Overview

SIPART PS100 positioner with polycarbonate lid and inspection window

SIPART PS100 electropneumatic positioner in aluminum enclosure without inspection window

The SIPART PS100 electropneumatic positioner is used to control the process valve or damper position of pneumatic linear or part-turn actuators. The SIPART PS100 electropneumatic positioners control the process valve 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 according to NAMUR NE 107
- Negligible air consumption in stationary operation
- Setting the application profile based on predefined selection options, e.g. tight-closing valve, 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
- Only one device version for linear and part-turn actuators
- Consistent parameter assignment with HART communication
- Safe use in hazardous areas

Application

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

- Valve manufacturing
- Chemical 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

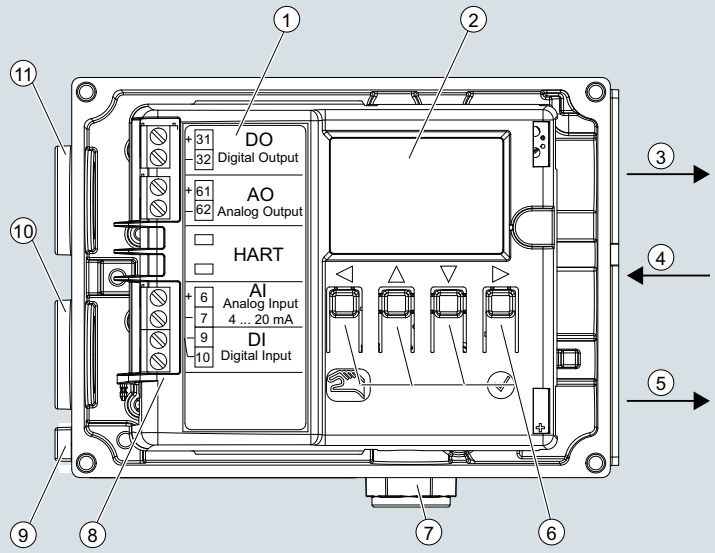
The SIPART PS100 positioner comprises the following components:

- Enclosure (base plate with lid)
- 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 actuating 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 DQ)
  - Position limit monitoring.
  - Output of an alarm in the event of a control deviation or a device fault.
  - Approach of a defined process valve position, disabling of keys, blocking of valve process valve by means of digital input.
- HART communication on parameter assignment and information on the device status



1. Wiring diagram on module cover
2. Display
3. Output: actuating pressure Y1
4. Input: supply air pressure 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 lid

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. Compressed air is only required to move the valve. In the controlled state, consumption of air is negligible.

Technical specifications

Input	
Analog input AI, terminals 6 and 7	
• Rated 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
• Type of communication	HART 7
Digital input (DI), terminals 9 and 10	
• Electrical isolation	Electrically connected to analog input Electrically isolated from the outputs
• Signal state 0, floating contact open	> 300 kΩ
• Signal state 1, floating contact closed	< 3 kΩ
• Contact load	Suitable only for floating contact; max. contact load < 20 µA, 3 V
Output	
Analog output (AO), terminals 61 and 62	
• Type of connection	2-wire connection
• Rated signal range	4 ... 20 mA
• Fault current	< 3.6 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%
• Electrical isolation	Electrically isolated from the other electrical inputs and outputs
Digital output (DQ), terminals 31 and 32	
• Maximum supply voltage U_H	35 V
• External current consumption	To be limited to 50 mA
• "Conductive" state	• Permissible rated current 50 mA • Maximum terminal voltage 3 V • Overload-proof
• "Locked" state "Locked" is also the state if the device is faulty or analog input (AI) is = 0 mA.	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
Degree of protection of enclosure	
• According to IEC 60529	IP66
• 6DR711* according to UL 50 E	Type 4X
Corrosion protection according to EN ISO 9227:2012 and EN ISO 12944:1999	
• 6DR710 polycarbonate enclosure	C5-M medium durability
• 6DR711 aluminum enclosure	C5-M medium durability

