

FIELDVUE® Instrumentation

Digital Valve Controller





***With FIELDVUE Digital Valve Controllers,
plant personnel can:***

- *Open a window to the process*
- *Reduce process variability*
- *Make informed decisions about process system conditions*
- *Help keep processes tightly controlled within specifications*
- *Optimize maintenance programs through advanced valve diagnostics*

**FIELDVUE®
Instrumentation**

Meeting Your Challenges. Exceeding Your Expectations.

Emerson recognizes the challenges you face to improve your plant's operating performance and profitability. By incorporating the right technology, you can effectively meet these challenges. FIELDVUE® instrumentation is that technology.

The FIELDVUE Digital Valve Controller (DVC), introduced in 1994 as the first digitally communicating HART-based valve positioner, has become the instrument of choice worldwide. The microprocessor-based DVC not only accurately positions the valve in response to small step changes, it also monitors and reports on the performance and health of the entire valve assembly.

With Asset Management Solutions (AMS) software, you can configure, calibrate, commission and diagnose field devices. In addition, the AMS ValveLink® SNAP-ON™ software allows you to easily access FIELDVUE instrument and valve diagnostic information that can be gathered on-line while the valves are controlling the process.

Why FIELDVUE Instrumentation?

No other supplier delivers Fisher's combination of product quality, reliability and award-winning solutions, like the FIELDVUE Digital Valve Controller. Extensive closed-loop testing reveals that Fisher valves with FIELDVUE DVCs simply out-perform the competition.

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The Design

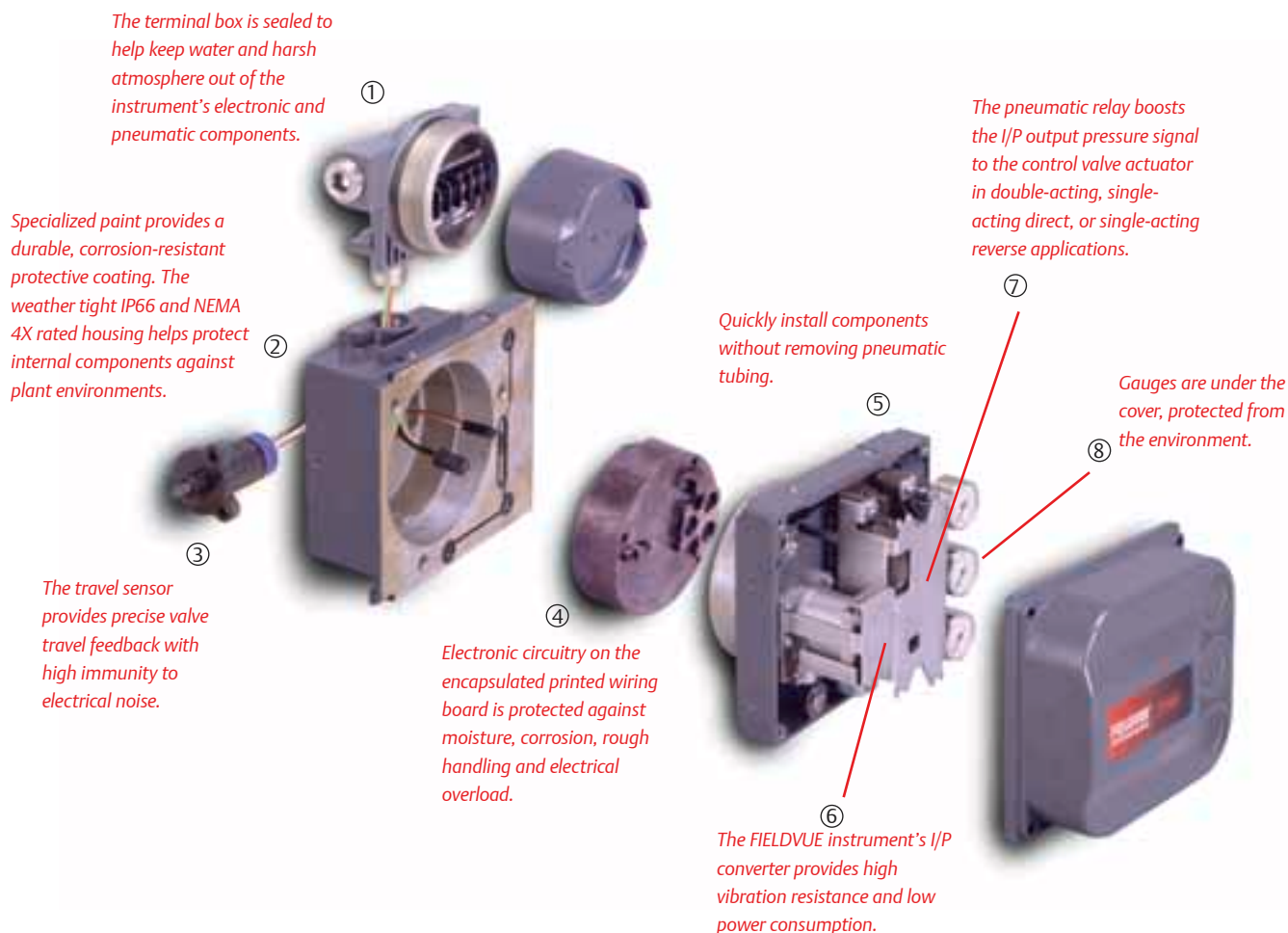
Many Design Elements Make FIELDVUE Instruments Truly Unique

