



## Unmatched aftermarket support

As one of the world's leading suppliers of fluid motion and control equipment, Flowserve knows the key to customer satisfaction and loyalty is unmatched aftermarket service. To this end, we have dedicated considerable resources to addressing your aftermarket needs.

## Original equipment installation and commissioning

Installing and starting up equipment can be problematic if careful attention is not paid to following the correct procedures. To ensure new equipment yields the specified performance and provides long, reliable service, our field engineers adhere to the industry's most rigorous standards for installation and start-up. Whether for mission-critical assets or ancillary support systems, our teams will work with your on-site personnel to ensure best practices are followed and all details are fastidiously managed.

Key steps include:

- Uncrating the equipment and conducting a witnessed inspection for visible and dimensional defects
- Preparing the foundation, setting and leveling the baseplate, and installing the foundation bolt
- Grouting the bedplate, aligning piping, and bolting up the pump
- Aligning the pump and driver and issuing a report on the level and alignment readings
- Completing the motor rotation check and one-hour solo run



## Local support when you need it

Our APAC regional network of Quick Response Centers (QRCs) is staffed by highly skilled engineers and technicians around the clock, seven days a week. They are available to respond to your questions, help you evaluate and troubleshoot problems, and provide you with reliable solutions with quantifiable business results.

## Scalable IoT solutions for your entire plant

Flowserve RedRaven IoT solutions give you the insights and tools you need to monitor, analyze and predict equipment performance — so you can respond to problems quickly and minimize disruptions and downtime. And because RedRaven solutions are scalable, they will grow with your needs.



### Data collection and analysis the way you want it

The RedRaven platform comprises a suite of technologies and service offerings that can be customized to meet your plant's unique needs. Technologies include equipment sensors, secure communication infrastructure, performance analytics and trend reporting tools. Service options include: condition monitoring, which allows you to capture asset performance data for analysis; and predictive monitoring capabilities, which apply data analysis software and algorithms to identify and diagnose equipment problems.

With access to advanced analytics and trend data, you can identify the slightest changes in equipment performance, variations that can indicate a problem is looming. The RedRaven platform uses engineered analytics, diagnostic and predictive capabilities that tell you how your flow control equipment is performing. You will not just receive data, you also will get real insights needed to make more informed decisions to improve your plant's efficiency, productivity and bottom line.

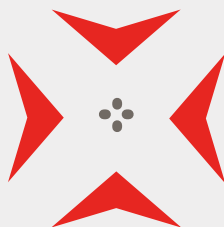
### Predict.

Use detailed insights to predict why your critical assets might experience issues.



### Act.

Make informed decisions to minimize disruptions and downtime and improve plant performance and reliability.



### Protect.

Protect your operation against equipment downtime and production impacts.



## RedRaven services

### Condition monitoring

Condition monitoring combines wireless sensors and an advanced visualization portal to detect changes in performance that could be an early indicator of failure. You can proactively identify equipment issues and uncover insights to improve your plant's efficiency, productivity and profitability.

### Predictive analytics

Predictive analytics provide near real-time equipment monitoring and analysis, enabling you to estimate and help you understand why your critical assets could fail and preventive action to take before it happens. You can identify potential issues earlier than with route-based equipment monitoring and respond to problems before they lead to downtime.

## A proven process

Flowserve IoT solutions follow a comprehensive and proven process to advance your existing capabilities and improve reliability. Our approach includes scalable solutions for critical, key and balance-of-plant equipment, capable of growing as your needs grow.

