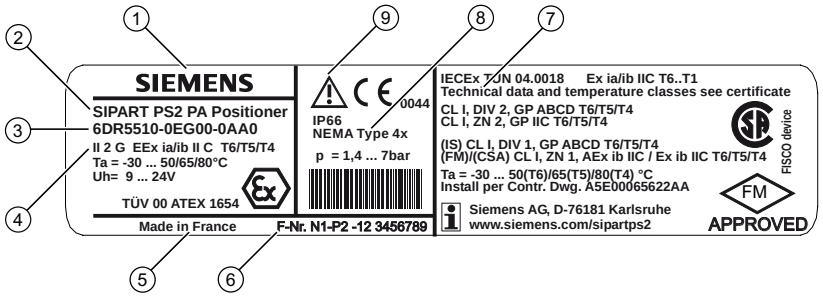
3.2.2 Type plate layout



Type plate layout, example

①	Manufacturer	⑥	Serial number
②	Product name	⑦	Approvals
③	Order number	⑧	Degree of protection
④	Technical data	⑨	Follow the operating instructions
⑤	Place of manufacture		

3.3 Operation with natural gas

3.3.1 Safety notes for operation with natural gas

When operating the positioner with natural gas, you must follow and adhere to the following safety notes:

⚠ WARNING

Operation with natural gas

1. Only the "EEx ia" version of the positioner and optional modules with the "EEx ia" type of protection may be operated with natural gas. Positioners with other types of protection, e.g. flameproof enclosure or versions for zones 2 and 22 are not permitted.
2. Do not operate the positioner with natural gas in closed spaces.
3. Natural gas is continuously blown off in the servo-drive depending on the model. Special care must therefore be taken during maintenance activities near the positioner. Always ensure that the immediate surroundings of the positioner are adequately ventilated.
4. The mechanical limit switch module may not be used when operating the positioner with natural gas.
5. Depressurize the devices operated with natural gas adequately during maintenance activities. Open the cover in an explosion-free atmosphere and depressurize the device for at least two minutes.

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Technical data

14

14.1 General technical data

General data	
Range of stroke (linear actuator)	3 ... 130 mm (0.12 ... 5.12") (angle of rotation of the feedback shaft 16 to 90°)
Angle of rotation (part-turn actuator)	30 ... 100°
Installation	
• On the linear actuator	Using the mounting kit 6DR4004-8V and, if required, an additional lever arm 6DR4004-8L on the actuators as per IEC 534-6 (NAMUR) with a fin, columns, or a plane surface.
• On the part-turn actuator	Using the mounting kit 6DR4004-8D on the actuators with fastening plane as per VDI/VDE 3845 and DIN 3337: The required mount must be provided on the actuator-side; shaft with groove, and M6 female thread.
Control unit	
• Five-point controller	Adaptive
• Dead zone	
dEbA = auto	Adaptive or can be preset
dEbA = 0.1 ... 10 %	Adaptive or can be preset
Analog-to-digital converter	
• Scanning time	10 ms
• Resolution	≤ 0,05 %
• Transmission error	≤ 0,2 %
• Temperature influence	≤ 0.1 %/10 K (≤ 0.1 %/18 °F)
Cycle time	
• 20 mA/HART device	20 ms
• PA device	60 ms
• FF device	60 ms (min. loop time)
Binary input BE1 (clamp 9/10; galvanically connected with basic device)	Only usable for a dry contact; max. contact load <5 mA at 3 V
Degree of protection [1])	IP66 according to EN 60529 / NEMA 4X
Mounting position	Any; in wet environment, pneumatic connections and outlet opening not upward
CE symbol	Conformity in regards to EMC guideline 89/336 EEC in agreement with the following norms
EMC requirements	EN 61326/A1 App. A.1 and NAMUR NE21 August 98

