SRD991 Intelligent Positioner with HART, FoxCom, PROFIBUS, F. Fieldbus or Without Communication

The intelligent positioner SRD991 is designed to operate pneumatic valve actuators and can be operated from control systems (e.g. the Foxboro I/A Series System), controllers or PC-based configuration- and operation tools such as VALcare™ (FDT software). The positioner is available with different communication protocols. The multi-lingual full text grafic-LCD (optional with infrared interface) in connection with the 3 push buttons allows a comfortable and easy 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
- Easy local operation with three key pads
- Multi-Lingual full text grafical LCD, or LEDs
- VALcare™ (FDT software) for valve diagnostics and predictive maintenance

with communication

- HART, FOUNDATION Fieldbus H1, PROFIBUS-PA, FoxCom
- Configuration by means of local keys, hand-held terminal (HART), PC or I/A Series system or with an infrared interface by means of IrCom

without communication

- Input signal 4 to 20 mA

COMMON FEATURES

- Stroke 8 to 120 mm / 260 mm (0.3 to 4.7 in / 10.2 in)
- Angle range up to 95 °
- 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 534, Part 6 – VDI/VDE 3847
- Mounting on rotary actuators acc. to VDI/VDE 3845
- Protection class IP 65 (IP 66 on request), NEMA 4X
- Approved for SIL applications
- Explosion protection: Intrinsic safety according to ATEX and FM/CSA

FOXBORO ECKARDT

OVERVIEW

The SRD991 consists of a **basic device** with digital controller with different **communication protocols** (or also simply 4-20 mA input). Into the basic device still **additional equipment** can be built, like additional 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**). To run very large actuators still **boosters** with increased air capacity can be flanged on additionally. Also different **manifolds** for connection and gauges can be flanged on.
For the pneumatic screw connections we offer different threads in the housing; with cable glands there are 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 SRD991.
By means of communication the device can be configured from the distance; or with **IrCom** + PC (Infrared Interface, approx. 1 m).

A large variety of attachment kits for all common valves and actuators are available - the current list is extended constantly and can be found in the Internet under
http://www.foxboro-eckardt.com/products/positioners_en.html

Basic devices:

All devices regulate digitally and have 3 push buttons and 5 LEDS for local configuration.

Device version	Indication	remote configuration
"H" HART (4-20 mA)	LCD or 5 LEDs	by communication / IrCom / Service plug
"P" Profibus	LCD or 5 LEDs	by communication / IrCom / Service plug
"Q" F.Fieldbus	LCD or 5 LEDs	by communication / IrCom / Service plug
"F" FoxCom-digital	LCD or 5 LEDs	by communication / IrCom / Service plug
"E" FoxCom-analog	5 LEDs	by communication
"D" Digital (4-20 mA) without communication	LCD or 5 LEDs	by IrCom / Service plug

Additional equipment, built into the basic device:

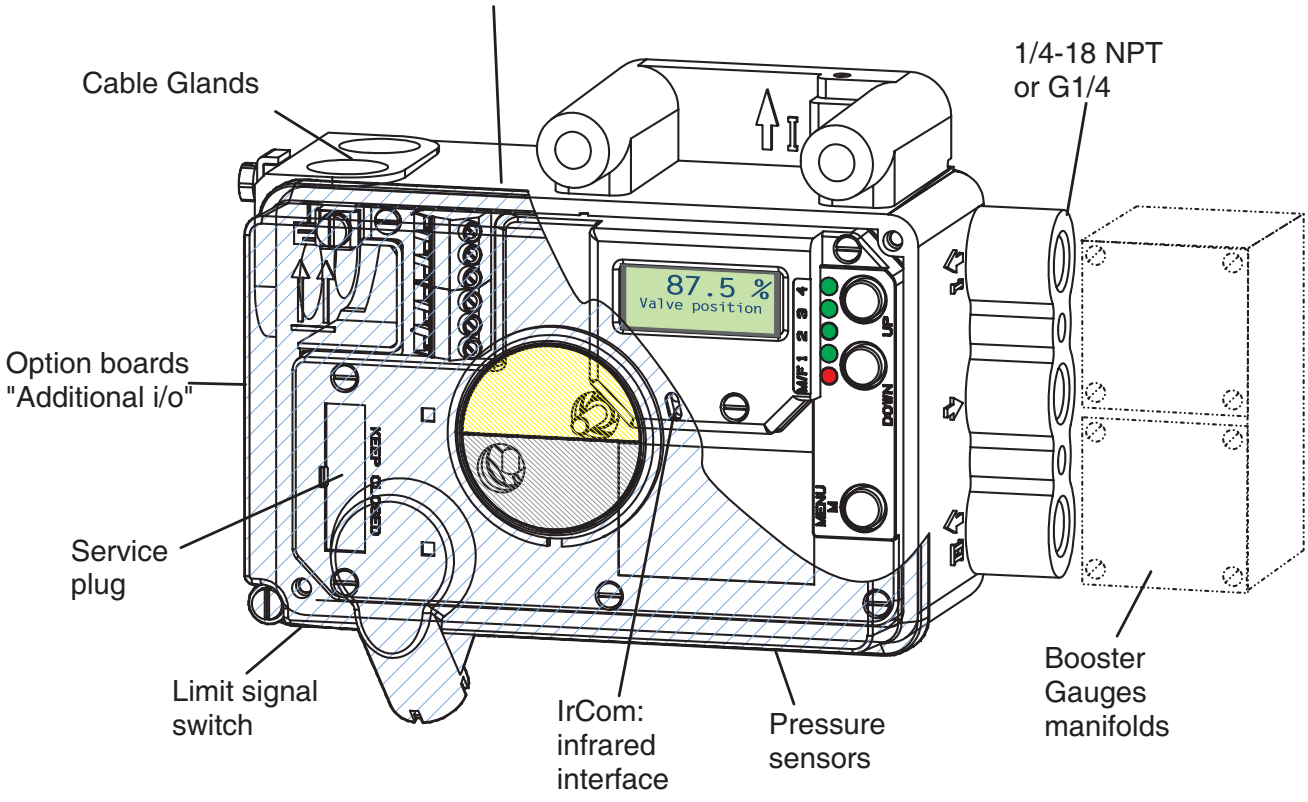
Option Board "Position Feedback" or	1 output 4-20 mA (to be supplied externally) supplies stroke / angles of rotation 1 alarm output becomes active with a configurable event
Option Board "2 Binary Inputs" or	2 external switches release a control function in the SRD, e.g. "close valve" (configurable)
Option Board "2 Binary Outputs"	2 binary outputs become active during limit value excess of the measured valve position
Grenzwertgeber	Supplies NAMUR signals during excess or falling below of two limit values supplies; inductiv, independent of the controller; in normal or safety version, or Micro switches
Pressure sensors	2 sensors measure the pressure of supply air and output y1; the values are passed on via communication [1)]
LCD or	Full text graphic LCD in 3 languages [2)]
LCD and IrCom	Full text graphic LCD in 3 languages, and infrared interface [2)]

Accessories see page 23

1) Pressure sensors not with basic device "D" Digital without communication
2) LCD not with basic device "E" FoxCom-analog

Contents . . . . . Page

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



FUNCTIONAL SPECIFICATIONS (common data for all versions)

Travel range

Stroke range . . . . . 8 ... 70 mm (0.3 ... 2.8 in),
and . . 60 ... 120 mm (2.4 ... 4.7 in),
and . . 100 ... 260 mm (3.9 ... 10.2 in)
Rotation angle range . . . . . up to 95 °
(without mechanical stop)

Supply

Supply air pressure . . . . . 1.4 ... 6 bar (20 ... 90 psig)
with spool valve . . . . . 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 [1] . . . . . according to ISO 8573-1
Solid particle size and density class 2.
Oil rate . . . . . class 3
For air supply, we recommend the FOXBORO ECKARDT FRS923 filter regulator.

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

Air consumption (steady state) l_n/h (scfh)

Supply air pressure bar (psig)	1.4 (20)	3 (45)	6 (90)
single acting	100 (3.5)	110 (3.9)	150 (5.3)
double acting	200 (7.0)	220 (7.8)	300 (10.6)

The listed values are simplified. The exact values can be determined using the following formulas:

single acting;
P in bar: Qcon= (Psup+1)*20 + Pout*60 [Nl/h]
P in psi: Qcon= (Psup+15)*0.0008 + Pout*0.0024 [scfm]

double acting:
P in bar: Qcon= (Psup + 1)*110 [Nl/h]
P in psi: Qcon= (Psup + 15)*0.0044 [scfm]

Qcon Max. Air consumption
Psup Supply pressure
Pout Output pressure

Air output l_N/h (scfh)

at max. deviation, single and double acting:

Supply air pressure bar (psig)	1.4 (20)	2 (30)	4 (60)	6 (90)	7 (105)	
without booster	2 700 (95)	3 500 (124)	5 500 (194)	7 500 (265)	–	
with Spool Valve	3 400 (120)	4 300 (151)	7 200 (254)	10 000 (350)	11 400 (400)	
with booster code F, G	18 000 (636)	24 000 (847)	40 000 (1 492)	55 000 (1 942)	–	
with booster code H	36 000 (1 271)	48 000 (1 695)	80 000 (2 825)	110 000 (3 884)	–	

Note: The use of boosters in connection with Spool valve must be individually examined.

The listed values are simplified. The exact values can be determined using the following formulas:

single acting and double acting:
P in bar: Qout= (Psup + 1)*1100 [Nl/h]
P in psi: Qout= (Psup+15)*2.6 [scfh]

with booster
single acting, doubled air capacity:
P in bar: Qout= (Psup +1)*15700 [Nl/h]
P in psi: Qout= (Psup+15)*36.8 [scfh]

with Spool Valve,
single acting and double acting:
P in bar: Qout= (Psup + 1)*1450 [Nl/h]
P in psi: Qout= (Psup+15)*3.4 [scfh]

1) Pressure dew point 10 K under ambient temperature
2) Data measured according to VDI/VDE 2177
3) With stroke 30 mm and lever length 90 mm

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

Attachment to rotary actuators acc. to VDI/VDE 3845 ....

with attachment kit . . . . . EBZG -R
- Further attachment kits see ModelCodes page 25
- Mounting orientation see attachment dimensions starting from page 26

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 . . . . Silicone (suitable for use in the colour- and lacquer industry)

Weight

Single acting . . . . . approx. 1.7 kg (3.7 lbs)
Double acting. . . . . approx. 2.0 kg (4.4 lbs)

Pneumatic connection

NAMUR mounting . . . . . 3 x female threads 1/4-18NPT or 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
Direct mounting . . . . . Instead of the output y1, an air connection on the back side 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
Wire cross section . . . . . 0.3 to 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)
Storage conditions
acc. to IEC 60721-3-1: . . . 1K5; 1B1; 1C2; 1S3; 1M2
Indicators
LCD (visible) [2] . . . . . –25 ... 70 °C (–13 ... 176 °F)
LEDs . . . . . –40 ... 80 °C (–40 ... 176 °F)
Relative humidity . . . . . up to 100 %
Protection class [3]
acc. to IEC 529. . . . . IP 65; IP 66 on request
acc. to NEMA . . . . . Type 4X

Electromagnetic compatibility EMC

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

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

SAFETY REQUIREMENTS

CE label

Electromagnetic compatibility [4] 89/336/EWG
Low-voltage regulation . . . . . 73/23/EWG 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.

