

# Electropneumatic Smart Positioner

### Description

The SP500 smart valve positioner is a loop powered device that is able to drive linear and quarter turn pneumatic valves. A 4-20 mA input signal determines the valve set point. Precise control is maintained through valve position feedback that automatically varies the pneumatic output pressure to overcome the effects of stem friction and flow forces to maintain desired valve position. Indication of valve position is provided through a continuous digital display of % travel. Valve position feedback is retrieved by means of a non contact technology based on Hall effect. The pneumatics are based on piezovalve technology - Therefore, high resolution, high reliability, vibration insensitivity and extremely low air consumption is guaranteed at steady state.

The SP500 includes many smart functions that can be fully programmed through menu driven software using an integral keypad and LCD alphanumeric data. Valve commissioning is simplified through an autostroke routine and LCD data of programming status, software travel switch status, mA input signal and valve diagnostics data. Moreover, the absence of mechanical linkages between the valve stem and the positioner, drastically simplifies and reduces the time required for the mounting procedure. The SP500 is supplied with a NAMUR standard mounting kit for attachment to yoke or pillar mounted actuators. For quarter turn valves, a mounting kit compliant to VDI/VDE 3845 is supplied.

The SP500 smart valve positioner supports optional expansion to include the HART® communication protocol, enabling complete configuration using a PC or handheld device.

### Air supply

The SP500 smart positioner must be provided with a high quality air supply. A Spirax Sarco MPC2 filter regulator with coalescing filter or equivalent must be used. A fixing kit is available to mount the MPC2 filter regulator onto the actuator. For further product data regarding the MPC2 see Technical Information sheet TI-1-609-US.

### Applications

The SP500 can be used with the following pneumatic actuators:

- PN1000 and PN2000 series, PN9000 series, PM series, PNS3000 and PNS4000 series, and the TN2277SE and TN2277SR**

### Optional extras

<b>Gauge block</b>	Complete manifold block with two two pressure gauges (supply pressure and pressure to the actuator)
<b>Retransmission and switch board</b>	4 - 20 mA valve position retransmission and 2 adjustable software switches
<b>Power supply board</b>	Allows 4 wire configuration: 2 for 4 - 20 mA input signal and 2 for independent 24 V power supply reducing positioner impedance to 50 Ω
<b>HART® board</b>	Enables communication using the HART® protocol

### Materials

Part	Material	Finish
<b>Case and cover</b>	Die cast aluminium	Anti-corrosive paint to RAL5010
<b>Magnet bracket</b>	Die cast aluminium	



For the programmable functions see page 2

SP500 with front cover closed



SP500 with front cover removed

### Technical data

<b>Input signal range</b>	4 - 20 mA nominal	
<b>Minimum input signal</b>	3.4 mA	
<b>Input impedance</b>	Standard	280 Ω
	With aux. power supply	50 Ω
<b>Minimum air supply pressure</b>	15 psig above minimum spring range pressure	
<b>Maximum air supply pressure</b>	100 psig	
<b>Air quality</b>	Air supply must be dry, oil and dust free to ISO 8573-1 class 2:3:1	
<b>Output pressure</b>	0 to 100% supply pressure	
<b>Stroke range</b>	Linear valves	½" to 4"
	Quarter turn valves	5° to 120°
<b>Action</b>	Single action/fail vent	
<b>Operating temperature</b>	14°F to 176°F	
<b>Maximum air flow</b>	2.5 cfm @ 20 psig	
	5 cfm @ 90 psig	
<b>Steady state air consumption</b>	Less than 0.01 scfm	
<b>Air connections</b>	Screwed ¼" NPT	
<b>Cable gland</b>	M20	
<b>Electrical connections</b>	Spring clamp terminals for 15 to 32 AWG	
<b>Enclosure rating</b>	IP65	
<b>Characteristics</b>	Linear, Equal % (ratio 1:50) or Fast opening (ratio 50:1)	
<b>Resolution (maximum)</b>	0.1% F.S. (Full Scale)	
<b>4 - 20 mA retransmit (optional)</b>	4 - 20 mA retransmission of valve position	
<b>Software travel switches (optional)</b>	Two software configured	1 x normally closed
	travel switches	1 x normally open
<b>Shipping weight</b>	4.85 lb	

Local regulation may restrict the use of this product below the conditions quoted. Limiting conditions refer to standard connections only. In the interests of development and improvement of the product, we reserve the right to change the specification.