Built for extreme operating conditions, FIELDVUE Digital Valve Controllers prove to be more reliable in difficult process environments than conventional valve instruments. They are designed to withstand extreme temperatures, harsh plant atmospheres, corrosive offshore environments and high vibration applications.

The DVC mounts on Fisher or non-Fisher sliding stem, rotary or quarter-turn actuators—including single- or double-acting actuators—without removing the valve and actuator from the line.

The rugged DVC uses a patented modular design that allows for fast inspection of critical components. The sub-modules consist of:

- ① Terminal Box
- ② Housing
- ③ Travel Sensor
- ④ Printed Wiring Board
- ⑤ Module Base
- ⑥ I/P Converter
- ⑦ Pneumatic Relay
- ⑧ Gauges



A Case-In-Point

A power plant in the western U.S. used a conventional pneumatic positioner on an eight-inch deaerator level valve. The valve was subjected to dust, vibration and temperatures of up to 140°F (60°C). This instrument became badly damaged as a result of severe vibration.

The solution to this problem was to install a FIELDVUE DVC on the valve's piston actuator, an application that took advantage of the DVC's double-acting capabilities. The plant's instrument technician noted that the FIELDVUE instrument was not only easy to install, calibrate, and configure, but it also outperformed and outlasted the conventional positioner.

The DVC6000 Series instrument can be used on single- or double-acting actuators.



The digital in Digital Valve Controller comes from the use of HART® or FOUNDATION™ fieldbus open communication protocol. While HART enables a digital signal to coexist with a 4-20 mA control signal, FOUNDATION fieldbus uses all-digital communication.

Simply select a microprocessor-based FIELDVUE DVC that matches your needs. The DVC6000 Series instrument (shown right) uses HART communication. The DVC5000F Series instrument features FOUNDATION fieldbus communication. Both DVCs are integral components of Emerson's PlantWeb® digital plant architecture.

| CAPABILITY | FIELDVUE DVC |
|------------------------------------|--------------|
| Single-Acting | ✓ |
| Double-Acting | ✓ |
| HART Protocol | ✓ |
| FOUNDATION Fieldbus Protocol | ✓ |
| Emergency Shutdown (ESD) | ✓ |
| Stainless Steel Construction | ✓ |
| One-Touch Calibration w/o Handheld | ✓ |
| Remote Mounting | ✓ |
| Offline Diagnostics w/ Analysis | ✓ |
| In-Service Diagnostics w/ Analysis | ✓ |
| On-Line Monitoring | ✓ |
| PlantWeb Alerts | ✓ |
| Intrinsically Safe | ✓ |
| Explosion Proof | ✓ |
| Flameproof | ✓ |

Rugged
Easy to Use
Proven
Reliable

The PlantWeb Advantage

FIELDVUE DVCs open a window to the process by giving a view of the valve's actual position and operating characteristics as well as diagnostics of the entire valve assembly and instrument.

FIELDVUE instrumentation plays an important role in Emerson's PlantWeb digital plant architecture. PlantWeb integrates intelligent field devices and modular software such as AMS or the DeltaV™ digital automation system. All are linked by information-rich HART or FOUNDATION fieldbus communication protocol.



Intelligent PlantWeb field devices, such as Fisher valves with FIELDVUE DVCs (Fisher Digital Valves), Rosemount® transmitters and Micro Motion® flowmeters, provide critical information not only about the devices but the process as well. Plant personnel can now make better-informed decisions, leading to increased availability, reduced variability, process optimization, increased throughput and enhanced product quality.

By using the power of intelligent devices, you can dramatically reduce your capital and engineering expenses, as well as ongoing operations and maintenance costs. You now have the opportunity to revolutionize the way you manage your plant.



