Water Industry Catalogue 2025

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ifm electronic

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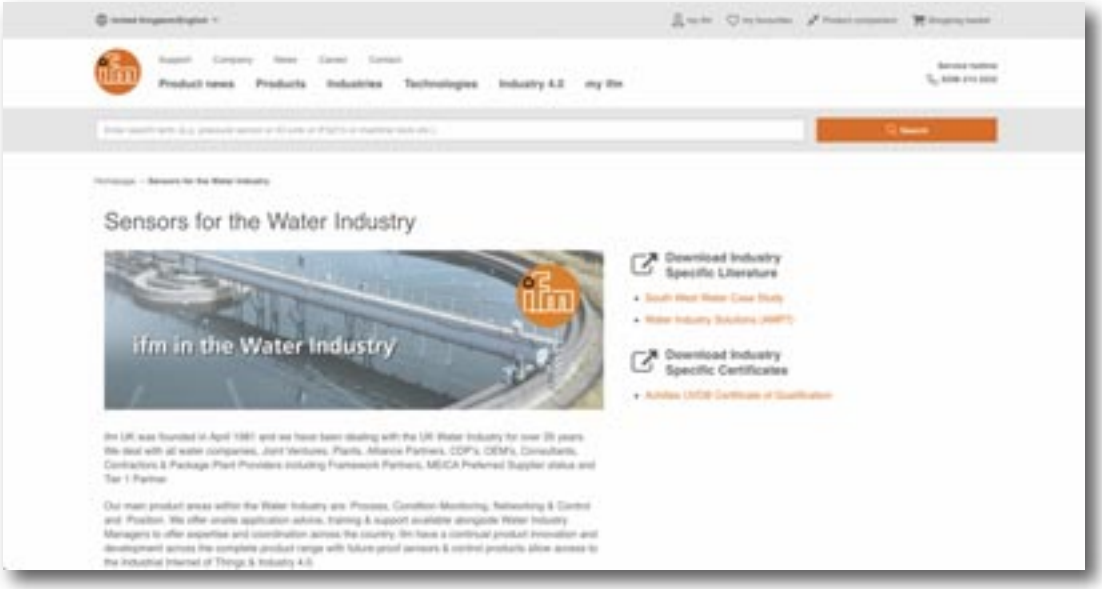
Expertise in the Water Industry

- ifm UK was founded in April 1981
- Dealing with the UK Water Industry for over 40 years
- Deal with all Water Companies, Joint Ventures, Plants, Alliance Partners, CDP's, OEM's, Consultants, Contractors & Package Plant Providers
- Water Companies Framework Partner, MEICA Preferred Supplier status and Tier 1 Partner
- Our main product areas within the Water Industry Process, Condition Monitoring, Networking & Control and Position.
- Onsite application advice, training & support available
- Next day delivery service from our UK based warehouse available, with no minimum order quantity
- Technical Support available on the phone or via email
- 5 year warranty on all ifm catalogue products
- Lunch & Learn, Product Awareness and Technology Open Days available
- Continual product innovation and development across our complete range
- www.ifm.com/uk website allows easy access to datasheets, drawings, wiring & operating instructions, accessories, certification & CAD files
- www.ifm-sensor.co.uk/water is the web page for the products that are most commonly used from ifm in the water industry
- Future-proof sensors & control products allow access to the Industrial Internet of Things & Industry 4.0
- Water Industry Managers to offer expertise and coordination across the country
- eshop ordering allows easy access to order, product availability and reduced carriage

Reg31 approval can be found on our water website www.ifm.com/uk/water



Booster Pumps

As water supply companies strive to maintain minimum delivery pressures and flow volumes for their customers, booster pumps are sometimes needed to support the existing distribution network. ifm's versatile range of electronic pressure sensors allow cost effective monitoring and control.

- **Reliable operation** from devices designed for the most harsh industrial environments
- **Versatile** in both function and connection - outputs to suit switched and or 4-20mA control
- **Cost reducing installation** - with the integral display and versatile outputs, one ifm sensor can replace a traditional switch, gauge and transmitter combination.

High-grade stainless steel

IO-Link

Reg 31 Approved

IP 67 IP 68 IP 69 K

Booster Pump Solution

Outline

Within the water industry, booster pumps are used for the transfer of clean water. To monitor the output of these booster pumps, often three devices are required.

1) Pressure transducer
2) Pressure switch
3) Indicator gauge

Solution

ifm electronic's Reg31 combined pressure sensor with the follow output configuration, switch and or transducer (4..20mA or IO LINK) with integrated Gauge or Display offers a cost effective, low maintenance, easy set up solution.

In some cases the client may only require switching or analogue signal, for these applications, ifm electronic can still offer loop powered transducers and electronic switches without displays

Pressure sensor type PI.

Robust stainless steel housing with hygienic / flush fitting. Programmable analogue and switching output. These units are REG31 certified.

Electronic manometer type PG27.

Rotatable display with LED bar graph for switch point indication. High grade stainless steel allows installation outside and in other harsh conditions. REG31 certified

Cables for all applications

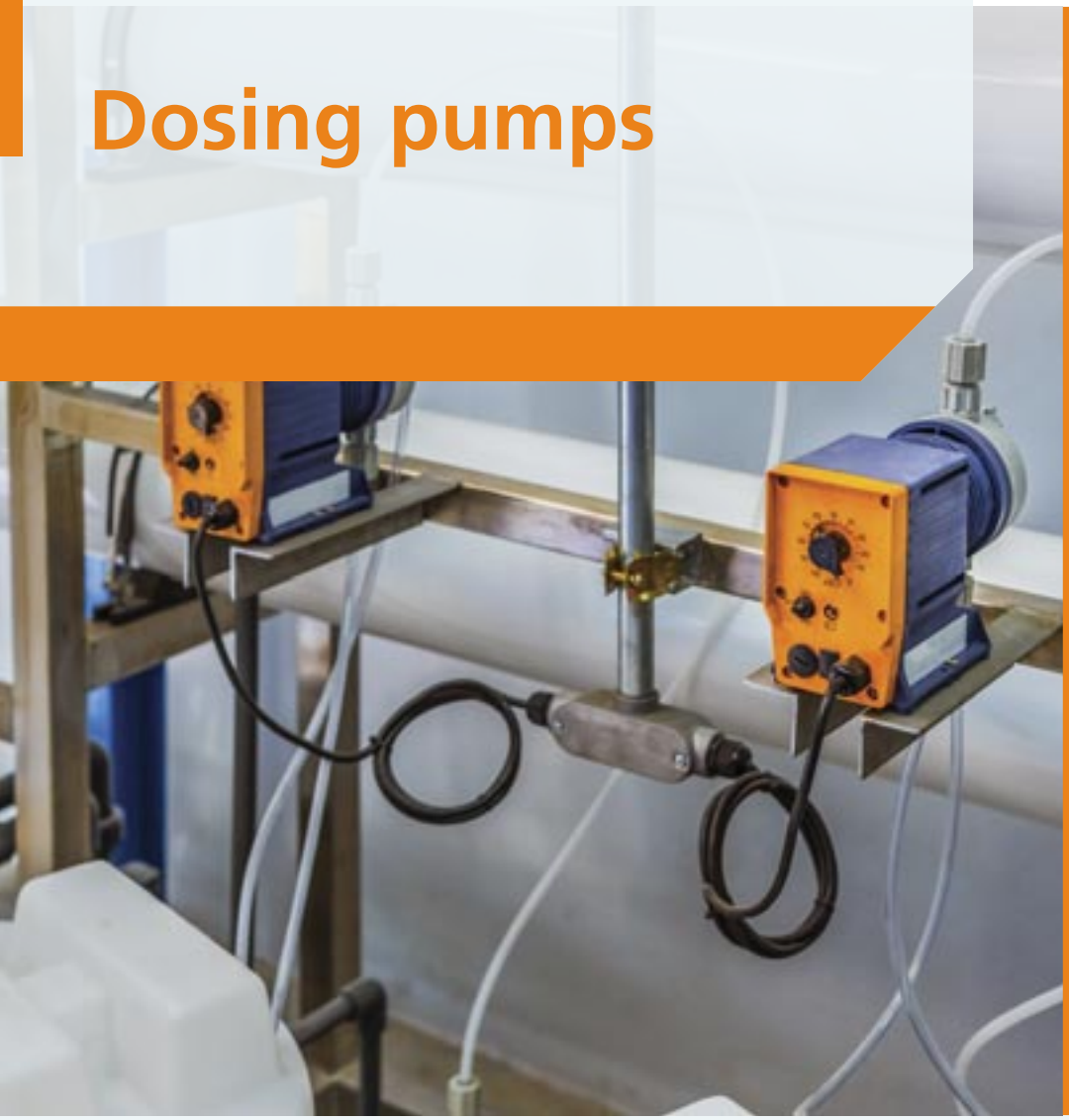
Ifm offer a range of cables suitable for both wet areas, outside and inside use with the very highest of IP ratings

Accessories

Full range of accessoriesfor mounting process sensors

Visit www.ifm.com/uk for full product details and more accessories

Dosing pumps



Dosing pumps are needed to deliver a controlled flow of a wide variety of substances. ifm's range of **electronic flow switches** will confirm correct operation and help ensure control is maintained.

Low flow rates are easily accommodated with the calorimetric sensing principal, down to 2ml/min with appropriate accessories

A **choice of wetted parts** allows most chemicals to be in contact with the flow probe. The choice of titanium ceramic and hastelloy will allow some of the harshest corrosive materials to be used in this application.

IP 67
IP 68
IP 69 K

IO-Link

High-grade stainless steel

Reg 31 Approved

The proven and reliable solution for confirming flow from a dosing pump.

Outline

Within the water industry, the most difficult application for flow sensors is where very low flows in dosing applications are required to be confirmed.

Solution

ifm electronic's range of calorimetric flow sensors have been proven for many years in this application. The choice of stainless steel, titanium and hastelloy will allow some of the harshest corrosive materials to be used in this application. Used in conjunction with the low flow blocks very small flows can be detected with the ifm flow switch.

Compact flow switch type SI.

Reliable monitoring of gases and liquids.

High repeatability.

Simple setting mode for quick set-up.

Flow probe type SF.

Suitable for use in confined spaces. For connection to evaluation electronics types SN / SR.

Cables for all applications

Ifm offer a range of cables suitable for both wet areas, outside and inside use with the very highest of IP ratings.

Accessories

Full range of accessories for mounting process sensors

Visit www.ifm.com/uk for full product details and accessories

Pure Water Applications

Precise process monitoring and full transparency for your process water treatment plants

- With IO-Link, transparency down to each individual sensor via the HMI and the controller
- Optimum resolution even with large measuring ranges
- Reduced sensor variety and thus reduced stock-keeping thanks to IO-Link

High-grade stainless steel

IO-Link

Reg 31 Approved

IP 67 IP 68 IP 69 K

Pure Water Solutions

Outline

Within the water industry, the most challenging application for conductivity sensors is accurately measuring extremely low conductivity in high-purity water, where precise control of flow and temperature is essential.

Solution

Various sensors of the automation specialist ifm are used to monitor the complex treatment process and ensure a permanently high quality of the ultra-pure water. Even the smallest contamination or remineralization could reduce the quality and must be avoided at all costs. The advantage of using ifm: There are no dead spaces causing static water, which could lead to unwanted enrichment. Another challenge is that demineralized water will constantly try to compensate for the unnatural desalinated state by dissolving minerals from the surrounding materials, e.g. from conventional stainless steel walls, which will lead to pitting over time. ifm provides special sensors for ultra-pure water applications. The contacting parts of the sensing face consist of high-grade stainless steel or other materials from which ultra-pure water cannot extract any molecules.

Conductivity sensors type LDL

Conductivity and interface detection type LDL. Early detection of interface between media and cleaning fluids. Temperature output available.

Flow sensors type SU.

Ultrasonic technology suitable for water, oil and glycol solutions. Measurement of non-conductive water also possible. Volumetric flow quantity, total quantity and temperature indication.

Pressure sensor type PN.

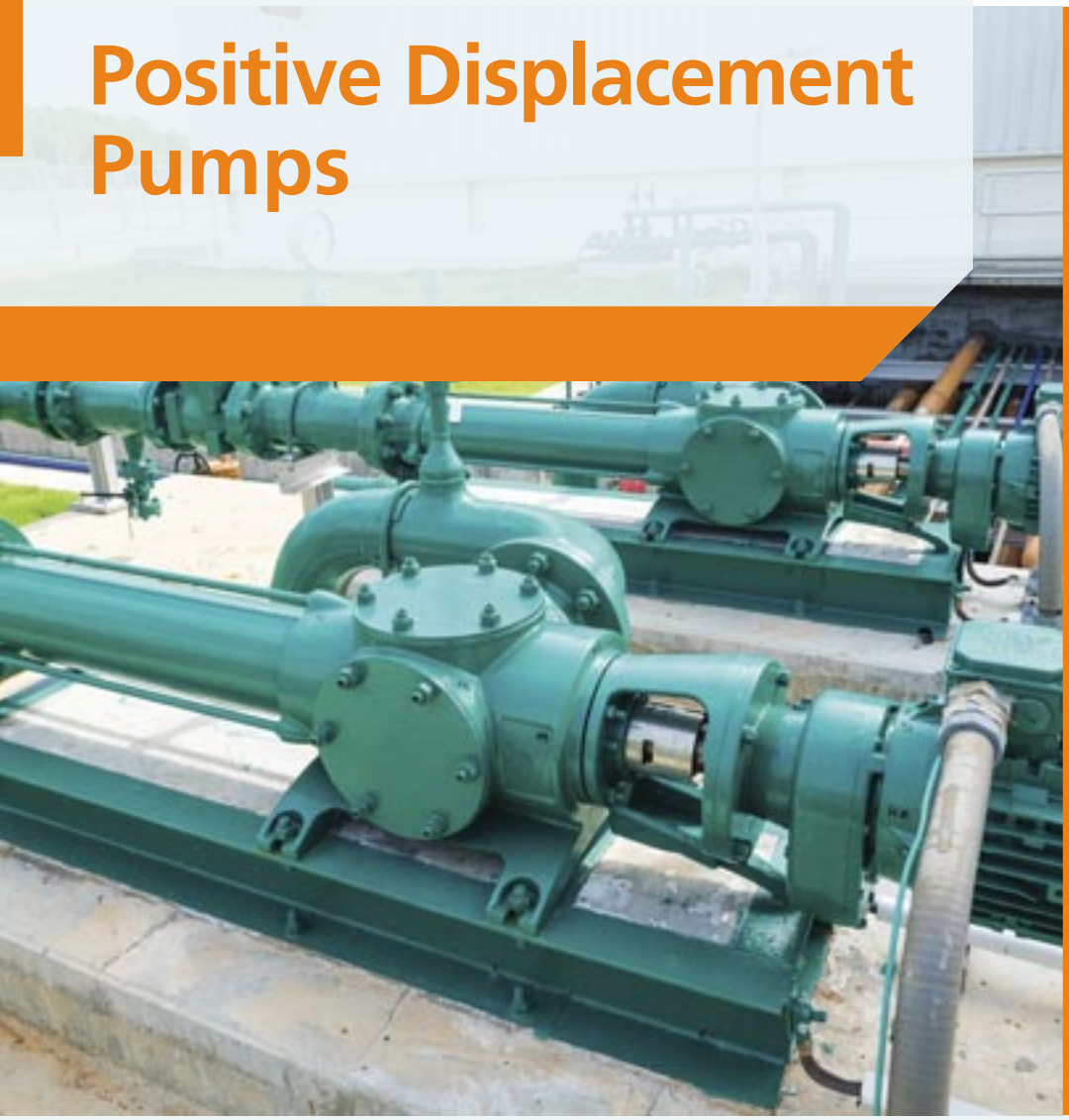
Intuitive, user-friendly handling. Programmable red/green display. Clearly visible indication of the switching status.

Accessories

Full range of accessories for mounting process sensors

Visit www.ifm.com/uk for full product details and more accessories

Positive Displacement Pumps



PD pumps are expensive to repair or replace when the ever present threat of over pressure causes damage. Ifm's range of flush mountable electronic pressure sensors will raise the alarm and allow damage to be prevented.

Reliable operation from tough ceramic sensing element and dependable set points

- **No nuisance tripping** - adjustable onboard time delay removes need for panel mounted timers
- **Cost reducing installation** - with the integral display and versatile outputs one ifm sensor can replace a traditional switch, gauge and transmitter combination.

IP 67
IP 68
IP 69 K

IO-Link

High-grade stainless steel

Reg 31 Approved

The proven and reliable alternative solution to Mechanical switches, gauges and transmitters on PD pumps.

Outline

Within the water industry, positive displacement pumps are used for the transfer of sludge. To protect these pumps against over pressure, pressure switches are used on the outlet of the pump. Because of the high solid content and possibility of blockage it is important to use flush mounted devices.
Flange mounted pressure switches or gauges with diaphragms are often used for indication. Over time, or through mechanical damage it is inevitable that these diaphragms will break causing leakage of sludge into the switches or gauges.

Solution

ifm flush mounted sensor are easily installed either via a flange plate or the ifm weld adaptor. The ifm solution offers a switched and or 4..20mA output, with an integrated display or gauge.

Pressure sensor type PI.

Robust stainless steel housing with hygienic / flush fitting. Programmable analogue and switching output. These units are REG31 certified.

Electronic manometer type PG27.

Rotatable display with LED bar graph for switch point indication. High grade stainless steel allows installation outside and in other harsh conditions. REG31 certified

Cables for all applications

Ifm offer a range of cables suitable for both wet areas, outside and inside use with the very highest of IP ratings.

Accessories

Full range of accessories for mounting process sensors

Visit www.ifm.com/uk for full product details and more accessories

Sludge Tank Level

Water companies are becoming more and more aware of the environmental incidents that can occur from the leaks or spills from sewage treatment plants and especially from holding tanks. .
Ifm's versatile range of electronic pressure sensors allow cost effective monitoring and control.

Reliable operation from devices designed for the most harsh industrial environments

Versatile in both function and connection- outputs to suit switched and or 4-20mA control

Cost reducing installation - with just two ifm sensors replacing the traditional float switches and ultrasonic transmitter combination.

IP 67
IP 68
IP 69 K

IO-Link

High-grade stainless steel

Reg 31 Approved

The proven and reliable solution for the correct indication of level in a sludge tank.

Outline

Within the water industry, sludge tanks are used for the holding of sludge prior to treatment. Normally the tank control uses atleast two or three devices:

1) Low Level mechanical float switch
2) High Level mechanical float switch
3) Ultrasonic Level Transmitter

As these devices are in the Atex area of the tank, they are both costly and difficult to maintain as they are either mounted inside the tank (float switches) or at the top of the tank.

