



USER INSTRUCTIONS

*Installation
Operation
Maintenance*

Logix™ 1500 Digital Positioner



These instructions must be read prior to installing, operating, and maintaining this equipment.

Experience In Motion

Contents

1	General Information	4
1.1	Scope Of Manual.....	4
1.2	Certification Instruction	4
1.3	Units	4
2	Safety Information	5
2.1	Intended Use.....	5
2.2	Disclaimer	5
2.3	Safety Symbols And Description.....	5
2.4	General Hazard Sources	6
2.5	Responsibility Of The Operating Company	6
2.6	Qualified Personnel And Targeted Group.....	6
2.7	Potential Explosive Areas	6
2.8	Nameplate Labels.....	6
2.9	Specific Conditions For Safe Use	9
2.10	Other Warnings And Notes.....	9
2.11	Protective Equipment.....	12
3	Product Description	12
3.1	General Product Description	12
3.2	Connections.....	15
3.3	Controls	16
3.4	Tools.....	20
3.5	Product Specifications	20
4	Packaging, Transportation And Storage.....	25
4.1	Unpacking.....	25
4.2	Packaging And Transportation.....	25
4.3	Storage.....	25
5	Installation.....	26
5.1	Inspection And Preparation	26
5.2	Configuration Kits	26
5.3	Direct Mounting	28
5.4	Non-Direct Mounting	28
5.5	Electrical Connections (Hart Or Analog Only).....	31
6	Operation.....	35
6.1	Start-Up	35
6.2	Quick Calibration	35
6.3	Normal Operation	35
6.4	Inner Loop Offset.....	37
6.5	Cleaning.....	37
6.6	Factory Reset	37
6.7	Shutdown	37
7	Maintenance	38
7.1	Spare Parts And Tools	38
7.2	Maintenance Procedure	38
8	Troubleshooting Guide	41
9	Disposal And Recycling	43
10	Technical Data.....	43
10.1	Model Number.....	43
	Annex A: Declaration Of Conformity	44

1 General Information

1.1 Scope of Manual



Read these instructions prior to installing, operating, using, or maintaining the equipment. Do not put the equipment into service until all the safe operating conditions in the instructions have been met. Failure to comply with the information provided in the user instructions is misuse.

The following user information covers the Logix 1500 Digital Positioner.

These instructions will familiarize the reader with the product and its permitted use. Operating the product in compliance with these instructions is important to help ensure reliability in service and to avoid risks. These instructions may not consider all local regulations. Always follow all plant safety requirements and applicable safety and health legislation.

Qualified personnel should follow the instructions provided and only use the product for its intended purpose. If you need clarification or have any uncertainties, contact Flowserve immediately. Contact information can be found at the back of this manual.

1.2 Certification Instruction

It is a legal requirement that machinery and equipment that is put into service within certain regions of the world shall conform to the Marking Directives that are applicable to Flowserve products (including the Machinery Directive, the Low Voltage Directive, the Electromagnetic Compatibility (EMC) Directive, the Pressure Equipment Directive (PED), and the Equipment for Potentially Explosive Atmospheres (ATEX)).

NOTICE The certificates that are defined in the contract requirements are provided with these instructions, where applicable. Examples of the certificates can be found in Annex A of this document. If required, copies of other certificates sent separately to the purchaser should be obtained by the purchaser for retention with this user instruction.

1.3 Units

This document uses dual ISO and US units.

2 Safety Information

2.1 Intended Use

 Do not operate the positioner beyond the parameters specified for the application. If there is any doubt as to the suitability of the positioner for the application intended, contact Flowserve for advice. Quote the serial number for comprehensive assistance.

Installing, operating, or maintaining the positioner in any way that is not covered in this user instruction could cause death, serious personal injury, or damage to the equipment. This includes any modification to the positioner or the use of parts that were not provided by Flowserve.

2.2 Disclaimer

Flowserve manufactures products to international quality-management standards as certified and audited by external quality assurance organizations. Genuine parts and accessories have been designed, tested, and incorporated into the products to help ensure continued product quality and performance in use. As Flowserve cannot test parts and accessories sourced from other vendors, the incorrect incorporation of such parts and accessories may adversely affect the performance and safety features of the product. The failure to properly select, install or use authorized Flowserve parts and accessories is misuse. Flowserve's warranty does not cover damage, injuries, or failure caused by misuse. In addition, any modification of Flowserve products or removal of original components is misuse.

2.3 Safety Symbols and Description

This user instruction contains specific safety markings where non-observance of an instruction would cause a hazard. The specific safety markings are as follows.

Symbol	Description
	DANGER This symbol indicates a hazardous situation that, if not avoided, will result in death or serious injury.
	WARNING This symbol indicates a hazardous situation that, if not avoided, could result in death or serious injury.
	CAUTION This symbol indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
	NOTICE This symbol precedes practices that are not related to physical injury.
	This is the safety alert symbol. It is used to alert you to potential physical injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

Table 1: Definition of safety symbols and markings

Symbol	Description
	ELECTRICAL HAZARD This symbol indicates electrical safety instructions where non-compliance would affect personal safety and could result in loss of life.
	ATEX PROTECTION This symbol indicates an explosive atmosphere according to ATEX. It is used in safety instructions where non-compliance in the hazardous area would cause the risk of an explosion.

Table 2: Additional symbols

2.4 General hazard sources

Certain hazards are inherently present when working with actuators and valves. If you are installing, removing, or repairing a positioner, bypass the valve or otherwise put the system in a safe condition. When you check the positioner during routine operation, take typical precautions for interacting with flow-control systems.

2.5 Responsibility of the Operating Company

Complete a risk assessment of the site where the product will be in operation by observing the working conditions.

Create site-specific work instructions for the operation of the product and ensure that the personnel have read and understand all applicable instructions. Provide training to the necessary personnel in regular intervals.

2.6 Qualified Personnel and Targeted Group

Qualified personnel include individuals who have the necessary training, experience, and instruction, as well as knowledge of relevant standards, specifications, accident-prevention regulations, and operating conditions that enable them to perform the necessary work safely. They have also been authorized by those responsible for the safety of the plant and are able to recognize and avoid potential dangers.

All personnel that are involved in the operation, installation, and maintenance of the unit must be qualified to carry out the work involved. If the personnel in question does not already possess the necessary knowledge and skill, provide appropriate training and instruction. If necessary, the operator may commission the manufacturer or supplier to provide applicable training.

Always coordinate repair activities with operation personnel and health and safety personnel.

2.7 Potential Explosive Areas



Ensure explosion protection by adhering to all instructions for equipment installed in potentially explosive atmospheres. For ATEX, both electrical and non-electrical equipment must meet the requirements of the European Explosion Protection Directive 2014/34/EU. Always observe the regional legal Ex requirements, e.g. Ex electrical items outside the EU may be required certified to other than ATEX e.g. IECEx, UL.

Use equipment only in the zone for which it is appropriate. Always check that all equipment is suitably rated and/or certified for the classification of the specific atmosphere in which it is to be installed.

2.8 Nameplate Labels

User shall permanently mark the box next to the protection method for that corresponds to their specific installation. Once marked the protection method cannot be changed.

Figure 1: Logix 1500 Series Warning Label and Nameplate

WARNING - Substitution of components may impair Intrinsic Safety.
WARNING - EXPLOSION HAZARD. DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.
WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS.
WARNING - To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
Field wiring shall be rated for 92 °C.

AVERTISSEMENT - La substitution de composants peut nuire à la sécurité intrinsèque.
AVERTISSEMENT - RISQUE D'EXPLOSION. NE DÉBRANCHEZ PAS L'EQUIPEMENT PENDANT QUE LE CIRCUIT EST SOUS TENSION OU À MOINS QUE LA ZONE SOIT EXEMPT DE CONCENTRATIONS INFLAMMABLES.
AVERTISSEMENT - RISQUE POTENTIEL DE CHARGE ELECTROSTATIQUE - VOIR LES INSTRUCTIONS.
AVERTISSEMENT - Pour éviter l'inflammation d'atmosphères inflammables ou combustibles, débranchez l'alimentation avant l'entretien.
Le câblage sur site doit être conçu pour une température de 92 °C.

警告-替换部件可能会损害本安全防护等级。
警告-爆炸危险。除非该区域没有可燃浓度气体，否则不要尝试在设备带电时开盖进行断电操作。
警告-潜在的静电电荷积聚危险-请参阅说明书。
警告-为防止易燃或工况环境可燃气体被点燃，维护前应断开电源。

Using box provided, permanently mark protection for specific installation. Once Marked it shall not be changed

FLOWERVE
Des. in Springville, UT USA
Mfg. in Suzhou, China 中国苏州

LOGIX 1500 SERIES
LOGIX 1500 系列数字定位器
Max. Supply Pressure 87psi Rated 30V, 4-20mA
最大供给压力 87psi 额定电压 30V, 4-20mA

FM24ATEX0002X
IECEx FMG 24.0004X

☐ II 1 G Ex ia IIC T6...T4 Ga
☐ Ex ia IIC T6...T4 Ga

US Cert: FM24US0011X
INTRINSICALLY SAFE

☐ CL I, Div 1, Grp A-D T6...T4
☐ CL I, Zone 0, AEx ia IIC T6...T4 Ga
☐ Ex ia IIC T6...T4 Ga

Install Per Control Drawing 643921 根据控制 643921 安装

CAN Cert: FM24CA0004X
NONINCENDIVE

☐ CL I, Div 2, Grp A-D T6...T4

Entity Parameters 体参数	
4-20mA	AO
UI(Vmax)=	30VDC 28VDC
Ii(IImax)=	100mA 93mA
Pi(Pmax)=	750mW 651mW
LI=	0 0
CI=	10.34nF 10.34nF

福斯流体控制(苏州)有限公司
苏州市苏州工业园区唯新路49号 邮编: 215121

T4Ta = -40°C to +85°C T5Ta = -40°C to +55°C T6Ta = -40°C to +40°C

Figure 2: Model Code Label

FLOWERVE **LOGIX 1500 Series**
MODEL: 15XX-XXX-XX **IP66**
SERIAL: XXXXXXXXXX

 **SUPPORT**
Americas +1 801-489-2300
EMA +43 (0) 4242 41181 999
Asia + (65) 6879 8900
digitalproductstac@flowserve.com

651995 - 01

Table 3: Logix 1500 IS Hazardous Location Information

Certification Code	Area	Protection Method	Markings	Temperature Code	
	52	USA/ CANADA	Intrinsically Safe	Class I, Div 1, Groups A, B, C, D T6...T4	T4 = -40C to +85C T5 = -40C to +55C T6 = -40C to +40C
				US -Class I, Zone 0, AEx ia IIC T6...T4 Ga	
				Canada - Ex ia IIC T6...T4 Ga	
				Class I, Div 2, Groups A, B ,C, D T6...T4	T4 = -40C to +85C T5 = -40C to +55C T6 = -40C to +40C
				II 1 G Ex ia IIC T6...T4 Ga	T4 = -40C to +85C T5 = -40C to +55C T6 = -40C to +40C
	ATEX			T4 = -40C to +85C T5 = -40C to +55C T6 = -40C to +40C	
	IECEx		Ex ia IIC T6...T4 Ga	T4 = -40C to +85C T5 = -40C to +55C T6 = -40C to +40C	
CCOE / PESO India	CCOE		Ex ia IIC T6...T4 Ga	T4 = -40C to +85C T5 = -40C to +55C T6 = -40C to +40C	

2.9 Specific Conditions of Use

- Using the box provided on the nameplate, the User shall permanently mark the type of protection chosen for the specific installation. Once the type of protection has been marked it shall not be changed.
- The Model Logix 1500 Digital Positioner's enclosure contains, by mass, more than 10% in total of aluminum and is considered a potential risk of ignition by impact or friction. Care must be taken into account to prevent impact and friction.
- The surface of the Model Logix 1500 Digital Positioner enclosure may cause risk from electrostatic discharge. Avoid installation that could cause electrostatic build-up, and only clean with a damp cloth.
- A l'aide de la case prévue sur la plaque signalétique, l'Utilisateur devra marquer de manière permanente le type de protection choisi pour l'installation spécifique. Une fois le type de protection marqué, il ne doit pas être modifié.
- Le boîtier du positionneur numérique Model Logix 1500 contient plus de 10 % d'aluminium (en masse) et présente un risque potentiel d'inflammation en cas de choc ou de frottement. Il convient de prendre des précautions pour éviter tout choc ou frottement
- La surface du boîtier du positionneur numérique Model Logix 1500 peut présenter un risque de décharge électrostatique. Évitez toute installation susceptible d'entraîner une accumulation d'électricité statique et nettoyez-le uniquement avec un chiffon humide.

