



Automation Technology for the Automotive Industry

Catalogue 2019/2020



ifm.com/gb/automotive

Reliable solutions for your applications



The automotive industry is one of the world's most innovative industries.

It has always been an important driving force of the economy. With a view to ensuring quality, reliability and economic efficiency, the manufacture of vehicles and automotive components such as engines and gearboxes is only possible in automated manufacturing facilities.

A central objective of the ifm group of companies is to increase the reliability and operational availability of manufacturing equipment. In addition to the proven sensor technology, new areas of application such as condition-based maintenance or monitoring of consumables in plants are constantly opened up.

In the future, too, ifm will remain a reliable and innovative partner for the automotive industry.

ifm – close to you!



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This industry-specific catalogue is available
for download on our website at:
ifm.com/gb/automotive-industry



ifm – the company matching your requirements

close to you:

Our worldwide sales and service team is here to help you at any time.

Engineering “Made in Germany”:

German engineering available worldwide.

Flexible:

Not only our service but our broad product portfolio perfectly suit the most varying requirements.

Innovative:

More than 880 patents and in 2018 about 100 patent applications.

Reliable:

5-year warranty on ifm products.



System instead of just components
ifm provides you with a broad portfolio for flexible automation of your production. Our range of more than 7,800 articles guarantees flexibility and compatibility.



Quality as part of our philosophy
Quality is an inherent part of our philosophy. We use our customers' feedback to continuously improve the quality of our products. Our sensors are tested with values far beyond the indicated limits using special procedures.



We are there for you

Close contact with our customers is part of our success. We have consistently developed our sales network right from the start.

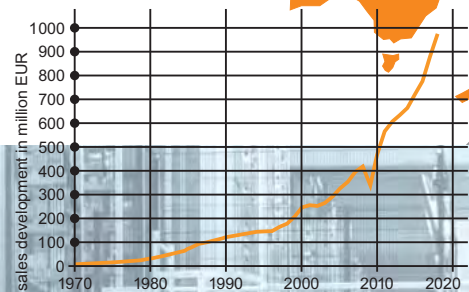
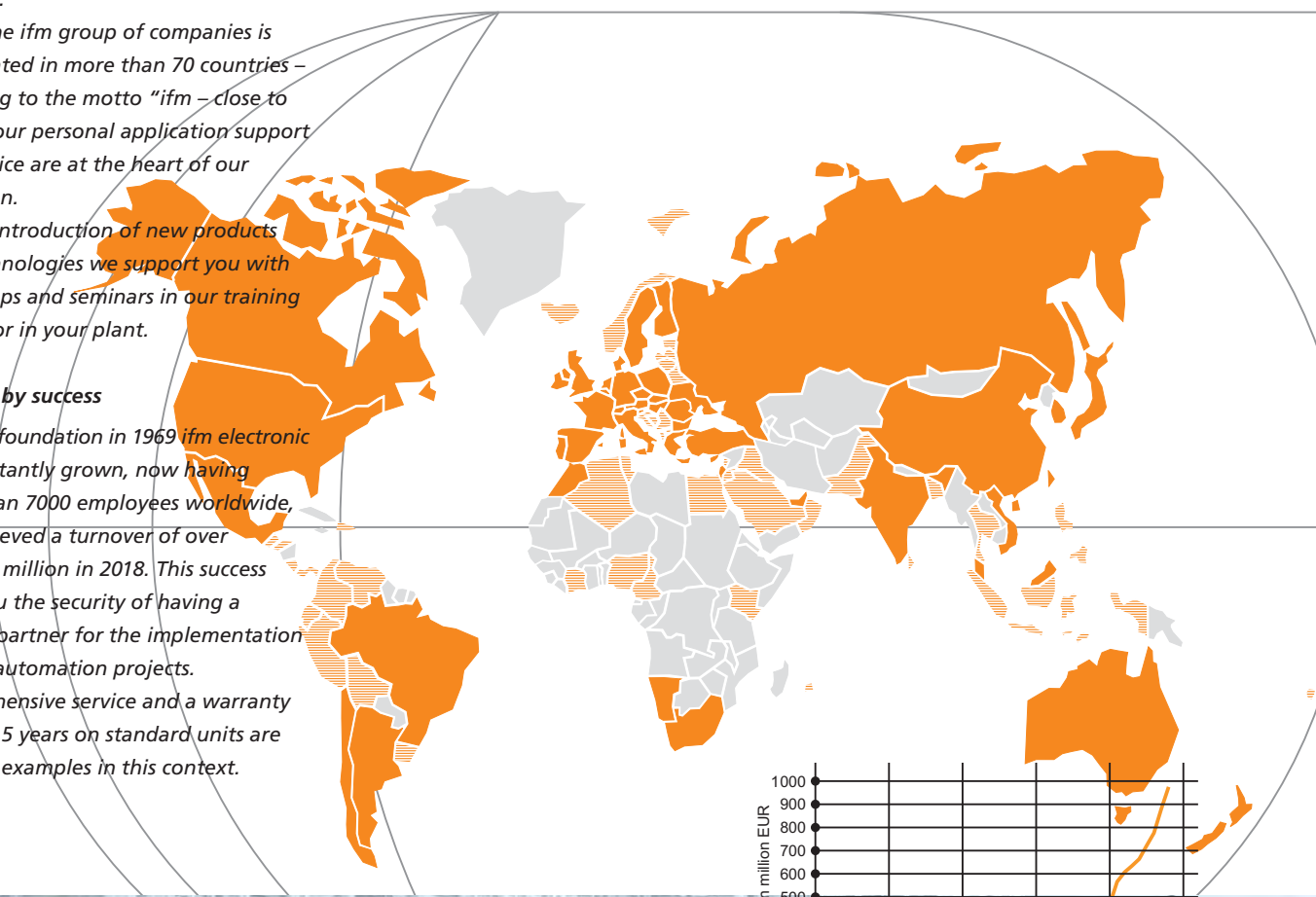
Today the ifm group of companies is represented in more than 70 countries – according to the motto “ifm – close to you!” Your personal application support and service are at the heart of our operation.

For the introduction of new products and technologies we support you with workshops and seminars in our training centres or in your plant.

Security by success

Since its foundation in 1969 ifm electronic has constantly grown, now having more than 7000 employees worldwide, and achieved a turnover of over EUR 975 million in 2018. This success gives you the security of having a reliable partner for the implementation of your automation projects.

Comprehensive service and a warranty of up to 5 years on standard units are just two examples in this context.



Product availability

Your deadlines matter to us. That is why we are constantly optimising our production processes. In order to be able to quickly and flexibly produce large quantities at a constantly high quality – and to continue to shorten delivery times.

See the current ifm company film to get to know us better:
ifm.com/gb/close-to-you



The ifm sales platform



Overview:

The ifm product range is clearly structured and the individual product platforms ensure quick orientation.

Selectors:

Choose between the most important technical data and you will get the product selection suitable for your requirements.

Compare:

You can compare the technical data of up to 3 products. Differences are marked in colour.

Search and find:

Enter the search term in the full text search and get suggestions for products, topics and product groups.

Order:

We provide a quick-order and csv import function for the shopping basket on the product pages.



More clarity

For each product group you can make a first selection via the platforms.

A clear visual language and explanatory texts give you a first impression of the products.



Compare products with each other

The selectors are the heart of the product search. The displayed selection criteria are adapted to each product range and the technical features of the products. The results can be displayed as tiles or lists.

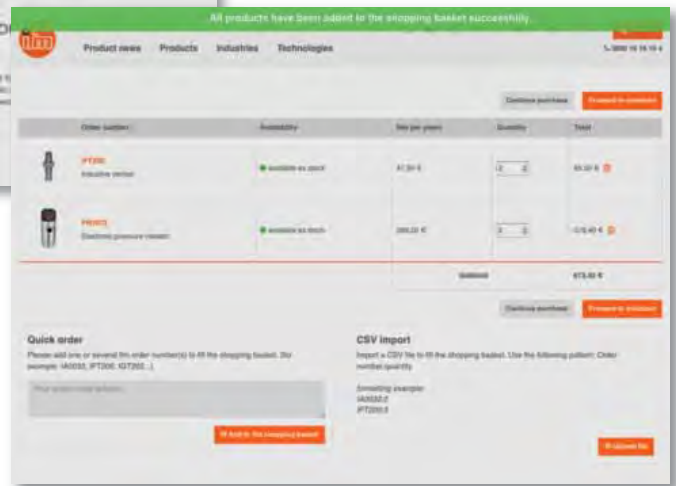
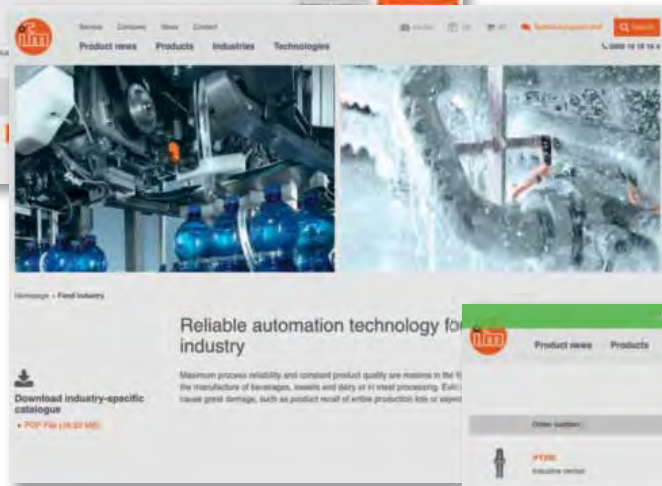


Easy purchasing

You are in control of everything in the shopping basket: quantity, modes of shipment and payment. We provide you with everything you can expect from a modern shop.

Customers relying on long-standing tried-and-tested articles can quickly order by entering the article number in the shopping basket. This saves time, in particular when a product has to be quickly reordered.

Navigation in the menu structure is no longer necessary.



For all types of display

Whether PC, laptop, tablet or smartphone – the design of the sales platform adapts to any screen size thus increasing user-friendliness. This also makes it possible to buy products using mobile equipment such as a smartphone.

Try us.
Click here to directly get to our homepage:
ifm.com



Your start into the industrial revolution. IO-Link solutions from ifm.



Simple:

The sensor parameters can be set from the controller or the master. No crawling or climbing required to set the sensor.

Transparent:

Many sensors supply measured values to the switching signals via IO-Link. The goal is a constant product quality with less energy and raw material consumption.

Reliable:

Transmission that is prone to errors and conversion of analogue signals is replaced with digital measured value transmission.

Low-cost:

Process information, switching status, diagnostic functions are transmitted without loss via a single port to the controller. Expensive analogue signal processing is no longer needed.

Fascination IO-Link

In the past binary switches usually provided simple switching signals or analogue values. Today the data from intelligent sensors is the basis for the next industrial revolution.

Sensors that extract all the information from your machines and equipment using the key technology IO-Link.

Leading manufacturers from the fields of sensors, actuators and control technology have developed IO-Link.

Together they developed a standardised and field-bus independent interface for automation providing the user with a point-to-point connection without complex addressing.

Benefit from the appeal of IO-Link, talk to us and stay as productive and competitive for your manufacturing processes of tomorrow.



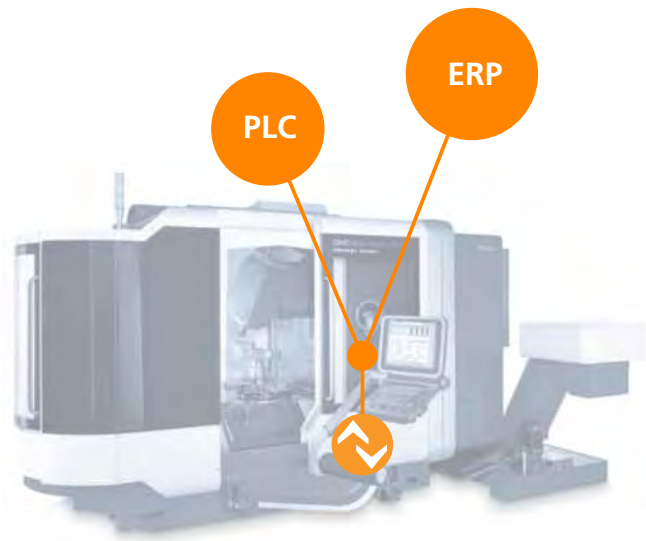


Head start with IO-Link

Use the advantages! Today IO-Link sensors from ifm give the user completely new options.

Additional sensor data, for example, is generated to achieve maximum efficiency and cost saving.

This allows process transparency from the machine to ERP to optimise your existing automation. Furthermore IO-Link has a lot more to offer:



No external influence of the signal

Data transfer is based on a 24 V signal. Screened cables and associated grounding are no longer necessary.



Tamper free

No wrong settings by operators.



No measured value losses

The entire measured value transmission is digital. Transmission that is prone to errors and conversion of analogue signals is replaced.



Identification

Only like for like replacement. No wrong sensors accepted.



Easy sensor replacement

All sensor parameters are stored in the master and transferred to the replaced unit.



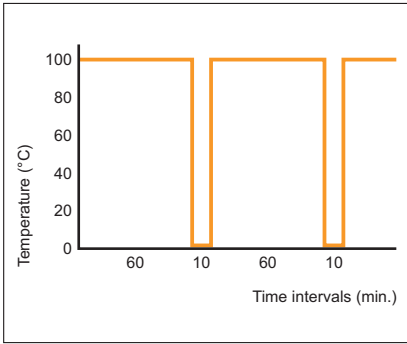
Wire-break detection / diagnostics

Wire-break or short-circuit is immediately detected.



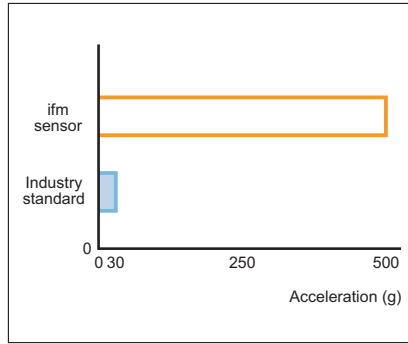
Point-to-point communication:
more details in our IO-Link video:
io-link.ifm





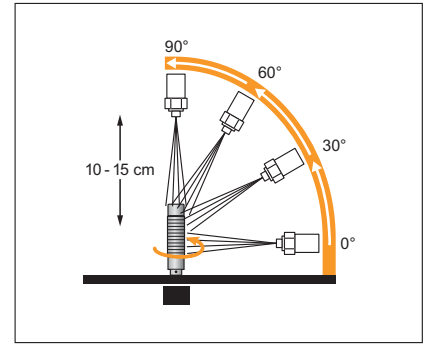
Thermal shock test

In pressure cleaning environments, proximity sensors are exposed to extreme temperature conditions. This is why ifm performs thermal shock tests on the sensors by cycling the temperature between 0 and 100 °C in short time intervals. After the test, the sensors' characteristics are tested to ensure high reliability.



Shock test

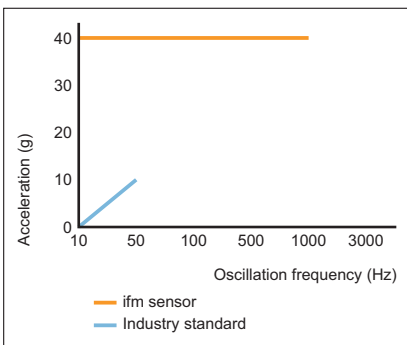
Sensors can be exposed to high levels of shock in industrial environments. This is why ifm sensors are tested at a shock level of 500 g. This test standard sets a new benchmark for inductive sensor product development.



IP 69K high-pressure cleaning test

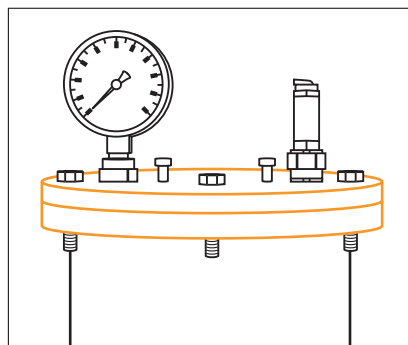
ifm inductive proximity sensors are tested in accordance with the IP 69K standard. The goal is to duplicate pressure cleaning conditions on a plant floor.

In the test fixture, the sensors are exposed to a 80 - 100 bar spray of water at a temperature of 80 °C. The duration of each cleaning cycle is 30 seconds. The test is performed at specified angles using a spray nozzle located at a distance of 10 - 15 cm from the sensor. ifm inductive sensors can withstand test conditions and are still operable providing 100 % of their sensing range.



Vibration test

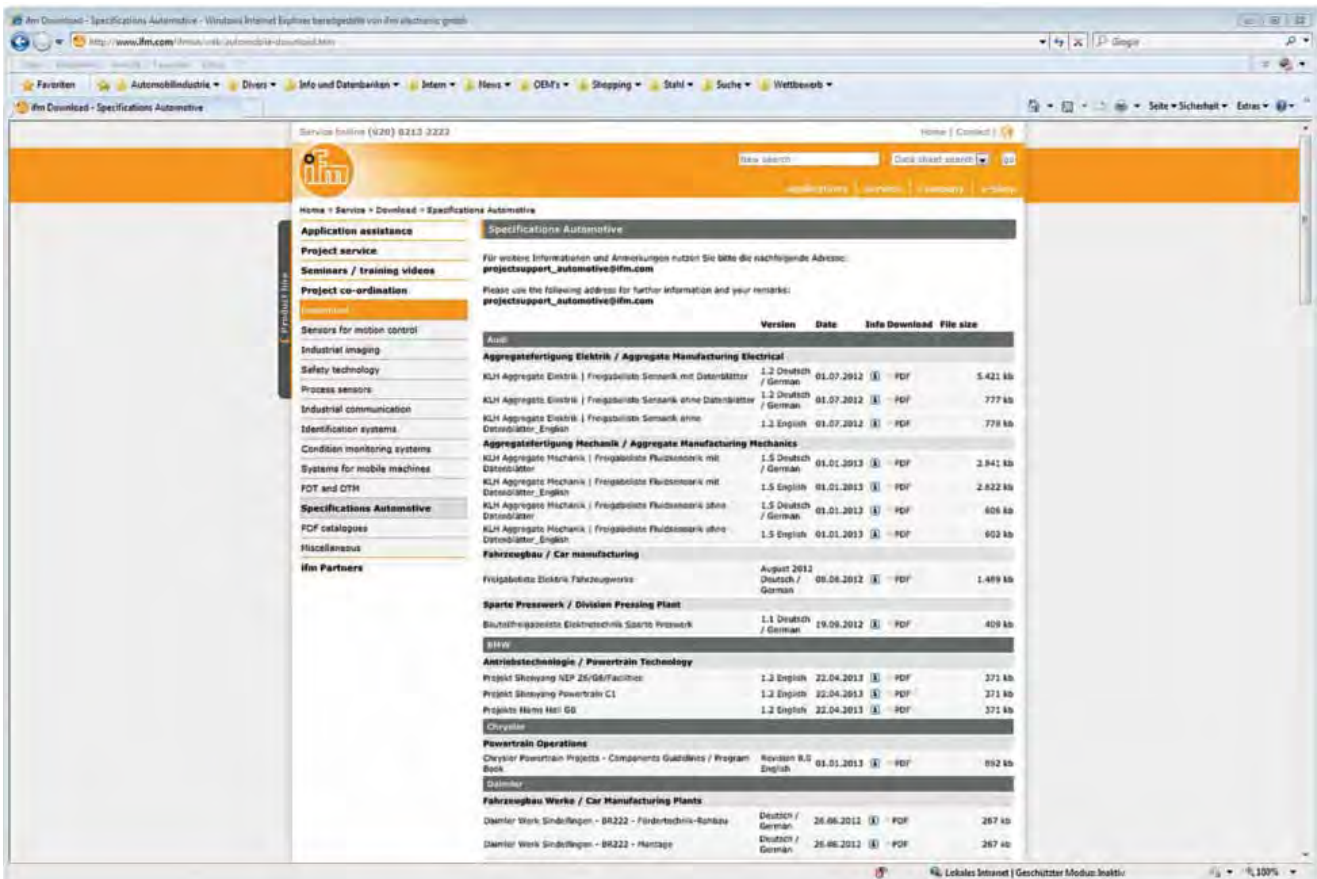
A vibration test is performed on the sensors at a level of 40 g with the oscillation frequency spanned between 0 and 2,000 Hz. This test checks the integrity of the electronic circuit and the surface-mounted components. The vibration test is designed to far exceed manufacturing plant conditions on industrial automation machinery.



Steam boiler test

To simulate the aging process, the washdown sensors are placed in a steam boiler. For inductive sensors: the test simulates whether penetrating water molecules can disturb the sensor behaviour. This is recognisable by a change in the sensing range. For photoelectric sensors: the test simulates whether water can penetrate into the sensor optics. Abrupt cooling in ice water will cause any moisture to fog up the lens on the inside.

Many ifm sensors are specified by car manufacturers and their suppliers

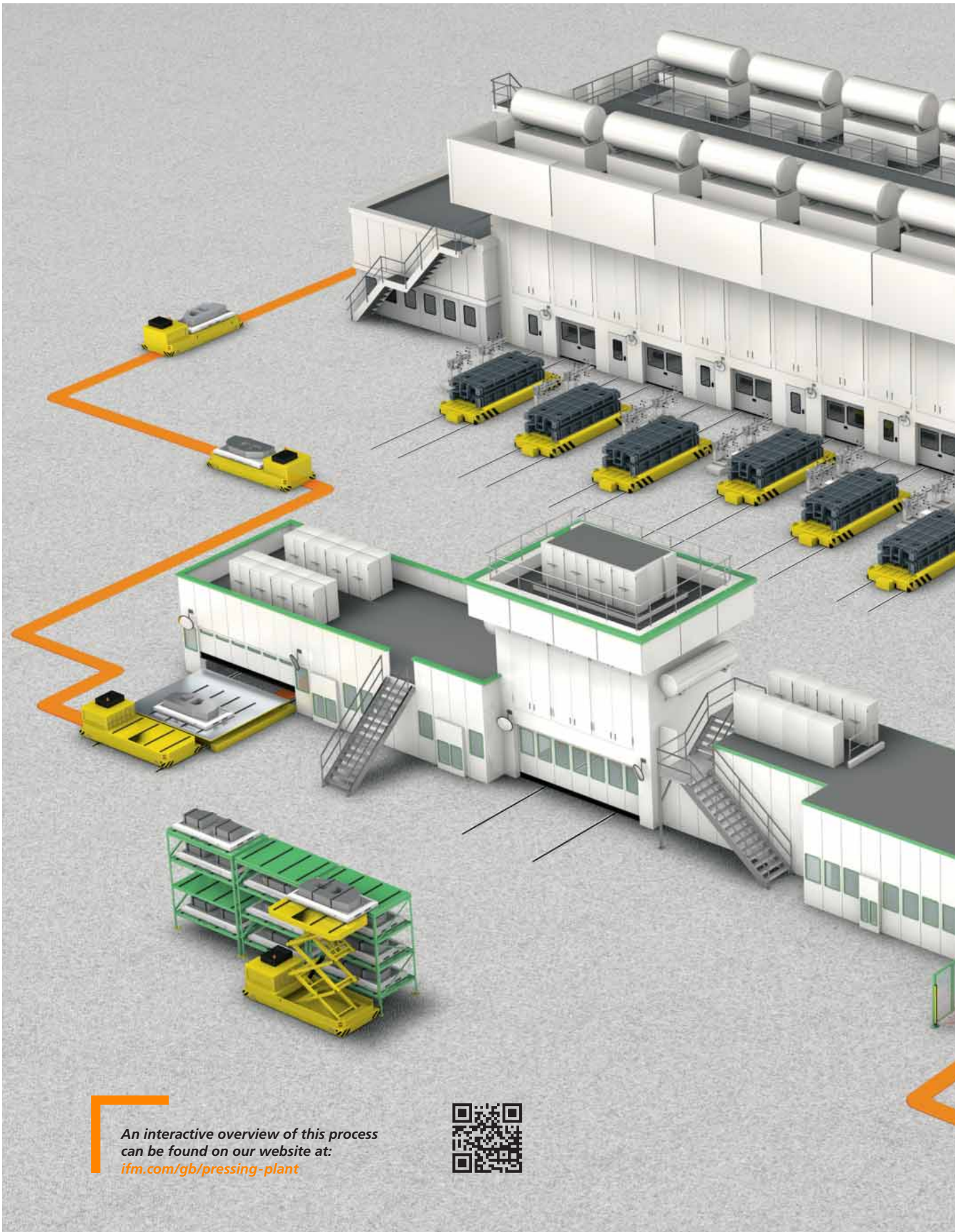


The screenshot shows the ifm website's 'Specifications Automotive' page. The page features a navigation menu on the left with categories like 'Application assistance', 'Sensors for motion control', and 'Specifications Automotive'. The main content area displays a table of specifications, including details on electrical and mechanical aggregate manufacturing, powertrain technology, and car manufacturing plants.

	Version	Date	Info Download	File size
Aggregatefertigung Elektrik / Aggregate Manufacturing Electrical				
KLH Aggregate Elektrik Freigabedate Sensoren mit Datenblätter	1.2 Deutsch / German	01.07.2012	[X] PDF	5.421 kb
KLH Aggregate Elektrik Freigabedate Sensoren ohne Datenblätter	1.2 Deutsch / German	01.07.2012	[X] PDF	777 kb
KLH Aggregate Elektrik Freigabedate Sensoren ohne Datenblätter_English	1.2 English	01.07.2012	[X] PDF	778 kb
Aggregatefertigung Mechanik / Aggregate Manufacturing Mechanics				
KLH Aggregate Mechanik Freigabedate Fluidsensoren mit Datenblätter	1.5 Deutsch / German	01.01.2013	[X] PDF	2.841 kb
KLH Aggregate Mechanik Freigabedate Fluidsensoren mit Datenblätter_English	1.5 English	01.01.2013	[X] PDF	2.822 kb
KLH Aggregate Mechanik Freigabedate Fluidsensoren ohne Datenblätter	1.5 Deutsch / German	01.01.2013	[X] PDF	606 kb
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Fahrzeugbau / Car manufacturing				
Freigabedate Elektrik Fahrzeugvers...	August 2012 Deutsch / German	08.08.2012	[X] PDF	1.469 kb
Sparte Presswerk / Division Pressing Plant				
Blauweißgasbetriebe Elektrotechnik Sparte Presswerk	1.1 Deutsch / German	19.09.2012	[X] PDF	409 kb
SIHV				
Antriebs-technologie / Powertrain Technology				
Projekt Shenyang NEF 25/GA/Facilities	1.3 English	22.04.2013	[X] PDF	371 kb
Projekt Shenyang Powertrain C1	1.3 English	22.04.2013	[X] PDF	371 kb
Projekt Hama HMI ES	1.2 English	22.04.2013	[X] PDF	371 kb
Chrysler				
Powertrain Operations				
Chrysler Powertrain Projects - Components Guidelines / Program Book	Revision B.0 English	01.01.2013	[X] PDF	692 kb
Daimler				
Fahrzeugbau Werke / Car Manufacturing Plants				
Daimler Werk Sindelfingen - BR222 - Fertigteile-Handb...	Deutsch / German	26.06.2011	[X] PDF	267 kb
Daimler Werk Sindelfingen - BR222 - Montage	Deutsch / German	26.06.2011	[X] PDF	267 kb

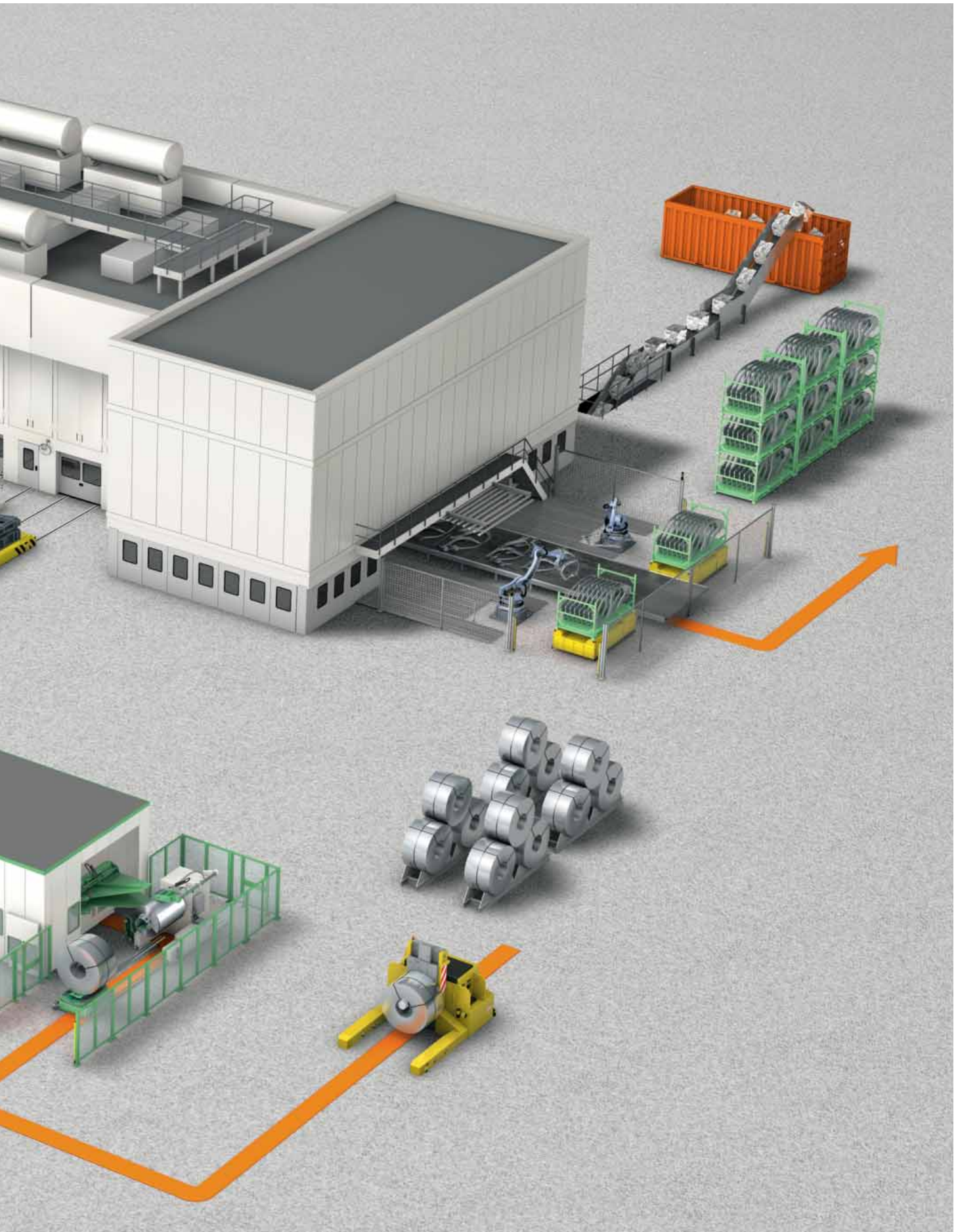
Approvals from the automotive industry

In many cases, production equipment and project requirements specify the use of products and technologies in the automotive industry. The devices and applications shown in this catalogue are suggested as solutions. A great number of products from ifm are listed with the renowned manufacturers. A list of globally valid specifications in the download area provides guidance for project engineering.



An interactive overview of this process
can be found on our website at:
ifm.com/gb/pressing-plant





Modern pressing plants are impressive, thanks to the highly automated processes used



First of all, the blanks are cut from steel coils on a coiling unit. Depending on requirements, these base sheets are edged and may be partially pre-punched.

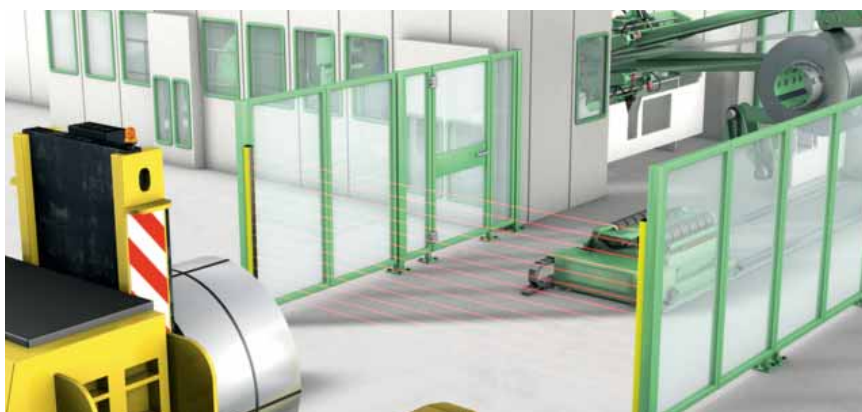
At several points in the process, oils and greases are used to lubricate the sheet metal for punching and pressing operations.

Cracks in the sheet metal result if the elastic limit of the material concerned is exceeded. This is avoided using multi-stage forming. Individual presses are linked together. This chain of presses is known as the press line.

Important components of a pressing plant are the hydraulics, as well as the lubrication and compressed air supply to the presses and grippers. The waste generated by the pressing and punching operation is processed in a scrap press for recycling in electric melting furnaces.

Pressing plants must work reliably, with very high availability of the plant components. Here the user is supported by sensors from ifm, with their high standards of reliability and robustness.


Coil transfer




Access restriction to coil transfer station

For operator protection, OY series safety light curtains restrict unauthorised access to accessible areas such as the coil transfer station. Depending on the design, the safety light curtains correspond to Type 2 or 4, in accordance with EN 61496.

Safety light curtains for access prevention · further products from page 249

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
	1563	30	1510	0...4 / 3...12	18.5	24	OY0505

Multi-code reader for identifying coils · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 53.5	132 x 94	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I302


Coil storage trolley



Level detection in the mobile hydraulics of heavy load lifters

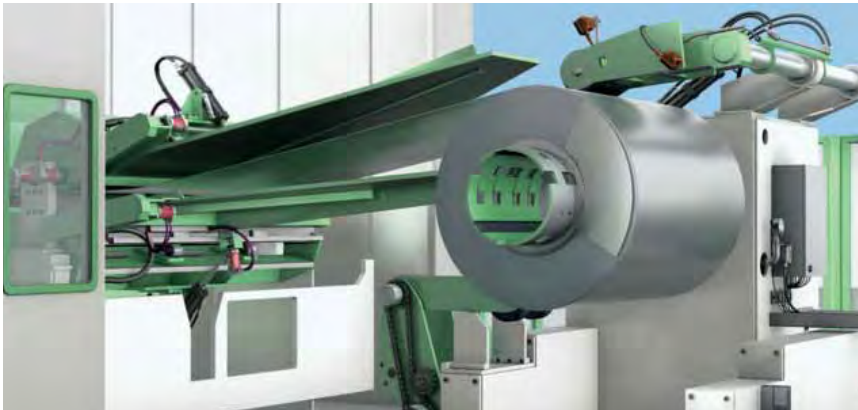
Here, a hydraulic drive is used instead of electric motors. A KQ series level sensor detects the level in the tank.

Capacitive sensors for level detection · further products from page 159

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6005

f = flush / nf = non flush / qf = quasi-flush


Strip flow




Strip flow in blank cutting plant and coil unwinder

The O1D PMD sensors monitor the correct running of the steel strip and coil unwinding. Once a defined circumference has been reached, the coil changeover starts automatically.

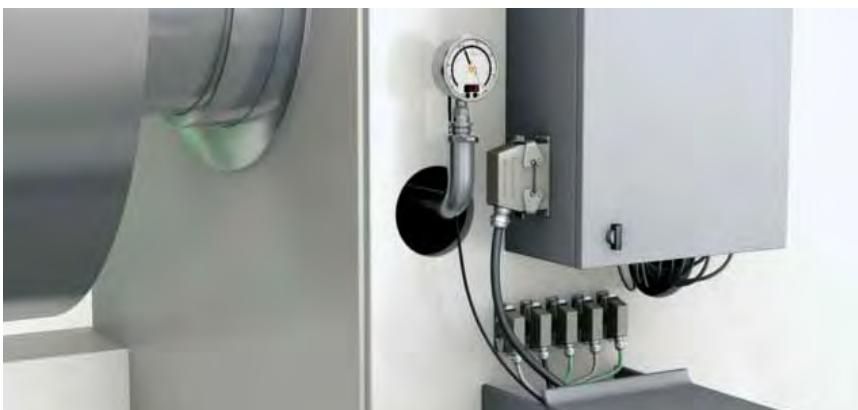
PMD distance sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D100

Inductive cylinder sensors · further products from page 175

Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
	25.3 x 5 x 6.5	PA (polyamide)	10...30	6000	IP 65 / IP 67	100	-25...85	MK5159


Unwinding the coil



System pressure always in view

The PG electronic contact manometer combines an easy-to-read manometer display with the advantages of an electronic pressure sensor. The operator can always see the correct pressure from the control console.

Pressure sensors for monitoring the system pressure · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ½ male	Display unit	-1...25	100	300	18...32	PG2453


Strip washing plant




The steel strip is washed with high-viscosity oil

Here, the flow monitor detects the flow of the special oil.

Flow sensors · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	M18 x 1.5	0.04...3	-20...90	100	0.5	18...30	SA5000

Compact temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-50...150 / -58...302	M18 x 1.5	Display unit	18...32	50	250	TN2511


Lubrication unit



Eccentricity monitoring on contact lubricators

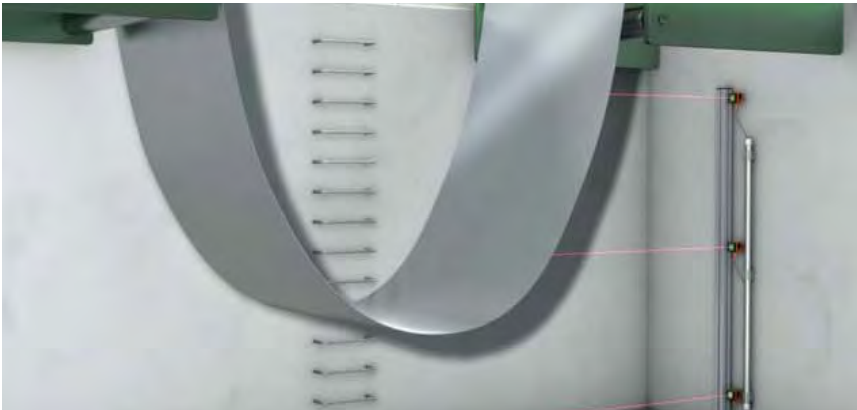
This inductive sensor, with a full-metal design, is ideal for application in rough environments.

Inductive full-metal sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M12 / L = 60	3 f	High-grade st. steel	10...36	IP 67 / IP 68	100	100	IFC258

f = flush / nf = non flush / qf = quasi-flush


Loop pit



Sag control with P MD time of flight sensors

The O1D distance sensors continually measure the sag of the coil loop.

PMD distance sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D120


Straightener




Analogue pressure sensors for controlling the straightening rollers

The strip runs through multiple straightening rollers to eliminate the bending stress. The control system receives feedback for further processing via the analogue values.

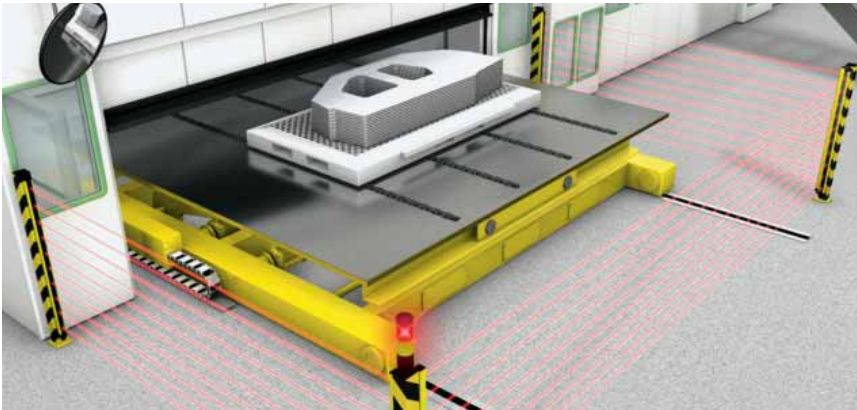
Pressure sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	-1...25	150	350	18...30	PN2093

Photoelectric distance sensors for detecting the strip · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D100

Blank removal




Access restriction

Blank removal

For operator protection, OY series safety light curtains restrict unauthorised access to accessible areas such as the blank removal station. Depending on the design, the safety light curtains correspond to Type 2 or 4, in accordance with EN 61496.

Safety light curtains for access prevention · further products from page 249

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
	1413	50	1360	0...4 / 3...12	10	24	OY0895


Monitoring of high-speed doors



Door monitoring

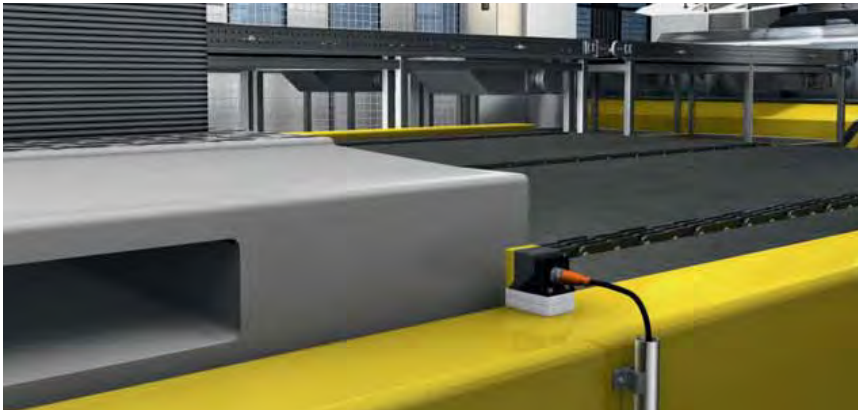
Fail-safe inductive sensors suitable for safety functions up to PL e / SIL 3, detect the end stop of the high-speed door without contact and without any specific counterpart.

Fail-safe inductive sensors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	66	10...15 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM7015

f = flush / nf = non flush / qf = quasi-flush


Load carrier



Position control of load carriers

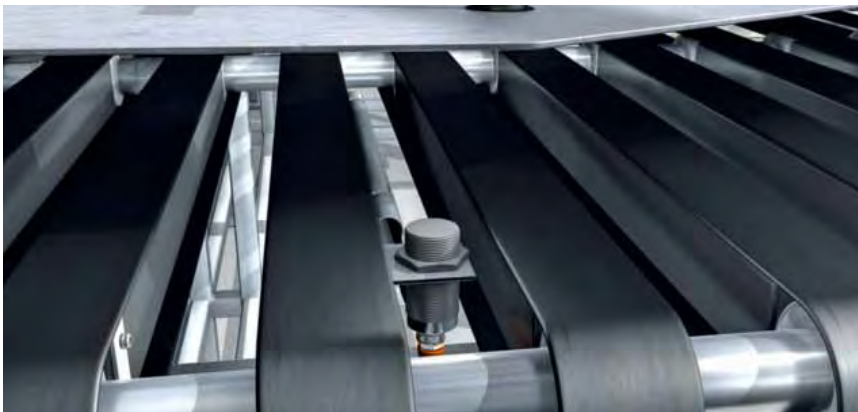
Contactless fail-safe inductive sensors suitable for safety functions up to PL e / SIL 3 directly detect the safe position of load carriers – without requiring a special counterpart.

