SIEMENS

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One that masters everything: SIPART PS2

Intelligent positioner for unlimited flexibility

Answers for industry.

Globally proven, universally versatile

With SIPART PS2, Siemens offers a positioner known for more than 20 years for its reliable and smooth sequences in the widest range of process industries and – what impresses customers most of all – for its versatility. It can control the entire spectrum of valves both safely and dependably and also perform special tasks with extreme precision.

The experience gained from the most diverse fields of application has been channeled into the continuous development of the SIPART PS2. This has made the product what it is today – a multi-talent that optimally fulfills a multitude of specific requirements.

Number one in the process industry
SIPART PS2 is the most widely used positioner for linear and part-turn actuators in the broad range of process industries, not least because the flexibility of this proven all-rounder ensures fulfillment of virtually every requirement. For reliable control of final control elements in chemical or oil and gas sectors, or for precise control of valves in the pharmaceutical or food industry: we can rely on SIPART PS2 to provide the right solution for every valve – namely, optimized control both for standard uses and for sophisticated fields of application.

Convincing advantages from the start
Whether the situation only involves easy mounting on various actuators or calls for fast and rugged commissioning or extensive functionality and diagnostics capability: the flexibility of SIPART PS2 offers clear-cut advantages. Its modularity and versatility make the special capabilities of this universal positioner stand out everywhere – and ensure that processes run safely, reliably and accurately.

SIPART PS2 at a glance
■ Comes standard with degree of protection IP66 or NEMA 4X, optionally with Makrolon®, aluminum or stainless-steel enclosure
■ Variants with external non-contacting travel sensors
■ High flexibility in the stroke range from 3 mm to 200 mm (more on request)
■ Communication via PROFIBUS PA, Foundation Fieldbus or HART
■ Intelligent diagnostic functions
■ Explosion-proof version

At home in many sectors

- Chemicals/petrochemicals
- Pharmaceuticals
- Food and beverage
- Oil and gas
- Energy
- Paper/cellulose
- Glass
- Water/wastewater
- Cement
- Mining and metals
- Marine engineering

Highly flexible, always first choice

A variety of mounting possibilities for numerous actuator and valve applications in the stroke and rotary ranges combined with a well-thought-out design concept make SIPART PS2 one of the most flexible and versatile positioners – all over the world. Users in a wide range of different sectors benefit from the many clear advantages that SIPART PS2 offers.

Easy mounting and initialization
SIPART PS2 can be easily mounted on a wide range of different standardized actuators: on rotary actuators to VDI / DDE 3845 or linear actuators to IEC 60 534-6 (NAMUR) as well as on non-standardized proprietary actuators. Over 400 mounting kits are available for this purpose. This reduces the effort required for mounting and simplifies the entire initialization process.

The widest range of different actuators and applications – one positioner

Vibration-resistant:
Non-Contacting Sensor (NCS)
SIPART PS2 really shows its strengths in applications where extreme vibrations occur. The Non-Contacting Sensor (NCS) detects the current position of the valve reliably and precisely based on the principle of the GMR (giant magnetoresistance) effect using the magnetic field lines. Compared to other methods that depend on the field strength and are therefore more adversely affected by it and by the effects of temperature, the GMR principle offers a further advantage: a greater distance is possible between the sensor and magnets. The compact construction and high IP68 degree of protection of the contactless and wear-free NCS are also suitable for use in applications in which conventional mounting solutions reach their limits.

Ideally suited to special applications
SIPART PS2 is also the best choice for applications that are not typical for positioners (e.g. with pneumatic cylinders). It is, of course, able to sense the current position via a mechanical interface. But, thanks to its modular design, it can also be connected to external distance measuring systems. The principle on which the external sensor is based is of no consequence here. Whether it is the contact or non-contacting type or uses a potentiometer, current signal or voltage value: SIPART PS2 impresses in every case. All these variants of external sensors – whether mounted externally or installed internally within the actuator component (e.g. in a pneumatic cylinder) – can be connected to the EMC filter module quickly and easily.

Worldwide use in hazardous areas
SIPART PS2 is well-equipped for worldwide use in hazardous areas. In addition to approvals for IECEx, ATEX, FM and CSA as an intrinsically safe (Ex ia/ib) or flameproof (Ex d) device, it has a number of other certificates of suitability for use in explosion-protected and maritime areas.

