

Fisher® 4320 Wireless Position Monitor

Closing the Loop with Wireless



Did You Know?

Are you ready to improve process efficiency and worker safety with a cost effective solution?

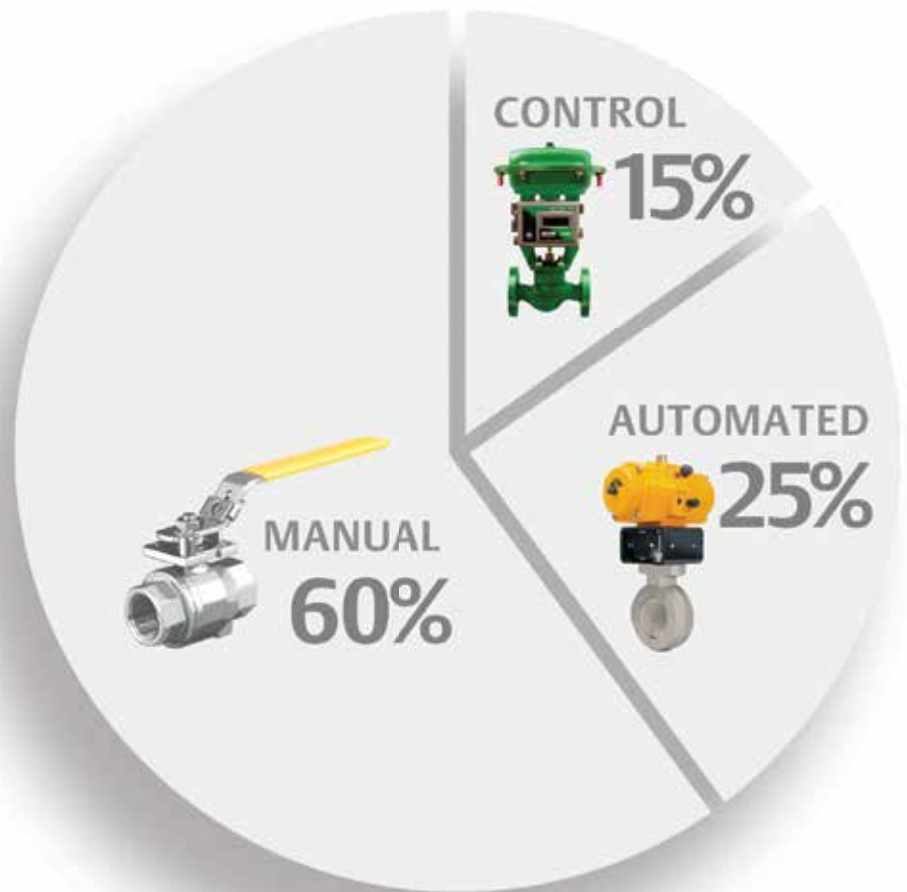
Automating a valve can be very costly and easily fall off the project priority list, resulting in manual actuation. The problem with manual valves is there is no visibility as to their current state. The average total cost to automate a valve is \$10,000 USD with the majority of cost going to traditional I/O, engineering, labor, and wires—not the valve.

Only 15% of the total valves in your plant are throttling control valves, while the other 85% are mostly discrete valves that are primarily manually operated. Are you confident that your process is running at optimal performance and your employees are working under the safest conditions?

Nearly 90% of plants experienced problems within the past year with non-automated valves. Manual actuation of valves takes time away from process operation and opens the opportunity for costly valve alignment mistakes that result in environmental spills, lost product, and safety hazards. Likewise, process upset is the first indication of a malfunctioning valve remotely actuated with no position feedback.

Moving the wrong valve leads to safety and environmental incidents and lost production. Exposure to hazardous environments increases safety risk.

TYPICAL PLANT VALVE DISTRIBUTION



What If You Could...

Improve process efficiency and reduce process upsets?

With Emerson's wireless valve automation technology, you can close the loop control. Solenoid controlled valves with a pneumatic actuator typically have no position feedback. If there is a maintenance issue with the valve assembly, the process keeps operating until an upset downstream from the valve is detected. A wireless position monitor can be added to the valve assembly to provide feedback into the control system without the time and costs of limit switches. For manual valves, a wireless automated valve provides an alternative to both solenoids and limit switches. The less time workers spend moving valves, the more time your process produces.

Reduce valve alignment mistakes?

