

## 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 to 80 °C (–40 to 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
  - pneumatic basic device:  
ATEX II 2 G c IIC T6 constructive design
  - electrical additional built-in equipment:  
ATEX II 2 G Ex ib/ia IIB/IIC T4/T6  
CU TR explosion protection

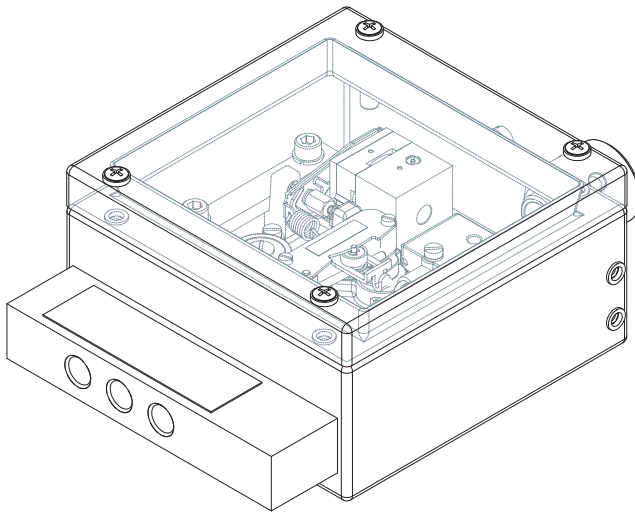
*Equipment should be installed, operated, serviced, and maintained only by qualified personnel.*

*No responsibility is assumed by Schneider Electric for any consequences arising from the use of this material.*

## SPECIAL VERSION OF SRP981

### SRP981 in Stainless Steel housing

Casing . . . . .	Stainless Steel 1.4404 / 316L, 1.25 mm thick
Ingress Protection . . . . .	IP65; IP66 under working conditions (supplied by air supply)
Impact resistance . . . . .	> 7 Joule acc. to EN 50014
Seals . . . . .	VMQ (Silicone)



For dimensional drawings see page 13.

Version for mounting to linear actuators, single acting can be ordered under special version ECEP EP 0301, together with Mounting kit EBZG.

Other versions for double acting or mounting to rotary actuators on request.

## TECHNICAL DATA

### Input

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

### Output

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

Supply air pressure . . . . .	1.4 to 6 bar (20 to 90 psig)
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	

For air supply, we recommend the FRS02 filter regulator.

### Ambient conditions

Ambient temperature . . . . .	-40 to 80 °C (-40 to 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 to 80 °C (-58 to 176 °F)
Protection class . . . . .	IP 54 (IP 65 on request)



## 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 <sup>1) 2) 3)</sup>



Current consumption  
Vane clear . . . . . > 3 mA  
Vane interposed . . . . . < 1 mA  
For control circuit with the following electrical values  
Supply voltage . . . . . DC 8 V, R<sub>i</sub> approx. 1 kOhm  
Residual ripple . . . . . < 5 %  
Permissible line resistance < 100 Ohm  
Response characteristic <sup>6)</sup>  
Gain . . . . . Continuously adjustable from 1:1 to approx. 7:1  
Switching differential . . . . . < 1 %  
Switching point repeatability < 0.2 %

#### Explosion protection <sup>7) 8)</sup>

Type of protection . . . . . II 2 G Ex 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<sub>max</sub> . . . . . 16 V  
I<sub>max</sub> . . . . . 25 mA  
P<sub>max</sub> . . . . . 64 mW  
Internal inductance . . . . . 100 µH  
Internal capacitance . . . . . 30 nF  
Ambient temperature  
Temperature class T6 . . . . . -40 to 65 °C (-40 to 149 °F)  
T1 to T5 . . . . . -40 to 80 °C (-40 to 176 °F)

Parts set for later installation  
Code T . . . . . EW 419 510 334  
Code U . . . . . EW 419 510 352

- 1) For the standard version code T, one switching amplifier is required e.g. Pepperl & Fuchs type WE 77/Ex2  
For the security version code U, a fail-safe switching amplifier for each inductive proximity sensor is required e.g. 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