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## Programmable functions

<b>Autostroke</b>	Automatic commissioning routine
<b>Valve type</b>	2-port or 3-port
<b>% travel</b>	Selectable 0 - 100% or 100% - 0% depending on valve/actuator configuration
<b>Control action</b>	Direct or reverse action (4-20 or 20-4 mA)
<b>Travel limits</b>	Setting of minimum and maximum travel limits
<b>Signal span</b>	4-20 mA or split ranged (minimum span 4 mA)
<b>Deadband</b>	Positional accuracy (minimum 0.2% to max. 10% of valve travel)
<b>Tight shut-off</b>	Fully vent or inflate at preset input signals
<b>Characteristic</b>	Linear, = % or fast opening input signal to valve travel relationship
<b>Travel time</b>	Slows down valve opening or closing
<b>Travel switches</b>	Software configured travel switch setting (range 0 - 100%)
<b>Reset</b>	Resets all programmed values
<b>Calibrate</b>	Centering
<b>Input signal</b>	Visualisation of input mA signal
<b>Auto operation / vent</b>	Option of automatic operation or vent (actuator) whilst reprogramming
<b>Data logging</b>	Diagnostic record of total number of valve strokes and completed hours run time.

## Available spares

<b>Pressure gauge</b>	Pressure gauge only Available ranges: 0 to 30 psig, 0 to 60 psig, 0 to 100 psig
<b>Filter plug kit</b>	Plug plus 3 off filters and 'O' rings
<b>Retransmission and switch board</b>	4 - 20 mA valve position retransmission and 2 adjustable software switches
<b>Power supply board</b>	Allows 4 wire configuration: 2 for 4 - 20 mA input signal and 2 for independent 24 V power supply reducing positioner impedance to 50 Ω
<b>HART® board</b>	enables communication using the HART® protocol

## Safety information, installation and maintenance

Full details are contained in the SP500 electropneumatic smart positioner Installation and Maintenance Instructions (IM-P343-35) supplied with the product.

## Positioner nomenclature guide

<b>Positioner series</b>	<b>SP500 = SP500</b> <b>SP501 = SP500 with HART® communication protocol</b>	<b>SP500</b>
<b>Movement/action</b>	<b>0 = Linear, single action</b> <b>1 = Rotary, single action</b>	<b>0</b>
<b>Retransmission + software switches (optional)</b>	<b>0 = Not mounted</b> <b>R = Mounted</b>	<b>R</b>
<b>Enclosure</b>	<b>0 = Standard</b>	<b>0</b>
<b>Approvals</b>	<b>0 = Standard</b>	<b>0</b>
<b>24 V power supply (optional)</b>	<b>0 = Not mounted</b> <b>P = Mounted</b>	<b>0</b>
<b>Remote sensor</b>	<b>0 = No</b>	<b>0</b>
<b>Extended stroke</b>	<b>0 = No</b>	<b>0</b>
<b>Gauge block</b>	<b>0 = Not mounted</b> <b>G2 = Full scale 30 psig</b> <b>G4 = Full scale 60 psig</b> <b>G7 = Full scale 100 psig</b>	<b>G4</b>

**Selection example:** **SP500** **0** **R** **0** **0** **0** **0** **0** **G4**

## How to order Please include all the required optional extras as described on the first page.

**Example:** 1 off Spirax Sarco SP500 0R00000G4 electropneumatic smart positioner equipped with retransmission and software switches board plus gauge block for full scale pressure of 60 psig.

**Caution:** The SP500 smart positioner must have a high quality air supply. A Spirax Sarco MPC2 filter regulator with coalescing filter or equivalent must be used.

## Dimensions (approximate) inches

A	B	C	D	E	F	G
5.7	4.4	4.1	1.6	4.3	1.2	6.8