DVC5000f Series Instrument

The DVC5000f Series instrument is registered with the latest FOUNDATION fieldbus specification.



*It contains either **Fieldbus Logic** (one DO and four DI) function blocks for ON-OFF applications or **Standard Control** (AO and PID) function blocks for throttling applications.*

*In addition, the Standard Control device has an **Input Selector (IS)** function block allowing selection from up to four **Analog Input (AI)** function blocks.*



The PlantWeb digital plant architecture with FOUNDATION fieldbus is playing a key role in the success of the Malampaya deepwater gas-to-power project located in the Philippines.

A Case-In-Point

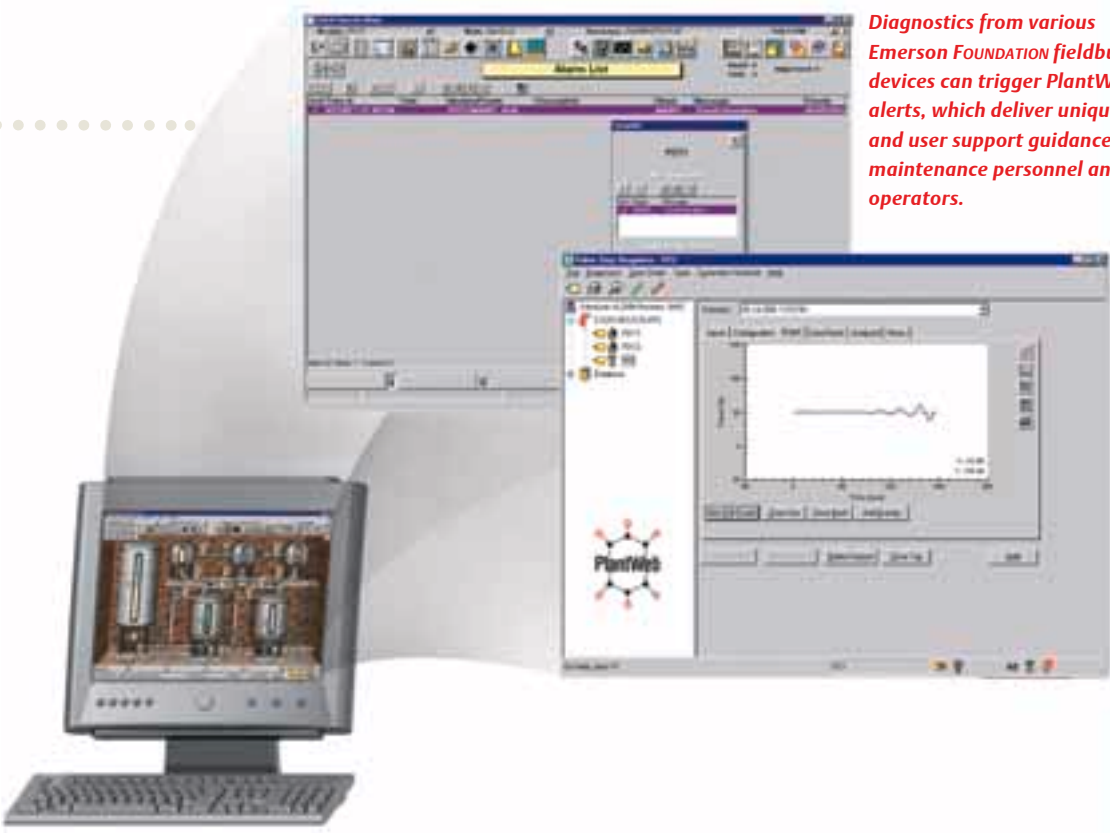
Developed by Shell Philippines Exploration B.V. (SPEX), the Malampaya project is the largest integrated offshore platform in Asia Pacific and includes an onshore gas processing plant.

For the Malampaya project, FOUNDATION fieldbus devices from Emerson were used, including FIELDVUE DVC5000f Series instruments on Fisher and Bettis® products. This represents one of the largest installations of DVC5000f instruments in the world.

To complete the PlantWeb architecture, AMS ValveLink diagnostics inside the DeltaV automation system are being used to detect erosion wear on the trim of the most critical valves on the platform. Using the power of field intelligence, Shell has been able to improve process availability and reduce maintenance and operating costs.



Diagnostics from various Emerson FOUNDATION fieldbus devices can trigger PlantWeb alerts, which deliver unique alert and user support guidance to maintenance personnel and operators.



Diagnostics run with AMS ValveLink software evaluate the health of control valves.

