Electropneumatic positioners Electric actuators

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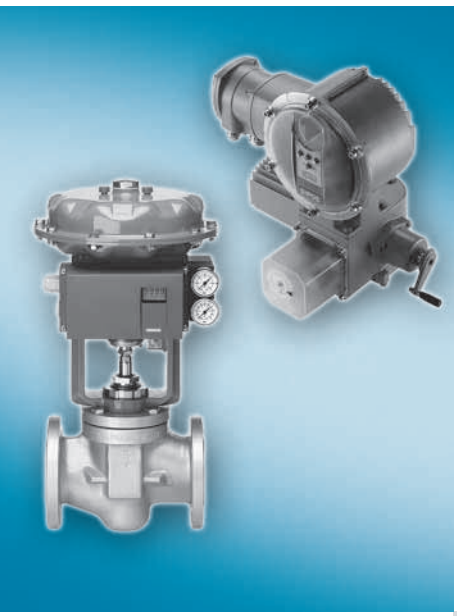
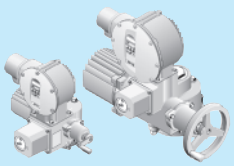
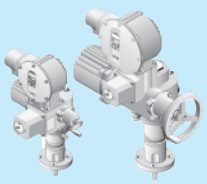
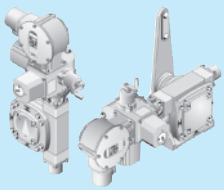
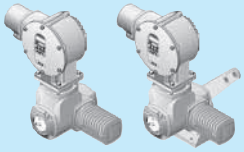


You can download all instructions, catalogs and certificates for SIPART PS2 and SIPOS free of charge at the following Internet address:
www.siemens.com/sipartps2
www.sipos.de

Product overview

Overview

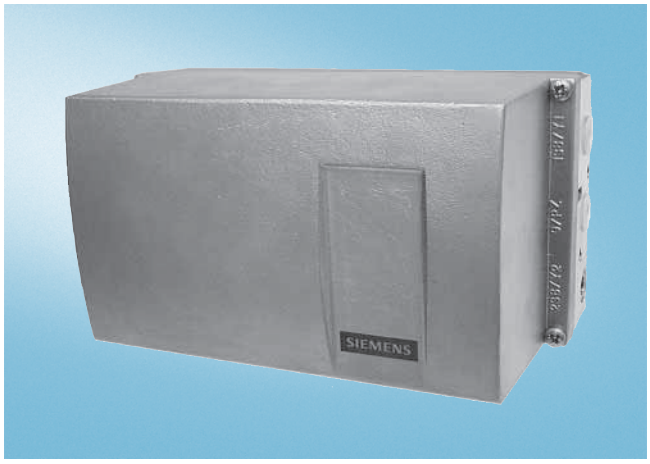
	Application	Device description	Catalog page	Software for parameterization
Electropneumatic positioners SIPART PS2				
	Position control Pneumatic linear or part-turn actuators, also for intrinsically-safe operation	**SIPART PS2** Universal device for positioning pneumatic actuators • Connection: 4 to 20 mA • HART, PROFIBUS PA or Foundation Fieldbus • Local manual operation • Binary inputs and outputs • Diagnosis functions • Blocking function • Automatic startup	6/3	SIMATIC PDM
	As above, but in flameproof casing for explosion-proof application	**SIPART PS2** As above, but in flameproof aluminium casing	6/3	SIMATIC PDM
Electric actuators SIPOS 5 Flash				
	Rotary actuators standard version and modulating duty for safe operation of valves	**Rotary actuator** Standard version: T_c 10 - 4000 Nm (7 - 2950 lbf ft) Modulating duty: T_c 15 - 2800 Nm (11 - 2065 lbf ft) • parameter assignments can be set by the customer • tripping torque and speed settable within type-specific ranges • binary and analog inputs and outputs dependent on design • freely assignable signaling outputs • positioner • process controller • reference torque curves for the valve can be stored and evaluated • speed setting dependent on travel • external analog speed input • positioner with proportional control/split-range functionality • travel dependent freely adjustable positioning times • PROFIBUS DP with V1 services • MODBUS RTU	6/26 6/28	SIMATIC PDM, functional block, COM-SIPOS, SIMA
	As above, but linear actuators modulating duty	**Linear actuator** Modulating duty: F_c 5.5 - 152 kN (1240 - 34200 lbf) • Cut-off force and positioning speed of actuator settable within type-specific ranges, • otherwise as above	6/30	SIMATIC PDM, functional block, COM-SIPOS, SIMA
	As above, but part-turn actuators standard version and modulating duty	**Part-turn actuator** Standard version: T_c 150 - 4300 Nm (111 - 3170 lbf ft) Modulating duty: T_c 250- 3400 Nm (184 - 2510 lbf ft) • Tripping torque and positioning time settable within type-specific ranges, • otherwise as above	6/32 6/34	SIMATIC PDM, functional block, COM-SIPOS, SIMA
	As above, but small part-turn actuators standard version and modulating duty	**Small part-turn actuators** Standard version: M_{ab} 32 - 125 Nm (23.6 - 92.2 lbf ft) Modulating duty: M_{ab} 32 - 125 Nm (23.6 - 92.2 lbf ft) • positioning time settable • otherwise as above	6/36	SIMATIC PDM, functional block, COM-SIPOS, SIMA

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Overview

SIPART PS2 electropneumatic positioner

SIPART PS2 EEx d electropneumatic positioner in flameproof casing



SIPART PS2 in stainless steel casing

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

Benefits

SIPART PS2 positioners offer decisive advantages:

- Simple installation and automatic commissioning (self-adjustment of zero and span)
- Simple operation with
  - Local operation and configuration of the device using three input keys and a user-friendly two-line LCD
  - Programming through SIMATIC PDM
- Very high-quality control thanks to an online adaptation procedure
- Negligible air consumption in stationary operation
- "Tight shut-off" function (ensures maximum positioning pressure on the valve seat)
- Numerous functions can be activated by simple configuring (e.g. characteristics and limits)
- Extensive diagnosis functions for valve and actuator
- Only one device version for linear and part-turn actuators
- Few moving parts, hence insensitive to vibrations
- External non-contacting position sensor as option for extreme ambient conditions

Application

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

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

The SIPART PS2 positioner is available:

- For single-action actuators: in plastic, stainless steel or aluminum casings, as well as flameproof aluminium casing (EEx d)
- For double-action actuators: in plastic and stainless steel casing, as well as flameproof aluminum casing (EEx d)
- For non-hazardous applications
- For hazardous applications in the designs
  - as intrinsically-safe device (EEx ia/ib) or
  - in flameproof aluminum casing (EEx d) or
  - in Ex n design (non sparking)

and in the versions:

- With 0/4 to 20 mA control communication through HART signal (as option)
- With PROFIBUS PA communication interface
- With Foundation Fieldbus (FF) communications interface.

Explosion-proof versions

The basic version of the device is available in an intrinsically-safe design with degree of protection EEx ia/ib or in a non-intrinsically-safe design for zone 2 (see Technical data for intrinsically-safe versions).

A non-intrinsically-safe application is permissible in zone 1 for the SIPART PS2 EEx d flameproof version (see "Technical Data"). It is then permissible to use all option modules (except external actuator travel detection systems, SIA module and NCS).

Stainless steel casing for extreme ambient conditions

The SIPART PS2 is available in a stainless steel casing for use in particularly aggressive environments (e.g. offshore operation, chlorine plants etc.). The device functions are the same as those of the basic versions.

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Design

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

The positioner consists of the following components:
- Casing and cover
- PCB with corresponding electronics with or without communication through HART
  or with electronics for communication in accordance with
  - PROFIBUS PA specification, IEC 61158-2; bus-supplied device, or
  - Foundation Fieldbus (FF) specification, IEC 61158-2, bus-supplied device
- Actuator travel detection system
- Terminal housing with screw terminals
- Pneumatic valve manifold with piezoelectric valve precontrol.

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

I_y module:
- Position feedback as a two-wire signal 4 to 20 mA.

Alarm module (3 outputs, 1 input):
- Signaling of two limits of the travel or angle by binary signals. The two limits can be set independently as maximum or minimum values.
- Output of an alarm if the setpoint position of the final control element is not reached in automatic mode or if a device fault occurs.
- Second binary input for alarm signals of for triggering safety reactions or for blocking/signaling function or safety position.

Limit signaling through slot-type initiators (SIA module)

Two limits can be signaled redundantly as NAMUR signals (EN 60947-5-6) by slot-type initiators using an easy-to-fit module. The module also contains an alarm output (see Alarm module).

Limit value signal via mechanical contacts (Limit value contact module)

Galvanic isolated switching contacts could indicate two redundant limits through an easy mounted module. A fault message output is also integrated in the module (see alarm module).

Valid for all modules described above:

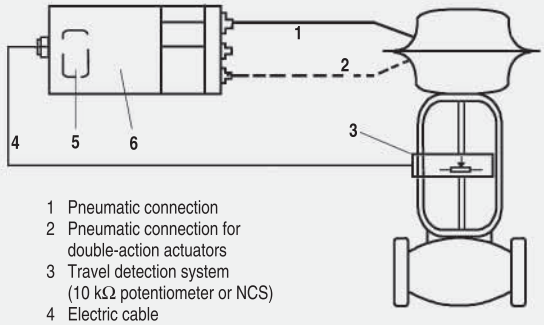
All signals are electrically isolated from one another and from the basic unit. The outputs indicate self-signaling faults.

Separate mounting of actuator travel detection system and controller unit

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

The following can be used for measuring the travel or angle:
- NCS sensor
- External position detection system C73451-A430-D78
- A commercially available potentiometer (10 kΩ resistance)

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

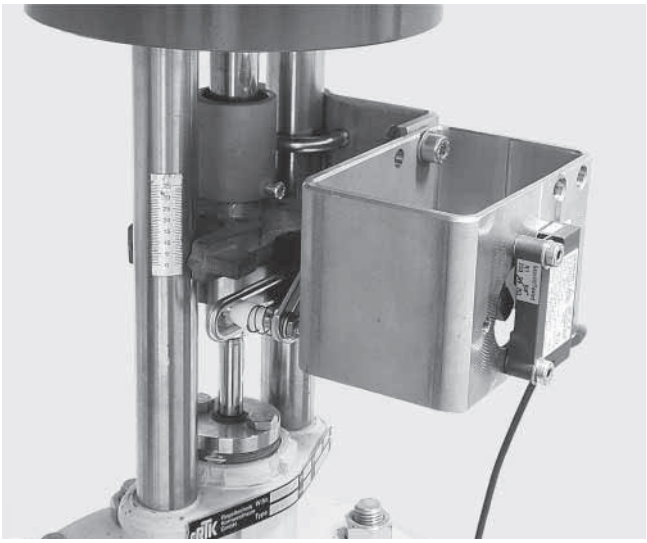


1 Pneumatic connection
2 Pneumatic connection for double-action actuators
3 Travel detection system (10 kΩ potentiometer or NCS)
4 Electric cable
5 Retrofitted EMC filter module (in device)
6 SIPART PS2

Separate connection of actuator travel detection system and controller unit

Non-contacting position sensor (NCS)

Contact and non-contacting positioning sensor (NCS) for part-turn actuator (left) and for linear actuator (right)



NCS for travels >14 mm

The actuator travel detection unit consists of a non-contacting position sensor instead of a potentiometer. All coupling elements are omitted such as coupling wheel and driver pin with part-turn actuators or lever and pick-up bracket with linear actuators.

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

The sensor does not require an additional power supply, i.e. SIPART PS2 (not for EEx d version) can be operated in a 2-wire system. The NCS (Non Contacting Position Sensor) consists of a potted sensor housing which must be mounted permanently and a magnet which is mounted on the spindle of linear actuators or on the shaft butt of part-turn actuators. For the version for travels

>14 mm, the magnet and the NCS are premounted on a stainless steel frame and offer the same interface mechanically as the positioner itself, i.e. they can be mounted using the standard mounting kits 6DR4004-8V, -8VK and -8VL.

The installation of a EMC filter module in the positioner (controller unit) is necessary in order to ensure a connection level with EMC according to EN 61326/A1 and NAMUR NE21 when using external sensors (see Ordering data for "EMC filter module")

Function

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

Mode of operation

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

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

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

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

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

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

Pneumatic valve manifold with piezoelectric valve precontrol

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

Local operation

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

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

Operation and monitoring with the SIMATIC PDM communications program

The SIMATIC PDM program is available for communication through the HART interface and also for the PROFIBUS PA coupling.

The SIMATIC PDM communications software permits easy remote operation and monitoring using a PC or laptop. The positioner can also be configured using this program. Parameters which provide important information for maintenance and fault diagnosis of the complete unit can also be determined using process data and comparison data.

When operating the SIPART PS2 through the HART interface, the connection is made directly to the 2-wire cable to the SIPART PS2 positioner through a HART modem that can be connected to the RS 232 or USB interface. The signals needed for communication in conformity with the HART protocol are superimposed on the current signal in accordance with the Frequency Shift Keying (FSK) method.

Automatic commissioning

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

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

Low air consumption

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

Comprehensive monitoring functions

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

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

Status monitoring with 3-stage alarm concept

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

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

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

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

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

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

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Functional safety acc. to SIL 2

The SIPART PS2 positioners are also suitable for control at fittings, which meet the special requirements of the functional safety up to SIL 2 to IEC 61508 or IEC 61511-1.

This is a single-action, venting positioner with an input of 4 to 20 mA, PROFIBUS PA and FOUNDATION Fieldbus (FF) for mounting on pneumatic actuators with spring return.

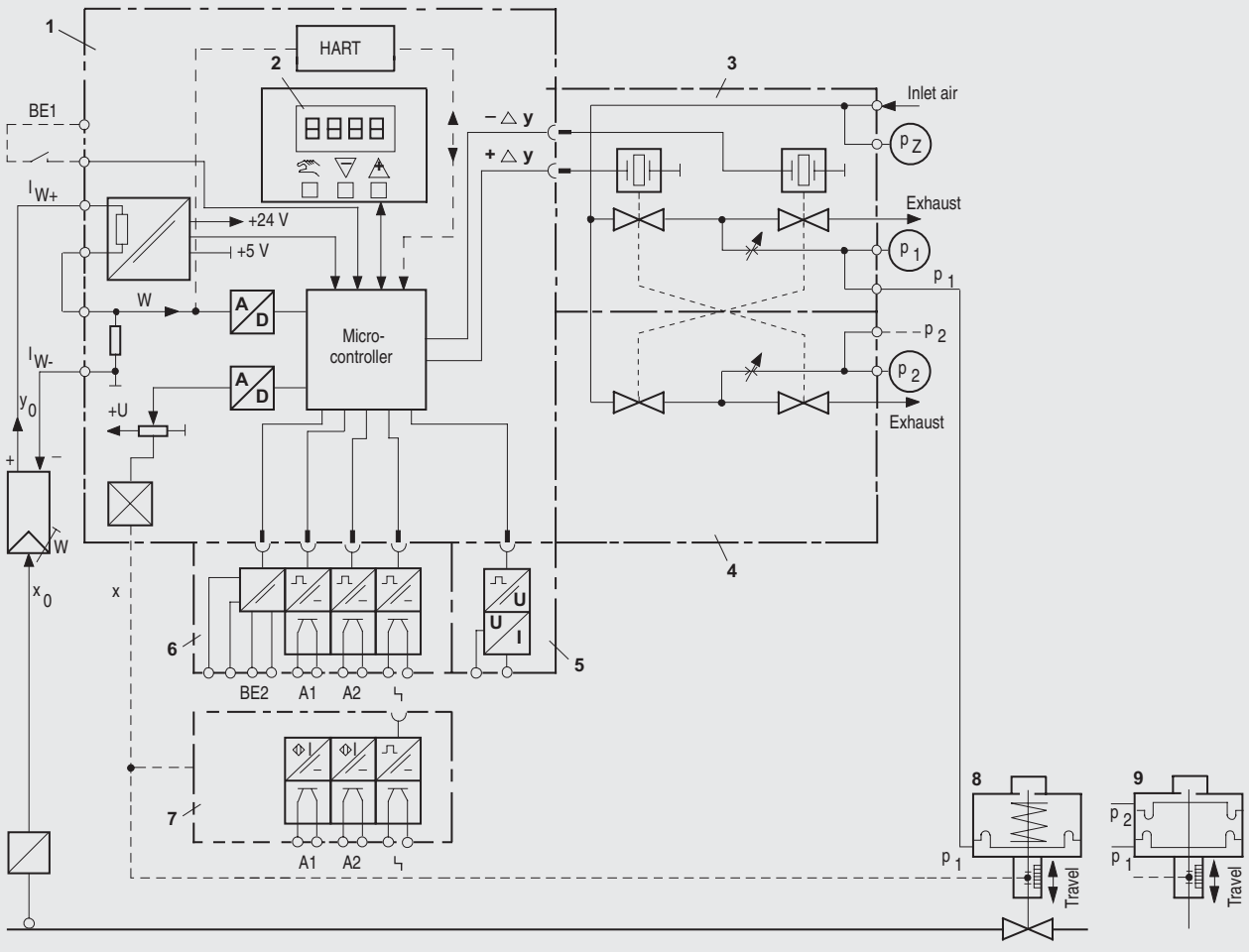
The positioner vents the valve actuator on demand or in the event of a fault and puts the valve in the preset safety position.

