

OpreX™ Asset Management and Integrity

Plant Asset Management Cavitation Detection System

A critical aspect in Plant Asset Management

A typical process plant consists of numerous assets such as piping, pumps and valves. All such assets need maintenance, but the timing of maintenance is not always clear. Often, periodic maintenance is scheduled much too frequently. This could be costly if it requires the process to shut down. If operators are fully aware of the health status of all assets, they can accurately determine when maintenance is required rather than performing periodic maintenance inappropriately or, even worse, expensive repair work after a failure.

Healthy assets contribute to the plant's operation, safety and availability. Yokogawa offers a broad variety of measurement instruments, which include self diagnostic functions and algorithms that provide health and operational status information. This information could prevent unnecessary maintenance activity, improve uptime and contribute to a safer operation. But some conditions occur in a plant asset where no measurement device is installed or where traditional measuring principles cannot be applied.



How can cavitation detection contribute to your plant's profitability?

Process industries use large, highly complex pumps. Failure of such process critical pumps could result in downtime costs that exceed \$200,000/day. Therefore, customers closely monitor these pumps and are strongly considering implementation of predictive maintenance solutions.

Since cavitation can damage a pump and result in a performance risk, customers are seeking a reliable solution that allows them to predict and prevent it.

Cavitation sensor data analysis leads to informed decision-making and strengthens operational process management in real-time. This intelligent innovative approach to eliminate cavitation will result in very high ROI for process users.

Cavitation detection features

Conventional cavitation detection methodologies deploy sound sensors or vibration sensors to monitor for abnormalities. By the time they report a problem, cavitation could be well underway. However, the Yokogawa system can accurately detect cavitation much earlier by directly measuring the weak pressure fluctuation as a bubble collapses within the transmitter.



Question

What is the advantage of Yokogawa's cavitation detection methodology compared with conventional one?



Answer

Yokogawa's unique and patented technology enables customers to monitor process conditions in a pump to predict the onset of cavitation even before the first air bubble forms. This early detection of a possible cavitation allows plant operators to take appropriate action and prevent any damage to the pump.



Question

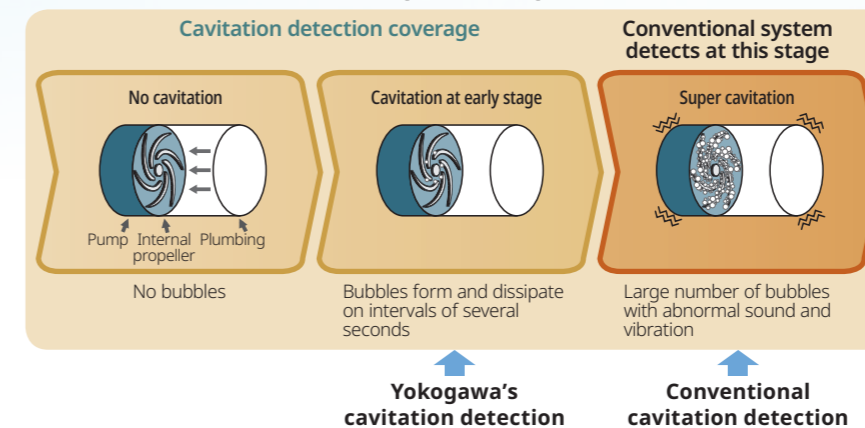
For what types of pumps and liquid the Yokogawa's cavitation detection system is applicable?



Answer

Applicable pump: Centrifugal pump
Applicable fluid: liquid (recommended viscosity range 0.78 to 5.00 mPa·s)
Recommended fluid temperature range: 2 to 50 Celsius degree

Detectable cavitation level (overview)



Liquid type	Viscosity
Ethylene	0.01 mPa·s
Water	1 mPa·s
Kerosene	3 mPa·s
Crude Oil	2,500 mPa·s



Question

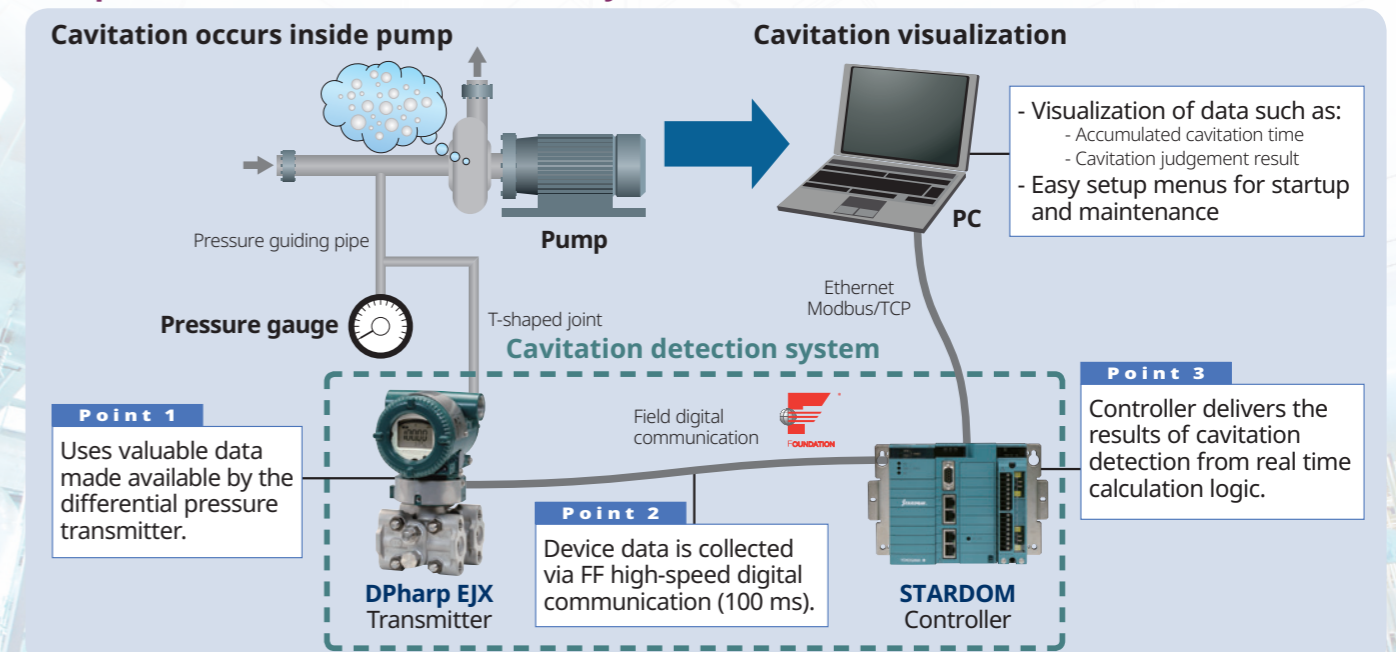
Can I avoid a cumbersome installation that requires piping modifications and difficult commissioning?



Answer

Yes. Yokogawa provides an easy setup mechanism that allows automatic configuration of numerous FOUNDATION™ Fieldbus (FF) equipment settings. This system incorporates unique sensing logic using a high-precision differential pressure transmitter (DPharp EJX) and a controller (STARDOM) that is capable of real-time operation on a 100 ms cycle.

Components of cavitation detection system



OpreX™ Yokogawa achieves operational excellence by providing products, services, and solutions based on the OpreX comprehensive brand that cover everything from business management to operations.

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