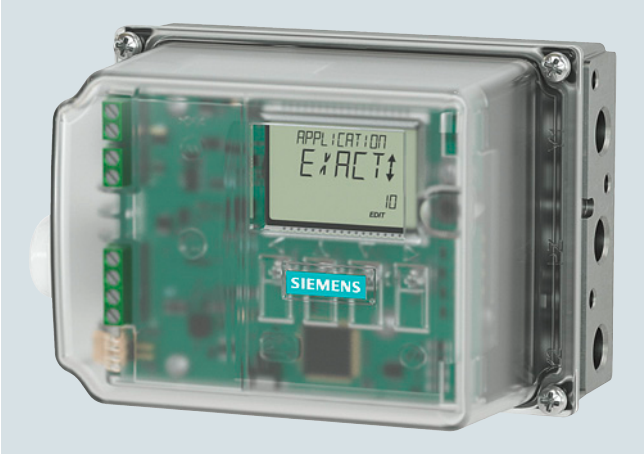
Overview

SIPART PS100 electropneumatic positioner in aluminum enclosure



SIPART PS100 positioner with inspection window

The SIPART PS100 electropneumatic positioners are used to control the valve or damper position of pneumatic linear or part-turn actuators. The SIPART PS100 electropneumatic positioners control the value according to the setpoint value.

Benefits

The SIPART PS100 positioners offer the following advantages:

- Fast commissioning at the push of a button
- Simple operation via the display and four buttons
- Display symbols in accordance with NAMUR NE 107
- Negligible air consumption in stationary operation
- Setting the application profile based on predefined selection options, e.g. tight-closing value, open/close valve, small valve
- Fast response in end positions ensures short positioning times and tight valves
- Insensitive to vibrations and steam hammer
- Leakage compensation ensures a constant actual value and protects the actuator
- One device suitable for linear or part-turn actuators

Application

The SIPART PS100 positioner is used, for example, in the following industries:

- Valve manufacturing
- Chemicals industry
- Power stations
- Paper and glass
- Water and wastewater
- Food and pharmaceuticals

The SIPART PS100 positioner can be used with pneumatic actuators and an analog input (AI), 4 to 20 mA.

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Design

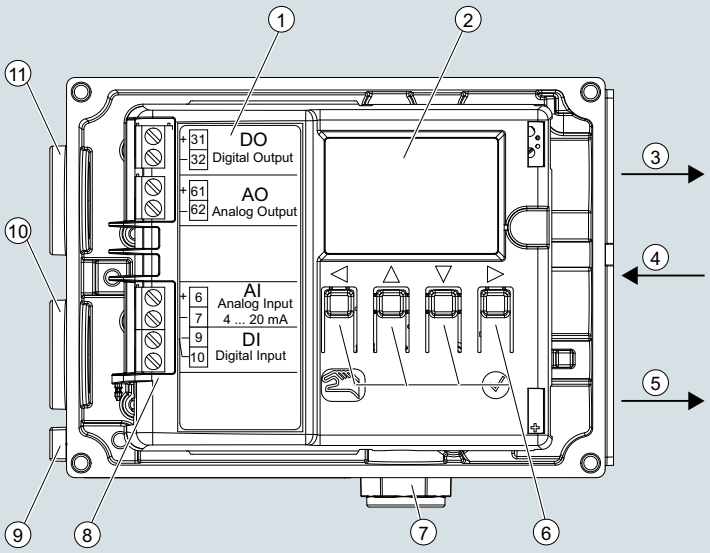
The SIPART PS100 positioner comprises the following components:

- Enclosure (base plate with cover)
- Electronics
- Wear-free, contact-free position detection
- Pneumatic block

The pneumatic block is located in the enclosure, the pneumatic connections for the inlet air and the positioning pressure on the right-hand side of the enclosure. The electrical connections are located on the left-hand side of the enclosure.
The SIPART PS100 positioner is fitted to the relevant pneumatic linear or part-turn actuator using an appropriate mounting kit. The positioner shaft is located on the underside of the base plate. The positioner shaft is connected to the spindle of the linear actuator or the actuator shaft of the part-turn actuator using the mounting kit.