This positioner meets the following requirements:
- Functional safety up to SIL 2 to IEC 61508 or IEC 61511-1, from firmware version C4 or higher
- Explosion protection for the versions 6DR5...-.E...
- Electromagnetic compatibility to EN 61326/A1, Appendix A.1

Configuring

The following settings, for example, can be configured in configuring mode as required with the SIPART PS2 positioner:
- Input current range 0 to 20 mA or 4 to 20 mA
- Rising or falling characteristic at the setpoint input
- Positioning speed limit (setpoint ramp)
- Split-range operation; adjustable start-of-scale and full-scale values
- Response threshold (dead zone); self-adjusting or fixed
- Direction of action; rising or falling output pressure with rising setpoint
- Limits (start-of-scale and full-scale values) of positioning range
- Limits (alarms) of the final control element position; minimum and maximum values
- Automatic "tight shut-off" (with adjustable response threshold)
- The travel can be corrected in accordance with the valve characteristic.
- Function of binary inputs
- Function of alarm output etc.

The key aspects of configuring the different SIPART PS2 versions are largely identical.



1 Motherboard with microcontroller and input circuit
2 Control panel with LCD and pushbuttons
3 Piezoelectric valve unit, always present
4 Valve unit, present as accessory in double-action positioner
5 Iy module for SIPART PS2 controller
6 Alarm module for 3 alarm outputs and one binay input
7 SIA module (slot initiator alarm module)
8 Spring loaded pneumatic actuator (single-action)
9 Springless pneumatic actuator (double-action)

Note:
Alarm module (6) and SIA module (7) can only be inserted as alternatives.

SIPART PS2, electropneumatic positioner, function diagram

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Technical specifications

SIPART PS2 (all versions)	
General data	
Travel range (linear actuators)	3 ... 130 mm (0.12 ... 5.12 inch) (angle of feedback shaft 16 ... 90°)
Angle of rotation (part-turn actuators)	30 ... 100°
Installation	
• On linear actuators	Using attachment set 6DR4004-8V and where necessary with an additional lever arm 6DR4004-8L on actuators according to IEC 534-6 (NAMUR) with ribs, bars or flat face
• On part-turn actuators	Using attachment set 6DR4004-8D on actuators with mounting plane according to VDI/VDE 3845 and DIN 3337: The required mounting console has to be provided on the actuator side; shaft with groove and female thread M6
Controller	
• Five-point switch	Self-adjusting
• Dead zone	
- dEbA = Auto	Self-adjusting or can be set as fixed value
- dEbA = 0.1 ... 10%	Self-adjusting or can be set as fixed value
A/D converter	
• Scan time	10 ms
• Resolution	≤ 0.05%
• Transmission error	≤ 0.2%
• Temperature effect	≤ 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 (terminals 9/10; electrically connected to the basic device)	Suitable only for floating contact; max. contact load < 5 mA with 3 V
Degree of protection[1]	IP66 to EN 60 529/NEMA 4x
Mounting position	Any; pneumatic connections and exhaust opening not facing up in wet environment
CE marking	Conformity as regards EMC Directive 89/336 EC in accordance with the following standards
EMC requirements	EN 61326/A1 Appendix A.1 and NAMUR NE21 August 98
Material	
• Housing	
- 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-proof)	GK AlSi12
• Pressure gauge block	Aluminium AlMgSi, anodized
Vibration resistance	
• Harmonic oscillations (sine-wave) according to DIN EN 60062-2-6/05.96	3.5 mm (0.14 inch), 2 ... 27 Hz 3 cycles/axis
	98.1 m/s² (321.84 ft/s²), 27 ... 300 Hz, 3 cycles/axis
• Bumping (half-sine) to DIN EN 60068-2-29/03.95	150 m/s² (492 ft/s²), 6 ms, 1000 shocks/axis
• Noise (digitally controlled) 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/axis
• Recommended continuous duty range of the complete fitting	≤ 30 m/s² (≤ 98.4 ft/s²) without resonance sharpness
Weight, basic device	
• Plastic casing	Approx. 0.9 kg (0.90 kg)
• Metal casing, aluminium	Approx. 1.3 kg (1.30 kg)
• Metal casing, stainless steel	Approx. 3.9 kg (3.90 kg)
• Metal casing EEx d version	Approx. 5.2 kg (11.46 lb)
Dimensions	See Dimensional drawings
Climate class 4	To DIN EN 60721-3-4
• Storage[2]	1K5, but -40 ... +80 °C (1K5, but -40 ... +176 °F)
• Transport[2]	2K4, but -40 ... +80 °C (2K4, but -40 ... +176 °F)
• Operation[3]	4K3, but -30 ... +80 °C (4K3, but -22 ... +176 °F)
Certificate and approvals	
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1, complies with requirements of article 3, paragraph 3 (sound engineering practice SEP)
Pneumatic data	
Power supply (inlet air)	
• Pressure	1.4 ... 7 bar (20.3 ... 101.5 psi): Sufficiently greater than max. drive pressure (actuating pressure)
Air quality to ISO 8573-1	
• Solid particle size and density	Class 2
• Pressure dew point	Class 2 (min. 20 K (36 °F) below ambient temperature)
• Oil content	Class 2
Unthrottled flow	
• Inlet air valve (ventilate actuator)[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)
• Outlet air valve (ventilate actuator)[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
Power consumption in the controlled state	< $3.6 \cdot 10^{-2}$ Nm³/h (0.158 USgpm)
Types of actuators	
• In plastic casing	Single-action and double-action
• In aluminium casing	Single-action
• In flameproof casing	Single-action and double-action
• In stainless steel casing	Single-action and double-action

1) Impact energy max. 1 Joule for plastic/aluminium casing.
2) During commissioning at ≤ 0 °C (≤ 32 °F) make sure that the valves are flushed long enough with the dry medium.
3) At ≤ -10 °C (14 °F) the display refresh rate of the LCD is limited. Only T4 is permissible when using I_Y module.
4) With EEx d version (6DR5..5-...) the values are reduced by approx. 20%

SIPART PS2

Technical specifications

SIPART PS2	Basic device without Ex protection	Basic device with EEx-d protection (flameproof casing)	Basic device with EEx ia/ib protection	Basic device with EEx n protection
Explosion protection to EN 50014, EN 50020 and EN 50021	Without	EEx d II 2 G EEx d II C T6	EEx ia/ib II 2 G EEx ia/ib II C T6	EEx n II 3 G EEx nA L [L] II C T6
Mounting location		Zone 1	Zone 1	Zone 2
Permissible ambient temperature for operation	-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)		
At ≤ -10 °C (+14 °F) the display refresh rate of the LCD is limited.				
(for basic devices with EEX ia/ib and EEx n protection the following applies: Only T4 is permissible when using I_y module.)				
Electrical data				
Input				
2-wire connection (terminals 6/8)				
Rated signal range	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA	4 ... 20 mA
Current to maintain the power supply	≥ 3.6 mA	≥ 3.6 mA	≥ 3.6 mA	≥ 3.6 mA
Required load voltage U_B (corresponds to Ω at 20 mA)				
• Without HART (6DR50..)				
- Typical	6.36 V (corresponds to 318 Ω)	6.36 V (corresponds to 318 Ω)	7.8 V (corresponds to 390 Ω)	7.8 V (corresponds to 390 Ω)
- Max.	6.48 V (corresponds to 324 Ω)	6.48 V (corresponds to 324 Ω)	8.3 V (corresponds to 415 Ω)	8.3 V (corresponds to 415 Ω)
• Without HART (6DR53..)				
- Typical	7.9 V (corresponds to 395 Ω)	–	–	–
- Max.	8.4 V (corresponds to 420 Ω)	–	–	–
• With HART (6DR51..)				
- Typical	6.6 V (corresponds to 330 Ω)	6.6 V (corresponds to 330 Ω)	–	–
- Max.	6.72 V (corresponds to 336 Ω)	6.72 V (corresponds to 336 Ω)	–	–
• With HART (6DR52..)				
- Typical	–	8.4 V (corresponds to 420 Ω)	8.4 V (corresponds to 420 Ω)	8.4 V (corresponds to 420 Ω)
- Max.	–	8.8 V (corresponds to 440 Ω)	8.8 V (corresponds to 440 Ω)	8.8 V (corresponds to 440 Ω)
• Static destruction limit	± 40 mA		–	–
Internal capacitance C_i				
• Without HART	–	–	≤ 22 nF	–
• With HART	–	–	≤ 7 nF	–
Internal inductance L_i				
• Without HART	–	–	≤ 0.12 mH	–
• With HART	–	–	≤ 0.24 mH	–
For connection to power circuits with	–	–	intrinsically safe U_o ≤ 30 V DC I_K ≤ 100 mA P ≤ 1 W	U_i ≤ 30 V DC I_i ≤ 100 mA

SIPART PS2	Basic device without Ex protection	Basic device with EEx-d protection (flameproof casing)	Basic device with EEx ia/ib protection	Basic device with EEx n protection
3-/4-wire device (terminals 2/4 and 6/8) (6DR52.. and 6DR53..)				
• Power supply U_H	18 ... 35 V DC	18 ... 35 V DC	18 ... 30 V DC	18 ... 30 V DC
• Current consumption I_H	(U_H - 7.5 V)/2.4 kΩ [mA]	(U_H - 7.5 V)/2.4 kΩ [mA]	(U_H - 7.5 V)/2.4 kΩ [mA]	(U_H - 7.5 V)/2.4 kΩ [mA]
• Internal capacitance C_i	–	–	≤ 22 nF	–
• Internal inductance L_i	–	–	≤ 0.12 mH	–
• For connection to power circuits with	–	–	intrinsically safe U_o ≤ 30 V DC I_k ≤ 100 mA P ≤ 1 W	U_i ≤ 30 V DC I_i ≤ 100 mA
Current input I_W				
Rated signal range	0/4 ... 20 mA	0/4 ... 20 mA	0/4 ... 20 mA	0/4 ... 20 mA
Load voltage at 20 mA	≤ 0.2 V (corresponds to 10 Ω)	≤ 0.2 V (corresponds to 10 Ω)	≤ 1 V (corresponds to 50 Ω)	≤ 1 V (corresponds to 50 Ω)
Internal capacitance C_i	–	–	≤ 22 nF	–
Internal inductance (L_i)	–	–	≤ 0.12 mH	–
For connection to power circuits with	–	–	intrinsically safe U_o ≤ 30 V DC I_k ≤ 100 mA P ≤ 1 W	U_i ≤ 30 V DC I_i ≤ 100 mA
Electrical isolation	between U_H and I_W	between U_H and I_W	between U_H and I_W (2 intrinsically safe circuits)	between U_H and I_W
Test voltage	840 V DC (1 s)	840 V DC (1 s)	840 V DC (1 s)	840 V DC (1 s)
Connections				
• Electric	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 EEx d certified cable gland M20 x 1.5, ½-14 NPT or M25 x 1.5	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 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 NCS; as option)				
• U_o	–	–	< 5 V	< 5 V
• I_o	–	–	< 75 mA	< 75 mA
• I_s	–	–	<160 mA	<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

SIPART PS2 PA

Technical specifications

SIPART PS2 PA	Basic device without Ex protection	Basic device with EEx-d protection (flameproof casing)	Basic device with EEx ia/ib protection	Basic device with EEx n protection
Explosion protection to EN 50014, EN 50020 and EN 50021	Without	EEx d II 2 G EEx d II C T4/T5/T6	EEx ia/ib II 2 G EEx ia/ib II C T6	EEx n II 3 G EEx nA L [L] II C T6
Mounting location		Zone 1 or zone 2	Zone 1	Zone 2
Permissible ambient temperature for operation	-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)		
At ≤ -10 °C (+14 °F) the display refresh rate of the LCD is limited.				
(for basic devices with Ex protection the following applies: Only T4 is permissible when using I_y module.)				
Electrical data				
Input				
Power supply (terminals 6/7)	Bus-supplied			
Bus voltage	9 ... 32 V	9 ... 32 V	9 ... 24 V	9 ... 32 V
• Bus connection with FISCO supply unit, ia or ib group IIC or IIB		–		
- Max. supply voltage U_o	–	–	17.5 V	–
- Max. short-circuit current I_o	–	–	380 mA	–
- Max. power P_o	–		5.32 W	–
• Bus connection with barrier, ia or ib group IIC or IIB		–		
- Max. supply voltage (U_o)	–	–	24 V	–
- Max. short-circuit current (I_o)	–	–	250 mA	–
- Max. power P_o	–	–	1.2 W	–
Current consumption	10.5 mA ± 10%	10.5 mA ± 10%	10.5 mA ± 10%	10.5 mA ± 10%
Fault current	0 mA	0 mA	0 mA	0 mA
Effective internal inductance	–	–	Li ≤ 8 µH	–
Effective internal capacitance	–	–	Negligible	–
Connection	–	–	Certified intrinsically safe circuit	–
Safety shutdown can be activated with coding bridge (terminals 81/82; electrically isolated from the basic device)				
• Input resistance	> 20 kΩ	> 20 kΩ	> 20 kΩ	> 20 kΩ
• Signal status "0" (shutdown active)	0 ... 4.5 V or unused	0 ... 4.5 V or unused	0 ... 4.5 V or unused	0 ... 4.5 V or unused
• Signal status "1" (shutdown not active)	13 ... 30 V	13 ... 30 V	13 ... 30 V	13 ... 30 V
• Effective Internal capacitance C_i	–	–	Negligible	–
• Effective internal inductance L_i	–	–	Negligible	–
• For connection to power supply with	–	–	Intrinsically safe	–
- Max. supply voltage U_i	–	–	< 30 V	< 30 V
- Max. short-circuit current I_i	–	–	<100 mA	<100 mA
- Maximum power P_i	–	–	< 1 W	–
Electrical isolation	Between basic device and the input for safety shutdown, as well as the outputs of the option modules	Between basic device and the input for safety shutdown, as well as the outputs of the option modules	The basic device and the input to the safety shutdown, as well as the outputs of the option modules, are individual, intrinsically-safe circuits	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	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s

SIPART PS2 PA	Basic device without Ex protection	Basic device with EEx-d protection (flameproof casing)	Basic device with EEx ia/ib protection	Basic device with EEx n protection
Communication	Layers 1 and +2 according to PROFIBUS PA, transmission technique according to IEC 1158-2; slave function; layer 7 (protocol layer) according to PROFIBUS DP, EN 50170 standard with the extended PROFIBUS functions (all data acyclic, manipulated variable, feedbacks and status also cyclic)			
C2 connections	Four connections to master class 2 are supported, automatic connection setup 60 s after break in communication;			
Device profile	PROFIBUS PA profile B, version 3.0, more than 150 objects			
Response time to master message	Typical 10 ms			
Device address	126 (when delivered)			
PC parameterizing software	SIMATIC PDM; supports all device objects. The software is not included in the scope of delivery			
Connections				
• Electric	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 EEx d certified cable gland M20 x 1.5, ½-14 NPT or M25 x 1.5	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT
• Pneumatic	Female thread G¼ DIN 45141 (¼-18 NPT)	Female thread G¼ DIN 45141 (¼-18 NPT)	Female thread G¼ DIN 45141 (¼-18 NPT)	Female thread G¼ DIN 45141 (¼-18 NPT)
External position sensor (potentiometer or NCS; as option)				
• U_o	–	–	< 5 V	< 5 V
• I_o	–	–	< 75 mA	< 75 mA
• I_s	–	–	< 160 mA	< 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

SIPART PS2 FF

Technical specifications

SIPART PS2 FF	Basic device without Ex protection	Basic device with EEx d protection, flameproof casing	Basic device with EEx ia/ib protection
Explosion protection to EN 50014, EN 50020 and EN 50021	Without	EEx d II 2 G EEx d II C T4/T5/T6	EEx ia/ib II 2 G EEx ia/ib II C T6
Mounting location		Zone 1 or zone 2	Zone 1
Permissible ambient temperature for operation	-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)	
At ≤ -10 °C (+14 °F) the display refresh rate of the LCD is limited. (for basic devices with Ex protection the following applies: Only T4 is permissible when using I_y module.)			
Electrical data			
Input			
Power supply (terminals 6/7)	Bus-supplied	Bus-supplied	Bus-supplied
Bus voltage	9 ... 32 V	9 ... 32 V	9 ... 24 V
• Bus connection with FISCO supply unit, ia or ib group IIC or IIB			
- Max. supply voltage U_o	–	–	17.5 V
- Max. short-circuit current I_o	–	–	380 mA
- Max. power P_o	–	–	5.32 W
• Bus connection with barrier, ia or ib group IIC or IIB			
- Max. supply voltage U_o	–	–	24 V
- Max. short-circuit current I_o	–	–	250 mA
- Max. power P_o	–	–	1.2 W
Electrical data			
Current consumption	10.5 mA ± 10%	10.5 mA ± 10%	10.5 mA ± 10%
Fault current	0 mA	0 mA	0 mA
Effective internal inductance	–	–	L_i ≤ 8 µH
Effective internal capacitance	–	–	Negligible
Connection	–	–	Certified intrinsically safe circuit
Safety shutdown can be activated with coding bridge (terminals 81/82; electrically isolated from the basic device)			
• Input resistance	> 20 kΩ	> 20 kΩ	> 20 kΩ
• Signal status "0" (shutdown active)	0 ... 4.5 V or unused	0 ... 4.5 V or unused	0 ... 4.5 V or unused
• Signal status "1" (shutdown not active)	13 ... 30 V	13 ... 30 V	13 ... 30 V
• Effective Internal capacitance C_i	–	–	Negligible
• Effective internal inductance L_i	–	–	Negligible
• For connection to power supply with	–	–	Intrinsically safe
- Max. supply voltage U_i	–	–	< 30 V
- Maximum short-circuit current I_i	–	–	<100 mA
- Maximum power P_i	–	–	< 1 W
Electrical isolation	Between basic device and the input for safety shutdown, as well as the outputs of the option modules	Between basic device and the input for safety shutdown, as well as the outputs of the option modules	The basic device and the input to the safety shutdown, as well as the outputs of the option modules, are individual, intrinsically-safe circuits
Test voltage	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s