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Technical data

14.1 General technical data

General data		
Material		
• Enclosure		
	6DR5**0-*** (plastic)	Glass fiber reinforced macrolon
	6DR5**1-*** (metal)	GD AlSi12
	6DR5**2-*** (stainless steel)	Austenitic stainless steel mat. no. 1.4581
	6DR5**5-*** (metal, pressure resistant)	GK AlSi12
• Pressure gauge block		Aluminum AlMgSi, anodized
Vibration resistance		
• Harmonic vibrations (sine) according to DIN EN 60062-2-6/05.96		3.5 mm (0.14"), 2 ... 27 Hz, 3 cycles/axes
		98.1 m/s² (321.84 ft/s²), 27 to 300 Hz, 3 cycles/axes
• Bump (half-sine) according to DIN EN 60068-2-29/03.95		150 m/s² (492 ft/s²), 6 ms, 1000 shocks/axle
• Noise (controlled digitally) according to DIN EN 60068-2-64/08.95		10 ... 200 Hz; 1 (m/s²)²/Hz (3.28 (ft/s²)²/Hz)
		200 ... 500 Hz; 0.3 (m/s²)²/Hz (0.98 (ft/s²)²/Hz)
		4 hours/axle
• Recommended range of continuous operation of the entire control valve		≤ 30 m/s² (98.4 ft/s²) without resonance peak
Weight, basic device		
• Plastic enclosure		Approximately 0.9 kg (1.98 lb)
• Metal enclosure, aluminum		Approximately 1.3 kg (2.87 lb)
• Metal enclosure, stainless steel		Approximately 3.9 kg (8.6 lb)
• Metal housing, Ex d version		Approximately 5.2 kg (11.46 lb)
Dimensions		See dimensional drawing
Climate class		According to DIN EN 60721-3-4
• Storage [2])		1K5, but -40 ... +80°C (1K5, but -40 ... +176°F)
• Shipping [2])		2K4, but -40 ... +80°C (2K4, but -40 ... +176°F)
• Operation [3])		4K3, but -30 ... +80°C (4K3, but -22 ... +176°F)

[1]) Impact energy max. 1 joule for plastic/aluminum enclosure.

[2]) Be sure that the valves have been flushed out enough with the dry medium when commissioning is at a temperature of ≤ 0°C (≤ 32 F).

[3]) When the temperature is ≤ -10°C (≤ 14°F) limited repetition rate of the LCD display. When using I_y module, only T4 is permissible.

Certificates and approvals	
Classification according to pressure equipment directive (PED 97/23/EC)	For fluid group 1 gases; fulfills requirements in article 3, paragraph 3 (good engineering practice SEP)

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Pneumatic data	
Auxiliary power (air supply)	
• Pressure	1,4 ... 7 bar (20.3 ... 101.5 psi): sufficiently greater than max. drive pressure (actuating pressure)
Air quality in accordance with 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	
• Air supply valve (vent drive) [4]	
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)
• Air exhaust valve (depressurize drive) [4]	
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)
Valve leakage	< $6 \cdot 10^{-4}$ Nm³/h (0.0026 USgpm)
Throttle ratio	Adjustable up to ∞: 1
Auxiliary power consumption in the controlled state	< $3{,}6 \cdot 10^{-2}$ Nm³/h (0.158 USgpm)
Versions	
• In the plastic enclosure	Single-acting and double-acting
• In the aluminum enclosure	Single-acting
• In the flameproof encapsulated housing	Single-acting and double-acting
• In the stainless steel enclosure	Single-acting and double-acting
[4]) When using device version Ex d (6DR5..5-...) values are reduced by approximately 20%.	

All the programming manuals mentioned are on the CD-ROM and are available on the internet.

