

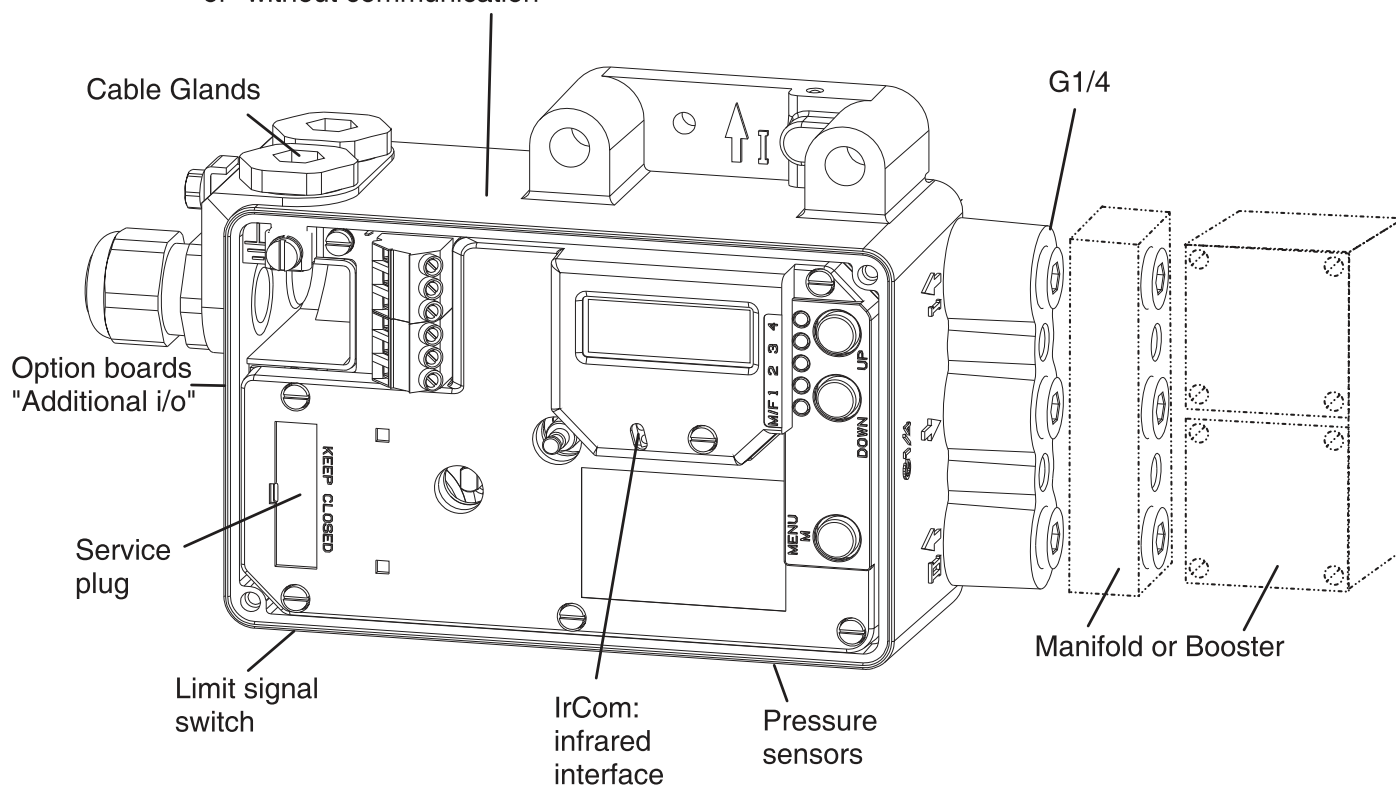
Valve Positioners

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



Electronics Version:

HART, FoxCom (Digital), PROFIBUS PA, FOUNDATION Fieldbus H1
or "without communication"



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DESCRIPTION

The intelligent positioner SRD991 is designed to operate pneumatic valve actuators and can be operated from control systems (like the I/A Series System), 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 (optional with infrared interface), in conjunction with the three push-buttons, provides a comfortable and easy local configuration and operation. For installations in contact with explosive atmospheres, certificates are available.

Main Features

Intelligent

- Autostart with self-calibration
- Self diagnostics, status and diagnostic messages
- Easy 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, PROFIBUS-PA, FOUNDATION Fieldbus H1, Configuration by means of local keys, handheld terminal (HART), PC or I/A Series system or with an infrared interface by means of IrCom
 - Without communication
 - ◊ Input signal 4...20 mA
- Stroke 8...260 mm (0.3...10.2 in.) with standard lever; larger stroke with special lever
- Angle range up to 95° (up to 300° on request)
- 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 VDI/VDE 3845 and IEC IEC 60534-6-2
- Protection class IP 66 and NEMA 4X
- Approved for SIL applications
- Explosion protection: Intrinsic Safety according to ATEX and FM/CSA

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 we offer different threads in the housing and adapters.

For use in hazardous areas there are approvals according to ATEX, FM, CSA.

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 or with IrCom + PC (Infrared Interface at approximately 0.5 m).

A large variety of attachment kits for all common valves and actuators are available. For high temperature or high vibration application, we recommend to mount the SRD991 remotely and not directly on the valve. For this, use the potentiometer unit. To ensure the high performance of the positioner, we offer Advanced Diagnostics and Premium Diagnostics utilities:

	Premium Diagnostics	Advanced Diagnostics
Autostart	Yes	Yes
Custom Characterization	Yes	Yes
Autodiagnostic	Yes	Yes
Alarm Management	Yes	Yes
Alarm Output for Switching (with Optionboard)	Yes	Yes
Status List acc. 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:

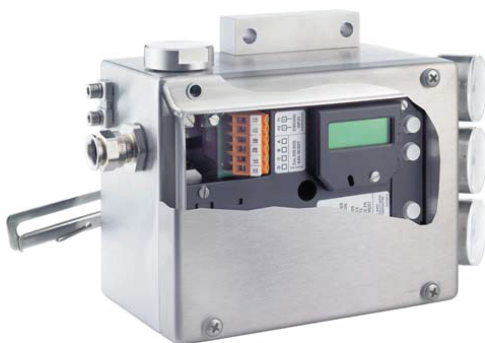
Option Board 2 Binary Inputs or	B	2 external switches (supplied by SRD) release a control function in the SRD, e.g. close valve (configurable)
Option Board 2 Binary Outputs or	P	2 binary outputs (to be supplied externally) become active during value limit in excess of the measured valve position
Option 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, Q	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 or		Full text graphic LCD in 3 languages
LCD and IrCom		Full text graphic LCD in 3 languages and infrared interface

For accessories like manifolds and boosters, see “Model Code Accessories” on page 29.

Special Versions of SRD991

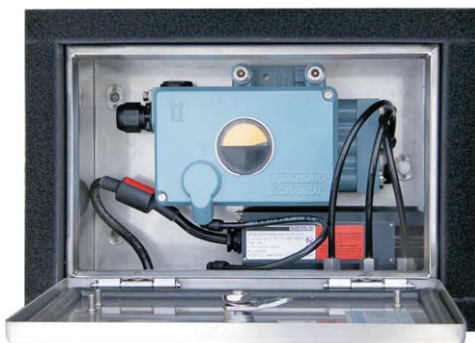
SRD991 Stainless Steel Housing

Order with model code SRD991-xxxxxxx-Zxxx.



SRD991 for Very Low Temperature

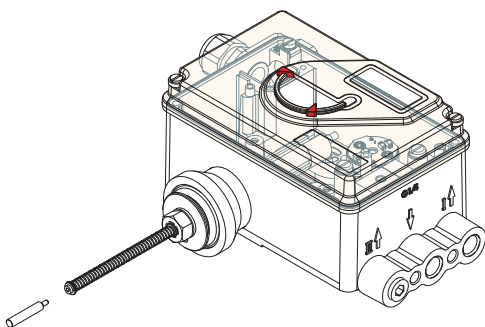
Version with heating system for temperature down to -60°C .



SRD991 for Top Mounting onto Small Actuators

Designed for direct mounting on top of small actuators without yoke. The 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.

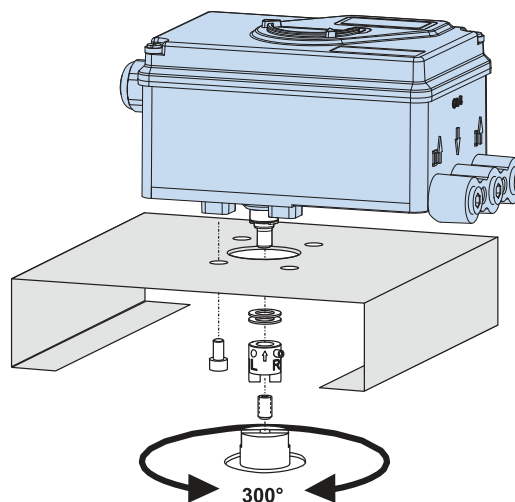


The Model Code of this basic device is SRD991-...ZZZ...-W.
The adapter part is dependent on the manufacturer and type of actuator and can be ordered under the code EBZG-TMxx
Consult us for the latest list of available adapter parts.

SRD991 Designated for PST (Partial Stroke Test for Emergency Shutdown)

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) offers operators a tool to identify the troubleshooting function of ESD valves. The test can be easily executed via the FDT-DTM based configuration diagnostic tool VALcare/Valve Monitor.

SRD991 for actuator with rotation up to 300° . This special 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 new gears. Order under special version ECEP EP0256.



FUNCTIONAL SPECIFICATIONS

(Common data for all versions)

Travel Range

Stroke range	8...260 mm (0.3...10.2 in) with standard feedback levers; special levers on request
Rotation angle range	Up to 95° (without mechanical stop) and up to 300° with a special construction on request (ECEP EPO256)

Supply

Supply air pressure	1.4...6 bar (20...90 psig)
With spool valve ³⁾	1.4...7 bar (20...105 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 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 please consult TI EVE0105_G.

Response Characteristic ^{1) 2)}

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...60 Hz up to 0.14 mm 60...500 Hz, up to 2 g < 0.25 % of travel span

Air Output I_n /h (scfh)

At maximum deviation, single and double acting:

Supply air pressure bar (psig)	1.4 bar (20 psig)	3 bar (45 psig)	6 bar (90 psig)
without booster ⁴⁾	2700 bar (95 psig)	5000 bar (177 psig)	7500 bar (265 psig)
with Spool Valve ³⁾	6000 bar (211 psig)	12,000 bar (423 psig)	18,000 bar (636 psig)
with booster code F, G	—	—	21,000 bar (742 psig)
with booster code H	—	—	42,000 bar (1484 psig)

NOTE: The use of boosters in connection with spool valve is not recommended.

Air Consumption, Steady State, I_n /h (scfh)

Supply air pressure bar (psig)	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)

Features

Automatic Startup—(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 parameter.

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 on next page).