Solution

ifm flush mounted pressure sensors are used to hydrostatically detect the level of the sludge. The digital alarms available from the ifm unit replace the float switches and the second pressure transmitter is scaled to give a 4..20mA output and replaces the ultrasonic device.
As the pressure sensors are mounted on a flange plate they are then flush mounted and no build up on the measuring cell takes place. These units are also mounted at ground level and out of the Atex area, the cost of the devices is not enhanced. Due to the mounting at ground level, there is no need for the stairway to access to the Ultrasonic devices. This alone can save many of thousands of pounds in costs.

Pressure sensor type PI.

Robust stainless steel housing with hygienic / flush fitting. Programmable analogue and switching output. These units are REG31 certified.

Electronic manometer type PG27

Rotatable display with LED bar graph for switch point indication. High grade stainless steel allows installation outside and in other harsh conditions. REG31 certified

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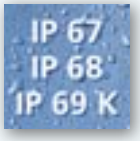
Full range of accessoriesfor mounting process sensors

Visit www.ifm.com/uk for full product details and more accessories

Blowers

Blowers are needed to generate the airflow that is used on aeration and other processes in the water industry. Ifm's range of flow meters and temperature measurement devices (either incorporated in the meter or as a separate device) will confirm the airflow rate and the temperature of the air being delivered. While the ifm pressure transmitters / switches will monitor for over and under pressure and the ifm vibration system will monitor the condition of the rotating elements of the asset.



The proven and reliable solution for confirming flow, temperature and monitoring of the asset.

Outline

Blowers are used in water treatment to supply the oxygen that is needed for treating and stabilising of wastewater, for both bacteria health and removal of gasses.

1) Air flow meter
2) Air flow switch
3) Pressure
4) Vibration Monitoring

Solution

The widely used ifm range of vibration sensors, monitor these assets 24/7 and can indicate well in advance of an impending problem as it develops and before catastrophic failure. The units are mounted inside the acoustic enclosure and there is no need to remove the covers to access the sensors. Please refer to the section in this booklet on Vibration monitoring for more information on the best solution for your needs.

Compact flow sensor type SA.

Optimised for water, oils and air.

Measurement of flow and temperature at the same time.

Red/green colour change display.

Temperature transmitters type TK.

Simple switch point setting by means of two setting rings.

Fast response times.

Pressure sensor type PQ.

Compact housing with display for pneumatic applications.
Clearly readable two colour display.

Accelerometer type VSA.

MEMS accelerometers for connection to VSE modules.

Wide frequency range and high operating temperatures for the requirements of harsh industrial environments.

Diagnostic module type VSE.

6 channel diagnostic modules for monitoring MEMS, IEPE or analogue inputs (4 channels for vibration).

Programmable to monitor and detect specific machine faults.

Sample boards

Throughout the water and effluent treatment processes there is a need to analyse a range of variables such as pH, chlorine, ozone and turbidity, etc. Ifm's range of electronic flow meters will confirm that the sample reaching the analysers is from a continuously flowing source.

Reg 31 Approved

IO-Link

IP 67
IP 68
IP 69 K

High-grade stainless steel

The proven and reliable solution for confirming flow, through the analytical instrumentation.

Outline

Environmental legislation requires that all water is tested to various standards. It is imperative that these instruments are obtaining a constant flow.

Solution

ifm's range of compact inline flow meters offers both switches and or a Transmitter (4..20mA or IO llnk). It can also be configured to measure the temperature of the media passing through the chamber. The unit also offers a fully integrated display of both flow rates and temperature if required.

Flow meter type SM.

Mag-flow technology with volumetric flow quantity, total quantity and temperature indication. High accuracy and repeatability.

Compact flow switch type SI.

Reliable monitoring of gases and liquids.

High repeatability.

Simple setting mode for quick set-up.

Cables for all applications

Ifm offer a range of cables suitable for both wet areas, outside and inside use with the very highest of IP ratings.

Accessories

Wide range of accessories available, including: mounting adapters, T-pieces, regulating valves and protective caps.

This is how it goes: the flawless ifm data avenue

Do you want to know more about the health status of your fans or the best time to change the mechanical sealing of your pump?

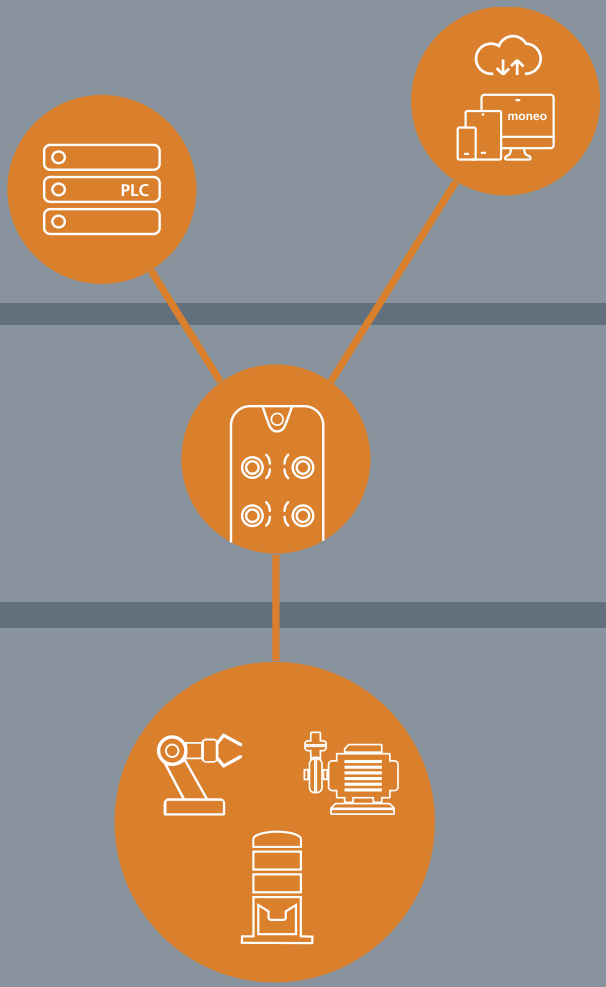
Do you want to be told when your compressor needs maintenance or your cooling circuit has a leak that needs to be fixed? The easiest way to get this information is to let the machines tell you. And the easiest way to get the machines to tell you is to contact us. We know where to put sensors to get the big health picture. We know what infrastructure is needed to get the data to your plc and to your IT level. And we know how to set the alarms to enable you to react early enough to prevent unexpected downtime and save a lot of money.

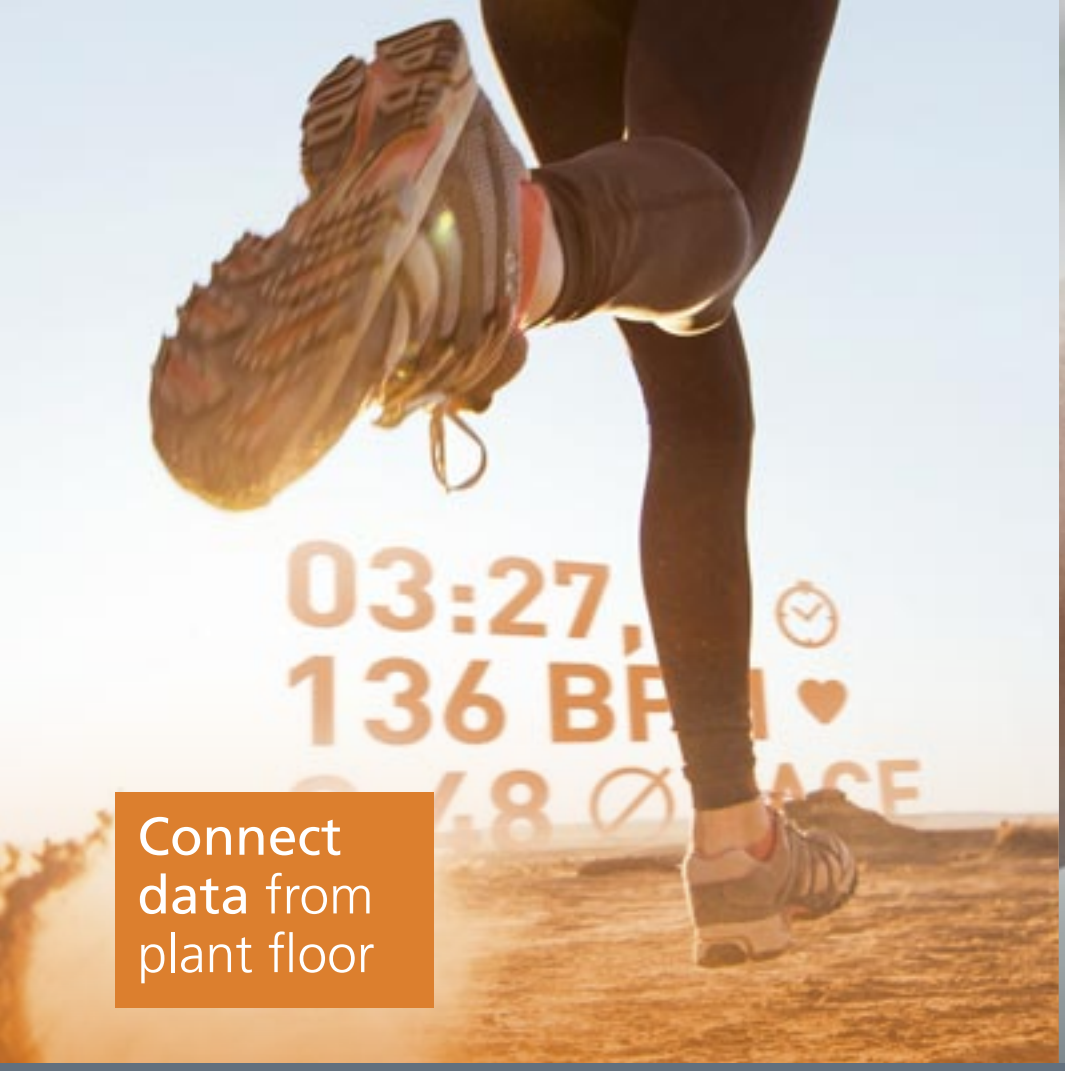
And at the end you will know all this, too.
Sounds good? Your machines say yes!

IT level: Software like the IIoT platform moneo processes the incoming data into value added information that helps the user to optimise his processes like internal and external supply chains or the maintenance management.

Middleware: IO-Link master, diagnostic electronics or edge devices gather and process data and transmit them to any destination where the data is further processed. This can be the plc and at the same time the IT infra-structure with ERP sytems, data memories or the cloud.

OT level: Sensors measure values like pressure, temperature, vibration, level or flow. Modern sensors with IO-Link can submit more than one value and also transmit more information like machine runtime or the number of process cycles.





Utilise the full power of your data

moneo: the IIoT platform for those who care about their plants

„My pulse frequency is 45 per minute when I'm asleep and healthy. If I am ill, it is about 55. Under full exertion, my heart pumps more than three times per second. I run my home course of ten kilometres in less than 50 minutes on a good day and at a temperature of about 20°C. How do I know all that?

The fitness tracker on my wrist collects my body data and my performances on a daily basis and analyses them for me. It helps me understand my body system. I can tell at a glance whether my body can cope with the exertion or whether I'm in the red zone and overexerting."

The sensors on my wrist make my complex human organism transparent to me. While such a thing may have been difficult to imagine in the past, it is hardly anything special for us today. Take a glance at your wrist to check how your body is doing. Just like that.

moneo: the result of a deep understanding of the machine

Monitoring the status and current condition of your machines and plants is very simple. With moneo. For more than half a century, we have had our finger on the pulse of the industry, shaping the evolution of automation. We are now distilling this expertise and in-depth understanding of all kinds of machines and plants from the OT level and combine it with the inexhaustible possibilities of digitalisation. Thanks to our IIoT platform, you can check the condition of your plant at any time. It will show you whether everything is running in the green zone or whether performance is declining, consumption values are getting out of hand or maintenance is required.

Get **actionable insights**

Data becomes information.
Information becomes added value.

Your plant already offers the preconditions for it: sensors permanently provide data on temperature, pressure, level and object presence. In most cases, however, this data only reaches the controller. And this only accounts for about 5 per cent of the wealth of knowledge that is available. Thanks to moneo, you can easily benefit from the remaining 95 per cent. Like a fitness tracker, our IIoT platform collects the incoming data, evaluates it and generates information you can use to optimise your processes and workflows and to optimise maintenance schedules.

Never again in the red

Temperature curves, compressed air consumption, cycle times, operating hours, levels, vibration behaviour – whatever may have an influence on the performance, production quality and energy efficiency of your industrial organism, with moneo, you will be able to act before your investments will run out of steam and before wear, lacking supplies or defects will lead to downtime or before precious energy will escape ineffectively through leaks. That is real added value. It saves money, nerves and time. You can, for example, rather invest the time you save after work to improve your best time on your 10-kilometre home run.

Do you want to understand your machines and plants better and keep them fit? Are you ready for more information, performance and efficiency?

Then start now. With moneo.

www.moneo.ifm

Compact flow sensor for potable water and general flow applications

Flow sensors

Applications:

Pump protection

System flow

Sampling

Air flow switch

Simple, fast and flexible mounting.

The flow sensors of the SI5 series can be integrated into almost every application by means of a wide selection of process adapters. The robust stainless steel housing provides high reliability even in cases of harsh environmental conditions, (Other wetted parts are available).

The unit is unaffected by the orientation of the sensing face with respect to the direction of flow, providing increased flexibility of installation.

Easy handling and high functionality

Adjustment to the flow and setting of the switch points are carried out using pushbuttons. Current flow and switch point are indicated with the local multi-coloured LEDs.

Electronic locking of the settings and factory reset of the parameters provide additional safety.

Setting range liquid / gas [cm/s]	Greatest sensitivity [cm/s]	Medium temperature [°C]	Response time [s]	Repeatability [% of the measured value]	U_b [V]	I_B [mA]	Order no.
Stainless steel wetted parts, M12 connector · output function							
3...300 / 200...3000	3...100 / 200...1200	-25...80	1...10	5 (0...100 cm/s)	19...36 DC	250	**SI0561**
Stainless steel wetted parts, M12 connector · output function - 1 x 3A Relay							
3...300 / 200...3000	3...100 / 200...1200	-25...80	1...10	5 (0...100 cm/s)	85...265 AC	-	**SI0562**
Titanium wetted parts, M12 connector · output function							
3...300 / 200...3000	3...100 / 200...800	-25...80	1...10	5 (0...100 cm/s)	19...36 DC	250	**SI5100**
Titanium wetted parts, M12 connector · output function							
3...300 / 200...3000	3...100 / 200...800	-25...80	1...10	5 (0...100 cm/s)	19...36 DC	250	**SI0553**

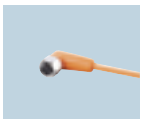
Accessories

Type	Description	Order no.
	Adapter, M18 x M1.5 - G 1/2 - Stainless	**E40096**
	Adapter, M18 x M1.5 - G 1/2 - Titanium	**E40114**
	Adapter, M18 x M1.5 - G 1/2 - Hastelloy	**E40175**
	Weld adapter, M18 x 1.5 - Ø 24 mm - Stainless steel	**E40124**
	Adapter, M18 x 1.5 - Ø 24 mm - Hastelloy	**E40176**
	PVC low flow block optimised for 0.2 to 3.0 l/min (ref to water) and includes E40099 adapter	**E40181**
	PVC low flow block optimised for 0.5 to 7.0 l/min (ref to water) and includes E40099 adapter	**E40182**
	PVC low flow block optimised for 0.02 to 1.0 l/min (ref to water) and includes E40099 adapter	**E40187**

Common technical data

Type SI		
Pressure resistance	[bar]	30
Power-on delay time	[s]	10
Short circuit / reverse polarity protection		• / •
Protection		IP 67, III
Operating temperature	[°C]	-25...80
Switch point setting		via pushbuttons
Optical function indication	LED	10
Sensor material / housing		high-grade stainless steel (316S12) / stainless steel

Connection technology

Type	Description	Order no.
	M12 socket, 5 m orange, PVC cable	**EVT001**
	M12 socket, 5 m orange, PVC cable	**EVT004**
	M12, Str 5m dual keyway PUR cable	**E11250**
	M12, Angled 5m dual keyway PUR cable	**E11248**

Modular flow switch for large pipes or difficult mounting

Flow sensors

Applications:

Pump protection

System flow detection

Air flow switch on aerators

High flexibility

Standardised M12 connections are used to connect control monitor and sensor as well as the supply. This allows the use of an evaluation and display unit in different applications, e.g. for different immersion depths and a wide range of aggressive liquids.

Easy handling and high functionality

Adjustment to the flow and setting of the switch points are carried out by pressing a pushbutton. Flow and switch point are indicated by a multicolour LED display. High repeatability of the switch points offers an optimum choice for use.

Electronic locking of the settings and factory reset of the parameters provide additional safety.

