You can download all instructions, catalogs and certificates for positioners free of charge at the following Internet address: www.siemens.com/positioners

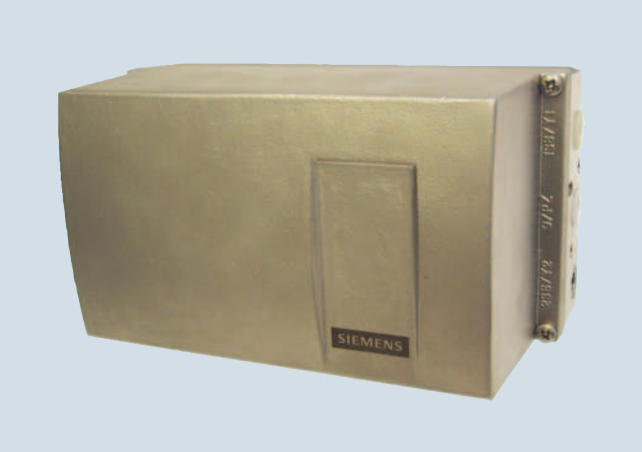
Overview

	Application	Description	Catalog page	Software for parameterization
Positioners				
	Position control of pneumatic linear or part-turn actuators, also for intrinsically safe operation	**SIPART PS2** Universal device for positioning pneumatic actuators • Connection: 4 to 20 mA • HART; PROFIBUS PA or FOUNDATION Fieldbus • Local manual operation • Binary inputs and outputs • Diagnostic function • Blocking function • Automatic startup	5/3	SIMATIC PDM
	As above, but in flameproof enclosure for explosion-proof application	**SIPART PS2** As above, but in flameproof aluminum enclosure	5/3	SIMATIC PDM

Overview

Electropneumatic positioner SIPART PS2 in the Makrolon enclosure

SIPART PS2 electropneumatic positioner in flameproof aluminum enclosure



SIPART PS2 in stainless steel enclosure

The SIPART PS2 electropneumatic positioner is used to control the final control element of pneumatic linear or part-turn actuators. The electropneumatic positioner moves the actuator to a valve position corresponding to the setpoint. Additional function inputs can be used to block the valve or to set a safety position. A binary input is present as standard in the basic device for this purpose.

Benefits

SIPART PS2 positioners offer decisive advantages:

- Simple installation and automatic commissioning (self-adjustment of zero and span)
- Simple operation with
  - Local operation (manual operation) and configuration of the device using three buttons and a user-friendly two-line display
  - Parameterization via SIMATIC PDM
- Very high-quality control thanks to an online adaptation procedure
- Negligible air consumption in stationary operation
- "Tight closing" function (ensures maximum positioning pressure on the valve seat)
- "Fail in place" function: Current position is retained on electrical power failure (does not apply in conjunction with SIL)
- Numerous functions can be activated by simple configuring (e. g. characteristic curves and limits)
- Extensive diagnostic functions for valve and actuator
- Only one device version for linear and part-turn actuators
- Few moving parts, hence insensitive to vibrations
- External non contacting sensor as option for extreme ambient conditions
- "Intelligent solenoid valve": Partial Stroke Test and solenoid valve function in one device
- Partial Stroke Test e. g. for safety valves
- Full Stroke Test, Multi Step Response Test, Valve Performance Test for performance and maintenance evaluation of the valve
- Can also be operated with purified natural gas, carbon dioxide, nitrogen or noble gases
- SIL (Safety Integrity Level) 2

Application

The SIPART PS2 positioner is used, for example, in the following industries:

- Chemical/petrochemical
- Power stations
- Paper and glass
- Water, waste water
- Food and pharmaceuticals
- Offshore plants

The SIPART PS2 positioner is available:

- For single-acting actuators: In Makrolon, stainless steel or aluminum enclosure, as well as flameproof aluminum enclosure
- For double-acting actuators: In Makrolon enclosure, stainless steel enclosure and flameproof aluminum enclosure
- For non-hazardous applications
- For hazardous applications in the versions
  - Intrinsic safety type of protection
  - Flameproof enclosure type of protection
  - Non-sparking type of protection
  - Dust protection by enclosure type of protection

and in the versions:

- With 0/4 ... 20 mA control with/without communication through HART signal
- With PROFIBUS PA communication interface
- With FOUNDATION Fieldbus (FF) communications interface

Explosion-proof versions

- Device with protection type "intrinsic safety" for use in Zone 1, 2, 21, 22 or Class I, II, III/Division 1/Groups A-G
- Device with protection type "dust protection with enclosure" for use in Zone 21, 22 or Class II, III/Division 1/Groups E-G
- Device with protection type "non-sparking" for use in Zone 2 or Class I, Division 2, Groups A-D
- Device with protection type "flameproof enclosure" for use in Zone 1 or Class I, Division 1, Groups A-D

Stainless steel enclosure for extreme ambient conditions

The SIPART PS2 is available in a stainless steel enclosure (with no window in the cover) for use in particularly aggressive environments (e.g. offshore operation, chlorine plants etc.). The device functions are the same as for the basic version.

Design

The SIPART PS2 positioner is a digital field device with a highly-integrated microcontroller.

The positioner consists of the following components:

- Enclosure and cover
- PCB with corresponding electronics with or without communication through HART 7
  or with electronics for communication in accordance with
  - PROFIBUS PA specification, IEC 61158-2; bus-supplied device, or
  - FOUNDATION Fieldbus (FF) specification, IEC 61158-2, bus-supplied device
- Position detection system
- Terminal housing with screw terminals
- Pneumatic valve manifold with piezoelectric valve precontrol.

The valve manifold is located in the housing, the pneumatic connections for the inlet air and the positioning pressure on the right-hand side. A pressure gauge block and/or a safety solenoid valve can be connected there as options. The SIPART PS2 positioner is fitted to the linear or part-turn actuator using an appropriate mounting kit. The circuit board container in the casing provides slots for separately ordered boards with the following functions:

Position feedback module

- Position feedback as a two-wire signal 4 to 20 mA

Alarm module (3 outputs, 1 input)

- Signaling of two limits of the travel or angle by binary signals. The two limits can be set independently as maximum or minimum values.
- Output of an alarm if the setpoint position of the final control element is not reached in automatic mode or if a device fault occurs.
- Second binary input for alarm signals of for triggering safety reactions, e. g. blocking function or safety position.

Limit signaling through slot-type initiators (SIA module)

Two limits can be signaled redundantly as NAMUR signals (EN 60947-5-6) by slot-type initiators. An alarm output is also integrated in the module (see "Alarm Module").

Limit value signal via mechanical contacts (mechanical limit switch module)

Two limits can be signaled redundantly by switching contacts. An alarm output is also integrated in the module (see "Alarm Module").

Valid for all modules described above:

All signals are electrically isolated from one another and from the basic unit. The outputs indicate self-signaling faults. The modules are easy to retrofit.

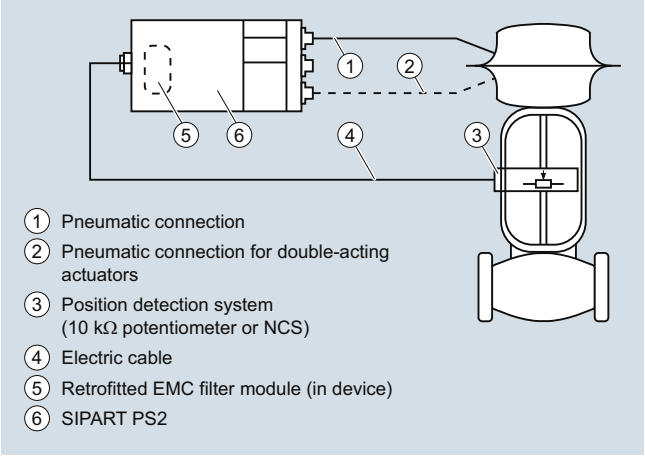
Separate mounting of position detection system and controller unit

The position detection system and controller unit can be connected separately for all casing versions of the SIPART PS2 (except flameproof design). Measurement of the travel or angle is carried out directly on the actuator. The controller unit can then be fitted a certain distance away, e. g. on a mounting pipe or similar, and is connected to the position detection system by an electric cable and to the actuator by one or two pneumatic lines. Such a split design is frequently advantageous if the ambient conditions at the fitting exceed the specified values for the positioner (e. g. strong vibrations).

The following can be used for measuring the travel or angle:

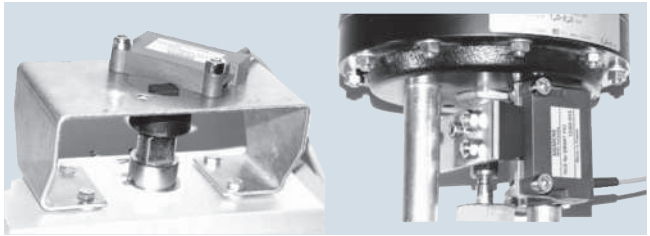
- NCS sensor
- External position detection system C73451-A430-D78
- A commercially available potentiometer (10 kΩ resistance), e. g. for higher application temperatures or customer-specific applications

The use of potentiometers is recommended for very small linear actuators with a short valve travel since, on the one hand, the space required by the potentiometer is very small and, on the other, the transmission characteristic is optimum for a small travel.



Separate mounting of position detection system and controller unit

Non contacting sensor (NCS)



NCS for part-turn actuator (6DR4004-.N.10) mounted with mounting console (left) and NCS for linear actuator ≤ 14 mm (0.55 inch) (6DR4004-.N.20) mounted with actuator-specific mounting solution (right)

NCS (6DR4004-.N.30) for travels > 14 mm (0.55 inch) mounted using mounting kit for NAMUR linear actuator

The NCS sensor consists of a non-contacting position sensor. All coupling elements are omitted such as coupling wheel and driver pin with part-turn actuators or lever and pick-up bracket with linear actuators for up to 14 mm travel.

This results in:

- Even greater resistance to vibration and shock
- No wear of sensor
- Problem-free mounting on very small actuators
- Negligible hysteresis with very small travels.

The sensor does not require an additional power supply, i. e. SIPART PS2 (not for Ex d version) can be operated in a 2-wire system. The NCS (Non Contacting Sensor) consists of a potted sensor housing which must be mounted permanently and a magnet which is mounted on the spindle of linear actuators or on the shaft butt of part-turn actuators. For the version for travels >14 mm (0.55 inch), the magnet and the NCS are premounted on a stainless steel frame and offer the same interface mechanically as the positioner itself, i. e. they can be mounted using the standard mounting kits 6DR4004-8V, -8VK and -8VL.

The installation of a EMC filter module in the positioner (controller unit) is necessary in order to ensure a connection level with EMC according to EC Declaration of Conformity when using external sensors (see "Selection and Ordering Data", "EMC Filter Module").

Function

The SIPART PS2 positioner works in a completely different way to normal positioners.

Mode of operation

Comparison of the setpoint and the actual value takes place electronically in a microcontroller. If the microcontroller detects a deviation, it uses a 5-way switch procedure to control the piezoelectric valves, which regulates the flow of air into and from the chambers of the pneumatic actuator or blows it in the opposite direction.

The microcontroller then outputs an electric control command to the piezoelectric valve in accordance with the size and direction of the deviation (deviation between setpoint and actual values). The piezoelectric valve converts the command into a pneumatic positional increment.

The positioner outputs a continuous signal in the area where there is a large system deviation (fast step zone); in areas of moderate system deviation (slow step zone) it outputs a sequence of pulses. No positioning signals are output in the case of a small system deviation (adaptive or variable deadband).

The linear or rotary motion of the actuator is detected by the mounting kit and transferred to a high-quality potentiometer over a shaft and a non-floating gear transmission.

The angular error of the pick-up in cases where the assembly is mounted on a linear actuator is corrected automatically.

