

Fisher® 4320

Automate Your Valves Without Wires



DID YOU KNOW?

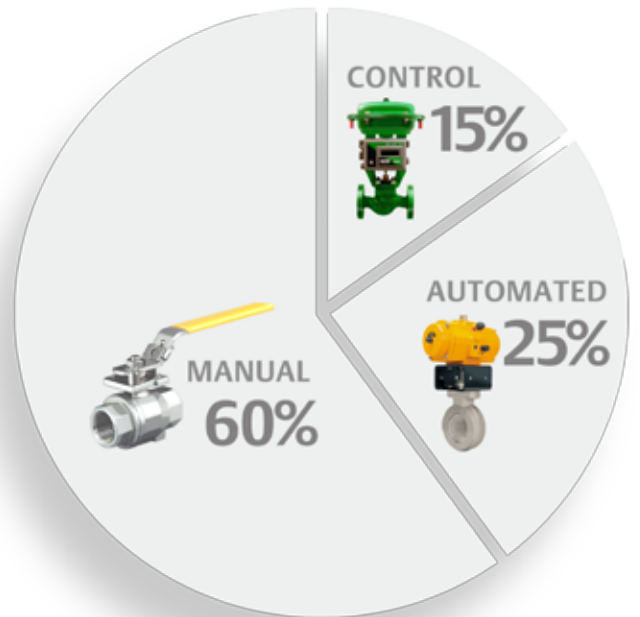
You can improve process efficiency and worker safety with a cost-effective solution.

Automating a valve can be very costly and easily fall off the project priority list, resulting in manual actuation. Manual valves don't offer visibility into the health of their current state, leaving you to play an expensive guessing game. The truth is, wiring your valves can be much more expensive than taking a wireless approach, with less benefits.

- **The average total cost to automate a valve is \$10,000 USD.** And the majority of that investment often goes to traditional I/O, engineering, labor, and wires—not the valve itself.
- **Only 15% of the total control valves in a typical process plant are throttling valves,** while the other 85% are mostly discrete valves that are manually operated.
- **Nearly 90% of plants have experienced problems with non-automated valves within the past year.** Manual actuation takes time away from process operation and opens the door for costly valve alignment mistakes that could result in environmental leakages, lost productivity, and safety hazards. Process upset is the first indication of a malfunctioning valve remotely actuated with no position feedback—don't let it get to that point.

Are you confident that your process is running at optimal performance and your employees are working under the safest conditions?

TYPICAL PLANT VALVE DISTRIBUTION



Moving the wrong valve is a preventable mistake that will likely lead to safety and environmental incidents, not to mention lost production. You need a solution that removes the doubt and helps you optimize your plant's output.



WHAT IF YOU COULD...

Eliminate valve alignment mistakes?

Manually-actuated control 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, the error may result in a safety hazard, environmental spill, or wasted process output. By automating that valve wirelessly, you also automate the valve alignment work practices to prevent human error.

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 these component costs increase, project approval becomes difficult and resources are stretched. This is when mistakes happen most frequently—limited resources leads to improvising, which often leads to inadequate work practices.

Emerson's *WirelessHART™* technology systems, including the Fisher 4320 wireless position monitor, can help you achieve more reliable communication within your process environment, without the added expense and time that wired systems demand.

Improve process efficiency and reduce process upsets?

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 with no need for limit switches. For manual valves, a wirelessly-automated valve provides an alternative to both solenoids and limit switches. The less time technicians spend moving valves, the more time your process has to actually produce.

Improve worker safety by removing them from hazardous areas?

Wirelessly-automated valves don't require ladders, concern for 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. By minimizing your personnel's exposure to hazardous areas, safety concerns can be significantly reduced. You can even monitor pressure safety valves in real time. Live data recording allows you to track exactly where the process upset is located and how long the release lasted, reducing the stress of complying with environmental regulations.

Know the status of your valve with predictive diagnostics?

You need a proactive maintenance solution to keep your process running reliably. Wireless automation offers position feedback, cycle counting, and stroke time data. The control signal, coupled with position feedback, can easily identify valve alignment issues. Use the cycle counter to track of the number of times a valve opens and closes. Monitoring both the cycle count and stroke time of your valve can make it easier to predict when valve maintenance will be required—something solenoids and limit switches simply cannot do.