SIPART PS2 FF	Basic device without Ex protection	Basic device with EEx d protection, flameproof casing	Basic device with EEx ia/ib protection
Communication			
Communications group and class	According to technical specification of the Fieldbus Foundation for H1 communication		
Function blocks	Group 3, Class 31PS (publisher, subscriber) 1 resource block (RB2) 1 analog output function block (AO) 1 PID function block (PID) 1 transducer block (standard advanced positioner valve)		
Execution times of the blocks	AO: 50 ms PID: 80 ms		
Physical layer profile	123, 511		
FF registration	Tested with ITK 4.6		
Connections			
Electric	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT	Screw terminals 2.5 AWG28-12 EEx d certified cable gland M20 x 1.5, ½-14 NPT or M25 x 1.5	Screw terminals 2.5 AWG28-12 Cable gland M20 x 1.5 or ½-14 NPT
Pneumatic	Female thread G¼ DIN 45141 (¼-18 NPT)	Female thread G¼ DIN 45141 (¼-18 NPT)	Female thread G¼ DIN 45141 (¼-18 NPT)
External position sensor (potentiometer or NCS; as option)			
• U_o	–	–	< 5 V
• I_o	–	–	< 75 mA
• I_s	–	–	< 160 mA
• P_o	–	–	< 120 mW
Maximum permissible external capacitance C_o	–	–	< 1 µF
Maximum permissible external inductance L_o	–	–	< 1 mH

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Technical specifications

Option modules	Without Ex protection (EEx d also)	With Ex protection EEx ia/ib	With Ex protection EEx n
Ex protection to EN 50014, EN 50020 and EN 50021	–	II 2G EEx ia/ib II C T4/T5/T6	II 3G EEx nA L [L] II C T6
Mounting location	–	Zone 1	Zone 2
Permissible ambient temperature for operation (For devices with Ex protection: Only in conjunction with the basic device 6DR5... -.E.... Only T4 is permissible when using I_y module)	-30 ... +80 °C (-22 ... +176 °F)	T4: -30 ... +80 °C (-22 ... +176 °F)[1)] T5: -30 ... +65 °C (-22 ... +149 °F)[1)] T6: -30 ... +50 °C (-22 ... +122 °F)[1)]	
Alarm module	6DR4004-8A (without Ex protection)	6DR4004-6A (with Ex protection)	6DR4004-6A (with Ex protection)
Binary alarm outputs A1, A2 and alarm output			
Signal status High (not responded) Signal status Low* (responded) (* Low is also the status when the basic device is faulty or has not electric power supply)	Active, R = 1 kΩ, +3/-1%* Disabled, I_R < 60 µA (* When used in the flameproof casing the current consumption is limited to 10 mA per output.)	≥ 2.1 mA ≤ 1.2 mA (Switching threshold with supply to EN 60947-5-6: U_H = 8.2 V, R_i = 1kΩ)	≥ 2.1 mA ≤ 1.2 mA (Switching threshold with supply to EN 60947-5-6: U_H = 8.2 V, R_i = 1kΩ)
Internal capacitance C_i	–	≤ 5.2 nF	–
Internal inductance L_i	–	Negligible	–
Power supply U_H	≤ 35 V	–	–
Connection to power circuits with	–	intrinsically safe switching amplifier EN 60947-5-6 U_o ≤ 15.5 V DC I_k ≤ 25 mA, P ≤ 64 mW	U_i ≤ 15.5 V DC
Binary input BE2			
• Electrically connected to the basic device			
- Signal status 0	Floating contact, open	Floating contact, open	Floating contact, open
- Signal status 1	Floating contact, closed	Floating contact, closed	Floating contact, closed
- Contact load	3 V, 5 µA	3 V, 5 µA	3 V, 5 µA
• Electrically isolated from the basic device			
- Signal status 0	≤ 4.5 V or open	≤ 4.5 V or open	≤ 4.5 V or open
- Signal status 1	≥ 13 V	≥ 13 V	≥ 13 V
- Natural resistance	≥ 25 kΩ	≥ 25 kΩ	≥ 25 kΩ
Static destruction limit	± 35 V	–	–
Internal inductance and capacitance	–	Negligible	–
Connection to power circuits	–	Intrinsically safe U_i ≤ 25.2 V	U_i ≤ 25.2 V DC
Electrical isolation	The 3 outputs, the input BE2 and the basic device are electrically isolated from each other		
Test voltage	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s
SIA module (not for EEx d version)	6DR4004-8G (without Ex protection)	6DR4004-6G (with Ex protection)	6DR4004-6G (with Ex protection)
Limit transmitter with slot-type initiators and alarm output	2-wire connection		
Ex protection	Without	II 2 G EEx ia/ib IIC T6	II 3 G EEx nA L [L] IIC T6
Connection	2-wire system to EN 60947-5-6 (NAMUR), for switching amplifier to be connected on load side		
2 slot-type initiators	Type SJ2-SN	Type SJ2-SN	Type SJ2-SN
Function	NC (normally closed)	NC (normally closed)	NC (normally closed)
Connection to power circuits with	nominal voltage 8 V Current consumption: ≥ 3 mA (limit value not responded) ≤ 1 mA (limit value responded)	Intrinsically safe switching amplifier EN 60947-5-6 U_i ≤ 15.5 V DC I_i ≤ 25 mA, P_i ≤ 64 mW	U_i ≤ 15.5 V DC P_i ≤ 64 mW
Internal capacitance	–	≤ 41 nF	–
Internal inductance	–	≤ 100 mH	–
Electrical isolation	The 3 outputs are electrically isolated from the basic device		
Test voltage	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s
Alarm output	See Alarm module	See Alarm module	See Alarm module

[1)] Only in conjunction with the basic device 6DR5...-E..... With Iy module only T4 permitted.

Accessory modules	Without Ex protection (EEx d also)	With Ex protection EEx ia/ib	With Ex protection EEx n
Limit value contact module	6DR4004-8K	6DR4004-6K	6DR4004-6K
Limit transmitter with mechanical ground contact and alarm output			
Ex protection	without	II 2 G EEx ia/ib IIC T6	II 3 G EEx nA L [L] IIC T6
Max. switching current AC/DC	4 A	Connection to intrinsically safe power circuits:	Connection to intrinsically safe power circuits:
		$U_o \leq 30$ V $I_k \leq 100$ mA, $P_i \leq 750$ mW	$U_o \leq 30$ V $I_k \leq 100$ mA, $P_i \leq 750$ mW
Max. switching voltage AC/DC	250 V / 24 V	30 V DC	30 V DC
Internal capacitance C_i	–	Negligible	–
Internal inductance L_i	–	Negligible	–
Electrical isolation	The 3 outputs are electrically isolated from the basic device		
Test voltage	3150 V DC, 2s	3150 V DC, 2 s	3150 V DC, 2 s
Alarm module	See Alarm module	See Alarm module	See Alarm module
I_y module	6DR4004-8J (without Ex protection)	6DR4004-6J (with Ex protection)	6DR4004-6J (with Ex protection)
DC output for position feedback	2-wire connection	2-wire connection	2-wire connection
Nominal signal range i	4 ... 20 mA, short-circuit-proof	4 ... 20 mA, short-circuit-proof	4 ... 20 mA, short-circuit-proof
Total operating range	3.6 ... 20.5 mA	3.6 ... 20.5 mA	3.6 ... 20.5 mA
Power supply U_H	+12 ... +35 V	+12 ... +30 V	+12 ... +30 V
External load R_B [kW]	$\leq (U_H$ [V] - 12 V) /i [mA]	$\leq (U_H$ [V] - 12 V) /i [mA]	$\leq (U_H$ [V] - 12 V) /i [mA]
Transmission error	≤ 0.3%	≤ 0.3%	≤ 0.3%
Temperature effect	≤ 0.1%/10 K (≤ 0.1%/18 °F)	≤ 0.1%/10 K (≤ 0.1%/18 °F)	≤ 0.1%/10 K (≤ 0.1%/18 °F)
Resolution	≤ 0.1%	≤ 0.1%	≤ 0.1%
Residual ripple	≤ 1%	≤ 1%	≤ 1%
Internal capacitance C_i	–	≤ 11 nF	–
Internal inductance L_i	–	Negligible	–
For connection to power circuits with		Intrinsically safe: $U_i \leq 30$ V DC $I_i \leq 100$ mA; $P_i \leq 1$ W (only T4)	$U_i \leq 30$ V DC $I_i \leq 100$ mA; $P_i \leq 1$ W (only T4)
Electrical isolation	Electrically isolated from the basic device	Electrically isolated from the basic device	Electrically isolated from the basic device
Test voltage	840 V DC, 1 s	840 V DC, 1 s	840 V DC, 1 s
NCS sensor			
(not for EEx d version)			
Position range			
• Linear actuator	3 ... 130 mm (0.12 ... 5.12 inch), to 200 mm (7.87 inch) on request	3 ... 130 mm (0.12 ... 5.12 inch), to 200 mm (7.87 inch) on request	3 ... 130 mm (0.12 ... 5.12 inch), to 200 mm (7.87 inch) on request
• Part-turn actuator	30° ... 100°	30° ... 100°	30° ... 100°
Linearity (after correction by SIPART PS2)			
• Linear actuator	± 1%	± 1%	± 1%
• Part-turn actuator	± 1%	± 1%	± 1%
Hysteresis	± 0.2%	± 0.2%	± 0.2%
Continuous working temperature	-40 ... +85 °C (-40 ... +185 °F), extended temperature range on request	-40 ... +85 °C (-40 ... +185 °F), extended temperature range on request	-40 ... +85 °C (-40 ... +185 °F), extended temperature range on request
Degree of protection of casing	IP68/NEMA 4X	IP68/NEMA 4X	IP68/NEMA 4X

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Selection and Ordering data	Order No.
Electropneumatic positioner SIPART PS2, PS2 PA and PS2 FF	6DR5 ■■■ - 0 ■■■■ - ■■A■
Version	
2-wire	
• Without HART (4 to 20 mA) ▶	0
• With HART, not explosion-protected (except EEx d) ▶	1
2-, 3-, 4-wire	
• With HART, explosion-protected ▶	2
• Without HART, not explosion-protected ▶	3
PROFIBUS PA connection	5
FOUNDATION Fieldbus connection (not EEx n)	6
For actuator	
Single-action ▶	1
Double-action ▶	2
Casing	
Plastic ▶	0
Aluminum; only single-action ▶	1
Stainless steel; not for EEx d version: FM/CSA and EEx n on request ▶	2
Aluminum; EEx d housing (flameproof)[1] ▶	5
Explosion protection	
Without ▶	N
With explosion protection EEx ia/ib or EEx d (CENELEC/FM/CSA)	E
With explosion protection EEx n, metal casing (CENELEC)	G
Connection thread electrical/pneumatic	
M20 x 1.5 / G¼ ▶	G
½-14 NPT / ¼-18 NPT	N
M20 x 1.5 / ¼-18 NPT	M
½-14 NPT / G¼	P
M25 x 1.5 / G¼ (only EEx d version)[1]	Q
With PROFIBUS plug M12 / G¼[2]	R
With PROFIBUS plug M12 / ¼-18 NPT[2]	S
M20 x 1.5 / VDI/VDE 3847	V
Limit monitor Installed, incl. 2nd cable gland	
Without ▶	0
Alarm module; electronic (6DR4004-.A)	1
SIA module; slot-type initiators (6DR4004-.G); not for EEx d version)	2
Limit value contact module (mechanical switching contacts (6DR4004-.K); not for EEx d version	3
Optional modules Installed, incl. 2nd cable gland	
Without ▶	0
ly module for position feedback signal (4 ... 20 mA) (6DR4004-.J)	1
EMC filter module for external position sensor (C73451-A430-D23), (not for EEx d version)	2
ly module and EMC filter module for external position sensor, not for EEx d version	3

Selection and Ordering data	Order No.
Electropneumatic positioner SIPART PS2, PS2 PA and PS2 FF	6DR5 ■■■ - 0 ■■■■ - ■■A■
Customer-specific design	
Without ▶	0
Brief instructions	
German/English ▶	A
French/Spanish/Italian	B
Mounted pressure gauge block	
Without ▶	0
Single-action G¼	1
Double-action G¼	2
Single-action ¼-18 NPT	3
Double-action ¼-18 NPT	4
Further designs	Order code
Add "-Z" to Order No. and specify Order Code.	
Version with stainless steel sound absorbers not for EEx d version; standard with stainless steel enclosures	**A40**
Customized preset bus address (max. 126) and/or software tag No. for PROFIBUS PA and FOUNDATION Fieldbus version, for plastic enclosures, for metal enclosures on request.	**Y25**

▶ Available ex stock

[1] EEx d version without cable gland.
[2] Not for EEx d, FM/CSA approval, EEx ia/ib (CENELEC) on request

Selection and Ordering data	Order No.
Accessories	
NCS sensor for non-contacting detection of position (not for EEx d version), cable length 6 m (19.68 ft)	6DR4004 - ■NN■0
Non explosion-proof	8
Explosion-protected, EEx ia/ib	6
For part-turn actuators, without mounting console	1
For linear actuators up to 14 mm (0.55 inch), without mounting bracket	2
For linear actuators >14 mm (0.55 inch), to 130 mm (5.12 inch) for mounting to IEC 60534-6, without mounting kit	3
The EMC filter module is additionally required for the controller unit. (separate order item, see below)	

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Selection and Ordering Data		Order No.
Accessories		
Alarm module for 3 alarm outputs and 1 binary input (functionality: 2 limit monitors, 1 fault alarm, 1 binary input)		
• Without explosion protection	▶	**6DR4004-8A**
• With explosion protection CENELEC	▶	**6DR4004-6A**
• With explosion protection FM/CSA[1)]		**6DR4004-7A**
SIA module (slot-type initiator alarm module, not for 6DR4 version and not for EEx d version)		
• Without explosion protection		**6DR4004-8G**
• With explosion protection CENELEC and FM/CSA[1)]		**6DR4004-6G**
Limit value contact module (with mechanical ground contacts, not for 6DR4 version and not for EEx d version)		
• without explosion protection		**6DR4004-8K**
• with explosion protection		**6DR4004-6K**
I_y module for position feedback signal (4 to 20 mA)		
• Without explosion protection	▶	**6DR4004-8J**
• With explosion protection CENELEC	▶	**6DR4004-6J**
• With explosion protection FM/CSA [1)]		**6DR4004-7J**
HART module (only for 6DR400 version)		
• Without explosion protection	▶	**6DR4004-8H**
• With explosion protection CENELEC	▶	**6DR4004-6H**
• With explosion protection FM[1)]		**6DR4004-7H**
HART modem for connecting to PC or laptop for 6DR40... and 6DR5...		
• with RS232 interface	▶ D)	**7MF4997-1DA**
• with USB interface	▶ D)	**7MF4997-1DB**
Mounting kit for NAMUR part-turn actuators		
(VDI/VDE 3845, without mounting plate)	▶	**6DR4004-8D**
The following mounting plates can be used with the NAMUR part-turn actuator mounting kit 6DR4004-8D. Size W x L x H (H = height of shaft butt)		
• 30 x 80 x 20 mm	▶ C)	**TGX:16152-105**
• 30 x 80 x 30 mm	▶ C)	**TGX:16300-147**
• 30 x 130 x 30 mm	▶ C)	**TGX:16300-149**
• 30 x 130 x 30 mm	▶ C)	**TGX:16300-151**
Mounting kit for other part-turn actuators The following mounting plates can be used together with the NAMUR part-turn actuator mounting kit 6DR4004-8D.		
• SPX (DEZURIK) Power Rac, sizes R1, R1A, R2 and R2A	▶ C)	**TGX:16152-328**
• Masoneilan Camflex II	▶ C)	**TGX:16152-350**
• Fisher 1051/1052/1061, sizes 30, 40, 60 to 70	▶ C)	**TGX:16152-364**
• Fisher 1051/1052, size 1033	▶ C)	**TGX:16152-348**
Mounting kit for NAMUR linear actuators		
NAMUR linear actuator mounting kit with short lever arm (2 to 35 mm)	▶	**6DR4004-8V**
• Lever arm for travels from 35 mm to 130 cm (1.38 inch to 5.12 inch)	▶	**6DR4004-8L**
• Reduced mounting kit for linear actuator (without fixing angle and U-bracket), with short lever with up to 35 mm travel (1.38 inch)	▶	**6DR4004-8VK**
• Reduced mounting kit for linear actuator (without fixing angle and U-bracket), with long lever with >35 mm travel (1.38 inch)	▶	**6DR4004-8VL**
Mounting kit for other linear actuators		
• Retrofitting kit for Moore series 72 and 750 valve positioners	▶ C)	**TGX:16152-117**
• Fisher type 657/667, size 30 to 80	▶ C)	**TGX:16152-110**
• SAMSON actuator type 3277 (yoke dimension (H5) = 101 mm [2)] (integrated connection without tube)	▶	**6DR4004-8S**
Pipe mounting		
Mounting bracket for pipe mounting of the SIPART PS2 position (e.g. when using the NCS sensor)	▶ C)	**TGX:16152-336**
Additional actuator items can be found at the following Internet address: *www.siemens.com/sipartps2* Customer-specific actuators available on request.		
Manometer block including pressure gauge		
• For single-action SIPART PS2 positioner (2 manometers, scaled in MPa and bar)	▶	**6DR4004-1M**
• For double-action SIPART PS2 positioner (3 manometers, scaled in MPa and bar)	▶	**6DR4004-2M**
• For single-action SIPART PS2 positioner with NPT thread (2 manometers, scaled in MPa and psi)	▶	**6DR4004-1MN**
• For double-action SIPART PS2 positioner with NPT thread (3 manometers, scaled in MPa and psi)	▶	**6DR4004-2MN**

▶ Available ex stock.