Control monitor for flow sensors of the SF series

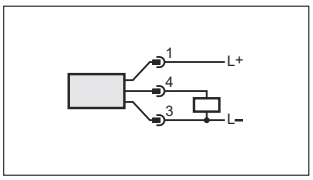
Operating voltage [V]	Current consumption [mA]	Protection	Power-on delay time [s]	Ambient temperature [°C]	Switch point adjustment	Material	Order no.
M12 connector · electrical design DC PNP / AC, relay							
19...36 DC	< 75	IP 67	10	-20...60	via pushbuttons	stainless steel (304S15)	**SR5900**
90...240 AC	< 45	IP 67	10	-20...60	über Taster	stainless steel (304S15)	**SR5906**

Sensors for connection to control monitor

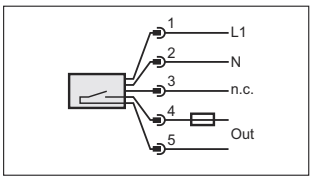
Setting range liquid / gaseous [cm/s]	Medium temperature [°C]	Response time [s]	Temperature gradient [K/min]	Pressure resistance [bar]	Sensor length [mm]	Material	Order no.
M12 connector · process connection adapter							
3...300 / 200...3000	-25...80	1...10	300	300	44	stainless steel (316S12)	**SF5200**
3...300 / 200...3000	-25...80	1...10	300	30	55	stainless steel (316S12)	**SF5201**
M12 connector · process connection clamp adapter · with flexible immersion depth							
3...300 / 200...3000	-25...80	1...10	30	30	191	stainless steel (316S12)	**SF6200**
3...300 / 200...3000	-25...80	1...10	30	30	106	stainless steel (316S12)	**SF6201**
M12 connector · process connection G 1/4 male, G 1/2 male, adapter · for aggressive media							
3...60 / -	5...70	2...20	7	30	12	ceramics*	**SF2405**
3...60 / -	5...70	2...20	7	30	15,5	ceramics*	**SF3405**
3...300 / 200...3000	-25...80	1...10	300	300	44	titanium (3.7035)	**SF5700**
3...300 / 200...3000	-25...80	1...10	300	300	63	titanium (3.7035)	**SF5701**
3...300 / 200...3000	-25...80	1...10	300	300	93	titanium (3.7035)	**SF5702**
3...300 / 200...3000	-25...80	1...10	300	300	143	titanium (3.7035)	**SF5703**
3...300 / 200...3000	-25...80	1...10	300	300	243	titanium (3.7035)	**SF5704**

* aluminium oxide, 99.7 %

Wiring diagram



SR5900



SR5906

Accessories

Type	Description	Order no.
	Protective cover, PP colourless	**E40203**

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket, 5 m orange, PVC cable	**EVT001**
	M12 socket, 5 m orange, PVC cable	**EVT004**
	M12, Str 5m dual keyway PUR cable	**E11250**
	M12, Angled 5m dual keyway PUR cable	**E11248**

Measuring flow rates without any obstacles: the SU Puresonic ultrasonic sensor

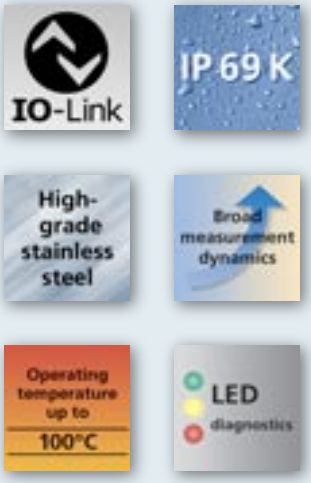
Flow sensors / flow meters

Accurate flow measurement of ultrapure water and water

A robust, component-free measuring pipe made of stainless steel offers high media resistance and permanent ingress resistance

The operating status LED signals the sensor status according to Namur NE107

Conclusions about the process quality are possible on the basis of the signal strength provided



Accurate measurement data even with ultrapure water

The SU Puresonic detects water flow rates with high precision at volumes up to 1000 l/min. Thanks to ultrasound technology, this also applies to ultra-pure water with low conductivity as produced in reverse osmosis plants. In combination with the conductivity sensors of the LDL family, reliable quality control can be established in the filtration process.

The measuring pipe of the SU Puresonic is made of stainless steel and is free of measuring elements, seals and moving parts. This means that faults caused by damage, leaks or blockages, which can occur in mechanical systems such as impellers or turbines, or, design-related pressure drops are excluded from the outset.

Signal strength as a quality and maintenance indicator

The continuously monitored signal strength makes it possible to draw concusions about the quality of the medium or the need for maintenance. A dropping value can be an indicator of an increase in particles in the medium or deposits on the inner wall of the pipe. The signal strength is transmitted acyclically via IO-Link and thus makes it possible to schedule maintenance work or adjust the process sequence at an early stage. This guarantees a high-end product quality. This function is also implemented for conventional systems that do not yet have IO-Link. If the signal strength falls below a predefined level, the device status will change and the sensor will signal this via the diagnostic output and the operating status LED.

LED: device status according to Namur recommendation

Similarly, changes in the device status are indicated by the clearly visible operating status LED. This is how the user on site will also be permanently informed about the health status of the sensor. The colouring corresponds to Namur Recommendation (NE) 107 for self-monitoring and diagnostics of field devices.

Minimising complexity / simple plug & play system

Compared to clamp-on sensors that need to be adjusted to the application depending on their installation situation, the SU Puresonic is a simple plug & play system: Influencing factors such as varying wall thicknesses and pipe materials no longer play a role thanks to the highly accurate inline measurement process. There is no need for time-consuming programming or adjustments, which saves a considerable amount of time during implementation.

Material and design offer maximum flexibility

The stainless steel measuring pipe ensures the SU Puresonic's resistance to a variety of media while the compact design makes the ultrasonic sensor very versatile and easy to use. The dimensions of the measuring and operating unit are kept so narrow that several sensors can easily be installed next to each other in a standard water manifold with a pitch of 50 millimetres.

Relevant process values via IO-Link

In addition to the flow rate and the sensor status, the total flow rate and the temperature are also available via IO-Link.

Measuring range [l/min]	Measuring range [gpm]	Process connection	Order no.
1...240	-	G 1 (DN25)	**SU8020**
5...1000	-	G 2 (DN50)	**SU2020**
1...240	0.25...63.4	G 1 (DN25)	**SU8021**
5...1000	1.32...264.18	G 2 (DN50)	**SU2021**
1...240	0.25...63.4	1" (NPT)	**SU8621**
5...1000	1.32...264.18	2" (NPT)	**SU2621**

Common technical data Type SU		
Pressure rating	[bar]	< 100
Output functions		IO-Link, analogue output 4...20 mA, pulse output, switching output, disgnostic output, totaliser switch point
Input functions		Counter reset
Flow		
Accuracy	[%]	± (1.0 MV + 0.5 VMR)
Repeatability	[%]	± 0.2
Medium temperature	[°C]	-20...100
Monimum condictivity	[µS]	from 0 µS
Temperature		
Measuring range	[°C]	-20...100
Accuracy	[K]	± 2.5

MV = value of the measuring range,
VMR = final value of the measuring range

Accessories

Type	Description	Order no.
IO-Link		
	IO-Link master with PROFINET interface	**AL1100**
	moneo|configure SA Stand-alone licence, software for online and offline parameter setting of IO-Link devices including maintenance and support until the end of the following year	**QMP010**

Additional sensors

Type	Description	Order no.
	Conductivity sensor for water with conductivity from 0.04 µS/cm	**LDL101**

Small bore flow meters

Flow sensors / flow meters

Applications:

Sample boards

Turbidity boards

Some chemical dosing applications

IO-Link

Reg 31 Approved

IP 67

High-grade stainless steel

The SM type flow meter

The new SM4 type flow meter operates according to Faraday's law of induction. The conductive medium flowing through a pipe in a magnetic field generates a voltage which is proportional to the flow velocity or volumetric flow quantity.

This voltage is tapped via electrodes and converted in the evaluation electronics. Its resistant materials mean the sensor is suitable for a multitude of media. A high protecting rating and a robust, compact housing distinguish the sensor in the field.

Design	Process connection	Measuring range [l/min]	Measuring accuracy [% of the final value]	Materials Seal	Pressure rating [bar]	Order no.
M12 connector · electrical design DC PNP / NPN · IO-Link						
	G 1/4	0.005...5	± (0.8 % MW + 0.2 % MEW)	EPDM	16	**SM4120**
	G 1/2	0.05...35	± (0.8 % MW + 0.2 % MEW)	EPDM	16	**SM6120**
	G 3/4	0.01...75	± (0.8 % MW + 0.2 % MEW)	EPDM	16	**SM7120**
	G 1	0.02...150	± (0.8 % MW + 0.2 % MEW)	EPDM	16	**SM8120**
	G 1/4	0.005...3	± (2 % MW + 0.5 % MEW)	EPDM	10	**SM4100**
	G 1/2	0.1...25	± (0.8 % MW + 0.5 % MEW)	EPDM	10	**SM6100**
	G 3/4	0.2...50	± (0.8 % MW + 0.5 % MEW)	EPDM	16	**SM7100**
	G 1	0.2...100	± (0.8 % MW + 0.5 % MEW)	EPDM	16	**SM8100**
	G 2	5...300	± (0.8 % MW + 0.5 % MEW)	EPDM	16	**SM9100**
	G 2	5...600	± (0.8 % MW + 0.5 % MEW)	EPDM	16	**SM2100**

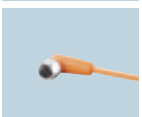
Common technical data

Design SM		
Operating voltage	[V]	18...30 DC
Current consumption	[mA]	< 80
Current rating	[mA]	200
Protection rating, protection class		IP 67, III
Medium temperature	[°C]	0...60
Ambient temperature	[°C]	-10...60
Materials in contact with the medium		high-grade stainless steel (316L/1.4404); PEEK

Accessories

Type	Description	Order no.
	Adapter G 1/4 for G 1/2, high-grade stainless steel (316L/1.4404)	**E40266**
	Grounding clamp for units with M12 connector high-grade stainless steel (316L/1.4404)	**E40234**
	USB IO-Link master for parameter setting and analysis of units Supported communication protocols: IO-Link (4.8, 38.4 and 230 kBit/s)	**E30390**
	Memory plug, parameter memory for IO-Link sensors	**E30398**

Connection technology

Type	Description	Order no.
	M12 socket, 2 m orange, PVC cable	**EVT064**
	M12 socket, 5 m orange, PVC cable	**EVT001**
	M12 socket, 2 m orange, PVC cable	**EVT067**
	M12 socket, 5 m orange, PVC cable	**EVT004**

Mechatronic flow sensors: extremely agile even with highly viscous oils

Flow sensors / flow meters

Precise measurements for viscosities up to 320 cSt

Fast flow or temperature changes do not affect the measurement

High measurement dynamics reduces type versions

For high-pressure applications up to 100 bar

No inlet and outlet pipe lengths required

Measured value transfer without conversion losses and easy setting via IO-Link

Easily withstands even heavy industry's harsh environments

The rougher the process environment, the higher the stress that the sensors need to withstand. For such conditions, the new SB mechatronic flow sensor, specifically suited for highly viscous oils, is the right choice. It provides the perfect combination of accuracy, flexibility and robustness required in heavy industry or in the steel industry. The sensor easily deals with high pressures, temperature fluctuations and air bubbles in the medium.

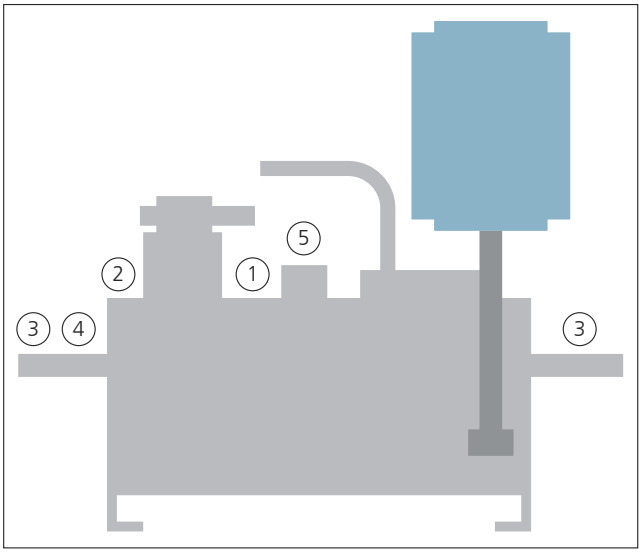
High performance

Due to the use of application-specific mechanics and a complex adjustment carried out during production, the new SB, like all other sensors of this series, is designed for maximum precision and minimum response time. Even with fluctuating temperature and viscosity values, the integrated temperature compensation and special oil calibration guarantee precise measurement results.

Process connection and pressure rating	Order no.		Order no.				Order no.		
	G 3/4 – PN 100		G 1 – PN 100				G 1 1/2 – PN 63		
Max. flow in l/min	**15**	**25**	**15**	**25**	**50**	**100**	**50**	**100**	**200**
ISO VG – 68 cSt	**SB3232**	**SB3233**	–	–	**SB3244**	**SB3246**	–	–	**SB3257**
ISO VG – 150 cSt	–	–	**SB5242**	–	**SB5244**	–	–	**SB5256**	–
ISO VG – 320 cSt	–	–	**SB7242**	**SB7243**	**SB7244**	–	–	**SB7256**	**SB7257**

Further viscosities and flow ranges on request!

Hydraulic applications



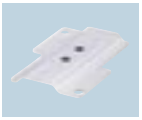
Sensors for installation on the power pack

1) Level sensor + probe
2) Level sensor for point level detection
3) Mechatronic flow meter
4) Pressure sensor
5) Temperature sensor

Common technical data		
Accuracy flow measurement		± 5 % of the final value*
Repeatability		± 1 %
Accuracy temperature measurement		3 K (25 °C; Q > 1 l/min)
Response time	[s]	0.01
Medium temperature	[°C]	up to 100
Pressure rating	[bar]	100
Protection rating, Protection class		IP 65 / IP 67, III
Output signal		IO-Link (configurable), switching output, frequency output flow / temperature

* Q > 1 l/min; 20...70 °C medium temperature

Accessories

Type	Description	Order no.
Installation		
	Label tag, PA	**E30422**
	Protective cover, PP	**E30420**
	Mounting plate for mechatronic flow sensors	**EM0012**
	USB IO-Link master for parameter setting and analysis of units Supported communication protocols: IO-Link (4.8, 38.4 and 230 kbits/s)	**E30390**
Connection technology		
	Socket, M12, 2 m, black, PUR cable	**EVC001**
	Socket, M12, 5 m, black, PUR cable	**EVC002**

Do you want to know the flow? The new generation of vortex sensors

Flow sensors / flow meters

- **Suitable for ultrapure water, water and water-based media**
- **Precise measurement of flow and temperature**
- **Durable and robust thanks to hydrolysis-resistant plastic**
- **High pressure and temperature resistance**

Tried-and-tested principle redesigned

New design, improved robustness and proven precision: with their inner and outer values, the new generation of Vortex sensors convinces all along the line, making the flow measurement of deionised water, drinking water or cooling water more easier than ever before.

Thanks to the new design and new materials, the number of inner seals could be minimised: housing and bluff body are made of one piece, guaranteeing high pressure and temperature resistance.

Process connection	Nominal width	Order no.	
		Seal: FKM	Seal: EPDM
G ½"	DN6	**SV3051**	**SV3151**
G ½"	DN8	**SV4051**	**SV4151**
G ¾"	DN10	**SV5051**	**SV5151**
G ¾"	DN15	**SV6051**	**SV6151**
G 1"	DN20	**SV7051**	**SV7151**
G 1 ¼"	DN25	**SV8051**	**SV8151**

More robust against hydrolysis, pressure and temperature

The material used is characterised by high hydrolysis resistance, which has a positive effect on the service life of the device. In addition, the material is resistant to microbiological attack, which reduces the risk of legionella development, especially in cooling water circuits.

Identical installation dimensions

The installation dimensions correspond to those of the existing Vortex generation, allowing for a smooth changeover to the new generation.

Common technical data		
Outputs		1x 4…20 mA 1x Pt1000
Measuring accuracy water	[%]	Q < 50 % MEW: < 1 (MEW) Q > 50 % MEW: < 2 (MW)
Repeatability	[%]	0.2 (MEW)
Medium temperature	[°C]	-15…125
Pressure rating	[bar]	16 (to max. 90 °C)
Bursting pressure	[bar]	100 (to max. 90 °C)
Materials (wetted parts)		PPS; PPSU; FKM or EPDM
Protection rating		IP65

Q = volume flow
MW = Measuring range value
MEW = Measuring range end value

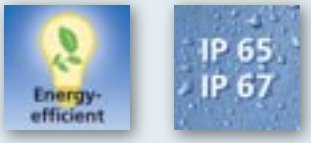
Thermal compressed air flow meter

Flow sensors / flow meters

Applications:

Blowers

Aeration systems



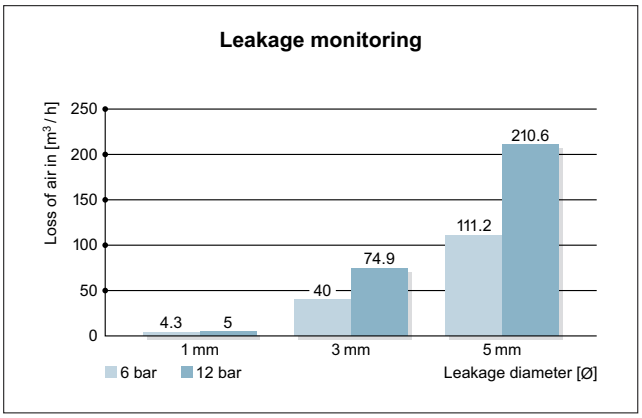
"All-in-one sensor" reduces costs

This new thermal compressed air meter for compressed air in industrial use distinguishes itself as a real all-rounder. It does not only have an integrated temperature sensor but it also features a pressure sensor, allowing the user to read four process values at once (volumetric flow, pressure, temperature, totaliser = total quantity meter) and optimise the production.

Compressed air monitoring at a glance

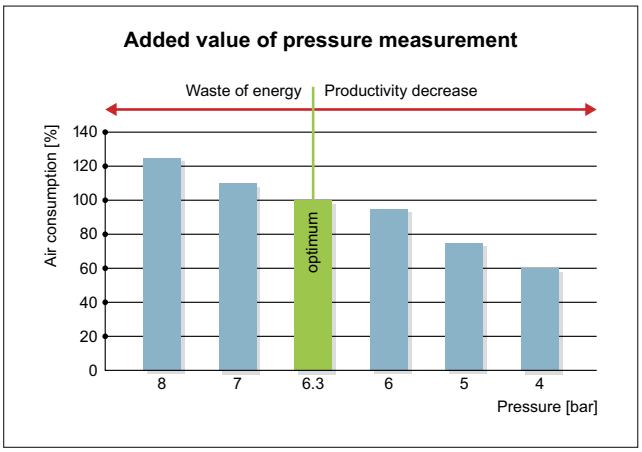
Integration of the SD compressed air meter into the maintenance unit of existing or new installations provides additional advantages. Now the process values of compressed air in industrial use can be effectively monitored in common compressed-air networks via the integrated TFT display, which allows for selection between four different and individually adjustable graphic layouts. The process values can also be transmitted via IO-Link.

Improvement of energy efficiency due to the integrated leakage monitoring in the installation



The SD's precise flow monitoring allows for leakage detection and energy cost savings. In addition, the unit's high repeatability enables exact allocation of the costs of compressed air to the respective production line as well as optimised product cost calculation.

Efficient monitoring of the operating pressure



Thanks to the integrated pressure measurement, both the pressure drop on the polluted filter systems and the compressed air system's general operating pressure can be optimally monitored which is quite important because if the installation comprises actuators that are operated at 5 bar instead of the ideal 6.3 bar, load speed is already reduced by 25%, with productivity decreasing.
On the other hand, an excessive operating pressure does not increase the performance but generates increased consumption of compressed air and increased wear of the unit.

* Applies to the specified article(s) and must be requested when ordering the sensor. Subsequent orders are only possible if the device is returned.