Options

- Built-in independent inductive limit switches
- Pressure sensors for monitoring of air supply and out- put 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 in-/outputs, to be supplied external

1) Data measured according to VDI/VDE 2177

2) With stroke 30 mm and lever length 90 mm

3) Spool valve is the type of amplifier used in device SRD991-Cxxxxx-S

4) Standard diaphragm amplifier

Operation and Configuration

The local LCD enables a fast and easy configuration as well as univocal diagnostic.

- 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 are English and German

Freely selectable third languages include French, Portugues, Spanish, Italian, Swedish. For the complete list, see "Model Codes SRD991" on page 27.

The third menu language has to be selected and specified with the order, otherwise the standard is French.

The third, freely selectable menu language can be modified to another language by means of the VALcare DTM². The additional languages can be downloaded from the PLF selector on our website.

Diagnostics

In the field:

- Status and Diagnostic messages via LCD
- Via VALcare or Valve Monitor DTM⁴
- 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 optional pressure sensors:

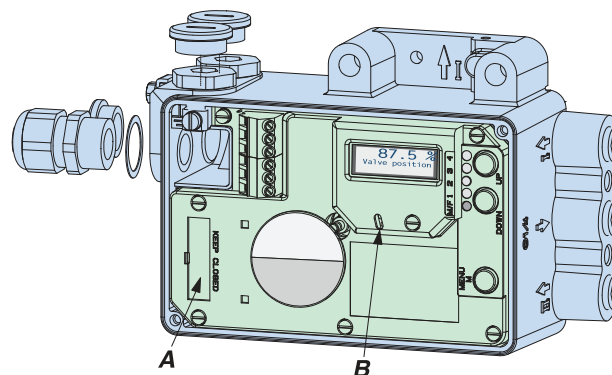
- Monitoring of the stem friction
- Histograms for displaying the friction-history over time

- Surveillance of air supply and output pressure, each with display of physical value

Additional diagnostical possibilities in control operation by means of optional external sensors.

Service Plug and IrCom

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. separa- ted, not Ex).



If the SRD is equipped with option "IrCom" B, communication can take place contactless via infrared with the positioner (even with a closed cover!). A modem "IR Interface" (not Ex) connected via RS232 interface to a PC with VALcare (DTM) makes communication possible up a range of approximately. 0.5 m.

(If the notebook has an IrDa interface, this cannot be used despite being similar technology as IrDa instruction set has no communication commands for positioners.)

2) With the versions "Intelligent without communication" this is only possible with modem EDC82

3) By means of "Additional inputs / outputs"

4) 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 or rotary actuator
Linear valve	left or right mounted
Rotary actuator	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
- PC among others by means of PC20/ PC50 /IFDC
- I/A Series System and other DCSs
- Depending on the version, configurations can be achieved by a non-contact, protocol-independent infrared interface by means of IRCOM.

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.

PHYSICAL SPECIFICATIONS (COMMON DATA FOR ALL VERSIONS)

Mounting attachment to stroke actuators	Direct, FlowPak/FlowTop	with attachment kit EBZG –E
	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 standard feedback lever (EBZG-A)	8...70 mm
	With extended feedback lever (EBZG-B)	60...120 mm
	With extended feedback lever (EBZG-A1)	110...260 mm
	Larger stroke ranges can be realized with special levers.	
Mounting attachment to rotary actuators acc. to VDI/VDE 3845	With attachment kit	EBZG -R
	For more attachment kits, see <i>"Model Codes Attachment Kits"</i> on page 31.	
	For mounting orientation, see <i>"Model Codes Attachment Kits"</i> on page 31.	
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	approx. 1.7 kg (3.7 lb)
	Double acting	approx. 2.0 kg (4.4 lb)
Pneumatic connection	NAMUR mounting	G 1/4 for pipe diameter 6...12 mm (0.24...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...12 mm (0.24...0.47 in.)
	Screw terminals	2 terminals for input, 4 terminals for additional inputs / outputs
	Wire cross section	0.3...2.5 mm ² (AWG 22-14)
	Test sockets	for options and communicator connection
Ambient conditions	Operating conditions	acc. to IEC 654-1
	The device can be operated at a class Dx location	
	Ambient temperature	Operation ¹⁾ – 40...80° C (– 40...176° F) Transport and storage – 40...80° C (– 40 ...176° F)
	If the device is exposed to sunlight and the temperature may rise above 80° C, we recommend a sun shade.	
	Storage conditions	acc. to IEC 60721-3-1: 1K5; 1B1; 1C2; 1S3; 1M2
	Indicators	LCD (visible) ²⁾ : –25...70° C (–13...176° F) LEDs (if present) : – 40...80° C (– 40...176° F)
	Relative humidity	up to 100 %
	Protection class ³⁾	acc. to IEC 529, IP66 acc. to NEMA, Type 4X

1) Details see Certificates of Conformity. With Option -T only –20 °C

2) Below –20 °C the LCD reacts only slowly; above +70°C the background becomes dark

3) Under service as directed

4) With PROFIBUS or FOUNDATION Fieldbus only, if shield of wiring is grounded on both sides

5) Pneumatic connection 1/4-18NPT made with a separate manifold delivered together with the device

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 ⁴⁾	2004/108/EC
	Low-voltage regulation	not applicable
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 must be observed acc. to EN 61010-1, appendix F (bzw. IEC 1010-1).

1) Details see Certificates of Conformity. With Option -T only -20° C

2) Below -20 °C the LCD reacts only slowly; above 70° C the background becomes dark

3) Under service as directed

4) With PROFIBUS or FOUNDATION Fieldbus only, if shield of wiring is grounded on both sides

5) Pneumatic connection 1/4-18NPT made with a separate manifold delivered together with the device

Electrical Classification ^{1) 2)}

See Certificates of Conformity EX EVE0105 A

Type of Protection "Intrinsically Safe"

Type AI 638	II 2 G EEx ia IIB/IIC, II 2 G EEx ib IIB/IIC	
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	PTB 00 ATEX 2128	
For use in hazardous areas in circuits certified as intrinsically safe with the following maximum values:	Input circuit: U max = 30 V, I max = 130 mA, P max = 0.9 W Li = negligible, Ci = 1.3 nF (5.3 nF to earth)	
Ambient Temperature Ranges	Temperature class T4:	- 40...80° C
	Temperature class T6:	- 40...55° C

Explosion Protection Zone 2

Installation of the SRD991 in potentially explosive atmospheres for Zone 2 (explosion protection EEx nA / nL)

The Intelligent Positioner SRD991, type AI 638 in protection level intrinsic safety "ia" (II 2 G EEx ib/ia IIB/IIC T6/T4 Gb) can be operated in potentially hazardous areas of Zone 2 (EEx nA / nL Gc) also on a normal (not intrinsically safe) power supply, of which the voltage output is not higher than the maximum value for explosion protection intrinsic safety (according to EN 50014 / EN 50020) described in the EC-Type-Examination Certificate PTB 00 ATEX 2128.

The non intrinsic safe circuit has additionally to fulfill the requirements of EN 61010-1 (IEC 1010-1), protection grade III, overvoltage category I.

See our Manufacturer's Declaration on our website.

Explosion Protection Zone 20

Certificate of Conformity	IBExU08 ATEX 1148
EX II 1D Ex iaD 20 T 100° C	- 40 °C < Ta < 80° C

Electrical Data

Supply circuit in type of protection Intrinsic safety Ex ia or Ex ib.

Profibus / Fieldbus		HART	
Ui	24 V DC	Ui	30V DC
Ii	380 mA	Ii	130 mA
Pi	5.32 W	Pi	0.9 W
Ci	1.3 nF	Ci	1.3 nF
Li	5 µH	Li	5 µH

Ci: effective inner capacity

Li: effective inner inductivity

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

The positioner type SRD991 fulfils 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.

1) With appropriate order only

2) National requirements must be observed

FM Type of Protection

IS / I, II, III / 1 / ABCDEFG / T4 Ta = 80° C Entity; Type 4X; DOKZ 534 396 058

NI/I/ 2 / ABCD; S/ II,III / FG / T4 Ta = 80° C; Type 4X;

IS / I,II,III / 1 / ABCDEFG / T4 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 Type of Protection "Intrinsic Safety / Non-Incendive"

Class I. Groups A, B, C and D

Class II. Groups E, F and G: Class III

Ex ia IIC T4/T6 IP65

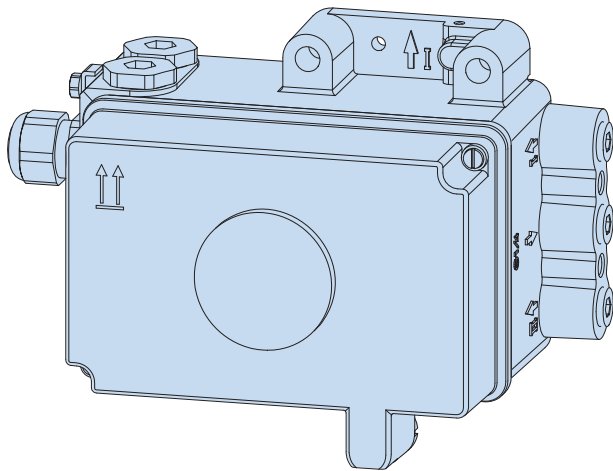
HART / 4 - 20mA / Profibus/Fieldbus -abbcdefg-j Positioner 12...36V DC. 4...20 mA or 48V DC, Intrinsically Safe when installed as per submittor's drawings DOKZ 534 396 067 or DOKZ 534 396 076 : Temp. Code T4 at max amb. 80° C or T6 at max. amb. 55° C

Class I. Div 2. Groups A. B. C and D

Class II. Div 2. Group F and G

Class III. Div 2: IP65 End

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



- 1) With appropriate order only
 2) National requirements must be observed

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...21.5 mA
Input Voltage	12...36 V DC ¹⁾ (unloaded)
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 AV voltage 0.5...10 kHz with < 3 dB non-linearity
Cable Capacity and Inductance	See HART standard specifications (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.	
Startup Time	Approx. 3 sec
Interruption Time Without Power Down	With LCD: typ. 80 ms ²⁾

- 1) On request we can specify higher voltage limits
 2) Worst case conditions 4-20 mA, with position feedback option, i/p-output with max. current
 3) Check CP for suitable ECBS

Configuration

Local / Display	See page 9
Software/Driver	VALcare or Valve Monitor(DTM)
Hardware	HART Modem for RS232 or USB port
Handheld Terminal	ex: HT991, HT375, HHT50
I/A Series System	FBM215 or FBM218 (redundant) in combination with CP60 3)/ FCP270
Other Control Systems	AMS, Siemens SIMATIC PDM (ProcessDeviceManager), Any decentralised Control System

DTM for HART

Local Configuration
 LCD Display, see page 9

Trough HART Communication

- PC20 standalone Software for PC (only via RS232)
- VALcare
- Valve Monitor
- Can be integrated onto any FDT Frame onto any Host suspending of FDT Frame
- H275/375
- AMS for Emerson
- PDM
- via service port

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	The actual file can be downloaded from our homepage