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

1) U.S. certification by FM institute

2) With a yoke dimension H5 = 95 mm, only the SIPART PS2 in a metal casing can be used.

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SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Connection block, for safety solenoid valve with extended mounting flange to NAMUR	
• For mounting to IEC 534-6	**6DR4004-1B**
• For SAMSON actuator (integrated mounting) see above	**6DR4004-1C**[1)]
External position detection system (with explosion protection to CENELEC, EEx ia, ib) for separate mounting of position sensor and controller (for for EEx d version), comprising SIPART PS2 plastic casing with integral potentiometer and sliding clutch (without electronics and valve block) The EMC filter module is additionally required for the controller unit. (separate ordering item below)	**C73451-A430-D78**
EMC filter module for connection of external position sensor (10 kΩ) or NCS sensor (not for EEx d version)	**C73451-A430-D23**
Documentation (see notes below)	
Instruction Manual SIPART PS2	
• German/English	**A5E00074600**
• French/Italian/Spanish	**A5E00074601**
Instruction Manual SIPART PS2 PROFIBUS PA	
• German/English	**A5E00120716**
• French/Italian/Spanish	**A5E00120717**
Instruction Manual NCS Sensor	
• German/English/French/Spanish/Italian	**A5E00097485**
SIPART PS2 device documentation	
• CD-ROM with complete documentation for all device versions	**A5E00214567**
Device manual for SIPART PS2 (not PA and FF)	
• German	**A5E00074630**
• English	**A5E00074631**
Manual for SIPART PS2 PROFIBUS PA	
• German	**A5E00127924**
• English	**A5E00127926**
SITRANS I outgoing isolator HART (see „SITRANS I supply units and isolation amplifiers“) with	
• 24 V DC power supply	**7NG4130-1AA11**
• 230 V AC power supply	**7NG4130-1BA11**

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

Note

All the above mentioned manuals are included on CD-ROM or can be downloaded from the Internet.

Following manuals are available in addition as downloads from the Internet or are included on CD-ROM:

- Instruction Manual SIPART PS2 FF, Electropneumatic Positioner (6DR56xx) with Foundation Fieldbus
  - German/English: A5E00214570
- Instruction Manual SIPART PS FF, Electropneumatic Positioner (6DR56xx) with Foundation Fieldbus
  - German: A5E00214568
  - English: A5E00214569

Scope of delivery:

Positioners

- 1 SIPART PS2 positioner as ordered
- 1 CD-ROM with the complete documentation for all versions and accessories
- Manual "SIPART PS2 - Configuration At a Glance"

Mounting kit for NAMUR linear actuators (see the following images)

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

Mounting kit for NAMUR part-turn actuators (see the following images)

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

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

More infomation

Training

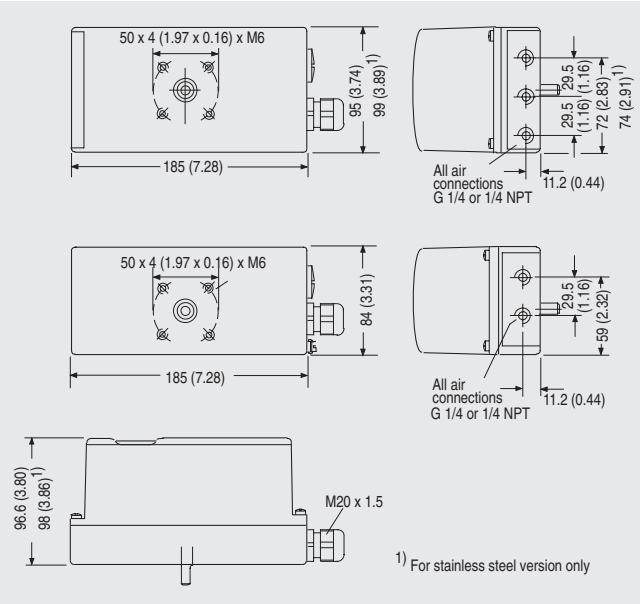
Refer to Catalog ITC for details of training courses for these devices.

Special versions

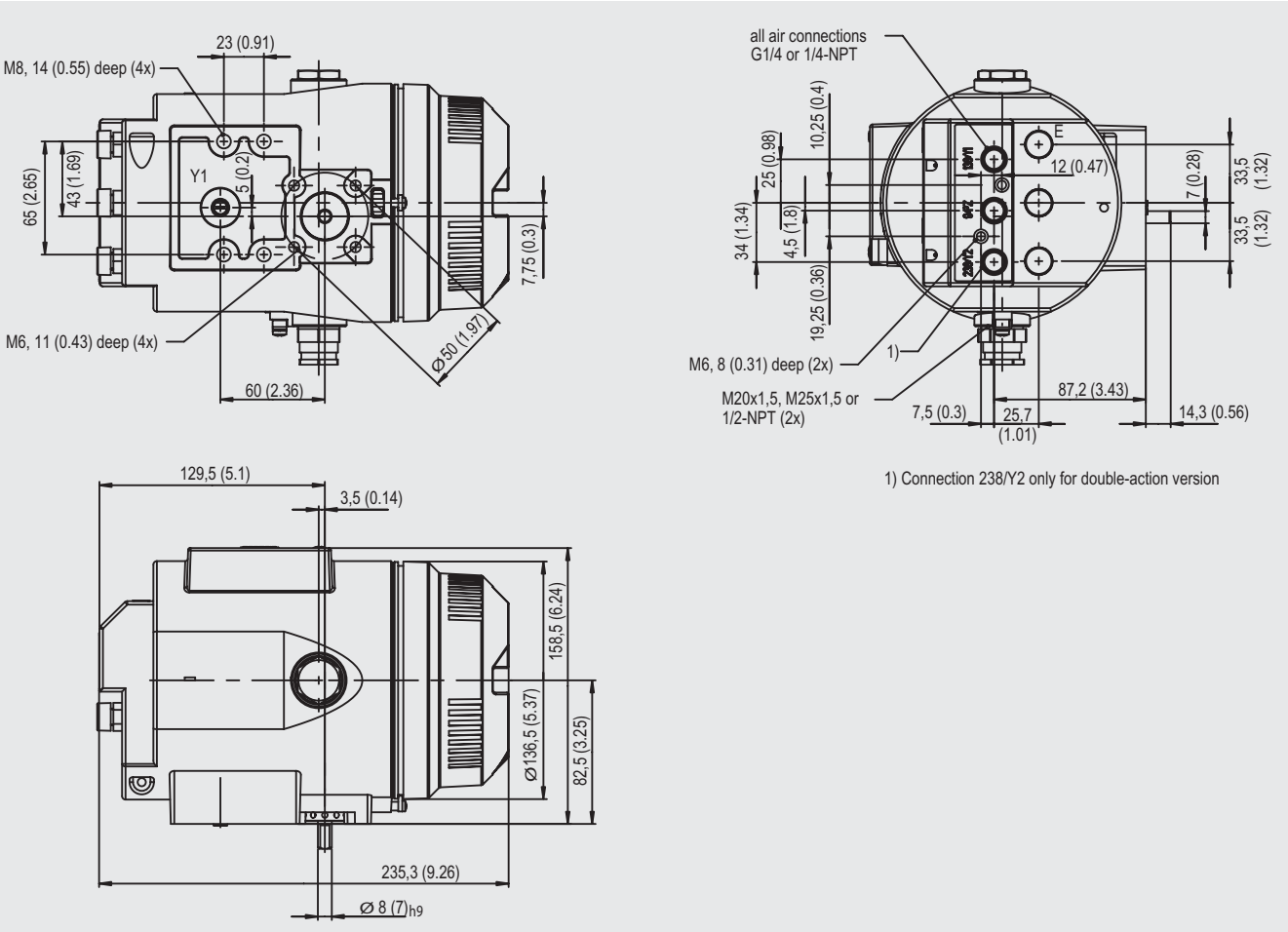
On request

SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF

Dimensional drawings

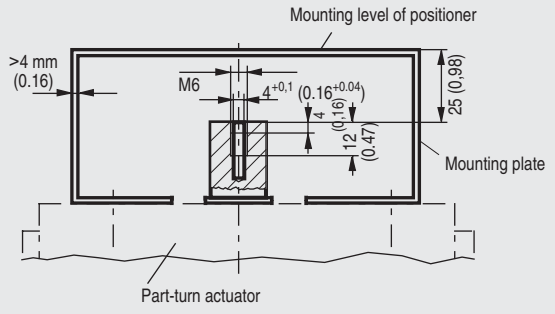


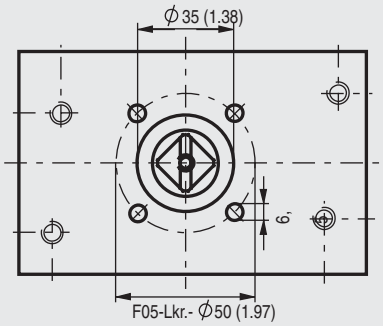
Plastic and stainless steel casing (top), aluminium casing (center), plastic and metal casing (bottom), dimensions in mm (inch)



1) Connection 238/Y2 only for double-action version

Flameproof casing left, dimensions in mm (inch)



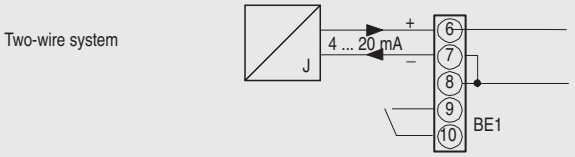


Mounting onto part-turn actuators; mounting plate (scope of delivery of actuator manufacturer), extract from VDI/VDE 3845, dimensions in mm (inch)

Schematics

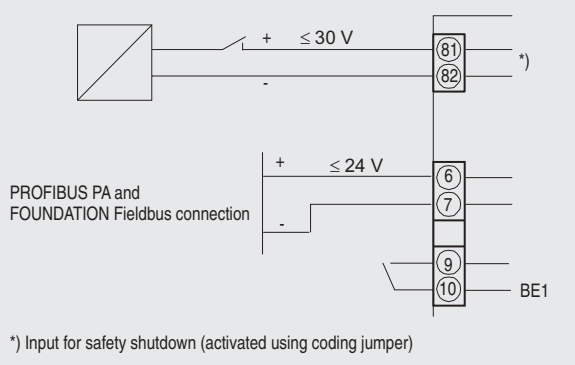
Electric connection of 2-wire devices (6DR50.. and 6DR51..)

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



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

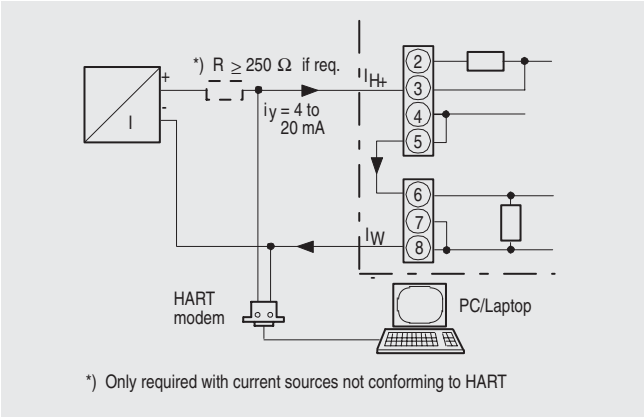
Electric connection of PROFIBUS PA device (6DR55..) and Foundation Fieldbus devices (6DR56..)



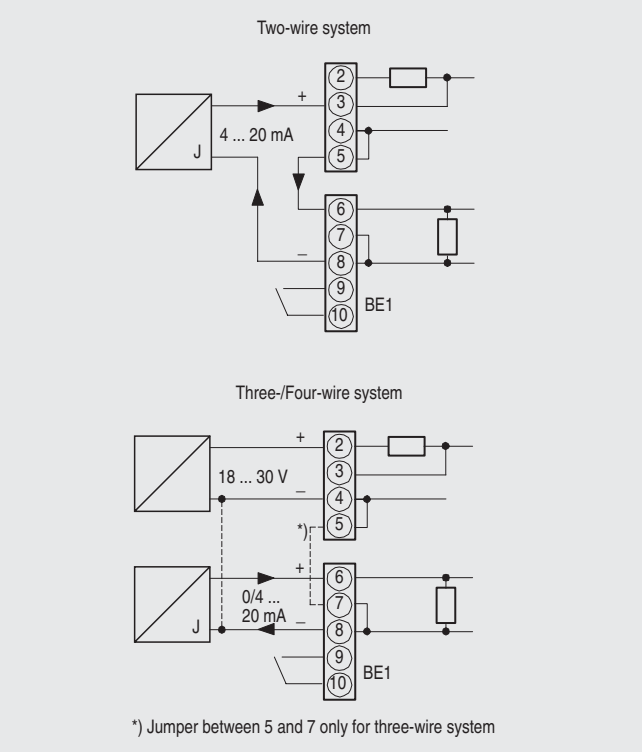
SIPART PS2 PA and SIPART PS2 FF electropneumatic positioner, input circuit for 6DR55.. and 6DR56..

