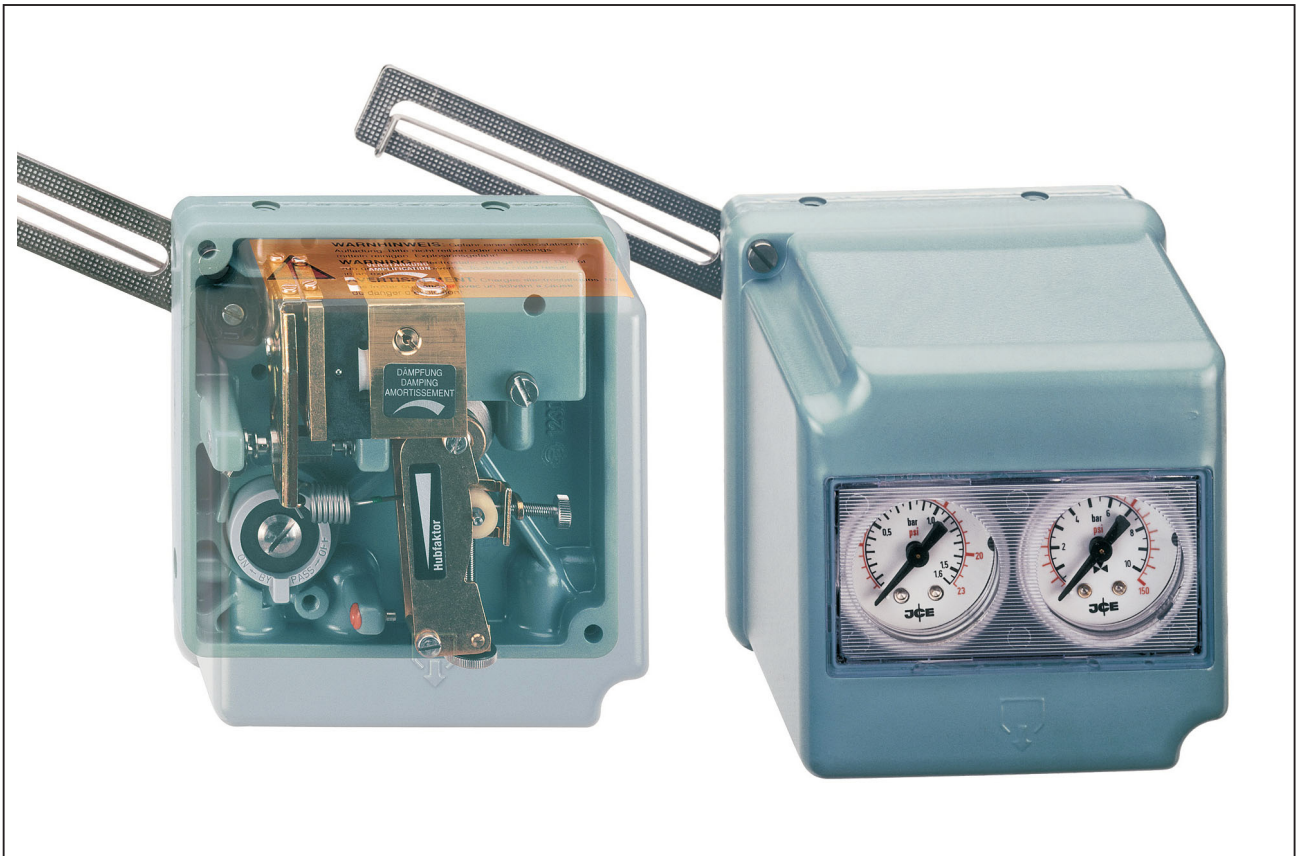


SRP981 Pneumatic Positioner



The SRP981 Positioner is for operation of pneumatic valve actuators with pneumatic control signals. It is used to reduce the adverse effects of valve friction, for higher thrust and shorter positioning time.

FEATURES

- Independent adjustment of stroke range and zero
- Adjustable amplification and damping
- Split range up to 4-fold possible
- Supply pressure up to 6 bar (90 psig)
- Low vibration effect in all directions
- Mounting according to IEC 534, part 6 (NAMUR)
- Rotation adapter for angles up to 120 °
- Ambient temperature -40 ... 80 °C (-40 ... 176 °F)
- Travel 8 to 100 mm (0.3 to 4 in)
- Angular range 30 ° to 120 °
- Modular system of additional equipment
 - Electrical limit switches
 - Electrical position transmitter
 - Booster
 - Connection manifold
- Protection class IP54 (IP 65 on request)
- Certificate No. 90/20226(E2) Lloyd's Register of Shipping for use on vessels
- Explosion protection
 - pn. basic device:
ATEX II 2 G c IIC T6 constructive design
 - el. additional built-in equipment:
ATEX II 2 G EEx ib/ia IIB/IIC T4/T6

TECHNICAL DATA

Input

Signal range 0.2 ... 1 bar (3 ... 15 psig)
 or split range
 down to Δw 0.2 bar (3 psi)
 Stroke range 8 ... 100 mm (0.3 ... 4 in)
 Angular range
 linear 30 ° ... 120 °
 equal percentage 90 °; from 70 ° linear