Access More Information

FIELDVUE Instruments Provide Much More Than Traditional Valve Positioning



The FIELDVUE Digital Valve Controller is a core component of PlantWeb architecture. The FIELDVUE DVC powers PlantWeb by capturing and delivering valve diagnostic data.

Coupled with AMS ValveLink software, the DVC provides users with an accurate picture of valve performance, including actual stem position, instrument input signal and pneumatic pressure to the actuator. Using this information, the DVC diagnoses not only itself, but also the valve and actuator to which it is mounted.

AMS ValveLink software provides the easy-to-use interface that lets you configure, calibrate, monitor, perform diagnostics and maintain records for virtually any FIELDVUE instrument-equipped valve in the plant, all from a central location.

A DVC with AMS ValveLink software lets you compare current operating status of the valve versus a historical database of performance. The diagnostics provided by AMS ValveLink include:

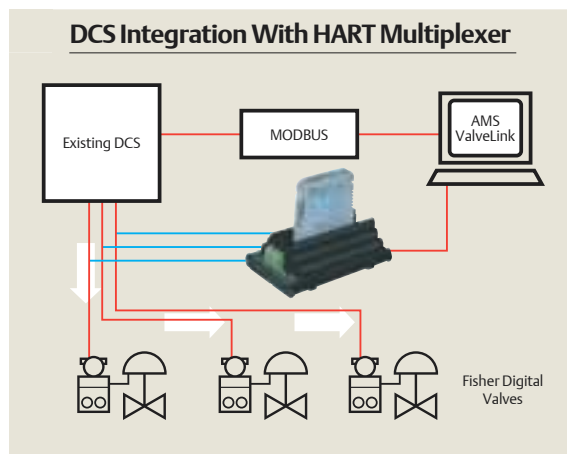
- In-Service Performance Diagnostics
- Online Trending
- ESD Partial Stroke Test
- Valve Signature Test
- Step Response Test
- Performance Step Test
- Dynamic Error Band Test
- Drive Signal Test
- Instrument Status Monitor

Advanced Features:

- PlantWeb Alerts
- Network Alert Scanning
- Batch Runner
- Event Messenger
- Alert Record Access
- Audit Log
- DataSync
- Valve Spec Sheet

Continuous Alert Monitoring

Continually scan multiple valves for alerts using VL2000 software, a HART multiplexer and HART-based FIELDVUE instruments. The Network Alert Log shows alert type, time on and time off.



A 1000-megawatt combined cycle power station in the United Kingdom experienced oscillations in the gas stream supply pressure at the turbine. Such supply instability increased the workload of individual turbines, therefore increasing the wear and maintenance activities needed on them.

Emerson conducted a loop performance audit on the main gas supply stream and identified the control valve assembly as the main contributor of process variability. Following replacement of the old valve positioner with a FIELDVUE Digital Valve Controller, process variability was reduced 50%.

The power station immediately saw a marked improvement in the plant performance in terms of stability. Yearly savings of €130,254 were anticipated with the reduction of unscheduled maintenance trips, extended life cycles of turbines and improved efficiency of the plant.

A Case-In-Point

With HART or FOUNDATION fieldbus communication, workers no longer have to be in hard-to-reach locations, hazardous areas or inclement weather to accurately assess a valve's performance.



Communicate With a DVC
Automate the tasks of commissioning DVCs using a **Handheld Communicator**.
Commission devices as well as run advanced diagnostics from a stand-alone computer using **AMS ValveLink VL2000 software**.
Add the capability for running advanced diagnostics on FIELDVUE DVCs to AMS software using **AMS ValveLink SNAP-ON**.
For the most complete PlantWeb solution, add the capability for running advanced diagnostics on FIELDVUE DVCs to a DeltaV digital automation system using **AMS ValveLink SNAP-ON for DeltaV-Fieldbus**.

Predictive Maintenance

Reduce the Cost of Maintenance on Your Equipment

The value that FIELDVUE instrumentation brings to control valve maintenance is one of its strongest features. Imagine the maintenance impact by knowing when a control valve does or doesn't need repair and if it does need repair, whether it needs to be removed from the line or not.

Running diagnostics on valves equipped with DVCs enables you to make sound, predictive maintenance decisions.

