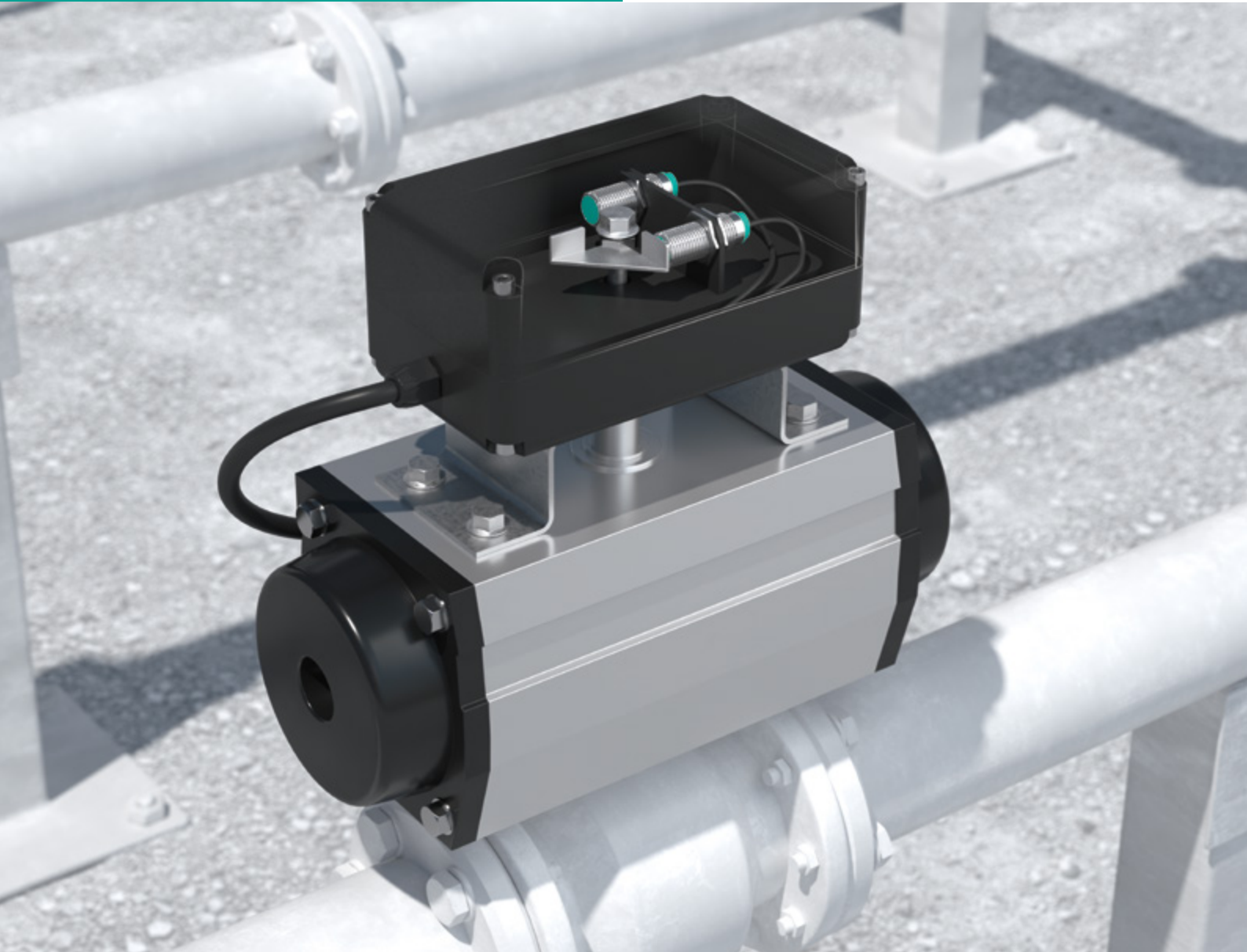


Inductive Meets Speed.

Inductive Distance Sensors
with IO-Link

Predictive maintenance
in high-speed applications
up to 3 m/s.



Your automation, our passion.

 **PEPPERL+FUCHS**

Committed to Tradition: Continuous Innovation in Inductive Sensor Technology

Pepperl+Fuchs has always made inductive sensor technology ready for industrial use. A technology that offers great potential for the future. This also applies to the latest innovation: the inductive distance sensors with speed measurement and IO-Link interface.



Speed as a Success Factor

The first proximity sensor with an inductive measuring principle was developed in Mannheim in 1958. Since then, Pepperl+Fuchs has been the world's leading supplier of inductive sensors for industrial applications and has traditionally been at the forefront of the further development of this technology. With the latest device types, it is now also possible to monitor object speed and acceleration.