### 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 <sup>2) 4)</sup>  
Supply voltage U<sub>s</sub> . . . . . DC 10 to 30 V  
Residual ripple . . . . . ±10 %, U<sub>s</sub> = 30 V  
Switching frequency . . . . . 2 kHz  
Constant current . . . . . 100 mA  
Response characteristics <sup>6)</sup>  
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 <sup>2) 5)</sup>  
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 <sup>6)</sup>  
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

**Electrical Position Transmitter Code W**

Input . . . . .  
 Stroke / angle from actuator  
 via positioner feedback lever  
 Sensor . . . . .  
 resistive precision conductive  
 plastic element  
 Stroke range . . . . .  
 15 to 80 mm (0.6 to 3.15 in)  
 < 15 mm (0.6 in) on request  
 Angular range . . . . .  
 60 to 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 to 36 V  
 Permitted ripple . . . . . < 10 % p.p.  
 Supply voltage dependency < 0.2 %

Response characteristic<sup>1)</sup>  
 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** <sup>2) 3)</sup>

Type of protection . . . . . II 2 G Ex 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  $\mu\text{H}$   
 Internal capacitance . . . . . to earth 10 nF or  
 6 nF differential

Ambient temperature  
 Temperature class T6 . . . -40 to 40 °C (-40 to 104 °F)  
 T5 . . . . -40 to 55 °C (-40 to 131 °F)  
 T4 . . . . -40 to 80 °C (-40 to 176 °F)

Parts set for later installation  
 Code W . . . . . EW 420 661 115

**Common Data** <sup>4)</sup>

Ambient conditions  
 Ambient temperature <sup>5) 6)</sup> . . . -25 to 80 °C (-13 to 176 °F)  
 -40 to 80 °C (-40 to 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 to 80 °C (-40 to 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 mm<sup>2</sup> (AWG 14)

Materials  
 Base plate . . . . . Galvanized steel  
 Control vane . . . . . Aluminum  
 Setting mechanism . . . . . Fiber glass-reinforced  
 polyamide

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 . . . . . 2004/108/EG  
 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 to 80 °C (-40 to 176 °F) for the fail-safe version of inductive  
 limit switch code

**MODEL CODES SRP981**

080715

<b>Pneumatic Positioner</b>	<b>SRP981</b>																			
<b>Version</b>																				
Single acting.....	-B																			
Double acting.....	-C																			
<b>Input</b>																				
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																			
<b>Mode of Action</b>																				
Increasing input increases output.....	D																			
Increasing input decreases output.....	R																			
<b>Gauges</b>																				
Without Gauges.....	L																			
Two Built-In Gauges (bar/psi).....(a).....	M																			
<b>Built-In Limit Switch / Position Transmitter</b>																				
Without.....	S																			
Inductive Limit Switch Three-Wire Technique, Without Explosion Protection (b).....	R																			
Inductive Limit Switch (Standard Vers.) w. Ex II 2 G Ex ia IIC T6 acc. to ATEX (b).....	T																			
Inductive Limit Switch (Security Vers.) w. Ex II 2 G Ex 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 Ex ia IIC T6 acc. to ATEX (b).....	W																			
<b>Cable Entry</b>																				
Without Cable Gland.....	1																			
M20 x 1.5 with one plastic cable gland, color gray.....	7																			
<b>Attachment Kit</b>																				
Order as auxiliary.....	N																			
<b>Manifold</b>																				
Order as auxiliary.....	A																			
<b>Options</b>																				
Amplifier free of nonferrous metals.....(a)(d).....	C																			
Manual Bypass Switch.....(a).....	T																			
EAC approved for intrinsic safety.....	R																			
Protection Class IP65.....(b).....	FA																			
Assembled Free of Oil and Grease / Designed for Aux. Energy Oxygen.....	S																			
Lloyd's Register of Shipping.....	X																			
Certificate EN 10204-2.1 - Certificate of compliance with the order.....	1																			
<b>Tag No. Labeling</b>																				
Stamped with water 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  
 (d) Not with Gauges M