VALVE MONITORING



No Such Thing As “Hard-to-Reach”

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 vital data, including percent-of-span, limit switch-equivalent feedback signals, valve position and temperature, and power module status. “No wires required” means the Smart Wireless network can be superimposed over any wiring infrastructure, regardless of what your existing process wiring looks like.



Eliminate Costly Mistakes

Sending a worker out to fix a valve can cost you. What if the wrong valve was maintained or it was moved to the wrong position? Human errors can result in lost production, reprocessing costs, or selling your product at a reduced price and specification. When you integrate valve alignment into the control logic, you can create automated process checks, in turn eliminating costly mistakes. Using the 4320 wireless position monitor, you can compare value set points and process conditions to valve position feedback to isolate problem valves and ensure the right valve is fixed as quickly as possible.



Protect Your Process

In locations prone to severe weather, the 4320 wireless position monitor can be used to protect the process and ensure proper operation. The energy-limiting nature of the device’s design makes it intrinsically safe and suitable for use in all zone locations. You can minimize process upsets and keep your plant performing optimally, regardless of environmental conditions.

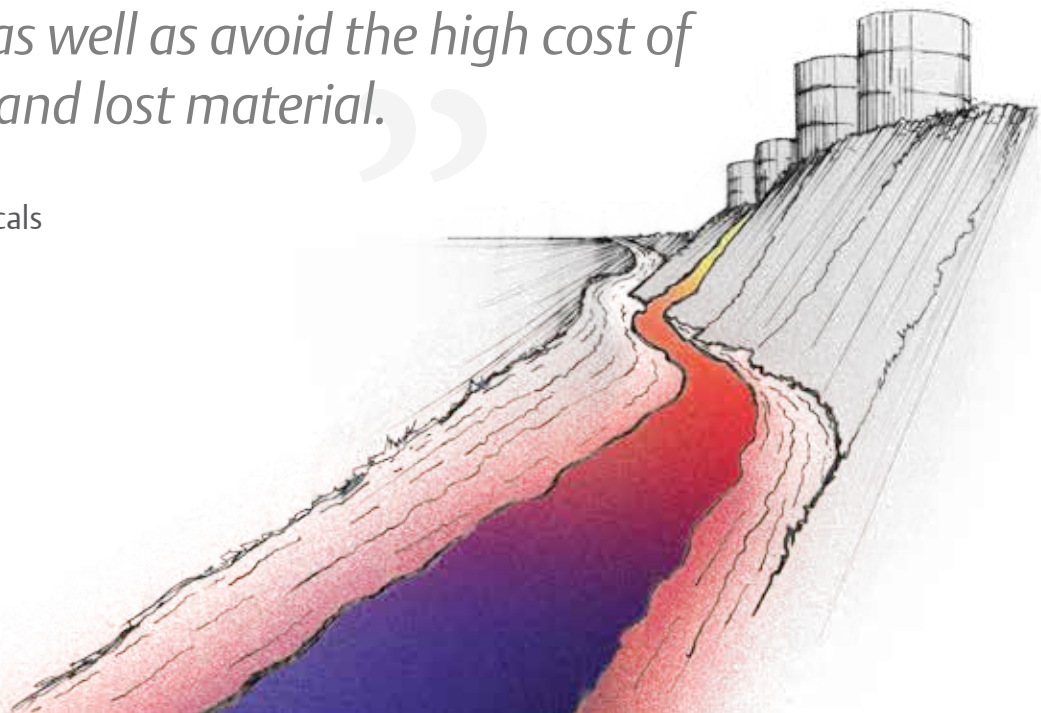
Wireless valve monitoring with the Fisher 4320 device enabled us to reduce inadvertent emissions and bad batches, as well as avoid the high cost of rework, clean-up, and lost material.

Kevin Root

Unit Manager, Harcros Chemicals



Click or scan with your mobile device to learn more about how Harcros Chemicals used a wireless solution to reduce leakage at their chemical facility.