Data for Predictive Maintenance







The sensors in the new product portfolio are available with either an analog output (current/voltage) or with IO-Link. With this interface, they provide comprehensive information for condition monitoring and predictive maintenance in addition to distance, speed, and acceleration measurement. IO-Link also enables field-level communication and the integration of the devices into Industry 4.0 applications.



Highlights

- Integrated condition monitoring functions: for example, continuous monitoring of the speed and acceleration of actuating elements
- Enables predictive maintenance of shock absorbers, hydraulic cylinders, valves, etc.
- Comprehensive data and customizable limits for temperature, operating times, and counters via IO-Link
- High measuring speed of up to 3 m/s for the fastest throughput times and increased productivity
- Developed and manufactured in-house, backed by the longest experience on the market, ensuring first-class consulting expertise and continuous innovation

Extract of Technical Data

						
	M8 Series	M12 Series	M18 Series	M30 Series	F33 Series	L2 Series
Search term	NAB*-8GM* NAN*-8GM*	NAB*-12GM* NAN*-12GM*	NAB*-18GM* NAN*-18GM*	NAB*-30GM* NAN*-30GM*	NAB8-F33*	NAN30-L2*
Max. switching distance						
Flush	2 mm	4 mm	8 mm	10 mm	8 mm	
Nonflush	4 mm	7 mm	12 mm	20 mm		30 mm
Measurable velocity						
Flush	0.7 m/s	1.4 m/s	2.7 m/s	2.4 m/s	2.7 m/s	
Nonflush	1.1 m/s	2.1 m/s	3.0 m/s	3.0 m/s		3.0 m/s
Connection	Cable, M8 plug	Cable, M12 plug	Cable, M12 plug	Cable, M12 plug	Cable	M12 plug
Output type	IO-Link					
Linearity	±3 %					
Repeat accuracy	±5 %					



For more information, visit
pepperl-fuchs.com/pf-inductive-speed

Inductive Multitasking

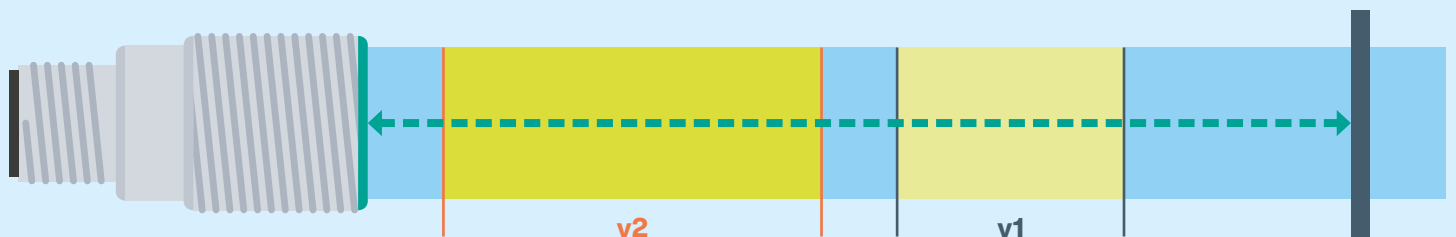
The inductive distance sensors with IO-Link determine the speed and acceleration of actuating elements for the first time, enabling predictive maintenance. Unexpected machine and system failures are avoided and maintenance processes can be planned in a more targeted manner.

Process Data and Additional Information via IO-Link

IO-Link creates the conditions for consistent bidirectional communication between the controller and field device. The interface transmits process and status data in parallel and enables the direct integration of sensors in Industry 4.0 applications.

In addition to the distance values and position, the inductive sensors provide valuable additional information, including temperature, operating times, and counter functions. This allows in-depth analysis and detailed condition monitoring. With freely selectable limit values and filters, the measurement is adapted to the customer application. For example, the accuracy of a measurement or the speed can be prioritized with a corresponding filter mode.

Precise Measurement Data for Optimized Production Processes



Speed Measurement

The sensor carries out two freely configurable speed measurements in one measuring process. Individual limit values can be defined.

Continuous Condition Monitoring in High-Speed Applications

The inductive distance sensors are the first devices of their kind that can also detect speed and acceleration. They measure reliably even at very high object speeds of up to 3 m/s. Two measuring windows can be parameterized in order to obtain an acceleration value for differentiated process monitoring.

The acceleration of an actuating element can be used to draw conclusions about the condition of wearing parts or the degree of soiling. If, for example, a damping element moves more and more slowly, this can be an indication of increasing contamination; increased acceleration can indicate wear or tearing after sticking. This allows the condition of valves, shock absorbers, and other components to be precisely recorded. Parameterized threshold values can trigger timely warnings to avoid damage, prevent unplanned downtime, and trigger timely maintenance operations.