The electronics are available with the following options:

- Analog output (AO) 4 to 20 mA
  The current position of the valve is converted into a 4 to 20 mA signal.
- Digital input and digital output (DI and DO)
  Output of an alarm in the case of a control deviation or a device fault.
  Approach of a defined value position, disabling of keys, blocking of valve by means of digital input.



1. Wiring diagram on module cover
2. Display
3. Output: Actuating pressure Y1
4. Input: Supply air PZ
5. Output: Actuating pressure Y2 for double-acting actuators
6. Buttons
7. Exhaust air outlet with a sound absorber
8. Connecting terminals
9. Grounding, thread M4
10. Lower cable gland, thread M20x1.5
11. Upper cable gland, thread M20x1.5

SIPART PS100, enclosure with open cover

Function

Local operation is performed using the built-in display and the four buttons. It enables, for example:

- Starting automatic commissioning with the press of a button
- Configuring the device
- Switching between the operating modes:
  - AUTO: The positioner controls the valve according to the analog input (AI) 4 to 20 mA
  - MANUAL: Valve movement with the middle keys

A hallmark of the SIPART PS100 is its own extremely low consumption of air. Thanks to the piezo technology, compressed air is only required to move the valve. In the controlled state, consumption of air is negligible.

Technical specifications

Input	
Analog input AI, terminal 6 and 7	
• Nominal signal range	4 ... 20 mA
• Minimum current to maintain operation	3.8 mA
• Maximum load voltage	6.5 V (corresponds to 325 Ω at 20 mA)
• Static destruction limit	± 40 mA
Digital input (DI), terminals 9 and 10	
• Galvanic isolation	Galvanically connected to analog input Galvanically isolated from the outputs
• Signal status 0, floating contact open	> 300 kΩ
• Signal status 1, floating contact closed	< 3 kΩ
• Contact load	Can only be used for floating contact; max. contact load < 20 µA, 3 V

Output	
Analog output (AO), terminals 61 and 62	
• Type of connection	2-wire connection
• Nominal signal range	4 ... 20 mA
• Dynamic range I_O	3.6 ... 20.5 mA
• Supply voltage U_H	12 ... 30 V
• External load R_B [kΩ]	≤ (U_H [V] - 12 V)/I_O [mA]
• Resolution in relation to the nominal signal range	0.05%
• Transmission error in relation to the nominal signal range	± 0.3%
• Effect of ambient temperature	± 0.1%/10K
• Maximum residual ripple	± 0.5%
• Galvanic isolation	Galvanically isolated from the other electrical inputs and outputs
Digital output (DO), terminals 31 and 32	
• Maximum supply voltage U_H	35 V
• External current consumption	To be limited to 50 mA
• Signal status High	Conductive, maximum terminal voltage 3 V
• Signal status Low The status is also Low if the device is faulty or analog input (AI) is = 0 mA.	Blocked, I < 60 µA

Operating conditions	
Ambient conditions for operation according to IEC 60068-2	For indoor and outdoor use
Ambient temperature	
• Ambient temperature	-20 ... +80 °C (-4 ... +176 °F)
• Relative humidity	0 ... 100%
Pollution degree according to IEC 61010-1	2
Overvoltage category according to IEC 61010-1	II
Enclosure degree of protection	
• According to IEC 60529	IP66
Vibration resistance	
• Harmonic oscillations (sine) according to IEC 60068-2-6	3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axis 98.1 m/s² (321.84 ft/s²), 27 ... 300 Hz, 3 cycles/axis
• Bump (half-sine) according to IEC 60068-2-27	150 m/s² (492 ft/s²), 6 ms, 1 000 shocks/axis
• Noise (controlled digitally) according to IEC 60068-2-64	10 ... 200 Hz; 1 (m/s²)²/Hz (3.28 (ft/s²)²/Hz) 200 ... 500 Hz; 0.3 (m/s²)²/Hz (0.98 (ft/s²)²/Hz) 4 hours/axis

