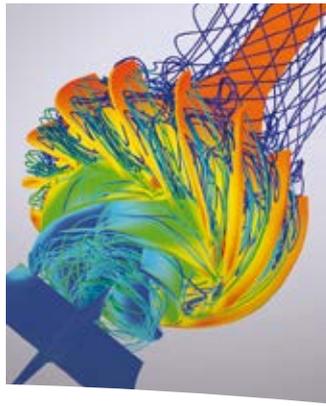




IPS Detect Online Condition Monitoring



Experience In Motion



Pump Supplier to the World

Flowserve is the driving force in the global industrial pump marketplace. No other pump company in the world has the depth or breadth of expertise in the successful application of pre-engineered, engineered, and special purpose pumps and systems.

Life Cycle Cost Solutions

Flowserve provides pumping solutions that permit customers to reduce total life cycle costs and improve productivity, profitability and pumping system reliability.

Market-Focused Customer Support

Product and industry specialists develop effective proposals and solutions directed toward market and customer preferences. They offer technical advice and assistance throughout each stage of the product life cycle, beginning with the initial inquiry.

Broad Product Lines

Flowserve offers a wide range of complementary pump types, from pre-engineered process pumps to highly engineered and special purpose pumps and systems. Pumps are built to recognized global standards and customer specifications.

Pump designs include:

- Single-stage process
- Between bearings single-stage
- Between bearings multistage
- Vertical
- Submersible motor
- Positive displacement
- Vacuum & Compressor
- Nuclear
- Specialty

Product Brands of Distinction

ACEC™ Centrifugal Pumps

Aldrich™ Pumps

Byron Jackson® Pumps

Calder™ Energy Recovery Devices

Cameron™ Pumps

Durco® Process Pumps

Flowserve® Pumps

IDP® Pumps

INNOMAG® Sealless Pumps

Lawrence Pumps®

Niigata Worthington™ Pumps

Pacific® Pumps

Pleuger® Pumps

Scienco™ Pumps

Sier-Bath® Rotary Pumps

SIHI® Pumps

TKL™ Pumps

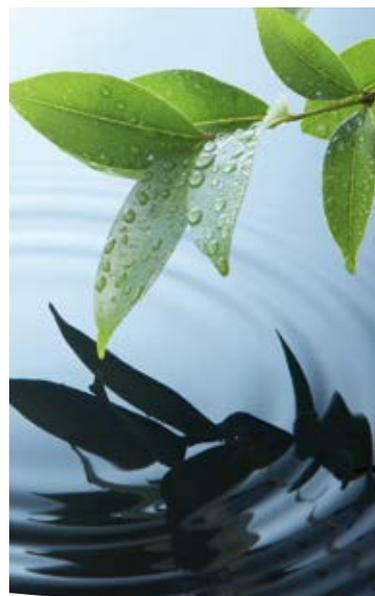
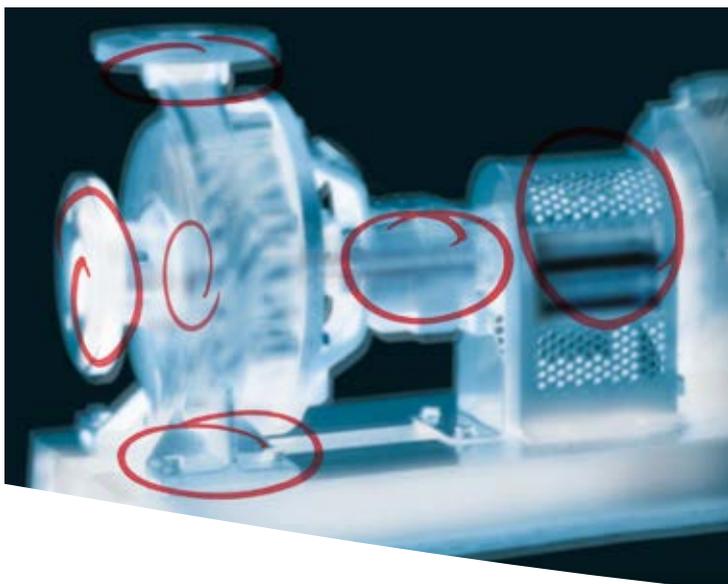
United Centrifugal® Pumps

