or DOKZ 534 396 076; Temp. Code T4 at Max Amb. 80°C or T6 at Max Amb. 55°C.

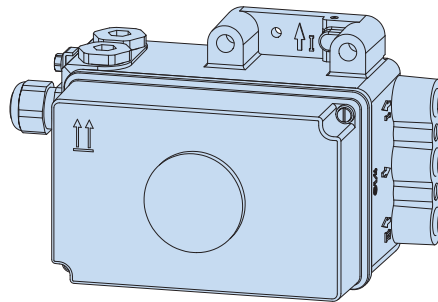
NOTE

Model Number is followed by suffix abcdefgh-j denoting minor mechanical differences and options not affecting safety.

NEPSI

The NEPSI certificate uses and expects the ATEX model codes EA4, EAA, ED4, EDA.

With Electrical Classification ATEX + Zone 20 Dust, Codes ED4 and EDA, the Travel indicator is not visible.



SRD991 WITH HART COMMUNICATION

SRD991-xHxxxx

Signal Input	Two wire system
Reverse polarity protection	Standard feature
Signal range	4-20 mA
Operating range	3.6 to 21.5 mA
Input voltage	DC 12 to 36 V (unloaded) (a)
Load	420 Ohms, 8.4 V at 20 mA
Communication signal	HART, 1200 Baud, FSK (Frequency Shift Key) modulated on 4-20 mA 0.5 Vpp at 1 kOhm load
Input impedance Zi	Z = 320 Ohms for ac voltage 0.5 to 10 kHz with < 3 dB non-linearity <ul style="list-style-type: none"> ▶ Cable capacity and inductance see HART standard specifications (e.g. C < 100 nF). ▶ Impedance of other devices at the input (parallel or serial) must be within HART spec. ▶ Applications without communication require not to exceed input capacitance parallel to the input not higher than 100 µF.
Start-up time	approximately 3 sec
Interruption time without power down: with LCD	typ. 80 ms (b)

- a. On request we can specify higher voltage limits
- b. Worst case conditions 4-20 mA, with position feedback option, i/p-output with max. current.

Configuration

The SRD991 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 local key pad and LCD display. See “Operation and Configuration”

DTM (Device Type Manager)

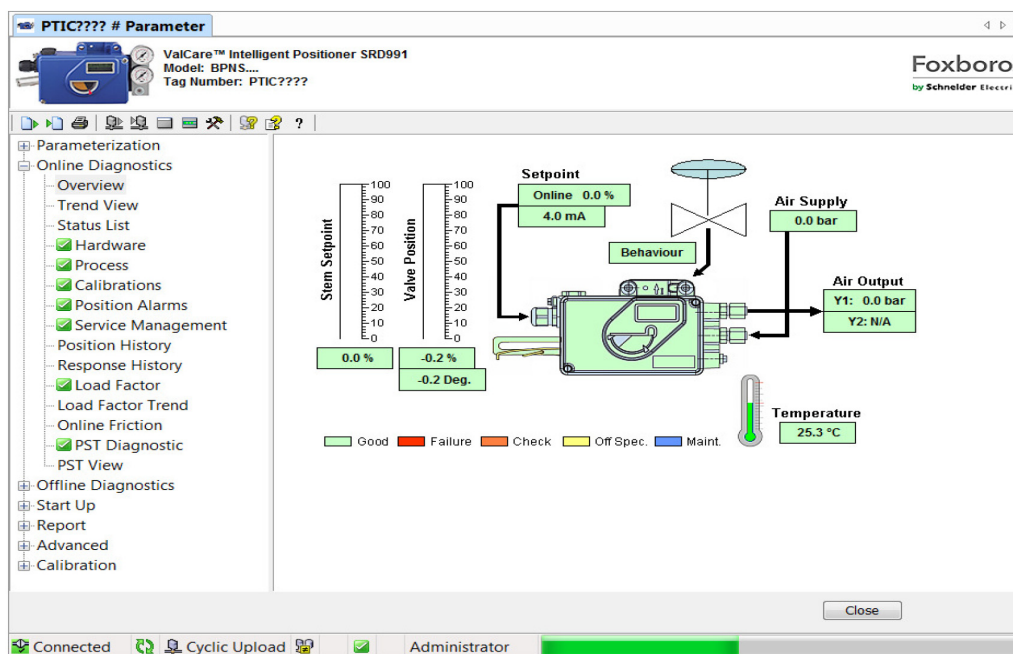
For more information on the FDT-DTM technology, visit <https://www.fdtgroup.org/products/fdt-dtm/>.

The is DTM fully certified for its interoperability and with the state-of-the-art presentation and diagnostics features. The DTM can be downloaded from Schneider Electric website.

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 Schneider Electric website.

Figure 6. Intelligent Positioner SRD 991



SRD991 WITH COMMUNICATION PROFIBUS-PA AND FOUNDATION FIELDBUS H1

SRD991-xPxxxx or SRD991-xQxxxx

PROFIBUS-PA

Data transfer	according to PROFIBUS- PA profile class B based on EN 50170 and DIN 19245 part 4
GSD file	download the file from the Schneider Electric website.

Configuration

Local / Display	See “Operation and Configuration”.
Software	VALcare™ -DTM
Hardware	PC- or PCMCIA- interfaces from Softing
EcoStructure™ Foxboro DCS	FBM 223 in combination with CP60
Other control systems	All Profibus-PA- compatible, e.g. Siemens SIMATIC PDM (Process Device Manager)

FOUNDATION FIELDBUS H1

Data transfer - FF Specification Rev. 1.4, Link-Master (LAS)

Two revisions of Firmware can be selected for the FOUNDATION Fieldbus devices in the model code of the positioner. The selection of the Firmware revision is depending of the DCS compatibility, the DD Files already installed in the DCS and the installed base on your site.

Check interoperability of following characteristics with your DCS before placing an order.

When selected Firmware FF16 in the model code	
Certified according to	ITK 4.6
Function Blocks	PID, AO, 2xDI, 1xDO Transducer, Resource
When selected Firmware FF18 in the model code	
Certified according to	ITK 6.0.1
Function Blocks	PID, AO, 4xDI, 1xDO, IS, OS, AI, MAI, Transducer, Resource

Additional functionality	Flat Addressing
DD files	download the files from the Schneider Electric website.

Configuration

Local / Display	see "Operation and Configuration"
Software	VALcare™ -DTM or National Instruments NI-FBUS configurator
Hardware	FBUS-interfaces from National Instruments (AT-FBUS and PCMCIA-FBUS)
EcoStruxure™ Foxboro DCS	FBM220 or FBM221 in combination with CP60
Other control systems	All FOUNDATION Fieldbus H1- compatible, e.g. SMAR, Fisher Rosemount Delta-V, Honeywell, Yokogawa, ABB

For both Fieldbus Devices

Input signal	digital
Supply voltage	DC 9 to 32 V (a)
max. Supply voltage	DC 36 V
Operating current	10.5 mA ± 0.5 mA (base current)
Current amplitude	± 8 mA
Fault current	Base current + 0 mA (base current + 4 mA by means of independent FDE-safety circuit) according to IEC 61158-2
Operating values	according to IEC 61158-2
Start-up time (init phase)	approx. 2 sec
Bus connection	Fieldbus interface based on IEC 61158-2 according to FISCO-Model
Power supply	Power supply is achieved dependent on the application by means of fieldbus power supply units or segment coupler

a. Data of Intrinsically Safe version.

Electrical Classification thereto

See "ELECTRICAL CLASSIFICATION".

SRD991 WITHOUT COMMUNICATION

SRD991-xDxxx

Signal Input	Two wire system
Reverse polarity protection	Standard feature
Signal range	4-20 mA
Operating range	3.6 to 21.5 mA
Input voltage	<ul style="list-style-type: none"> ▶ For SRD991-xDxxxx, DC 8.5 to 36 V (unloaded) (a) ▶ For SRD991-xDFxxx, DC 12 to 36 V (unloaded)
Load (b)	<ul style="list-style-type: none"> ▶ For SRD991-xDxxxx, 300 Ohms, 6 V at 20 mA ▶ For SRD991-xDFxxx, 420 Ohms, 8.4 V at 20 mA
Start-up time	approx. 3 sec
Interruption time without power down with LCD	typ. 80 ms (c)

- a. On request we can specify higher voltage limits.
- b. With applications without communication the capacity parallel to input may not be higher than 100°F.
- c. Worst case conditions 4-20 mA, with position feedback option, i/p-output with max. current

Configuration

Local / Display	See "Operation and Configuration".
Software	VALcare™ DTM
Hardware	per modem EDC82 or EDC90

Electrical Classification thereto

See "ELECTRICAL CLASSIFICATION".

OVERVIEW ADDITIONAL EQUIPMENT

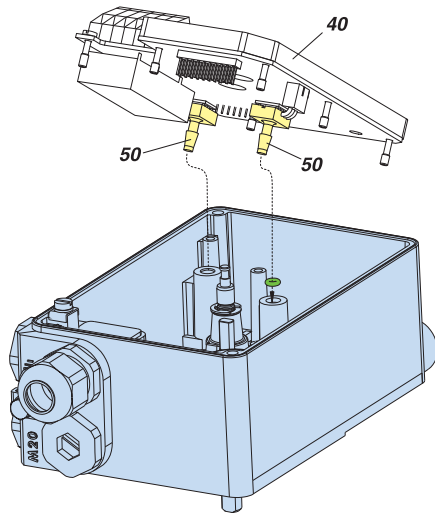
(built into any basic device)

Built-in Pressure sensors for Premium Diagnostic, Code Option –B

For supply air and output y1 to actuator

Measuring range	0 to 8 bar (0 to 120 psig)
Accuracy	2%
Temperature influence	0.5% / 10 K (-40 to 80°C)

Figure 7. Built-in Pressure sensors



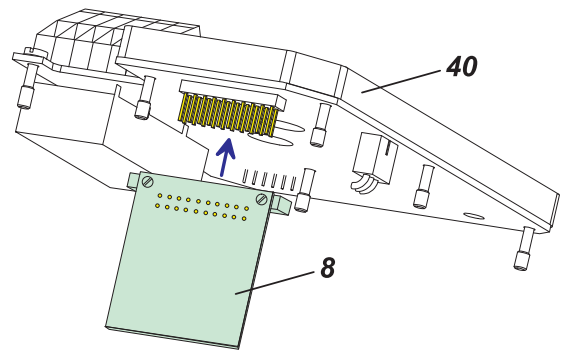
Pressure sensors 50

Additional Inputs / Outputs:

One module Additional inputs / outputs 8 can be plugged onto main electronics 40 as shown in Figure 8.