Fail-safe inductive sensors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	66	10...15 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM7015

f = flush / nf = non flush / qf = quasi-flush



Belt conveyors



Part detection on belt conveyors

“R” series full-metal inductive sensors are designed for heavy-duty work in the press shop. Here a sensor detects whether a blank has been placed on the conveyor belt.

Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M30 / L = 70	12 f	High-grade st. steel	10...36	IP 67	2	100	IIR200
	M30 / L = 40	12 f	High-grade st. steel	10...36	IP 67	25	100	IIR203

f = flush / nf = non flush / qf = quasi-flush


Tool exchange carrier



Inductive sensors detect the position of interchangeable tools

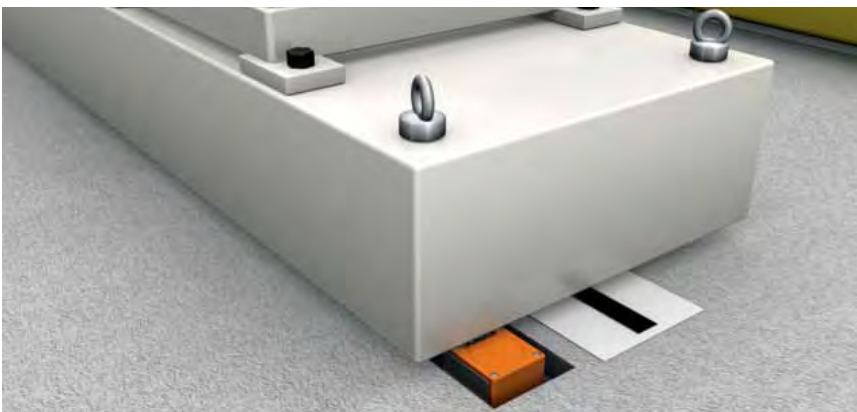
The rectangular design IDC inductive sensors can be installed overflush. This enables the position of the tool on the positioning table to be determined for automatic locking.

Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5058

f = flush / nf = non flush / qf = quasi-flush


Positioning carriage for exchangeable gripper



Inductive sensors detect the position of the positioning carriage

The rectangular design IDC inductive sensors can be installed overflush. In this way, the position of the positioning carriage can be determined for automatic locking.

Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5055

f = flush / nf = non flush / qf = quasi-flush


Measurement of compressed air consumption



Compressed air consumption sensor for recording energy consumption

The SD series compressed air meter continuously records the compressed air consumption of the suction grippers.

Compressed air meter for the measurement of compressed air consumption · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	R1 (DN25)	1.8...225.0	16	< 0.1	18...30	SD8000
	R2 (DN50)	5...700	16	< 0.1	18...30	SD2000


Vacuum monitoring



Vacuum sensors monitor the suction grippers

PN7 series vacuum sensors detect the required vacuum for operating the suction grippers.

Vacuum sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	-1...1	10	30	18...30	PN7099


Hydraulics




Monitoring of power packs

LK and TR series sensors detect the level and the temperature in hydraulic power packs.

LK level sensors · further products from page 303

Type	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
	472	390	18...30	0...35 / 35...60	0...70	200	LK1023

Temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR7439


Lubrication



System pressure always in view

The PG electronic contact manometer combines an easy-to-read manometer display with the advantages of an electronic pressure sensor. The plant service personnel always have the correct pressure in view.

Pressure sensors in the circulating oil lubrication · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ½ male	Display unit	-1...25	100	300	18...32	PG2453



Monitoring of drives



Condition monitoring of drives

VSA series sensors record the vibration levels of the drives, enabling condition-oriented maintenance.

Vibration monitoring systems · further products from page 373

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · Connector · housing: stainless steel 316L / 1.4404	VSA001
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · Profinet IO data interface · PA	VSE150



Transferring signals and data



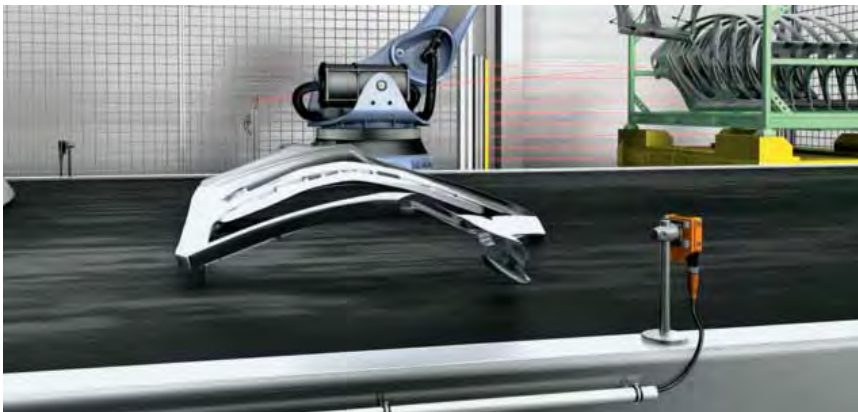
Controllers and gateways

The controller controls the communication in AS-i networks. Gateways provide a connection from the AS-i to the higher-level bus system.

Controllers, gateways · further products from page 337

Type	Number of AS-i masters	Description	Order no.
	2	AS-i EtherNet/IP gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1422
	2	AS-i Profibus gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profibus DP (DPV0 + DPV1) · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1412


Part detection on conveyor belts



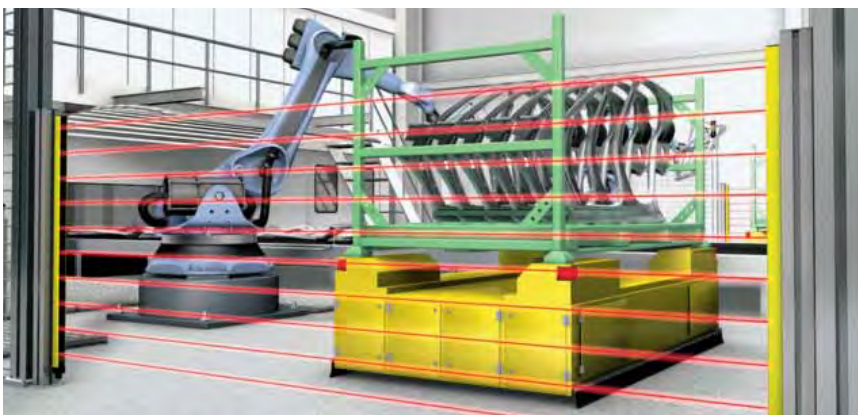
Part detection with through-beam sensors

The O5E / O5S type photoelectric sensors reliably detect the sheet metal parts placed on the conveyor.

Infrared / red light sensors for part recognition · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Receiver	25 m	Red	–	H/D PNP	O5E500
	Transmitter	25 m	Red	625	–	O5S500


De-stacking sheet metal parts in racks



**Access restriction
De-stacking sheet metal parts**

For operator protection, OY series safety light curtains restrict unauthorised access to accessible areas such as the sheet metal parts de-stacking station. Depending on the design, the safety light curtains correspond to Type 2 or 4, in accordance with EN 61496.

Safety light curtains for access prevention · further products from page 249


Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
	1563	30	1510	0...4 / 3...12	18.5	24	OY050S

Scrap press



Loose parts become bales of scrap
The blank offcuts are compressed into bales of scrap in a high-pressure press.

PN7 series pressure sensors up to 600 bar · further products from page 259


Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	0...600	800	2500	18...30	PN7160

Scrap conveyor - strip flow monitoring



Removal of scrap bales
The compact DIA speed monitor detects the pulses of the conveyor driveshaft.

Compact speed monitors for checking the conveyor · further products from page 229

Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
	M30 / L = 92.3	10 f	DC PNP/NPN	10...36 DC	5...3600	0...30	DI5024

f = flush / nf = non flush / qf = quasi-flush


Material transport / storage




Traceability of sheet metal components

Traceability plays an important role in the automotive industry. ifm's RFID system is used to identify press parts.

RFID systems for reading codes on metal

Type	Description	Order no.
	ID tag · ID-TAG/D55x13/04 · Ø 55 x 13 mm · Housing materials: PA 6	E80351

RFID UHF antenna

Type	Description	Order no.
	RFID UHF antenna · Housing materials: housing: aluminium / Protective cover: plastics / TNC socket: brass / PTFE · Operating frequency 865...870 MHz	ANT830


Locking of transport frames

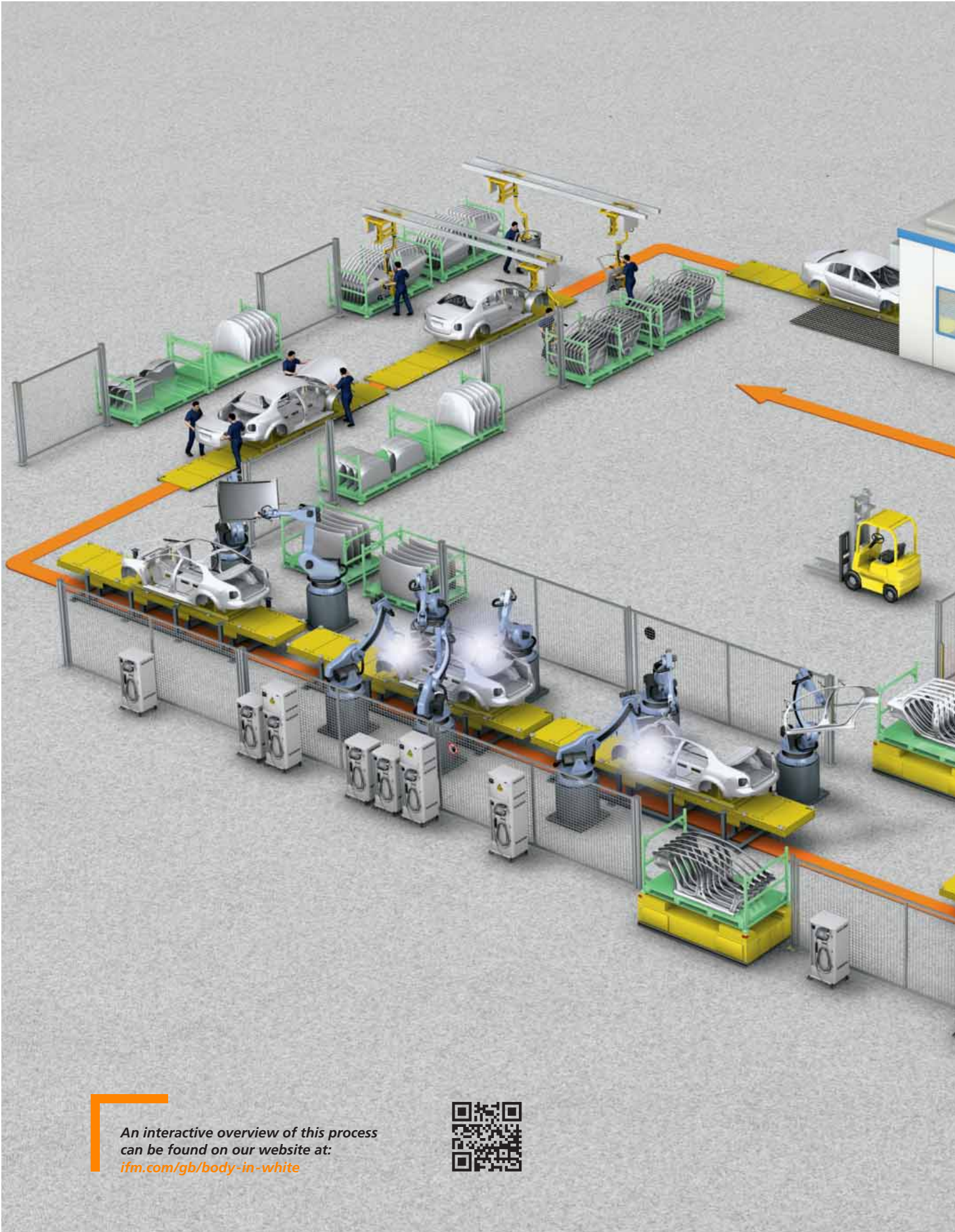


Monitoring the locking of transport frames

MK series magnetic cylinder sensors detect the travel on a locking cylinder.

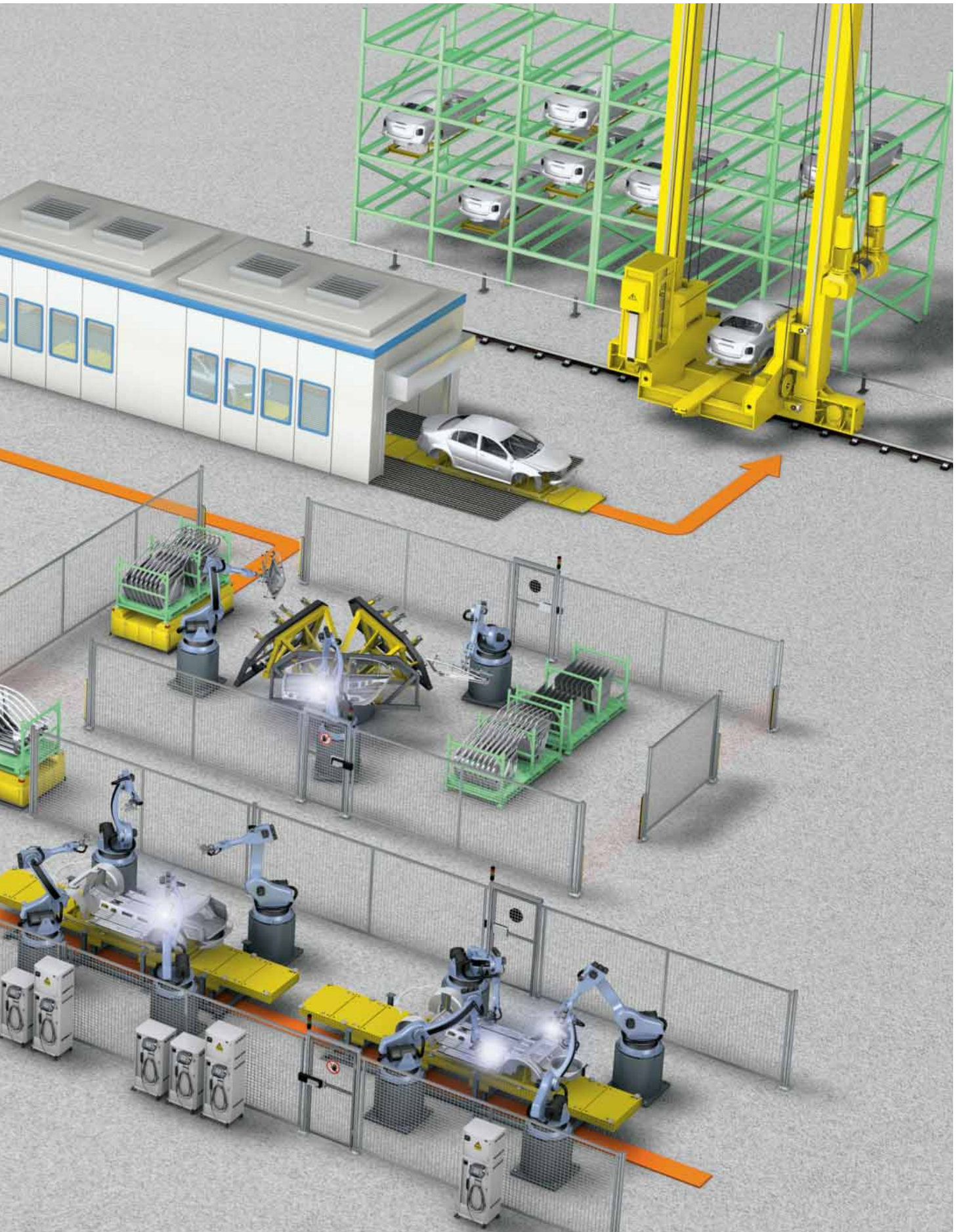
Inductive cylinder sensors · further products from page 175

Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	200	-25...85	MK5108



An interactive overview of this process
can be found on our website at:
ifm.com/gb/body-in-white





The reliability of the sensors increases the availability of the plant



In the body-in-white, up to 200 individual parts and assemblies are put together to form a self-supporting body.

As well as the well-established resistance welding, also known as "spot welding", depending on the mix of materials a variety of joining processes are used.

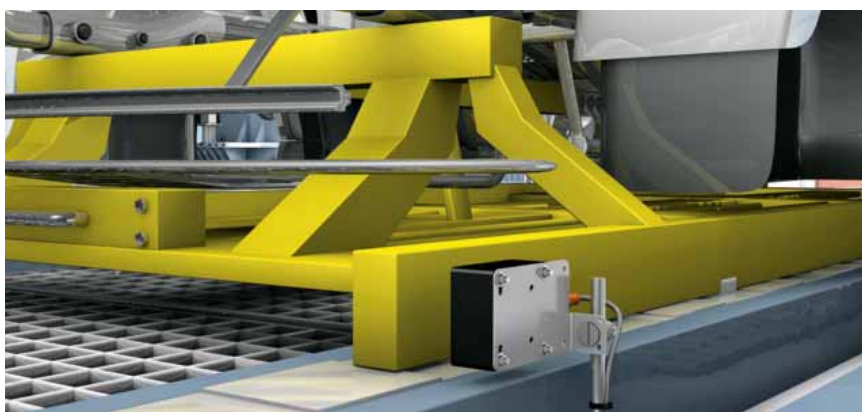
For lightweight materials such as aluminium and magnesium, joining processes such as laser welding, flanging or clinching are more appropriate.

Suitable adhesives are also available nowadays. These adhesives also contribute in part to damping noise as well as sealing seams and joints.

The requirements for the reliability and availability of the plant are very high in body-in-white manufacture, since the material flow must not stall in the subsequent painting process.

Here, sensors from ifm, with their high standards of reliability and robustness, help to achieve these goals sustainably.


Monitoring the skid position



Monitoring the skid position

The IDC-type inductive sensors reliably detect the positions of the skids.

Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U_b [V]	Protection	f [Hz]	I_{load} [mA]	Order no.
	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5059

f = flush / nf = non flush / qf = quasi-flush


Monitoring the body position



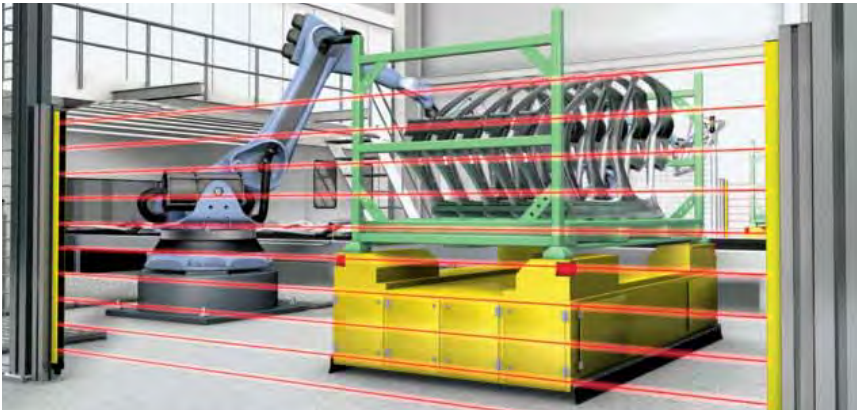
Detecting the body position

Using time of flight measurement, photoelectric sensors reliably detect the position of the body on the skid, for controlling the subsequent welding processes.

PMDLine photoelectric sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U_b [V]	Order no.
	Background suppression	0.03...2 m	33	< 5	10...30	O5D100

Securing the manufacturing cell area




Access restriction

Removal of sheet metal parts

For operator protection, OY series safety light curtains restrict unauthorised access to accessible areas such as the sheet metal parts removal station. Depending on the design, the safety light curtains correspond to Type 2 or 4, in accordance with EN 61496.

Safety light curtains for access prevention · further products from page 249

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
	1563	90	1510	0...4 / 3...12	6.5	24	OY1105


Door protection in transfer areas



Closed check on transfer stations

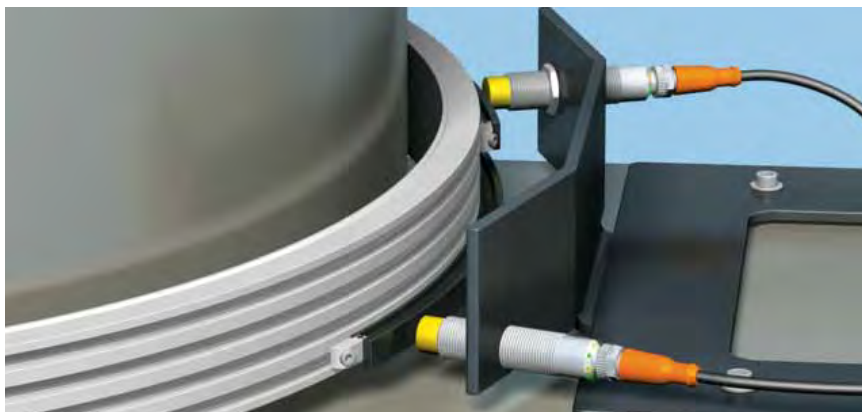
Fail-safe inductive sensors suitable for safety functions up to PL e / SIL 3 directly detect the safe position of high-speed doors without contact and without any specific counterpart.

Fail-safe inductive sensors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	66	10...15 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM701S
	66	4...20 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM705S

f = flush / nf = non flush / qf = quasi-flush


Axis range scanning with reference circles



Range scanning Axis 1 for robots

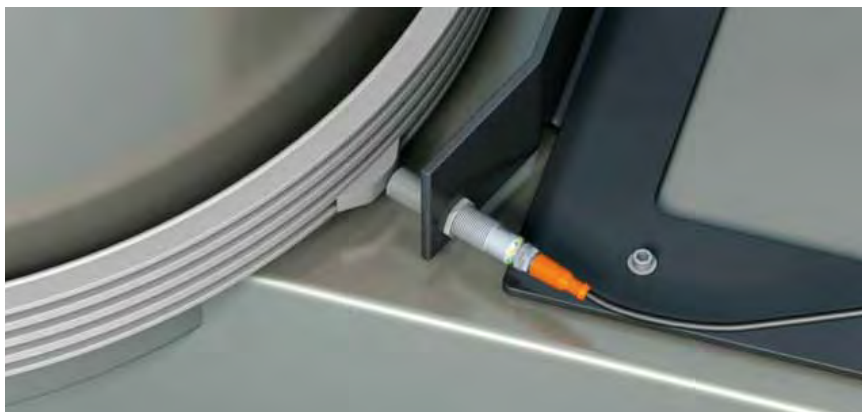
Fail-safe inductive sensors suitable for safety functions up to PL d / SIL 2 detect the safe operating area of robots without contact and without any special counterpart.

Fail-safe inductive sensors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	70.5	1...8 nf	High-grade st. steel	24	IP 65 / IP 67	≤ 1 / ≤ 1	GG7115

f = flush / nf = non flush / qf = quasi-flush


Axis range scanning with limit fields



Range scanning Axis 1 for robots

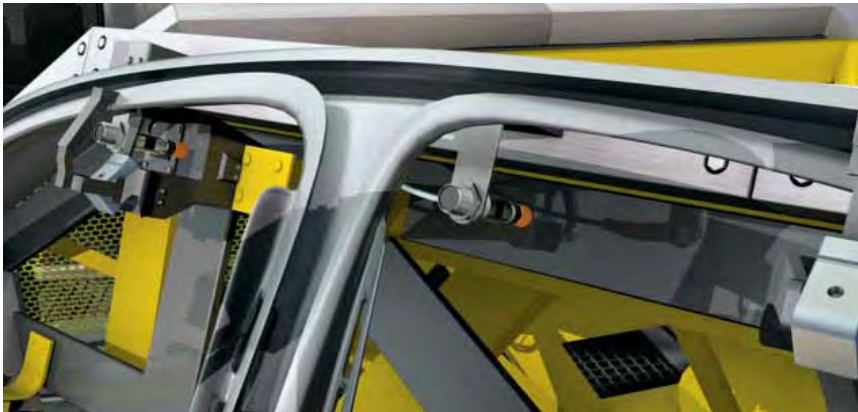
Category SIL 2 fail-safe inductive sensors detect the presence of metals without contact and without requiring a special counterpart. This minimises the mechanical effort involved.

Fail-safe inductive sensors for the reliable detection of metals · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	86.5	> 10 f	Brass	24	IP 65 / IP 67	≤ 5 / ≤ 5	GG8515

f = flush / nf = non flush / qf = quasi-flush

Loading check on turntables



Photoelectric sensors detect the side part in a turntable

All parts must be placed correctly in the clamping frame. Here, the OGH500 photoelectric sensors ensure reliable detection.

Photoelectric sensors · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Background suppression	15...300 mm	Red	25	H/D PNP	OGH500



Parts check in welding tools



Inductive sensors detect components in welding equipment without disruption

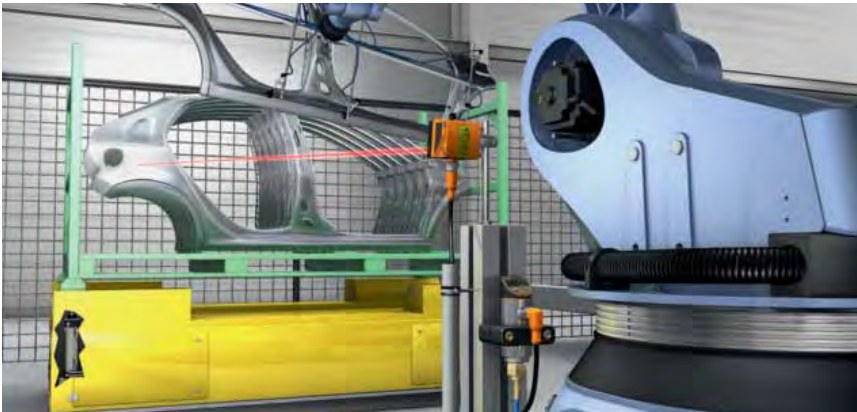
The magnetic field resistant sensors for detecting parts can be directly assembled in the welding tools. Furthermore, the coating helps prevent welding spatter (or 'slag') from sticking.

Electromagnetic field immune sensors with correction factor K = 1 · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M12 / L = 65	4 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IFW204
	M12 / L = 65	8 nf	Brass	10...30	IP 67	2000	100	IFW201

f = flush / nf = non flush / qf = quasi-flush


Removal of parts from material carriers



“Empty” detection of material carriers

The O1D photoelectric distance sensor uses the analogue output to detect how full the material carrier is.

PMD distance sensors with time of flight measurement for detecting the loading condition · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.2...10 m	1...33	< 15 x 15	18...30	O1D105


Pressure monitoring on suction grippers



Pressure measurement on suction grippers

The vacuum sensors detect whether there is sufficient vacuum present for a safe gripping operation.

Vacuum sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	-1...1	10	30	18...30	PN2099


Clamping fixtures



Robust full-metal sensors are close by

"R" series full-metal inductive sensors are designed for heavy-duty work in welding equipment. A non-stick coating ensures a long holding time in the tools.

Full metal sensors with non-stick coating against weld spatter · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M18 / L = 70	6 f	High-grade st. steel	10...36	IP 67	2	100	IGR200

f = flush / nf = non flush / qf = quasi-flush


Connection technology for clamping fixtures and sensors




It all depends on the cable

Signals from clamping fixtures and sensors must be transmitted to the controller without disruption. Here, ifm offers a wide range of cables made from PUR (not crosslinked by irradiation) with grey or orange sheath colour.

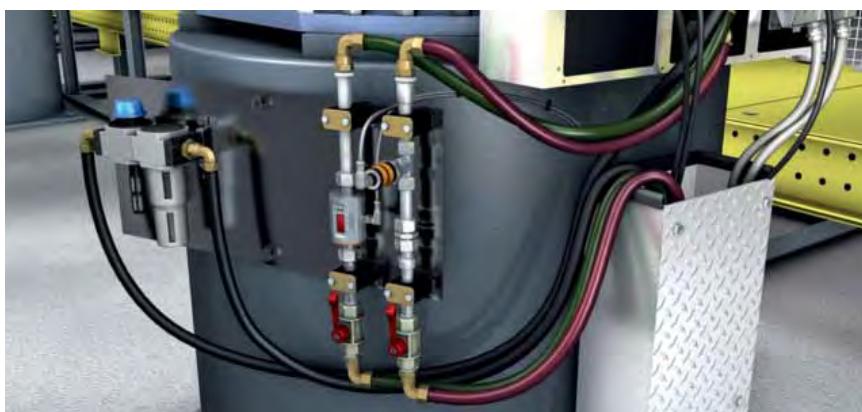
Connectors weld slag resistant · further products from page 383

Type	Description	Order no.
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW007

Jumpers weld slag resistant · further products from page 383

Type	Description	Order no.
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW024

Cooling water monitoring on welding guns




Monitoring of cooling circuits in welding robots


The SM magnetic-inductive volumetric flow sensor detects the amount of cooling water in the system.

The pressure sensor PK recognises the sudden drop in pressure in the circuit, e.g. when changing the caps.

Magnetic-inductive volumetric flow sensors · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G½	0.25...25.00	16	< 0.150	18...30	SM6000

Pressure sensors in the cooling circuit with the PK pressure sensor · further products from page 259

Type	Process connection	Display	Measuring range [bar]	Overload max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ male / M5 female	Operation	0...10	25	300	9.6...32	PK6524


Cooling water monitoring in welding stations



Cooling water monitoring in welding stations

The mechatronic flow sensor switches very quickly when the level falls below the minimum, thus protecting the system.

Mechatronic flow sensors · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G ½	0.3...15	-10...100	40	0.01	18...30	SBG232


Measurement of compressed air consumption



Compressed air monitoring in plant and robot installation boards

Here, SD8000 compressed air meters detect both the consumptions at normal pressure (6 bar) as well as in the high-pressure system (12 bar). Consumptions are recorded and leaks detected.

Compressed air meters for consumption measurement and leakage detection · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	R1 (DN25)	1.8...225.0	16	< 0.1	18...30	SD8000




Shielding gas monitoring in welding equipment



Shielding gas monitoring in welding processes

The SD compressed air meter reliably detects the presence and consumption of argon, carbon dioxide or nitrogen.

Compressed air meters · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G ¼ (DN8)	N ₂ : 0.04...15.00 Ar: 0.08...24.04 CO ₂ : 0.04...14.36	0...60	16	< 0.1	18...30	SD5100
	R½ (DN15)	N ₂ : 0.2...75.0 Ar: 0.4...122.0 CO ₂ : 0.2...74.7	0...60	16	< 0.1	18...30	SD6100
	R1 (DN25)	N ₂ : 0.8...225.0 Ar: 1.2...366.6 CO ₂ : 0.8...223.6	0...60	16	< 0.1	18...30	SD8100


Gluing body components



Temperature monitoring of mixing head

The temperature of the adhesive components must not fall below pre-defined values. The TN temperature sensor passes the analogue signals on to the pump controller.

Compact temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
	-50...150 / -58...302	M18 x 1.5	45	18...32	1 / 3	TN2511

Sealing of seams




Application of liquid PVC

To improve the vehicle acoustics and corrosion protection, liquid PVC is applied to the folded and flanged edges.


The temperature sensor TR detects the correct temperature and reports faults immediately.

The correct pump pressure is controlled using an analogue pressure sensor.

Temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR2439

Pressure sensors with analogue output for pump control · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	0...250	500	1200	18...30	PN3071

Type identification of car bodies and components




Detection of structural parts

The complexity and diversity of the components places a great demand on the logistics and manufacturing processes.

Here, the O2D series vision sensors help to keep an overview and ensure quality.

Vision sensors · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	400 x 300	0.633	10	Infrared	-10...60	O2D224

Detection of adhesive pads for noise damping




Adhesive pads for noise damping

Increasingly, adhesive pads are applied between the welded structural parts to dampen noise.

Here, O2V series vision sensors detect the presence of these pads, thus ensuring process quality.

Vision sensors · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	White light	-10...60	O2V102

Manipulators for the assembly of add-on parts




Manipulators support the operators in the assembly shop

Heavy loads and complex components are lifted and assembled using manipulators.

Here, a PK-type pressure sensor monitors the correct working pressure in the compressed air supply.

Pressure sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G 1/4 male / M5 female	Operation	0...10	25	300	9.6...32	PK6524

Valve connection via AS-i AirBoxes




AS-i AirBoxes minimise the connection complexity

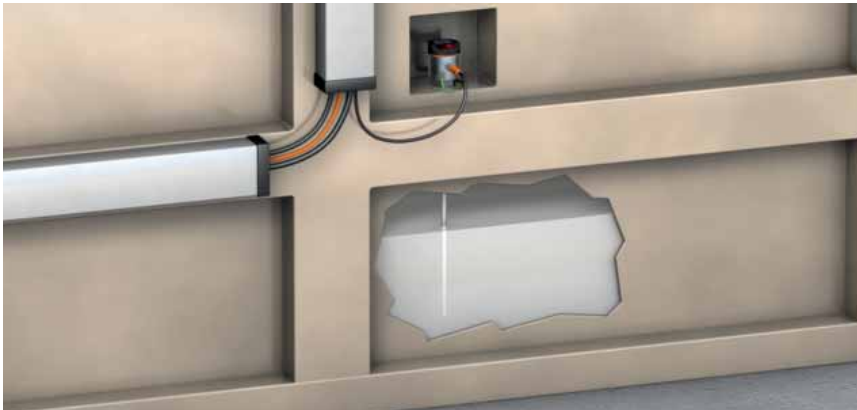
The cylinder movements must be scanned. At the same time, the compressed air is required by the cylinders.

Here, ifm's AS-i AirBoxes link compact valves with digital feedback inputs.

AS-i AirBoxes · further products from page 347

Type	Description	Order no.
	AS-i AirBox · 5/2-way bistable slide valve free from overlapping · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5253


Monitoring the fill level of cleaning agents



Detecting limit levels with fill level sensors

A special cleaning solution for degreasing is required for an optimum washing process. Here, the LK81 series sensor monitors the automatic filling of the storage container.

Level sensors - further products from page 303

Type	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
	728	585	18...30	0...35 / 35...55	0...70	200	LK8124


Pressure monitoring in the washing plant



Pressure measurement in the car body washing plant

The pressure is generated using a high-pressure pump. A PK series pressure sensor controls the optimum working pressure in the washing plant.

Pressure sensors - further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ male / M5 female	Operation	0...400	600	1600	9.6...32	PK6520



Monitoring of drives in lifts



Condition monitoring of drives

The VSA vibration sensor monitors the condition of the drive motor. This enables faults to be detected more easily.

Vibration monitoring systems · further products from page 373

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · Connector · housing: stainless steel 316L / 1.4404	VSA001
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Combi-con connection · PA	VSE002


Cable position detection for deflector pulleys



Cable position detection for deflector pulleys

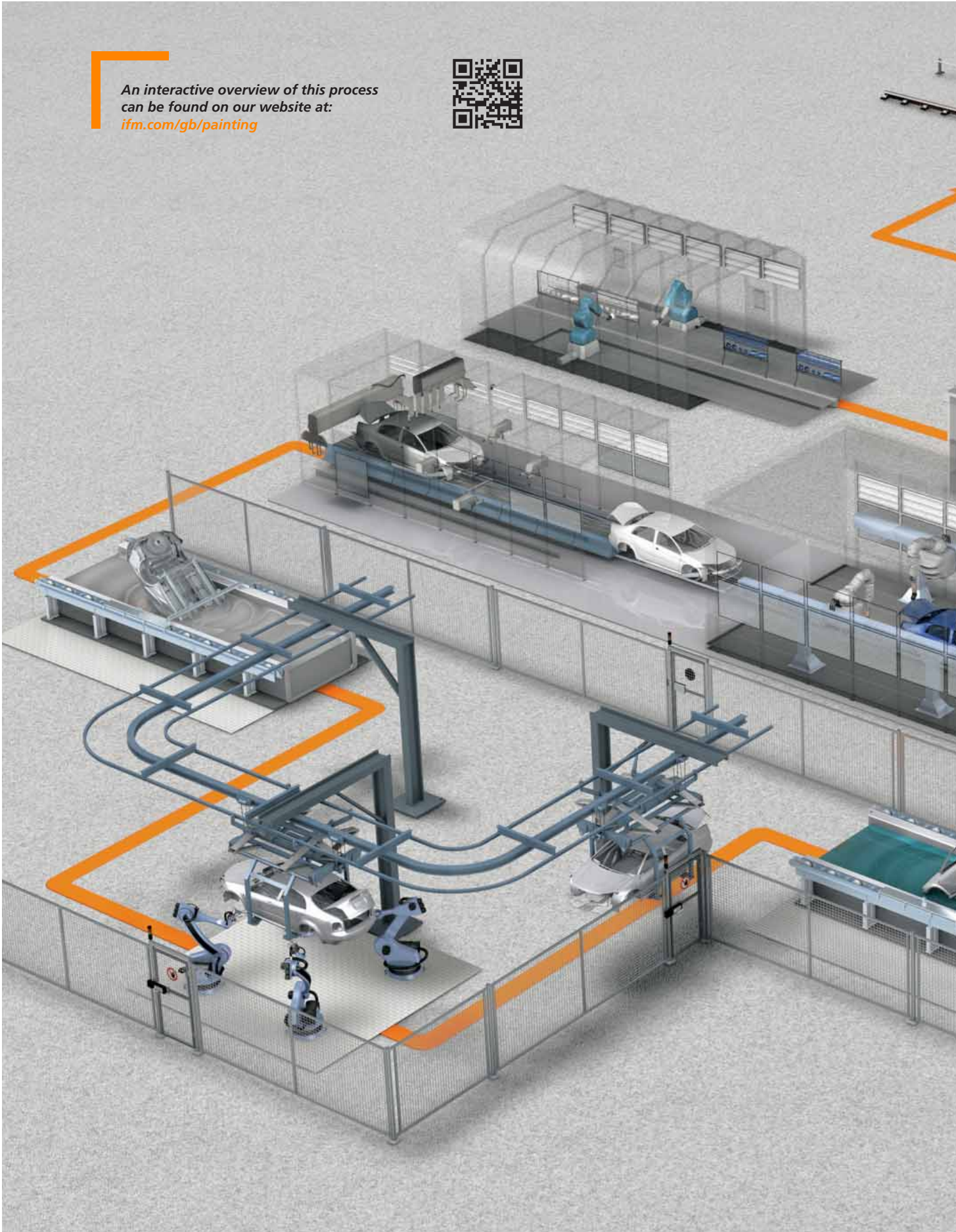
Category SIL 2 and PL d inductive safety sensors detect the cable position on deflector pulleys in lifts.

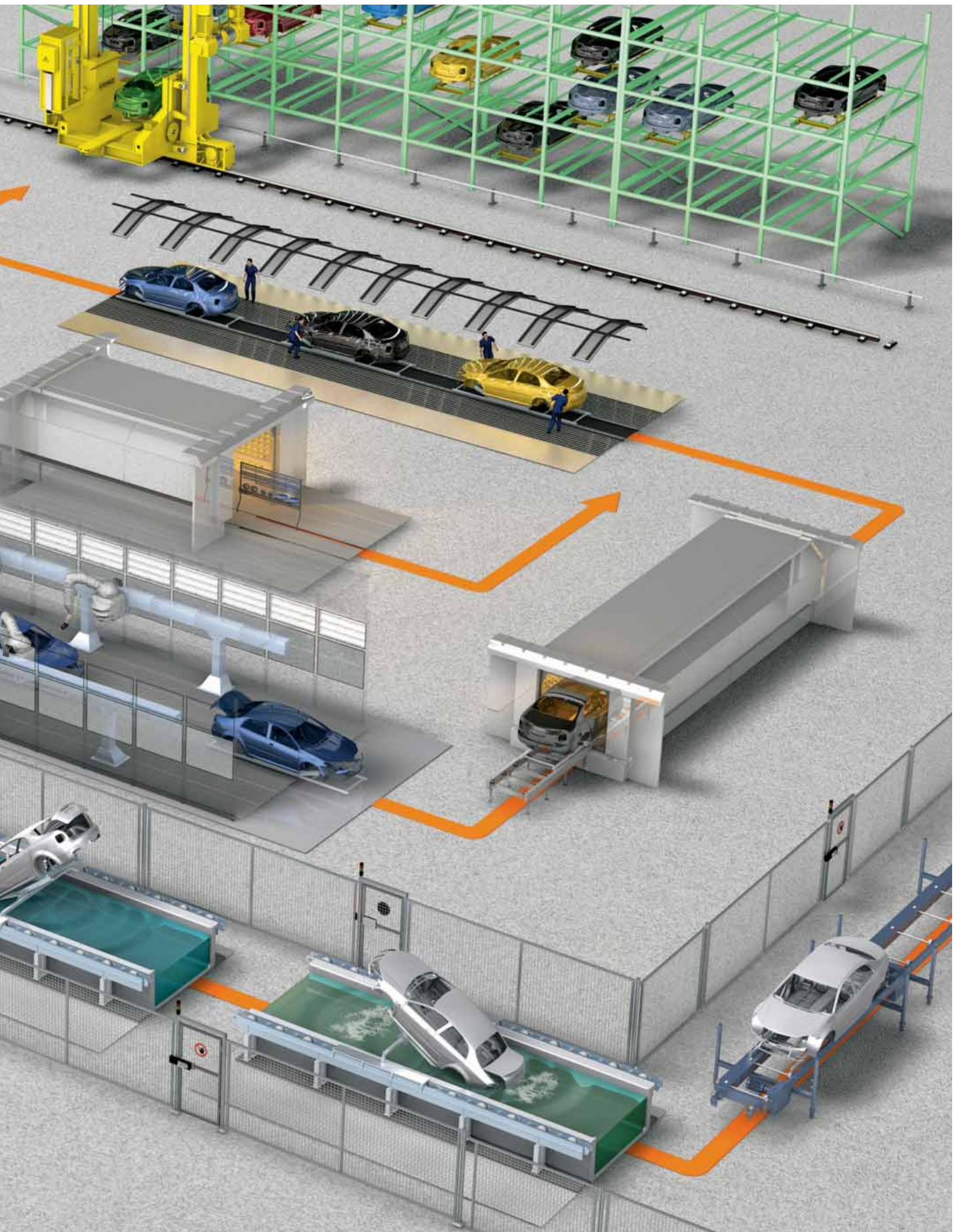
Fail-safe inductive sensors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	70.5	1...8 nf	High-grade st. steel	24	IP 65 / IP 67	≤ 1 / ≤ 1	GG7115

f = flush / nf = non flush / qf = quasi-flush

An interactive overview of this process
can be found on our website at:
ifm.com/gb/painting





Position sensors and fluid sensors improve the process quality



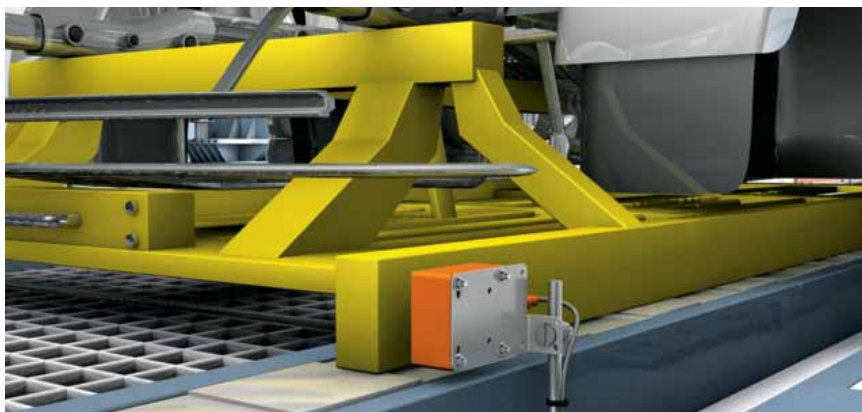
Now it's time for some colour.