FUNCTIONAL SPECIFICATIONS (common data for versions "Intelligent with communication" HART, PROFIBUS-PA, FOUNDATION Fieldbus H1, FoxCom)

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 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 see next page.

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
  - 2 binary outputs (position alarms)
  - 2 binary inputs

Operation and Configuration

Local . . . . . with local key pads
Display. . . . . Multi-lingual Graphic LCD[1)]
and five 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 - ...

(further menu languages on request)
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™ software .
The additional languages can be downloaded from our homepage. [2)]

Position feedback and Alarms

Position feedback. . . . . via communication
Optional [3)]. . . . . 4-20 mA Position feedback
Alarms . . . . . via communication
Optional [3)]. . . . . 1 Alarm output
Positions-Alarms . . . . . via communication,
Upper and lower pre-alarm
Upper and lower main alarm
Optional [3)]. . . . . 2 binary outputs,
Upper and lower pre-alarm
Upper and lower main alarm
Independant feedback
Limit signal switch (inductiv) . Normal version
Security version etc.

Diagnostics

– in the field:
- Self diagnostics
- Status and Diagnostic messages

– via VALcare™ Valve Diagnostic Software:
- 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, not sufficient 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 and IrCom

All basic devices (except FoxCom version before HW rev.3) are equipped with a service plug at the front side. There via RS232 interface a PC with VALcare™ (FDT Software) can be connected via modem EDC82 (galv. separated, not Ex).

If the SRD is equipped with option "IrCom", communication can take place contactless via infrared with the positioner (even with a closed cover!). Modem "IR Interface" (not Ex) is connected via RS232 interface to a PC (for practical reasons a notebook) with VALcare™ (FDT software) and makes possible a range of approx. 1 m.
(If the notebook has an IrDa interface, this cannot be used, despite similar technique. The IrDa instruction set has no communication commands for positioners.-)

1) Not with version FoxCom analog
2) With the versions "Intelligent without communication" this is only possible with modem EDC82
3) By means of "Additional inputs / outputs"

Manual local 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 [1)]
- Enhanced Autostart
- Smooth response [1)]
- Fast response [1)]

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 with 12.5 % or 1 % [1)]
Pneumatic test. . . . . Function to test the pneumatic output
Workshop . . . . . input and angle calibation
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

Safety position at
- Air supply failure . . . . . pressure y1 = zero
- Electric power failure . . . . . pressure y1 = zero
- Failure of electronics . . . . . pressure y1 = zero
- 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

1) from HW-Rev. 3.4 / Firmware Rev. 16

Electrical classification [4) 5)]

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 communication HART and "without communication":

T4 with explosion protection code EA4

Version with communication HART, FOUNDATION F.,PROFIBUS und FoxCom:

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 °C to + 80 °C

Temperature class T6: . . . . –40 °C to + 55 °C

Explosion protection Zone 2

It is recommended to use the positioner with explosion protection “intrinsically safe” (consider temperature class).

In the Federal Republic of Germany these positioners may be operated in Zone 2 with non-intrinsically safe circuits if the operating values do not exceed the maximum reference values.

Type of protection FM “intrinsic safety”

(Electronics family AI 638, per FM 3003731)

Class I, Div. 1, Groups A, B, C, D;

hazardous locations indoor and outdoor, NEMA Type 4X

Type of protection FM “non-incendive”

(Electronics family AI 638, per FM 3003731)

Class I, Div. 2, Groups A, B, C, D, F, G;

hazardous locations indoor and outdoor, NEMA Type 4X

Type of protection CSA “intrinsic safety / non-incendive”

(Electronics family AI 638, per CSA 1703912)

Class I, Div. 2, Groups A, B, C, D;

Intrinsically Safe for Class I, Div 1, Groups A, B, C, D

hazardous locations indoor and outdoor, NEMA Type 4X

See Certificate of Conformity for details.

4) With appropriate order only

5) National requirements must be observed

BASIC DEVICE with communication HART

Signal Input . . . . . Two wire system
Reverse polarity protection . . feature
Signal range . . . . . 4 to 20 mA
Operating range . . . . . 3.6 to 21.5 mA
Input voltage . . . . . DC 12...36 V [1] (unloaded)
Load . . . . . 420 Ohms, 8.4 V at 20 mA
Communication signal . . . . . HART, 1200 Baud, FSK (Frequency Shift Key) modulated on 4 to 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
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 . . . . . approx. 3 sec
Interruption time without power down:
with LCD + LED . . . . . typ. 80 ms [2]

Configuration

Local / Display . . . . . see page 6
Software . . . . . VALcare™ (FDT-Software)
Hardware . . . . . Modem MOD991 for PC, IBM compatible
Hand Held Terminal . . . . . e.g. HT991
I/A Series System . . . . . FBM215 or FBM218 (redundant) in combination with CP60 [3]
Other control systems . . . . . AMS, Siemens SIMATIC PDM (ProcessDeviceManager)

Electrical classification hereto:

see page 8

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

BASIC DEVICE with communication FoxCom

Operating mode digital (from HW-Rev.3.0)

Input . . . . . Two-wire system, digital
Reverse polarity protection . . standard feature
Supply voltage . . . . . DC 8 to 36 V
Supply current . . . . . ~ 9 mA at 24 V
Communication signal . . . . . FoxCom digital, 4800 Baud, FSK (Frequency Shift Key), modulated on supply voltage
Input impedance Zi. . . . . ~ 500 Ohms (3 to 15 kHz)
Start-up time . . . . . approx. 2 sec
Interruption time without power down:
- with LCD . . . . . 85 ms [1)]
- with LED . . . . . 75 ms [1)]

Cable capacitances (< 100 µF), inductances and impedance of other attached devices must be conformal for FOXBORO specification.

Configuration:

Local . . . . . with local push buttons
Display. . . . . Multi-lingual Graphic LCD and five LEDs
Software . . . . . VALcare™ (FDT-Software)
Hardware. . . . . Modem PC10
I/A Series System . . . . . FBM 43 in combination with CP40 [1)] (CP60 on request), and FBM 243, 246 in combination with CP60 [1)]

Electrical classification hereto:

see page 8

Operating mode analog

Input . . . . . Two-wire system
Reverse polarity protection . . standard feature
Signal range . . . . . 4 to 20 mA
Operating range. . . . . 3.6 to 21.5 mA
Input voltage . . . . . DC 13 to 36 V
max. Load . . . . . 650 Ohm, 13 V at 20 mA
Communication signal . . . . . FoxCom analog, 600 Baud, FSK (Frequency Shift Key), modulated on 4 to 20 mA
Input impedance Zi. . . . . ~ 500 Ohm (0.5 to 20 kHz)

Configuration:

Local . . . . . with local push buttons
Indication . . . . . 5 LEDs
Software . . . . . VALcare™ (FDT-Software)
Hardware. . . . . Modem PC10
I/A Series System . . . . . FBM 44 in combination with CP40 [1)] (CP60 on request), and pure analog control by means of FBM204, FBM205, FBM215 and FBM218, in combination with CP60 [1)] Others on request

Test sockets
- for connection of communicators
- for non-interruptable current measurement at Code E; interlock diode can be switched off

Electrical classification hereto:

see Certificates of Conformity EX EVE0105 A

Type of protection FM “intrinsic safety”

(Electronics family BIA 637 per FM 3003731)
Class I, Div. 1, Groups A, B, C, D; hazardous locations indoor and outdoor, NEMA Type 4X

Type of protection FM “non-incendive”

(Electronics family BIA 637 per FM 3003731)
Class I, Div. 2, Groups A, B, C, D, F, G; hazardous locations indoor and outdoor, NEMA Type 4X

Type of protection CSA “intrinsic safety”

(Electronics family BIA 637 per CSA 1001984 and CSA 1001988, only basic device without options.)
Class I, Div. 1, Groups A, B, C, D; hazardous locations indoor and outdoor, NEMA Type 4X

1) Check CP for suitable ECBs

2) Only FM and CSA

BASIC DEVICE with communication PROFIBUS-PA and FOUNDATION Fieldbus H1

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 6
Software . . . . . VALcare™ (FDT-Software)
Hardware . . . . . PC- or PCMCIA- interfaces from Softing
I/A Series System . . . . . FBM 223 in combination with CP60 [1)]
Other control systems . . . . . All Profibus-PA- compatible, e.g. Siemens SIMATIC PDM (ProcessDevice 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 [2)]. . . . . 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 6
Software . . . . . VALcare™ (FDT-Software) 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 [1)]
Other control systems . . . . . All FOUNDATION Fieldbus H1- compatibe, e.g. SMAR, Fisher Rosemount Delta-V, Honeywell, Yokogawa, ABB

For both fieldbus devices

Input signal . . . . . digital
Supply voltage . . . . . DC 9 to 32 V [3)]
max. Supply voltage . . . . . DC 48 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 1158-2
Operating values . . . . . according to IEC 1158-2
Start-up 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 hereto:

see page 8

1) Check CP for suitable ECBs
2) From HW Rev. 3.4 / Firmware 16
3) Data of ”Intrinsically Safe” version

BASIC DEVICE with 4-20 mA Intelligent without communication (replaces SRD992)

Signal Input . . . . . Two wire system
Reverse polarity protection . . feature
Signal range . . . . . 4 to 20 mA
Operating range . . . . . 3.6 to 21.5 mA
Input voltage . . . . . DC 8.5 to 36 V [1] (unloaded)
Load . . . . . 300 Ohms, 6 V at 20 mA
With applications without communication the capacity parallel to input may not be higher than 100 µF.