- ▶ 2 Binary inputs or
- ▶ 2 Binary in/outputs or
- ▶ Position feedback and Alarm

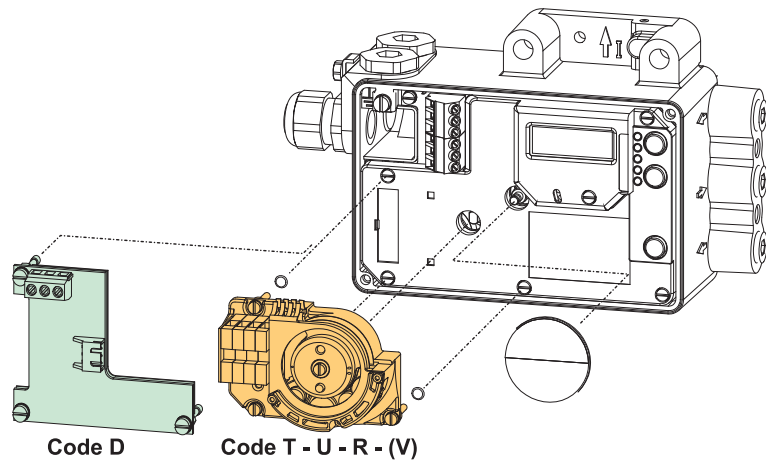
Figure 8. Additional Inputs / Outputs



Built-in Limit Switch

See Figure 9 for more details.

Figure 9. Built-in Limit Switch



Parts Kits

For additional installation of auxiliary functions

Table 2. Parts Kits for additional installation of auxiliary functions

	Supply	Parts Kit
Model codes, Additional inputs / outputs		
Code B: 2 Binary inputs (Contact inputs)	internal	EW 411 407 325
Code E: 2 Binary in/outputs	external	EW 411 407 956
Code F: Position feedback 4-20 mA and Alarm (ATEX)	external	EW 426 434 228
Model codes, Limit signal switches		
Code T: Limit signal switch, normal version	external	EW 426 164 012
Code U: Limit signal switch, security version	external	EW 426 164 021
Code R: Limit signal switch, 3-wire	external	EW 426 164 057
Code V: Limit signal switch, micro switches	external	EW 426 164 066
Code D: Entry for remote potentiometer	internal	EW 426 164 093

ADDITIONAL EQUIPMENT BUILT INTO ANY BASIC DEVICE

Additional Inputs / Outputs: Two Binary (Contact) inputs – Code B

Two independent binary inputs, supplied with the basic device, for connection of external switches.

A connected switch is loaded with 3.5 V, 150 µA. This option 'Binary inputs' can also be used to activate PST (Partial Stroke Test).

The binary inputs can be used for diagnostics or are also configurable for the control functions:

Switch 1	Switch 2	Actuator Control Function
close	close	normal operation
open	close	go to stop at 0%
open	open	go to stop at 100%
close	open	hold last position

Terminals for

- ▶ EB1: K2/1 +: 13
K2/2 -: 14
- ▶ EB2: K3/1 +: 15
K3/2 -: 16

For further information about the contact inputs, refer to TI EVE0105 B.

Electrical Classification ATEX / IECEx

For types of protection and temperature classes of basic device, see "ELECTRICAL CLASSIFICATION".

Additions for this option in EU-Type Examination Certificate IECEx EPS 16.0034 and EPS 16 ATEX 1083:

To this electric circuit only passive electric circuits galvanically separated from earth may be attached.

The electric circuit has the following maximum values:

$U_o = 7.88 \text{ V}$,

$I_o = 11.4 \text{ mA}$,

$P_o = 23 \text{ mW}$

Characteristic is linear.

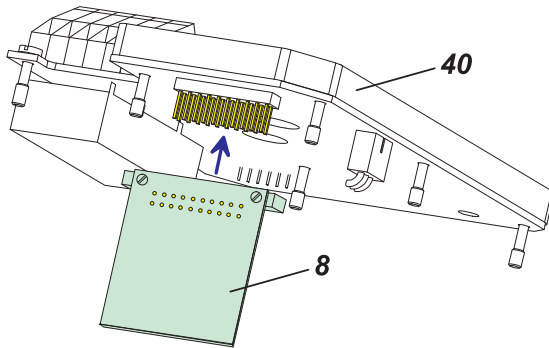
For the maximum values of outer inductances and capacities L_o and C_o refer to the following table (L_i and C_i included):

IIC		IIB	
L_o [mH]	C_o [fF]	L_o [mH]	C_o [fF]
100	0.72	100	3.9
10	1.1	10	5.5
1	1.6	1	8.7
0.1	2.7	0.1	15
0.01	4.7	0.01	27

OVERVIEW ADDITIONAL EQUIPMENT

The electric circuits of "2 binary inputs" are galvanically connected with all other circuits and isolated from earth.

Figure 10. Additional Inputs / Outputs

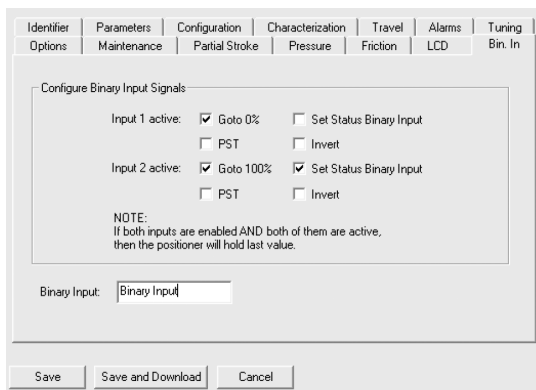


One module Additional inputs / outputs 8 can be plugged onto main electronics 40 as shown in Figure 8.

- ▶ 2 Binary inputs or
- ▶ 2 Binary in/outputs or
- ▶ Position feedback and Alarm

DTM Configuration Window

Figure 11. DTM Configuration Window



Additional Inputs / Outputs

Two Binary In / Outputs – Code E

This option board is recommended for PST applications.

Output

2 galvanically separated signals. Limit signals / alarms freely configurable via local keys or via communication.

Two-wire system, according to DIN 19234, for external supply.	
Supply voltage	DC 8 to 36 V (a) (b)
Configured as NAMUR signal: Logic:	
Limit value not exceeded	< 1 mA
Limit value exceeded	typ. 6 mA
Device fault	< 50 µA
Configured as On/Off signal:	
Limit value not exceeded	< 50 µA
Limit value exceeded	> 20 mA/20 V / > 40 mA/10 V (power derated)
Reference: AB1 for upper, AB2 for lower limit value	
Terminals for AB1	K2/1 + : 81 K2/2 - : 82
Terminals for AB2	K3/1 + : 83 K3/2 - : 84

- a. Other values in hazardous areas.
- b. On request we can specify higher voltage limits.

Input

The kind of Signals Input can be configured as On/Off or as NAMUR signal in accordance to DIN 19234.

Configured as NAMUR signal:	
Unloaded supply voltage	> 8 V
Input:	
Logic 0	> 0.35 mA, < 1 mA
Logic 1	> 2.2 mA, < 6 mA
Input current Limited to	approx. 6 mA
Configured as On/Off signal:	
Input:	
Logic 0	< 4 mA
Logic 1	> 6 mA
Signal Voltage Range	8 to 36 V (a)

a. Other values in hazardous areas.

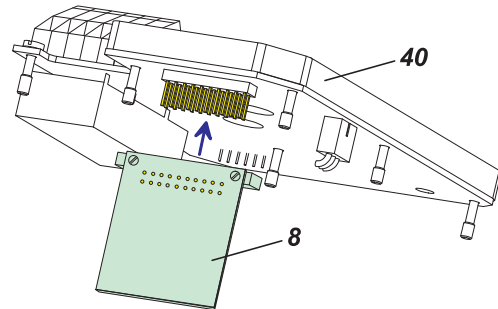
Electrical Classification ATEX / IECEx

Types of protection and temperature classes as basic device, see “ELECTRICAL CLASSIFICATION”.

Additions for this option in EU-Type Examination Certificate IECEx EPS 16.0034 and EPS 16 ATEX 1083. For use in hazardous areas in circuits certified as intrinsically safe with the maximum values as described in the EU-Type Examination Certificate in chapter “Option UNI-IO”.

The circuits Channel 1 and Channel 2 are electrically safe separated from each other, from all other external circuits and from earth.

Figure 12. Additional Inputs / Outputs

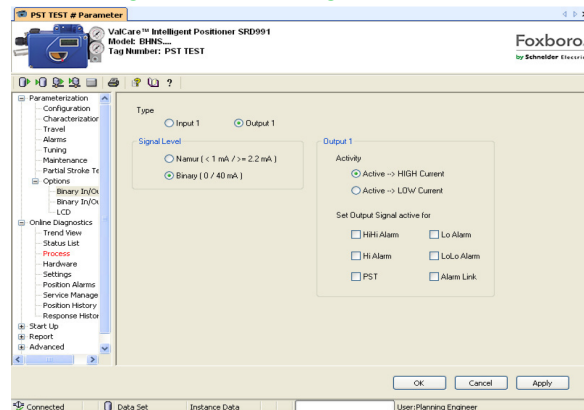


One module Additional inputs / outputs 8 can be plugged onto main electronics 40.