2.10 Other Warnings and Notes

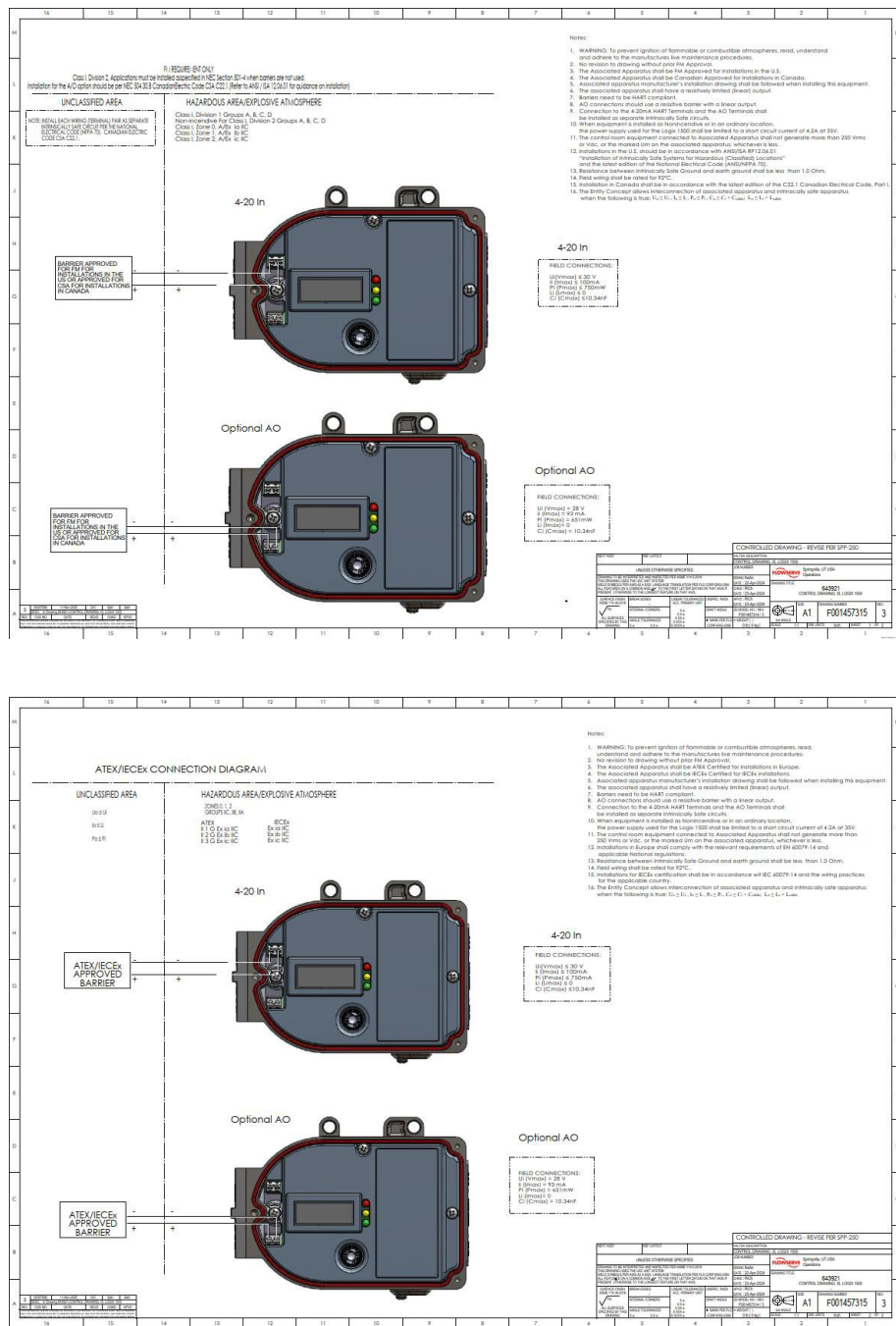
- **⚠ WARNING** To prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.
- **⚠ WARNING** Substitution of components may impair intrinsic safety. Do not open, maintain, or service in an area where an explosive atmosphere may be present.
- **⚠ WARNING** EXPLOSION HAZARD. DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE UNLESS THE AREA IS FREE OF IGNITIBLE CONCENTRATIONS.
- **⚠ WARNING** POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
- Connect the positioner to suitably rated intrinsically safe equipment and install the positioner in accordance with applicable intrinsically safe installation standards, including control drawing.
- The associated apparatus shall have a resistively limited (linear) output.
- Use appropriately rated cable insulation at higher temperatures.
- Cables, cable guards, or conductors in conduit should have insulation rated for at least 18K above the maximum expected ambient temperature of the environment of installation.
- Make provisions externally to provide transient overvoltage protection to a level not to exceed 140% of the peak rated input voltage.
- Contact Flowserve for repairs.
- Discontinue use of equipment if the fasteners that secure the enclosure cover or the cover window are damaged.
- Only operate the positioner when it has successfully passed all acceptance criteria during inspection.
- Do not operate the positioner in a partially assembled condition.
- If the conditions of service on the customer's purchase order change, seek written agreement from Flowserve before operation.
- Observe equipment labels and keep them in a legible condition. Replace any damaged or illegible labels immediately.
- Installations for IECEx certification shall be in accordance with IEC 60079-14 and the wiring practices for the country of origin.
- Installations in Europe shall comply with the relevant requirements of EN 60079-14 and applicable National regulations.
- Field wiring shall be rated for 92°C.

Table 4: Entity Parameters

Field Connections	4-20mA	Optional AO
U_i (Vmax) =	30V	28V
I_i (Imax) =	100 mA	93 mA
P_i =	750 mW	651 mW
C_i =	10.34nF	10.34nF
L_i =	0	0

When equipment is installed as Non-incendive or in an ordinary location, the power supply used for the Logix 1500 shall be limited to a short circuit current less than 4.2A at 35V.

Figure 3 – Connection Diagram



2.11 Protective Equipment

Flowserve positioners use high-pressure air to operate. Use eye protection when working around pressurized equipment.

⚠ DANGER Adhere to standard industry safety practices when working on this or any process-control product. Specifically, use personal protective equipment as warranted.

3 Product Description

3.1 General Product Description

The Logix 1500 is a digital positioner for general applications. The Logix 1500 uses a pneumatic actuation medium (clean air) to allow users to precisely control the position of the actuator and valve. This positioner uses a 4–20 mA current signal and the HART communication protocol to allow remote operation.

Figure 4: Exploded View of the Logix 1500

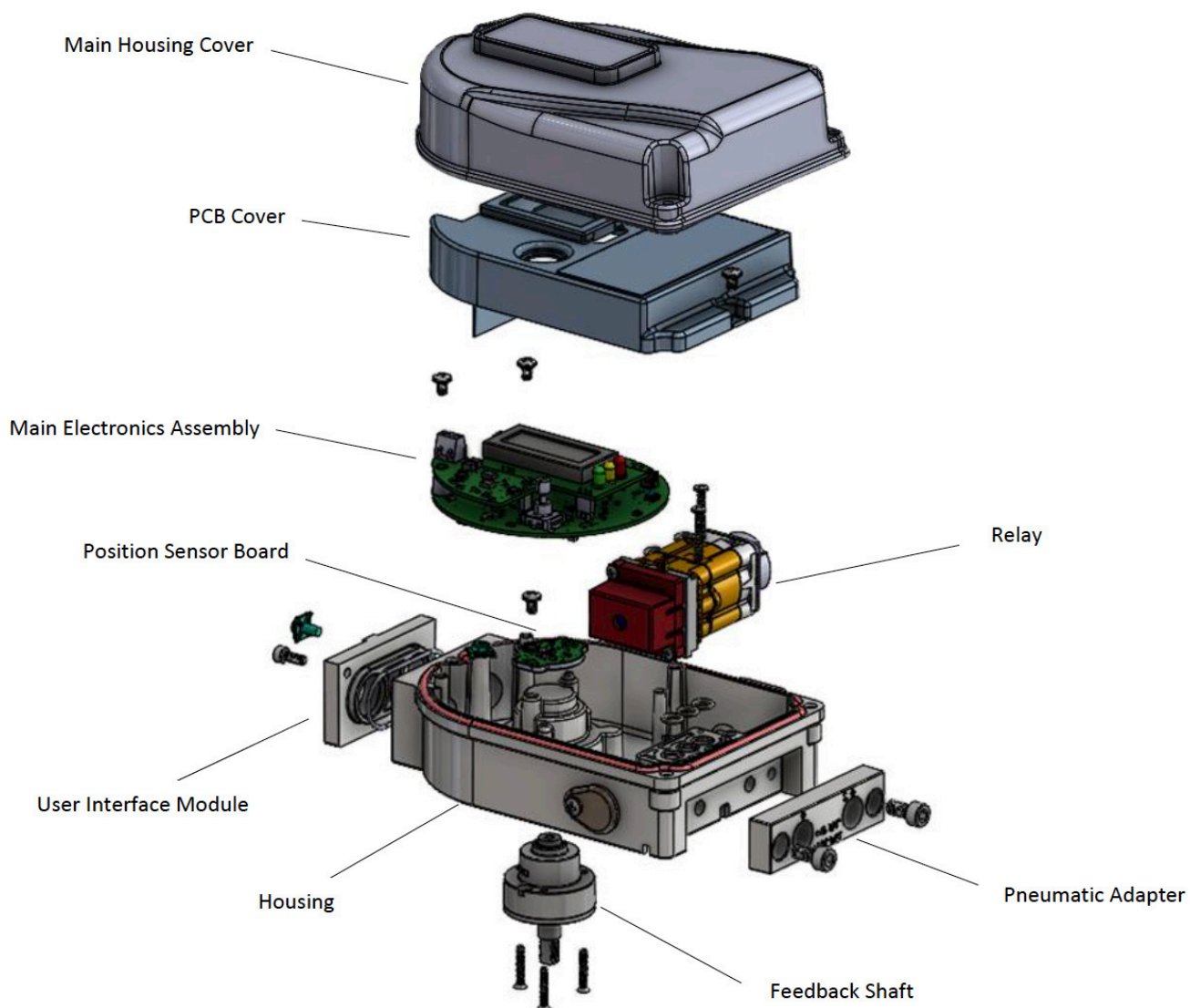
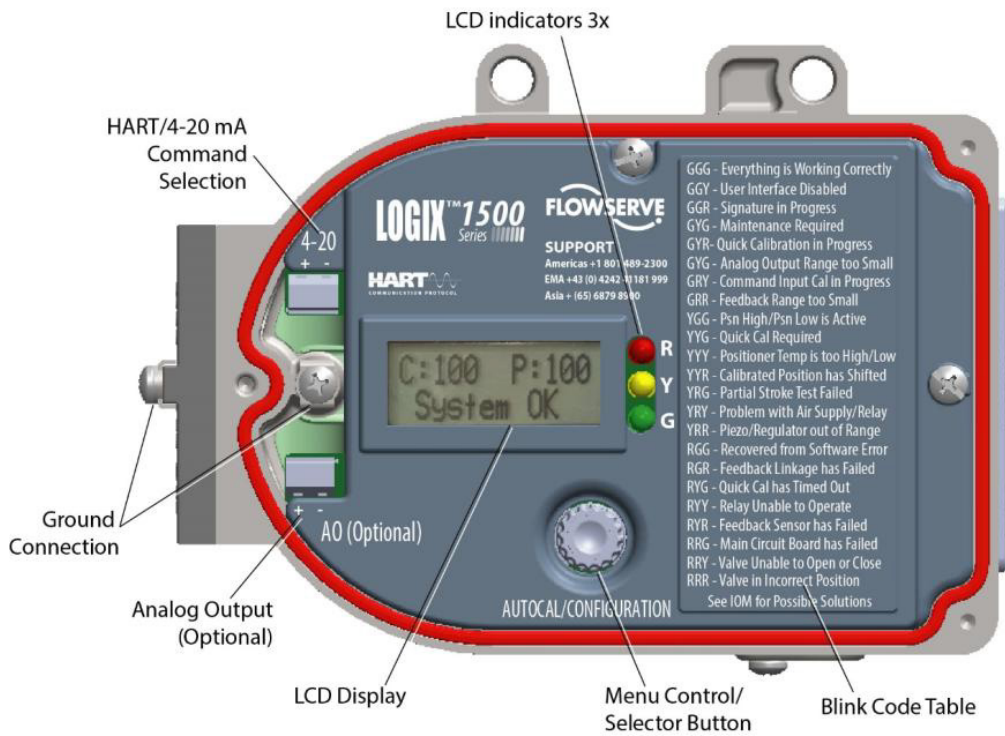