Manually actuated valves depend on field operators following proper work practices to ensure all valves are in the correct position. If a valve is in the wrong position during startup, shutdown, or batch operations, then the error can result in a safety incident, environmental spill, or lost product. By automating that valve wirelessly, you also automate the valve alignment work practices to prevent worker error.

Improve worker safety by removing them from hazardous areas?

Wireless automated valves don't need ladders, worry about stairs, or care when the weather changes. A controlled process means you can check the status of your valves from the safety of your control room. Reduce worker safety concerns with hazardous locations by minimizing exposure. You can even monitor pressure safety valves in real time to know exactly where the process upset is located and how long the release lasted with data recording for environmental compliance.

Know the status of your valve with predictive diagnostics?

Wireless automation offers position feedback, cycle counter, and stroke time. The control signal, coupled with feedback, easily identifies valve alignment issues. Use the cycle counter to keep track of the number of times a valve opens and closes. Monitor stroke time and cycle count to predict when a valve needs maintenance—something solenoids and limit switches cannot do. Let wireless automation do the valve work so you can focus on other areas of your plant.

Reduce the time and cost of traditional valve automation?

A solenoid with two limit switches requires three sets of wires, three discrete I/O points, and the time to engineer, install, and manage the project. When the costs go up, project approval becomes difficult, and mistakes happen when workers don't follow work practices. Wireless automation with *WirelessHART™* technology ensures reliable communication in the process environment without the costs and project time wires demand.

Valve Monitoring

No Wires, No Problem

Every plant has blind spots and hard-to-reach equipment. The Fisher® 4320 wireless position monitor sends a wireless feedback signal through the Smart Wireless network to indicate percent-of-span, limit switch equivalent feedback signals, valve position, device temperature, and power module status. This unobtrusive position monitor won't disturb your existing process wiring; no wires means the Smart Wireless network can be superimposed over any wiring infrastructure. The position monitor can be used to analyze equipment such as control, automated, or relief valves; displacement and float level sensors; and regulators.

Minimize Process Upsets

The 4320 wireless position monitor is ideal in situations where you want to monitor valve position feedback to isolate problem valves. By using this device, you can minimize process upsets and keep your plant performing.

Eliminate Costly Mistakes

Sending a worker out to fix a valve can cost you. What if the wrong valve was worked on or it was in the wrong position? Errors can result in lost production, reprocessing costs, or selling at reduced price and specification. When you integrate valve alignment into the control logic, you can create automated process checks, in turn eliminating costly mistakes. With the 4320 wireless position monitor you can compare valve set points and process conditions to valve position feedback to isolate problem valves and ensure you fix the right valve in a timely fashion.

Protect the Process

In weather-prone locations, the 4320 wireless position monitor can be used to protect the process and ensure proper operation. Due to the energy-limiting nature of the design, this intrinsically safe device is suitable for use in all zone locations.