- ▶ 2 Binary inputs or
- ▶ **2 Binary in/outputs** or
- ▶ Position feedback and Alarm

DTM Configuration Window

Figure 13. DTM Configuration Window



OVERVIEW ADDITIONAL EQUIPMENT

Additional Inputs / Outputs – Code F**Position Feedback 4-20 mA and Alarm**

with electrical classification ATEX / IECEx

Stroke / angle derived from positioner feedback 1 output analog, galvanically separated, two-wire system according to DIN 19234, for external supply

Supply voltage	DC 8 to 36 V (a) (b)
Signal range	3.8 to 20.5 mA
0% and 100% configurable	
Device fault	< 50 μ A
Terminals for AI1	K3/1 + : 83 K3/2 – : 84

- Other values in hazardous areas
- On request we can specify higher voltage limits

Feedback signal can be reversed (20 --> 4 mA).

1 binary alarm output, galvanically separated, two-wire system, according to DIN 19234, for external supply

Supply voltage	external, DC 8 to 36 V
Logic	<ul style="list-style-type: none"> ▶ no alarm: < 1 ▶ alarm: > 3 mA ▶ device fault < 50 μA
Configurable as switch output	
Limit value not exceeded	< 50 μ A
Limit value exceeded	> 20 mA/20 V / > 40 mA/10 V (power derated)
Terminals for AB1	K2/1 + : 81 K2/2 – : 82

The binary output for Alarm will be activated in the following cases:

- ▶ Remaining control deviation
- ▶ Circuit to I/P module is disturbed
- ▶ Circuit to potentiometer is disturbed
- ▶ Calibration error:
 - ▶ no angle calibration
 - ▶ no current calibration
- ▶ Autostart failed

These pre-settings can be configured via communication with the Alarm Link function in the DTM.

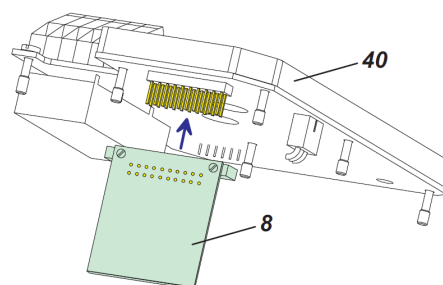
Electrical Classification ATEX / IECEx:

Types of protection and temperature classes as basic device, see “ELECTRICAL CLASSIFICATION”.

Additions for this option in EU-Type Examination Certificate IECEx EPS 16.0034 and EPS 16 ATEX 1083:

For use in hazardous areas in circuits certified as intrinsically safe with the maximum values as described in the EU-Type Examination Certificate in chapter “Option UNI-IO”. The circuits Channel 1 and Channel 2 are electrically safe separated from each other, from all other external circuits and from the earth.

Figure 14. Additional Inputs / Outputs



One module Additional inputs / outputs 8 can be plugged onto main electronics 40 as shown in Figure 8.

- ▶ 2 Binary inputs or
- ▶ 2 Binary in/outputs or
- ▶ **Position feedback and alarm**

DTM Configuration Window

See Figure 15 and Figure 16 for more information.

Figure 15. DTM Configuration Window 1

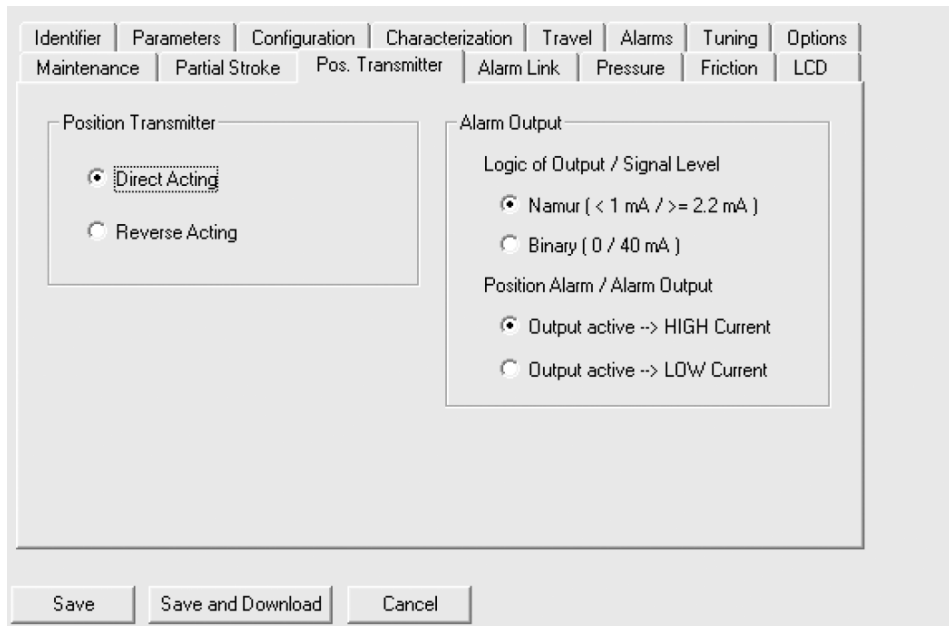
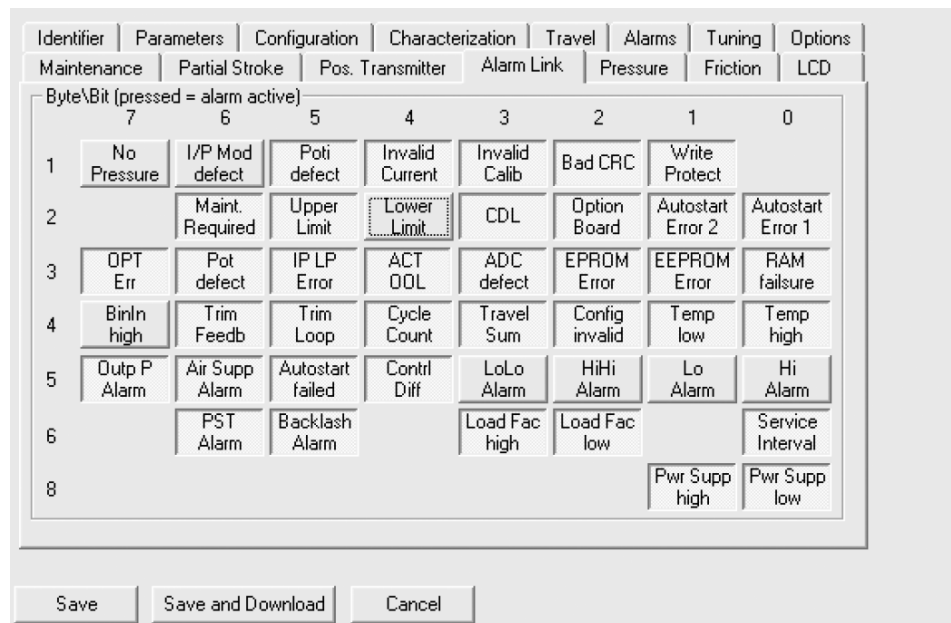


Figure 16. DTM Configuration window 2



ENTRY FOR REMOTE POTENTIOMETER

(for remote mounting main unit) – Code D

This remote application is used in applications where high temperatures or vibration are present and can result in negative influences on the control. It can also be used in places not easy to reach, to ensure an easier handling of the unit, or for cylinders with large strokes.

The Positioner SRD991 (Remote unit) is mounted far away from the valve or cylinder in a safe environment.

The Potentiometer unit is dismantled on the valve or cylinder. This potentiometer unit can be made of a derivative version of the SRI990 positioner (only potentiometer in the housing) or of an external potentiometer like a linear potentiometer for application onto cylinders, for example.

This option is to be used with a potentiometer unit 3 wires system with approx. 5 kOhm resistance.

If the following requirements are observed, the set-up is insensitive to electrical disturbances caused by high electromagnetic fields, EMC and HF-radiation.

Cable Length max - 10 m (32 ft)

Cable Specification:

- ▶ 3-wire twisted pair, shielded
- ▶ Shield needs to be connected on both ends to the internal ground
- ▶ Shield endings need to be kept very short when connecting to the ground
- ▶ A HF cable gland is not required

For more information about remote mounting, refer to TI EVE0105 R.

NOTE

The functionality and certifications are only ensured with the 5 kOhm potentiometer.

Electrical Classification ATEX / IECEx:

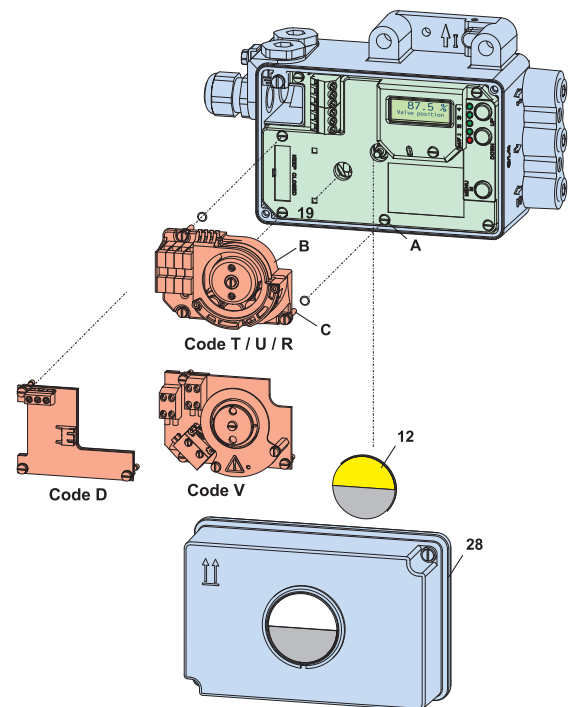
Types of protection and temperature classes as basic device, see “ELECTRICAL CLASSIFICATION”.

