

Logix™ 500si Digital Positioner

Introduction:

The Logix 500si Series digital positioner is a full-feature, high performance digital positioner for general purpose and intrinsically-safe applications. The Logix 510si digital positioner offers digital performance and features from a 4-20 mA analog input signal. The Logix 520si adds further enhancements relying on the industry standard HART protocol for communication and additional functionality. The Logix 520si provides a wealth of information and advanced functionality to the user. Both models offer a wide variety of modular options to meet specific application requirements.



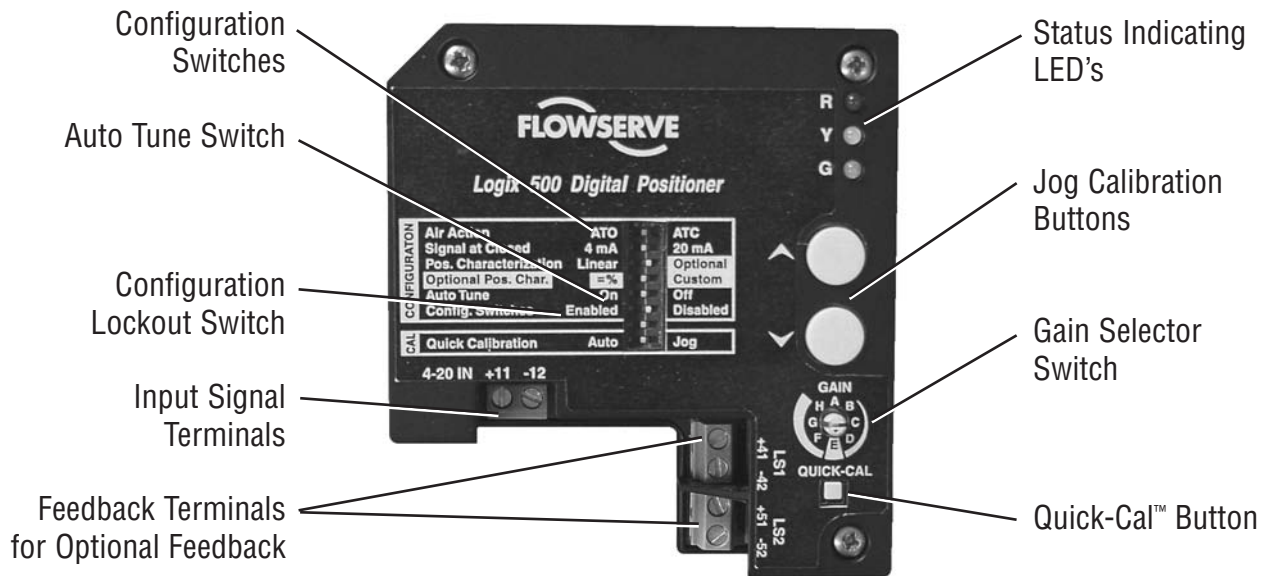
Applications:

The Logix 500si digital positioner combines state-of-the-art piezo valve technology with inner-loop feedback. High performance control combined with minimal air consumption makes it suitable for use in precise pneumatic actuator control applications using rack and pinion, scotch-yoke, vane and linear actuators.

The Logix 500si is provided with NAMUR VDI/VDE mounting interfaces for direct mounting to rotary actuators and semi-integrated mounting to linear actuators. The shaft is internally spring loaded to remove deadband between the positioner and actuator stem regardless of mounting style. The positioner is ideally suited for both rotary or linear actuator applications, with mounting kits available for each.