Measuring range [m³/h]	Medium	Process connection	Order no.
0.05...15	Air	G 1/4 (DN8)	**SD5500**
0.25...75	Air	R 1/2 (DN15)	**SD6500**
0.8...225	Air	R 1 (DN25)	**SD8500**
8...2011	Air	Flange DN65	**SDG350**
12...2769	Air	Flange DN80	**SDG450**
19...4667	Air	Flange DN100	**SDG550**
43...10320	Air	Flange DN150	**SDG750**
73...17480	Air	Flange DN200	**SDG850**

Calibration certificate for flow sensors (SD)*	
ISO calibration (6 calibration points)	**ZC0020**
DAkkS calibration (6 calibration points)	**ZC0075**

Common technical data Type SD		
Temperature		
Measuring range	[°C]	-10...60
Accuracy	[K]	± 0.5
Response time T09	[s]	0.5
Pressure		
Measuring range	[bar]	-1...16
Deviation of the characteristics	[%]	< ± 0.5 (BFSL)
Repeatability	[%]	± 0.2
Response time	[s]	0.05
Output signal		switching output, analogue output, pulse output, IO-Link (configurable)

The basis for a comprehensive energy management system according to DIN EN ISO 50001

Following the EU directive on energy efficiency DIN EN ISO 50001, all Member States have undertaken to achieve energy savings. The requirement for obtaining energy tax reductions is the implementation of an energy management system. The standard requires records on measurement equipment calibration to ensure correctness and repeatability of the measured data. Combining the new SD compressed air meter with regular DAkkS calibrations provides the optimum basis for a reliable energy management system.

Reduction of installation, maintenance and hardware costs

Integration of several measuring parameters in just one sensor does not only save considerable hardware costs (pressure sensor, temperature sensor, wiring and input cards) but also installation and maintenance costs.

Pressure sensors with or without display, parameter setting via IO-Link.

Pressure sensors / pressure transmitters

Process connection G1”

Programmable analogue output in 2-wire operation.

Additional switching output in 3/4-wire operation.

High overall accuracy (0.2 %) and electronic temperature compensation.

Reg 31 Approved

IP 67
IP 68
IP 69 K

Flexible and visible
The pressure sensors of the PI27 series with clearly visible LED display can not only be connected as 3- or 4-wire units but also as 2-wire units in a current loop. Reducing wiring complexity in new installations and facilitates exchange in existing 2-wire connections. The PG27 pressure sensors are a 3:1 decide with clear needle gauge, current output and adjustable switch point.

Flush and clean
These sensors are available with a flush G1" fitting meaning they can be used in all applications without there being danger of the port being blocked by the medium.

Flush pressure sensors with Aseptoflex Vario G1 process connection.

Measuring range Relative pressure [bar]	$P_{overload}$ max. [bar]	Analogue start point [bar]	Analogue end point [bar]	Set point SP1 [bar]	Reset point rP1 [bar]	Step increment [bar]	Order no.
Output function switching output PNP/NPN programmable + analogue output programmable							
-1...25	100	-1.00...20.00	4.00...25.00	-0.96...25.00	-1.00...24.96	0.01	**PI1703**
-1...10	50	-1.0...8.0	1.00...10.00	-0.99...10.00	-1.00...9.99	0.01	**PI1704**
-1...4	30	-1.00...3.20	0.02...4.00	-0.994...4.000	-1.000...3.994	0.001	**PI1705**
-0.124...2.5	20	-0.124...1.994	0.382...2.500	-0.120...2.500	-0.124...2.496	0.001	**PI1706**
-0.05...1	10	-0.05...0.80	0.15...1.00	-0.049...1.00	-0.05...0.999	0.001	**PI1707**
-0.0124...0.25	6	-0.0124...0.1994	0.0382...0.2500	-0.012...0.25	-0.0124...0.2496	0.0001	**PI1708**
-1...1	10	-1.000...0.599	-0.599...1.000	-0.997...1	-1...0.997	0.001	**PI1709**
-0.005...0.1	4	-0.005...0.080	0.015...0.1	-0.0049...0.1	-0.005...0.0999	0.0001	**PI1789**

Flush manometer with G1 Aseptoflex Vario process connection

Measuring range Relative pressure [bar]	Extended display range [bar]	$P_{overload}$ max. [bar]	Analogue start point [bar]	Analogue end point [bar]	Set point SP1 [bar]	Reset point rP1 [bar]	Order no.
Output function PNP/NPN programmable + analogue output programmable							
-1...25	40	100	-1.00...33.76	5.24...40.00	-0.96...40.00	-1.00...39.96	**PG2793**
-1...10	16	50	-1.0...13.50	1.5...16.00	-0.98...16.00	-1.00...15.98	**PG2794**
-1...4	6.4	30	-1.00...5.40	0.00...6.40	-0.99...6.40	-1.00...6.39	**PG2795**
-0.124...2.5	4	20	-0.124...3.370	0.500...4.000	-0.120...4.000	-0.124...3.996	**PG2796**
-0.05...1	1.6	10	-0.05...1.35	0.2...1.60	-0.048...1.60	-0.05...1.598	**PG2797**
-0.0124...0.25	0.4	10	-0.0124...0.3376	0.05...0.40	-0.012...0.40	-0.0124...0.3996	**PG2798**
-1...1	1.6	10	-1...1.1	-0.5...1.6	-0.998...1.6	-1...1.598	**PG2799**
-0.005...0.1	0.16	4	-0.005...0.135	0.02...0.16	-0.0048...0.16	-0.005...0.1598	**PG2789**

Flush pressure sensors with Aseptoflex Vario process connection.

Factory setting Measuring range [bar]	Measuring range Relative pressure [bar]	$P_{overload}$ max. [bar]	Analogue start point [bar]	Analogue end point [bar]	Medium temperature [°C]	Repeatability [% of span]	Order no.
Analogue output and IO-Link							
0...25	-1...25	100	-1...20	4...25	-25...125	< ± 0.1	**PM1703**
0...16	-1...16	75	-1...12.8	2.2...16	-25...125	< ± 0.1	**PM1714**
0...10	-1...10	50	-1...8	1...10	-25...125	< ± 0.1	**PM1704**
0...6	-10...6	30	-1...4.8	0.2...6	-25...125	< ± 0.1	**PM1715**
0...4	-1...4	30	-1...3.2	-0.2...4	-25...125	< ± 0.1	**PM1705**
0...2.5	-0.125...2.5	20	-0.125...2	0.375...2.5	-25...125	< ± 0.1	**PM1706**
0...1.6	-0.1...1.6	15	-0.1...1.28	0.22...1.6	-25...125	< ± 0.1	**PM1717**
0...1	-0.05...1	10	-0.05...0.8	0.15...1	-25...125	< ± 0.1	**PM1707**
-1...1	-1...1	10	-1...0.6	-0.6...1	-25...125	< ± 0.1	**PM1709**
0...0.25	-0.0125...0.25	10	-0.0125...0.2	0.0375...0.25	-25...125	< ± 0.1	**PM1708**
0...0.1	-0.005...0.1	4	-0.005...0.08	0.0015...0.1	-25...125	< ± 0.1	**PM1789**

Pressure sensors with display and G 1/4 external thread.

Measuring range Relative pressure [bar]	$P_{overload}$ max. [bar]	Analogue start point [bar]	Analogue end point [bar]	Set point SP1 [bar]	Reset point rP1 [bar]	Step increment [bar]	Order no.
Two switching outputs, one of them programmable as IO-Link and one as analogue							
0...100	300	0...80	20...100	0.6...100	0.2...99.6	0.2	**PE2592**
-1...25	150	-1...20	4...25	-0.85...25	-0.95...24.9	0.05	**PE2593**
-1...10	75	-1...8	-1...10	-0.94...10	-0.98...9.96	0.02	**PE2594**
-0.125...2.5	20	-0.125...2	0.375...2.5	-0.11...2.5	-0.12...2.49	0.005	**PE2596**
-1..1	10	-1.0...0.6	-0.6...1.0	-0.985...1.000	-0.995...0.990	0.005	**PE2599**

PQ Cube pressure sensor sets new standards

Pressure sensors / pressure transmitters

- **Clearly visible display**
- **Two-colour display of the process values to identify the acceptable range**
- **Easy mounting using accessories**
- **Devices with switching output, analogue output and IO-Link**
- **Various pressure ranges available**

IO-Link

IP 65

Robust in every corner
The robustness of the PQ Cube makes it the ideal choice for use on vacuum grippers and all other pneumatic applications. Whether it is the IP65 housing, the brass sockets or the proven accurate, dust and dirt resistant measuring cell – everything is designed for permanent use in demanding industrial environments.

TFT display: convenient data visualisation
At the same time, we have not compromised on comfort: On the 1" TFT display you can read all relevant data and information in clear writing. A nine-language installation wizard helps you set it up.

Pressure sensors with display

Measuring range [bar]	Outputs	Process fitting	Order no.
Communication interface IO-Link 1.1 COM 3			
-1...10	2 switching outputs DC PNP/NPN	G1/4	**PQS812**
-1...1	2 switching outputs DC PNP/NPN	G1/4	**PQS816**
-1...0	2 switching outputs DC PNP/NPN	G1/4	**PQS819**
-1...10	1 switching output + 1 analogue output 4...20 mA / 0...10 V / 1...5 V	G1/4	**PQC812**
-1...1	1 switching output + 1 analogue output 4...20 mA / 0...10 V / 1...5 V	G1/4	**PQC816**
-1...0	1 switching output + 1 analogue output 4...20 mA / 0...10 V / 1...5 V	G1/4	**PQC819**

Chemical resistant seal for ifm pressure sensors

Pressure sensors

Applications:

Chemical tanks

Brine tanks

High-grade stainless steel

IP 67
IP 68
IP 69 K

Resistant to aggressive media

Low pressure chemical seal for aggressive media

The seal has a minimum span of 0.6 bar due to the increase in the actual measuring diaphragm. This allows accuracy to be maintained as the displacement area of the diaphragm has been increased. There are many different flange options available, also a ½" threaded version.

The diaphragm and wetted parts can be either manufactured or coated with the following:

Hastelloy C276, Inconel 625, Monel 400, Tantalum (Diaphragm only), Titanium, Zirconium, Gold Plating, Rhodium Plating, PFA Coating (Diaphragm only), PTFE foil and liner.

Please contact ifm Technical department to discuss your requirements

Options	
Speak to ifm to discuss your requirements	
Diaphragm material	Stainless steel AISI 316 Ti, Titanium, Monel, Hastelloy-C, Tantalum, Nickel
Bottom housing	Stainless steel AISI 316 covered PTFE (TE1000P model), PVC, Monel, Hastelloy-C, PVDF
Capillary tube	Stainless steel AISI 316 or covered stainless steel, flexible, max length 6m
Ranges	0/400 bar mod.

Common technical data		
Seal		Stainless steel AISI 316
Sealing ring		Viton x T. max 250°C, Inconel / Silver x T.max 400°C
Diaphragm		Stainless steel AISI 316
Ranges	[°C]	-40...250
Accuracy		At 20°C or at temperature stated when ordering ±0.5% for direct line, ±1% for flexible line
Process connection		½" threaded BSP / NPT male or femal
Flushing connection		⅛" NTP upon request

Connection technology

Type	Description	Order no.
	M12 socket, 2 m orange, PVC cable	**EVT064**
	M12 socket, 5 m orange, PVC cable	**EVT001**
	M12 socket, 2 m orange, PVC cable	**EVT067**
	M12 socket, 5 m orange, PVC cable	**EVT004**

Submersible hydrostatic level measurement

Pressure sensors

Applications:

Storage towers

Storage tanks

Reservoirs

Application areas

The PS series submersible pressure transmitters are used for level measurement in containers, tanks, wells, flowing water, bore holes and wastewater plants. The accuracy of 0.5 % and the long-term stability of 0.2 % per year contribute to the reliable operation of the transmitter.

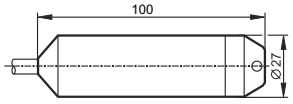
Robust, reliable and flexible

All submersible pressure transmitters have a robust high-grade stainless steel housing. For applications where a high resistance to media is requested (e.g. slurry, oils or fuels) the FEP cable is available.
The ATEX submersible pressure transmitters of the PS3xxA series are designed for level measurement in areas subject to explosion. The sensors can be used in zone 0, 1, 2 or zone 20, 21, 22.

Measuring range Relative pressure [bar]	Overload pressure [bar]	Pull force cable	Cable length [m]	Reg31 approval	Order no.
Submersible pressure transmitters with PUR cable for standard applications					
0.25	2	1000 N	5	•	**PS3208**
0.6	4	1000 N	10	•	**PS3407**
0.6	4	1000 N	15	•	**PS3427**
0.6	4	1000 N	30	•	**PS3607**
1	5	1000 N	15	•	**PS3417**
1	5	1000 N	30	•	**PS3617**
Submersible pressure transmitters with FEP cable for high resistance to media					
0.25	2	500 N	5	–	**PS4208**
0.25	2	500 N	10	–	**PS4408**
0.6	3	500 N	10	–	**PS4407**
0.6	3	500 N	20	–	**PS4506**
1	5	500 N	15	–	**PS4417**
1	5	500 N	30	–	**PS4607**
Submersible pressure transmitters with FEP cable for hazardous areas					
0.25	2	500 N	5	–	**PS308A**
0.6	4	500 N	10	–	**PS307A**
1	5	500 N	15	–	**PS317A**

Dimensions

Example PS3208



Accessories

Type	Description	Order no.
	Cable fixing clamps *	**E30399**
	Filter element *	**E30400**
	Splitter box * with vent and terminal block	**E30401**
	Additional weight, approx. 500 g	**E30402**

* use only outside the hazardous area

Further technical data		
Operating voltage	[V DC]	18...30
Analogue output	[mA]	4...20
Accuracy / deviation (in % of the span)		
Accuracy (BFSL)		≤ 0.25 (PS3: 0.5)
Accuracy incl. non-linearity		≤ 0.5 (PS3: 1)
Non-linearity (BFSL)		≤ 0.2
Long-term stability per year		≤ 0.2
Temperature coefficients (TEMPCO) (in % of the span per 10 K)		
Greatest TEMPCO of zero		≤ 0.2
Greatest TEMPCO of the span		≤ 0.2
Design PS3 Ambient temperature / Medium temperature	[°C]	-10...50
Design PS4 Ambient temperature / Medium temperature	[°C]	-10...85
Design PS3 ATEX approval		**1G, 1/2G, 2G:** T6 -10...60, T5: -10...80, T4: -10...85
Ambient temperature / Medium temperature	[°C]	**1D, 1/2D, 2D:** -10...40 (750 mW) / -10...70 (650 mW) / -10...85 (550 mW)
Housing material		High-grade stainless steel (316Ti / 1.4571)

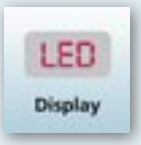
Modular temperature monitor with display

Temperature sensors

Applications:

Bearing temperature monitoring

System water temperature



One unit for many sensors

The TR evaluation unit is a universal control and display unit for connection of PT100 / PT1000 sensors (TT, TM and TS series)

Automatic detection of the probe

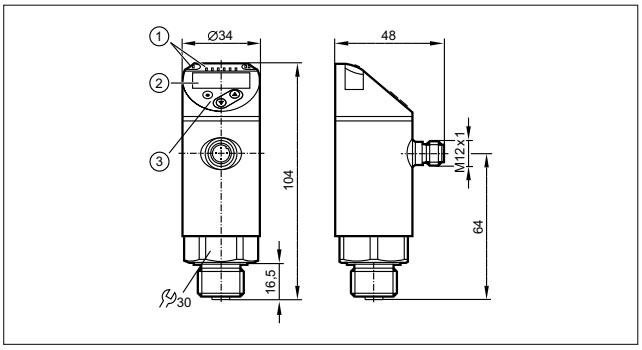
The evaluation unit automatically detects whether two-wire, three-wire or four-wire Pt100 or Pt1000 sensors are connected.

Wide measuring range

Thanks to the extended measuring range of -100...600 °C, an enormous number of common temperature measurement and monitoring tasks in the manufacturing and process industries can be solved. And, of course, ifm also offers the corresponding temperature sensors.

Measuring range [°C]	Factory setting [°C]	Process connection	Pressure resistance [bar]	Response dynamics T05 / T09 [s]	Order no.
Output function 1 x NO / NC programmable · 1 x analogue output 4...20 mA or 0...10 V programmable					
-100...600	-40...300	G 1/2 A	depends on the connected sensor		**TR2439**
Output function 2 x NO / NC programmable					
-100...600	-40...300	G 1/2 A	depends on the connected sensor		**TR7439**

Dimensions



1) LEDs (display unit / switching status)
2) 4-digit alphanumeric display / alternating indication of red and green
3) Programming buttons

Accessories

Type	Description	Order no.
	Protective cover for fluid sensors with M12 connector, polypropylene homopolymer	**E30420**
	Mounting clamp, Ø 34 mm, PBT	**E10017**
	Mounting clamp, Ø 34 mm, PA	**E10193**

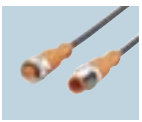
Connection technology

Type	Description	Order no.
	Socket, M12, 2 m black, PUR cable	**EVC001**
	Socket, M12, 5 m black, PUR cable	**EVC002**
	Socket, M12, 2 m black, PUR cable	**EVC004**
	Socket, M12, 5 m black, PUR cable	**EVC005**

Further technical data		
Operating voltage	[V]	18...32 DC
Current rating	[mA]	250
Accuracy	[K]	± 0,3 + (± 0,1 % MS)
Resolution display	[K]	0,1
Electrical design		PNP / NPN
Protection		IP 67
Communication interface		IO-Link

Temperature sensors for connection to the TR type		
Version High-temperature cable sensor	**Installation length [mm]**	**Order no.**
2 m, PFA / PTFE cables	100	**TS2451**
2 m, PFA / PTFE cables	150	**TS2452**
2 m, PFA / PTFE cables	200	**TS2453**
2 m, PFA / PTFE cables	250	**TS2454**

IO-Link accessories

Type	Description	Order no.
Included in the set		**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

Compact 4...20mA transmitter with display

Temperature sensors

Applications:

System water temperature

Cooling systems

Lubrication temperature monitoring

Extremely fast, robust and flexible

The compact TN type temperature sensors are distinguished by excellent response times, high pressure resistance and integrated process connections. The sensors easily resist applications with temperatures up to 150 °C and high pressure loads up to 400 bar. The measuring range is freely scalable.