Additions for this option in EU-Type Examination Certificate IECEx EPS 16.0034 and EPS 16 ATEX 1083:

For use in hazardous areas in circuits certified as Intrinsically Safe with the following maximum values:

- ▶ $U_{max} = 6.5 \text{ V}$
- ▶ $I_{supply} = 25 \text{ mA}$
- ▶ $I_{wiper} \leq 1 \text{ mA}$
- ▶ $P_{total} \leq 40 \text{ mW}$

Figure 17. Remote Mounting Main Unit



BUILT-IN LIMIT SWITCHES

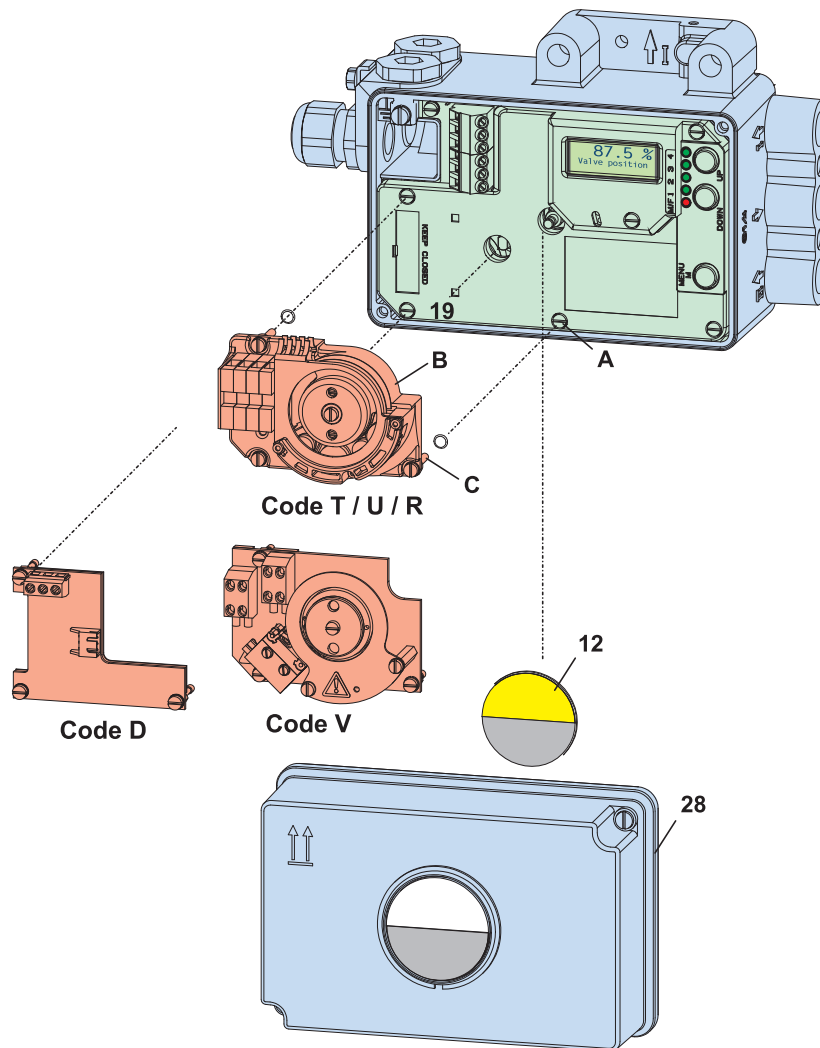
Stroke / Angle derived from Positioner Feedback

Standard version (SJ2-N)	Code T (only to -20°C)
Security version (SJ2-SN)	Code U
3-wire (SI2-K08-AP7/ PNP)	Code R (no Ex, -25 to 70°C)
Micro switches (V4NS)	Code V (no Ex)
Entry for remote potentiometer	Code D

Materials

- ▶ Control vanes - Aluminum
- ▶ Transmission shaft - 1.4571

Figure 18. Remote Mounting Main Unit



Inductive Limit Switch (CODE T, U)

Output	2 inductive proximity sensors according to DIN 19 234 or NAMUR for connection to switching amplifier (a)
Current consumption	
Vane clear	> 2.2 mA
Vane interposed	< 1 mA
for control circuit with the following electrical values	
Supply voltage	DC 8 V, R _i approx. 1 kOhm
Supply voltage range	DC 5 to 25 V (with no Ex)
Residual ripple	< 10% p.p.
Permissible line resistance	< 100 Ohms
Response characteristic (b) (c)	
Switching differential	< 1%
Switching point repeatability	< 0.2%
Terminals for	
GW1	41+, 42-
GW2	51+, 52-

- a. Operating mode min. (= low) / max. (= high) selectable by adjustment of switch vanes.
- b. Data measured according to VDI/VDE 2177.
- c. With stroke 30 mm and lever length 90 mm.

Electrical Classification ATEX / IECEx of Versions "T" and "U":

Types of protection and temperature classes as basic device, see "ELECTRICAL CLASSIFICATION".

Additions for this option in EU-Type Examination Certificate IECEx EPS 16.0034 and EPS 16 ATEX 1083:

For use in hazardous areas in circuits certified as Intrinsically Safe with the following maximum values:

- U_i= 16 V,
- I_i= 25 mA,
- P_i= 64 mW

SJ2-N (Code T) -> P_i = 34 mW

SJ2-SN (Code U) -> P_i = 64 mW

Internal capacitance and inductance:

- C_i= 30 nF,
- L_i= 100 µH

The electric circuits of "Built-in Limit Switch" are galvanically separated from all other circuits and from earth.

Inductive Limit Switch, Three-wire System – CODE R

Input	Stroke / angle from actuator via positioner feedback lever
Output	2 inductive proximity sensors, three-wire system, LED indication, contact, pnp (a)
Supply voltage U _S	DC 10 to 30 V
Residual ripple	± 10%, U _S = 30 V
Switching frequency	2 kHz
Constant current	100 mA
Response characteristic (b)	
Gain	continuously adjustable from 1:1 to approx. 7:1
Switching differential	< 1%
Switching point repeatability	< 0.2%
Terminals for	
GW1	42
GW2	52
Supply	41+, 43-

- a. Data measured according to VDI/VDE 2177.
- b. Operating mode normally open / normally closed selectable by vane adjustment

Mechanical Switches (Micro Switches) - CODE V

only without Ex protection

Stroke / angle derived from positioner feedback lever

Output	2 mechanical switches (Micro switches) (a) (b)
Manufacturer	Saia-Burgess
Type	V4NS-C4-AC1-UL (UL- and CSA-approved)
Parts set for subsequent mounting:	
Code V	EW 426 164 066
Absolute limit values AC of mechanical switches built into positioner:	
U _{max}	130 V AC (c)
I _{max}	0.5 A (resistive Load)(c)
I _{max}	0.03 A (inductive Load) (d)

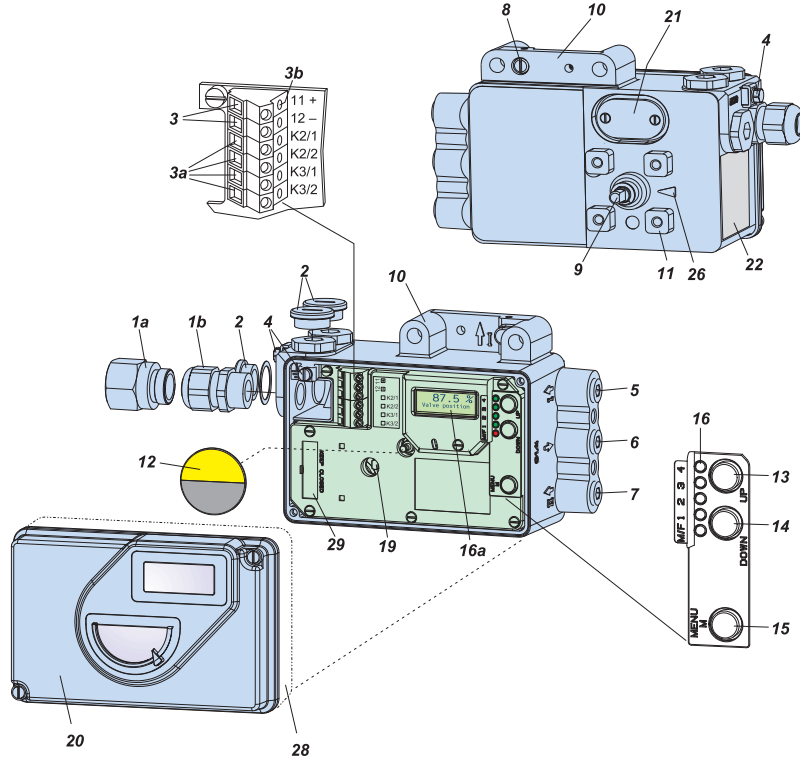
Absolute limit values DC of mechanical switches built into positioner: (e)	
U _{max}	30 V
DC I _{max}	1 A
Switching Differential	< 2.5%
Terminals for:	
SW1	41, 42
SW2	51, 52

- a. Operating mode min. (=low) / max. (=high) selectable by adjusting the respective vane
- b. Operating mode normally open / normally closed selectable by vane adjustment
- c. Approval according to UL (UL 1054) and CSA (CSA 22.2 No. 55) at 6,000 operations and T = 65°C / 149°F
- d. Based on EN 61058-1, at 10,000 operations and T = 85°C / 185°F
- e. General rating at 50,000 operations and T = 85°C / 185

The circuit of the mechanical switches have to be protected by a suitable fuse. The diameter of the protective conductor needs to be at least 1.5 mm² / AWG 16.

FUNCTIONAL DESIGNATIONS

Figure 19. Functional Designations



- 1a** Adapter, e.g. 1/2"-14 NPT
- 1b** Cable gland
- 2** Plug, interchangeable with Pos.1
- 3** Screw terminals (a) (11 / 12) for input (w) or for bus connection IEC 61158-2
- 3a** Screw terminals (a) for additional inputs / outputs
- 3b** Test sockets Ø 2 mm, integrated in terminal block
- 4** Ground connection
- 5** Female thread (c) 1/4 -18 NPT for output I (y1)
- 6** Female thread (c) 1/4 -18 NPT for air supply (s)
- 7** Female thread (c)1/4 -18 NPT for output II (y2)
- 8** Direct attachment hole for output I (y1)
- 9** Feedback shaft
- 10** Connection manifold for attachment to stroke actuators (not with VDI/VDE 3847 version)
- 11** Connection base for attachment to rotary actuators
- 12** Travel indicator
- 13** Key UP
- 14** Key DOWN
- 15** Key M (Menu)
- 16** Status display (1 red LED, 4 green LEDs) (b)
- 16a** LCD with true text in 3 different languages
- 19** Fixing shaft for limit switch
- 20** Cover with window to 12
- 21** Air vent, dust and water protected
- 22** Data label
- 26** Arrow is perpendicular to shaft 9 at angle 0 degree
- 28** High cover with built-in limit switch
- 29** Plug for service connector

- a. Alternatively Cage clamps (WAGO) instead of screw terminals.
- b. Depending on the version, the device is equipped with or without LEDs.
- c. With marked letter "G" in the housing the pneumatic connecting threads are cut as G 1/4 instead of 1/4-18 NPT.

