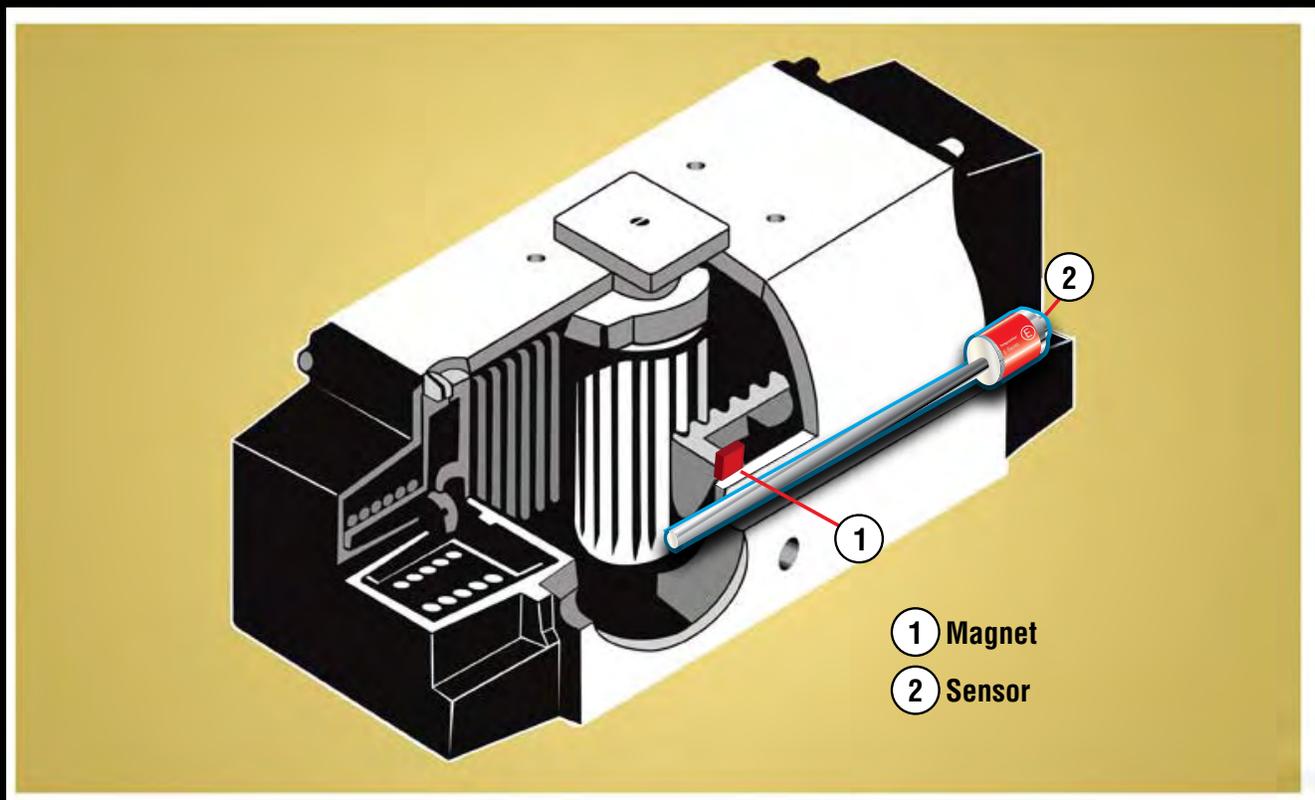


Magnetostrictive, Absolute, Non-contact
Linear-Position Sensors

Document Part Number
551281 Revision A

Process Control Valve Actuator Feedback



Absolute Position Sensors for Process Control Valve Actuators

Closed Loop Process

Process Control Systems that include Valves with Actuators and Positioners need to have an accurate feedback of the actual valve position. Current Positioners used with pneumatic or hydraulic actuators have mechanical feedback components (cams, levers, balancing beams), making them sensitive to corrosion, dirt or mineral contaminations and unsuitable for a high vibration environment. Variable Closed Loop Process Control needs a reliable continuous feedback device to describe the current position of the valve, not just an open or closed switch status.