When connected in a 2-wire system, the SIPART PS2 draws its power exclusively from the 4 to 20 mA setpoint signal.
The electric power is also connected through the 2-wire bus signal with PROFIBUS operation (SIPART PS2 PA).
The same applies for the FOUNDATION Fieldbus version.

Pneumatic valve manifold with piezoelectric valve precontrol

The piezoelectric valve can release very short control pulses. This helps achieve a high positioning accuracy. The pilot element is a piezoelectric bending converter which switches the pneumatic main controller unit. The valve manifold is characterized by an extremely long service life.

Local operation

Local operation is performed using the built-in display and the three buttons. Switching between the operating levels Automatic, Manual, Configuring and Diagnosis is possible at the press of a button.

In manual mode the drive can be adjusted over the entire range without interrupting the circuit.

Operation and monitoring with the SIMATIC PDM configuration software

The configuration software SIMATIC PDM permits simple operation, monitoring, configuration and parameterization of the device. The diagnostic information available can be read via SIMATIC PDM from the device. Communication is carried out via the HART protocol or PROFIBUS PA. For the HART protocol, the device can be accessed both via a HART modem and via a HART-compatible input/output module (remote IO). The corresponding device description files, such as GSD and (Enhanced) EDD are available for both types of communication.

In addition, the SITRANS DTM provides software based on tried and tested EDD technology that can be used to parameterize field devices via a DTM (Device Type Manager) using an FDT frame application (e. g. PACTware). SITRANS DTM and the necessary device-specific enhanced EDD are available for download free of charge. The software provides the relevant communication interfaces for HART and PROFIBUS.

Automatic commissioning

With a simple configuration menu the SIPART PS2 can be quickly adapted to the fitting and adjusted by means of an automatic startup function.

During initialization, the microcontroller determines the zero point, full-scale value, the direction of action and the positioning speed of the fitting. From this data it establishes the minimum pulse time and the deadband, thus optimizing the control.

Low air consumption

A hallmark of the SIPART PS2 is its own extremely low consumption of air. Normal air losses on conventional positioners are very costly. Thanks to the use of modern piezoelectric technology, the SIPART PS2 consumes air only when it is needed, which means that it pays for itself within a very short time.

5

Comprehensive monitoring functions

The SIPART PS2 has various monitoring functions with which changes on the actuator and valve can be detected and signaled if applicable when a selectable limit has been exceeded. This information may be important for diagnosis of the actuator or valve. The measuring data to be determined and monitored, some of whose limits can be adjusted, include:

- Travel integral
- Number of changes in direction
- Alarm counter
- Self-adjusting deadband
- Valve end limit position (e. g. for detection of valve seat wear or deposits)
- Operating hours (also according to temperature and travel ranges) as well as min./max. temperature
- Operating cycles of piezoelectric valves
- Valve positioning time
- Actuator leakages

At a glance with the Diagnostics Cockpit

With the Diagnostics Cockpit, the HART variants of the SIPART PS2 provide a straightforward way of getting started with the world of diagnostic capabilities. All relevant information (setpoint, actual value, control deviation, status of the diagnostic system, etc.) of the valve is available at a glance. Additional facts and details are just a few mouse clicks away from the Diagnostics Cockpit.

Status monitoring with 3-stage alarm concept

The intelligent electropneumatic SIPART PS2 positioner is equipped with additional monitoring functions. The status indications derived from these monitoring functions signal active faults of the unit. The severity of these faults are graded using "traffic light signaling", symbolized by a wrench in the colors green, yellow and red (in SIMATIC PDM and Maintenance Station):

- Need for maintenance (green wrench)
- Urgent need for maintenance (yellow wrench)
- Imminent danger of unit failure or general failure (red wrench)

This allows users to put early measures into action before a serious valve or actuator fault occurs which could result in a system shutdown. The fact that a fault indication is signaled, such as the onset of a diaphragm break in the actuator or the progressive sluggishness of a unit, enables the user to ensure system reliability at any time by means of suitable maintenance strategies.

This three-stage alarm hierarchy also allows early detection and signaling of other faults, such as the static friction of a packing box, the wearing of a valve plug/seating, or precipitations or incrustations on the fittings.

These fault indications can be output either line-conducted over the alarm outputs (see above) of the positioner (max. 3), or via communication over the HART or field bus interfaces. In this case, the HART, PROFIBUS and FF versions of SIPART PS2 permit a differentiation of the various fault indications, as well as a trend representation and histogram function of all key process variables with regard to the fittings.

The device display also displays the graded maintenance requirements, complete with identification of the source of the fault.

Maintenance required for valve

The Full Stroke Test, Step Response Test, Multi Step Response Test and Valve Performance Test provide detailed information about the maintenance required of the valve. With the help of HART communication, you receive comprehensive test results and can identify the extent of the maintenance measures. In order to quantify the performance capability of valves, characteristic values such as step response times (T63, T86, user-selectable Txx), dead times, overshoot, hysteresis, errors of measurement, non-linearity, etc., are determined.

Functional safety acc. to SIL2

The positioner is suitable for use on valves that satisfy the special requirements in terms of functional safety up to SIL 2 in accordance with IEC 61508 or IEC 61511. The variants 6DR5.1.-0....-....-Z C20 are available for this.

These are single-acting positioners for mounting on pneumatic actuators with spring return.

The positioner vents the valve actuator on demand/in the event of a fault and puts the valve in the preset safety position.

This positioner meets the following requirement:

- Functional safety up to SIL 2 in accordance with IEC 61508 or IEC 61511 for safe venting.

SIPART PS 2 as "intelligent solenoid valve“

Open/Close valves, safety fittings in particular, are generally pneumatically controlled over a solenoid valve. If you use SIPART PS2 instead of this type of solenoid valve, the positioner performs two tasks in a single device (without extra wiring)

- Firstly, it switches the fitting off on demand by venting the actuator (functional safety acc. to SIL 2 (see above)
- Secondly, it can perform a Partial Stroke Test at regular intervals (1 - 365 days), which prevents the blocking of the fitting, e. g. due to corrosion or furring.

As in this case SIPART PS2 is constantly working in normal operation (e. g. 99 % position), it also acts as a permanent test function for the pneumatic output circuit, which is not usually possible when using a solenoid valve.

Solenoid valves on control valves can also not normally be tested during operation. They are therefore not necessary when using SIPART PS 2 with a 4-wire connection system as the venting is carried out on demand by SIPART PS2. This means that on control valves, both the control function and the shut-off function can be carried out by a single device.

Configuring

In configuring mode, the SIPART PS2 positioner can be configured to requirements and include the following settings:

- Input current range 0 to 20 mA or 4 to 20 mA
- Rising or falling characteristic curve at the setpoint input
- Positioning speed limit (setpoint ramp)
- Splitrange operation; adjustable start-of-scale and full-scale values
- Response threshold (deadband); self-adjusting or fixed
- Direction of action; rising or falling output pressure with rising setpoint
- Limits (start-of-scale and full-scale values) of positioning range
- Limits (alarms) of the final control element position; minimum and maximum values
- Automatic "tight closing" (with adjustable response threshold)
- The travel can be corrected in accordance with the valve characteristic curve.
- Function of binary inputs
- Function of alarm output etc.

Configuration of the various SIPART PS2 versions is largely identical.

Technical specifications

SIPART PS2 (all versions)

Rated conditions	
Ambient conditions	For indoor and outdoor use
Ambient temperature	In hazardous areas, observe the maximum permitted ambient temperature according to the temperature class. See "Technical Specifications" on page 5/9.
• Permitted ambient temperature for operation[1)]	-30 ... +80 °C (-22 ... +176 °F)
• Altitude	2 000 m above sea level. At altitudes greater than 2 000 m above sea level, use a suitable power supply.
• Relative humidity	0 ... 100 %
Degree of protection[2)]	IP66 according to IEC/EN 60529/NEMA 4X
Mounting position	Any; pneumatic connections and exhaust opening not facing up in wet environment
Vibration resistance	
• Harmonic oscillations (sine-wave) according to EN 60068-2-6/10.2008	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 EN 60068-2-27/02.2010	150 m/s² (492 ft/s²), 6 ms, 1000 shocks/axis
• Noise (digitally controlled) according to EN 60068-2-64/04.2009	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
• Recommended continuous duty range of the complete fitting	≤ 30 m/s² (98.4 ft/s²) without resonance sharpness
Climatic class	According to EN 60721-3-4
• Storage	1K5, but -40 ... +80 °C (1K5, but -40 ... +176 °F)
• Transport	2K4, but -40 ... +80 °C (2K4, but -40 ... +176 °F)
• Operation[1)3)4)]	4K3, but -30 ... +80 °C (4K3, but -22 ... +176 °F)[3)]
Pneumatic data	
Auxiliary power (air supply)	Compressed air, carbon dioxide (CO_2), nitrogen (N), noble gases or cleaned natural gas
• Pressure[5)]	1.4 ... 7 bar (20.3 ... 101.5 psi)
Air quality to ISO 8573-1	
• Solid particulate size and density	Class 2
• Pressure dew point	Class 2 (min. 20 K (36 °F) below ambient temperature)
• Oil content	Class 2
Unrestricted flow (DIN 1945)	
• Inlet air valve (ventilate actuator)[6)]	
- 2 bar (29 psi)	4.1 Nm³/h (18.1 USgpm)
- 4 bar (58 psi)	7.1 Nm³/h (31.3 USgpm)
- 6 bar (87 psi)	9.8 Nm³/h (43.1 USgpm)
• Outlet air valve (deaerate actuator for all versions except fail in place)[6)]	
- 2 bar (29 psi)	8.2 Nm³/h (36.1 USgpm)
- 4 bar (58 psi)	13.7 Nm³/h (60.3 USgpm)
- 6 bar (87 psi)	19.2 Nm³/h (84.5 USgpm)
• Outlet air valve (deaerate actuator for fail in place version)	
- 2 bar (29 psi)	4.3 Nm³/h (19.0 USgpm)
- 4 bar (58 psi)	7.3 Nm³/h (32.2 USgpm)
- 6 bar (87 psi)	9.8 Nm³/h (43.3 USgpm)
Valve leakage	< $6 \cdot 10^{-4}$ Nm³/h (0.0026 USgpm)
Restrictor ratio	Adjustable up to ∞ : 1
Auxiliary power consumption in the controlled state	< $3{,}6 \cdot 10^{-2}$ Nm³/h (0.158 USgpm)
Sound pressure	L_{Aeq} < 75 dB L_{Amax} < 80 dB
Design	
Mode of operation	
• Range of stroke (linear actuators)	3 ... 130 mm (0.12 ... 5.12 inch) (angle of positioner shaft 16 ... 90°) Larger range of stroke on request.
• Angle of rotation range (part-turn actuators)	30 ... 100°
Mounting type	
• On linear actuators	Using mounting kit 6DR4004-8V and where necessary with an additional lever arm 6DR4004-8L on actuators according to IEC 60534-6-1 (NAMUR) with ribs, bars or flat face.
• On part-turn actuators	Using mounting kit 6DR4004-8D on actuators with mounting plane according to VDI/VDE 3845 and IEC 60534-6-2.
Weight, positioner without option modules or accessories	
• 6DR5..0 Glass-fiber reinforced enclosure made from polycarbonate	Approx. 0.9 kg (1.98 lb)
• 6DR5..1 Aluminum enclosure, narrow	Approx. 1.3 kg (2.86 lb)
• 6DR5..2 Stainless steel enclosure	Approx. 3.9 kg (8.6 lb)
• 6DR5..3 Aluminum enclosure	Approx. 1.6 kg (3.53 lb)
• 6DR5..5 Flameproof aluminum enclosure	Approx. 5.2 kg (11.46 lb)
Material	
• Enclosure	
- 6DR5..0 Makrolon	Glass-fiber reinforced polycarbonate (PC)
- 6DR5..1 Aluminum, narrow	GD AlSi12
- 6DR5..2 Stainless steel	Austenitic stainless steel 316Cb, mat. No. 1.4581
- 6DR5..3 Aluminum	GD AlSi12
- 6DR5..5 Aluminum, flameproof	GK AlSi12
• Pressure gauge block	Aluminum AlMgSi, anodized
Dimensions	See "Dimensional Drawings" on page 5/22
Device versions	
• In Makrolon enclosure 6DR5..0	Single-acting and double-acting
• In aluminum enclosure 6DR5..1	Single-acting
• Im aluminum enclosure 6DR5..3 and 6DR5..5	Single-acting and double-acting
• In stainless steel enclosure 6DR5..2	Single-acting and double-acting