VALVE MONITORING APPLICATIONS

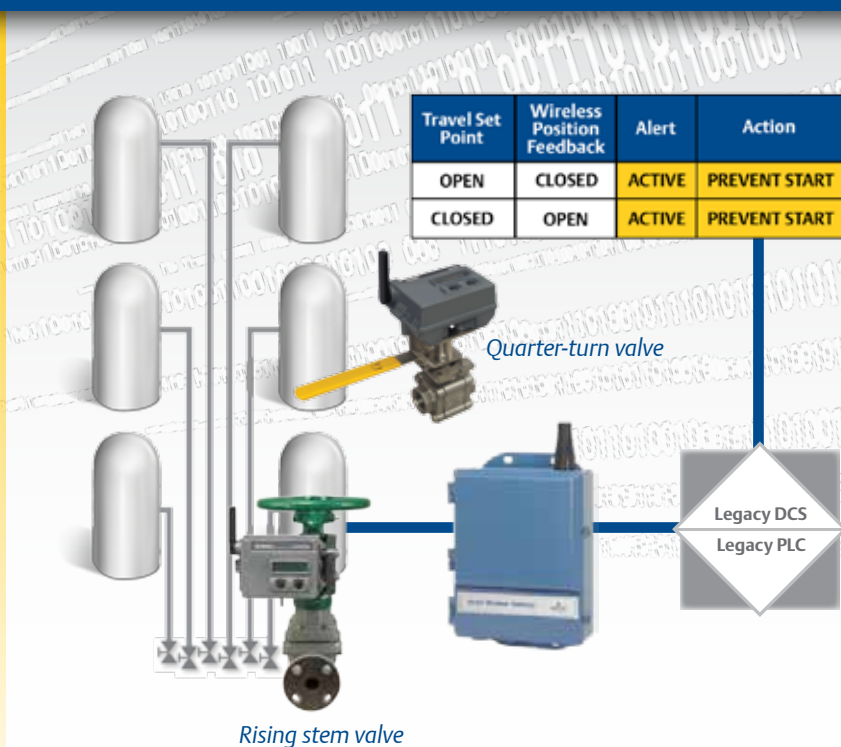
FEEDSTOCK VALVES

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, improving 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 time and money.



ISOLATION VALVES

CHALLENGES of the application

- Current control can be affected by leaking isolation valves that, in turn, can affect product quality.
- Lack of valve position visibility can cause production issues and requires personnel to visit the valve in the field.

BENEFITS of position feedback

- Improved visibility in the control room means trips to the field are no longer necessary, streamlining your process.
- Using superior Fisher valve technology can help ensure tight valve shutoff, resulting in improved process reliability.



VALVE MONITORING APPLICATIONS

DRAIN VALVES



CHALLENGES of the application

- Because drain valves are not typically operated as regularly as other valves, sticking issues are more common.
- Residuals can quickly build up in the vessel, causing clogged flow lines and requiring extra time and effort to remedy.

BENEFITS of position feedback

- With an automated drain sequence, residuals are removed from the system more frequently, increasing the reliability of your process.
- Advanced reporting techniques are used to help identify potential valve issues before they disrupt the process, minimizing your risk of unplanned maintenance or downtime.

LEVEL DUMP VALVES



CHALLENGES of the application

- The inability to wire moving skids can make it difficult to monitor valve positions between two control areas.
- Environmental leakage issues arise if a valve is not 100% closed during transit between sites.

BENEFITS of position feedback

- With the capability to measure a variety of valve data, including position, temperature, and pressure, you can reduce the risk of environmental leakage and improve safety for your routine functions.
- Knowing the exact position of your valve is just the beginning. All data can then be reported, analyzed, and shared between two process units, ensuring certainty about valve position even during relocation.

PROCESS SAMPLE VALVES

CHALLENGES of the application

- The control room lacks adequate valve state visibility, often resulting in processing delays or another visit to the valve.
- Operators take samples from their process for research, design, and quality purposes, which is often a resource burden.
- Environmental Protection Agency compliance issues can arise if valves are not closed properly, leading to 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 optional interlocks can be valuable tools for preventing environmental leakages, allowing you to handle pre-diagnosed issues promptly instead of being caught off-guard.
- Eliminating the need for wires, conduit/cable trays, or I/O points makes installation simpler and saves on the time and costs associated with electrical work.



