

Overview


SIPART PS2 electropneumatic positioner in polycarbonate enclosure with aluminum gauge block (optional)



SIPART PS2 electropneumatic positioner in aluminum enclosure



SIPART PS2 electropneumatic positioner in stainless steel enclosure with stainless steel gauge block (optional)



SIPART PS2 electropneumatic positioner in flameproof aluminum enclosure (Ex d) with aluminum gauge block (optional)



SIPART PS2 electropneumatic positioner in flameproof stainless steel enclosure 316L with stainless steel gauge block (optional)

The SIPART PS2 electropneumatic positioners are used to control the process valve or damper position of pneumatic linear or part-turn actuators or via positioning cylinder according to the setpoint specification. A digital input can trigger holding of the position or approach of the safety setting of the process valve.

Benefits

SIPART PS2 positioners offer decisive advantages:

- Simple mounting and automatic commissioning
- Simple operation and configuration of the device using 3 buttons and one 2-line local display or via SIMATIC PDM
- Very high control performance
- Negligible air consumption in stationary operation
- "Tight closing" function ensures maximum positioning pressure on the process valve seat
- "Fast Open/Fast Close" function for defined approach of the end position with fast reaction to new setpoint specifications
- "Fail in Place" function:
Maintain current position on failure of electrical and/or pneumatic auxiliary power
- Numerous functions can be activated by simple configuring (e.g. characteristic curves and limits)
- One device variant for linear and part-turn actuators
- Insensitive to vibrations due to few moving parts and optionally with wear-free position detection
- External non-contacting sensor as option for extreme ambient conditions

Positioners

SIPART PS2

Technical description

- "Intelligent solenoid valve": Solenoid valve function and diagnostics in one device
- Extensive diagnostic functions for process valve and actuator, e.g.:
 - Full Stroke Test
 - Multi Step Response Test
 - Valve Performance Test
 - Valve Signature, pressure sensor-aided
 - Partial Stroke Test e.g. for safety process valves (also pressure sensor-aided) for performance and maintenance evaluation of the valve
- Can be operated with natural gas, carbon dioxide, nitrogen or noble gases
- SIL (Safety Integrity Level) 2

Application

The SIPART PS2 positioner is used worldwide on all pneumatic actuators, in all applications and industries:

- Chemical industry
- Petrochemical industry
- Oil and gas
- Water/wastewater industry
- Power supply
- Pharmaceutical industry
- Food, beverage and tobacco industries

The devices are available in variants for:

- 4 to 20 mA
- HART communication
- PROFIBUS PA communication
- FOUNDATION Fieldbus (FF) communication
- Single- and double-acting valves in various enclosure designs and various materials (polycarbonate, aluminum and stainless steel)
- Applications without explosion protection requirements
- Hazardous applications in the versions:
 - Device protection with intrinsic safety (Ex i) for use in Zone 1, 2, 21, 22 or Class I, II, III/Division 1/Groups A-G
 - Device dust ignition protection by enclosure (Ex t) type of protection for use in Zone 21, 22 or Class II, III/Division 1/Groups E-G
 - Device protection with increased security (Ex e) for use in Zone 2 or Class I, Division 2, Groups A-D
 - Device protection with flameproof enclosure (Ex d) 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 for use in particularly aggressive environments (e.g. offshore operation, chlorine plants). The device functionality is not different due to the enclosure variants.

Design

The SIPART PS2 digital positioner comprises the following components:

- Base plate with lid with/without inspection window, depending on the variant
- Electronics with screw-type terminals:
 - 4 to 20 mA
 - 4 to 20 mA with HART
 - PROFIBUS PA according to IEC 61158-2, bus-supplied
 - FOUNDATION Fieldbus (FF) according to IEC 61158-2, bus-supplied
- Position feedback via potentiometer or non-contacting sensor (NCS)
- Pneumatic block

The pneumatic connections for supply air and actuating pressure are located on the right side of the enclosure. A gauge block, venting gauge block, booster, VDI3847 interface 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.

Optional expansion with modules and functions

Optionally, SIPART PS2 can be expanded with the following modules and functions:

Analog Output Module (AOM)

Analog position feedback 4 to 20 mA.

Digital I/O Module (DIO) with 3 digital outputs and 1 digital input

- Signaling of two limits of the travel or angle. The two limits can be parameterized 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/valve fault occurs.
- 2nd digital input for alarm signals or for triggering safety reactions, e.g. hold position or approach safety position.

Inductive Limit Switches (ILS)

Via the inductive switches, 2 independent limits can be set and monitored as NAMUR signal (EN 60947-5-6). The module also contains an integrated fault indicator (see "Digital I/O Module (DIO)").

Mechanic Limit Switches (MLS)

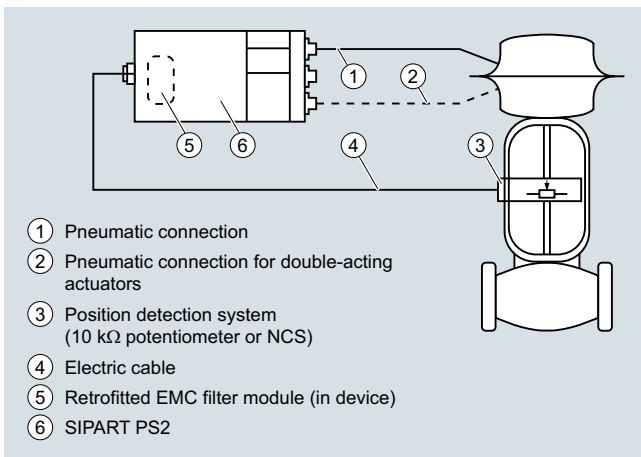
2 independent limits can be monitored via the mechanical switches. The module also contains an integrated fault indicator (see "Digital I/O Module (DIO)").

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 positioner and position detection

Separate mounting of the positioner and position detection can be implemented with SIPART PS2. Only measurement of the stroke or angle, for example, is carried out directly on the actuator. This means that the positioner can be installed at a distance in a protected area. Components are connected electrically via a cable and pneumatically via tubes or pipes. The system is often advantageous if the ambient conditions at the valve exceed the specified values for the positioner (e.g. strong vibrations, radiation, magnetism).



Separate installation of the position detection and positioner SIPART PS2

Use for position detection

The following can be used for position detection:

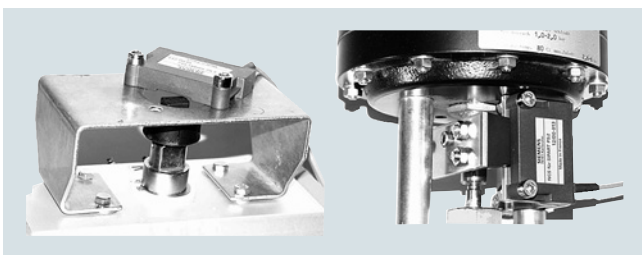


SIPART PS2, NCS for strokes > 14 mm

- Non-contacting sensor (NCS)
- Position Transmitter
- Linear potentiometers
- Commercial sensors

Non-contacting sensor (NCS)

For SIPART PS2



Left: NCS for part-turn actuator (6DR4004-.N.10) mounted on mounting console 6DR4004-1D to 4D

Right: NCS for linear actuator (6DR4004-.N.20) mounted with actuator-specific/customer-specific mounting solution

Position Transmitter

With potentiometer, with NCS, with NCS and ILS or with NCS and MLS for SIPART PS2.

Mounting takes place like with SIPART PS2.



Linear potentiometers

With 3K, 5K or 10 to 20 kΩ (e.g. pneumatic cylinder).

Commercial sensors

With 4 to 20 mA or 0 to 10 V (only with non-ex applications).

Function

Monitoring functions

The SIPART PS2 has comprehensive monitoring functions with which changes on the actuator and process valve can be detected and signaled depending on the set limit. This information provides important indications on the status of the valve. Determined/monitored measuring data:

- Travel integral
- Number of changes in direction
- Alarm counter
- Self-adjusting deadband
- Process valve end position (e.g. for detection of process valve seat wear or deposits)
- Operating hours (also according to temperature and position ranges) as well as min./max. temperature
- Operating cycles of piezoelectric valves in pneumatic block
- Process 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 on the valve, such as setpoint, actual value, control deviation, status of the diagnostic system, etc., is available at a glance. Additional facts and details are just a few mouse clicks away from the Diagnostics Cockpit.

Positioners

SIPART PS2

Technical description

Status monitoring with 3-stage alarm concept

The intelligent electropneumatic SIPART PS2 positioner is equipped with additional monitoring functions. The status alarms derived from these monitoring functions signal active faults of the valve with grading in the form of traffic light signaling. The status alarms are 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 valve failure or general failure (red wrench)

This allows users to put early measures into action before an acute process valve or actuator fault occurs which could result in a system shutdown. Early alarms indicate, for example, the onset of a diaphragm break in the actuator or progressive sluggishness of a valve. In this way, users can guarantee plant safety and availability with suitable maintenance strategies.

This 3-stage alarm hierarchy also allows early detection and signaling of static friction of a packing gland, wear of a process valve plug/seat, or deposits or coatings on the fittings.

These fault indications can be output either line-conducted over the alarm outputs of the positioner (maximum 3), or via communication over the HART or fieldbus interfaces. In this case, the HART, PROFIBUS and FOUNDATION Fieldbus variants of SIPART PS2 allow for differentiation of the various fault indications, as well as a trend representation and histogram function of all key process variables with regard to the valve.

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

Maintenance required of control valves

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 the HART communication system, 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 or Txx), dead times, overshoot, hysteresis, measurement deviations and non-linearity are determined.

Functional Safety according to SIL 2

In the variants 6DR5.1.-0.....-Z C20, the positioner is suitable for use on single-acting valves with spring return that satisfy the special requirements in terms of functional safety up to SIL 2 according to IEC 61508 or IEC 61511. The positioner depressurizes the process valve actuator on demand/in the event of a fault (safe depressurizing) and puts the process valve in the preset safety position.

Valve Signature

With pressure sensor-aided Valve Signature, the characteristic curve of the valve can be recorded, saved in the device (max. 10 characteristic curves) and displayed in PDM, for example. The reference characteristic curve is recorded at the beginning directly during initialization. Based on the exportable data, friction values, spring characteristics, hysteresis, breakout pressures can be determined. If the test is regularly repeated, characteristic curves can be compared with one another and changes over time can be displayed as the basis for a predictive maintenance approach.

Partial Stroke Test

With the pressure sensor-aided Partial Stroke Test, the function of safety (open/close) valves can be checked reliably during operation. Up to 10 characteristic curves and important parameters are saved in the device. They can be displayed in PDM, for example. Recording of the reference characteristic curve takes place during operation and in settled state. Based on the exportable data, friction values, spring characteristics, hysteresis, breakout pressures can be determined. If the test is regularly repeated, characteristic curves can be compared with one another and changes over time can be displayed as the basis for a predictive maintenance approach.

Intelligent solenoid valve

The SIPART PS2 can (parameterizable) take on the function of a solenoid valve for open/close valves and also offers intelligent diagnostics for valves with the pressure sensor-aided Partial Stroke Test, for example. For devices without explosion protection and only in connection with the pressure sensor-aided diagnostics, SIPART PS2 can also be operated with 24 V, i.e. without additional wiring. All other devices must be supplied with 4 to 20 mA. SIPART PS2 takes on the function as "Intelligent solenoid valve" with additional pressure sensor-aided diagnostics and handles multiple tasks in one device:

- The positioner opens and closes the valve quickly and without control.
- In a safety scenario, during power failure, the SIPART PS2 drives the valve into the safety position "Functional Safety according to SIL 2".
- A pressure sensor-aided Partial Stroke Test can be performed automatically at regular intervals. This test keeps the valve in regular movement and prevents rusting of the valve due to corrosion or incrustation.

Solenoid valves on control valves normally cannot be tested during operation. They are therefore not necessary when using SIPART PS2 as the depressurizing 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

The SIPART PS2 positioner contains the following configurations:

- 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)
- Split-range mode: 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 of position range, start-of-scale/full-scale value
- Limits (alarms) of the process valve position: Minimum and maximum value
- Automatic tight closing stroke adjustment in accordance with the valve process characteristic curve
- Function of the digital inputs
- Function of alarm output, etc.