First the car bodies must be degreased and other dirt removed. As part of the pretreatment, aluminium parts are lightly sandpapered, in order to enable a perfect coating. The bodies receive their first corrosion protection in an EPD bath (electrophoretic deposition – cathodic dip coating). Then the base coat is applied. This filler smooths out any unevenness. After the base coat and the topcoat, the clear coat is applied to give the bodies their shine.

A paint shop incorporates conveyor technology, various dip tanks as well as numerous robots for applying the individual paintwork. In between, there are evaporation zones and drying chambers. Heat generation, water treatment, paint tank maintenance, exhaust air and fresh air supply are absolutely vital for reliable operation.

Here sensors from ifm, with their high standards of repeatability and switch point stability, help the operator to ensure the high quality of the painting process in series production.



Floor conveyors



Monitoring the skid position

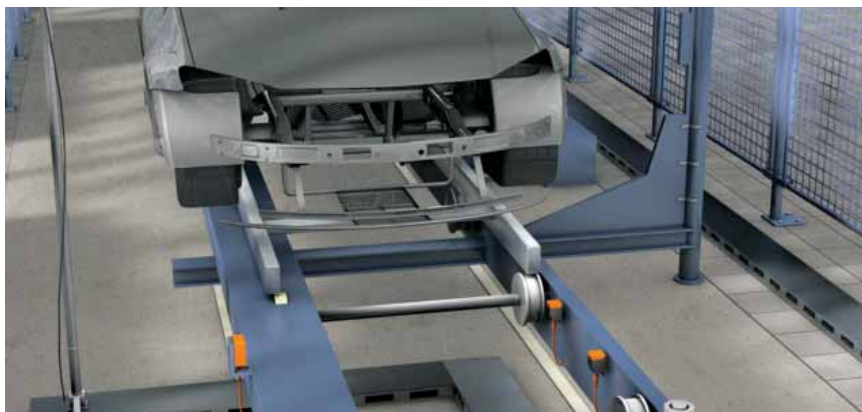
ID series inductive sensors reliably detect the positions of the skids on the floor conveyors.

Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5058
	105 x 80 x 40	60 nf	PPE	10...36	IP 65	100	250	ID5005

f = flush / nf = non flush / qf = quasi-flush



Roller conveyor systems



Monitoring the skid position

The IMC series inductive sensors reliably detect the positions of the skids in roller conveyors.

Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	60	200	IM5117
	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	60	200	IM5136

f = flush / nf = non flush / qf = quasi-flush

Conveyor technology





Detecting the body position

Photoelectric sensors reliably detect the position of the body on the skid to control the subsequent processes.


Photoelectric sensors for determining position · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Background suppression	50...1800 mm	Red	50	H/D PNP	O5H500


PMDLine photoelectric sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	0.03...2 m	33	< 5	10...30	O5D100
	Background suppression	0.03...2 m	33	< 5	10...30	O5D150

Adjustable mounting systems · further products from page 409

Type	Description	Order no.
	Mounting set · Clamp mounting · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21083
	Mounting set · Clamp mounting · With protective cover · rod mounting Ø 12 mm · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21210

Protective bracket · further products from page 409

Type	Description	Order no.
	Mounting set · Clamp mounting · With protective cover · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21084


Cleaning of the body




Pressure measurement in the car body washing plant

The pressure is generated using a high-pressure pump. Here, the PG series pressure sensor, with an analogue output, controls the optimum working pressure of the pump.

Pressure monitoring in a high-speed pump · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ½ male	Display unit	0...400	800	1200	18...32	PG2450

Magnetic-inductive volumetric flow sensors for freshwater inflow monitoring · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G½	0.25...25.00	-10...70	16	< 0.150	18...30	SM6000


Monitoring the fill level of cleaning agents



Level sensors detect the optimum filling level in the tank

A special cleaning solution for degreasing is required for an optimum washing process. Here, the LK31 series sensors with an analogue output monitor the optimum fill level in the storage tank.

Level sensors · further products from page 303

Type	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
	728	585	18...30	0...35 / 35...55	0...70	200	LK3124


EPD bath (electrophoretic deposition – cathodic dip coating)



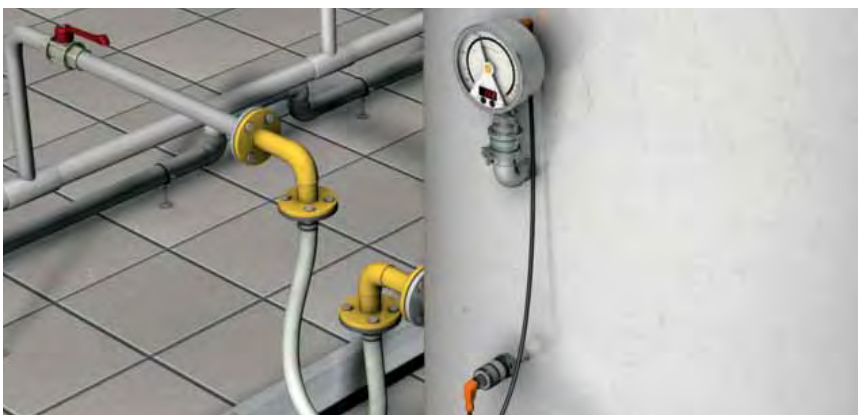
Detecting the state of doors and flaps

The bodies receive their first corrosion protection in an EPD bath. Here, the O2D series vision sensors detect whether plastic spacing sleeves are keeping the doors and flaps slightly open.

Vision sensors for position detection · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	Infrared	-10...60	O2D222


Rinsing



Detecting rinsing water in the tank

A temperate rinsing solution is required for an ideal process in the pretreatment. The PG series pressure sensor monitors the pressure in the tank. The TK series temperature sensor activates when the temperature falls below a minimum level.

Pressure sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	Sealing cone G1 male	Display unit	-1...10	50	150	18...32	PG2894*

* Attention: The unit must only be installed in a process connection for G1 sealing cone! The G1 male sealing cone of the unit is only suited for adapters with metal end stop!


Cavity sealing




Sealing cavities with liquid wax

To improve corrosion protection, liquid wax is applied in the cavities. Here, the temperature sensor TR detects the correct temperature and reports faults immediately. The pump pressure is controlled using an analogue pressure sensor.

Temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR2439

Pressure sensors with analogue output for pump control · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	0...250	500	1200	18...30	PN3071


Sealing



Temperature monitoring on the dispensing head

The temperature of the sealant may not fall below defined values. The TN temperature sensor passes the analogue signals on to the pump controller.

Compact temperature sensors for temperature monitoring · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
	-50...150 / -58...302	M18 x 1.5	45	18...32	1 / 3	TN2511

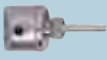
Freshwater supply



Monitoring the freshwater feed

Treated water is required for all the different rinsing zones. The SI flow sensor continuously monitors the inflow of water.

Flow sensors · further products from page 287

Type	Setting range liquids / gases [cm/s]	Material sensor tip	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	3...300 / 200...3000	3...100 / 200...800	-25...80	30	1...10	19...36	SI5000


Control of the pneumatic valve actuators



Position feedback on valve actuators

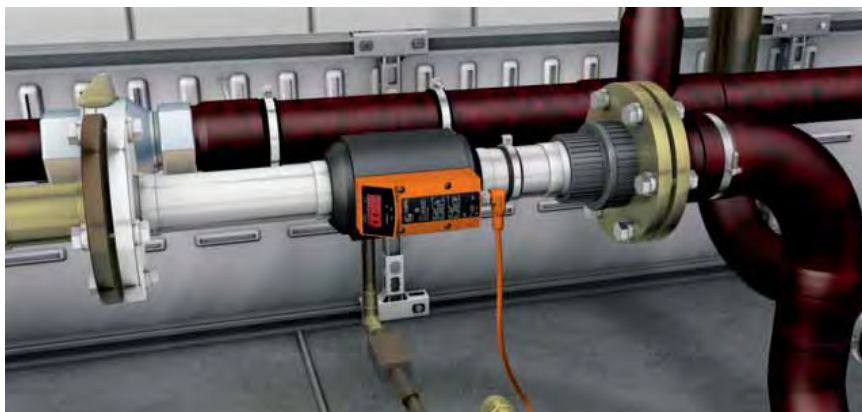
The IN series dual sensor contains two inductive sensors for "Open / Closed" detection of the valve position using control cams. The digital output controls the solenoid valve of the pneumatic valve actuator.

Inductive dual sensors for position feedback on pneumatic valve actuators · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f AC / DC [Hz]	I _{load} AC / DC [mA]	Order no.
	40 x 26 x 26	4 nf	PBT	10...36	IP 67	1300	250	IN5225

f = flush / nf = non flush / qf = quasi-flush


Fresh air supply



Air consumption measurement

The SD compressed air meter continuously measures the air flow. The measured values are used as a basis to determine the actual consumption.

Compressed air meters determine the actual consumption · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	R1½ (DN40)	3.5...410.0	16	< 0.1	18...30	SD9000


Exhaust



Speed detection on fans


The exhaust air from the painting cabins is extracted and delivered to the thermal post-combustion. The speed sensor monitors the fans for underspeed and blockages.

Speed detection · further products from page 229

Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
	M30 / L = 82	10 f	DC PNP	10...36 DC	5...300	15	DI5009

f = flush / nf = non flush / qf = quasi-flush

Vibration sensors for bearing monitoring in drives · further products from page 373

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · Connector · housing: stainless steel 316L / 1.4404	VSA001


Bath maintenance



Ultrafiltration

A proportion of the paint is continuously removed from the dip-bath and fed through the ultrafiltration unit. The residual solid content is mixed back into the bath. The clean filtrate is used as a rinsing solution. Here the temperature sensor monitors the correct temperature.

Temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR2439


Paint recycling



Detecting the fill level in the tanks

The paint spray, precipitated by the water, is captured and filtered. The paint acquired in this way can be reintroduced to the mixture. The LMT level sensor detects whether the level in the tank falls below a minimum value.

Point level sensors · further products from page 303

Type	Process connection	Process pressure max. [bar]	Application	Protection	Order no.
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT110



Monitoring the painting robot nozzles



Flow measurement on painting robots

The paint application demands a high degree of availability from the systems. Here, the SU volumetric flow sensor detects any blockages of the nozzles.

Flow meters · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G¾	0.1...50.0	-10...80	16	< 0.250	19...30	SU7000
	G1	0.2...100.0	-10...80	16	< 0.250	19...30	SU8000


Control of the painting robots



Detect start position for the painting process

Water-soluble clear coats give the painted car bodies their shimmering shine. The O1D102 photoelectric distance sensor detects the start position for the paint process.

PMD distance sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.2...3.5 m	1...50	< 6 x 6	18...30	O1D102



Paint supply



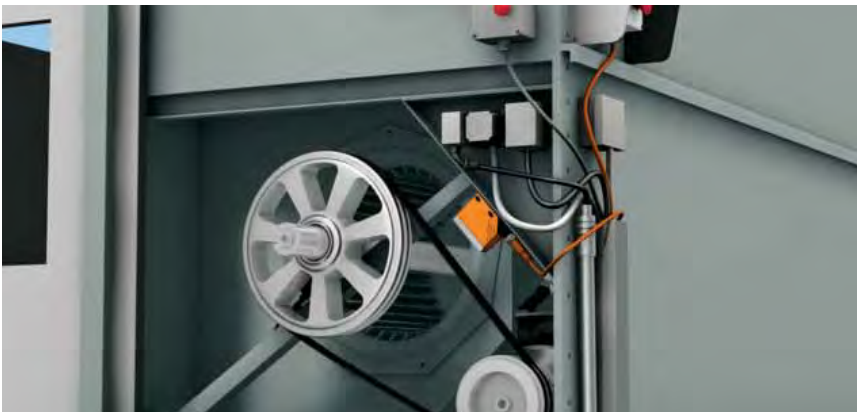
Pump monitoring

The paint supply demands a high degree of availability from the pumps. The VSA vibration sensor monitors the function of the pump motor.

Vibration monitoring systems · further products from page 373

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · Connector · housing: stainless steel 316L / 1.4404	VSA001
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Combicon connection · PA	VSE002

Fan monitoring



Belt breakage check on fans

The spray booths are maintained at a slight positive pressure to keep impurities from the air at bay. If the fan breaks down, quality problems result. The photoelectric sensor scans the fan belt for breakages.

Photoelectric sensors · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Background suppression	50...1800 mm	Red	50	H/D PNP	O5H500


Heat production



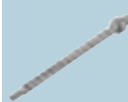
Temperature measurement in heating channels

Heated air must be provided for the evaporation zones. The temperature evaluation unit continually measures the temperature of the air. If the temperature falls below a minimum level, it gives an alarm signal.

Evaluation systems for temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR2439

Temperature sensors · further products from page 317

Type	Measuring range [°C]	Diameter [mm]	Installation length [mm]	Sensor element	Dynamic response T05 / T09 [s]	Order no.
	-40...150	10	160	1 x Pt 1000	1 / 3	TT1050


Monitoring of high-speed doors



Door monitoring

Fail-safe inductive sensors suitable for safety functions up to PL e / SIL 3, detect the end stop of the high-speed door without contact and without any specific counterpart.

Fail-safe inductive sensors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	66	10...15 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM701S

f = flush / nf = non flush / qf = quasi-flush


Identification of add-on parts



Identifying appropriate add-on parts

The painted add-on parts must be assigned to the corresponding body. The multi-code reader detects the codes on the build-tickets. This prevents incorrect assembly of add-on parts.

Multicode reader · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 59	400 x 300	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I304


Skid identification




Determining the whereabouts of skids

The painted car bodies travel through the final inspection on skids, to the high stack storage. At any time, the RFID system can determine the whereabouts of the skids in each of the zones.

RFID systems for reading codes on metal

Type	Description	Order no.
	RFID UHF antenna · Housing materials: housing: aluminium / cover: plastics / TNC socket: brass / PTFE · Operating frequency 902...928 (FCC) MHz	ANT930

ID tag

Type	Description	Order no.
	ID tag · ID-TAG/D55x13/04 · Ø 55 x 13 mm · Housing materials: PA 6	E80351


Occupation of storage location




Optically detecting whether a compartment is occupied

After the paint process, the bodies are stored temporarily. Using the prismatic reflector, the retro-reflective sensor with polarisation filter on the transport lift can detect whether a compartment is occupied or not.

Photoelectric sensors · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Polarisation filter	0.075...10 m	Red	250	H/D PNP	O5P500

Accessories · further products from page 409

Type	Description	Order no.
	Prismatic reflector · Ø 80 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20005


Position feedback



Detecting travel lengths and positions of the storage and retrieval machine

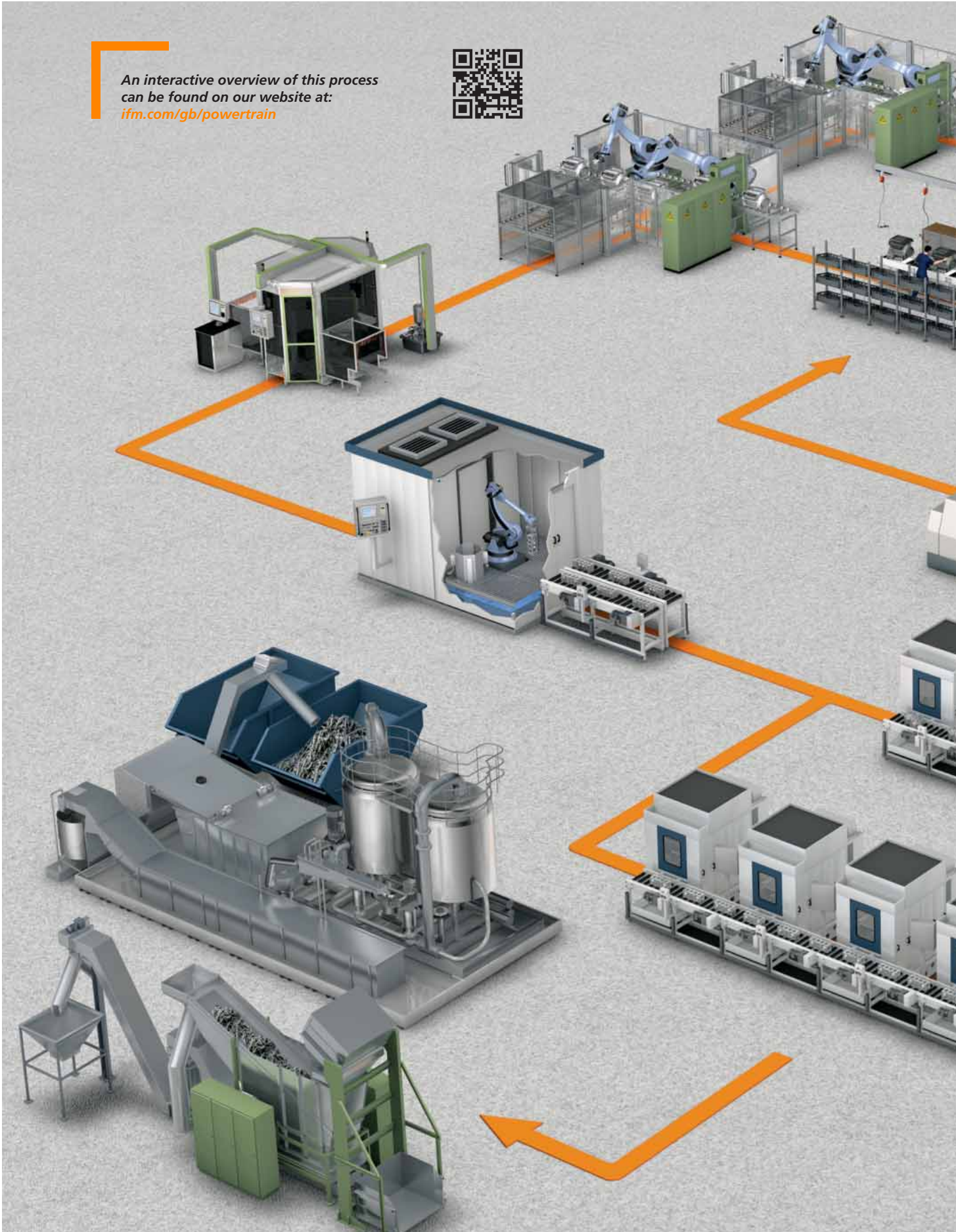
The car body lift moves parallel to the high-stack storage. The IMC series inductive sensors detect the cam switches for the positioning and braking of the stacker crane.

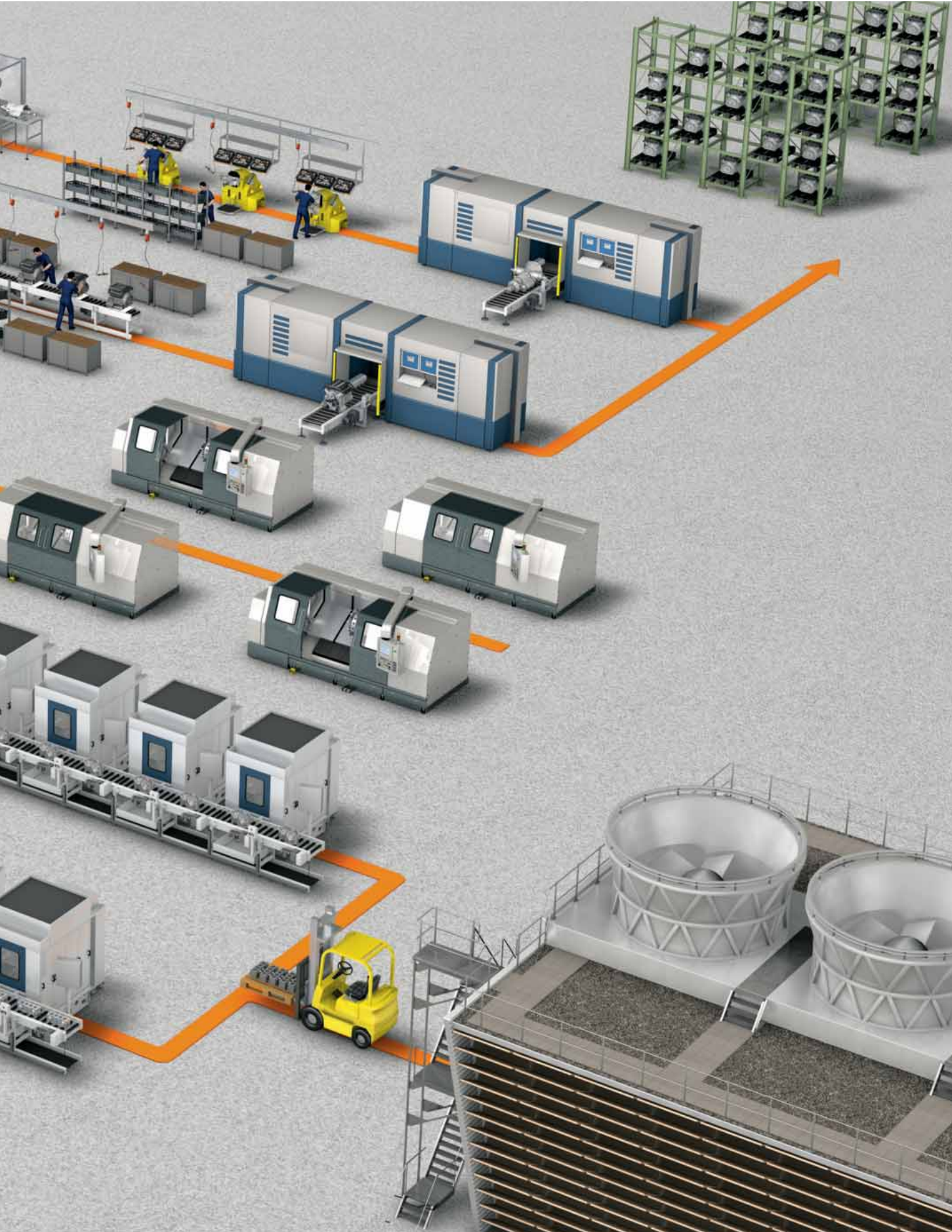
Inductive sensors · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	100	200	IM5123

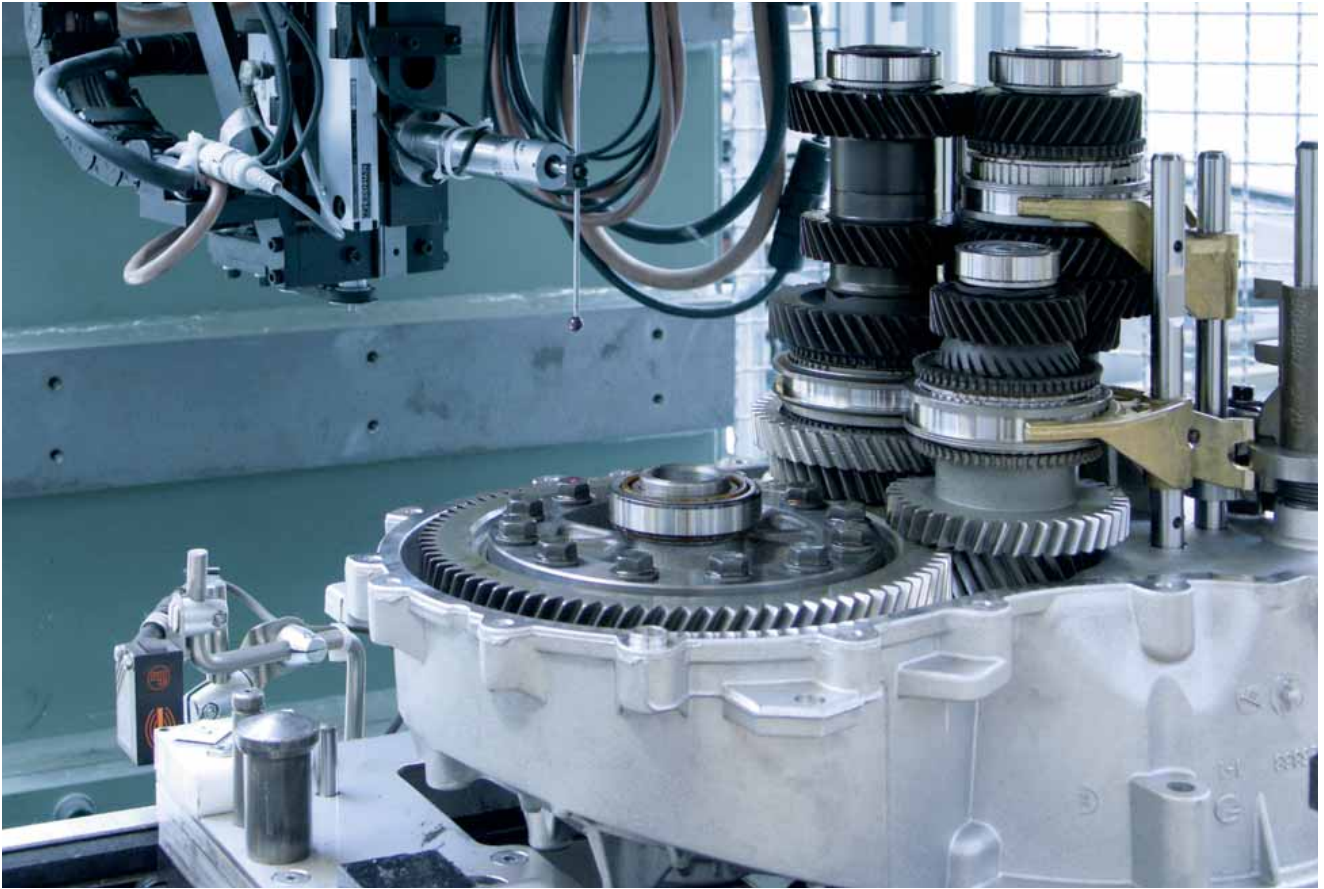
f = flush / nf = non flush / qf = quasi-flush

An interactive overview of this process
can be found on our website at:
ifm.com/gb/powertrain





Manufacturing precision increases customer satisfaction



The combination of engine and gearbox, also called the powertrain, forms the heart of the drive unit.

The basic components such as crankcase, cylinder head or gearbox housing are made in the foundry. These components are then finished by mechanical processing. In many work steps, gear wheels and shafts are processed and then assembled into gearboxes. In engine production, powerful petrol, diesel or hybrid drives are created out of the mosaic of crankshaft, camshafts, connecting rods and many other parts and sub-assemblies.

Here, sensors from ifm – with their high standards of repeatability and switch point stability – help the operator ensure the consistently high quality standards in series production.

Foundry - coolant monitoring




Drawing water from deep wells

Melt furnaces and casting moulds must be cooled. Water is drawn from deep wells for this purpose.

The SM2000 volumetric flow sensor detects whether air is sucked up with it, thus helping to avoid damage to the equipment.

Flow rate measurement · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G2 flat seal	8...600	-10...70	16	< 0.35	18...32	SM2000


Foundry - casting moulds




Preparation of casting moulds

The casting moulds are united automatically. O1D photoelectric sensors detect the casting moulds for the control system.

PMD distance sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D100

Safety light grids · further products from page 255

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
	1053	-	910	0...4 / 3...12	3	24	OY1165

Dry processing for chip removal machining




Blowing out drill holes


SD6000 series compressed air meters detect a defined air volume for blowing out drill holes.

The PN5004 pressure sensor monitors the required minimum pressure.

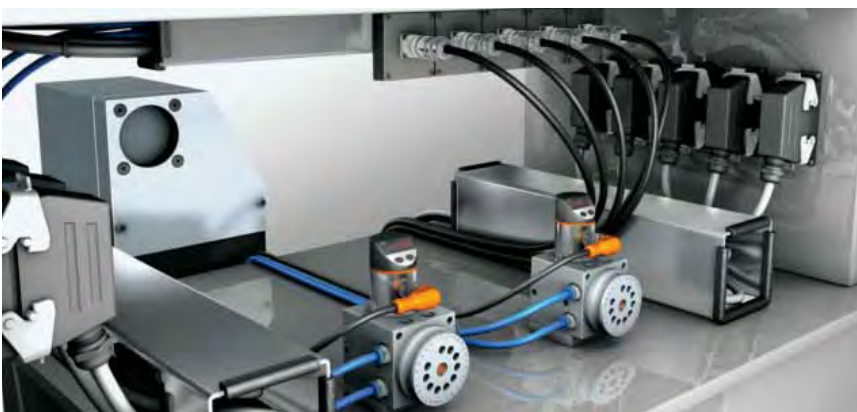
Compressed air meters determine the actual consumption · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	R½ (DN15)	0.6...75.0	16	< 0.1	18...30	SD6000

Pressure sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	-1...10	75	150	18...30	PN7094


System solution: Part seat monitoring of workpieces



Part seat monitoring

The workpieces to be processed must lie flat on the workpiece carrier to ensure dimensional accuracy. The PS7 control unit detects any contamination due to swarf or abrasion.

Control unit for part seat monitoring · further products from page 259

Type	Description	Order no.
	Control unit for part seat monitoring · Setting by adjustment of the pneumatic bridge · Integrated pressure sensor with 2 switching outputs · and 4-digit alphanumeric display for trend display or display of current pressure · Cable	PS7570

Position and part detection in machine tools




Full-metal sensors for application in oils and coolants

Modern engines and gearboxes are, to a large extent, manufactured from aluminium alloys.


Full-metal inductive sensors with correction factor $K = 0$ are unaffected by aluminium swarf.

Full-metal inductive sensors with correction factor $K = 0$ · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U_b [V]	Protection	f [Hz]	I_{load} [mA]	Order no.
	M18 / L = 70	4.5 f	High-grade st. steel	10...36	IP 68	100	100	IGC249

f = flush / nf = non flush / qf = quasi-flush

Connectors · further products from page 383

Type	Description	Order no.
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW005


Flow check for internal cooling of drill



Extending the holding times

Continuous cooling of the drill is essential if not much coolant is being used or if the drill holes are long. The mechatronic flow sensor is able to detect extremely quickly if the amount of coolant is no longer sufficient.

Flow transmitters with integrated backflow prevention · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U_b [V]	Order no.
	G ½	0.3...25	0...60	200	< 0.01	24	SBU623
	G ½	0.3...50	0...60	200	< 0.01	24	SBU624


Hydraulic aggregates




Monitoring of power packs

LR and TR series sensors detect the level and temperature in the hydraulic units.

Temperature sensors · further products from page 317

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR7439

Level sensors with guided wave radar · further products from page 303

Type	Process connection	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
	G ¾ male	-	L-40 (L-60)	18...30	0...80	200	LR7000


Filter monitoring



Differential pressure monitoring

PNI-type electronic pressure sensors with an analogue input evaluate the pressure difference in filter elements in combination with PA-type transmitters.

Differential pressure measurement with PNI and PA · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	0...25	100	350	18...30	PNI023

Camshaft manufacture




Grinding camshafts

The surface quality produced here is extremely important for the quality of the shafts.

To ensure the quality, the grinding emulsion must be applied constantly.

Flow sensors · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	M18 x 1.5	0.04...3	-20...90	100	0.5	18...30	SA5000

Crankshaft manufacture




Identifying crankshafts


To ensure traceability, the crankshafts are coded with data such as production date and batch information.

This information is then read and verified by the O2I code reader.

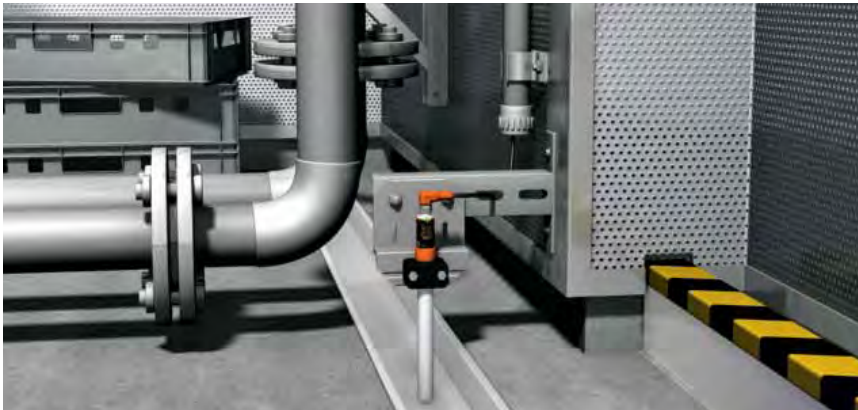
Multi-code reader for identifying codes · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 53.5	132 x 94	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I302

Connectors · further products from page 383

Type	Description	Order no.
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 2 m · Housing materials: PUR / PC	E11898


Lubricant preparation



Leakage detection to section 19 of the German Federal Water Act

The LI binary level sensor reliably monitors whether coolant is leaking from any pipes and tanks and collecting in the gutter. In this case, an alarm is triggered immediately.

Level sensors (to section 19 of the German Federal Water Act WHG) · further products from page 303

Type	Probe length [mm]	Output	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
	132	Normally closed	10...36	0...35	0...65	200	LI2241

Swarf disposal



“Full” detection for swarf hoppers

The O1D photoelectric sensor uses the analogue output to the controller to detect the level in the swarf hopper. Both long swarf and short-chipping swarf are detected.

PMD photoelectric sensors for detecting the loading condition · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.2...10 m	1...33	< 15 x 15	18...30	O1D105
	Photoelectric distance sensor	0.3...6 m	1...33	< 8 x 8	18...30	O1D155



Cleaning parts



Full-metal inductive sensors with extended temperature range

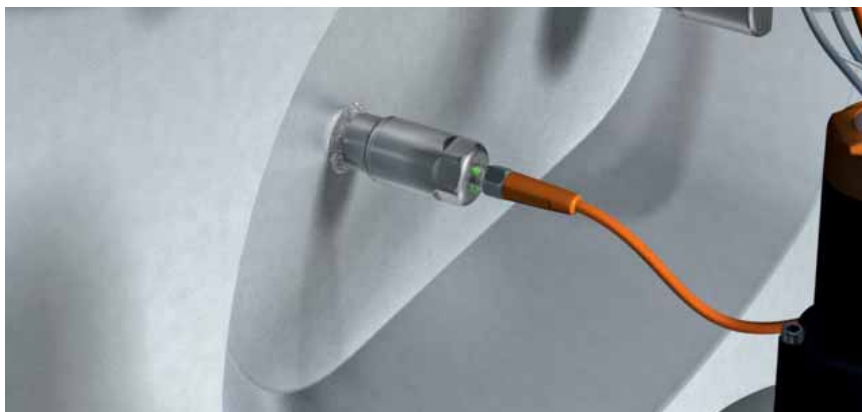
Components and assemblies must be cleaned after various manufacturing operations. The ifm sensors can withstand ambient temperatures of up to 100 °C.

Full-metal inductive sensors for wet areas · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M18 / L = 70	5 f	High-grade st. steel	10...36	IP 68 / IP 69K	100	100	IGT247
	M18 / L = 70	12 nf	High-grade st. steel	10...36	IP 65 / IP 67 / IP 68 / IP 69K	500	100	IGT249

f = flush / nf = non flush / qf = quasi-flush


Industrial cleaning equipment



Determining limit levels

The LMT limit level sensor has many applications in industrial cleaning systems. Applications such as detecting levels in flood tanks, oil separators, working tanks and use as a probe to warn of leakages.

Sensors for point level detection · further products from page 303

Type	Process connection	Process pressure max. [bar]	Application	Protection	Order no.
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT110


Leak test



Leak test on components and assemblies


In automated test stations, the test pieces are placed under pressure using compressed air. Depending on the rate of leakage, the pressure loss must not exceed the tight tolerances.

Inductive sensors for position control · further products from page 121

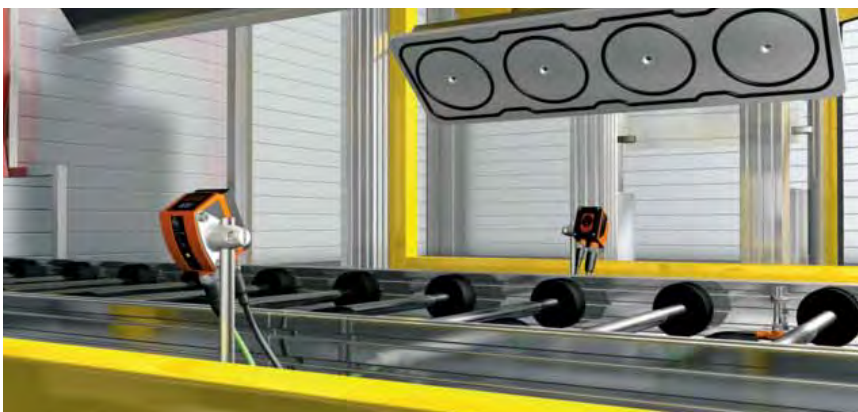
Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M12 / L = 60	4 f	Brass	10...30	IP 68	700	200	IFC229

f = flush / nf = non flush / qf = quasi-flush

Pressure sensors · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	Display unit	-0.0125...25	10	30	18...30	PN2098


Leakage test station



Leak test on components and assemblies

Object detection sensors tell the automated test stations whether the system has been set up correctly for the item being tested.

Vision sensors · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	400 x 300	0.633	10	Infrared	-10...60	O2D224


Pneumatic maintenance unit




Flow meters for compressed air

The SD volumetric flow sensor continuously monitors the compressed air consumption of the consumers connected to the maintenance unit. The impulse signals per volume unit are forwarded via the AS-i CompactLine module to the control system.

Compressed air meter for the measurement of compressed air consumption · further products from page 287

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G ¼ (DN8)	0.12...15.00	16	< 0.1	18...30	SD5000

CompactLine: AS-i modules for field applications · further products from page 341

Type	Description	Order no.
	Active CompactLine module · IR addressing possible · Version 2.11 and 3.0 with extended addressing mode · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / threaded inserts in the lower part: Brass nickel-plated / O-Ring : Viton / Piercing contacts: CuSn6 surface nickel and tin-plated	AC2457


Screw stations



Photoelectric fork sensors in feed equipment

The vibration conveyors are used, for example, to deliver screws to the assembly stations. The OPU photoelectric fork sensor checks the presence of the screws.

Photoelectric sensors · further products from page 207

Type	Fork width (w) [mm]	Fork depth (d) [mm]	Smallest detectable object Ø [mm]	Switching frequency [Hz]	Output H = light-on D = dark-on	U _b [V]	Order no.
	50	55	0.5	4000	H/D PNP	10...35	OPU203


Fuel supply in engine test rigs



Pressure sensors resist extreme pressure peaks

On the engine test rigs, extreme operating conditions are simulated in the "Hot test". During the test, extreme pressure peaks in the fuel supply are a frequent occurrence.

Pressure transmitter with analogue output · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G ¼ female	–	0...100	300	650	16...32	PA9022



Vibration monitoring in engine test rigs



Protecting the braking motor

Due to the engine being tested, the induction motor is sometimes exposed to extreme vibration loading. If the values are too extreme, the load is reduced.

Vibration monitoring systems · further products from page 373

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · Connector · housing: stainless steel 316L / 1.4404	VSA001
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Combicon connection · PA	VSE002


Quality assurance in driveshaft manufacture




Checking the assembly

In the manufacture of drive shafts, the object detection sensor checks whether a needle bearing has been assembled, whether it is the correct bearing and whether it has been correctly assembled.

Sensors for object recognition · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	Infrared	-10...60	O2D222

Illumination · further products from page 245

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	–	100 x 100	–	10	Infrared	0...50	O2D905


RFID in the gearbox assembly shop



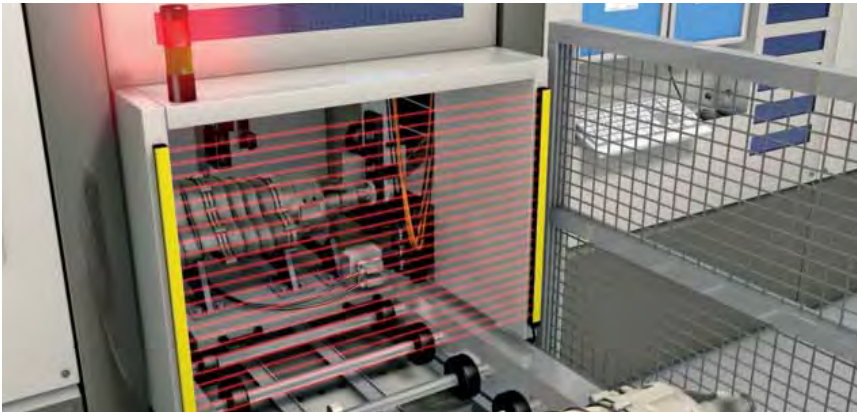
Identifying the part carriers

Thanks to RFID technology, the current work step of the gearbox is always known.

RFID systems with AS interface · further products from page 365

Type	Description	Order no.
	Read/write head · With integrated AS-i slave profile 7.4 · M12 connector · Housing materials: housing: PPE / Metal parts: diecast zinc / brass nickel-plated	DTA300

Automated loading of gearbox test rig




Test rig access restriction

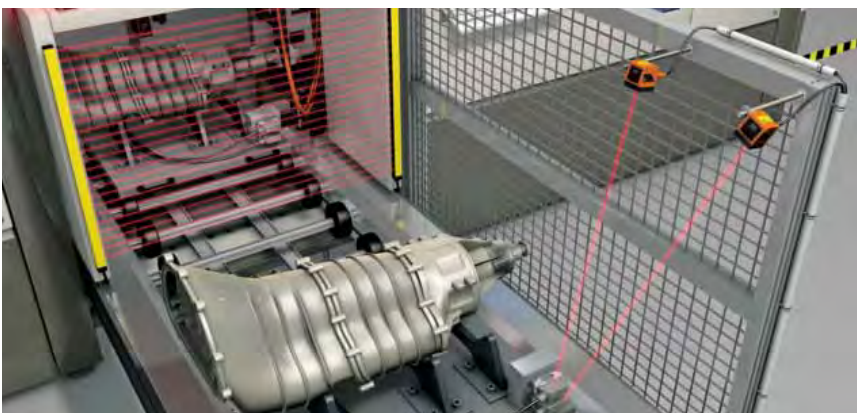
For operator protection, OY series safety light curtains restrict unauthorised access to accessible areas such as the loading zones.

The safety light curtains correspond to Type 4, in accordance with EN 61496.

Safety light curtains for access prevention · further products from page 249

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
	1263	14	1210	0...3 / 1...6	16.5	24	OY0085


Workpiece carriers in the gearbox test rig




Locking the workpiece carrier and detecting connectors

On the workpiece carriers, it must be detected whether the connectors have been connected in the correct positions. During the test run, the gearbox is held in place using locking bolts.