Maximum flexibility in the stroke range
SIPART PS2 offers a wide stroke range as the answer to the wide variety of different actuators and the growing number of "mini valves" with extremely small strokes. The scale is adjustable from 3 mm to 200 mm. Our proven positioner can even be integrated in modern actuators "pipeless" without any additional effort.

Intelligently designed down to the last detail

It is no coincidence that countless users in a wide variety of industries rely on SIPART PS2: The experience gained over many years in the various fields of application has been channeled into these highly accurate and reliable positioners.

All inclusive
SIPART PS2 already has all important functions such as position feedback or limit signaling "on-board." They can be set easily via a user-friendly display with three push buttons – without the need for any additional equipment. The positioner knows the characteristics of all valves inside out, so cams or further signaling devices are unnecessary. SIPART PS2 operates without an additional electrical power supply in accordance with the two-wire principle. Therefore, it ensures easy and flexible implementation and is the ideal alternative to conventional technology.

Fast commissioning
SIPART PS2 can be commissioned easily within just a few minutes thanks to the possibility of direct operation of the device by means of push buttons, a display and the adjustable slipping clutch. The coupling ensures a smooth initialization process by eliminating costly removal and reinstallation of the device.

SIPART PS2 teaches itself the respective application characteristics and sets itself up to meet the particular requirement as best as possible. If changes occur over time due to environmental effects or wear, the device automatically adjusts itself and transmits alarm signals – depending on the communications interface via HART, PROFIBUS PA, Foundation Fieldbus or a digital output.

Optimized inventory management
SIPART PS2 also sets standards for easy stockkeeping. Plant builders and operators profit from the fact that the standard device remains unchanged: whether it is used for linear or rotary actuators, for large or small strokes, for control valves or open/close valves, for proprietary actuators or applications with external sensors, for firm, precise control or additional diagnostic functions including the Partial Stroke Test.

Protected against hostile environments
In an optional Makrolon, aluminum or stainless-steel enclosure, SIPART PS2 is best equipped to withstand any conditions. With degree of protection IP66 or NEMA 4X as standard, it withstands even the most hostile environmental conditions. Thanks to the innovative pneumatic block, even several days of humid compressed air will have no effect – as well as temperature variations or pressure changes in the piping system. Faults are almost totally excluded and the control functions without interruption.

Explosion-proof version
SIPART PS2 is also available with an explosion-proof enclosure. Protected by a flap with a bullet-proof glass pane, the display can be read at all times and is simple and convenient to use even after the flap is opened during ongoing operation.

Extremely communicative
SIPART PS2 demonstrates its communicative side in dialog with higher-level systems. It can be integrated into the communications landscape via PROFIBUS PA, Foundation Fieldbus or HART protocol. With HART and PROFIBUS, it is also possible to use SIMATIC PDM to clearly display and document saved trends, histograms, as well as commissioning and operating data.

Economically and ecologically beneficial

Current market conditions demand careful analysis of the operating costs of a device during the procurement process. For positioners, compressed air consumption is the main consideration here. This is minimized by SIPART PS2 along with the CO_2 emissions generated by the energy consumption of the compressors. Compared to conventional devices, it achieves potential savings of up to 90% – an economical and ecological win-win situation.

Less compressed air, reduced cost...
Effectively reducing compressed air consumption is not simply a case of turning the usual setting screws, e.g. for optimizing compressor technology, renewing the compressed air distribution network, etc., because, apart from the main loads, the auxiliary loads also consume large quantities of compressed air in the end. SIPART PS2 really stands out with its extremely low internal air consumption rate of only 0.036 m^3/h. Given the appropriate boundary conditions, the following values can be achieved for one device over a year: Energy consumption for compressed air generation of only 33 kW/h, at a cost of approximately 2 euros. In comparison,the energy consumption of a conventional device for the generation of compressed air would be 560 kW/h, amounting to costs of around 34 euros.

... and lower emissions
The environment also benefits from the reduced compressed air consumption of SIPART PS2: Assuming that a plant is equipped with 1,000 positioners, conventional devices would produce around 3,500 metric tons of CO_2 emissions over a period of 10 years. This represents an enormous potential for savings that SIPART PS2 fully exploits. It sets the standard with CO_2 emissions of only 21 kg per device per annum. For the example quoted above (i.e. 1,000 SIPART PS2 positioners over a period of 10 years), this would result in only 210 metric tons of CO_2 emissions.