Start-up time . . . . . approx. 3 sec
Interruption time without power down:
with LCD + LED . . . . . typ. 80ms [2]

Configuration

Local / Display . . . . . see page 6
Software . . . . . VALcare™ (FDT-Software)
Hardware . . . . . per modem EDC82

Electrical classification hereto:

see page 8

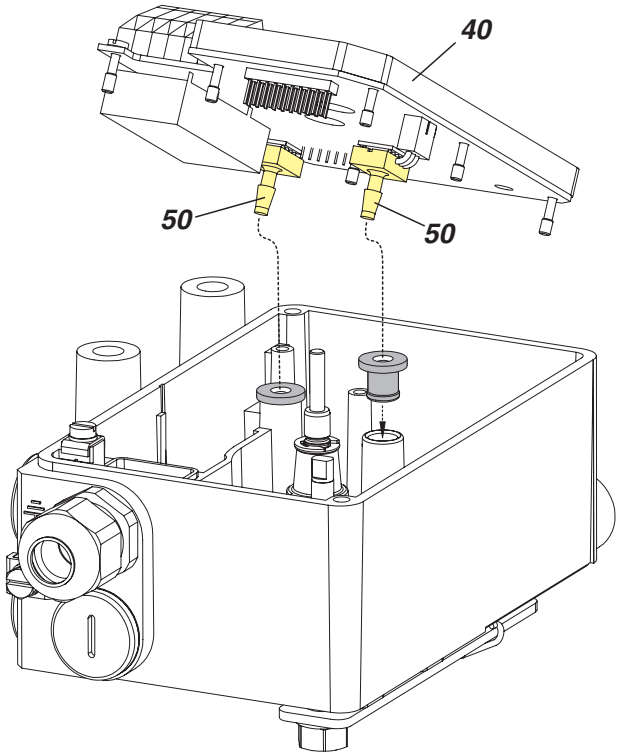
1) On request we can specify higher voltage limits
2) Worst case conditions 4-20mA, with position feedback option, i/p-output with max. current

OVERVIEW ADDITIONAL EQUIPMENT

(built into any basic device except FoxCom-analog

Built-in Pressure sensors, Code Option –B *)

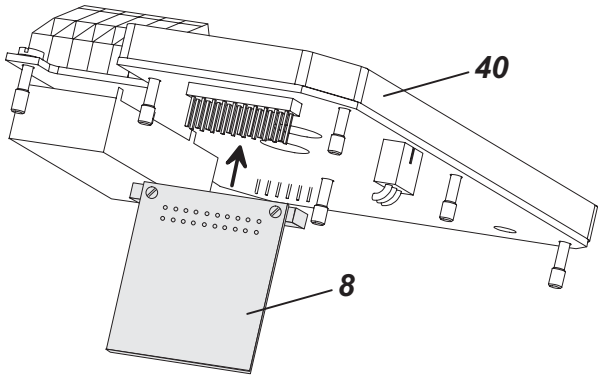
For supply air and output y1 to actuator
Measuring range . . . . . 0 to 8 bar (0 to 120 psig)
Accuracy 0.5%
Temperature influence . . . . . 0.5 % / 10k (–40 to 80 °C)



Pressure sensors ***50***

Additional Inputs / Outputs:

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

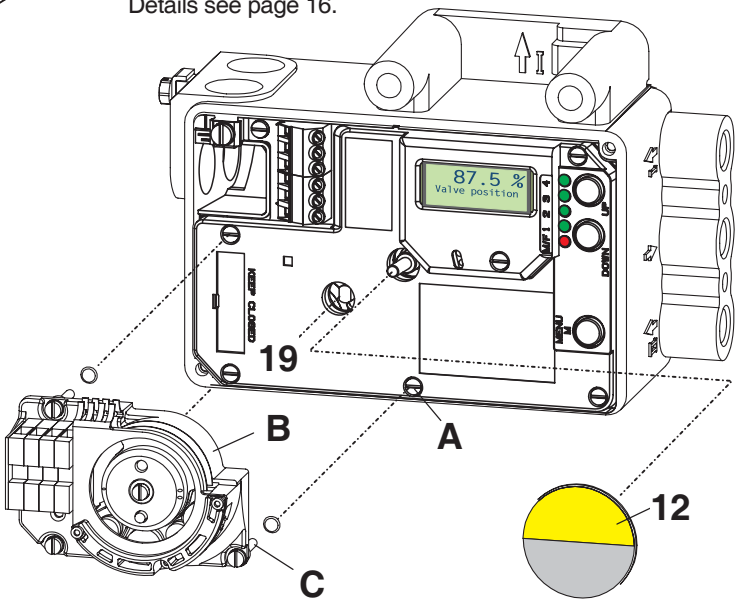


- Position feedback or
- 2 Binary outputs or
- 2 Binary intputs

Details see following pages.

Built-in Limit Switch

Built-in Limit signal switch ***B***
Details see page 16.



Parts Kits for additional installation of auxiliary functions

Model code Additional inputs / outputs/ Limit signal switch	before HW-Rev. 3.0	from HW-Rev. 3.0
Code B: Binary intputs	EW 411 407 273	EW 411 407 325
Code D: Potentiometer Input		EW 411 407 352
Code P: Binary outputs	EW 411 407 264	EW 411 407 316
Code Q: Position feedback 4-20 mA	EW 411 407 255	EW 411 407 282
Code T: Limit signal switch, normal version	EW 426 164 012	EW 426 164 012
Code U: Limit signal switch, security version	EW 426 164 021	EW 426 164 021
Code R: Limit signal switch, 3-wire		EW 426 164 057
Code V: Limit signal switch, micro switches		EW 426 164 066

ADDITIONAL EQUIPMENT built into basic device of versions HART, PROFIBUS-PA, FOUNDATION Fieldbus H1, FoxCom-digital

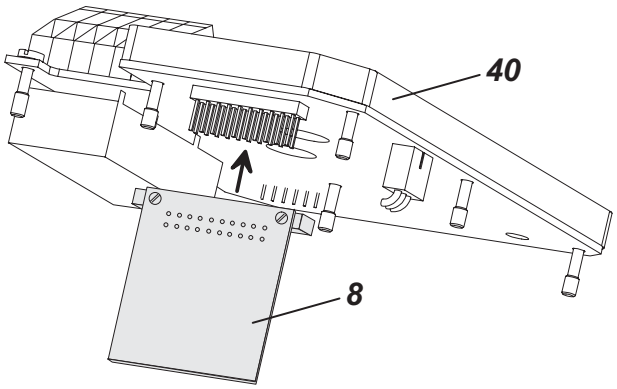
Additional Inputs / Outputs: Two Binary inputs – Code B

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.

The binary inputs can be used for diagnostics or 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

Klemmen für EB1. . . . . A: 13+
B: 14–
EB2. . . . . C: 15+
D: 16–



One module “Additional inputs / outputs” ***8*** can be plugged on main electronics ***40*** :
- Position feedback or
- 2 Binary outputs or
- 2 Binary intputs

Electrical Classification ATEX hereto:

Types of protection and temperature classes as basic device, see page 8.
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:
Uo= 7.88 V, Io= 11.4 mA, Po= 23 mW
Characteristic is linear
For the maximum values of outer inductances and capacities Lo and Co refer to the following table (Li and Ci included):

IIC		IIB	
Lo [mH]	Co [µF]	Lo [mH]	Co [µF]
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.

Types of protection FM/CSA

as basic device, see page 8.

Additional Inputs / Outputs: Two binary outputs (limit signals) – Code P

Stroke / angle derivated from positioner feedback
2 galvanically separated limit signals
Signaling of limit value violation of the measured valve position.
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 ... 36 V [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 AB1 . . . . . A: 81+
B: 82–
AB2. . . . . C: 83+
D: 84–

Electrical Classification ATEX hereto:

Types of protection and temperature classes as basic device, see page 8.
Additions for this option, Type AI 638 P, in EC- Certificate of Conformity PTB 00 ATEX 2128:

For use in hazardous areas in circuits certified as intrinsically safe with the following maximum values:
Ui= 16 V, Ii= 80 mA, Pi= 250 mW
Internal capacitance and inductance: Ci= 26 nF, Li= 5 µH
The electric circuits of "2 binary outputs" are galvanically separated from all other circuits and from earth.

Types of protection FM/CSA

as basic device, see page 8.

Additional Inputs / Outputs: Position feedback 4...20 mA – Code Q

Stroke / angle derivated from positioner feedback
1 output analog, galvanically separated, two-wire system according to DIN 19234, for external supply
supply voltage . . . . . DC 8 ... 36 V [1) 2)]
signal range . . . . . 3.8 to 21.5 mA
0 % and 100 % configurable
device fault . . . . . < 1 mA
Terminals for AI1 . . . . . C: 31+
D: 32–

1 binary alarm output, galvanically separated, two-wire system, according to DIN 19234, for external supply
supply voltage . . . . . external, DC 8 ... 36 V [1) 2)]
Logic . . . . . no alarm . . .< 1mA
alarm . . . . . > 2.2 mA
device fault < 50 µA
Terminals for AB1. . . . . A: 81+
B: 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.

Electrical Classification ATEX hereto:

Types of protection and temperature classes as basic device, see page 8.
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 following maximum values:
Ui= 16 V, Ii= 80 mA, Pi= 250 mW
Internal capacitance and inductance: Ci= 26 nF, Li= 5 µH
The electric circuits of "Position feedback 4...20 mA" are galvanically separated from all other circuits and from earth.

Types of protection FM/CSA

as basic device, see page 8.

1) Other values in hazardous areas
2) On request we can specify higher voltage limits

Built-in Limit Switch

Inductive Limit Switch

– 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)

Stroke / angle derivated from positioner feedback.
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 . . . . . DC 8 V, R_i approx. 1 kOhm
supply voltage range. . . . DC 5...25 V (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–
GW2 . . . . . 51+, 52–

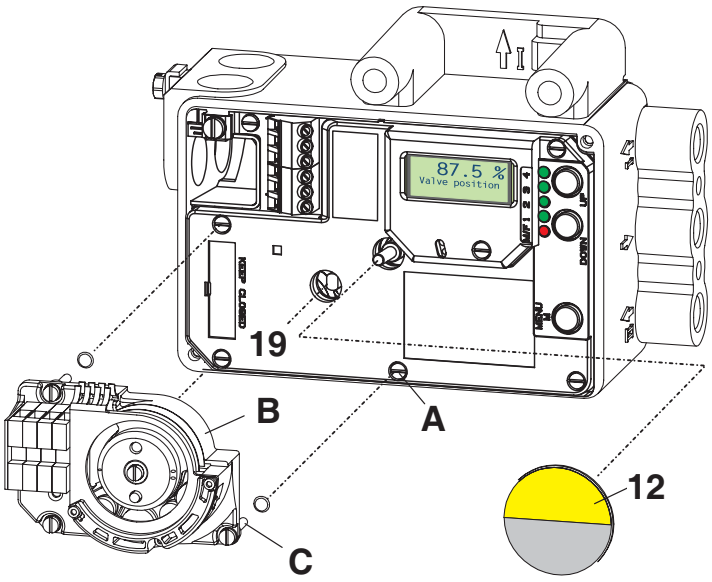
Electrical Classification ATEX of versions "T" and "U":

Types of protection and temperature classes as basic device, see page 8.
Additions for this option, Type AI 638 K, in EC- Certificate of Conformity PTB 00 ATEX 2128:

Types of protection and temperatur classes as basic device. For use in hazardous areas in circuits certified as intrinsic-ally safe with the following maximum values:
Ui= 16 V, Ii= 25 mA, Pi= 64 mW
Internal capacitance and inductance: Ci= 30 nF, Li= 100 µH
The electric circuits of "Built-in Limit Switch" are galvanically separated from all other circuits and from earth.

Types of protection FM/CSA

as basic device, see page 8.