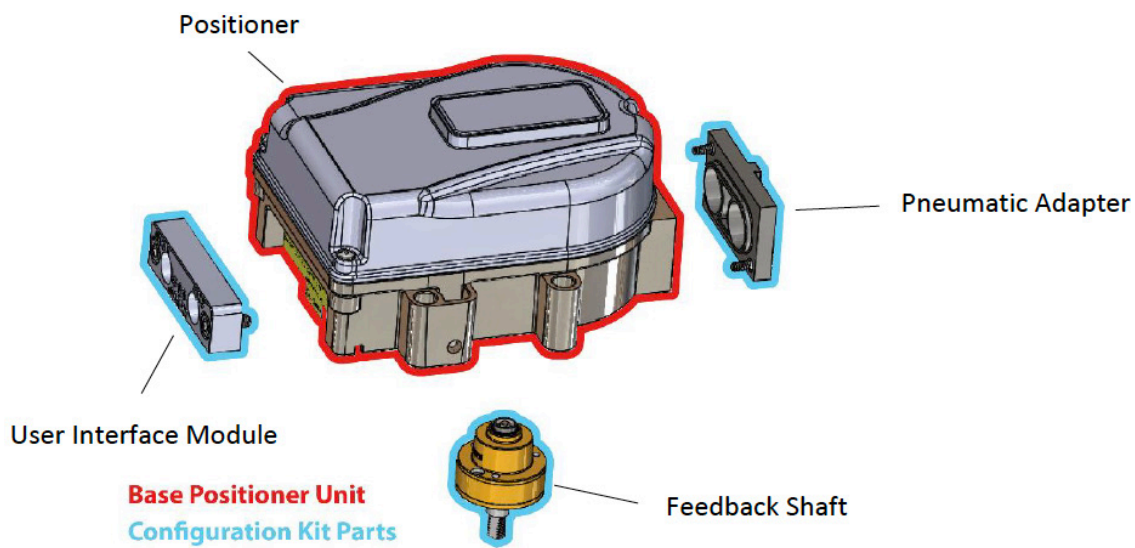
Figure 5: Logix 1500 External Features



3.1.1 Configuration Kits

Because the Logix 1500 is customizable for different applications, it is broken down into a base unit and configuration kits.

Figure 6: Base Unit and Configuration Kit Parts



The configuration kits are required for operation and include a shaft, a conduit adapter, an air connection adapter or gauge block, and plugs. Flowserve offers eight installation kits.

Table 5: Configuration Kits

Kit	Shaft	Conduit	Air Connection/Gauges
0A	Linear D - Shaft (Valtek Standard)	½" NPTF	¼" NPTF Adapter
0B	Linear D - Shaft (Valtek Standard)	M20 x 1.5	¼" NPTF Adapter
0C	Linear D - Shaft (Valtek Standard)	½" NPTF	¼" NPTF Standard Nickel Plated, psi (bar/kPa)
0D	Linear D - Shaft (Valtek Standard)	M20 x 1.5	¼" NPTF Standard Nickel Plated, psi (bar/kPa)
0E	Rotary Namur - Shaft	½" NPTF	¼" NPTF Adapter
0F	Rotary Namur - Shaft	M20 x 1.5	¼" NPTF Adapter
0G	Rotary Namur - Shaft	½" NPTF	¼" NPTF Standard Nickel Plated, psi (bar/kPa)
0H	Rotary Namur - Shaft	M20 x 1.5	¼" NPTF Standard Nickel Plated, psi (bar/kPa)

3.2 Connections

The Logix 1500 positioner requires electrical connections and pneumatic connections for operation.

3.2.1 Electrical Connections

The HART electrical connection provides a 4–20 mA signal to the positioner at the terminals labeled “4–20” or the tabs labeled “HART.” A signal above 3.8 mA will activate the positioner. LEDs on the device will light up, which indicates that power is connected. You must install the conduit adapter before you can make the electrical connections. See section 5.2.2 for more information.

3.2.2 Pneumatic Connections

The positioner has a supply port and an output port to support single-acting functions. You must install the air connection adapter or the gauge block to be able to make the pneumatic connection. See section 5.2.1 for more information.

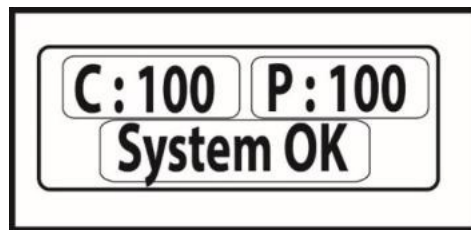
3.3 Controls

The Logix 1500's user interface includes an LCD screen, buttons, and blinking LEDs.

3.3.1 LCD Screen and Buttons

The LCD provides a variety of useful information and functions. The main view provides an instant display of important status parameters: position (P), final command (C), and the current alarm status. The final command is the command adjusted according to a characterization curve, tight shut off, or soft limits that have been applied. The final command should match the position.

Figure 7: LCD Main View



Use the rotary switch to navigate from the main view to the menu tree. This menu tree provides detailed information and allows the user to perform common functions. To enter the menu, briefly press the rotary switch. Rotate the switch to scroll through the menus. Press the switch again to select menu options.

Figure 8: LCD Navigation

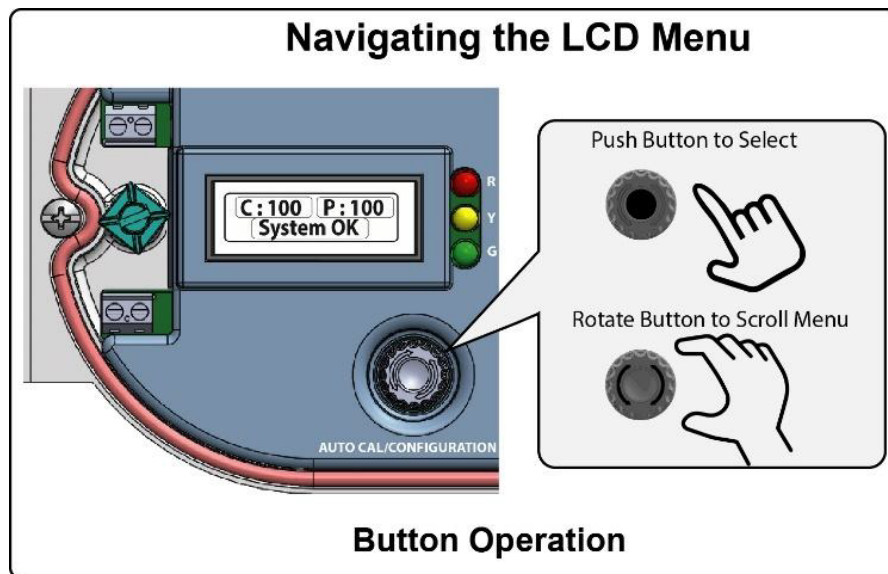
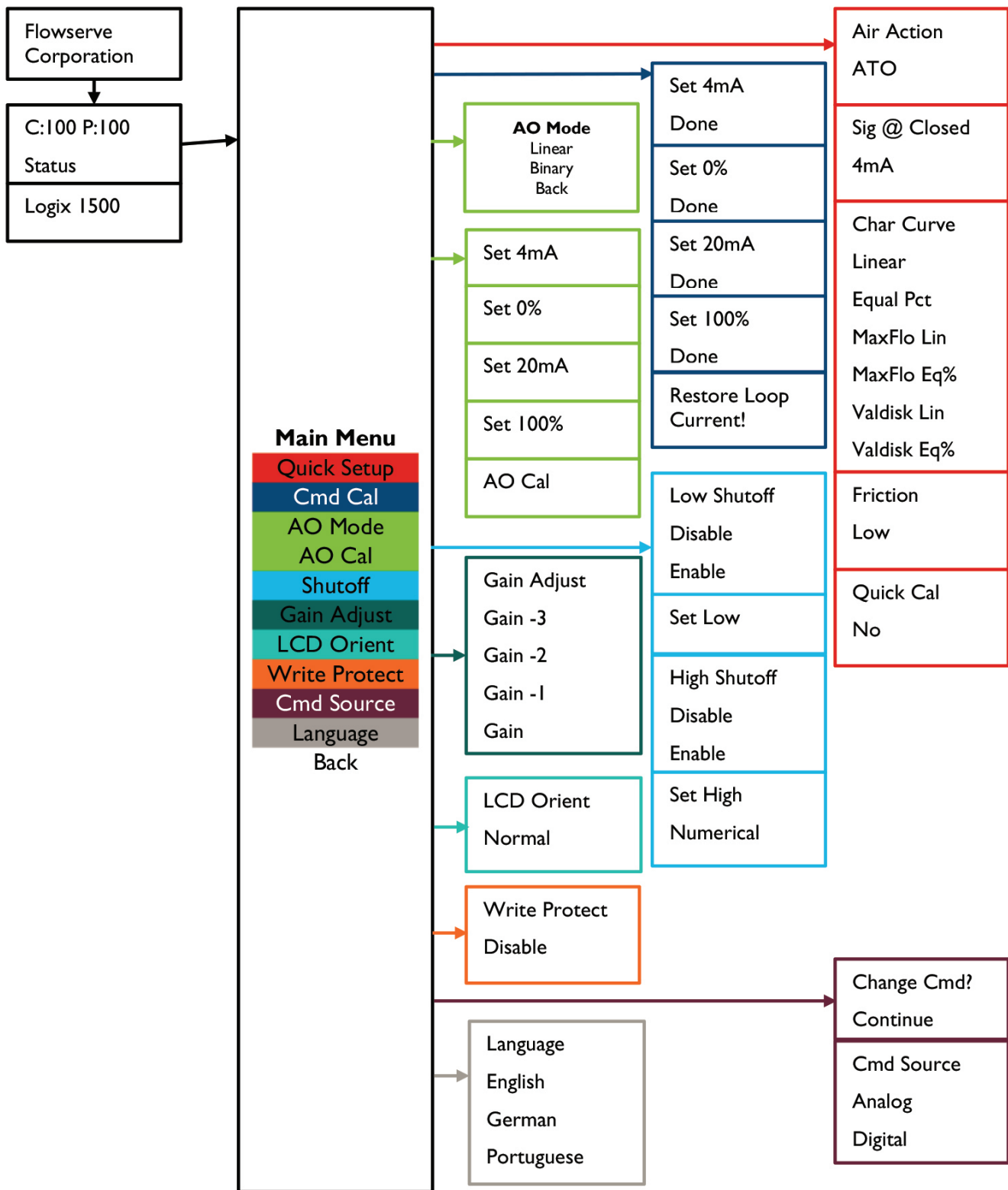


Figure 9: LCD Menu Tree



*Colors denote which tree goes with which main menu item. The LCD is monotone.

3.3.2 LED Blink Codes

The Logix 1500 includes three LEDs that blink three times to quickly indicate the status of the positioner from a distance. Below is a guide to the codes that are unique to the Logix 1500 positioner.