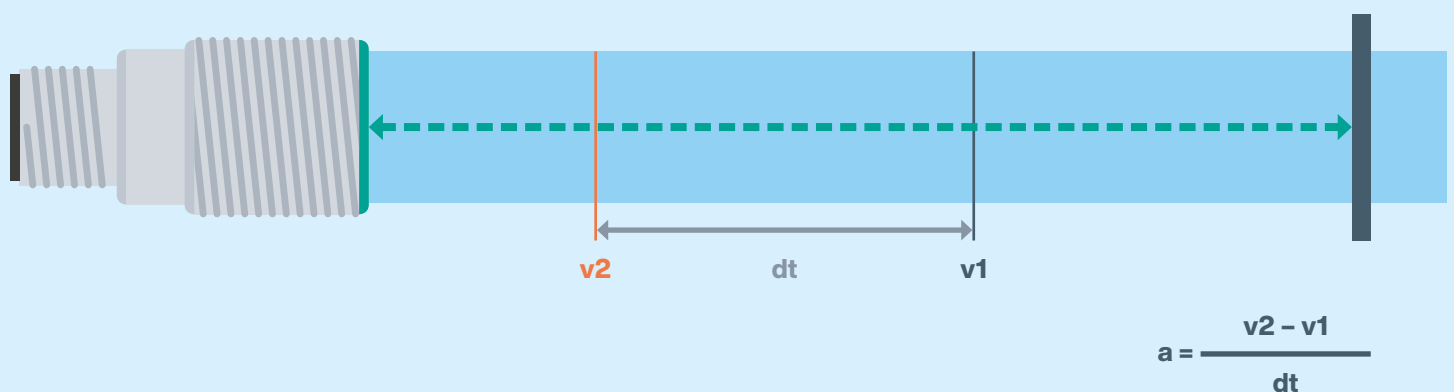
Data via IO-Link Interface

Cyclical:

Transmission of warnings when parameterized limit values are reached

On request:

Transmission of detailed measured values



Acceleration Determination

The acceleration of the object is calculated from the two determined speeds. Individual limit values can be defined.

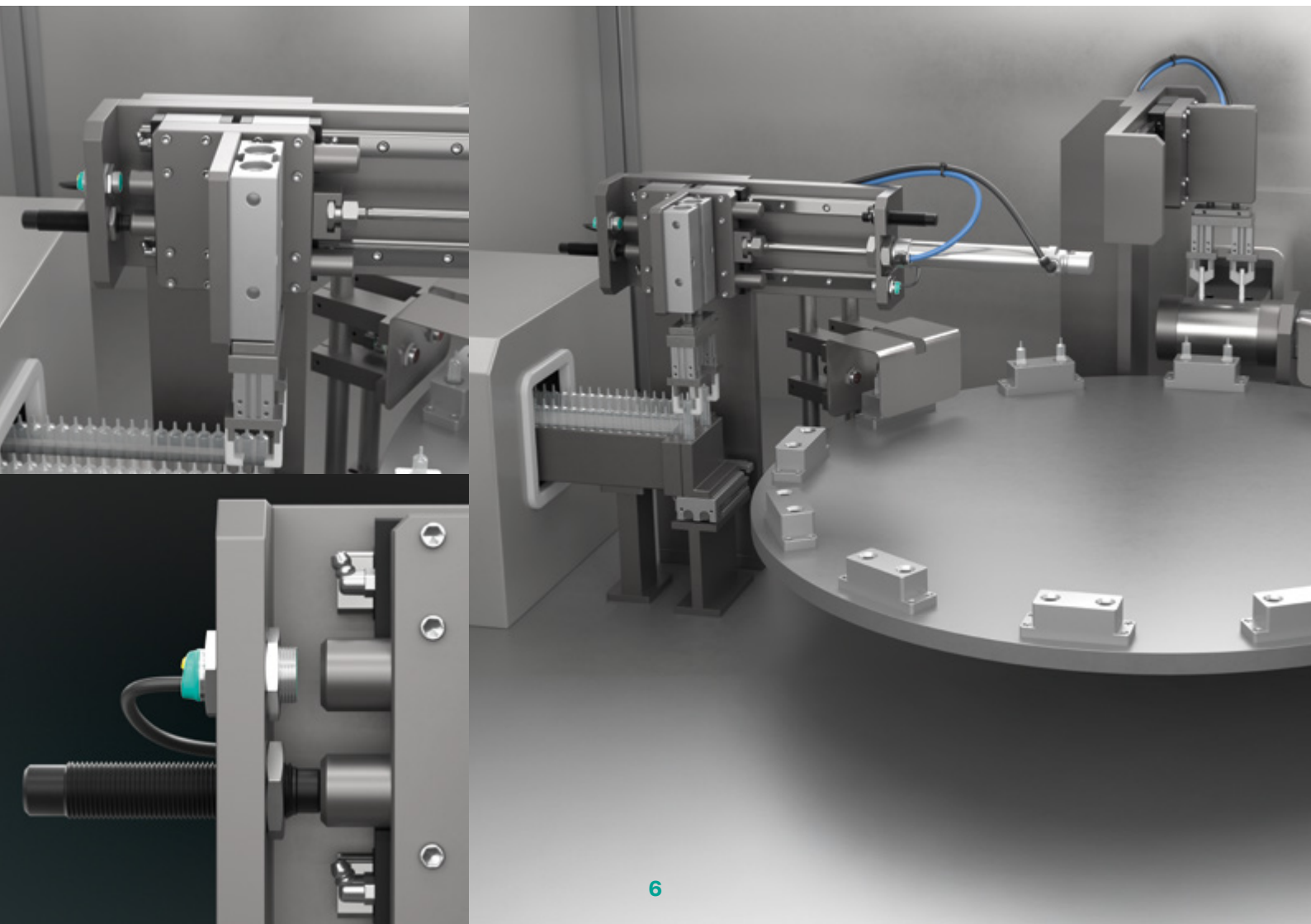
a: Acceleration
v: Velocity
dt: Delta time