**MODEL CODES Accessories**

<b>Couple lever / cam</b>	<b>EBZG</b>
Standard (a = 72 mm) .....	-AN
Extended (a = 91 mm) .....	-BN
Inverse equal percentage cam for rotary actuators .....	-CN
<b>Spring set</b>	<b>FESG</b>
Range springs (4 pcs) .....	-FN
<b>Attachment kit</b>	<b>EBZG</b>
For diaphragm actuators with casting yoke acc. NAMUR. (incl. standard Couple Lever) (for <b>SRP981</b> , SRI983, SMP981, SMI983, SGE985) .....	-GN
For diaphragm actuators with pillar yoke acc. NAMUR. (incl. standard Couple lever) (for <b>SRP981</b> , SRI983, SMP981, SMI983, SGE985) .....	-FN
For rotary actuators, without flange, 3 drill holes 6.5 mm (for <b>SRP981</b> , SRI983, SRI986, SMP981, SMI983, SGE985) ..	-PN
For rotary actuators, without flange, 4 threads M6 (e.g. for Petras actuators) (for <b>SRP981</b> , SRI983, SRI986, SMP981, SMI983, SGE985) .....	-NN
For rotary actuators, with flange (for <b>SRP981</b> , SRI983, SRI986, SMP981, SMI983, SGE985) .....	-JN
For rotary actuators acc. to VDI/VDE 3845, with shaft (for <b>SRP981</b> , SRI983, SRI986, SMP981, SMI983, SGE985) ..	-ZN
For Masoneilan type Camflex II (for <b>SRP981</b> , SRI983, SRI986, SMP981, SMI983, SGE985) .....	-RN
For Masoneilan type Sigma F (for SRI986, <b>SRP981</b> , SRI983) .....	-SN
For Masoneilan type 37/38, Fisher Elliott type 656, 667 (for <b>SRP981</b> , SRI983, SGE985, SMI983, SMP981) .....	-TN
For Gulde type P (for <b>SRP981</b> , SRI983) .....	-UN
For Masoneilan type 87/88 (for <b>SRP981</b> , SRI983, SMP981, SMI983, SGE985) .....	-EN
For Masoneilan VariPak (for <b>SRP981</b> , SRI983, SGE985, SMI983, SMP981) .....	-MN
For IAL actuators (for <b>SRP981</b> , SRI983, SGE985, SMI983, SMP981) .....	-VN
Brackets VDI/VDE 3845 (A = 130 mm/5.12 in; B = 50 mm/1.97 in) ( <b>SRP981</b> , SRI983, SRI986, SGE985, SMI983, SMP981)	-C3
Brackets VDI/VDE 3845 (A = 80 mm/3.15 in; B = 30 mm/1.18 in) ( <b>SRP981</b> , SRI983, SRI986, SGE985, SMI983, SMP981).	-C2
Brackets VDI/VDE 3845 (A = 80 mm/3.15 in; B = 20 mm/0.79 in) ( <b>SRP981</b> , SRI983, SRI986, SGE985, SMI983, SMP981).	-C1
<b>Manifold (Connection 1/4-18NPT)</b>	<b>LEXG</b>
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
<b>Booster (Connection 1/4-18NPT)</b>	<b>VKXG</b>
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

(continued at next page)

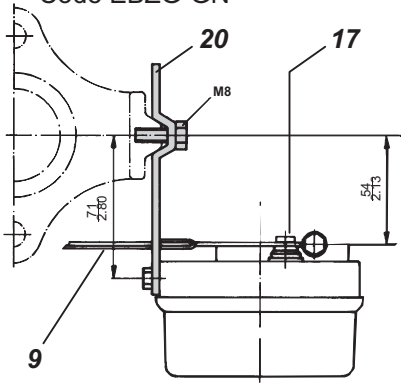
**MODEL CODES Accessories** (continued)

<b>Adapter</b>	<b>AD</b>
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
<b>Cable gland</b>	<b>BUSG</b>
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 Ex d . . . . .	-S7
M20 x 1.5 brass Zinc plated Ex d . . . . .	-S8
1/2-14 NPT cable gland 6 to 12 mm, Stainless steel, Ex d . . . . .	-N1
1/2-14 NPT cable gland 6 to 12 mm, Steel Zinc plated, Ex d . . . . .	-N2
1/2-14 NPT, brass Zinc plated, Ex d . . . . .	-N3
M20 x 1.5 plug, plastic . . . . .	-V3
M20 x 1.5 plug, Stainless steel, Ex d . . . . .	-V4
1/2-14 NPT plug, Stainless Steel, Ex d . . . . .	-V5
M20 x 1.5 plug, brass Zinc plated, Ex d . . . . .	-V6
1/2-14 NPT plug, brass Zinc plated, Ex d . . . . .	-V7