Color Code	LCD Text	Description	Possible Solutions
GGG	System OK	Everything is working correctly.	
GGY	UI Disable	The user interface has been disabled. It is not possible to make changes to the configuration using the menu button.	This setting is set via DTM. Connect to the device with the DTM to change this.
GGR	Sig In Prog	A signature is in progress.	Wait for the signature to complete or use the DTM to abort it.
GYG	Maint Req	The travel and/or cycle accumulators indicate that maintenance is required.	Check the valve and relay for excessive wear and correct behavior then reset the accumulators via the DTM. This feature must be enabled via the DTM.
GY Y		Reserved	
GYR	Quick Cal	A quick calibration (which calibrates the stroke of the valve) is in progress.	Wait for it to complete or abort it with a single press of the menu button.
	FB Cal	A position feedback calibration (which calibrates the position feedback sensor) is in progress.	Complete the calibration by rotating the feedback arm in a complete circle (unmount positioner) until it completes. This can be aborted with a single press of the menu button.
	Cmd Cal	A command input calibration (which calibrates the 4–20 mA loop current input) is in progress.	Complete the calibration by following the steps in the menu or abort it with a single press of the menu button.
	AO Cal	An analog output calibration (which calibrates the 4–20mA loop current output) is in progress.	Complete the calibration by following the steps in the menu or abort it with a single press of the menu button.
GRG	AO Range	The analog output range has been set too small.	Perform an analog output calibration (AO Cal).
GRY	Cmd Range	The command input range has been set too small.	Perform a command input calibration (Cmd Cal).
GRR	Psn Range	The position feedback range has been set too small.	Adjust the feedback linkage to rotate the feedback arm farther and perform a quick calibration.
YGG	Psn High	The position high alert is active.	The positioner has been configured to generate this alert when the position is above a set threshold. Update the settings using the DTM.
	Psn Low	The position low alert is active.	The positioner has been configured to generate this alert when the position is below a set threshold. Update the settings using the DTM.
YGY		Reserved	
YGR	FB Cal Req	The position feedback sensor has not yet been calibrated.	Perform a position feedback calibration. (Should have been done in the factory.)
YYG	Cal Req	The stroke of the valve has not yet been calibrated.	Perform a quick calibration.
YYY	Temp High	The internal temperature of the positioner is above the maximum temperature it was designed for.	Reduce the ambient temperature.
	Temp Low	The internal temperature of the positioner is below the minimum temperature it was designed for.	Increase the ambient temperature.

Color Code	LCD Text	Description	Possible Solutions
Y Y R	Psn > 100%	The position is above the 100% position found during calibration. The feedback arm rotation may have shifted, or the valve seat could be worn down.	Inspect the valve and feedback arm for proper function. If no problems are found, perform a quick calibration.
Y R G	Psn < 0%	The position is below the 0% position found during calibration. The feedback arm rotation may have shifted, or the valve seat could be worn down.	Inspect the valve and feedback arm for proper function. If no problems are found, perform a quick calibration.
Y R Y	PST Fail	The most recent partial stroke test has failed.	Check the pass/fail criteria and/or rerun the test. Clear this alarm. This alarm may be cleared using the DTM.
	Check Air	The relay is stuck in a depressurized state. This is usually caused by supply air being disconnected, but it could be a problem with the internal pressure regulator or relay.	Check that the supply pressure air is connected and in the correct pressure range. If this alarm persists even with air supply pressure in the correct range, check the internal pressure regulator and/or replace the relay.
	Piezo Low	The piezo voltage required to hold the relay in the null position is too low. This could be caused by the piezo developing a memory problem or the internal pressure regulator drifting out of the correct range.	Check the internal pressure regulator and, if it is outputting the correct pressure, replace the piezo (or the relay including the piezo), then perform a quick calibration.
	Piezo High	The piezo voltage required to hold the relay in the null position is too high. This could be caused by the piezo developing a memory problem or the internal pressure regulator drifting out of the correct range.	Check the internal pressure regulator and, if it is outputting the correct pressure, replace the piezo (or the relay including the piezo), then perform a quick calibration.
R G G	SW Error	The positioner has recovered from a software error.	Using the DTM, collect the error information and send it to a Flowserve representative for evaluation. This alarm will clear automatically after about 6 minutes.
R G Y		Reserved	
R G R	FB Fail	The feedback linkage has failed. The measured position is well out of the range of the valve's stroke measured during calibration.	Check/repair the feedback linkage and perform a quick calibration.
	Timeout	The quick calibration has timed out.	Check the air supply and perform another quick calibration. Watch for the valve to be able to stroke and to be stable during the calibration.
R Y Y	Relay Fail	The relay is unable to operate correctly.	Verify all internal cables are connected correctly. Check the internal pressure regulator and, if it is outputting the correct pressure, replace the relay and perform a quick calibration.
R Y R	Psn Sns Fail	The feedback position sensor has failed.	Verify that all internal cables are connected correctly. Replace the feedback position sensor board and perform a position feedback calibration followed by a quick calibration.
R R G	HW Fail	The main circuit board has failed.	Replace the main circuit board then perform a position feedback calibration followed by a quick calibration.
R R Y	Can't Open	The positioner can move the relay to the correct position, but the valve is unable to open.	Verify that the actuator is tubed correctly. Check for obstructions and a sufficiently strong spring on the correct side of the actuator.
	Can't Shut	The positioner can move the relay to the correct position, but the valve is unable to close.	Verify that the actuator is tubed correctly. Check for obstructions and a sufficiently strong spring on the correct side of the actuator.
R R R	Psn Dev	The valve is not at the correct position (for any reason).	Check for other active alarms. Perform a quick calibration.

3.4 Tools

To assemble and install the Logix 1500 positioner, you will need

- #2 Phillips screwdriver
- 3/16" hex wrench
- 7/64" hex wrench

3.5 Product Specifications

Review the following specification tables to understand the Logix 1500 positioner.

Table 7: Input Signal (HART) Specifications

Power Supply	4-20mA input. 3.6mA minimum Voltage Drop to conform to HART standard
Input Signal Range	4 - 20 mA
Compliance Voltage	9 to 30 VDC @ 20 mA
Effective Resistance	500 Ω @ 20 mA Typical
Minimum Required Operating Current	4.0 mA
Power Interruption Time Limit	After applying power for at least 1 minute, 40 ms. power interruption will not cause the positioner to reset.
Power-up time	Time from the application of power to begin controlling valve < 1.0 second.
Communications	HART protocol (Logix 15X2- only)
Wire	Terminal 24-16 AWG .511-1.291 mm
Cable	Refer to the HART Field Communications Protocol Application Guide, HART HCF LIT

Table 8: Pneumatic Output Specifications

Output Pressure Range	0 to 100% of air supply pressure. 14.3 Nm ³ /h @ 1.5 bar (5.33 SCFM @ 22 PSI) 30.6 Nm ³ /h* @ 4.1 bar (12.2 SCFM* @ 60 PSI Cv 0.47)
Output Air Capacity	*Port screen filters may reduce the air output capacity to 22.4 Nm ³ /h @ 4.1 bar (12.8 SCFM @ 60 PSI Cv 0.35). Removal of the filters may be required to obtain maximum air capacity.
Primary Output Ports (Pressurized port is in an energized state. Port is exhausted upon loss of power.)	Port A

Table 9: Air Supply Specifications

Minimum Input Pressure	1.5 Bar (22 PSI)
Maximum Input Pressure	5.5 Bar (80 PSI)
Air Supply Quality	The air supply must be free from moisture, oil, and dust by conforming to the ISA 7.0.01 standard. (A dew point at least 18° F below ambient temperature, particle size below five microns, and oil content not to exceed one part per million).
Operating Humidity	0 - 100% non-condensing
Acceptable Supply Gases	Air, sweet natural gas, nitrogen, and CO2 are acceptable gases. No sour gas applications with more than 20 ppm H2S shall be used in our positioners. For Type nA and Type tb installation, only connect air or inert gas to the air supply inlet.
Air Consumption Standard Relay	0.069 Nm³/h @ 1.5 bar (0.041 SCFM @ 22 PSI) 0.082 Nm³/h @ 4.1 bar (0.050 SCFM @ 60 PSI Cv 0.008)

Table 10: Analog Output Specifications

Terminal Power Supply Range	10 to 28 VDC, (24 VDC Typical)
Linear Current Signal Output	4 to 20 mA
Binary Current Output	≤0.9mA to ≥21mA
Linearity	±0.5% F.S.
Repeatability	0.25% F.S.
Hysteresis	1.0% F.S.
Bandwidth	4Hz
Operating Temperature	-40 to 85°C (-40 to 185°F)

Table 11: Stroke Output Specification

Feedback Shaft Rotation	Minimum 15°, Maximum 110° 60° recommended for linear applications
-------------------------	--

Table 12: Positioner Performance Characteristics

Positioners can achieve the following Performance Characteristics if properly configured and calibrated.	
Resolution	≤ 0.25%
Linearity	+/- 1.25%
Repeatability	≤ 0.25%
Hysteresis	≤ 1.0%
Deadband	≤ 0.3%
Sensitivity	≤ 0.25%
Stability	≤ 0.5%
Long term drift	≤ 0.5%
Supply Pressure Effect	≤ 0.2% per 10 psi (0.69 bar)
NOTICE Based on test results from medium sized actuator on a low friction valve tested per IEC-61514.	

Table 13: Temperature Specifications

Operating Temperature Range	-40°C to +85°C
Transport and Storage Range	-55°C to +85°C (-67°F to +185°F)
NOTICE Reduced performance possible at low and high temperatures. LCD may not be readable at temperatures below -20°C (-4°F) and temperatures above 70°C (158°F).	

Table 14: Physical Specifications

Housing Material	Aluminum Cast, powder-painted Copper-free aluminum (EN AC-43400/EN ACAl-Si10Mg(Fe))
Soft Goods	Fluorosilicone / Fluorocarbon / Buna-N
Weight of Assembled Positioner	1.18 kg (2.6 lbs.) – Aluminum Cover 0.11 kg (0.25 lbs.) – Additional weight of Gauges

Logix™ 1500 Digital Positioner

Figure 10: Positioner Dimensions (No Gauges)

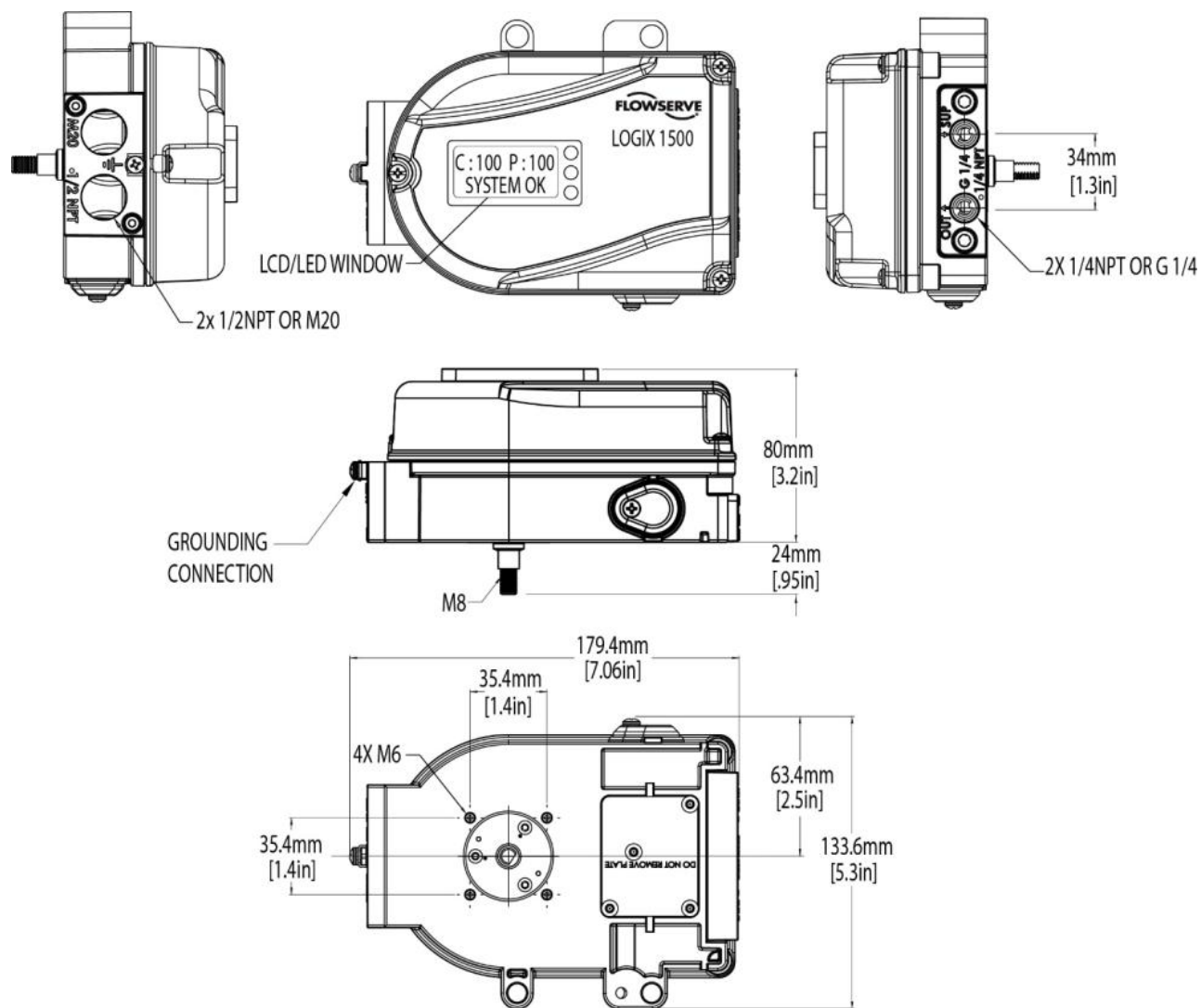


Figure 11: Positioner Dimensions (With Gauges)