Gauge	
• Degree of protection	
- Gauge made of plastic	IP31
- Gauge made of steel	IP44
- Gauge made of stainless steel 316	IP54
• Vibration resistance	According to EN 837-1
Connections, electrical	
• Screw terminals	2.5 mm^2 AWG30-14
• Cable gland	
- Without explosion protection as well as with Ex i	M20x1.5 or ½-14 NPT
- With explosion protection Ex d	Ex d certified M20x1.5; ½-14 NPT or M25x1.5
Connections, pneumatic	Female thread G¼ or ¼-18 NPT
Controller	
Controller unit	
• Five-point switch	Self-adjusting
• Deadband	
- dEbA = Auto	Self-adjusting
- dEbA = 0.1 … 10 %	Can be set as fixed value
Analog-to-digital converter	
• Scan time	10 ms
• Resolution	≤ 0,05 %
• Transmission error	≤ 0,2 %
• Temperature influence effect	≤ 0.1 %/10 K (≤ 0.1 %/18 °F)
Certificates and approvals	
Classification according to pressure equipment directive (PED 97/23/EC)	For gases of fluid group 1, complies with requirements of article 3, paragraph 3 (sound engineering practice SEP)
CE conformity	You can find the appropriate directives and standards, including the relevant versions, in the EC Declaration of Conformity on the Internet.
Explosion protection	
Explosion protection according to ATEX/IECEx	
• Flameproof enclosure "d"	II 2 G Ex d IIC T6/T4 Gb
• Intrinsic safety "i"	II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc II 2 D Ex ia IIIC T110°C Db
• Non-sparking "nA"	II 3 G Ex nA IIC T6/T4 Gc
• Dust, protection with "t" enclosure[7]	II 2 D Ex tb IIIC T100°C Db
Explosion protection according to FM/CSA, suitable for installations according to NEC 500/NEC 505	
• Flameproof enclosure "XP"	XP, Class I, Division 1, Gr. ABCD XP, Class I, Zone 1, AEx d, IIC, T6/T4
• Intrinsic safety "IS"	IS / I, II, III / 1 / A-G IS / 1 / AEx / Ex ib / IIC, Gb IS / 21 / AEx / Ex ib / IIIC, Db, T110°C
• Non-sparking "NI"	NI / I / 2 / A-D NI / 2 / AEx / Ex nA, Ex ic / IIC, Gc
• Dust, protection with "DIP" enclosure[7]	DIP / II, III / 1 / E-G DIP / 21 / AEx / Ex tb / IIIC, Db, T100°C

Permissible ambient temperature	
For operation with and without HART[1)3)]	
• 6DR501./6DR502./6DR521./ 6DR522.	T4: -30 ... +80 °C (-22 ... +176 °F) T6: -30 ... +50 °C (-22 ... +122 °F)
• 6DR5.15/6DR5.25	T4: -30 ... +80 °C (-22 ... +176 °F) T6: -30 ... +50 °C (-22 ... +122 °F)
For operation with PROFIBUS PA or with FOUNDATION Fieldbus[1)3)]	
• 6DR551./6DR552./6DR561./ 6DR562.	T4: -20 ... +75 °C (-4 ... +167 °F) T6: -20 ... +50 °C (-4 ... +122 °F)
• 6DR5515/6DR5525/6DR5615/ 6DR5625	T4: -30 ... +80 °C (-22 ... +176 °F) T6: -30 ... +50 °C (-22 ... +122 °F)
Natural gas as driving medium	For technical specifications using natural gas as driving medium, see operating instructions.

1) The following applies to fail in place:
Without explosion protection: -20 ... +60 °C (-4 ... +140 °F)
With explosion protection:
T4: -20 ... +60 °C (-4 ... +140 °F)
T6: -20 ... +50 °C (-4 ... +122 °F)

2) Max. impact energy 1 Joule for enclosure with inspection window 6DR5..0 and 6DR5..1 or max. 2 Joule for 6DR5..3.

3) At ≤ -10 °C (≤ 14 °F) the display refresh rate of the indicator is limited. When using position feedback module, only T4 is permitted.

4) -20 ... +80 °C (-4 ... + 176 °F) for 6DR55..-0G..., 6DR56..-0G..., 6DR55..-0D... and 6DR56..-0D...

5) The following applies to fail in place: 3 ... 7 bar (43.5 ... 101.5 psi).

6) With Ex d version (6DR5..5-…) values are reduced by approx. 20 %.

7) For aluminum enclosure, narrow, single-acting, without inspection window 6DR5..1-.D...-..A.-Z...
For stainless steel enclosure, 6DR5..2-.D...-..A.-Z...
For aluminum enclosure, with inspection window 6DR5..3-.K...-..A.-Z...

Technical specifications

SIPART PS2 with and without HART

	Basic device without Ex protection	Basic device with Ex d explosion protection	Basic device with "ia"explosion protection	Basic device with explosion protection "ic", "nA", "t"
Electrical specifications				
Current input I_W				
• Rated signal range		0/4 ... 20 mA		
• Test voltage		840 V DC, 1 s		
• Binary input BE1 (terminals 9/10; electrically connected to the basic device)		Suitable only for floating contact; max. contact load < 5 µA at 3 V		
2-wire connection (terminals 6/8) 6DR50.. and 6DR53.. without HART 6DR51.. and 6DR52.. with HART				
Current to maintain the auxiliary power supply		≥ 3.6 mA		
Required load voltage U_B (corresponds to Ω at 20mA)				
• Without HART (6DR50..)				
- Typical	6.36 V (= 318 Ω)	6.36 V (= 318 Ω)	7.8 V (= 390 Ω)	7.8 V (= 390 Ω)
- max.	6.48 V (= 324 Ω)	6.48 V (= 324 Ω)	8.3 V (= 415 Ω)	8.3 V (= 415 Ω)
• Without HART (6DR53..)				
- Typical	7.9 V (= 395 Ω)	-	-	-
- max.	8.4 V (= 420 Ω)	-	-	-
• With HART (6DR51..)				
- Typical	6.6 V (= 330 Ω)	6.6 V (= 330 Ω)	-	-
- max.	6.72 V (= 336 Ω)	6.72 V (= 336 Ω)	-	-
• With HART (6DR52..)				
- Typical	-	8.4 V (= 420 Ω)	8.4 V (= 420 Ω)	8.4 V (= 420 Ω)
- max.	-	8.8 V (= 440 Ω)	8.8 V (= 440 Ω)	8.8 V (= 440 Ω)
• Static destruction limit	±40 mA	±40 mA	-	-
Effective internal capacitance C_i				
• Without HART	-	-	11 nF	"ic": 11 nF
• With HART	-	-	11 nF	"ic": 11 nF
Effective internal inductance L_i				
• Without HART	-	-	207 µH	"ic": 207 µH
• With HART	-	-	310 µH	"ic": 310 µH
For connecting to circuits with the following peak values	-	-	U_i = 30 V I_i = 100 mA P_i = 1 W	"ic": U_i = 30 V I_i = 100 mA "nA"/"t": U_n ≤ 30 V I_n ≤ 100 mA
3-/4-wire connection (terminals 2/4 and 6/8) 6DR52.. with HART, explosion-protected 6DR53.. without HART, not explosion-protected)				
Load voltage at 20 mA	≤ 0.2 V (= 10 Ω)	≤ 0.2 V (= 10 Ω)	≤ 1 V (= 50 Ω)	≤ 1 V (= 50 Ω)
Power supply U_H	18 ... 35 V DC	18 ... 35 V DC	18 ... 30 V DC	18 ... 30 V DC
Current consumption I_H		$(U_H$ -7.5 V)/2.4 kΩ [mA]		
Effective internal capacitance C_i	-	-	22 nF	"ic": 22 nF
Effective internal inductance L_i	-	-	0.12 mH	"ic": 0,12 mH
For connecting to circuits with the following peak values	-	-	U_i = 30 V DC I_i = 100 mA P_i = 1 W	"ic": U_i = 30 V I_i = 100 mA "nA/"t": U_n ≤ 30 V I_n ≤ 100 mA
Electrical isolation	between U_H and I_W	between U_H and I_W	between U_H and I_W (2 intrinsically safe circuits)	between U_H and I_W
HART communication				
HART version		7		
PC parameterization software		SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.		

SIPART PS2 with PROFIBUS PA/with FOUNDATION Fieldbus

	Basic device without Ex protection	Basic device with Ex d explosion protection	Basic device with "ia"explosion protection	Basic device with explosion protection "ic", "nA", "t"
Electrical specifications				
Power supply, bus circuit (terminals 6/7)		Bus-supplied		
Bus voltage	9 ... 32 V	9 ... 32 V	9 ... 24 V	9 ... 32 V
For connecting to circuits with the following peak values				
• Bus connection with FISCO supply unit			U_i = 17.5 V I_i = 380 mA P_i = 5.32 W	"ic": U_i = 17.5 V I_i = 570 mA "nA"/"t": $U_n \leq$ 32 V
• Bus connection with barrier			U_i = 24 V I_i = 250 mA P_i = 1.2 W	"ic": U_i = 32 V "nA"/"t": $U_n \leq$ 32 V
Effective internal capacitance	-	-	C_i = negligible	C_i = negligible
Effective internal inductance	-	-	L_i = 8 µH	"ic": L_i = 8 µH
Current consumption		11.5 mA ± 10 %		
Additional error signal		0 mA		
Safety shutdown can be activated with coding bridge (terminals 81/82)		electrically isolated from bus circuit and binary input		
• Input resistance		> 20 kΩ		
• Signal state "0" (shutdown active)		0 ... 4.5 V or unconnected		
• Signal state "1" (shutdown not active)		13 ... 30 V		
For connecting to power supply with the following peak values			U_i = 30 V I_i = 100 mA P_i = 1 W	"nA": $U_n \leq$ 30 V $I_n \leq$ 100 mA "ic": U_i = 30 V I_i = 100 mA
• Effective Internal capacitance	-	-	C_i = negligibly small	C_i = negligibly small
Binary input BE1 for PROFIBUS (terminals 9/10); electrically connected to the bus circuit)		Bridged or connection to switching contact. Suitable only for floating contact; max. contact load < 5 µA at 3 V		
Electrical isolation				
• For basic device without Ex protection and for basic device with Ex d		Electrical isolation between basic device and the input for safety shutdown, as well as the outputs of the option modules		
• For basic device Ex "ia"		The basic device and the input to the safety shutdown, as well as the outputs of the option modules, are separate, intrinsically safe circuits.		
• For basic device Ex "ic", "nA", "t"		Electrical isolation between basic device and the input for safety shutdown, as well as the outputs of the option modules		
Test voltage		840 V DC, 1 s		
PROFIBUS PA communication				
Communication		Layers 1 and +2 according to PROFIBUS PA, transmission technology according to IEC 61158-2; slave function; layer 7 (protocol layer) according to PROFIBUS DP, EN 50170 standard with the extended PROFIBUS functions (all data acyclic, manipulated variable, feedbacks and status also cyclic)		
C2 connections		Four connections to master class 2 are supported; automatic connection setup 60 s after break in communication		
Device profile		PROFIBUS PA profile B, version 3.0, more than 150 objects		
Response time to master message		Typically 10 ms		
Device address		126 (when delivered)		
PC parameterization software		SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.		

