

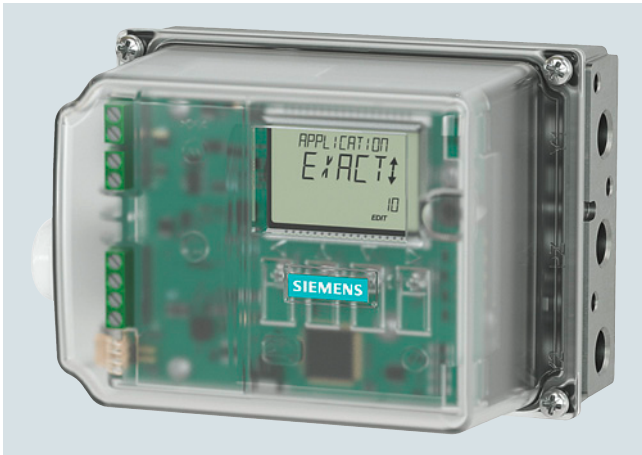
Positioners

SIPART PS100

Overview



SIPART PS100 electropneumatic positioner in aluminum enclosure



SIPART PS100 positioner with 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 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
- 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.

Design

The SIPART PS100 positioner comprises the following components:

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

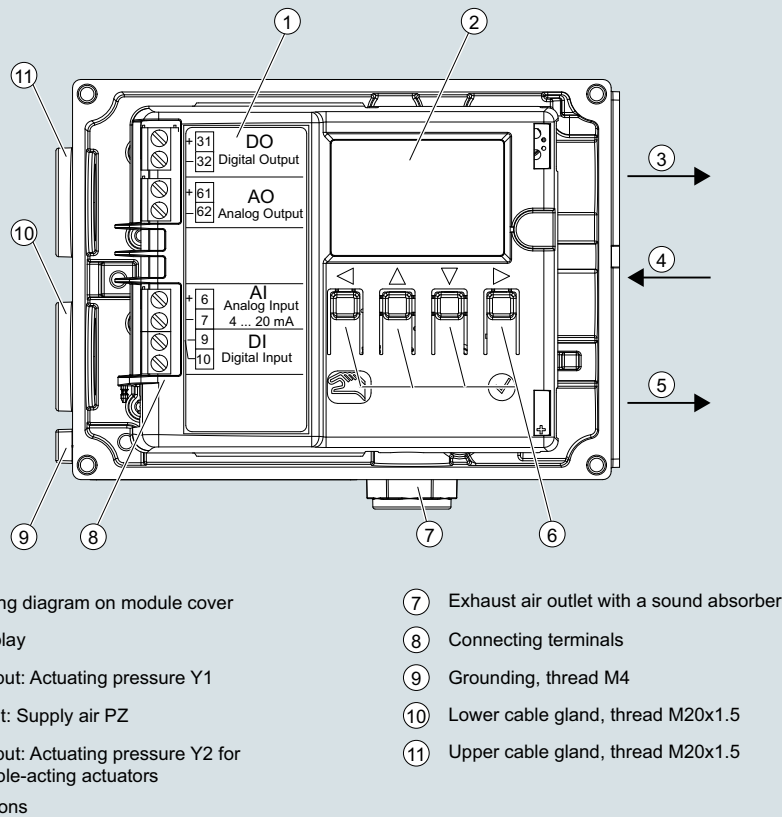
The pneumatic block is located in the enclosure, the pneumatic connections for the inlet air and the positioning pressure on the right-hand side of the enclosure. The electrical connections are located on the left-hand side of the enclosure.

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.



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. Thanks to the piezo technology, compressed air is only required to move the valve. In the controlled state, consumption of air is negligible.