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

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



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



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

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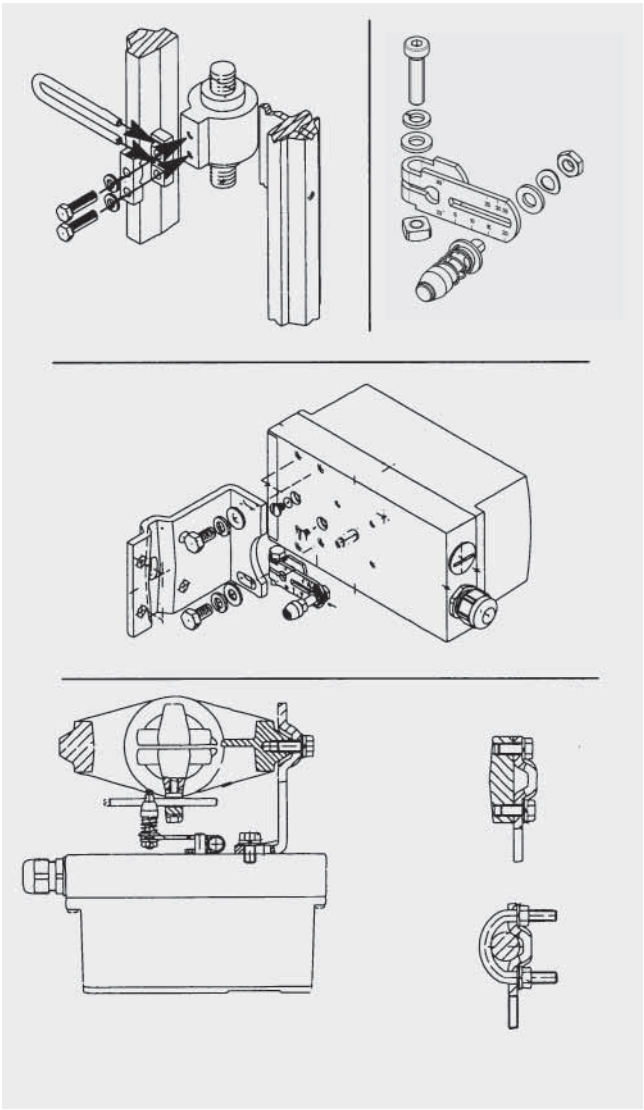
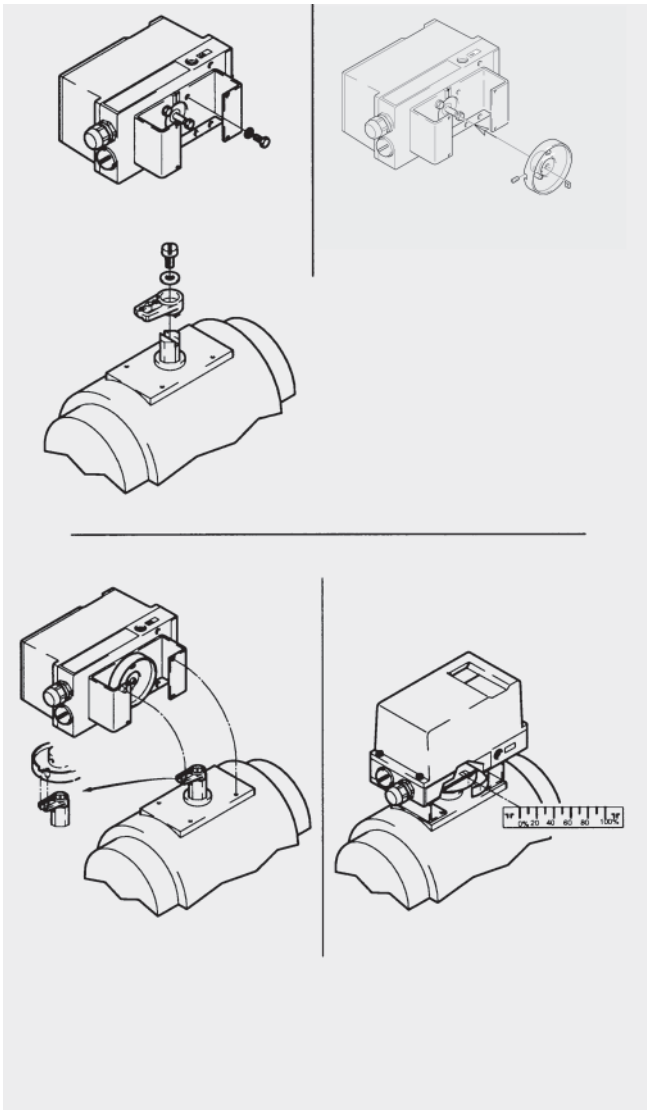
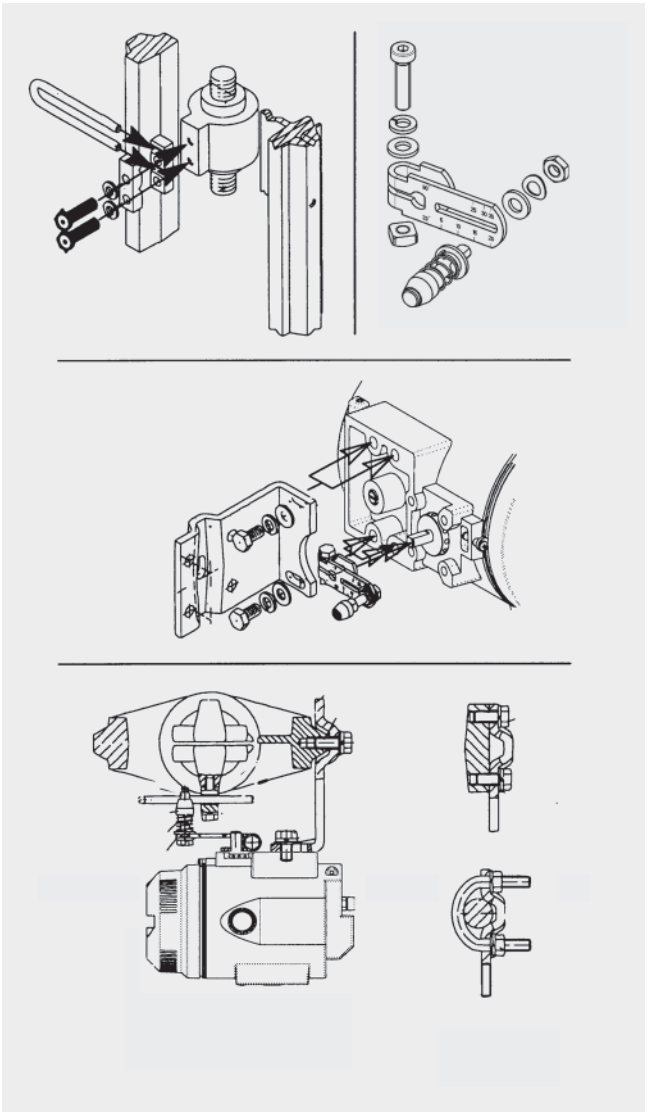
SIPART PS2, PS2 PA, PS2 FF, PS2 EEx d, PS2 EEx d PA and PS2 EEx d FF



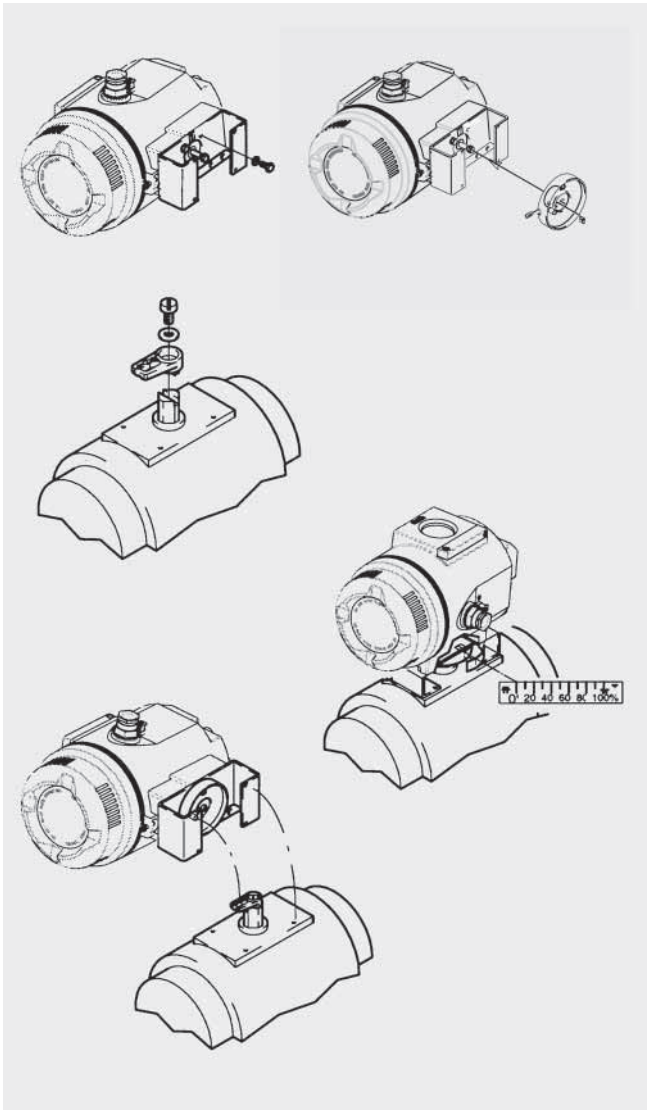
Mounting of SIPART PS2 on linear actuators



Mounting of SIPART PS2 on part-turn actuators



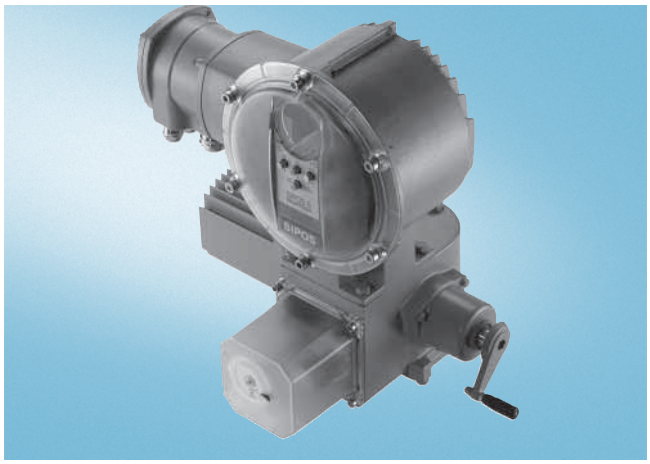
Mounting of SIPART PS2 EEx d on linear actuators



Mounting of SIPART PS2 EEx d on part-turn actuators

Rotary, linear and part-turn actuators Technical Description

Overview



SIPOS 5 Flash, electric actuator (rotary actuator)

Applications

SIPOS 5 Flash electric actuators are used primarily in process plants for safe and precise control of valves (ordinary valves, gate valves, dampers, vanes and cocks).

SIPOS 5 Flash actuators are equally well-suited for use in power plants, in chemical and petrochemical plants and in the water- / wastewater treatment whenever the aim is to replace conventional control technology, such as reversing contactor or thyristor-type controllers and switching cabinets, with decentralized controls integrated in the actuator.

Principle of operation

Three-phase current for the asynchronous motor is generated by means of the power circuit module in the electronic, regardless of the power supply (1-phase or 3-phase). Frequency converters and microcontrollers allow different speeds and precise tripping torques to be set (no overtorque).

The phase angle is checked and automatically adjusted, so that the direction of rotation is always correct.

The compact design of the electronics, in which the control module and the power circuit module are tuned to one another exactly, permits the actuator to be soft-started - something that helps prolong the life-time of the valve. Thanks to the integrated electronics, the starting current is not higher than the rated current, so that connecting cables with a smaller cross-section can be used compared to conventional actuators.

The gearbox used is a sturdy, proven worm shaft/worm wheel assembly, which is self-locking up to an output speed of 80 rpm.

The travel is recorded and electronically evaluated by means of a precision potentiometer.

The integrated electronics is responsible for measuring the torque and for cut-off when the tripping torque is reached. The travel-dependent cut-off function is also controlled by this unit.

During the startup phase or in the event of a power failure, the actuator can be positioned with the aid of a hand crank handle or -wheel.

Linear and part-turn movements are achieved by means of a combination of a rotary actuator and a thrust-unit or worm gear box.

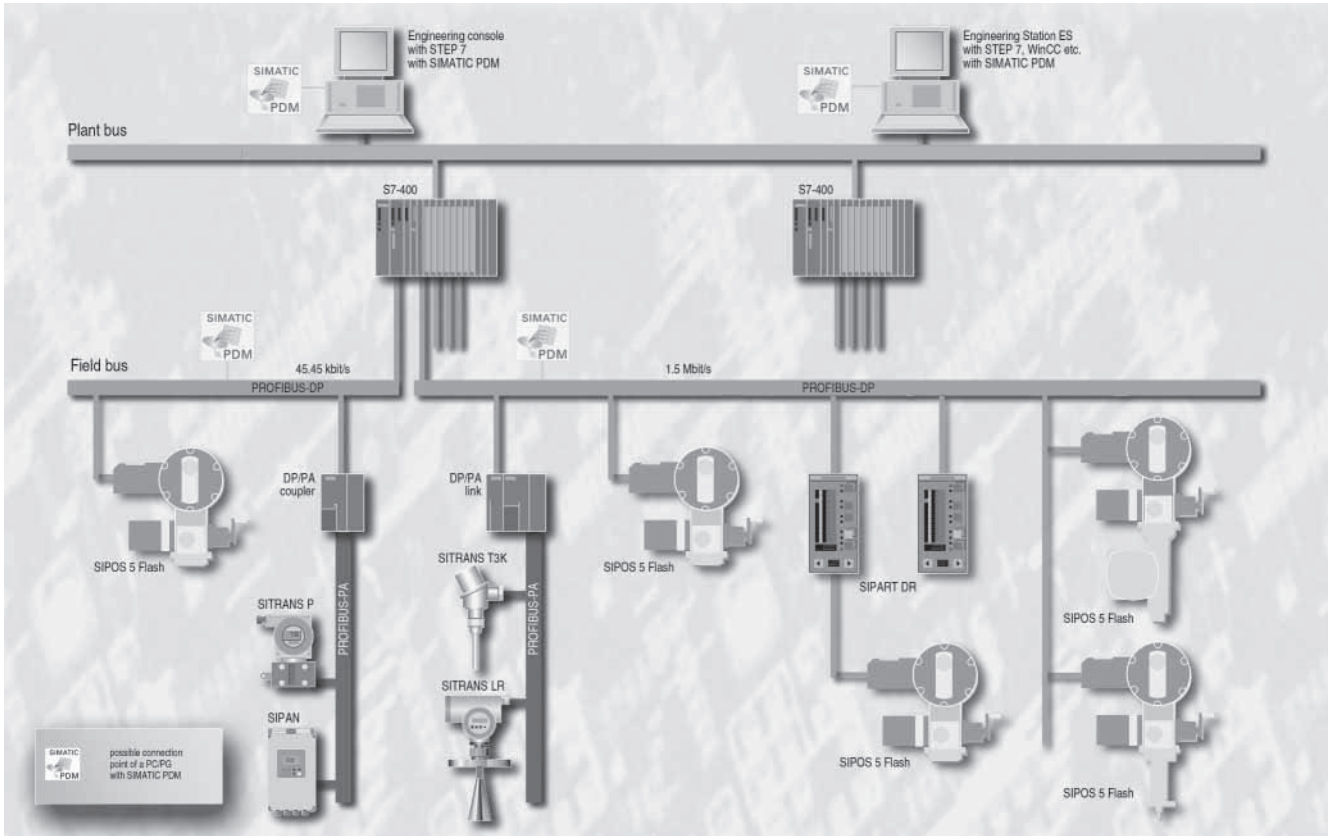
Outstanding features

SIPOS 5 Flash actuators are outstanding for the high quality of their electronics unit and the ruggedness of their mechanical components:

- IP67 degree of protection (IP68 on request).
- Constant efficiency over the complete lifecycle.
- Little maintenance required (inspection recommended after 8 years).
- Non-wearing asynchronous motor.
- Soft starting in the end positions and soft approach to the end positions.
- Housing material: corrosion-resistant aluminum alloy with stainless steel bolts on the outside.
- Separate mounting of electronics unit and gear unit by loosening a flange connection (4 bolts).
- Tripping torques (or cut-off forces) and speeds (or positioning time /positioning speeds) are freely selectable within a defined range without altering the hardware.
- Operator prompting with PROFITRON in plain text and 8 languages (expandable).
- Three valve reference torque curves with 1% steps can be stored and evaluated in the actuator electronics (optional).
- Speed setting can be programmed according to valve position using 10 interpolation points (optional).
- External analog speed input via 0/4-20 mA (optional).
- Functional enhancements made available over the internet in the form of firmware updates. They can be activated if required.
- Firmware can be updated without replacing the hardware (Flash EEPROM).
- Reduced spare parts stock due to interchangeable components.

Electrical connection/electronic circuits

- Frequency range: 47 to 63 Hz
- 1-phase power supply 230 V (± 15%)
- 3-phase power supply range: 400 to 460 V (± 15%)
- Other power supplies possible in conjunction with matching transformers (optional)
- Solid-state full motor protection and automatic phase sequence correction
- Additional external 24 V DC supply possible
- Customized assignment of signaling outputs
- Position actual value: 0/4 to 20 mA (depending on design)
- Internal positioner via analog setpoint input: 0/4 to 20 mA (optional)
- Internal process controller via analog setpoint input: 0/4 to 20 mA (optional)
- Parameters can be programmed via:
  - Local control unit
  - PC parameterization software: COM-SIPOS (optional)
  - SIMA Actuator control system (optional)
  - Function blocks (optional)
  - SIMATIC PDM
- Totally integrated control, monitoring and parameterization for PROFITRON in conjunction with PROFIBUS
- PROFIBUS DP-V1 (optional) (acyclic services)



SIMATIC PDM communication with SIPOS 5 Flash

Other products

2SM5...-...	SIMA Actuator control system
	Small linear actuators
2SB6...-...	• for modulating duty control systems F_c 2 - 25 kN (450 - 5620 lbf)
	Small part-turn actuators
M77325-...	• for on-off duty control systems T_c 25 - 200 Nm (18 - 148 lbf ft)
M77326-...	• for modulating duty control systems T_c 30 - 200 Nm (22 - 148 lbf ft)
	Double motor actuators
M76348-...	• for modulating duty T_c 750 - 3000 Nm (553 - 2210 lbf ft)
	Rotary actuators for nuclear applications according to KTA 3504
M76361-.../ M76371-...	• for on-off duty (SIWI and SIWI-C/CD) or (SIWI-AS and SIWI-CAS)
M76362-.../ M76372-...	• for modulating duty (SIWI and SIWI-C/CD) or (SIWI-AS and SIWI-CAS)
2SY5...-...	Spare parts for rotary, linear and part-turn actuators
2SX5...-...	Accessories

Note:
With the exception of the rotary actuators for nuclear plants (available on request), all our products - including spare parts and accessories - are listed in the Siemens product database (FDB).

Further information

All our printed documentation is stocked at the Siemens Logistic Center in Fürth, from which they can be obtained free of charge. They include ordering data, technical data, instruction manuals, spare parts lists, sales brochures and the complete SIPOS catalog.