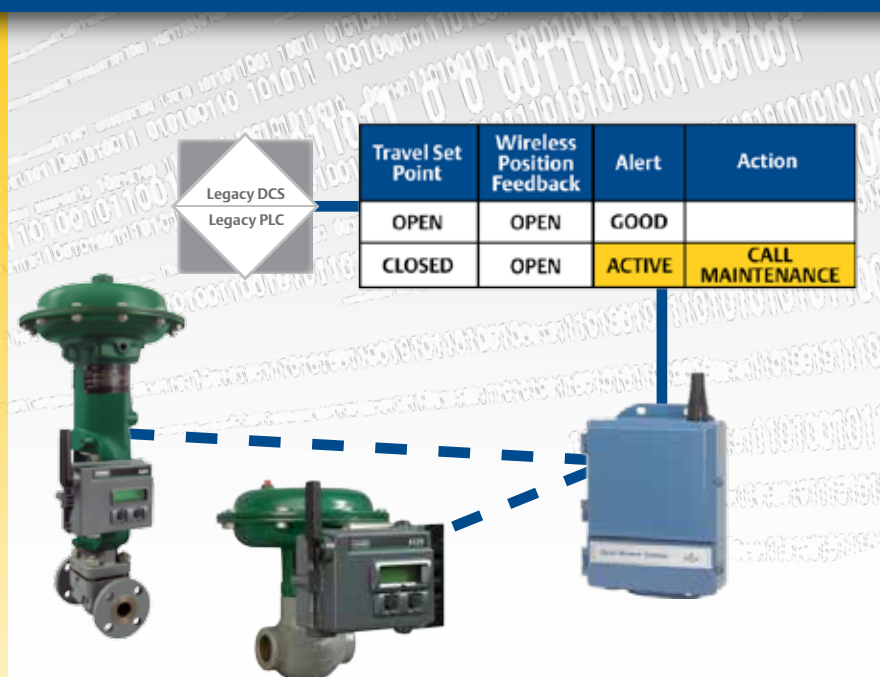
SOLENOID-LIMITED VALVES

CHALLENGES of the application

- Automated valves with solenoids typically do not include position feedback, increasing the risk of undetected valve failures.
- Low valve visibility from 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 require additional 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