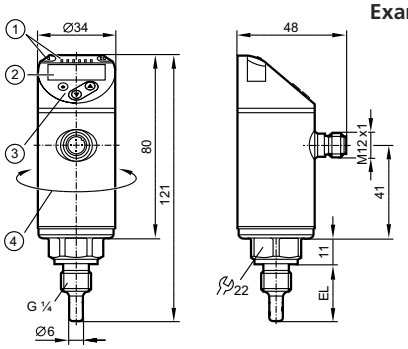
Updating a classic

What is new is the quick and easy handling via three pushbuttons. The display can be switched from the indication of "red" to an alternating indication of "red - green". So, switching states can be highlighted or an independent colour window can be created. The sensor head can be rotated and offers optimum readability from any position. Thanks to captive laser labelling on the stainless steel housing, the units can still be identified after years.

Process connection	Pressure resistance [bar]	Installation length [mm]	Measuring range [°C]	Factory setting [°C]	Order no.
Output function 1 x NO / NC programmable · 1 x analogue output 4...20 mA or 0...10 V programmable					
M18 x 1.5 I	300	45	-50...150	-40...150	**TN2511**
Output function 2 x NO / NC programmable					
M18 x 1.5 I	300	45	-50...150	-40...150	**TN7511**
Output function 2 x NO / NC programmable or 1 x NO / NC + 1 x analogue (4...20 mA / 0...10 V; scalable)					
G 1/2	300	30	-50...150	-50...150	**TN2405**
G 1/2	300	50	-50...150	-50...150	**TN2415**
G 1/2	160	100	-50...150	-50...150	**TN2435**
G 1/2	160	150	-50...150	-50...150	**TN2445**
1/2" NPT	300	30	-50...150	-50...150	**TN2303**
1/2" NPT	300	50	-50...150	-50...150	**TN2313**
1/2" NPT	160	100	-50...150	-50...150	**TN2333**
1/2" NPT	160	150	-50...150	-50...150	**TN2343**
G 1/4	400	25	-50...150	-50...150	**TN2105**
G 1/4	400	50	-50...150	-50...150	**TN2115**
1/4" NPT	400	25	-50...150	-50...150	**TN2603**
1/4" NPT	400	50	-50...150	-50...150	**TN2613**

Dimensions

Example 2105



1) LEDs (display unit / switching status), 2) 4-digit alphanumeric display / alternating indication of red and green, 3) Programming buttons, 4) Upper part of the housing can be rotated by 345°

Accessories

Type	Description	Order no.
	Protective cover for fluid sensors with M12 connector, polypropylene homopolymer	**E30420**
	Adapter, M18 x 1.5 - G 1/2 High-grade stainless steel (316L/1.4404)	**E40096**
	Thermowell for temperature sensors, Ø 6 mm, high-grade stainless steel (316L/1.4404)	**E37610**

Further technical data		
Operating voltage	[V]	18...32 DC
Current rating	[mA]	250
Accuracy	[K]	± 0.3 + (± 0.1 % MS)
Response dynamics T05 / T09	[s]	1 / 3
Resolution display	[K]	0.1
Electrical design		PNP / NPN
Protection		IP 67
Communication interface		IO-Link

IO-Link accessories

Type	Description	Order no.
Included in the set		**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

Compact 4...20mA temperature transmitter

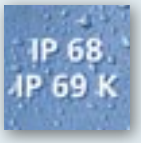
Temperature sensors

Applications:

Bearing temperature monitoring

System water temperature

Digester tank temperature



Versatile

The TA type temperature sensor is a universal transmitter with a 4...20 mA current output which can be scaled over the -50 to 150 °C measuring range. Scaling is done simply via the integrated IO-Link interface

Flexible

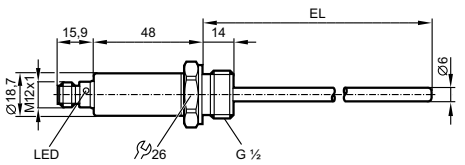
The compact design, the integrated process connections and a multitude of probe lengths enable particularly simple installation.

Fast and precise

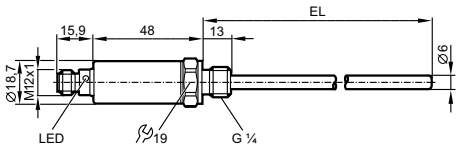
A high level of accuracy is achieved using a class A accuracy Pt1000 sensor and factory calibration. In addition, ifm's tried and tested film technology ensures excellent dynamic response times. So this sensor is suited for all highly precise and rapid processes.

Dimensions

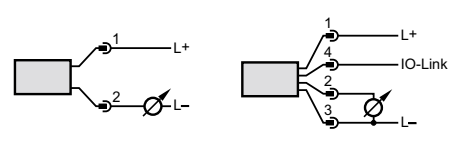
TA24



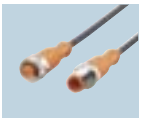
TA21



Wiring diagram



IO-Link accessories

Type	Description	Order no.
Included in the set		**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

Connection technology

Type	Description	Order no.
	Socket, M12, 2 m black, PUR cable	**EVC001**
	Socket, M12, 5 m black, PUR cable	**EVC002**
	Socket, M12, 2 m black, PUR cable	**EVC004**
	Socket, M12, 5 m black, PUR cable	**EVC005**

Nominal length [mm]	Pressure resistance [bar]	Order no.
Process connection G ½ Temperature range (scaled 4...20 mA) -50...150 °C		
30	300	**TA2405**
50	300	**TA2415**
100	160	**TA2435**
150	160	**TA2445**
Process connection G ¼ Temperature range (scaled 4...20 mA) -50...150 °C		
25	400	**TA2105**
50	400	**TA2115**
100	160	**TA2135**
150	160	**TA2145**

Further technical data		
Operating voltage	[V DC]	18...32
Reverse polarity / overload protection		• / •
Measuring element		Pt1000, class A
Response dynamics T05 / T09		1 s / 3 s
Protection		IP 67, IP 68, IP 69K / III
Measuring range	[°C]	-50...150
Accuracy	[K]	± 0.3 + (± 0.1 % MS)
Ambient temperature	[°C]	-25...80
IO-Link revision		1.1
Materials (wetted parts)		high-grade stainless steel (316L/1.4404)

TOP PRODUCT

Conductivity sensor for clamp and hygienic pipe fittings

Analytical sensors

- **Solid tip prevents breakage**
- **Reduce inaccuracies associated with a time-based cleaning process**
- **Flexible process adjustments increase system efficiency**
- **Easily adapted to new recipes and media**
- **Loss-free digital transmission of measured values**

CIP/SIP

IP 67
IP 68
IP 69 K

IO-Link

3A

FDA

EHEDG

Applications

The sensors are used in cleaning processes (CIP) in the food industry. They detect the concentration of cleaning agents, check the rinsing water for residues and are used for product validation.

Potential

Precise, fast and reliable measurements during the process help to improve plant availability and optimise cleaning cycles. A reduced amount of cleaning agents, lower energy consumption during rinsing and lower water consumption result in considerable cost savings. In addition, the machine uptime is increased.

Stability

The solid tip design guarantees stability even if the sensor is exposed to increased stress.

Process connection	Measuring range µS/cm	Order no.
Application: version with long tip, installation in screwed socket connections		
G 1/2	100...15000	**LDL100**
G 1/2	0.04...1000	**LDL101**
G 1 Aseptoflex Vario	100...1000000	**LDL200**
G 1 Aseptoflex Vario	100...1000000	**LDL201**
G 1 Aseptoflex Vario	100...1000000	**LDL220**
G 1	100...1000000	**LDL210**
G 1 1/2 coupling nut	100...2000000	**LDL400**

Accessories

Type	Description	Order no.
IO-Link		
	USB IO-Link master for parameter setting and analysis of units Supported communication protocols: IO-Link (4.8, 38.4 and 230 kbits/s)	**ZZ1060**
	LR DEVICE (supplied on USB flash drive) Software for online and offline parameter setting of IO-Link sensors and actuators	**QA0011**
Connection technology		
	Socket, M12, 4 poles 5 m, grey, MPPE cable	**EVF001**
	Socket, M12, 4 poles 2 m, grey, MPPE cable	**EVF064**
	Socket, M12, 4 poles 5 m, grey, MPPE cable	**EVF004**
	Socket, M12, 4 poles 2 m, grey, MPPE cable	**EVF067**

Advantages of LDL at a glance:

Much shorter commissioning time
- No need for additional evaluation electronics
- Simple wiring using M12 connector

Robust and compact design
- The fully welded stainless steel housing prevents water ingress
- Tip made of solid material prevents breakage under high load

Attractive offer
- High availability and fast delivery times
- Flexible adapter concept reduces / simplifies warehousing

Precise radar level measurement for open and closed tanks

Level sensors

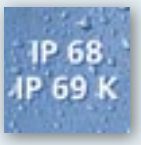
Level measurement with millimetre precision of up to 10 metres

Non-contact measuring principle: no malfunctions due to deposits or wear

Direct measurement or through non-metallic walls

Simple installation and maintenance-free operation

Remote sensor parameter setting and level monitoring via connection to the IT system



Precise measurement on any tanks

The LW2120 radar level sensor measures levels of liquid media up to 10 metres precisely and without blind areas. The 80 GHz frequency used ensures stable and precise measurement results, even in the presence of steam or condensate in the tank for example.

With the antenna extension, available as an accessory, the sensor may also be used outside closed metal tanks, for example on open tubs.

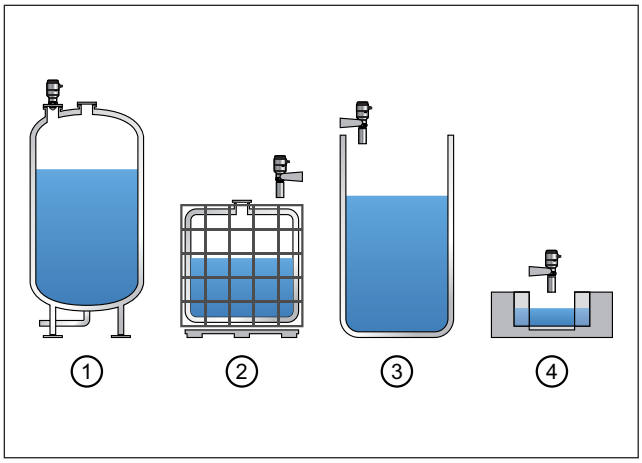
The radar measuring system can also penetrate through non-metallic walls, allowing the level sensor to be easily mounted above plastic tanks such as IBC containers.

Type	Process connection	Outputs	Order no.
	G1	2 switching outputs or 1 switching and 1 analogue output 4...20 mA	**LW2120**

Accessories

Description	Order no.
Antenna extension	**E33705**
Mounting bracket incl. lock nut	**E33706**
Welding adapter Ø 38 mm	**E30500**
Welding adapter Ø 50 mm	**E30130**
Welding adapter Ø 60 mm	**E30149**
Welding adapter Ø 85 mm	**E30501**
Mounting accessories IO-Link	
USB IO-Link master for parameter setting and analysis of devices, supported communication protocols: IO-Link (4.8, 38.4 and 230 kbits/s)	**ZZ1060**
moneo|configure SA Stand-alone licence, software for online and offline parameter setting of IO-Link devices including maintenance and support until the end of the following year	**QMP010**
IO-Link Bluetooth adapter	**EI0330**
IO-Link Bluetooth adapter	**E30446**
IO-Link data splitter PNP	**E43406**
IO-Link data splitter NPN	**E43410**
Connection technology	
M12 connection cable, angled, 2 m, black, PUR cable	**EVC004**
M12 connection cable, angled, 5 m, black, PUR cable	**EVC005**
M12 connection cable, angled, 10 m, black, PUR cable	**EVC006**
M12 connection cable, angled, 20 m, black, PUR cable	**EVC087**

Further technical data		
Operating voltage	[V DC]	18...30
Current consumption	[mA]	< = 80
Measuring range	[m]	0.01...10
Measurement accuracy		± 2 mm
Measuring principle		FMCW (80 GHz)



1) Storage tank
2) Plastic tank
3) Outside use
4) Flow rate measurement
Flow rate measurement in Venturi flumes (e.g. Parshall, Khafagi-Venturi) can also be implemented with the radar sensor.

Level and distance measurement even in poor visibility

Radar sensors

- **Long ranges and a wide temperature range**
- **Reliable measurements even inprecipitation, fog, dust and dirt**
- **Simultaneous detection of distance and speed**
- **Adaptable to specific applications thanks to various operating modes**
- **Intuitive set-up and visualisation of the measured data using the ifm Vision Assistant software**

IP 68
IP 69 K

IO-Link

Radar sensor for harsh environmental and weather conditions

The distance sensor detects objects by means of a focused radar beam. The powerful technology also allows the detection of targets whose reflection properties are poor.

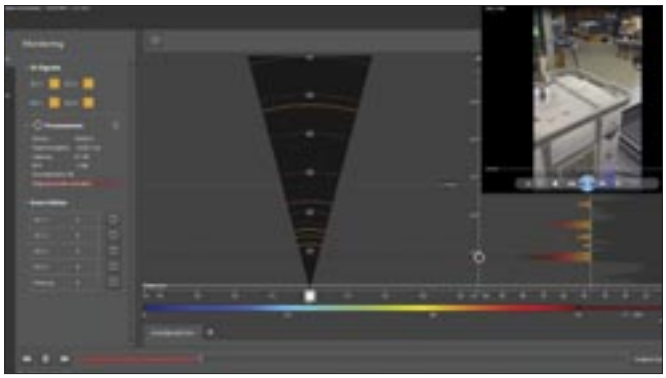
The data obtained in this way can be clearly visualised using the "Vision Assistant" software. For example, the distance profile can show multiple objects simultaneously, while their relative speed can also be output at the same time.

.

Type	Horizontal x vertical opening angle [°]	Frequency [GHz]	Output (2x configurable)	Order no.
Distance sensor	40 x 30	60...64	IO-Link | binary | 4...20 mA | 0...10 V	**R1D100**
Distance sensor with reduced transmitter power	40 x 30	60...64	IO-Link | binary | 4...20 mA | 0...10 V	**R1D102**
Distance sensor	40 x 20	77...81	IO-Link | binary | 4...20 mA | 0...10 V	**R1D200**
Area surveillance	140 x 50	60...64	IO-Link | binary | 4...20 mA | 0...10 V	**R2D100**
Area surveillance	140 x 30	77...81	IO-Link | binary | 4...20 mA | 0...10 V	**R2D200**
Area surveillance	140 x 50	60...64	IO-Link | binary	**R2D110**
Area surveillance	140 x 30	77...81	IO-Link | binary	**R2D210**

Reliable detection in harsh environments

With its long range, shock and vibration resistance properties and different operating modes, the radar sensor is designed to accurately detect objects even in the most adverse conditions. Whether in rain, snow, strong wind or extreme dust: the powerful radar sensor technology ensures reliable operation at all times.



Setting software

Common technical data		
Temperature range	[°C]	-40…80
Protection rating		IP65 | IP67 | IP69K

Application areas

R1D can also be mounted above the IBC tote and read the liquid (only) level reliable without adjusting the parameters.

Flexibility

Sometimes the customer does not want to install and remove the level sensor every time when they change the totes, so they would need a rack to mount the sensors. If the sensor is mounted on the rack, the totes can be removed and replaced without touching the sensor.

Metal structures can be ignored with parameter setting. Max. Min power and RCS can be adjusted so that the sensor only detects the media and ignores the metal bars despite the R1D's wide beam profile.

Continuous ultrasonic level measurement

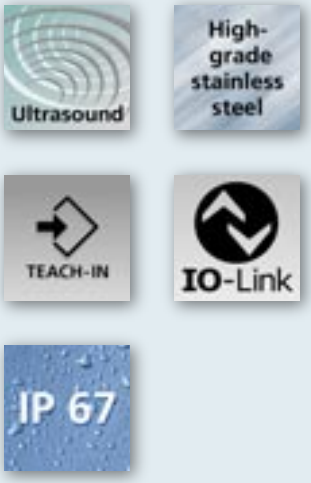
Ultrasonic sensors

Applications:

Tank levels

Open well levels

Open channel levels



Long ranges

The new ifm ultrasonic sensors in M30 design are distinguished by their long range of up to 8 m. This makes them particularly suited for the detection of objects far away or for continuous level monitoring, e.g. of bulk materials or liquids. As opposed to photoelectric sensors colour, transparency or the object's or medium's surface shine do not affect sensing.

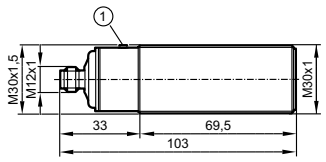
Adjustable sound beam

Due to limited space unwanted reflections at the inside of the tank may occur in level applications. This can lead to faulty measurement results. Thanks to IO-Link, the sound beam can be set individually according to the application. With IO-Link, the user is well prepared for Industry 4.0.

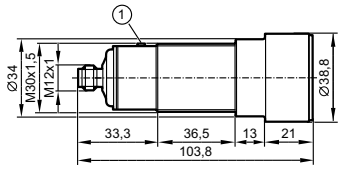
Type	Setting	Output	Operating voltage according to cULus [V DC]	Order no.	Order no.	Order no.
Ultrasonic diffuse-reflection sensor · 3-wire DC, 4-pole				**3500 mm**	**6000 mm**	**8000 mm**
M30 x 1.5	pushbutton, IO-Link	2 x PNP	10...30; "supply class 2"	**UIT500**	**UIT503**	**UIT506**
M30 x 1.5	pushbutton, IO-Link	PNP + 4…20 mA	10...30; "supply class 2"	**UIT501**	**UIT504**	**UIT507**
M30 x 1.5	pushbutton, IO-Link	PNP + 0…10 V	10...30; "supply class 2"	**UIT502**	**UIT505**	**UIT508**
M30 x 1.5	pushbutton	2 x NPN	10...30; "supply class 2"	**UIT509**	**UIT512**	**UIT515**
M30 x 1.5	pushbutton	NPN + 4…20 mA	10...30; "supply class 2"	**UIT510**	**UIT513**	**UIT516**
M30 x 1.5	pushbutton	NPN + 0…10 V	10...30; "supply class 2"	**UIT511**	**UIT514**	**UIT517**

Dimensions

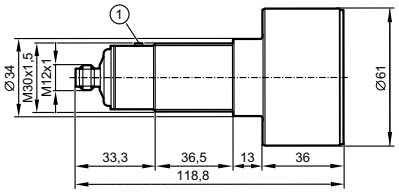
Example UIT500



Example UIT503



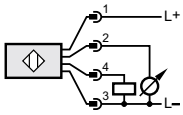
Example UIT506



1) Teach button

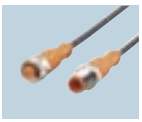
Wiring diagram

Example UIT501

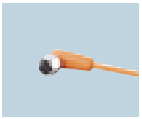


Common technical data		
Current rating Switching output	[mA]	100
Ambient temperature	[°C]	-20...70
Temperature compensation		•
Protection rating		IP 67
Connection		M12 connector
Status indications	LED	2 x yellow
Echo	LED	1 x green

IO-Link accessories

Type	Description	Order no.
	Included in the set	**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

Connection technology

Type	Description	Order no.
	M12 socket, 2 m orange, PVC cable	**EVT064**
	M12 socket, 5 m orange, PVC cable	**EVT001**
	M12 socket, 2 m orange, PVC cable	**EVT067**
	M12 socket, 5 m orange, PVC cable	**EVT004**

Ultrasonic level detection with small deadband

Ultrasonic sensors

Applications:

Tank levels

Bund level

Catch pot level

The alternative for difficult surfaces

Ultrasonic sensors transmit and receive sound waves in the ultrasonic range. The object to be detected reflects the sound waves and the distance information is determined via time of flight measurement. As opposed to photoelectric sensors, colour, transparency or the object's surface shine do not play a role.