You can order these SIPOS Aktorik documents at your convenience from www.click4business-supplies.siemens.de

The latest version of the following documents is always published on our web site at www.sipos.de ordering data, technical data, wiring diagrams and dimensional drawings (also in dxf format), instruction manuals, spare parts lists, certificates etc., and of course information about contacts and service centers worldwide.

For all further information or technical support, please contact:

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Donaustr. 36

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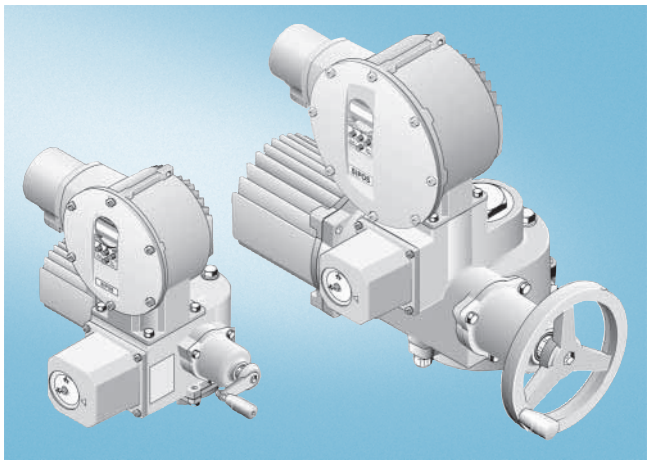
Internet: www.sipos.de

SIPOS AKTORIK

6

Rotary actuators (standard version)



Electric rotary actuator (standard version), series S

Description standard design

- short-time duty S2-15 min acc. to DIN EN 60034, protection class IP67 acc. to DIN EN 60529 (IP68 on request)
- motor insulation class F, temperature range -20 to +60 °C (-4 to +140 °F)

- „non intrusive“ for PROFITRON (after adjustment of the end positions of the valve)
- handwheel for emergency operation (disconnected during normal operation)
- PROFITRON: 3 reference torque curves of the valve can be stored
- electronic motor protection, automatic phase sequence correction
- frequency range of the power supply 47 to 63 Hz
- 24 V DC supply for electronics unit possible
- travel limits continuously adjustable
- tripping torque adjustable from 30% to 100% of max. output torque in steps of 10%
- output speed adjustable in 7 steps within the speedrange, step-up distance factor 1.4
- self-acting cut-off (depending on torque, travel, etc.)
- indication that actuator is in operation
- separate mounting of the electronics unit possible
- external screws stainless steel
- operating instructions German/English
- programming by customer possible.

Selection and Ordering data

Order No. 2SA50 ■■ - ■■■■ - ■■■■ - Z ■■■ (Order code)

tripping torque, adjustable [Nm] ([lbf ft])
the minimum value is set as standard (30% Md_{max}) [1]

	Weight [kg] ([lb])	Order No.
10 - 30 (7 - 22)	19.5 (43)	1
20 -60 (15 - 44)	20.5 (45.2)	2
40 - 125 (30 - 92)	33 (72.8)	3
80 - 250 (118 - 369)	39 (86)	4
160 - 500 (118 - 369)	64 (141)	5
350 - 1000 (258 - 738)	70 (154)	6
(516 - 1475) 700 - 2000	149 (328)	7
(1035 - 2950) 1400-4000	155 (342)	8

flange size
for the torque ranges [Nm]

DIN ISO 5210	DIN 3210		Thrust max. [Nm] ([lbf])	Order No.
F07	-	10-30	20 (4500)	0
F10	G0	10-30 20-60 40-125	40 (8990)	1
F12	-	40-125 80-250	70 (15700)	2
F14	G1/2	40-125 80-250 160-500	100 (22500)	3
F16	G3	160-500 350-1000	150 (33700)	4
F25	G4	700-2000	-	5
F30	G5	1400-4000	-	6

outputshaft design
for the torque ranges [Nm]

Form	DIN	10 - 30	20 - 60	40 - 125	80 - 50	160 - 500	350 - 1000	700 - 2000	1400 - 4000	outputshaft with	Order No.	Order code
A	ISO 5210	•	•	•	•	•	•	•	•	threaded bush	0	
	103 [2]	•	•	•	•	•	•	•	•	+ acme thread	additionally - Z	Y 1 8
B1	ISO 5210	•	•	•	•	•	•	•	•	big bore/keyw.	2	
C	3338	•	•	•	•	•	•	•	•	claw coupling	3	
B3	ISO 5210	•	•	•	•	•	•	•	•	bore w. keyway	5	
B2/B4 [3]	ISO 5210	•	•	•	•	•	•	•	•	bore w. keyway	9	H 2 Y
A	3210	•	•	•	•	•	•	•	•	threaded bush	9	H 0 A
	103 [2]	•	•	•	•	•	•	•	•	+ acme thread	additionally - Z	Y 1 8
B	3210	•	•	•	•	•	•	•	•	big bore/keyw.	9	H 2 A
C	3210	•	•	•	•	•	•	•	•	claw coupling	9	H 3 A
D	3210	•	•	•	•	•	•	•	•	free end shaft	9	H 4 A
E	3210	•	•	•	•	•	•	•	•	bore w. keyway	9	H 5 A
B/E [3]	3210	•	•	•	•	•	•	•	•	bore w. keyway	9	H 3 Y

1) Other torque settings - see additional features „Y01“.
2) The acme screw thread must be expressly stated, e.g. Tr 16x4 LH DIN 103.
3) The special bore must be stated, e.g. Ø26 with featherkey A8x7 DIN 6885.

Selection and Ordering data

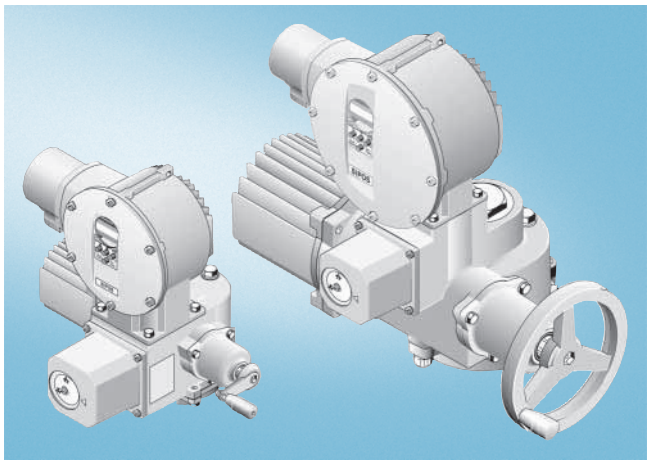
Order No. 2SA50 ■■ - ■■■■ - ■■■■ - Z ■■■ — Order code

speed range	**output speed**, adjustable [rpm] for the torque ranges [Nm]	set at[1]	Order code
1,25 - 10	non selflocking … 1400-4000	3,5	A
2,5 - 20	700-2000 1400-4000	7	B
5 - 28	700-2000	14	C
5 - 40	10-30 20-60 40-125 80-250 160-500 350-1000		
10 - 80	10-30 20-60 40-125 80-250 160-500 350-1000	28	D
20 - 112	10-30 … 160-500	56	E
20 - 160	20-60 40-125 80-250		
	power supply (acceptable voltage tolerance: ±15%) [2] applied are RFI-filters class A for the torque ranges [Nm]		
1 x AC 230 V	10-30 20-60 / 40-125 speedrange 5 to 40 rpm		D
3 x AC 400 - 460 V	10-30 20-60 / 40-125 / 80-250 160-500 350-1000 700-2000 1400-4000		E
	mechanical position indicator		
	without		0
	with		1
	spindle protection tube [mm] ([inch]) [3] for the torque ranges [Nm]		
	10 - 30 | 20 - 60 | 40 - 125 | 80 - 250 | 160 - 500 | 350 - 1000 | 700 - 2000 | 1400 - 4000		
without	retrofitting not possible		0
standard	230 (9.1) | 320 (12.6)		1
special length	470 (18.5) | 710 (28)		2
prepared	recommended for mounting on gate valve		3
basic type	**basic design electronics unit with local control station** (local/remote pushbutton lockable by means of a padlock (Order No. 2SX5302-0VS00))		
ECOTRON EC	5 binary outputs, 3 binary inputs, Flash EEPROM, setting via DIP-switches and potentiometer		3
PROFITRON PR	8 binary outputs, 4 binary inputs, Flash EEPROM, analog actual position value, analog threshold value switch programming via pushbuttons and display		4
	add-ons for the electronics unit		
	without add-on		A
	relay board with 5 outputs (opening and closing functions)		B
	PROFIBUS DP single channel with V1 services [4]		C
	PROFIBUS DP double channel (redundant) with V1 services [4]		D
	MODIBUS RTU single channel [4]		E
	MODIBUS RTU double channel (redundant) [4]		F
use with	**software-function**		
EC or PR	standard version		A
PR	travel dependent output speed adjustment		D
	external analog output speed setpoint		F
	travel dependent freely adjustable positioning times		J
	electric connection		
	direct connection with round hood (with plugs to the printed circuit board)		3
	round plug with screw connection		4

Additional features see page 6/38.

1) Other settings of the output speed - see additional features „Y07“.
2) Connection to other power supply via adaption transformer 2SX560.-... on request.
3) From top of gearbox housing.
4) Only in combination with round plug (see Electric connection, data position „16“) possible.

Rotary actuators for modulating duty (closed-loop control)



Electric rotary actuator for modulating duty, series R

Description standard design

- intermittent duty S4 / S5 min. 25% duty cycle, 1200 c/h acc. to DIN EN 60034, protection class IP67 acc. to DIN EN 60529 (IP68 on request)
- motor insulation class F, temperature range -20 to +60 °C (-4 to +140 °F)
- „non intrusive“ for PROFITRON (after adjustment of the end positions of the valve)
- handwheel for emergency operation (disconnected during normal operation)
- PROFITRON: 3 reference torque curves of the valve can be stored
- electronic motor protection, automatic phase sequence correction
- frequency range of the power supply 47 to 63 Hz
- 24 V DC supply for electronics unit possible
- analog actual position value (0/4 to 20 mA)
- travel limits continuously adjustable
- tripping torque adjustable from 70% to 100% of max. output torque in steps of 10%
- output speed adjustable in 7 steps within the speedrange, step-up distance factor 1.4
- self-acting cut-off (depending on torque, travel, etc.)
- soft starting for high positioning accuracy (starting current less than rated current
- indication that actuator is in operation
- separate mounting of the electronics unit possible
- external screws stainless steel
- operating instructions German/English
- programming by customer possible

6

Selection and Ordering data

Order No. 2SA55 ■■ - ■■■■■ - ■■■■ - Z ■■■ Order code

max. torque (running torque at modulat. duty)		**tripping torque**, adjustable [Nm] ([lbf ft]) the minimum value is set as standard (70% Md_{max}) [1]	Weight [kg] ([lb])	Order No.
15	(11)	15-20 (11 - 15)	19.5 (43)	1
30	(22)	30-40 (22 - 30)	20.5 (45.2)	2
60	(44)	60-80 (44 - 59)	33 (72.8)	3
125	(92)	125-175 (92 - 129)	39 (86)	4
250	(184)	250-350 (184 - 258)	64 (141)	5
500	(369)	500-700 (369 - 516)	70 (154)	6
1000	(738)	(738 - 1035) 1000-1400	149 (328)	7
2000	(1475)	(1475 - 2065) 2000-2800	155 (342)	8

DIN ISO 5210	DIN 3210	**flange size** for the torque ranges [Nm]	Order No.
F07	-	15-20	0
F10	G0	15-20 30-40 60-80	1
F12	-	60-80 125-175	2
F14	G1/2	60-80 125-175 250-350	3
F16	G3	250-350 500-700	4
F25	G4	1000-1400	5
F30	G5	2000-2800	6

type	DIN	**outputshaft design** for the torque ranges [Nm] 15 - 20	30 - 40	60 - 80	125 - 175	250 - 350	500 - 700	1000 - 1400	2000 - 2800	outputshaft with	Order No.	Order code
A	ISO 5210	•	•	•	•	•	•	•	•	threaded bush	0	
	103 [2]	•	•	•	•	•	•	•	•	+ acme thread	additionally - Z	Y18
B1	ISO 5210	•	•	•	•	•	•	•	•	big bore/keyw.	2	
C	3338	•	•	•	•	•	•	•	•	claw coupling	3	
B3	ISO 5210	•	•	•	•	•	•	•	•	bore w. keyway	5	
B2/B4 [3]	ISO 5210	•	•	•	•	•	•	•	•	bore w. keyway	9	H2Y
A	3210	•	•	•	•	•	•	•	•	threaded bush	9	H0A
	103 [2]	•	•	•	•	•	•	•	•	+ acme thread	additionally - Z	Y18
B	3210	•	•	•	•	•	•	•	•	big bore/keyw.	9	H2A
C	3210	•	•	•	•	•	•	•	•	claw coupling	9	H3A
D	3210	•	•	•	•	•	•	•	•	free and shaft	9	H4A
E	3210	•	•	•	•	•	•	•	•	bore w. keyway	9	H5A
B/E [3]	3210	•	•	•	•	•	•	•	•	bore w. keyway	9	H3Y

1) Other torque settings - see additional features „Y01“.
2) The acme screw thread must be expressly stated, e.g. Tr 16x4 LH DIN 103.
3) The special bore must be states, e.g. ∅26 with featherkey A8x7 DIN 6885.

Selection and Ordering data

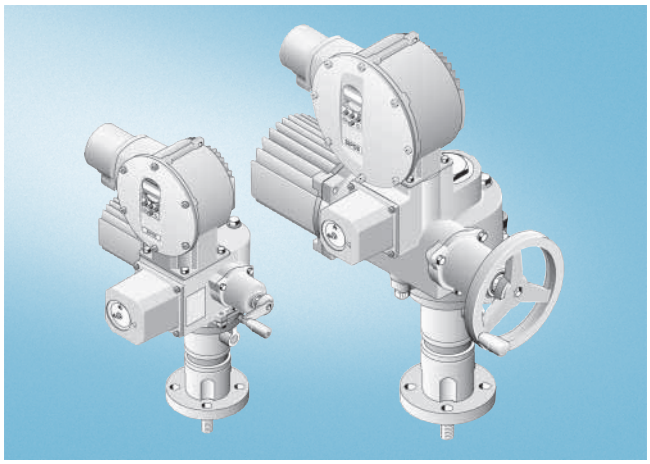
Order No. 2SA55 ■■ - ■■■■■ - ■■■■ - Z ■■■ — Order code

				Order code
speed range	**output speed**, adjustable [rpm] for the torque ranges [Nm]		set at [1]	
1,25 - 10	15-20 30-40 60-80 125-175 250-350 500-700 1000-1400 2000-2800		3,5	A
5 - 40	15-20 30-40 60-80 125-175 250-350 500-700		14	C
	power supply (acceptable voltage tolerance: ±15%) [2] applied are RFI-filters class A for the torque ranges [Nm]			
1 x AC 230 V	15-20 30-40 60-80			D
3 x AC 400 - 460 V	15-20 30-40 60-80 125-175 250-350 500-700 1000-1400 2000-2800			E
	mechanical position indicator			
	without			0
	with			1
	spindle protection tube [mm] ([inch]) [3] for the torque ranges [Nm]			
	15 - 20 / 30 - 40 / 60 - 80 / 125 - 175 / 250 - 350 / 500 - 700 / 1000 - 1400 / 2000 - 2800			
without	retrofitting not possible			0
standard	230 (9.1)	320 (12.6)		1
special length	470 (18.5)	710 (28)		2
prepared	recommended for mounting on gate valve			3
basic type	**basic design electronics unit with local control station** (local/remote pushbutton lockable by means of a padlock (Order No. 2SX5302-0VS00)			
ECOTRON EC	5 binary outputs, 3 binary inputs, Flash EEPROM, analog actual position value setting via DIP-switches and potentiometers			3
PROFITRON PR	8 binary outputs, 4 binary inputs, Flash EEPROM, analog actual position value, analog threshold value switch programming via pushbuttons and display			4
	add-ons for the electronics unit			
	without add-on			A
	relay board with 5 outputs (opening and closing functions)			B
	PROFIBUS-DP single channel with V1 services [4]			C
	PROFIBUS-DP double channel (redundant) with V1 services [4]			D
	MODIBUS RTU single channel [4]			E
	MODIBUS RTU double channel (redundant) [4]			F
use with	**software-function**			
EC or PR	standard version			A
PR	positioner			B
	process controller			C
	travel dependent output speed adjustment			D
	positioner + travel dependent output speed adjustment			E
	external analog output speed setpoint			F
	positioner + external analog output speed setpoint			G
	positioner with proportional control / split-range functionality			H
	travel dependent freely adjustable positioning times			J
	electric connection			
	direct connection with round hood (with plugs to the printed circuit board)			3
	round plug with screw connection			4

Additional features see page 6/38.