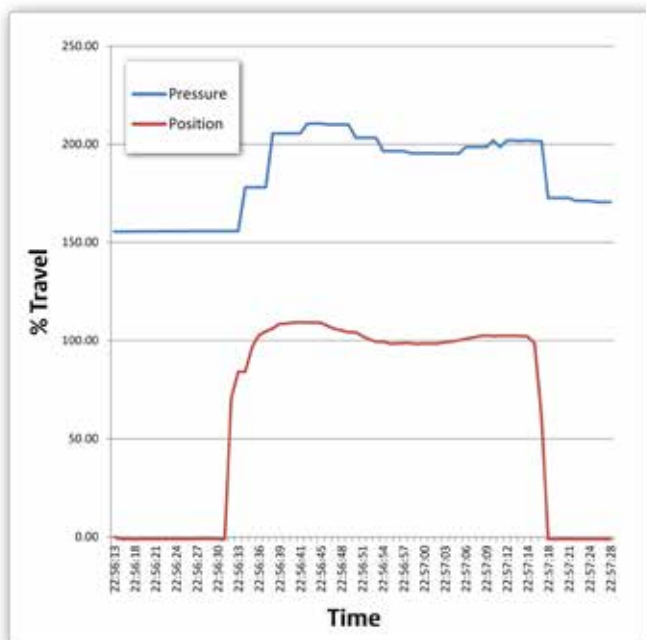
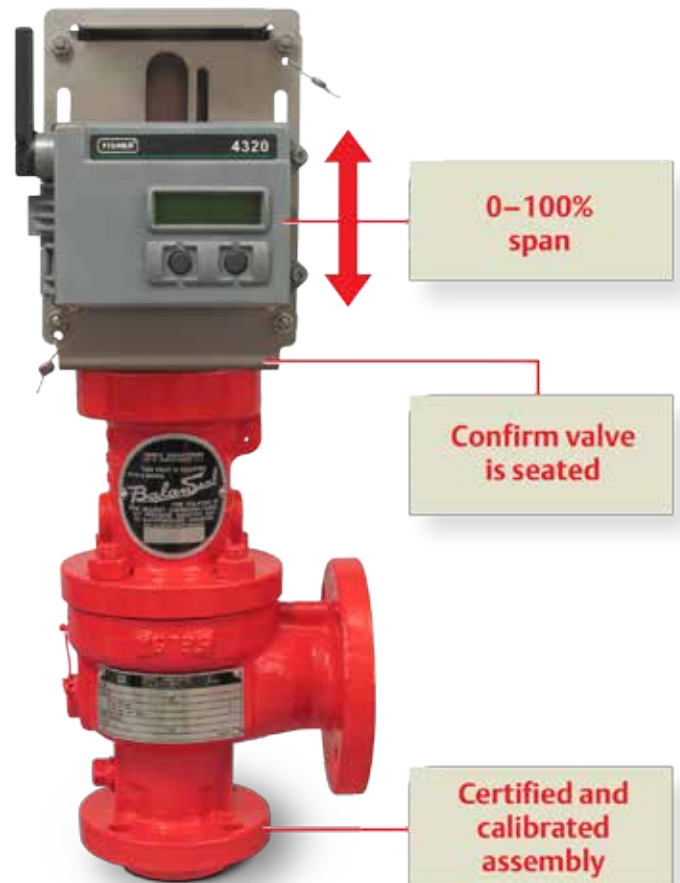
Meet Compliance Standards

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, as 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 timestamped data.

Monitoring Made Easy

With relief valve monitoring capabilities, you can monitor areas of your 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 high emissions-related fines.

With the ability to track and monitor your pressure relief valves in real time, you can rely on immediate feedback during an overpressure event. We call that *peace of mind*.



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

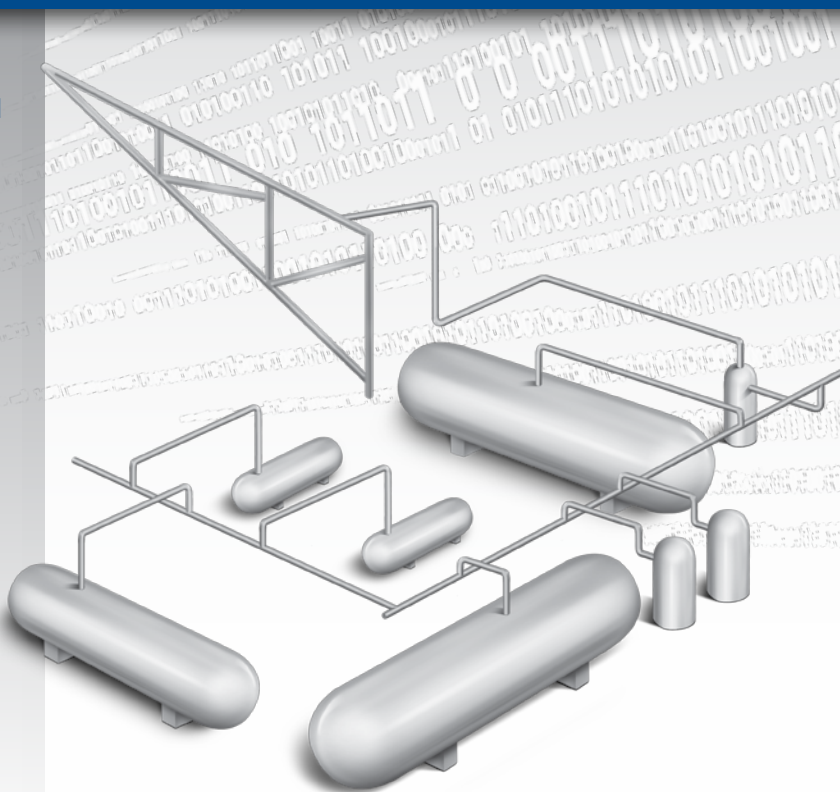
TOWER TO FLARE

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 precision is difficult.
- Improper monitoring and a lack of specific valve data can result in unexpected issues or downtime.