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Technical specifications

Input		Pneumatic data	
Analog input AI, terminal 6 and 7		Pneumatic operating medium	Compressed air, carbon dioxide (CO ₂), nitrogen (N ₂), noble gases
• Nominal signal range	4 ... 20 mA	• Operating pressure	1.4 ... 7 bar (20.3 ... 101.5 psi)
• Minimum current to maintain operation	3.8 mA	Quality class of compressed air according to ISO 8573-1	
• Maximum load voltage	6.5 V (corresponds to 325 Ω at 20 mA)	• Solid impurities	Class 3
• Static destruction limit	± 40 mA	• Pressure dew point	Min. 20 K (36 °F) below ambient temperature
Digital input (DI), terminals 9 and 10		• Oil content	Class 3
• Galvanic isolation	Galvanically connected to analog input Galvanically isolated from the outputs	Flow rate	
• Signal status 0, floating contact open	> 300 kΩ	• Aerate process drive	
• Signal status 1, floating contact closed	< 3 kΩ	- Supply pressure 4 bar (58 psi)	7.1 Nm ³ /h (31.3 USgpm)
• Contact load	Can only be used for floating contact; max. contact load < 20 μA, 3 V	- Supply pressure 6 bar (87 psi)	9.8 Nm ³ /h (43.1 USgpm)
Output		• Depressurize process drive	
Analog output (AO), terminals 61 and 62		- Actuating pressure 4 bar (58 psi)	13.7 Nm ³ /h (60.3 USgpm)
• Type of connection	2-wire connection	- Actuating pressure 6 bar (87 psi)	19.2 Nm ³ /h (84.5 USgpm)
• Nominal signal range	4 ... 20 mA	Leakage actuator chamber (positioner portion)	< 6 · 10 ⁻⁴ Nm ³ /h (0.0026 USgpm)
• Dynamic range I _O	3.6 ... 20.5 mA	Consumption at operating medium in the controlled state	< 3.6 · 10 ⁻² Nm ³ /h (0.158 USgpm)
• Supply voltage U _H	12 ... 30 V	Sound pressure level	L _{A eq} < 75 dB L _{A max} < 80 dB
• External load R _B [kΩ]	≤ (U _H [V] - 12 V)/I _O [mA]	Construction	
• Resolution in relation to the nominal signal range	0.05%	Supported actuator types	
• Transmission error in relation to the nominal signal range	± 0.3%	• Linear actuator, range of stroke	10 ... 130 mm (0.39 ... 5.12")
• Effect of ambient temperature	± 0.1%/10K	• Part-turn actuator, angle-of-rotation range	10 ... 100°
• Maximum residual ripple	± 0.5%	Weight, positioner without accessories	
• Galvanic isolation	Galvanically isolated from the other electrical inputs and outputs	• With aluminum lid	1.055 kg (2.32 lb)
Digital output (DO), terminals 31 and 32		• With polycarbonate lid	0.905 kg (2.00 lb)
• Maximum supply voltage U _H	35 V	Werkstoff	
• External current consumption	To be limited to 50 mA	• Lid	• Aluminum • Polycarbonate
• Signal status High	Conductive, maximum terminal voltage 3 V	• Base plate	Aluminum
• Signal status Low	Blocked, I < 60 μA	Material	
The status is also Low if the device is faulty or analog input (AI) is = 0 mA.		• Enclosure	Aluminum EN AC-AISI(Fe)
Operating conditions		• Pressure gauge block	Aluminum, anodized or stainless steel 316
Ambient conditions for operation according to IEC 60068-2	For indoor and outdoor use	• Pressure gauge	• Plastic, plant brass • Stainless steel, plant brass nickel-plated • Stainless steel, plant stainless steel 316
Ambient temperature		Torques	
• Ambient temperature	-20 ... +80 °C (-4 ... +176 °F)	• Lid fixing screws	1.5 Nm (1.1 ft lb)
• Relative humidity	0 ... 100%	• Part-turn actuator fixing screws DIN 933 M6x12-A2	5 Nm (3.7 ft lb)
Pollution degree according to IEC 61010-1	2	• Linear actuator fixing screws DIN 933 M8x16-A2	12 Nm (8.9 ft lb)
Overvoltage category according to IEC 61010-1	II	• Gland pneumatic G ¹ / ₄	15 Nm (11.1 ft lb)
Enclosure degree of protection		• Gland pneumatic ¹ / ₄ -18 NPT	
• According to IEC 60529	IP66	- Without sealant	12 Nm (8.9 ft lb)
• 6DR711* according to UL 50 E	Type 4X	- With sealant	6 Nm (4.4 ft lb)
Vibration resistance		• M20 cable gland, plastic	4 Nm (3 ft lb)
• Harmonic oscillations (sine) according to IEC 60068-2-6	3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axis 98.1 m/s ² (321.84 ft/s ²), 27 ... 300 Hz, 3 cycles/axis	• M20 cable gland, metal	6 Nm (4.4 ft lb)
• Bump (half-sine) according to IEC 60068-2-27	150 m/s ² (492 ft/s ²), 6 ms, 1 000 shocks/axis	• Cable gland, ¹ / ₂ -14 NPT metal	15 Nm (11.1 ft lb)
• Noise (controlled digitally) according to IEC 60068-2-64	10 ... 200 Hz; 1 (m/s ²) ² /Hz (3.28 (ft/s ²) ² /Hz) 200 ... 500 Hz; 0.3 (m/s ²) ² /Hz (0.98 (ft/s ²) ² /Hz) 4 hours/axis	• 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)