Technical specifications

SIPART PS2 (all versions)

Operating conditions			
Ambient conditions	For indoor and outdoor use	Restrictor ratio	Adjustable
Ambient temperature	In hazardous areas, observe the maximum permitted ambient temperature according to the temperature class.	Auxiliary power consumption in the controlled state	< 0.036 Nm ³ /h (0.158 USgpm)
• Permissible ambient temperature for operation ¹⁾	-30 ... +80 °C (-22 ... +176 °F) Optional -40 ... +80 °C (-40 ... +176 °F)	Sound pressure	L _{Aeq} < 75 dB L _{Amax} < 80 dB
• Altitude	≤ 2 000 m above mean sea level. At altitudes greater than 2 000 m above mean sea level, use a suitable power supply.	Sound pressure with installed Siemens booster	L _{Aeq} < 95 dB L _{Amax} < 98 dB
• Relative humidity	0 ... 100%	Design	
Type of protection ²⁾	IP66/Type NEMA 4X	Mode of operation	
Corrosion protection according to EN ISO 9227:2012 and EN ISO 12944:1999		• Range of stroke (linear actuators)	3 ... 130 mm (0.12 ... 5.12 inch); greater stroke range on request
• 6DR5..0 Polycarbonate enclosure	C5-M medium durability	• Angle of rotation range (part-turn actuators)	30 ... 100° (up to 180° on request)
• 6DR5..3 Aluminum enclosure and 6DR5..5 Aluminum enclosure, flameproof	C5-M medium durability	Mounting type	
• 6DR5..2 Stainless steel enclosure and 6DR5..6 Stainless steel enclosure, flameproof	C5-M high durability	• 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.
Mounting position	Any. Electrical connections and exhaust opening not facing up in wet environment (outdoor/rain).	• On part-turn actuators	Using mounting kit 6DR4004-8D or TGX:16300-1556 on actuators with mounting plane according to VDI/VE 3845 and IEC 60534-6-2: The actuator-specific mounting console 6DR4004-1D ... 4D must be ordered separately, see the selection and ordering data.
Vibration resistance		Weight, positioner without option modules or accessories	
• Harmonic oscillations (sine) according to EN 60068-2-6/10.2008	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	• 6DR5..0 Glass-fiber reinforced polycarbonate enclosure	Approx. 0.9 kg (1.98 lb)
• Bumping (half-sine) according to EN 60068-2-27/02.2010	150 m/s ² (492 ft/s ²), 6 ms, 1 000 shocks/axis	• 6DR5.11 Aluminum enclosure, only single-acting	Approx. 1.3 kg (2.86 lb)
• 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	• 6DR5..2 Stainless steel enclosure	Approx. 3.9 kg (8.6 lb)
• Recommended continuous duty range of the complete valve	≤ 30 m/s ² (98.4 ft/s ²) without resonance sharpness	• 6DR5..3 Aluminum enclosure	Approx. 1.6 kg (3.53 lb)
Climatic class	According to IEC EN 60721-3	• 6DR5..5 Aluminum, flameproof	Approx. 5.2 kg (11.46 lb)
• Storage	1K5, but -40 ... +80 °C (1K5, but -40 ... +176 °F)	• 6DR5..6 Stainless steel enclosure, flameproof	Approx. 8.4 kg (18.5 lb)
• Transport	2K4, but -40 ... +80 °C (2K4, but -40 ... +176 °F)	Material	
Pneumatic data		Dimensions	See "Dimension drawings"
Auxiliary power (inlet air)	Compressed air, carbon dioxide (CO ₂), nitrogen (N ₂), noble gases or natural gas	Device versions	
• Pressure ³⁾	1.4 ... 7 bar (20.3 ... 101.5 psi)	• In polycarbonate enclosure 6DR5..0	Single-acting and double-acting
Air quality according to ISO 8573-1		• In aluminum enclosure 6DR5..1	Single-acting
• Solid particulate size and density	Class 3	• In aluminum enclosures 6DR5..3 and 6DR5..5	Single-acting and double-acting
• Pressure dew point	Class 3 (min. 20 K (36 °F) below ambient temperature)	• In stainless steel enclosures 6DR5..2 and 6DR5..6	Single-acting and double-acting
• Oil content	Class 3	Gauge block	
Unrestricted flow (DIN 1945)		• Type of protection with:	
• Inlet air (pressurize actuator) ⁴⁾		- Pressure gauge made of plastic	IP31
- 2 bar; 0.1 KV (29 psi; 0.116 CV)	4.1 Nm ³ /h (18.1 USgpm)	- Gauge made of metal	IP44
- 4 bar; 0.1 KV (58 psi; 0.116 CV)	7.1 Nm ³ /h (31.3 USgpm)	- Pressure gauge made of stainless steel 316	IP54
- 6 bar; 0.1 KV (87 psi; 0.116 CV)	9.8 Nm ³ /h (43.1 USgpm)	• Vibration resistance	According to EN 837-1
• Exhaust air (depressurize actuator for all versions except fail in place) ⁴⁾		Connections, electrical	
- 2 bar; 0.2 KV (29 psi; 0.232 CV)	8.2 Nm ³ /h (36.1 USgpm)	• Screw terminals	2.5 mm ² AWG30-14
- 4 bar; 0.2 KV (58 psi; 0.232 CV)	13.7 Nm ³ /h (60.3 USgpm)	• Cable bushing	
- 6 bar; 0.2 KV (87 psi; 0.232 CV)	19.2 Nm ³ /h (84.5 USgpm)	- Without explosion protection as well as with Ex i	M20x1.5 or ½-14 NPT
• Exhaust air (depressurize actuator for fail in place version)		- With explosion protection Ex d	Ex d-certified M20x1.5; ½-14 NPT or M25x1.5
- 2 bar; 0.1 KV (29 psi; 0.116 CV)	4.3 Nm ³ /h (19.0 USgpm)	Connections, pneumatic	Female thread G¼ or ¼-18 NPT
- 4 bar; 0.1 KV (58 psi; 0.116 CV)	7.3 Nm ³ /h (32.2 USgpm)		
- 6 bar; 0.1 KV (87 psi; 0.116 CV)	9.8 Nm ³ /h (43.1 USgpm)		

Positioners

SIPART PS2

Technical specifications

Controller	
Controller unit	
• Five-point switch	Adaptive
• Deadband	
- dEbA = Auto	Adaptive
- 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 2014/68/EU)	For gases of fluid group 1, complies with requirements of article 4, 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.
UL conformity	You can find the appropriate directives and standards, including the relevant versions, in the UL-CERTIFICATE OF COMPLIANCE on the Internet.
Explosion protection	
Explosion protection according to ATEX/IECEX	Depending on the device version; see "Explosion protection" section
Natural gas as driving medium	
	For technical data using natural gas as driving medium, see operating instructions.

- 1) At ≤ -10 °C (≤ 14 °F), the refresh rate of the local display is limited. When using Analog Output Module (AOM), only T4 is permissible.
- 2) Max. impact energy 1 joule for enclosure with inspection window 6DR5..0 and 6DR5..1 or max. 2 joules for 6DR5..3.
- 3) The following applies to fail in place double acting: 3 ... 7 bar (43.5 ... 101.5 psi)
- 4) When using Ex d versions (6DR5..5-... and 6DR5..6-...), values are reduced by approximately 20%.

SIPART PS2 with 4 ... 20 mA / HART

	Electronics without explosion protection	Electronics with Explosion protection Ex d	Electronics with explosion protection Ex i	Electronics with explosion protection Ex i, Ex e, Ex t
Electrical specifications				
Current input I_W			4 ... 20 mA	
• Rated signal range			840 V DC, 1 s	
• Test voltage			Suitable only for floating contact; max. contact load < 5 μ A at 3 V	
• Digital input BIN1 (terminals 9/10; galvanically connected to basic device)				
<u>2-wire connection (terminals 6/8)</u>				
6DR50.. and 6DR53..; 4 ... 20 mA				
6DR51.. and 6DR52..; HART				
Current to maintain the auxiliary power supply	≥ 3.6 mA			
Required load voltage U_B (corresponds to Ω at 20 mA)				
• 4 ... 20 mA (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)
• 4 ... 20 mA (6DR53..)				
- Typical	7.9 V (= 395 Ω)	-	-	-
- Max.	8.4 V (= 420 Ω)	-	-	-
• HART (6DR51..)				
- Typical	6.6 V (= 330 Ω)	6.6 V (= 330 Ω)	-	-
- Max.	6.72 V (= 336 Ω)	6.72 V (= 336 Ω)	-	-
• 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				
• 4 ... 20 mA	-	-	11 nF	"ic": 11 nF
• HART	-	-	11 nF	"ic": 11 nF
Effective internal inductance L_i				
• 4 ... 20 mA	-	-	209 μ H	"ic": 209 μ H
• HART	-	-	312 μ H	"ic": 312 μ H
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 "ec"/"t": $U_n \leq 30$ V $I_n \leq 100$ mA
<u>3-/4-wire connection (terminals 2/4 and 6/8)</u>				
6DR52..; HART, explosion-proof				
6DR53..; 4 ... 20 mA, not explosion-proof				
Load voltage at 20 mA	≤ 0.2 V (= 10 Ω)	≤ 0.2 V (= 10 Ω)	≤ 1 V (= 50 Ω)	≤ 1 V (= 50 Ω)
Auxiliary power U_{AUX}	18 ... 35 V DC	18 ... 35 V DC	18 ... 30 V DC	18 ... 30 V DC
Current consumption I_H	$(U_{AUX} - 7.5 \text{ V}) / 2.4 \text{ k}\Omega$ [mA]			
Effective internal capacitance C_i	-	-	22 nF	22 nF
Effective internal inductance L_i	-	-	0.12 mH	0.12 mH
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 "ec"/"t": $U_n \leq 30$ V $I_n \leq 100$ mA
Electrical isolation	Between U_{AUX} and I_W	Between U_{AUX} and I_W	Between U_{AUX} and I_W (2 intrinsically safe circuits)	Between U_{AUX} 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.			

Positioners

SIPART PS2

Technical specifications

Pressure sensor module 6DR51.. -Z P01/ -Z P02

Current input I_W

- Rated signal range

- Test voltage

- Digital input DI1 (terminals 9/10; electrically connected to the basic device)

4 ... 20 mA

840 V DC, 1 s

Suitable only for floating contact; max. contact load < 5 μ A at 3 V

4 ... 20 mA

840 V DC, 1 s

Suitable only for floating contact; max. contact load < 5 μ A with 3 V

Current to maintain the auxiliary power supply

≥ 3.6 mA

≥ 3.6 mA

Required load voltage U_B (corresponds to Ω at 20 mA)

9.4 V (= 470 Ω)

9.4 V (= 470 Ω)

Static destruction limit

± 30 V

± 40 mA

Effective internal capacitance C_i

-

-

Effective internal inductance L_i

-

-

For connecting to circuits with the following peak values

-

-

SIPART PS2 with PROFIBUS PA/with FOUNDATION Fieldbus

	Electronics without explosion protection	Electronics with Explosion protection Ex d	Electronics with explosion protection Ex i	Electronics with explosion protection Ex i, Ex e, Ex t
Electrical specifications				
<u>Auxiliary power supply, bus circuit</u>				
Bus voltage	9 ... 32 V	9 ... 32 V	Bus-supplied 9 ... 24 V	9 ... 32 V
For connecting to circuits with the following peak values				
• Bus connection with FISCO supply unit			$U_i = 17.5 \text{ V}$ $I_i = 380 \text{ mA}$ $P_i = 5.32 \text{ W}$	"ic": $U_i = 17.5 \text{ V}$ $I_i = 570 \text{ mA}$ "ec"/"t": $U_n \leq 32 \text{ V}$
• Bus connection with barrier			$U_i = 24 \text{ V}$ $I_i = 250 \text{ mA}$ $P_i = 1.2 \text{ W}$	"ic": $U_i = 32 \text{ V}$ "ec"/"t": $U_n \leq 32 \text{ V}$
Effective internal capacitance C_i	-	-	Negligibly small	Negligibly small
Effective internal inductance L_i	-	-	8 μH	"ic": 8 μH
Current consumption			11.5 mA \pm 10%	
Additional fault current			0 mA	
<u>Safety shutdown can be activated with "jumper" (terminals 81/82)</u>			Electrically isolated from bus circuit and digital input	
• Input resistance			> 20 k Ω	
• 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				
			$U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 1 \text{ W}$	"ec": $U_n \leq 30 \text{ V}$ $I_n \leq 100 \text{ mA}$ "ic": $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$
Effective internal capacitance and inductance	-	-	Negligibly small	Negligibly small
Digital input DI1 for PROFIBUS (terminals 9/10); electrically connected to the bus circuit)			Jumpered or connection to switching contact. Suitable only for floating contact; max. contact load < 5 μA at 3 V	
Electrical isolation				
• For basic device without explosion 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 i			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 e, Ex 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 3.02, 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.	
FOUNDATION Fieldbus communication				
Communications group and class			According to technical specification of the FOUNDATION Fieldbus for H1 communication	
Function blocks/functions			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) Link Active Scheduler (LAS) function	
Execution times of the blocks			AO: 30 ms PID: 40 ms	
Physical layer profile			123, 511	
FF registration			Tested with ITK 6.0	
Device address			22 (when delivered)	

Positioners

SIPART PS2

Technical specifications

Option modules

Digital I/O Module (DIO)	Without explosion protection suitable for Ex d	With explosion protection Ex i	With explosion protection Ex i, Ex e, Ex t
	6DR4004-8A	6DR4004-6A	6DR4004-6A
3 digital output current circuits		<ul style="list-style-type: none"> Alarm output A1: Terminals 41 and 42 Alarm output A2: Terminals 51 and 52 Alarm output: Terminals 31 and 32 	
<ul style="list-style-type: none"> Auxiliary power U_{Aux} Signal state <ul style="list-style-type: none"> High (not addressed) Low ^{*)} (addressed) <p>^{*)} The status is also Low if the basic device is faulty or without auxiliary power.</p> <ul style="list-style-type: none"> For connecting to circuits with the following peak values 	<p>≤ 35 V and the current consumption is to be limited to < 25 mA</p> <p>Conductive, $R = 1$ kΩ, $+3/-1\%$ *) Blocked, $I_R < 60$ μA</p> <p>^{*)} When using in the flameproof enclosure, the current consumption must be restricted to 10 mA per output.</p>	<p>≥ 2.1 mA ≤ 1.2 mA</p> <p>Switching threshold with supply to EN 60947-5-6: $U_{Aux} = 8.2$ V, $R_i = 1$ kΩ</p> <p>$U_i = 15$ V $I_i = 25$ mA $P_i = 64$ mW</p>	<p>≥ 2.1 mA ≤ 1.2 mA</p> <p>Switching threshold with supply to EN 60947-5-6: $U_{Aux} = 8.2$ V, $R_i = 1$ kΩ</p> <p>"ic": $U_i = 15$ V $I_i = 25$ mA "ec"/"t": $U_n \leq 15$ V</p>
Effective internal capacitance C_i	-	5.2 nF	5.2 nF
Effective internal inductance L_i	-	Negligibly small	Negligibly small
1 circuit		Digital input DI2: Terminals 11 and 12, terminals 21 and 22 (jumper)	
<ul style="list-style-type: none"> Electrically connected to the basic device <ul style="list-style-type: none"> Signal state 0 Signal state 1 Contact load Electrically isolated from the basic device <ul style="list-style-type: none"> Signal state 0 Signal state 1 Natural resistance Static destruction limit Connecting to circuits with the following peak values 		<p>Floating contact, open Floating contact, closed 3 V, 5 μA</p> <p>≤ 4.5 V or open ≥ 13 V ≥ 25 kΩ</p>	
<ul style="list-style-type: none"> Static destruction limit Connecting to circuits with the following peak values 	± 35 V	$U_i = 25.2$ V	"ic": $U_i = 25.2$ V "ec"/"t": $U_n \leq 25.5$ V
Effective internal capacitance C_i	-	Negligibly small	Negligibly small
Effective internal inductance L_i	-	Negligibly small	Negligibly small
Electrical isolation		The three outputs, the DI2 input and the basic device are galvanically isolated from each other.	
Test voltage		840 V DC, 1 s	
Analog Output Module (AOM)	Without explosion protection suitable for Ex d	With explosion protection Ex i	With explosion protection Ex i, Ex e, Ex t
	6DR4004-8J	6DR4004-6J	6DR4004-6J
DC output for position feedback		2-wire connection	
1 current output: Terminals 61 and 62		4 ... 20 mA, short-circuit-proof	
Rated signal range		3.6 ... 20.5 mA	
Total operating range			
Auxiliary power U_{Aux}	+12 ... +35 V	+12 ... +30 V	+12 ... +30 V
External load R_B [k Ω]		$\leq (U_{Aux} [V] - 12 V)/I$ [mA]	
Transmission error		$\leq 0.3\%$	
Temperature influence effect		$\leq 0.1\%/10$ K ($\leq 0.1\%/18$ °F)	
Resolution		$\leq 0.1\%$	
Residual ripple		$\leq 1\%$	
For connecting to circuits with the following peak values	-	<p>$U_i = 30$ V $I_i = 100$ mA $P_i = 1$ W</p>	<p>"ic": $U_i = 30$ V $I_i = 100$ mA "ec"/"t": $U_n \leq 30$ V $I_n \leq 100$ mA $P_n \leq 1$ W</p>
Effective internal capacitance C_i	-	11 nF	11 nF
Effective internal inductance L_i	-	Negligibly small	Negligibly small
Electrical isolation		Electrically isolated from the alarm option and safely isolated from the basic device	
Test voltage		840 V DC, 1 s	