Configuration

Local / Display	See page 9
Software	VALcare DTM
Hardware	PC- or PCMCIA- interfaces from Softing
I/A Series System	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)
Certified According To	ITK 4.01
Function Blocks	PID, AO, Transducer, Resource
Certified According To	ITK 4.6
Function Blocks	PID, AO, 2xDI, 1xDO Transducer, Resource
Additional Functionality	Flat Addressing
DD Files	The actual file can be downloaded from our homepage

Configuration

Local / Display	See page 9
Software	VALcare DTM or National Instruments NI-FBUS configurator
Hardware	FBUS-interfaces from National Instruments (AT-FBUS and PCMCIA- FBUS)
I/A Series System	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	9...32V DC ¹⁾
Max. Supply Voltage	48V DC
Operating Current	10.5 mA $\pm$ 0.5 mA (base current)
Current Amplitude	$\pm$ 8 mA
Fault Current	Base current + 0 mA (base current + 4 mA by means of independent FDE-safety circuit) according to IEC 1158-2
Operating Values	According to IEC 1158-2
Startup Time (Init Phase)	Approx. 2 sec
Bus Connection	Fieldbus interface based on IEC 1158-2 according to FISCO-Model
Power Supply	Power supply is achieved dependant on the application by means of fieldbus power supply units or segment coupler
Electrical Classification	See page 13

1) Data of "Intrinsically Safe" version

SRD991 without Communication

SRD991-xDxxxx

Signal Input	Two wire system
Reverse Polarity Protection	Standard feature
Signal Range	4...20 mA
Operating Range	3.6...21.5 mA
Input Voltage	8.5...36V DC ¹⁾ (unloaded)
Load	00 Ohms, 6 V at 20 mA
With applications without communication the capacity parallel to input may not be higher than 100 μ F.	
Startup Time	Approx. 3 sec
Interruption Time Without Power Down	With LCD, typ. 80 ms ²⁾

1) On request we can specify higher voltage limits

2) Worst case conditions 4-20 mA, with position feedback option, i/p-output with max. current

Configuration

Local / Display	See page 9
Software	VALcare (DTM)
Hardware	per modem EDC82
Electrical classification	See page 13

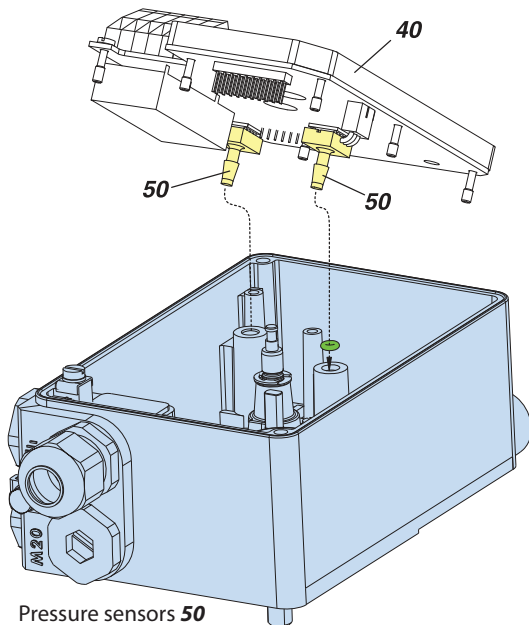
ADDITIONAL EQUIPMENT

This equipment can be added to any basic device.

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

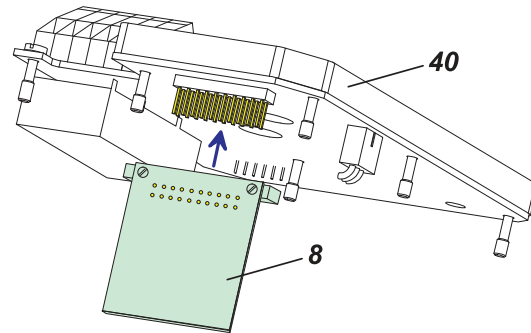
For supply air and output y1 to actuator:

Measuring Range	0...8 bar (0...120 psig)
Accuracy	2%
Temperature Influence	0.5% / 10 K (– 40...80° C)



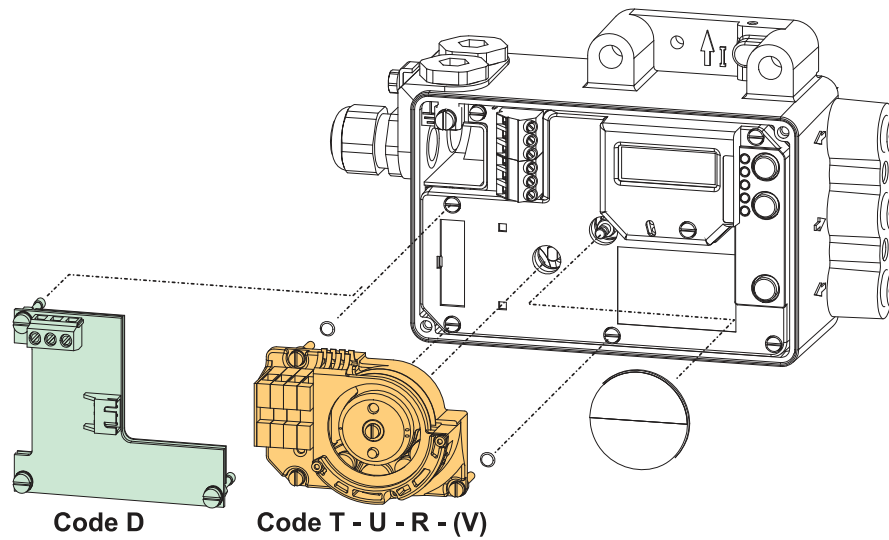
Additional Inputs / Outputs

One module “Additional inputs / outputs” 8 can be plugged onto main electronics 40:



- 2 binary inputs or
 - 2 binary outputs or
 - 2 binary in/outputs or
 - Position feedback and alarm
- Details on the following pages.

Built-in Limit Switch



Parts Kits for additional installation of auxiliary functions:

Model Code	Additional Inputs / Outputs	Supply	Parts Kit
Code B	2 Binary inputs (Contact inputs)	internal	EW 411 407 325
Code E	2 Binary in/outputs	external	EW 411 407 956
Code P	2 Binary outputs	external	EW 411 407 316
Code F	Position feedback 4...20 mA and Alarm (ATEX)	external	EW 426 434 228
Code Q	Position feedback 4...20 mA and Alarm (FM/CSA)	external	EW 411 407 282

Model Code	Limit Signal Switch	Supply	Parts Kit
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 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 μ A.

The *Binary Inputs* option 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%
close	open	go to stop at 100%
open	open	hold last position

Terminals for:

- EB1—A: 13+ B: 14–
- EB2—C: 15+ D: 16–

For further information about the contact inputs please consult TI EVE0105_B.

Electrical Classification ATEX

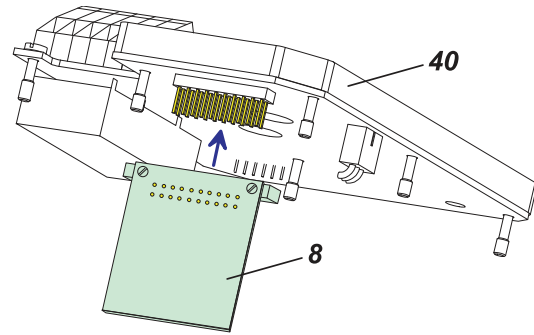
- Types of protection and temperature classes of basic device, see [page 13](#).
- Additions for this option, Type AI 638 B, in EC- Certificate of Conformity PTB 00 ATEX 2128:
 - ◊ To this electric circuit only passive electric circuits galvanically separated from earth may be attached.
 - ◊ The electric circuit has the following maximum values: $U_o = 7.88$ V, $I_o = 11.4$ mA, $P_o = 23$ 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):

IC		IIB	
L_o [mH]	C_o [μ F]	L_o [mH]	C_o [μ F]
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

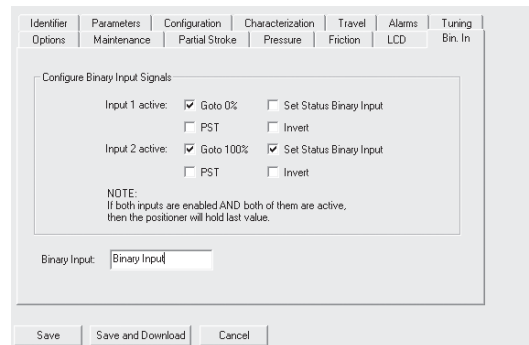
The electric circuits of 2 *Binary Inputs* are galvanically connected with all other circuits but separated from earth.

One module “Additional inputs / outputs” **8** can be plugged onto main electronics **40**:



- 2 binary inputs or
- 2 binary outputs or
- 2 binary in/outputs or
- Position feedback and alarm

DTM Configuration Window



Two Binary Outputs (Limit Signals) – Code P

- Stroke / angle derived from positioner feedback
- 2 galvanically separated limit signals
- Signaling of limit value exceeding of the measured valve stem position
- Limit signals / alarms freely configurable via local keys or via communication
- Two-wire system, according to DIN 19234, for external supply

Supply Voltage	8...36V DC ^{1) 2)}	
Logic	limit value not exceeded	< 1 mA
	limit value exceeded	> 2.2 mA (typ. 6 mA)
	device fault	< 50 µA
Configurable as Switch Output	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	
Terminals for AB1³⁾	A: 81+ B: 82–	
Terminals for AB2³⁾	C: 83+ D: 84–	

1) Other values in hazardous areas

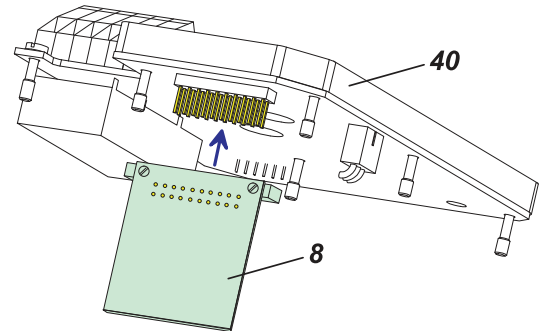
2) On request we can specify higher voltage limits

3) Terminals 81...84 are marked as K21...K32 within certificate of conformity.

Electrical Classification ATEX

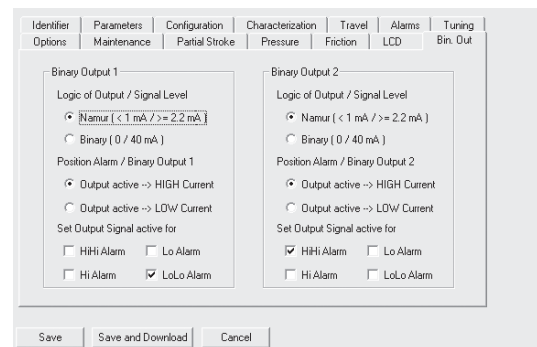
- Types of protection and temperature classes as basic device, see [page 13](#).
- Additions for this option, Type AI 638 P, in EC- Certificate of Conformity PTB00ATEX2128:
 - ◇ For use in hazardous areas in circuits certified as intrinsically safe with the following maximum values: $U_i = 16\text{ V}$, $I_i = 80\text{ mA}$, $P_i = 250\text{ mW}$
 - ◇ Internal capacitance and inductance: $C_i = 26\text{ nF}$, $L_i = 5\text{ µH}$. The electric circuits of 2 *Binary Outputs* are galvanically separated from all other circuits and from earth.