Western Land Roller™ Irrigation Pumps

Wilson-Snyder® Pumps

Worthington® Pumps

Worthington Simpson™ Pumps



IPS Detect ... Early failure detection

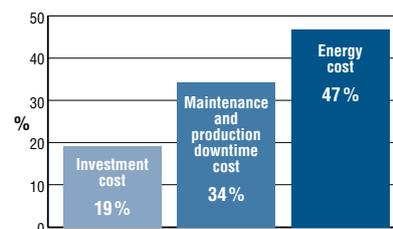
If you look at the life cycle costs of rotating machines, it is clear that, in addition to energy costs, service and maintenance costs present the greatest source of savings potential. The goal here is to reduce service and maintenance costs through the use of efficient and intelligent condition monitoring systems and to avoid high costs due to loss of production.

Early detection and diagnosis of failure maximizes the lead time for maintenance and ensures optimal machine availability, production, efficiency and reliability. Currently, a large number of machines are monitored using hand-held vibration measuring instruments. However, since this method only captures a snapshot of the machine's operating condition, the information obtained can usually only be interpreted by vibration specialists in order to determine a prognosis for the remaining lifetime of the machine.

Through online condition monitoring, the operator can determine the vibration data and thus the operating condition on an ongoing basis. Failure or wear in monitored machines can be detected at an early stage by increased vibration. If the velocities from recent days or weeks are compared with each other, for example, then the remaining lifetime of the machine can be determined. This enables a sudden total loss or production downtime to be avoided.

Maintenance strategies

With an online monitoring system, maintenance work can be planned, expensive consequential damage avoided and system processes optimized. This enables the life cycle costs to be reduced considerably.



Benefits of online condition monitoring

Life cycle costs

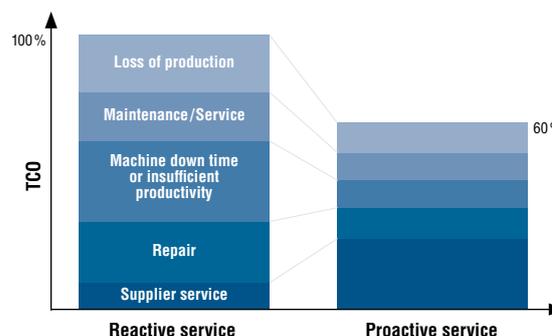
- Minimized maintenance and production downtime costs
- Prevention of total losses

Process optimization

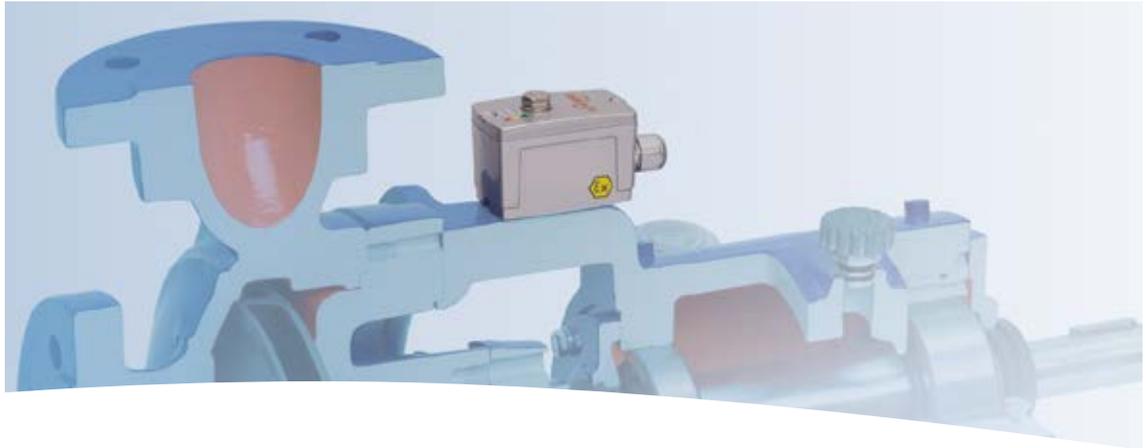
- Production processes
- Condition-based maintenance
- Reduced need for spare parts