Inductive Limit Switches (ILS)	Without explosion protection suitable for Ex d	With explosion protection Ex i	With explosion protection Ex i, Ex e, Ex t
	6DR4004-8G	6DR4004-6G	6DR4004-6G
Limit transmitter with Inductive Limit Switches (ILS) and fault indicator			
2 Inductive Limit Switches (ILS)		<ul style="list-style-type: none"> • Digital output (limit transmitter) A1: Terminals 41 and 42 • Digital output (limit transmitter) A2: Terminals 51 and 52 	
<ul style="list-style-type: none"> • Connection • Signal state High (not addressed) • Signal state Low (addressed) • 2 Inductive Limit Switches (ILS) • Function • Connecting to circuits with the following peak values 	2-wire system acc. to EN 60947-5-6 (NAMUR), for switching amplifier to be connected on load side	$> 2.1 \text{ mA}$ $< 1.2 \text{ mA}$	
		Type SJ2-SN NC (normally closed) contact	
	Rated voltage 8 V current consumption: $\geq 3 \text{ mA}$ (limit value not addressed), $\leq 1 \text{ mA}$ (limit value addressed)	$U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	"ic": $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ "ec": $U_n \leq 15 \text{ V}$ $P_n \leq 64 \text{ mW}$
Effective internal capacitance C_i	-	161 nF	161 nF
Effective internal inductance L_i	-	120 μH	120 μH
1 alarm output		Digital output: Terminals 31 and 32	
<ul style="list-style-type: none"> • Connection • Signal state High (not addressed) • Signal state Low (addressed) • Auxiliary power U_{Aux} 	On switching amplifier according to EN 60947-5-6: (NAMUR), $U_{Aux} = 8.2 \text{ V}$, $R_i = 1 \text{ k}\Omega$		
	$R = 1.1 \text{ k}\Omega$	$> 2.1 \text{ mA}$	$> 2.1 \text{ mA}$
	$R = 10 \text{ k}\Omega$	$< 1.2 \text{ mA}$	$< 1.2 \text{ mA}$
	$U_{Aux} \leq 35 \text{ V DC}$ $I \leq 20 \text{ mA}$	-	-
<ul style="list-style-type: none"> • Connecting to circuits with the following peak values 	-	$U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	"ic"/"nL": $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ "ec": $U_n \leq 15 \text{ V}$ $P_n \leq 64 \text{ mW}$
Effective internal capacitance C_i	-	5.2 nF	5.2 nF
Effective internal inductance L_i	-	Negligibly small	Negligibly small
Electrical isolation		The 3 outputs are electrically isolated from the basic device.	
Test voltage		840 V DC, 1 s	

Positioners

SIPART PS2

Technical specifications

Mechanic Limit Switches (MLS)	Without explosion protection suitable for Ex d	With explosion protection Ex i	With explosion protection Ex i, Ex e, Ex t
	6DR4004-8K	6DR4004-6K	6DR4004-6K
Limit transmitter with mechanical switching contacts			
2 limit value contacts			
<ul style="list-style-type: none"> Max. switching current AC/DC For connecting to circuits with the following peak values 	4 A	-	-
Effective internal capacitance C_i	-	Negligibly small	Negligibly small
Effective internal inductance L_i	-	Negligibly small	Negligibly small
<ul style="list-style-type: none"> Max. switching voltage AC/DC 	250 V/24 V	30 V DC	30 V DC
1 alarm output			
<ul style="list-style-type: none"> Connection 	On switching amplifier according to EN 60947-5-6: (NAMUR), $U_{Aux} = 8.2 \text{ V}$, $R_i = 1 \text{ k}\Omega$	Digital output: Terminals 31 and 32	-
<ul style="list-style-type: none"> Signal state High (not addressed) Signal state Low (addressed) Auxiliary power 	$R = 1.1 \text{ k}\Omega$ $R = 10 \text{ k}\Omega$ $U_{Aux} \leq 35 \text{ V DC}$ $I \leq 20 \text{ mA}$	$> 2.1 \text{ mA}$ $< 1.2 \text{ mA}$ -	$> 2.1 \text{ mA}$ $< 1.2 \text{ mA}$ -
<ul style="list-style-type: none"> Connecting to circuits with the following peak values 	-	$U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ $P_i = 64 \text{ mW}$	"ic": $U_i = 15 \text{ V}$ $I_i = 25 \text{ mA}$ "t": $U_n = 15 \text{ V}$ $I_n = 25 \text{ mA}$
Effective internal capacitance C_i	-	5.2 nF	5.2 nF
Effective internal inductance L_i	-	Negligibly small	Negligibly small
Electrical isolation		The 3 outputs are electrically isolated from the basic device.	
Test voltage		3150 V DC, 2 s	
Operating conditions altitude	Max. 2 000 m above sea level At altitudes greater than 2 000 m above sea level, use a suitable power supply	-	-
Analog Input Module (AIM)	Without explosion protection	With explosion protection Ex i	With explosion protection Ex i, Ex e, Ex t
	6DR4004-8F	6DR4004-6F	6DR4004-6F
	The Analog Input Module (AIM) 6DR4004-6F and -8F is required to connect a Non-Contacting Sensor (NCS) or Position Transmitter 6DR4004-1ES to -4ES. Potentiometers of other types with resistance values between 3 and 20 k Ω can also be connected. In non-explosion-proof applications, 4 ... 20 mA and 0 ... 10 V signals can also be processed.		
R-potentiometer			
<ul style="list-style-type: none"> Peak values when powered by the base unit with PA (6DR55) or with FF communication (6DR56) 	$U_{max} = 5 \text{ V}$	$U_o = 5 \text{ V}$ $I_o = 75 \text{ mA static}$ $I_o = 160 \text{ mA momentary}$ $P_o = 120 \text{ mW}$ $C_o = 1 \mu\text{F}$ $L_o = 1 \text{ mH}$	$U_{max} = 5 \text{ V}$
<ul style="list-style-type: none"> Peak values when supplied by other basic devices (6DR50/1/2/3/9) 	$U_{max} = 5 \text{ V}$	$U_o = 5 \text{ V}$ $I_o = 100 \text{ mA}$ $P_o = 33 \text{ mW}$ $C_o = 1 \mu\text{F}$ $L_o = 1 \text{ mH}$	$U_{max} = 5 \text{ V}$
Signal 20 mA			
<ul style="list-style-type: none"> Rated signal range Internal load R_B Static destruction limit 	0 ... 20 mA 200 Ω 40 mA	- - -	- - -
Signal 10 V			
<ul style="list-style-type: none"> Rated signal range Internal resistance R_i Static destruction limit 	0 ... 10 V 25 k Ω 20 V	- - -	- - -
Supply and signal circuits		Electrically connected to the basic device	

NCS sensor	Without explosion protection	With explosion protection Ex i, Ex e	With explosion protection Ex t
	6DR4004-8N*	6DR4004-6N*	6DR4004-6N*
Position range		3 ... 14 mm (0.12 ... 0.55")	
<ul style="list-style-type: none"> Linear actuator 6DR4004-.N.20 Linear actuator 6DR4004-.N.30 Part-turn actuator 	10 ... 130 mm (0.39 ... 5.12"); up to 200 mm (7.87") on request	30° ... 100°	
Linearity for NCS sensor and internal NCS module 6DR4004-5L/-5LE (after correction by means of positioner)		± 1%	
Hysteresis for NCS sensor and NCS module 6DR4004-5L/-5LE		± 0.2%	
Temperature influence (range: Rotation angle 120° or stroke 14 mm)		≤ 0.1%/10 K (≤ 0.1%/18 °F) for -20 ... +90 °C (-4 ... +194 °F) ≤ 0.2%/10 K (≤ 0.2%/18 °F) for -40 ... -20 °C (-40 ... -4 °F)	
Climatic class		According to IEC EN 60721-3	
<ul style="list-style-type: none"> Storage Transport 		1K5, but -40 ... +90 °C (1K5, but -40 ... +194 °F) 2K4, but -40 ... +90 °C (2K4, but -40 ... +194 °F)	
Continuous working temperature	-40 °C ... +90 °C (-40 °F ... +194 °F)	-	-
Vibration resistance		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 300 m/s ² (984 ft/s ²), 6 ms, 4 000 shocks/axis	
Degree of protection		IP68 according to IEC/EN 60529; Type 4X according to UL 50 E	
For connecting to circuits with the following peak values	-	U _i = 5 V I _i = 160 mA P _i = 120 mW	U _i = 5 V
Effective internal capacitance C _i	-	110 nF + 110 nF per meter of connecting cable	110 nF + 110 nF per meter of connecting cable
Effective internal inductance L _i	-	270 μH + 6.53 μH per meter of connecting cable	270 μH + 6.53 μH per meter of connecting cable
Explosion protection according to ATEX/IECEX	-	Intrinsic safety Ex i: II 2 G Ex ia IIC T6/T4 Gb	Intrinsic safety Ex i: II 3 G Ex ic IIC T6/T4 Gc Non-sparking Ex t: II 3 G Ex ec IIC T6/T4 Gc
Explosion protection according to FM	-	Intrinsic safety Ex i: IS, Class I, Division 1, ABCD IS, Class I, Zone 1, AEx ib, IIC	Non-sparking Ex t: NI, Class I, Division 2, ABCD NI, Class I, Zone 2, AEx ec, IIC
Permissible ambient temperature			
<ul style="list-style-type: none"> ATEX/IECEX 	-	T4: -40 ... +90 °C (-40 ... +194 °F) T6: -40 ... +70 °C (-40 ... +158 °F)	
<ul style="list-style-type: none"> FM/CSA 	-	T4: -40 ... +85 °C (-40 ... +185 °F) T6: -40 ... +70 °C (-40 ... +158 °F)	

Positioners
SIPART PS2

Technical specifications

Explosion protection

1	2	3	4	5	6	7	-	8	9	10	11	12	-	13	14	15	16	-					
6	D	R	5	a	y	b	-	0	c	d	e	f	-	g	*	*	h	-	Z	j	j	j	

Upper row: Order position of Article No.; lower line in color: Article No. with variable positions

6DR5ayb-	0cdef-	g**h-	Z jij
a (version) = 0, 2, 5, 6	c (explosion protection) = E, D, F, G, K	g = 0, 2, 6, 7, 8	jij (-Z order code) = = A20, A40, C20, D53, D54, D55, D56, D57, F01, K**, L1A, M40, R**, S**, Y** * = any character
y (actuator) = 1, 2	d (thread) = G, N, M, P, R, S	h (pressure gauge block) = 0, 1, 2, 3, 4, 9	jij (-Z order code) = = A20, A40, C20, D53, D54, D55, D56, D57, F01, K**, L1A, M40, R**, S**, Y** * = any character
b (enclosure) = 0, 1, 2, 3	e (limit monitor) = 0, 1, 2, 3, 9		jij (-Z order code) = = A20, A40, C20, D53, D54, D55, D56, D57, F01, K**, L1A, M40, R**, S**, Y** * = any character
	f (option module) = 0, 1, 2, 3		jij (-Z order code) = = A20, A40, C20, D53, D54, D55, D56, D57, F01, K**, L1A, M40, R**, S**, Y** * = any character