MTS Sensor Absolute Position

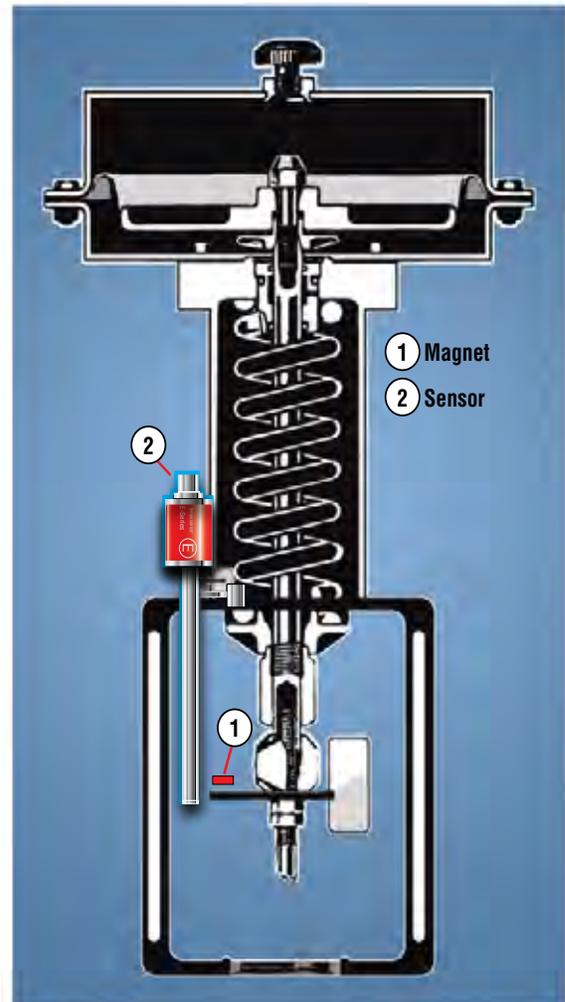
MTS Sensors can provide an Absolute Position sensor based on Temposonics® Magnetostrictive technology that has no moving mechanical components and is wear free, calibration free and maintenance free.

This sensor uses a permanent magnet as the position marking element attached to an actuator moving component. Position reading is done by sensing the magnetic field through an air gap of 3-7mm. Due to the nature of the magnetic field; position sensing can be done through walls of non-ferrous materials such as aluminum, or stainless steel by mounting the magnet inside the actuator body, while not affecting the enclosure rating of the actuator.

Since the magnetostrictive technology is based on measuring the time delay between an interrogation wave and a reflecting wave, temperature expansion of the linear components will not affect the accuracy of the measurement.

Valve position feedback can be monitored by the Process Control plant software to detect valve malfunctions if preset positions are not reached. This monitoring of the valves is very important in processes, for example, where sludge buildup can obstruct valve closure. Preventive maintenance programs can be put in place at some defined threshold valve characteristics before the entire system becomes critical and has to be taken out of production.

MTS Temposonics Sensors can produce a variety of output signals, analog or digital, that can be scaled into engineering units for process control. Fieldbus communication is also available.



Diaphragm Valve Actuator with MTS Position



R-Series Sensors

R-Series Sensors

R-Series sensors offer high speed and accuracy for critical motion control applications. With a variety of advanced interfaces and housings, there is a sensor to fit most any application.

These sensors offer 1 micron resolution and fast updates with interfaces such as SSI and Industrial Ethernet.



E-Series Sensors

E-Series Sensors

E-Series sensors provide an optimum price-performance ratio for basic position feedback applications where the highest performance is not necessary. These sensors offer the benefit of magnetostriction in an economical package.



C-Series Sensor with the M1 Environmental Package

C-Series Sensors

MTS Temposonics C-Series sensors offer small package sizes and a highly attractive cost for both embedded and fasten-on continuous position in light industrial applications not needing the performance of the industrial MTS position sensors.

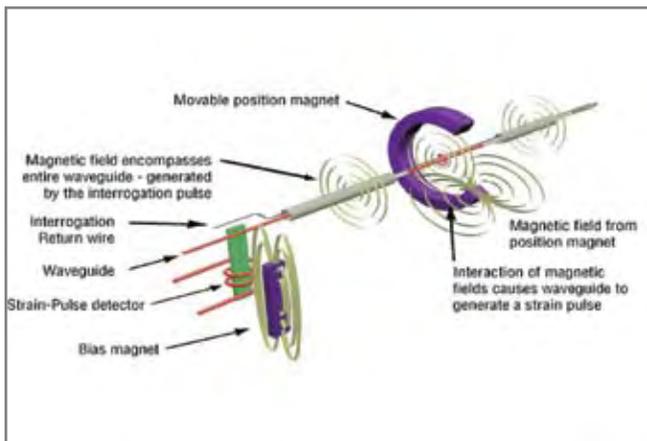
C-Series sensors can be installed inside protective housings inherent in the valve design, eliminating redundant housing costs and making the final assembly very compact. Available in 0-5 volt analog and SSI digital outputs, with or without protective housings, the C-Series is a modular, integratable option to alternative linear position sensors.



Explosion-Proof Housing

Explosion-Proof Housing

Explosion-proof housing is available for the R-Series absolute position sensor. This high pressure housing is ATEX EEx approved and UL and cUL approved for use in hazardous locations with Temposonics position sensors. The ATEX approval covers dust, UL and cUL approvals cover flammable gases, vapors or liquids.



Magnetostrictive Technology

Wear-free Measuring Principle

The major advantage of all Temposonics® sensors is their magnetostrictive measuring principle. They detect positions via magneto-mechanical effects, which means completely without contact and wear.

The sensing element is embedded inside the sensor housing. The sensor head accommodates the complete electronics for active signal processing. A free running or guided magnet moves without contact over the sensor housing and marks the current position through its wall.

To determine the position, the sensor electronics send an electric pulse through the sensing element. In the area of the position magnet, a partial twist of the sensing element generates a torsional wave, which travels as a strain pulse to the ends of the sensing element. A special signal converter converts the strain pulse into standard output signals. Exact determination of the magnet position is achieved by runtime measurement, by the time elapsed between the start of the current pulse and the return of the strain pulse signal.

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