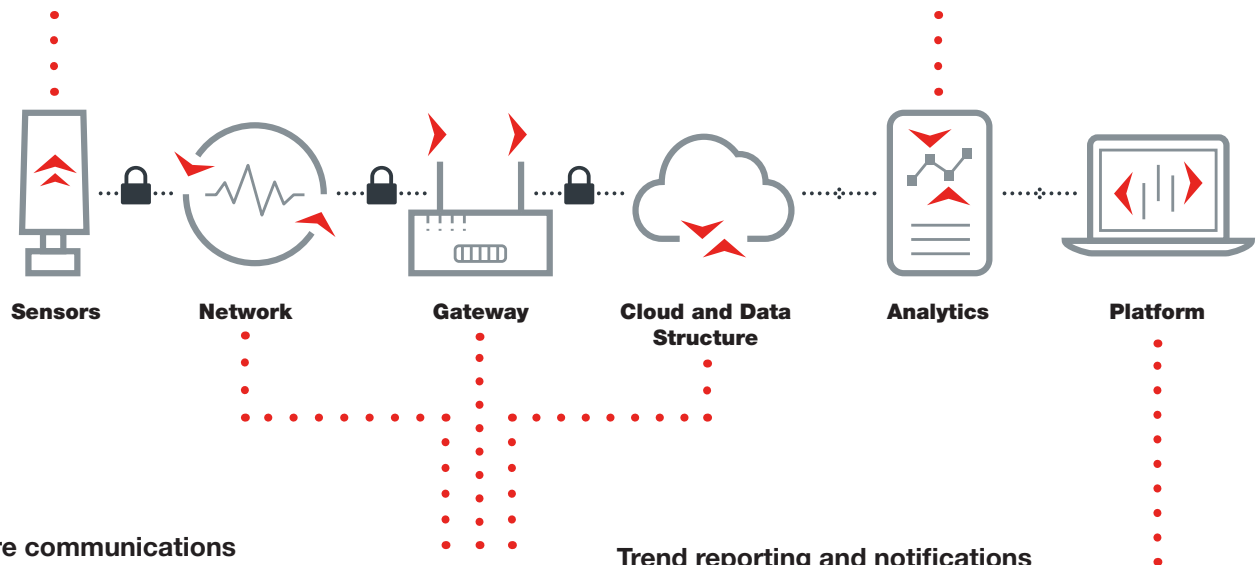


### Innovative sensors

Wired and/or wireless sensors collect vibration, pressure and temperature data for analysis. Long-range wireless sensors enable cost-effective monitoring of thousands of assets over sprawling facilities.

### Application-specific analysis

Equipment performance data is analyzed with technology designed specifically for pumps, valves and seals, so you can gain a clearer understanding of how to increase the efficiency, productivity and reliability of the equipment you use every day.



### Secure communications

Our secure system architecture collects data from equipment sensors and transmits it via a secure encrypted network.

### Trend reporting and notifications

Trend reports provide insights into equipment performance over time, while emails and alerts inform you when an asset experiences a problem, so you can take immediate action.



## Training to enhance workforce competency

Flowserve educational resources are focused on helping plant operators, reliability specialists, engineers and maintenance personnel deepen their understanding of flow management equipment and systems.

### Course offerings

Flowserve has developed dozens of standard courses designed for rapid dissemination of fundamental and advanced topics related to the process plant environment. Examples include:

- Pump and Seal Operator Training
- Pump and Mechanical Seal Principles
- Pump and Seal Reliability

A full listing of courses may be viewed at:

[www.flowserve.com/education-training-catalog](http://www.flowserve.com/education-training-catalog)



### On-site training

Education and training programs are sometimes more effectively deployed at your location, where you can enjoy the time savings and convenience of on-site instruction. More importantly, on-site training allows our Flowserve trainers to incorporate real examples from your environment to drive home important principles. This allows trainees the opportunity to immediately discuss learned techniques and practices in the context of everyday issues and apply these principles under the guidance of Flowserve experts.

### Custom courses

In addition to our standard educational offerings, Flowserve education and training experts can develop or customize an existing course to satisfy your training needs. Because the training is customized, we can address your specific process and equipment issues as part of the course content, increasing its relevancy and effectiveness. Examples of customized training include:

- Decoking system operation and maintenance
- High-energy pumps (e.g., double-double case barrel pumps) operation, maintenance and repair

Many customers choose to engage with Flowserve for extended contracts to ensure all personnel are ultimately taught the principles that will drive a more efficient and profitable plant operation. Certifications can be provided to ensure personnel achieve customer-specified performance standards.

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