Type of protection 6DR5ayb-*cdef-g*Ah-Zjij	Ex marking ATEX-IECEX	Ex marking FM-CSA
Intrinsic safety • For c = E and b = 0	II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc	CI I Zn 1 AEx ib IIC Gb CI I Zn 1 Ex ib IIC Gb IS CI I Div 1 Gp A-D
Flameproof enclosure and dust explosion protection by enclosure • For c = E and b = 5, 6	II 2 G Ex db IIC T6/T4 Gb II 2 D Ex tb IIIC T100°C Db	FM CI I Zn 1 AEx db IIC Gb XP CI I Div 1 Gp A-D CSA CI I Zn 1 Ex db IIC Gb XP CI I Div 1 Gp C-D FM + CSA Zn 21 AEx tb IIIC T100°C Db Zn 21 Ex tb IIIC T100°C Db DIP CI II, III Div 1 Gp E-G
Intrinsic safety • For c = E and b = 1, 2, 3	II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc II 2 D Ex ia IIIC T130°C Db	CI I Zn 1 AEx ib IIC Gb CI I Zn 1 Ex ib IIC Gb Zn 21 AEx ib IIIC, T130°C Db Zn 21 Ex ib IIIC, T130°C Db IS CI I, II, III Div 1 Gp A-G
Increased safety (non-incendive NI) • For c = G and b = 1, 2, 3, 5, 6	II 3 G Ex ec IIC T6/T4 Gc	CI I Zn 2 AEx nA IIC Gc CI I Zn 2 Ex nA IIC Gc NI CI I Div 2 Gp A-D
Increased safety (non-incendive NI) and dust ignition protection by enclosure • For c = D and b = 1, 2, 3	II 2 D Ex tb IIIC T100°C Db II 3 G Ex ec IIC T6/T4 Gc	DIP Zn 21 AEx tb IIIC T100°C Db Zn 21 Ex tb IIIC T100°C Db DIP CI II, III Div 1 Gp E-G NI: CI I Zn 2 AEx nA IIC Gc CI I Zn 2 Ex nA IIC Gc NI CI I Div 2 Gp A-D

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Type of protection 6DR5ayb-*cdef-g*Ah-Zjjj	Ex marking ATEX-IECEx	Ex marking FM-CSA
Intrinsic safety, increased safety (non-incendive NI) and dust ignition protection by enclosure <ul style="list-style-type: none"> For c = K and b = 1, 2, 3, 5, 6 6DR4004-1ES Position Transmitter (Potentiometer) 6DR4004-2ES Position Transmitter (NCS) 6DR4004-3ES Position Transmitter (NCS, ILS) 6DR4004-4ES Position Transmitter (NCS, MLS) 	II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc II 3 G Ex ec IIC T6/T4 Gc II 2 D Ex ia IIIC T130°C Db II 2 D Ex tb IIIC T100°C Db	<u>FM</u> CI I Zn 1 AEx ib IIC T6/T4 Gb IS CI I Div 1, Gp A-D CI I Zn 2 AEx ec IIC T6/T4 Gb NI CI I Div 2 Gp A-D Zn 21 AEx ib IIIC Db T130°C IS CI I, II, III Div 1 Gp A-G Zn 21 AEx tb IIIC T100°C Db DIP CI II, III Div 1 Gp E-G <u>CSA</u> Ex ia IIC T6/T4 Gb Ex ic IIC T6/T4 Gc IS CI I Div 1, 2 Gp A-D Ex ec IIC T6/T4 Gc CI I Div 2 Gp A-D Ex ia IIIC T130°C Db CI II, III Div 1 Gp E-G Ex tb IIIC T100°C Db CI II, III Div 1 Gp E-G
Intrinsic safety and increased safety (non-incendive NI) <ul style="list-style-type: none"> For c = F and b = 1, 2, 3, 5, 6 	II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc II 3 G Ex ec IIC T6/T4 Gc II 2 D Ex ia IIIC T130°C Db	<u>FM</u> CI I Zn 1 AEx ib IIC T6/T4 Gb IS CI I Div 1, Gp A-D CI I Zn 2 AEx ec IIC T6/T4 Gb NI CI I Div 2 Gp A-D Zn 21 AEx ib IIIC Db T130°C IS CI I, II, III Div 1 Gp A-G <u>CSA</u> Ex ia IIC T6/T4 Gb Ex ic IIC T6/T4 Gc IS CI I Div 1, 2 Gp A-D Ex ec IIC T6/T4 Gc CI I Div 2 Gp A-D Ex ia IIIC T130°C Db CI II, III Div 1 Gp E-G
<ul style="list-style-type: none"> 6DR4004-6N**-0-*** Non-Contacting Sensor (NCS) 	II 2 G Ex ia IIC T6/T4 Gb II 3 G Ex ic IIC T6/T4 Gc II 2 D Ex ia IIIC T130°C Db II 3 G Ex ec IIC T6/T4 Gc	<u>IS</u> CI I Zn 1 AEx ib IIC Gb CI I Zn 1 Ex ib IIC Gb Zn 21 AEx ib IIIC T130°C Db Zn 21 Ex ib IIIC T130°C Db IS CI I, II, III Div 1 Gp A-G <u>NI</u> CI I Zn 2 AEx nA IIC Gc CI I Zn 2 Ex nA IIC Gc NI CI I Div 2 Gp A-D
Maximum permissible ambient temperature ranges	Temperature class T4	Temperature class T6
Positioners <ul style="list-style-type: none"> 6DR5ayb-0cdef-g*Ah-Z jjj 6DR5ayb-0cdef-g*Ah-Z M40 6DR5ayb-0cdef-g*Ah-Z jjj for a = 0, 2 and f = 0, 2 6DR5ayb-0cdef-g*Ah-Z M40 for a = 0, 2 and f = 0, 2 	-30 °C ≤ Ta ≤ +80 °C -40 °C ≤ Ta ≤ +80 °C -30 °C ≤ Ta ≤ +80 °C	-30 °C ≤ Ta ≤ +50 °C -40 °C ≤ Ta ≤ +50 °C -30 °C ≤ Ta ≤ +60 °C
Analog Output Module (AOM) <ul style="list-style-type: none"> Installed: 6DR5ayb-0cdef-g.Ah-Z ... for f = 1, 3 Can be retrofitted 6DR4004-6J Installed and can be retrofitted: 6DR5ayb-0cdef-g*Ah-Z M40 for f = 1, 3 	-30 °C ≤ Ta ≤ +80 °C -40 °C ≤ Ta ≤ +80 °C	- -
Position Transmitter <ul style="list-style-type: none"> Non-contacting sensor (NCS) 6DR4004-6N**-0-*** Position Transmitter (potentiometer) 6DR4004-1ES Position Transmitter (NCS) 6DR4004-2ES Position Transmitter (NCS, ILS) 6DR4004-3ES Position Transmitter (NCS, MLS) 6DR4004-4ES 	-40 °C ≤ Ta ≤ +90 °C -40 °C ≤ Ta ≤ +90 °C -40 °C ≤ Ta ≤ +90 °C -40 °C ≤ Ta ≤ +90 °C -40 °C ≤ Ta ≤ +90 °C	-40 °C ≤ Ta ≤ +70 °C -40 °C ≤ Ta ≤ +60 °C -40 °C ≤ Ta ≤ +50 °C -40 °C ≤ Ta ≤ +50 °C -40 °C ≤ Ta ≤ +50 °C

Positioners

SIPART PS2

Technical specifications

Booster

Operating conditions

Climatic class	According to IEC EN 60721-3
• Storage	1K5, but -40 ... +80 °C (1K5, but -40 ... +176 °F)
• Transport	2K4, but -40 ... +80 °C (2K4, but -40 ... +176 °F)
Vibration resistance	
• Harmonic oscillations	According to ISA-S75.13
• Bumping (half-sine) according to EN 60068-2-27/02.2010	150 m/s ² (492 ft/s ²), 6 ms, 1 000 shocks/axis



Design

Booster weight	
• Single-acting	
- Optional module for standard enclosure	2.9 kg (6.5 lb)
- Installed with polycarbonate enclosure	4.0 kg (8.8 lb)
- Optional module for flameproof aluminum enclosure	3.3 kg (7.3 lb)
- Installed with flameproof aluminum enclosure	7.9 kg (17.4 lb)
• Double-acting	
- Optional module for standard enclosure	4.3 kg (9.4 lb)
- Installed with polycarbonate enclosure	5.3 kg (11.7 lb)
- Optional module for flameproof aluminum enclosure	4.7 kg (10.4 lb)
- Installed with flameproof aluminum enclosure	9.3 kg (20.5 lb)
Connections	
• Pneumatic	½-14 NPT or G½

Pneumatic data

Auxiliary power (inlet air)	Compressed air, carbon dioxide (CO ₂), nitrogen (N ₂), noble gases or cleaned natural gas
• Pressure	1.4 ... 7 bar (20.3 ... 101.5 psi)
• Inlet air	According to ISO 8573-1
• Air consumption	1.2 × 10 ⁻² Nm ³ /h (0.007SCFM)
Pressure gauge	Stainless steel enclosure MPa, bar, psi Type of protection IP54
Flow capacity	Cv = 2.0


Selection and ordering data

	Article No.	Order code		Article No.	Order code
SIPART PS2 electropneumatic positioner	6DR5			6DR5	
					
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Version					
4 ... 20 mA	0				
4 ... 20 mA, HART	1	1)			
4 ... 20 mA, HART, (3-, 4-wire)	2				
4 ... 20 mA (3-/4-wire)	3	N			
PROFIBUS PA	5				
FOUNDATION Fieldbus	6				
Without electronics (for 19" remote variant)	9				
Actuator					
Single-acting	1				
Double-acting	2				
Enclosure					
Polycarbonate, glass-fiber reinforced ²⁾	0				
Stainless steel, without inspection window, 1.4581	2				
Aluminum, AlSi12	3				
Type of protection (Ex)					
Without explosion protection		N			
Increased safety (Ex e) ³⁾ , Dust ignition protection by enclosure (Ex t) ³⁾		D			
Intrinsic safety (Ex i)		E			
Intrinsic safety (Ex i), Increased safety (Ex e) ³⁾		F			
Increased safety (Ex e) ³⁾		G			
Intrinsic safety (Ex i), Increased safety (Ex e) ³⁾ , Dust ignition protection by enclosure (Ex t) ³⁾		K			
Connection thread electric/ pneumatic					
M20x1.5/G¼		G			
½-14 NPT / ¼-18 NPT		N			
M20x1.5/¼-18 NPT		M			
½-14 NPT / G¼		P			
M12 device plug (A coding) for electronics ⁴⁾ / G¼ The M12 cable socket can be ordered separately with 6DR4004-5A.		R			
M12 device plug (A coding) for electronics ⁴⁾ / ¼-18 NPT The M12 cable socket can be ordered separately with 6DR4004-5A		S			
Limit monitor Including 2nd cable gland					
None				0	
Digital I/O Module (DIO), 1 digital input, 3 digital outputs (2 limits min. or max., 1 fault indicator). Device plug M12 optionally orderable with -Z D55.				1	
Inductive Limit Switches (ILS), 2 inductive limit switches and 1 digital output (DQ). Device plug M12 optionally orderable with -Z D56.				2	
Mechanic Limit Switches (MLS), 2 mechanical limit switches and 1 digital output (DQ). Not applicable for natural gas applications. Device plug M12 optionally orderable with -Z D57.				3	
Internal NCS module for non-contacting position detection for actuators > 14 mm. The internal position detection is not applied but can be ordered in addition with -Z K11.				9	L 1 A
Option modules Including 2nd cable gland					
None				0	
Analog Output Module (AOM), analog position feedback 4 ... 20 mA. Device plug M12 optionally orderable with -Z D53.				1	
Analog Input Module (AIM) to connect external position detection systems, e. g. NCS Sensor, Position Transmitter 6DR4004-1ES/2ES/3ES/4ES or other sensors. The internal position detection is not applied but can be ordered in addition with -Z K11. Device plug M12 optionally orderable with -Z D54.				2	
Analog Output Module (AOM) and Analog Input Module (AIM). The internal position detection is not applied but can be ordered in addition with -Z K11. Device plug M12 is not available.				3	
Brief instructions					
English/German/Chinese					A
French/Italian/Spanish					B
Version					
Standard / Fail Safe					A
• Depressurizing the actuator in case of failure of electrical auxiliary power					F
Fail in Place					F
• Maintain position in case of failure of electrical and/or pneumatic auxiliary power					G
Fail to Open					G
• Pressurizing of the actuator in case of failure of electrical auxiliary power					G