The Logix 500si is constructed from durable cast aluminum and treated with an anodized undercoat and powder topcoat for protection against the toughest applications in all process industries including:

1. Chemical and Petrochemical
2. Power
3. Food and Beverage
4. Pharmaceutical
5. Municipal
6. Wastewater Treatment



Direct User Interface

Features:

1. **Quick-Cal** function provides fast, push-button automatic commissioning of positioner. The **Direct User Interface** allows immediate local access to positioner control without requiring multi-level menus, a handheld communicator or laptop computer.
2. **Two-Stage Control** to provide faster response and tighter control. State-of-the-art piezo technology combined with inner-loop feedback provides high performance with minimal air consumption.
3. The **Jog Calibrate** function allows the user to quickly and easily calibrate the positioner on all actuators without physical stroke stops.
4. **Auto Tune Function.** A simple press of a button starts the self-calibration and auto tune process, reducing commissioning time and ensuring consistency between one valve and the next regardless of who performs the procedure. Additionally, a gain selector switch allows the user to increase or decrease the calculated gain to achieve optimal performance.
5. **Local Status LEDs** provide operators with a window into the system, alerting personnel to potential problems. The LEDs provide instant information relating to internal diagnostic codes, indicating 36 different conditions. These codes indicate positioner status and alarms without the need for a handheld communicator or laptop computer.
6. Using **HART Protocol**, the Logix 520si works with existing handheld communicators for configuration and to supply extensive information regarding positioner status and performance. SoftTools™ software allows the operator to run diagnostics and signatures, calibrate, display parameters, log data, set alarms, and perform many other functions in a familiar Windows environment with on-line help files.
7. **21-Point Custom Characterization** allows the user to program desired response curve to signal input.
8. **Optional Feedback.** End of travel limit switches give positive indication of full open or full close valve position indication. 4-20 mA analog feedback provides continuous position indication.
9. **Visual Position Indication**, by either flat indicator or highly visible dome.

FlowsERVE Corporation
Flow Control Division
www.flowsERVE.com

1350 N. Mountain Springs Parkway
Springville, Utah 84663-3004
Phone: 801 489 8611

1978 Foreman Dr.
Cookeville, TN 38501
Phone: 931 432 4021

Materials of Construction:

Housing: Die Cast, powder-painted aluminum

Shaft: Stainless Steel

Seals: Nitrile

SoftTools™ Software Requirements:

**Minimum 80486 processor, Windows 95 or NT,
16MB total memory (32MB recommended),
20MB available hard disk space.**

Certification/Listings:

Housing protection to IP65

ATEX II IG EEx ia IIC T6

Factory Mutual and CSA

Non Incendive - CL I, Div 2, Groups A, B, C, D

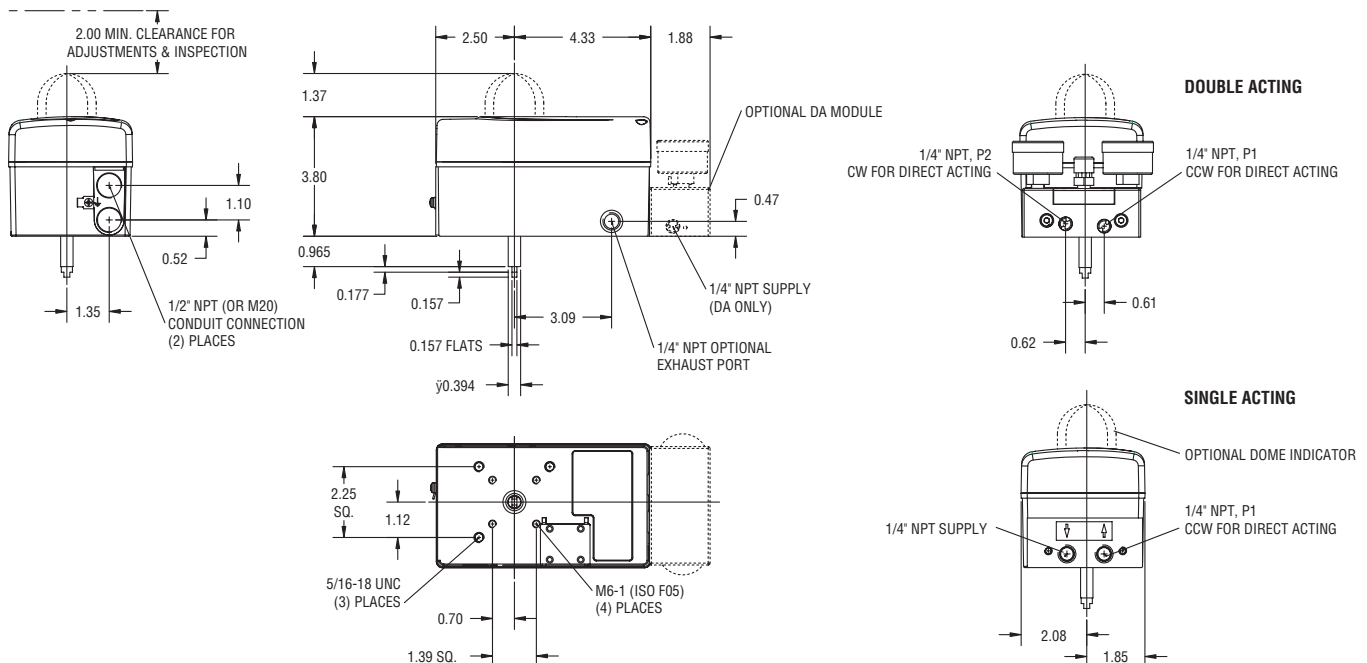
Intrinsically Safe - CL I, Div 1, Groups A, B, C, D