Pneumatic data	
Pneumatic operating medium	Compressed air, carbon dioxide (CO_2), nitrogen (N_2), noble gases
• Operating pressure	1.4 ... 7 bar (20.3 ... 101.5 psi)
Quality class of compressed air according to ISO 8573-1	
• Solid impurities	Class 3
• Pressure dew point	Min. 20 K (36 °F) below ambient temperature
• Oil content	Class 3
Flow rate	
• Aerate process drive	
- Supply pressure 4 bar (58 psi)	7.1 Nm³/h (31.3 USgpm)
- Supply pressure 6 bar (87 psi)	9.8 Nm³/h (43.1 USgpm)
• Depressurize process drive	
- Actuating pressure 4 bar (58 psi)	13.7 Nm³/h (60.3 USgpm)
- Actuating pressure 6 bar (87 psi)	19.2 Nm³/h (84.5 USgpm)
Leakage actuator chamber (positioner portion)	< 6 ·10^{-4} Nm³/h (0.0026 USgpm)
Consumption at operating medium in the controlled state	< 3.6 ·10^{-2} Nm³/h (0.158 USgpm)
Sound pressure level	$L_{A\,eq}$ < 75 dB $L_{A\,max}$ < 80 dB

Construction	
Supported actuator types	
• Linear actuator, range of stroke	10 ... 130 mm (0.39 ... 5.12")
• Part-turn actuator, angle-of-rotation range	10 ... 100°
Weight, positioner without accessories	Approx. 1.0 kg (2.20 lb)
Material	
• Enclosure	Aluminum EN AC-AlSi(Fe)
• Pressure gauge block	Aluminum, anodized or stainless steel 316
• Pressure gauge	• Plastic, plant brass • Stainless steel, plant brass nickel-plated • Stainless steel, plant stainless steel 316
Torques	
• Cover fixing screws	1.5 Nm (1.1 ft lb)
• Part-turn actuator fixing screws DIN 933 M6x12-A2	5 Nm (3.7 ft lb)
• Linear actuator fixing screws DIN 933 M8x16-A2	12 Nm (8.9 ft lb)
• Gland pneumatic G¼	15 Nm (11.1 ft lb)
• Gland pneumatic ¼-18 NPT	
- Without sealant	12 Nm (8.9 ft lb)
- With sealant	6 Nm (4.4 ft lb)
• M20 cable gland, plastic	4 Nm (3 ft lb)
• M20 cable gland, metal	6 Nm (4.4 ft lb)
• Cable gland, ½-14 NPT metal	15 Nm (11.1 ft lb)
• Cable gland for NPT gland in the NPT adapter	68 Nm (50 ft lb)
NOTICE: To avoid damage to the device, the NPT adapter must be held in place while the NPT gland is screwed into the NPT adapter.	
• Screw cap made of plastic	2.5 Nm (1.8 ft lb)
• Screw cap made of metal	4 Nm (3 ft lb)
• Pressure gauge block fixing screws	6 Nm (4.4 ft lb)

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Pressure gauge	
• Degree of protection	
- Pressure gauge plastic, plant brass	IP31
- Pressure gauge metal, plant brass nickel-plated	IP44
- Pressure gauge stainless steel, stainless steel 316L	IP54
Connections, electrical	
• Screw terminals	2.5 mm^2 AWG30-14
• Cable bushing	M20x1.5 or ½-14 NPT with NPT adapter
Connections, pneumatic	G¼ or ¼-18 NPT
Controller	
Controller unit	
• Five-point controller	Adaptive
• Deadband	
- Adjustable peak value	± 0.1 ... 3%
- Minimization of the peak value	Always active
Analog input (AI), terminal 6 and 7	
• Sampling interval	50 ms
• Resolution	0.05%
Position detection	
• Sampling interval	10 ms
• Resolution at 10 mm stroke	0.1%
• Temperature influence	0.1%/10 K (0.1%/18 °F)