Positioners

SIPART PS2

Selection and ordering data

	Article No.	Order code	Options	Order code
SIPART PS2 electropneumatic positioner 	6DR5		Append suffix "-Z" to Article No., add order code and plain text.	
Gauge block None		0	Stainless steel sound absorber Standard with stainless steel enclosures	A40
With gauges made of plastic IP31 (MPa, bar)			Functional Safety (SIL 2) for 6DR5.1* only (single-acting positioner) Device suitable for use according to IEC 61508 and IEC 61511.	C20
<ul style="list-style-type: none"> Block made of aluminum, single-acting, G$\frac{1}{4}$ Block made of aluminum, double-acting, G$\frac{1}{4}$ 		1	M12 device plug (D coding) The M12 cable socket can be ordered separately with 6DR4004-5D.	
With gauges made of plastic IP31 (MPa / psi)			Connected with Analog Output Module (AOM)	D53
<ul style="list-style-type: none"> Block made of aluminum, single-acting, $\frac{1}{4}$-18 NPT Block made of aluminum, double-acting, $\frac{1}{4}$-18 NPT 		2	Connected with Analog Input Module (AIM)	D54
With gauges made of metal IP44 (MPa, bar, psi)			Connected with Digital I/O Module (DIO)	D55
<ul style="list-style-type: none"> Block made of aluminum, single-acting, G$\frac{1}{4}$ Block made of aluminum, double-acting, G$\frac{1}{4}$ 		3	Connected with Inductive Limit Switches (ILS)	D56
<ul style="list-style-type: none"> Block made of aluminum, single-acting, $\frac{1}{4}$-18 NPT Block made of aluminum, double-acting, $\frac{1}{4}$-18 NPT 		4	Connected with Mechanic Limit Switches (MLS)	D57
With gauges made of stainless steel IP54 (MPa, bar, psi)			Fail in Place Maintain position in case of failure of electrical and/or pneumatical auxiliary power	F01
<ul style="list-style-type: none"> Block made of stainless steel 316, single-acting, G$\frac{1}{4}$ Block made of stainless steel 316, double-acting, G$\frac{1}{4}$ Block made of stainless steel 316, single-acting, $\frac{1}{4}$-18 NPT Block made of stainless steel 316, double-acting, $\frac{1}{4}$-18 NPT 		9	Optimized control behavior for small actuators (< 200 cm3)	K10
		R 1 A	Additional internal position detection by means of a potentiometer	K11
		R 2 A	Pneumatic terminal strip made of stainless steel 316	K18
		R 1 B	Interface according to VDI/VDE 3847 For single- and double-acting, with CATS (Clean Air To Spring) only for single-acting. Not for flameproof enclosures.	K20
		R 2 B	Operation with natural gas Device is optimized for natural gas operation. Exhaust air (natural gas) cannot be dissipated collectively.	K50
		R 1 C	Permitted ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F) For 6DR5..1*, 6DR5..2*, 6DR5..3*: Lid without inspection window	M40
		R 2 C	Pressure sensor supported monitoring/diagnostics	
		R 1 D	Monitoring of the device/user-specific min./max. supply pressure Pz.	P01
		R 2 D	Hold position on demand. Messages according to Namur NE107.	
* Can be ordered on request:		*	Monitoring of the device/user-specific min./max. supply pressure PZ.	P02
Gauge block 316 with gauge IP65, 316L (MPa, bar, psi)		*	Hold position on demand.	
		*	Valve Signature, Partial Stroke Test, monitoring of leakage and positioning pressure (triggered), positioning pressure limitation for single acting. Messages according to Namur NE107.	
Venting gauge block			Marine approval	
Depressurizing of Y2 on compressed air failure with gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.			DNV GL (Det Norske Veritas & Germanischer Lloyd)	S10
<ul style="list-style-type: none"> Block made of aluminum, double-acting, G$\frac{1}{4}$ Block made of aluminum, double-acting, $\frac{1}{4}$-18 NPT 		9	LR (Lloyds Register)	S11
		R 2 E	BV (Bureau Veritas)	S12
		R 2 F	ABS (American Bureau of Shipping)	S14
Booster (Cv = 2)			KR (Korean Register of Shipping)	S15
Aluminum with gauges made of metal IP44 (MPa, bar, psi)			CCS (China Classification Society)	S16
<ul style="list-style-type: none"> Single-acting, G$\frac{1}{2}$ Double-acting, G$\frac{1}{2}$ Single-acting, $\frac{1}{2}$-14 NPT Double-acting, $\frac{1}{2}$-14 NPT 		9	RINA (Registro Italiano Navale)	S17
		R 1 J	TAG plate made of stainless steel, 3-line	A20
		R 2 J	Text line 1: Plain text from Y17 Text line 2: Plain text from Y15 Text line 3: Plain text from Y16	
		R 1 K	Measuring point description	Y15
		R 2 K	Input field: Max. 16 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA; specify in plain text	

1) Explosion protection Ex i only available in connection with order option -Z P01/P02

2) Only for type of protection Ex i

3) Impact energy on inspection window max. 2 joule for aluminum enclosure 6DR5..3.

4) Device plug M12 mounted and electrically connected in versions 6DR50.., 6DR51.., 6DR55.. and 6DR56..

Options	Order code
Measuring point text Input field: Max. 24 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA; specify in plain text	Y16
Measuring point number (TAG no.) Input field: Max. 32 characters; specify in plain text	Y17
Preset bus address Input field: Specify in plain text (for 6DR55.. and 6DR56.. only)	Y25
Customer-specific parameter setting Input field: Specify in plain text	Y30
Special design / Product Variant Request (PVR) Input field: Specify order number from PVR clarification in plain text Examples: • Conformal Coating / Tropicalization • Gauge block with IP65 gauge • SIPART PS2 for part-turn applications up to 180° Creation of a "Product Variant Request" is a prerequisite.	Y99 VP001 VP002 VP003

Rating plate and TAG plate made of stainless steel

<p>SIEMENS</p> <p>SIPART PS2</p> <p>6DR5010-0NG00-0AA0 SW: 5.01.00</p> <p>-Z Y15+Y16+Y17+A20</p> <p style="text-align: center;">Iw=4...20mA</p> <p style="text-align: center;">Siemens AG, DE-76181 Karlsruhe www.siemens.com/sipartps2</p> <p style="text-align: center;">MADE IN FRANCE</p>	<p>IP66 / Type 4X</p> <p>p = 1.4 ... 7 bar</p> <p>Ta = -30°C...+80°C</p> <p>Y15: YYYYYYYYYYYYYYYYYYYY</p> <p>Y16: ZZZZZZZZZZZZZZZZZZZZZ</p> <p>Y17: XXXXXXXXXXXXXXXXXXXXXXX</p> <p style="text-align: right;">I_{max}=100mA U_{max}=35VDC</p>	<div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> DIO <input type="checkbox"/> NCS <input type="checkbox"/> ILS <input type="checkbox"/> AIM <input type="checkbox"/> MLS <input type="checkbox"/> AOM </div> </div> <p>S/N: N1A6101234567</p>
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Y17:XXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

○ Y15:YYYYYYYYYYYYYYYYYYYYYYYYYY ○


Y16:ZZZZZZZZZZZZZZZZZZZZZZZZZZZZZZ

Positioners SIPART PS2

Selection and ordering data

	Article No.	Order code		Article No.	Order code
SIPART PS2 electropneumatic positioner, in flameproof enclosure 	6DR5	- 0		6DR5	- 0
<p>↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</p>					
Version 4 ... 20 mA 4 ... 20 mA, HART ¹⁾ 4 ... 20 mA, HART, (3-, 4-wire) 4 ... 20 mA (3-/4-wire) PROFIBUS PA FOUNDATION Fieldbus Without electronics (for 19" remote variant)	0 1 2 3 5 6 9				
Actuator Single-acting Double-acting	1 2				
Enclosure Aluminum, flameproof, AISi12 Stainless steel, 316L, flameproof, 1.4409	5 6				
Type of protection (Ex) Without explosion protection Flameproof enclosure (Ex d), Dust ignition protection by enclosure (Ex t) Intrinsic safety (Ex i), increased safety (Ex e) Increased safety (Ex e) Intrinsic safety (Ex i), Increased safety (Ex e), Dust ignition protection by enclosure (Ex t) Flameproof enclosure (Ex d), Dust ignition protection by enclosure (Ex t), Intrinsic safety (Ex i)	N E F G K P				
Connection thread electric/pneumatic M20x1.5/G¼ ½-14 NPT / ¼-18 NPT M20x1.5/¼-18 NPT ½-14 NPT / G¼ M25x1.5/G¼	G N M P Q				
SIPART PS2 electropneumatic positioner, in flameproof enclosure 					
Limit monitor None Digital I/O Module (DIO), 1 digital input, 3 digital outputs (2 limits min. or max., 1 fault indicator). Inductive Limit Switches (ILS), 2 inductive limit switches and 1 digital output (DQ). Mechanic Limit Switches (MLS), 2 mechanical limit switches and 1 digital output (DQ). Not applicable for natural gas applications. Internal NCS module for non-contacting position detection for actuators > 14 mm. The internal position detection is not applied but can be ordered in addition with -Z K11.		0 1 2 3 9			L 1 A
Option modules None Analog Output Module (AOM), analog position feedback 4 ... 20 mA. Analog Input Module (AIM) to connect external position detection systems, e. g. NCS Sensor, Position Transmitter 6DR4004-1ES/2ES/3ES/4ES or other sensors. The internal position detection is not applied but can be ordered in addition with -Z K11. Analog Output Module (AOM) and Analog Input Module (AIM). The internal position detection is not applied but can be ordered in addition with -Z K11.		0 1 2 3			
Brief instructions English/German/Chinese French/Italian/Spanish					A B
Version Standard / Fail Safe • Depressurizing the actuator in case of failure of electrical auxiliary power Fail in Place • Maintain position in case of failure of electrical and/or pneumatic auxiliary power Fail to Open • Pressurizing of the actuator in case of failure of electrical auxiliary power					A F G

5

	Article No.	Order code	Options	Order code
SIPART PS2 electropneumatic positioner, in flameproof enclosure 	6DR5 - 0 - 0		Append suffix "-Z" to Article No., add order code and plain text.	
				Functional Safety (SIL 2) for 6DR5.1* (only single-acting positioner) Device suitable for use according to IEC 61508 and IEC 61511.
			Fail in Place Maintain position in case of failure of electrical and/or pneumatic auxiliary power	F01
			Optimized control behavior for small actuators (< 200 cm³)	K10
			Additional internal position detection by means of a potentiometer	K11
			Pneumatic terminal strip made of stainless steel 316	K18
			Operation with natural gas Device is optimized for natural gas operation. Exhaust air (natural gas) cannot be dissipated collectively.	K50
			Permitted ambient temperature during operation -40 ... 80 °C (-40 ... +176 °F) For 6DR5..1*, 6DR5..2*, 6DR5..3*: Lid without inspection window	M40
			Pressure sensor supported monitoring/diagnostics	
			Monitoring of the device/user-specific min./max. supply pressure Pz. Hold position on demand. Messages according to Namur NE107.	P01
			Monitoring of the device/user-specific min./max. supply pressure PZ. Hold position on demand. Valve Signature, Partial Stroke Test, monitoring of leakage and positioning pressure (triggered), positioning pressure limitation for single acting. Messages according to Namur NE107.	P02
			Marine approval	
			DNV GL (Det Norske Veritas & Germanischer Lloyd)	S10
			LR (Lloyds Register)	S11
			BV (Bureau Veritas)	S12
			ABS (American Bureau of Shipping)	S14
			KR (Korean Register of Shipping)	S15
			CCS (China Classification Society)	S16
			RINA (Registro Italiano Navale)	S17
			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
			Measuring point description Input field: Max. 16 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA; specify in plain text	Y15
			Measuring point text Input field: Max. 24 characters for HART, max. 32 characters for PROFIBUS PA, FOUNDATION Fieldbus and 4 ... 20 mA; specify in plain text	Y16
			Measuring point number (TAG no.) Input field: Max. 32 characters; specify in plain text	Y17
			Preset bus address Input field: Specify in plain text (for 6DR55.. and 6DR56.. only)	Y25
			Customer-specific parameter setting Input field: Specify in plain text	Y30
			Special design / Product Variant Request (PVR) Input field: Specify order number from PVR clarification in plain text Examples: <ul style="list-style-type: none"> Conformal Coating / Tropicalization Gauge block with IP65 gauge SIPART PS2 for part-turn applications up to 180° Creation of a "Product Variant Request" is a prerequisite.	Y99
				VP001
				VP002
				VP003
Gauge block None		0		
With gauges made of plastic IP31 (MPa, bar)				
<ul style="list-style-type: none"> Block made of aluminum, single-acting, G¼ 		1		
<ul style="list-style-type: none"> Block made of aluminum, double-acting, G¼ 		2		
With gauges made of plastic IP31 (MPa / psi)				
<ul style="list-style-type: none"> Block made of aluminum, single-acting, ¼-18 NPT 		3		
<ul style="list-style-type: none"> Block made of aluminum, double-acting, ¼-18 NPT 		4		
With gauges made of metal IP44 (MPa, bar, psi)				
<ul style="list-style-type: none"> Block made of aluminum, single-acting, G¼ 		9 R 1 A		
<ul style="list-style-type: none"> Block made of aluminum, double-acting, G¼ 		9 R 2 A		
<ul style="list-style-type: none"> Block made of aluminum, single-acting, ¼-18 NPT 		9 R 1 B		
<ul style="list-style-type: none"> Block made of aluminum, double-acting, ¼-18 NPT 		9 R 2 B		
With gauges made of stainless steel IP54 (MPa, bar, psi)				
<ul style="list-style-type: none"> Block made of stainless steel 316, single-acting, G¼ 		9 R 1 C		
<ul style="list-style-type: none"> Block made of stainless steel 316, double-acting, G¼ 		9 R 2 C		
<ul style="list-style-type: none"> Block made of stainless steel 316, single-acting, ¼-18 NPT 		9 R 1 D		
<ul style="list-style-type: none"> Block made of stainless steel 316, double-acting, ¼-18 NPT 		9 R 2 D		
* Can be ordered on request:		*	*	*
Gauge block 316 with gauge IP65, 316L (MPa, bar, psi)				
Venting gauge block				
Depressurizing of Y2 on compressed air failure with gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.				
<ul style="list-style-type: none"> Block made of aluminum, double-acting, G¼ 		9 R 2 E		
<ul style="list-style-type: none"> Block made of aluminum, double-acting, ¼-18 NPT 		9 R 2 F		
Booster (Cv = 2)				
Aluminum with gauges made of metal IP44 (MPa, bar, psi)				
<ul style="list-style-type: none"> Single-acting, G½ 		9 R 1 P		
<ul style="list-style-type: none"> Double-acting, G½ 		9 R 2 P		
<ul style="list-style-type: none"> Single-acting, ½-14 NPT 		9 R 1 Q		
<ul style="list-style-type: none"> Double-acting, ½-14 NPT 		9 R 2 Q		

¹⁾ Explosion protection Ex i only available in connection with order option -Z P01/P02

Positioners

SIPART PS2

Selection and ordering data

Accessories

Sensors and modules for remote variants

NCS sensor

	Article No.
NCS sensor For contact-free position detection (not for Ex d version) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	6DR4004-N0
Explosion protection Non-explosion-proof In type of protection <ul style="list-style-type: none"> • Intrinsic safety • Non-sparking 	8 6
Cable length 6 m (19.68 ft) 20 m (65.67 ft) 40 m (131.23 ft)	N P R
Actuator type Linear actuator for stroke ≤ 14 mm (0.55 inch) Mounting is actuator-specific. Namur mounting kit 6DR4004-8V can be used as basis. Linear actuator for strokes ≥ 14 ... 130 mm (0.55 ... 5.12 inch) Mounting is actuator-specific. For mounting, the mounting kit 6DR4004-8V or the long lever 6DR4004-8L in addition can be used, depending on the stroke. Part-turn actuator, magnet holder made of anodized aluminum A Namur mounting console can be ordered separately with 6DR4004-1D/-2D/-3D/-4D.	2 3 4