Technical specifications

	Basic device without Ex protection	Basic device with Ex d explosion protection	Basic device with "ia"explosion protection	Basic device with explosion protection "ic", "nA", "t"
FOUNDATION Fieldbus communication				
Communications group and class	According to technical specification of the Fieldbus Foundation for H1 communication			
Function blocks	Group 3, Class 31PS (Publisher Subscriber) 1 Resource Block (RB2) 1 Analog Output Function Block (AO) 1 PID Function Block (PID) 1 Transducer Block (Standard Advanced Positioner Valve)			
Execution times of the blocks	AO: 60 ms PID: 80 ms			
Physical layer profile	123, 511			
FF registration	Tested with ITK 5.0			
Device address	22 (when delivered)			

Option modules

	Without Ex protection/ with Ex protection Ex d	With explosion protection "ia"	With explosion protection "ic", "nA", "t"
Alarm module	**6DR4004-8A**	**6DR4004-6A**	**6DR4004-6A**
3 binary output circuits		• Alarm output A1: Terminals 41 and 42 • Alarm output A2: Terminals 51 and 52 • Alarm output: Terminals 31 and 32	
• Power supply U_H	≤ 35 V	-	-
• Signal state			
- High (not activated)	Conductive, R = 1 kΩ, +3/-1 % *)	≥ 2.1 mA	≥ 2.1 mA
- Low *) (activated)	Blocked, I_R < 60 µA	≤ 1.2 mA	≤ 1.2 mA
*) Low is also the status when the basic device is faulty or is without additional electrical power supply.	*) When used in the flameproof enclosure the current consumption must be limited to 10 mA per output.	Switching threshold with supply to EN 60947-5-6: U_H = 8.2 V, R_i = 1 kΩ	Switching threshold with supply to EN 60947-5-6: U_H = 8.2 V, R_i = 1 kΩ
• For connecting to circuits with the following peak values	-	U_i = 15 V I_i = 25 mA P_i = 64 mW	"ic": U_i = 15 V I_i = 25 mA "nA"/"t": U_n ≤ 15 V
Effective internal capacitance	-	C_i = 5.2 nF	C_i = 5.2 nF
Effective internal inductance	-	L_i = negligibly small	L_i = negligibly small
1 binary output circuit	Binary input BE2: Terminals 11 and 12, terminals 21 and 22 (bridge)		
• Electrically connected to the basic device			
- Signal state 0		Floating contact, open	
- Signal state 1		Floating contact, closed	
- Contact load		3 V, 5 µA	
• Electrically isolated from the basic device			
- Signal state 0		≤ 4.5 V or open	
- Signal state 1		≥ 13 V	
- Natural resistance		≥ 25 kΩ	
• Static destruction limit	± 35 V	-	-
• For connecting to circuits with the following peak values	-	U_i = 25.2 V	"ic": U_i = 25.2 V "nA"/"t": U_n ≤ 25.5 V
Effective internal capacitance	-	C_i = negligibly small	C_i = negligibly small
Effective internal inductance	-	L_i = negligibly small	L_i = negligibly small
Electrical isolation	The 3 outputs, the input BE2 and the basic device are electrically isolated from each other		
Test voltage	840 V DC, 1 s		
Position feedback module	**6DR4004-8J**	**6DR4004-6J**	**6DR4004-6J**
DC output for position feedback			
1 current output: Terminals 61 and 62		2-wire connection	
Rated signal range		4 ... 20 mA, short-circuit proof	
Total operating range		3.6 … 20.5 mA	
Power supply U_H	+12 … +35 V	+12 … +30 V	+12 … +30 V
External loads R_B [kΩ]		≤ (U_H [V] – 12 V)/I [mA]	
Transmission error		≤ 0,3 %	
Temperature influence effect		≤ 0.1 %/10 K (≤ 0.1 %/18 °F)	
Resolution		≤ 0,1 %	
Residual ripple		≤ 1 %	
• For connecting to circuits with the following peak values	-	U_i = 30 V I_i = 100 mA P_i = 1 W	"ic": U_i = 30 V, I_i = 100 mA "nA"/"t": U_n ≤ 30 V, I_n ≤ 100 mA P_n ≤ 1 W
Effective internal capacitance	-	C_i = 11 nF	C_i = 11 nF
Effective internal inductance	-	L_i = negligibly small	L_i = negligibly small
Electrical isolation	Electrically isolated from the alarm option and safely isolated from the basic device		
Test voltage	840 V DC, 1 s		

Technical specifications

	Without Ex protection	With explosion protection "ia"	With explosion protection "ic", "nA", "t"
SIA module	**6DR4004-8G**	**6DR4004-6G**	**6DR4004-6G**
Limit transmitter with slot-type initiators and alarm output			
2 slot-type initiators	• Binary output (limit transmitter) A1: Terminals 41 and 42 • Binary output (limit transmitter) A2: Terminals 51 and 52		
• Connection	2-wire system to EN 60947-5-6 (NAMUR), for switching amplifier to be connected on load side		
• Signal state High (not activated)	> 2.1 mA		
• Signal state Low (activated)	< 1.2 mA		
• 2 slot-type initiators	Type SJ2-SN		
• Function	NC (normally closed)		
• Connecting to circuits with the following peak values	Rated voltage 8 V current consumption: ≥ 3 mA (limit value not responded), ≤ 1 mA (limit value responded)	U_i = 15 V I_i = 25 mA P_i = 64 mW	"ic": U_i = 15 V I_i = 25 mA "nA": U_n ≤ 15 V P_n ≤ 64 mW
Effective internal capacitance	-	C_i = 41 nF	C_i = 41 nF
Effective internal inductance	-	L_i = 100 µH	L_i = 100 µH
1 alarm output	Binary output: Terminals 31 and 32		
• Connection	On switching amplifier according to EN 60947-5-6: (NAMUR), U_H = 8.2 V, R_i = 1 kΩ).		
• Signal state High (not activated)	R = 1.1 kΩ	> 2.1 mA	> 2.1 mA
• Signal state Low (activated)	R = 10 kΩ	< 1.2 mA	< 1.2 mA
• Power supply U_H	U_H ≤ 35 V DC I ≤ 20 mA	-	-
• Connecting to circuits with the following peak values	-	U_i = 15 V I_i = 25 mA P_i = 64 mW	"ic": U_i = 15 V I_i = 25 mA "nA": U_n ≤ 15 V P_n ≤ 64 mW
Effective internal capacitance	-	C_i = 5.2 nF	C_i = 5.2 nF
Effective internal inductance	-	L_i = negligibly small	L_i = negligibly small
Electrical isolation	The 3 outputs are electrically isolated from the basic device.		
Test voltage	840 V DC, 1 s		

	Without Ex protection	With explosion protection "ia"	With explosion protection "ic", "nA", "t"
Mechanical limit switch module	6DR4004-8K	6DR4004-6K	6DR4004-6K
Limit transmitter with mechanical switching contacts			
2 limit value contacts		• Binary output A1: Terminals 41 and 42 • Binary output A2: Terminals 51 and 52	
• Max. switching current AC/DC	4 A	-	-
• Connecting to circuits with the following peak values	-	U_i = 30 V I_i = 100 mA P_i = 750 mW	"ic": U_i = 30 V I_i = 100 mA "nA": $U_n \leq$ 15 V
Effective internal capacitance	-	C_i = negligibly small	C_i = negligibly small
Effective internal inductance	-	L_i = negligibly small	L_i = negligibly small
• Max. switching voltage AC/DC	250 V/24 V	30 V DC	30 V DC
1 alarm output		Binary output: Terminals 31 and 32	
• Connection		On switching amplifier according to EN 60947-5-6: (NAMUR), U_H = 8.2 V, R_i = 1 kΩ).	-
• Signal state High (not activated)	R = 1.1 kΩ	> 2.1 mA	> 2.1 mA
• Signal state Low (activated)	R = 10 kΩ	< 1.2 mA	< 1.2 mA
• Auxiliary power	$U_H \leq$ 35 V DC I ≤ 20 mA	-	-
• Connecting to circuits with the following peak values	-	U_i = 15 V I_i = 25 mA P_i = 64 mW	"ic": U_i = 15 V I_i = 25 mA
Effective internal capacitance	-	C_i = 5.2 nF	C_i = 5.2 nF
Effective internal inductance	-	L_i = negligibly small	L_i = negligibly small
Electrical isolation		The 3 outputs are electrically isolated from the basic device	
Test voltage		3 150 V DC, 2 s	
Rated conditions altitude	Max. 2 000 m NN At altitudes over 2 000 m NN, use a suitable power supply	-	-
EMC filter module	EMC filter module type C73451-A430-D23 is required for NCS sensor or an external potentiometer. External position sensor (potentiometer or NCS; as option) with the following peak values		
Resistance of external potentiometer		10 kΩ	
Peak values when suppled via the PROFIBUS basic device	-	U_o = 5 V I_o = 75 mA statisch I_o = 160 mA kurzfristig P_o = 120 mW	U_o = 5 V I_o = 75 mA - P_o = 120 mW
Peak values when suppled via other basic devices	-	U_o = 5 V I_o = 100 mA P_o = 33 mW C_o = 1 µF L_o = 1 mH	U_o = 5 V I_o = 75 mA P_o = 120 mW C_o = 1 µF L_o = 1 mH
Electrical isolation		Electrically connected to the basic device	

Technical specifications

	Without Ex protection	With explosion protection "ia"	With explosion protection "ic", "nA", "t"
NCS sensor			
Position range			
• Linear actuator 6DR4004-.N.20		3 ... 14 mm (0.12 ... 0.55")	
• Linear actuator 6DR4004-.N.30		10 ... 130 mm (0.39 ... 5.12"); up to 200 mm (7.87") on request	
• Part-turn actuator		30° ... 100°	
Linearity (after correction by positioner)			
• Linear actuator		± 1 %	
• Part-turn actuator		± 1 %	
Hysteresis		± 0,2 %	
Continuous working temperature	-40 °C ... +90 °C (-40 °F ... +194 °F)	-	-
Climatic class		Nach DIN EN 60721-3-4	
• Storage		1K5, but -40 ... +90 °C (1K5, but -40 ... +176 °F)	
• Transport		2K4, but -40 ... +90 °C (2K4, but -40 ... +176 °F)	
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 according to IEC 60068-2-29		300 m/s² (984 ft/s²), 6 ms, 4 000 shocks/axis	
Degree of protection of enclosure		IP68 according ot IEC EN 60529; NEMA 4X / Encl. Type 4X	
• Connecting to circuits with the following peak values	-	U_i = 5 V I_i = 160 mA P_i = 120 mW	"ic"/"nA": U_i = 5 V
Effective internal capacitance	-	C_i = 180 nF	C_i = 180 nF
Effective internal inductance	-	L_i = 922 µH	L_i = 922 µH
Explosion protection according to ATEX/IECEx	-	Intrinsic safety "ia": II 2 G Ex ia IIC T6/T4 Gb	Intrinsic safety "ic": II 3 G Ex ic IIC T6/T4 Gc Non-sparking "nA": II 3 G Ex nA IIC T6/T4 Gc
Explosion protection according to FM	-	Intrinsic safety "ia": IS, Class I, Divison 1, ABCD IS, Class I, Zone 1, AEx ib, IIC	Non-sparking, "nA": NI, Class I, Divison 2, ABCD NI, Class I, Zone 2, AEx nA, IIC
Permissible ambient temperature			
• ATEX/IECEx	-	T4: -40 ... +90 °C (-40 ... +194 °F) T6: -40 ... +70 °C (-40 ... +158 °F)	
• FM	-	T4: -40 ... +85 °C (-40 ... +185 °F) T6: -40 ... +70 °C (-40 ... +158 °F)	

Selection and ordering data

Article No. 6 D R 5 - 0 . . . - 0 A . . .