Output

Output to actuator 0 ... 100 %
 supply air pressure

Supply

Supply air pressure 1.4 ... 6 bar (20 ... 90 psig)
 Supply air. free of oil, dust, water
 according to IEC 654-2

Ambient conditions

Ambient temperature -40 ... 80 °C (-40 ... 176 °F)
 Relative humidity up to 100 %
 Operating conditions
 as per IEC 654-1 The device can be operated
 at a class D2 location
 Transport and storage
 temperature -50 ... 80 °C (-58 ... 176 °F)

Protection class IP 54 (IP 65 on request)

Response characteristic¹⁾

Amplification adjustable
 Sensitivity < 0.1 % F.S.
 Non-linearity (terminal
 based adjustment) < 1.0 % F.S.
 Hysteresis < 0.3 % F.S.
 Supply air dependency. < 0.2 % / 0.1 bar (1.5 psi)
 Temperature effect. < 0.3 % / 10 K

Air consumption

supply air pressure	air consumption
single acting	
1.4 bar (20 psig)	200 l _r /h (7.1 scfh)
3.0 bar (45 psig)	400 l _r /h (12.4 scfh)
6.0 bar (90 psig)	600 l _r /h (21.2 scfh)
double acting	
1.4 bar (20 psig)	350 l _r /h (10.6 scfh)
3.0 bar (45 psig)	550 l _r /h (17.7 scfh)
6.0 bar (90 psig)	750 l _r /h (33.5 scfh)

Air output

Load effect²⁾ -3 % for delivery flow
 2 350 l_r/h (83 scfh)
 +3 % for exhausted flow
 1 900 l_r/h (67 scfh)

Capacity at max. deviation

Supply air pressure bar (psig)	1.4 (20)	2 (30)	4 (60)	6 (90)
without booster	2 700 (95)	3 500 (124)	5 500 (194)	7 500 (265)
l _r /h (scfh)				
with booster code VKXG -FN,-GN	18 000 (636)	24 000 (847)	40 000 (1 412)	55 000 (1 942)
l _r /h (scfh)				
with booster code VKXG -HN	36 000 (1 271)	48 000 (1 695)	80 000 (2 825)	110 000 (3 884)
l _r /h (scfh)				

Data measured according to VDI/VDE 2177

- 1) Data based on following parameters:
 stroke 30 mm (1.28 in), range spring FES 628/1, feedback lever effective length 117.5 mm (4.63 in), max. amplification, supply air pressure 3 bar (45 psig)
- 2) measured at air supply 1.4 bar (20 psig) and 50 % of signal range

Materials

Base plate	Aluminium (Alloy No. 230) finished with DD-varnish gray blue
Cover.	impact resistant polyester gray blue
All moving parts of feedback system	1.4305 / 1.4571
Mounting bracket	1.4301

Weight

single acting without gauges.	approx. 0.7 kg (1.5 lbs)
with gauges	approx. 0.8 kg (1.8 lbs)
double acting	approx. 0.9 kg (2.0 lbs)
attachment kit for diaphragm actuators	approx. 0.3 kg (0.6 lbs)
for rotary actuators	approx. 0.5 kg (1.1 lbs)

Connection

Pneumatic	Female threads G 1/8 acc. to ISO 228
---------------------	---

Mounting

Type of mounting	for attaching to diaphragm actuators acc. IEC 534-6 (NAMUR) for attaching to rotary actuators
Mounting orientation.	any

Gauges

Indicating range Input.	0 ... 1.6 bar (0 ... 23 psig)
Output	0 ... 10 bar (0 ... 150 psig)
Error limit	class 1.6

ACCESSORIES**Connection Manifold With Gauges Code J, M**

Indicating range	0 ... 10 bar (0 ... 150 psig)
Error limit	class 1.6
Pneumatic connections	Female threads Q 1/4-18 NPT acc. to DIN 45 141

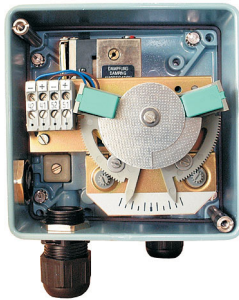
Connection Manifold With Gauges Code K, L, N

Indicating range Supply, output	0 ... 10 bar (0 ... 150 psig)
Input.	0 ... 1.6 bar (0 ... 23 psig)
Error limit	class 1.6
Pneumatic connections	Female threads Q 1/4-18 NPT acc. to DIN 45 141

ADDITIONAL EQUIPMENT (built-in into basic device)**Inductive Limit Switch Code T, U**
Two-wire system

Input Stroke / angle from actuator via positioner feedback lever

Output 2 inductive proximity sensors acc. to DIN 19234 or NAMUR for connection to a switching amplifier with an intrinsically safe control circuit ^{1) 2) 3)}



Current consumption
Vane clear > 3 mA
Vane interposed < 1 mA

for control circuit with the following electrical values
Supply voltage DC 8 V, R_i approx. 1 k Ω
Residual ripple < 5 %
Permissible line resistance < 100 Ω