System safety

- Minimized risk for people and the environment
- Detection of unacceptable operating conditions



Online, safe and cost-efficient ... the IPS Detect sensor



The IPS Detect sensor is the ideal solution for all rotating machines for which online vibration monitoring has not been used up to now due to cost reasons.

It can be used for all types of machines and is easy to install. The IPS Detect sensor with "Ex ia" ATEX certification is also optionally available for use in zone 1.

The sensor measures the vibration velocity in accordance with DIN/ISO 10816 in the context of preventive maintenance and the acceleration spectrum up to 5.6 kHz; that said, the acceleration spectrum is divided into frequency bands and unacceptable operating conditions (cavitation etc.) are thus detected.



Online monitoring with LED display

The IPS Detect sensor measures vibration velocity and acceleration every 30 seconds (over 1,000,000 measurements per year). Through the intelligent evaluation of this data with the defined boundary values as per DIN/ISO 10816, the machine's condition can be displayed via integrated LEDs. Furthermore, instances of boundary values being exceeded are logged in the sensor's error memory.

Can be used anywhere

- All rotating machines with a speed >240 rpm
- For applications in non-hazardous and hazardous areas
- Compact and easy to install
- Power supply 11 – 30 V DC
- 4 – 20 mA HART® current interface
- Can be used at up to 160/80 °C (320/176 °F)

Cost-efficient

Due to its low investment costs and simple installation, the IPS Detect sensor is a highly cost-efficient alternative to hand-held vibration measurements.

IPS Detect online solutions at a glance

LED display



Distributed control system



Remote diagnosis



Detect operating conditions safely

- Unbalance
- Maximum flow exceeded
- Misalignment of pump and drive
- Mechanical friction of rotating components
- Pipeline forces
- Loose mechanical components
- Bearing wear
- Magnetic coupling desynchronisation
- Coupling wear
- Resonance frequencies
- Cavitation
- Fluid noise

IPS Detect LED display



11 – 30 V DC
Electrical connection box

The basic component of each IPS Detect LED online condition monitoring system is the sensor that is attached to the machine being monitored and provided with a power supply of between 11 and 30 V DC. This power is supplied via the existing electrical connection box that already supply other installed sensors (temperature, pressure, etc.).

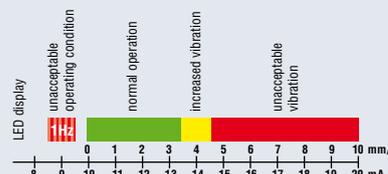
Only the IPS Detect LED sensor is required for a visual on-site display of operating conditions. The condition of each machine is shown by the LEDs on the sensor (green, yellow, red).

Technical data for IPS Detect LED

- Vibration velocity values (RMS 10(4) Hz – 1 kHz; 0 – 20 mm/s) in accordance with DIN/ISO 10816, 5199, 9905
- Condition monitoring at up to 5.6 kHz (normal/unacceptable operating condition)
- 4 – 20 mA HART® current loop
- Installation up to 160 °C (320 °F) surface temperature through cooling units
- LED display green, yellow and red
- Integrated error memory
- Simple installation on pump
- No experience with vibration-measuring technology required
- Installation in hazardous areas (up to zone 1)

Condition information via LEDs

LED normal (green)	normal operation
LED warning (yellow)	increased vibration
LED failure (red)	unacceptable vibration
LED failure (flashing red)	unacceptable operating condition



Simple installation

- Installation of sensor on machine with M8 hexagonal bolt or adhesive adapter
- Electrical connection (11 – 30 V DC)
- Calibration with push button

*IPS Detect
Distributed
control system*



The 4 – 20 mA current interface is used for transferring the IPS Detect data for the integration of online condition monitoring in existing control or process control technology. This data can, of course, also be transferred via wireless technology.