Access Diagnostic Information Using AMS ValveLink Software

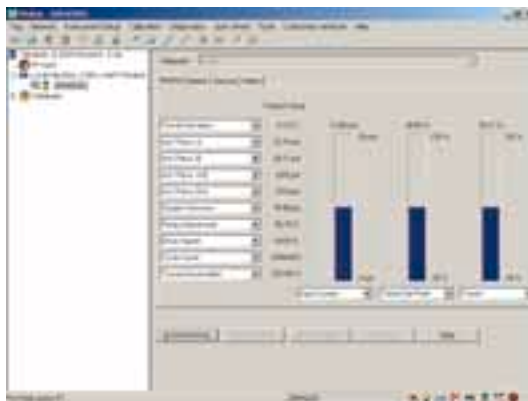
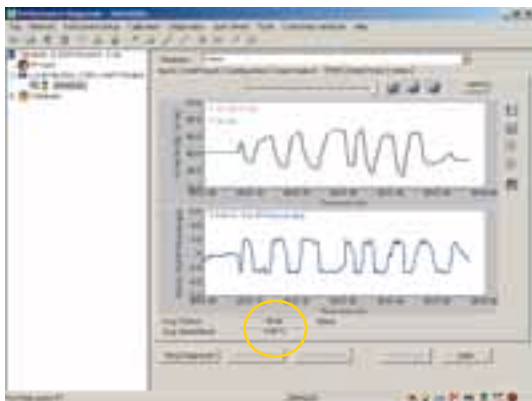
Calculate average friction and deadband with Performance Diagnostics while the valve is on-line and in-service. View instrument parameters and alerts on the Status Monitor screen. Execute multiple tasks back-to-back without intervention using Batch Runner.

Integrate and use the technology that FIELDVUE instrumentation provides to:

- **Monitor** - Alerts can signal implied or actual problems with the valve assembly. Scan these alerts continuously and provide immediate feedback to operations while the valves are controlling the process.
- **Diagnose** - To determine a valve's operating performance and condition, use in-service Performance Diagnostics and the monitoring capabilities of FIELDVUE DVCs. Then schedule maintenance for the least disruptive time. To make informed decisions on specific maintenance needs and activities of your valves, use off-line diagnostics.
- **Streamline Tasks** - Automate diagnostic tests and other repetitive actions using AMS ValveLink software's Batch Runner.
- **Document** - Save valuable time by using FIELDVUE DVCs and AMS ValveLink software to track and record changes. A historical record is generated for maintenance activities such as configuration changes, calibration and diagnostic tests. Each event is time and date stamped and put into a permanent log. FIELDVUE instrumentation eases the burden of documenting maintenance information for ISO certification or regulatory compliance reporting.
- **Review History** - Spot emerging valve repair requirements before they impact performance by comparing current operating status of the valve versus a historical database of performance.



AMS is a core component of the PlantWeb digital plant architecture.



A Case-In-Point

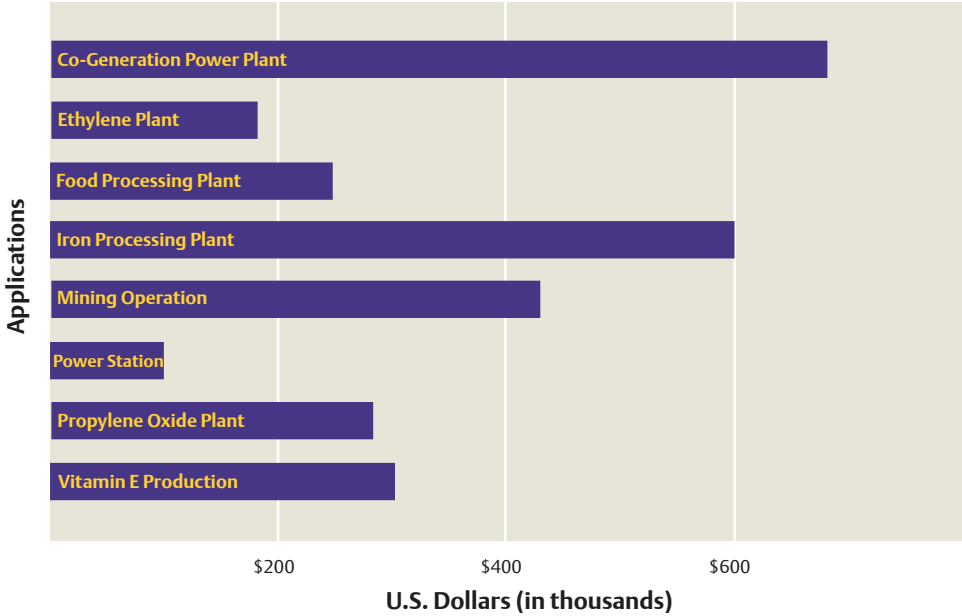
A refinery in South East Asia asked Emerson to help them select instruments for a new project. Refinery personnel needed valve controllers that could perform 50% valve travel in two seconds, respond to 1/2% signal changes and allow zero overshoot. FIELDVUE DVCs met the stringent requirements of this application. The refinery installed a DVC on their flow control, pressure control and raffinate valves.