Response characteristic ⁶⁾
Gain Continuously adjustable from 1:1 to approx. 7:1
Switching differential < 1 %
Switching point repeatability < 0.2 %

Explosion protection ^{7) 8)}

Type of protection II 2 G EEx ib/ia IIB/IIC T4/T6
Certificate of conformity PTB 02 ATEX 2153
For operation in certified intrinsically safe circuits with the following maximum values:

U_{max} 16 V
 I_{max} 25 mA
 P_{max} 64 mW
Internal inductance 100 μ H
Internal capacitance 30 nF
Ambient temperature
Temperature class T6 -40 ... 65 °C (-4 ... 149 °F)
T1 to T5 -40 ... 80 °C (-4 ... 176 °F)

Parts set for later installation

Code T EW 419 510 334
Code U EW 419 510 352

Inductive Limit Switch Code R
Three-wire system

Input Stroke / angle from actuator via positioner feedback lever

Output 2 inductive proximity sensors, three-wire system, LED-indication, contact, pnp ^{2) 4)}

Supply voltage U_s DC 10 ... 30 V
Residual ripple \pm 10 %, $U_s = 30$ V
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 %

Parts set for later installation

Code R EW 419 510 291

Limit Switch Assembly with Micro switches Code V

Input Stroke / angle from actuator via positioner feedback lever

Output 2 micro-switches ^{2) 5)}

Connected load
Alternating current
Switching capacity max. 250 VA
Switching voltage max. 50 V
Switching current with ohmic resistance max. 5 A
inductive resistance max. 2 A
Bulb, metal filament max. 0.5 A
Direct current

Switching voltage, max.	Ohmic load	Inductive load
30 V	5 A	3 A
50 V	1 A	1 A

Response characteristic ⁶⁾

Gain Continuously adjustable from 1:1 to approx. 7:1
Switching differential < 2.5 %
Switching point repeatability < 0.2 %

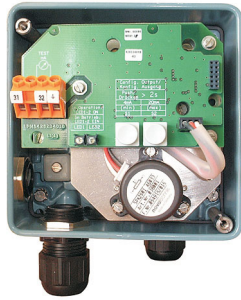
Parts set for later installation

Code V EW 420 421 017

- 1) For the standard version code T one switching amplifier is required eg Pepperl & Fuchs type WE 77/Ex2
For the security version code U a fail-safe switching amplifier for each inductive proximity sensor is required eg Pepperl & Fuchs type WE 77/Ex-SH-03
- 2) Operating mode min. (= low) / max. (= high) selectable by adjustment of switch vanes
- 3) Operating mode normally closed circuit / normally open circuit selectable at switch amplifier output
- 4) Contact closed within the positive range
- 5) Contact open within the positive range
- 6) For feedback lever effective length of 117.5 mm (4.63 in), stroke 30 mm (1.28 in) and maximum gain
- 7) National installation regulations must be observed
- 8) For retrofitting in positioner version -B and -C, the product must be tested by a qualified inspector as a special version in accordance with ElexV.

Electrical Position Transmitter Code W

- Input Stroke / angle from actuator via positioner feedback lever
- Sensor resistive precision conductive plastic element
- Stroke range 15 ... 80 mm (0.6 ... 3.15 in)
< 15 mm (0.6 in) on request
- Angular range 60 ... 120 °
- Output Two-wire system
- Signal range 4 ... 20 mA
- Permitted load $R_{B \max} = (U_S - 12 \text{ V}) / 0.02 \text{ A}$
(U_S = supply voltage)
- Power supply
- Supply voltage DC 12 ... 36 V
- Permitted ripple < 10 % p.p.
- Supply voltage dependency < 0.2 %
- Response characteristic¹⁾
- Non-linearity with terminal based setting. < 1.0 % F.S.
- Hysteresis < 0.5 % F.S.
- External resistance dependency < 0.2 % / $\Delta R_{B \max}$
- Temperature effect < 0.3 % / 10 K

**Explosion protection** ^{2) 3)}

- Type of protection II 2 G EEx ib/ia IIB/IIC T4/T6
- Certificate of conformity PTB 02 ATEX 2153
- For operation in certified intrinsically safe circuits with the following maximum values:
- U_{\max} T4: 30 V T6: 22 V
- I_{\max} T4: 130 mA T6: 66 mA
- P_{\max} T4: 0,9 W T6: 0,5 W
- Internal inductance 9 μ H
- Internal capacitance to earth 10 nF or
6 nF differential
- Ambient temperature
- Temperature class T6 -40 ... 40 °C (-40 ... 104 °F)
- T5 -40 ... 55 °C (-40 ... 131 °F)
- T4 -40 ... 80 °C (-40 ... 176 °F)