BENEFITS of position feedback

- Improve overall design and output of your process with data that pinpoints exactly when and where a relief event occurs.
- 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

- Harsh process conditions can affect the amount of energy that is required to operate heat exchangers effectively, costing you more in maintenance and general upkeep each year.
- 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 positions forces reactive measures to be taken, often when issues are beyond correction.

BENEFITS of position feedback

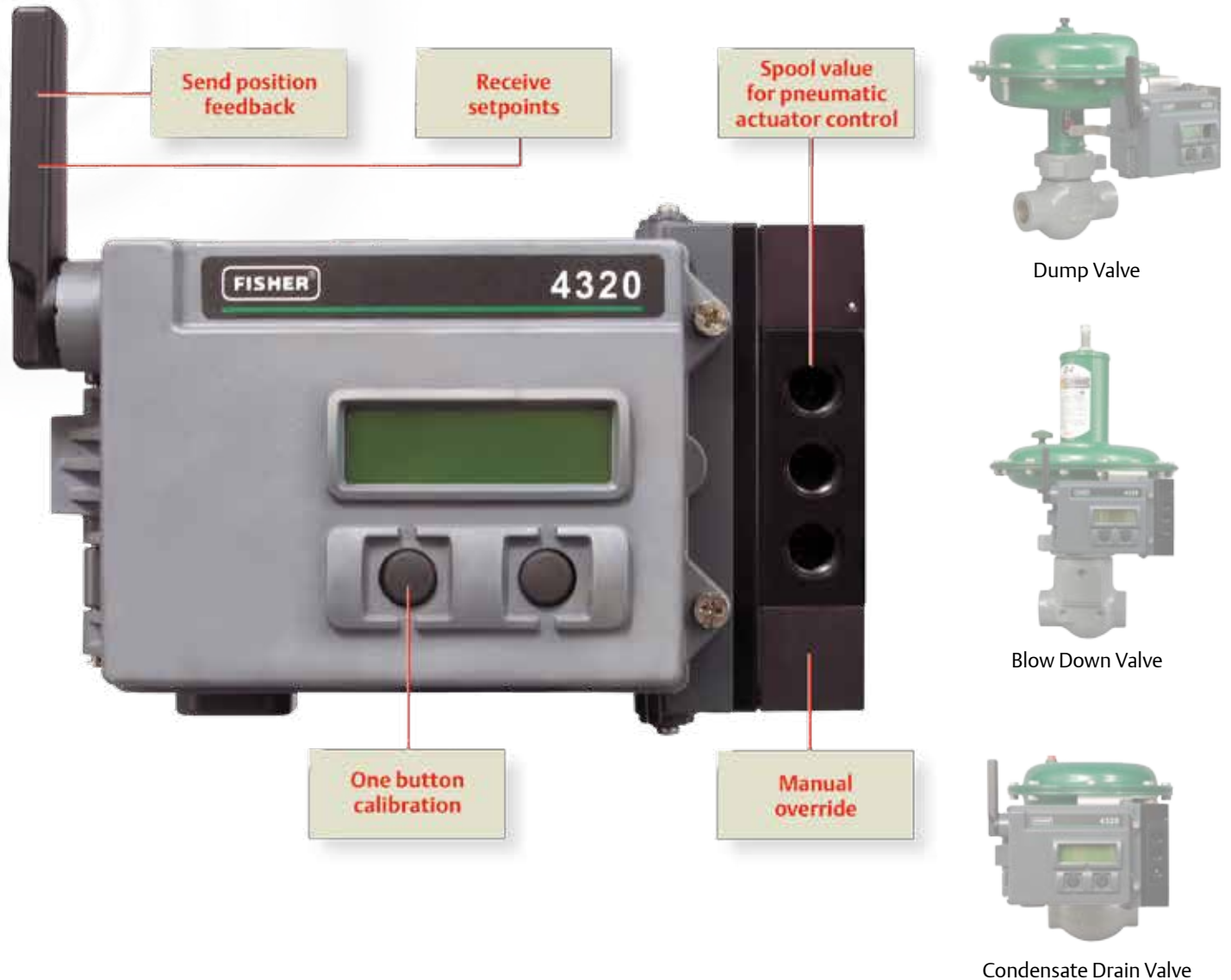
- Inadequate manual inspections are replaced with frequent and reliable data reports, allowing for precise process control.
- Track exactly how many cycles the exchanger has been through and receive updates about the last desalting or neutralizing sequences to maximize the service life of your assets.
- Continuous, accurate feedback can help uncover issues before they take your unit down.