Specifications:

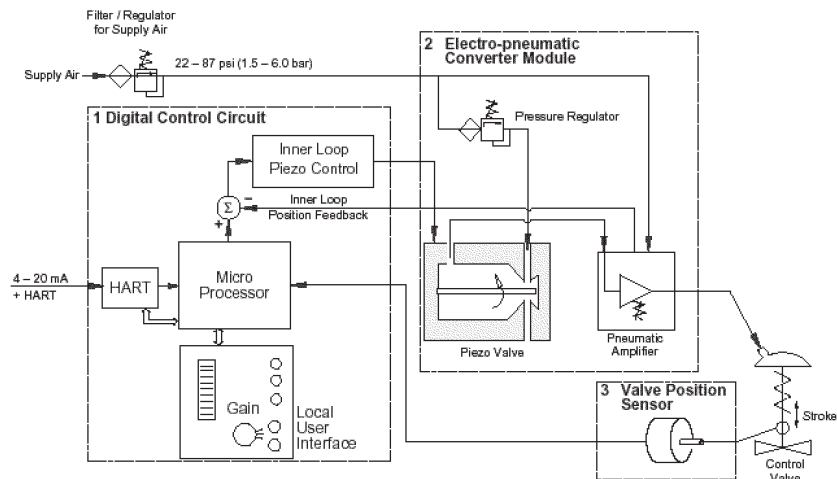
	510si	520si
Power Supply	Two-wire, 4-20 mA Input	
Compliance Voltage	6.0 VDC	12.6 VDC
Voltage Supply (max.)	30 VDC	30 VDC
Communications	NONE	HART
Minimum Start-up Current	3.6 mA	3.6 mA
Minimum Operating Current	3.6 mA	3.6 mA
Supply Air Quality	Free from moisture, oil and dust per ISA-7.0.01	
Supply Pressure Range	22 to 87psi (1.5 to 6.0 bar)	
Air Consumption (steady state)	22 psi (1.5 bar)	0.047 SCFM (0.08 m³/h)
	87 psi (6.0 bar)	0.071 SCFM (0.12 m³/h)
Output Flow	22 psi (1.5 bar)	1.4 SCFM (2.4 m³/h)
Capacity	87 psi (6.0 bar)	4.1 SCFM (7.0 m³/h)
Linearity	±1.0% FS	
Resolution	0.1% FS	
Repeatability	0.2% FS	
Hysteresis	0.8% FS	
Deadband	0.2% FS	
Operating Temperature	Standard	-4°F to 178°F (-20°C to 80°C)
	Low	Not Available -4°F to 175°F (-40°C to 80°C)
Weight	2.7 lbs (1.2 kg)	