Valve Monitoring Applications

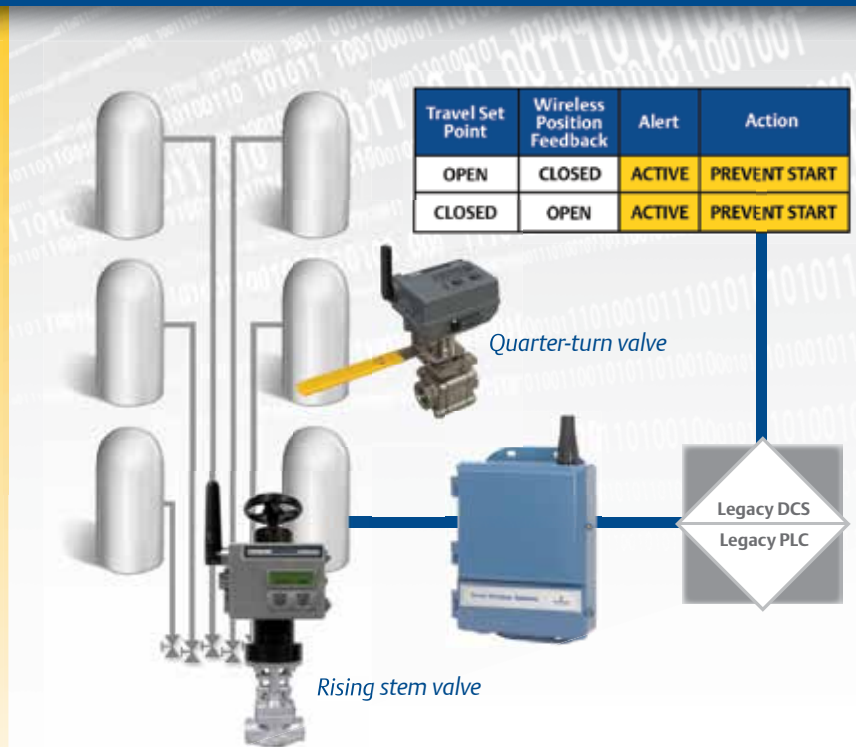
FEEDSTOCK VALVES

CHALLENGES of the application

- Off-specification products often have a greater potential to waste feedstock or increase costs due to rework.
- Manual valve operating procedures can be unreliable and are susceptible to human error.
- The control room must radio the field operator to confirm the valve is in the correct position, reducing process efficiency.

BENEFITS of position feedback

- Access to real-time monitoring and reporting can eliminate doubt regarding a valve's specific position, increasing your process reliability.
- A valve's state can be integrated into control logic to automate process calibration and diagnostics, making it easier for you to get the accuracy you require.
- Utilizing automated checklist procedures can minimize costly mistakes, saving your plant essential time and money.



FIRE PROTECTION VALVES

CHALLENGES of the application

- In many cases, key responders have no knowledge of a valve's status prior to arriving in the field.
- The control room does not have access to feedback indications for valves and have no option but to react to valve issues as they occur.

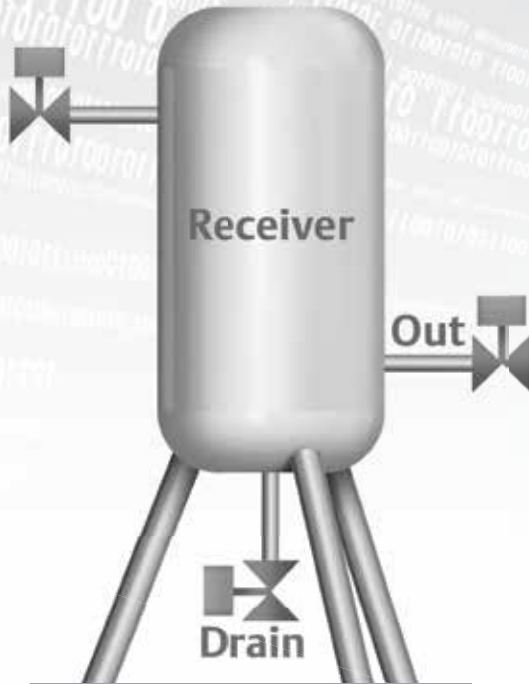
BENEFITS of position feedback

- Receiving feedback of a valve's status in real time can be key for preventative maintenance, helping you identify problems before they become costly failures.
- Alarms notify key responders about valve issues fast and efficiently, increasing the time you have to make decisions that are critical to your process.
- The intrinsically safe design of this device allows it to be used in any zone classification, lessening the frequency of personnel in hazardous or remote locations.



Valve Monitoring Applications

RESERVOIR VESSELS



CHALLENGES of the application

- Drain valves are prone to leaking or failing over time.
- Residuals in the vessel can lead to sticking valves or clogged flow lines.
- Valves that are not operated regularly tend to stick and often require extra time and effort to remedy.

BENEFITS of position feedback

- When residuals are removed from the system more often using an automated drain sequence, the reliability of your process significantly increases.
- With advanced reporting techniques, valve issues can be identified much quicker, minimizing your risk of unplanned maintenance or downtime.

CHEMICAL PROCESSING SKIDS



CHALLENGES of the application

- There is a greater risk of environmental leakage issues if a valve is not 100% closed during transit.
- The inability to wire moving skids can make it difficult to monitor valve positions between two control areas.

BENEFITS of position feedback

- With the capability to measure a variety of valve data, like position, temperature, and pressure, you can reduce the risk of environmental leakage and improve safety for your routine functions.
- With specific valve position monitoring, all data can be reported, trended, and shared between two process units, ensuring certainty about valve position even during relocation.

PROCESS SAMPLE VALVES

CHALLENGES of the application

- Operators take samples from their process for research, design, and quality purposes, which is often a resource burden.
- The control room lacks adequate valve state visibility, often resulting in processing delays or another visit to the valve.
- Environmental Protection Agency compliance issues can arise if valves are not closed properly, often resulting in expensive fines.