One module “Additional inputs / outputs” **8** can be plugged onto main electronics **40**:



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

DTM Configuration Window



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	8...36V DC ^{1) 2)}	
Configured as NAMUR signal	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	
Terminals for AB1³⁾	A: 81+ B: 82–	
Terminals for AB2³⁾	C: 83+ D: 84–	

Input

The kind of Signals Input can be configured as On/Off or as NAMUR signal in accordance (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...36 V ¹⁾

1) Other values in hazardous areas

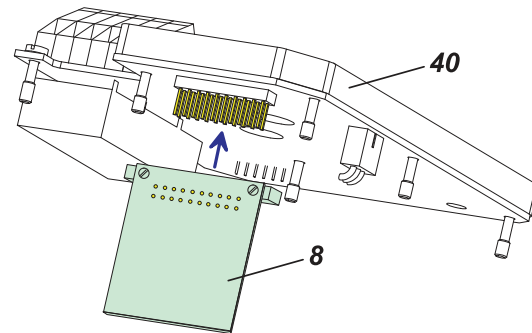
2) On request we can specify higher voltage limits

3) Terminals 81...84 are marked as K21...K32 within certificate of conformity.

Electrical Classification ATEX

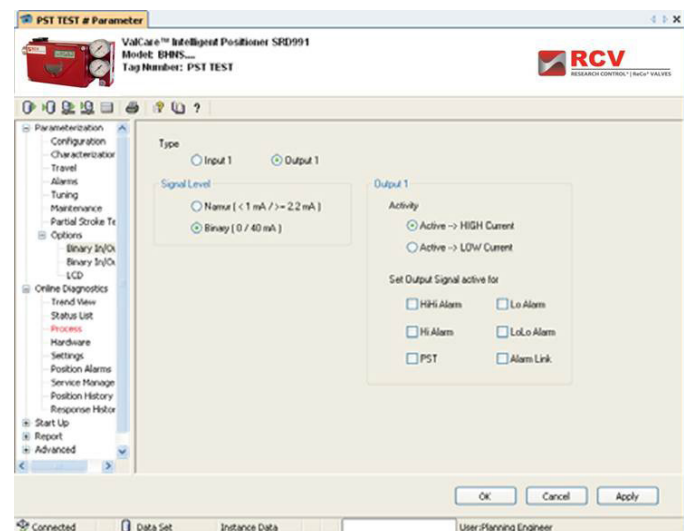
See PTB 00 ATEX 2128 Certificate.

One module “Additional inputs / outputs” **8** can be plugged onto main electronics **40**:



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

DTM Configuration Window



Position Feedback 4...20 mA and Alarm

Code F with Electrical Classification ATEX

Code Q with Electrical Classification FM/CSA

- Stroke / angle derived from positioner feedback
- 1 output analog, galvanically separated, two-wire system according to DIN 19234, for external supply
- 0 % and 100 % configurable

Supply Voltage	8...36V DC ^{1) 2)}
Signal Range	3.8...20.5 mA
Device Fault	< 50 μ A
Terminals for AI1	C: 31+ D: 32–
Feedback Signal	Can be reversed (20 --> 4 mA)

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

Supply Voltage	External, 8...36V DC ^{1) 2)}
Logic	No alarm < 1mA
	Alarm > 3 mA
	Device fault < 50 μ A

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 AB1³⁾	A: 81+ B: 82–

1) Other values in hazardous areas

2) On request we can specify higher voltage limits

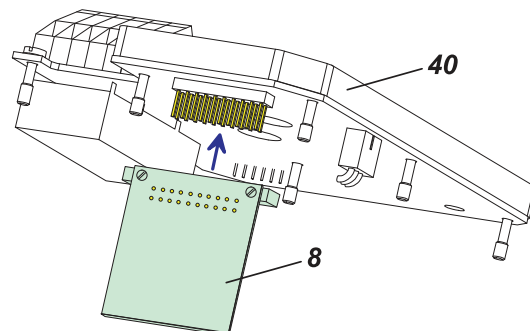
3) Terminals 81 and 82 are marked as Terminals 21 and 22 in certificate of conformity

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

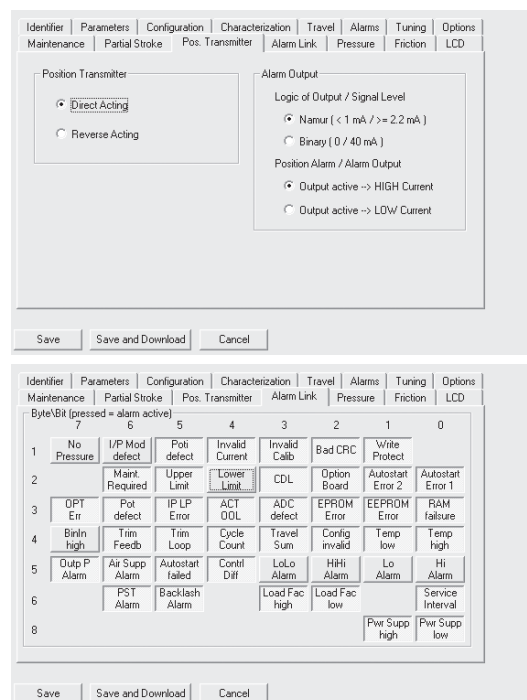
These pre-settings can be configured via communication with the Alarm Link function in the DTM.

One module “Additional inputs / outputs” **8** can be plugged onto main electronics **40**:



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

DTM Configuration Window



Electrical Classification ATEX

- For types of protection and temperature classes as basic device, see [page 13](#).
- Additions for this option, Type AI 638 Q, in EC – Certificate of Conformity PTB 00 ATEX 2128:
 - ◊ For use in hazardous areas in circuits certified as intrinsically safe with the maximum values as described in the Certificate of Conformity, 5. Supplement.
 - ◊ The electric circuits of *Position Feedback 4...20 mA* are galvanically separated from all other circuits and from earth.

Entry for Remote Potentiometer – Code D

For remote mounting main unit.

This remote application is used in applications where high temperatures or vibration are present and can result in negative influences to 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.

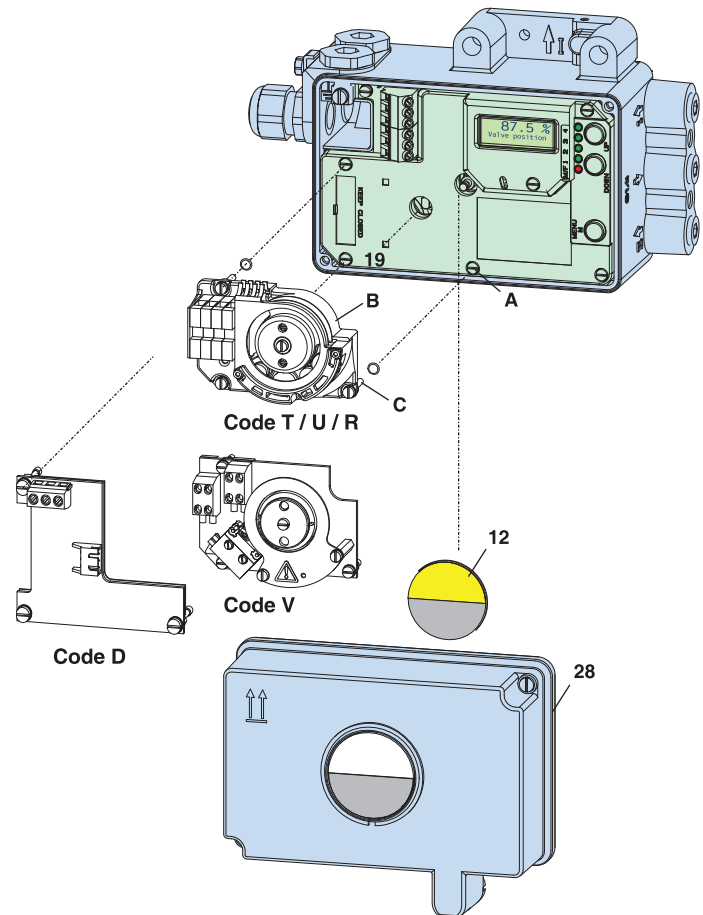
The Potentiometer unit is mounted on the valve or cylinder. This potentiometer unit can be made of a derivative version of the SRI990 positioner (only potentiometer in the housing) or of an external potentiometer like a linear potentiometer for application onto cylinders, for example.

This option is to be used with a potentiometer unit 3-wire system with ca. 5 kOhm resistance.

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

- Cable Length max. is 10 m (32 ft)
- Cable Specification (not supplied):
 - ◊ 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
 - ◊ An HF cable gland is not required

For more information about remote mounting please consult TI EVE0105_R.