PMD distance sensors with time of flight measurement · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D100

Inductive cylinder sensors for stroke detection on locking cylinders · further products from page 175

Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5107


Provision of engine and transmission



Identification of engine and transmission

Engine and gearbox variants must also be safely assigned for further use, in consideration of country-specific versions.

Multi-code reader for identifying codes · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 53.5	64 x 48	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I300


Shipping of engine and transmission

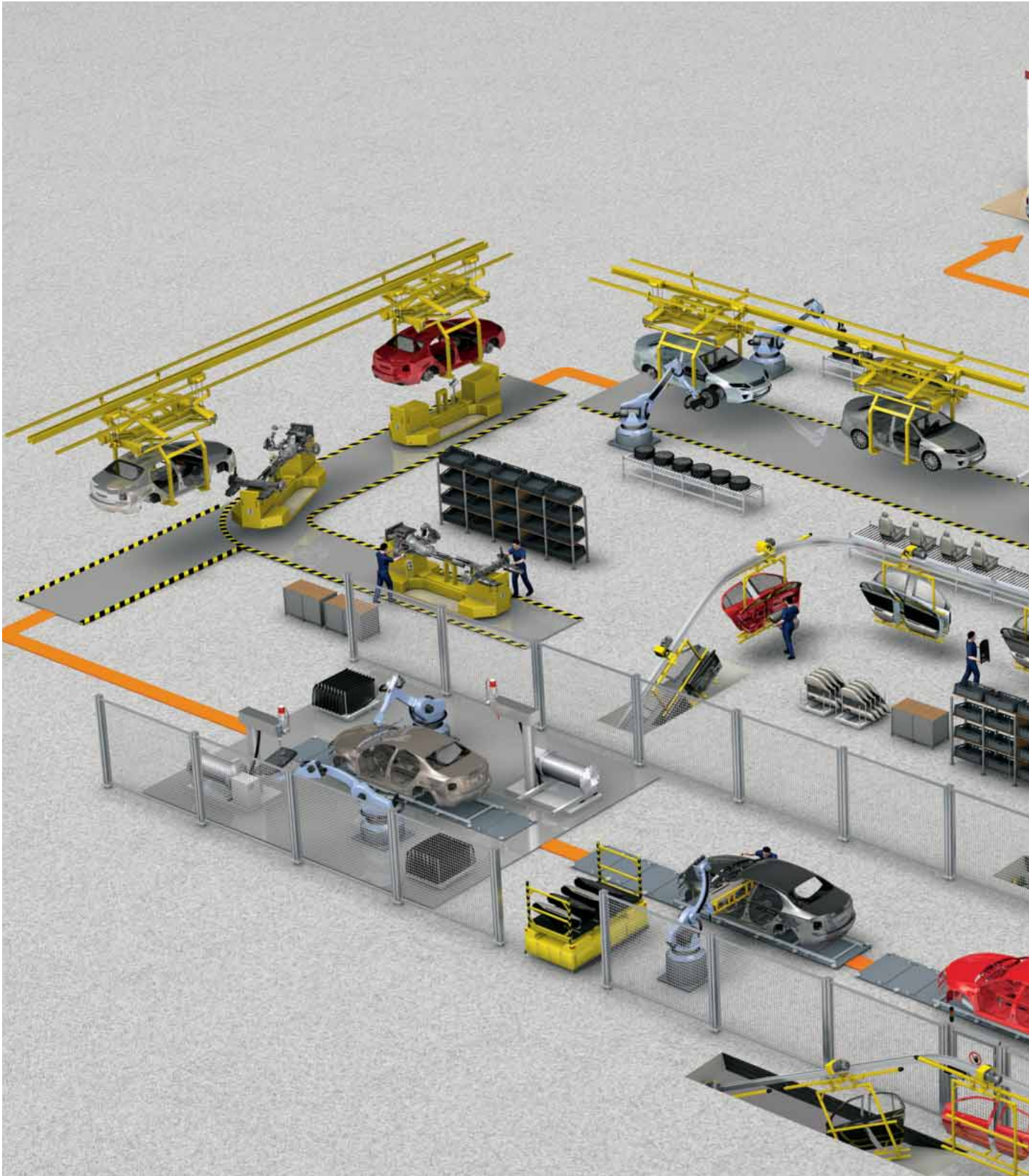


Engine and transmission completeness check

Engine and gearbox variants differ from each other in many ways for country-specific versions. Before shipping to the assembly plant, the presence of, for example, stoppers, ID marks and similar are checked.

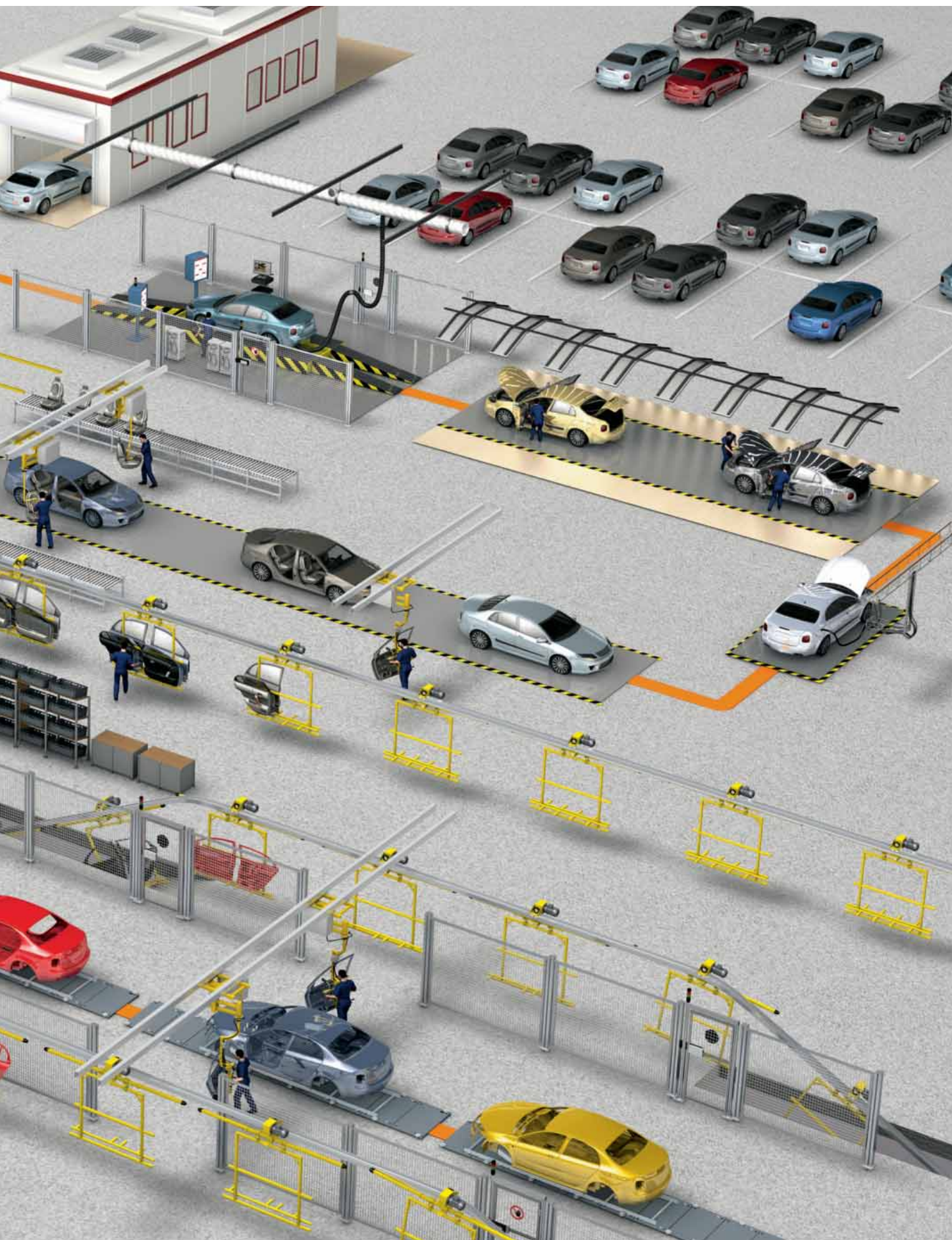
Vision sensors for checking tasks · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	640 x 480	1.0	10	Infrared	-10...60	O2D220



An interactive overview of this process
can be found on our website at:
ifm.com/gb/assembly





The jigsaw becomes a car



Piece by piece, the complete vehicle is formed from many individual components. Countless bolts fix the assemblies in their places. Clips hold carpets and the interior trim in place. Kilometres of cables and wiring form the vehicle's nervous system. The tyres and wheel rims are often used to further individualise the wheels. Customer-specific equipment options make the car more interesting but represent huge logistical challenges. Here it is absolutely essential to assign the parts and components according to the equipment options desired by the customer. In the end, it is the assembly which determines the success of the transformation of jigsaw pieces into high-quality product. Here, ifm is able to provide well-proven sensors for the diverse requirements of assembly processes. Our many years of experience also enable us to develop sensors and systems for the assembly tasks of the future, and provide them to the user.


Disassembling the doors



Identifying the appropriate doors

The doors are removed from the car body and forwarded to the door module assembly area. The O2I multi-code reader checks the codes on the doors and / or the build-tickets. This avoids incorrect assignment to the vehicles later on.

Multi-code reader for identifying doors · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 53.5	64 x 48	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I300


Transport to door module assembly



Travelling doors


The doors are transported for further processing via the overhead electric monorail conveyor. IMC series inductive sensors detect the position of the hangers. Photoelectric distance sensors are responsible for preventing collisions.

Inductive sensors for determining position · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	80	200	IM5116

f = flush / nf = non flush / qf = quasi-flush

Photoelectric sensors for approach check · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.3...6 m	1...33	< 8 x 8	18...30	O1D155

Detecting add-on parts for door modules




Identifying appropriate add-on parts

The painted components, e.g. wing mirrors, must be assigned to the appropriate car body.

The multi-code reader detects the codes on the build-tickets. This prevents incorrect assembly of add-on parts.

Multi-code reader identification of add-on parts · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 53.5	64 x 48	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I300


Function check of electrical equipment



Check connector position for diagnostics

After the assembly of mirrors, locks and window lifts, the electrical function is checked using a diagnostics connector device. The KF5002 capacitive sensor detects whether the diagnostics connector device is still connected after the test and releases the next production step.

Capacitive sensors for determining position · further products from page 159

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	M12 / L = 61	8 nf	High-grade st. steel	10...36	IP 65	50	100	KF5002

f = flush / nf = non flush / qf = quasi-flush


Dashboard removal



Removing instrument panels without collisions

During the gripping operation, the distance sensors measure the distance to the instrument panel. If the distance falls below the value previously stored in the robot's program, the gripping robot reduces its speed to avoid a collision.

Collision monitoring with time of flight sensors · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.2...3.5 m	1...50	< 6 x 6	18...30	O1D102


Dashboard installation



Positioning the instrument panels

The O2V object detection sensors recognise a characteristic form in the car body. The sensors detect the position during the approach, and give correction data to the robot control if necessary.

Vision sensors for controlling installation · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	White light	-10...60	O2V102


Door protection in transfer areas



Closed check on transfer stations

Fail-safe inductive sensors suitable for safety functions up to PL e / SIL 3 directly detect the safe position of high-speed doors without contact and without any specific counterpart.

Inductive safety sensor for monitoring high-speed doors · further products from page 247

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
	66	10...15 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM701S
	66	4...20 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM705S

f = flush / nf = non flush / qf = quasi-flush


Pressure monitoring on suction grippers for windscreen assembly



Pressure measurement on suction grippers

The vacuum sensors detect whether there is sufficient vacuum present for a safe gripping operation.

Vacuum pressure sensor for measuring the vacuum on a suction gripper · further products from page 259

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
	G 1/8 female / M5 female	Display unit	-1...1	20	30	18...32	PQ3809


Positioning the car body



Fine positioning of the car body


The IDC inductive sensor detects the presence of the car body before the defined position. The motion slows down until the OPU photoelectric fork sensor signals that the exact position has been reached.

IDC series inductive sensors for position detection · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5058

f = flush / nf = non flush / qf = quasi-flush

Photoelectric fork sensors for determining the exact position · further products from page 207

Type	Fork width (w) [mm]	Fork depth (d) [mm]	Smallest detectable object Ø [mm]	Switching frequency [Hz]	Output H = light-on D = dark-on	U _b [V]	Order no.
	120	60	0.8	2000	H/D PNP	10...35	OPU205

Robot guidance for windscreen assembly



Light scanner for positioning the grippers

The windcreens are removed by grippers. Four O5H series reflection light scanners are used to precisely position the gripper. The windscreen is held in place precisely and without stress.

Photoelectric sensors for gripper positioning · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Background suppression	50...1800 mm	Red	50	H/D PNP	O5H500

Quality assurance in the suspension assembly




Position check of brake discs


The ifm vision sensors monitor the exact position of the brake discs. The next assembly step will only be released if their position is correct.

This saves subsequent costs, which would be incurred due to the rectification work required for incorrectly assembled brake discs.

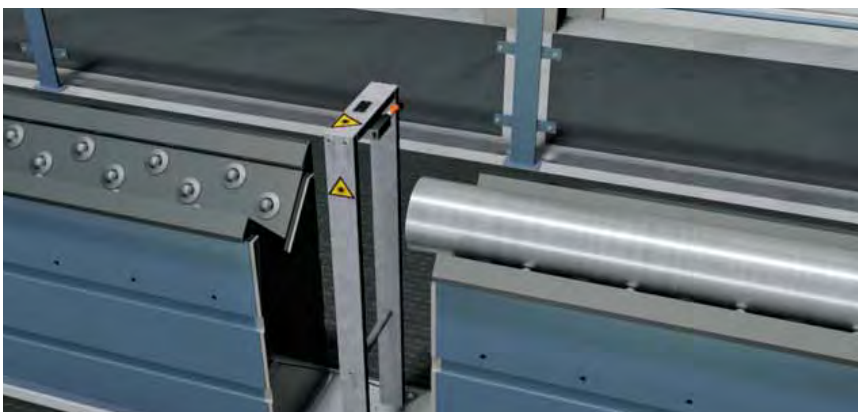
Vision sensors for position detection · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	Infrared	-10...60	O2D222

Touch sensor · further products from page 159

Type	U _b [V]	I _{load} [mA]	Current consumption [mA]	Ambient temperature [°C]	Protection	Order no.
	24	200	30	-40...85	IP 67 / IP 69K	KT5002


Manufacture of exhaust systems



Cutting pipes for exhaust systems to length

In an automatic saw, the pipes are cut to the appropriate length corresponding to that stored in the program. The OJ reflection light scanner is used to determine the start position for the length measurement, using an absolute shaft encoder.

Laser reflection light scanner for determining the start position · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Background suppression	15...200 mm	–	2 x 1	10...30	OJ5152


Collision protection in the assembly area



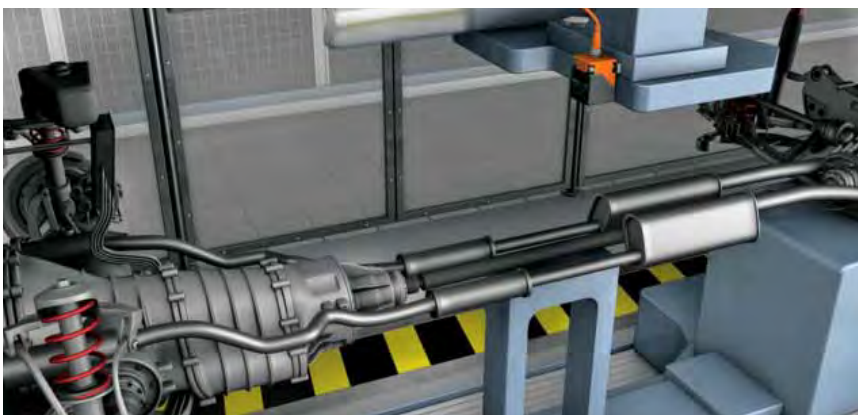
Detecting when the assembly platform is free

Here, the O1D distance sensor detects whether the assembly platform is free. Only when no car body is present will the hangar be lowered and the car body positioned.

Photoelectric detection of car bodies · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.2...10 m	1...33	< 15 x 15	18...30	O1D105


Marriage



Uniting the car body with the drivetrain


The IMC inductive sensor controls the lowering of the car body onto the assembly platform. The O1D distance sensors detect whether other driverless transport systems are approaching the assembly platform.

Inductive sensors for determining position · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	100	200	IM5115

f = flush / nf = non flush / qf = quasi-flush

Photoelectric sensors for approach check · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.3...6 m	1...33	< 8 x 8	18...30	O1D155


Wheel transport



Transporting the wheels to the assembly station

The O5S (transmitter) / O5E (receiver) through-beam sensors detect the complete wheels on the roller conveyor. This ensures there are no interruptions in the transport to the assembly stations.

Photoelectric detection of complete wheels · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Transmitter	25 m	Red	625	–	O5S500
	Receiver	25 m	Red	–	H/D PNP	O5E500


Wheel assembly



Assembling the wheels

The O2V vision sensors detect pre-programmed bolt hole patterns in the wheel rims. The robots can grip the wheels in a defined way and approach the bolting position with extreme precision.

Detecting the pattern of bolt holes · further products from page 237

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
	CMOS image sensor B/W, VGA resolution 640 x 480	640 x 480	1.0	10	White light	-10...60	O2V100


Detection of seats



Identifying the seat assemblies

Each seat is clearly identifiable via an integrated RFID tag and so can be assigned to the correct vehicle.

RFID 13.56 MHz antenna · further products from page 367

Type	Description	Order no.
	Read/write head · M12 connector · 5 positions of the sensing face selectable · Housing materials: housing: PA / Metal parts: stainless steel	ANT513


Pressure monitoring of suction grippers for seat assembly



Pressure measurement on suction grippers

The vacuum sensors detect whether there is sufficient vacuum present for a safe gripping operation.

Vacuum pressure sensor for measuring the vacuum on a suction gripper · further products from page 259

Type	Process connection	Display	Measuring range [bar]	P _{overload} max. [bar]	P _{bursting} min. [bar]	U _b DC [V]	Order no.
	G 1/8 female	Display unit	-1...1	20	30	18...32	PQ7809


Reassembling the doors



Installation of the door modules

The labels on the doors are read before assembly. This ensures that the completed doors are assigned to the correct vehicle.

Multi-code reader identification of add-on parts · further products from page 371

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
	60 x 42 x 59	400 x 300	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I304

Transport to the door assembly area




On the way to visual inspection

The assembled vehicle is placed on a conveyor by a lift. The O5P500 retro-reflective sensor with polarisation filter detects whether the transfer station is free. IM5115 series inductive sensors monitor the conveyor motion.

Photoelectric detection of car bodies · further products from page 189

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
	Polarisation filter	0.075...10 m	Red	250	H/D PNP	O5P500

Inductive sensors for determining position · further products from page 121

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	100	200	IM5115

f = flush / nf = non flush / qf = quasi-flush

State recognition




Detecting the bonnet condition "open"

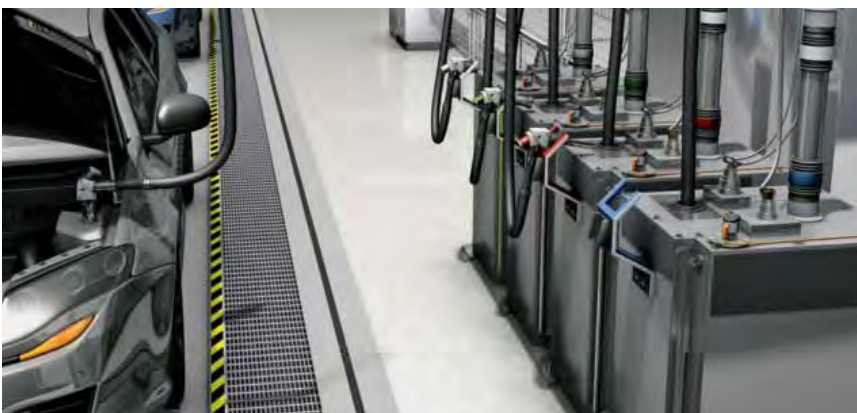
If the car body travels to a defined position with an open bonnet, the light beam to the assembly shop floor will be broken and clearance to proceed will be given.

A closed bonnet is also recognised and the automatic docking to the filling station prevented.

Photoelectric detection of car bodies · further products from page 209

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
	Photoelectric distance sensor	0.2...3.5 m	1...50	< 6 x 6	18...30	O1D102

Filling with various fluids




Filling tanks and auxiliary units

Before the function test, the car needs to be filled up with various fluids such as windscreen washer, brake fluid and a minimum amount of fuel.

The level sensors detect the preselected amounts on extraction from the appropriate filling station.

Detection of levels of different media · further products from page 303

Type	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
	472	390	18...30	0...35 / 35...60	0...70	200	LK1023


Function test – roller dynamometer




Checking the vehicle properties

The roller dynamometer is used for testing, for example, acceleration and deceleration. Adhering to tailpipe emission values is also an important test criterion. The exhaust gases must be extracted under controlled conditions.

Flow monitoring in a suction system · further products from page 287

Type	Setting range liquids / gases [cm/s]	Greatest sensitivity [cm/s]	Medium temperature [°C]	Response time [s]	Max. T ₀ gradient [K/min]	Pressure rating [bar]	Order no.
	3...300 / 200...3000	3...60 / 200...800	-25...80	1...10	300	300	SF5200

Control monitor for flow sensors · further products from page 331

Type	U _b / Tolerance [V] / [%]	Current consumpt. [mA]	Power consumpt. [VA]	Power-on delay time [s]	Output when flow is present	Output when temperature is exceeded	Output in case of wire break	Order no.
	24 DC / +10 / -20	90	–	10...80	relay energised	relay energised	relay de-energised	SR0150*

* Note on use of miniature fuses for electrical connection

Miniature fuse to IEC60127-2 sheet 1, ≤ 5 A (fast acting)
Recommendation: check the unit for reliable function after a short circuit.


Rain test




Leakage test in the washing plant

In the "Rain test", the finished vehicles are tested for leaks. The SM6000 volumetric flow sensor measures the water flow rate. The PG2450 pressure sensor with analogue output controls the ideal working pressure of the pump.

Water flow rate monitoring with volumetric flow sensors · further products from page 287

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	G½	0.25...25.00	-10...70	16	< 0.150	18...30	SM6000

Pressure monitoring in a high-speed pump · further products from page 259

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
	G ½ male	Display unit	0...400	800	1200	18...32	PG2450

List of articles

Order no.	Approvals	Catalogue page	Order no.	Approvals	Catalogue page
AC0045	CE, CUL	349	AC5205	CE, CUL, EAC	345
AC0075	CE, CUL	349	AC5208	CE, CUL, EAC	345
AC0095	CE, CRUUS	349	AC5209	CE, CUL, EAC	345
AC0105	CE, CUL	349	AC5210	CE, CUL, EAC	345
AC0305	CE, CUL	349	AC5214	CE, CUL, EAC	345
AC0340		337	AC5215	CE, CUL, EAC	345
AC0415	CE, CUL, TÜV Nord	349	AC5222	CE, CUL, EAC	345
AC1154	CE	341, 345	AC5225	CE, CUL, EAC	345
AC1250	CE, CRUUS, EAC	351	AC5227	CE, CUL, EAC	347
AC1253	CE, CRUUS, CUL	339	AC5228	CE, CUL, EAC	347
AC1254	CE, CRUUS, CUL	339	AC5235	CE, CUL, EAC	345
AC1257	CE, CUL	339	AC5243	CE, CUL, EAC	347
AC1258	CE, CRUUS, CUL	339	AC5245	CE, CUL, EAC	345
AC1401	CE, CUL, Profinet, EAC	337	AC5246	CE, CUL, EAC	347
AC1402	CE, CUL, Profinet, EAC	337	AC5251	CE, CUL, EAC	347
AC1411	CE, CUL, EAC, PI	337	AC5253	CE, CUL, EAC	347
AC1412	CE, CUL, EAC, PI	337	AC5270	CE, CUL, EAC	347
AC1421	CE, CUL, EAC	337	AC5285	CE, CUL, EAC	347
AC1422	CE, CUL, EAC	337	AL1100	CE, CUL, Profinet	161, 211
AC1433	CE, CUL	337	AL1102	CE, CUL, Profinet	353
AC1434	CE, CUL	337	AL1120	CE, CUL	353
AC2410	CE, CUL	343	AL1122	CE, CUL	353
AC2412	CE, CUL	343	AL1200	CE, CUL, Profinet	357
AC2417	CE, CUL	343	AL1202	CE, CUL, Profinet	357
AC2451	CE, CUL	343	AL1220	CE, CUL	357
AC2452	CE, CUL	343	AL1222	CE, CUL	357
AC2455	CE, CUL	343	AL1300	CE, Profinet	355
AC2457	CE, CUL	343	AL1302	CE, Profinet	355
AC2459	CE, CUL	343	AL1320	CE	355
AC2482	CE, CUL	343	AL1322	CE	355
AC2488	CE, CUL	343	AL1330	CE	355
AC3200	CE, CUL, EAC	341	AL1332	CE	355
AC3201	CE, CUL, EAC	341	AL1340	CE	355
AC3216	CE, CUL	341	AL1342	CE	355
AC3217	CE, CUL	341	AL1900	CE, Profinet	161, 361
AC3218	CE, CUL	341	AL1920	CE	361
AC3219	CE, CUL	341	AL1930	CE	361
AC3220	CE, CUL, EAC	341	AL1940	CE	361
AC3221	CE, CUL, EAC	341	AL2330	CE	353, 357
AC3222	CE, CUL	341	AL2400	CE, CUL	353, 357
AC4025	CE, CUL, EAC, Profinet	351	AL2401	CE, CUL	353, 357
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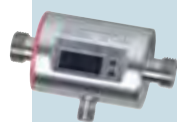
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Flow sensors at a glance



Magnetic-inductive

Flow meter system



Vortex

Flow meter system



Mechatronic

Flow meter system



Ultrasonic

Flow meter system



Thermal

Compressed air meters



Thermal

Flow sensors



Thermal

Flow sensors



Software and accessories

IO-Link interface



For industrial applications



		Suitable for media													
		Sensor type	Absolute measurement			Relative measurement			Oil	Deionised water ¹⁾	Cooling water ²⁾	Emulsion (oil-water mixture); glycol mixture ²⁾		Chemical liquids of low concentration ²⁾	
			Air, industrial gases Ar, N ₂ , CO ₂												
SM	SMxx50	✓	-	-	-	✓	✓	✓	✓	✓	MID Technology	LEO Display	IP 67	IO-Link	
SV	SVxx50	✓	-	-	✓	✓	✓	✓	✓	✓	High-grade stainless steel	Rotatable connection	IP 65 IP 67	IO-Link	
SBY / SBG	SBT	✓	-	✓	-	✓	✓	✓	✓	-	Operating temperature up to 100°C	LEO Display	IP 65 IP 67	IO-Link	
	SBU	✓	-	✓	-	-	-	-	-	-					
SU		✓	-	✓	✓	✓	✓	✓	✓	✓	Ultrasound	High-grade stainless steel	LEO Display	IP 67	
SD		✓	✓	-	-	-	-	-	-	-	High-grade stainless steel	LEO Display	IP 65	IO-Link	
SI5xxx	SR / SN	✓	✓	✓	✓	✓	✓	✓	✓	✓	High-grade stainless steel	TEACH-IN	IP 65 IP 67	IO-Link	
SA		✓	✓	✓	✓	✓	✓	✓	✓	✓	High-grade stainless steel	LEO Display	IP 65 IP 67	IO-Link	

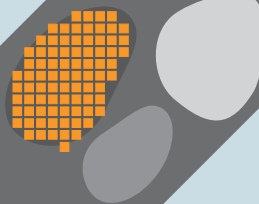
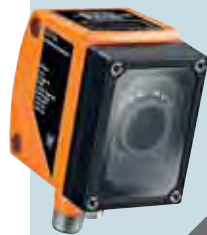
¹⁾ < 20 µS/cm ²⁾ > 20 µS/cm

✓ limited suitability ✓ good suitability

Vision sensors at a glance



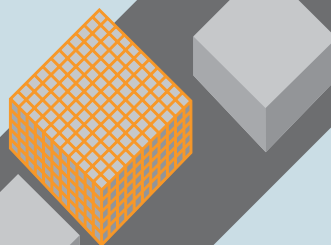
Object recognition
Compare contours
O2D sensor



Object inspection
Count pixels
O2V sensor



Identification
Read codes
O2I sensor



















3D object recognition
Detect dimensions
O3D sensor



**Software
and accessories**



	no colour contrast to the background	objects smaller than 1 cm²	variable shapes	moving objects, variable orientation and position	moving 1D and 2D codes, variable orientation and position	
<p>For objects with defined geometry. For assessment of presence and completeness, for position detection and for sorting tasks. Use for quality assurance in assembly automation and on machine tools.</p>	-	✓	-	✓	-	   
<p>For objects and scenes with variable features. For optical level monitoring, for full / empty monitoring and fault and hole recognition. Use for quality assurance in assembly automation and on packaging machines.</p>	-	✓	✓	✓	-	   
<p>For 1D and 2D codes as well as text. For monitoring processes in industrial automation. Use in product tracking, control and identification.</p>	-	✓	-	-	✓	   
<p>For the three-dimensional detection of objects and scenes using the time of flight measurement. For assessment of level and completeness as well as for object dimensioning. Use e.g. in packaging and conveying technology.</p>	✓	-	✓	✓	-	   

Identification systems at a glance



Multi-code readers



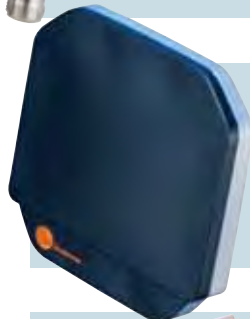
**LF system
125 kHz**



**LF/HF system
125 kHz
13.56 Mhz**



**HF system
13.56 Mhz**



**UHF system
865 to 928 MHz**



**Software
and accessories**



For industrial applications



				System type	Optical code reader	RFID systems	Range	Fieldbus
Identification of e.g. bar codes, QR or Data Matrix codes and text for the monitoring of process operations.	O2I	✓			up to 2m		RS232 Ethernet TCP/IP EtherNet/IP	
Identification in routing conveyors.	DTA3xx		✓		up to 100 mm		AS-i	
Identification in conveyors. Large data volumes, high speed.	DTE10x ANT4xx ANT5xx ANT600		✓		up to 200 mm		SAP/ERP Profibus-DP Profinet EtherNet/IP TCP/IP Ethercat	
Identification in production plants.	DTI		✓		100 mm		IO-Link	
Identification in production and logistics. Long ranges, many tags.	DTE810 DTE820 DTE910		✓		up to 10m		Ethernet TCP/IP EtherNet/IP	

Vibration monitoring systems at a glance



Basic vibration sensors and transmitters

Vibration sensors and transmitters for permanent monitoring of the overall vibration condition of machines and plants to ISO 10816.



Intelligent vibration sensors

The compact vibration sensors of type VN monitor the overall vibration condition of machines and plants to ISO 10816.



Diagnostic electronics

6-channel diagnostic system for the evaluation of dynamic signals (e.g. acceleration) and analogue inputs. Flexible, detailed monitoring and analysis.



Acceleration sensors

Acceleration sensors measure the dynamic forces at the machine surface.



























Software and accessories

The software VES004 is used for the parameter setting and the online data monitoring of all intelligent vibration sensors and diagnostic electronics.



For industrial applications



	Type	Analogue output	Switching output	Fieldbus interface	Integrated display	History function	Network capability TCP/IP	Signal inputs e.g. temperature	Diagnostics
VT	✓	-	-	-	-	-	-	-	   
VK	✓	✓	-	-	-	-	-	-	   
VN	✓	✓	-	✓	✓	-	✓	-	   
VSE002 VSE100	✓	✓	-	-	✓	✓	✓	✓	   
VSE15x	✓	✓	✓	-	✓	✓	✓	✓	   
VSA VSP	-	-	-	-	-	-	-	-	   



More than just sensors: The ifm group of companies offers a wide range of solutions for the automotive industry. On the following pages you will find an overview of all the products summarised into categories. In addition to the system descriptions we will also show you the most important features of the products. For more information please visit us online at ifm.com

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<i>Accessories</i>	408 - 421
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<i>Power supplies</i>	422 - 425

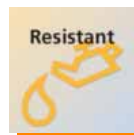
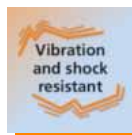


For oils and coolants

Inductive sensors for machine tools



- Resistant to aggressive oils and coolants
- Increased sensing range for higher uptime
- Protection IP 68
- Laser type label for permanent identification of the unit
- High shock and vibration resistance



Absolutely sealed

Long life is achieved due to a special design and additional seals as well as the use of resistant materials such as PBT or ceramics to ensure the protection against oils and coolants. All units of this series (C series) feature the protection rating IP 67 / IP 68 and the protection class II.

Long sensing range

The increased sensing range is ensured over the whole temperature range. This provides better protection against failures due to mechanical damage.

M12 connector

The connection is made via a robust M12 connector with integrated, clearly visible 4-port LED for indication of the switching status.

Future-proof details


ifm sensors have been designed for a service life of many years. This is also reflected by the details. For example the captive laser type label means the units can still be clearly identified after years of use.











Application example: Eccentric monitoring






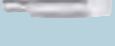
Sensors for oils and coolants with increased sensing range

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function  · 3-wire · DC PNP

	M8 / L = 50	2 f	High-grade st. steel	10...36	IP 67	1000	200	IE5381
	M12 / L = 45	4 f	Brass	10...30	IP 68	700	100	IFC204
	M12 / L = 45	4 f	Brass	10...36	IP 68	700	100	IFC206
	M12 / L = 50	7 nf	Brass	10...30	IP 68	700	100	IFC205
	M18 / L = 45	8 f	Brass	10...30	IP 68	400	100	IGC204
	M18 / L = 46	8 f	Brass	10...36	IP 68	400	100	IGC206
	M18 / L = 50	12 nf	Brass	10...30	IP 68	300	100	IGC205

M12 connector · Output function  · 3-wire · DC PNP

	M12 / L = 45	4 f	Brass	10...30	IP 68	700	100	IFC207
	M12 / L = 45	4 f	Brass	10...36	IP 68	700	100	IFC209
	M12 / L = 50	7 nf	Brass	10...30	IP 68	700	100	IFC208
	M18 / L = 45	8 f	Brass	10...30	IP 68	400	100	IGC207
	M18 / L = 46	8 f	Brass	10...36	IP 68	400	100	IGC209
	M18 / L = 51	12 nf	Brass	10...36	IP 68	300	100	IGC208

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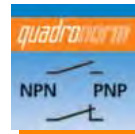


For oils and coolants

Inductive sensors in 2-wire technology for machine tools



- Resistant to aggressive oils and coolants
- Increased sensing range for higher uptime
- Protection IP 68
- Laser type label for permanent identification of the unit
- High shock and vibration resistance



Absolutely sealed

Long life is achieved due to a special design and additional seals as well as the use of resistant materials such as PBT or ceramics to ensure the protection against oils and coolants. All units of this series (C series) feature the protection rating IP 67 / IP 68 and the protection class II.

Long sensing range

The increased sensing range is ensured over the whole temperature range. This provides better protection against failures due to mechanical damage.

M12 connector

The connection is made via a robust M12 connector with integrated, clearly visible 4-port LED for indication of the switching status.










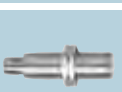





Future-proof details

ifm sensors have been designed for a service life of many years. This is also reflected by the details. For example the captive laser type label means the units can still be clearly identified after years of use.



Longer uptime due to components adapted to each other.

Sensors for oils and coolants with increased sensing range

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 2-wire · DC PNP/NPN								
	M12 / L = 45	4 f	Brass	10...30	IP 68	700	100	IFC200
	M12 / L = 50	7 nf	Brass	10...30	IP 68	700	100	IFC201
	M18 / L = 46	8 f	Brass	10...30	IP 68	400	100	IGC200
	M18 / L = 51	12 nf	Brass	10...30	IP 68	250	100	IGC201
M12 connector · Output function  /  · 2-wire · DC PNP/NPN								
	M12 / L = 60	4 f	Brass	10...36	IP 68	700	100	IFC234
	M12 / L = 60	7 nf	Brass	10...36	IP 68	500	100	IFC235
	M18 / L = 70	8 f	Brass	10...36	IP 68	400	100	IGC222
	M30 / L = 70	15 f	Brass	10...30	IP 68	100	100	IIC208
	M30 / L = 70	22 nf	Brass	10...36	IP 68	100	100	IIC209
M12 connector · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M12 / L = 70	4 f	Brass	10...30	IP 68	500	100	IFC210
	M18 / L = 70	8 f	Brass	10...30	IP 68	400	100	IGC210

f = flush / nf = non flush / qf = quasi-flush

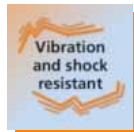


For oils and coolants

Inductive sensors with 60 mm housing length



- Load current 200 mA and supply voltage 10...36 V DC
- Increased sensing range for higher uptime
- IP 67 / IP 68 as well as resistant to oils and coolants
- Laser type label for permanent identification of the unit
- High vibration and shock resistance



Universal use

The sensors have the load current of 200 mA required by the automotive industry and a connection voltage of 10...36 V DC. With a total length of 60 mm and a thread area of 40 mm the sensors have been designed for universal use.

Absolutely sealed

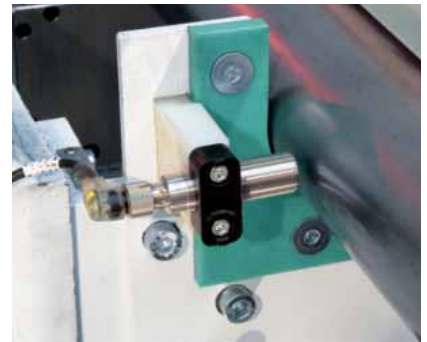
Long life is achieved due to a special design and additional seals as well as the use of a plastic which is resistant to oils, coolants and lubricants. All units of this series (C series) feature the protection rating IP 67 / IP 68 and the protection class II.

Long sensing range

The increased sensing range is ensured over the whole temperature range. This provides better protection against failures due to mechanical damage.


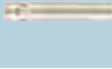





M12 connector

The connection is made via a robust M12 connector with integrated, clearly visible 4-port LED for indication of the switching status.





Standardised housing lengths allow compact installation.

Sensors for oils and coolants with increased sensing range

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 3-wire · DC PNP								
	M12 / L = 60	4 f	Brass	10...30	IP 68	700	200	IFC229
	M12 / L = 60	7 nf	Brass	10...30	IP 68	700	200	IFC230
	M18 / L = 60	12 nf	Brass	10...36	IP 68	300	200	IGC220
	M18 / L = 60	8 f	Brass	10...36	IP 68	400	200	IGC221
	M30 / L = 60	15 f	Brass	10...36	IP 68	100	200	IIC206
	M30 / L = 60	22 nf	Brass	10...36	IP 68	100	200	IIC207

f = flush / nf = non flush / qf = quasi-flush

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002

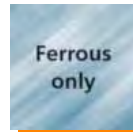
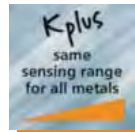
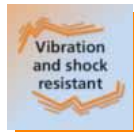


For oils and coolants

Inductive sensors with $K = 1$ or selective metal detection



- IP 67 / IP 68 as well as resistant to oils and coolants
- Sensors with constant sensing range for all metals (correction factor = 1)
- Extra-high switching frequency up to 2 kHz
- Sensors with "ferrous-only" feature: Only ferrous metals are detected
- Laser type label for permanent unit identification



Absolutely sealed

Long life is achieved due to a special design and additional seals, as well as the use of a special plastic that is resistant to oil, coolants and lubricants.

Correction factor 1

The "K=1" sensors have the same sensing range on all metals, i.e. the correction factor is constantly 1.

Selective "ferrous-only" metal detection

The inductive new "ferrous-only" sensors only detect ferrous metals. Aluminium chips which build up on the active face during the process and lead to incorrect switching of conventional sensors are ignored due to this principle.

Sensing range

The increased sensing range is ensured across the whole temperature range, giving better protection against failure due to mechanical damage.

M12 connector

The connection is made via a robust M12 connector with integrated, clearly visible 4-port LED for indication of the switching status.




Different metals are safely detected.


Sensors for oils and coolants with correction factor K = 1

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M8 connector · Output function  · 3-wire · DC PNP

	M8 / L = 60	1.5 f	High-grade st. steel	10...30	IP 65 / IP 67	1000	100	IE5390
	M8 / L = 60	4 nf	High-grade st. steel	10...30	IP 65 / IP 67	1000	100	IE5391

M12 connector · Output function  · 3-wire · DC PNP

	M12 / L = 60	2.5 f	High-grade st. steel	10...36	IP 68	100	100	IFC264
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M12 connector · Output function  · 3-wire · DC PNP



	M12 / L = 65	3 f	stainless steel (316L)	10...30	IP 68	2000	100	IFC259
	M18 / L = 65	5 f	High-grade st. steel	10...30	IP 68	2000	100	IGC232
	M30 / L = 65	10 f	High-grade st. steel	10...30	IP 68	2000	100	IIC218

f = flush / nf = non flush / qf = quasi-flush

Full metal sensors for oils and coolants with correction factor K = 0

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
------	--------------------	-----------------------	----------	-----------------------	------------	-----------	---------------------------	-----------

M12 connector · Output function  · 3-wire · DC PNP

	M12 / L = 60	2.5 f	High-grade st. steel	10...36	IP 68	100	100	IFC263
	M18 / L = 70	4.5 f	High-grade st. steel	10...36	IP 68	100	100	IGC249

f = flush / nf = non flush / qf = quasi-flush

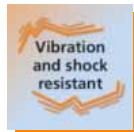


For industrial applications

Inductive M12 sensors with long sensing ranges



- High shock and vibration resistance
- Different housing length for almost all applications
- Safe and quick mounting due to robust and reinforced housing
- All sensors with robust M8 or M12 connection
- Laser type label for permanent identification of the unit



Long sensing range

The increased sensing range is ensured across the whole temperature range, giving better protection against failure due to mechanical damage. With M12 connection the sensors allow to reach sensing ranges up to 4 or 7 mm. In practice this corresponds to a value which is up to twice as high compared to standard sensors.

Plug-and-socket connection

The connection is made via a robust M8 or M12 connector with integrated, clearly visible 4-port LED for indication of the switching status.

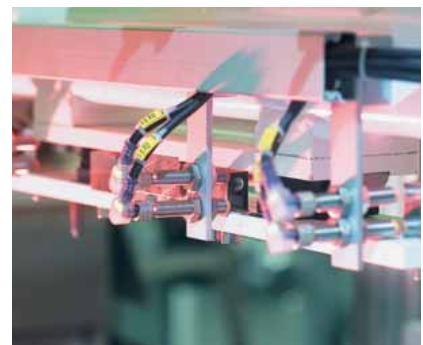
Short length

The housing length of the two short designs is only 46 mm (flush) and 51 mm (non flush). The units can thus also be used where available space is extremely limited.

Future-proof details

ifm sensors have been designed for a service life of many years. This is also reflected by the details.


For example the captive laser type label means the units can still be clearly identified after years of use.





Long sensing ranges allow versatile use.