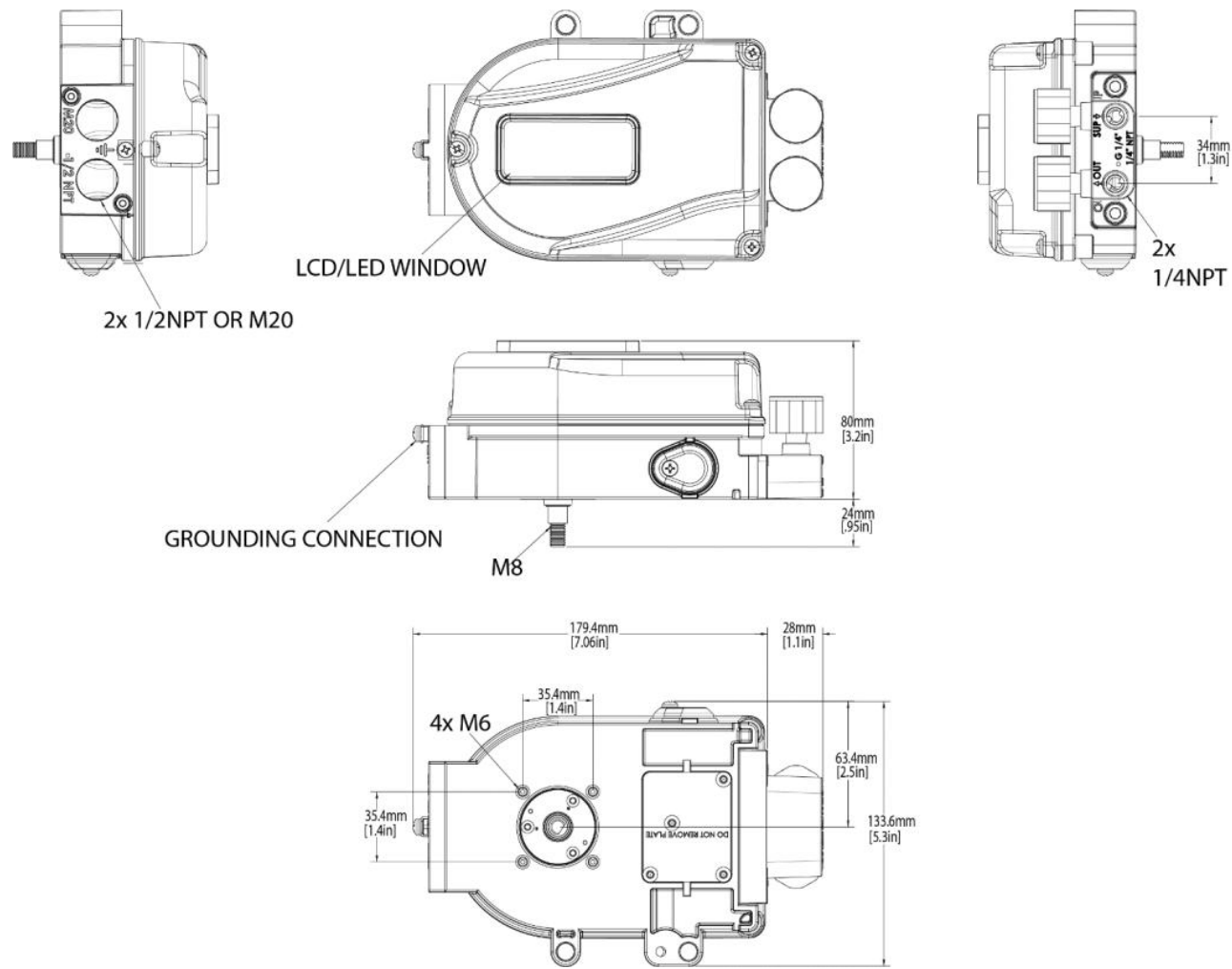


Table 15: ValveSight DTM Software Specifications

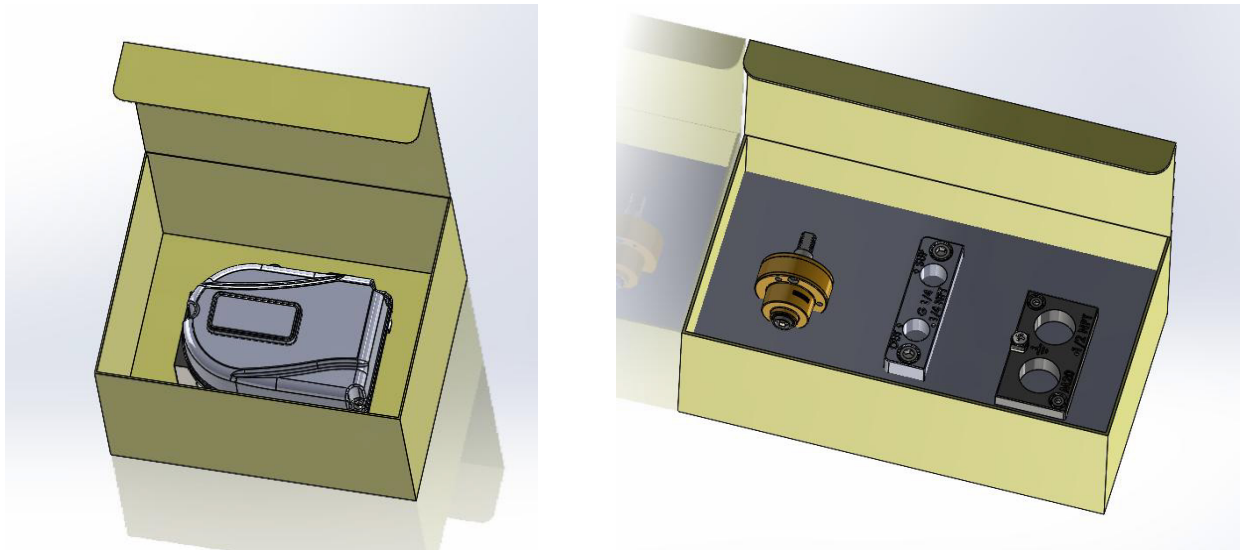
Computer	Minimum Pentium processors running Windows 2000, XP, Server 2003, Server 2003 R2, Server 2008 (32-bit & 64-bit Versions), Server 2008 R2 (32-bit & 64-bit Versions), 7 (32-bit & 64-bit Versions), 8 (32-bit & 64-bit Versions), and 10 (32-bit & 64-bit Versions) (Memory: >64MB Available HARD Disk Space: >64MB)
Ports	One minimum available with a maximum of eight possible. Can also communicate via serial and USB connections.
HART Filter	In some cases required in conjunction with some DCS hardware.

4 Packaging, Transportation And Storage

4.1 Unpacking

While unpacking the valve and Logix 1500 positioner, compare the packing list to the materials received. Each shipping container includes a list that describes the system and accessories that are included in the package. Note that the configuration kit is shipped in a separate box from the base positioner.

Figure 12: Base Unit Package and Configuration Kit Package



If you encounter shipping damage, contact the shipper immediately. If you have any other problems, contact Flowserve. Contact information can be found on the back page of this user instruction.

WARNING The stickers that cover the conduit ports, pneumatic ports, shaft cavity, and direct mount port only protect the inside of the positioner during shipment. If you do not replace these with the appropriate hardware, liquid and debris may enter and damage the positioner.

4.2 Packaging and Transportation

While unpacking the valve and Logix 1500 positioner, compare the packing list to the materials received.

4.3 Storage

Store Flowserve control valves and instruments in a clean, dry environment to prevent damage. Avoid flooding the equipment with any liquids, including rainwater that may accumulate in packaging materials. Additionally, prevent dirt or sand accumulation in the pneumatic and valve ports by keeping the stickers in place on the positioner until you fit it with conduit or air supply lines. These stickers are fitted to protect the positioner ports from foreign materials.

If Flowserve products have been in storage for an extended period, inspect them for corrosion or deterioration before you use them. You are responsible for providing fire protection for these products.

NOTICE The positioner is only IP66/NEMA 4X certified after it is installed and has been fitted with the proper adapters, tubing, conduits, or permanent plugs.

5 Installation

5.1 Inspection and Preparation

Before you install the positioner, inspect the parts for damage and ensure that the cover is in place. If there is contamination in the positioner, gently clean the positioner components using a soft, damp cloth. You may need to remove some parts for better access. Do not allow water to enter the electronics assembly.

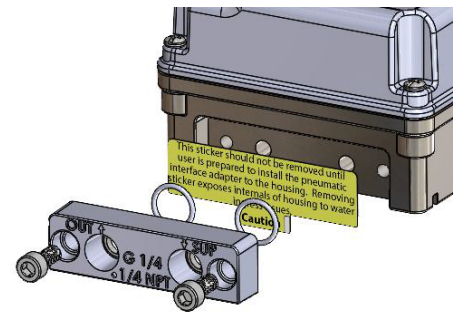
5.2 Configuration Kits

For the Logix 1500 to function safely and effectively, install the parts from the configuration kits before you mount the positioner.

5.2.1 Air Connection Adapter or Gauge Block Installation

1. Remove the sticker that covers the housing's air connection ports.
2. Place 2 O-rings in the back of the ports on the air connection adapter or gauge block.
3. Carefully place the air connection adapter or gauge block over the ports on the positioner. Ensure that the O-rings do not fall out.
4. Use a 3/16" hex wrench to torque 2 hexagon socket screws into the air connection adapter or gauge block. Torque the screws to 2.5 N-m (22 in-lbs.).

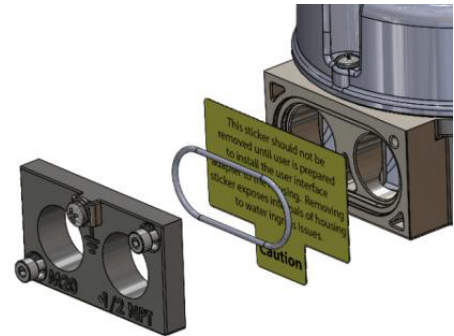
Figure 13: Installing the Air Connection Adapter



5.2.2 Conduit Adapter Installation

1. Remove the sticker that covers the housing's conduit ports.
2. Place the gasket into the groove in the housing.
3. Place the conduit adapter on the housing. Ensure that the hole for the ground screw is closer to the front of the housing.
4. Use a 7/64" hex wrench to torque 2 hexagon socket screws into the conduit adapter. Torque the screws to 1.4 N-m (12 in-lbs.).
5. Place a ground-screw top washer over the hole for the ground screw.
6. Use a #2 Phillips screwdriver to install the ground screw.