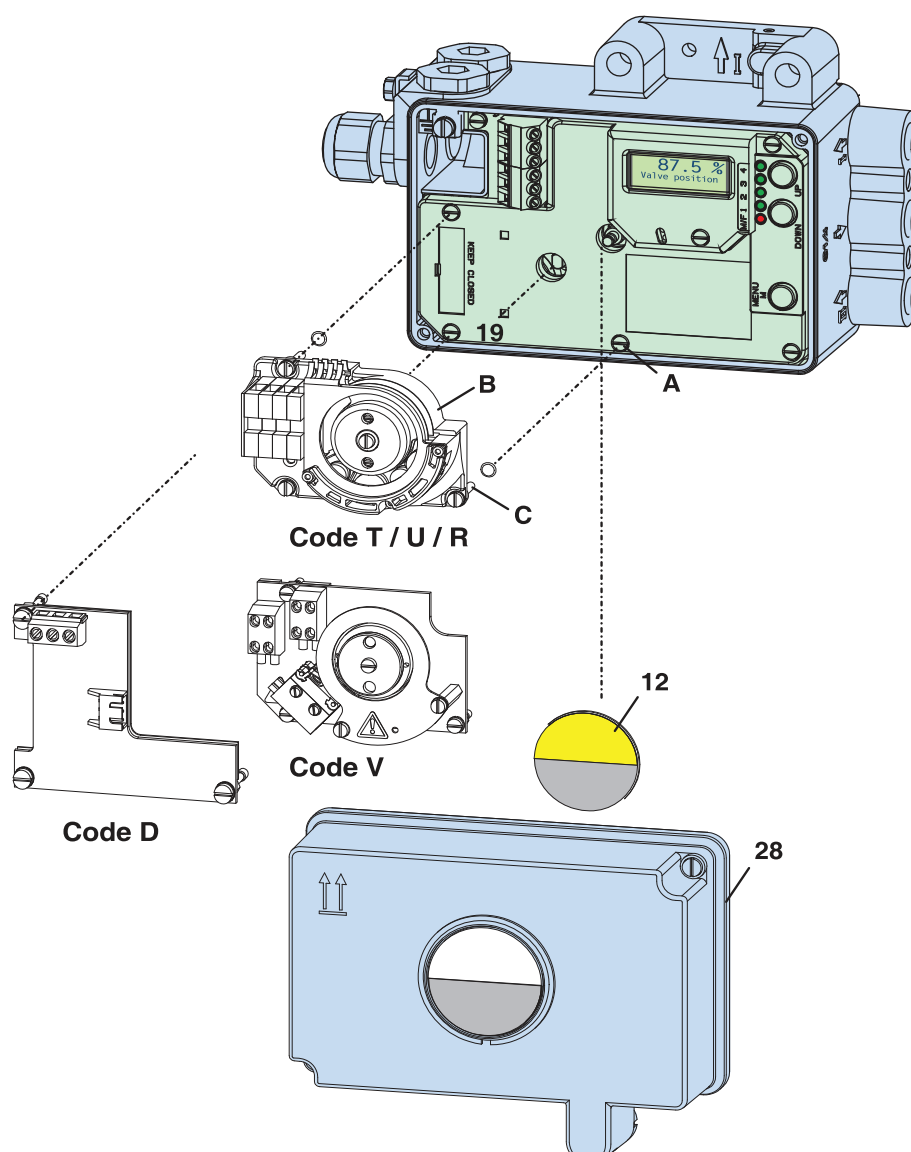
Built-in Limit Switches

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)
Micro Switches	Code V (no Ex)
Entry for Remote Potentiometer	Code D

Materials

Control vanes	Aluminum
Transmission shaft	1.4571



Inductive Limit Switch – Code T, U

Output	2 inductive proximity sensors acc. to DIN 19 234 or NAMUR for connection to switching amplifier ¹⁾	
Current Consumption	Vane clear	> 2.2 mA
	Vane interposed	< 1 mA
For control circuit with the following electrical values:	Supply voltage	8V DC, R _i approx. 1 kOhm
	Supply voltage range	5...25V DC (with "no Ex")
	Residual ripple	< 10 % p.p. permissible
	Line resistance	< 100 Ohms
Response Characteristic ^{2) 3)}	Switching differential	< 1
	% switching point repeatability	< 0.2 %
Terminals for GW1	41+, 42–	
Terminals for GW2	51+, 52–	

Electrical Classification ATEX of versions T and U

- For types of protection and temperature classes as basic device, see *page 13*.
- Additions for this option, Type AI 638 K, in EC- Certificate of Conformity PTB00ATEX2128:
 - Types of protection and temperature classes as basic device. 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.
 - 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.

1) Operating mode min. (= low) / max. (= high) selectable by adjustment of switch vanes

2) Data measured according to VDI/VDE 2177

3) With stroke 30 mm and lever length 90 mm switches)

5) Operating mode min. (=low) / max. (=high) selectable by adjusting the respective vane

6) Operating mode normally open / normally closed selectable by vane adjustment

7) Approval according to UL (UL 1054) and CSA (CSA 22.2 No. 55) at 6000 operations and T = 65° C / 149° F

8) Based on EN 61058-1, at 10,000 operations and T = 85° C / 185° F

9) General rating at 50,000 operations and T = 85° C / 185° F

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 ²⁾	
Supply Voltage US	10...30V DC	
Residual Ripple	± 10 %, U _s = 30V	
Switching Frequency	2 kHz	
Constant Current	100 mA	
Response Characteristic ⁶⁾	Gain	continuously adjustable from 1:1 to approx. 7:1
	Switching differential	< 1 % Switching point
	Repeatability	< 0.2 %
	Terminals for GW1	42
	Terminals for GW2	52
	Supply	41+, 43–

1) Operating mode min. (= low) / max. (= high) selectable by adjustment of switch vanes

2) Data measured according to VDI/VDE 2177

3) With stroke 30 mm and lever length 90 mm switches)

Mechanical Switches (Micro Switches) – Code V (Only Without Ex Protection)

Input	Stroke / angle derived from positioner feedback lever	
Output	2 mechanical switches (micro ^{5) 6)}	
Manufacturer	Saia-Burgess	
Type	V4NS-C4-AC1-UL (UL- and CSA-approved)	
Parts set for subsequent mounting	Code V	EW 426 164 066
	U _{max}	130V AC ⁷⁾
	I _{max}	0.5 A (resistive Load) ⁷⁾
Absolute limit values AC of mechanical switches built into positioner	I _{max}	0.03 A (inductive Load) ⁸⁾
	U _{max}	1 A
	I _{max}	1 A
Absolute limit values DC of mechanical switches built into positioner ⁹⁾		
Switching Differential		< 2.5 %
Terminals for SW1		41, 42
Terminals for SW2		51, 52

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.

Input for Remote Potentiometer – Code D

This option is necessary when the positioner is not mounted directly onto the valve but far away of it. In this case a potentiometer with 3 wires must be mounted onto the valve to give the valve position to the controller.

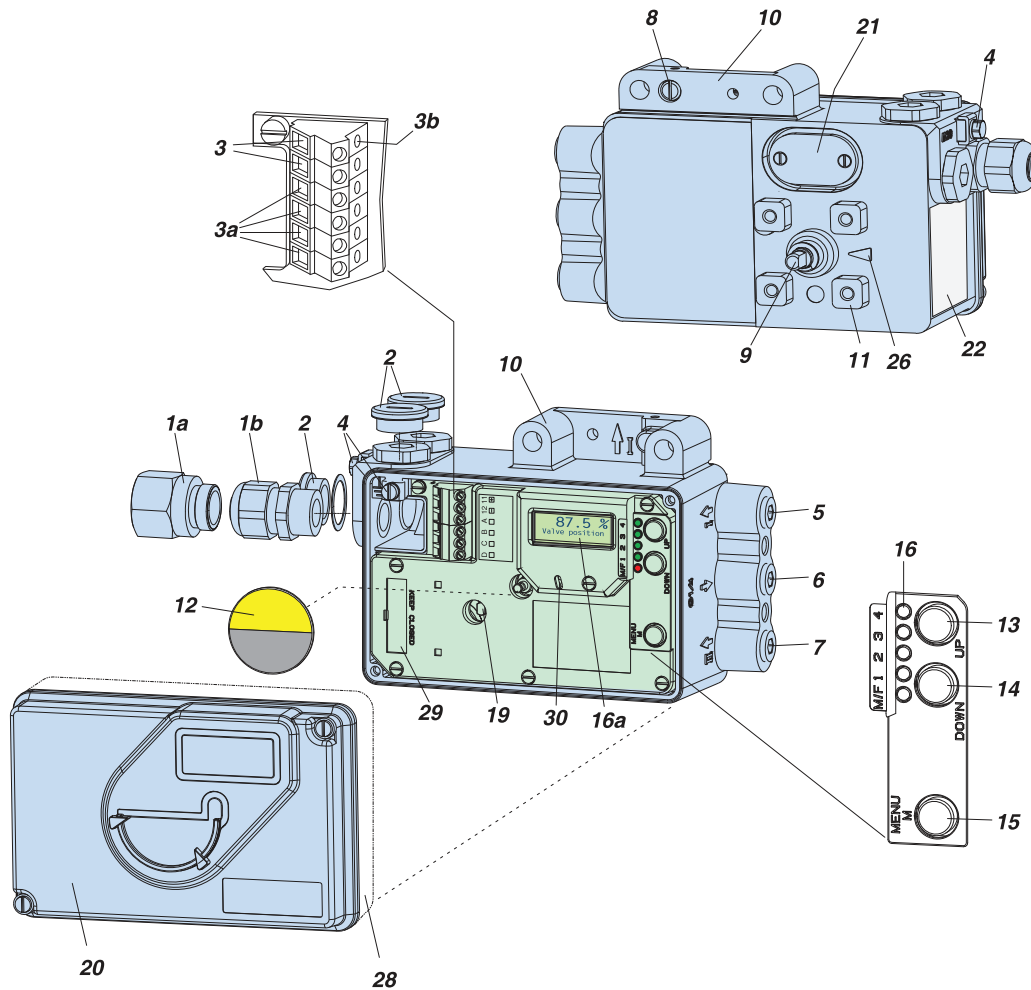
Remote potentiometer type to use in connection to this option: Resistance of 5 kOhm up to 10 kOhm (for other value of resistance please consult us).

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. is 10 m (32 ft)
- Cable specification (not supplied):
 - ◊ 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
 - ◊ An HF cable gland is not required

For more information about remote mounting, see TI EVE0105_R.

FUNCTIONAL DESIGNATIONS



1a	Adapter, eg. 1/2"-14 NPT	11	Connection base for attachment to rotary actuators
1b	Cable gland	12	Travel indicator
2	Plug, interchangeable with Pos.1	13	Key UP
3	Screw terminals ¹⁾ (11 / 12) for input (w) or for bus connection IEC 1158-2	14	Key DOWN
3a	Screw terminals ¹⁾ for additional inputs / outputs	15	Key M (Menu)
3b	Test sockets Ø 2 mm, integrated in terminal block	16a	LCD with true text in 3 different languages
4	Ground connection	19	Fixing shaft for limit switch
5	Female thread G 1/4 for output I (y1)	20	Cover with window to 1
6	Female thread G 1/4 for air supply (s)	21	Air vent, dust and water protected
7	Female thread G 1/4 for output II (y2)	22	Data label
8	Direct attachment hole for output I (y1)	26	Arrow is perpendicular to shaft 9 at angle 0 degree
9	Feedback shaft	28	High cover with built-in limit switch
10	Connection manifold for attachment to stroke actuators (not with VDI/VDE 3847 version)	28	Plug for service connector
		30	IrCom interface