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
• Bumping (half-sine) according to IEC 60068-2-27	150 m/s² (492 ft/s²), 6 ms, 1 000 shocks/axis
• Noise (digitally controlled) 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)
Air quality according to ISO 8573-1	
• Solid particulate size and density	Class 3
• Pressure dew point	Class 3 (min. 20 K (36 °F) below ambient temperature)
• Oil content	Class 3
Flow	
• Pressurize process drive	
- Inlet air pressure 4 bar (58 psi)	7.1 Nm³/h (31.3 USgpm)
- Inlet air 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	L_{Aeq} < 75 dB L_{Amax} < 80 dB
Design	
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	
• Lid	• Aluminum • Polycarbonate
• Base plate	Aluminum
• Gauge block	Aluminum, anodized or stainless steel 316
• Pressure gauge	• Plastic, mechanics brass • Stainless steel, mechanics brass nickel-plated • Stainless steel, mechanics stainless steel 316
Torques	
• Lid 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)
• ½-14 NPT cable gland, metal	15 Nm (11.1 ft lb)

Technical specifications

• ½-14 NPT cable gland, metal in the NPT adapter **IMPORTANT:** To avoid damage to the device, the NPT adapter must be held in place while the NPT gland is screwed into the NPT adapter.	68 Nm (50 ft lb)
• Union nut made of plastic	2.5 Nm (1.8 ft lb)
• Union nut made of metal	4 Nm (3 ft lb)
• Pressure gauge block fixing screws	6 Nm (4.4 ft lb)
Pressure gauge	
• Degree of protection	
- Pressure gauge plastic, mechanics brass	IP31
- Pressure gauge metal, mechanics brass nickel-plated	IP44
- Pressure gauge stainless steel, mechanics 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 switch	Adaptive
• Deadband	
- Adjustable peak value	± 0.1 to 3%, plus hysteresis (half of the deadband, but at least 0.2%)
- Minimization of the peak value	Always active
Analog input (AI), terminals 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 effect	0.1%/10 K (0.1%/18 °F)
Explosion protection	You can find details on explosion protection in the operating instructions and the explosion protection certificates: https://support.industry.siemens.com/cs/ww/en/ps/25458/man https://support.industry.siemens.com/cs/ww/en/ps/25458/cert

Selection and ordering data

	Article No.
SIPART PS100 electropneumatic positioner without explosion protection ↗	**6DR71 - 0 - 0**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Enclosure material	
Polycarbonate, lid with inspection window	**0**
Aluminum, lid without inspection window	**1**
Actuator type	
For single-acting actuators	**1**
For double-acting actuators	**2**
Communication	
2-wire, 4 ... 20 mA	**N**
2-wire, 4 ... 20 mA, HART	**AN**
Device option 1	
Without device option 1	**N**
With digital input (DI) and digital output (DQ)	**A**
Device option 2	
Without device option 2	**0**
With analog output (AQ) 4 ... 20 mA	**1**
Thread of the lower cable entry/ cable gland	
M20 x 1.5/without cable gland	**0**
M20 x 1.5/with plastic cable gland	**1**
M20 x 1.5/with metal cable gland	**2**
½-14 NPT/without cable gland	**4**
Thread of the upper cable entry/ cable gland	
M20 x 1.5/with blanking plug	**0**
M20 x 1.5/with plastic cable gland	**1**
M20 x 1.5/with metal cable gland	**2**
½-14 NPT/without cable gland	**4**
Pneumatic thread	
G¼	**A**
¼-18 NPT	**B**
Pneumatic accessories	
Without gauge block	**A**
Gauge made of plastic, block made of aluminum	**C**
Gauge made of metal, block made of aluminum	**D**
Gauge made of stainless steel, block made of stainless steel	**E**

	Article No.
SIPART PS100 electropneumatic positioner with explosion protection ↗	**6DR71 - N - 0**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Enclosure material	
Polycarbonate, lid with inspection window	**0** **1**
Aluminum, lid without inspection window	**1**
Actuator type	
For single-acting actuators	**1**
For double-acting actuators	**2**
Degree of protection	
Ex i (ATEX, IECEx,...)[1]	**1**
Ex i; Ex e (ATEX, IECEx,...)[1]	**2**
Ex i; Ex e; Ex t (ATEX, IECEx,...)[1]	**3**
Communication	
2-wire, 4 ... 20 mA	**N**
2-wire, 4 ... 20 mA, HART	**A**
Device option 2	
Without device option 2	**0**
With analog output (AQ) 4 ... 20 mA	**1**
Thread of the lower cable entry/ cable gland	
M20 x 1.5/without cable gland	**0**
M20 x 1.5/with plastic cable gland	**1**
M20 x 1.5/with metal cable gland	**2**
½-14 NPT/without cable gland	**4**
Thread of the upper cable entry/ cable gland	
M20 x 1.5/with blanking plug	**0**
M20 x 1.5/with plastic cable gland	**1**
M20 x 1.5/with metal cable gland	**2**
½-14 NPT/without cable gland	**4**
Pneumatic thread	
G¼	**A**
¼-18 NPT	**B**
Pneumatic accessories	
Without gauge block	**A**
Gauge made of plastic, block made of aluminum	**C**
Gauge made of metal, block made of aluminum	**D**
Gauge made of stainless steel, block made of stainless steel	**E**

[1] You will find all currently available certificates on http://www.siemens.com/processinstrumentation/certificates.

