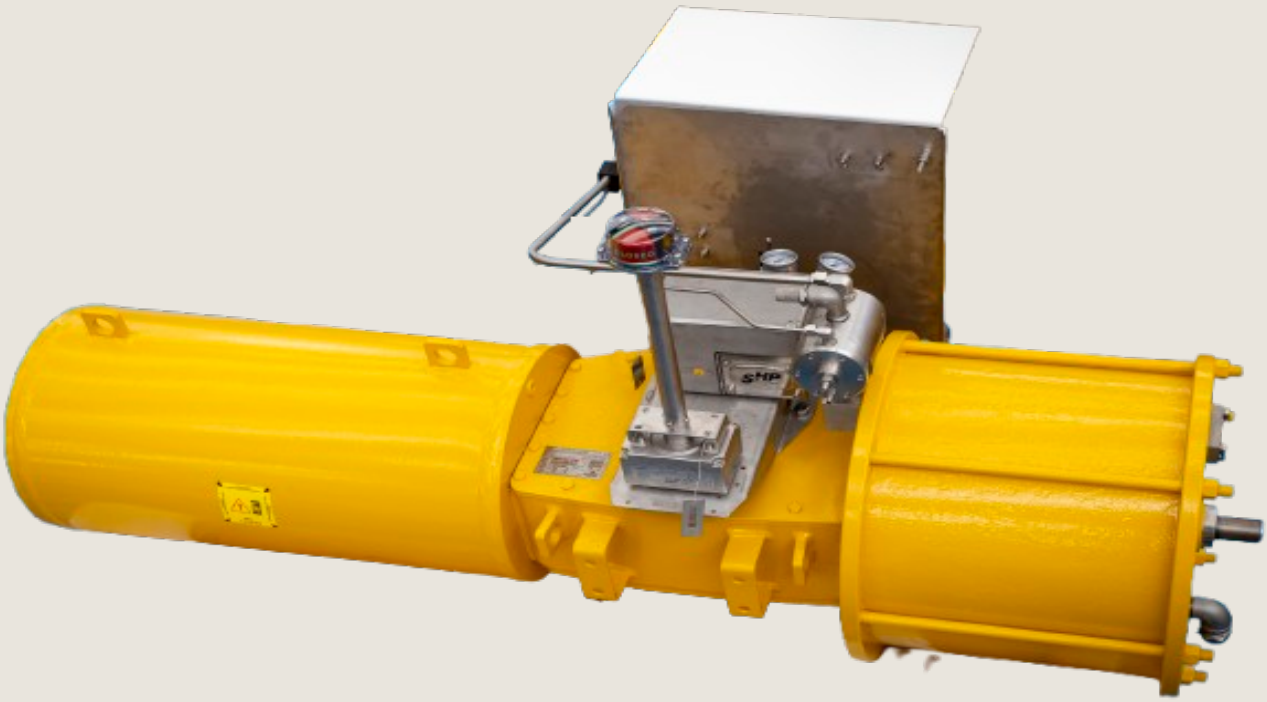
Process Automation

IMI STI

SHP-SIS

Safety Smart High-Performance Positioner

Breakthrough engineering for a better world



SHP

Safety Smart High-Performance

The SHP-SIS is a smart, high-performance digital pneumatic positioner engineered for safety instrumented systems (SIS). We have designed the positioner to provide our customers with a reliable safety function for blow down and emergency shut down valve actuation in critical on/off applications. Featuring a patented algorithm and flow system developed by our engineering experts the SHP-SIS delivers exceptional safety performance with ultra-fast stroking times. It includes online data monitoring combined with advanced online and offline diagnostics, as well as built-in partial stroke testing (PST) capabilities. This feature ensures that it complies with functional safety requirements while supporting preventative maintenance.

- The SHP-SIS features a contactless travel sensor, a 3D sensor with 360° reading sensors incapsulated yet no contact in 360 deg magnetic flux.
- No alignment or pre-defined position needed for installation.
- A tough touch screen provides the user with complete and easy access to the full configuration and calibration, and from here full PST testing can be carried out.
- Fully encapsulated electronic, tested for high vibration and reliability.
- One device, multiple functions [single, double acting, standard and remote mounting]
- No need to order different part numbers to manage Low Flow (0,3) High Flow(2) CV
- Integrated local control panel display and keyboard.