MODEL CODES SRD991

<u>Description</u>	<u>Model</u>
Intelligent Positioners	SRD991
Version	
Single Acting	-B
Double Acting	-C
Input/Communication	
Intelligent without communication (4 - 20 mA)	D
HART Communication (4 - 20 mA)	H
PROFIBUS-PA (according to FISCO)	P
FOUNDATION Fieldbus H1 (incl. PID-Fct. Block, according to FISCO)	Q
Additional Inputs/Outputs	
Prepared for Additional In-/Outputs	N
Binary Inputs (a)	B
Binary Inputs-Outputs (mandatory for ESD application) (a)	E
Position Feedback 4 - 20 mA and one Binary Output for Alarm	F
Built-In Limit Switch	
Without Built-In Limit Switch	S
Inductive Limit Switch - Intrinsically Safe (Standard Version SJ2-N)	T
Inductive Limit Switch - Intrinsically Safe (Security Version SJ2-SN)	U
Inductive Limit Switch - Three wire version (b)	R
Mechanical Switches (Micro-Switches) / UL- and CSA-approved (b)	V
Potentiometer Input - CEM Filter (for Remote Mounting - main unit) (c)	D
Cable Entry	
M20 x 1.5 without Cable Gland	1
1/2"-14 NPT (with Adapter(s) M20x1.5 to 1/2"-14 NPT)	6
M20 x 1.5 with One Plastic Cable Gland	7
Electrical Classification	
Without Ex	ZZZ
for Input/Communication D, H (d)	
for Input/Communication H, F (e)	
II 2 G Ex ia IIC T4 Gb according to ATEX / IECEx (f)	EA4
II 2 G Ex ia IIC T6 Gb according to ATEX / IECEx (g)	EAA
II 3 G/D Ex ic T4 Gc/Dc according to ATEX	2C4
II 3 G/D Ex ic T6 Gc/Dc according to ATEX	2CA
II 2 G Ex ia IIC T4 Gb + II 1D Ex iaD 20 T100°C Da according to ATEX / IECEx (f)	ED4
II 2 G Ex ia IIC T6 Gb + II 1D Ex iaD 20 T100°C Da according to ATEX / IECEx (g)	EDA
FM Nonincendive for Class I, Division 2, Groups A, B, C, D, Hazardous Locations Indoors and Outdoors, Type 4X	NFM
for Input/Communication D, H (d)	
FM Approved for Intrinsic Safety Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors and Outdoors, Type 4X	FAA
for Input/Communication D, H (d)	
CSA Approved for Intrinsic Safety Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors and Outdoors, Type 4X	CAA
for Input/Communication D, H (d)	
EAC Approved for Intrinsic Safety Ex ia IIC T4 (f)	RU4
EAC Approved for Intrinsic Safety Ex ia IIC T6..T4 (g)	RU6
NEPSI – Ex ia IIC T4/T6 Gb Ex iaD 20 T100°C IP65	
INMETRO – Ex ia IIC T6 Gb (-40°C <= Tamb <= +55°C) IP66	BA6
INMETRO – Ex ia IIC T4 Gb (-40°C <= Tamb <= +80°C) IP66	BA4
Attachment Kit	
Order as Auxiliary	N

MODEL CODES SRD991 (CONTINUED)

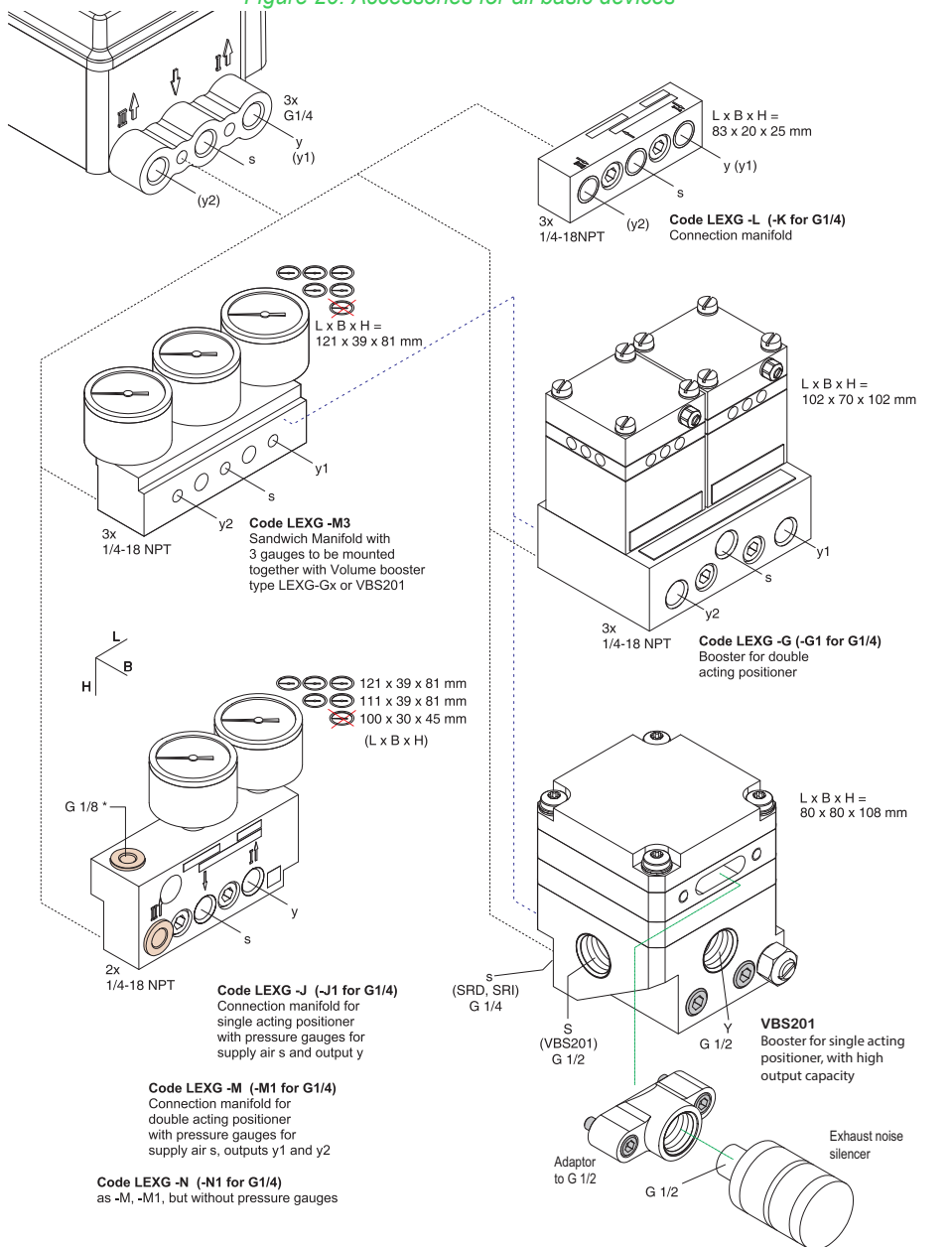
Description	Model
Intelligent Positioners	SRD991
Manifold	
Pneumatic connection 1/4 - 18 NPT made of an additional manifold	Y
Pneumatic connection G 1/4	R
OPTIONS	
Premium Diagnostics Features (made with built-in Pressure Sensors) (h)	-B
Positioner free of copper and its alloys (i)	-C
Pneumatic Amplifier in the "Spool Valve" Version (j)	-S
Approved for SIL2 / SIL3 application	-Q
Custom Configuration	-T
With Russian Passport	-R
Version of Positioner according to VDI/VDE 3847	-N
Version for ESD Valve with PST functionalities (k)	-E
Rotating angle up to 300°	-J
Stainless Steel Housing (l)	-Z
Stainless Steel Housing without SST gauges (ll)	-Z1
Stainless Steel Housing 10 bar supply (m)	-ZK
Stainless Steel Housing 10 bar supply without SST gauges (m)	-ZK1
Top Mounting version of SRD991 with built-in linear potentiometer (n) (o)	-W
LCD with Menu-Language in English / German / French	-V01
LCD with Menu-Language in English / German / Spanish	-V02
LCD with Menu-Language in English / German / Portuguese	-V03
LCD with Menu-Language in English / German / Polish	-V04
LCD with Menu-Language in English / German / Czech	-V05
LCD with Menu-Language in English / German / Italian	-V06
LCD with Menu-Language in English / German / Turkish	-V07
LCD with Menu-Language in English / German / Swedish	-V08
LCD with Menu-Language in English / German / Finnish	-V09
LCD with Menu-Language in English / German / Russian	-V11
LCD with Menu-Language in English / German / Hungarian	-V12
LCD with Menu-Language in English / German / Serbian	-V13
LCD with Menu-Language in English / German / Dutch	-V14
LCD with Menu-Language in English / German / Romanian	-V15
LCD with Menu-Language in English / German / Lithuanian	-V16
Tag No. Labeling	
Stamped with Weather Resistant Color	-G
Stainless Steel Label Fixed with Wire	-L

- a. Not available with Electrical Classification FAA, NFM and CAA
- b. Only with Electrical Classification: ZZZ
- c. Only with ELECTRICAL CLASSIFICATION EA4, EAA or ZZZ
- d. Not with Optional Features -B
- e. Only in connection with Optional Features -B
- f. Only with Input/Communication D, H
- g. Only with Input/Communication F, H, P and Q
- h. Only available for Input/Communication F, H, P and Q in connection with Electrical Classification ZZZ, FAA, NFM, EAA, CAA & GAA
- i. Available WITH (Version: B) or WITH (Version: C) AND (Optional Features: S)
- j. Only with Version -C
- k. Only with (additional Inputs/Outputs E) AND (Optional Feature -B)
- l. Available WITH (Version: C) AND (Built-in Limit Switch: S, D) AND (Electrical Classification: ZZZ, EA4, EAA, GA4, GAA, NFM, FAA) OR WITH (Version: B) AND (Built-in Limit Switch: S, D) AND (Electrical Classification: ZZZ, EA4, EAA, GA4, GAA, NFM, FAA)
- m. Available WITH (Version: C) and (Built-in Limit Switch: S, D) and (Electrical Classification: ZZZ, EA4, EAA, EDA, D4, GA4, GAA, NFM, FAA) AND (Optional feature -S) NOT WITH (Optional feature -B)

- n. Only with (Built-in limit switch -S) and (Electrical Classification EAx, NFM, FAA, GAx)
- o. Not with (optional feature -N OR Z OR Z1)

ACCESSORIES, FOR ALL BASIC DEVICES

Figure 20. Accessories for all basic devices



* Unused threads for pressure gauges are closed by means of lock screw Part No. 425 024 013.