After two years of smooth operation, personnel experienced problems with the pressure control valve. When controlling at less than 20% travel, the valve fluctuated. Instead of shutting down the plant to determine the problem, the Emerson team used the DVC's Performance Diagnostic (PD) capability to monitor and test the valve while it remained in-service and on-line.

Using AMS ValveLink, the Emerson team determined that the valve's average friction decreased during travel, when the friction should have remained constant. A decrease in packing friction caused the fluctuation. As a solution, the valve was re-tuned and the input filter time of the control system was increased. The customer avoided an unnecessary shutdown that would have cost them \$135,000 USD.



Annual Savings With DVC Diagnostics
(Includes Time and Predictive Maintenance Savings)



In the words of one of our customers: "When decision making is based on facts rather than on speculation, maintenance work can be applied when it is most needed and where it delivers maximum return."

Companies from a variety of industries saved money by installing FIELDVUE DVCs. They used the diagnostics that DVCs provide to identify which valves needed repair and which ones could be kept in operation.

Time Savings

Reduce commissioning time by using AMS ValveLink software's automated calibration procedures. For example, zero and span are configured automatically without the need for manual adjustments.

Specialty Applications

When the need arises for a valve positioner that can test the final control element in a safety instrumented system (SIS), withstand highly corrosive environments or mount remotely from the valve, Fisher has a FIELDVUE solution for you.

Safety Instrumented System Applications - Now you can test the availability of the final control element in a safety instrumented system (SIS) without disrupting production. FIELDVUE DVCs allow automated **partial-stroke testing** of the final control element while the process is operating, so availability of the valve is assured should a demand arise.

The simplicity, reliability and flexibility of the partial-stroke test permits a less labor intensive, more secure, and more frequent testing of the final control element.

During each partial-stroke test, the DVC automatically checks the mechanical movement of the valve, collects diagnostic data, generates audit documentation and improves system performance. With the diagnostic data, maintenance personnel can more effectively schedule repair activities.

Potential time and cost savings include a lower base cost, less space, shorter testing time and reduced labor requirements.

A Case-In-Point

Production and processing operations at Saudi Aramco's Shedgum gas plant and the Saudi Aramco Company's Yanbu' facility use FIELDVUE instruments on critical, emergency isolation valves.

On-line since early 2000, the FIELDVUE units have exceeded system operators' expectations by enabling the systematic, partial-stroke testing of emergency shutdown valves without impacting production rates.

Patrick Flanders, instrument engineer at Saudi Aramco, credits FIELDVUE instruments with bringing a new level of security to safety instrumented systems. "Before the FIELDVUE-ESD concept evolved, it was difficult to functionally test these valves and very difficult to document any meaningful test results," Mr. Flanders explains. "Now, thanks to the Fisher FIELDVUE design, it's not only possible to check valves, but we can also do so more safely, at less cost, and with greater efficiency."