1) Alternatively WAGO terminals instead of screw terminals

2) Depending on the version, the device is equipped with or without LEDs

MODEL CODES SRD991

Intelligent Positioner SRD991									010811
VERSION									
Single Acting	-B								
Double Acting	-C								
Input/Communication									
Intelligent without communication (4...20 mA)		D							
HART Communication (4...20 mA)		H							
FoxCom Communication (Digital/IT2)	(1)	F							
PROFIBUS-PA (acc. to FISCO)		P							
FOUNDATION Fieldbus H1 (incl. PID-Function Block, acc. to FISCO)		Q							
Additional Inputs/Outputs									
Prepared For Additional In-/Outputs			N						
Two Binary Outputs			P						
Position Feedback 4 - 20 mA and one Binary Output for Alarm	(g)(e)		Q						
Binary Inputs	(z)		B						
Binary Inputs-Outputs (mandatory for ESD application)	(z)		E						
Position Feedback 4 - 20 mA and one Binary Output for Alarm	(z)		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	(u)			R					
Mechanical Switches (Micro-Switches) / UL- and CSA-approved	(u)			V					
Potentiometer Input - CEM Filter (for Remote Mounting - main unit)	(k)			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	(y)								
for Input/Communication H, F	(x)								
EEx ia IIC T4 according to ATEX	(c)					EA4			
II 2 G EEx ia IIC T6 according to ATEX)	(d)					EAA			
II 3 D/D Ex n T4 according to ATEX	(b)					2C4			
II 3 D/D Ex n T6 according to ATEX	(b)					2CA			
II 2 G EEx ia IIC T4 according to ATEX + Zone 20 Dust	(c)					ED4			
II 2 G EEx ia IIC T6 according to ATEX + Zone 20 Dust	(d)					EDA			
FM Nonincendive for Class I, Division 2, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors, NEMA 4X for Input/Communication D, H	(y)					NFM			
FM Approved for Intrinsic Safety Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors, NEMA 4X for Input/Communication D, H	(y)					FAA			
CSA Approved for Intrinsic Safety Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors, NEMA 4X for Input/Communication D, H	(y)					CAA			
GOST Approved for Intrinsic Safety ExiallCT4	(c)					GA4			
GOST Approved for Intrinsic Safety ExiallCT6, T4	(d)					GAA			
Attachment Kit									
Order as Auxiliary							N		
Manifold									
Pneumatic connection 1/4 - 18 NPT made of an additional manifold								Y	
Pneumatic connection G 1/4								R	

(a) ONLY WITH (additional Inputs/Outputs E) AND (Optional Feature -B)

(b) Not released

(c) Only with Input/Communication D, H

(d) Only with Input/Communication F, H, P and Q

(e) NOT WITH (electrical certification ZZZ, EA4, EAA, GA4, GAA)

(f) 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)

(g) Available ONLY WITH (Electrical Classification: FAA, NFM, CAA)

(h) Available WITH (Version: B) OR WITH (Version: C) AND (Optional Features: S)

(j) ONLY WITH (Built-in limit switch -S) AND (Electrical Classification -ZZZ)

(k) Only with ELECTRICAL CLASSIFICATION EA4, EAA or ZZZ

(l) NOT WITH (optional feature -N OR Z OR Z1)

(n) Only with Version -C

(s) Only available with Optional Feature LCD (-V01 to -Vxx)

(v) Only available for Input/Communication F, H, P and Q in connection with Electrical Classification ZZZ, FAA, NFM, EAA, CAA & GAA

(w) Only available for Version single-acting -B in connection with Input/Communication -D and -H (x) Only in connection with Optional Features -B

(y) Not with Optional Features -B

(z) Not available with Electrical Classification FAA, NFM and CAA

(1) On request

MODEL CODES SRD991 (CONTINUED)

OPTIONS		
Premium Diagnostics Features (made with built-in Pressure Sensors)	(v)	-B
Positioner free of copper and its alloys	(h)	-C
Infrared Interface for Communication by Means of IRCOM	(s)	-I
Pneumatic Amplifier in the "Spool Valve" Version	(n)	-S
Approved for SIL2 / SIL3 application	(w)	-Q
Custom Configuration		-T
Version of Positioner according to VDI/VDE 3847		-N
Version for ESD Valve with PST functionalities	(a)	-E
Stainless Steel Housing	(f)	-Z
Stainless Steel Housing without SST gauges	(f)	-Z1
Top Mounting version of SRD991 with built-in linear potentiometer	(j)(l)	-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 / Chinese	(b)	-V10
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) ONLY WITH (additional Inputs/Outputs E) AND (Optional Feature -B) (b) Not released

(c) Only with Input/Communication D, H

(d) Only with Input/Communication F, H, P and Q

(e) NOT WITH (electrical certification ZZZ, EA4, EAA, GA4, GAA)

(f) 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)

(g) Available ONLY WITH (Electrical Classification: FAA, NFM, CAA)

(h) Available WITH (Version: B) OR WITH (Version: C) AND (Optional Features: S) (j) ONLY WITH (Built-in limit switch -S) AND (Electrical Classification -ZZZ)

(k) Only with ELECTRICAL CLASSIFICATION EA4, EAA or ZZZ (l) NOT WITH (optional feature -N OR Z OR Z1)

(n) Only with Version -C

(s) Only available with Optional Feature LCD (-V01 to -Vxx)

(v) Only available for Input/Communication F, H, P and Q in connection with Electrical Classification ZZZ, FAA, NFM, EAA, CAA & GAA

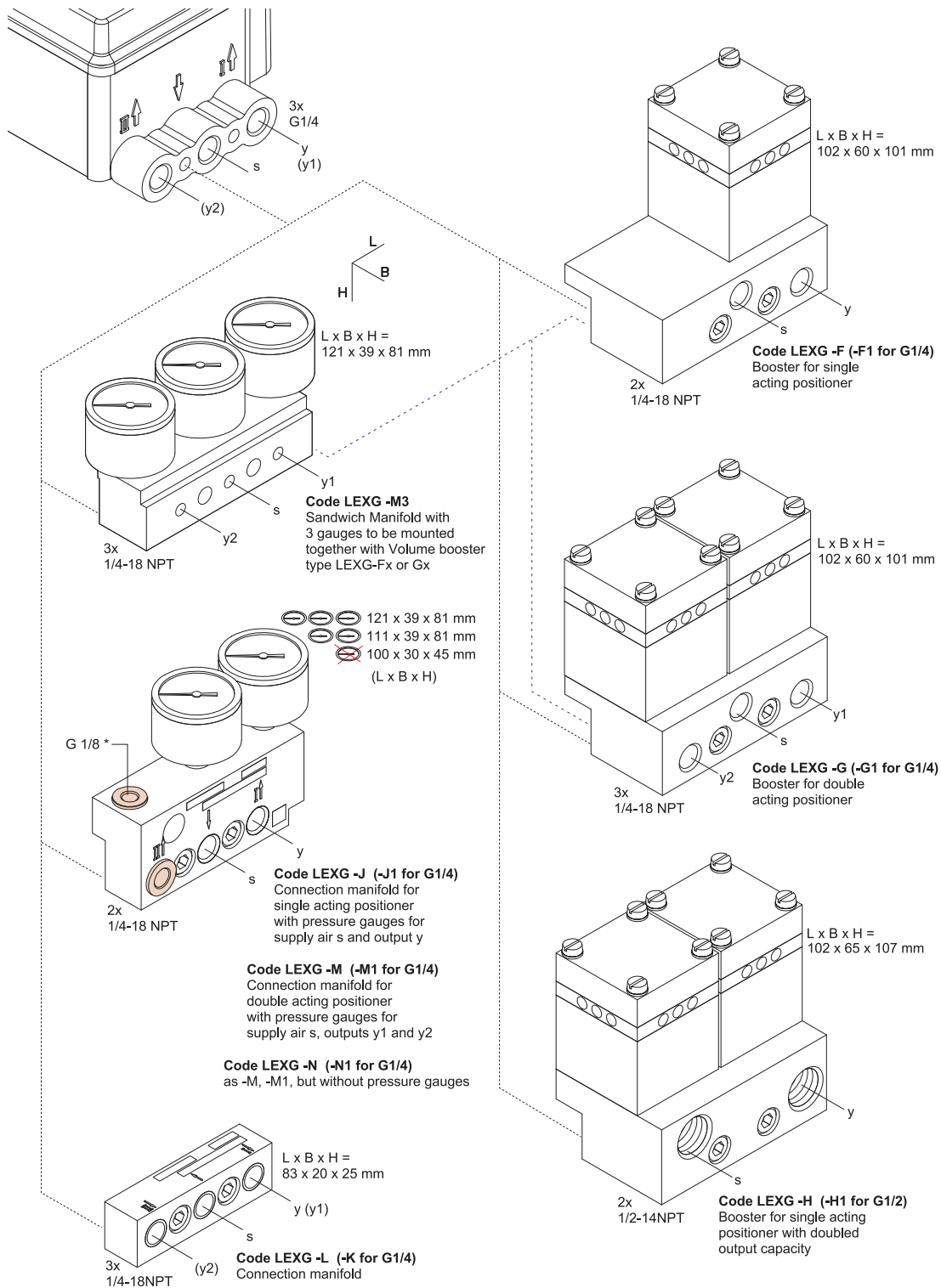
(w) Only available for Version single-acting -B in connection with Input/Communication -D and -H (x) Only in connection with Optional Features -B

(y) Not with Optional Features -B

(z) Not available with Electrical Classification FAA, NFM and CAA

(l) On request

Model Code Accessories



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

Accessories for Intelligent Positioners	
Cable Gland	BUSG
M20 x 1.5 stainless steel	-S6
M20 x 1.5 plastic, color gray	-K6
M20 x 1.5 plastic, color blue	-K7
M20 x 1.5 plastic, color white	-K9
M20 x 1.5 HF-cable gland for Fieldbus	-P4
M20 x 1.5 Plug-connector for Fieldbus (ss / threaded connection 7/8 - UN)	-F2
M20 x 1.5 Plug-connector for Profibus PA (ss / threaded connection M12)	-P3
M20 x 1.5 stainless steel EEx d	-S7
M20 x 1.5 brass zink plated EEx d	-S8
1/2-14 NPT cable gland 6...12 mm, Stainless steel, EEx d	-N1
1/2-14 NPT cable gland 6...12 mm, Steel zink plated, EEx d	-N2
1/2-14 NPT, brass zink plated, EEx d	-N3
M20 x 1.5 Plug, plastic	-V3
M20 x 1.5 Plug, EEx d / explosionproof certified, stainless steel	-V4
1/2-14 NPT Plug, EEx d / explosionproof certified, stainless steel	-V5
M20 x 1.5 Plug, brass zink plated, EEx d	-V6
1/2-14 NPT Plug, brass zink plated, EEx d	-V7
Adapter	AD
Adapter 1/2" NPT to 3/4" NPT (stainless steel)	-A3
Adapter M20 x 1.5 to 1/2" - 14 NPT (internal thread) (Brass nickel plated)	-A5
Adapter M20 x 1.5 to 1/2" - 14 NPT (internal thread) (stainless steel)	-A6
Adapter M20 x 1.5 to PG13.5 (internal thread) (stainless steel)	-A7
Adapter M20 x 1.5 to G1/2" (internal thread) (stainless steel)	-A8
Adapter (plastic) M20 x 1.5 to PG13.5 (internal thread)	-A9
Manifold (for SRD960, SRD991 and SRI990)	LEXG
With Connection G 1/4	-K
Gauge Manifold (for SRD960, SRD991 and SRI990 with 1/4 - 18 NPT connection)	
Without gauges	-N
With gauges for Version single acting	-J
With gauges for Version double acting	-M
Sandwich Manifold with gauges to be mounted together with Volume booster type LEXG-Fx or Gx	-M3
with G1/4 connection	
Without gauges	-N1
With gauges for Version single acting	-J1
With gauges for Version double acting	-M1
Booster Relay (for SRD960, SRD991 and SRI990, with connection 1/4 - 18 NPT)	
for Version single acting	-F
for Version double acting	-G
for Version single acting with doubled output capacity	-H
with connection G1/4 - 18	
for Version single acting	-F1
for Version double acting	-G1
for Version single acting with doubled output capacity	-H1
Booster Relay (mounted independent from positioner, for SRD960, SRD991 und SRI990, with connection G1/4)	
for Version single acting	-X1
for Version double acting	-Y1
for Version single acting with doubled output capacity	-Z1