Position Transmitter

- Review technical data for explosion protection (ATEX / IECEx / FM / CSA / not Ex d).
- SIPART PS2 externally mounted in protected area.
- Prerequisite: SIPART PS2 with integrated Analog Input Module (AIM) as order option or retrofit with 6DR4004-6F/-8F.
- Variant with cable and cable socket M12 stainless steel 6DR4004-5D on request

	Article No.
Position Transmitter (potentiometer) In aluminum enclosure with potentiometer, without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-1ES
Position Transmitter (NCS) Aluminum enclosure with non-contacting position detection (NCS), without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-2ES
Position Transmitter (NCS, ILS) In aluminum enclosure with non-contacting position detection (NCS) and inductive limit switches (ILS), without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-3ES
Position Transmitter (NCS, MLS) In aluminum enclosure with non-contacting position detection (NCS) and mechanic limit switches (MLS), without electronics, without pneumatic block, for separate mounting of position detection on actuator.	6DR4004-4ES

Additional accessories

	Article No.
Control unit for 3x SIPART PS2 4 ... 20 mA 19" control unit with 3x electronics, 2-wire, 4 ... 20 mA, for remote installation of the electronics for the SIPART PS2 positioner 6DR59* in the protected area (e.g. against radiation, dirt, temperature, etc.)	A5E00151560
Control unit for 5x SIPART PS2 PA 19" control unit including 5x PROFIBUS PA module, for remote installation of the electronics of the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.), order 1x plug panel A5E00252845 or A5E00252830 separately.	A5E00250501
Control unit for 10x SIPART PS2 PA 19" control unit including 10x PROFIBUS PA module, for remote installation of the electronics of the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.), order 2x plug panel A5E00252845 or A5E00252830 separately.	A5E00250502
Control unit for 15x SIPART PS2 PA 19" control unit including 15x PROFIBUS PA module, for remote installation of the electronics of the SIPART PS2 6DR59* in a protected area (e.g. against radiation, dirt, temperature, etc.), order 3x plug panel A5E00252845 or A5E00252830 separately.	A5E00250503
Plug panel for control unit (50) Plug panel (back panel) for 19" PROFIBUS PA control unit with Burndy 50 plug (50 pins) to connect a max. of 5 pcs of SIPART PS2 w/o electronic board (6DR59*). The Burndy 50 cable socket is already included in the scope of delivery. Order in addition: 1x for A5E00250501, 2x for A5E00250502 and 3x for A5E00250503.	A5E00252845
Plug panel for control unit (50+8) Plug panel (back panel) for 19" PROFIBUS PA control unit with Burndy 50 plug (50 pins) to connect a max. of 5 pcs of SIPART PS2 w/o electronic (6DR59*). Additional Burndy 8 plug (8 pins) to link communication between control units. The Burndy 50 cable socket is already included in the scope of delivery. Order in addition: 1x for A5E00250501, 2x for A5E00250502 and 3x for A5E00250503.	A5E00252830
Analog Input Module (AIM) For connecting external position detection systems to the SIPART PS2, for example Position Transmitter 6DR4004-1ES/2ES/3ES/4ES, NCS sensor or others. <ul style="list-style-type: none"> • With explosion protection • Without explosion protection 	6DR4004-6F 6DR4004-8F
Digital I/O Module (DIO) 1 digital input, 3 digital outputs (2 limits min. or max., 1 fault indicator) <ul style="list-style-type: none"> • With explosion protection • Without explosion protection 	6DR4004-6A 6DR4004-8A
Inductive Limit Switches (ILS) 2 inductive limit switches and 1 digital output (DQ) <ul style="list-style-type: none"> • With explosion protection • Without explosion protection 	6DR4004-6G 6DR4004-8G
Mechanic Limit Switches (MLS) 2 mechanic limit switches and 1 digital output (DQ). Not applicable for natural gas applications! <ul style="list-style-type: none"> • With explosion protection • Without explosion protection 	6DR4004-6K 6DR4004-8K
Analog Output Module (AOM) For analog position feedback 4 ... 20 mA <ul style="list-style-type: none"> • With explosion protection • Without explosion protection 	6DR4004-6J 6DR4004-8J

	Article No.		Article No.
Internal NCS module For non-contacting position detection, for installation in the SIPART PS2		Mounting kit for NAMUR part-turn actuators	
• Without explosion protection	6DR4004-5L	VDI/VDE 3845, with plastic coupling wheel, without mounting console	6DR4004-8D
• With explosion protection	6DR4004-5LE	VDI/VDE 3845, with stainless steel coupling, without mounting console	TGX:16300-1556
Overvoltage protection		Console to mount the SIPART PS2, NCS sensor or Position Transmitter on NAMUR part-turn actuators VDI/VDE 3845	
Overvoltage protection up to 6 kV for 2-wire, M20 x 1.5	6DR4004-1LP	• 80 x 30 x 20 mm (3.15 x 1.18 x 0.79 inch)	6DR4004-1D
Overvoltage protection up to 6 kV for 3-wire, M20 x 1.5	6DR4004-2LP	• 80 x 30 x 30 mm (3.15 x 1.18 x 1.18 inch)	6DR4004-2D
Overvoltage protection up to 6 kV for 4-wire, M20 x 1.5	6DR4004-3LP	• 130 x 30 x 30 mm (5.12 x 1.18 x 1.18 inch)	6DR4004-3D
Overvoltage protection up to 6 kV for PA/FF, M20 x 1.5	6DR4004-4LP	• 130 x 30 x 50 mm (5.12 x 1.18 x 1.97 inch)	6DR4004-4D
Cable socket M12 stainless steel		Mounting kit for other part-turn actuators	
A-coding, for cable mounting (0.25 ... 0.5 mm ²). The cable socket can be connected to SIPART PS2 with M12 device plug.	6DR4004-5A	The following mounting consoles can be used together with the NAMUR part-turn actuator mounting kit 6DR4004-8D.	
D-coding, for cable mounting (0.25 ... 0.5 mm ²). The cable socket can be connected to SIPART PS2 with M12 device plug.	6DR4004-5D	SPX (DEZURIK) Power Rack, sizes R1, R1A, R2 and R2A	TGX:16152-328
Gauge block		Masoneilan Camflex II	TGX:16152-350
With gauges made of plastic IP31 (MPa, bar)		Fisher 1051/1052/1061, sizes 30, 40, 60 to 70	TGX:16152-364
• Block made of aluminum, single-acting, G ¹ / ₄	6DR4004-1M	Fisher 1051/1052, size 33	TGX:16152-348
• Block made of aluminum, double-acting, G ¹ / ₄	6DR4004-2M		
With gauges made of plastic IP31 (MPa, psi)		Mounting kit for NAMUR linear actuators	
• Block made of aluminum, single-acting, ¼-18 NPT	6DR4004-1MN	NAMUR linear actuator mounting kit with short lever arm (2 ... 35 mm (0.08 ... 1.38 inch))	6DR4004-8V
• Block made of aluminum, double-acting, ¼-18 NPT	6DR4004-2MN	Lever arm for strokes of 35 ... 130 mm (1.38 ... 5.12 inch) without NAMUR mounting bracket	6DR4004-8L
With gauges made of metal IP44 (MPa, bar, psi)		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
• Block made of aluminum, single-acting, G ¹ / ₄	6DR4004-1P	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
• Block made of aluminum, double-acting, G ¹ / ₄	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 IP54 (MPa, bar, psi)		Mounting console, stainless steel 316L	6DR4004-8R
• Block made of stainless steel 316, single-acting, G ¹ / ₄	6DR4004-1Q	Robust design to support extended loads like SIPART PS2 in a flameproof stainless steel 316L enclosure or as a variant with the booster. The console gets mounted and therefore supported by both stands of the actuator.	
• Block made of stainless steel 316, double-acting, G ¹ / ₄	6DR4004-2Q	Tapered roller made of stainless steel 316 for replacing the tapered roller made of plastic in the mounting kits 6DR4004-8V, -8VK, -8VL	6DR4004-3N
• Block made of stainless steel 316, single-acting, ¼-18 NPT	6DR4004-1QN	Terminal blocks made of stainless steel 316 for replacement of the aluminum terminal blocks in the 6DR4004-8V, -8VK and -8VL mounting kits	6DR4004-3M
• Block made of stainless steel 316, double-acting, ¼-18 NPT	6DR4004-2QN		
Gauge block 316 with gauge IP65, 316L (MPa, bar, psi)	Can be ordered on request		
Venting gauge block		Mounting kit for other linear actuators	
Depressurizing of Y2 on compressed air failure with gauges made of metal IP44 (MPa, bar, psi). The double-acting actuator with springs moves into the safety position.		MASONEILAN type 87/88	TGX:16152-1210
• Block made of aluminum, double-acting, G ¹ / ₄	6DR4004-2RE	MASONEILAN type 37/38, all sizes	TGX:16152-1215
• Block made of aluminum, double-acting, ¼-18 NPT	6DR4004-2RF	Fisher type 657/667, sizes 30 ... 80	TGX:16152-900
Booster (Cv = 2)		Samson actuator type 3277	6DR4004-8S
Aluminum with gauges made of metal IP44 (MPa, bar, psi)		Yoke dimension = 101 mm (integrated connection without tube), not for Ex d	
For SIPART PS2 enclosure variants 6DR5..0/2/3* (non-flameproof enclosure)		Pneumatic terminal strip made of stainless steel 316	
• Single-acting, G ¹ / ₂	6DR4004-1RJ	As spare part or to replace the pneumatic terminal strip made of aluminum	
• Double-acting, G ¹ / ₂	6DR4004-2RJ	• Single-acting, G ¹ / ₄	6DR4004-1R
• Single-acting, ½-14 NPT	6DR4004-1RK	• Double-acting, G ¹ / ₄	6DR4004-2R
• Double-acting, ½-14 NPT	6DR4004-2RK	• Single-acting, ¼-18 NPT	6DR4004-1RN
For SIPART PS2 enclosure variants 6DR5..5/6* (flameproof enclosure)		• Double-acting, ¼-18 NPT	6DR4004-2RN
• Single-acting, G ¹ / ₂	6DR4004-1RP		
• Double-acting, G ¹ / ₂	6DR4004-2RP	Connection block	
• Single-acting, ½-14 NPT	6DR4004-1RQ	For safety solenoid valve with extended mounting flange according to NAMUR	
• Double-acting, ½-14 NPT	6DR4004-2RQ	• For mounting according to IEC 534-6	6DR4004-1B
		• For SAMSON actuator (integrated mounting), see above ¹⁾	6DR4004-1C
Interface according to VDI/VDE 3847	6DR4004-5PB		
For single- and double-acting, with CATS (Clean Air To Spring) only for single-acting, not for flameproof enclosures		SITRANS I100 isolating power supply HART	7NG4124-1AA00
		With 24 V DC auxiliary power (see "SITRANS I supply units and isolation amplifiers")	

Positioners

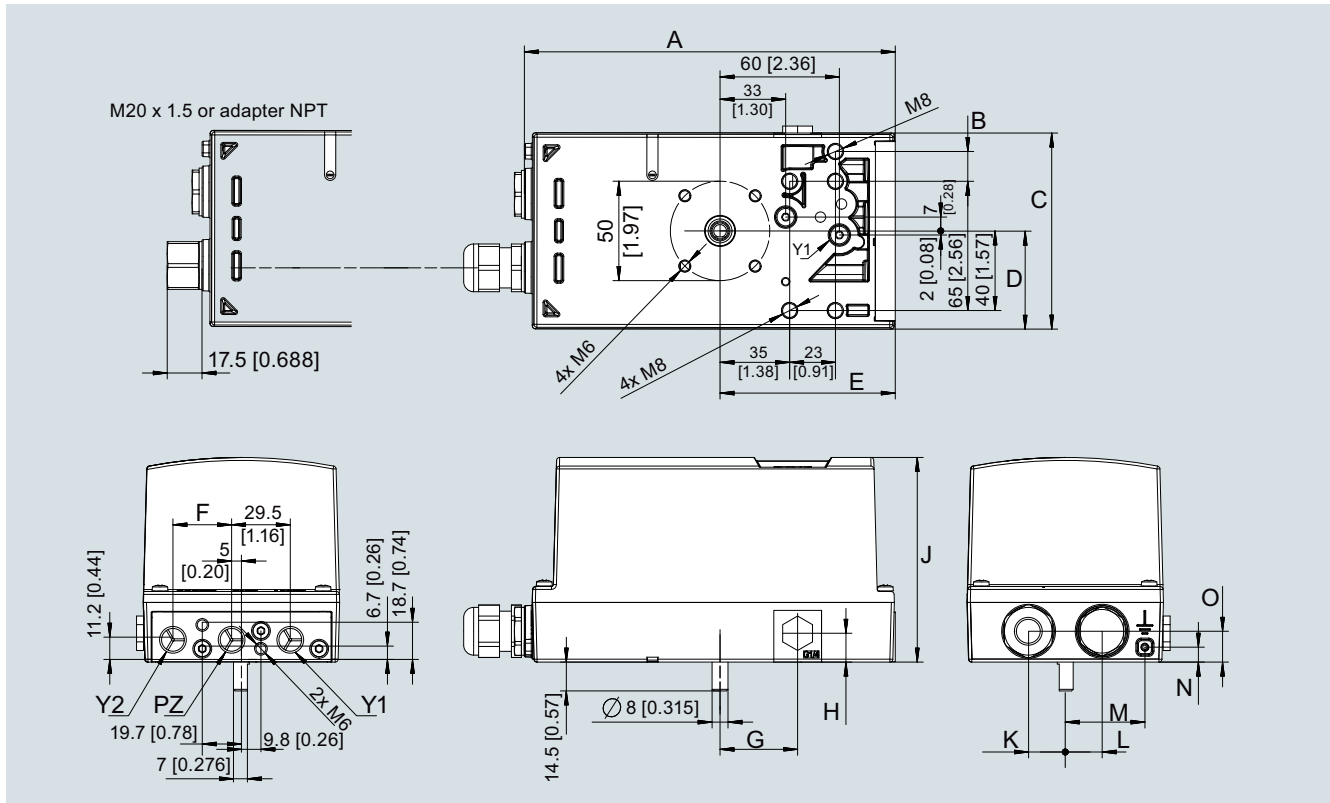
SIPART PS2

Selection and ordering data

	Article No.
SITRANS I200 output isolator HART With 24 V DC auxiliary power (see "SITRANS I supply units and isolation amplifiers")	7NG4131-0AA00
HART modem with USB interface	7MF4997-1DB
SIPART PS2 / PS100 demo case	6DR4004-5DE