MODEL CODES ACCESSORIES

Description	Model
Accessories for intelligent Positioners	
Filter Regulators	
Filter Regulator FRS923-2SK Filter Regulator for -40°C to 80°C	FRS01
Filter Regulator Filter Regulator for -20°C to 70°C	FRS02
Filter Regulator Stainless Steel (316) Filter Regulator	FRS03
Mounting Bracket for FRS02 or FRS03	EBZG-FR1
Orientable Mounting Bracket for FRS02 or FRS03	EBZG-FR2
Nipple for direct mounting Filter regulator 1/4 NPT both sides	VG-91
Communication / Modem / DTM	
HART USB Modem (made by Ifak) with ATEX IS Certification	MOD900
DTM for SRD Series for HART / FF / Profibus	VALCARE
ATEX IS Barrier Rail Mounted Module, 1 Channel, ATEX Ex ia IIC / FM Intrinsically Safe (TV228-SEGX)	TV228
Booster Relay	
Booster Cv 1.4 - Alum Housing	VBS200
Booster Cv 1.4 - Alum Housing	VBS201
Booster Cv 1.4 - Alum Housing	VBS202
Booster Cv 1.4 - Alum Housing	VBS203
Booster Cv 1.4 - Alum Housing	VBS204
Booster Cv 7 - Alum Housing - Remote mount	VBS300
Booster Cv 7 - SST Housing - Remote mount	VBS310
Booster Relay with connection 1/4-18 NPT	LEXG-G
Booster Relay with connection G 1/4	LEXG-G1
Surge / Lightning Protection	
Surge/Lightning Protection for 4-20 mA with or without HART type TP48-N-NDI	BUSG-L1
Surge/Lightning Protection for FF/Profibus type TP32-N-NDI	BUSG-L4
Lock-in Relays	
Lock-In Relay for loss of air supply for single acting / NAMUR Mounting	LEXG-VR1
Lock-In Relay (Fail Freeze) for loss of air supply and electric power for single and double acting / SRI990 direct mounting	LEXG-VR6
Lock-In Relay for loss of air supply for single and double acting / direct mounting	LEXG-VR8
Wireless HART Module	
Wireless HART Module Type Mactek BULLET for PST Monitoring (no Ex)	BUSG-WH1
Wireless HART Module Type Mactek BULLET for PST Monitoring (Intrinsically Safe ATEX+FM)	BUSG-WH2
Cable Gland	
Cable Gland, M20x1.5 Plug-Connector for Fieldbus (ss / Threaded Connection 7/8 - UN)	BUSG-F2
Cable Gland, M20x1.5 Plastics, Color Gray / Black	BUSG-K6
Cable Gland, M20x1.5 Plastics, Color Blue	BUSG-K7
Cable Gland, M20x1.5 Plastics, Color White	BUSG-K9
Cable Gland, M20x1.5 Plug-Connector for Fieldbus (ss/Threaded Connection M12)	BUSG-P3
Cable Gland, M20x1.5 HF for Fieldbus	BUSG-P4
Cable Gland, M20x1.5 Stainless Steel	BUSG-S6

MODEL CODES ACCESSORIES (CONTINUED)

Description	Model
Accessories for intelligent Positioners	
Tube Fittings	
Tube Fittings, G 1/4 A, 6x1 mm, 1 pc	VG-01
Tube Fittings, G 1/4 A, 6x1 mm, 2 pcs	VG-02
Tube Fittings, G 1/4 A, 6x1 mm, 3 pcs	VG-03
Tube Fittings, 1/4 NPT, 6x1 mm, 2 pcs	VG-52
Tube Fittings, 1/4 NPT, 6x1 mm, 3 pcs	VG-53
Adapter	
Adapter (Brass with Nickel Coating) M20 x 1.5 to 1/2 - 14 NPT (Internal Thread)	AD-A5
Adapter (ss) M20x1.5 to 1/2-14 NPT (Internal Thread)	AD-A6
Adapter (ss) M20x1.5 to G 1/2" (Internal Thread)	AD-A8
Adapter (Plastic) M20x1.5 to PG13.5 (Internal Thread)	AD-A9

MODEL CODES ATTACHMENT KITS

Description	Model
Accessories for Positioners (SRD991, SRI990, SRD960)	
Attachment Kit	
For diaphragm actuators with casting yoke according to NAMUR (incl. standard Couple lever)	-H
For diaphragm actuators with pillar yoke according to NAMUR (incl. standard Couple lever)	-K
For directly mounting (incl. standard Couple lever)	-D
For mounting to rotary actuators according to VDI/VDE 3845 (without bracket)	-R
For FoxTop / FoxPak	-E
Brackets VDI/VDE 3845 (A = 130 mm / 5.12 in; B = 50 mm / 1.97 in)	-C3
Brackets VDI/VDE 3845 (A = 80 mm / 3.15 in; B = 30 mm / 1.18 in)	-C2
Brackets VDI/VDE 3845 (A = 80 mm / 3.15 in; B = 20 mm / 0.79 in)	-C1
For Badger Meter - Research Control Series 754 and 755 Size 1/2 inch	-B1
For Fisher	-F1
657, 667 (linear) size 30 and 40	
1051, 1052, 1061 size 40	-F2
657, 667 size 30 and 60	-F3
657, 667 size 70 and 100	-F4
1051, 1052, 1061 size 33	-F5
1051, 1052, 1061 size 60	-F6
For P-Series / such as -H with installed height 80 mm (3.15 in)	-H1
NAMUR-Attachment kit for centered mounting position on the casting yoke	-H2
For mounting on ADAR control valve	-H3
Micro flow control valve	-H4
Such as -K with installed height 80 mm (3.15 in)	-K1
For Kinetrol	
(Actuator Size 05)	-K2
(Actuator Size 07)	-K3
(Actuator Size 09)	-K4
For Metso / Neles Rotary actuators	
Type AB6 and Type BJ & BC size 8 and 10, B1C11	-L1
Type BJ and BC size 12 and 16, B1C17	-L2
For ARI-Armaturen - Direct mounting to actuator type DR	-P1
For ARCA - Direct mounting to actuator type BR 812	-P2
For Samson	
Type 3277 with 1/4 - 18 NPT	-S1
Type 3277 with G 1/4	-S2
Type 3277 with 1/4 - 18 NPT and gauges for supply and output pressure	-S5
Type 3277 with G 1/4 and gauges for supply and output pressure	-S6
Microflow Type 3277-5	-S8

MOUNTING TO LINEAR ACTUATORS

MODEL CODES ATTACHMENT KITS (CONTINUED)

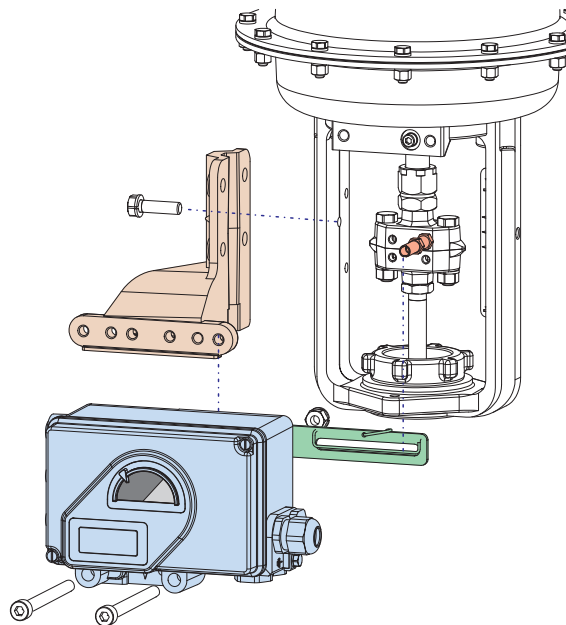
Description	Model
Accessories for Positioners (SRD991, SRI990, SRD960)	
Attachment Kit	EBZG
Tuflin/XOMOX Type MX60	-T1
Type MX200	-T2
Type MX450 / Type MX750 / Type MX1250	-T3
Type MX3000	-T4
For Hagan actuators (left of pneumatic cylinder)	-X2
(right of pneumatic cylinder)	-X1
For AMRI rotary actuator (requires minor modification of actuator) (a)	-X3
For Siemens actuators V-Series	-S3
For Sereg Maxflo, Revca, Reglob new type	-S4
Maxflo "old type"	-S7
CNX (Flowserve)	-S9
For Masoneilan Type Camflex II	-M
47/48 (Sigma-F)	-M1
Type 37/38 size 15 and 18 (complete kit)	-M2
Type 87/88 all sizes	-M4
Varipac	-M5
37/38 size 9, 11, 13	-M6
/Severn Glocon Type Domotor size small	-M7
For Valtek Linear Actuator all Sizes - Stroke up to 4 inch / 102 mm	-V1
For VETEC Type R150	-V2

a. Contact Global Customer Support for further assistance.