BENEFITS of position feedback

- Industry-leading technology enables you to monitor valves from the convenience of your control room and reduce mistakes that can affect your bottom line.
- Alarms and possible interlocks can be valuable tools for preventing environmental leakage, allowing you to handle pre-diagnosed issues promptly.
- No wiring, conduit/cable trays, or I/O points are required, not only making installation simpler but also eliminating the time and cost associated with electrical work.



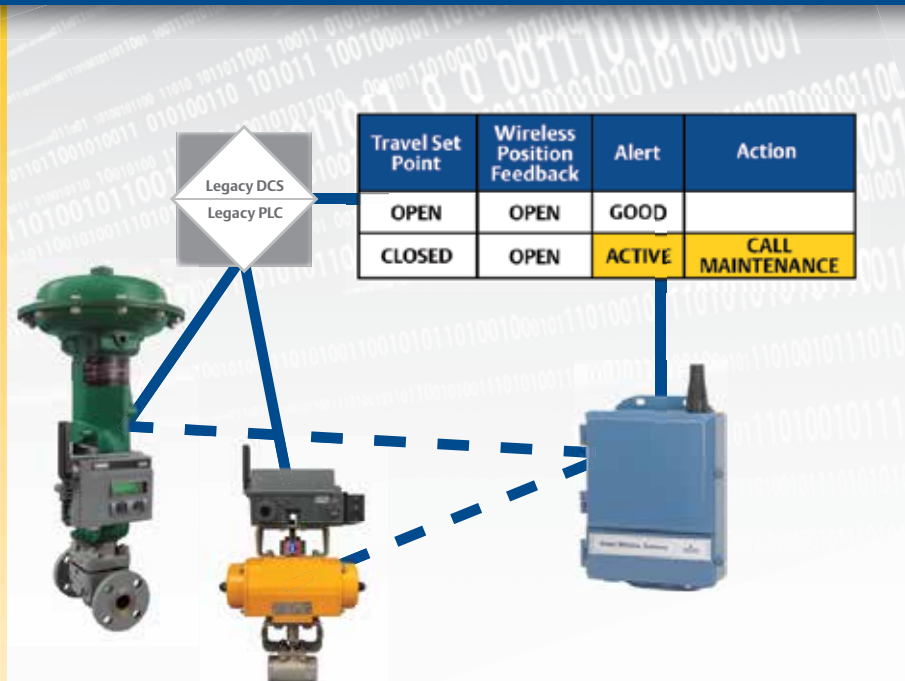
SOLENOID-LIMITED VALVES

CHALLENGES of the application

- Automated valves with solenoids do not typically include position feedback, increasing the risk of undetected valve failures.
- Low valve visibility in the control room requires operators to visit the valve in the field, often leading to delays and distractions.
- Failed units can cause process upsets and take time to isolate the root problem.

BENEFITS of position feedback

- Diagnostic information for stuck valve identification can be accessed sooner, lengthening the lifecycle of your valve.
- Access to reliable, automated data reports can reduce the amount of time you spend waiting on valve changes or manual verifications.



