spirax sarco

TI-P343-36
CH Issue 3

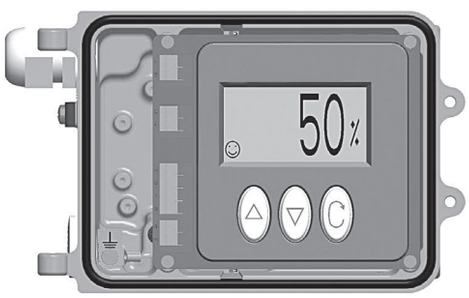
SP400
Electropneumatic Smart Positioner

Description

The SP400 is a loop powered digital valve positioner for linear and quarter-turn pneumatic valves. It has been designed for users that want the benefits of a smart digital positioner but do not need all the functionality and extra features of the SP500.
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 the desired valve position. Indication of valve position is provided through a continuous digital display of % travel.
The pneumatics are based on piezo-valve technology giving high resolution, high reliability, vibration insensitivity and class-leading low air consumption.
The SP400 includes straightforward functionality that can be easily set up through the screen and keypad. The absence of mechanical linkages greatly reduces the time required for the mounting procedure and the software has been designed to simplify operations as much as possible: commissioning requires just assembling the SP400 to the valve and pressing one button.
The SP400 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.

For the programmable functions see page 2

SP400 with front cover closed



SP400 with front cover removed

Air supply

The SP400 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-P054-04.

Applications

The SP400 can be used with the following pneumatic actuators:

PN1000 and PN2000 series
PNS3000 and PNS4000 series
PN9000 series

Optional extras

Gauge block	Complete manifold block with two two pressure gauges (supply pressure and pressure to the actuator)

Materials

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

Technical data

Input signal range		4 - 20 mA nominal
Minimum input signal		3.6 mA
Air supply pressure		1.4 - 7.0 bar (5-10 psi above spring range pressure)
Air quality		Air supply must be dry, oil and dust free to ISO 8573-1 class 2:3:1
Output pressure		0 to 100% supply pressure
Stroke range	Linear valves	10 mm to 100 mm
	Quarter turn valves	5° to 120°
Action		Single action / fail vent
Operating temperature		-10°C to +80°C
Maximum air flow		4.2 normal m³/h at 1.4 bar g
		8.5 normal m³/h at 6.0 bar g
Steady state air consumption		Less than 0.016 normal m³/h
Air connections		Screwed ¼" NPT
Cable gland		M20
Electrical connections		Spring clamp terminals for 0.2 to 1.5 mm² wire
Enclosure rating		IP65
Characteristics		Linear
Resolution (maximum)		0.1% F.S. (Full Scale)
Shut-off		1%
Shipping weight		2.2 kg

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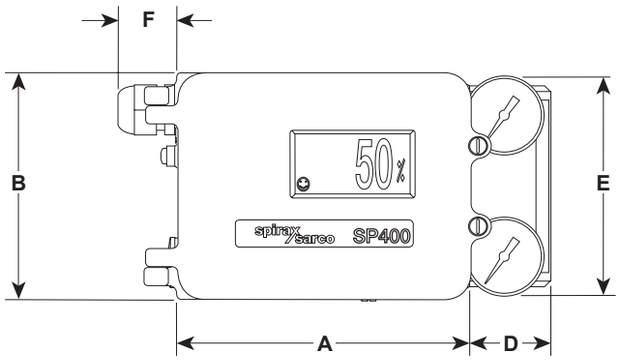
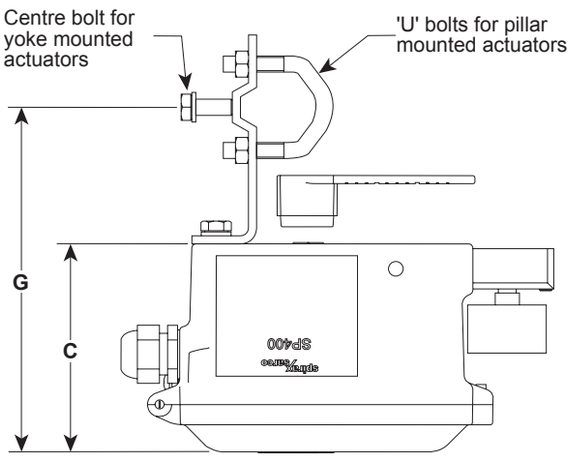
Dimensions (approximate) in mm