Built-in Limit Switch

Built-in Limit Switch

Mechanical Switches (Micro Switches) Code V

(only without Ex protection)
Stroke / angle derivated from positioner feedback lever

Output . . . . . 2 mechanical switches (Micro switches)[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

Absolute limit values **AC**
of mechanical switches built into positioner:
Umax. . . . . 130 V AC [7)]
Imax . . . . . 0.5 A (resistive Load) [7)]
Imax . . . . . 0.03 A (inductive Load) [8)]

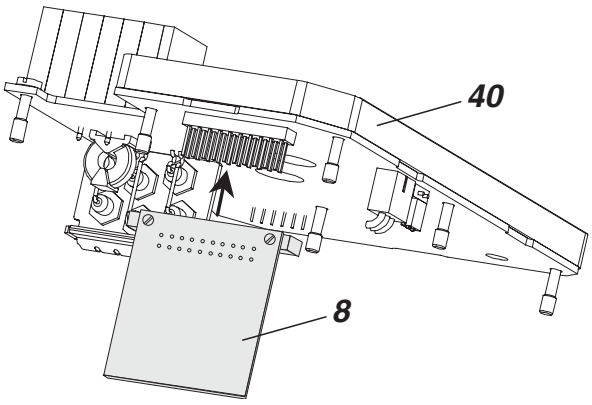
Absolute limit values **DC**
of mechanical switches built into positioner: [9)]
Umax. . . . . 30 V DC
Imax . . . . . 1 A

Switching Differential: . . . . . < 2.5 %

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.

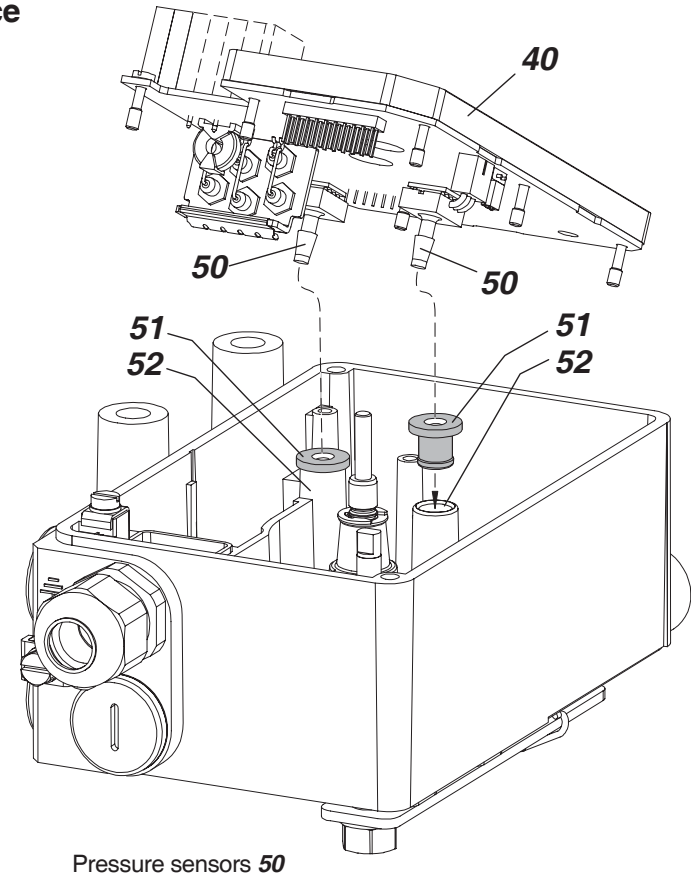
1) Operating mode min. (= low) / max. (= high) selectable by adjustment of switch vanes
2) Data measured according to VDI/VDE 2177
3) With stroke 30 mm and lever length 90 mm
5) Operating mode min. (=low) / max. (=high) selectable by adjusting the respective vane
6) Operating mode normally open / normally closed selectable by vane adjustment
7) Approval according to UL (UL 1054) and CSA (CSA 22.2 No. 55) at 6,000 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

ADDITIONAL EQUIPMENT for basic device with communication FoxCom-analog



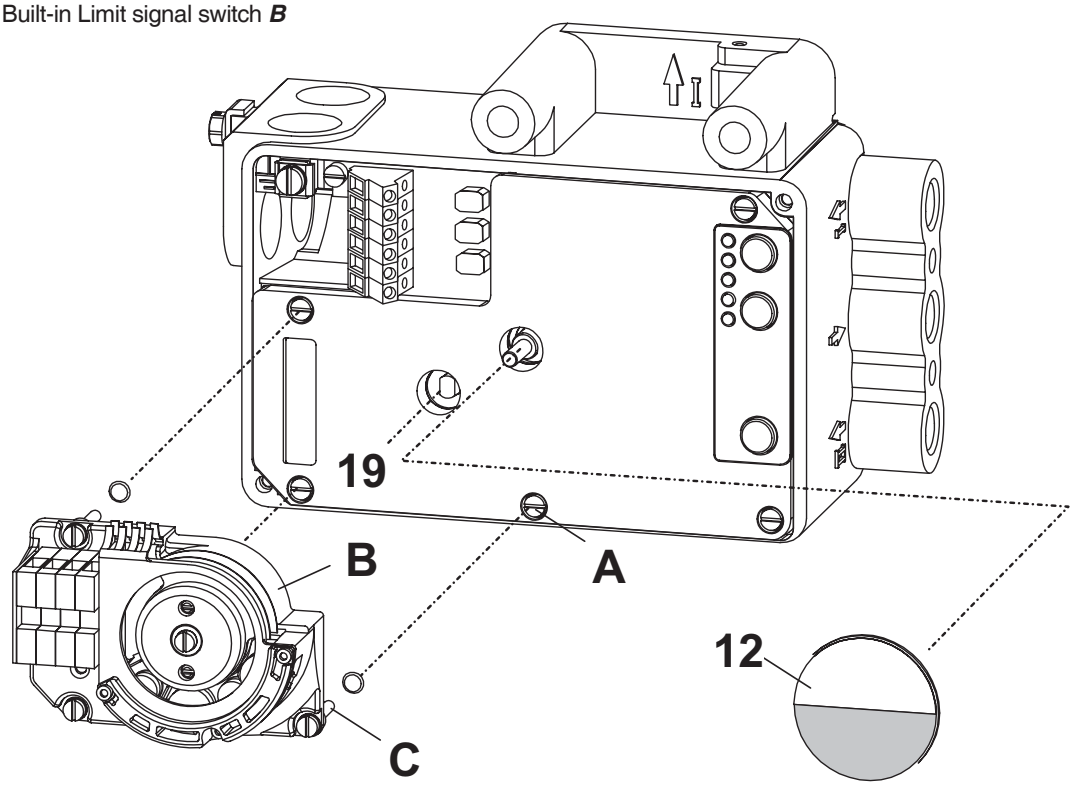
One module “Additional inputs / outputs” ***8*** can be plugged on main electronics ***40*** :

- Position feedback or
- 2 Binary outputs or
- 2 Binary intputs



Pressure sensors ***50***

Built-in Limit signal switch ***B***



ADDITIONAL EQUIPMENT
(built into basic device, version FoxCom-analog, with FM approval)

Additional Inputs / Outputs:
Two binary outputs (limit signals) - Code P

2 galvanically separated binary outputs
Signaling of limit value violation of the measured valve position, configurable
Two-wire system, according to DIN 19234, for external supply.
supply voltage . . . . . DC 8 to 36 V [1) 2)]
Logic:
limit value not exceeded . . . < 1 mA
limit value exceeded. . . . . > 2.2 mA (typ. 6 mA)
device fault . . . . . < 50 µA
Reference: AB1 for upper, AB2 for lower limit
Terminals for AB1 . . . . . 81+, 82–
AB2. . . . . 83+, 84–

Additional Inputs / Outputs:
Two Binary inputs – Code B

Two independent binary inputs, supplied by basic device, for connection of sensors.
A connected switch is loaded with 3.5 V, 150 µA.

The binary inputs can be used for diagnostics or 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 . . . . . 13+, 14–
EB2. . . . . 15+, 16–

Electrical classification for this addition equipment:

see Certificate of Conformity. EX EVE0105 A

Type of protection FM “intrinsic safety”
(Electronics family BIA 637 per FM 3003731)
Class I, Div. 1, Groups A, B, C, D;
hazardous locations indoor and outdoor, NEMA Type 4X

Type of protection FM “non-incendive”
(Electronics family BIA 637 per FM 3003731)
Class I, Div. 2, Groups A, B, C, D, F, G;
hazardous locations indoor and outdoor, NEMA Type 4X

Electrical Classification hereto:
see left column

1) Other values in hazardous areas
2) On request we can specify higher voltage limits

Additional Inputs / Outputs: Position feedback 4...20 mA – Code Q

Stroke / angle derivated 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 [1) 2)]
signal range . . . . . 3.8 to 21.5 mA
0 % and 100 % configurable
device fault . . . . . < 1 mA
Terminals for AI1 . . . . . 31+, 32–

1 binary alarm output, galvanically separated, two-wire system, according to DIN 19234, for external supply
supply voltage . . . . . external, DC 8 to 36 V [1) 2)]
Logic . . . . . no alarm . . .< 1mA
alarm . . . . . > 2.2 mA
device fault < 50 µA
Terminals for AB1. . . . . 81+, 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)

Electrical classification hereto:

see previous page

Additional Inputs / Outputs: Built-in Limit Switch

Inductive Limit Switch
– standard version (SJ2-N) . . . . . Option T
– security version (SJ2-SN) . . . . . Option U
– 3-wire (SI2-K08-AP7/ PNP). . . . . Option R
– Micro switches . . . . . Option V *)

Stroke / angle derivated from positioner feedback, two-wire system
Output . . . . . 2 inductive proximity sensors acc. to DIN 19 234 or NAMUR for connection to switching amplifier [3)]
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 (only with ZZZ)
residual ripple . . . . . < 10 % p.p.
permissible
line resistance . . . . . < 100 Ohms
Response characteristic [4) 5)]
switching differential . . . . . < 1 %
switching point repeatability . . . . . < 0.2 %
Terminals for GW1. . . . . 41+, 42–
GW2 . . . . . 51+, 52–

Electrical classification hereto:

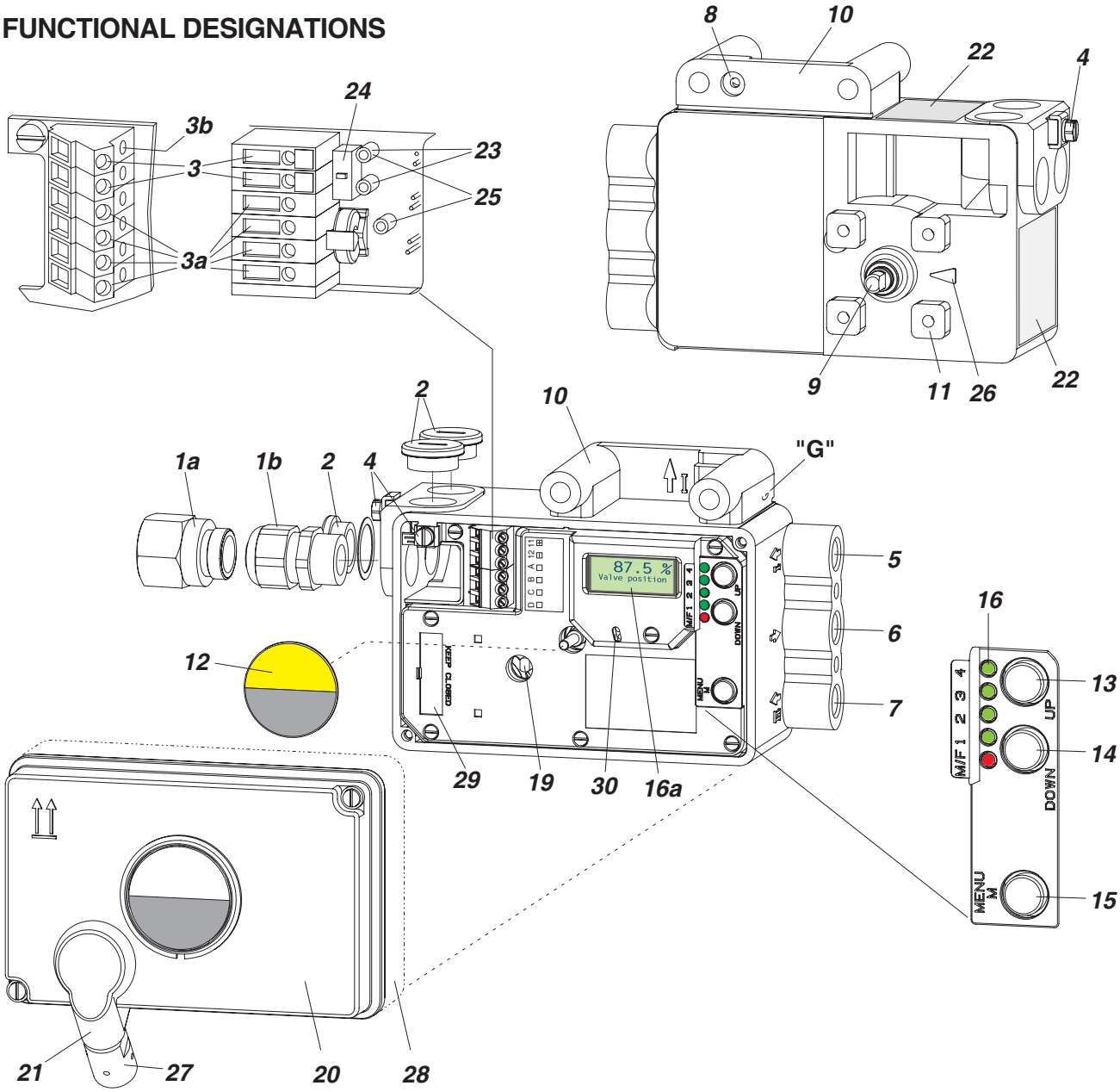
see previous page

Built-in Pressure sensors, Code Option –B

For supply air and output y1 to actuator
Measuring range . . . . . 0 to 8 bar (0 to 120 psig)
Accuracy 0.5%
Temperature influence . . . . . 0.5 % / 10k (–40 to 80 °C)

1) Other values in hazardous areas
2) On request we can specify higher voltage limits
3) Operating mode min. (= low) / max. (= high) selectable by adjustment of switch vanes
4) Data measured according to VDI/VDE 2177
5) With stroke 30 mm and lever length 90 mm
*) In preparation

FUNCTIONAL DESIGNATIONS



1a Adapter, eg. 1/2”-14 NPT
1b Cable gland
2 Plug, interchangeable with Pos.***1***
3 Screw terminals [1] (11 / 12) for input (w) or for bus connection IEC 1158-2 [3]
3a Screw terminals [1] for additional inputs / outputs
3b Test sockets Ø 2 mm, integrated in terminal block
4 Ground connection
5 Female thread [G] 1/4 -18 NPT for output I (y1)
6 Female thread [G] 1/4 -18 NPT for air supply (s)
7 Female thread [G] 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)
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
23 Tip jacks [2] Ø 2 mm for current measurement
24 Switch [2] for current measurement
25 Tip jacks [2] Ø 2 mm for communication
26 Arrow is perpendicular to shaft ***9*** at angle 0 degree
27 Ball valve for protection class NEMA 4X
28 High cover with built-in limit switch
29 Plug for service connector [3]
30 IrCom interface

G) With marked letter "G" in the housing the pneumatic connecting threads are cut as G 1/4 instead of 1/4-18 NPT
1) Alternatively WAGO terminals instead of screw terminals
2) Only FoxCom version
3) Not with FoxCom version

MODEL CODES SRD991

Intelligent Positioner	**SRD991**								170305
VERSION									
Single Acting		-B							
Double Acting		-C							
Input/Communication									
Intelligent without communication (4 - 20 mA)			D						
HART Communication (4 - 20 mA)			H						
FoxCom Communication (4 - 20 mA/IT1)			E						
FoxCom Communication (Digital/IT2)			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				Q					
Binary Inputs	(z)			B					
Sensor Input	(b)			C					
Potentiometer Input	(z)			D					
Built-In Limit Switch									
Without Built-In Limit Switch					S				
Inductive Limit Switch - Intrinsic Safe (Standard Version SJ2-N)					T				
Inductive Limit Switch - Intrinsic Safe (Security Version SJ2-SN)					U				
Inductive Limit Switch - Three wire version	(u)				R				
Mechanical Switches (Micro-Switches)	(u)				V				
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		
EEx ia IIC T4 [according to ATEX: (c)] [according to CENELEC: (e)(p)(t)]							EA4		
II 2 G EEx ia IIC T6 according to ATEX	(d)						EAA		
II 3 D EEX ia Ta (Ta=80°C) according to ATEX							ED3		
FM Nonincendive For Class I, Division 2, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors, NEMA 4X							NFM		
FM Intrinsic Safety Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors, NEMA 4X							FAA		
CSA Intrinsic Safety Class I, Division 1, Groups A, B, C, D, Hazardous Locations Indoors And Outdoors, NEMA 4X							CAA		
GOST Approved For Intrinsic Safety	(b)						GAA		
Attachment Kit									
Order as Auxiliary								N	
Manifold									
Order as Auxiliary									A

(continued on next page)

MODEL CODES SRD991 (continued)

OPTIONS		
Two Built-In Presure Sensors For Supply Air And Output To Actuator Y1	(v)	-B
Amplifier Free Of Nonferrous Metals	(w)	-C
Infrared Interface For Communication By Means Of IRCOM	(s)	-I
Pneumatical Connections G 1/4 instead of 1/4-18 NPT		-P
Pneumatic Amplifier in the Version "Spool Valve"	(n)	-S
Certificate for SIL2 / SIL3 application	(w)	-Q
Custom Configuration		-T
Version of Positioner according to VDI/VDE 3847(m)	(g)(m)	-N
LCD with Menu-Language in English / German / French	(k)(f)	-V01
LCD with Menu-Language in English / German / Spanish	(k)(f)	-V02
LCD with Menu-Language in English / German / Potuguese	(k)(f)	-V03
LCD with Menu-Language in English / German / Polish	(k)(f)	-V04
LCD with Menu-Language in English / German / Czech	(k)(f)	-V05
LCD with Menu-Language in English / German / Italian	(k)(f)	-V06
LCD with Menu-Language in English / German / Turkish	(b)(k)(f)	-V07
LCD with Menu-Language in English / German / Swedish	(k)(f)	-V08
LCD with Menu-Language in English / German / Finnish	(k)(f)	-V09
LCD with Menu-Language in English / German / Chinese.	(b)(k)(f)	-V10
LCD with Menu-Language in English / German / Russian	(k)(f)	-V11
LCD with Menu-Language in English / German / Hungarian	(k)(f)	-V12
LCD with Menu-Language in English / German / Serbian	(k)(f)	-V13
LCD with Menu-Language in English / German / Dutch	(k)(f)	-V14
Tag No. Labeling		
Stamped With Weather Resistant Color		-G
Stainless Steel Label Fixed With Wire		-L

(b) Not released
(c) Only with Input/Communication D, H
(d) Only with Input/Communication F, H, P and Q
(e) Not with Input/Communication P and Q
(f) Select one option -V01 to -V14
(g) On request
(k) Not with Input/Communication E
(m) In addition select one Mounting-Adapter EBZG -N1 to -N4
(n) Only with Version -C
(p) Not with Input/Communication D, H
(s) Only available with Option LCD (-V01 to -V14)
(t) After 1. July 2003 in the region of validity for ATEX this version with Electrical Classification acc. to CENELEC is only available as a spare part
(u) Not available with Electrical Classification EA4, EAA, NFM, FAA & CAA
(v) Only available for Input/Communication F, H in connection with Electr. Classification ZZZ, FAA, NFM, EAA and CAA
(w) Only available for Version single-acting B in connection with Input/Communication D and H
(x) Only in connection with Option -B
(y) Not with Option -B
(z) Not available with Electrical Classification FAA, NFM and CAA

Accessories, for all basic devices:

Booster relay, Code LEXG - ...

Air output . . . . . see table on page 4

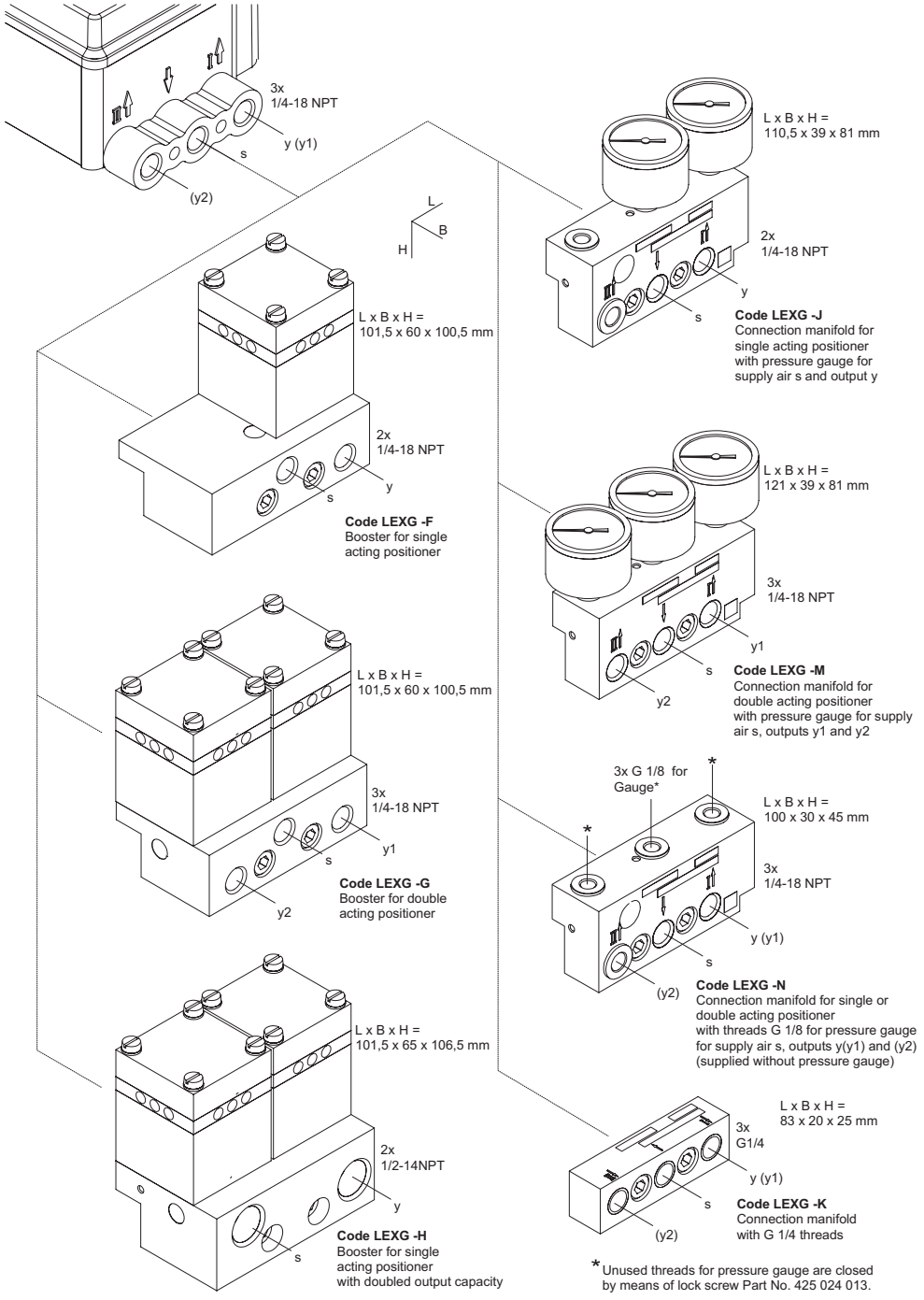
Lateral attachment to positioner, **connection 1/4 -18 NPT:**
LEXG -F Booster relay for version single acting
LEXG -G Booster relay for version double acting
Lateral attachment to positioner, **connection 1/2 -14 NPT:**
LEXG -H Booster relay for version single acting, with doubled output capacity