Relief Valve Monitoring

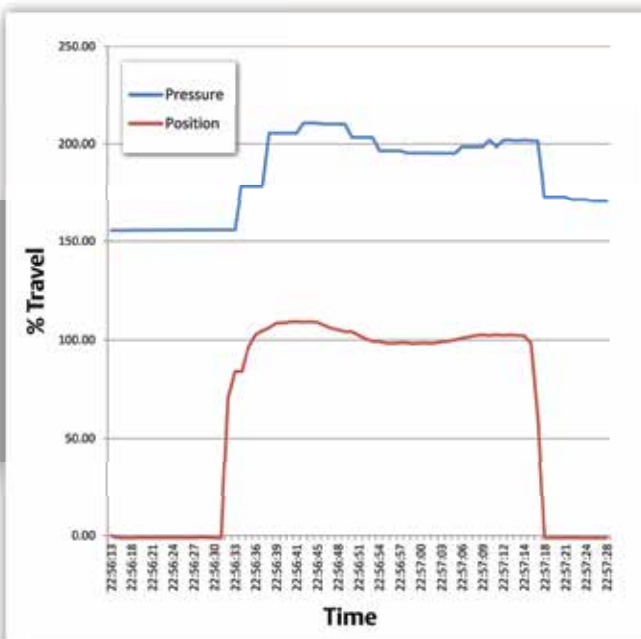
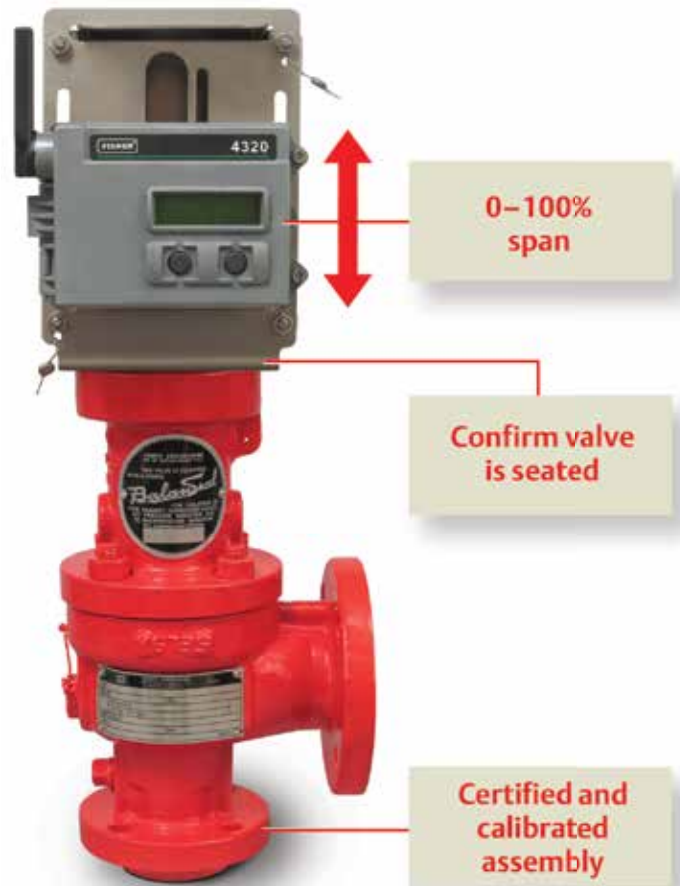
Meet Compliance Standards

Monitoring and reporting volatile organic compound (VOC) release to the environment can be a pain. If not in compliance, you may face fines and public scrutiny. What if those fines are based on inaccurate inspection and monitoring? It would be reassuring to know that your process is following regulated compliance standards. The 4320 wireless position monitor, combined with a relief valve, can detect and report simmer and full releases of process liquids and gases. Valve simmer does not always occur before a full lift, it depends on the valve and the application. The information can be logged into the data historian on the operator screen. The position monitor also provides open and closed timestamp data.

Monitoring Made Easy

With the relief valve monitoring capability, you can monitor areas of the plant that have previously been expensive, difficult, or impossible using traditional technologies. Data captured through the monitoring of process pressure could be used to determine the quantity of product being released. This includes environmental monitoring of the plant site and simple physical observation of pressure relief valves and flare volume. This means a plant can monitor product loss without using overly conservative assumptions that could cause very high emission fines.

This solution provides plants with the ability to track and monitor pressure relief valves in real time, providing immediate feedback during an overpressure event.



With data reporting at your fingertips you'll know exactly when the valve opened, how long it was open, and when it is completely closed.