If the transferred data is also to be recorded for subsequent evaluation, the IPS DataUSB trend data memory is also installed. Using IPS Vibrosoft software, the error memory can be read and a professional trend data analysis carried out.

IPS DataUSB trend data memory

- Vibration data for process adjustment
- Long-term data storage
- Direct USB communication
- Evaluate trend data quickly
- Simple power supply



IPS Vibrosoft software

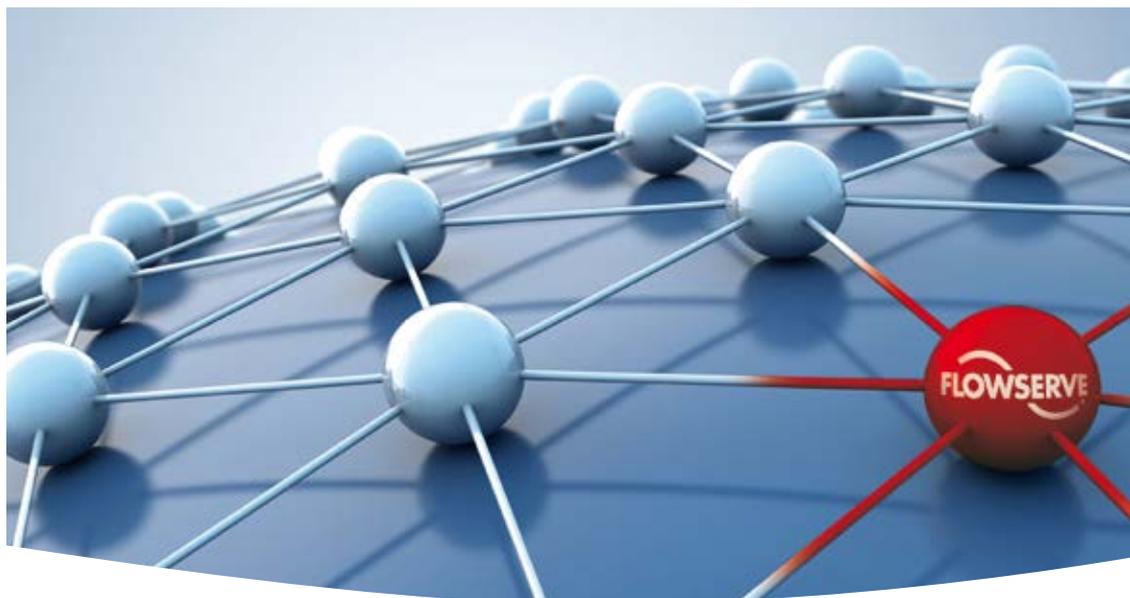
- Condition monitoring
- Configuration
- Error memory
- Data analysis
- EDD/DTM



Options

	Standard	Advanced	Professional			
Condition information	<p>Warning/ Failure via LEDs</p>	<p>Warning/ Failure via LEDs</p> <p>Error memory analysis</p>	<p>Warning/ Failure via LEDs</p> <p>Error memory analysis</p> <p>Trend data analysis</p>			
Installation components	<p>Process control DCS input module</p>	<p>Process control DCS input module</p> <p>Desktop computer/laptop</p>	<p>Process control DCS input module</p> <p>Desktop computer/laptop</p>			
Data transfer	Two-wire cable	Field bus remote IO	LAN	WIFI	EDD/DTM	Wireless HART®