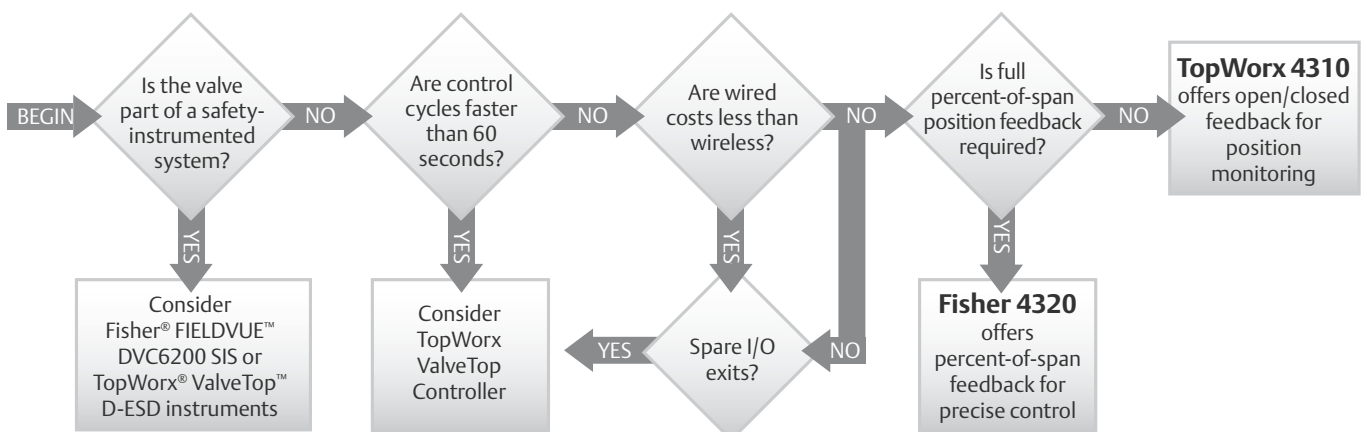
FISHER 4320 POSITION MONITOR



FISHER 4320 POSITION MONITOR WITH ON/OFF OUTPUT CONTROL OPTION



WHEN SHOULD I CONSIDER 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.



Click or scan with your mobile device to read more about how one customer saved over €160,000 with a wireless solution.