High performance

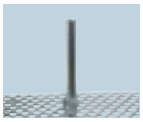
The ifm ultrasonic sensors in M18 design provide a particularly small blind zone and long sensing ranges which are usually only achieved by sensors of a considerably larger design.

The sensors operate reliably with heavy soiling so that they can be used in applications in which photoelectric sensors meet their limits.

Type	Housing length/ dimensions [mm]	Setting	Output	Order no.	Order no.	Order no.	Order no.	Order no.
Ultrasonic diffuse-reflection sensor · 3-wire DC, 4-pole				**300 mm***	**800 mm***	**1200 mm***	**1600 mm***	**2200 mm***
M18	60	Wire	PNP	**UGT500**	**UGT503**	**UGT506**	–	–
M18	60	Wire	NPN	**UGT521**	**UGT522**	**UGT523**	–	–
M18	60	Wire	4...20 mA	**UGT501**	**UGT504**	**UGT507**	–	–
M18	60	Wire	0...10 V	**UGT502**	**UGT505**	**UGT508**	–	–
Ultrasonic diffuse-reflection sensor · 3-wire DC, 4-pole				**300 mm***	**800 mm***	**1200 mm***	**1600 mm***	**2200 mm***
M18 Cube	53 x 20 x 38	Pushbutton	PNP + 4…20 mA	**UGT580**	**UGT582**	**UGT584**	–	–
M18 Cube	53 x 20 x 38	Pushbutton	PNP + 0…10 V	**UGT581**	**UGT583**	**UGT585**	–	–
M18 Cube	53 x 20 x 38	Pushbutton	NPN + 4…20 mA	**UGT586**	**UGT588**	**UGT590**	–	–
M18 Cube	53 x 20 x 38	Pushbutton	NPN + 0…10 V	**UGT587**	**UGT589**	**UGT591**	–	–
Ultrasonic diffuse-reflection sensor · 3-wire DC, 4-pole				**300 mm***	**800 mm***	**1200 mm***	**1600 mm***	**2200 mm***
M18	98	Pushbutton, IO-Link	2 x PNP	–	–	–	**UGT509**	**UGT512**
M18	98	Pushbutton, IO-Link	PNP + 4…20 mA	–	–	–	**UGT510**	**UGT513**
M18	98	Pushbutton, IO-Link	PNP + 0…10 V	–	–	–	**UGT511**	**UGT514**
M18	98	Pushbutton	2x NPN	–	–	–	**UGT515**	**UGT518**
M18	98	Pushbutton	NPN + 4…20 mA	–	–	–	**UGT516**	**UGT519**
M18	98	Pushbutton	NPN + 0…10 V	–	–	–	**UGT517**	**UGT520**
Ultrasonic retro-reflective sensor · 3-wire DC, 3-pole				**300 mm***	**800 mm***	**1200 mm***	**1600 mm***	**2200 mm***
M18	98	Pushbutton, IO-Link	PNP	–	–	–	**UGR500**	**UGR501**
M18	98	Pushbutton	NPN	–	–	–	**UGR502**	**UGR503**

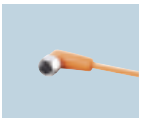
* Max. range

Accessories

Type	Description	Order no.
	Mounting set for clamp mounting, diecast zinc, Ø 12 mm	**E20720**
	Mounting set for clamp mounting, stainless steel, Ø 12 mm	**E21206**
	Mounting set for clamp mounting, diecast zinc, Ø 12 mm	**E20721**
	Mounting set for clamp mounting, stainless steel, Ø 12 mm	**E21207**
	Rod, 100 mm, Ø 12 mm, M10 thread, stainless steel	**E20938**
	Rod, 200 mm, Ø 10 mm, M10 thread, stainless steel	**E20940**
	Cube for mounting on an aluminium profile, M10 thread, diecast zinc	**E20951**

Common technical data		
Operating voltage	[V DC]	10...30
Current rating Switching output	[mA]	100
Operating temperature range	[°C]	-20...70
Temperature compensation		•
Protection		IP 67
Connection		M12 connector
Status indications	LED	yellow
Echo	LED	green

Connection technology

Type	Description	Order no.
	M12 socket, 2 m orange, PVC cable	**EVT064**
	M12 socket, 5 m orange, PVC cable	**EVT001**
	M12 socket, 2 m orange, PVC cable	**EVT067**
	M12 socket, 5 m orange, PVC cable	**EVT004**

Long distance laser sensor for distance and level applications

Photoelectric sensors

Applications:

- **Centrifuge hopper level**
- **Ro/Ro bins**
- **Linear aerators**
- **Open channel level on dirty water**

No interference caused by extraneous light

The new generation of the popular O1D sensors with the innovative on-chip time-of-flight measurement system based on PMD technology (Photonic Mixer Device) oper-ates reliably with extraneous light of up to 100,000 lux. This exceeds the values of standard optical sensors many times over and corresponds to the light conditions on a bright summer day with direct sunlight.

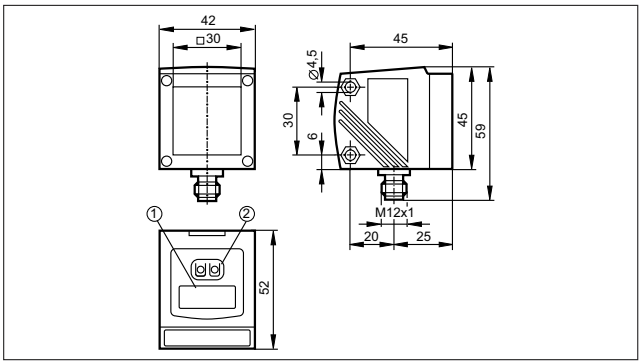
These sensors can be used in workshops where daylight hits the sensor or target from above. Even reflective objects such as metal surfaces are reliably detected or reflective strips on high-vis vests reliably suppressed.

Applications:
Distance, level and object detection in automation technology.

Electrical design	Background suppression [m]	Switching outputs	Laser class	Sampling rate [Hz]	Light spot diameter [mm]	Operating range [m]	Order no.
Distance detection							
DC PNP	0...19	2*	2	max. 50, adjustable	6 (for 10 m)	0.2...10	**O1D100**
DC NPN	0...19	2*	2	max. 50, adjustable	6 (for 10 m)	0.2...10	**O1D103**
DC PNP	> 10...100	2*	2	max. 33, adjustable	6 (for 10 m)	0.2...10	**O1D105**
DC PNP	> 6...100	2*	1	max. 33, adjustable	5 (for 6 m)	0.3...6	**O1D155**
Object detection							
DC PNP	> 10...100	1	2	1	6 (for 10 m)	0.2...10	**O1D101**
DC NPN	> 10...100	1	2	1	6 (for 10 m)	0.2...10	**O1D104**
Level detection							
DC PNP	> 10...100	2*	2	max. 33, adjustable	6 (for 10 m)	0.2...10	**O1D300**

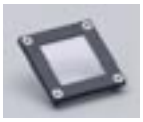
* one switching output can be configured as analogue output (0...10 V or 4...20 mA)

Dimensions



1) 4-digit alphanumeric display
2) programming buttons

Accessories

Type	Description	Order no.
	Mounting set for clamp mounting, Ø 12 mm / stainless steel	**E2D101**
	Cube for mounting on an aluminium profile, M10 thread, diecast zinc	**E20951**
	Mounting adapter, G1A process connection, stainless steel	**E21224**
	Protective cover, plastic, PMMA	**E21133**
	Protective cover, glass	**E21171**
	Cooling and protection box, aluminium	**E21248**

Further technical data

Type O1D		
Operating voltage	[V]	10...30 DC
Connection		M12 connector
Protection		IP 67 / III
Short-circuit protection, pulsed		•
Reverse polarity / overload protection		• / •
EMC		EN 60947-5-2
Material	housing front pane LED window	diecast zinc glass polycarbonate
Function display Switching status Operation	 LED LED	 yellow green
Distance value, programming		4-digit alphanumeric display

Connectors and splitter boxes

Type	Description	Order no.
	Socket, M12, 2 m orange, PVC cable	**EVT064**
	Socket, M12, 5 m orange, PVC cable	**EVT001**
	Socket, M12, 2 m orange, PVC cable	**EVT067**
	Socket, M12, 5 m orange, PVC cable	**EVT004**

Permanent machine protection made easy

Systems for vibration monitoring and diagnostics

Applications:

Overall vibration monitoring

Vibration monitoring on;

Pumps
Motors
Centrifuges
Fans

Permanent vibration monitoring

The electronic VK type vibration monitor monitors online the overall vibration condition of machines and equipment according to ISO 10816. The sensor measures the rms vibration velocity on a non-rotating component surface. When an adjustable limit value is exceeded the unit sets to alarm via a switching contact.

In addition the characteristic value is provided as current signal (4...20 mA) for connection to the process control system.

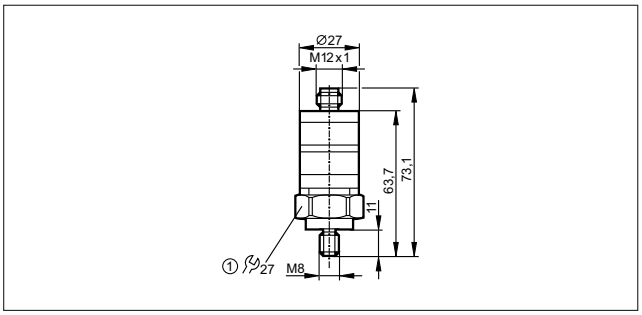
Easy operating concept

The easy set-up via 2 radial setting rings allows quick setting of the switch point and response delay.

The protective cap, which can be obtained as an accessory, ensures protection against tampering.

Vibration monitor VK
Setting of the switch point and response delay via setting rings directly on the unit.
Monitoring of the overall vibration condition of machines and equipment according to ISO 10816.

Dimensions



1) Tightening torque 15 Nm

Technical data

Vibration monitor VKV022 / VKV021		
Operating voltage [V] (If only the switching output is used, a 9.6 V supply is sufficient).		18...32 DC
Switching output		1 switching output NC, adjustable switch point, PNP, can withstand up to 500 mA
Analogue output	VKV022	4...20 mA (4 mA = 0 mm/s; 20 mA = 50 mm/s)
Analogue output	VKV021	4...20 mA (4 mA = 0 mm/s; 20 mA = 25 mm/s)
Response delay		adjustable from 1...60 seconds
Reverse polarity protection		•
Protection		IP 67, III
Ambient temperature [°C]		-25...80
Housing material		high-grade stainless steel, plastic (Makrolon)
Overload protection [g]		100
Frequency range [Hz]		10...1000
Measuring range	VKV022 [mm/s] VKV021 [mm/s]	0...50 0...25
Measurand		Vibration velocity rms
Connection		M12 connector

Accessories
(to be ordered separately)

Type	Description	Order no.
	Protective cover, transparent plastic	E30094

Connectors and splitter boxes
(to be ordered separately)

Type	Description	Order no.
	Socket, M12, 2 m orange, PVC cable	EVT064
	Socket, M12, 5 m orange, PVC cable	EVT001
	Socket, M12, 2 m orange, PVC cable	EVT067
	Socket, M12, 5 m orange, PVC cable	EVT004

Continuous vibration monitoring.

Systems for vibration monitoring and diagnostics

Continuous vibration monitoring according to ISO 10816.

2-wire loop powered.

4...20 mA signal output.

True rms monitoring of the overall velocity.

Robust metal housing provides high protection rating.

The sensor

The vibration transmitter type VT monitors machinery and equipment according to ISO 10816. The sensor measures the true rms velocity of non-rotating component surfaces. The values are then transmitted as an analogue signal (4...20 mA) directly to the PLC.

The applications

Due to its robust design, high IP Rating as well as the maximum ambient temperature of 105 °C the sensor is suitable for use in harsh environments.

The installation

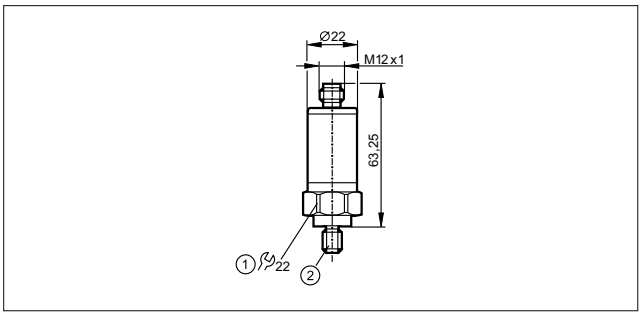
The unit is quick and easy to install. No extra parameter software is required.

Vibration transmitter VT
Overall vibration monitoring of machinery and equipment according to ISO 10816.
M12 connector.

Technical data

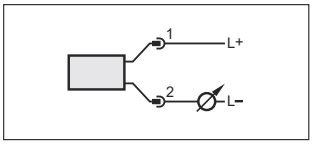
		Vibration transmitter VTV121	Vibration transmitter VTV122
Operating voltage	[V]	9.6…32 DC	9.6…32 DC
Analogue output	[mA]	4...20	4...20
Load for analogue output	[Ω]	max. (Ub - 9.6 V) x 50; 720 at Ub = 24 V	max. (Ub - 9.6 V) x 50; 720 at Ub = 24 V
Protection		IP 68 / IP 69K, III	IP 68 / IP 69K, III
Ambient temperature	[°C]	-30...125	-30...105
Housing material		stainless steel 316L / 1.4404	stainless steel 316L / 1.4404
Shock resistance	[g]	400	400
Frequency range	[Hz]	10...1000	10...1000
Accuracy	[%]	< ± 3	< ± 3
Repeatability	[%]	< 0.5	< 0.5
Non-linearity (in % of the span)		< ± 0.25	< ± 0.25
Measuring range	[mm/s]	4 mA = 0 mm/s; 20 mA = 50 mm/s	4 mA = 0 mm/s; 20 mA = 25 mm/s
Measurand		Vibration velocity rms	Vibration velocity rms
Connection		M12 connector	M12 connector

Dimensions



1) tightening torque 8 Nm
2) customer specific connection configuration

Wiring diagram



Connectors and splitter boxes
(to be ordered separately)

Type	Description	Order no.
	Socket, M12, 4-pole, 5 m orange, PVC cable	EVT004
	Socket, M12, 4-pole, 10 m orange, PVC cable	EVT005
	Socket, M12, 4-pole, 25 m orange, PVC cable	EVT006

Please note permissible temperature range

Simple to implement industrial condition monitoring

Systems for vibration monitoring and diagnostics

Applications:

Vibration monitoring on;

Motors
Pumps
Blowers
Centrifuges

Real-time maintenance for industrial machines

Industrial grade machine protection integrates directly into your existing control platform. Machine condition is continually monitored for common fault conditions of impacts, component fatigue, and friction. This allows the timely and predictable scheduling of maintenance before major damage or failure and production downtime. Machines are continuously and permanently protected unlike intermittent monitoring systems.

Easy connection thanks to IO-Link

The industrial proven IO-Link system simplifies integrating Industry 4.0 technology directly into your existing control platform. Expensive secondary networks, gateways, and IT support is not needed. IO-Link masters send status signals to the controls and have as the ability to send calculated and raw vibration signals to higher level systems for advanced analytics.

Process values

The vibration sensor VVB001 internally acquires and analyzes various process values that are used to detect machine errors.

v-RMS (Machine looseness conditions)

Effective value of the vibration velocity, identifies component fatigue.

a-RMS (Machine friction conditions)

Effective value of the acceleration, identifies mechanical rubbing.

a-Peak (Machine impact conditions)

Maximum acceleration, identifies mechanical impacts.

Crest-Factor

a-Peak/a-RMS, is one of the important measures of overall machine condition.

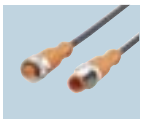
Temperature

Identifies a rising temperature caused by excessive friction or other effects (e.g. electrical causes).

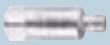
Raw data

For detailed analysis or cause analysis in case of damage, the sensor also provides raw data of the acceleration recording. These are issued on request as a BLOB (Binary Large Object) and transmitted using IO-Link. The system can record the operating condition at 4 second intervals and transmit the data during several minutes to higher level systems.

Accessories

Type	Description	Order no.
Included in the set		**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

The products

Type	Description	Order no.
	Industrial machines	**VVB001**
	Big machines, performance: > 300 kW, speed: > 600 rpm	**VVB010**
	Big machines, performance: > 300 kW, speed: 120 rpm to < 600 rpm	**VVB011**
	Small machines, performance: < 300 kW, speed: > 600 rpm	**VVB020**
	Small machines, performance: < 300 kW, speed: 120 rpm to < 600 rpm	**VVB021**

Common technical data		
Operating voltage	[V DC]	18...30
Measurement range	[g]	0...50
Frequency range	[Hz]	2...10000
Ambient temperature	[°C]	-30...120
Protection rating		IP 67, IP 68, IP 69K
Housing material		Stainless steel 1.4404 / 316L
Communication interface		IO-Link 1.1 COM2 slave; 38.4 kbaud

Accessories

Type	Description	Order no.
Installation		
	Glue adapter, stainless steel M8 x 1.25 female thread	**E30473**
	Glue adapter, stainless steel 1/4 - 28 UNF female threadl	**E30474**
Connection technology		
	Connection cable, M12 / M12, LED, 2 m black, PUR cable, 4 poles	**EVC023**
	Connection cable, M12 / M12, LED, 5 m black, PUR cable, 4 poles	**EVC024**
	Connection cable, M12 / M12, LED, 10 m black, PUR cable, 4 poles	**EVC135**
	Connection cable, M12 / M12, LED, 20 m black, PUR cable, 4 poles	**EVC137**

Machine condition in all dimensions

Systems for vibration monitoring and diagnostics

Applications:

Vibration monitoring on;

Motors
Pumps
Blowers
Centrifuges

VVB as 3-axis vibration sensor with IO-Link

Automatic monitoring of the relevant condition indicators

Integrated unbalance and bearing analysis

IO-Link simplifies integration into existing control systems and IT-based maintenance planning

Proven indicators monitored in 3 dimensions

The VVB30x continuously detects the vibrations in three measurement axes and uses them to calculate proven indicators for evaluating the machine condition. This provides the user with information on fatigue (v-RMS), mechanical friction (a-RMS), impacts (a-Peak) and bearing wear (Crest). The surface temperature is also transmitted as an additional wear indicator.