Lateral attachment to positioner, **connection G1/4:**
LEXG -F1 Booster relay for version single acting
LEXG -G1 Booster relay for version double acting
Lateral attachment to positioner, **connection G1/2:**
LEXG -H1 Booster relay for version single acting, with doubled output capacity

Attachment to positioner acc. to IEC 534 part 6 (NAMUR), mounted **independent** from positioner, connection from positioner to booster with tubes, **connection G1/4:**
LEXG -X1 Booster relay for version single acting
LEXG -Y1 Booster relay for version double acting
Mounted **independent** from positioner, **connection G1/2:**
LEXG -Z1 Booster relay for version single acting, with doubled output capacity

Gauges manifold

Lateral attachment to positioner
with 2 or 3 gauges . . . . . Accuracy class 1.6
Indicating range . . . . . 0 to 10 bar (0 to 150 psig)
connection . . . . . 1/4 -18 NPT or G1/4,
see next page



Model Codes Accessories

Accessories for intelligent Positioners

Cable Gland	**BUSG**
M20 x 1.5 stainless steel	-S6
M20 x 1.5 plastics, color gray	-K6
M20 x 1.5 plastics, color blue	-K7
M20 x 1.5 plastics, 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 Fieldbus (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
Gauges 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
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

(continued next page)

Model Codes Accessories (continued)

Standard Attachment Kits for SRD991, SRD992, SRI990 and SRD960 **EBZG**

For diaphragm actuators with casting yoke acc. NAMUR (IEC 534-6):
- Attachment Kit (incl. standard Couple lever) . . . -H
- Attachment Kit (incl. standard Couple lever) with installed height 80 mm / 3.15 in . . . -H1

For diaphragm actuators with pillar yoke acc. NAMUR (IEC 534-6):
- Attachment Kit (incl. standard Couple lever) . . . -K
- Attachment Kit (incl. standard Couple lever) with installed height 80 mm / 3.15 in . . . -K1

For diaphragm actuators with casting yoke or pillar yoke acc. NAMUR (VDI/VDE 3847) to interface at actuator *):
- Attachment Kit without gauges, with feedback-lever . . . -N1
- Attachment Kit prepared for gauges, with feedback-lever . . . -N2
- Attachment Kit with gauges (supply/Y1), with feedback-lever . . . -N3
- Attachment Kit with gauges (supply/Y1/Y2), with feedback-lever . . . -N4

For mounting to rotary actuators acc. VDI/VDE 3845
- For mounting without bracket . . . -R

for Schmidt Armaturen
- For FlowTop / FlowPak (SRD991, SRI990) . . . -E
- For FlowTop / FlowPak (SRD960) . . . -E1

Couple Lever for SRD...
- Reduced (stroke 0 ... 8 mm) . . . -A2
- Standard (stroke 8... 70 mm) . . . -A
- Extended (stroke 60...120 mm) . . . -B
- Extended XL (stroke 110...260 mm) . . . -A1

Standard Attachment Kits for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985
- For diaphragm actuators with casting yoke acc. NAMUR. (incl. standard Couple lever) (for SRI986) . . . -HN
- For diaphragm actuators with pillar yoke acc. NAMUR (incl. standard Couple lever) (for SRI986) . . . -KN
- For rotary actuators, without flange, 3 drill holes 6.5 mm (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -PN
- For rotary actuators, without flange, 4 threads M6 (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -NN
- For rotary actuators, with flange (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -JN
- For rotary actuators acc. to VDI/VDE 3845, with shaft (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -ZN
- For Masoneilan type Camflex II (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -RN

Couple Lever for SRP...
- Standard (a = 72 mm) (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -AN
- Extended (a = 91 mm) (for SRP981, SRI983, SRI986, SMP981, SMI983, SGE985) . . . -BN

Cam for SRP...
- Inverse equal percentage cam for rotary actuators (for SRP981, SRI983, SRI986) . . . -CN

Mounting brackets for attachment to rotary actuators acc. to VDI/VDE 3845 for all positioners
- Attachment dimension at actuator: A= 80 mm / Pivot height: B= 20 mm . . . -C1
- Attachment dimension at actuator: A= 80 mm / Pivot height: B= 30 mm . . . -C2
- Attachment dimension at actuator: A=130 mm / Pivot height: B= 50 mm . . . -C3

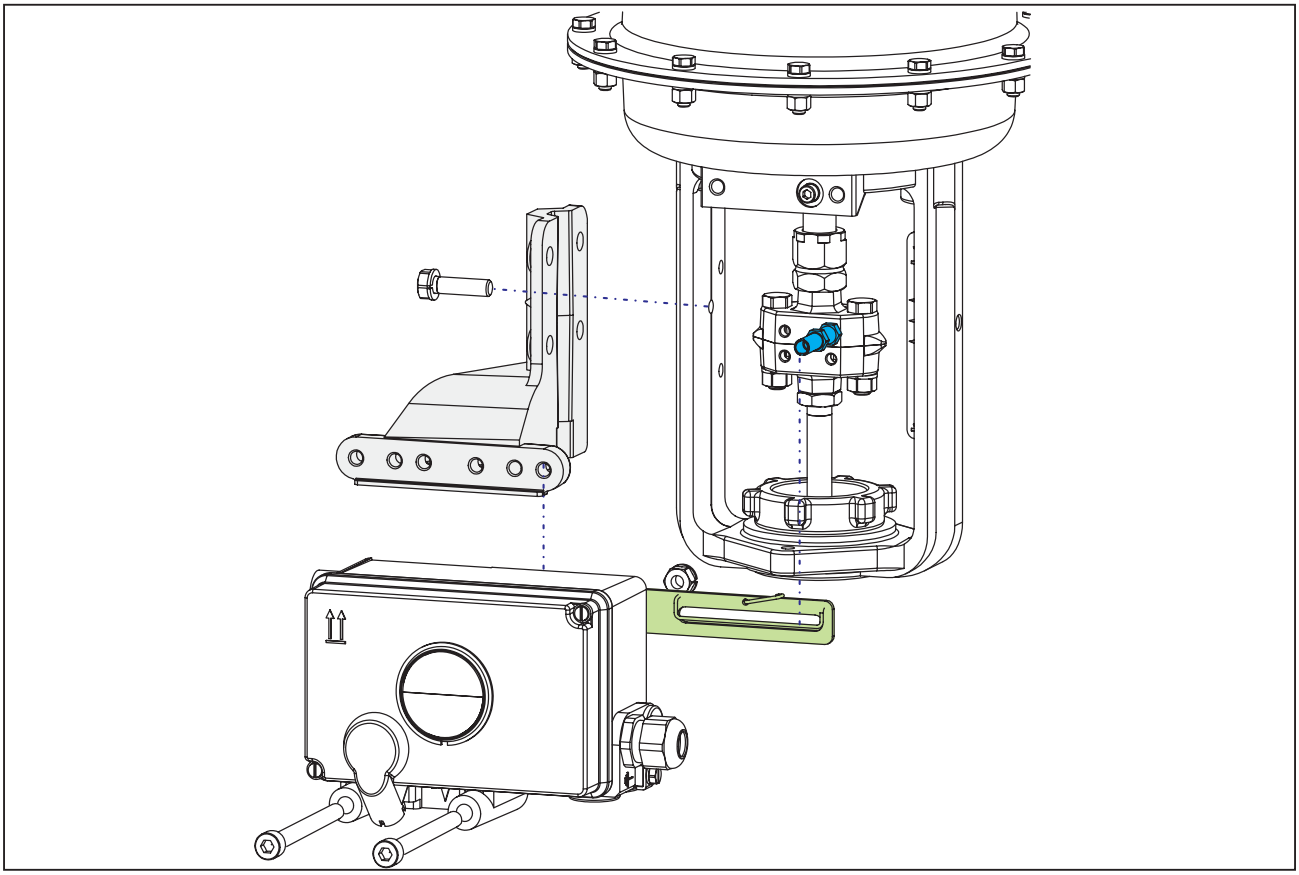
Range springs for SRP... **FESG**
- Range Springs (4 pc.) (for SRP981, SRI983, SRI986) . . . -FN

Special Attachment Kits (attachment kits deviating from above indicated standards) *):
- ARCA
- Research Control Valves - Badger Meter
- Fisher –Emerson (Typ 657/667, 3024S, 1250, 1051, 1052, 1061)
- Hagan
- Ingersoll Rand
- Kämmer - Flowserve
- Kinetrol
- Masoneilan (Typ 35 Camflex II, 47/48 Sigma-F, 37/38, 87/88, 28 VariPak, Paramax)
- Samson
- Schmidt Armaturen - Flowserve (Typ FoxPak / FoxTop)
- Sereg – Flowserve (Typ Maxflo, Reglob, Revca)
- Valtek – Flowserve (Mark-Serie)
- VETEC
- Worcester – Flowserve

*) We recommend to contact our field service before selection of these mounting kits.
Further Attachment kits on request. See also http://www.foxboro-eckardt.com /Products /Positioners /Attachment kits