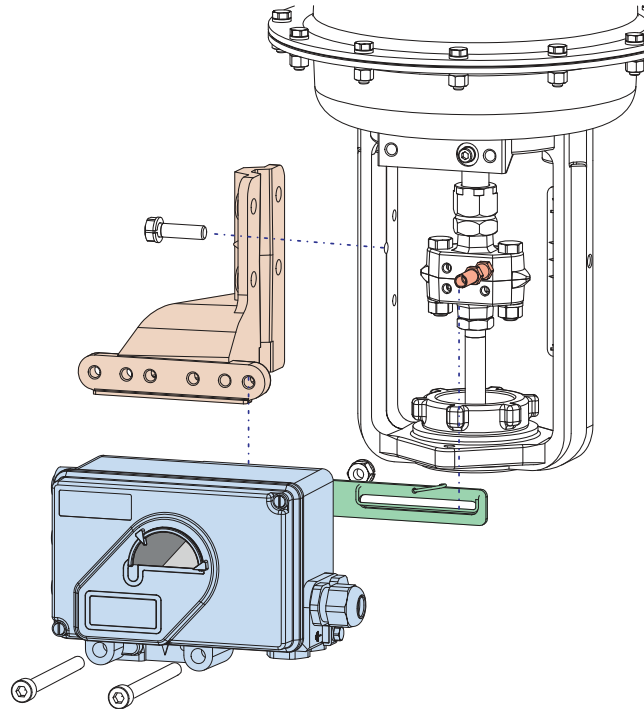
Model Codes Attachment Kits

Accessories for Positioners (SRD991, SRI990, SRD960)		012007
Attachment Kit	EBZG	
For diaphragm actuators with casting yoke acc. NAMUR (incl. standard Couple lever)		-H1
For diaphragm actuators with pillar yoke acc. NAMUR (incl. standard Couple lever)		-K
For directly mounting (incl. standard Couple lever)		-D
For mounting to rotary actuators acc. VDI/VDE 3845 (without bracket)		-R
For FoxTop / FoxPak (g)		-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 in.		-B1
For Fisher:		
657, 667 (linear) size 30 and 40		-F1
1051, 1052, 1061 size 40		-F2
657, 667 size 30 and 60		-F3
657, 667 size 70 and 100		-F3
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 (k)		-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 (g)		-S5
Type 3277 with G 1/4 and gauges for supply- and output-pressure (g)		-S6
Micro flow Type 3277-5 (k)		-S8
Tuflin / XOMOX: (h)		
Type MX60 (h)		-T1
Type MX200 (h)		-T2
Type MX450 / Type MX750 / Type MX1250 (h)		-T3
Type MX3000 (h)		-T4
For Hagan actuators:		
(left of pneumatic cylinder)		-X2
(right of pneumatic cylinder)		-X1
For AMRI rotary actuator (requires minor modification of actuator. Please consult the factory before ordering!)		-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 size		-M4
Varipac		-M5
37/38 size 9, 11, 13		-M6
Severn Glocon Type Domotor size small (h)		-M7
For Valtek Linear Actuator all Sizes - Stroke up to 4 inn / 102 mm		-V1
For VETEC Type R150		-V2

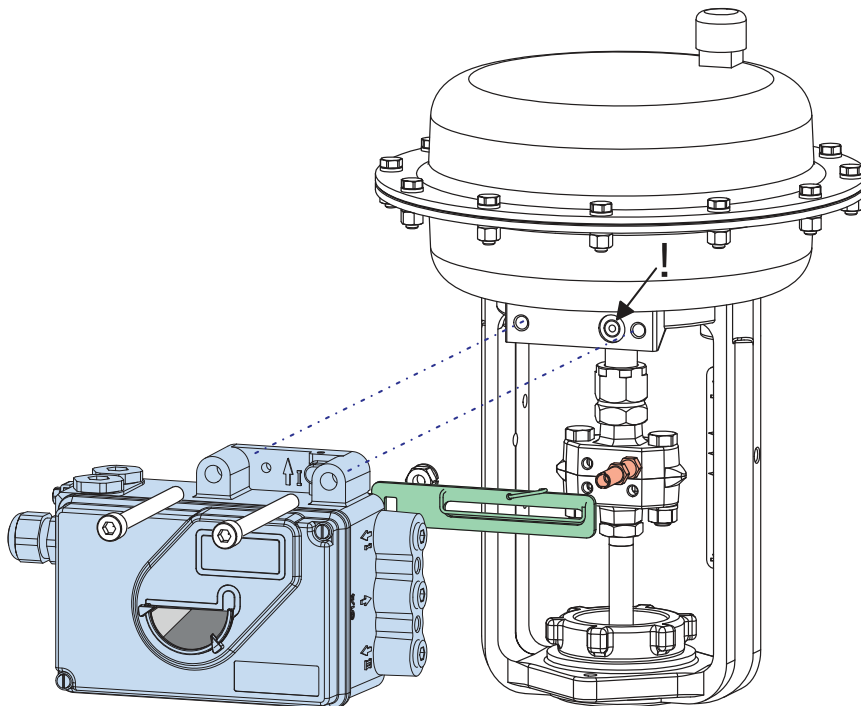
MOUNTING

Mounting to Linear Actuators

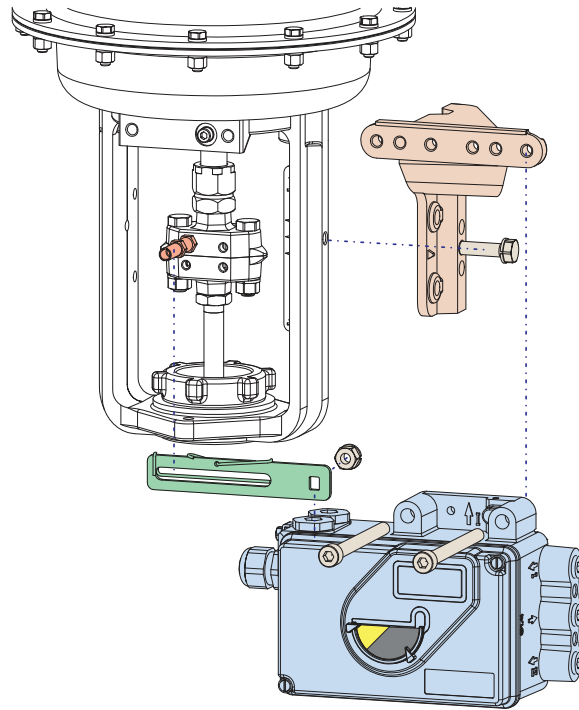
Attachment to stroke actuators accessory to IEC 534-6 (NAMUR), left hand