Safety Instrumented System

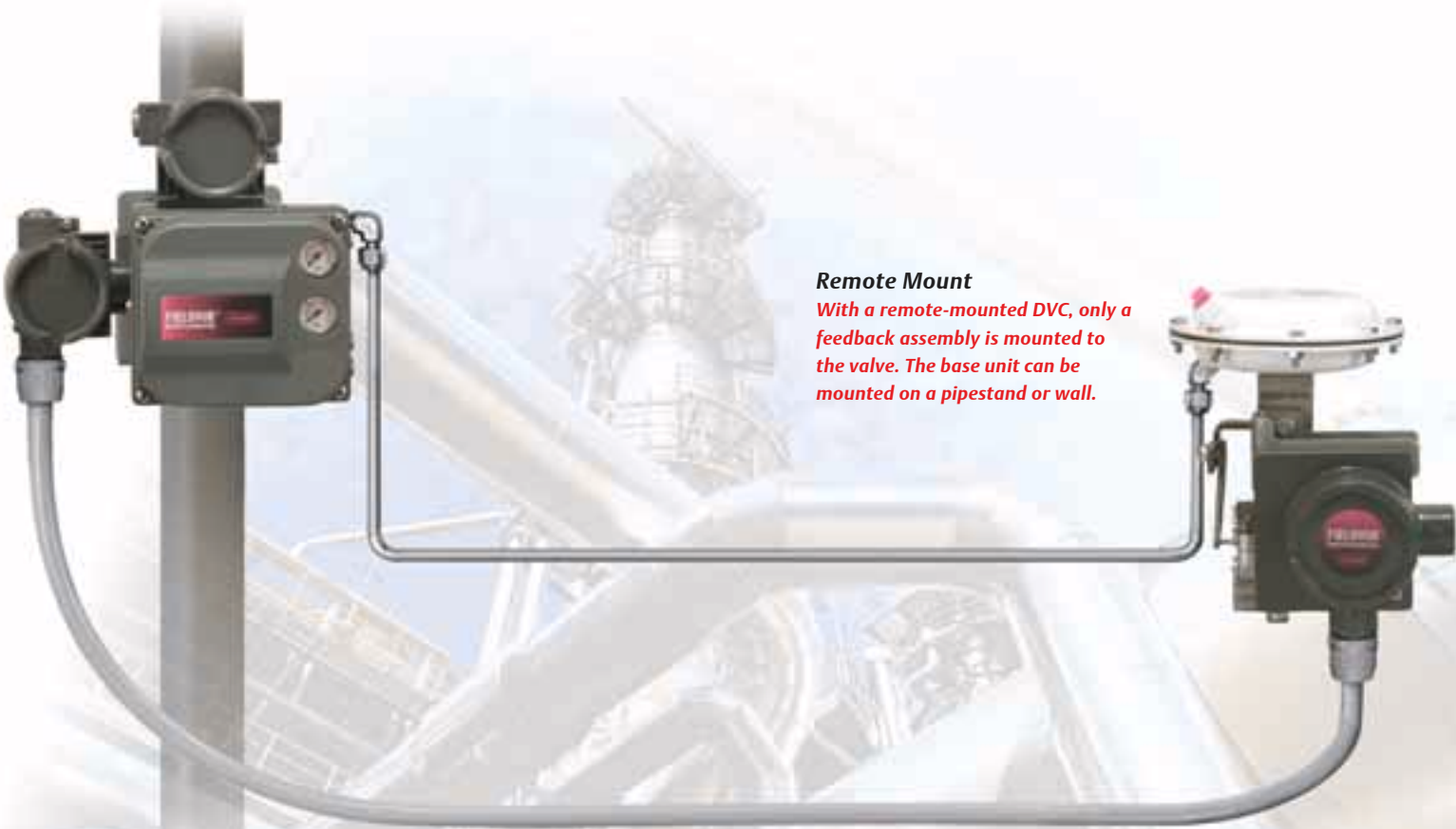
The TÜV certificate verifies that FIELDVUE instruments are suitable for safety-related applications up to and including Safety Integrity Level 3 (SIL3).

Corrosive Environment Applications - To withstand the hostile and corrosive environments found in the Chemical, Pulp & Paper and Hydrocarbon industries—particularly offshore—we offer a DVC with **stainless steel** housing that provides a greatly extended service life.



Remote Mounting - With today's unique process environments, you can't always mount a positioner on the valve. For high temperature environments up to 125°C (257°F), smaller valves, small footprints, low level radiation areas in nuclear applications and inaccessible locations, use a remote-mounted DVC.

Corrosion Resistant
FIELDVUE DVCs are available with stainless steel housing that allows their use in highly corrosive environments.



Remote Mount
With a remote-mounted DVC, only a feedback assembly is mounted to the valve. The base unit can be mounted on a pipestand or wall.

Standardize Across the Plant

Imagine getting flow control accuracy as tight as 0.25%! Fisher makes it a reality when you specify a Fisher Digital Valve. Optimal performance comes from using FIELDVUE instruments on Fisher's easy-e® globe and Vee-Ball® rotary valves as well as Baumann™ and CON-TEK® valves.

Thanks to an ever-expanding selection of mounting kits, FIELDVUE Digital Valve Controllers can be used on over 1,000 different types of Fisher and non-Fisher valves. And we're making more every day.

Support and Service

Emerson Process Management Educational Services offers FIELDVUE instrument training for technicians, engineers, and others responsible for installing, calibrating, and troubleshooting control-valve-related instruments and software.

Whether it's diagnostic services, valve repair or parts, Fisher understands the relationship between its prompt service and your profitability. With locations throughout the world, Emerson's Instrument and Valve Services will be there when you need them.

Sustained Performance

To achieve your goal of improving profitability, equip your entire plant with FIELDVUE DVCs together with AMS Valvelink software, or improve the performance of one loop at a time. You can count on Fisher to have the technologies, products, solutions and support.