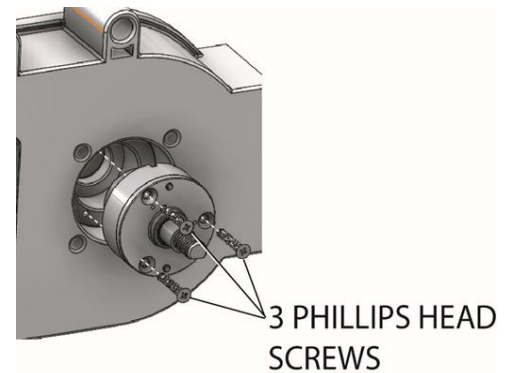
Figure 14: Installing the Conduit Adapter



5.2.3 Feedback Shaft Installation

1. Apply 3M Scotch-Weld Thread locker TL22 or Loctite 243 to the three holes on the back of the positioner housing.
2. Insert and align the new shaft assembly with the back of the housing.
3. Torque the three screws to 0.9 N-m (8 in-lb).
4. Adjust the positioner to the correct mounting orientation.
5. Connect the shaft assembly to the follower arm assembly within the working range of the shaft assembly.

Figure 15: Installing the Feedback Shaft



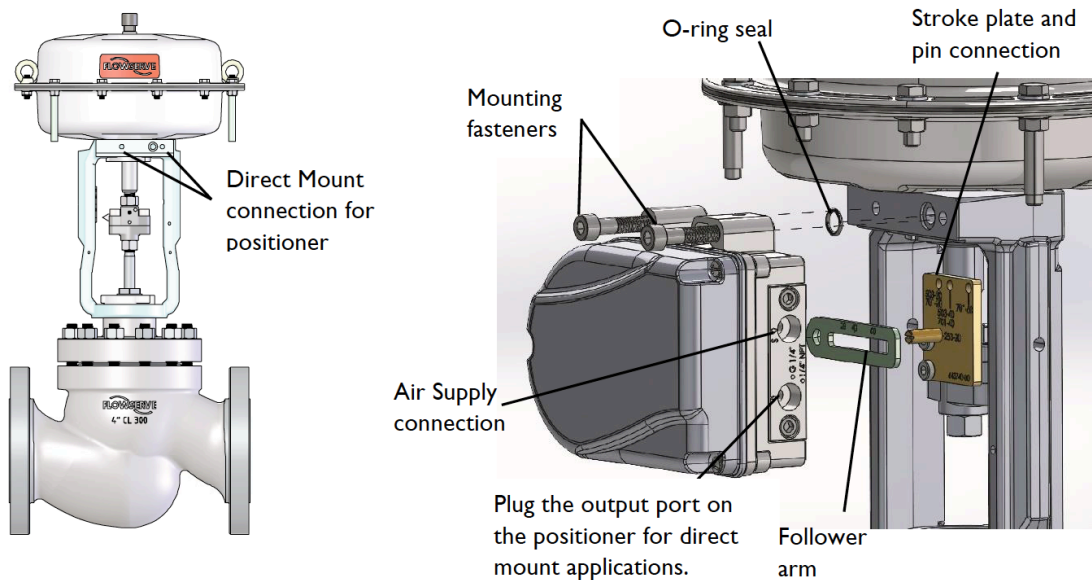
5.3 Direct Mounting

CAUTION Only mount the positioner assembly to an actuator that is compatible with Flowserve direct mount devices. Refer to table 16 for a list of Logix 1500 mounting kits. Consult with a Flowserve sales representative for information on compatible actuator options.

To mount the positioner directly to the actuator without using tubing, follow these steps:

1. Attach the positioner. Refer to figure 16.
2. Make sure the feedback shaft and take-off arm are properly aligned.

Figure 16: Logix 1500 with a Direct Mount to the FlowTop



5.4 Non-Direct Mounting

If you plan to use non-direct mounting for the positioner, you will need to connect the positioner to the actuator with the appropriate compression fitting connectors, or tubing. For best performance, use 10 mm (3/8 in) tubing for actuators that are 645 cm² (100 in²) or larger, and the orientation shown in figure 17 or an orientation rotated no more than 90° on any axis is recommended.

Mounting kits consist of all bracketing, bolting, stem clamps and stem clamp bolting, etc. required to mount the Logix 1500 positioner. It does not include any actuator parts nor yoke clamps and bolting. Contact Flowserve for assistance in selecting the correct mounting kit.

Table 16: Logix 1500 Mounting Kits

Typical Linear Actuator Mounting Kits

FlowTop & Kämmer KP-Actuator	
KP-P4 (Stroke 60mm) KP-P5 (Stroke 60mm)	70-ABS310898
Kämmer KP-Actuator	
KP-P1	70-ABS311006
KP-P2	
KP-P3	
KP-P4 (Stroke 10-40mm)	
KP-P5 (Stroke 10-40mm)	

Typical Direct Mounting¹ Kits

FlowTop	
All sizes	651953.999.000
Kämmer KP-Actuator	
KP-P1	70-ABS100295 (compact mounting ²)
KP-P2	70-ABS100280
KP-P3	
KP-P4 (Stroke 10-40mm)	
KP-P5 (Stroke 10-40mm)	
1 Direct mounting uses the upper yoke plate to allow the supply air from the positioner to flow through the yoke into the drive. For fail open and in general for KP-P5, piping has to be added. 2 Compact mounting uses a plate to mount the positioner to the upper yoke plate. Piping has to be added.	

Typical Rotary Actuator Mounting Kits

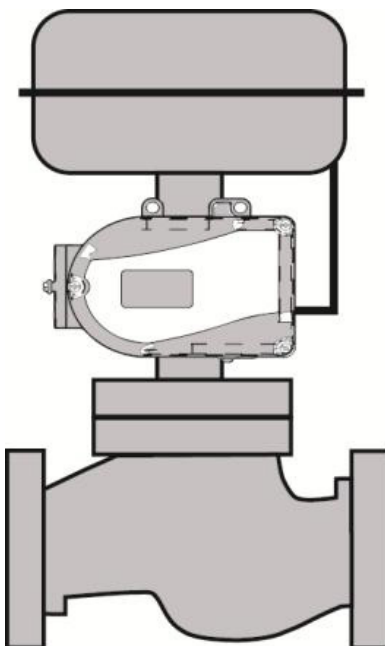
SuperNova Size	Size in mm	Kit
SNA050–SNA100	30 mm x 80 mm x 20 mm	NK28A
SNA115–SNA200	30 mm x 130 mm x 30 mm	NK313A
SNA250–SNA300	30mm x 130 mm x 50 mm	NK513A1

5.4.1 Determine the Air Action

The Logix 1500 is a single-acting positioner. Determine whether your actuator is to be air-to-open (fail close or ATO) or air-to-close (fail open or ATC). Use tubing to connect the positioner's output port to the proper port on the actuator.

⚠ DANGER Proper tubing orientation is critical for the positioner to function correctly and have the correct failure mode. Backward tubing could cause an unsafe failure mode.

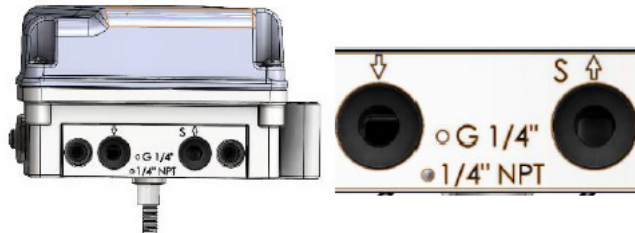
Figure 17: Tubing of Linear, Single-Acting, Air-to-Open Actuators



5.4.2 Connect the Supply Port

The air connection adapter and the gauge block have labels that indicate the size of the threads in the positioner ports (1/4" NPT).

Figure 18: Logix 1500 Supply Ports with Detail



If the air may be dirty, install an air filter.

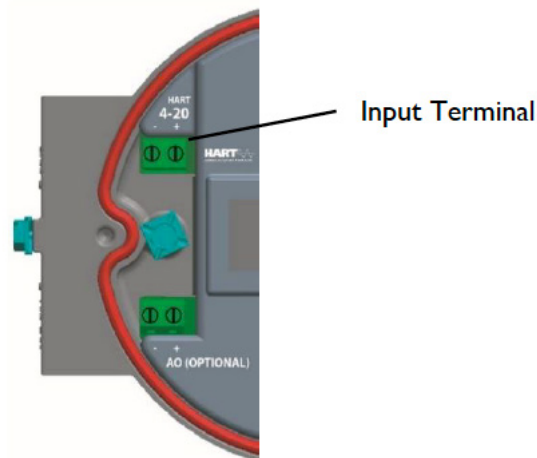
⚠ DANGER In applications where the supply pressure exceeds the maximum actuator pressure rating, a regulator is necessary to reduce the pressure to the actuator's maximum rating. Exceeding the maximum actuator supply pressure may cause the actuator to explode, which can result in death, injury, or property damage.

5.5 Electrical Connections (HART or Analog Only)

For Logix 1500 digital positioners that use the HART communication protocol, the protocol is superimposed on the 4–20 mA current signal. It uses two frequencies: 1200 Hz and 2200 Hz.

⚠ CAUTION Connect only wires with compatible electrical signals to the terminals. Voltages or currents outside the specified range can damage the circuit boards.

Figure 19: Terminal Diagram (HART)



5.5.1 Command Input (4–20 mA) Connection

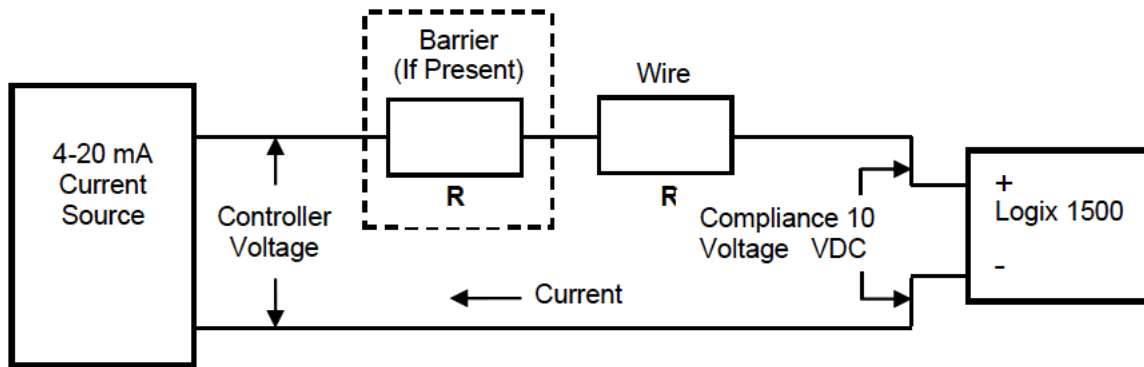
For models that support HART communications, connect the 4–20 mA current source to the input terminal labelled “HART 4–20,” shown in Figure 19. Depending on the current source, a HART filter may be necessary. For models that are Analog Only, connect the 4–20 mA current source to the input terminal labelled “AO (Optional).” See Section 8, Troubleshooting.

NOTICE The polarity of the terminals is labelled on the cover; however, the command input connection is polarity insensitive.

Output compliance voltage refers to the maximum voltage that the current source can provide. A current loop system consists of the current source, wiring resistance, barrier resistance (if present), and the Logix 1500's impedance.

The Logix 1500 requires that the current loop system allows for a 10 VDC drop across the positioner at the maximum loop current. The current loop system should have a minimum compliance voltage greater than 10 VDC and a maximum less than 32 VDC. The current operating range is from 4 to 20 mA.

Figure 20: Compliance Voltage Schematic



To determine if the loop will support the Logix 1500, perform the calculation in the following equation. The available voltage must be greater than 10 VDC to support the Logix 1500.

Equation 1: Compliance Voltage Equation

$$\text{Available Voltage} = \text{Controller Voltage} - \text{Current}_{\text{max}} \times (R_{\text{barrier}} + R_{\text{wire}})$$

Example:

Controller Voltage = 19 V

Current_{max} = 20 mA

R_{barrier} = 300 Ω

R_{wire} = 25 Ω

Available Voltage = 19 V – 0.020 A × (300 Ω + 25 Ω)

Available Voltage = 12.5 V

The available voltage (12.5 V) is greater than the minimum required voltage (10.0 V), so this system will support the Logix 1500.

CAUTION Always limit the current for 4–20 mA operation. Never connect a voltage source directly across the Logix 1500 terminals. Permanent circuit board damage may occur.