¹⁾ Only together with 6DR4004-8S

Dimensional drawings



SIPART PS2, non-flameproof enclosure, dimensions in mm (inch)

Value	6DR5..0		6DR5..1	6DR5..2	6DR5..3	
	G $\frac{1}{4}$	$\frac{1}{4}$ -18 NPT			G $\frac{1}{4}$	$\frac{1}{4}$ -18 NPT
A	184.5 (7.26)	186.5 (7.34)	185 (7.28)	186.5 (7.34)	186.5 (7.34)	188.5 (7.42)
B	-	-	-	15 (0.59)	-	-
C	95 (3.74)	84 (3.31)	99 (3.90)	98.6 (3.88)	98.6 (3.88)	98.6 (3.88)
D	48 (1.89)	34.5 (1.36)	49.5 (1.95)	48.6 (1.91)	48.6 (1.91)	48.6 (1.91)
E	88.5 (3.48)	88.8 (3.50)	88.5 (3.48)	88.5 (3.48)	88.8 (3.50)	88.8 (3.50)
F ¹⁾	29.5 (1.16)	-	29.5 (1.16)	29.5 (1.16)	29.5 (1.16)	29.5 (1.16)
G	39 (1.54)	44 (1.73)	39 (1.54)	39 (1.54)	39 (1.54)	39 (1.54)
H	14.5 (0.57)	16 (0.63)	16 (0.63)	16 (0.63)	14.5 (0.57)	14.5 (0.57)
J	96.6 (3.80)	96.6 (3.80)	98.5 (3.88)	103 (4.06)	103 (4.06)	103 (4.06)
K	18.5 (0.73)	22 (0.87)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)
L	18.5 (0.73)	7 (0.23)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)	18.5 (0.73)
M	-	26.5	41.5	40	40	40
N	-	7.5	7.5	7.5	7.5	7.5
O	14.5 (0.57)	14.5 (0.57)	14.5 (0.57)	14.5 (0.57)	15.5 (0.61)	15.5 (0.61)
P	> 150 (5.91)					

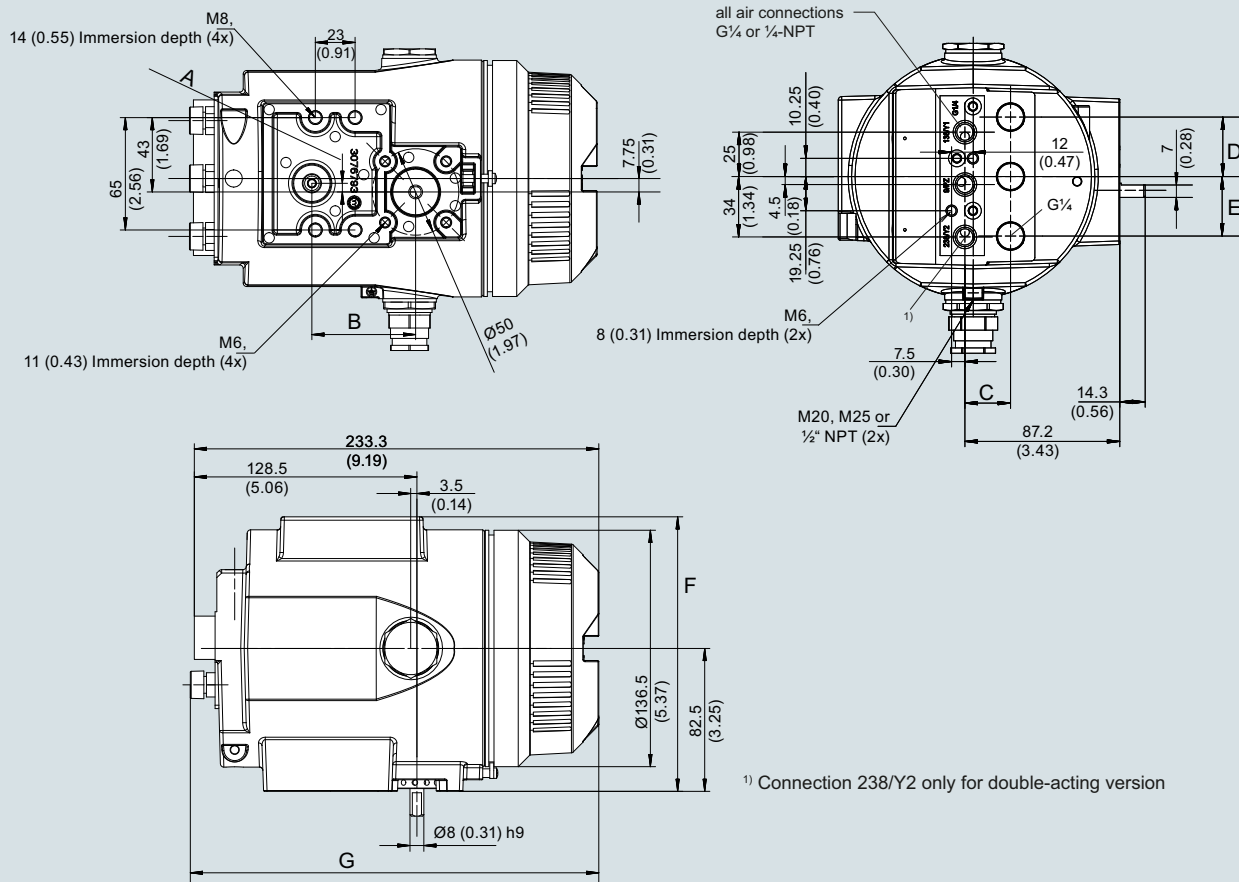
Adhere to this minimum clearance P for service and maintenance above the lid.

¹⁾ Dimension applies only to double-acting drives

6DR5..0	Polycarbonate enclosure; dimensions with pneumatic connection G $\frac{1}{4}$ or $\frac{1}{4}$ -18 NPT
6DR5.11	Aluminum enclosure, only single-acting
6DR5..2	Stainless steel enclosure, without inspection window
6DR5..3	Aluminum enclosure; dimensions with pneumatic connection G $\frac{1}{4}$ or $\frac{1}{4}$ -18 NPT

Positioners SIPART PS2

Dimensional drawings

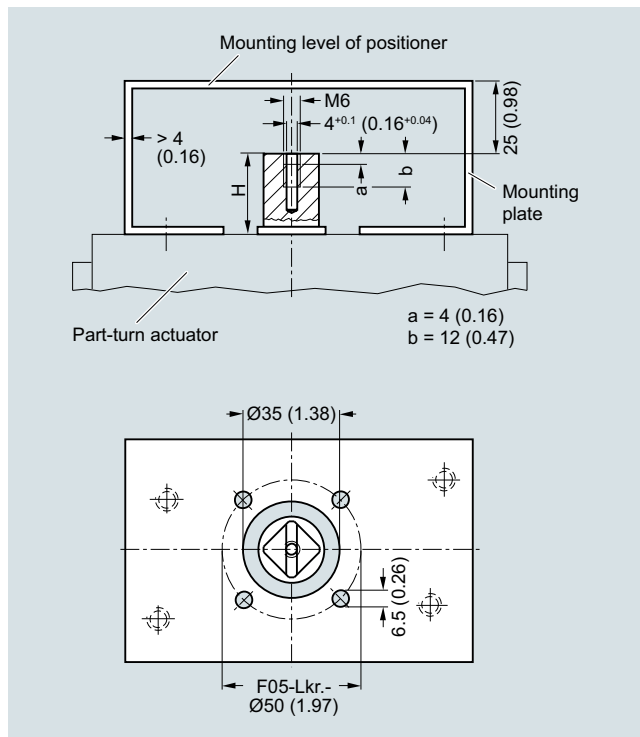


SIPART PS2, flameproof enclosure, dimensions in mm (inch)

Value	6DR5..5	6DR5..6
A	5 (0.2)	-
B	60 (2.36)	-
C	25.7 (1.01)	21.7 (0.85)
D	33.5 (1.32)	25 (0.99)
E	33.5 (1.32)	-
F	158.5 (6.24)	160 (6.3)
G	235.3 (9.26)	227.6 (8.96)

6DR5..5 Aluminum enclosure, flameproof;
dimensions with pneumatic connection G $\frac{1}{4}$ or $\frac{1}{4}$ -18 NPT

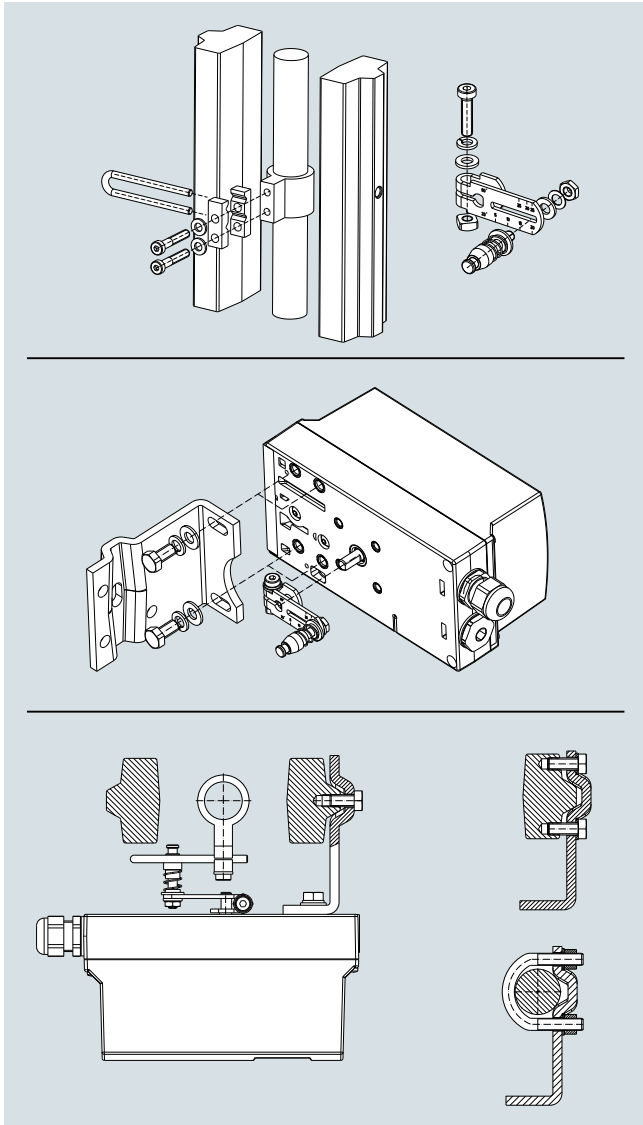
6DR5..6 Stainless steel enclosure, flameproof



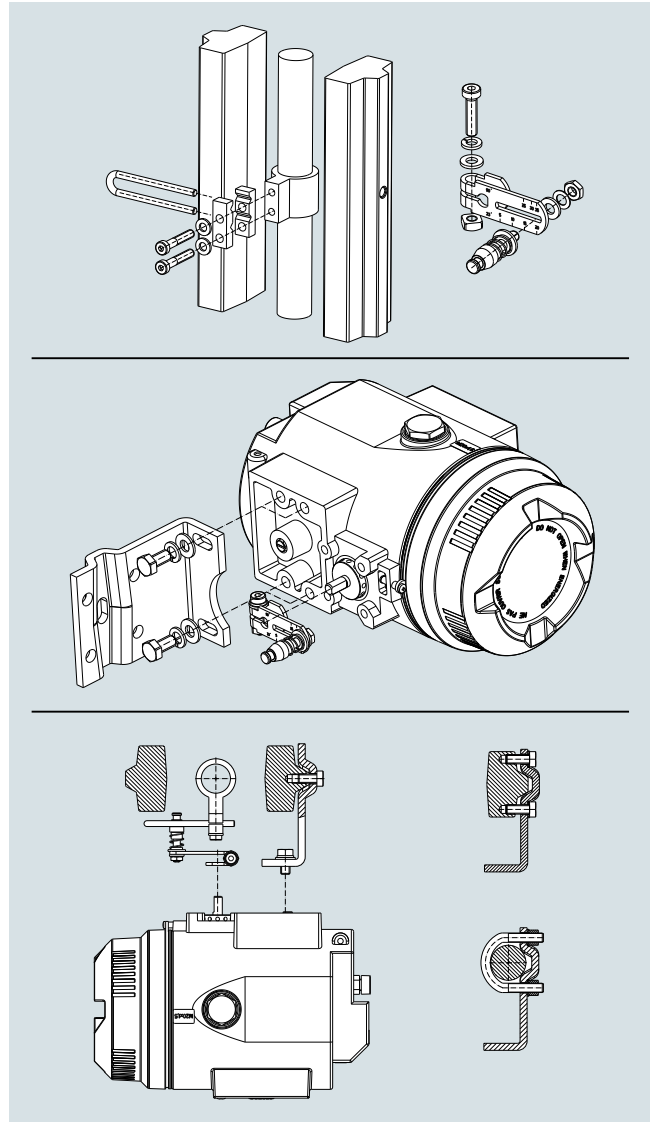
Mounting onto part-turn actuators; mounting console can be ordered via 6DR4004-1D/-2D/-3D/-4D, extract from VDI/VDE 3845, dimensions in mm (inch)