Sliding-Stem Control Valve with Type DVC6010 Digital Valve Controller



Rotary Control Valve with Type DVC6020 Digital Valve Controller



Quarter-Turn Control Valve with Type DVC6030 Digital Valve Controller

The Next Step

Take these steps to learn more about the benefits that FIELDVUE instruments can offer you.

Look in Fisher technical documents for complete product specifications and third party approvals.

FIELDVUE DVC6000 Series Digital Valve Controllers
Fisher Bulletin 62.1:DVC6000

FIELDVUE DVC5000f Series Digital Valve Controllers for FOUNDATION Fieldbus
Fisher Bulletin 62.1:DVC5000f

AMS ValveLink VL2000 Software
Fisher Bulletin 62.1:VL2000

DVC6000 Series Digital Valve Controllers for ESD Solutions
Fisher Bulletin 62.1:DVC6000(S1)

To obtain a copy, contact your local Emerson sales office or access the Web site, www.FIELDVUE.com. (Click on LIBRARY)

Read about companies that use FIELDVUE DVCs and find out what they've been worth to them.

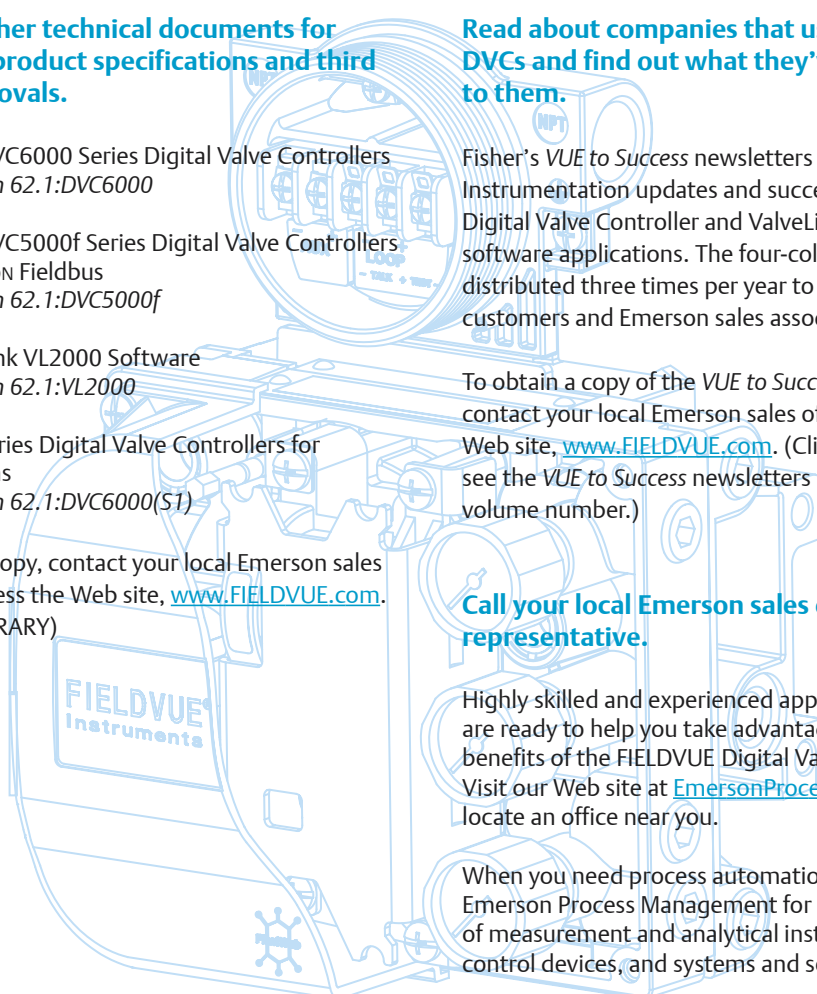
Fisher's *VUE to Success* newsletters contain FIELDVUE Instrumentation updates and success stories on Digital Valve Controller and ValveLink VL2000 software applications. The four-color newsletter is distributed three times per year to FIELDVUE customers and Emerson sales associates worldwide.

To obtain a copy of the *VUE to Success* newsletter, contact your local Emerson sales office or access the Web site, www.FIELDVUE.com. (Click on LIBRARY and see the *VUE to Success* newsletters listed by volume number.)

Call your local Emerson sales office or sales representative.

Highly skilled and experienced applications experts are ready to help you take advantage of the many benefits of the FIELDVUE Digital Valve Controller. Visit our Web site at EmersonProcess.com/Fisher to locate an office near you.

When you need process automation products, turn to Emerson Process Management for an extensive lineup of measurement and analytical instruments, final control devices, and systems and software.





This mark indicates a core component of the PlantWeb digital plant architecture.

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