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Selection and ordering data

Options	Order code
Append suffix "**-Z**" to Article No., add order code and plain text.	
TAG plate made of stainless steel, 3-line Input fields Text line 1: Plain text from Y15 Text line 2: Plain text from Y16 Text line 3: Plain text from Y17	**A20**
Version with stainless steel sound absorbers	**A40**
Measuring point description Input field: Max. 16 characters; specify in plain text	**Y15**
Measuring point text Input field: Max. 24 characters; specify in plain text	**Y16**
Measuring point number (TAG no.) Input field: Max. 32 characters; specify in plain text	**Y17**

Accessories	Article No.
Gauge block	
With gauges made of plastic IP31 (MPa, bar)	
• Block made of aluminum, single-acting, G¼	**6DR4004-1M**
• Block made of aluminum, double-acting, G¼	**6DR4004-2M**
With gauges made of plastic IP31 (MPa, psi)	
• Block made of aluminum, single-acting, ¼-18 NPT	**6DR4004-1MN**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2MN**
With gauges made of metal IP44 (MPa, bar, psi)	
• Block made of aluminum, single-acting, G¼	**6DR4004-1P**
• Block made of aluminum, double-acting, G¼	**6DR4004-2P**
• Block made of aluminum, single-acting, ¼-18 NPT	**6DR4004-1PN**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2PN**
With gauges made of stainless steel 316 IP54 (MPa, bar, psi)	
• Block made of stainless steel 316, single-acting, G¼	**6DR4004-1Q**
• Block made of stainless steel 316, double-acting, G¼	**6DR4004-2Q**
• Block made of stainless steel 316, single-acting, ¼-18 NPT	**6DR4004-1QN**
• Block made of stainless steel 316, double-acting, ¼-18 NPT	**6DR4004-2QN**
Venting gauge block Depressurizing of Y2 on compressed air failure with gauges made of metal IP44 (MPa, bar, psi). The DA actuator with springs moves into the safety position.	
• Block made of aluminum, double-acting, G¼	**6DR4004-2RE**
• Block made of aluminum, double-acting, ¼-18 NPT	**6DR4004-2RF**
Booster (Cv = 2) Aluminum with gauges made of metal IP44 (MPa, bar, psi)	
• Single-acting, G½	**6DR4004-1RJ**
• Double-acting, G½	**6DR4004-2RJ**
• Single-acting, ½-14 NPT	**6DR4004-1RK**
• Double-acting, ½-14 NPT	**6DR4004-2RK**
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**
Console for mounting on Namur part-turn actuators VDI/VDE 3845	
• 80 x 30 x 20 mm (3.15 x 1.18 x 0.79 inch)	**6DR4004-1D**
• 80 x 30 x 30 mm (3.15 x 1.18 x 1.18 inch)	**6DR4004-2D**
• 130 x 30 x 30 mm (5.12 x 1.18 x 1.18 inch)	**6DR4004-3D**
• 130 x 30 x 50 mm (5.12 x 1.18 x 1.97 inch)	**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 Rack, sizes R1, R1A, R2, 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**