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%, plus hysteresis (half of the deadband, but at least 0.2%)
- 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)

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Selection and ordering data

	Article No.	Options	Order code
SIPART PS100 electropneumatic positioner	6 DR 7 1 - - - - 0	Add "-Z" to Article No., specify order code and free text.	
Click on the Article no. for the online configuration in the PIA Life Cycle Portal.		TAG plate made of stainless steel, 3 lines	A20
Enclosure material	0 1	Text line 1: Free text from Y15 Text line 2: Free text from Y16 Text line 3: Free text from Y17	
Polycarbonate, lid with window		Version with stainless steel sound absorbers	A40
Aluminum, lid without window		Customer-specific device settings	Order code
Actuator type	1 2	Add "-Z" to Article No., specify order code and free text.	
Single-acting		Measuring point description	Y15
Double-acting		Input field: Free text, max. 16 characters	
Degree of protection	0	Measuring point text	Y16
None		Input field: Free text, max. 24 characters	
Communication	N	Measuring point number (TAG no.)	Y17
2-wire, 4 ... 20 mA		Input field: Free text, max. 32 characters	
Device option 1	N A	Accessories	Article No.
None		Pressure gauge block with	
Digital input (DI) and digital output (DO)		2 plastic IP31 pressure gauges, aluminum block, single-acting G $\frac{1}{4}$, scaled in MPa and bar	6DR4004-1M
Device option 2	0 1	3 plastic IP31 pressure gauges, aluminum block, double-acting G $\frac{1}{4}$, scaled in MPa and bar	6DR4004-2M
None		2 plastic IP31 pressure gauges, aluminum block, single-acting $\frac{1}{4}$ -18 NPT, scaled in MPa and psi	6DR4004-1MN
Analog output (AO) 4 ... 20 mA		3 plastic IP31 pressure gauges, aluminum block, double-acting $\frac{1}{4}$ -18 NPT, scaled in MPa and psi	6DR4004-2MN
Thread of the lower cable entry/cable gland	0 1 2 4	2 steel IP44 pressure gauges, aluminum block, single-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	6DR4004-1P
M20x1.5/None		3 steel IP44 pressure gauges, aluminum block, double-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	6DR4004-2P
M20x1.5/Plastic		2 steel IP44 pressure gauges, aluminum block, single-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	6DR4004-1PN
M20x1.5/Metal		3 steel IP44 pressure gauges, aluminum block, double-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	6DR4004-2PN
$\frac{1}{2}$ -14 NPT/None		2 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, single-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	6DR4004-1Q
Thread of the upper cable entry/cable gland	0 1 2 4	3 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, double-acting G $\frac{1}{4}$, scaled in MPa, bar, psi	6DR4004-2Q
M20x1.5/With blanking plug		2 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, single-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	6DR4004-1QN
M20x1.5/Plastic		3 stainless steel 316 IP54 pressure gauges, stainless steel 316 block, double-acting $\frac{1}{4}$ -18 NPT, scaled in MPa, bar, psi	6DR4004-2QN
M20x1.5/Metal		Booster	
$\frac{1}{2}$ -14 NPT/None		Single-acting, aluminum, G $\frac{1}{2}$, 6DR5..0/2/3	6DR4004-1RJ
Pneumatic thread	A B	Double-acting, aluminum, G $\frac{1}{2}$, 6DR5..0/2/3	6DR4004-2RJ
G $\frac{1}{4}$		Single-acting, aluminum, $\frac{1}{2}$ -14 NPT, 6DR5..0/2/3	6DR4004-1RK
$\frac{1}{4}$ -18 NPT		Double-acting, aluminum, $\frac{1}{2}$ -14 NPT, 6DR5..0/2/3	6DR4004-2RK
Pneumatic accessories	A C D E	Single-acting, aluminum, G $\frac{1}{2}$, 6DR5..5	6DR4004-1RP
Without pressure gauge block		Double-acting, aluminum, G $\frac{1}{2}$, 6DR5..5	6DR4004-2RP
Pressure gauge made of plastic, block made of aluminum		Single-acting, aluminum, $\frac{1}{2}$ -14 NPT, 6DR5..5	6DR4004-1RQ
Pressure gauge made of metal, block made of aluminum		Double-acting, aluminum, $\frac{1}{2}$ -14 NPT, 6DR5..5	6DR4004-2RQ
Pressure gauge made of stainless steel, block made of stainless steel			