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

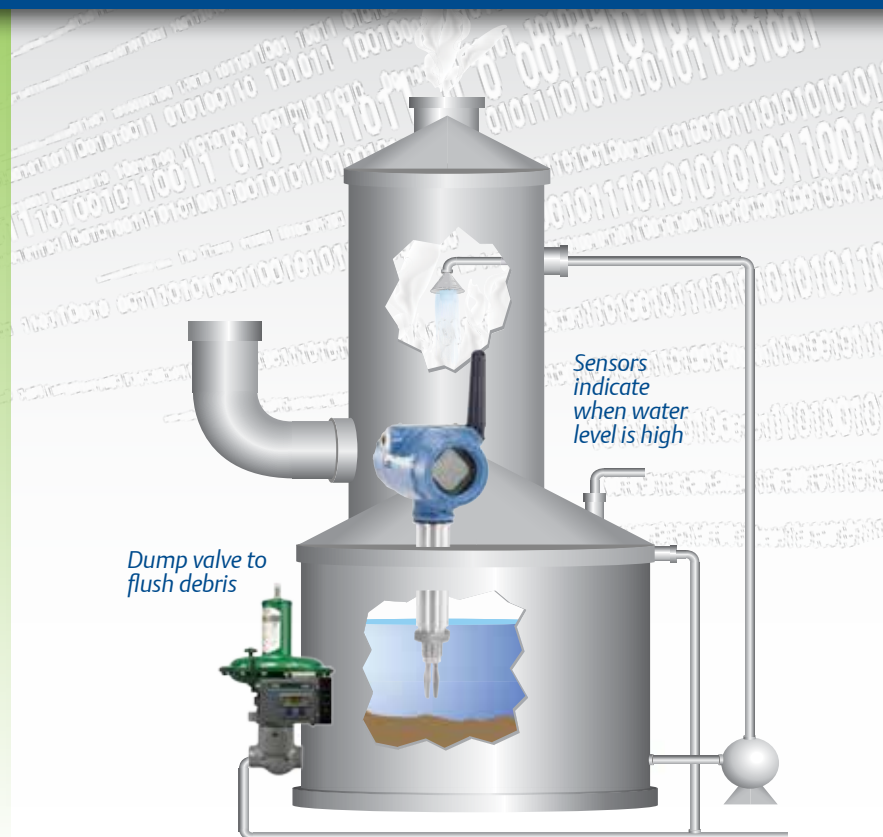
GAS CLEANING TOWER

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.



COMPRESSOR-SCRUBBER DUMP VALVES

CHALLENGES of the application

- Condensate levels can fluctuate quickly, requiring an immediate response.
- Wiring to dump valves complicates their design, increases cost, and makes control more complex.

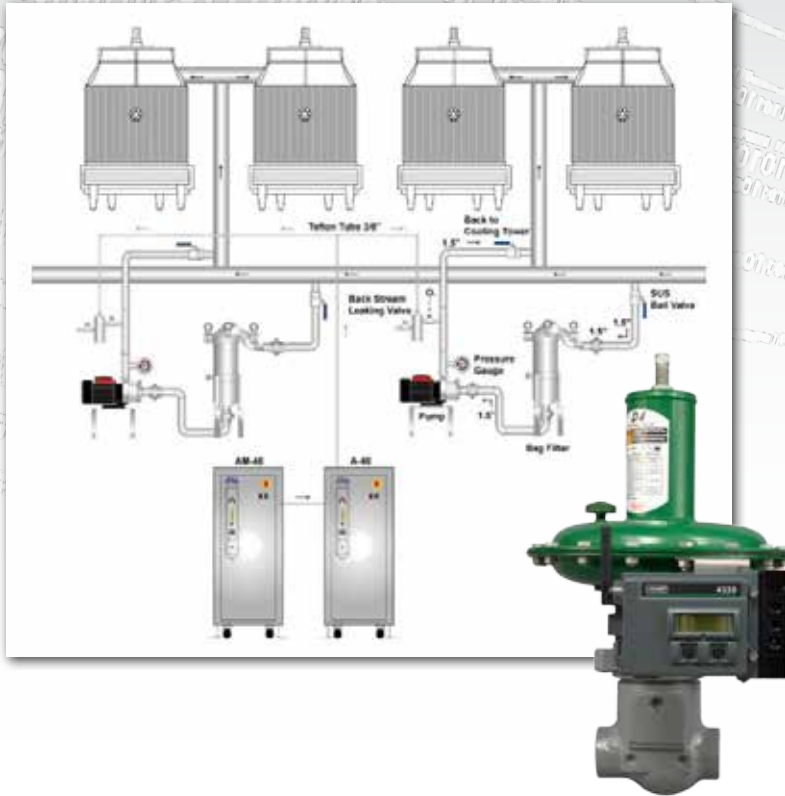
BENEFITS of wireless automation

- By removing the wires and adding actual position feedback, you can achieve smarter valve control that simplifies your process.
- The reliability of your dump operation can be significantly improved with real-time data reports.
- Using less people and equipment to operate your dump valves can result in reduced project costs and time savings.



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.

DUMP VALVES



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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