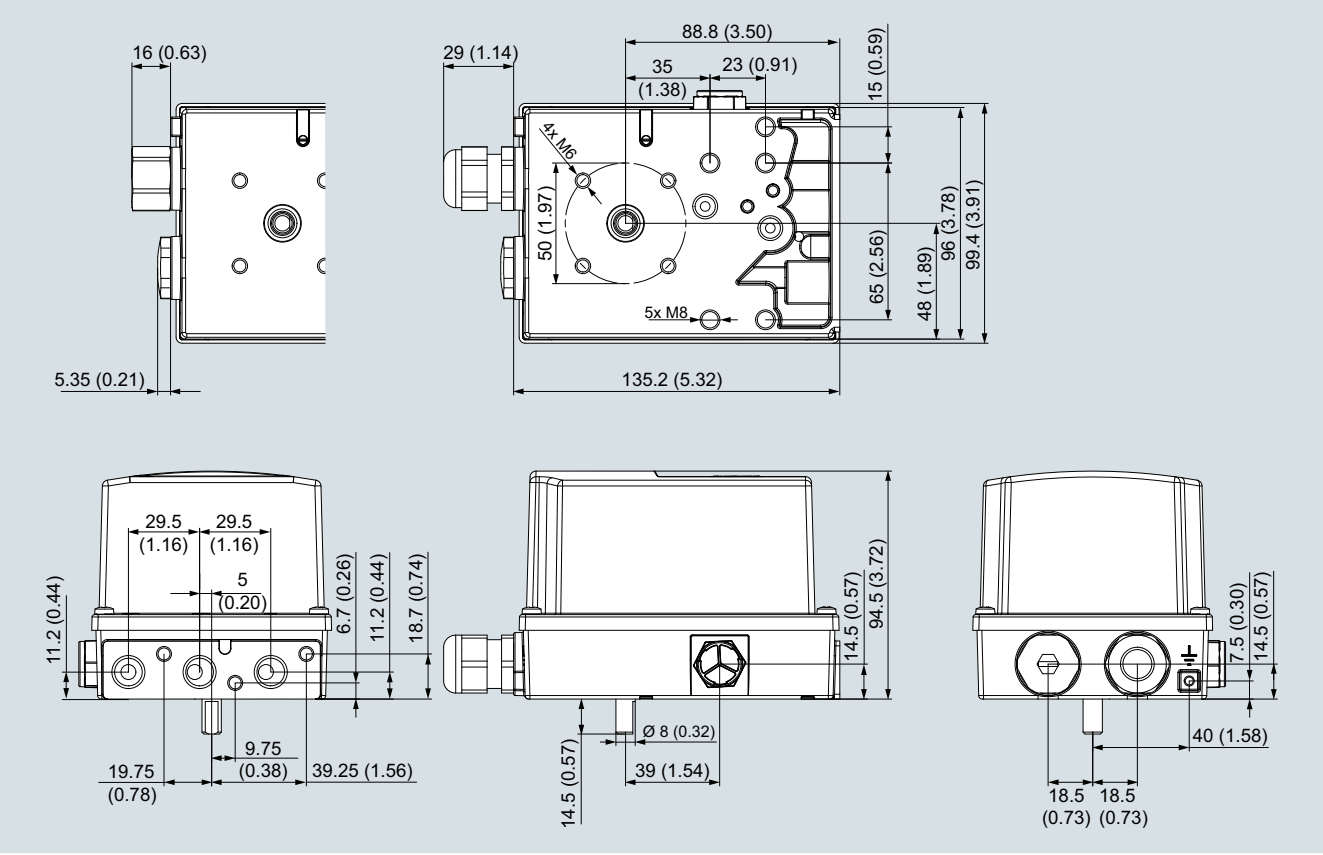
Accessories	Article No.
Mounting kit for NAMUR linear actuators	
NAMUR linear actuator mounting kit with short lever arm (2 ... 35 mm (0.08 ... 1.38 inch))	**6DR4004-8V**
Lever arm for strokes of 35 ... 130 mm (1.38 ... 5.12 inch) without NAMUR mounting bracket	**6DR4004-8L**
Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with short lever with up to 35 mm (1.38 inch) stroke	**6DR4004-8VK**
Reduced mounting kit (as for 6DR4004-8V but without fixing angle and U-bracket), with long lever > 35 mm (1.38 inch) stroke	**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 87/88	**TGX:16152-1210**
MASONEILAN type 37/38, all sizes	**TGX:16152-1215**
Fisher type 657/667, sizes 30 ... 80	**TGX:16152-900**
OPOS interface according to VDI/VDE 3847	
OPOS adapter with interface VDI/VDE 3847, blanketing, not for flameproof enclosures	**6DR4004-5PB**
SITRANS I100 isolating power supply HART (see "SITRANS I supply units and isolation amplifiers")	
With 24 V DC auxiliary power	**7NG4124-1AA00**
SITRANS I200 output isolator HART (see "SITRANS I 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)

More information

Documentation

The entire documentation is available for download free of charge in various languages at:
http://www.siemens.com/processinstrumentation/documentation