5.5.1.1 Cable Requirements

Cable capacitance and length can affect the communication signal, so consider the capacitance and network resistance of potential cables to determine the maximum allowable length for each option. Use a cable with a lower capacitance per foot rating to allow for longer runs. Refer to the latest version of the HART Communication Application Guide for installation practices and cable length limitations.

CAUTION

Wire sizes between 24 and 16 AWG should be used for connections to the screw terminals. Wires outside of this range may not form a good connection or may damage the terminals.

The input loop current signal should be in shielded cable. To remove environmental and electrical noise, tie the shield wire to the current source, not the positioner.

5.5.1.2 Intrinsically Safe Barriers

If your positioner is HART-enabled, select an intrinsically safe barrier that is HART compatible. If the barrier is not compatible, it may prevent HART communication while still allowing normal positioner control.

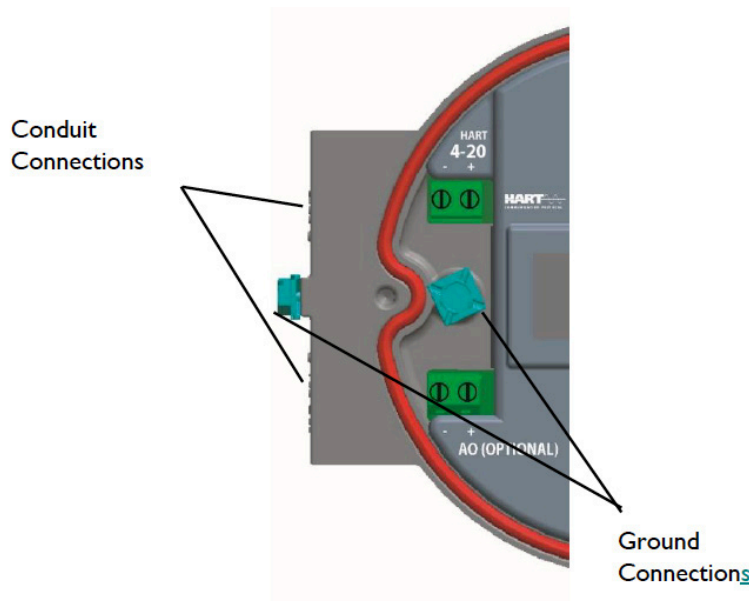
5.5.1.3 Conduit

This product has two (1/2" NPT or M20) electrical conduit connections.

5.5.1.4 Grounding

The grounding terminals, located near the electrical conduit ports, should be used to provide an adequate and reliable earth-ground reference. Tie the outer grounding terminal to the same ground as the electrical conduit and the inner grounding terminal to the cable shield. For maximum conducted immunity, tie one side of the shield to a common earth reference.

Figure 21: Conduit and Grounding (HART)



5.5.1.5 Electromagnetic Compatibility

The Logix 1500 digital positioner has been designed to operate correctly in the electromagnetic (EM) fields that are common in industrial environments, in accordance with standards EN61000-4-3, 4, 5, 6, 8, and 11 Radiated Immunity and EN55011 61000-3-2, 3 Radiated Emissions. To ensure proper operation, take the following precautions:

- Only use the positioner in environments with EM field strengths below 10 V/m (electric field).
- Keep portable EM devices, such as hand-held two-way radios, more than 30 cm away from the device.

To reduce the risk of electrical noise, use proper wiring and shielding techniques for control lines and route control lines away from sources of electromagnetic interference where possible. For recommendations on electromagnetic line filters, contact a Flowserve representative. If the device is exposed to a severe electrostatic discharge, it may be necessary to inspect and even recalibrate the Logix 1500 positioner to restore its operation.

5.5.2 AO I/O Circuits

The Logix 1500 digital positioner has an optional AO board that can be used in linear or binary mode. In both modes the 4mA and 20mA values should always be set to 4mA and 20mA.

Linear mode will produce a 4–20 mA signal that corresponds to the position of the valve. This output reflects the actual position of the valve, including all failure modes except for power loss. The 0% and 100% values can be set for split ranged operation (4-12mA or 12-20mA) and can also be reversed.

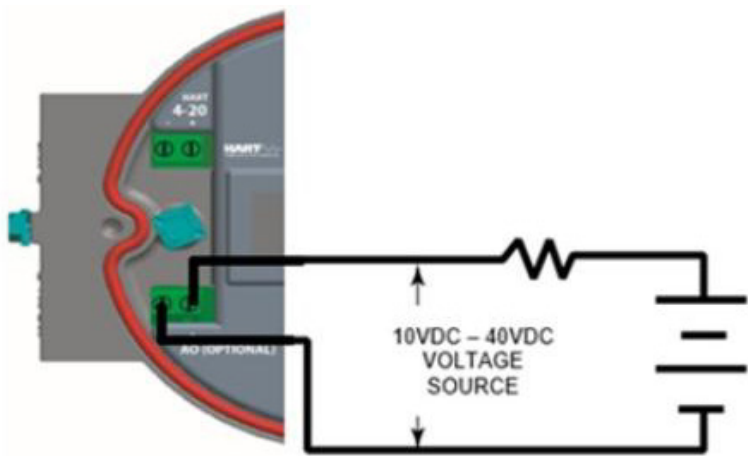
In binary mode the AO outputs the 100% value (typically calibrated to be 7mA) during normal operation. When a position deviation alarm is active, meaning positioner is unable to control, it outputs the 0% value (typically calibrated to less than 1.2mA). the 0% and 100% values can be set to any value, provided they are not within about 1mA of each other.

The mode and calibration of the AO board are set through the LCD menu or by HART command.

The AO signal is based on the signal-at-closed setting. If the valve closes with a 4-mA signal, the AO will show a 4-mA signal when closed. If the valve closes with a 20-mA signal, the AO will show a 20-mA signal when closed. This can be changed through an AO calibration.

CAUTION When installing the AO board, observe proper electrostatic discharge precautions when connecting to a power supply or loop calibrator.

Figure 22: Analog Output Circuit



For AO function, connect AO terminals in series with a 10–28 VDC power supply, including a method to determine the current. The AO current will follow the valve position and will have a range of 4 to 20 mA. The impedance of the connection and load must be less than 250Ω.

Table 17: 18Auxiliary Circuit Status

Circuit	Condition	Status Indication
AO	Monitoring Position (typical 4–20 mA)	Output (mA)
	Less than 10 V on AO terminals.	No Loop Power

6 Operation

6.1 Start-Up

To set up the Logix 1500, enter the **Quick Setup** wizard via the LCD menu (see Figure 5) and follow these steps:

1. Select **ATO** or **ATC** to program the air action (whether increasing pressure in port A will cause the valve to open or close).
2. Choose **4 mA** or **20 mA** to program the signal strength at the closed position.
3. Select Linear, Equal Percent, MaxFlo Linear, MaxFlo Equal Percent, Valdisk Linear, Valdisk Equal Percent, ShearStream Linear, ShearStream Equal Percent, Quick Open, or Custom to program the characteristic curve (the relationship between the command signal and the valve position).
4. Choose **Low** or **High** to indicate the friction level.
5. Select **Yes** or **No** to perform a Quick Calibration.

6.2 Quick Calibration

The Logix 1500 digital positioner can be calibrated through a process called QUICK-CAL. This calibration determines the closed and open positions of the valve and gathers information about the response of the valve to set control gains automatically. The QUICK-CAL can be initiated by choosing to perform it at the end of the Quick Setup in the LCD menu, or by starting it remotely using the DTM.

 **CAUTION** The valve may stroke unexpectedly during the QUICK-CAL, so notify the proper personnel and ensure that the valve is properly isolated.

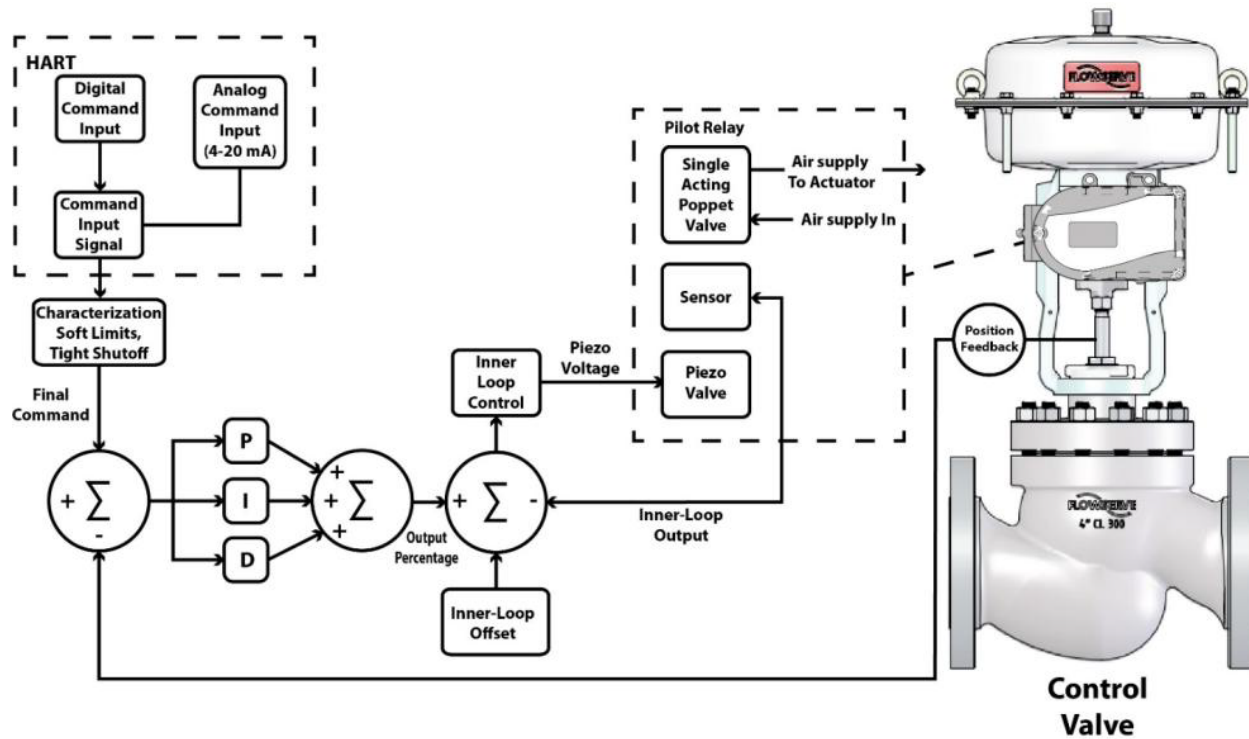
The status of the calibration will be displayed on the LCD as “Cal in Prog,” and the LEDs will blink green-yellow-red.

Once the QUICK-CAL is complete, you can adjust gains under the “Gain Adjust” option in the menu tree.

6.3 Normal Operation

The Logix 1500 is compatible with both linear and rotary mountings for single-acting applications. This digital positioner can be configured via the local user interface, a handheld device, or a DTM and uses the HART protocol or Analog Only to allow for two-way communication and has a minimum start-up current requirement of 3.8 mA. It is a closed-loop feedback instrument that consists of electronic and pneumatic components, as shown in Figure 23.

Figure 23: Principles of Operation of the Logix 1500



6.3.1 Position Definition

In the HART analog command mode, the 4–20 mA signal is converted to a position as a percentage. During loop calibration, the signals corresponding to 0% and 100% valve positions are defined. Regardless of whether the command mode is analog or digital, 0% is always considered the closed position of the valve and 100% is always considered the open position.

6.3.2 Command Input and Final Command

The command input signal, expressed as a percentage, is modified by a characterization/limits block in the software. This allows for field adjustments and can apply no adjustment (linear mode), one of several predefined characterization curves (including equal percent), or a custom 21-point curve defined by the user.

In linear mode, the input signal is passed directly to the control algorithm at a 1:1 ratio. The predefined equal percent characterization curve maps the input signal to a standard-rangeability equal-percent curve. If custom characterization is enabled, the input signal is mapped to a user-defined 21-point output curve set using a handheld device or ValveSight software.

Additionally, user-defined features such as soft limits and tight shutoff may also impact the position. The final command, which is used to position the stem after evaluating characterization curves and user limits, is the result of this process.