Parts set for later installation

- Code W EW 420 661 092

Common Data ⁴⁾

- Ambient conditions
- Ambient temperature ^{5) 6)} -25 ... 80 °C (-13 ... 176 °F)
-40 ... 80 °C (-40 ... 176 °F)
- Relative humidity up to 100 %
- Operating conditions
- as per IEC 654-1 The device can be operated at a class D2 location
- Transport and storage
- temperature -40 ... 80 °C (-40 ... 176 °F)
- Protection class IP 54 (IP 65 on request)
- Electrical connection
- Line entry 1 or 2 cable glands M20x1.5
(others with Adapter AD-...)
- Cable diameter 6 to 12 mm (0.24 to 0.47 in)
- Screw terminals Screw terminals for wires up to 2.5 mm² (AWG 14)
- Materials
- Base plate Galvanized steel
- Control vane Aluminum
- Setting mechanism Fibre glass-reinforced polyamid
- Electromagnetic compatibility EMC
- Operating conditions industrial environment
- Immunity according to
- NAMUR recommendation NE21 fulfilled
- EN 61 326 fulfilled
- EN 61 000-6-2 fulfilled
- Emission according to
- EN 55 011,
Group 1, Class A fulfilled
- EN 61 000-6-2 fulfilled
- CE marking
- Electromagnetic compatibility 89/336/EWG
- Low voltage regulations w/o Ex: 73/23/EWG fulfilled
(with Ex: not applicable)
- Safety
- as per DIN EN 61010-1
(DIN IEC 61010-1)
- (VDE 0411 part 1). safety class III
- overvoltage category 1
- internal fuses none
- external fuses Limitation of power supplies for fire protection has to be observed due to EN 61010-1 9.3. ff.

- 1) For feedback lever effective length of 117.5 mm (4.63 in) and stroke 30 mm (1.28 in)
- 2) National installation regulations must be observed
- 3) For retrofitting in positioner version -B and -C, the product must be tested by a qualified inspector as a special version in accordance with ElexV
- 4) Except manifold with gauges
- 5) Without explosion protection
- 6) -40 ... 80 °C (-40 ... 176 °F) for the fail-safe version of inductive limit switch code U

MODEL CODES SRP981

Pneumatic Positioner	SRP981									011004
Version										
Single Acting		-B								
Double Acting.		-C								
Input										
Signal Range 0.2 to 1 bar/3 to 15 psi/ 20 - 100 kPa; Split-Range Up To 4-Fold Possible, Must Be Specified										-I
Mode of Action										
Increasing Input Increases Output										D
Increasing Input Decreases Output										R
Gauges										
Without Gauges.										L
Two Built-In Gauges (bar/psi) (a)										M
Two Built-In Gauges (kPa/psi) (a)										N
Built-In Limit Switch/Position Transmitter										
Without										S
Inductive Limit Switch Three-Wire Technique, Without Explosion Protection . (b)										R
Inductive Limit Switch (Standard Version) w. Expl. Prot. II 2 G EEx ia IIC T6 acc. to ATEX (b)										T
Inductive Limit Switch (Security Version) w. Expl. Prot. II 2 G EEx ia IIC T6 acc. to ATEX (b)										U
Two Micro Switches, Without Explosion Protection. . . (b)										V
Position Transmitter 4-20 mA, with Expl. Prot. II 2 G EEx ia IIC T6 acc. to ATEX . (b)										W
Cable Entry										
Without Cable Gland										1
M20 x 1.5 With One Plastic Cable Gland, Color Gray . (c)										7
Attachment Kit										
Order as Auxiliary										N
Manifold										
Order as Auxiliary										A
Options										
Amplifier Free Of Nonferrous Metals (a)										-C
Manual Bypass Switch (a)										-T
Protection Class IP65 (b)										-F
Assembled Free Of Oil And Grease / Designed for Aux. Energy Oxygen										-S
Tag No. Labeling										
Stamped With Weather Resistant Color										-G
Stainless Steel Label Fixed With Wire										-L

Example Model Code: SRP981 -B I D L S 1 N A -L

(a) Only available with Version -B
 (b) Not available with Gauge Code M or N
 (c) Not available with Built-In Limit Switch / Position Transmitter Code S

Auxiliaries see EVE9902
 Fittings see EOO9001L

MODEL CODES Accessories

Couple lever / cam		EBZG
Standard (a = 72 mm) (for SRP981 , SRI983, SRI986, SMP981, SMI983, SGE985)		-AN
Extended (a = 91 mm) (for SRP981 , SRI983, SRI986, SMP981, SMI983, SGE985)		-BN
Inverse equal percentage cam for rotary actuators (for SRP981 , SRI983, SRI986)		-CN
Spring set		FESG
Range-Springs (4 pc.) (for SRP981 , SRI983, SRI986)		-FN

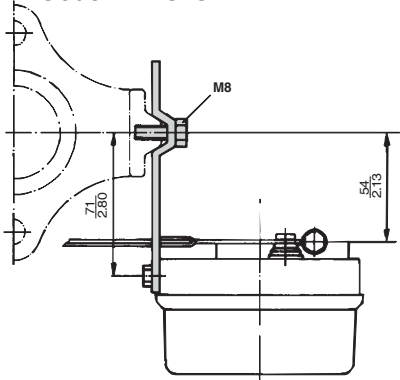
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MODEL CODES Accessories (continued)