Sensors with increased sensing range for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
------	--------------------	-----------------------	----------	-----------------------	------------	-----------	---------------------------	-----------



M12 connector · Output function  · 2-wire · DC PNP/NPN

	M12 / L = 45	4 f	Brass	10...30	IP 67	700	100	IFS200
	M12 / L = 50	7 nf	Brass	10...30	IP 67	700	100	IFS201

M12 connector · Output function  · 3-wire · DC PNP

	M12 / L = 45	4 f	Brass	10...30	IP 67	700	100	IFS204
	M12 / L = 50	7 nf	Brass	10...30	IP 67	700	100	IFS205
	M12 / L = 70	4 f	Brass	10...30	IP 67	700	100	IFS212
	M12 / L = 70	7 nf	Brass	10...30	IP 67	700	100	IFS213



M12 connector · Output function  · 3-wire · DC PNP

	M12 / L = 45	4 f	Brass	10...30	IP 67	700	100	IFS206
	M12 / L = 50	7 nf	Brass	10...30	IP 67	700	100	IFS207

M8 connector · Output function  · 3-wire · DC PNP

	M12 / L = 46	4 f	Brass	10...36	IP 67	700	100	IFS210
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M12 connector · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN

	M12 / L = 70	4 f	Brass	10...30	IP 67	500	100	IFS208
	M12 / L = 70	7 nf	Brass	10...30	IP 67	500	100	IFS209

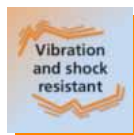
f = flush / nf = non flush / qf = quasi-flush



Inductive M18 sensors with long sensing ranges



- High shock and vibration resistance
- Different housing lengths for almost every application
- Safe and quick mounting due to robust and reinforced housing
- All sensors have corrosion-resistant M12 connectors
- Laser type label for permanent identification of the unit



Long sensing range

The increased sensing range is ensured across the whole temperature range, giving better protection against failure due to mechanical damage. With M18 connection the sensors allow to reach sensing ranges up to 8 or 12 mm. In practice this corresponds to a value which is up to twice as high compared to standard sensors.

Plug-and-socket connection

The connection is made via a robust M12 connector with integrated, clearly visible 4-port LED for indication of the switching status.

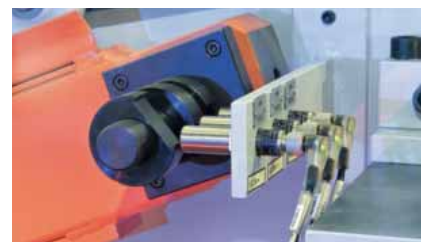
Short length

The housing length of the two short designs is only 46 mm (flush) and 51 mm (non flush). The units can thus also be used where available space is extremely limited.















Future-proof details

ifm sensors have been designed for a service life of many years. This is also reflected by the details.

For example the captive laser type label means the units can still be clearly identified after years of use.



Sensors with increased sensing range for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 2-wire · DC PNP/NPN								
	M18 / L = 46	8 f	Brass	10...30	IP 67	300	100	IGS200
	M18 / L = 51	12 nf	Brass	10...30	IP 67	250	100	IGS201
M12 connector · Output function  · 3-wire · DC PNP								
	M18 / L = 45	8 f	Brass	10...30	IP 67	400	100	IGS204
	M18 / L = 50	12 nf	Brass	10...30	IP 67	300	100	IGS205
	M12 / L = 70	8 f	Brass	10...30	IP 67	400	100	IGS212
	–	12 nf	Brass	10...30	IP 67	300	100	IGS213
M12 connector · Output function  · 3-wire · DC PNP								
	M18 / L = 45	8 f	Brass	10...30	IP 67	400	100	IGS206
	M18 / L = 50	12 nf	Brass	10...30	IP 67	300	100	IGS207
M12 connector · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M18 / L = 70	8 f	Brass	10...30	IP 67	400	100	IGS208
	M18 / L = 70	12 nf	Brass	10...30	IP 67	300	100	IGS209

f = flush / nf = non flush / qf = quasi-flush



For industrial applications

Full-metal inductive sensors with extended temperature range



- Sensor housing and front face of stainless steel
- Wide temperature range of 0...100 °C
- Temperature shock resistant even in case of frequent temperature fluctuations
- High ingress protection: IP 67 / IP 68 / IP 69K
- Resistant to high-pressure cleaning and aggressive cleaning agents



Materials

Both the threaded body and the sensing face of the housing are made of stainless steel.

Wide temperature range

The permissible application range of the sensors covers 0 to 100 °C. Furthermore, the units are exceptionally resistant to temperature shocks.

Increased sensing ranges

The increased sensing ranges for non-flush installation give you more safety in case of mechanical tolerances.














Ingress resistance in wet areas

The sensors for use up to 100 °C undergo frequent cleaning operations, temperature shocks and feature high resistance to cleaning agents.

- temperature shock test to EN 60068-2-14 Nc
- artificial ageing in a 1000-hour long-term test to EN 60068-2-14 Nb (temperature cycle test)
- leak check using the steam boiler test



Full-metal inductive sensors

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 3-wire · DC PNP								
	M12 / L = 45	4 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	IFT257
	M12 / L = 45	4 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	IFC275
	M12 / L = 45	4 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2	100	IFR207
	M12 / L = 60	3 f	High-grade st. steel	10...36	IP 68 / IP 69K	100	100	IFT240
	M18 / L = 45	8 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	IGT258
	M18 / L = 45	8 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	IGC258
	M18 / L = 45	8 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2	100	IGR207
	M18 / L = 70	5 f	High-grade st. steel	10...36	IP 68 / IP 69K	100	100	IGT247
	M30 / L = 50	15 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	50	100	IIT243
	M30 / L = 50	15 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	50	100	IIC233
	M30 / L = 50	15 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2	100	IIR207
	M30 / L = 70	10 f	High-grade st. steel	10...36	IP 68 / IP 69K	50	100	IIT228

f = flush / nf = non flush / qf = quasi-flush

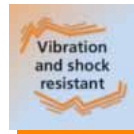


For oils and coolants

Full-metal inductive sensors M8 to M30



- Ideal for metalworking applications
- Devices and connectors are adapted for use in oils
- Strong sensing face, resistant to impact
- Vibration and shock resistant
- Laser type label for permanent identification of the unit



Materials

For the one-piece housing the threaded body and the sensing face are made of stainless steel.

Oils and coolants

Oils and coolants heavily impact the installed machine components. The O-ring seal made of FKM combined with the corresponding ecolink connector ensures high protection against malfunctions.

Application tests








A series of tests qualified the sensors for use in harsh environments:

- vibration test
- shock test
- impact test
- coolant test





Robust sensors for use in harsh environments.

Full metal sensors for oils and coolants

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M8 connector · Output function  · 3-wire · DC PNP								
	M8 / L = 50	2 f	High-grade st. steel	10...36	IP 67	100	100	IEC201
M12 connector · Output function  · 3-wire · DC PNP								
	M8 / L = 60	2 f	High-grade st. steel	10...36	IP 67 / IP 68 / IP 69K	100	100	IEC200
	M12 / L = 60	3 f	High-grade st. steel	10...36	IP 67 / IP 68	100	100	IFC258
	M18 / L = 70	5 f	High-grade st. steel	10...36	IP 67 / IP 68	100	100	IGC248
	M30 / L = 70	10 f	High-grade st. steel	10...36	IP 67 / IP 68	50	100	IIC224

f = flush / nf = non flush / qf = quasi-flush

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002

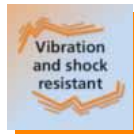


For elektro-
magnetic fields

Full-metal inductive sensors for use in welding applications



- Ideal for metalworking applications
- Non-stick coating against weld spatter
- Mechanically resistant to impacts on the sensing face
- Vibration and shock resistant
- Laser type label for permanent identification of the unit



Materials

For the one-piece housing the threaded body and the sensing face are made of stainless steel.

Use in welding applications

The non-stick coating allows weld spatter to roll off the sensor. The high temperature range of up to 85 °C also enables handling of critical applications.

Application tests


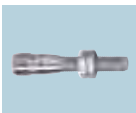




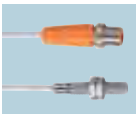
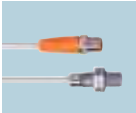

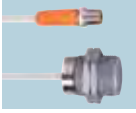
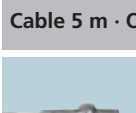







A series of tests qualified the sensors for use in harsh environments:

- vibration test
- shock test
- impact test
- coolant test



Longer lifetime in welding applications
due to anti-adhesive coating.

Full metal sensors with non-stick coating against weld spatter

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 3-wire · DC PNP								
	M8 / L = 60	2 f	High-grade st. steel	10...36	IP 67 / IP 68	100	100	IER200
	M12 / L = 60	4 f	High-grade st. steel	10...36	IP 67	2	100	IFR200
	M18 / L = 70	6 f	High-grade st. steel	10...36	IP 67	2	100	IGR200
	M30 / L = 70	12 f	High-grade st. steel	10...36	IP 67	2	100	IIR200
Cable 0.3 m · with M12 connector · Output function  · 2-wire · DC PNP/NPN								
	M8 / L = 45	2 f	High-grade st. steel	10...36	IP 67	150	100	IER203
	M12 / L = 40	4 f	High-grade st. steel	10...36	IP 67	75	100	IFR203
	M12 / L = 40	4 f	High-grade st. steel	10...36	IP 67	75	100	IFR206
	M18 / L = 40	6 f	High-grade st. steel	10...36	IP 67	50	100	IGR203
	M18 / L = 40	6 f	High-grade st. steel	10...36	IP 67	50	100	IGR206
	M30 / L = 40	12 f	High-grade st. steel	10...36	IP 67	25	100	IIR203
	M30 / L = 40	12 f	High-grade st. steel	10...36	IP 67	25	100	IIR206
Cable 5 m · Output function  · 2-wire · DC PNP/NPN								
	M8 / L = 45	2 f	High-grade st. steel	10...36	IP 67	150	100	IER205
	M12 / L = 40	4 f	High-grade st. steel	10...36	IP 67	75	100	IFR205
	M18 / L = 40	6 f	High-grade st. steel	10...36	IP 67	50	100	IGR205
	M30 / L = 40	12 f	High-grade st. steel	10...36	IP 67	25	100	IIR205

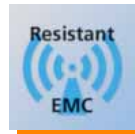
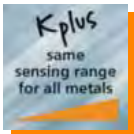
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Electromagnetic field immune inductive sensors with $K = 1$



- Designs: M12, M18, M30
- Electromagnetic field immune: suitable for all AC / DC and medium frequency welding systems.
- Increased sensing range for higher uptime
- Cylindrical types with high switching frequency
- Resistant to weld slag due to Duroplast cover and PTFE coating



Electromagnetic-field immune, resistant to weld slag

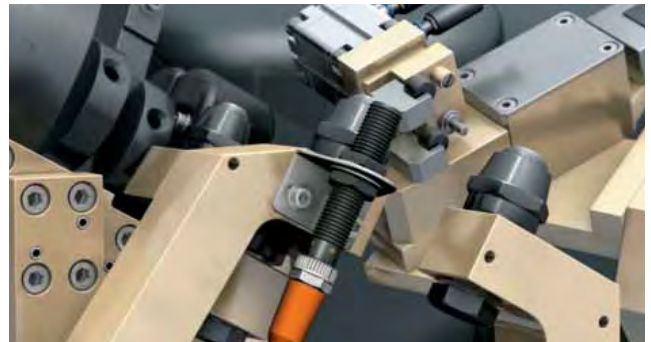
Due to the special coil structure the proximity sensors are insensitive to interfering magnetic fields which occur during the welding process. This makes them an optimum choice for use in welding equipment. The sensing face is made of a thermoset and the surface of the metal housing is PTFE-coated so that no weld slag adheres to the housing.

Correction factor = 1

No matter whether steel, aluminium, copper or other non-ferrous metals: The "K=1" sensors have the same sensing range on all metals, i.e. the correction factor is constantly 1.








Increased sensing range

The increased sensing range is ensured over the whole temperature range. This provides better protection against failures due to mechanical damage. In practice it corresponds to a value up to twice as high compared to standard sensors.





The sensors function without problems in welding applications.

Electromagnetic field immune sensors with correction factor K = 1

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 3-wire · DC PNP								
	M12 / L = 65	3 f	Brass	10...30	IP 67	2000	100	IFW200
	M12 / L = 65	8 nf	Brass	10...30	IP 67	2000	100	IFW201
	M18 / L = 65	5 f	Brass	10...30	IP 67	2000	100	IGW200
	M18 / L = 65	12 nf	Brass	10...30	IP 67	2000	100	IGW201
	M30 / L = 65	10 f	Brass	10...30	IP 67	2000	100	IIW200
	M30 / L = 65	22 nf	Brass	10...30	IP 67	2000	100	IIW201

f = flush / nf = non flush / qf = quasi-flush

Connectors

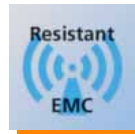
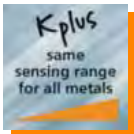
Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW001
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW002
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW004
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW005



Electromagnetic field immune inductive sensors with $K = 1$



- Housing: rectangular, the sensing face can be rotated to 5 different positions
- Electromagnetic field immune: suitable for all AC / DC and medium frequency welding systems
- Increased sensing range for higher uptime
- Resistant to weld slag due to Duroplast cover and PTFE coating



Electromagnetic-field immune, resistant to weld slag

Due to the special coil structure the proximity sensors are insensitive to interfering magnetic fields which occur during the welding process. This makes them an optimum choice for use in welding equipment. The sensing face is made of a thermoset and the surface of the metal housing is PTFE-coated so that no weld slag adheres to the housing.

Correction factor = 1

No matter whether steel, aluminium, copper or other non-ferrous metals: the "K=1" sensors have the same sensing range on all metals, i.e. the correction factor is constantly one.

Increased sensing range

The increased sensing range is ensured over the whole temperature range. This provides better protection against failures due to mechanical damage. Compared to standard sensors it corresponds to a value which in practice is up to twice as high.



Sensors for industrial applications, rectangular housings

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · 3-wire · DC PNP								
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	200	200	IM5128
	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	200	200	IM5130
	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	200	200	IM5131
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	200	200	IM5119
	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	200	200	IM5120
	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	200	200	IM5129
M12 connector · Output function  · 4-wire · DC PNP								
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	200	200	IM5132
	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	200	200	IM5133
	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67 / IP 69K	200	200	IM5135
	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	200	200	IM5124
	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	200	200	IM5125
	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	200	200	IM5126

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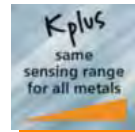
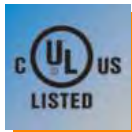


For elektro-
magnetic fields

Electromagnetic field immune Kplus sensors for welding areas



- Uniform sensing range for the reliable detection of all metals
- Robust design with non-stick coating
- Electromagnetic field immune sensor technology to prevent incorrect switching
- Wide temperature range for universal use
- High protection ratings up to IP 68 / IP 69K



Use in harsh welding applications

The inductive Kplus sensors withstand harsh operating conditions and reliably detect metal objects even in case of soiling.








The sensor housing and the fixing nuts have a non-stick coating to prevent sticking of weld slag. Strong magnetic fields occur in welding processes.

The new sensor technology prevents incorrect switching.

The quick connection with the connector and matching cable from the ecolink range is the ideal basis for permanent use.







Electromagnetic field immune Kplus sensors with correction factor 1

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M8 connector · Output function  · 3-wire · DC PNP								
	M8 / L = 40	3 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IEW200
	M8 / L = 40	6 nf	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IEW201
M12 connector · Output function  · 3-wire · DC PNP								
	M12 / L = 65	4 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IFW204
	M18 / L = 65	8 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IGW202
	M30 / L = 65	15 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IIW202

f = flush / nf = non flush / qf = quasi-flush

Accessories

Type	Description	Order no.
	Mounting sleeve · M12 x 1 - Ø 8 mm · 28 mm · with end stop · for type M8 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12587
	Mounting sleeve · M16 x 1 - Ø 12 mm · 33.5 mm · with end stop · for type M12 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12452
	Mounting sleeve · M22 x 1 - Ø 18 mm · 33.5 mm · with end stop · for type M18 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12453
	Mounting sleeve · M36 x 1.5 - Ø 30 mm · 33.5 mm · with end stop · for type M30 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12454

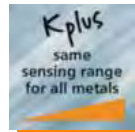
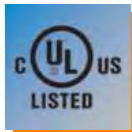


For industrial applications

Kplus sensors: one sensing range for all metals



- Uniform sensing range for the reliable detection of all metals
- Compact dimensions for use in the smallest of space
- Electromagnetic field immune sensor technology to prevent incorrect switching
- Wide temperature range for universal use
- High protection ratings up to IP 68 / IP 69K



Constant correction factor
















Kplus sensors have the same sensing range for all types of metals.

They are for example perfectly suited for the detection of aluminium, where conventional sensors show a considerably reduced sensing range. The high switching frequencies enable the monitoring of fast changing switching states.

With the new sensor technology, these sensors are insensitive to magnetic fields and can for example be reliably used right next to electrical brakes. The wide temperature range as well as the high protection ratings enable universal use of the new Kplus sensors.



Electromagnetic field immune Kplus sensors with correction factor 1

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M8 connector · Output function  · 3-wire · DC PNP								
	M8 / L = 40	3 f	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IES200
	M8 / L = 40	6 nf	High-grade st. steel	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IES201
M12 connector · Output function  · 3-wire · DC PNP								
	M12 / L = 45	4 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IFS289
	M12 / L = 45	10 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IFS290
	M12 / L = 60	4 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IFS285
	M12 / L = 60	10 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IFS286
	M18 / L = 45	8 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IGS279
	M18 / L = 45	15 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IGS280
	M18 / L = 60	8 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IGS277
	M18 / L = 60	15 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IGS278
	M30 / L = 45	15 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IIS269
	M30 / L = 60	15 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IIS267
	M30 / L = 60	30 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	2000	100	IIS268

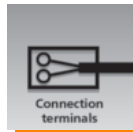
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Inductive sensors for conveying



- Very long sensing ranges up to 60 mm
- Different sizes for demanding applications
- M12 connector easy to mount and maintain
- Versions in 3-wire and 4-wire technology
- Type IM: sensing face in 5 positions freely selectable, clearly visible corner LEDs



Applications

The inductive rectangular sensors are particularly suited for use in conveying.

Type IM

The two clearly visible LEDs of the inductive rectangular sensor IM (40 x 40 mm) can be seen even under adverse installation conditions.

By loosening the adjusting screw, the sensing face can be rotated to 5 different positions and thus be optimally adapted to your applications.

Long sensing ranges


The high sensing ranges are guaranteed over the complete temperature range. They provide sufficient protection against mechanical damage ensuring higher machine uptime.





Sensors for industrial applications, rectangular housings

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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Cable 0.8 m · with M12 connector · Output function  · 2-wire · DC PNP/NPN


	40 x 40 x 54	15 f	PA (polyamide)	10...36	IP 67	200	100	IM5137
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Cable 0.8 m · with M12 connector · Output function  · 2-wire · DC PNP/NPN


	40 x 40 x 54	15 f	PA (polyamide)	10...36	IP 67	200	100	IM5138
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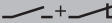
M12 connector · Output function  · 3-wire · DC PNP


	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	100	200	IM5115
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	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	80	200	IM5116
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	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	60	200	IM5117
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	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5055
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M12 connector · Output function  · 4-wire · DC PNP

	40 x 40 x 54	20 f	PA (polyamide)	10...36	IP 67	100	200	IM5123
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	40 x 40 x 54	35 nf	PA (polyamide)	10...36	IP 67	80	200	IM5134
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	40 x 40 x 54	40 nf	PA (polyamide)	10...36	IP 67	60	200	IM5136
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	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5058
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	92 x 80 x 40	50 f	PPE	10...36	IP 67	70	250	ID5059
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f = flush / nf = non flush / qf = quasi-flush



Inductive M8 sensors



- Small designs with M8 or M12 connectors or cable connection
- Different housing lengths for almost every application
- Increased sensing range for higher uptime
- High switching frequencies up to 2,000 Hz



Application

M8 inductive sensors with short housing length are perfectly suited for applications where space is at a premium.

Absolutely sealed

Long life is achieved due to a special design as well as the use of resistant materials such as PBT or ceramics to ensure the protection against oils and coolants. The units have protection rating IP 67.

Long sensing range

The sensing range is ensured over the entire temperature range. This provides better protection against failures due to mechanical damage.

Future-proof details


ifm sensors have been designed for a service life of many years. This is also reflected by the details. Due to the captive laser type label the units can for example still be clearly identified after years of use.






M8 inductive sensors are perfectly suited for applications where space is at a premium.



Sensors for industrial applications, threaded housings

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function  · 3-wire · DC PNP

	M8 / L = 53	1 f	Brass	10...36	IP 67	750	200	IE5090
	M8 / L = 62	2 f	Brass	10...36	IP 67	1000	250	IE5312
	M8 / L = 62	2 f	Brass	10...36	IP 67	800	250	IE5318
	M8 / L = 62	2 f	Brass	10...36	IP 67	1000	250	IE5257
	M8 / L = 62	4 nf	Brass	10...36	IP 67	300	200	IE5288

M8 connector · Output function  · 3-wire · DC PNP

	M8 / L = 50	1 f	Brass	10...36	IP 65 / IP 67	2000	200	IE5266
	M8 / L = 50	2 f	Brass	10...36	IP 65 / IP 67	1300	200	IE5287
	M8 / L = 50	2 f	Brass	10...36	IP 65 / IP 67	1000	250	IE5328
	M8 / L = 52	4 nf	Brass	10...36	IP 65 / IP 67	800	200	IE5329

Cable 2 m · Output function  · 3-wire · DC PNP


	M8 / L = 35	1 f	Brass	10...36	IP 67	750	200	IE5072
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f = flush / nf = non flush / qf = quasi-flush


Connectors

Type	Description	Order no.
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Socket M12, 5/4-pole, 4-wire

	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
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Socket M8, 3-pole, 3-wire

	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC145
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For industrial applications

Extra-short inductive M8 sensors



- Extra-short design – perfectly suited for applications where space is at a premium
- 3 connection technologies selectable: M8 connector, cable or pigtail
- M8 connector for especially fast mounting
- Increased sensing range for higher uptime
- Flexible connection as 2 or 3-wire



Long sensing range

The increased sensing range is ensured across the whole temperature range, giving better protection against failure due to mechanical damage. With the M8 sensors sensing ranges of 3 mm (flush) and 5 mm (non flush) can be reached. In practice this corresponds to a value which is up to 3 times higher in comparison to standard sensors.

Short length

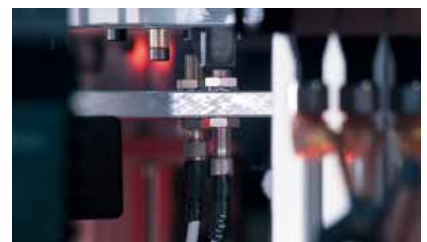
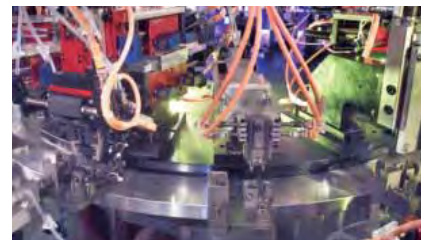
M8 inductive sensors with extra-short housing length are perfectly suited for applications where space is at a premium.

Universal connection possibilities for type M8








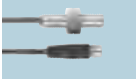


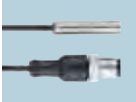




The sensors can either be used as 2-wire or 3-wire units.

Three connections possible

You can select between M8 connections, 2 m PVC cable or 30 cm PVC cable with potted M12 connection.



Sensors for industrial applications, threaded housings

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M8 connector · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M8 / L = 40	3 f	Brass	10...30	IP 65 / IP 67	800	100	IE5338
	M8 / L = 40	5 nf	High-grade st. steel	10...30	IP 65 / IP 67	600	100	IE5340
M8 connector · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M8 / L = 40	3 f	Brass	10...30	IP 65 / IP 67	800	100	IE5349
	M8 / L = 40	5 nf	High-grade st. steel	10...30	IP 65 / IP 67	600	100	IE5350
Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M8 / L = 37	3 f	Brass	10...30	IP 67	1000	100	IE5344
	M8 / L = 37	5 nf	Brass	10...30	IP 65 / IP 67	700	100	IE5346
Cable 0.3 m · with M12 connector · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M8 / L = 37	3 f	Brass	10...30	IP 67	1000	100	IE5351
	M8 / L = 37	5 nf	Brass	10...30	IP 67	700	100	IE5352
Cable 2 m · Output function  · 3-wire DC PNP · 2-wire DC PNP/NPN								
	M8 / L = 37	3 f	Brass	10...30	IP 67	1000	100	IE5343
	M8 / L = 37	5 nf	Brass	10...30	IP 67	700	100	IE5345

f = flush / nf = non flush / qf = quasi-flush



For industrial applications

Small inductive cylindrical designs



- Ideal for applications where space is restricted
- Three different designs: Ø 3, Ø 4, M5
- Two different connection technologies: M8 connector and cable
- Long sensing range for more plant uptime
- Wide temperature range and high switching frequencies up to 5,000 Hz



Short housing length

Thanks to their short housing length, the inductive sensors are perfectly suited for applications where space is at a premium.

M8 connector

A clearly visible 4-port LED for output status indication is integrated into the M8-connector design.

High switching frequency

The small sensors reach switching frequencies of 5,000 Hz - and this over the whole temperature range.

Increased tightening torque

During mounting the stainless steel housing allows a tightening torque which is up to twice as high as for standard sensors.




Safe position detection even where space is at a premium.

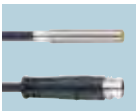
Sensors for industrial applications, threaded housings


Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M8 connector · Output function  · 3-wire · DC PNP

	M5 / L = 45	0.8 f	stainless steel	10...36	IP 65	2000	100	IY5036
	M5 / L = 41	1.5 nf	stainless steel	10...30	IP 67	1800	100	IY5048

Cable 0.1 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP

	M5 / L = 30	0.8 f	stainless steel	10...36	IP 65	2000	100	IY5045
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Cable 2 m · Output function  · 3-wire · DC PNP


	M5 / L = 23	0.8 f	stainless steel	10...30	IP 65	2000	100	IY5051
	M5 / L = 23	1.2 f	stainless steel	10...30	IP 65	2000	100	IY5052
	M5 / L = 30	0.8 f	stainless steel	10...36	IP 65	2000	100	IY5029
	M5 / L = 27	1.5 nf	stainless steel	10...30	IP 67	1800	100	IY5049

f = flush / nf = non flush / qf = quasi-flush

Sensors with smooth sleeve for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M8 connector · Output function  · 3-wire · DC PNP

	Ø 4 / L = 45	0.8 f	stainless steel	10...36	IP 65	2000	100	IZ5035
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Cable 2 m · Output function  · 3-wire · DC PNP

	Ø 4 / L = 23	0.8 f	stainless steel	10...30	IP 65	2000	100	IZ5051
	Ø 4 / L = 23	1.2 f	stainless steel	10...30	IP 65	2000	100	IZ5052
	Ø 4 / L = 30	0.8 f	stainless steel	10...36	IP 65	2000	100	IZ5026

f = flush / nf = non flush / qf = quasi-flush



For industrial applications

Small inductive rectangular designs



- Ideal for applications where space is restricted
- Different sizes for special applications
- Two different connection technologies: M8 connector and cable
- M8 connector for fast mounting
- Quick, easy and flexible mounting due to compact designs



Where space is at a premium












The small inductive rectangular sensors are particularly suited for use in applications where space is at a premium, as can typically be found in robotics, assembly and handling technology.

Connection

The user can select between units with connection cables or versions with M8 connection on the unit. This allows particularly fast fitting of the sensor.





Sensors for industrial applications, rectangular housings

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M8 connector · Output function  · 3-wire · DC PNP								
	40 x 8 x 8	2 f	Brass	10...36	IP 65	2000	250	IL5004
	40 x 8 x 8	2 f	Brass	10...36	IP 65	2000	250	IL5005
	28 x 10 x 16	2 f	PBT	10...30	IP 65 / IP 67	800	200	IS5035
	28 x 10 x 16	4 nf	PBT	10...30	IP 65 / IP 67	2000	200	IS5071
	40 x 12 x 26	2 f	PBT	10...36	IP 67	1400	250	IN5230
	40 x 12 x 26	4 nf	PBT	10...36	IP 65	1300	250	IN5212
Cable 2 m · Output function  · 3-wire · DC PNP								
	40 x 12 x 26	2 f	PBT	10...36	IP 67	1400	250	IN5121
	40 x 12 x 26	4 nf	PBT	10...36	IP 67	1300	250	IN5129
	40 x 8 x 8	2 f	Brass	10...36	IP 65	2000	250	IL5002
	40 x 8 x 8	2 f	Brass	10...36	IP 65	2000	250	IL5003
	28 x 10 x 16	2 f	PBT	10...30	IP 67	800	200	IS5001
	28 x 10 x 16	4 nf	PBT	10...30	IP 67	2000	200	IS5070

f = flush / nf = non flush / qf = quasi-flush

Connectors

Type	Description	Order no.
Socket M8, 3-pole, 3-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC144
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC145

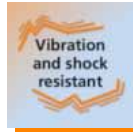


For industrial applications

Inductive sensors with M12, M18, M30 and 40 x 40 mm housings



- Accurate position monitoring – transmission of the distance as linearised process value via IO-Link
- Reduced stock-keeping – function and polarity selectable via IO-Link
- Very high repeatability
- Wide temperature range from -40...+85 °C for universal use



Much more than a pulse pick-up!

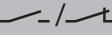








ifm's new inductive sensors with IO-Link incorporate several functions in one unit. They can be used as switching sensors with adjustable switch point or measuring systems with a measured value transmitted via IO-Link. The output signal can be set to NC or NO and PNP or NPN allowing many possible combinations. This allows reduction of the multitude of types, reducing the cost of stock.

Highest precision

The new sensors are so precise that they detect even minute changes. Even the true run of a spindle or the tension of a saw blade is reliably detected. If the target leaves the detection zone or comes too close to the sensing face, a warning may be given. All data acquired can be transmitted and recorded via IO-Link. This new development is unbeatable.





Sensors for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · DC PNP/NPN								
	M12 / L = 60	0.375...3.75 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	600	100	IF6123
	M12 / L = 60	0.7...7 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	600	100	IF6124
	M18 / L = 60	0.75...7.5 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	300	100	IG6615
	M18 / L = 60	1.3...13 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	300	100	IG6616
	M30 / L = 65	1.3...13 f	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	II5973
	M30 / L = 65	2.3...23 nf	Brass	10...30	IP 65 / IP 66 / IP 67 / IP 68 / IP 69K	100	100	II5974
	40 x 40 x 54	2.1...21 f	PA (polyamide)	10...30	IP 67	100	100	IM5172
	40 x 40 x 54	2.6...26 nf	PA (polyamide)	10...30	IP 67	100	100	IM5173

f = flush / nf = non flush / qf = quasi-flush

Accessories

Type	Description	Order no.
	Angle bracket · for type M30 · Housing materials: stainless steel	E10737
	Mounting clamp · Ø 30 mm · with end stop · For sensors with 45° chamfer · for type M30 · Housing materials: PC	E11996



Capacitive sensors



- Detection of metal and non-metal materials
- Easy setting of the switch point by pressing a pushbutton or turning a potentiometer
- Automatic detection of PNP or NPN output loads
- NO / NC selectable
- Clearly visible indication of the switching status



Capacitive sensors

Capacitive sensors are used for the non-contact detection of any objects as well as for level monitoring. In contrast to inductive sensors, which only detect metallic objects, capacitive sensors can also detect non-metallic materials.

Set-up

The user can set the sensitivity via potentiometer or teach button. For sensors with teach function the output function NO or NC as well as the switch point are set by pressing the two buttons. The automatic detection of a PNP or NPN load, the variable setting of the switching function and the fast connection via connector facilitate the set-up and reduce the number of different versions.

Application

Capacitive sensors which are optimised for media with a dielectric constant below 20 (DK < 20) monitor the levels of dry bulk material and liquids (e.g. oils, plastic granulates) – in pipes and in silos or through sight glasses.



Capacitive sensors guarantee the safe detection of liquids as well as non-metallic materials.

Sensors for industrial applications, DC

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function · 3-wire · DC PNP

	M12 / L = 60	4 f	High-grade st. steel	10...36	IP 65	50	100	KF5001
	M12 / L = 61	8 nf	High-grade st. steel	10...36	IP 65	50	100	KF5002

M12 connector · Output function / · 3-wire · DC PNP

	M30 / L = 90	8 f	High-grade st. steel	10...30	IP 65 / IP 67	10	100	KI5085
	M30 / L = 90	15 nf	High-grade st. steel	10...30	IP 65 / IP 67	10	100	KI5087

f = flush / nf = non flush / qf = quasi-flush

Sensors for the detection of conductive media through a wall, DC

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function / · 3-wire · DC PNP



	M18 / L = 87	8 nf	PBT	10...36	IP 65 / IP 67	10	200	KG5071
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f = flush / nf = non flush / qf = quasi-flush

Sensors for the detection of granulates for the plastics industry, DC

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function / · 3-wire · DC PNP

	M18 / L = 87	12 nf	PBT	10...36	IP 65 / IP 67	10	200	KG5066
	M30 / L = 90	20 nf	PBT	10...36	IP 65 / IP 67	10	200	KI5083

f = flush / nf = non flush / qf = quasi-flush



For industrial applications

Capacitive sensors with LED signal display



- Precise evaluation of the application by visualisation of the process value via IO-Link
- One sensor for many applications: PNP / NPN, NC / NO and time function selectable
- Better adjustment to difficult applications thanks to extended settings
- Unique display and operating concept via LED visualisation
- See and compensate switch point movement



Visualised switch point

The capacitive sensors stand out not only because of their excellent technical data but most of all with their new and unique visualisation concept. The LED display makes it much easier for the user to set the optimal switch point, which is in the centre of the display. The green LEDs either side of the switch point indicate the reliability of the switch point. Deposits, material changes etc. are displayed directly on the sensor and the user can readjust the switch point precisely as needed.

Easy diagnostic support

If help is needed with the effects of process changes this is much easier to explain and rectify with the clear switch-point visualisation.



IO-Link highlights:

- Current process value plus binary reading available
- NO or NC function with switch-on and switch-off delay
- Output response: One-point, window function adjustable
- Potentiometer can be activated or deactivated
- Counter for operating hours and switching operations



Capacitive sensors

Type	Dimensions [mm]	Sensing range [mm]	Material	U_b [V]	Protection	f [Hz]	I_{load} [mA]	Order no.
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 M12 connector · Output function  · DC PNP




	M30 / L = 92	25 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	40	200	KI6000
	M18 / L = 92.5	15 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	30	200	KG6000

 Cable 2 m · Output function  · DC PNP

	M30 / L = 92	25 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	40	200	KI6001
	M18 / L = 92.5	15 nf	PBT	10...30	IP 65 / IP 67 / IP 69K	30	200	KG6001

f = flush / nf = non flush / qf = quasi-flush

Accessories

Type	Description	Order no.
	IO-Link master with Profinet interface · I/O modules for use in the control cabinet · Screw terminal · Housing materials: housing: polyamide	AL1900
	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · Housing materials: housing: polyamide / socket: Brass nickel-plated	AL1100
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398



For industrial applications

Capacitive sensors for flush installation



- Easy adjustment by pressing a pushbutton
- Automatic detection of PNP or NPN output loads
- NO/NC selectable
- Clearly visible indication of the switching status
- Easy mounting via fixing straps



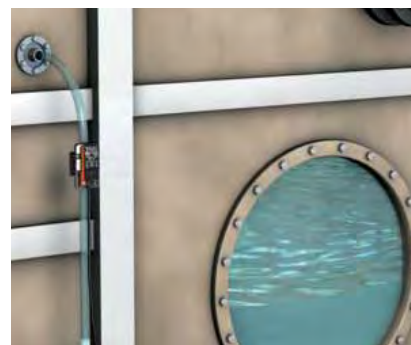
Application

Capacitive sensors detect bulk materials or liquids through non-metallic materials. The capacitive sensors of the KQ series can either be fixed on a flat surface or on tubes using mounting brackets and cable ties.

Using optional accessories the sensors can be integrated into a wide range of applications in a flexible and time-saving way.









Set-up

The new operating concept enables setting and adjustment of the output function by pressing just one pushbutton. The automatic detection of the load simplifies the connection to common controllers.





Easy mounting of the sensors to detect the desired level.

Sensors for the detection of conductive media through a wall


Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
Cable 2 m · Output function  · 3-wire · DC PNP/NPN								
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6001
Cable 2 m · Output function  · 3-wire · DC PNP								
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6002
Cable 0.04 m · with M8 connector · Output function  · 3-wire · DC PNP								
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6004
Cable 0.1 m · with M12 connector · Output function  · 3-wire · DC PNP								
	20 x 14 x 48	12 nf	PBT	10...30	IP 65 / IP 67	10	100	KQ6005

f = flush / nf = non flush / qf = quasi-flush

Accessories mounting components

Type	Description	Order no.
	Mounting adapter for free-standing mounting · for type KQ5, KQ6 · Housing materials: adapter: PBT / inserts: Brass / screw: steel galvanised	E12153
	Mounting adapter · Pipe and tube installation KQ5 / KQ6 with cable ties · Fixing of the types KQ5 and KQ6 to pipes and tubes · Housing materials: Mounting adapter: PA 12 black	E12163

Connectors

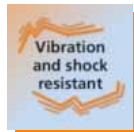
Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001



Capacitive touch sensors for installation on walls



- Non-contact switching, no pressure necessary, wear and tear-free
- Optical feedback by LEDs in case of switching
- Oil-resistant, protection rating IP 69K, impact and scratch resistant
- Easy wiring thanks to tried-and-tested 3-wire technology



Reliable operation

The capacitive measuring principle detects an approaching human hand.

Dynamic touch sensors suppress interference such as water, layers of ice or foreign bodies to a large extent. However, a gloved hand will still trigger them.

Static touch sensors detect hands and objects for as long as the sensing face is damped.

Touch sensors also work through glass. Compared to mechanical switches the sensors operate without wear. Since they react to contact, no pressure is required for activation. This means considerably increased ease of use.

The green LEDs can be controlled separately and for example be used to indicate the status of plant and machinery.

Mounting options

Three common M4 cylinder head bolts or tapping screws of 3.9 mm diameter are required to mount the sensor on a wall.





Activation of a process as long as the hand touches the sensor.


Dynamic capacitive touch sensors

Type	U _b [V]	I _{load} [mA]	Current consumption [mA]	Ambient temperature [°C]	Protection	Order no.
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Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP

	24	200	30	-40...85	IP 67 / IP 69K	KT5002
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Cable 2 m · Output function  · 3-wire · DC PNP


	24	200	30	-40...85	IP 67 / IP 69K	KT5001
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Static capacitive touch sensors

Type	U _b [V]	I _{load} [mA]	Current consumption [mA]	Ambient temperature [°C]	Protection	Order no.
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Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP

	24	200	30	-40...85	IP 67 / IP 69K	KT5006
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Cable 2 m · Output function  · 3-wire · DC PNP

	24	200	30	-40...85	IP 67 / IP 69K	KT5005
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Connectors

Type	Description	Order no.
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Socket M8, 4-pole, 4-wire

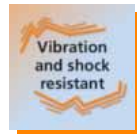
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC150
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC151
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC153
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC154



Illuminated capacitive touch sensor in metal M22 housing



- Compact and robust stainless steel housing
- High protection rating for the requirements of harsh industrial environments
- Use in applications with regular cleaning
- Dynamic principle to prevent tampering
- Easy installation in housings with a Ø 22.5 mm hole



Illuminated touch sensor in metal housing

Capacitive touch sensors can be used, for example, as a start and stop button on machines, as enable switches and for opening and closing gates. Compared to mechanical switches the sensors operate without wear. Dynamic touch sensors detect an approaching human hand and suppress interference such as water, layers of ice or foreign bodies to a large extent. However, a gloved hand will still trigger them. Static touch sensors detect hands and objects even through glass for as long as the sensing face is covered which provides, for example, protection against vandalism.


Sensors with the latching operating principle can be switched on by touching briefly and switched off again by touching briefly again. The housing with protection rating IP 69K is resistant to oils and also impact and scratch resistant. Powerful LEDs as optical feedback signal that the sensor has been activated. The green LEDs can be controlled separately and, for example, be used to indicate the status of plant and machinery.


The sensor can be installed in all housings with a Ø 22.5 mm hole.





Dynamic capacitive touch sensors

Type	U _b [V]	I _{load} [mA]	Current consumption [mA]	Ambient temperature [°C]	Protection	Order no.
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Cable 2 m · Output function  · DC PNP


	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5309
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Cable with connector 0.3 m · Output function  · DC PNP


	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5311
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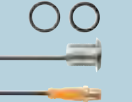
Static capacitive touch sensors


Type	U _b [V]	I _{load} [mA]	Current consumption [mA]	Ambient temperature [°C]	Protection	Order no.
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Cable 2 m · Output function  · DC PNP

	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5310
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Cable with connector 0.3 m · Output function  · DC PNP

	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5312
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Cable 2 m · Output function  · DC PNP

	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5320
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Capacitive touch sensors with latching evaluation principle

Type	U _b [V]	I _{load} [mA]	Current consumption [mA]	Ambient temperature [°C]	Protection	Order no.
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Cable 2 m · Output function  · DC PNP

	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5350
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Cable 0.3 m · Output function  · DC PNP

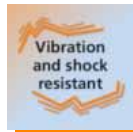
	24	200	30	-40...85	IP 65 / IP 67 / IP 69K	KT5351
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Magnetic sensors



- Long sensing ranges also through non-magnetisable metals
- No mutual interference of the sensors
- Temperature-stable and reproducible switch point
- Full-metal housing: Impact, shock and vibration-resistant



Demanding applications

Due to their operating principle, magnetic sensors can detect special targets (permanent magnets) through all non-magnetisable materials and thus be mounted behind covers made of stainless steel, non-ferrous metal, plastics, wood or glass which ensures inexpensive and fast mounting. There is no need for bore holes or flush installation.

Long sensing range

Magnetic sensors have a similar operating principle as inductive sensors. They detect damping magnets without contact. Due to this operating principle an extremely high sensing range can also be achieved with smaller types.

High switching frequency

ifm sensors reach a switching frequency of more than 5,000 Hz. This high switching frequency applies to the whole temperature range.

Mechanically demanding applications

Thanks to the tolerant response behaviour, reliable switch-point detection is also ensured with high mechanical tolerances.





Magnetic sensors provide long sensing ranges.