Direct attachment to stroke actuators

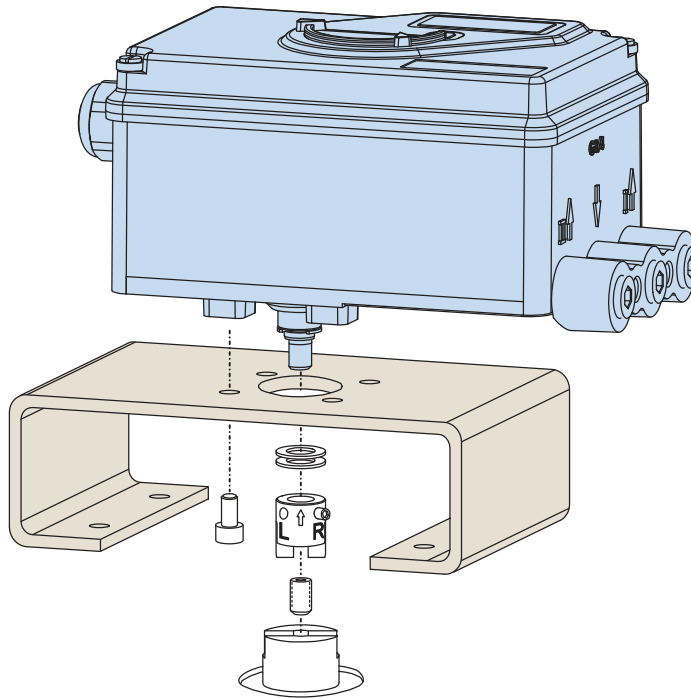


Attachment to stroke actuators accessory to IEC 534-6 (NAMUR), right hand

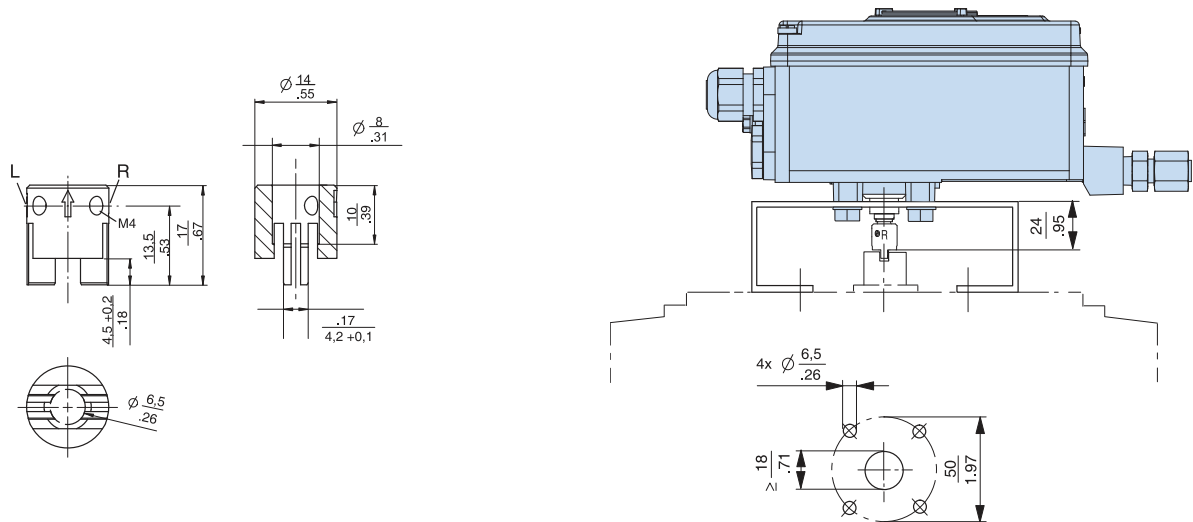


Mounting to Rotary Actuators

Delivery of bracket by manufacturer of actuator

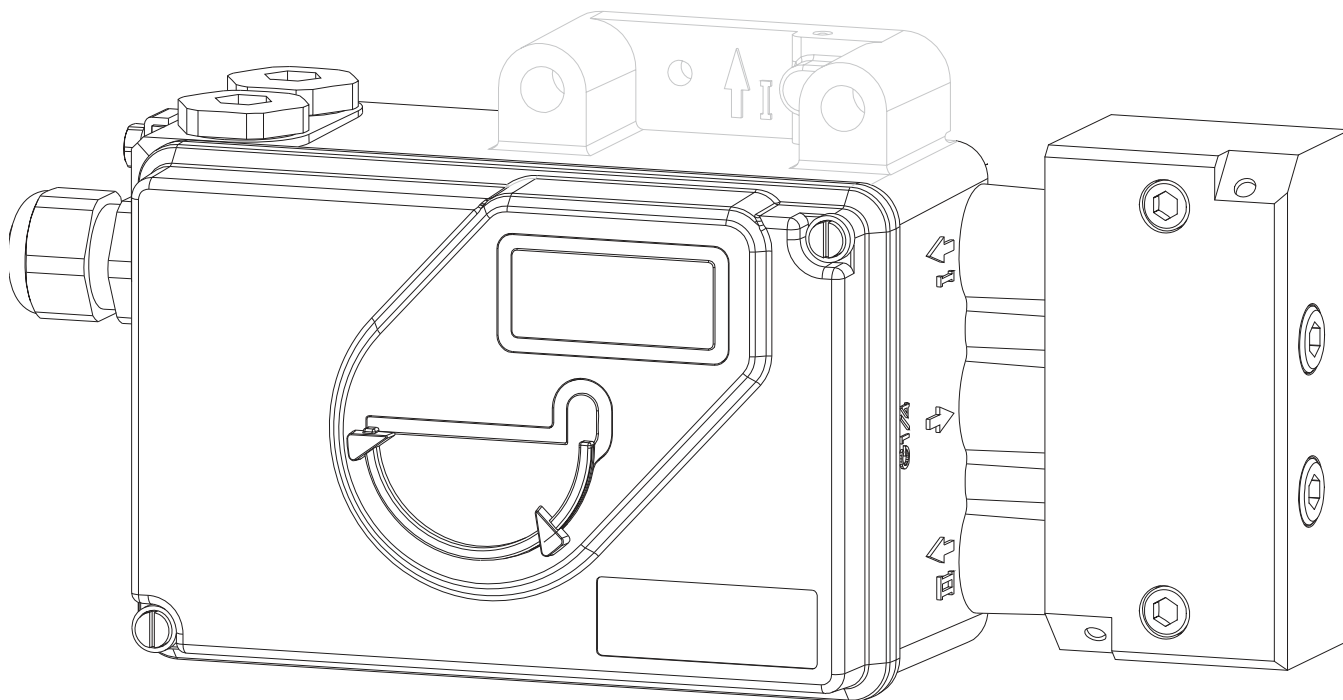


Dimensions of Attachment to Rotary Actuators Accessory to VDI/VDE 3845

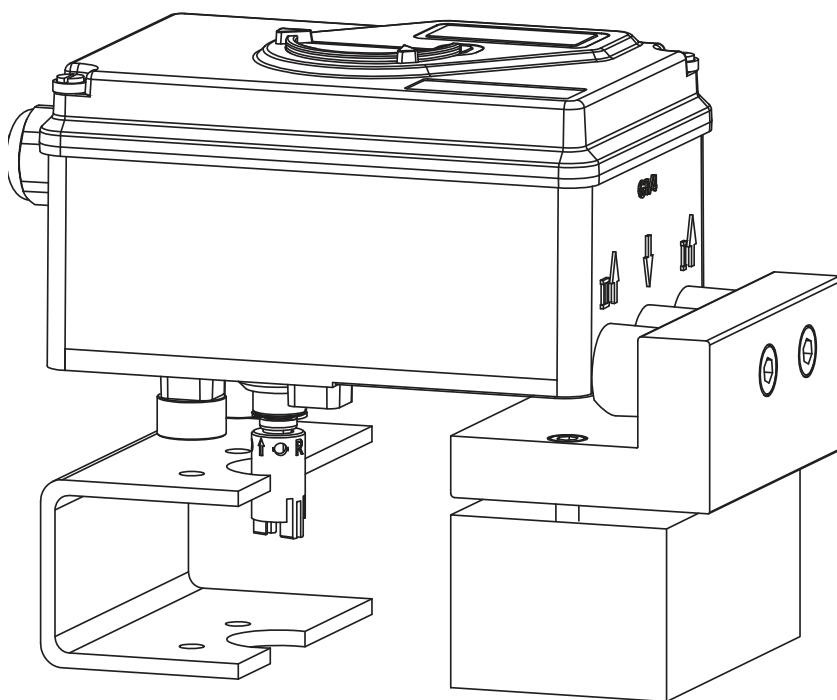


Mounting Accessory to VDI/VDE 3847

Mounting to Linear Actuators

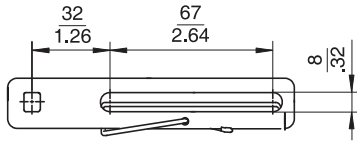


Mounting to Rotary Actuators

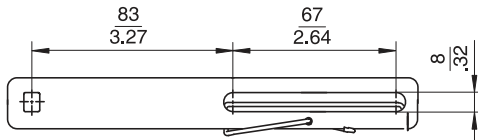


Dimensions of Components of Attachment Kits (Samples)

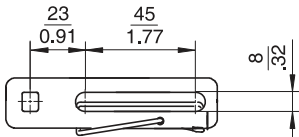
Feedback lever Code EBZG-A for 8..70 mm travel



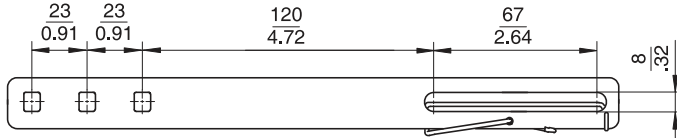
Feedback lever Code EBZG-B for 60..120 mm travel



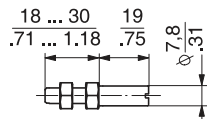
Feedback lever FlowPak/FlowTop in Code EBZG-E



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

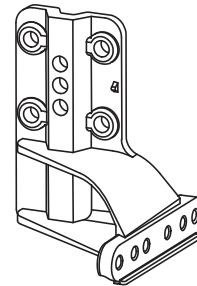
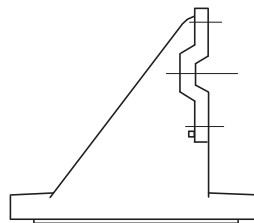
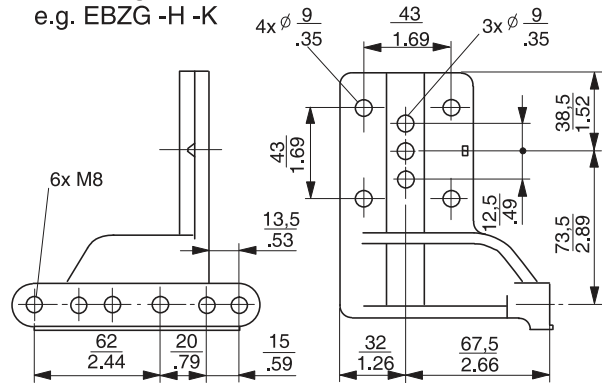


Carrier bolt for connection to valve stem



Mounting bracket

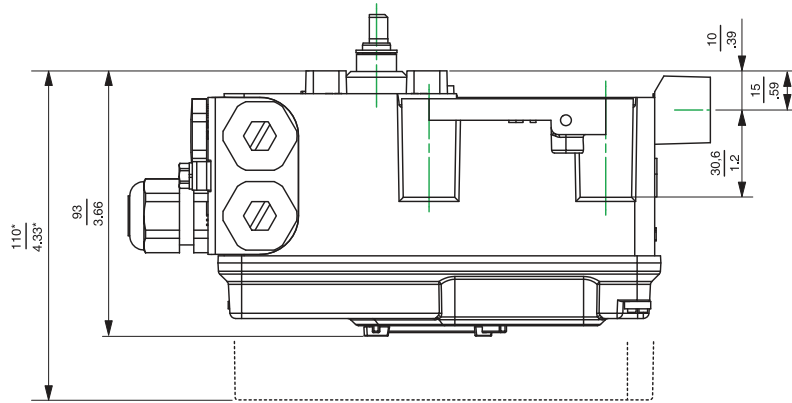
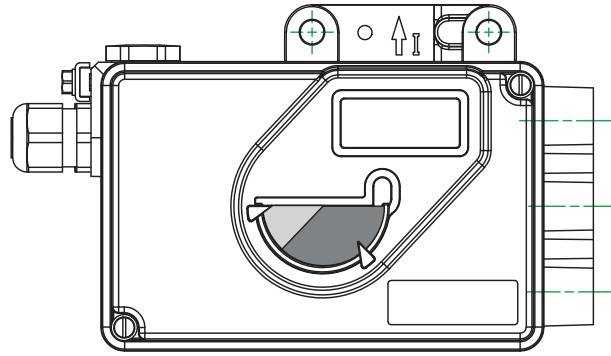
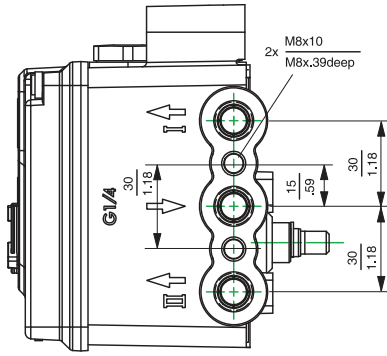
e.g. EBZG -H -K



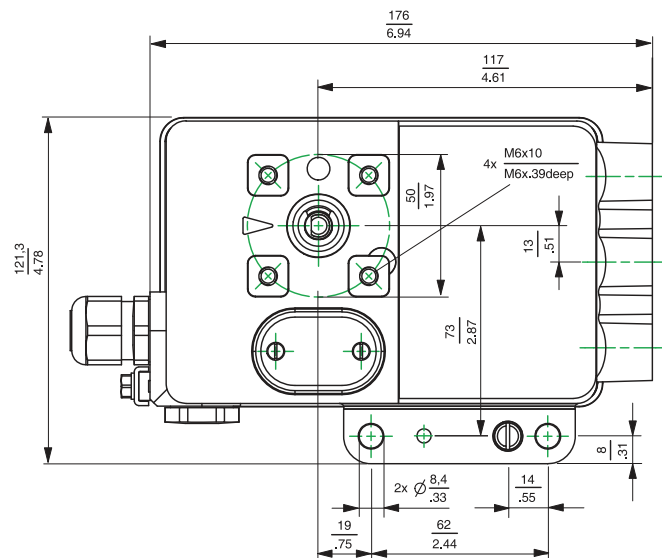
mm
in

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



mm
in





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