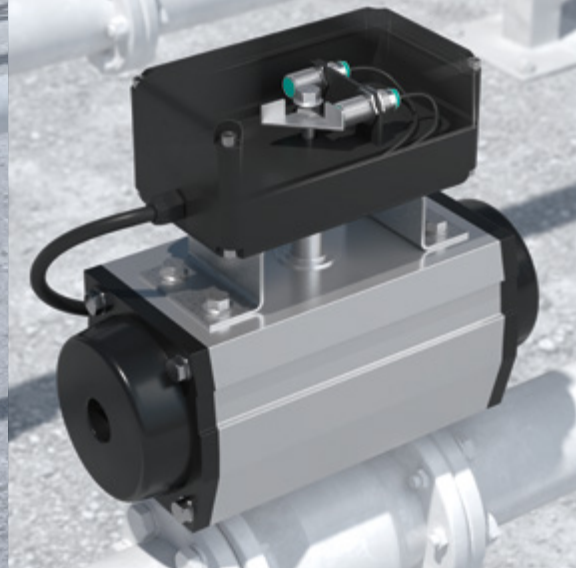
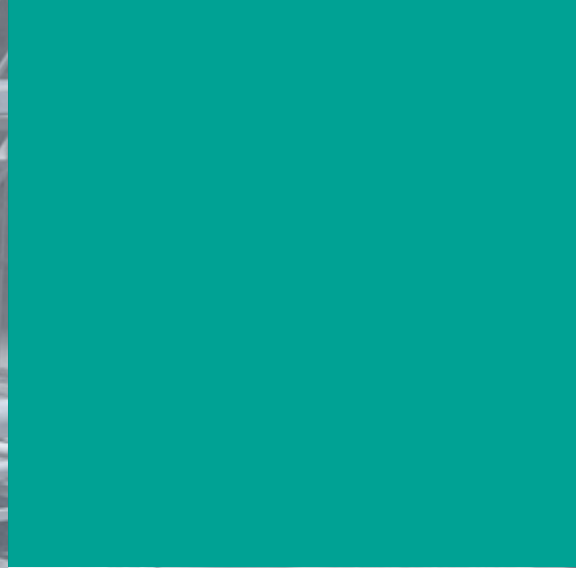
The Application Always in View

The inductive distance sensors with IO-Link continuously provide differentiated information about moving components. This means that the control system always keeps a close eye on critical process steps in machines and systems.

Wear Monitoring for Pick and Place

In pick-and-place applications, such as the production of syringes in the pharmaceutical industry, shock absorbers slow down the movement of certain actuators. At high cycle rates, they inevitably wear out. An inductive distance sensor carries out two speed measurements each time the shock absorber moves and calculates the braking effect as negative acceleration. The degree of wear can be identified based on the measurement data. Maintenance can be planned in a targeted manner to avoid unplanned system downtime.





Valve Position Detection and Progress Analysis

Defined end positions are reached when flaps or valves are opened and closed. Two inductive distance sensors detect not only the valve position, but also the speed of motion. This provides information on soiling and wear of the valve. Predictive maintenance can be planned based on the measured data depending on the condition. Compared to purely time-based cyclical maintenance, this also saves on manpower and costs.

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- Industrial Sensors
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- Enterprise Mobility
- Hazardous Area Products and Solutions

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