1) Other settings of the output speed - see additional features „Y07".
2) Connection to other power supply via adaption transformer 2SX560.-... on request.
3) From top of gearbox housing.
4) Only in combination with round plug (see Electric connection, data position „16") possible

Linear actuators for modulating duty (closed-loop control)



Electric linear actuator for modulating duty, series R

- „non intrusive“ for PROFITRON (after adjustment of the end positions of the valve)
- handwheel for emergency operation (disconnected during normal operation)
- PROFITRON: 3 reference force-stroke of the valve can be stored
- electronic motor protection, automatic phase sequence correction
- frequency range of the power supply 47 to 63 Hz
- 24 V DC supply for electronics unit possible
- analog actual position value (0/4 to 20 mA)
- travel limits continuously adjustable
- force dependent cut-off adjustable in 10% steps from 70% to 100% $F_{max.}$
- travel speed adjustable in 7 steps, step-up distance factor 1.4
- self-acting cut-off (depending on cut-off force, travel distance, etc.)
- soft starting for high positioning accuracy (starting current less then rated current)
- indication that actuator is in operation
- separate mounting of the electronics unit possible
- external screws stainless steel
- operating instructions German/English
- programming by customer possible

Description standard design

- intermittent duty S4 / S5 min. 25% duty cycle, 1200 c/h acc. to DIN EN 60034, protection class IP67 acc. to DIN EN 60529
- motor insulation class F, temperature range -20 to +60 °C (-4 to +140 °F)

6

Selection and Ordering data

Order No. 2SB55 ■■ - ■■■■ 0 - ■■■■ - Z ■■■ Order code

max. thrust (travel force under mod. duty)		**cut-off force**, adjustable [kN] ([lbf]) the minimum value is set as standard (70% F_{max}) [1]	weight [kg] ([lb])	
5.5	(1240)	5,5-7,7 (1240 - 1730)	27.5 (61)	1
11	(2470)	11-15,4 (2470 - 3460)	28.5 (63)	2
17.5	(3930)	17,5-25 (3930 - 5620)	43 (95)	3
31	(7080)	31,5-45 (7080 - 10100)	62 (137)	4
52	(14100)	62,5-90 (14100 - 20200)	91 (201)	5
90	(23800)	106-152 (23800 - 34200)	119 (262)	6

DIN 3358	**flange size** for the cut-off force ranges [kN]		
F07	5,5-7,7 / 11-15,4		0
F10	5,5-7,7 / 11-15,4 / 17,5-25		1
F14	31,5-45 / 62,5-90		3
F16	106-152		4

driving rod (without yoke)		**stroke** [mm] ([inch]) for the cut-off force ranges [kN] [2]							
thread	thread length [mm]([inch])	5,5 - 7,7	11 - 15,4	17,5 - 25	31,5 - 45	62,5 - 90	106 - 152	pitch [mm] ([inch])	more weight [kg] ([lb])	
M12 x 1,25	25 (0.98)	50 (1.97)						5 (0.20)	-	
M16 x 1,5	25 (0.98)		50 (1.97)					5 (0.20)	-	
M20 x 1,5	30 (1.18)			63(2.48)				6 (0.24)	-	
M36 x 3	55 (2.17)				80 (3.15)	80 (3.15)		7 (0.28)	-	
M42 x 3	65 (2.56)						100 (3.94)	8 (0.31)	-	0
M12 x 1,25	25 (0.98)	100 (3.94)						5 (0.20)	1 (2.2)	
M16 x 1,5	25 (0.98)		100 (3.94)					5 (0.20)	1 (2.2)	
M20 x 1,5	30 (1.18)			125 (4.92)				6 (0.24)	2 (4.4)	
M36 x 3	55 (2.17)				160 (6.30)	160 (6.30)		7 (0.28)	3 (6.6)	
M42 x 3	65 (2.56)						200 (7.87)	8 (0.31)	5 (11)	1
M12 x 1,25	25 (0.98)	200 (7.87)						5 (0.20)	2 (4.4)	
M16 x 1,5	25 (0.98)		250 (9.84)					5 (0.20)	2 (4.4)	
M20 x 1,5	30 (1.18)			250 (9.84)				6 (0.24)	5 (11)	
M36 x 3	55 (2.17)				320 (12.6)	320 (12.6)		7 (0.28)	9 (20)	
M42 x 3	65 (2.56)						400 (15.7)	8 (0.31)	17 (37)	2
M12 x 1,25	25 (0.98)	400 (15.7)						5 (0.20)	5 (11)	
M16 x 1,5	25 (0.98)		400 (15.7)					5 (0.20)	5 (11)	
M20 x 1,5	30 (1.18)			400 (15.7)				6 (0.24)	8 (18)	
M36 x 3	55 (2.17)				400 (15.7)	400 (15.7)		7 (0.28)	12 (26)	9 H0B

[1] For other cut-off force settings - see additional features „Y03“.
[2] For travel distance setting - see table and additional features „Y04“.

Selection and Ordering data

Order No. 2SB55 ■■ - ■■■■ 0 - ■■■■ - Z ■■■ — Order code

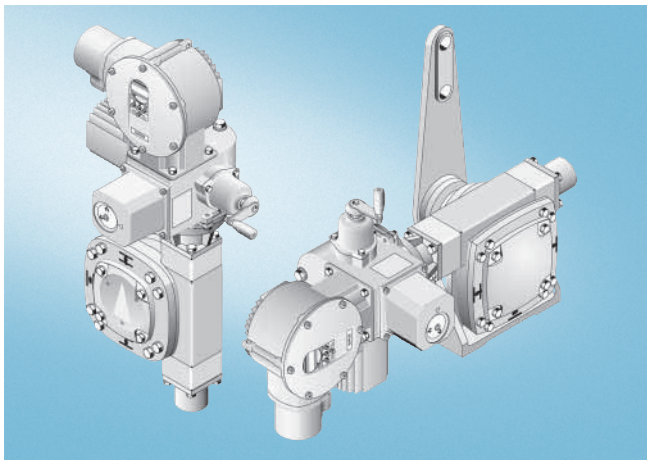
	signalling gear unit setting for travel [mm] ([inch]) for the cut-off force ranges [kN]							
	5.5 - 7.7	11 - 15.4	17.5 - 25	31.5 - 45	62.5 - 90	106 - 152		
	4 (0.16)	4 (0.16)	4.8 (0.19)	5.6 (0.22)	5.6 (0.22)	6.4 (0.25)		
	10.5 (0.41)	10.5 (0.41)	12.6 (0.50)	14.7 (0.58)	14.7 (0.58)	16.8 (0.66)		
	27.5 (1.08)	27.5 (1.08)	33 (1.30)	38.5 (1.52)	38.5 (1.52)	44 (1.73)		
	70 (2.76)	70 (2.76)	84 (3.31)	98 (3.86)	98 (3.86)	112 (4.41)	set as standard [1]	
	180 (7.09)	180 (7.09)	216 (8.50)	252 (9.92)	252 (9.92)	288 (11.3)		
	465 (18.3)	465 (18.3)	558 (21.9)	651 (25.6)	651 (25.6)	744 (30.5)		

positioning speed range	**positioning speed** [mm/min] ([inch/min]) for the cut-off force ranges [kN]	set at [2]	
25 - 200 (0.98 - 7.97)	5,5-7,7 / 11-15,4	70 (2.76)	
30 - 240 (1.18 - 9.45)	17,5-25	84 (3.31)	
35 - 280 (1.38 - 11)	31,5-45 / 62,5-90	98 (3.86)	
40 - 320 (1.57 - 12.6)	106-152	112 (4.41)	C
	power supply (acceptable voltage tolerance: ±15%) [3] applied are RFI-filters class A for the cut-off force ranges [Nm]		
1 x AC 230 V	5,5-7,7 / 11-15,4 / 17,5-25		D
3 x AC 400 - 460 V	5,5-7,7 / 11-15,4 / 17,5-25 / 31,5-45 / 62,5-90 / 106-152		E
	mechanical position indicator		
	without		0
	with		1
basic type	**basic design electronics unit with local control station** (local/remote pushbutton lockable by means of a padlock. (Order No.2SX5302-0VS00))		
ECOTRON EC	5 binary outputs, 3 binary inputs, Flash EEPROM, analog actual position valuet setting via DIP-switches and potentiometers		3
PROFITRON PR	8 binary outputs, 4 binary inputs, Flash EEPROM, analog actual position value, analog threshold value switch programming via pushbuttons and display		4
	add-ons for the electronics unit		
	without add-on		A
	relay board with 5 outputs (opening and closing functions)		B
	PROFIBUS DP single channel with V1 services [4]		C
	PROFIBUS DP double channel (redundant) with V1 services [4]		D
	MODIBUS RTU single channel [4]		E
	MODIBUS RTU double channel (redundant) [4]		F
use with	**software-function**		
EC or PR	standard version		A
PR	positioner		B
	process controller		C
	travel dependent positioning speed adjustment		D
	positioner + travel dependent positioning speed adjustment		E
	external analog positioning speed setpoint		F
	positioner + external analog positioning speed setpoint		G
	positioner with proportional control / split-range functionality		H
	travel dependent freely adjustable positioning times		J
	electric connection		
	direct connection with round hood (with plugs to the printed circuit board)		3
	round plug with screw connection		4

Additional features see page 6/38.

[1] For other travel distance setting - see additional features „Y04“.
[2] Other settings of the positioning speed - see additional features „Y08“.
[3] Connection to other power supply via adaption transformer 2SX560.-... on request.
[4] Only in combination with round plug (see Electric connection, data position „16“) possible.

Part-turn actuators (standard version)



Electric part-turn actuator (standard version), series S

Description standard design

- short-time duty S2-15 min acc. to DIN EN 60034, protection class IP67 acc. to DIN EN 60529 (IP68 on request)
- motor insulation class F, temperature range -20 to +60° C (-4 to +140 °F)
- „non intrusive“ for PROFITRON (after adjustment of the end positions of the valve)
- handwheel for emergency operation (disconnected during normal operation
- PROFITRON: 3 reference torque curves of the valve can be stored
- electronic motor protection, automatic phase sequence correction
- frequency range of the power supply 47 to 63 Hz
- 24 V DC supply for electronics unit possible
- travel limits continuously adjustable (angle-dependent)
- tripping torque adjustable from 30% to 100% of max. output torque in steps of 10%
- positioning time adjust. in 7 steps, step-up distance factor: 1.4
- self-acting cut-off (depending on torque, travel, etc.)
- indication that actuator is in operation
- separate mounting of the electronics unit possible
- external screws stainless steel
- operating instructions German/English
- programming by customer possible

Selection and Ordering data

Order No. 2SC50 ■■ - ■■■■ - ■■■■ - Z Order code ■■■

tripping torque, adjustable [Nm] ([lbf ft])
the minimum value is set as standard (30% Md_{max}) [1]

direct mounting

	flange ISO 5211	weight [kg] ([lb])	
150-250 (111 - 184)	F07	26 (57.3)	10
150-500 (111 - 369)	F10	26.5 (58.4)	11
		31 (68.3)	31
320-1000 (236 - 738)	F12	32.5 (71.7)	32
		36 (79.4)	42
700-2100 (516 - 1550)	F14	38 (83.8)	43
		60 (132)	53
1400-4300 (1035 - 3170)	F16	65 (143)	54
		74 (163)	64
	F25	79 (174)	65

base + leverarm

150-350 (111 - 258)		34 (75)	28
320-1000 (236 - 738)		49.5 (109)	48
700-2100 (516 - 1550)		83 (183)	58
1400-4300 (1035 - 3170)		102 (225)	68

valve connection (coupling or leverarm)
direct mounting [6] [mm] (1 mm = 0.0394 inch), for the torque ranges [Nm]

coupling (splined bush) ISO 5211	with flange							
	150 - 250	150 - 500	320 - 1000	700 - 2100	1400 - 4300			
	F07	F10	F12	F14	F16	F25		
unbored								0
bore [2] Ø [mm]	22	28	36	48	60	72	with 1 keyw. acc. to DIN 6885 Part1	1
square bore [2][3] [mm]	19	22	27	36	46	55		2
bore w. 2 flats [2][4] [mm]	19	22	27	36	46	55		3
special bore [2][5] Ø [mm]	38	50	60	80	90		maximum diameter with 1 keyway acc. to DIN 6885 Part1	9 H1Y

leverarm lengths	**base + leverarm** for the torque ranges [Nm]	hole taper 1:10	suitable damper rod [7]	
150/200	150-350	16 H8	2SX5304-0KG00	
150/200/250	320-1000	22 H8	2SX5304-0KG01	
300/400	700-2100	26 H8	2SX5304-0KG02	
300/400	1400-4300	26 H8	2SX5304-0KG02	8

1) Other torque settings - see additional features „Y01“.
2) Coupling with thread and grub screw.
3) Another keyway width: code number 2 replace by 9 and order code H4Y.
4) Another keyway width: code number 3 replace by 9 and oder code H5Y.
5) The special bore must be stated, e.g. Ø26 with featherkey A8x7 DIN 6885.
6) Without spigot at the connecting flange; with spigot - see additional features „S18“.
7) Consisting of damper leverarm with ball joints at right and left (please order separately).

Selection and Ordering data

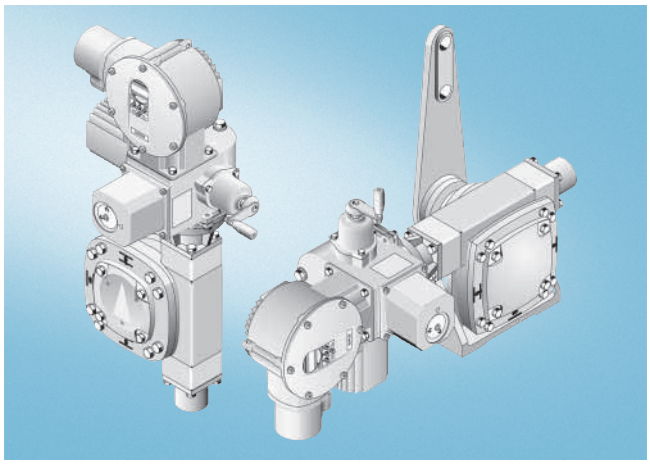
Order No. 2SC50 ■■ - ■■■■■ - ■■■■ - Z ■■■ Order code

positioning range	**positioning time** [s/90°] (positioning time $t_{120°} = 1.33 \times t_{90°}$) for the torque ranges [Nm]		set at [1]	
160 - 20	150-250 150-350 150-500 320-1000 700-2100 1400-4300		56	C
	power supply (acceptable voltage tolerance: ±15%) [2] applied are RFI-filters class A for the torque ranges [Nm]			
1 x AC 230 V	150-250 150-350 150-500 320-1000 700-2100			D
3 x AC 400 - 460 V	150-250 150-350 150-500 320-1000 700-2100 1400-4300			E
	mechanical position indicator			
	without			0
	with			1
	swing angle/direction of rotation/mounting position display and pointer cover are mounted one above the other as standard [3]			
swing angle	position of the worm shaft	direction of rot. at output drive		
90°	right side	clockwise		0
	left side	clockwise		1
	right side	anti-clockwise		2
	left side	anti-clockwise		3
> 90° - 360° [4]	right side	clockwise		4
	left side	clockwise		5
	right side	anti-clockwise		6
	left side	anti-clockwise		7
basic type	**basic design electronics unit with local control station** (local/remote pushbutton lockable by means of a padlock (Order No. 2SX5302-0VS00))			
ECOTRON EC	5 binary outputs, 3 binary inputs, Flash EEPROM, setting via DIP-switches and potentiometers			3
PROFITRON PR	8 binary outputs, 4 binary inputs, Flash EEPROM, analog actual position value, analog threshold value switch programming via pushbuttons and display			4
	add-ons for the electronics unit			
	without add-on			A
	relay board with 5 outputs (opening and closing functions)			B
	PROFIBUS-DP single channel with V1 services [5]			C
	PROFIBUS-DP double channel (redundant) with V1 services [5]			D
	MODIBUS RTU single channel [5]			E
	MODIBUS RTU double channel (redundant) [5]			F
use with	**software-function**			
EC or PR	standard version			A
PR	travel dependent positioning time adjustment			D
	external analog positioning time setpoint			F
	travel dependent freely adjustable time adjustment			J
	electric connection			
	direct connection with round hood (with plugs to the printed circuit board)			3
	round plug with screw connection			4

Additional features see page 6/38.

1) For other positioning time setting - see additional features „Y09“.
2) Connection to other power supply via adaption transformer 2SX560.-... on request.
3) For other mounting arrangements - see additional features „S50“, „S51“ und „S52“.
4) Freely rotating gear, i.e. without end stop.
5) Only in combination with round plug (see Electric connection, data position „16“) possible.

Part-turn actuators for modulating duty (closed-loop control)



Electric part-turn actuator for modulation duty, series R

- „non intrusive“ for PROFITRON (after adjustment of the end positions of the valve)
- handwheel for emergency operation (disconnected during normal operation)
- PROFITRON: 3 reference torque curves of the valve can be stored
- electronic motor protection, automatic phase sequence correction
- frequency range of the power supply 47 to 63 Hz
- 24 V DC supply for electronics unit possible
- analog actual position value (0/4 to 20 mA)
- travel limits continuously adjustable (angle-dependent)
- tripping torque adjustable from 70% to 100% of max. output torque in steps of 10%
- positioning time adjust. in 7 steps, step-up distance factor: 1.4
- self-acting cut-off (depending on torque, travel, etc.)
- soft starting for high positioning accuracy (starting current less than rated current)
- indication that actuator is in operation
- separate mounting of the electronics unit possible
- external screws stainless steel
- operating instructions German/English
- programming by customer possible.