Order code

SIPART PS2 electropneumatic positioner in enclosure made of Makrolon, aluminum and stainless steel

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Version

2-wire (4 to 20 mA)
- Without HART — 0
- With HART, not explosion-protected — 1

2-, 3-, 4-wire (0/4 to 20 mA)
- With HART, explosion-protected — 2
- Without HART, not explosion-protected — 3

PROFIBUS PA connection — 5
FOUNDATION Fieldbus connection — 6

For actuator

Single-acting — 1
Double-acting — 2

Enclosure

Makrolon — 0
Aluminum, narrow; only single-acting — 1 1
Stainless steel, without inspection window — 2
Aluminum — 3

Explosion protection

Without — N
With protection type — E
- Intrinsic safety

With protection type[1] — D
- Non-sparking
- Dust protection via enclosure

With protection type[2] — F
- Intrinsic safety
- Non-sparking

With protection type[2] — G
- Non-sparking

With protection type[1] — K
- Intrinsic safety
- Non-sparking
- Dust protection via enclosure

Connection thread electrical/pneumatic

M20x1.5/G¼ — G
½-14 NPT / ¼-18 NPT — N
M20x1.5/¼-18 NPT — M
½-14 NPT / G¼ — P
Plug M12 / G¼[3] — R
Plug M12 / ¼-18 NPT[3] — S

► Available ex stock

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

1) Enclosure: aluminum narrow 6DR5..1 or stainless steel 6DR5..2, each without inspection window in the cover. Aluminum 6DR5..3 with inspection window in the cover and max. impact energy 2 Joule.

2) Enclosure: aluminum or Makrolon, each with inspection window in the cover. Max. impact energy 1 Joule for enclosure with inspection window 6DR5..0 and 6DR5..1 or max. 2 Joule for 6DR5..3.

3) Connector M12 mounted and electrically connected in versions 6DR55.. and 6DR56..
Connector M12 mounted in versions 6DR50.., 6DR51.., 6DR52.. and 6DR53..
Not for protection type "dust protection by enclosure" 6DR5...-0D... and 6DR5...-0K...

Selection and ordering data

Article No. 6 D R 5 - 0 . . . - 0 A . . .

Order code

SIPART PS2 electropneumatic positioner in enclosure made of Makrolon, aluminum and stainless steel

Limit monitor
Installed, incl. 2nd cable gland

Without — 0
Alarm module; electronic (6DR4004-.A) — 1
SIA module; slot-type initiators (6DR4004-.G) — 2
Mechanical limit switch module (mechanical switching contacts (6DR4004-.K)) — 3

Option modules
Installed, incl. 2nd cable gland

Without — 0
Position feedback module for position feedback signal (4 ... 20 mA) (6DR4004-.J) — 1
EMC filter module for external position sensor in the SIPART PS2 enclosure (C73451-A430-D23), NCS sensor 6DR4004-.N..0 and external position sensing with non-Siemens potentiometer — 2
Position feedback module and EMC filter module for external position sensor — 3

Customer-specific design

Without — 0

Brief instructions

German/English — A
French/Spanish/Italian — B

Mounted pressure gauge block

Without — 0

Gauge made of plastic

Block made of aluminum, single-acting G¼, scaled in MPa and bar — 1
Block made of aluminum, double-acting G¼, scaled in MPa and bar — 2
Block made of aluminum, single-acting ¼-18 NPT, scaled in MPa and psi — 3
Block made of aluminum, double-acting ¼-18 NPT, scaled in MPa and psi — 4

Gauge made of steel

block made of aluminum, single-acting G¼, scaled in MPa, bar, psi — 9 R 1 A
Block made of aluminum, double-acting G¼, scaled in MPa, bar, psi — 9 R 2 A
Block made of aluminum, single-acting ¼-18 NPT, scaled in MPa, bar, psi — 9 R 1 B
Block made of aluminum, double-acting ¼-18 NPT, scaled in MPa, bar, psi — 9 R 2 B

Gauge made of stainless steel 316

Block made of stainless steel 316, single-acting G¼, scaled in MPa, bar, psi — 9 R 1 C
Block made of stainless steel 316, double-acting G¼, scaled in MPa, bar, psi — 9 R 2 C
Block made of stainless steel 316, single-acting ¼-18 NPT, scaled in MPa, bar, psi — 9 R 1 D
Block made of stainless steel 316, double-acting ¼-18 NPT, scaled in MPa, bar, psi — 9 R 2 D

Selection and Ordering data SIPART PS2

Selection and ordering data	Article No.	Order code
SIPART PS2 electropneumatic positioner in enclosure made of Makrolon, aluminum and stainless steel	**6 D R 5 ■■■ - 0 ■■■■ - 0 ■ A ■ ■■■**	
Further designs Add "-Z" to Article No. and specify Order Code.	Order code	
TAG plate made of stainless steel, 3-line Text line 1: Plain text from Y17 Text line 2: Plain text from Y15 Text line 3: Plain text from Y16	**A20**	
Version with stainless steel sound absorbers Standard with stainless steel enclosure	**A40**	
Functional safety (SIL 2) only for 6DR5.1. (single-acting positioners) Device suitable for use according to IEC 61508 and IEC 61511	**C20**	
Fail in Place Holding function in case of auxiliary electrical power failure	**F01**	
Pneumatic terminal block made of stainless steel 316 For device versions in Makrolon enclosure	**K18**	
OPOS adapter with interface VDI/VDE 3847 blanketing, not for flameproof aluminum enclosure	**K20**	
Marine approval		
Germanischer Lloyd certificate	**S10**	
LR Lloyds Register certificate	**S11**	
BV Bureau Veritas certificate	**S12**	
ABS American Bureau of Shipping certificate	**S13**	
DNV-GL Det Norske Veritas	**S14**	
Measuring point description Max. 16 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA, specify in plain text: **Y15: .....**	**Y15**	
Measuring point text Max. 24 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA, specify in plain text: **Y16: .....**	**Y16**	
Measuring point number (TAG No.) Max. 32 characters, specify in plain text: **Y17: .....**	**Y17**	
Preset bus address Specify in plain text: **Y25: .....** (only for 6DR55.. and 6DR56..)	**Y25**	
Customer-specific parameter setting Specify in plain text: Y30:	**Y30**	

► Available ex stock

Selection and ordering data

	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof aluminum enclosure, without cable gland ↗	6 D R 5	
	5 - 0 E	- 0 A
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Version		
2-wire (4 to 20 mA)		
• Without HART	0	
• With HART	1	
2-, 3-, 4-wire (0/4 to 20 mA)		
• With HART ►⬟	2	
• Without HART	3	
PROFIBUS PA connection	5	
FOUNDATION Fieldbus connection	6	
For actuator		
Single-acting ►⬟	1	
Double-acting ►⬟	2	
Connection thread electrical/pneumatic		
M20 x 1.5 / G¼ ►⬟	G	
½-14 NPT / ¼-18 NPT ►⬟	N	
M20 x 1.5 / ¼-18 NPT	M	
½-14 NPT / G¼	P	
M25x1.5 / G¼	Q	
Limit monitor Built-in		
Without ►⬟	0	
Alarm module; electronic (6DR4004-8A)	1	
Option modules Built-in		
Without ►⬟	0	
Position feedback module for position feedback signal (4 ... 20 mA) (6DR4004-8J)	1	
EMC filter module for external position sensor	2	
Position feedback module and EMC filter module for external position sensor	3	
Brief instructions		
German/English ►⬟		A
French/Spanish/Italian		B

► Available ex stock

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

Selection and ordering data

	Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof aluminum enclosure, without cable gland	6 D R 5 5 - 0 E - 0 A	
Mounted pressure gauge block		
Without ►⬟	0	
Gauge made of plastic, block made of aluminum, single-acting G¼, scaled in MPa and bar	1	
Gauge made of plastic, block made of aluminum, double-acting G¼, scaled in MPa and bar	2	
Gauge made of plastic, block made of aluminum, single-acting ¼-18 NPT, scaled in MPa and psi	3	
Gauge made of plastic, block made of aluminum, double-acting ¼-18 NPT, scaled in MPa and psi	4	
Gauge made of steel		
Block made of aluminum, single-acting G¼, scaled in MPa, bar, psi	9	R 1 A
Block made of aluminum, double-acting G¼, scaled in MPa, bar, psi	9	R 2 A
Block made of aluminum, single-acting ¼-18 NPT, scaled in MPa, bar, psi	9	R 1 B
Block made of aluminum, double-acting ¼-18 NPT, scaled in MPa, bar, psi	9	R 2 B
Gauge made of stainless steel 316		
Block made of stainless steel 316, single-acting G¼, scaled in MPa, bar, psi	9	R 1 C
Block made of stainless steel 316, double-acting G¼, scaled in MPa, bar, psi	9	R 2 C
Block made of stainless steel 316, single-acting ¼-18 NPT, scaled in MPa, bar, psi	9	R 1 D
Block made of stainless steel 316, double-acting ¼-18 NPT, scaled in MPa, bar, psi	9	R 2 D
Further designs Add "-Z" to Article No. and specify Order Code.		Order code
TAG plate made of stainless steel, 3-line Text line 1: Plain text from Y17 Text line 2: Plain text from Y15 Text line 3: Plain text from Y16		**A20**
Functional safety (SIL 2) only for 6DR5.1. (single-action positioners) Device suitable for use according to IEC 61508 and IEC 61511		**C20**
Fail in Place Holding function in case of auxiliary electrical power failure		**F01**
Measuring point description Max. 16 characters for HART, max. 32 characters for PROFIBUS PA and FOUNDATION Fieldbus, specify in plain text: **Y15: .....**		**Y15**
Measuring point text Max. 24 characters for HART, max. 32 characters for PROFIBUS PA and FOUNDATION Fieldbus, specify in plain text: **Y16: .....**		**Y16**
Measuring point number (TAG No.) Max. 32 characters, specify in plain text: **Y17: .....**		**Y17**
Preset bus address Specify in plain text: **Y25: .....** only for 6DR55.. and 6DR56..)		**Y25**

► Available ex stock

5

5

Selection and ordering data		Article No.
Accessories		
Position feedback module for position feedback signal (4 ... 20 mA)		
• Without explosion protection	►	**6DR4004-8J**
• With explosion protection ATEX/IECEx	►	**6DR4004-6J**
• With explosion protection FM/CSA		**6DR4004-7J**
Alarm module for 3 alarm outputs and 1 binary input (functionality: 2 limit monitors, 1 fault alarm, 1 binary input)		
• Without explosion protection	►	**6DR4004-8A**
• With explosion protection ATEX/IECEx	►	**6DR4004-6A**
• With explosion protection FM/CSA		**6DR4004-7A**
SIA module (slot-type initiator alarm module, not for Ex d version)		
• Without explosion protection	►	**6DR4004-8G**
• With ATEX/IECEx and FM/CSA explosion protection	►	**6DR4004-6G**
Mechanical limit switch module (with mechanical ground contacts, not for Ex d version)		
• Without explosion protection	►	**6DR4004-8K**
• With explosion protection	►	**6DR4004-6K**
EMC filter module with and without explosion protection for connection of external position sensor (10 kΩ) or NCS sensor	►	**C73451-A430-D23**

► Available ex stock

Selection and ordering data	Article No.
Accessories	
NCS sensor for non-contacting detection of position (not for Ex d version)	↗ 6DR4004-■N■■0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Explosion protection	
Not explosion-proof	8
With protection type (ATEX/IECEx/FM) • Intrinsic safety • Non-sparking	6
Cable length	
6 m (19.68 ft)	N
20 m (65.67 ft)	P
40 m (131.23 ft)	R
Actuator type	
For part-turn actuators, glass fiber-reinforced polyester magnet holders[1]	1
For linear actuators up to 14 mm (0.55 inch)[2]	2
For linear actuators > 14 ... 130 mm (0.55 ... 5.12 inch)[3]	3
For part-turn actuators, anodized aluminum magnet holders	4

1) Fitted with mounting console, available for order separately as accessory.
2) Mounted with individual mounting solution. Only a NAMUR mounting bracket can be used as mounting base (order separately as accessory).
3) Mounted with NAMUR interface. Article No. either 6DR4004-8V or 6DR4004-8V + 6DR4004-8L depending on stroke range.
Or mounted without NAMUR interface, individual mounting solution. Article No. 6DR4004-8VK or 6DR4004-8VL can be used as individual mounting solution depending on the stroke range.