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14.2 Technical specifications of the device version with PROFIBUS PA

	Basic unit without explosion protection	Basic unit with Ex d explosion protection (flameproof enclosure)	Basic unit with Ex ia/ib explosion protection	Basic unit with Ex n/dust explosion protection
Explosion protection complying with ATEX	Without	Ex d II 2 G Ex d II C T4/T5/T6	Ex ia/ib II 2 G Ex ia/ib II C T6	Ex n II 3 G Ex nA nL [nL] II C T6/T5/T4 Dust II 3D Ex tD A22 IP66 T100°C
Installation point		Zone 1	Zone 1	Zone 2/22
Permissible ambient temperature for operation Restricted display refresh rate of the LC at ≤ -10 °C (+14 °F). (For standard controllers with explosion protection: only T4 is permitted when using with the I_y module)	-30 ... +80 °C (-22 ... +176 °F)	T4: -30 ... +80°C (-22 ... +176°F) T5: -30 ... +65°C (-22 ... +149°F) T6: -30 ... +50°C (-22 ... +122°F)		T4: -20 ... +75°C T5: -20 ... +65°C T6: -20 ... +50°C

Electrical data				
	Basic unit without explosion protection	**Basic unit with Ex d explosion protection (flameproof enclosure)**	**Basic unit with Ex ia/ib explosion protection**	**Basic unit with Ex n/dust explosion protection**
Input				
Auxiliary power supply (terminals 6/7)	Bus-powered	Bus-powered	Bus-powered	Bus-powered
Bus voltage	9 ... 32 V	9 ... 32 V	9 ... 24 V	9 ... 32 V
• Bus connector with supply unit			Intrinsically safe FISCO	For "nA" and "tD": U_n = 32 V DC For "nL": FNICO
Max. supply voltage U_o	-	-	17.5 V	17.5 V
Max. short circuit current I_o	-	-	380 mA	570 mA
Max. power P_o	-	-	5.32 W	-
• Bus connector with barrier			Intrinsically safe	For "nL"
Max. supply voltage U_o	-	-	24 V	32 V
Max. short circuit current I_o	-	-	250 mA	-
Max. power P_o	-	-	1.2 W	-
Current consumption	11.5 mA ± 10%	11.5 mA ± 10%	11.5 mA ± 10%	11.5 mA ± 10%
Fault current	0 mA	0 mA	0 mA	0 mA

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Electrical data				
	Basic unit without explosion protection	**Basic unit with Ex d explosion protection (flameproof enclosure)**	**Basic unit with Ex ia/ib explosion protection**	**Basic unit with Ex n/dust explosion protection**
Effective internal inductance L_i	-	-	8 µH	8 µH (for "nL")
Effective internal capacitance C_i	-	-	Negligible	Negligible
Safety shutdown with coding bridge can be activated (terminals 81/82; galvanically isolated from the standard controller)				
• Input resistance	> 20 kΩ	> 20 kΩ	> 20 kΩ	> 20 kΩ
• Signal status "0" (shutdown active)	0 ... 4.5 V or unconnected	0 ... 4.5 V or unconnected	0 ... 4.5 V or unconnected	0 ... 4.5 V or unconnected
• Signal status "1" (shutdown inactive)	13 ... 30 V	13 ... 30 V	13 ... 30 V	13 ... 30 V
• Effective internal capacitance C_i	-	-	Negligible	Negligible
• Effective internal inductance L_i	-	-	Negligible	Negligible
• For connecting to a power source with	-	-	Intrinsically safe	For "nA", "nL" and "tD"
Maximum supply voltage U_i	-	-	30 V	30 V
Maximum short circuit current I_i	-	-	100 mA	100 mA
Maximum power P_i	-	-	1 W	-
Electrical isolation	Between the standard controller and the input for safety shutdown and the outputs of optional modules	Between the standard controller and the input for safety shutdown and the outputs of optional modules	The standard controller, the input for safety shutdown and the outputs of optional modules are individual intrinsically safe circuits.	Between the standard controller and the input for safety shutdown and the outputs of optional modules
Test voltage	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s