Sensors for industrial applications


Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M8 connector · Output function  · 3-wire · DC PNP

	28 x 10 x 16	60	PBT	10...30	IP 67	5000	200	MS5010
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Cable 2 m · Output function  · 3-wire · DC PNP


	28 x 10 x 16	60	PBT	10...30	IP 67	5000	200	MS5011
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M8 connector · Output function  · 3-wire · DC PNP

	M8 / L = 60	60	stainless steel (316L)	10...30	IP 67	5000	200	ME5010
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M12 connector · Output function  · 3-wire · DC PNP


	M12 / L = 60	60	High-grade st. steel	10...30	IP 65 / IP 67	5000	200	MFS210
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	M18 / L = 60	70	High-grade st. steel	10...30	IP 65 / IP 67	5000	200	MGS206
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Full metal sensors for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function  · 3-wire · DC PNP

	M12 / L = 60	60	High-grade st. steel	10...30	IP 65 / IP 67	5000	200	MFS211
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	M18 / L = 60	70	High-grade st. steel	10...30	IP 65 / IP 67	5000	200	MGS204
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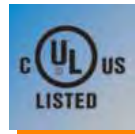


For industrial applications

Magnetically-coded sensors



- Activation from different directions aids installation
- Conceal behind stainless steel for enhanced tamper prevention
- Connect in series and still identify which door is open
- Meets the new interface description CB24I from ZVEI
- Meets highest safety level to ISO 13849-1 and SILCL 3 to IEC 62061



Non-contact door monitoring

Magnetic sensors allow monitoring of the door status without contact.

Can reach PL e to ISO 13849-1 and SILCL 3 to IEC 62061 when used with suitable evaluation units.

Easy connection

Various connection versions with cable, M8 connector (4-pin) and M12 connector (4-pin) provide a standardised connection.

With the UL and EAC approvals your machine can be operated worldwide without any concerns.

Easy installation

The standard designs in a small and large version ensure various applications even if there is only little space.



Magnetically coded sensors for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
Cable 2 m · Output function  /  · DC								
	36 x 13 x 26	5 nf	PA	24	IP 67 / IP 69K	150	50	MN200S
	88 x 13.1 x 25	8 nf	PA	24	IP 67 / IP 69K	150	50	MN500S
Cable 6 m · Output function  /  · DC								
	36 x 13 x 26	5 nf	PA	24	IP 67 / IP 69K	150	50	MN201S
	88 x 13.1 x 25	8 nf	PA	24	IP 67 / IP 69K	150	50	MN501S
M8 connector · Output function  /  · DC								
	36 x 13 x 26	5 nf	PA	24	IP 67 / IP 69K	150	50	MN202S
	88 x 13.1 x 25	8 nf	PA	24	IP 67 / IP 69K	150	50	MN502S
Cable with connector 0.1 m · Output function  /  · DC								
	36 x 13 x 26	5 nf	PA	24	IP 67 / IP 69K	150	50	MN203S
	88 x 13.1 x 25	8 nf	PA	24	IP 67 / IP 69K	150	50	MN503S
Cable 2 m · Output function 2 x NO, 1 x NC · DC								
	36 x 13 x 26	5 nf	PA	24	IP 67 / IP 69K	150	50	MN204S
	88 x 13.1 x 25	8 nf	PA	24	IP 67 / IP 69K	150	50	MN504S

f = flush / nf = non flush / qf = quasi-flush

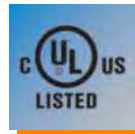


For industrial applications

Coded RFID sensors



- Unique actuator coding prevents tampering
- Connect up to 32 sensors in series with the safety integrity remaining at the same level
- Flashing LEDs monitor sensing area
- Programme the sensor as often as desired ensuring easy set-up
- Meets the new interface description CB24I from ZVEI



Preventive maintenance





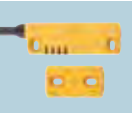
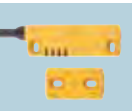
The sensors can display switch-off operation of the sensors directly using the LED display if the actuator slowly leaves the sensing range. This means that for example the door and the actuator can be ideally paired to each other and higher machine uptime is achieved. They meet the requirements ISO 13849-1 and IEC 62061. Even if 32 sensors are connected in series, the highest safety level is maintained.

Non-contact door monitoring

The non-contact RFID sensors allow reliable monitoring of the door status without any wear.





RFID-coded safety sensors

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function 2 x OSSD, 1 x PNP · DC PNP								
	72 x 18 x 25	12 nf	PA	20.4...26.4	IP 67 / IP 69K	1	50	MN700S
	72 x 18 x 25	12 nf	PA	20.4...26.4	IP 67 / IP 69K	1	50	MN701S
	72 x 18 x 25	12 nf	PA	20.4...26.4	IP 67 / IP 69K	1	50	MN702S
Cable 2 m · Output function 2 x OSSD, 1 x PNP · DC PNP								
	72 x 18 x 25	12 nf	PA	20.4...26.4	IP 67 / IP 69K	1	50	MN703S
	72 x 18 x 25	12 nf	PA	20.4...26.4	IP 67 / IP 69K	1	50	MN704S
	72 x 18 x 25	12 nf	PA	20.4...26.4	IP 67 / IP 69K	1	50	MN705S

f = flush / nf = non flush / qf = quasi-flush

Accessories

Type	Description	Order no.
	Spacer · for magnetic sensor MN2 · for mounting on ferromagnetic metal · Housing materials: PA	E1258S
	Magnetically coded target · for magnetic sensor MN2 · Housing materials: PA	E1101S

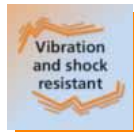


For industrial applications

T-slot cylinder sensors



- Self-locking fixture for quick mounting and easy adjustment
- Convenient: Easy fit 'drop from the top' into a T-slot
- Unit versions available with connection cable and M8 or M12 cable plug
- Moulded cable ensuring very good strain relief
- Ingress protection in all applications due to the high protection rating



Quick adjustment and easy mounting

The cylinder sensor can be easily inserted from above into the T-slot where it clicks home due to the innovative clamping mechanism. For easy switch point positioning the sensor can be moved in the slot until it is fixed definitely using the slotted / hexagonal socket screw.

Robust design and good fixing









Since the sensor is completely surrounded by the slot there is no room for mechanical damage. The fixing at the end of the sensor reduces leverage and provides better protection against inadvertent tear-out or switch point change.

Different versions for your application

The sensor is suited for the common T-slot cylinders. Tailor-made accessories enable mounting on different cylinder types such as trapezoidal slot, tie-rod, clean-line or integrated profile cylinders.



T-slot sensors for industrial applications

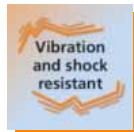
Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
Cable 0.3 m · with M12 connector · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	200	-25...85	MK5108
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5107
	25.3 x 5 x 6.5	PA (polyamide)	10...30	9	IP 65 / IP 67	100	-25...85	MK5214
Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5102
	25.3 x 5 x 6.5	PA (polyamide)	10...30	9	IP 65 / IP 67	100	-25...85	MK5215
Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	200	-25...85	MK5106
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5101
Cable 0.5 m · with M8 connector · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5121
Cable 1 m · with M12 connector · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5116
Cable 0.3 m · with M12 connector · Output function  · 2-wire · DC PNP/NPN								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	4000	IP 65 / IP 67	100	-25...85	MK5109



T-slot cylinder sensors for short-stroke cylinders



- Short travel distance for high-precision position detection
- Exact position detection thanks to a very small hysteresis of ≤ 1 mm
- Reliable detection of weak magnetic fields
- Convenient: Easy fit 'drop from the top' into a slot
- Only 25 mm length sensor for many cylinder sizes



AMR cell for the sensitive touch

The new cylinder sensors use an AMR sensing element. This operates to the magnetoresistive principle. The AMR cell has an extremely sensitive reaction to magnetic fields. So the sensors can be used wherever exact position detection and small hysteresis are important (e.g. short-stroke cylinders).

Robust design and good fixing






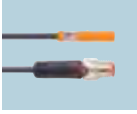


The sensor is immediately locked in the slot by its self-locking mechanism. The moulded cable and fixing point additionally provide incomparable strain relief.

Adapter for almost any cylinder profile





Thanks to the wide selection of adapter accessories the T-slot sensor can be fixed to almost every clean-line, tie rod, integrated profile or trapezoidal slot cylinder.



T-slot sensors for short-stroke cylinders

Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
Cable 2 m · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	6000	IP 65 / IP 67	100	-25...85	MK5140
Cable 0.3 m · with M12 connector · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	6000	IP 65 / IP 67	100	-25...85	MK5139
Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	6000	IP 65 / IP 67	100	-25...85	MK5159
Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP								
	25.3 x 5 x 6.5	PA (polyamide)	10...30	6000	IP 65 / IP 67	100	-25...85	MK5138

Adapters for trapezoidal slot cylinders

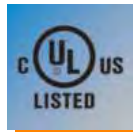
Type	Description	Order no.
	Adapter for trapezoidal slot cylinders · for types MKT (T-slot cylinder sensors) · Housing materials: aluminium alloy / set screw: stainless steel	E11796
	Adapter for tie rod / integrated profile cylinders · for types MKT (T-slot cylinder sensors) · Clamping range 5...11 mm · Housing materials: aluminium / screw: stainless steel	E11797
	Adapter for tie rod / integrated profile cylinders · for types MKT (T-slot cylinder sensors) · Clamping range 9...15 mm · Housing materials: aluminium / screw: stainless steel	E11799
	Fixing strap for clean-line cylinders · Piston diameter 16...20 mm · for type MKT · Housing materials: adapter: PA / Fixing strap: stainless steel	E11817
	Fixing strap for clean-line cylinders · Piston diameter 25...32 mm · for type MKT · Housing materials: adapter: PA / Fixing strap: stainless steel	E11818
	Fixing strap for clean-line cylinders · Piston diameter 40 mm · for type MKT · Housing materials: adapter: PA / Fixing strap: stainless steel	E11819



Cylinder sensors for C-slots



- Sensor for easy mounting in C-slots
- Robust fixing at the housing end for strong strain relief
- Connection and switching output variants for any application
- Electronic GMR measuring cell for a long sensor life
- Now also available as 2-wire version for PNP or NPN PLC's



Flush in the C-slot

The cylinder sensor can be used for the common C-slot such as for SMC. Its height of only 5 mm allows flush mounting. Especially this cylinder manufacturer requires slot-mounting and, often, 2-wire connection.

Long life


The sensors function without contact and almost without wear. Their life is much longer than that of the common reed contacts.


With the GMR cell (giant magneto resistive), the sensor detects the magnet on the piston through the aluminium wall of the cylinder. This saves expensive repair and downtimes.




C-slot sensors for industrial applications


Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
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Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 2-wire · DC PNP/NPN

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	4000	IP 65 / IP 67	100	-25...85	MK5362
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Cable 0.3 m · with M12 connector · Output function  · 2-wire · DC PNP/NPN

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	4000	IP 65 / IP 67	100	-25...85	MK5363
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Cable 2 m · Output function  · 2-wire · DC PNP/NPN

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	4000	IP 65 / IP 67	100	-25...85	MK5365
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Accessories for cylinder sensors

Type	Description	Order no.
	C-slot cylinder memorisation block · for types MKC (C-slot cylinder sensors) · Housing materials: PA / stainless steel	E12004
	Switched-mode power supply 24 V DC · 60 W power output · Primary switched mode · Output current 2.5 A, regulated · DC ok output · Housing materials: polycarbonate ABS	DN1031

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001
Socket M8, 3-pole, 3-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC141

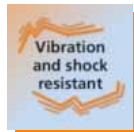


For industrial applications

Extremely short C-slot cylinder sensors



- Self-clamping fixture for easy adjustment and quick mounting
- Convenient: Easy fit 'drop from the top' into a C-slot
- Unit versions available with connection cable and cable plug
- Moulded cable ensuring very good strain relief
- Suitable for the most common C-slots



Quick adjustment and easy mounting

The cylinder switch is suited for small parallel grippers and short-stroke cylinders with C-slot. Due to the height of only 5 mm it can be flush-mounted in the most common C-slots from above and is largely protected against damage.

A 17.5 mm short version is available for miniature grippers. The sensor is inserted into the slot where it is held in position by a clamping mechanism. The moulded cable at the end of the cylinder switch provides excellent strain relief.

Long life


Non-contact sensors virtually work without wear and often achieve a longer life than Reed switches. This saves expensive repair and downtimes.





Safe detection of the end positions even for short cylinders.


Non flush C-slot sensors for industrial applications

Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
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Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP

	17.5 x 2.8 x 7.7	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5301
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Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP


	17.5 x 2.8 x 7.7	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5302
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Flush C-slot sensors for industrial applications

Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
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Cable 2 m · Output function  · 3-wire · DC PNP

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5312
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Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5310
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Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5311
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Cable 0.3 m · with M12 connector · Output function  · 3-wire · DC PNP

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	10000	IP 65 / IP 67	100	-25...85	MK5314
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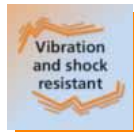


For industrial applications

C-slot cylinder sensors for short-stroke cylinders



- Precise switch point detection because of the very small hysteresis of ≤ 1 mm
- Short travel distance of ≤ 5 mm for high-precision position detection
- Reliable detection of weak magnetic fields
- Convenient: Easy fit 'drop from the top' into a slot
- Available as 25.8 mm flat, flush or 17.5 mm short housing



AMR cell for the sensitive touch

The new C-slot cylinder sensors use now an AMR sensing element. This operates to the magnetoresistive principle. The AMR element reacts extremely sensitively to changes of magnetic fields. This results in accurate switch point detection, which is in particular important for short-stroke cylinders.

Robust design and good fixing

The sensor is immediately locked in the C-slot by its self-locking mechanism. The moulded cable and fixing point additionally provide incomparable strain relief.

Two tried-and-tested housings


The user can choose between a 17.5 mm short, non flush housing and a 25.8 mm flat, flush housing.




Exact switch point detection on short-stroke cylinders


C-slot sensors for short-stroke cylinders


Type	Dimensions [mm]	Material	U _b [V]	f [Hz]	Protection	I _{load} [mA]	T _a [°C]	Order no.
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Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP

	17.5 x 2.8 x 7.7	PA (polyamide)	10...30	5000	IP 65 / IP 67	100	-25...85	MK5330
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Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP

	17.5 x 2.8 x 7.7	PA (polyamide)	10...30	5000	IP 65 / IP 67	100	-25...85	MK5331
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Cable 0.3 m · with M8 connector (snap-fit) · Output function  · 3-wire · DC PNP

	26.1 x 2.8 x 5.5	PA (polyamide)	10...30	5000	IP 65 / IP 67	100	-25...85	MK5326
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Cable 0.3 m · with M8 connector · Output function  · 3-wire · DC PNP

	25.8 x 2.8 x 5	PA (polyamide)	10...30	5000	IP 65 / IP 67	100	-25...85	MK5328
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Adapters

Type	Description	Order no.
	T-slot adapter for C-slot sensor · for types MKC (C-slot cylinder sensor) for installation in T-slot cylinders · (height 7.7 mm) · Housing materials: diecast zinc / fixing element: stainless steel	E11914
	T-slot adapter for C-slot sensor · for types MKC (C-slot cylinder sensor) for installation in T-slot cylinders · (height 5 mm) · Housing materials: diecast zinc / fixing element: stainless steel	E11928

Connectors

Type	Description	Order no.
splitter box M8, 3-pole, LED		
	Splitter box · 8 way · Gold-plated contacts · Cable · 2 m · Housing materials: PBT-GF 20 / Brass nickel-plated	EBC070
	Splitter box · 8 way · Gold-plated contacts · Cable · 5 m · Housing materials: PBT-GF 20 / Brass nickel-plated	EBC054

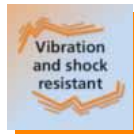
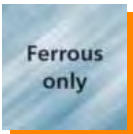


For industrial applications

Robust position sensors with active metal face



- Extremely pressure resistant with over 10 million pressure cycles
- Best value performer
- Complementary output provides higher operational reliability
- Standard M12 housing with ingress-resistant cable entry
- Short housing (40 mm) for extremely low-profile cylinders



Function principle

The new MFH series sensor is suited for flush mounting in various steels. With its 1.8 mm sensing range it shows reliable switching characteristics. The new operating principle of this unit is based on a magnetic-inductive technology that detects only ferromagnetic metals (e.g. steel). It is sealed by means of an O-ring and a supporting ring towards the pressure area.


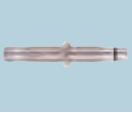











Applications

Besides use in hydraulic cylinders, the sensor is also ideal for other hydraulic components such as valves or pumps. MFH operates reliably for the lifetime of the cylinder. Furthermore, it is used in mechanical engineering processes, e.g. in plastic injection-moulding or process industry applications.

Its attractive price means the sensor can also be considered for simple components where this option used to be too expensive.



Full-metal sensors for high-pressure resistant applications on hydraulic cylinders and valves

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
M12 connector · Output function  · DC PNP								
	M12 / L = 93	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	MFH200
	M12 / L = 60	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	MFH202
M12 connector · Output function  · DC PNP								
	M12 / L = 60	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	MFH204
Cable 2 m · Output function  · DC PNP								
	M12 / L = 41	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	MFH205
Cable 2 m · Output function  · DC PNP								
	M12 / L = 41	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	MFH207
Cable 2 m · Output function normally open / closed · DC PNP								
	M12 / L = 41	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	MFH208
M12 connector · Output function normally open / closed · DC PNP								
	M12 / L = 60	1.8 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	100	MFH209
M12 connector · Output function  · DC PNP								
	M14 / L = 53	2 f	High-grade st. steel	10...36	IP 65 / IP 68 / IP 69K	1000	200	M9H200

f = flush / nf = non flush / qf = quasi-flush



Ultrasonic sensors in stainless steel housing



- Robust high-grade stainless steel housing for demanding applications
- Sensing range up to 1.2 m in M18 cube design and 2.2 m in M18 design
- The vibrating sound transducer reduces the deposit of dirt
- Retro-reflective operation for orientation-independent object detection
- Easy setting via teach button, wire teach or IO-Link



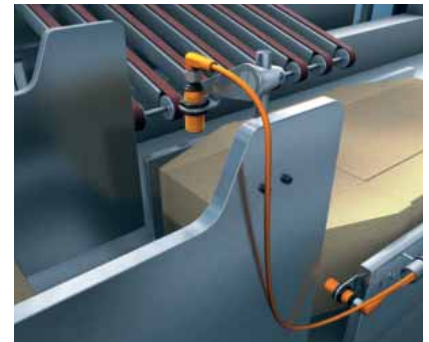
The alternative for difficult surfaces

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. Blister packages in packaging technology or transparent plastic bowls in the food industry, for example, can be reliably detected.

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.








Ultrasonic diffuse-reflection sensor with stainless steel housing

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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M12 connector · Output function 2 x normally open / closed programmable · 3-wire · DC PNP

	M18 / L = 97.5	1600	stainless steel 316L / 1.4404	10...30	IP 67	3	100	UGT509
	M18 / L = 97.5	2200	stainless steel 316L / 1.4404	10...30	IP 67	2	100	UGT512



M12 connector · Output function 1 x NO / NC programmable + 1 x current output · 3-wire · DC PNP

	M18 / L = 97.5	1600	stainless steel 316L / 1.4404	10...30	IP 67	3	100	UGT510
	M18 / L = 97.5	2200	stainless steel 316L / 1.4404	10...30	IP 67	2	100	UGT513
	53 x 20 x 37.7	300	stainless steel (17-4 PH/1.4542)	10...30	IP 67	8	100	UGT580
	53 x 20 x 37.7	800	stainless steel (17-4 PH/1.4542)	10...30	IP 67	5	100	UGT582
	53 x 20 x 37.7	1200	stainless steel (17-4 PH/1.4542)	10...30	IP 67	5	100	UGT584

Ultrasonic retro-reflective sensor

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f [Hz]	I _{load} [mA]	Order no.
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 M12 connector · Output function  /  · 3-wire · DC PNP

	M18 / L = 97.5	1600	stainless steel 316L / 1.4404	10...30	IP 67	2	100	UGR500
	M18 / L = 97.5	2200	stainless steel 316L / 1.4404	10...30	IP 67	2	100	UGR501

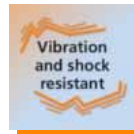


For industrial applications

Photoelectric M12 sensors – robust and universal



- Available as through-beam, retro-reflective and diffuse reflection sensor
- Metal housing for robust applications
- Adjustable ranges
- LED display to check operation, switching status and function
- Wide range of system components for easy and secure mounting



Photocell in M12 housing

The robust metal housing as well as the common M12 threaded design also allow use in a rough industrial environment. In addition, the M12 photocell features easy fixing, alignment and handling.

Function check output

In case of a short-circuit of the switching output, faulty object detection (maladjustment, soiling of the lenses) or an internal failure, the function check output is set. The LEDs on the sensor indicate the type of failure.





Setting sensitivity

The setting sensitivity allows easy and precise adjustment using the potentiometer.








Safe detection of transported parts on a conveyor belt.

Cylindrical OF housing (M12) BasicLine

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M12 connector · 10...36 DC · metal · IP65						
	Diffuse reflection sensor	1...200 mm	Infrared	92	H/D PNP	OF5012
	Diffuse reflection sensor	1...400 mm	Infrared	185	H/D PNP	OF5027
Retro-reflective sensor · M12 connector · 10...36 DC · metal · IP65						
	Retro-reflective sensor	0.05...1.5 m	Infrared	140	H/D PNP	OF5016
	Polarisation filter	0.2...0.8 m	Red	70	H/D PNP	OF5025
Through-beam sensor · M12 connector · 10...36 DC · metal · IP65						
	Transmitter	4 m	Infrared	700	–	OF5021
	Receiver	4 m	Infrared	–	H/D PNP	OF5022

Prismatic reflectors, reflective tape and fixing components

Type	Description	Order no.
	Prismatic reflector · Ø 80 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20005
	Prismatic reflector · 45 x 28 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20452
	Mounting set · Ø 12.2 mm · Clamp mounting · free-standing M8 · for type OF, IF · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20860
	Mounting set · Ø 12.2 mm · Clamp mounting · free-standing M8 · for type OF, IF · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20856
	clamp · Ø 14 mm; M12 · free-standing M12 · Housing materials: clamp: diecast zinc	E20796

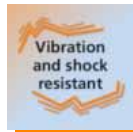


For industrial applications

Photoelectric M18 sensors – robust and universal



- Long ranges
- Robust high-grade stainless steel housing for harsh environments
- Available as through-beam, retro-reflective and diffuse reflection sensor
- Diffuse reflection sensor with adjustable background suppression
- Universal mounting using system components and mounting accessories

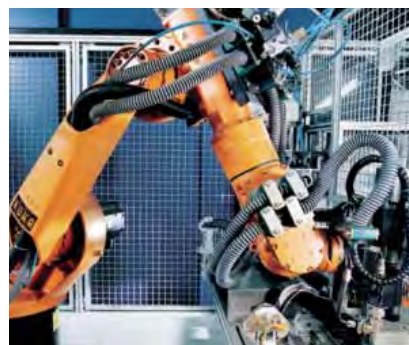


All-round photocell

High-quality technology, extraordinary features and an outstanding price / performance ratio make this sensor suitable for almost all industrial areas. The robust high-grade stainless steel housing and the common M18 threaded type also allow use in a rough industrial environment.




Variants

For use in standard applications through-beam and retro-reflective sensors with polarisation filter without setting options are available. The diffuse reflection sensors with background suppression can be easily and precisely adapted to your application using the potentiometer.



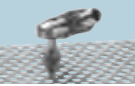




A safe solution in every application.

Cylindrical housing OG (M18) BasicLine

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65						
	Diffuse reflection sensor	2...600 mm	Red	50	H PNP	OGT200
	Background suppression	15...250 mm	Red	21	H PNP	OGH200
Retro-reflective sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67						
	Polarisation filter	0.03...4 m	Red	160	D PNP	OGP200
	Polarisation filter	0.03...4 m	Red	160	H PNP	OGP201
Through-beam sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67						
	Transmitter	20 m	Red	800	–	OGS200
	Receiver	20 m	Red	–	D PNP	OGE200
	Receiver	20 m	Red	–	H PNP	OGE201

Prismatic reflectors, reflective tape and fixing components

Type	Description	Order no.
	Prismatic reflector · Ø 80 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20005
	Prismatic reflector · 45 x 28 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20452
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20718
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20719
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20720

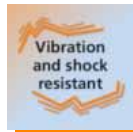


For industrial applications

High-performance M18 photocell



- Extremely long ranges
- Robust high-grade stainless steel housing for harsh environments
- Available as through-beam, retro-reflective and diffuse reflection sensor
- Teach mode for simple and precise adjustment to the application
- Universal mounting using system components and mounting accessories



High-performance photocell

High-quality technology, extraordinary features and an outstanding price / performance ratio make this sensor suitable for all industrial areas. The extremely long ranges allow use in many applications.








Highest precision and simple handling

The innovative teach mode allows optimum setting of the sensors in no time. This is high-tech for the high demands of industry on robustness and precision – implemented in a user-friendly and low-cost version with excellent performance.


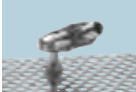



Individual setting depending on the application requirements.

Cylindrical housing OG (M18) PerformanceLine

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP67						
	Diffuse reflection sensor	2...800 mm	Red	66	H/D PNP	OGT500
	Background suppression	15...300 mm	Red	25	H/D PNP	OGH500
Diffuse reflection sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67						
	Background suppression	15...300 mm	Red	25	H/D NPN	OGH502
Retro-reflective sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP67						
	Polarisation filter	0.03...5 m	Red	200	H/D PNP	OGP500
Retro-reflective sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67						
	Polarisation filter	0.03...5 m	Red	200	H/D PNP	OGP501
	Polarisation filter	0.03...5 m	Red	200	H/D NPN	OGP503
Through-beam sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP67						
	Transmitter	25 m	Red	1000	–	OGS500
	Receiver	25 m	Red	–	H/D PNP	OGE500
Through-beam sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67						
	Receiver	25 m	Red	–	H/D PNP	OGE501

Prismatic reflectors, reflective tape and fixing components

Type	Description	Order no.
	Prismatic reflector · Ø 80 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20005
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20718
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20719

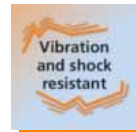


For industrial applications

Photoelectric sensor in metal housing with M18 thread



- Small, compact and robust: a high performance sensor
- Excellent quality at an attractive price
- Through-beam and retro-reflective sensors and diffuse reflection sensors with background suppression
- Easy teach mode for fast set-up
- Universal mounting and large selection of fixing accessories



New design: OG-Cube

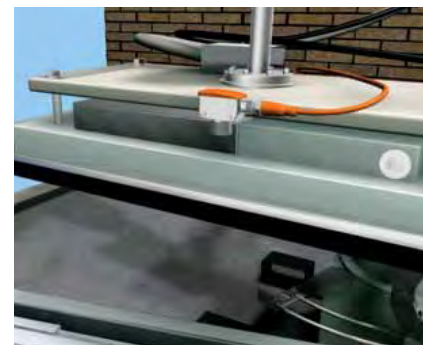
This sensor was developed for use in harsh industrial environments. The tried-and-tested technology of the well-known OG series is now integrated in a stable, rectangular metal housing.

Long ranges, small design

The photoelectric sensors are distinguished by long ranges of 4 m for retro-reflective sensors and 200 mm for diffuse reflection sensors. Together with the small housing design both features provide more flexibility for the construction of plant and machinery.


Time-savings during installation and set-up

The teach mode and the extensive range of fixing components ensure fast and cost-saving installation.



Compact design for applications in harsh environments.

Rectangular housing OG (M18)

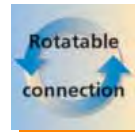
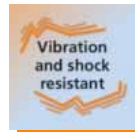
Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M12 connector · 10...30 DC · metal · IP67						
	Background suppression	100 mm	Red	7	H PNP	OGH280
	Background suppression	200 mm	Red	13	H PNP	OGH281
	Background suppression	15...200 mm	Red	13	H/D PNP	OGH580
Retro-reflective sensor · M12 connector · 10...30 DC · metal · IP65 / IP67						
	Polarisation filter	0.1...4 m	Red	160	D PNP	OGP280
Retro-reflective sensor · M12 connector · 10...30 DC · metal · IP67						
	Polarisation filter	0.1...4 m	Red	160	H PNP	OGP281
Through-beam sensor · M12 connector · 10...30 DC · metal · IP67						
	Transmitter	20 m	Red	800	–	OGS280
	Receiver	20 m	Red	–	D PNP	OGE280
	Receiver	20 m	Red	–	H PNP	OGE281
	Receiver	20 m	Red	–	D NPN	OGE282



O5 photocells for conveying



- Extremely long ranges
- Reliable background suppression
- Easy setting of "ON" and "OFF" state by pushbuttons
- Versions with fixed setting or with potentiometer available
- Universal mounting using system components and mounting accessories



All-round photocell

High-quality technology, extraordinary features and an outstanding price / performance ratio allow use of this sensor in almost all industrial areas. Easy installation is ensured by a clever mounting concept, with special fixtures as well as an adapter plate. The plug can be rotated by 270° so that it can be aligned in any direction.

Versions without setting options

For use in standard applications.

Versions with potentiometer




For easy setting and simple applications.

Versions with teach function









This innovative setting method makes complicated programming unnecessary. The unit features one button each for setting a precise on and off state.



Rectangular housing O5 PerformanceLine

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M12 connector · 10...36 DC · plastics · IP67						
	Background suppression	50...1800 mm	Red	50	H/D PNP	O5H500
Retro-reflective sensor · M12 connector · 10...36 DC · plastics · IP67						
	Polarisation filter	0.075...10 m	Red	250	H/D PNP	O5P500
Through-beam sensor · M12 connector · 10...36 DC · plastics · IP67						
	Transmitter	25 m	Red	625	–	O5S500
	Receiver	25 m	Red	–	H/D PNP	O5E500

Prismatic reflectors, reflective tape and fixing components

Type	Description	Order no.
	Prismatic reflector · Ø 35 mm · round · fixing by screw · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20954
	Prismatic reflector · Ø 80 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20005
	Prismatic reflector · 45 x 28 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20452
	Reflective tape · TS-02 · 50 x 1000 mm · For red light and infrared light retro-reflective sensors · Housing materials: plastics / acrylic	E21015
	Mounting set · Clamp mounting · With protective cover · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21084
	Mounting set · Clamp mounting · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21083
	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21087
	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21085



For industrial applications

Photoelectric O6 sensors for coolant applications



- Long life due to resistant materials
- Diffuse reflection sensor with reliable background suppression
- Range is independent of the object colour
- Design with 4-pole M8 connector
- Stainless steel housing with protection rating IP 68 / IP 69K



IP 67
IP 68
IP 69 K

High-grade stainless steel

Visible red light

The optimum choice in metalworking

The new high-performance O6 coolant sensors are especially suited for applications in metal working. Other applications are conveyor technology and the automotive industry.

The potentiometers are fitted with a double seal. The front pane is embedded flush. Viton which is proven in demanding applications was chosen as the sealing material. The transparent black housing cover ensures that, even in bright lighting conditions, the LEDs are highly visible.





Best optical performance

The diffuse reflection sensors provide reliable background suppression, even in cases of highly reflective backgrounds and objects like the oily and greasy metal surfaces of the parts to be worked. The sensing range is independent of the type and colour of the object to be detected.








The new O6 coolant reliably performs its duty in applications with coolants / oils.



Rectangular O6 design for oils and coolants

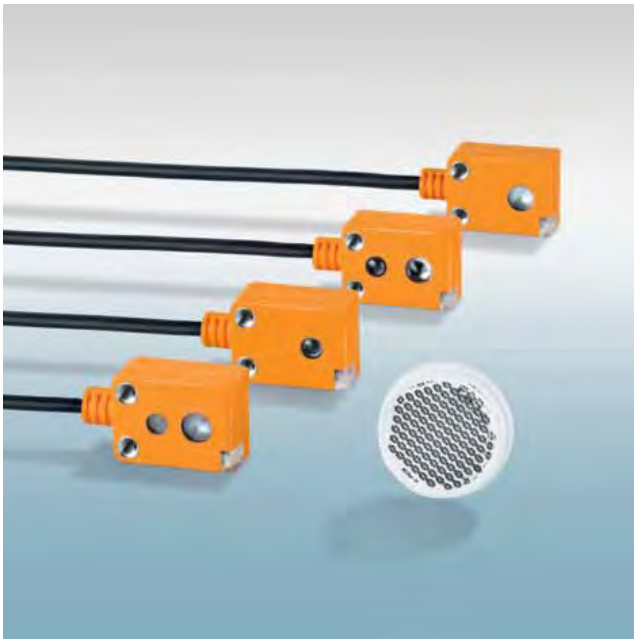
Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M8 connector · 10...30 DC · high-grade stainless steel · IP65 / IP67 ; IP68						
	Background suppression	2...200 mm	Red	8	H/D PNP	O6H400
	Diffuse reflection sensor	5...500 mm	Red	15	H/D PNP	O6T400
Retro-reflective sensor · M8 connector · 10...30 DC · high-grade stainless steel · IP65 / IP67 ; IP68						
	Polarisation filter	0.05...5 m	Red	150	H/D PNP	O6P400
Through-beam sensor · M8 connector · 10...30 DC · high-grade stainless steel · IP65 / IP67 ; IP68						
	Transmitter	10 m	Red	300	–	O6S400
	Receiver	10 m	Red	–	H/D PNP	O6E400

Accessories for O6 design

Type	Description	Order no.
	Mounting set · O6 · Clamp mounting · rod mounting Ø 10 mm · for type O6 · Housing materials: stainless steel 316Ti / 1.4571	E21272
	Mounting set · O6 · Clamp mounting · rod mounting Ø 12 mm · for type O6 · Housing materials: stainless steel 316Ti / 1.4571	E21275
	Angle bracket · O6 · for type O6 · Housing materials: stainless steel 316Ti / 1.4571	E21271
	Protective cover · O6 · for type O6 · Housing materials: stainless steel 316Ti / 1.4571	E21273
	Mounting rod · Ø 10 / M8 · Length: 150 mm · straight · Housing materials: stainless steel 316Ti / 1.4571	E21081
	Mounting rod · Ø 12 / M10 · Length: 130 mm · straight · Housing materials: stainless steel 316Ti / 1.4571	E20938
	Prismatic reflector · Ø 50 mm · round · fixing by screw · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20956
	Prismatic reflector · 48 x 48 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: front plate: PMMA / base: ABS	E20744



O7 – small powerful photoelectric sensors



- Ideal for position detection in feeding and handling
- Through-beam, retro-reflective and diffuse reflection sensors with fixed setting
- Visible red light for an easy alignment
- Diffuse reflection sensor with precise background suppression
- Small light spot for detecting small objects



Applications

Whenever there is little space for sensors or when small parts are to be detected, the small photoelectric sensors of the O7 series are the ideal problem solvers. Typical applications are feeding and handling technology.

Advantages

The small light spot and the narrow light cone enable the detection of small objects even over long distances. With their fixed setting, the sensors are ready for operation immediately after installation (plug & play). Diffuse reflection sensors with background suppression with 30, 50 or 100 mm range are available. Visible red light allows fast and simple alignment.




Rectangular housing O7 BasicLine

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
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Diffuse reflection sensor · Cable 0.2 m · with M8 connector · 10...30 DC · plastics · IP65

	Background suppression	5...30 mm	Red	2.5	H PNP	O7H200
	Background suppression	5...50 mm	Red	2.5	H PNP	O7H202
	Background suppression	3...100 mm	Red	7	H PNP	O7H204



Retro-reflective sensor · Cable 0.2 m · with M8 connector · 10...30 DC · plastics · IP65

	Polarisation filter	0.03...1 m	Red	55	D PNP	O7P200
	Polarisation filter	0.03...1 m	Red	55	H PNP	O7P201

Through-beam sensor · Cable 0.2 m · with M8 connector · 10...30 DC · plastics · IP65

	Transmitter	0...1.5 m	Red	90	–	O7S200
	Receiver	0...1.5 m	Red	–	D PNP	O7E200
	Receiver	0...1.5 m	Red	–	H PNP	O7E201



Prismatic reflectors, reflective tape and fixing components

Type	Description	Order no.
	Prismatic reflector · 48 x 48 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: front plate: PMMA / base: ABS	E20744
	Mounting set · O7 · Clamp mounting · rod mounting Ø 10 mm · Housing materials: fixture: stainless steel / clamp: stainless steel / screw: stainless steel / nut: stainless steel	E21237

Connectors

Type	Description	Order no.
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Socket M8, 3-pole, 3-wire

	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC142
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC145



For industrial applications

OJ – photoelectric sensors for assembly and handling technology



- Ideal for position detection in feeding and handling
- Through-beam and retro-reflective sensors with adjustable range
- Visible red light facilitates alignment during mounting
- High switching frequency for fast processes
- Mounting via snap-in technology or fixing holes



Applications

Whenever there is little space for sensors or when small parts are to be detected, the small photoelectric sensors of the OJ series are the ideal problem solvers. Typical applications are assembly and handling technology.

Quick and easy mounting

The OJ50xx series is mounted using the innovative snap-in technology. The sensor is pushed into the guides of the fixture until the spring clicks home.




The units of the OJ51xx series have two fixing holes on the side for mounting. It allows quick mounting of the sensor by means of fixing holes reinforced with stainless steel sleeves, without requiring additional accessories.

Visible red light




All sensors operate with visible red light which considerably facilitates alignment during installation and set-up.



Rectangular housing OJ PerformanceLine, lateral sensing face

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Through-beam sensor · M8 connector · 10...30 DC · plastics · IP67						
	Transmitter	10 m	Red	1000	–	OJ5030
	Receiver	10 m	Red	–	H/D PNP	OJ5031
	Transmitter	10 m	Red	1000	–	OJ5130
	Receiver	10 m	Red	–	H/D PNP	OJ5131
Retro-reflective sensor · M8 connector · 10...30 DC · plastics · IP67						
	Polarisation filter	0...2 m	Red	64	H/D PNP	OJ5026
	Polarisation filter	0...2 m	Red	64	H/D PNP	OJ5126

Rectangular housing OJ PerformanceLine, front sensing face

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Through-beam sensor · M8 connector · 10...30 DC · plastics · IP67						
	Transmitter	10 m	Red	1000	–	OJ5008
	Receiver	10 m	Red	–	H/D PNP	OJ5009
	Transmitter	10 m	Red	1000	–	OJ5108
	Receiver	10 m	Red	–	H/D PNP	OJ5109
Retro-reflective sensor · M8 connector · 10...30 DC · plastics · IP67						
	Polarisation filter	0...2 m	Red	64	H/D PNP	OJ5004
	Polarisation filter	0...2 m	Red	64	H/D PNP	OJ5104

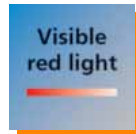


For industrial applications

OJ diffuse reflection sensor with background suppression



- Ideal for position detection in feeding and handling
- Precise background suppression for a reliable function
- Visible red light facilitates alignment during mounting
- High switching frequency for fast processes
- Mounting via snap-in technology or fixing holes



Background suppression

With electronic background suppression the sensors can be set to ensure precise and safe detection of objects with various surfaces independently of any background.

Quick and easy mounting

The OJ50xx series is mounted using the innovative snap-in technology. The sensor is pushed into the guides of the fixture until the spring clicks home.

The units of the OJ51xx series have two fixing holes on the side for mounting. It allows quick mounting of the sensor by means of fixing holes reinforced with stainless steel sleeves, without requiring additional accessories.




Visible red light

All sensors operate with visible red light which considerably facilitates alignment during installation and set-up.






Flexible and easy setting of the detection zone.



Rectangular housing OJ PerformanceLine, lateral sensing face

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M8 connector · 10...30 DC · plastics · IP67						
	Diffuse reflection sensor	1...600 mm	Red	60	H/D PNP	OJ5022
	Diffuse reflection sensor	1...1000 mm	Infrared	150	H/D PNP	OJ5071
	Background suppression	15...400 mm	Red	< 18	H/D PNP	OJ5048
	Diffuse reflection sensor	1...600 mm	Red	60	H/D PNP	OJ5122
	Background suppression	100 mm	Red	< 13	H PNP	OJH200
	Background suppression	15...400 mm	Red	< 18	H/D PNP	OJ5148

Rectangular housing OJ PerformanceLine, front sensing face

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M8 connector · 10...30 DC · plastics · IP67						
	Diffuse reflection sensor	1...600 mm	Red	60	H/D PNP	OJ5000
	Diffuse reflection sensor	1...1000 mm	Infrared	150	H/D PNP	OJ5070
	Background suppression	15...400 mm	Red	< 18	H/D PNP	OJ5044
	Diffuse reflection sensor	1...600 mm	Red	60	H/D PNP	OJ5100
	Background suppression	15...400 mm	Red	< 18	H/D PNP	OJ5144

Accessories OJ housing

Type	Description	Order no.
	Mounting set · OJ · for side lens · Clamp mounting · free-standing M8 · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20968
	Swivel-mount clip · for type OJ · Housing materials: diecast zinc	E20974
	Angle bracket · for type OJ · Housing materials: high-grade stainless steel	E20984



For industrial applications

Robust photoelectric fork sensors with high switching frequency



- Metal housing reduces distortion
- Quick set-up, transmitter and receiver setting not necessary
- Easy sensitivity setting via potentiometer
- Light-on / dark-on mode selectable via rotary switch
- Fine and precise light beam across the whole fork width









Optical sensors in new designs

The new ifm units with robust metal housing resist distortion compared to conventional plastic forks. Compared to through-beam sensors, their advantage is that the time-consuming alignment of transmitter and receiver is not necessary. These optical sensors are used in particular for part monitoring in feeder and handling systems. Further application examples are belt edge or double feed monitoring with the exact sensitivity setting via potentiometer being very helpful. The fine light beam with its constant small diameter is also ideal for monitoring shaft imbalance.







Precise detection of screws in feeder systems.

Optical fork sensors

Type	Fork width (w) [mm]	Fork depth (d) [mm]	Smallest detectable object Ø [mm]	Switching frequency [Hz]	Output H = light-on D = dark-on	U _b [V]	Order no.
Optical fork sensor · M8 connector · 10...35 DC · metal · IP67							
	10	17	0.3	10000	H/D PNP/NPN	10...35	OPU200
	20	25	0.4	4000	H/D PNP	10...35	OPU201
	30	35	0.5	4000	H/D PNP	10...35	OPU202
	50	55	0.5	4000	H/D PNP	10...35	OPU203
	80	55	0.5	4000	H/D PNP	10...35	OPU204
	120	60	0.8	2000	H/D PNP	10...35	OPU205

Connectors

Type	Description	Order no.
Socket M8, 3-pole, 3-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC141
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC142
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC144
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC145



For industrial applications

M18 laser sensors for highest precision for small objects



- Reliable detection even of tiny objects up to 1.5 mm
- Quality and precision at an unbeatable price
- Visible laser light spot for a simple sensor alignment
- Setting process saves time and cost during set-up
- Precise background suppression for a reliable function



Highly precise laser sensors

Even tiny objects are reliably detected thanks to the laser technology. The sensor set-up is very user-friendly: the visible laser spot and the new teach method enable optimum sensor setting in no time. Using the new OG type laser sensors price is no longer an issue.

Variants

This series covers powerful through-beam systems, retro-reflective sensors with polarisation filter and diffuse reflection sensors with background suppression for demanding applications frequently found in assembly and handling technology. All sensors have a robust stainless steel housing.



The precise laser beam allows the detection of objects even through tiny openings.