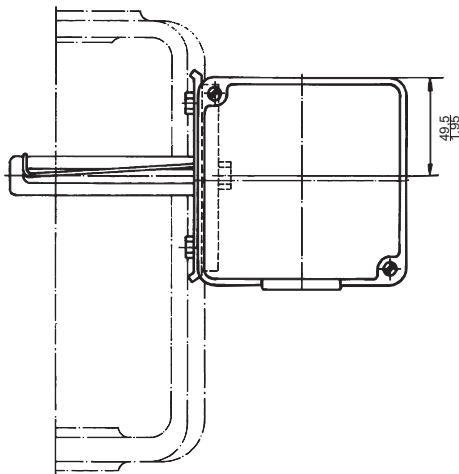
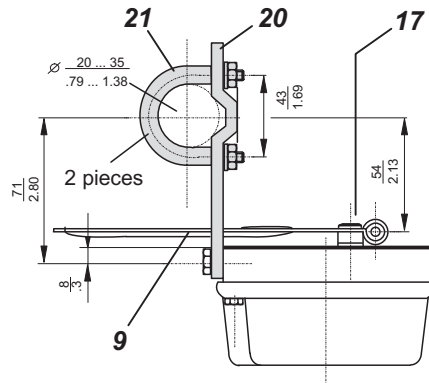


**ATTACHMENT KIT FOR DIAPHRAGM ACTUATORS**

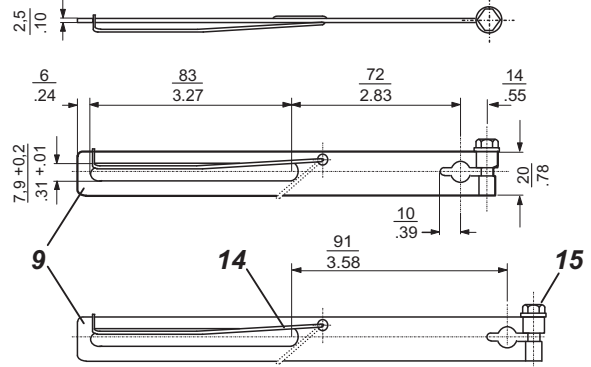
**Attachment to casting yoke**  
according to IEC 534-6 (NAMUR)  
Code EBZG-GN



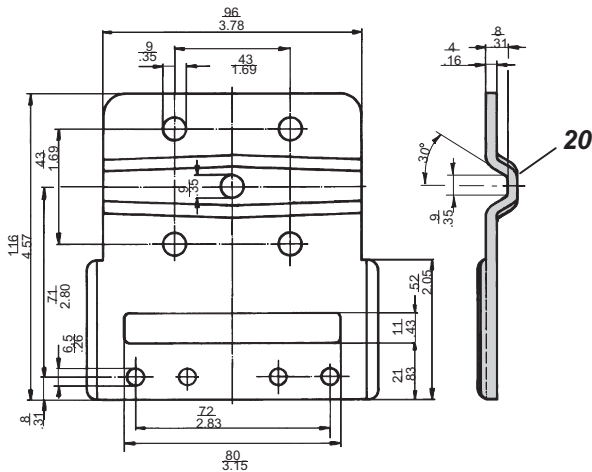
**Attachment to pillar yoke**  
according to IEC 534-6 (NAMUR)  
Code EBZG-FN



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

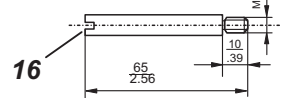


**Mounting bracket**  
according to IEC 534-6 (NAMUR)  
for Code EBZG-GN, FN



mm
in

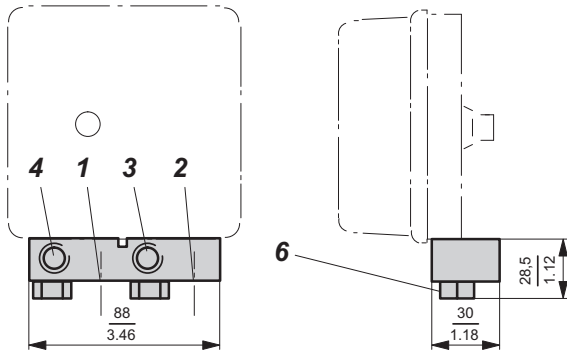
**Carrier bolt**  
for attachment to valve stem