Mounting kit for NAMUR linear actuators 6DR4004-8V

- 1 mounting bracket
- 2 clamps
- 1 U-bracket
- 1 lever arm with adjustable tapered roller
- 2 U-bolts
- Various screws and lock washers



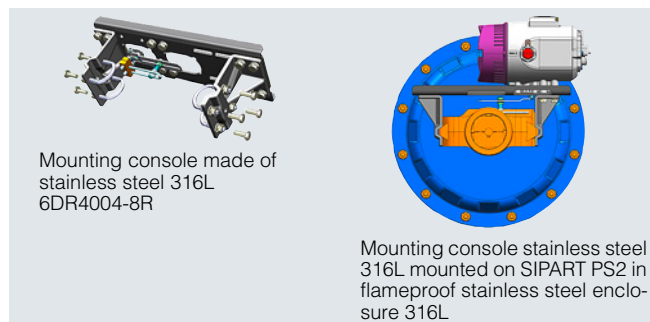
Mounting of SIPART PS2 on linear actuators



Mounting of SIPART PS2 in flameproof aluminum enclosure on linear actuators

Mounting console made of stainless steel 316L for linear actuators 6DR4004-8R

- Console with 2 adjustable mounting brackets
- 4 U-brackets for pillar mounting
- 1 lever arm with adjustable tapered roller
- 2 clamps with U-bracket
- Screws and lock washers



Mounting console made of stainless steel 316L 6DR4004-8R

Mounting console stainless steel 316L mounted on SIPART PS2 in flameproof stainless steel enclosure 316L

Positioners

SIPART PS2

Mounting kits

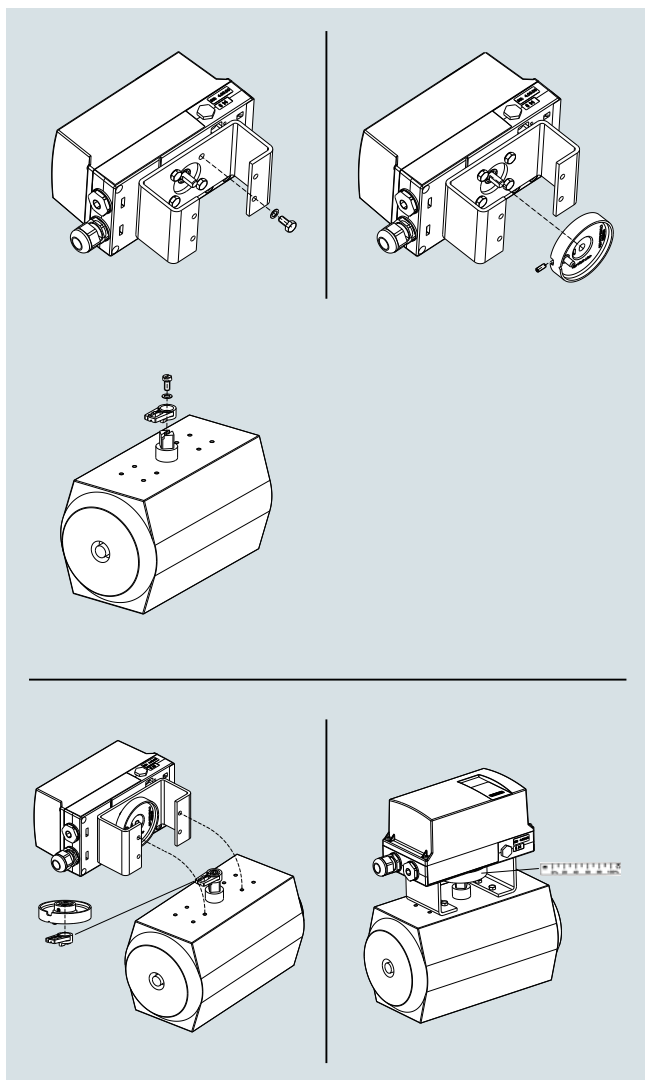
Mounting kit for NAMUR part-turn actuators 6DR4004-8V

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

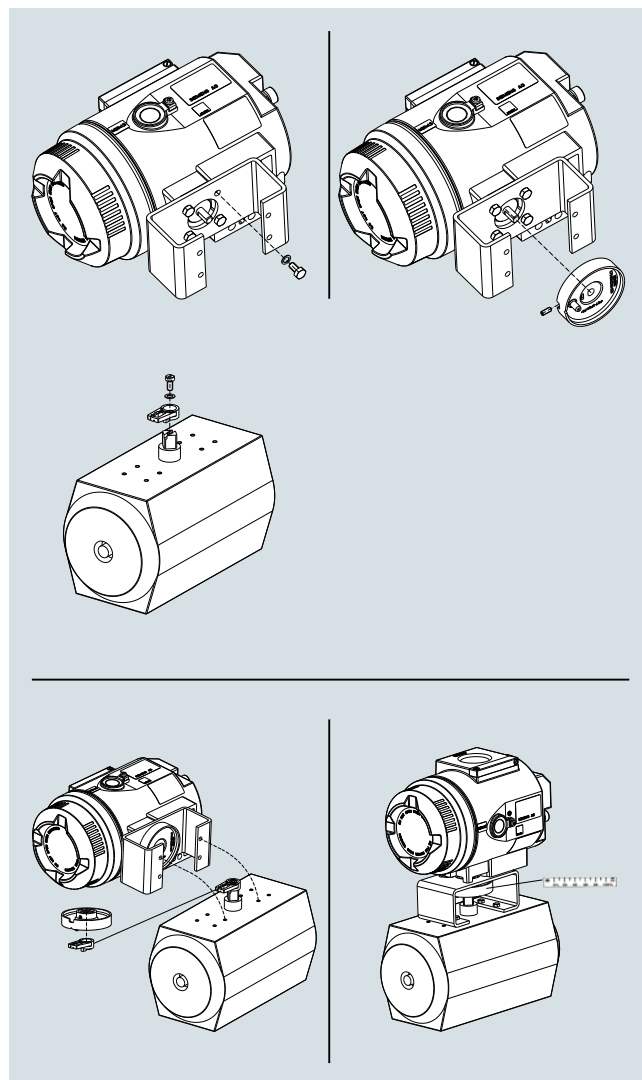
Important

The mounting console for mounting on the part-turn actuators is not included in the scope of delivery, but can be ordered separately via 6DR4004-1D/-2D/-3D/-4D. Fastening screws are not included in the scope of delivery (see "Technical data")

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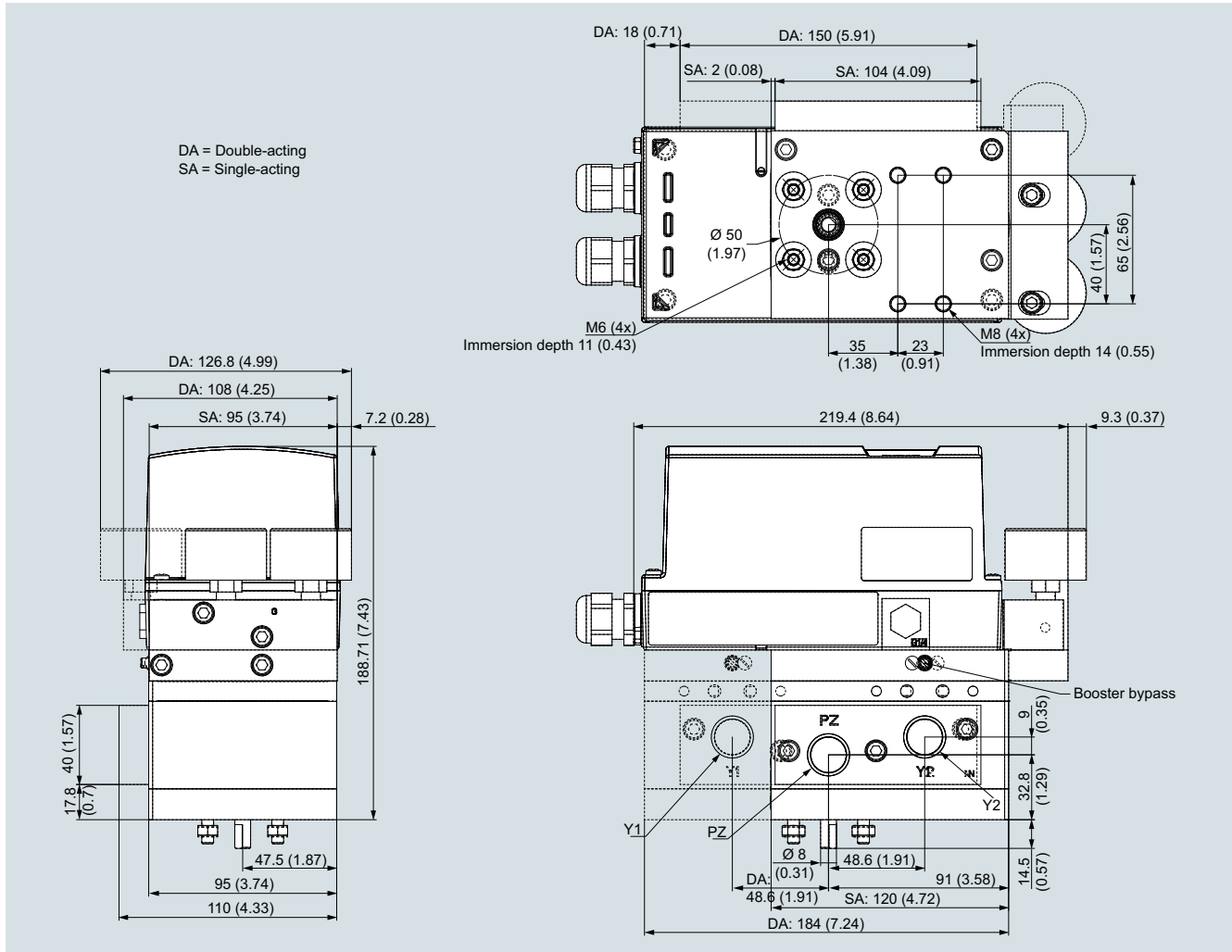


Mounting of SIPART PS2 on part-turn actuators



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

Booster mounted on positioner

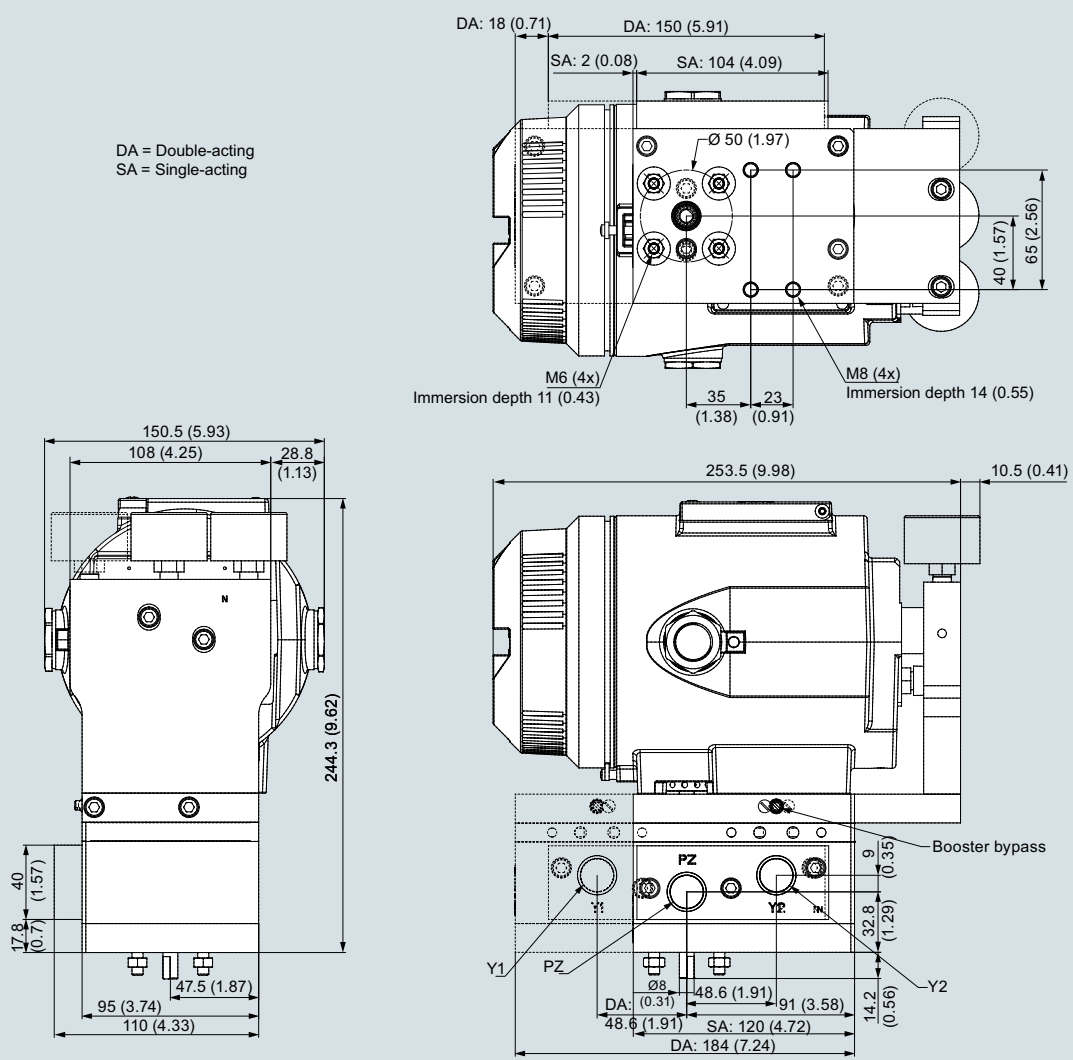


Booster mounted on positioner, dimensions in mm (inch)

Positioners SIPART PS2

Dimensional drawings

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Booster mounted on positioner in a flameproof enclosure, dimensions in mm (inch)

More information

Special designs

On request

Documentation

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