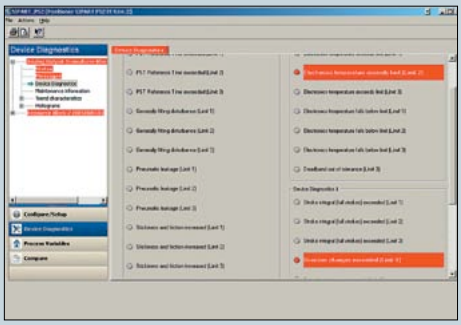
SIPART PS2: At a glance

Do you have a hostile environment?	SIPART PS2 is available in Makrolon, aluminum and stainless-steel enclosures.
Does your control system communicate by bus?	SIPART PS2 is available in PROFIBUS PA and Fieldbus Foundation versions.
Do you need alarm signals independent of the microprocessor?	SIPART PS2 has optional internal slot initiators or limit value contacts – also for retrofitting.
Do you have applications which require a high degree of protection or expose the positioner to strong vibrations?	The non-contacting sensor (NCS) has IP68 degree of protection and is extremely resistant to shocks and vibrations.
Do you want to record the valve position using external potentiometers?	External potentiometers or the NCS can be connected to SIPART PS2 via the EMC filter module.
Do you want to test your solenoid valve or replace its function (including the Partial Stroke Test) with a positioner?	SIPART PS2 prevents the closing of valves during the solenoid valve test, or monitors open/close valves as an "intelligent solenoid valve."

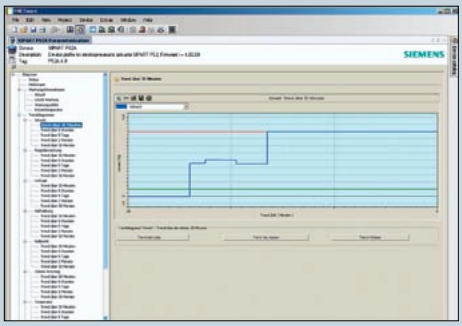
Technical specifications	
Setpoint signal	0/4 – 20 mA with/without HART signal or PROFIBUS PA/Foundation Fieldbus protocol
Stroke range	3 mm to 200 mm (larger strokes available on request)
Rotary angle range	30° to 100°
Auxiliary power – Pneumatic – Electric Load voltage	 1.4 to 7 bar 4 to 20 mA (two-wire system) or 18 to 30 V (four-wire system) or bus infeed 10.5 mA with PROFIBUS/Foundation Fieldbus 6.36 V (non-Ex without HART)
Airflow – Supply to actuator (for Δp = 6 bar) – Actuator to exhaust (for Δp = 6 bar)	 9.8 m^3_n/h 19.2 m^3_n/h
Max. air bleed in settled state	< 0.036 m^3_n/h
Required air quality	Class 2 in accordance with ISO 8573-1
Binary inputs	One digital input for floating contact
Explosion protection	II 2 G Ex d IIC T6/T4 Gb (explosion-proof enclosure "d") II 2 G Ex ia IIC T6/T4 Gb (intrinsic safety "ia") II 2 D Ex ia IIIC 110 °C Db (intrinsic safety "ia") II 3 G Ex ic IIC T6/T4 Gc (intrinsic safety "ic") II 3 G Ex nA IIC T6/T4 Gc (non-sparking, energy-limited "nA") II 3 D Ex tb IIIC T100 °C Dc IP66 (dust, protected by enclosure "t")
Additional approvals	FM CSA SIL 2 in accordance with IEC 61508/IEC 61551 Others on request
Ambient temperature	–30 °C to +80 °C (other temperature ranges on request)
Accessories/Options (can be retrofitted)	Limit module: – Electrical alarm outputs including fault output and – Binary intput (floating contact or 24 V) – Slot initiators including fault output – Limit value contacts including fault output Mounting kits Pressure gauge block Solenoid valve block Position feedback, 4 – 20 mA External position sensor, also non-contacting

Simply safe and ideal diagnostic interaction

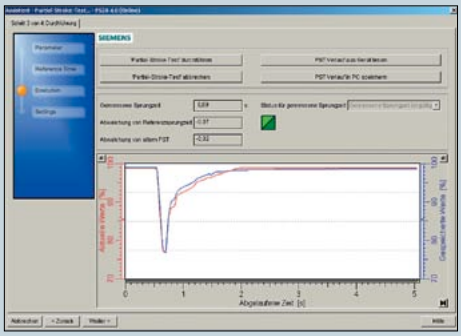
The intelligent positioner SIPART PS2 is equipped with comprehensive functionalities and delivers reliable diagnostic data about itself, its environment, and the valve and actuator. It reduces maintenance requirements in the plant, ensures optimized process control and offers a high level of functional safety in emergency situations.