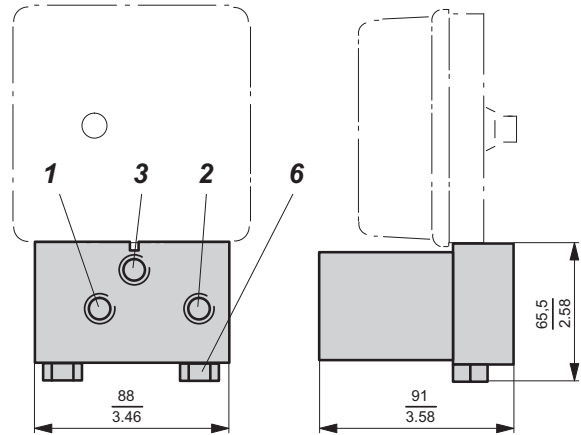


**DIMENSIONS Additional equipment**

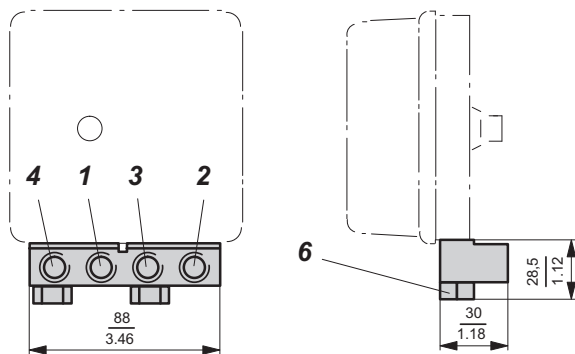
**Connection manifold, staggered connections  
Code LEXG-BN**



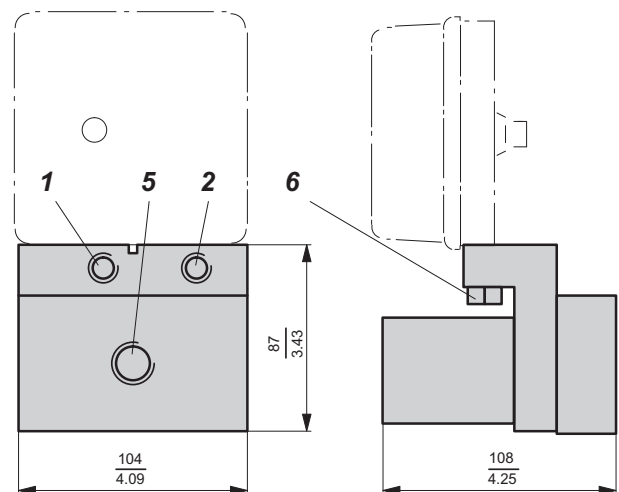
**Booster single acting  
Code VKXG-FN**



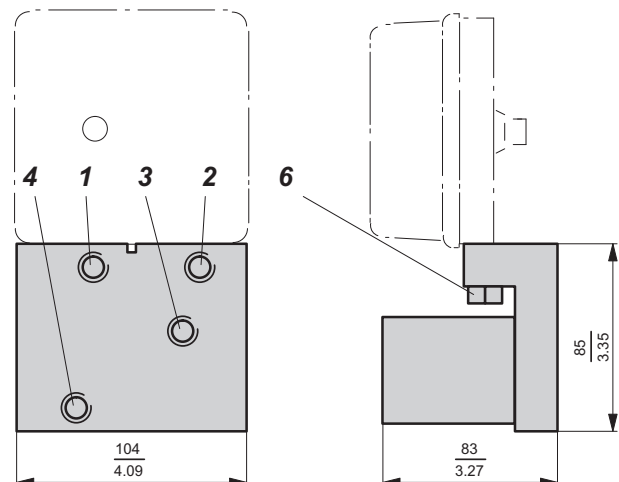
**Connection manifold, connections same level  
Code LEXG-CN**