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.

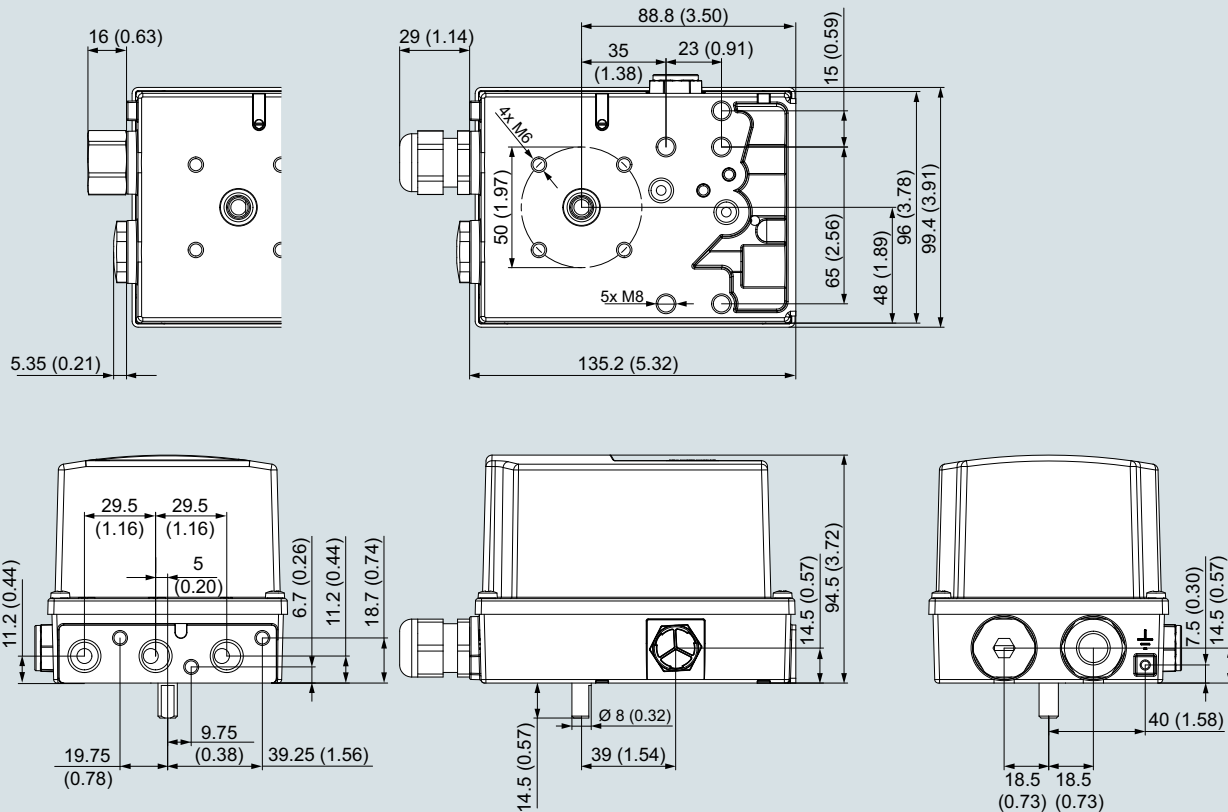
Scope of delivery for positioner

1 SIPART PS100 positioner as ordered

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Dimensional drawings



Non-flameproof enclosure, dimensions in mm (inch)

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