In the Basic condition monitoring version, the sensor also analyses machine unbalance and detects the machine operating hours based on the vibration level. The DataScience condition monitoring version also has the integrated option of bearing analysis BearingScout™.

Data flow towards control system and IT level

All data is transmitted simultaneously both to the control system and to the IT level via IO-Link, so that the user has all relevant indicators for IT-based condition monitoring, for example in the **moneo** IIoT platform.

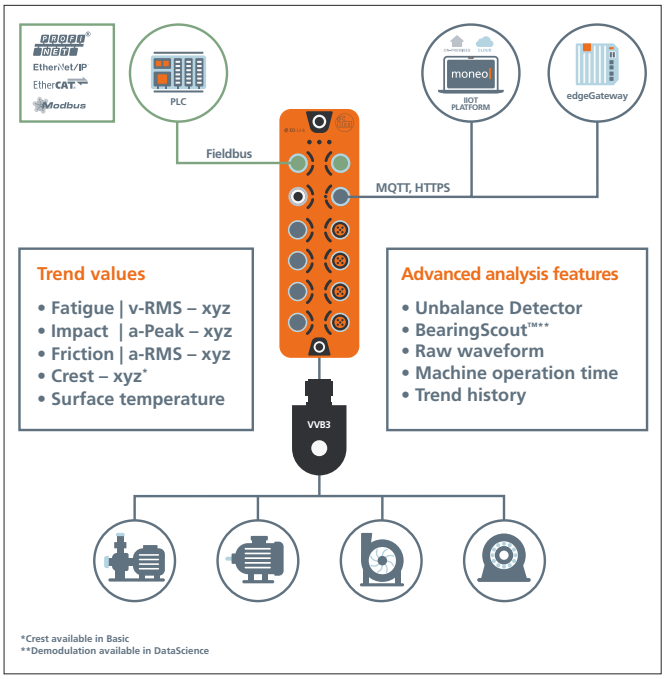
Simple limit value setting to ISO 20816-3

Setting the vibration limit values is also easy with the VVB30x: based on the ISO 20816-3 standard, the machine category can be selected and the limit values defined for this can be transferred to the sensor by system command. If a limit value is exceeded, a detailed fault analysis is easily possible thanks to the integrated BLOB ring memory. Up to 12 seconds of raw data can be provided automatically. In addition, the sensor is equipped with an internal characteristic value history that provides an overview of the last nine days.

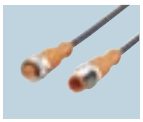
Thanks to the VVB30x, a comprehensive vibration analysis and precise machine monitoring is easier than ever before.

Version Condition monitoring	Units of measurement	Order no.
Basic	m/s, m/s², °C	**VVB301**
DataScience	m/s, m/s², °C	**VVB302**
Basic	mm/s, mg, °C	**VVB305**
DataScience	mm/s, mg, °C	**VVB306**

Technical data		
Frequency range	[Hz]	2...5600
Measuring range velocity	[mm/s]	0...300
Measuring range acceleration	[g]	0...16
Ambient temperature	[°C]	-30...80



Accessories

Type	Description	Order no.
Included in the set		**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

Out of the control cabinet: vibration diagnostics directly in the field

Systems for vibration monitoring and diagnostics

- **Robust IP 67 housing for decentralised use**
- **Fast, error-free installation and retrofitting thanks to standard M12 connections**
- **Six signal inputs collect all relevant data for condition monitoring**
- **Integrated separation between automation and IT network**
- **Compatible with all common acceleration sensors**

IP 67 · Modbus · real-time · EtherNet/IP · cULus LISTED · PROFINET

For efficient and decentralised vibration diagnostics

The VSE9xx diagnostic system can be mounted directly in the field thanks to its robust IP 67 housing. There it can evaluate up to four dynamic signals (e.g. acceleration) and forward the data via Ethernet or field bus.
Two additional inputs (1x pulse signal, 1x analogue) can be used to collect further information relevant for condition monitoring, such as speed and temperature.

Easy integration even into existing systems

The IP 67 VSE is perfect for simple retrofitting of a vibration monitoring system to your existing installations. The complete IP 67 portfolio from ifm, which also includes switches, IO-Link masters, power supplies and edgeDevices, offers you maximum flexibility when retrofitting your system. Time, space and costs for installation are significantly reduced.

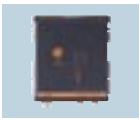
Type	Description	Order no.
	Diagnostic electronics TCP/IP	VSE903
	Diagnostic electronics PROFINET	VSE950
	Diagnostic electronics Ethernet/IP	VSE951
	Diagnostic electronics Modbus/TCP	VSE953

Secure connection via standard M12 connection

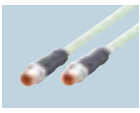
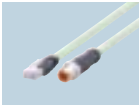
The acceleration sensors are connected to the VSE via standard M12 connection cable. This enables error-free installation and also ensures ingress resistance against external influences required in the field.

Further technical data		
Operating voltage	[V DC]	19.2…28.8
Current consumption	[mA]	200
Number of dynamic inputs		4
Frequency range	[Hz]	0…12000
Dynamic input Resolution	[bit]	16
Number of digital inputs		1
Digital input Frequency range	[Hz]	0.1…100000
Number of analogue inputs		1
Resolution analogue input	[bit]	12
Number of digital outputs		2
Output function		normally open / normally closed
Number of analogue outputs		1
Ambient temperature	[°C]	0…60
Protection rating		IP 67
Housing material		Aluminium, anodised

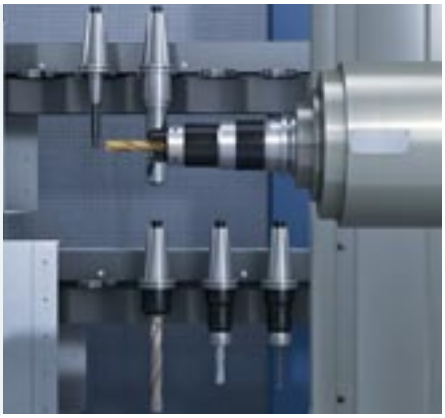
Accessories

Type	Description	Order no.
	Ethernet switch	AL3050
	Ethernet switch with loop-through function power supply	AL3150
	Power supply IP 67	DN4234

Connection technology

Type	Description	Order no.
M12/M12 Ethernet and patch cable		
	1 m	EVC905
	5 m	EVC907
	10 m	EVC908
M12/RJ45 Ethernet and patch cable		
	1 m	EVC925
	3 m	EVC936
	5 m	EVC927
M12 connection cable		
	5 m	EVT398
	10 m	EVT399
	25 m	EVT400
M12 connector		
	Wirable	EVC812

Online condition monitoring with fieldbus interface



Systems for vibration monitoring and diagnostics

Applications:

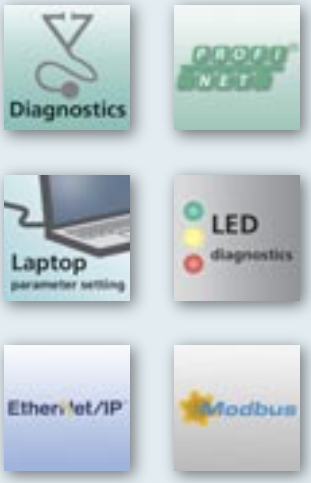
Vibration analysis of rolling elements

Bearing damage frequency

Misalignment

Looseness

Balance



Extensive and customisable condition monitoring

VSE150 is a 6-channel diagnostic system designed to evaluate 4 dynamic signals (e.g. rotational acceleration) and 2 analogue inputs. The new VSE15x family provides different fieldbus interfaces to exchange data with a PLC. This makes it possible to display the measuring values directly on the control system and optimally adapt the monitoring functions to the operating states and processes of the machine.
In addition to the fieldbus, 2 fast digital switching outputs (response time ≤1 ms) are provided for time-critical alarms.

Reduced network complexity saves time and money

The direct PLC connection via fieldbus allows auxiliary parameters (e.g. rotational speed and triggers for operating states) as well as non-time-critical alarms from condition monitoring to be exchanged over the bus.
This not only reduces wiring complexity but also saves the cost of providing the corresponding inputs/outputs on the PLC.

Process-optimised condition monitoring

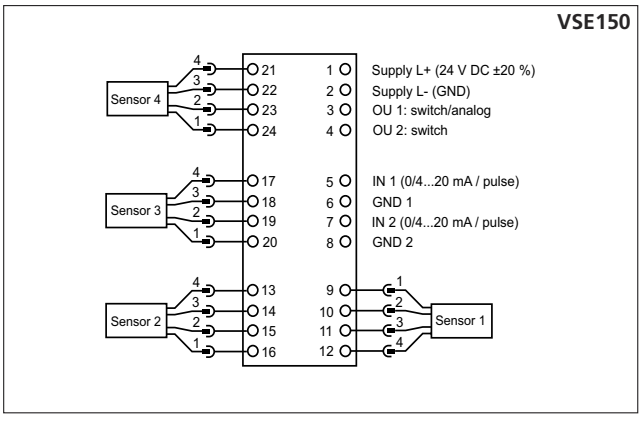
Machines with varying processes such as machine tools have high demands on condition monitoring systems. To recognise deterioration in quality at an early stage and avoid scrap or even damage, a process-dependent detection of even the smallest change is necessary. This can only be achieved by interlinking the operating parameters (e.g. rotational speed, power consumption, feed rate, tool) and the vibration data – ideally in the PLC. This combination of control and condition monitoring data enables process-dependent monitoring, leading to a considerable increase in quality and process reliability.

The same applies to diagnosis (rolling-element bearing condition, ball screw, unbalance), where, in many cases, a high degree of diagnostic validity can only achieved by combining the vibration monitoring data with the machine/process parameters of the PLC. Influencing process factors must be minimised and the measured data evaluated systematically. Here, too, integrating condition monitoring with the PLC is an enormous advantage and a direct fieldbus connection provides the optimal solution.

Rapid response protects machinery

If machine protection (e.g. crash monitoring) is part of the monitoring concept of a machine, a fast response is critical to minimise potential damage. Here, reaction speed is everything.
For time-critical alarms, the diagnostic electronics provides two additional digital outputs. The response time of the diagnostic electronics from the time the event occurs until the switching output reacts is 1 ms. This signal can be used to initiate an immediate machine stop to protect man and machine and minimise or even completely avoid consequential damage.

Wiring diagram



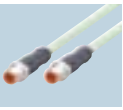
Products

Type	Description	Order no.
Panel mount		
	PROFINET IO Device class C	**VSE150**
	Ethernet/IP	**VSE151**
	Modbus TCP	**VSE153**
Field mount		
	TCP/IP	**VSE903**
	PROFINET	**VSE950**
	Ethernet/IP	**VSE951**
	Modbus TCP	**VSE953**

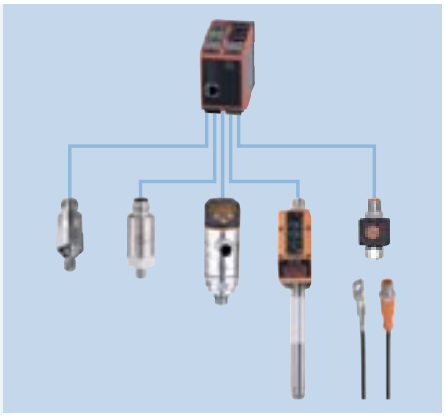
Accessories

Type	Description	Order no.
	Ethernet switch	**AL3050**
	Ethernet switch with loop-through function power supply	**AL3150**
	Power supply IP 67	**DN4234**

Connection technology

Type	Description	Order no.
M12/M12 Ethernet and patch cable		
	1 m	**EVC905**
	5 m	**EVC907**
	10 m	**EVC908**
M12/RJ45 Ethernet and patch cable		
	1 m	**EVC925**
	3 m	**EVC936**
	5 m	**EVC927**
M12 connection cable		
	5 m	**EVT398**
	10 m	**EVT399**
	25 m	**EVT400**
M12 connector		
	Wirable	**EVC812**

Complete standalone vibration system



Systems for vibration monitoring and diagnostics

Applications:

Vibration analysis of rolling elements

Bearing damage frequency

Misalignment

Looseness

Balance

Diagnostic electronics with high performance

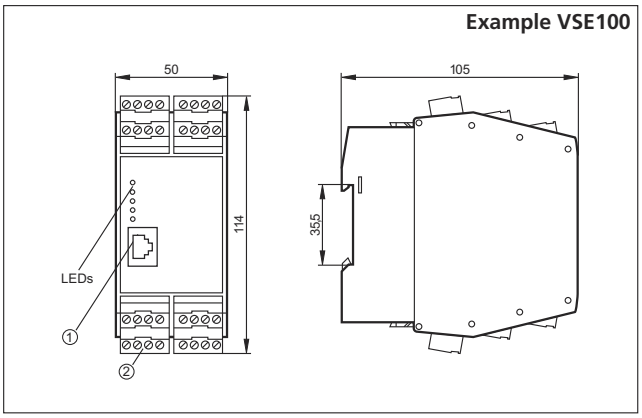
The flexible configuration of the 4 dynamic inputs now makes it possible to connect and continually monitor different types of sensors. This is valid for VSE units with firmware version 11 or higher. The sensors can be vibration sensors type VSA, IEPE or process sensors with a 4...20 mA output. Two further analogue inputs can be used to connect additional process sensors such as for speed or temperature.

This functionality provides different possibilities for machine and process monitoring. The on-board FIFO-memory with up to 600,000 values provides a simple method for data comparison and can be used for trending.

Simple networking

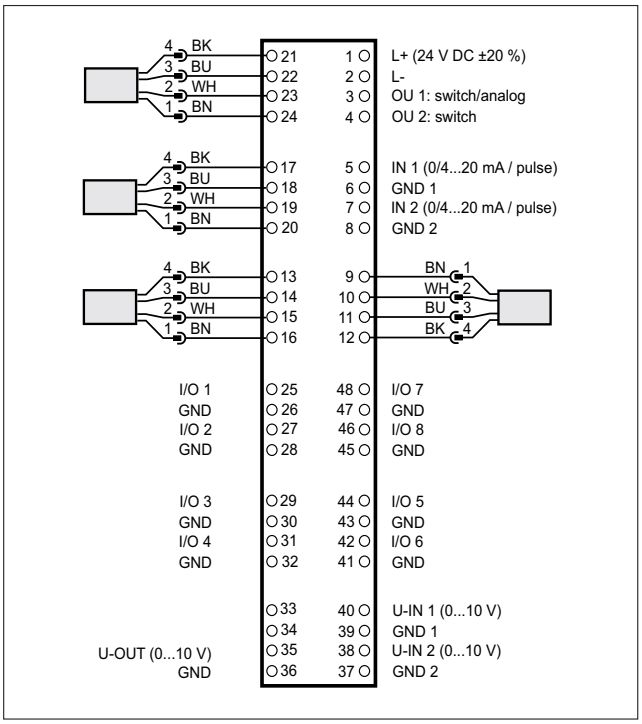
The units can easily be connected to the company network using the Ethernet interface and the OPCserver software type VOS. Vibration and process data can thus be integrated into higher systems such as SCADA or MES.

Dimensions



1) Ethernet interface
2) Combicon connector with screw connectors (optional)

Wiring diagram



Technical data

Diagnostic electronics VSE002, VSE100		
Operating voltage	[V]	24 DC ± 20 % IEPE input 24 DC + 20 %
Ambient temperature	[°C]	0...70
Protection		IP 20, III
Housing	VSE002 VSE100	DIN rail 1" DIN rail 2"
Inputs / Outputs **VSE002**		4 dynamic inputs, sensor type VSA/IEPE/4...20mA in any combination 2 analogue inputs (0/4...20 mA or pulse 24 V) 1x digital alarm output (PNP 100 mA) 1x selectable digital (PNP 100 mA) or analogue (0/4...20 mA / 0...10 V) alarm output
Inputs / Outputs **VSE100**		4 dynamic inputs, sensor type VSA/IEPE/4...20mA in any combination 2 analogue inputs (0/4...20 mA or 0...10 V or pulse 24 V) 1x digital alarm output (PNP 100 mA) 1 x selectable digital (PNP 100 mA) or analogue (0/4...20 mA / 0...10 V) alarm output 8 x digital outputs / inputs (freely configurable) (PNP 100 mA)
History function		integrated
Data interface		Ethernet TCP/IP, (10 / 100 MBits)

Accessories

Type	Description	Order no.
	Parameter software	**VES004**
	octavis OPC server software German / English	**VOS001**
	Connection cable Ethernet cross-over patch cable 2 m, PVC cable, RJ45 plug / RJ45 plug	**EC2080**
	Connection cable Ethernet cross-over patch cable 5 m, PVC cable, RJ45 plug / RJ45 plug	**E30112**

Neat and robust - Full metal inductive sensors

Inductive sensors

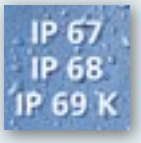
Applications:

Scrapers

Bridge positioning

Pen stocks

Gratecovers



High reliability even under extreme conditions
Full-metal sensors can be used for all applications but in particular when an application presents challenges to the mechanical design. Additionally, the compact and short design permits use even in the smallest of spaces.

Applications:
wet and robust application.