Selection and ordering data

	Article No.
SIPART PS100 electropneumatic positioner ↗	**6DR7 1 - - 0**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Enclosure material	
Aluminum, cover without inspection window	**1**
Actuator type	
Single-acting	**1**
Double-acting	**2**
Degree of protection	
None	**0**
Communication	
2-wire, 4 ... 20 mA	**N**
Device option 1	
None	**N**
Digital input (DI) and digital output (DO)	**A**
Device option 2	
None	**0**
Analog output (AO) 4 ... 20 mA	**1**
Thread of the lower cable entry/ cable gland	
M20x1.5/None	**0**
M20x1.5/Plastic	**1**
M20x1.5/Metal	**2**
½-14 NPT/None	**4**
Thread of the upper cable entry/cable gland	
M20x1.5/With blanking plug	**0**
M20x1.5/Plastic	**1**
M20x1.5/Metal	**2**
½-14 NPT/None	**4**
Pneumatic thread	
G¼	**A**
¼-18 NPT	**B**
Pneumatic accessories	
Without pressure gauge block	**A**
Pressure gauge made of plastic, block made of aluminum	**C**
Pressure gauge made of metal, block made of aluminum	**D**
Pressure gauge made of stainless steel, block made of stainless steel	**E**

Options	Order code
Add "**-Z**" to Article No., specify order code and free text.	
TAG plate made of stainless steel, 3 lines Text line 1: Free text from Y15 Text line 2: Free text from Y16 Text line 3: Free text from Y17	**A20**
Version with stainless steel sound absorbers	**A40**

Customer-specific device settings	Order code
Add "**-Z**" to Article No., specify order code and free text.	
Measuring point description Input field: Free text, max. 16 characters	**Y15**
Measuring point text Input field: Free text, max. 24 characters	**Y16**
Measuring point number (TAG no.) Input field: Free text, max. 32 characters	**Y17**

Accessories	Article No.
Pressure gauge block with	
2 plastic IP31 pressure gauges, aluminum block, single-acting G¼, scaled in MPa and bar	**6DR4004-1M**
3 plastic IP31 pressure gauges, aluminum block, double-acting G¼, scaled in MPa and bar	**6DR4004-2M**
2 plastic IP31 pressure gauges, aluminum block, single-acting ¼-18 NPT, scaled in MPa and psi	**6DR4004-1MN**
3 plastic IP31 pressure gauges, aluminum block, double-acting ¼-18 NPT, scaled in MPa and psi	**6DR4004-2MN**
2 steel IP44 pressure gauges, aluminum block, single-acting G¼, scaled in MPa, bar, psi	**6DR4004-1P**
3 steel IP44 pressure gauges, aluminum block, double-acting G¼, scaled in MPa, bar, psi	**6DR4004-2P**
2 steel IP44 pressure gauges, aluminum block, single-acting ¼-18 NPT, scaled in MPa, bar, psi	**6DR4004-1PN**
3 steel IP44 pressure gauges, aluminum block, double-acting ¼-18 NPT, scaled in MPa, bar, psi	**6DR4004-2PN**
2 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, single-acting G¼, scaled in MPa, bar, psi	**6DR4004-1Q**
3 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, double-acting G¼, scaled in MPa, bar, psi	**6DR4004-2Q**
2 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, single-acting ¼-18 NPT, scaled in MPa, bar, psi	**6DR4004-1QN**
3 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, double-acting ¼-18 NPT, scaled in MPa, bar, psi	**6DR4004-2QN**
Booster	
Single-acting, aluminum, G½, 6DR5..0/2/3	**6DR4004-1RJ**
Double-acting, aluminum, G½, 6DR5..0/2/3	**6DR4004-2RJ**
Single-acting, aluminum, ½-14 NPT, 6DR5..0/2/3	**6DR4004-1RK**
Double-acting, aluminum, ½-14 NPT, 6DR5..0/2/3	**6DR4004-2RK**
Single-acting, aluminum, G½, 6DR5..5	**6DR4004-1RP**
Double-acting, aluminum, G½, 6DR5..5	**6DR4004-2RP**
Single-acting, aluminum, ½-14 NPT, 6DR5..5	**6DR4004-1RQ**
Double-acting, aluminum, ½-14 NPT, 6DR5..5	**6DR4004-2RQ**