Distinctive Product Features

- Direct/reverse mode without changing mechanical parts.
- SHP positioner is certified according to IEC 61508:2010 up to SIL 3 for Electrical and Pneumatic DETT.

Digital Twin Technology

- Seamless online swap-over during emergencies for uninterrupted safety operation.
- Complete digital inventory of valve configuration and performance history.
- Smart commissioning ensures faster setup with minimal input.
- Setup with minimal manual input.

On-Screen Diagnostics

- Touchscreen interface with NE107- compliant status alerts.
- Instant troubleshooting - no tools or special equipment needed.

Safety

- TUV certified safety performance for SIS applications.
- PST functions with data monitoring and online diagnostic tool for valve health monitoring and diagnosis.
- A reliable and safe reverse configuration means you will not lose connection with the SHP-SIS in case of a weak signal.
- Pressure, travel and time limits for PST testing abort, to safety function protection.
- "TEST SOV" feature available.

Technical specifications

Hardware

Housing: stainless steel ASTM A351 / low copper aluminum EN AC 43500.
Total weight < 9kg (stainless steel) / < 4kg (aluminum).
Total dimensions less than 225mm x 145mm x 155mm.
Mechanical interface for fixing screws according to VDE/VDI 3845 (NAMUR).
Pneumatic connections: 3 x ½" NPT female.
Electrical connections: 3 x ½" NPT female (Ex ia) / 1 x ½" NPT female (Ex d).

Pneumatic

Operating pressure range = 2.5 / 10.5bar – 150PSI (fail freeze 8bar, natural gas 7bar).
Design pressure = 15bar / 220PSI.
Instrument air / natural gas / nitrogen / sweet and dry gases, according to ISO 8573-1 class 3 (oil concentration) and class 3 (dust concentration).
High Flow →Supply Cv max = 2.3 / Exhaust Cv max = 2.3 (180Nm3/h @ 6bar/ 21 °C). (Air consumption ≤ 1.5Nm3/h @ 6bar / 21 °C).

Position Feedback

Contactless sensor into positioner, able to work 360°rotation.
Remote contactless sensor (option), up to 20m distance from the positioner.
Linear magnet kit (option) available when strokes up to 100mm / 4 inch.

Environment

Operating temperature range = -55°C / +85°C, see Ex certificate for T4 - T5 - T6.
Storage temperature range = -55°C / +85°C.
IP 66
Type 4X for indoor use (Alluminium enclosure).
Type 4X for outdoor use (Stainless steel enclosure).

Electronic

Communication protocol HART 7, 4-20mA.
Input voltage range = 10-30V (Ex ia) / 18-30V (Ex d) / 17V-30V (Ex ia fail freeze application).
Impedance < 500Ω (Ex ia) / < 900 Ω (Ex d) / < 850 Ω (Ex ia fail freeze application).
Output signal 4-20mA passive loop.
Digital input 24V isolated qty 2 configurable.
Digital output 24V isolated qty 2 configurable (qty 2 NPN or qty 1 NAMUR), external power supply needed.
Electric consumption < 1W.
Electronic internal loop update rate = 10ms.
Analog output update rate = 10ms.

Performances

Quick action = 100ms (time needed to achieve Cv max starting from Cv = 0).
Hysteresis + Dead band = +/- 0.10%. (*)
Repeatability = +/- 0.05%. (*)
Sensitivity = +/- 0.10%. (*)
Linearity = +/- 0.30%. (*)
Thermal drift from -55°C to +85°C < 0.4%.
(from -40°C to +85°C < 0.1%).

(*) @ 21°C / 120° rotation.

Applications

Fail safe (Pneumatic connection A vent / B pressurised).

Optional accessories

Remote feedback sensor.

Universal linkage for:
linear long stroke actuator
(70÷1700 mm).

VDI/VDE 3845 for rotary applications.

Lever for side yoke or top mounting application.
customized application.

Directly mounted pneumatic accessories:
gauges and lock up valve.

Collected or high silenced exhaust.

High speed communication kit.

High corrosion resistance.