Relief Valve Monitoring Applications

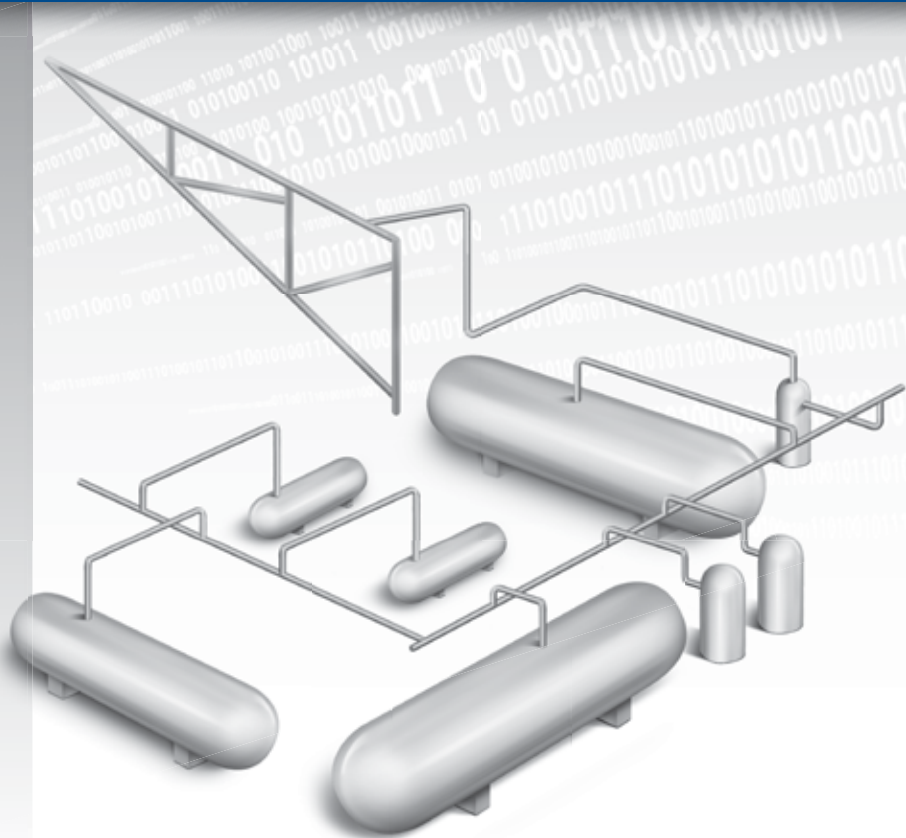
TOWER TO FLARE

CHALLENGES of the application

- Traditional emissions estimates that are based on personnel shift timing can be inaccurate and overages can result in costly fines.
- Making assumptions about a valve's position based on its last manual inspection is unreliable and often inaccurate.
- Improper monitoring and a lack of specific valve data can result in unexpected issues or downtime.

BENEFITS of position feedback

- Timestamped trending and reporting of all data can help you take a more proactive approach to maintenance, leading to higher production efficiency.
- Reduce costs associated with VOC emissions, ranging from supplemental projects to correcting facility mistakes, by automating the operating environment.



HEAT EXCHANGER

CHALLENGES of the application

- Due to intense conditions, efficiency of exchangers gradually require more energy to operate and can degrade over time.
- Corrosion can occur from insufficient desalting or neutralizing and can eventually lead to complete failure of the unit.
- The inability to monitor a valve's status as it is changing forces reactive measures to be taken, often when issues are beyond correction.

BENEFITS of position feedback

- Inadequate manual inspections are replaced with frequent and reliable data reports, allowing you to get the precise control and stability your process requires.
- Continuous, accurate feedback can lead to a more proactive maintenance approach, allowing you to uncover issues before they take your unit down.