A	B	C	D	E	F	G
145	113	105	40	109	30	172



Programmable functions

Autostroke	Automatic commissioning routine
Valve type	2-port or 3-port
% travel	Selectable 0 - 100% or 100% - 0% depending on valve / actuator configuration
Control action	Direct or reverse action (4 - 20 or 20 - 4 mA)
Split range	OFF range 4 - 20 mA
	Low range 4 - 13 mA
	High range 11 - 20 mA
Deadband	0.5%
	1.5%
	3.0%
	5.0%
Reset	Resets all programmed values
Input signal	Visualisation of input mA signal



Available spares

Pressure gauge	Pressure gauge only Available ranges: 0 to 2 bar, 0 to 4 bar or 0 to 7 bar
Filter plug kit	Plug plus 3 off filters and 'O' rings

Safety information, installation and maintenance

Full details are contained in the SP400 electropneumatic smart positioner Installation and Maintenance Instructions (IM-P343-37) supplied with the product.

Positioner nomenclature guide

Positioner series	**SP400**	**SP400**
Movement / action	**0** = Linear, single action **1** = Rotary, single action	**0**
Retransmission + software switches	**0** = Not mounted	**0**
Enclosure	**0** = Standard	**0**
Approvals	**0** = Standard	**0**
24 V power supply	**0** = Not mounted	**0**
Remote sensor	**0** = No	**0**
Extended stroke	**0** = No	**0**
Gauge block	**0** = Not mounted **G2** = Full scale 2 bar **G4** = Full scale 4 bar **G7** = Full scale 7 bar	**G4**

Selection example:

SP400	0	0	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 SP400 000 000 0G4 electropneumatic smart linear positioner equipped with gauge block for full scale pressure of 4 bar.

Caution: The SP400 smart positioner must have a high quality air supply. A Spirax Sarco MPC2 filter regulator with coalescing filter or equivalent must be used inclusive of fixing kit - See Technical Information sheet TI-P054-04 for further data and How to order.

TI-P343-34
CTLS Issue 5

SP500
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

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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-P054-04.

Applications

The SP500 can be used with the following pneumatic actuators:

PN1000 and PN2000 series
PNS3000 and PNS4000 series
PN9000 series

Optional extras

Gauge block	Complete manifold block with two two pressure gauges (supply pressure and pressure to the actuator
Retransmission and switch board	4 - 20 mA valve position retransmission and 2 adjustable software switches
Power supply board	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
HART® board	Enables communication using the HART® protocol