Cylindrical OG housing (M18) Laser PerformanceLine, laser class 1

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
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Diffuse reflection sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67

	Background suppression	20...200 mm	Red	1.2	H/D PNP	OGH700
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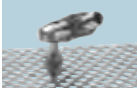

Retro-reflective sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67

	Polarisation filter	0.2...15 m	Red	78	H/D PNP	OGP700
	Polarisation filter	0.2...2 m	Red	5	H/D PNP	OGP701

Through-beam sensor · M12 connector · 10...36 DC · high-grade stainless steel · IP65 / IP67

	Transmitter	60 m	Red	312	–	OGS700
	Transmitter	2 m	Red	5	–	OGS701
	Receiver	60 m	Red	–	H/D PNP	OGE700
	Receiver	2 m	Red	–	H/D PNP	OGE701

Accessories

Type	Description	Order no.
	Prismatic reflector · 48 x 48 mm · rectangular · for retro-reflective laser sensors and glass and film detection · Housing materials: plastics	E20722
	Prismatic reflector · 30 x 20 mm · rectangular · for retro-reflective laser sensors · Housing materials: front plate: PMMA / base: ABS	E20994
	Prismatic reflector · Ø 10 mm · round · fixing by screw · M3 · for retro-reflective laser sensors · Housing materials: screw: stainless steel 316 / 1.4401 / spring washer: stainless steel 316 / 1.4401 / nut: stainless steel 316 / 1.4401 / front plate: PMMA / base: ABS	E20990
	Prismatic reflector · Ø 19 mm · round · fixing by screw · M3 · for retro-reflective laser sensors · Housing materials: screw: stainless steel 316 / 1.4401 / spring washer: stainless steel 316 / 1.4401 / nut: stainless steel 316 / 1.4401 / front plate: PMMA / base: ABS	E20993
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20718
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20719



For industrial applications

OGD photoelectric sensors with time of flight technology



- Small design with M18 thread and time of flight technology
- Two versions: “Long Range” or “Precision”
- Provision of the distance value via IO-Link and 2-colour display
- Comfortable setting via 3 pushbuttons or parameter setting via IO-Link



“Long Range” PMD distance sensor

The OGD Long Range precisely measures the distance to the object via laser light and time of flight technology for distances up to 1,500 mm.

The class 1 laser sensor performs better than conventional red light sensors even in very demanding circumstances e.g. in detecting shiny metallic surfaces reliably. The excellent reflection resistance and background suppression, together with a high excess gain, enable reliable operation.

“Precision” version

This OGD version is characterised by a 300 mm range and a small light spot diameter. The distance information allows to verify the presence or the correct installation of small parts, e.g. whether an O-ring has been installed.



Precise distance detection using time of flight measurement.

Rectangular housing OG (M18)

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output	Order no.
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M12 connector, 5 poles · 10...30 DC · metal · IP65 / IP67

	Photoelectric distance sensor	0.025...0.3 m	Red	< 1 x 1	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP	OGD592
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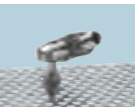





Rectangular housing OG (M18)

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output	Order no.
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M12 connector, 5 poles · 10...30 DC · metal · IP65 / IP67

	Photoelectric distance sensor	0.025...1.5 m	Red	< 5 x 5	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP	OGD580
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Accessories

Type	Description	Order no.
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20718
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: stainless steel	E20870
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · Housing materials: housing: polyamide / socket: Brass nickel-plated	AL1100
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



OJ – photoelectric laser sensors for assembly and handling technology



- High precision: Even tiny objects up to 0.8 mm can be detected reliably
- High switching frequency up to 2000 Hz for fast processes
- Front or side lens with various fixing options
- Mounting via snap-in technology or fixing holes



Applications

Whenever there is little space for sensors or when small parts are to be detected, the small photoelectric sensors of the OJ series are the ideal problem solvers. Typical applications are assembly and handling technology.

High precision and laser protection class 1

The sensors even detect tiny objects up to a diameter of only 0.8 mm. A laser of protection class 1 (EN 60825) now offers more application opportunities for this highly-precise, small and tried-and-tested sensor.

Excellent price / performance ratio

Using the new OJ type laser sensors the decision for laser units is no longer an issue.



Easy alignment and mounting

The laser light spot visible on the object simplifies the alignment of the sensors which are also installed in a very short time by means of the extensive fixing components.





Laser protection class 1 requires no additional protective measures for the operators.



Rectangular housing OJ Laser PerformanceLine, lateral sensing face, laser class 1

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Through-beam sensor · M8 connector · 10...30 DC · plastics · IP67						
	Transmitter	15 m	Red	< 24	–	OJ5038
	Transmitter	1 m	Red	< 4	–	OJ5041
	Receiver	15 m	Red	–	H/D PNP	OJ5039
	Receiver	1 m	Red	–	H/D PNP	OJ5042
	Transmitter	15 m	Red	< 24	–	OJ5138
	Transmitter	1 m	Red	< 4	–	OJ5141
	Receiver	15 m	Red	–	H/D PNP	OJ5139
	Receiver	1 m	Red	–	H/D PNP	OJ5142

Retro-reflective sensor · M8 connector · 10...30 DC · plastics · IP67

	Polarisation filter	8 m	Red	< 12	H/D PNP	OJ5036
	Polarisation filter	8 m	Red	< 12	H/D PNP	OJ5136


Rectangular housing OJ Laser PerformanceLine, front sensing face, laser class 1

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Retro-reflective sensor · M8 connector · 10...30 DC · plastics · IP67						
	Polarisation filter	8 m	Red	< 12	H/D PNP	OJ5014
	Polarisation filter	8 m	Red	< 12	H/D PNP	OJ5114

Connectors

Type	Description	Order no.
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Socket M8, 4-pole, 4-wire

	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC154
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OJ laser diffuse reflection sensor with background suppression



- Ideal for position detection in feeding and handling
- Precise background suppression for a reliable function
- High precision: Even tiny objects up to 0.8 mm can be detected reliably
- Front or side lens with various fixing options
- Mounting via snap-in technology or fixing holes



Background suppression

With electronic background suppression the sensors can be set to ensure precise and reliable detection of objects with various surfaces independently of any background.

Quick and easy mounting

The OJ50xx series is mounted using the innovative snap-in technology. The sensor is pushed into the guides of the fixture until the spring clicks home.

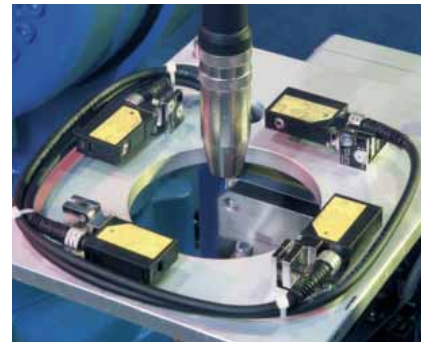
The units of the OJ51xx series have two fixing holes on the side for mounting. It allows quick mounting of the sensor by means of fixing holes reinforced with stainless steel sleeves, without requiring additional accessories.

High precision

The sensors even detect tiny objects up to a diameter of only 0.8 mm.



Visible laser light spot

The laser light spot visible on the object simplifies alignment of the sensors.






Objects of different sizes are safely detected.



Rectangular housing OJ Laser PerformanceLine, lateral sensing face, laser class 1

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M8 connector · 10...30 DC · plastics · IP67						
	Background suppression	15...200 mm	Red	2 x 1	H/D PNP	OJ5054
	Background suppression	7...150 mm	Red	0.8	H/D PNP	OJ5058
	Background suppression	15...200 mm	Red	2 x 1	H/D PNP	OJ5154
	Background suppression	7...150 mm	Red	0.8	H/D PNP	OJ5158


Rectangular housing OJ Laser PerformanceLine, front sensing face, laser class 1

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
Diffuse reflection sensor · M8 connector · 10...30 DC · plastics · IP67						
	Background suppression	15...200 mm	Red	2 x 1	H/D PNP	OJ5052
	Background suppression	15...200 mm	Red	2 x 1	H/D PNP	OJ5152
	Background suppression	7...150 mm	Red	0.8	H/D PNP	OJ5056

Accessories OJ housing

Type	Description	Order no.
	Mounting and fine adjustment bracket for laser units · for front lens · for type OJ · Housing materials: diecast zinc	E20975
	Mounting and fine adjustment bracket for laser units · for side lens · for type OJ · Housing materials: diecast zinc	E20976

Connectors

Type	Description	Order no.
Socket M8, 4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC154



For industrial applications

Extremely compact laser, distance and level sensor



- Photoelectric distance detection with a range of up to 10 m, with reflector up to 75 m
- 2 switching outputs; one output can be configured as analogue output
- Scalable detection range and window function
- Can be used in applications needing background suppression
- Big 4-digit alphanumeric display for measured values



Detection of objects with long ranges

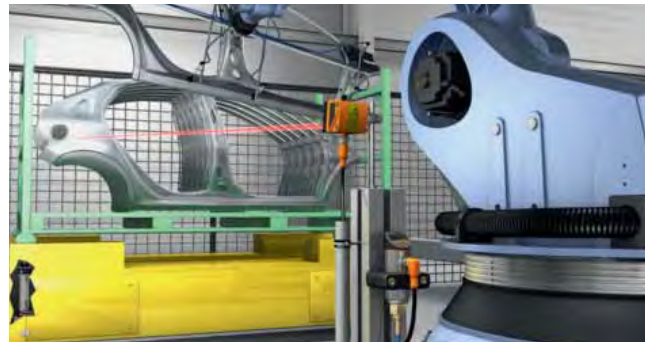
The O1D laser sensor provides non-contact distance measurement up to 10 metres.

Compact and flexible





The outputs can be programmed for two switch points or one switch point and one analogue output. The display can also provide the measured values in inches, millimetres or metres. The O1D102 has been specially designed for the detection of black metallic lacquers.

Combined advantages


Photoelectric systems with background suppression and ultrasonic sensors are inexpensive alternatives for distance measurement, however their ranges are shorter. Traditional time-of-flight systems offer an improved level of performance but are much higher in cost. The O1D combines the advantages of these systems at an attractive price.




Rectangular housing O1 for optical distance measurement, laser class 2

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
Photoelectric distance sensor · M12 connector · 18...30 DC · metal · IP67						
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D100
	Background suppression	0.2...10 m	1...50	< 15 x 15	18...30	O1D120
	Photoelectric distance sensor	0.2...3.5 m	1...50	< 6 x 6	18...30	O1D102
	Photoelectric distance sensor	0.2...10 m	1...33	< 15 x 15	18...30	O1D105



Rectangular housing O1 for optical distance measurement, laser class 1

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
Photoelectric distance sensor · M12 connector · 18...30 DC · metal · IP67						
	Photoelectric distance sensor	0.3...6 m	1...33	< 8 x 8	18...30	O1D155

Rectangular housing O1 Laser PerformanceLine with background suppression, laser class 2

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output	Order no.
Photoelectric distance sensor · M12 connector · 18...30 DC · metal · IP67						
	Background suppression	0.2...10 m	–	< 15 x 15	normally open / closed programmable PNP	O1D101

Accessories O1 housing

Type	Description	Order no.
	Mounting set · Clamp mounting · rod mounting Ø 12 mm · for type O1D · Housing materials: fixture: stainless steel / clamp: stainless steel / screws: stainless steel / nut: high-grade stainless steel	E2D101
	Mounting set · E2D101 + E20938 + E20951	E21079



For industrial applications

O5D – first standard photocell with time of flight measurement (PMD)



- Reliable background suppression and colour-independent detection
- Precise time of flight measurement in housing sizes of standard photoelectric sensors
- Shiny surfaces are detected reliably (e.g. stainless steel)
- Any sensor position, even an oblique angle to the object
- Switch point setting to the nearest centimetre via "+/-" buttons and display



Time of flight measurement as standard sensor

The O5D with time of flight measurement (PMD = Photonic Mixer Device) combines the following advantages: long range, reliable background suppression, visible red light and high excess gain. In the same price range as standard sensors, it is a clever alternative.

Easy handling

The switch point is set easily to the nearest centimetre via "+/-" buttons and display or alternative via IO-Link, which also allows read-out of the actual value.

Any surface and any mounting position

Shiny, matt, dark or light objects of any colour: the O5D features reliable background suppression. The unit allows any angle of incidence and thus any mounting position. This simplifies installation and saves costs.



Time of flight measurement at the price of a standard sensor.

Rectangular housing O5 for optical distance measurement, laser class 1

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm

	Background suppression	0.03...2 m	33	< 5	10...30	O5D150
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Rectangular housing O5 for optical distance measurement, laser class 2

Type	Operating principle	Range	Sampling rate [Hz]	Spot Ø at max. range [mm]	U _b [V]	Order no.
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: cm


	Background suppression	0.03...2 m	33	< 5	10...30	O5D100
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Photoelectric distance sensor · M12 connector · 10...30 DC · metal · IP65 / IP67 · Display unit: inch


	Background suppression	0.03...2 m	33	< 5	10...30	O5D101
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Accessories O5 housing


Type	Description	Order no.
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	Mounting set · Clamp mounting · With protective cover · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21084
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	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21087
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	Mounting set · Clamp mounting · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21083
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	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21085
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	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
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	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
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	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011
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For industrial applications

Fibre optic amplifiers



- Precise connection of different fibre optics
- Various glass fibre materials for different applications
- Range 0...120 mm (through-beam sensor)
- Range 0...40 mm (diffuse reflection sensor)
- Cable connection or M12 connector



Application

Fibre optic sensors are used where mounting space for photoelectric standard sensors is restricted.

Advantages of these systems: The evaluation unit (fibre optic amplifier) and the photoelectric components are located separately from the sensing surface of the system. Fibre optic sensing heads can therefore be mounted in places where access is difficult.

Through-beam principle

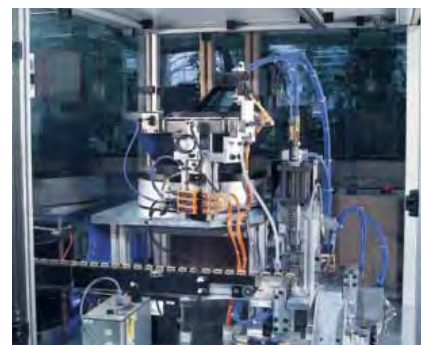
Transmitting and receiving fibre optics are laid separately. The two ends (fibre optic heads) are mounted opposite each other. The light beam interruption is evaluated according to the through-beam principle.

Diffuse reflection principle

Transmitting and receiving fibre optics are in one sheath and one sensing head. Evaluation is based on the diffuse reflection principle.

Fibre optics

Plastic fibre optics are suited for standard applications if no particular demands such as heat or chemical resistance are made. Glass fibre optics are more resistant to heat, ageing and chemicals than plastic fibre optics.




Tried-and-tested technology for complex applications.


OKF amplifiers for glass fibre optics

Type	Number of input channels	For fibre optics	Type of light	Sensing range through beam	Sensing range diffuse	Output H = light-on D = dark-on	U _b [V]	Order no.
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Type OKF · Cable 2 m · plastics · DC

	1	FE/FT-00	Red	0...0.12 m	0...40 mm	H/D PNP	10...36	OK5001
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Type OKF · M12 connector · plastics · DC

	1	FE/FT-00	Red	0...0.12 m	0...40 mm	H/D PNP	10...36	OK5008
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OUF amplifiers for glass fibre optics

Type	Number of input channels	For fibre optics	Type of light	Sensing range through beam	Sensing range diffuse	Output H = light-on D = dark-on	U _b [V]	Order no.
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Type OUF · Cable 2 m · plastics · DC

	1	FE/FT-00	Infrared	0.12 m	40 mm	H PNP	10...36	OU5001
	1	FE/FT-00	Infrared	0.12 m	40 mm	D PNP	10...36	OU5002

Type OUF · M12 connector · plastics · DC

	1	FE/FT-00	Infrared	0...0.12 m	0...40 mm	H PNP	10...36	OU5043
	1	FE/FT-00	Infrared	0...0.12 m	0...40 mm	D PNP	10...36	OU5044

Glass fibre optics for OOF / OKF and OUF housings, through-beam system

Type	Description	Order no.
	Through-beam sensor · M4 · straight · Housing materials: PVC, adapter:, PPO, Fibre optic: glass	E20059
	Through-beam sensor · Ø 3 · angled · Housing materials: PVC, adapter:, PPO, Fibre optic: glass	E20062



For industrial applications

OBF fibre optic amplifier with high performance



- High performance such as a high switching frequency of 3000 Hz
- LED display to check operation, switching status and function
- Variable mounting options: DIN rail or free-standing mounting
- Easy parameter setting via pushbuttons
- Wide range of fibre optics and accessories



New generation

The new generation of fibre-optic amplifiers of type OBF have an unbeatable price / performance ratio.

Variable installation

The sensors can be mounted on a DIN rail or using fixing holes. The simple ifm teach concept guarantees fast set-up. The sensor is ready for operation by pressing the programming buttons twice.

For demanding applications

For demanding applications extended functions such as manual fine adjustment as well as pulse stretching (time delay function) are available.




The use of fibre optics allows the detection of objects where space is at a premium.


OBF amplifiers for acrylic fibre optics

Type	Number of input channels	For fibre optics	Type of light	Sensing range through beam	Sensing range diffuse	Output H = light-on D = dark-on	U _b [V]	Order no.
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Type OBF · M12 connector · plastics · DC · Function check output

	1	FE/FT-00	Red	0...2 m	0...100 mm	H/D PNP/NPN	10...30	OBF500
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Type OBF · M8 connector · plastics · DC · Function check output

	1	FE/FT-00	Red	0...2 m	0...100 mm	H/D PNP/NPN	10...30	OBF501
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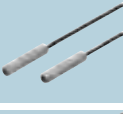
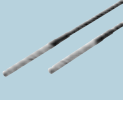
Type OBF · M8 connector · plastics · DC

	1	FE/FT-00	Red	0...2 m	0...100 mm	H/D PNP/NPN	10...30	OBF503
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Type OBF · Cable 2 m · plastics · DC · Function check output

	1	FE/FT-00	Red	0...2 m	0...100 mm	H/D PNP/NPN	10...30	OBF502
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Acrylic fibre optics for OBF / OOF housings, through-beam system

Type	Description	Order no.
	Through-beam sensor · M3 · straight · Housing materials: PE (polyethylene), Fibre optic: PMMA	E20603
	Through-beam sensor · M4 · straight · Housing materials: PE (polyethylene), Fibre optic: PMMA	E20615
	Through-beam sensor · M4 · straight · Housing materials: PE (polyethylene), Fibre optic: PMMA	E20606
	Through-beam sensor · M4 · straight · Housing materials: PE (polyethylene), Fibre optic: PMMA	E20753
	Through-beam sensor · M6 · straight · Housing materials: PE (polyethylene), Fibre optic: PMMA	E20752
	Through-beam sensor 90°- deflection of the light beam · FE-11-EPV-E3R/2m · Ø 3 · angled · Housing materials: PE (polyethylene), Fibre optic: PMMA	E20714



Sensors for colour, contrast, glass and film detection



- The colour sensor detects even finest shades of colour, 5 tolerance steps can be selected
- Contrast sensor with teach function for automatic transmitted-light colour
- The sensor for transparent objects detects glass, films and PET bottles
- High switching frequencies for fast moving applications
- Auto-Detect for PNP/NPN configuration, time-saving teach functions



Colour sensor for production control

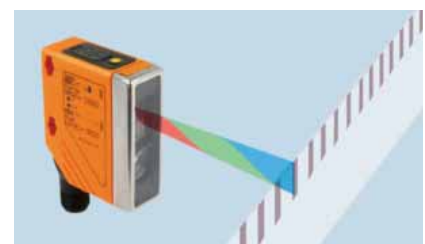
The colour sensor detects objects based on their colour and is particularly suited for applications in the automotive industry. With five selectable tolerance steps the user defines the permissible colour differences. An adjustment to the application is made via pushbuttons. The high switching frequency of 2,000 Hz allows precise colour detection even for very fast applications.

Contrast sensor for object detection

The O5K contrast sensor can solve a variety of applications in the assembly, handling and material handling technology. It detects registration marks or printed colour bars by determining the difference between the target and the background. The high colour contrast sensitivity and resolution guarantee reliable detection.

Detection of transparent objects

The sensors of the O5G series detect transparent objects such as film, glass, PET / plastic bottles or transparent packaging. Normal photoelectric sensors are not suited for this. Standard sensors have too much excess gain and "burn" through the clear material.



Sensors for colour detection

Type	Operating principle	Measuring range	Light spot diameter [mm]	U _b [V]	Current consumption [mA]	Sampling rate / switching frequency [Hz]	Order no.
------	---------------------	-----------------	-----------------------------	-----------------------	-----------------------------	---	-----------

M12 connector · Output function light-on / dark-on programmable · DC PNP/NPN

	Colour sensor	15...19 mm	2.5 x 6	10...36	50	2000	O5C500
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Contrast sensors

Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
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M12 connector · Output function light-on / dark-on programmable · DC PNP/NPN

	Diffuse contrast sensor	18...22 mm	RGB	1.5 x 5	H/D PNP/NPN	O5K500
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Sensors for the detection of transparent objects


Type	Operating principle	Range	Type of light	Spot Ø at max. range [mm]	Output H = light-on D = dark-on	Order no.
------	---------------------	-------	---------------	------------------------------	---------------------------------------	-----------

M12 connector · Output function light-on / dark-on programmable via pushbutton · DC PNP/NPN

	Polarisation filter	0...3 m	Red	80	H/D PNP/NPN	O5G500
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M8 connector · Output function light-on / dark-on programmable · DC PNP

	Polarisation filter	0.2...1.5 m	Red	64	H/D PNP	OJ5185
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	Polarisation filter	0.2...1.5 m	Red	64	H/D PNP	OJ5186
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Prismatic reflector

Type	Description	Order no.
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	Prismatic reflector · 48 x 48 mm · rectangular · for retro-reflective laser sensors and glass and film detection · Housing materials: plastics	E20722
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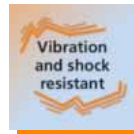


For industrial applications

Programmable incremental encoders with display



- **Reduced stock-keeping:**
Can be used as encoder, speed sensor or counter
- **Ideal for series applications:**
3 Operating modes and configuration can be set via IO-Link
- **Resolution of 1...10,000**
and signal level (TTL / HTL)
freely programmable
- **Display: Two-colour electronic**
rotatable display of the process values
- **Versatile: M12 connector**
can be used radially or axially



No compromises

The magnetic sensing principle provides the accuracy of photoelectric encoders and the robustness of magnetic systems.

Simple

Resolution and signal level can be programmed.

The encoders have a wide voltage range of 4.75...30 V DC and are therefore suited for universal use.

Multifunctional

Performance Line encoders have an integrated signal evaluation for speed monitoring, counter functions and detection of the direction of rotation.

Intuitive




The encoders provide easy setting, position indication by means of display and operating keys and intuitive menu navigation.

Networked






Diagnostic and parameter data are reliably transferred via IO-Link. This makes the products fit for Industry 4.0.



Encoders with display, programmable via IO-Link or pushbuttons

Type	Shaft	U _b [V]	Ambient temperature [°C]	Description	Order no.
M12 connector · 8 poles · Output function HTL 50 mA (preset at the factory) / TTL 50 mA					
	12	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP520
	12	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP521
	15	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP522
	9.525	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP523
	15.875	4.75...30	-40...85	Hollow shaft encoder open to one side · display · Magnetic detection system · Connector, radial, can also be used axially	ROP524
	6	4.75...30	-40...85	Solid shaft encoder · display · Magnetic detection system · Synchro-flange · Connector, radial, can also be used axially	RUP500
	10	4.75...30	-40...85	Solid shaft encoder · display · Magnetic detection system · Clamping flange · Connector, radial, can also be used axially	RVP510

Accessories

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Jumper · straight / straight · Free from halogen · 0.3 m · Housing materials: PUR	E12432
	Stator coupling · Housing materials: stainless steel	E60205
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398



For industrial applications

Compact speed monitors



- 2 in 1: speed sensor and evaluation in one compact housing
- Particularly space-saving design
- Reduced installation complexity
- Easy parameter setting by potentiometer or pushbutton
- For direct connection to a PLC



Compact speed monitors

In many industrial applications drives need to be monitored for rotational speed or standstill. In the automotive, food & beverage, steel and mining industries, speed sensors are used to safely detect standstill, overspeed and underspeed of drives or belt break on conveyors.

The compact speed monitors of the DI series integrate rotational speed detection and monitoring in one unit. The sensor head operates using inductive sensing principles. The sensor detects metal actuating surfaces on rotating machine parts, e.g. on toothed wheels or camshafts. The integrated evaluation converts this information into rotational speed.


The target speed is set easily via potentiometer or pushbutton on the unit.



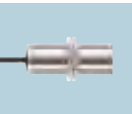
Speed monitor with integrated sensor

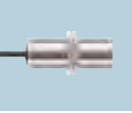
Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
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Type DGA M18 x 1 · M12 connector · high-grade stainless steel

	M18 / L = 68	12 nf	DC PNP	10...36 DC	3...6000	0...15	DI6001
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Type DIA M30 x 1.5 · Cable 2 m · metal

	M30 / L = 80	10 f	DC PNP	10...36 DC	5...3600	15	DI5020
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	M30 / L = 80	10 f	AC/DC	20...250 AC/DC	5...3600	12	DI0101*
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f = flush / nf = non flush / qf = quasi-flush

* Note on use of miniature fuses for electrical connection

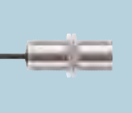
Miniature fuse to IEC60127-2 sheet 1, ≤ 2 A (fast acting)

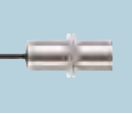
Recommendation: check the unit for reliable function after a short circuit.

Speed monitors with integrated sensor, ATEX category 3D

Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
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Type DIA M30 x 1.5 · Cable 2 m · metal

	M30 / L = 80	10 f	DC PNP	10...36 DC	5...3600	15	DI520A
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	M30 / L = 80	10 f	AC/DC	20...250 AC/DC	5...3600	12	DI103A*
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f = flush / nf = non flush / qf = quasi-flush

* Note on use of miniature fuses for electrical connection


Miniature fuse to IEC60127-2 sheet 1, ≤ 2 A (fast acting)

Recommendation: check the unit for reliable function after a short circuit.

Multifunctional displays for digital signals / frequency input

Type	Inputs / outputs	Description	Order no.
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AX460 · universal unit for displaying and monitoring analogue signals
(e.g. pressure sensors, temperature sensors or flow sensors)

	2 x analogue in	Digital display · Multi-functional display and evaluation system · for analogue standard signals · Ambient temperature -20...60 °C · screw terminals · Operating voltage 115...230 AC (50...60 Hz) / 18...30 V DC · IP 65	DX2041
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For industrial applications

Compact speed sensors with IO-Link



- Various designs for different applications
- Adjustable modes, e.g. single, two-point or window mode
- Many additional functions via IO-Link
- Flush and non flush
- Connector unit with 24 V DC supply voltage



Compact speed monitoring


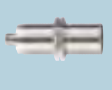







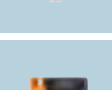

The evaluation electronics are integrated in the sensor housing. This allows for low-cost and easy monitoring of rotating as well as linear movements regarding over-speed and underspeed. The limit of the speed at which the output switches is set via IO-Link.

Applications

Especially in the field of conveying technology the compact speed sensors can be used for various applications, for example for monitoring belt conveyors or bucket elevators. Here they are typically used to monitor underspeed, blockage or standstill. The different designs and the large speed range allow for an integration into almost any application.





Compact speed sensors

Type	Dimensions [mm]	Sensing range [mm]	Electrical design	U _b [V]	Setting range [puls. / min.]	Start-up delay [s]	Order no.
Connector M12 · Output function  · DC PNP/NPN							
	M30 / L = 92.3	10 f	DC PNP/NPN	10...36 DC	5...3600	0...30	DI5024
M12 connector · Output function  · DC PNP/NPN							
	M12 / L = 60	3.5 f	DC PNP/NPN	10...30 DC	5...24000	0...30	DI5027
	M12 / L = 60	6.5 nf	DC PNP/NPN	10...30 DC	5...24000	0...30	DI5028
	M18 / L = 60	7 f	DC PNP/NPN	10...30 DC	5...24000	0...30	DI5029
	M18 / L = 60	12 nf	DC PNP/NPN	10...30 DC	5...24000	0...30	DI5030
	M30 / L = 65	12 f	DC PNP/NPN	10...30 DC	5...14400	0...30	DI5031
	M30 / L = 65	21 nf	DC PNP/NPN	10...30 DC	5...14400	0...30	DI5032
	40 x 40 x 54	20 f	DC PNP/NPN	10...30 DC	5...9600	0...30	DI5033
	40 x 40 x 54	24 nf	DC PNP/NPN	10...30 DC	5...9600	0...30	DI5034

f = flush / nf = non flush / qf = quasi-flush

Accessories

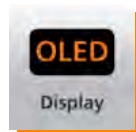
Type	Description	Order no.
	Target wheel · Plastic disk with 8 screws as "target" · Centered drill holes	E89010
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390



Evaluation systems



- Intuitive, user-friendly handling
- Integrated wide-range power supply
- Easily programmable output functions
- Devices for monitoring standstill, speed, direction, slip, and frequency
- Switching relays and transistor outputs, scalable analogue output



Evaluation systems


Pulse evaluation systems monitor rotating and linear movements as well as all physical quantities which can be converted into pulse sequences. Units with different functions allow customised monitoring of slow and fast rotational speeds as well as complex synchronous or direction monitoring. Relay or transistor outputs give a signal if the actual value is above or below the set limit value.



Universal speed monitors

Type	U _b [V]	In-puts	Input function	Setting range [puls. / min.]	Setting range [Hz]	Out-puts analogue	Out-puts relays	Out-puts transist.	Order no.
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Type FR-1 · dual-chamber terminals 2 x 2.5 mm² (2 x AWG 14) · plastics

	110...240 AC (50...60 Hz) / 27 DC (typ. 24 DC)	1	PNP / NPN / Namur	1...60000	0.1...1000	1	2	2	DD2503
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Standard speed monitors / standstill monitor

Type	U _b [V]	In-puts	Input function	Setting range [puls. / min.]	Setting range [Hz]	Out-puts analogue	Out-puts relays	Out-puts transist.	Order no.
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Type D200 · Unit: 4-pole terminal strips, pin separation 5.0 mm · plastics

	110...240 AC / 27 (24) DC	1	PNP	0.1...10 / 10...1000	–	–	1	1	DD0203
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Universal speed monitors with sensor wire monitoring

Type	U _b [V]	In-puts	Input function	Setting range [puls. / min.]	Setting range [Hz]	Out-puts analogue	Out-puts relays	Out-puts transist.	Order no.
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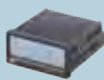


Type FR-1N · dual-chamber terminals 2 x 2.5 mm² (2 x AWG 14) · plastics

	110...240 AC (50...60 Hz) / 27 DC (typ. 24 DC)	1	Namur 8.2 V	1...60000	0.1...1000	1	2	2	DD2603
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Multifunctional displays for digital signals / frequency input

Type	Inputs / outputs	Description	Order no.
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AX460 · universal unit for displaying and monitoring analogue signals (e.g. pressure sensors, temperature sensors or flow sensors)

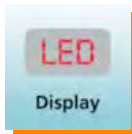
	2 x analogue in	Digital display · Multi-functional display and evaluation system · for analogue standard signals · Ambient temperature -20...60 °C · screw terminals · Operating voltage 115...230 AC (50...60 Hz) / 18...30 V DC · IP 65	DX2041
	2 x analogue in 4 x digital out	Digital display · Multi-functional display and evaluation system · for analogue standard signals · Ambient temperature -20...60 °C · screw terminals · Operating voltage 115...230 AC (50...60 Hz) / 18...30 V DC · IP 65	DX2042
	2 x analogue in 4 x digital out	Digital display · Multi-functional display and evaluation system · for analogue standard signals · Analogue output · Ambient temperature -20...60 °C · screw terminals · Operating voltage 115...230 AC (50...60 Hz) / 18...30 V DC · IP 65	DX2043



Decentralised display, preprocessing and conversion of analogue signals



- Mini display to monitor values
- Clearly visible display with red / green colour change
- Compact design with protection rating IP 67
- Parameter setting via IO-Link
- Conversion of analogue measured values to an IO-Link communication



Analogue signals at a glance

The compact connector unit is simply inserted in the connection cable of analogue sensors (4...20 mA). It displays the measured values locally.

The user can set a switch point or limit at which the transistor output switches. A colour change (red / green) of the display indicates this unmistakably. Critical process states or operational problems are reliably signalled.

Converter for Industry 4.0

A special feature is the signal conversion: The threshold display converts analogue signals to digital IO-Link signals.


Today they are required in almost any modern industrial environment and for Industry 4.0 applications.





Multifunctional displays for analogue standard signals

Type	Inputs / outputs	Description	Order no.
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Decentralised display, preprocessing and conversion of 4...20 mA analogue signals

	-	Threshold display · 4...20 mA analogue input · transistor output · IO-Link interface · 4-digit alphanumeric display / alternating indication of red and green · Conversion of analogue measured values to an IO-Link communication · Analogue input 4...20 mA · Ambient temperature -25...60 °C · Operating voltage 18...30 V DC · IP 67	DP2200
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Accessories

Type	Description	Order no.
	Mounting clip · Housing materials: 2.1247	E89208
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390

Software

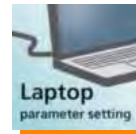
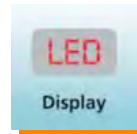
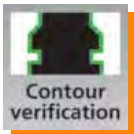
Type	Description	Order no.
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



Object recognition for assembly, production and quality control



- 2D vision sensor for object recognition
- Robust, industrially compatible housing with integrated lighting
- Easy parameter setting
- Integrated Ethernet process interface with position indication
- 128 MB RAM: teaching of 32 applications with up to 24 models each possible



Contour sensor for production control

The sensor uses orientation-independent contour verification. The application possibilities range from presence, position and orientation monitoring via sorting and counting tasks to quality control.

Lighting and evaluation unit are integrated in a robust, industrially compatible IP 67 housing for the use in the temperature range -10...60 °C. Extra-slim backlights are available for transmitted light applications.



Operating concept

With an intuitive step-by-step interface and good / bad parts the user can simply create a model of the object to be recognised. The recognition software compares the object with the stored ideal, regardless of orientation, and transmits the results (good or bad, position, orientation) to the higher-level PLC. The sensor can manage up to 32 separate tasks with a maximum of 24 models each.



Sensors support the user with quality assurance.


Sensors for object recognition

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
Type O2D2 · M12 plug, 8 poles M12 socket, 4 poles · metal · DC							
	CMOS image sensor B/W, VGA resolution 640 x 480	640 x 480	1.0	10	Infrared	-10...60	O2D220
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	Infrared	-10...60	O2D222
	CMOS image sensor B/W, VGA resolution 640 x 480	400 x 300	0.633	10	Infrared	-10...60	O2D224

Fixing components for vision sensors

Type	Description	Order no.
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 12 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D110
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 14 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D112
	Operating software · O2D	E2D200
	Glass protective pane · O2D / O2I · Housing materials: housing: diecast zinc black / lens: float glass	E21168
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 5 m · Housing materials: TPU	E21139
	Touch Panel PC · 12.1" colour display · Intel Atom CPU 1.6 GHz · 2 GByte RAM · Windows Embedded Standard 7 SP1 (32 bits)	E2D400
	Plastic diffuser · O2D / O2I · Housing materials: housing: diecast zinc black / lens: PMMA	E21165

Connectors

Type	Description	Order no.
Socket M12, 8/7-pole, 8-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: PUR	E11231
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: PUR	E11232



Object inspection for packaging, production and quality control



- Stand-alone unit with integrated lighting
- For inspection tasks with variable features
- Compact and robust design
- User-friendly parameter setting
- Integrated Ethernet process interfaces (TCP/IP, EtherNet/IP)



Stand-alone unit

Stand-alone unit with integrated lighting and evaluation in a robust, industrially compatible IP 67 housing for the use in the temperature range -10...60 °C.

User-friendly parameter setting

All parameters can be set conveniently via a menu-guided parameter setting software.

Object recognition

The blob analysis used determines the selected characteristics of objects. They allow to check the presence, size, position or completeness of the objects.

Ethernet process interfaces

The Ethernet interface also provides remote maintenance with storage of error images and evaluation data, an update option for the sensors as well as the process image for the connection of programmable logic controllers.







Applications in backlighting method

Extra-slim backlights are available for transmitted light applications.



The presence of adhesive pads for noise reduction is checked.

Object inspection sensors

Type	Operating principle	Max. field of view size [mm]	Resolution [mm]	Detection rate [Hz]	Type of light	Ambient temperature [°C]	Order no.
Type O2V · M12 plug, 8 poles M12 socket, 4 poles · metal · DC							
	CMOS image sensor B/W, VGA resolution 640 x 480	640 x 480	1.0	10	White light	-10...60	O2V100
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	White light	-10...60	O2V102
	CMOS image sensor B/W, VGA resolution 640 x 480	400 x 300	0.633	10	White light	-10...60	O2V104
	CMOS image sensor B/W, VGA resolution 640 x 480	640 x 480	1.0	10	Infrared	-10...60	O2V120
	CMOS image sensor B/W, VGA resolution 640 x 480	1320 x 945	2.0	10	Infrared	-10...60	O2V122
	CMOS image sensor B/W, VGA resolution 640 x 480	400 x 300	0.633	10	Infrared	-10...60	O2V124

Fixing components for vision sensors

Type	Description	Order no.
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 12 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D110
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 14 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D112
	Operating software · O2D	E2D200
	Glass protective pane · O2D / O2I · Housing materials: housing: diecast zinc black / lens: float glass	E21168
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 5 m · Housing materials: TPU	E21139



Photoelectric 3D level measurement and point level detection



- Continuous measurement of uneven surfaces
- Determines min, max or mean values
- Teaching of different tank shapes
- Interfering structures are suppressed
- Non-contact detection of opaque media for levels of up to 10 m



Flexible configuration

The system detects solid, opaque solids and bulk materials in tanks, silos or hoppers with levels of up to 10 m. The O3D reliably detects the load height in machinery for mechanical handling, e.g. belts, and the loading of pallets.





The sensor determines the level via a defined background and transmits the process value via analogue output or digitally and noise immune via the Ethernet process interface. Alternatively, the O3D may be used as a point level switch.

The measuring segment of the sensor can be adapted to the shape of the respective tank. Agitators and other attachments can be suppressed via "exclusion regions". Various container shapes, such as hoppers, silos or even inclined belts can be recognised by the sensor.


This means that for bulk materials the average level is indicated, even if there are conical heaps or funnelling.






Sensors for 3D object recognition

Type	Operating principle	Resolution (pixels)	Angle of aperture (horizontal x vertical) [°]	Lighting	Max. sampling rate [Hz]	Ambient temperature [°C]	Order no.
3D sensor · Type O3D · M12 connector · metal · DC							
	3D sensor	176 x 132	40 x 30	Infrared LED	25	-10...50	O3D300
	3D sensor	176 x 132	60 x 45	Infrared LED	25	-10...50	O3D302
	3D sensor	176 x 132	40 x 30	Infrared LED	25	-10...50	O3D310
	3D sensor	176 x 132	60 x 45	Infrared LED	25	-10...50	O3D312


System components

Type	Description	Order no.
	Mounting set · O3D · Clamp mounting · Type Smart Camera · rod mounting Ø 14 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E3D301

Connection cables for 2D and 3D sensors

Type	Description	Order no.
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 2 m · Housing materials: PUR / PC	E11898
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: PUR	E11231
	Socket · straight · Free from halogen · M12 connector · 2 m · Housing materials: PUR	E11950

Software

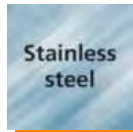
Type	Description	Order no.
	Operating software for PMD 3D sensor · O3D	E3D200



Completeness monitoring for the packaging technology



- Different handling units can be taught
- Reliable detection of underfill or overfill
- Automatic position tracking
- Colour-independent and extraneous-light resistant due to time-of-flight technology (PMD).
- Switching outputs and Ethernet process data interface



Incomplete shipments – never again





If a pallet with only one incomplete handling unit reaches the customer, he often returns all goods. This does not only lead to dissatisfaction but also to additional costs. Completeness monitoring provides the remedy. Often individual sensors are installed above each individual handling unit position. This is, however, not very flexible if the handling unit type or size changes. Then changes become necessary. If colour or texture of the handling units change, conventional sensors reach their limits.

All these problems are unknown to completeness monitoring on the basis of 3D sensors: The 3D sensor looks at the handling unit from above and compares it with the models taught in by the user. It signals any deviation via a switching output.


Continuous exchange with users and extensive handling tests have led to extraordinarily simple operation and integrability of the sensor.






Cameras for 3D object recognition

Type	Operating principle	Resolution (pixels)	Angle of aperture (horizontal x vertical) [°]	Lighting	Max. sampling rate [Hz]	Ambient temperature [°C]	Order no.
3D camera · Type O3D · M12 connector · metal · DC							
	3D camera	176 x 132	40 x 30	Infrared LED	25	-10...50	O3D301
	3D camera	176 x 132	60 x 45	Infrared LED	25	-10...50	O3D303
	3D camera	176 x 132	40 x 30	Infrared LED	25	-10...50	O3D311
	3D camera	176 x 132	60 x 45	Infrared LED	25	-10...50	O3D313


System components

Type	Description	Order no.
	Mounting set · O3D · Clamp mounting · Type Smart Camera · rod mounting Ø 14 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E3D301

Connection cables for 2D and 3D sensors

Type	Description	Order no.
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 2 m · Housing materials: PUR / PC	E11898
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 2 m · Housing materials: TPU	E21138
	Socket · straight · Free from halogen · M12 connector · 2 m · Housing materials: PUR	E11950

Software

Type	Description	Order no.
	Operating software · O3D3xx	E3D300



Lighting elements for contour and position verification



- Ultra-slim design
- Permanent light or pulse operation
- Additional operating mode for 4 times more light
- Three illuminated area sizes
- Infrared or red light



Ultra-slim design

The new generation of ifm's backlights can be screwed onto a wall or the mounting accessory, requiring only little space due to the extremely slim design of only 9.2 mm.

Various operating modes

The backlights allow operation with two different light intensities due to the microprocessor technology: In the "normal" mode the element can work in the permanent or pulsed mode, in the "high" mode pulse operation with 4 times more light is possible. The exposure time is thus reduced by 75 to 80 % which is an advantage especially for fast processes.





Numerous versions

They generate a homogeneous light field with visible red or invisible infrared light. They can be obtained in three different sizes.




Specific backlights extend the range of applications of object recognition sensors and object inspection sensors.