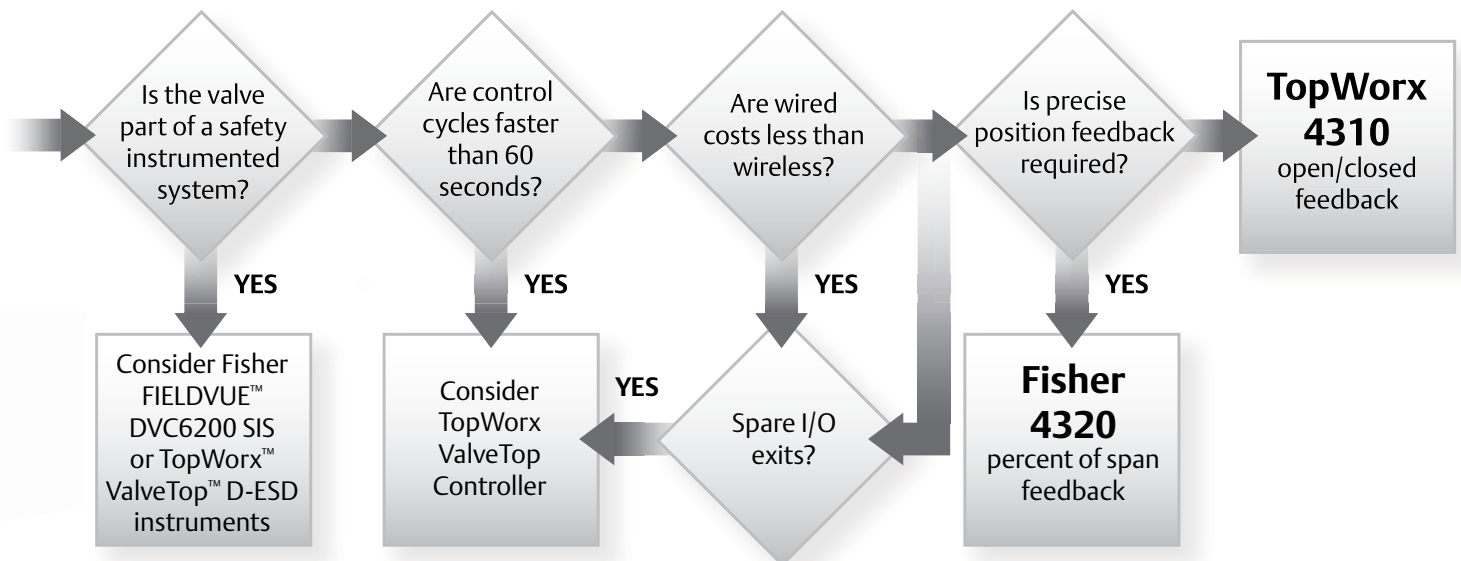
Fisher 4320 Position Monitor



Fisher 4320 Position Monitor with On/Off Output Control Option



Where do I use wired versus wireless automation?



Wireless Valve Automation

Wireless Improves Plant Efficiency

Less time moving valves means more time to attend to scheduled tasks. Faster valve alignment means more time meeting your needs. Wireless allows you to automate process startup, shut down, and switch over procedures.

Wireless Reduces Lost Batches, Increases Capacity

Automation can take the human error out of your process and prevent the occurrence of bad batches. Automating the manually-operated components of your process can eliminate troublesome sources of variability.

Wireless Improves Personnel Safety

Automating your plant can mean reducing your workers' exposure to hazardous environments, inclement weather, and mistake-prone infrastructures, like ladders or stairs. With more efficient processes in place, your experienced workforce has more time to train new personnel and potentially reduce costly mistakes in the future.

Wireless Reduces Unwanted Emissions

Fill or transfer valves can be sources of excessive level, temperature, and pressure that cause trips and lead to unplanned downtime. Minimize the chances of a manual valve being the root cause of hazardous emissions by converting to wireless.

TANK FARM & TANKER LOADING STATIONS

CHALLENGES of the application

- Valves are typically mounted in a pipe rack several feet in the air or inside a dyke wall confinement, making them hard to reach.
- Safety concerns arise when operators must climb on equipment or piping to access a valve.

BENEFITS of wireless automation

- Preventative maintenance and faster stuck valve identification can lead to higher production efficiency.
- With an intrinsically safe device that can be placed in any zone location, you can significantly decrease the frequency with which your field operators are subjected to hazardous situations.



Wireless Valve Automation Applications

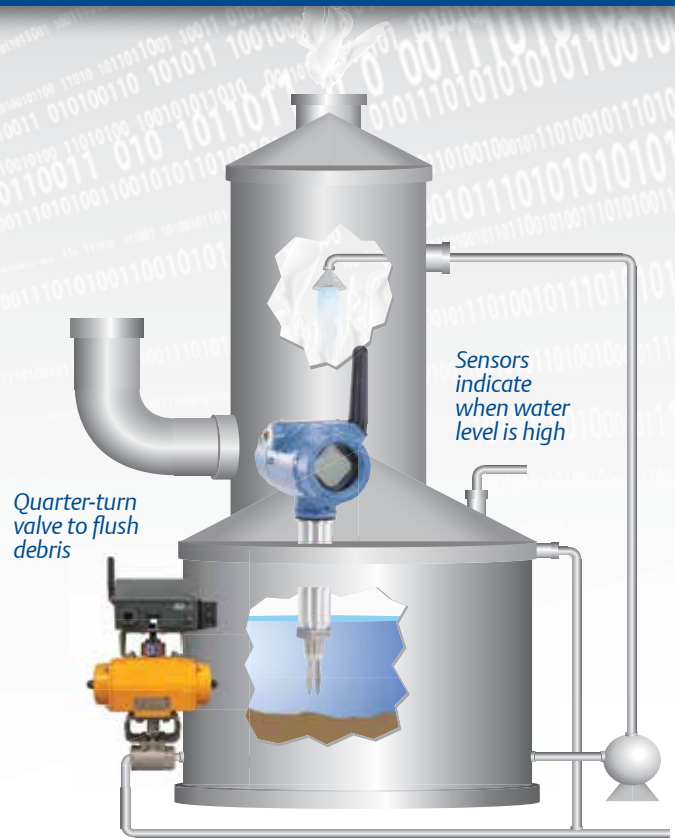
GAS CLEANING TOWER

CHALLENGES of the application

- A traditional overflow drain does not flush debris from the water chamber.
- The collection of debris at the bottom of a tank can cause expedited pump failure.
- Frequent maintenance is not only costly, but can lead to a reduction in process reliability and efficiency.