Selection and ordering data		Article No.
External position detection system (with explosion protection to ATEX/IECEx) for separate mounting of position sensor and controller unit (not for Ex d version), comprising SIPART PS2 Makrolon enclosure with integral potentiometer and sliding clutch (without electronics and valve block) The EMC filter module is additionally required for the controller unit. (separate ordering item, see above).	►	**C73451-A430-D78**
Gauge block with		
2 gauges made of plastic, block made of aluminum, single-acting G¼, scaled in MPa and bar	►	**6DR4004-1M**
3 gauges made of plastic, block made of aluminum, double-acting G¼, scaled in MPa and bar	►	**6DR4004-2M**
2 gauges made of plastic, block made of aluminum, single-acting ¼-18 NPT, scaled in MPa and psi	►	**6DR4004-1MN**
3 gauges made of plastic, block made of aluminum, double-acting ¼-18 NPT, scaled in MPa and psi	►	**6DR4004-2MN**
2 gauges made of steel Block made of aluminum, single-acting G¼, scaled in MPa, bar, psi	►	**6DR4004-1P**
3 gauges made of steel Block made of aluminum, double-acting G¼, scaled in Mpa, bar, psi	►	**6DR4004-2P**
2 gauges made of steel Block made of aluminum, single-acting ¼-18 NPT, scaled in MPa, bar, psi	►	**6DR4004-1PN**
3 gauges made of steel Block made of aluminum, double-acting ¼-18 NPT, scaled in MPa, bar, psi	►	**6DR4004-2PN**
2 gauges made of stainless steel 316 Block made of stainless steel 316, single-acting G¼, scaled in MPa, bar, psi	►	**6DR4004-1Q**
3 gauges made of stainless steel 316 Block made of stainless steel 316, double-acting G¼, scaled in MPa, bar, psi	►	**6DR4004-2Q**
2 gauges made of stainless steel 316 Block made of stainless steel 316, single-acting ¼-18 NPT, scaled in MPa, bar, psi	►	**6DR4004-1QN**
3 gauges made of stainless steel 316 Block made of stainless steel 316, double-acting ¼-18 NPT, scaled in MP, bar, psi	►	**6DR4004-2QN**
Pneumatic terminal block made of stainless steel 316 to replace the pneumatic terminal block made of aluminum for SIPART PS2 with Makrolon enclosure		
Single-acting with G¼	►	**6DR4004-1R**
Double-acting with G¼	►	**6DR4004-2R**
Single-acting with ¼-18 NPT	►	**6DR4004-1RN**
Double-acting with ¼-18 NPT	►	**6DR4004-2RN**
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**
The following mounting consoles can be used with the NAMUR part-turn actuator mounting kit 6DR4004-8D. Size W x L x H (H = height of shaft butt)		
• 30 x 80 x 20 mm	►	**TGX:16152-105**
• 30 x 80 x 30 mm	►	**TGX:16300-147**
• 30 x 130 x 30 mm	►	**TGX:16300-149**
• 30 x 130 x 50 mm	►	**TGX:16300-151**

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 (2 ... 35 mm (0.08 ... 1.38 inch)	▶	**6DR4004-8V**
• Long lever for travels from 35 ... 130 mm (1.38 ... 5.12 inch) without NAMUR mounting bracket	▶	**6DR4004-8L**
• Reduced mounting kit (like 6DR4004-8V but without fixing angle and U-bracket), with short lever with up to 35 mm travel (1.38 inch)	▶	**6DR4004-8VK**
• Reduced mounting kit (like 6DR4004-8V but without fixing angle and U-bracket), with long lever with > 35 mm travel (1.38 inch)	▶	**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		
• Retrofitting kit for Moore series 72 and 750 valve positioners	▶	**TGX:16152-117**
• Masoneilan type 87/88	▶	**TGX:16152-620**
• Fisher type 657/667, size 30 to 80	▶	**TGX:16152-110**
• Samson actuator type 3277 (yoke dimension (H5) = 101 mm^2 (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 aluminum enclosure	▶	**6DR4004-5PA**
• OPOS/NAMUR mounting kit with short lever (complete), base plate, rail, mounting parts	▶	**6DR4004-5PL**
Connection block, for safety solenoid valve with extended mounting flange to NAMUR		
• For mounting to IEC 534-6	▶	**6DR4004-1B**
• For SAMSON actuator (integrated mounting) see above	▶	**6DR4004-1C**[1)]

Documentation (see notes below)		
Operating Instructions		
• SIPART PS2 HART German		**A5E00074630**
• SIPART PS2 HART English		**A5E00074631**
• SIPART PS2 PROFIBUS PA German		**A5E00127924**
• SIPART PS2 PROFIBUS PA English		**A5E00127926**
• SIPART PS2 FOUNDATION Fieldbus German		**A5E00214568**
• SIPART PS2 FOUNDATION Fieldbus English		**A5E00214569**
SIPART PS2 Compact Instruction Manual		
• English, French, German, Spanish, Italian, Dutch		**A5E03436620**
• Estonian, Latvian, Lithuanian, Polish, Romanian		**A5E03436655**
• Bulgarian, Czech, Finnish, Slovakian, Slovenian		**A5E03436664**
• Danish, Greek, Portuguese, Swedish, Hungarian		**A5E03436683**
Operating Instructions for NCS Sensor		
• English, German, French, Italian, Spanish, Portuguese (Brazil)		**A5E00097485**
SIPART PS2 device documentation		
• DVD with complete documentation for all device versions		**A5E00214567**
SITRANS I100 output isolator HART (see "SITRANS I supply units and isolation amplifiers") with		
• 24 V DC auxiliary power	▶	**7NG4124-0AA00**
SITRANS I200 output isolator HART (see "SITRANS I supply units and isolation amplifiers") with		
• 24 V DC auxiliary power	▶	**7NG4131-0AA00**
HART modem for connecting to PC or laptop		
• with USB interface	▶	**7MF4997-1DB**

▶ Available ex stock

[1)] Only together with 6DR4004-8S and 6DR4004-1M.

Note:

All the above-mentioned manuals are included on DVD and can be downloaded from www.siemens.de/sipartps2.

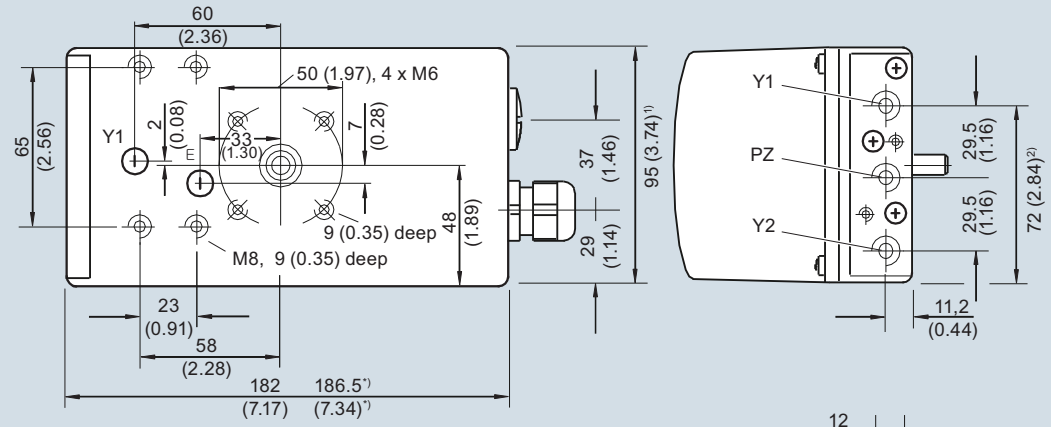
Scope of delivery for positioner

- 1 SIPART PS2 positioner as ordered
- 1 DVD with the complete documentation for all versions and accessories
- Short manual "SIPART PS2 - Configuration At a Glance"

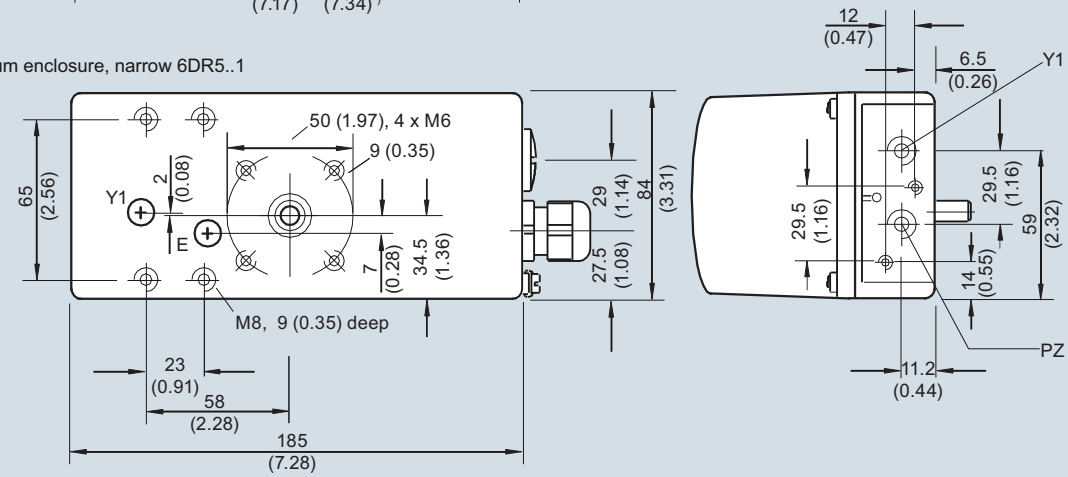
Selection and ordering data	Article No.
NCS-Sensor spare parts	
Magnet holder made of fiberglass-reinforced polyester including magnet for non-contacting position detection for part-turn actuators	**A5E00078030**
Magnet holder made of anodized aluminum including magnet for non-contacting position detection for part-turn actuators	**A5E00524070**

Dimensional drawings

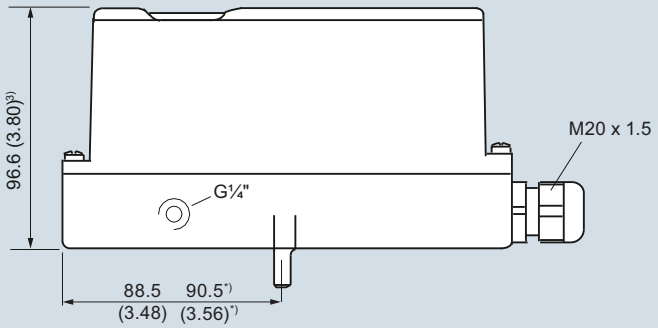
Makrolon enclosure 6DR5..0
Stainless steel enclosure 6DR5..2