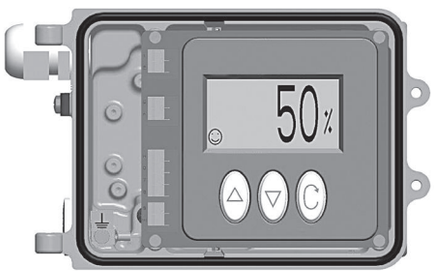
Materials

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

SP500 with front cover closed

For the programmable functions see page 2

SP500 with front cover removed



Technical data

Input signal range		4 - 20 mA nominal
Minimum input signal		3.4 mA
Air supply pressure		1.4 - 7.0 bar (5-10 psi above spring range pressure)
Communication protocol		HART® communication protocol superimposed over dc current signal
Air quality		Air supply must be dry, oil and dust free to ISO 8573-1 class 2:3:1
Output pressure		0 to 100% supply pressure
Stroke range	Linear valves	10 mm to 100 mm
	Quarter turn valves	5° to 120°
Action		Single action/fail vent
Operating temperature		-10 °C to +80 °C
Maximum air flow		4.2 normal m³/h at 1.4 bar g 8.5 normal m³/h at 6.0 bar g
Steady state air consumption		Less than 0.016 normal m³/h
Air connections		Screwed ¼" NPT
Cable gland		M20
Electrical connections		Spring clamp terminals for 0.2 to 1.5 mm² wire
Enclosure rating		IP65
Characteristics		Linear, Equal % (ratio 1:50) or Fast opening (ratio 50:1)
Resolution (maximum)		0.1% F.S. (Full Scale) Tolerance ±0.5% F.S. (Full Scale)
4 - 20 mA retransmit (optional)		4 - 20 mA retransmission of valve position
Software travel switches (optional)	Two software configured travel switches	1 x normally closed 1 x normally open
Shipping weight		2.2 kg

Programmable functions

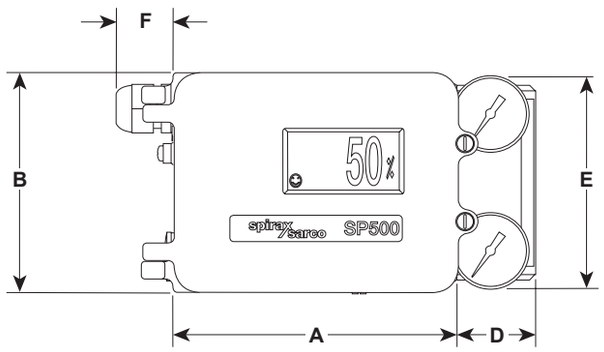
Autostroke	Automatic commissioning routine
Valve type	2-port or 3-port
% travel	Selectable 0 - 100% or 100% - 0% depending on valve/actuator configuration
Control action	Direct or reverse action (4-20 or 20-4 mA)
Travel limits	Setting of minimum and maximum travel limits
Signal span	4-20 mA or split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

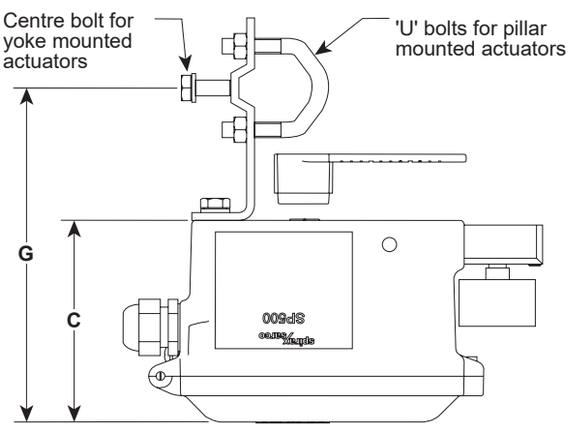
Available spares

Pressure gauge	Pressure gauge only Available ranges: 0 to 2 bar, 0 to 4 bar or 0 to 7 bar
Filter plug kit	Plug plus 3 off filters and 'O' rings
Retransmission and switch board	4 - 20 mA valve position retransmission and 2 adjustable software switches
Power supply board	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
HART® board	enables communication using the HART® protocol

Dimensions (approximate) in mm

A	B	C	D	E	F	G
145	113	105	40	109	30	172





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

Positioner series	**SP500** = **SP500** **SP501** = **SP500** with HART® communication protocol	**SP500**
Movement/action	**0** = Linear, single action **1** = Rotary, single action	**0**
Retransmission + software switches (optional)	**0** = Not mounted **R** = Mounted	**R**
Enclosure	**0** = Standard	**0**
Approvals	**0** = Standard	**0**
24 V power supply (optional)	**0** = Not mounted **P** = Mounted	**0**
Remote sensor	**0** = No	**0**
Extended stroke	**0** = No	**0**
Gauge block	**0** = Not mounted **G2** = Full scale 2 bar **G4** = Full scale 4 bar **G7** = Full scale 7 bar	**G4**

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 4 bar.

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 inclusive of fixing kit - See Technical Information sheet TI-P054-04 for further data and How to order.