MOUNTING TO LINEAR ACTUATORS

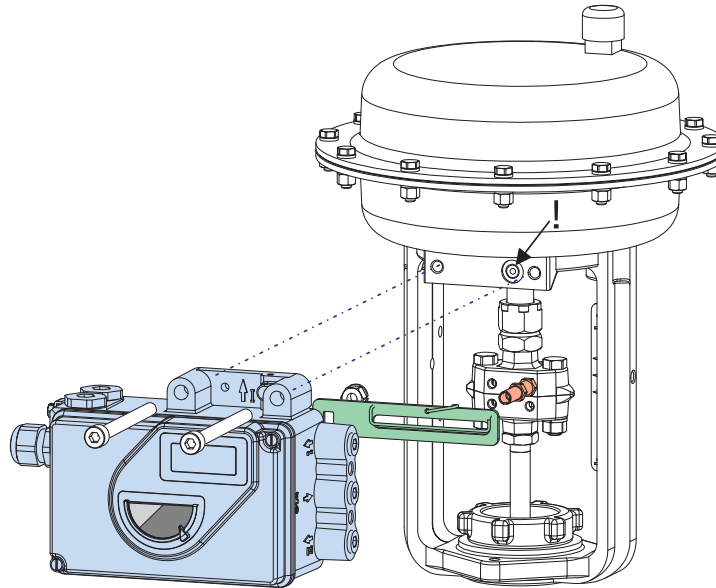
Attachment to stroke actuators according to IEC 6534-6 (NAMUR), left hand

Figure 21. Attachment to stroke actuators according to IEC 534-6 (NAMUR), Left Hand



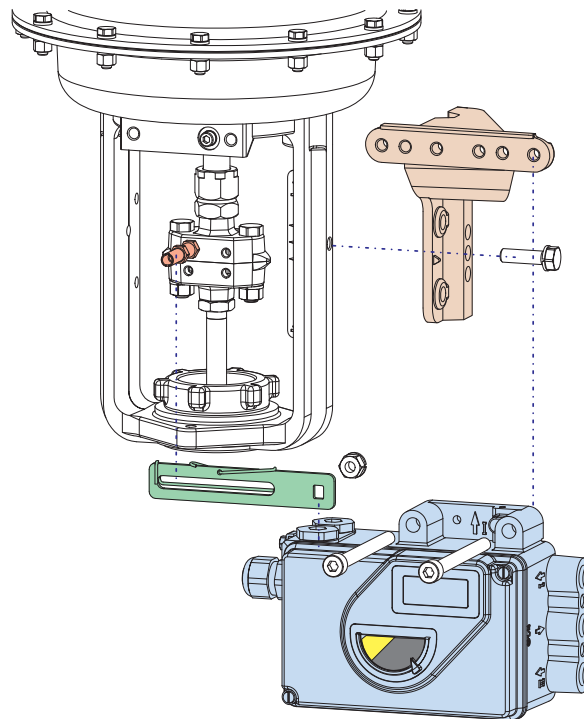
Direct attachment to stroke actuators

Figure 22. Direct Attachment to Stroke Actuators



Attachment to stroke actuators according to IEC 6534-6 (NAMUR), right hand

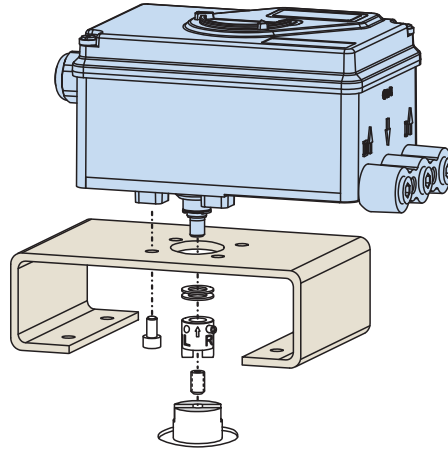
Figure 23. Attachment to Stroke Actuators according to IEC 534-6 (NAMUR), Right Hand



MOUNTING TO ROTARY ACTUATORS

Delivery of bracket by manufacturer of actuator.

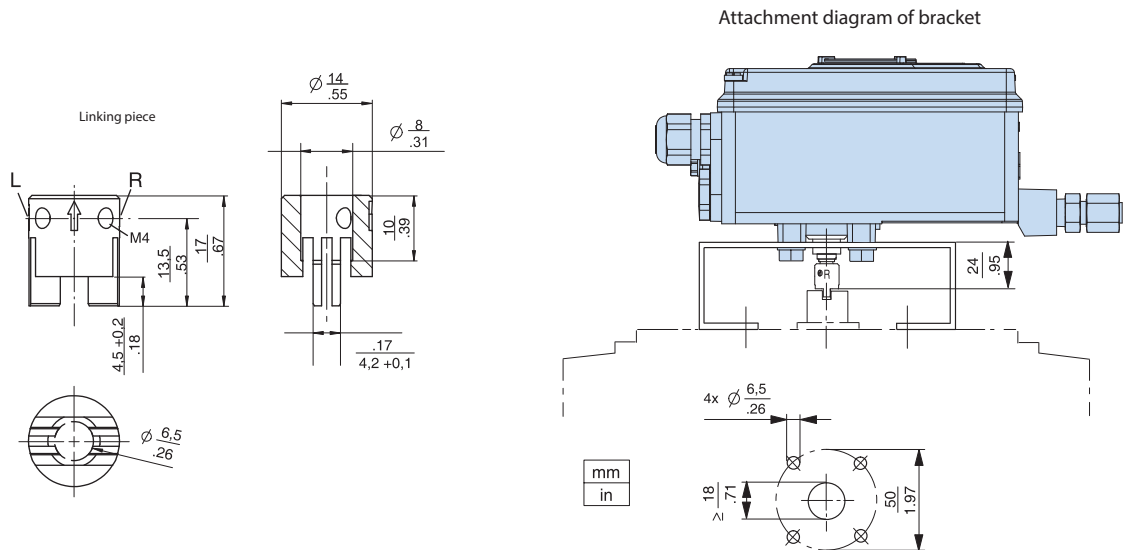
Figure 24. Mounting to Rotary Actuators



DIMENSIONS

Attachment to rotary actuators according to VDI/VDE 3845.

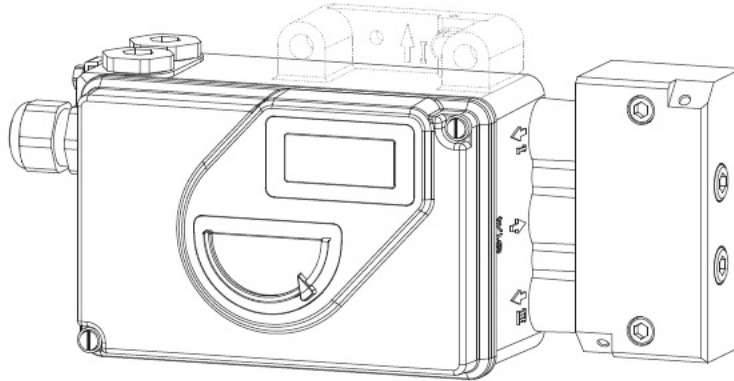
Figure 25. Attachment to Rotary Actuators according to VDI/VDE 3845



MOUNTING ACCORDING TO VDI/VDE 3847

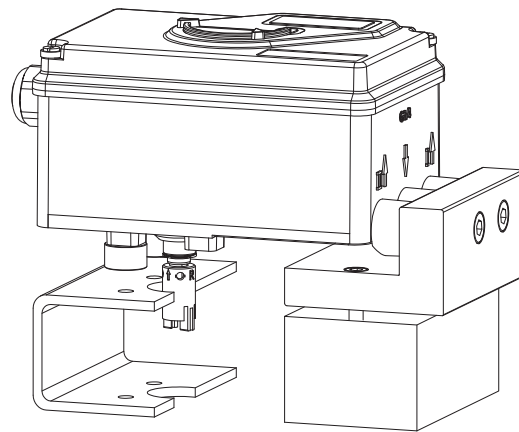
Mounting to Linear actuators

Figure 26. Mounting to Linear Actuators



Mounting to Rotary actuators

Figure 27. Mounting to Rotary Actuators

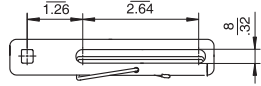


DIMENSIONS

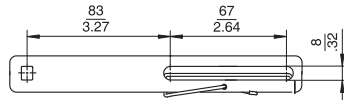
Components of Attachment kits (samples)

Figure 28. Components of Attachment Kits (samples)

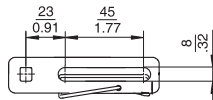
Feedback lever Code EBZG-A for 8..70 mm travel



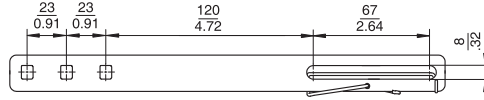
Feedback lever Code EBZG-B for 60..120 mm travel



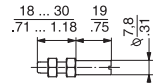
Feedback lever FlowPak/FlowTop in Code EBZG-E



Feedback lever Code EBZG-A1 for 100..260 mm travel

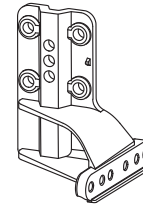
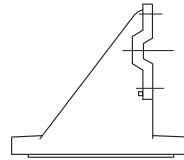
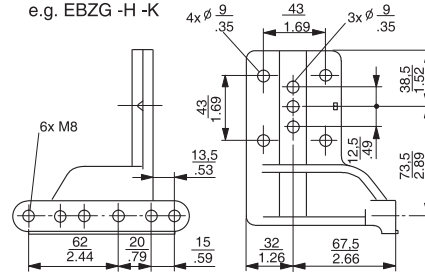