**Booster single acting with doubled output capacity  
Code VKXG-HN**



**Booster double acting  
Code VKXG-GN**

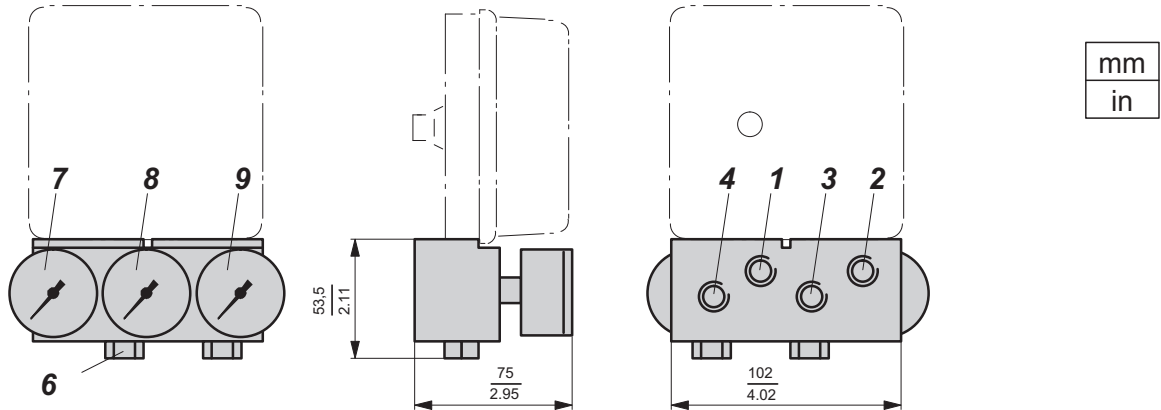


mm
in

- 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



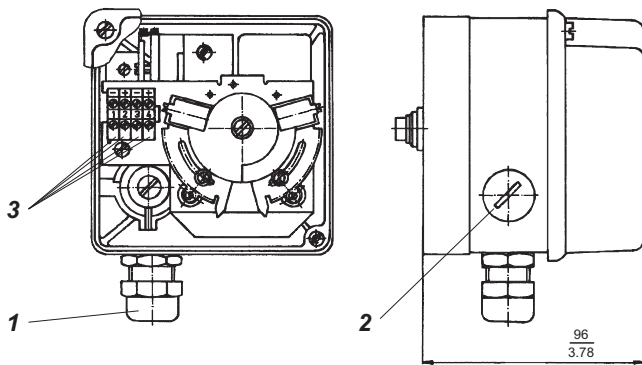
Manifold Code LEXG	7 Gauge for	8 Gauge for	9 Gauge for	Version Action
-JN (-RN*)	without	output (y)	supply air	single
-KN (-RN*)	input (w)	without	supply air	single
-LN (-RN*)	input (w)	output (y)	supply air	single
-MN (-SN*)	supply air	output I (y1)	output II (y2)	double
-NN (-TN*)	input (w)	output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

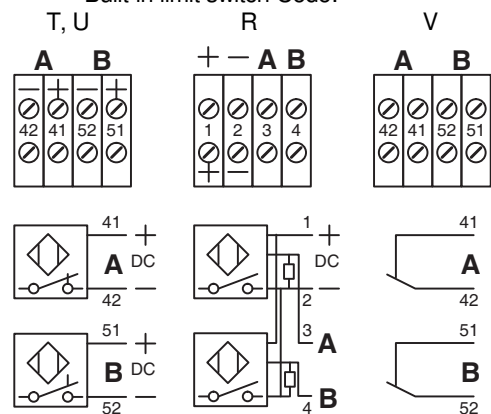
\*) Connection manifold for gauges, without gauges (for customer's gauges)

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

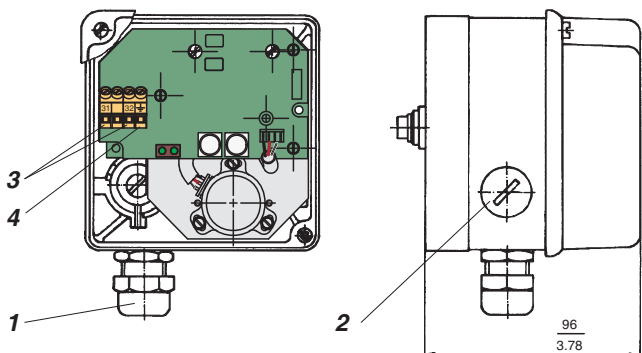


- 1 Cable gland
- 2 Dummy plug, can be replaced with 1
- 3 Connection terminals

Built-in limit switch Code:

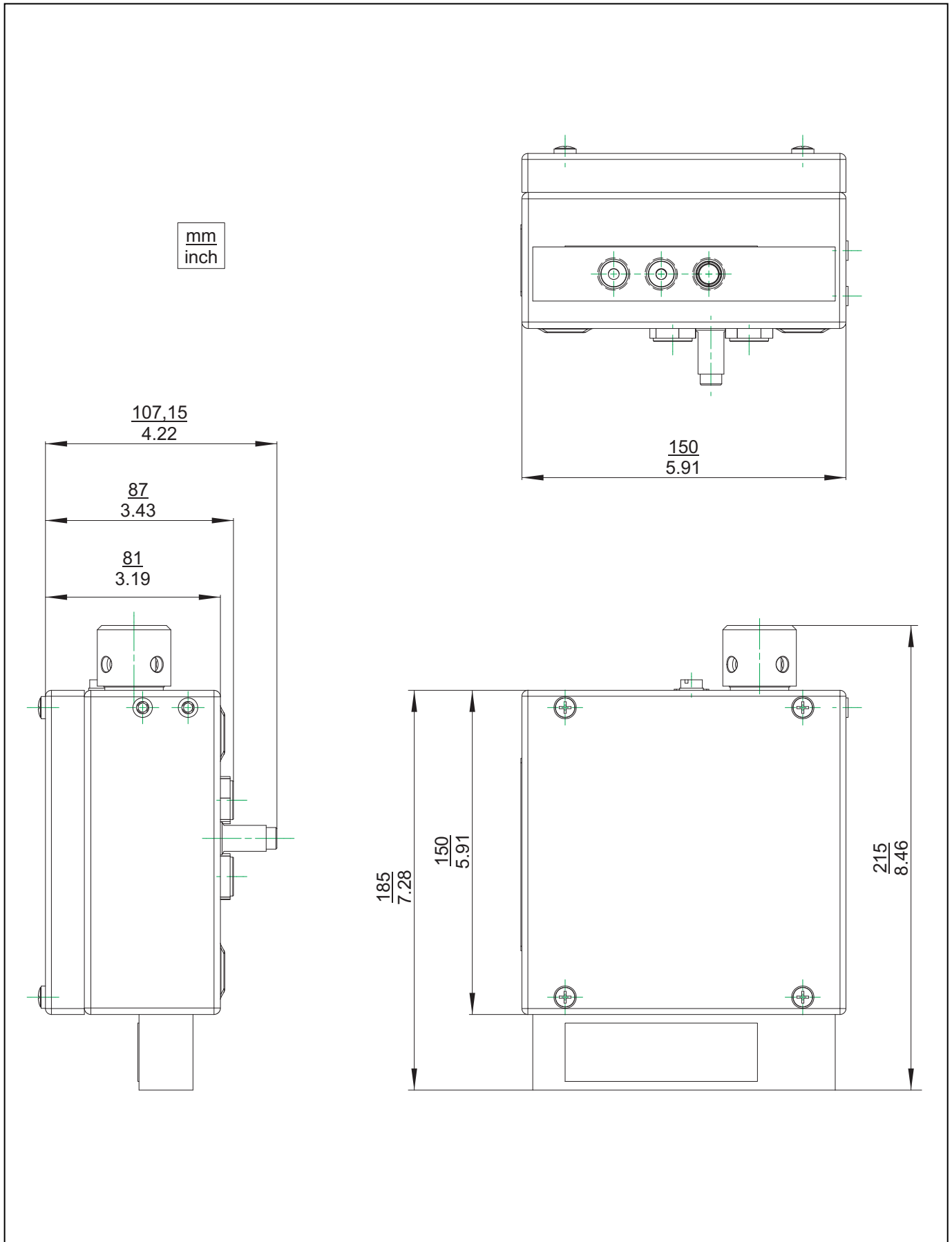


**Built-in position transmitter Code W**

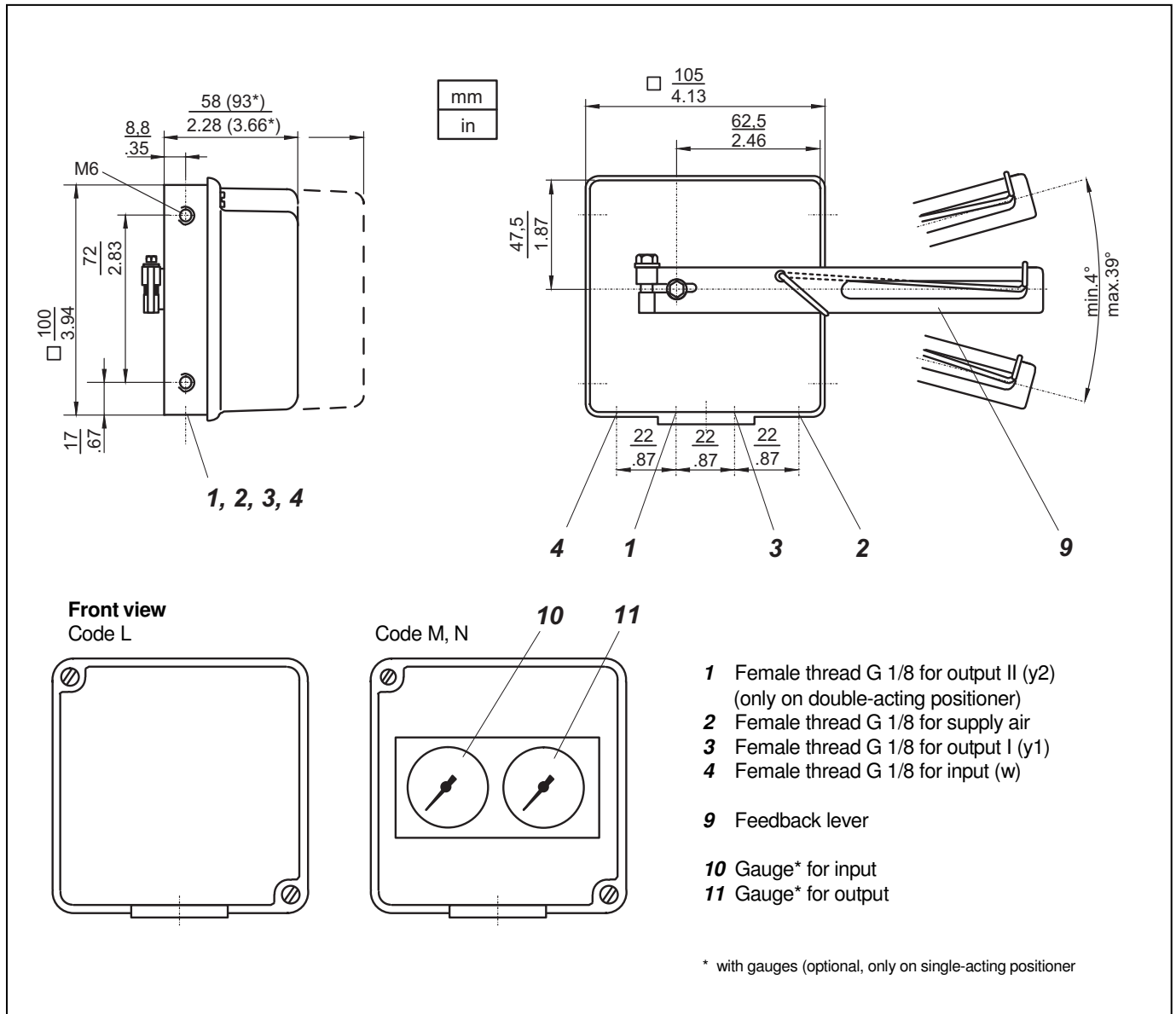


- 1 Cable gland
- 2 Dummy plug, can be replaced with 1
- 3 Connection terminals (+/-)
- 4 Ground connection

**DIMENSIONS SRP981 Special version in Stainless Steel housing**



**DIMENSIONS, CONNECTIONS**



Schneider Electric Systems USA, Inc.  
 38 Neponset Avenue  
 Foxboro, MA 02035  
 United States of America  
<http://www.schneider-electric.com>

Global Customer Support  
 Inside U.S.: 1-866-746-6477  
 Outside U.S.: 1-508-549-2424  
<https://pasupport.schneider-electric.com>

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