Dimensions:



Principles of Operation:

The Logix 500si positioner consists of three main modules: 1) the microprocessor-based electronic control module (optional HART communications) and direct user interface switches; 2) the piezo valve based electro-pneumatic converter module; and 3) the infinite resolution valve position sensor. The basic positioner operation is best understood by referring to the figure below. The complete control circuit is powered by the 2-wire, 4-20 mA command signal. The optional HART module sends and receives the FSK HART digital communications superimposed over the 4-20 mA signal wires providing 2-way digital communications to the microprocessor. The analog 4-20 mA command is passed to the microprocessor, where it is compared to the measured valve stem position. The control algorithm in the processor performs dual gain control calculations and produces an output command to the analog piezo valve, which drives the pneumatic amplifier. The pilot valve position in the pneumatic amplifier is measured and relayed to the inner-loop control circuit. This 2-stage control provides for more responsive and tighter control than is possible with a single-stage control algorithm. The pneumatic amplifier controls the airflow to the actuator. The change of pressure and volume of the air in the actuator causes the valve to stroke. As the valve approaches the desired position, the difference between the commanded signal and the measured position becomes smaller and the output to the piezo is decreased. This causes the pilot valve to close and the resulting flow to decrease, which slows the actuator movement as it approaches the new commanded position. When the valve actuator is at the desired position, the pneumatic amplifier output is held at zero, which holds the valve in a constant position.



How To Order (Select **Bold Type Code** from each column that applies) Continued Below

Model	Diagnostics	Certifications	Paint Color	Threaded Connections	Feedback Shaft	Operating Temperature
51 - 4-20 mA Analog	0si - Standard Diagnostics	-02 - Intrinsically-safe (FM/CSA) ¹	-B - Black	1 - 1/2" NPT Conduit, 1/4" NPT Pneumatic	D - Standard Linear	S - Standard -4°F to 178°F (-20°C to 80°F)
52 - HART 4-20 mA		-14 - General Purpose		2 - M20 Conduit, 1/4" NPT Pneumatic	-D Shaft	E - Extended (-40°F to 185°F) (-40°C to 85°C)
		-15 - Intrinsically-safe (ATEX) ²			R - Standard NAMUR Rotary Shaft	

Continued from Above **How To Order** (Select **Bold Type Code** from each column that applies)

Language	Visual Indicator	Special Options	Add-in Electronic Options	Limit Switches	Manifold Options	Gauge Options
E - English F - French G - German	0 - None F - Flat D - Domed	0 - No Special Options	0 - No Add-in Circuits F - 4-20 mA Feedback (510si only)	0 - No Limit Switches 1 - Two Mechanical Switches 2 - Two Reed Switches 3 - Two NAMUR V3 Type Proximity Switch P+F NJ2-V3-N 4 - Two Slot Type NAMUR Sensor P+F S2 S1N 5 - Two Slot Type NAMUR Sensor P+F S2 SN 6 - Two Slot Type NAMUR Sensor P+F S2N	Blank - None DA - Double Acting GM - Gauge Manifold	Blank - None 1 - PSI/BAR/KPA Stainless with Brass Internals 3 - PSI/BAR/KPA Stainless with Stainless Internals

Notes: ¹ FM/CSA certification to intrinsically-safe C.I.I, Div.1, Gr. ABCD

² ATEX II 1G EEx ia IIC intrinsically-safe certification

Ordering example: **510si-02-B1RSE-F002**. Automax Logix 500si positioner with basic 4-20 mA input, I.S. approvals, black aluminum enclosure, 1/2" NPT conduit, 1/4" NPT pneumatic, NAMUR rotary mounting, standard temperature range, English language, flat visual indicator. No special options or add-ins, two proximity reed switches for end of travel feedback.