Description standard design

- intermittent duty S4 / S5 min. 25% duty cycle, 1200 c/h acc. to DIN EN 60034, protection class IP67 acc. to DIN EN 60529 (IP68 on request)
- motor insulation class F, temperature range -20 to +60 °C (-4 to +140 °F)

6

Selection and Ordering data

Order No. **2SC55 ■■ - ■■■■■ - ■■■■ - Z** Order code **■■■**

max. torque (running torque at modulating duty)	**tripping torque**, adjustable [Nm] ([lbf ft]) the minimum value is set as standard (70 % Md_{max}) [1] **direct mounting**	flange ISO 5211	weight [kg] ([lb])	
250 (184)	250-330 (184 - 243)	F10	31 (68.3)	1 1
		F12	32.5 (71.7)	1 2
500 (369)	500-700 (369 - 516)		36 (79.4)	2 2
		F14	38 (83.8)	2 3
1000 (738)	(738 - 1105) 1000-1500		60 (132)	3 3
		F16	65 (143)	3 4
2000 (1770)	(1770 - 2510) 2400-3400		74 (163)	4 4
		F25	79 (174)	4 5
	base + leverarm			
250 (184)	250-330 (184 - 243)		42.5 (93.7)	1 8
500 (369)	500-700 (369 - 516)		49.5 (109)	2 8
1000 (738)	(738 - 1105) 1000-1500		60 (183)	3 8
2000 (1770)	(1770 - 2510) 2400-3400		74 (225)	4 8

valve connection (coupling or leverarm) **direct mounting** [6] [mm] (1 mm = 0.0394 inch), for the torque ranges [Nm]

coupling (splined bush) ISO 5211	250-330	500-700	1000-1500	2400-3400		
with flange	F10	F12	F14	F16	F25	
unbored						0
bore [2] Ø [mm]	28	36	48	60	72	w. 1 keyway acc. to DIN 6885 Part1 — 1
square bore [2)3)] [mm]	22	27	36	46	55	2
bore w. 2 flats [2)4)] [mm]	22	27	36	46	55	3
special bore [2)5)] Ø [mm]	50	60	80	90		maximum diameter w. 1 keyway acc. to DIN 6885 Part1 — 9 H1Y

leverarm length	**base + leverarm**	hole taper 1:10	suitable damper rod [7]	
150/200/250	250-330	22 H8	2SX5304-0KG01	
150/200/250	500-700	22 H8	2SX5304-0KG01	
300/400	1000-1500	26 H8	2SX5304-0KG02	
300/400	2400-3400	26 H8	2SX5304-0KG02	8

1) Other torque settings - see additional features „Y01“.
2) Coupling with thread and grub screw.
3) Another keyway width: code number 2 replace by 9 and order code H4Y.
4) Another keyway width: code number 3 replace by 9 and order code H5Y.
5) The special bore must be stated, e.g. Ø26 with featherkey A8x7 DIN 6885.
6) Without spigot at the connecting flange; with spigot - see additional features „S18“.
7) Consisting of damper leverarm with ball joints at right and left (please order separately).

Selection and Ordering data

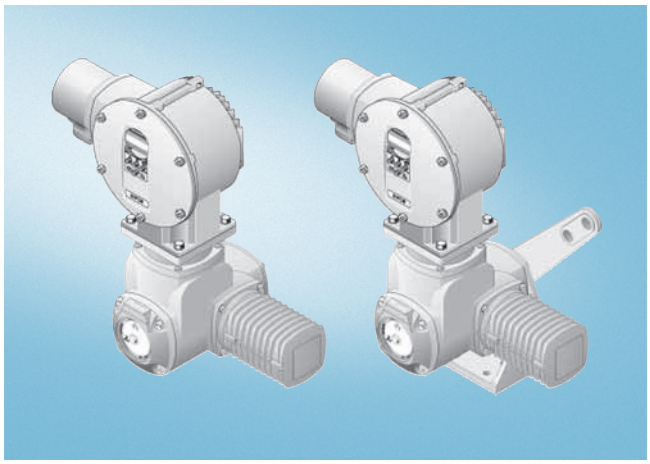
Order No. 2SC55 ■■ - ■■■■■ - ■■■■ - Z ■■■ Order code

				Order code
positioning range	**positioning time** [s/90°] (positioning time $t_{120°}$ = 1,33 x $t_{90°}$) for the torque ranges [Nm]		set at [1]	
160 - 20	250-330 / 500-700 / 1000-1500 / 2400-3400		56	C
	power supply (acceptable voltage tolerance: ±15%) [2] applied are RFI-filters class A for the torque ranges [Nm]			
1 x AC 230 V	250-330 / 500-700 / 1000-1500			D
3 x AC 400 - 460 V	250-330 / 500-700 / 1000-1500 / 2400-3400			E
	mechanical position indicator			
	without			0
	with			1
	swing angle/direction of rotation/mounting position display and pointer cover are mounted one above the other as standard [3]			
swing angle	position of the worm shaft	direction of rot. at output		
90°	right side	clockwise		0
	left side	clockwise		1
	right side	linanti-clockwiseks		2
	left side	anti-clockwise		3
> 90° - 360 ° [4]	right side	clockwise		4
	left side	clockwise		5
	right side	anti-clockwise		6
	left side	anti-clockwise		7
basic type	**basic design electronics unit with local control station** (local/remote pushbutton lockable by means of a padlock Order No. 2SX5302-0VS00))			
ECOTRON EC	5 binary outputs, 3 binary inputs, Flash EEPROM, analog actual position value setting via DIP-switches and potentiometers			3
PROFITRON PR	8 binary outputs, 4 binary inputs, Flash EEPROM, analog actual position value, analog threshold value switch programming via pushbuttons and display			4
	add-ons for the electronics unit			
	without add-on			A
	relay board with 5 outputs (opening and closing functions)			B
	PROFIBUS-DP single channel with V1 services [5]			C
	PROFIBUS-DP double channel (redundant) with V1 services [5]			D
	MODIBUS RTU single channel [5]			E
	MODIBUS RTU double channel (redundant) [5]			F
use with	**software-function**			
EC or PR	standard version			A
PR	positioner			B
	process controller			C
	travel dependent positioning time adjustment			D
	positioner + travel dependent positioning time adjustment			E
	external analog positioning time setpoint			F
	positioner + external analog positioning time setpoint			G
	positioner with proportional control / split-range functionality			H
	travel dependent freely adjustable positioning times			J
	electric connection			
	direct connection with round hood (with plugs to the printed circuit board)			3
	round plug with screw connection			4

Additional features see page 6/38.

[1] For other positioning time setting - see additional features „Y09“.
[2] Connection to other power supply via adaption transformer 2SX560.-... on request.
[3] Or other mounting arrangements - see additional features „S50“, „S51“ and „S52“.
[4] Freely rotating gear, i.e. without end stop.
[5] Only in combination with round plug (see Electric connection, data position „16“) possible.

Small part-turn actuator



Small part-turn actuator, standard version and modulating duty, series S and R

- motor insulation class F, temperature range: -20 to +60°C (-4 to +140 °F)
- "non intrusive" for PROFITRON (after adjustment of the end positions of the valve)
- hand wheel for emergency operation (handwheel is subordinate to motor operation!)
- electronic motor protection, automatic phase sequence correction
- frequency range of the power supply 47 to 63 Hz
- 24 V DC supply for electronics unit possible
- analog actual position value (0/4 to 20 mA)
- travel limits continuously adjustable (angle-dependent)
- mechanical limitation of travel
- positioning time adjustable in 7 steps, step-up distance factor 1.4
- self-acting cut-off (depending on torque, travel)
- soft starting for high positioning accuracy (starting current less than rated current)
- indication that actuator is in operation
- separate mounting of the electronics unit possible
- external screws staninless steel
- operation instructions German/English
- programming by customer possible.

Description standard design

- Standard: short time duty S2-15 min acc. DIN EN 60034
- Modulating: intermittent duty S4 / S5 min. 25% duty cycle, 1200 c/h acc. DIN EN 60034
- protectiont class IP67 acc. DIN EN 60529 (IP68 on request)

6

Selection and Ordering data

Order No. 2SG5 ■■■ - ■■■■ - ■■■■ - Z ■■■ Order code

mode	**cut-off torque** [Nm] [(lbf ft)]	max. torque (running torque at modulating duty)	flange size ISO 5211/ base + leverarm	weight [kg] [(lb)]	Order No.
standard duty	32 (23.6)	28 (20.7)	F04	16 (35)	000
			F05/F07	16 (35)	001
			base + leverarm	19 (42)	008
	63 (46.5)	55 (40.6)	F04	16 (35)	010
			F05/F07	16 (35)	011
			base + leverarm	19 (42)	018
	125 (92.2)	110 (81.1)	F05/F07	18 (40)	020
			base + leverarm	22 (49)	028
modulating duty	32 (23.6)	28 (20.7)	F04	16 (35)	500
			F05/F07	16 (35)	501
			Fbase + leverarm	19 (42)	508
	63 (46.5)	55 (40.6)	F04	16 (35)	510
			F05/F07	16 (35)	511
			base + leverarm	19 (42)	518
	125 (92.2)	110 (81.1)	F05/F07	18 (40)	520
			Fbase + leverarm	22 (49)	528

valve connection (coupling or leverarm)
direct mounting [mm] (1 mm = 0.0394 inch), for the torque [Nm]

coupling (splined bush) DIN EN ISO 5211	32/63 with flange [5] F04	32/63 with flange [5] F05/F07	125 with flange [5] F05/F07		Order No.
unbored					0
bore [1] Ø [mm]	15		18	with 1 keyway acc. to DIN 6885 Part1	1
square bore [1)2)] [mm]	11		14		2
bore w. two-flats [1)3)] [mm]	11		14		3
special bore [1)4)] Ø [mm]	15		20	maximum diameter with 1 keyway acc. to DIN 6885 Part1	9 H1Y

leverarm lengths	**base + leverarm**			hole taper 1:10	suitable damper rod [6]	Order No.
100/150	32/63			16 H8	2SX5304-0KG00	8
150/200			125			

1) Coupling with thread and grub screw.
2) Another keyway width: code number „2“ replace by „9“ and order code „H4Y“.
3) Another keyway width: code number „3“ replace by „9“ and order code „H5Y“.
4) The special bore must be stated, e.g. Ø15 with featherkey A8x7 DIN 6885.
5) Without spigot at the connecting flange; with spigot - see additional features „S18“.
6) Consisting of damper leverarm with ball joints at right and left (please order separately).

Selection and Ordering data

			Order No.	Order code
			2SG5 ■■■ - ■■■■■ - ■■■■ - Z	■■■
positioning range	**positioning time** [s/90°] (positioning time $t_{120°}$ = 1,33 x $t_{90°}$)	set at [1]		
80 - 10		28	C	
	power supply (acceptable voltage tolerance: ±15 %) [2] applied are RFI-filters class A			
1 x AC 230 V			D	
3 x AC 400 - 460 V			E	
	mechanical position indicators			
	with		1	
	swing angle (±8°)/direction of rotation display and pointer cover are mounted one above the other as standard			
swing angle	direction of rotation			
90°	clockwise closed		0	
	anti-clockwise closed		2	
120°	clockwise closed		4	
	anti-clockwise closed		6	
basic type	**basic design electronics unit with local control station** (local/remote pushbutton lockable by means of a padlock (Order No. 2SX5302-0VS00)			
ECOTRON EC	5 binary outputs, 3 binary inputs, Flash EEPROM, analog actual position value (only actuator for modulating duty 2SG55), setting via DIP-switches and potentiometers		3	
PROFITRON PR	8 binary outputs, 4 binary inputs, Flash EEPROM, analog actual position value, analog threshold value switch programming via pushbuttons and display		4	
	add-ons for the electronics unit			
	without add-on		A	
	relay board with 5 outputs (opening and closing functions)		B	
	PROFIBUS DP single channel with V1-services [3]		C	
	PROFIBUS DP double channel (redundant) with V1-services [3]		D	
	MODIBUS RTU single channel [3]		E	
	MODIBUS RTU double channel (redundant) [3]		F	
	software function			
EC or PR	standard version		A	
PR	positioner [4]		B	
	process controller [4]		C	
	travel dependent positioning time adjustment		D	
	positioner and travel dependent positioning time adjustment [4]		E	
	external analog positioning time setpoint		F	
	positioner and external analog positioning time setpoint [4]		G	
	positioner with proportional control / split-range functionality [4]		H	
	travel dependent freely adjustable positioning times		J	
	electric connection			
	direct connection with round hood (with plugs to the printed circuit board)			3
	round plug with screw connection			4

Additional features see page 6/38.

[1] For other positioning time setting see additional features „Y09".
[2] Connection to other power supply via adaptation transformer 2SX560.-... on request.
[3] Only in combination with round plug (see „electric connection", data position 16).
[4] Only actuator for modulating duty 2SG55.

Rotary, linear and part-turn actuators
Additional features

Selection and Ordering data	Order code
Additonal features	
Please add **„-Z“** to Order No. and specify Order code(s)	
Customised settings/programming possible	
Rotary actuators 2SA5...	
tripping torque set to specify in plain text: **Y01: ... Nm in direction OPEN and ... Nm in direction CLOSE**	**Y01**
signalling gear unit (36 revolutions/stroke set as standard, possible are 0.8; 2.1; 5.5;14; 36; 93; 240; 610; 1575; 4020) except 2SA5.7... and 2SA5.8...: (9 revolutions/stroke set as standard, possible are 0.2; 0.52; 1.37; 3.5; 9; 23.2; 60; 152; 393; 1005) specify in plain text: **Y02: ... revs/stroke**	**Y02**
output speed set to (7-step, step-up factor 1.4 step 4 is set as standard) specify in plain text: **Y07: ... rpm**	**Y07**
Linear actuators 2SB5...	
cut-off force set to specify in plain text: **Y03: ... kN** thrusting and pulling	**Y03**
signalling gear unit set to (dependent on pitch, 70; 84; 98; 112 mm set as standard) specify in plain text: **Y04: ... mm** travel	**Y04**
positioning speed set to (7-step, step-up factor 1.4 step 4 is set as standard) specify in plain text: **Y08: ... mm/min**	**Y08**
Part-turn actuators 2SC5...	
tripping torque set to: specify in plain text: **Y01: ... Nm in direction OPEN and ... Nm in direction CLOSE**	**Y01**
positioning time set to: (7-step, step-up factor 1.4 step 4 is set as standard) specify in plain text: **Y09: ... sec/90°**	**Y09**
Small part-turn actuators 2SG5...	
positioning time set to: (7-step, step-up factor 1,4, step 4 is set as standard) specify in plain text: **Y09: ... sec/90°**	**Y09**
Other settings/programming	
Please specify in plain text or use the enclosed programming sheet	**Y11**
Parameter assignment acc. to Siemens PG standard for FUM block	**Y12**
Parameter assignment acc. to Siemens PG standard for SIM block	**Y15**
Customer specific software-programming	**Y99**

Other designs available on request.

Selection and Ordering data (cont.)	Order code
Separate mounting	
installation kit including mounting bracket and tubular steel stirrup (lead ends are prepared for plug in) Further designs on request.	
Connecting cable with connection plug hoods for electronics unit and gear unit are completely assembled (connecting cable shielded, Oelflex-SERVO-730CY and Unitronic LiYCY) additional Order Code for length of cable: **R7.**	**S41**
• length 3 m (118 inch) • length 5 m (197 inch) • length 10 m (394 inch)	**R70** **R71** **R72**
Customer-plate and product documentation	
customer-plate	
• customer-plate with free inscription • 2 customer-plates with free inscription	**B00** **B15**
product documentation: operating instructions and rating-plate (German/English as standard)	
operating instructions monolingual, rating-plate foreign-language/English	
• French • Spanish • Italian	**B50** **B51** **B52**
• Russian • Finnish • Czech	**B53** **B54** **B55**
• Swedish • Polish • Chinese	**B56** **B57** **B58**
Other paint	
standard version: 80 µm coat of paint in colour RAL 7030 for service outdoors, by the sea, in industrial environments, and in not humid climates	
unpainted	**L30**
heavy-duty corrosion protection	**L32**
top coat of paint for colour other than RAL 7030 specify in plain text: **Y35: colour RAL ...**	**Y35**
Others	
only part-turn actuators 2SC5...	
spigot ring for direct mounting for flange size F07, F10, F12, F14, F16 and F25	**S18**
mounting position	
B worm gearbox turned 90° to the right (handwheel over pointer cover)	**S50**
C worm gearbox turned 180° to the right (handwheel to left of pointer cover)	**S51**
D worm gearbox turned 90° to the left (handwheel opposite pointer cover)	**S52**
only small part-turn actuators 2SG5...	
spigot ring for direct mounting for flange size F04, F05 and F07	**S18**