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Communication				
	Basic unit without explosion protection	**Basic unit with Ex d explosion protection (flameproof enclosure)**	**Basic unit with Ex ia/ib explosion protection**	**Basic unit with Ex n/dust explosion protection**
	Layers 1 + 2 as per PROFIBUS PA, transmission technique as per IEC 1158-2; slave function layer 7 (protocol layer) as per PROFIBUS DP, standard EN 50170 with the extended PROFIBUS functionality (all data is acyclic, manipulated variables, feedback and statuses are additionally cyclic)			
C2 connections	Four connections with the master class 2 are supported; automatic connection termination 60 s after interruption in communication			
Device profile	PROFIBUS PA profile B, version 3.0; over 150 objects			
Response time for a master telegram	Typically, 10 ms			
Device address	126 (in the as-delivered condition)			
PC parameter assignment software	SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery.			

Connections				
	Basic unit without explosion protection	**Basic unit with Ex d explosion protection (flameproof enclosure)**	**Basic unit with Ex ia/ib explosion protection**	**Basic unit with Ex n/dust explosion protection**
• Electric	Screw terminals 2.5 AWG28-12 Cable feedthrough M20x1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 Ex d certified cable feedthrough M20x1.5, ½-14 NPT or M25x1.5	Screw terminals 2.5 AWG28-12 Cable feedthrough M20x1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 Cable feedthrough M20x1.5 or ½-14 NPT
• Pneumatic	Female thread G¼ DIN 45141 or ¼-18 NPT	Female thread G¼ DIN 45141 or ¼-18 NPT	Female thread G¼ DIN 45141 or ¼-18 NPT	Female thread G¼ DIN 45141 or ¼-18 NPT
External position sensor (potentiometer or NSC; option) with the following maximum values				
• U_o	-	-	5 V	5 V
• I_o (static)	-	-	75 mA	75 mA
• I_s (brief)	-	-	160 mA	-
• P_o	-	-	120 mW	120 mW
Maximum permissible external capacitance C_o	-	-	1 µF	1 µF
Maximum permissible external inductance L_o	-	-	1 mH	1 mH

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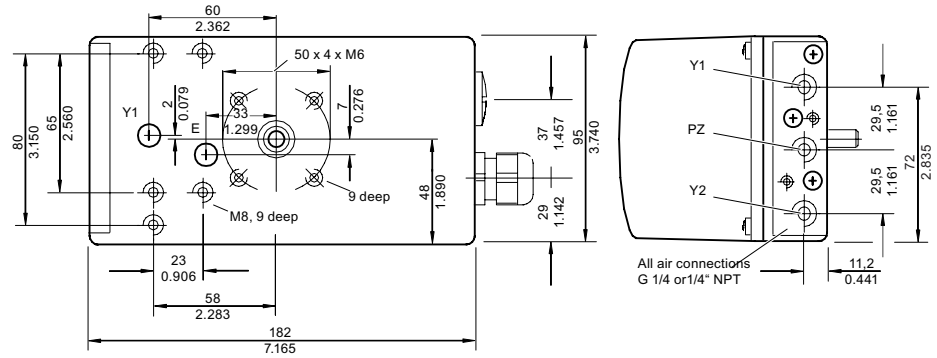
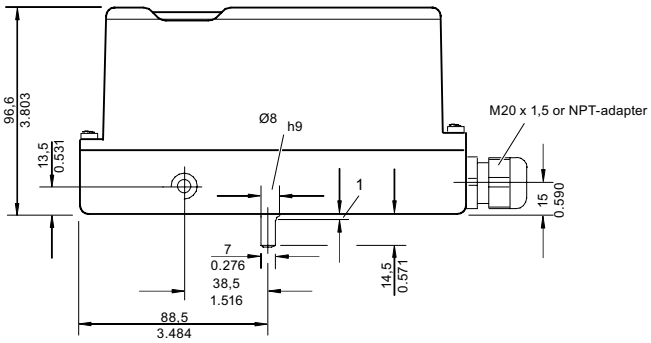
15 Dimension drawings

15.1 Positioner with plastic enclosure 6DR5**0





dimension units: mm / inch

Figure 15-1 Dimensions of plastic enclosure version

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