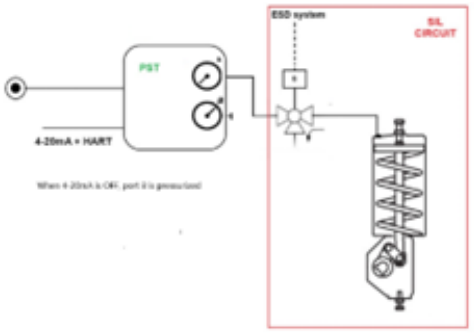
Fail in place version.

Advanced diagnostic with option pack.

Display and push button.

Low bleed version.

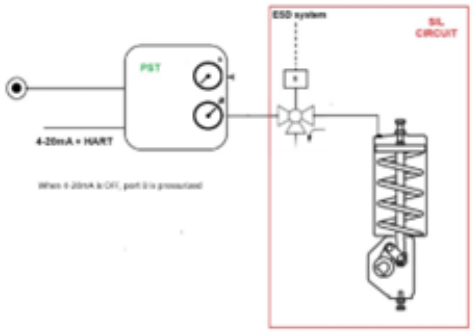
Direct / Reverse mode with the same device



Schematic '1' : PST device connected in DIRECT output mode

SIS functionality normally controls solenoid valves but the SIL certification adds extra safety.

The SHP can move valves into the safe position in case of signal or pressure failure.

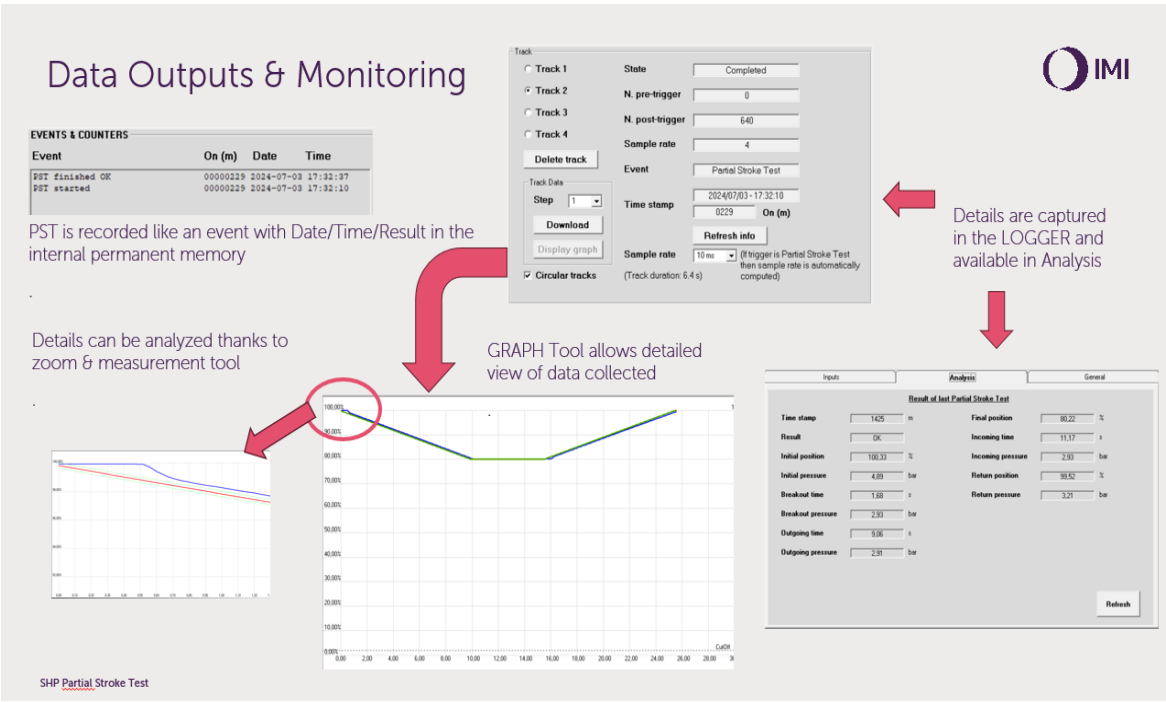


Schematic '2' : PST device connected in REVERSE output mode

Our customers require not only a high level of safety but also have a need to avoid any unexpected trip stemming from the PST.

To ensure this the SHP can be connected in reverse mode so that the PST device does not impair valve functionality. The safety valve will not be impaired and remains in control of the SOV device.

Easy interface for configuration and data analisys



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