Aluminum enclosure, narrow 6DR5..1

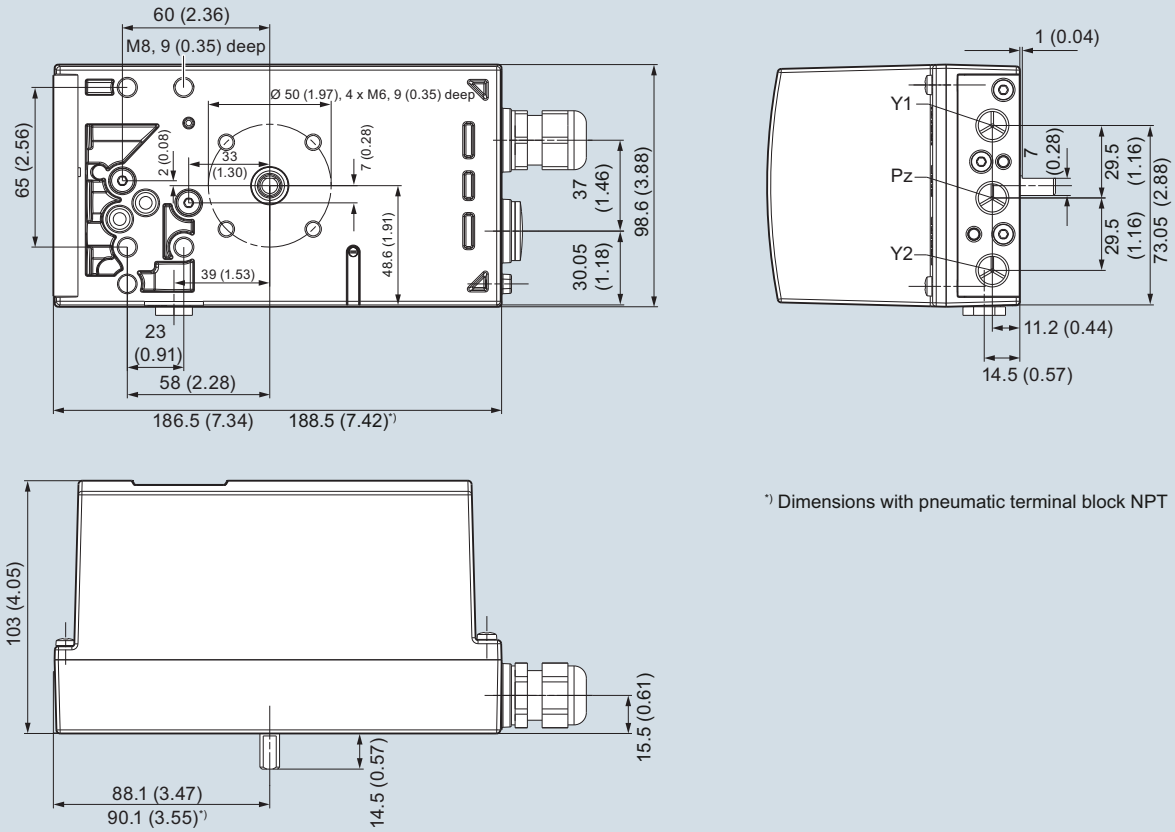


Makrolon enclosure 6DR5..0
Aluminum enclosure, narrow 6DR5..1
Stainless steel enclosure 6DR..2



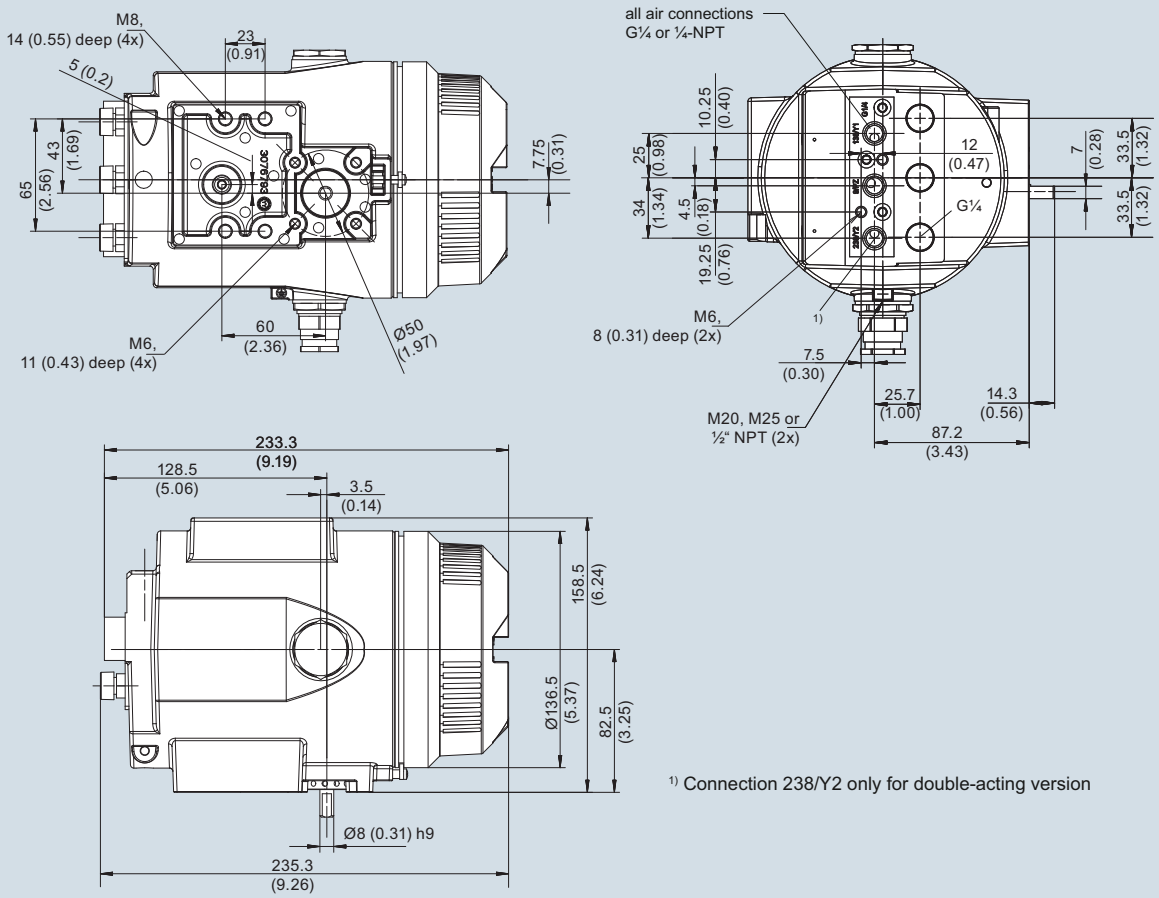
*) Dimensions with pneumatic terminal block NPT
Stainless steel version, values:
1) 99 (3.89)
2) 74 (2.91)
3) 98 (3.86)

Dimensional drawings for enclosure, dimensions in mm (inch)

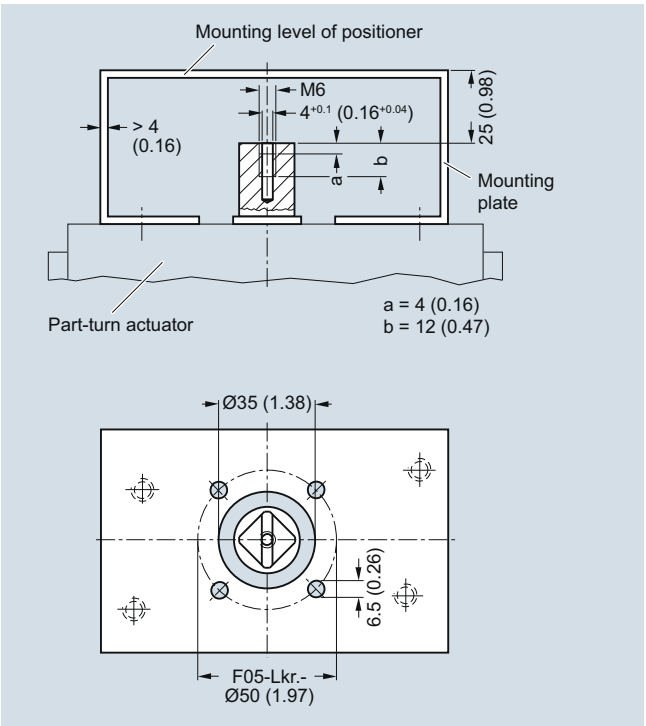


Aluminum enclosure 6DR5..3, dimensions in mm (inch)

Dimensional drawings



Flameproof aluminum enclosure 6DR5..5, dimensions in mm (inch)

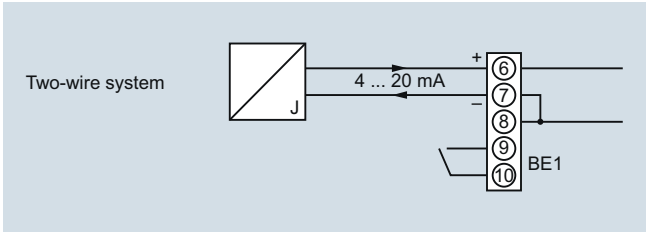


Mounting onto part-turn actuators; mounting consoles (scope of delivery of actuator manufacturer), extract from VDI/VDE 3845, dimensions in mm (inch)

Schematics

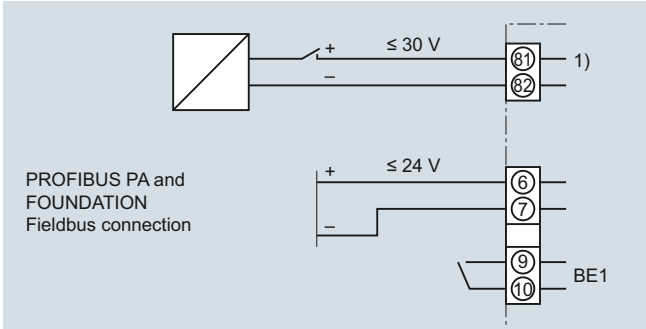
Electric connection of 2-wire devices (6DR50.. and 6DR51..)

Devices of types 6DR50.. and 6DR51.. are operated in a 2-wire system.



SIPART PS2 electropneumatic positioner, input circuit for 6DR50.. and 6DR51..

Electric connection of PROFIBUS PA device (6DR55..) and FOUNDATION Fieldbus device (6DR56..)

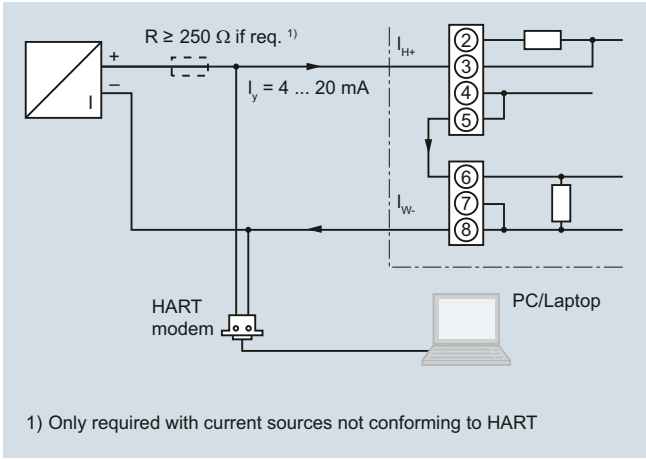


1) Input for safety shutdown (activated using coding jumper)

SIPART PS2 PA and SIPART PS2 FF electropneumatic positioner, input circuit for 6DR55.. and 6DR56..