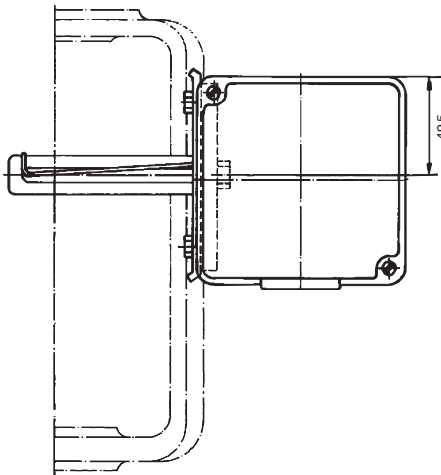
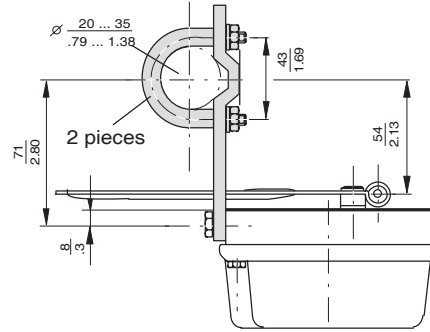
Attachment kit	EBZG
For diaphragm actuators with casting yoke acc. NAMUR. (incl. standard Couple Lever) (for SRP981 , SRI983, SMP981, SMI983, SGE985)	-GN
For diaphragm actuators with pillar yoke acc. NAMUR. (incl. standard Couple lever) (for SRP981 , SRI983, SMP981, SMI983, SGE985)	-FN
For rotary actuators, without flange, 3 drill holes 6.5 mm (for SRP981 , SRI983, SRI986, SMP981, SMI983, SGE985)	-PN
For rotary actuators, without flange, 4 threads M6 (e.g for Petras actuators) (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
For Masoneilan type Sigma F (for SRI986, SRP981 , SRI983)	-SN
For Masoneilan type 37/38, Fisher Elliott type 656, 667 (for SRP981 , SRI983, SGE985, SMI983, SMP981)	-TN
For Guide type P (for SRP981 , SRI983)	-UN
For Masoneilan type 87/88 (for SRP981 , SRI983, SMP981, SMI983, SGE985)	-EN
For Masoneilan VariPak (for SRP981 , SRI983, SGE985, SMI983, SMP981).	-MN
For IAL actuators (for SRP981 , SRI983, SGE985, SMI983, SMP981)	-VN
Brackets VDI/VDE 3845 (A = 130 mm/5.12 in; B = 50 mm/1.97 in) (SRP981 , SRI983, SRI986, SGE985, SMI983, SMP981)	-C3
Brackets VDI/VDE 3845 (A = 80 mm/3.15 in; B = 30 mm/1.18 in) (SRP981 , SRI983, SRI986, SGE985, SMI983, SMP981).	-C2
Brackets VDI/VDE 3845 (A = 80 mm/3.15 in; B = 20 mm/0.79 in) (SRP981 , SRI983, SRI986, SGE985, SMI983, SMP981).	-C1
Manifold (Connection 1/4-18NPT)	LEXG
Staggered connections (for SRP981, SRI986)	-BN
Connections same level (for SRP981, SRI986)	-CN
Staggered connections for 1/4"-thread pneum. tube-conn. (e.g. tube-diameter: 8 mm / 0.3 in) (for SRP981, SRI986)	-DN
With gauges for supply air, y, for version single acting (for SRP981, SRI986).	-JN
With gauges for supply air, w, for version single acting (for SRP981)	-KN
With gauges for supply air, w, y, for version single acting (for SRP981)	-LN
With gauges for supply air, y1, y2, for version double acting (for SRP981, SRI986)	-MN
With gauges for w, y1, y2, for version double acting (for SRP981)	-NN
Gauge manifold without gauge (for SRP981, SRI986)	-RN
Gauge manifold without gauge, for supply air, y1, y2, for version double acting (for SRP981, SRI986)	-SN
Gauge manifold without gauge, for w, y1, y2, for version double acting (for SRP981) (b)	-TN
Booster (Connection 1/4-18NPT)	VKXG
For version single acting (for SRP981, SRI986)	-FN
For version double acting (for SRP981, SRI986).	-GN
For version single acting with doubled output capacity (for SRP981, SRI986)	-HN
Adapter	AD
Adapter 1/2" NPT to 3/4" NPT (stainless steel)	-A3
Adapter M20 x 1.5 to G1/2" (internal thread) (stainless steel)	-A8
Adapter M20 x 1.5 to 1/2" - 14 NPT (internal thread) (brass with nickel coating)	-A5
Adapter M20 x 1.5 to 1/2" - 14 NPT (internal thread) (stainless steel)	-A6
Adapter (plastic) M20 x 1.5 to PG13.5 (internal thread)	-A9
Cable gland	BUSG
M20 x 1.5 plastics, color blue	-K7
M20 x 1.5 plastics, color white	-K9
M20 x 1.5 stainless steel.	-S6
M20 x 1.5 plastics, color gray	-K6
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, Stainless steel, EEx d.	-V4
1/2-14 NPT plug, Stainless Steel, EEx d	-V5
M20 x 1.5 plug, brass zink plated, EEx d	-V6
1/2-14 NPT plug, brass zink plated, EEx d	-V7