**IPS Detect
Remote diagnosis**

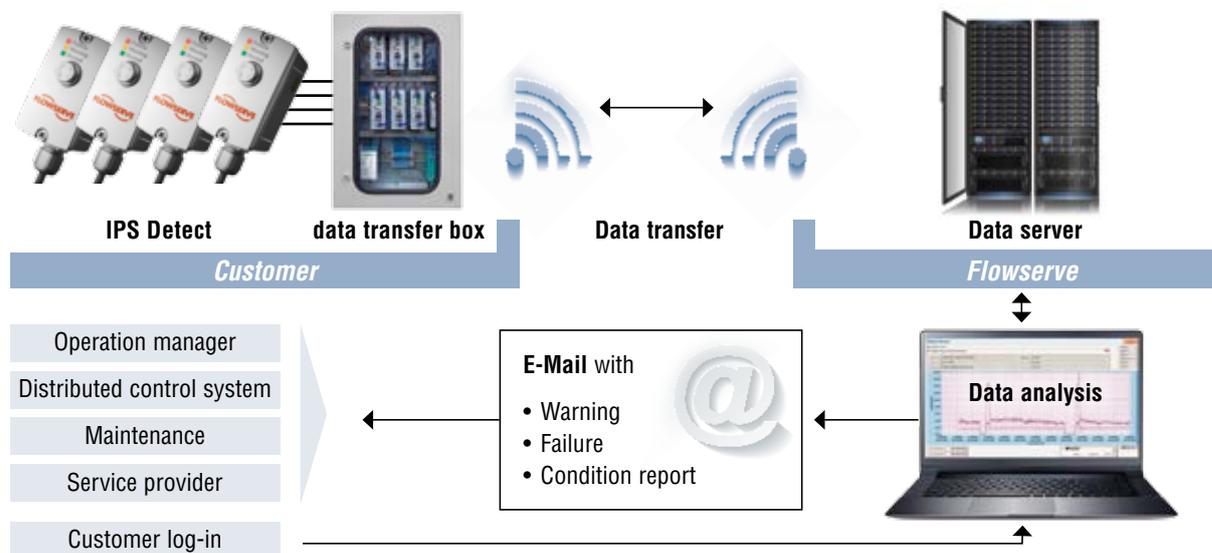


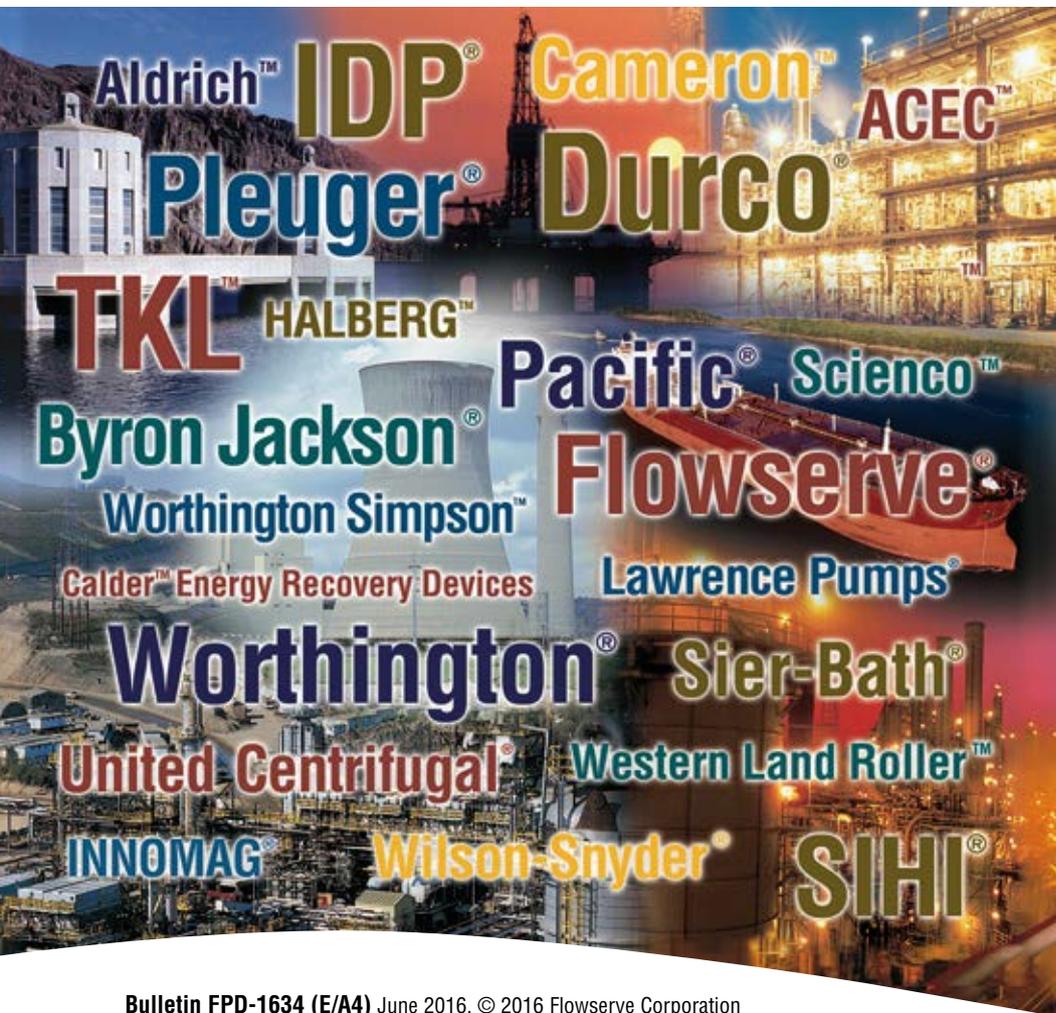
For remote online condition monitoring, we developed the IPS Detect iCMS (intelligent condition monitoring system) service agreement, i.e. the machine to be monitored is equipped with IPS Detect and the data transfer box on site. The measured data are transferred to the data server via the GSM modem and then saved and analyzed by a special software. If there are any deviations from the permissible vibration boundary values, an e-mail containing additional information about the warning or failure message is automatically sent to the customer (operation manager, distributed control system, maintenance, etc.). In the case of a failure message, our vibration experts will develop a detailed analysis of the trend data, through which potential process optimizations can be introduced.

IPS Detect iCMS service agreement

- Two years contract
- Purchase or rental of hardware (sensor and data transfer box)
- Simple installation on site
- 24/7 online condition monitoring (1,000,000 measurements per year)
- Warning and failure messages are sent via e-mail (condition report with measurement protocol)
- Condition reports are sent via e-mail every three months
- Detailed analysis (in the case of failure) by our specialists
- Customer log-in on data server

IPS Detect iCMS





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To find your local Flowserve representative:

For more information about Flowserve Corporation,
visit www.flowserve.com or call +1 937 890 5839.

USA and Canada

Flowserve Corporation
5215 North O'Connor Blvd.
Suite 2300
Irving, Texas 75039-5421 USA
Telephone: +1 937 890 5839

Europe, Middle East, Africa

Flowserve Corporation
Parallelweg 13
4878 AH Etten-Leur
The Netherlands
Telephone: +31 76 502 8100

Latin America

Flowserve Corporation
Martín Rodríguez 4460
B1644CGN-Victoria-San Fernando
Buenos Aires, Argentina
Telephone: +54 11 4006 8700
Telefax: +54 11 4714 1610

Asia Pacific

Flowserve Pte. Ltd.
10 Tuas Loop
Singapore 637345
Telephone: +65 6771 0600
Telefax: +65 6862 2329