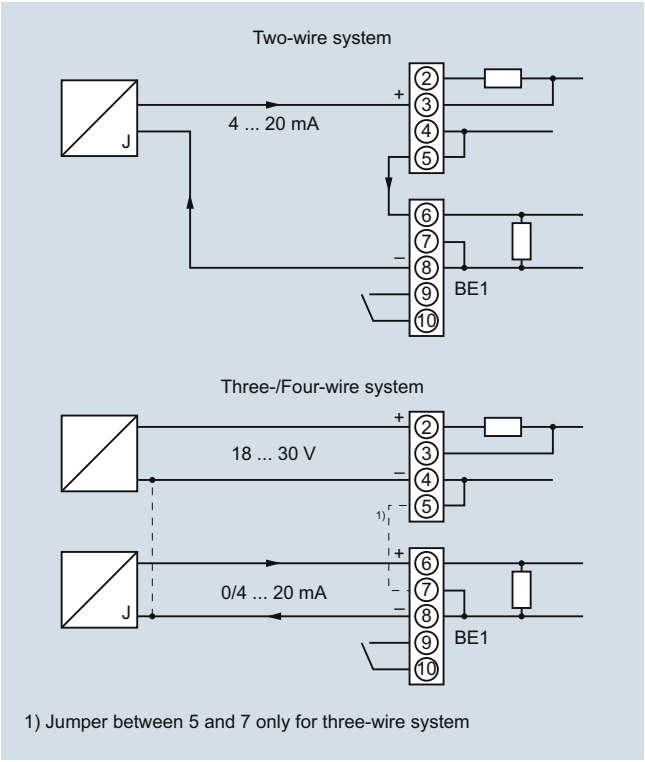
Electric connection of 2-, 3- and 4-wire device (6DR52.. and 6DR53..)

Devices of types 6DR52.. and 6DR53.. can be operated in a 2-, 3- and 4-wire system.



1) Only required with current sources not conforming to HART

SIPART PS2 electropneumatic positioner, example of connection for communication through HART for 6DR52..



1) Jumper between 5 and 7 only for three-wire system

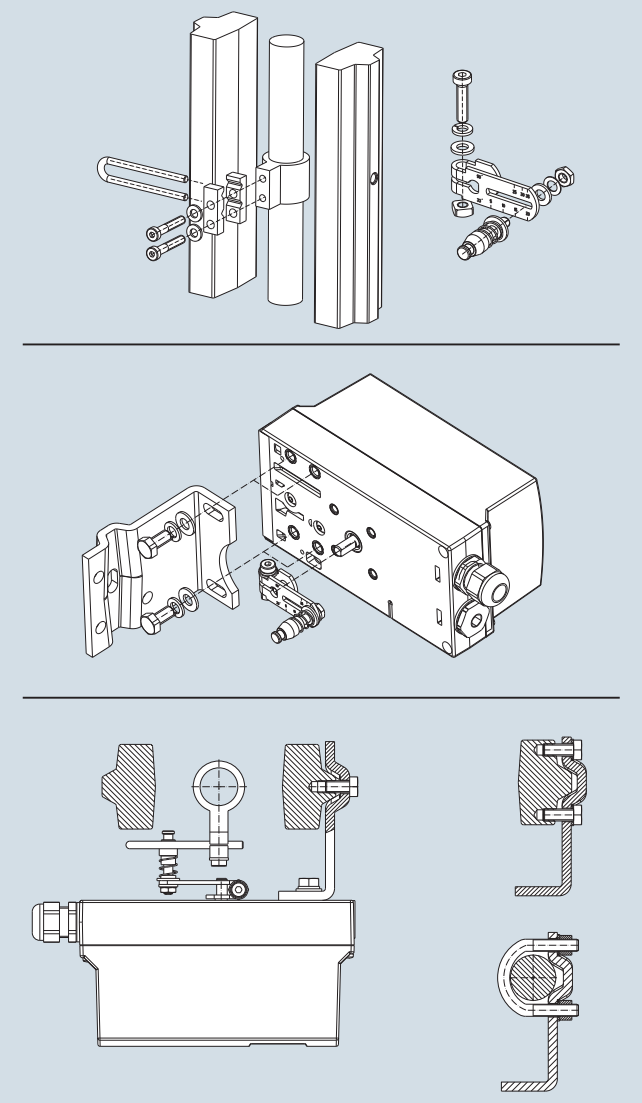
SIPART PS2 electropneumatic positioner, input circuits for 6DR52.. and 6DR53..

5

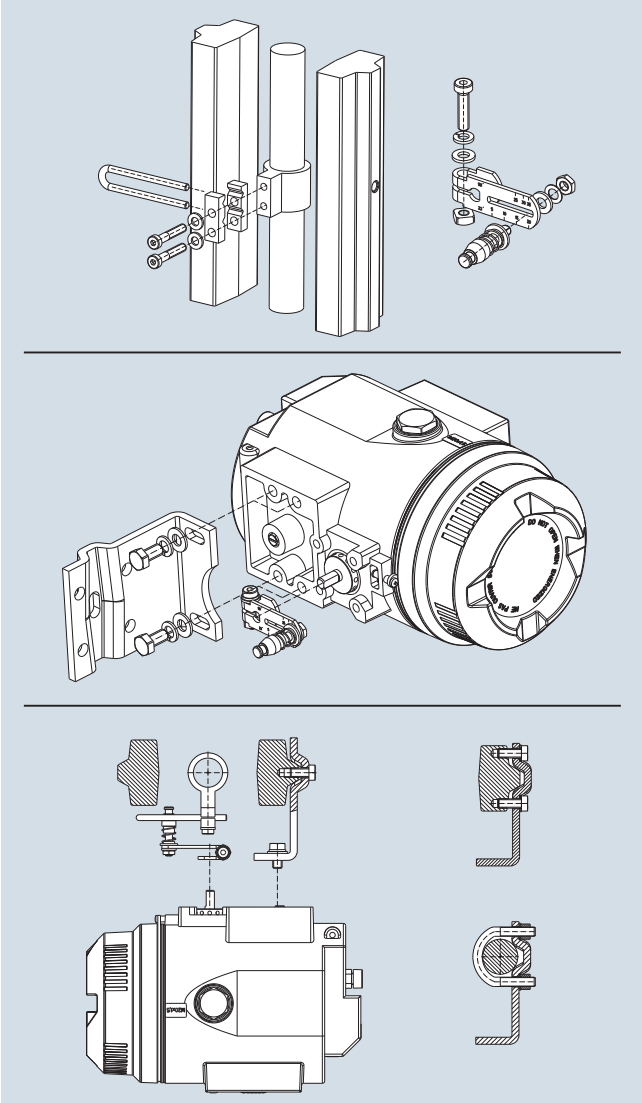
Mounting kit

Mounting kit for NAMUR linear actuators

- 1 mounting bracket
- 2 mounting prisms
- 1 U-bracket
- 1 lever arm with adjustable pick-up roll
- 2 U-bolts
- Various screws and lock washers



Mounting of SIPART PS2 on linear actuators

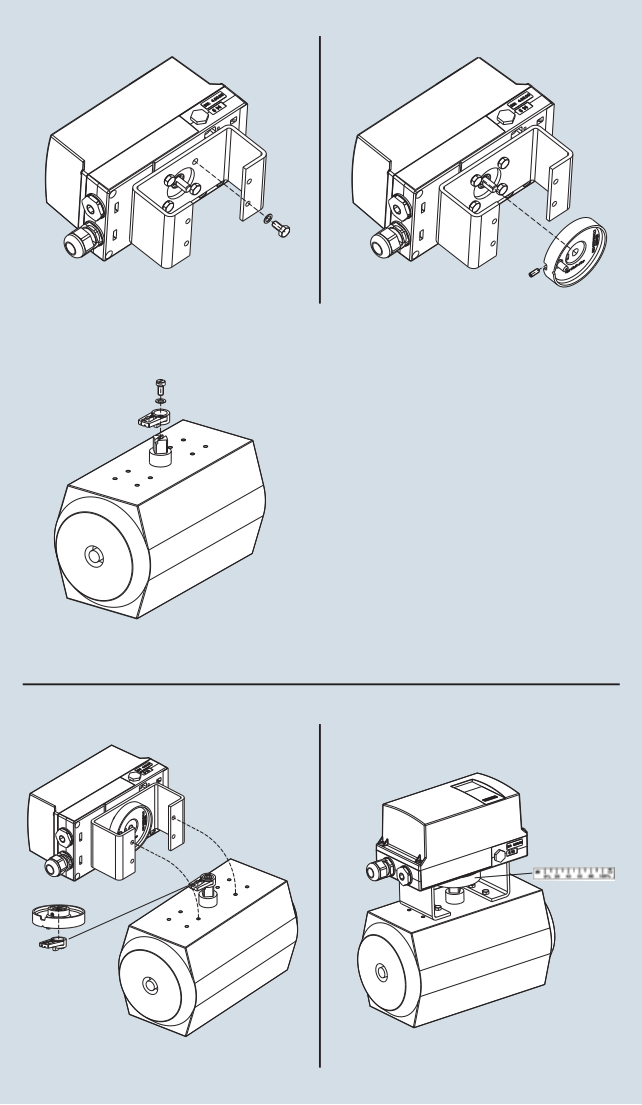


Mounting of SIPART PS2 in flameproof aluminum enclosure on linear actuators

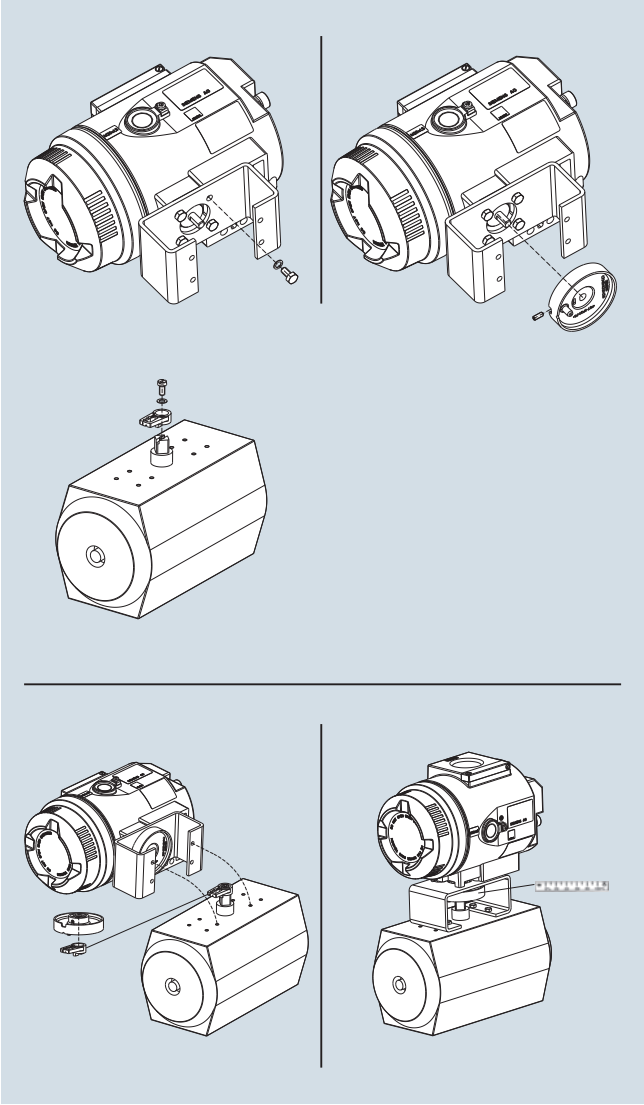
Mounting kit for NAMUR part-turn actuators

- 1 coupling wheel
- 1 driver pin
- 8 scales
- 1 pointer
- Various screws and lock washers

Caution: The mounting consoles and the screws for mounting onto the part-turn actuator are not included in the scope of delivery and must be provided by the customer (see "Technical specifications")



Mounting of SIPART PS2 on part-turn actuators



Mounting of SIPART PS2 in flameproof aluminum enclosure on part-turn actuators

More information

Special versions

On request

Notes