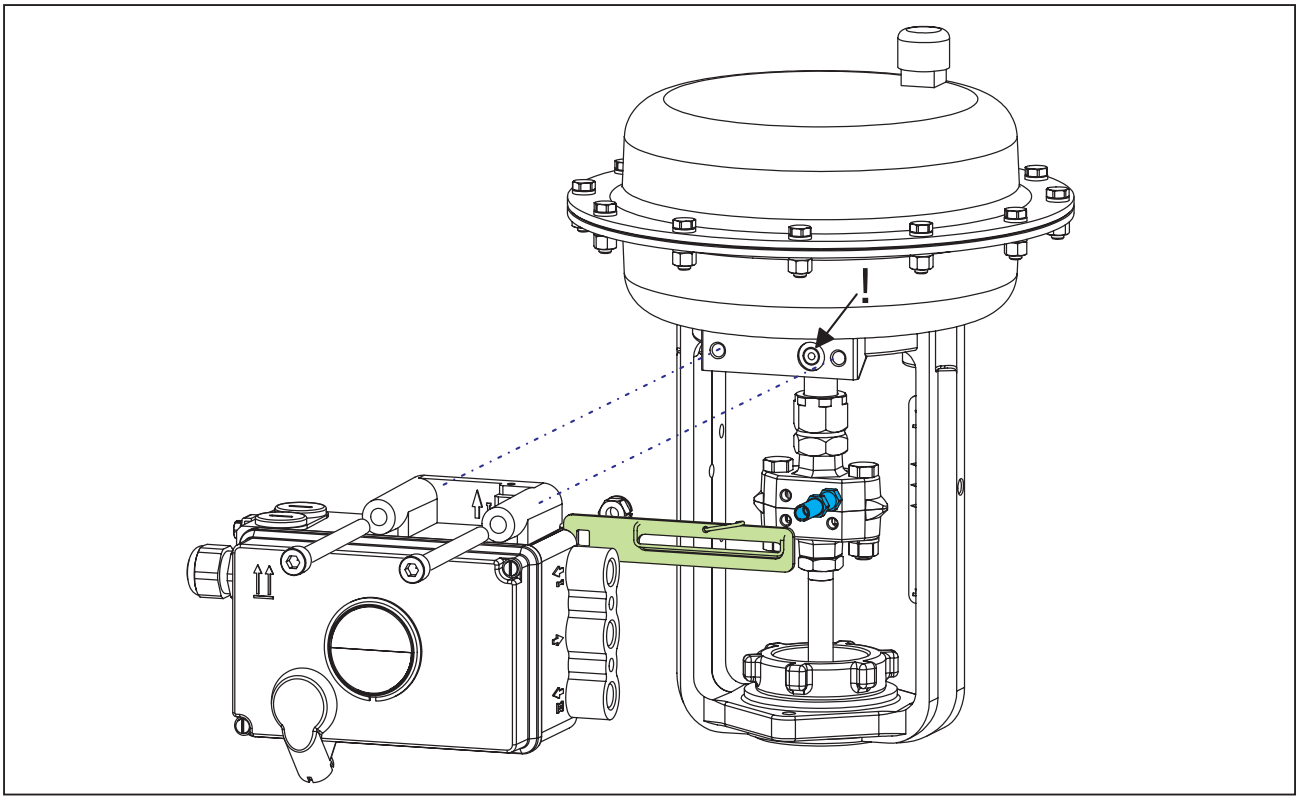
MOUNTING TO LINEAR ACTUATORS

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



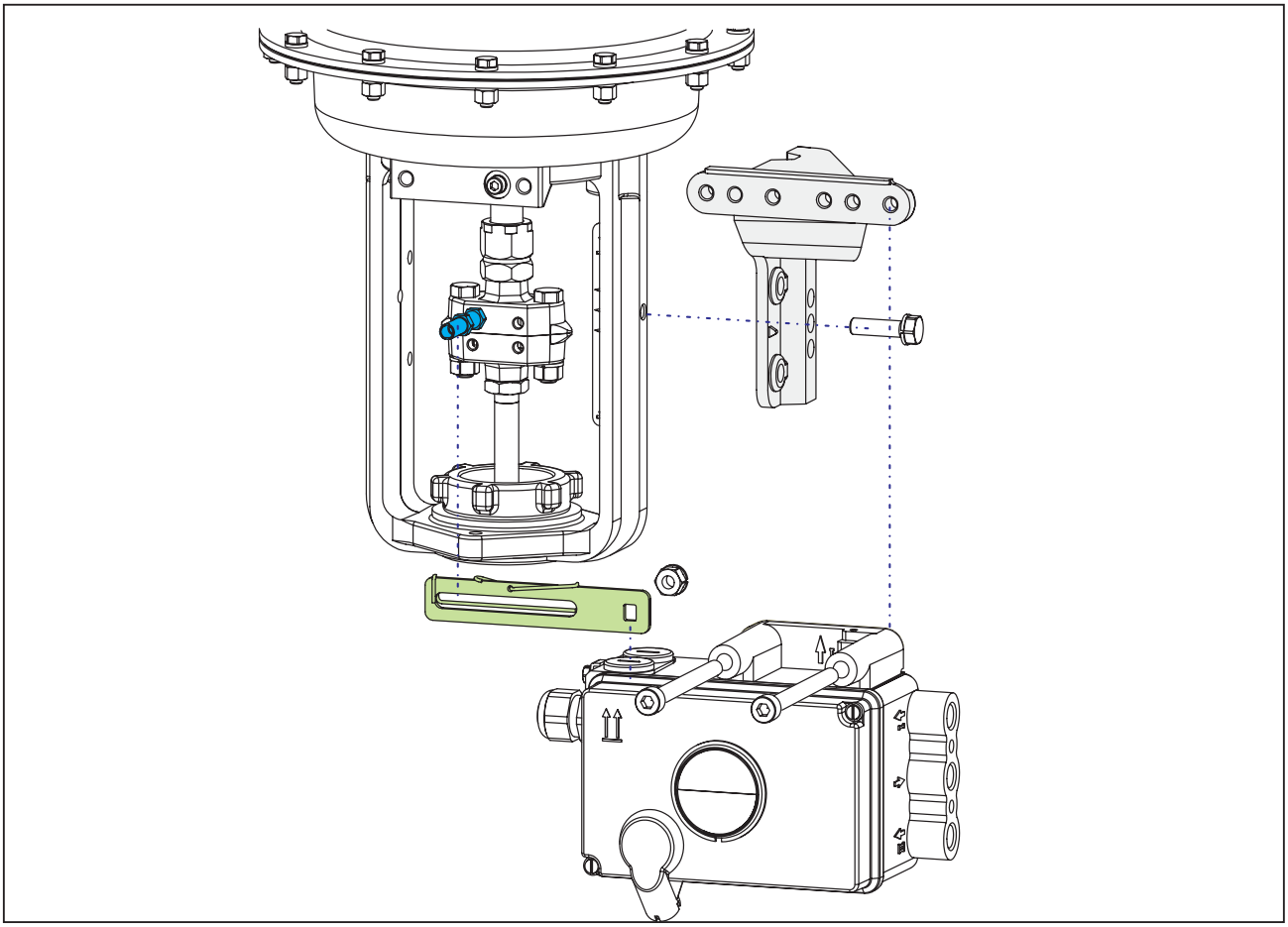
MOUNTING TO LINEAR ACTUATORS

Direct attachment to stroke actuators



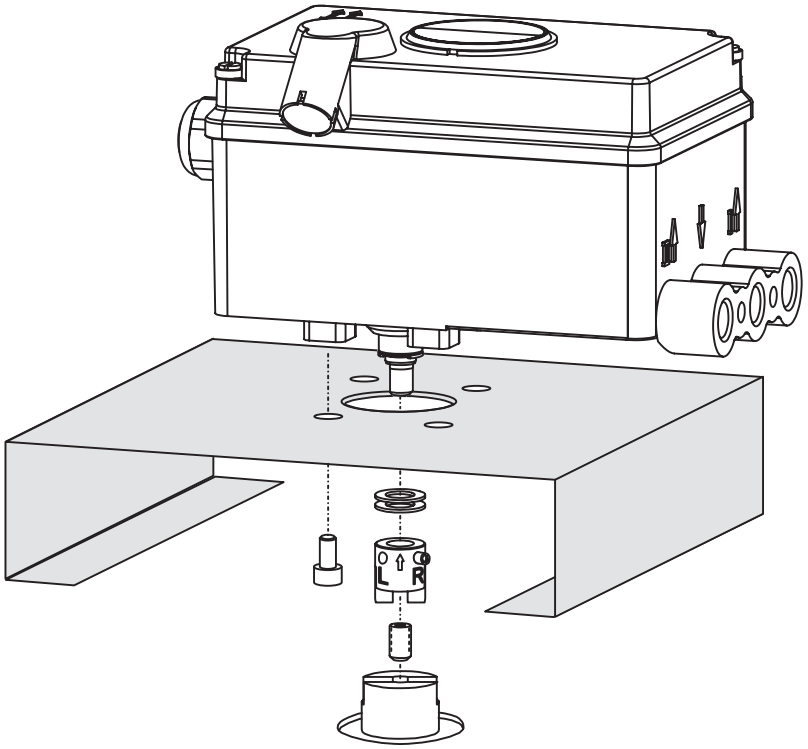
MOUNTING TO LINEAR ACTUATORS

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



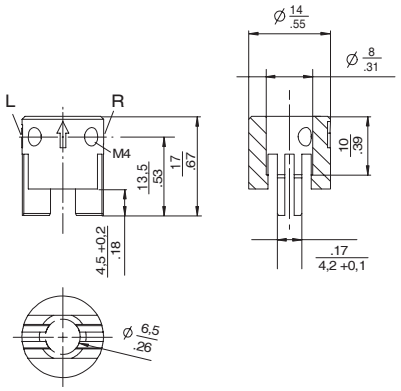
MOUNTING TO ROTARY ACTUATORS

Delivery of bracket by manufacturer of actuator



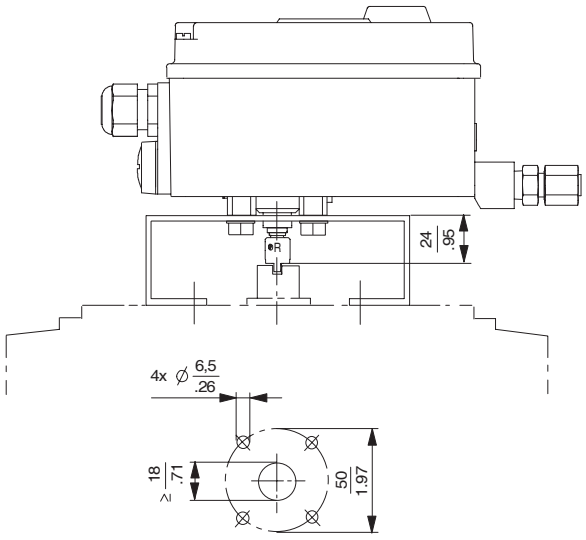
DIMENSIONS – Attachment to rotary actuators acc. to VDI/VDE 3845