Type	Dimensions Length [mm]	Sensing range [mm]	f [Hz]	Ambient temperature [°C]	Housing material	Order no.
M12 connector · output function ⎍ · 3-wire DC PNP						
M12	L = 70	6 nf	500	0...100	stainless steel 316L / 1.4404	**IFT245**
M18	L = 70	12 nf	500	0...100	stainless steel 316L / 1.4404	**IGT249**
M30	L = 70	25 nf	250	0...100	stainless steel 316L / 1.4404	**IIT231**
Cabled · output function ⎍ · 3-wire DC PNP						
M12	L = 40	4 nf	100	-40...85	stainless steel 316L / 1.4404	**IFC278**
M18	L = 40	8 nf	100	-40...85	stainless steel 316L / 1.4404	**IGC261**
M30	L = 45	15 nf	50	-40...85	stainless steel 316L / 1.4404	**IIC237**
M12 connector · output function ⎍ · 3-wire DC PNP						
M12	L = 45	4 nf	100	-40...85	stainless steel 316L / 1.4404	**IFC275**
M18	L = 45	12 nf	500	-40...85	stainless steel 316L / 1.4404	**IGC258**
M30	L = 50	25 nf	250	-40...85	stainless steel 316L / 1.4404	**IIC233**

Accessories

Type	Description	Order no.
	Angle bracket for type M12, stainless steel	**E10735**
	Angle bracket for type M18, stainless steel	**E10736**
	Angle bracket for type M30, stainless steel	**E10737**

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket, 4-pole, 5 m orange, PVC cable	**EVT001**
	M12 socket, 4-pole, 10 m orange, PVC cable	**EVT002**
	M12 socket, 4-pole, 5 m orange, PVC cable	**EVT004**
	M12 socket, 4-pole, 10 m orange, PVC cable	**EVT005**
	M12 socket, 4-pole, 5 m orange, PVC cable, LED	**EVT007**
	M12 socket, 4-pole, 10 m orange, PVC cable, LED	**EVT008**

Long range proximity switch with up to 10x the range

Magnetic sensors

Applications:

- Scrapers
- Final effluent bins
- Bridge alignment position
- Linear aerator alignment

Easy solutions for difficult applications

In special applications, the ifm magnetic sensors with these new targets offer long sensing ranges where other technologies reach their limits. In challenging applications, the combination of magnetic sensor and target can maximise performance.

Restricted space

New magnets with a small design offer easier mounting options in a machine, even where space is restricted, due to countersinks or a thread. Due to the new targets it is possible to double the M12 sensors' range while an enlargement of clear space between sensor and magnet provides a more flexible installation as well as an increased process safety.

Designation	Drill hole diameter [Ø mm]	External diameter [Ø mm]	Material	Sn at MFS211 [mm]	T_a [°C]	Order no.
Ring magnet						
M3.2	3.5	13	Barium ferrite	24	-40...200	**E12537**
M6.0	3.5	12	Neodymium	21	-40...80	**E12538**
M6.1	5.5	24	Neodymium	55	-40...80	**E12539**
Threaded magnet						
M7.0	–	Width across flats 10, hexagonal nut	Neodymium, tin-plated	15	-40...80	**E12540**
M7.1	–	12	Neodymium, plastics	31	-40...60	**E12541**

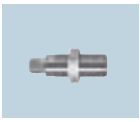
Accessories

Type	Description	Order no.
	Angle bracket for type M12, stainless steel	**E10735**
	Angle bracket for type M18, stainless steel	**E10736**
	Mounting clamp, with end stop for types M12	**E11047**
	Mounting clamp, with end stop for types M18	**E11048**

Connection technology

Type	Description	Order no.
	Socket, M12, 2 m orange, PVC cable	**EVT064**
	Socket, M12, 5 m orange, PVC cable	**EVT001**
	Socket, M8, 3-pole, 5 m orange, PVC cable	**EVT123**
	Socket, M8, 3-pole, 10 m orange, PVC cable	**EVT124**

Sensors

Type	Description	Order no.
	Magnetic sensor, plastics 28 x 10 x 16 / NO	**MS5010**
	Magnetic sensor, plastics 28 x 10 x 16 / NO	**MS5011**
	Magnetic sensor, stainless steel M12 x 60 mm / NC	**MFS210**
	Magnetic sensor, stainless steel M12 x 60 mm / NO	**MFS211**
	Magnetic sensor, stainless steel M18 x 60 mm / NO	**MGS204**
	Magnetic sensor, stainless steel M18 x 60 mm / NC	**MGS206**

Sensors in combination with a magnet

Type	Sensing range [mm]				
	M3.2	M6.0	M6.1	M7.0	M7.1
MGS20...	25	28	55	20	38
MS50...	20	25	50	15	31
MFS2...	20	25	50	15	31

Further magnets

Type	Description	Order no.
	Damping element M3.0, Ø 20 mm, barium ferrite	**E10751**
	Damping element M5.0, Ø 35 mm, barium ferrite	**E10753**
	Damping element M4.1, Ø 40 mm, barium ferrite / stainless steel (1.4571 / 316Ti)	**E11803**
	Damping element M3.1, Ø 20 mm, barium ferrite / stainless steel (1.4571 / 316Ti)	**E12291**

Panel mounted bus connectivity modules

IO-Link masters CabinetLine

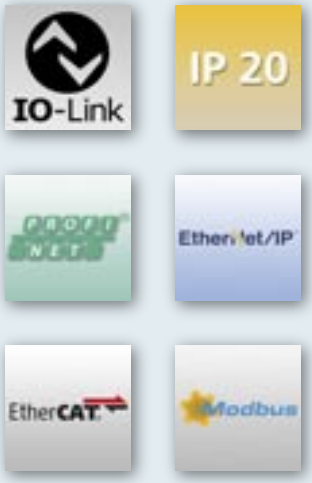
Separation between automation and IT network

Industry 4.0 ready via new IoT core

8 IO-Link ports with full V1.1 functionality

PROFINET, EtherNet/IP, EtherCat, Modbus TCP or TCP/IP JSON

Master and device configurable via the moneo|configure soft-



IO-Link master for the automation and IT world

The IO-Link master modules for the control cabinet serve as a gateway between intelligent IO-Link sensors and the field bus. Besides, important information of the intelligent sensors can simultaneously be sent into the IT world.

With a separate IoT Ethernet socket the IT network can be set up completely separated from the automation network. Sensor information is transferred into the IT world via the established TCP/IP JSON interface.

Advantages and customer benefits

- **Separation between automation and IT network**

  Machine uptime is of highest priority. The automation network must by no means be interrupted by external factors. Therefore the unit features a separate IoT Ethernet socket separating IT and automation network. This means that important sensor information can be safely sent to the IT and ERP systems.

- **Sensor configuration with moneo|configure**

  The intuitive software finds all IO-Link masters in the network and creates an overview of the whole plant. In addition, all connected sensors are displayed with the respective parameters. This makes it possible to set the parameters of all sensors in the system from one central point.

- **Easy sensor connection**

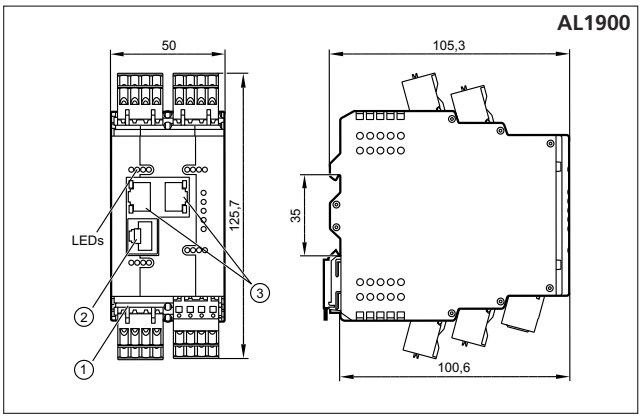
  The sensors and actuators are connected via standard M12 connection cables without screening. The connection cables are fixed via removable COMBICON connectors on the IO-Link master. Up to 8 IO-Link sensors can be connected and be supplied with up to 3.6 A. The cable can be up to 20 m long.

- **Reliable digital data**

  The sensor data is transferred digitally.
  Unlike analogue signals, contact resistance and EMC interference cannot corrupt the signals.

Dimensions

AL1900



1) Combicon connector
2) IoT-Port
3) Profinet IO data interface

The products

Type	Description	Order no.
IO-Link master CabinetLine		
	PROFINET + IoT 8-port	**AL1900**
	EtherNet/IP + IoT 8-port	**AL1920**
	EtherCat + IoT 8-port	**AL1930**
	Modbus TCP + IoT 8-port	**AL1940**
	MQTT JSON 8-port	**AL1950**

Technical data

IO-Link master CabinetLine AL1900, AL1920, AL1930, AL1940		
Operating voltage	[V DC]	20...30
Total current consumption	[A]	≤ 3.9
IO-Link version		1.1
Number of IO-Link ports		8 A ports
Number of binary inputs		8 + 8
Number of binary inputs		8
Parameter memory		•
Current for all ports (device supply)	[A]	≤ 3.6
Protection		IP 20
Electrical connections		COMBICON connector
Installation		DIN rail
Ambient temperature	[°C]	-25...65
Dimensions	[mm]	114.2 x 50 x 105.3

Accessories

Type	Description	Order no.
	**moneo|configure SA** (Stand-alone) licence, software for online and offline parameter setting of IO-Link devices including maintenance and support until the end of the following year	**QMP010**
	Ethernet adapter M12 / RJ45	**E21140**

Field mounted bus connectivity modules

IO-Link master
StandardLine IP68/69K

- **4 or 8 IO-Link ports with full V1.1 functionality**
- **IP 69K field module for wet areas**
- **Master and devices configurable via the moneo|configure software**
- **Industry 4.0 ready via LR AGENT EMBEDDED**
- **Voltage supply via standard**

Robust field bus modules for demanding applications

The decentralised IO-Link masters are used as gateways between intelligent IO-Link sensors and the fieldbus. Thanks to their special housing materials and high ingress resistance (IP 69K), they can be used directly in wet areas. The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVF product series.
The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.

High-quality materials especially suited to the application and intensive monitoring during and after production guarantee maximum quality standards.

Advantages and customer benefits

- **Configuration of sensors with moneo|configure**

  The intuitive software finds all IO-Link masters in the network and creates an overview of the whole plant. Besides, all sensors connected are indicated with the respective parameters. This means that parameter setting of all sensors in the system is possible from one central point.

- **Easy sensor connection**

  The sensors and actuators are connected via standard M12 connection cables without screening. Depending on the device type, up to 4 or 8 IO-Link sensors can be connected and supplied with up to 3.6 A.
  The cable can be up to 20 m long.

- **Reliable digital data**

  The sensor data is transferred digitally. Unlike analogue signals, contact resistance and EMC interference cannot corrupt the signals.

- **Direct connection to the IT**

  The integrated LR AGENT EMBEDDED is capable of transmitting the process values directly to ERP systems, without detour via the PLC. This second communication path is available in parallel to the fieldbus via the bus wiring.

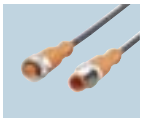
Connection technology

Type	Description	Order no.
Ethernet cable (fieldbus)		
	1 m	**EVF530**
	2 m	**EVF531**
	5 m	**EVF532**
	10 m	**EVF533**
M12 socket 1 mm² (power)		
	2 m	**EVF480**
	5 m	**EVF481**
	10 m	**EVF482**
	20 m	**EVF483**
M12 connection cable 0.34 mm² (sensor)		
	1 m	**EVF042**
	2 m	**EVF043**
	5 m	**EVF044**
	10 m	**EVF045**

Products

Type	Description	Order no.
IO-Link master StandardLine		
	Profinet 4-port	**AL1101**
	EtherNet/IP 4-port	**AL1121**
	Modbus TCP 4-port	**AL1341**
	Profinet 8-port	**AL1103**
	EtherNet/IP 8-port	**AL1123**
	Modbus TCP 8-port	**AL1343**
IO-Link-Module		
Output module 6 x 2DO		**AL2230**

Accessories

Type	Description	Order no.
Included in the set		**ZZ1060**
	IO-Link master USB 1 port	**AL1060**
	Connection cable M12 / M12, 1 m, PUR cable	**EVC012**
	Connection cable M12 socket, B-coded / USB plug	**E12689**
	LR DEVICE (USB stick), IO-Link parameter setting software	**QA0011**

io-key – the key to the industrial IoT

IO-Link accessories

Pre-configured, no SIM card required

Web-based dashboard for visualisation and analysis of cloud data

Email or text message when limit values are exceeded

IO-Link sensor data is sent directly via mobile network to the cloud

Two IO-Link sensors can be connected

Cloud connection for all IO-Link sensors

The io-key recognises up to two connected IO-Link sensors and sends their process values automatically via GSM mobile network to the cloud where the data is stored. The user can visualise and analyse the data via a web-based dashboard.

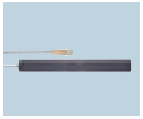
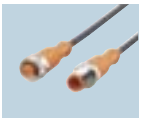
Alarms are sent as a text message or email

A few mouse clicks suffice to set limit values in the dashboard, so that the plant operator will be warned by email or text message when values are exceeded or not reached.

Export

The data from all sensors can be summarised and exported automatically as a report at any time.

Accessories

Type	Description	Order no.
	Plug-in power supply, 90...264 V AC / 24 V DC	E80120
	Plug-in power supply with interchangeable adapter, 100...240 V AC / 24 V DC	E80121
	Level sensor 0.1 m cable, M12 connector, 5 pins	KQ1001
	Vibration diagnostics sensor for industrial machines	VVB001
	Signal converter for PT100/PT1000 temperature sensors to IO-Link	TP9237
	Smart valve sensor M12 connector	MVQ101
	IO-Link input module, 6 x 2 inputs; M12 connector; IP 67	AL2340
	Thermal compressed air meter, G 1/4 0.05...15 Nm³/h	SD5500
	Evaluation system and display for analogue signals	DP2200
Connection technology		
	Connection cable, M12, 1 m, black, PUR cable	EVC042
	Connection cable, M12, 2 m, black, PUR cable	EVC043
	Y connection cable, M12, 0,3 m, black, PUR cable	EVC614

Products

Description	Order no.	
io-key version	**Europe**	**global**
io-key, IoT gateway for 2 IO-Link sensors	**AIK001**	**AIK050**
Transmission interval XS 1 x per day	**AIS910**	**AIS950**
Transmission interval S 1 x per hour	**AIS911**	**AIS951**
Transmission interval M 1 x per minute	**AIS912**	**AIS952**
Transmission interval L every 10 seconds	**AIS913**	**AIS953**
SMS notification (up to 10 SMS)	**AIS990**	
Edge alarm function (up to 1000 alarms/month)	**AIS991**	

From sensor to IoT

Sensor information can be collected directly and sent to the cloud without requiring any connection to a controller, PC or company network.

Apart from voltage supply and GSM network availability, the io-key requires no infrastructure.

ifm offers two versions of the io-key with different radio modules and data tariffs for European and global mobile networks.

As all ifm products, the io-key is a sturdy unit and has a high protection rating of IP 65. Hence, it can be used in harsh industrial environments.

Application examples

The io-key is suited for all applications that do not primarily require permanent transmission of measured values in real-time.

The io-key can even be used to monitor and evaluate remote parts of the plant that are not connected to the company infrastructure.

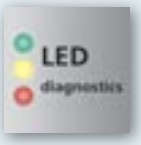
For example:

– Tank monitoring using a capacitive continuous level sensor type KQ10xx
– Measurement of compressed air consumption and leakage monitoring using an compressed air meter type SDxxxx
– Fan monitoring using a vibration diagnostics sensor type VVBxxx
– Valve monitoring using a valve sensor type MVQxxx

Current converter with relay outputs

Systems for pulse evaluation

- **Integrated wide-range power supply for the sensor supply**
- **Small design requiring only very little space**
- **Plug-in screw terminals simplify installation**
- **PNP or NPN control selectable**
- **One or two-channel design**



Relay for high load currents

The transistor outputs of conventional sensors are designed for small load currents. If the user wants to switch higher currents or even alternating currents, he must use a switching amplifier. It uses the sensor signal to control an output relay.

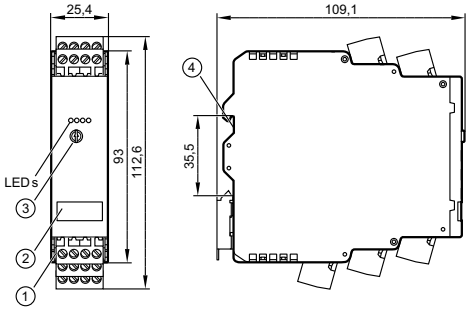
Flexible and space-saving

ifm offers switching amplifiers in one and two-channel design. They have an integrated wide-range power supply (110...240 V AC) to supply the connected sensors with voltage (24 V DC). The new switching amplifiers are distinguished by their slim design so that they only need little space in the control cabinet.

Type	U_b [V]	Inputs	Pulse input	Input frequency [Hz]	Outputs Relay	Auxiliary energy for sensors	Order no.
Application: power supply and signal evaluation (e.g. for sensors)							
	110...240 AC 50...60 Hz	1	PNP / NPN	≤ 10	1	24 V DC, 300 mA	**DN0210**
	110...240 AC 50...60 Hz	2	PNP / NPN	≤ 10	2	24 V DC, 2 x 150 mA	**DN0220**

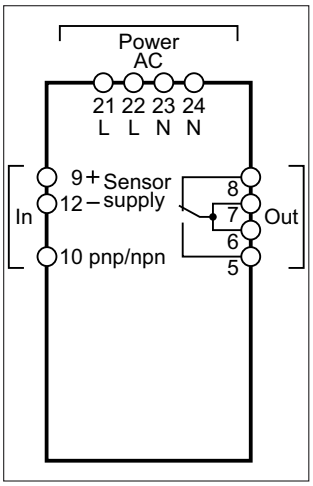
Dimensions

DN0220

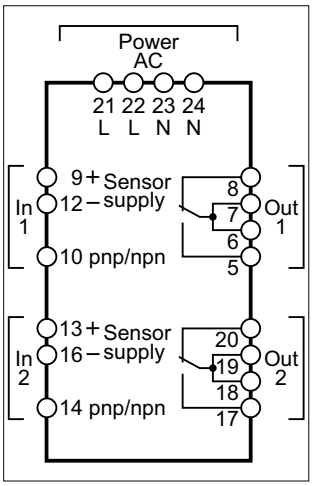


1) plug-in screw terminals
2) panel for labelling
3) potentiometer
4) DIN rail mounting

Wiring diagram



DN0210 (1-channel)



DN0220 (2-channel)

Further technical data		
Setting range: selectable for PNP and NPN switching sensors		
Relay output Contact rating	[A]	4 (240 V AC, 24 V DC); resistive load
Auxiliary energy for sensors	[V]	24 DC SELV, ± 10 %, 300 mA, short-circuit and overload protected
Protection housing / terminals		IP 20 / IP 20
Ambient temperature	[°C]	-20...60
Display DN0210	LED Power supply Output Fault	 1 x green 1 x yellow (lights, if output relay is energised) 1 x red
Display DN0220	LED Power supply Output Fault	 1 x green 2 x yellow (light, if output relay is energised) 1 x red
Potentiometer		Selection PNP / NPN
Housing material		Plastic: PC GF20
Mounting		Rail TH35 (according to EN 60715)
Connection		Unit: 4-pole terminal blocks with 5.0 mm pitch; Connector: 4 poles with screw connection

Accessories

Type	Description	Order no.
	Connector, 4 poles with screw terminals, pack of 5 (supplied)	**E40173**
	Connector, 4 poles with cage clamps, pack of 5	**E40171**

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