ATTACHMENT KIT FOR DIAPHRAGM ACTUATORS

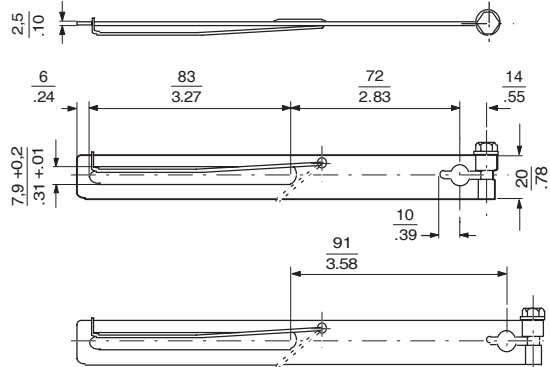
Attachment to casting yoke
according to IEC 534-6 (NAMUR)
Code EBZG-GN



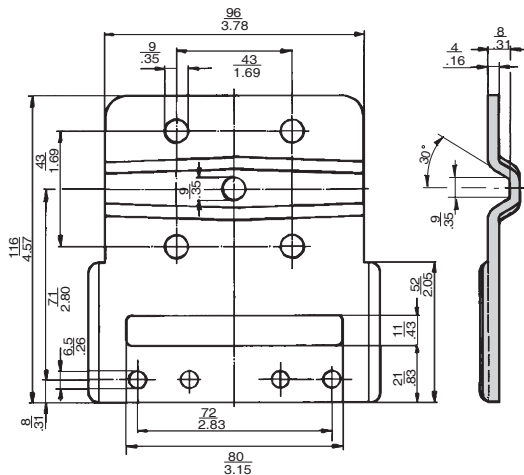
Attachment to pillar yoke
according to IEC 534-6 (NAMUR)
Code EBZG-FN



Feedback lever
Code EBZG-AN, -FN, -GN
Code EBZG-BN (extended version)

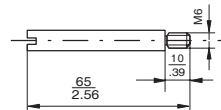


Mounting bracket
according to IEC 534-6 (NAMUR)
for Code EBZG-GN, FN



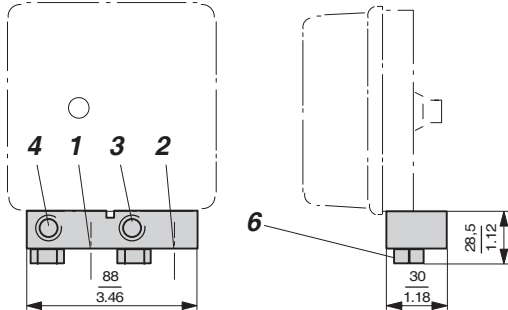
mm
in

Carrier bolt
for attachment to valve stem

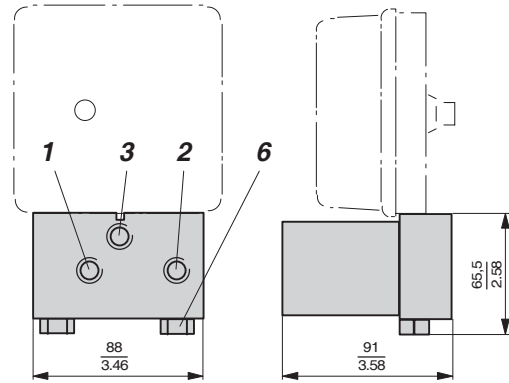


DIMENSIONS Additional equipment

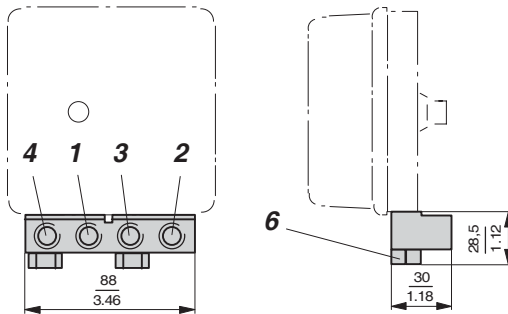
Connection manifold, staggered connections
Code LEXG-BN