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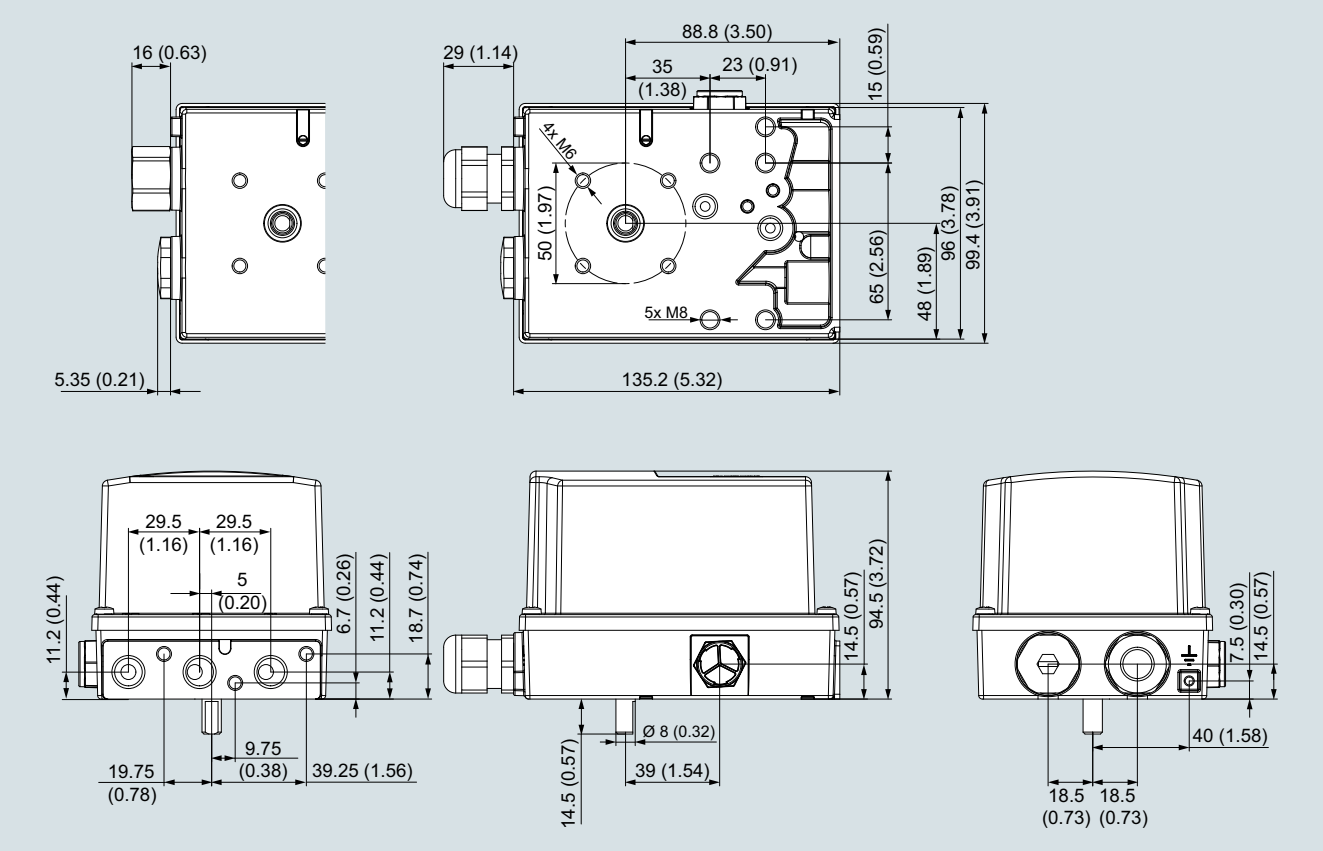
Accessories	Article No.
Mounting kit for NAMUR part-turn actuators	
VDI/VDE 3845, with plastic coupling wheel, without mounting console	**6DR4004-8D**
VDI/VDE 3845, with stainless steel coupling, without mounting console	**TGX:16300-1556**
SIPART PS100 console for NAMUR installation on part-turn actuators	
• 80 x 30 x 20 mm	**6DR4004-1D**
• 80 x 30 x 30 mm	**6DR4004-2D**
• 130 x 30 x 30 mm	**6DR4004-3D**
• 130 x 30 x 50 mm	**6DR4004-4D**
Mounting kit for other part-turn actuators	
The following mounting consoles can be used together with the NAMUR part-turn actuator mounting kit 6DR4004-8D.	
• SPX (DEZURIK) Power Rac, sizes R1, R1A, R2 and R2A	**TGX:16152-328**
• Masoneilan Camflex II	**TGX:16152-350**
• Fisher 1051/1052/1061, sizes 30, 40, 60 to 70	**TGX:16152-364**
• Fisher 1051/1052, size 33	**TGX:16152-348**
Mounting kit for NAMUR linear actuators	
• NAMUR linear actuator mounting kit with short lever arm (2 ... 35 mm (0.08 ... 1.38 inch))	**6DR4004-8V**
• Lever arm for strokes of 35 ... 130 mm (1.38 ... 5.12 inch) without NAMUR mounting bracket	**6DR4004-8L**
• Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with short lever with up to 35 mm stroke (1.38 inches)	**6DR4004-8VK**
• Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with long lever with greater than 35 mm stroke (1.38 inches)	**6DR4004-8VL**
• Roll and disk made of stainless steel 316 for replacement of the Teflon roll and aluminum disk in the 6DR4004-8, -8VK and -8VL mounting kits for NAMUR linear actuators	**6DR4004-3N**