Carrier bolt for connection to valve stem



Mounting bracket

e.g. EBZG -H -K



mm
in

Weights of LEXG Manifolds

LEXG -F = 0.90 kg

LEXG -F1 = 1.00 kg

LEXG -G = 1.25 kg

LEXG -G1 = 1.38 kg

LEXG -H = 1.40 kg

LEXG -H1 = 1.55 kg

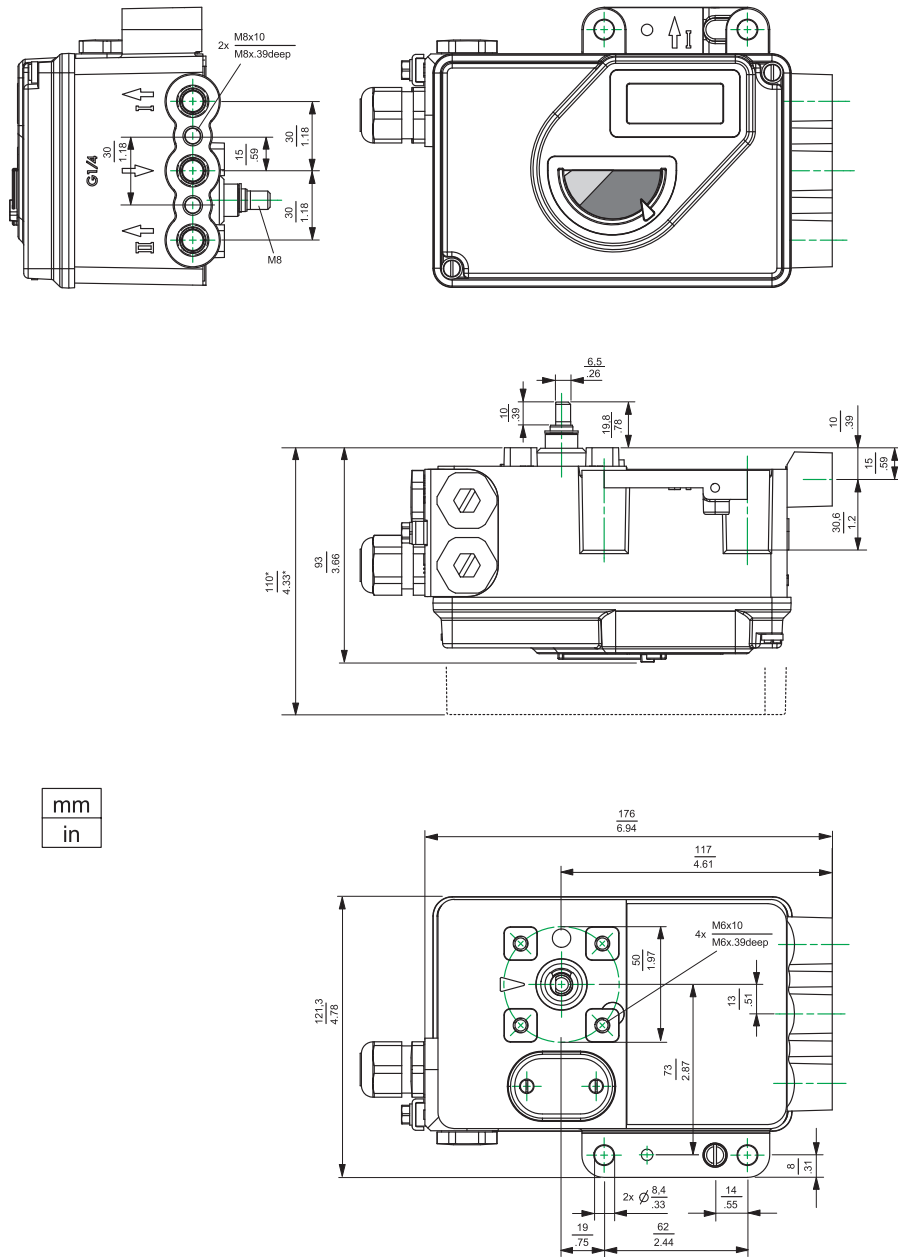
LEXG -J/-J1 = 0.40 kg

LEXG -M/-M1 = 0.45 kg

LEXG -N/-N1 = 0.28 kg

LEXG -K = 0.12 kg

Figure 29. Dimensions

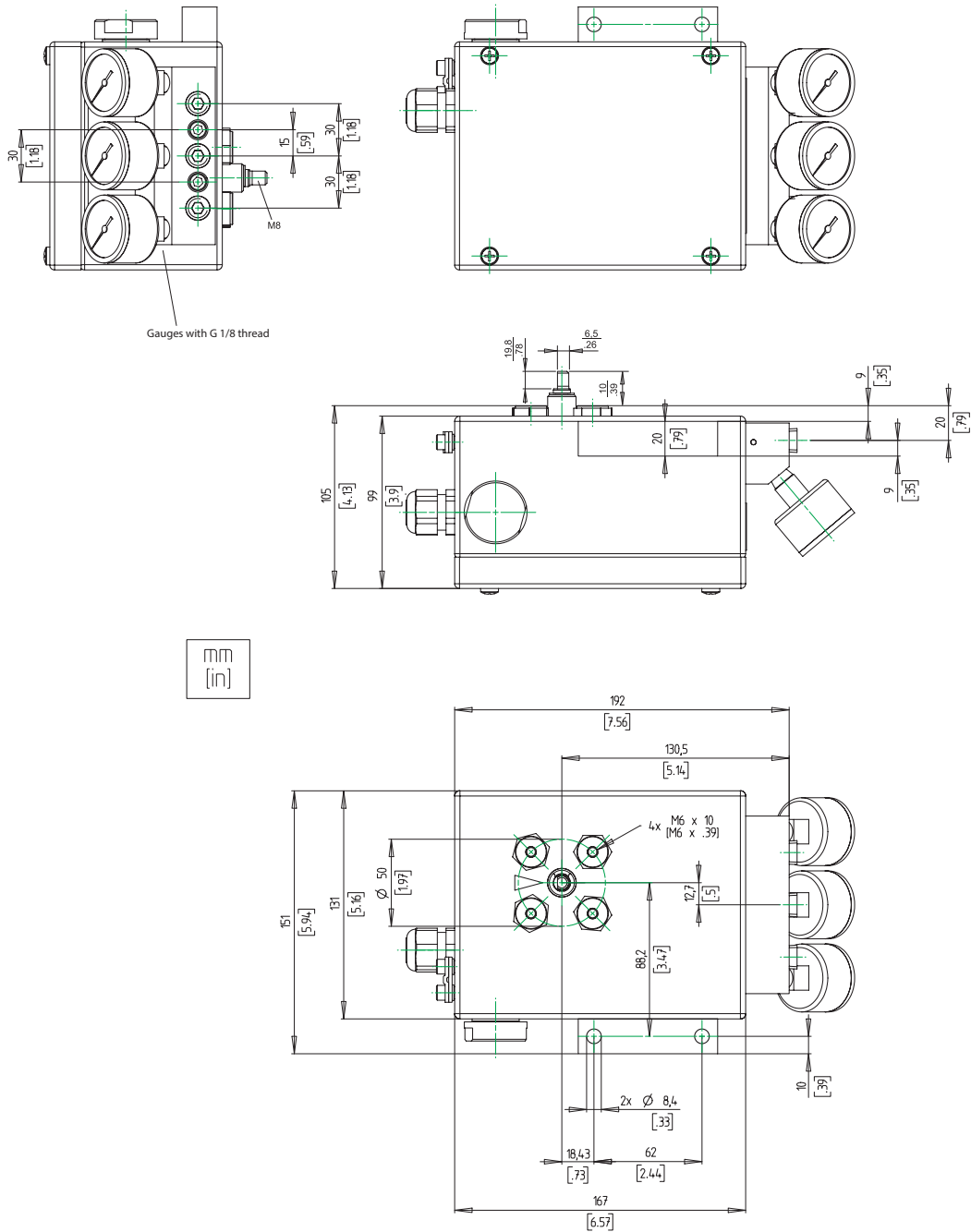


*Dimension with high cover
with option "built-in limit switch".

DIMENSIONS INOX

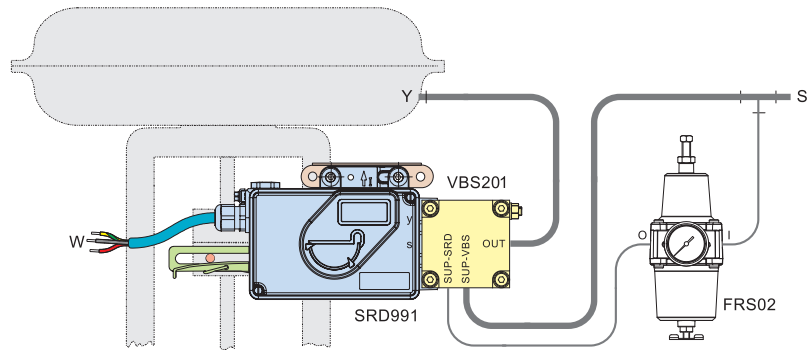
SRD991 in stainless steel housing

Figure 30. SRD991 in Stainless Steel Housing



TYPICAL APPLICATION VBS201

Figure 31. TYPICAL APPLICATION VBS201: Direct Side Mounted



NOTES

ORDERING INSTRUCTIONS

1. Model Number
2. Electrical Safety Design Code
3. Accessories
4. User Tag Information

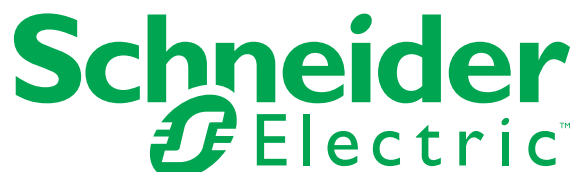
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These product lines offer a broad range of measurement and instrument products, including solutions for pressure, flow, analytical, temperature, positioning, and controlling.

For a list of these offerings, visit our web site at:

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