BENEFITS of wireless automation

- A local user interface eliminates the need for multi-instrument field calibration, simplifying your process, reducing your plant inventory, and lowering your project expenses.
- Automated flushing of debris helps maintain process efficiency to ensure your plant meets environmental standards.
- By reducing the amount of debris flowing through the pump, maintenance cycles are lengthened and production efficiency can be maximized.



REMOTE PUMP STATIONS

CHALLENGES of the application

- Pump stations are frequently located far from the control room, requiring extended time for operators to reach the unit.
- The control room has limited access to data regarding a valve's status, often resulting in poor response times for failures.

BENEFITS of wireless automation

- Monitoring a valve's status in real time can mean relying less on manual resources and reducing mistakes that can affect your bottom line.
- Integrated position feedback allows you to act quickly when issues arise, resolving timing loops or errors that could otherwise bring your unit down.
- The ability to monitor numerous valve elements simultaneously, like flow, temperature, and pressure, can provide you with unmatched confidence in your process stability.



Wireless Valve Automation Applications

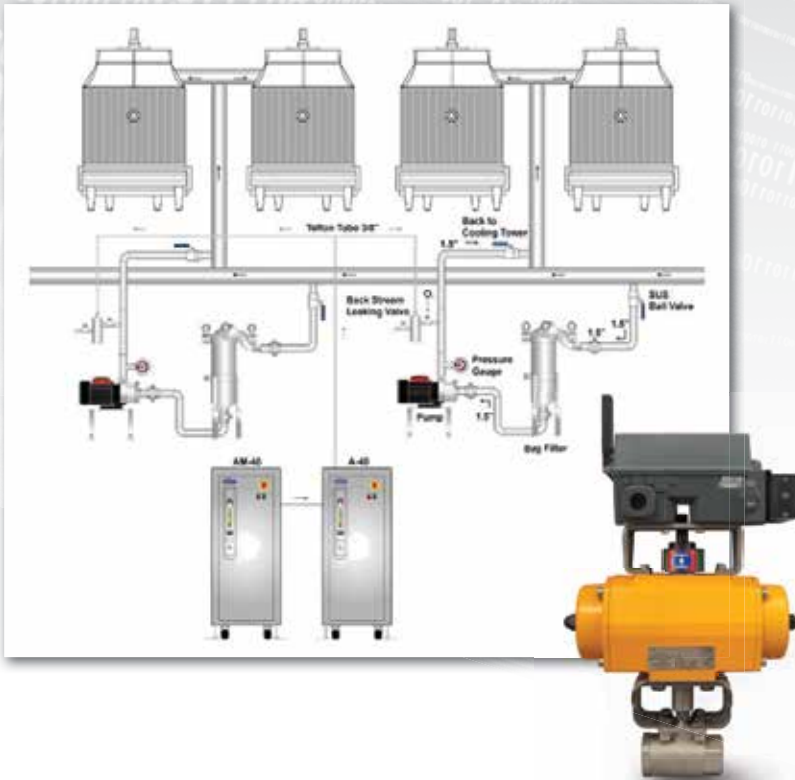
COOLING TOWERS

CHALLENGES of the application

- Cooling towers are traditionally diagnosed in the field, requiring extra time for travel and manual inspections.
- When a valve's specific position is unknown by operators, a slower response time for failures can result.
- Manual valves can be a source of mistakes that lower process efficiency and often lead to poor product quality, down time, or delays.

BENEFITS of wireless automation

- With automated control of your valves, positions can be monitored and reported around the clock with ease, allowing you to attend to other priorities with confidence.
- The interlocking capability can shut down pumps to stop flow if an issue should arise, sparing valuable resources and reducing lost product.



REMOTE PONDS

CHALLENGES of the application

- Remote locations of ponds can make field operation difficult and hazardous.
- There is no flow indication for effluent to the ponds; a broken process line can cause a spill and contaminate the property.

BENEFITS of wireless automation

- Without hardware issues or cables to break or fail, wireless instruments can be placed where wired devices simply won't reach, providing you with the reliable results you require with added immediacy.
- Monitoring valve positions and other process data, like flow, temperature, and pressure, keeps you up-to-date on all your valve's activity, improving your throughput and operating consistency.



Proven Wireless Technology

All automated valves should be wireless. Why?

- Lowers cost of ownership
- Improves process efficiency
- Simplifies installation
- Reduces mistakes
- Enhances safety and reliability



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