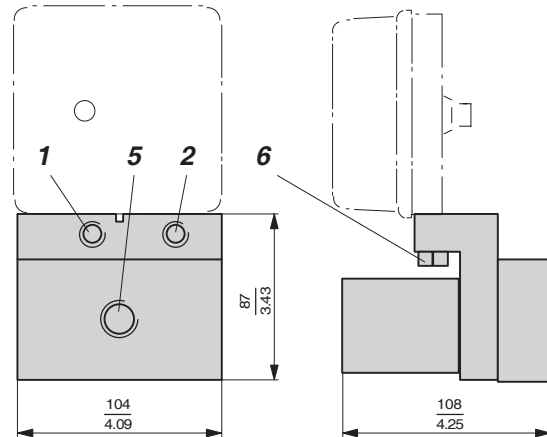
Booster single acting
Code VKXG-FN



Connection manifold, connections same level
Code LEXG-CN

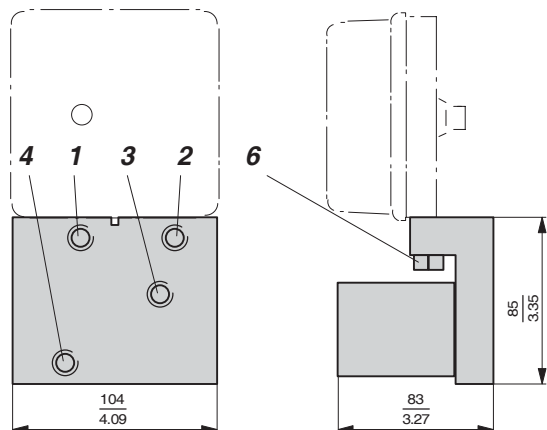


Booster single acting with doubled output capacity
Code VKXG-HN



mm
in

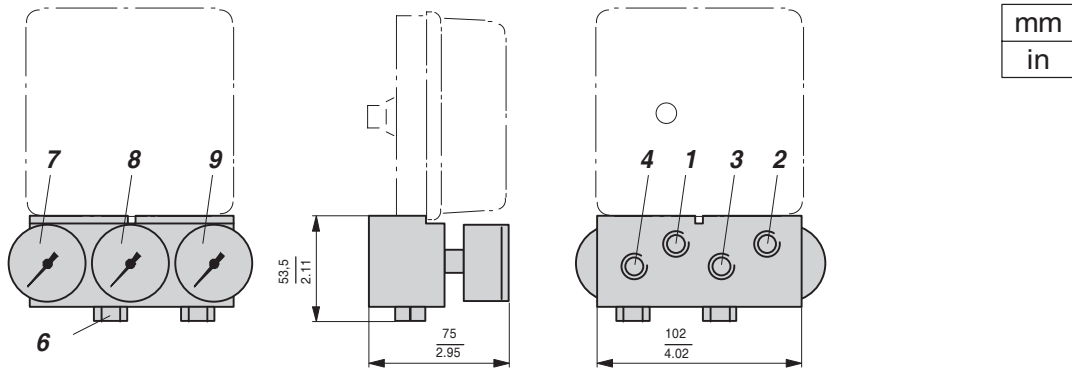
Booster double acting
Code VKXG-GN



- 1 Female thread 1/4-18 NPT for supply air
- 2 Female thread 1/4-18 NPT for input (w)
- 3 Female thread 1/4-18 NPT for output I (y1)
- 4 Female thread 1/4-18 NPT for output II (y2)
- 5 Female thread 1/2-14 NPT for output I (y1)
- 6 Fixing screws 17 mm A/F

DIMENSIONS Additional equipment

Connection manifold with gauges Code LEXG-JN, -KN, -LN, -MN, -NN
 Connection manifold for gauges Code LEXG-RN, -TN, -SN



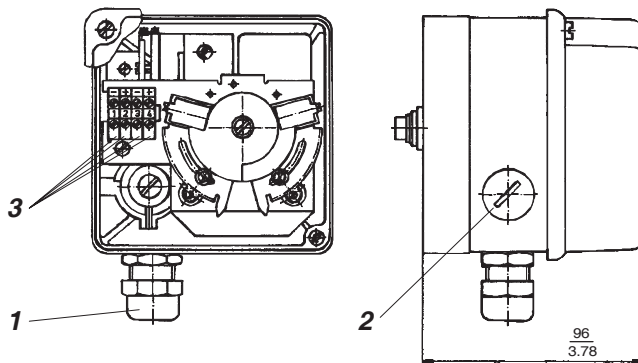
Manifold Code LEXG	7 Gauge for	8 Gauge for	9 Gauge for	Version Action
-JN (-RN*)	without	output (y)	supply air	single
-KN (-RN*)	input (w)	without	supply air	single
-LN (-RN*)	input (w)	output (y)	supply air	single
-MN (-SN*)	supply air	output I (y1)	output II (y2)	double
-NN (-TN*)	input (w)	output I (y1)	output II (y2)	double

- 1 Female thread 1/4-18 NPT for supply air
- 2 Female thread 1/4-18 NPT for input (w)
- 3 Female thread 1/4-18 NPT for output I (y1)
- 4 Female thread 1/4-18 NPT for output II (y2) (only on manifold Code M, N)

6 Fixing screws 17 mm A/F

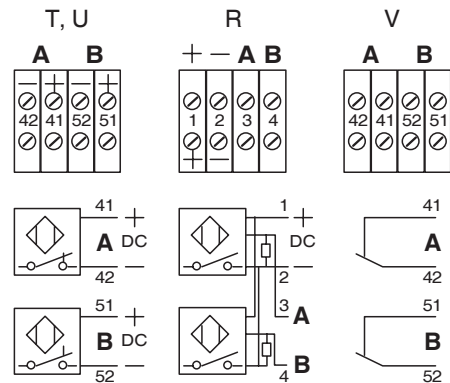
*) Connection manifold for gauges, without gauges (for customer's gauges)