Linking piece



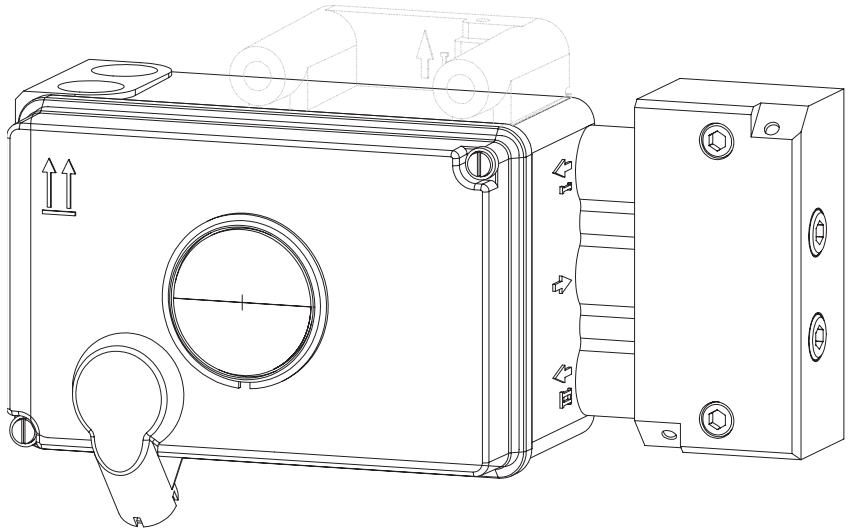
mm
in

Attachment diagram of bracket

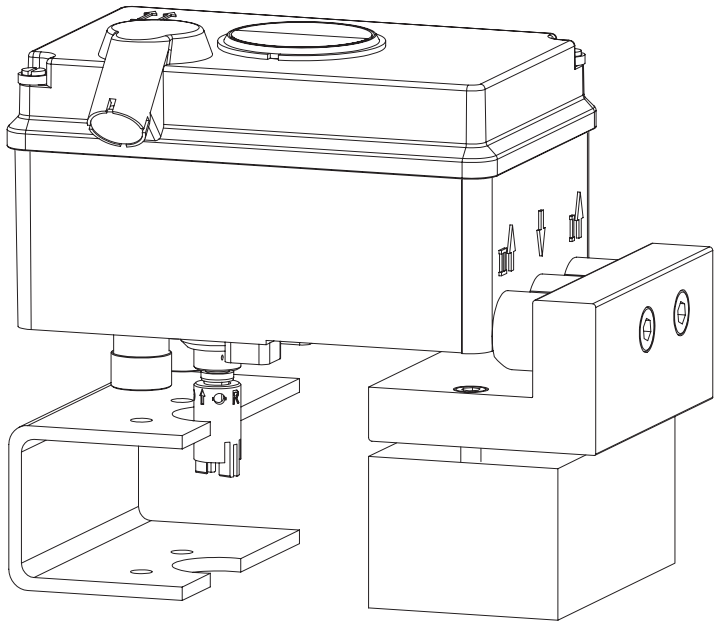


MOUNTING acc. to VDI/VDE 3847

Mounting to Linear Actuators



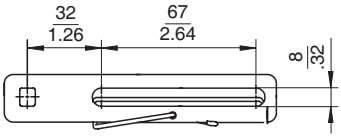
Mounting to Rotary Actuators



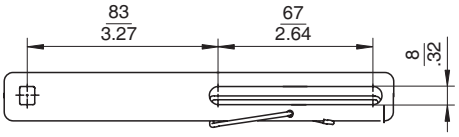
DIMENSIONS

Components of Attachment kits (samples)

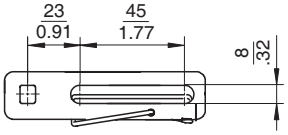
Feedback lever Code EBZG-A for 8..70 mm travel



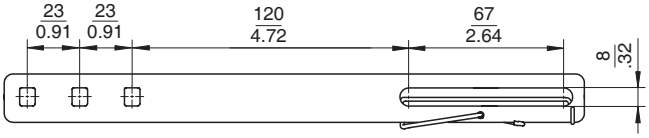
Feedback lever Code EBZG-B for 60..120 mm travel



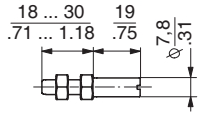
Feedback lever FlowPak/FlowTop in Code EBZG-E



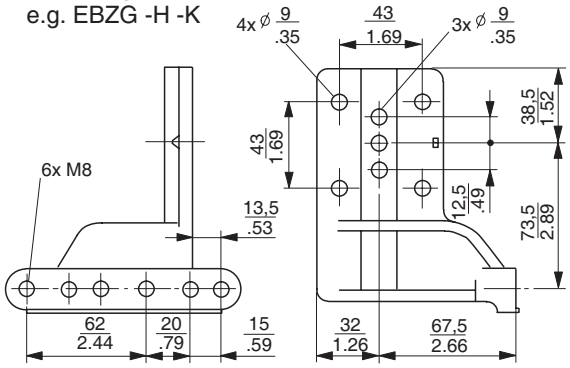
Feedback lever Code EBZG-A1 for 100...260 mm travel

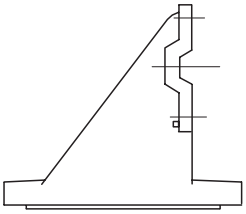


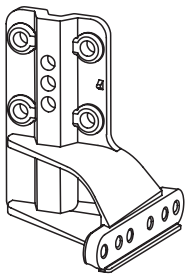
Carrier bolt for connection to valve stem



Mounting bracket
e.g. EBZG -H -K

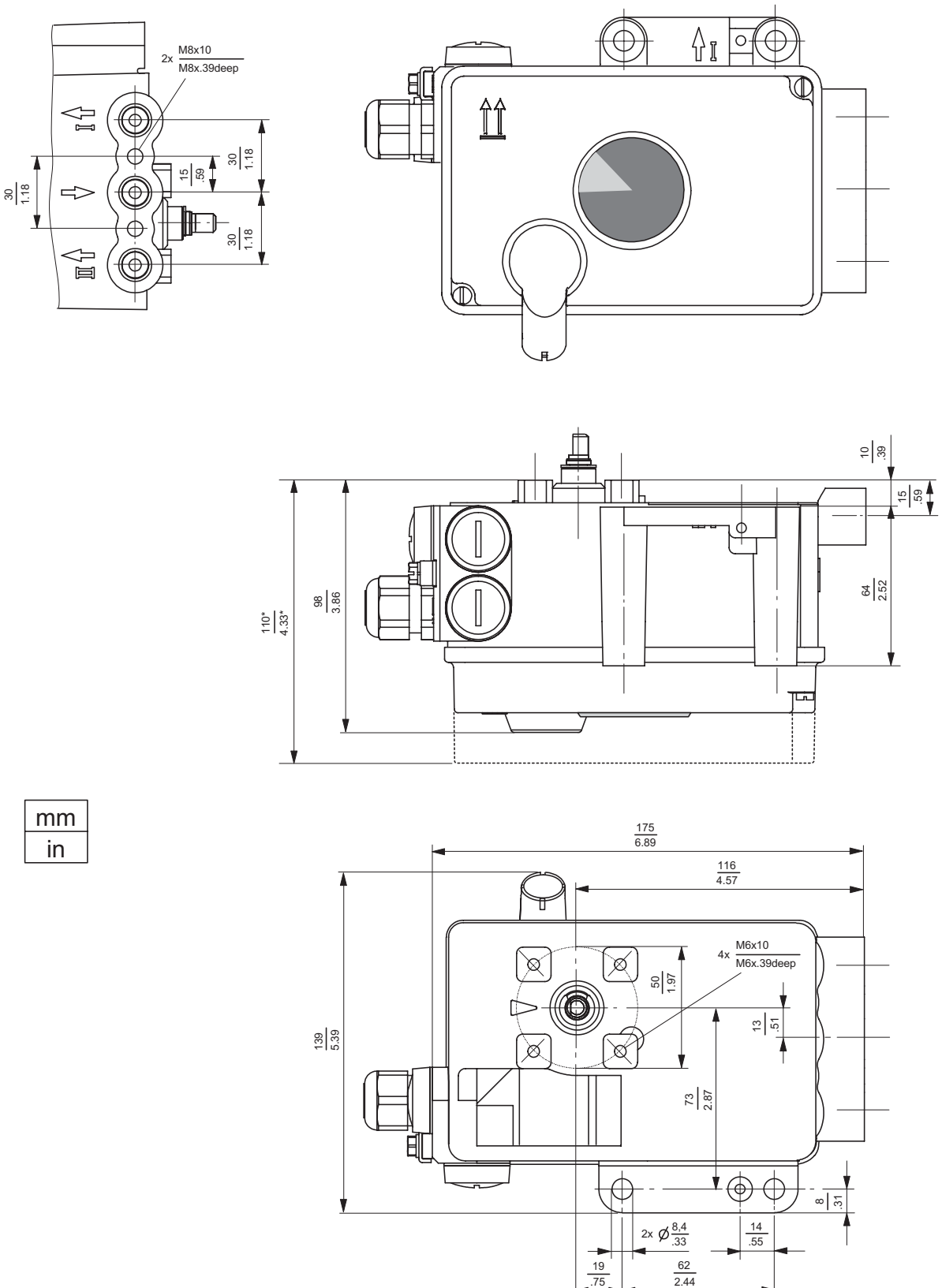






mm
in

DIMENSIONS



*) Dimensions with high cover
for option “limit switch”

Additional Documentation for this product

Technical Information of Attachment Kits for Positioners:

TI EVE0011 A	Overview of Attachment Kits of all positioners on actuators/valves of different manufacturers

Quick Guide:

QG EVE0105 A	Extract of Master Instruction for an easy to use, easy understandable and fast start-up. This document highlights the most important.

Master Instructions:

MI EVE0105 E	SRD991 – all versions –

Technical Information for Fieldbus-Communication:

TI EVE0105 P	SRD991/960 -PROFIBUS-PA
TI EVE0105 Q	SRD991/960 -FOUNDATION Fieldbus H1

Master Instruction for HART-Communication:

MI EVE0105 B	HART with Hand-Held Terminal

Valve diagnostic-, configuration- and operation-software VALcare™:

MI EVE0501 V	VALcare™ Valve diagnostic for Positioners HART / FoxCom / PROFIBUS-PA, FOUNDATION Fieldbus and IRCOM

Additional Documentation for other products

Product Specifications

PSS EVE0101 A	SRP981	Pneumatic Positioner
PSS EVE0102 A	SRI986	Electro-Pneumatic Positioner
PSS EVE0103 A	SRI983	Electro-Pneumatic Positioner- explosion proof or EEx d version
PSS EVE0105 A	SRD991	Intelligent Positioner
PSS EVE0107 A	SRI990	Analog Positioner
PSS EVE0109 A	SRD960	Universal Positioner
PSS EMO0100 A	Accessories for devices with HART Protocol	

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