6.3.3 Outer Loop

The Logix 1500 positioner uses a two-stage algorithm for positioning the stem. The inner loop, or pilot relay control, and the outer loop, or stem position control, work together to accurately position the stem. A stem position sensor measures the movement of the stem and compares it to the desired position, or final command. If there is any deviation between the two, the control algorithm sends a signal to the inner loop to adjust the relay poppet valve and move the stem in the appropriate direction. As the stem moves, the actuator pressures change, and the deviation is reduced until it reaches zero. At this point, the stem has reached the desired position, and the inner loop returns to a balanced, or null, position.

6.3.4 Inner Loop

The inner loop of the Logix 1500 uses a driver module that includes a sensor and a piezo valve modulator to control the position of the relay valve. The piezo valve modulator uses a piezo beam to adjust the air pressure beneath a diaphragm. When piezo valve receives a higher voltage, the piezo beam bends and closes off against a nozzle, which increases the pressure under the diaphragm. As the pressure increases or decreases, the poppet valve moves up or down accordingly. The sensor sends the poppet valve position back to the inner loop electronics for control purposes.

6.4 Inner Loop Offset

The inner loop offset is the position of the poppet where the pressures are balanced and the valve position is held in a steady state. The control algorithm uses this value as a reference when determining the piezo voltage, which is important for proper control. The inner loop offset is automatically optimized and set during stroke calibration.

6.5 Cleaning

With the cover in place and with cover bolts torqued to specifications, the positioner may be cleaned with a damp cloth. Do not use abrasive materials, detergents, or chemicals.

6.6 Factory Reset

To perform a factory reset on the Logix 1500 digital positioner, hold the QUICK-CAL button while applying power until the LCD turns on. This will reset all internal variables to their default values, including the calibration. The positioner will need to be recalibrated after a factory reset. Remember to restore any user-configured limits, alarm settings, and valve information.

NOTICE For HART and Analog Only positioners, a factory reset will always reset the command source to analog 4–20 mA.

CAUTION A factory reset may result in the inability to operate the valve until it is properly reconfigured. Notify the proper personnel and ensure that the valve is properly isolated.

6.7 Shutdown

The Logix 1500 positioner does not have a shutdown function. Disconnect the power supply from the positioner if shutdown is necessary.

7 Maintenance

7.1 Spare Parts and Tools

The modular nature of the Logix 1500 allows you to replace components at your facility. Table 18 shows the spare parts that you can order from a Flowserve representative and the parts that a Flowserve service team can replace for you. Note that some parts cannot change depending on the serial number of your positioner. Table 19 explains the tools and torque requirements for screws you may replace or install during maintenance. For parts that need to be replaced by the Flowserve service team, contact your Flowserve sales representative.

Table 18: Spare Parts

Spare Part	Interchangeability	Part Number
Aluminum Cover Assembly	No, S/N dependent	651652.999.000
Air Relay Assembly	N/A, Flowserve service team only	670554.990.000
Linear Shaft Assembly	Yes	651950.999.000
Rotary Shaft Assembly	Yes	651951.999.000
½" NPT Conduit Adapter	Yes	643925.999.000
M20 Conduit Adapter	Yes	643929.999.000
¼" NPT Air Connection Adapter	Yes	643757.999.000
¼" NPT Gauge Block	Yes	651171.999.000
Analog Output Board	Yes, Flowserve service team only	

Table 19: Necessary Hardware

Part and Number of Screws	Tool	Torque
Air Connection Adapter (2 screws)	3/16" Hex	2.5 N-m (22 in-lbs.)
Conduit Adapter (2 screws)	7/64" Hex	1.4 N-m (12 in-lbs.)
PCB Cover (2 screws)	#2 Phillips	0.7 N-m (6 in-lbs.)
Aluminum Cover (4 screws)	#2 Phillips	1.1 N-m (10 in-lbs.)
Feedback Shaft (2 screws)	#2 Phillips	0.9 N-m (8 in-lbs.)
Relay Assembly (2 screws)	#2 Phillips	1.4 N-m (12 in-lbs.)

7.2 Maintenance Procedure



Any work on the machine must be performed when it is at a standstill and in a de-energized state. It is imperative that the procedure for shutting down the machine is followed, as described in Section 6.7.

Before working on the equipment, take measures to prevent an uncontrolled start. Ensure that power will not be applied to the device during maintenance.

7.2.1 Replacing the Air Connection Adapter or Gauge Block

Refer to Figure 16 while completing these instructions.

1. Make sure the valve is bypassed or in a safe condition.
2. Disconnect the power supply and the conduit from the positioner.
3. Disconnect the air supply and the actuator tubing from the positioner.
4. Unmount the positioner from the actuator and disengage the shaft assembly from the follower arm assembly.
5. Remove the two screws from the air connection adapter or gauge block.
6. Discard the old hardware.
7. Follow the installation steps from section 5.2.1.
8. Remount the positioner.
9. Reconnect the power and air supplies.
10. Perform a stroke calibration.
11. Recalibrate the positioner.

7.2.2 Replacing the Conduit Adapter

Refer to Figure 16 while completing these instructions.

1. Make sure the valve is bypassed or in a safe condition.
2. Disconnect the power supply and the conduit from the positioner.
3. Disconnect the air supply and the actuator tubing from the positioner.
4. Unmount the positioner from the actuator and disengage the shaft assembly from the follower arm assembly.
5. Remove the two screws from the conduit adapter.
6. Discard the old hardware.
7. Follow the installation steps from section 5.2.2.
8. Remount the positioner.
9. Reconnect the power and air supplies.
10. Perform a stroke calibration.
11. Recalibrate the positioner.

7.2.3 Replacing the Shaft Assembly

Refer to Figure 16 while completing these instructions.

12. Make sure the valve is bypassed or in a safe condition.
13. Disconnect the power supply and the conduit from the positioner.
14. Disconnect the air supply and the actuator tubing from the positioner.
15. Unmount the positioner from the actuator and disengage the shaft assembly from the follower arm assembly.
16. Place the positioner facedown so that the shaft is pointing up and remove the three feedback screws.
17. Discard the old hardware.
18. Follow the installation steps from section 5.2.3.
19. Remount the positioner.
20. Reconnect the power and air supplies.
21. Perform a stroke calibration.
22. Recalibrate the positioner.

8 Troubleshooting Guide

Table 20 contains some common solutions related to commissioning. For additional help with errors, refer to Table 6: Blink Code Errors.

Table 20: Troubleshooting

Failure	Probable Cause	Corrective Action
None of the LEDs are blinking.	The current source is too low.	Verify that the current source supplies at least 3.8 mA.
	The current source's voltage is too low.	Verify that the voltage source supplies at least 10 VDC at the terminals of the device.
Communications are erratic.	The current source bandwidth is not limited to 25Hz.	Maximum allowable current source rate of change is 924 mA per second.
	The maximum cable length or cable impedance was exceeded.	Check the cable's size, length, and capacitance.
	The HART modem is not receiving enough power.	Verify that the laptop battery is not low.
	There is interference with the I.S. barrier.	Use a HART-compatible I.S. barrier.
The unit does not respond to analog commands.	The positioner is in digital command mode.	Switch to analog command mode using Valve Sight DTM or a handheld communicator.
	An error occurred during calibration.	Check the status codes. Correct the calibration error and recalibrate the positioner.
The valve position reading is not accurate.	The stroke is not calibrated.	Perform a stroke calibration (Quick-Cal).
	The analog input is not calibrated.	Perform an analog-input calibration.
	The tight shutoff is active.	Verify the tight shutoff settings.
	Custom characterization or soft stops are active.	Verify custom characterization or soft-stop limits.
The position is driven fully open or closed and will not respond to the command.	There is a bad stroke calibration.	Perform a stroke calibration (Quick-Cal).
	The relay sensor or magnet is not connected.	Verify the hardware connections.
	A technician selected the wrong air action in the software.	Check ATO and ATC settings. Recalibrate using Quick-Cal to apply settings.
	The actuator tubing is backward.	Verify ATO/ATC actuator tubing.
	The relay or piezo is malfunctioning.	Replace the relay or piezo.
	The control parameter inner loop offset is too high or low.	Perform a stroke calibration (Quick-Cal).
The positioner is sticking or hunting.	The electropneumatic converter is contaminated.	Check the air supply for proper filtering and meeting of ISA specifications ISA-7.0.01.
	The control tuning parameters are incorrect.	Decrease the proportional gain settings using the menu.
	The positioner is experiencing high packing friction.	Change to "HI FRICTION" mode in the menu.
	The valve or actuator is the wrong size for the operating conditions.	Verify that the valve and actuator are sized properly for operating conditions.

9 Disposal And Recycling

At the end of the equipment service life, the relevant materials and parts should be recycled or disposed of using local environmental regulation methods. If the product contains substances which are harmful to the environment, then the removal or disposal of the equipment must be in accordance with local/regional regulations. This includes any liquid and/or gas in the “seal system” or utility.

Proper disposal of the Logix 1500 is essential for the protection of the environment and community. If proper disposal is not possible, this product may be returned to Flowserve for disposal. Contact your local sales representative for more information about Flowserve's disposal process and associated fee. Note that the Logix 1500 is not within the scope of the Waste Electronics and Electrical Equipment (WEEE) Directive 2012/19/EU and should not be disposed of through municipal waste collection services.

10 Technical Data

10.1 Model Number

Selection	Description	Code
Base Model	Logix 1500 Series	15
Housing	Aluminum Enclosure	0
Communication	4–20 mA input – Analog Only	1
	HART 7	2
-		
Certifications	General Purpose	14
	14 Intrinsically Safe Protection Method (US/CAN, ATEX, IECEx)	52
Analog Output	No Analog Output	0
	Analog Output	1
-		
Configuration Options	Base Positioner Unit without configuration kit, no special options	00
	Linear Shaft, ½" NPTF Conduit, ¼" NPTF Pneumatic, No Gauges	0A
	Linear Shaft, M20 Conduit, ¼" NPTF Pneumatic, No Gauges	0B
	Linear Shaft, ½" NPTF Conduit, ¼" NPTF Pneumatic, Gauges	0C
	Linear Shaft, M20 Conduit, ¼" NPTF Pneumatic, Gauges	0D
	Rotary Shaft, ½" NPTF Conduit, ¼" NPTF Pneumatic, No Gauges	0E
	Rotary Shaft, M20 Conduit, ¼" NPTF Pneumatic, No Gauges	0F
	Rotary Shaft, ½" NPTF Conduit, ¼" NPTF Pneumatic, Gauges	0G
	Rotary Shaft, M20 Conduit, ¼" NPTF Pneumatic, Gauges	0H

ANNEX A: DECLARATION OF CONFORMITY

Below is an example of Declaration of Conformity for the Logix 1500 Digital Positioner.



Statement of Compliance with Applicable European Directives

We: Flowserve US Inc.
1350 N Mountain Springs Pkwy
Springville, Utah 84663
United States of America

as the manufacturer of the equipment listed below:

Model Logix 1500 Digital Positioner

confirm, in accordance with the requirements of clause 1.2.7 of the Essential Health and Safety Requirements of Community Directive 94/9/EC on equipment and protective systems intended for use in potentially explosive atmospheres that the above equipment has been designed and manufactured so as to:

- (a) avoid physical injury or other harm which might be caused by direct or indirect contact;
- (b) assure that surface temperatures of accessible parts or radiation which would cause a danger, are not produced;
- (c) eliminate non-electrical dangers which are revealed by experience;
- (d) assure that foreseeable conditions of overload shall not give rise to dangerous situations.

and where these risks are wholly or partly covered by other Community Directives, the equipment satisfies the requirements of those specific Directives.

and that literature describing the equipment will not contradict the instructions with regard to safety aspects.

Issued on: April 26, 2024

Authorised by:

A handwritten signature in black ink, appearing to read "Stephanie Hunter", written over a light gray rectangular background.

Name: Stephanie Hunter

Position: Quality Engineer, Authorized Representative



Headquarters

Flowserve Corporation
5215 North O'Connor Blvd.
Suite 700
Irving, Texas 75039-5421 USA

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

©2026 Flowserve Corporation. All rights reserved. This document contains registered and unregistered trademarks of Flowserve Corporation. Other company, product, or service names may be trademarks or service marks of their respective companies.

AI10M001029 (EN/LTR) February 2026