Built-in limit switch Code R, T, U, V

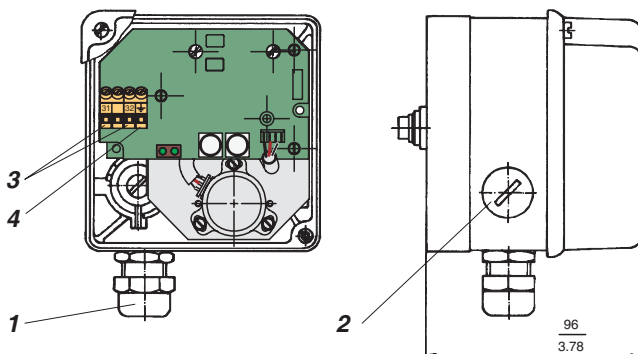


- 1 Cable gland
- 2 Dummy plug can be replaced with 1
- 3 Connection terminals

Built-in limit switch Code

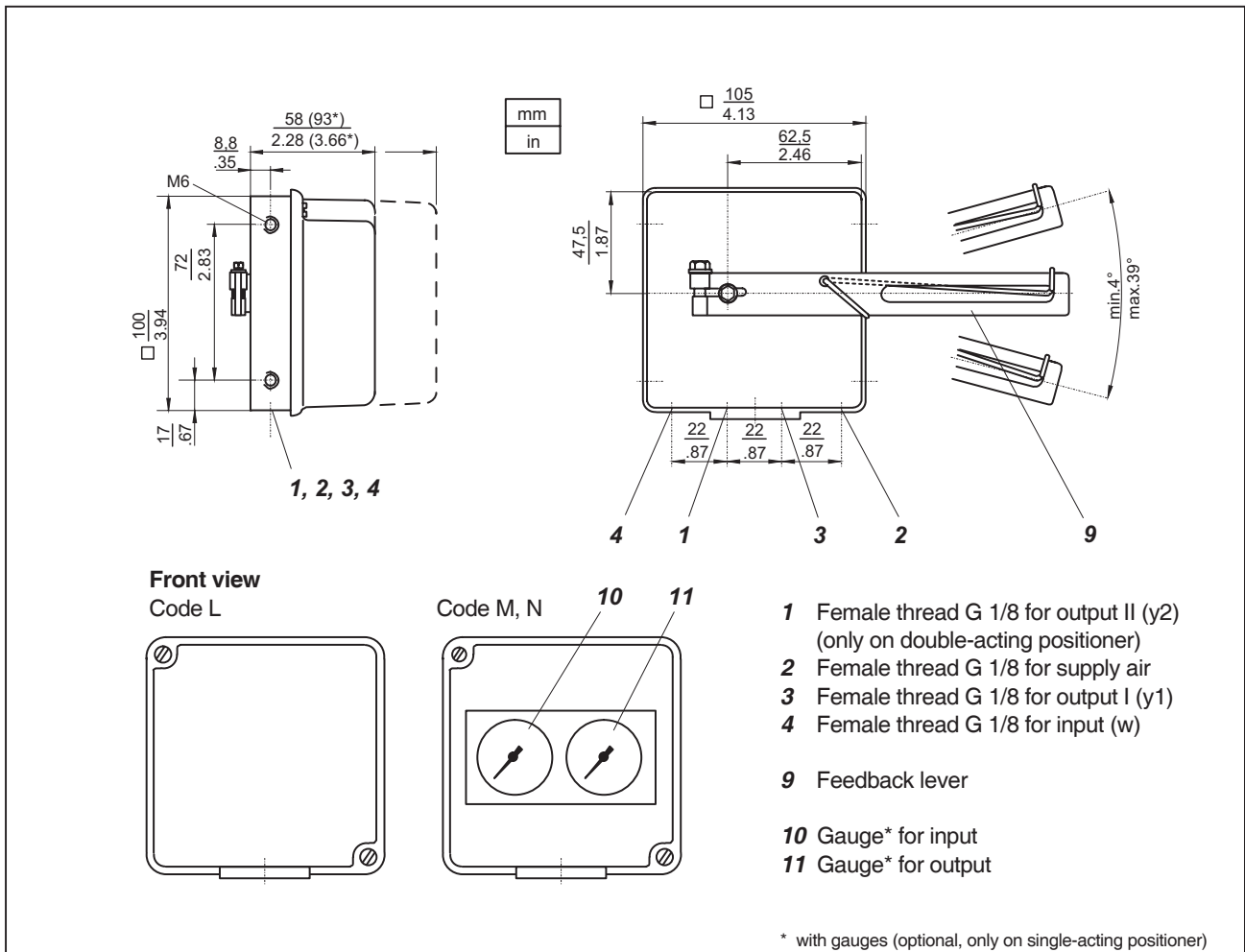


Built-in position transmitter Code W



- 1 Cable gland
- 2 Dummy plug can be replaced with 1
- 3 Connection terminals (+/-)
- 4 Ground connection

DIMENSIONS, CONNECTIONS



Further Product Specification Sheets:

PSS EVE0101A-(de)	SRP981	Pneumatic Positioner
PSS EVE0102A-(de)	SRI986	Electro-Pneumatic Positioner
PSS EVE0103A-(de)	SRI983	Electro-Pneumatic Positioner - explosion proof or EEx d version
PSS EVE0105A-(de)	SRD991	Intelligent Positioner
PSS EVE0107A-(de)	SRI990	Analog Positioner
PSS EVE0109A-(de)	SRD960	Universal Positioner

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