• Two terminal blocks made of stainless steel 316 for replacement of the aluminum terminal blocks in the 6DR4004-8V, -8VK and -8VL mounting kits for NAMUR linear actuators	**6DR4004-3M**
Mounting kit for other linear actuators	
• Masoneilan type 37/38, size 6 to 51 mm (< 2 inches)	**TGX:16152-595**
• Masoneilan type 87/88	**TGX:16152-1210**
• Masoneilan type 37/38, size 51 to 254 mm (> 2 inches)	**TGX:16152-1215**
• Fisher type 657/667, size 30 to 80	**TGX:16152-900**
• Samson actuator type 3277 Yoke dimension = 101 mm (integrated connection without tube), not for Ex d	**6DR4004-8S**
OPOS interface according to VDI/VDE 3847	
• OPOS adapter with interface VDI/VDE 3847, blanketing, not for flameproof enclosures	**6DR4004-5PB**
Terminal block	
For safety solenoid valve with extended mounting flange according to NAMUR	
• For mounting according to IEC 534-6	**6DR4004-1B**
• For SAMSON actuator (integrated mounting), see above[1)]	**6DR4004-1C**
Documentation	
The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
SITRANS I100 isolating power supply HART (see "SITRANS I power supply units and isolation amplifiers") with	
• 24 V DC auxiliary power	**7NG4124-0AA00**
SITRANS I200 output isolator HART (see "SITRANS I power supply units and isolation amplifiers") with	
• 24 V DC auxiliary power	**7NG4131-0AA00**

1) Only together with 6DR4004-8S.

Scope of delivery for positioner

1 SIPART PS100 positioner as ordered

Dimensional drawings



Non-flameproof enclosure, dimensions in mm (inch)