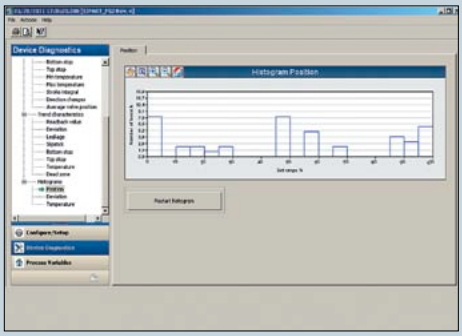
Example of diagnostic messages in Emerson AMS Foundation Fieldbus: Violation of temperature limit and stroke number



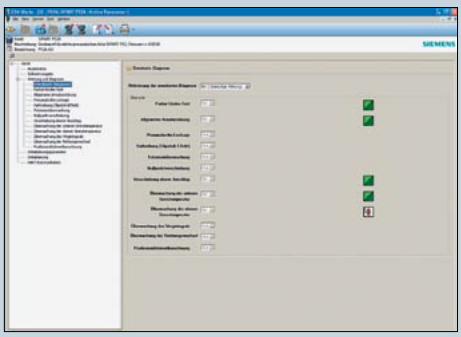
Example of trend curve in Pactware DTM HART: Display of actual value trend curve



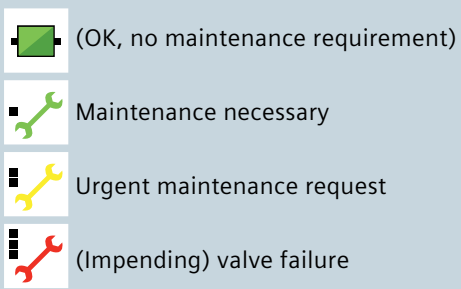
Example of Partial Stroke Test in Siemens SIMATIC PDM HART: Comparison of Partial Stroke Test curves



Example of histogram in Emerson AMS HART: Histogram of the position



Example of diagnostic overview in Yokogawa DTM Works HART: Diagnostic functions and information about temperature limit violation



Symbols on control desk:
They indicate the current maintenance status

Three-stage alarm concept
SIPART PS2 is equipped with comprehensive diagnostic functions as standard. It continuously checks the actuator and valve in order to provide advanced warning of expensive failures during operation. The three-stage alarm concept, which provides early information on required maintenance or an imminent failure of the valve, supports preventative and efficient maintenance.

Partial stroke and solenoid valve test
By means of regular partial stroke testing, SIPART PS2 ensures that ESD (emergency shutdown) valves and other open/close valves remain movable in case of an emergency. SIPART PS2 is also capable of testing the built-on solenoid valve. In the case of solenoid valves (e.g. ESD or solenoid valves), the solenoid valve can also be replaced completely by SIPART PS2. With SIL 2 certification, the positioner takes over the function of the valve and can additionally control and carry out the Partial Stroke Test.

Systematic interoperability
SIPART PS2 supports both commonly used parameterization concepts EDD (Enhanced Device Description) based on EDDL (Electronic Device Description Language) and FDT / DTM (Field Device Tool / Device Type Manager). It also stands out through its proven interoperability – with the Siemens process control system SIMATIC PCS 7, with SIMATIC PDM, and with process control systems and asset management systems from other vendors. Plant operators therefore benefit from additional diagnostic messages that the positioner outputs to these systems – thus creating added value for processes in terms of preventative measures.

All standard diagnostics at a glance:

- Alarm status based on NAMUR NE107
- Partial Stroke Test for open/close and control valves
- Pneumatic leaks
- Stiffness of a valve
- Stiction of the stuffing box
- Wear of the valve seat or plug
- Deposits or caking on the valve seat of plug
- Cracking of the valve plug and blockage of a pipeline (with continuous processes)
- Trend diagrams
- Histograms
- Stroke counter for valve
- Direction reversal counter
- Operating hours counter
- Deadband
- Temperature measurement

More information:
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