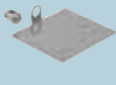
Illumination units, backlight

Type	Dimensions [mm]	Type of light	Active illuminated area [mm]	I ₀ normal light intensity [mA]	I ₀ high light intensity [mA]	Trigger	Order no.
PUR cable 0.15 m · with M12 connector · metal · DC							
	108 x 9.8 x 81	Red	50 x 50	200	100	External; 24 V PNP to IEC61131-1	O2D911
	108 x 9.8 x 81	Infrared	50 x 50	200	100	External; 24 V PNP to IEC61131-1	O2D907
	161.2 x 9.8 x 133	Red	100 x 100	450	250	External; 24 V PNP to IEC61131-1	O2D912
	161.2 x 9.8 x 133	Infrared	100 x 100	450	250	External; 24 V PNP to IEC61131-1	O2D908
PUR cable 2 m · metal · DC							
	108 x 9.8 x 81	Infrared	50 x 50	200	100	External; 24 V PNP to IEC61131-1	O2D903
	108 x 9.8 x 81	Red	50 x 50	200	100	External; 24 V PNP to IEC61131-1	O2D902
	161.2 x 9.8 x 133	Infrared	100 x 100	450	250	External; 24 V PNP to IEC61131-1	O2D905
	161.2 x 9.8 x 133	Red	100 x 100	450	250	External; 24 V PNP to IEC61131-1	O2D904

Illumination units, ring

Type	Dimensions [mm]	Type of light	Active illuminated area [mm]	I ₀ normal light intensity [mA]	I ₀ high light intensity [mA]	Trigger	Order no.
PUR cable with M12 connector 0.3 m · metal · DC							
	Ø 122 / L = 20.5	Red	Ø 66 / 106	800	1300	external; 24 V PNP	O2D915
	Ø 122 / L = 20.5	Infrared	Ø 66 / 106	800	1400	external; 24 V PNP	O2D917
	Ø 122 / L = 20.5	White light	Ø 66 / 106	800	1200	external; 24 V PNP	O2D919

Fixing components for vision sensors

Type	Description	Order no.
	Mounting set · Backlight 50 x 50 mm · Clamp mounting · Housing materials: Mounting plate: stainless steel / clamp: high-grade stainless steel	E2D108
	Mounting set · Backlight 100 x 100 mm · Clamp mounting · Housing materials: Mounting plate: stainless steel / clamp: high-grade stainless steel	E2D109



For industrial applications

Fail-safe inductive sensors



- No special key or coded magnet is required as target
- High tolerance to misalignment and nuisance tripping
- Self-monitoring sensor function
- Rated up to SIL 2 or SIL 3 according to IEC 61508



Safe and sound.

The non-contact fail-safe inductive sensors detect standard targets made of metal such as stainless steel or mild steel. Coded magnets or special mechanical keys are not required as targets. This reduces the installation time considerably and avoids misalignment issues and nuisance tripping. The sensors continuously monitor the sensing window for target position and dwell time. They can be used with all standard safety relays, PLCs and bus systems.

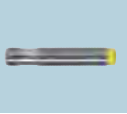



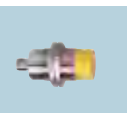

Critical applications

The sensor can be used to monitor safety applications including high-speed door monitoring, open and closed valve position, part presence, lift positions or the travel range of robots and robotic arms.





The ifm fail-safe sensors are installed quickly, no coded target is required. This saves time and money.

Inductive sensors for safety-related applications, 2 x OSSD, SIL 2, PL d

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
M12 connector · Output function 2 x OSSD (A1 and A2) · 4-wire · DC PNP							
	70	0.5...4 nf	High-grade st. steel	24	IP 65 / IP 67	≤ 1 / ≤ 1	GF711S
	70.5	1...8 nf	High-grade st. steel	24	IP 65 / IP 67	≤ 1 / ≤ 1	GG711S
	70	1...5 f	Brass	24	IP 65 / IP 67	≤ 1 / ≤ 1	GG712S
	86.5	> 10 f	Brass	24	IP 65 / IP 67	≤ 5 / ≤ 5	GG851S
	70	1...15 nf	High-grade st. steel	24	IP 65 / IP 67	≤ 10 / ≤ 1	GI711S
	70	1...10 f	High-grade st. steel	24	IP 65 / IP 67	≤ 10 / ≤ 1	GI712S


f = flush / nf = non flush / qf = quasi-flush

Inductive sensors for safety-related applications, 2 x OSSD, SIL 3, PL e

Type	Length [mm]	Enable zone [mm]	Housing material	U _b DC [V]	Protection	Response time in case of a safety request / enable time [ms]	Order no.
M12 connector · Output function 2 x OSSD (A1 and A2) · 4-wire · DC PNP							
	80	6...12 nf	High-grade st. steel	24	IP 68 / IP 69K	≤ 50 / ≤ 200	GI701S
	66	10...15 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM701S
	66	4...20 nf	PPE	24	IP 65 / IP 67	≤ 50 / ≤ 200	GM705S

f = flush / nf = non flush / qf = quasi-flush

Accessories

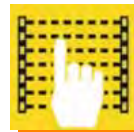
Type	Description	Order no.
	Spacer · 10 mm · for type IMC / GMC · for centred mounting on metal · Housing materials: plastics	E12528



Safety light curtains Finger protection type 4 / SIL 3



- Safety light curtains type 4 to IEC 61496
- Now with SIL 3 to IEC 61508 and PL to ISO 13849
- Compact housing dimensions (28 x 30 mm)
- Protected area width selectable on the unit: 0...3 m or 1...6 m
- Easy to connect via the tried-and-tested M12 connector (5 or 8-pin)



Protection for the plant personnel

Wherever motion of machine parts presents a danger to people or goods, safety light curtains are used. When activated, this protective equipment deactivates the outputs, which immediately stops the machines.

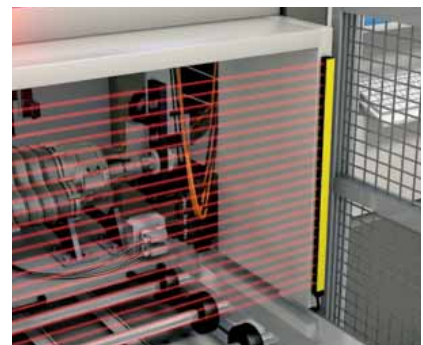
Safety light curtains consist of an optical transmitter and receiving element. In the transmitter element there are several light emitters and an equal number of receivers in the receiving element. If one or several light beams are interrupted, the system deactivates the safe outputs.

Certified safety

The safety light curtains have been developed according to current standards and have been certified by TÜV Süd. They meet the requirements to EN 61496, ESPE type 4 / SIL 3.


Finger protection

The protective function "finger protection" is guaranteed at a resolution of 14 mm.



The light curtains can be fitted simply and neatly into the application. A dead band and impermissible intervention are avoided.

Safety light curtains type 4, SIL 3, PL e, resolution 14 mm, protected area width up to 6 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	213	14	160	0...3 / 1...6	4	24	OY001S
	363	14	310	0...3 / 1...6	5.5	24	OY002S
	513	14	460	0...3 / 1...6	7.5	24	OY003S
	663	14	610	0...3 / 1...6	9	24	OY004S
	813	14	760	0...3 / 1...6	11	24	OY005S
	963	14	910	0...3 / 1...6	13	24	OY006S
	1113	14	1060	0...3 / 1...6	14.5	24	OY007S
	1263	14	1210	0...3 / 1...6	16.5	24	OY008S
	1413	14	1360	0...3 / 1...6	18	24	OY009S
	1563	14	1510	0...3 / 1...6	20	24	OY010S



Safety light curtains Hand protection type 4 / SIL 3



- Type 4 safety light curtains to IEC 61496
- Now with SIL 3 to IEC 61508 and PL to ISO 13849
- Compact housing dimensions (28 x 30 mm)
- Protected area width selectable on the unit: 0...4 m or 3...12 m
- Easy to connect via the tried-and-tested M12 connector (5 or 8-pin)



Protection for the plant personnel

Wherever motion of machine parts presents a danger to people or goods, safety light curtains are used. When activated, this protective equipment deactivates the outputs, which immediately stops the machines.

Safety light curtains consist of an optical transmitter and receiving element. In the transmitter element there are several light emitters and an equal number of receivers in the receiving element. If one or several light beams are interrupted, the system deactivates the safe outputs.

Certified safety

The safety light curtains have been developed according to current standards and have been certified by TÜV Süd. They meet the requirements to EN 61496, ESPE type 4 / SIL 3.


Hand protection

The protective function 'hand protection' is guaranteed at a resolution of 14, 20, 30 or 40 mm.




Protection for the plant personnel even over long distances.

Safety light curtains type 4, SIL 3, PL e, resolution 30 mm, protected area width up to 12 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	213	30	160	0...4 / 3...12	4	24	OY041S
	363	30	310	0...4 / 3...12	5.5	24	OY042S
	513	30	460	0...4 / 3...12	7.5	24	OY043S
	663	30	610	0...4 / 3...12	8.5	24	OY044S
	813	30	760	0...4 / 3...12	10.5	24	OY045S
	963	30	910	0...4 / 3...12	12	24	OY046S
	1113	30	1060	0...4 / 3...12	14	24	OY047S
	1263	30	1210	0...4 / 3...12	15.5	24	OY048S
	1413	30	1360	0...4 / 3...12	17	24	OY049S
	1563	30	1510	0...4 / 3...12	18.5	24	OY050S

Safety light curtains type 4, SIL 3, PL e, resolution 40 mm, protected area width up to 12 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	213	40	160	0...4 / 3...12	3.5	24	OY061S
	363	40	310	0...4 / 3...12	4.5	24	OY062S
	513	40	460	0...4 / 3...12	5.5	24	OY063S
	663	40	610	0...4 / 3...12	6.5	24	OY064S
	813	40	760	0...4 / 3...12	7.5	24	OY065S
	963	40	910	0...4 / 3...12	9	24	OY066S
	1113	40	1060	0...4 / 3...12	10	24	OY067S
	1263	40	1210	0...4 / 3...12	11	24	OY068S
	1413	40	1360	0...4 / 3...12	12	24	OY069S
	1563	40	1510	0...4 / 3...12	13	24	OY070S



For industrial applications

Safety light curtains Body protection type 4 / SIL 3



- Type 4 safety light curtains to IEC 61496
- Now with SIL 3 to IEC 61508 and PL to ISO 13849
- Compact housing dimensions (28 x 30 mm)
- Protected area width selectable on the unit: 0...4 m or 3...12 m
- Easy to connect via the tried-and-tested M12 connector (5 or 8-pin)



Protection for the plant personnel

Wherever motion of machine parts presents a danger to people or goods, safety light curtains are used. When activated, this protective equipment deactivates the outputs, which immediately stops the machines.

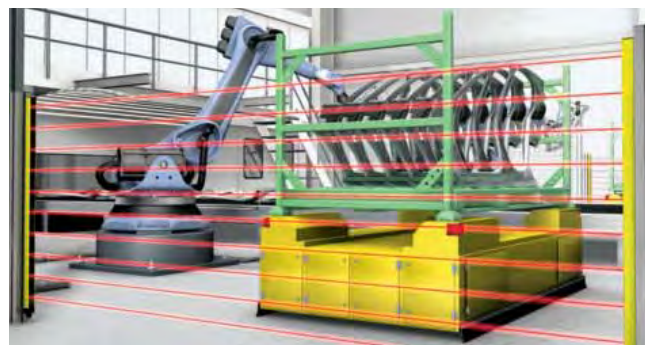
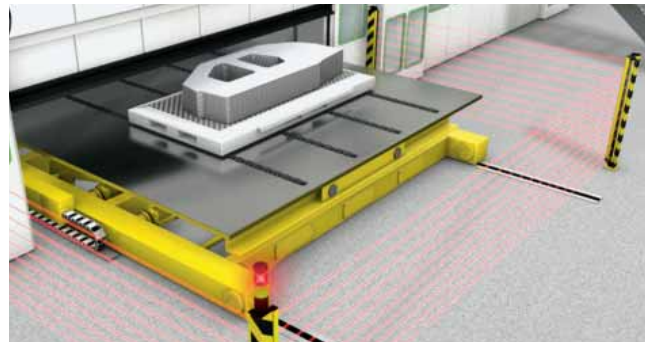
Safety light curtains consist of an optical transmitter and receiving element. In the transmitter element there are several light emitters and an equal number of receivers in the receiving element. If one or several light beams are interrupted, the system deactivates the safe outputs.

Certified safety

The safety light curtains have been developed according to current standards and have been certified by TÜV Süd. They meet the requirements to EN 61496, ESPE type 4 / SIL 3.


Protection for body or parts of bodies

The protective function 'primary guarding body or parts of bodies' is guaranteed at a resolution of 50 or 90 mm.



Efficient safeguarding of hazardous areas.


Safety light curtains type 4, SIL 3, PL e, resolution 50 mm, protected area width up to 12 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	363	50	310	0...4 / 3...12	4	24	OY082S
	513	50	460	0...4 / 3...12	4.5	24	OY083S
	663	50	610	0...4 / 3...12	5.5	24	OY084S
	813	50	760	0...4 / 3...12	6.5	24	OY085S
	963	50	910	0...4 / 3...12	7.5	24	OY086S
	1113	50	1060	0...4 / 3...12	8.5	24	OY087S
	1263	50	1210	0...4 / 3...12	9	24	OY088S
	1413	50	1360	0...4 / 3...12	10	24	OY089S
	1563	50	1510	0...4 / 3...12	11	24	OY090S

Safety light curtains type 4, SIL 3, PL e, resolution 90 mm, protected area width up to 12 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	663	90	610	0...4 / 3...12	4	24	OY104S
	813	90	760	0...4 / 3...12	4.5	24	OY105S
	963	90	910	0...4 / 3...12	5	24	OY106S
	1113	90	1060	0...4 / 3...12	5.5	24	OY107S
	1263	90	1210	0...4 / 3...12	5.5	24	OY108S
	1413	90	1360	0...4 / 3...12	6	24	OY109S
	1563	90	1510	0...4 / 3...12	6.5	24	OY110S

Safety relays for safety light curtains

Type	U _b [V]	Electrical design	ISO 13849-1: Category / performance level	IEC 61508: SIL	Order no.
	24	Relay	4 / e	3	G2001S



Safety light grids for the protection of robot cells



- Safety light grids type 2 or type 4 or to IEC 61496
- Now with SIL to IEC 61508 and PL to ISO 13849
- For applications with ranges of up to 60 m
- Safety light grids with active / passive system (single sided wiring)
- Easy to connect via the tried-and-tested M12 connector (5 or 8-pin)



Protection for the plant personnel

Safety light grids are used to protect the hazardous area of an industrial robot.

They consist of an optical transmitter and receiving element. In the transmitter element there are several light emitters and an equal number of receivers in the receiving element. If one or several light beams are interrupted, the system deactivates the safe outputs.

Based on the known transmitter / receiver principle, safety light grids offer ranges up to 60 m.

Active / passive system

The transmitter and the receiver are integrated in the housing of the active element. The passive element houses the reflecting mirrors. The electrical connection is only located on one side, this being the side of the active element. Thus, the user saves time and money with regard to wiring.


Certified safety

The safety light grids have been developed in accordance with the current standards and certified by TÜV Süd. They conform to the requirements of EN 61496, ESPE type 2 / SIL 2 or type 4 / SIL 3.




Safety light grids protect the operating area of robots.


Safety light grids with active / passive system type 4, SIL 3, PL e, 2, 3, 4 beams, protected area width up to 6 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	736	–	510	0...6 / 0...6	10	24	OY901S
	1036	–	810	0...6 / 0...6	10.5	24	OY902S
	1136	–	910	0...6 / 0...6	10.5	24	OY903S


Safety light grids type 4, SIL 3, PL e, 2, 3, 4 beams, protected area width up to 12 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	653	–	510	0...4 / 3...12	2.5	24	OY114S
	953	–	810	0...4 / 3...12	3	24	OY115S
	1053	–	910	0...4 / 3...12	3	24	OY116S

Safety light grids type 4, SIL 3, PL e, 2, 3, 4 beams, protected area width up to 20 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	653	–	510	0...10 / 3...20	2.5	24	OY120S
	953	–	810	0...10 / 3...20	2.5	24	OY121S
	1053	–	910	0...10 / 3...20	2.5	24	OY122S

Safety light grids type 4, SIL 3, PL e, 2, 3, 4 beams, protected area width up to 60 m

Type	Sensor length [mm]	Resolution / detection capacity [mm]	Protected area height [mm]	Protected area width [m]	Response time [ms]	U _b [V]	Order no.
M12 connector							
	736	–	510	8...30 / 18...60	7	24	OY951S
	1036	–	810	8...30 / 18...60	7	24	OY952S
	1136	–	910	8...30 / 18...60	7	24	OY953S



Safety relays for the protection of operators and machinery



- Multifunctional with relay outputs or semiconductor outputs
- E-stop with cross-fault monitoring and optional simultaneity monitoring
- Connection of mechanical safety switches and fail-safe sensors
- Two-hand control to EN 574, type IIIC, mechanical or electronic
- Certified to IEC 61508, EN 954-1, ISO 13849-1, EN 574 type IIIC



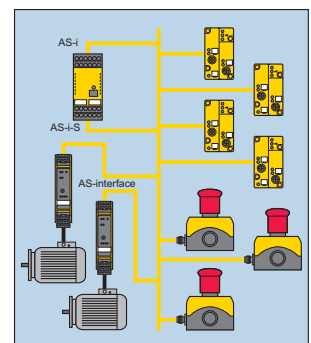
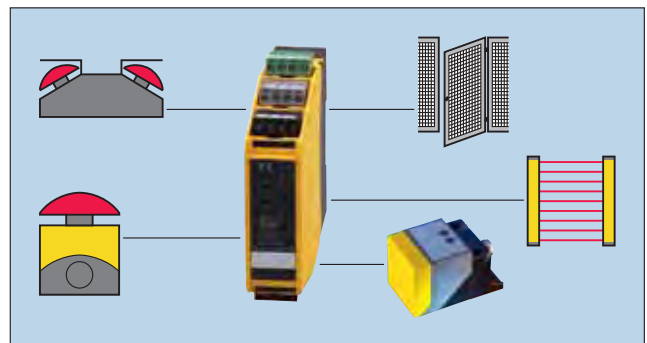
Reliable switching

This safety relay can be used in a variety of ways. It performs monitoring tasks in safety applications in combination with different non-contact guards.



The evaluation of the signals from safety light barriers, safety light curtains, electronic fail-safe sensors or mechanical safety switches for protective guard contacts or electronic position sensors or mechanical position switches with or without cross-fault monitoring are only a few applications.

The safety relay has several multifunctional self-detecting and self-monitoring short-circuit protected inputs and outputs. The simultaneity monitoring of inputs and the functions "monitored" or "automatic start" can be set as an option.


The operation in two-hand control to EN 574 type IIIC in combination with electronic sensors or mechanical switches is another advantage of the safety relay.




Safety relays with relay outputs for fail-safe sensors

Type	U _b [V]	Electrical design	ISO 13849-1: Category / performance level	IEC 61508: SIL	Order no.
	24	Relay	4 / e	3	G1501S
	24	Relay	4 / e	3	G1502S

Safety relays with solid state outputs for fail-safe sensors

Type	U _b [V]	Electrical design	ISO 13849-1: Category / performance level	IEC 61508: SIL	Order no.
	24	Semi-conductor outputs	4 / e	3	G1503S

Safety relays for safety light curtains

Type	U _b [V]	Electrical design	ISO 13849-1: Category / performance level	IEC 61508: SIL	Order no.
	24	Relay	4 / e	3	G2001S

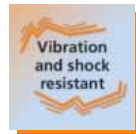


For industrial applications

Pressure sensors PN7 with two switching outputs and display



- **Condition-based maintenance:**
Overload counter detects pressure peaks
- **Extended diagnostics:**
minimum and maximum value memory detects pressure fluctuations
- **Clearly indicate the acceptable ranges:**
programmable red / green display
- **The process connection can be rotated**
for optimum alignment
- **Fast switch point setting:**
Setting via 3 pushbuttons



Powerful pressure monitoring



The pressure sensors of the PN7 series are characterised by a modern and user-friendly design. Thanks to their high overload protection, IP 67 and captive laser labelling, the new PN7 sensors excel even in harshest environments.

Set-up, maintenance and operation are facilitated by a 4-digit LED display, which is visible from all sides even at greater distances, and two switching status LEDs on the sensor head. 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 screwed-on sensor can be rotated in any direction. Mounting brackets, which can be obtained as an option, allow installation in any position.



Sensors with switching outputs and display with IO-Link

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN							
	G ¼ female	Display unit	0...600	800	2500	18...30	PN7160
	G ¼ female	Display unit	0...400	800	1700	18...30	PN7070
	G ¼ female	Display unit	0...250	500	1100	18...30	PN7071
	G ¼ female	Display unit	0...100	300	650	18...30	PN7092
	G ¼ female	Display unit	0...25	150	350	18...30	PN7093
	G ¼ female	Display unit	-1...10	75	150	18...30	PN7094
	G ¼ female	Display unit	0...2.5	20	50	18...30	PN7096
	G ¼ female	Display unit	-1...1	10	30	18...30	PN7099
	G ¼ female	Display unit	0...1	10	30	18...30	PN7097
	G ¼ male / M5 female	Display unit	0...600	800	2500	18...30	PN7560
	G ¼ male / M5 female	Display unit	0...400	800	1700	18...30	PN7570
	G ¼ male / M5 female	Display unit	0...250	500	1100	18...30	PN7571
	G ¼ male / M5 female	Display unit	0...100	300	650	18...30	PN7592
	G ¼ male / M5 female	Display unit	0...25	150	350	18...30	PN7593
	G ¼ male / M5 female	Display unit	-1...10	75	150	18...30	PN7594
	G ¼ male / M5 female	Display unit	0...2.5	20	50	18...30	PN7596
	G ¼ male / M5 female	Display unit	-1...1	10	30	18...30	PN7599
	G ¼ male / M5 female	Display unit	0...1	10	30	18...30	PN7597

Accessories

Type	Description	Order no.
	Angle bracket · Housing materials: PA66-	E30421
	Protective cover · for fluid sensors with M12 connector · Housing materials: Polypropylene homopolymer	E30420
	label tag · for fluid sensors · Housing materials: PA	E30422

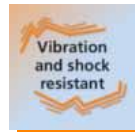
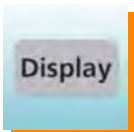


For industrial applications

Pressure sensor PN7 with two switching outputs and NPT or UNF process connection



- Two switching outputs
- High switch point accuracy and switching frequency
- Highly overload-resistant ceramic measuring cell for more than 100 million switching operations
- Different versions with pressure ranges between -1...400 bar
- Clear and easy operating concept with extended features for optimum use



Long-term stability

The maximum robustness and long life ensure trouble-free and reliable operation of the pressure sensors. The ceramic-capacitive measuring principle with a special support of the measuring diaphragm makes the pressure sensors immune to overload operation and high pressure peaks.

Worldwide use for reduced storage

For the pressure switch PN7 the output logic of the switching function can be changed from PNP to NPN.









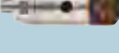
UNF process connection

For pressure sensors with UNF process connection the pressure unit psi is set at the factory.



ifm sensors are adapted to the needs of the different markets.

Sensors with switching outputs and display

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN							
	¼" NPT female	Display unit	0...400	800	1700	18...30	PN7270
	¼" NPT female	Display unit	0...250	500	1100	18...30	PN7271
	¼" NPT female	Display unit	0...100	300	650	18...30	PN7292
	¼" NPT female	Display unit	0...25	150	350	18...30	PN7293
	¼" NPT female	Display unit	-1...10	75	150	18...30	PN7294
	¼" NPT female	Display unit	0...2.5	20	50	18...30	PN7296
	¼" NPT female	Display unit	0...1	10	30	18...30	PN7297
	¼" NPT female	Display unit	-1...1	10	30	18...30	PN7299
	7/16-20 UNF (SAE)	Display unit	0...400	800	1700	18...30	PN7370
7/16-20 UNF (SAE)	Display unit	0...100	300	650	18...30	PN7392	
	¼" NPT male	Display unit	-1...10	75	150	18...30	PN7694
	¼" NPT male	Display unit	0...100	300	650	18...30	PN7692
	¼" NPT male	Display unit	0...25	150	350	18...30	PN7693
	¼" NPT male	Display unit	0...2.5	20	50	18...30	PN7696
	¼" NPT male	Display unit	0...2.5	10	30	18...30	PN7697
	¼" NPT male	Display unit	-1...1	10	30	18...30	PN7699
	¼" NPT male	Display unit	0...400	800	1700	18...30	PN7670
	¼" NPT male	Display unit	0...250	500	1100	18...30	PN7671



For industrial applications

Pressure sensor PN3 with switching output and analogue output



- Selectable analogue output and integrated switching functions
- Country-specific pressure units, selectable in bar/mbar, kPa/MPa, psi
- Memory function for the highest measured system pressure
- 4-digit 10-segment display for set and measured values
- High switch point accuracy and switching frequency



Robust and convenient

The maximum robustness and long life ensure trouble-free and reliable operation of the ifm pressure sensors. The ceramic-capacitive measuring principle with a special support of the measuring diaphragm makes the pressure sensors immune to overload operation and high pressure peaks. Maximum pressure peaks can be saved and read in negative as well as in positive measuring ranges.

The user can choose between the analogue output functions 4...20 mA or 0...10 V and a binary switching output. In addition, all parameters can be read and set conveniently via an interface on the PC.



Worldwide use for reduced storage

For the pressure sensors of the PN3 series, the pressure units indication (bar/mbar, kPa/MPa, psi) can be freely selected, allowing OEMs to use the same type of pressure sensor regardless of the country where the machine is to be installed.



Pressure sensors for universal use.

Sensors with switching outputs and analogue outputs and display

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function normally open / closed programmable; 4...20 mA or 0...10 V · DC PNP							
	G ¼ female	Display unit	0...600	800	2500	18...30	PN3160
	G ¼ female	Display unit	0...400	800	1700	18...30	PN3070
	G ¼ female	Display unit	0...250	500	1200	18...30	PN3071
	G ¼ female	Display unit	0...100	300	650	18...30	PN3092
	G ¼ female	Display unit	0...25	150	350	18...30	PN3093
	G ¼ female	Display unit	-1...10	75	150	18...30	PN3094
	G ¼ female	Display unit	0...2.5	20	50	18...30	PN3096
	G ¼ female	Display unit	-1...0	20	50	18...30	PN3129
	G ¼ female	Display unit	0...1	10	30	18...30	PN3097
	G ¼ male / M5 female	Display unit	0...100	300	650	18...30	PN3592
	G ¼ male / M5 female	Display unit	0...25	150	350	18...30	PN3593
	G ¼ male / M5 female	Display unit	0...10	75	150	18...30	PN3594
	G ¼ male / M5 female	Display unit	0...2.5	20	50	18...30	PN3596
	G ¼ male / M5 female	Display unit	0...1	10	30	18...30	PN3597
	G ¼ male / M5 female	Display unit	0...600	800	2500	18...30	PN3560
	G ¼ male / M5 female	Display unit	0...400	800	1700	18...30	PN3570
G ¼ male / M5 female	Display unit	0...250	500	1200	18...30	PN3571	

Accessories

Type	Description	Order no.
	Adapter · G ¼ male - G ¼ male · Housing materials: 1.4404 / sealing ring: FKM	E30143
	Protective cover · for fluid sensors with M12 connector · Housing materials: Polypropylene homopolymer	E30420
	Angle bracket · Housing materials: PA66-	E30421
	label tag · for fluid sensors · Housing materials: PA	E30422

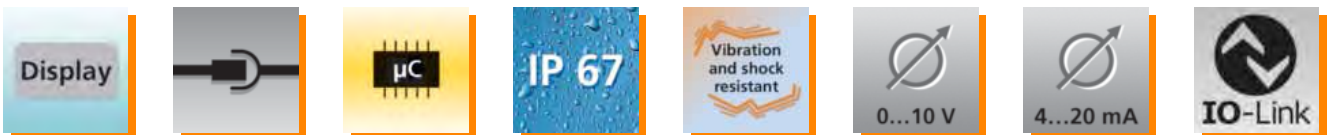


For industrial applications

Pressure sensor PN2 with analogue and switching outputs



- Analogue output scalable and selectable: 0...10 V / 4...20 mA
- Switching output function NO/NC programmable
- Switching output logic (NPN/PNP) selectable
- Country-specific pressure units
- Parameter setting, diagnosis and transmission of process values via IO-Link



Robust measuring cell

Long-term stability and highly robust design ensure a trouble-free and reliable operation. The ceramic-capacitive measuring principle with a special support of the measuring diaphragm makes the sensors immune to overload operation and high pressure peaks.

Adaptation to the controller

The analogue output of the sensor, which can be set to either 4 ... 20 mA or 0 ... 10 V, can be very easily adapted to match the actually required measuring range. Parameters ASP (analogue start point) and AEP (analogue end point) enable user-specific setting of the sensor's zero point and span.

Worldwide use for reduced storage

For the pressure sensor PN2 the output logic (PNP or NPN) is just as selectable as the pressure units (bar /mbar, KPa/MPa, psi), allowing OEMs to use the same type of pressure sensor regardless of the country where the machine is to be installed.



Pressure sensor PN2 with IO-Link

IO-Link is a simple, point-to-point communication protocol between an IO-Link enabled device (typically a sensor or actuator) and an IO-Link master. This technology has now been implemented in the pressure sensors of the PN2 series.






Using IO-Link, machine parameters can be transferred to higher control levels.

Sensors with switching outputs and analogue outputs and display

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 2 x normally open / closed programmable or 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V; scaleable 1:5) · DC PNP/NPN							
	G ¼ female	Display unit	0...400	800	1700	18...30	PN2070
	G ¼ female	Display unit	0...250	500	1200	18...30	PN2071
	G ¼ female	Display unit	0...100	300	650	18...30	PN2092
	G ¼ female	Display unit	-1...25	150	350	18...30	PN2093
	G ¼ female	Display unit	-1...10	75	150	18...30	PN2094
	G ¼ female	Display unit	-0.125...2.5	20	50	18...30	PN2096
	G ¼ female	Display unit	-0.05...1	10	30	18...30	PN2097
	G ¼ female	Display unit	-0.0125...25	10	30	18...30	PN2098
	G ¼ female	Display unit	-1...1	10	30	18...30	PN2099
	G ¼ male / M5 female	Display unit	0...600	800	2500	18...30	PN2560
	G ¼ male / M5 female	Display unit	0...400	800	1700	18...30	PN2570
	G ¼ male / M5 female	Display unit	0...250	500	1200	18...30	PN2571
	G ¼ male / M5 female	Display unit	0...100	300	650	18...30	PN2592
	G ¼ male / M5 female	Display unit	-1...25	150	350	18...30	PN2593
	G ¼ male / M5 female	Display unit	-1...10	75	150	18...30	PN2594
	G ¼ male / M5 female	Display unit	-0.125...2.5	20	50	18...30	PN2596
	G ¼ male / M5 female	Display unit	-0.05...1	10	30	18...30	PN2597
	G ¼ male / M5 female	Display unit	-0.5...0.5	10	30	18...30	PN2569
	G ¼ male / M5 female	Display unit	-0.0125...0.25	10	30	18...30	PN2598
G ¼ male / M5 female	Display unit	-1...1	10	30	18...30	PN2599	

Accessories

Type	Description	Order no.
	Protective cover · for fluid sensors with M12 connector · Housing materials: Polypropylene homopolymer	E30420
	Angle bracket · Housing materials: PA66-	E30421
	label tag · for fluid sensors · Housing materials: PA	E30422

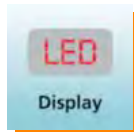
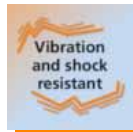


For industrial applications

Fully electronic contact manometer



- Optimum readability and electronic pointer display mean reliable operation
- Rotatable display with LED bar graph for switch point indication
- Output functions programmable via LED display and optical touch fields
- G 1/2 manometer connection
- Pressure range up to 400 bar

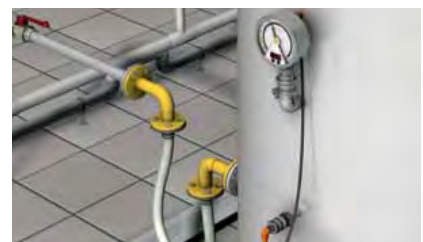
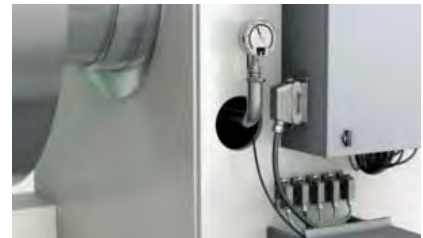


Electronic "contact manometer" PG

In many industrial areas mechanical contact manometers are often used because of their highly visible display.

The electronic "contact manometer" of the series PG combines the high visibility of a manometer display with the advantages of an electronic pressure sensor, for example the programmable switching and analogue output (scalable), the high overload protection as well as the integrated temperature compensation.

The LED bar graph shows set and reset points, trends and the limits of dynamic pressure fluctuations, if any. The pointer is controlled via a stepping motor as it has been tried and tested many times in cars (tachometer). When disconnected, the pointer is not visible.



Electronic contact manometers with switching output and analogue output

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 1 x normally open / closed programmable + 1 x analogue (4...20 / 20...4 mA, scalable) · DC PNP/NPN							
	G ½ male	Display unit	0...400	800	1200	18...32	PG2450
	G ½ male	Display unit	0...250	600	1000	18...32	PG2451
	G ½ male	Display unit	0...100	300	700	18...32	PG2452
	G ½ male	Display unit	-1...25	100	300	18...32	PG2453
	G ½ male	Display unit	-1...10	50	150	18...32	PG2454
	G ½ male	Display unit	-1...4	30	100	18...32	PG2455
	G ½ male	Display unit	-0.125...2.5	20	50	18...32	PG2456
	G ½ male	Display unit	-0.05...1	10	30	18...32	PG2457
	G ½ male	Display unit	-1...1	10	30	18...32	PG2409

Connectors

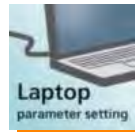
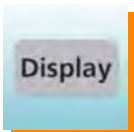
Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC004
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005



Flush pressure sensors for hydrostatic level measurement



- Continuous level and point level measurement with analogue / switching output
- Irrespective of conductivity and dielectrics of the medium
- High precision and absolute long-term stability due to ceramic measuring cell
- Flush process connection
- Process connection G 1 male



Level detection

For hydrostatic level detection of liquids in tanks and vessels, special requirements are made on the measuring device and process connection.

Apart from high accuracy and long-term stability, the sensor must meet the highest hygienic requirements. The pressure sensors meet these requirements to a particular degree.




Advantages

ifm pressure sensors feature a ceramic measuring cell which is largely resistant to aggressive media and abrasion, allowing use in a wide range of applications.

Flush mount installation in the tank or vessel wall ensures reliable cleaning and sterilisation in the process. The housing is potted, so offering optimum protection against humidity and chemicals.






Flush pressure sensors with display

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 1 x normally open / normally closed programmable + 1 x normally open / normally closed programmable or 1 x analogue (4...20 / 20...4 mA, scalable) · 2 wires DC / 3 wires DC PNP/NPN							
	Sealing cone G1 male	Display unit	-1...10	50	150	20...32	PI2894*
	Sealing cone G1 male	Display unit	-0.05...1	10	30	20...32	PI2897*
	Sealing cone G1 male	Display unit	-0.0124...0.25	10	30	20...32	PI2898*



* Attention: The unit must only be installed in a process connection for G1 sealing cone!
The G1 male sealing cone of the unit is only suited for adapters with metal end stop!

Electronic contact manometers with switching output and analogue output

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 1 x normally open / closed programmable + 1 x analogue (4...20 / 20...4 mA, scalable) · DC PNP/NPN							
	Sealing cone G1 male	Display unit	-1...10	50	150	18...32	PG2894*
	Sealing cone G1 male	Display unit	-0.05...1	10	30	18...32	PG2897*
	Sealing cone G1 male	Display unit	-0.0124...0.25	10	30	18...32	PG2898*

* Attention: The unit must only be installed in a process connection for G1 sealing cone!
The G1 male sealing cone of the unit is only suited for adapters with metal end stop!

Electronic pressure sensors without display

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · 2-wire DC; 3-wire DC							
	Sealing cone G1 male	–	ASP = 0.0 mbar; AEP = 1000 mbar	10	30	18...30	PM1607
	Sealing cone G1 male	–	ASP = 0.0 mbar; AEP = 250 mbar	10	30	18...30	PM1608

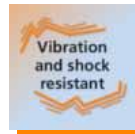


For industrial applications

Pressure sensor PK with easy-turn operating concept



- Simple switch point setting via two setting rings with optimum readability
- Robust stainless steel measuring cell
- Mechanical locking prevents inadvertent switch point manipulation
- High bursting pressure range for gaseous and liquid media
- Ideal use in accumulator charging circuits, hydraulic and pneumatic applications



The easy operating concept

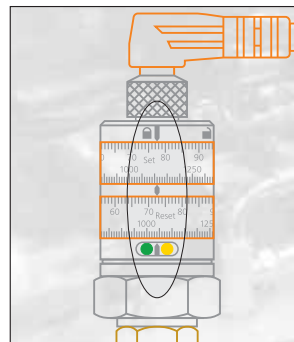
The ease of handling is fascinating: Due to the radial setting rings with a unit scale for optimum readability every user can adjust the set point and reset point quickly and precisely even without system pressure being applied.

Thanks to mechanical locking unintentional manipulation is excluded. Two clearly visible LEDs indicating the switching status and operating status provide the required transparency.



Versatile use

The robust pressure sensor can be used in nearly all industrial applications, not only in standard hydraulic and pneumatic applications but also at gas pressures up to 400 bar.



The maximum robustness of the stainless steel measuring cell ensures high long-term stability and wear-free operation over millions of pressure cycles.



PK sensors with mechanical setting and switching outputs

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function  · DC PNP							
	¼" NPT male / M5 female	Operation	0...400	600	1600	9.6...32	PK6220
	¼" NPT male / M5 female	Operation	0...100	200	1000	9.6...32	PK6222
	¼" NPT male / M5 female	Operation	0...10	25	300	9.6...32	PK6224
	G ¼ male / M5 female	Operation	0...400	600	1600	9.6...32	PK6520
	G ¼ male / M5 female	Operation	0...250	400	1000	9.6...32	PK6521
	G ¼ male / M5 female	Operation	0...100	200	1000	9.6...32	PK6522
	G ¼ male / M5 female	Operation	0...25	60	500	9.6...32	PK6523
	G ¼ male / M5 female	Operation	0...10	25	300	9.6...32	PK6524

Accessories

Type	Description	Order no.
	Damping screw · for pressure sensors with M5 internal thread	E30057
	Protective cover · with lead seal option · for pressure sensors type PK · for temperature sensors type TK · for vibration sensors type VK · Housing materials: PP transparent	E30094

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002

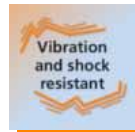


For industrial applications

Pressure sensor PK with fixed hysteresis and easy-turn operating concept



- Two separate switching outputs with fixed hysteresis (1 %)
- Simple switch point setting via two setting rings with optimum readability
- Robust stainless steel measuring cell
- Mechanical locking prevents inadvertent switch point manipulation
- High bursting pressure range for gaseous and liquid media



The ingenious solution

The compact ifm pressure sensor of the PK series is the first electronic pressure sensor to feature a successful combination of very easy setting and high long-term stability. This pressure sensor is distinguished by a high pressure peak resistance and excellent resistance against aggressive media.

The easy operating concept

Thanks to the radial setting rings with a unit scale for optimum readability every user can set the switching outputs quickly and precisely even without system pressure being applied. Units with two separate switching outputs and a fixed hysteresis have now been added to this series. The fixed reset point is 1 % of the freely selected set point.


Thanks to mechanical locking unintentional manipulation is excluded. Two clearly visible LEDs indicating the switching status and operating status provide the required transparency.





PK sensors with mechanical setting and switching outputs

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
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M12 connector · Output function  /  · DC PNP

	G ¼ male / M5 female	Switching status	0...400	600	1600	9.6...32	PK7520
	G ¼ male / M5 female	Switching status	0...250	400	1000	9.6...32	PK7521
	G ¼ male / M5 female	Switching status	0...100	200	1000	9.6...32	PK7522
	G ¼ male / M5 female	Switching status	0...25	60	500	9.6...32	PK7523
	G ¼ male / M5 female	Switching status	0...10	25	300	9.6...32	PK7524


M12 connector · Output function  · DC PNP

	G ¼ male / M5 female	Operation	0...400	600	1600	9.6...32	PK5520
	G ¼ male / M5 female	Operation	0...250	400	1000	9.6...32	PK5521
	G ¼ male / M5 female	Operation	0...100	200	1000	9.6...32	PK5522
	G ¼ male / M5 female	Operation	0...25	60	500	9.6...32	PK5523
	G ¼ male / M5 female	Operation	0...10	25	300	9.6...32	PK5524

Accessories

Type	Description	Order no.
	Damping screw · for pressure sensors with M5 internal thread	E30057
	Protective cover · with lead seal option · for pressure sensors type PK · for temperature sensors type TK · for vibration sensors type VK · Housing materials: PP transparent	E30094

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002

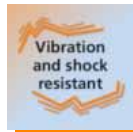


For industrial applications

Compact pressure transmitter PA with analogue current output



- 0.5 % overall accuracy
- Versions with 4...20 mA analogue output
- Long-term stability and overload protection due to the ceramic-capacitive measuring principle
- Excellent price / performance ratio
- Different versions with pressure ranges between -1...600 bar



Precise and compact

The pressure transmitter family PA is distinguished by a high total accuracy of 0.5 % and a compact housing. The tried-and-tested pressure sensing principle using a ceramic-capacitive measuring cell ensures reliable and long-term stable analogue values in mobile and stationary hydraulic applications.

The compact housing design allows easy installation of the units in narrow applications that are difficult to access.


Long-term stability

The maximum robustness and long life ensure trouble-free and reliable operation of the pressure transmitters. The ceramic-capacitive measuring principle with a special support of the measuring diaphragm makes the pressure transmitters immune to overload operation and high pressure peaks.




Long-term stable analogue values ensure reliable monitoring of hydraulic power packs.


PA sensors for industrial applications with analogue outputs

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 4...20 mA · DC							
	G ¼ female	–	0...600	800	1200	9.6...32	PA3060
	G ¼ female	–	0...400	600	1000	9.6...32	PA3020
	G ¼ female	–	0...250	400	850	9.6...32	PA3021
	G ¼ female	–	0...100	300	650	9.6...32	PA3022
	G ¼ female	–	0...25	150	350	9.6...32	PA3023
	G ¼ female	–	0...10	75	150	9.6...32	PA3024
	G ¼ female	–	0...2.5	20	50	9.6...32	PA3026
	G ¼ female	–	0...1	10	30	9.6...32	PA3027
	G ¼ female	–	0...0.25	10	30	9.6...32	PA3028
	G ¼ female	–	-1...0	10	30	9.6...32	PA3029

Adapters

Type	Description	Order no.
	Adapter · G ¼ A - G ¼ A · Housing materials: 1.4404 / sealing ring: FKM	E30143

Accessories

Type	Description	Order no.
	Threshold display · 4...20 mA analogue input · transistor output · IO-Link interface · 4-digit alphanumeric display / alternating indication of red and green · Conversion of analogue measured values to an IO-Link communication · M12 connectors · Housing materials: PA	DP2200

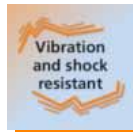


For industrial applications

Compact pressure transmitter PA with analogue voltage output



- 0.5 % overall accuracy
- Versions with 0...10 V analogue output
- Long-term stability and overload protection due to the ceramic-capacitive measuring principle
- Excellent price / performance ratio
- Different versions with pressure ranges between -1...600 bar



Precise and compact

The pressure transmitter family PA is distinguished by a high total accuracy of 0.5 % and a compact housing. The tried-and-tested pressure sensing principle using a ceramic-capacitive measuring cell ensures reliable and long-term stable analogue values in mobile and stationary hydraulic applications.

The compact housing design allows easy installation of the units in narrow applications that are difficult to access.


Long-term stability

The maximum robustness and long life ensure trouble-free and reliable operation of the pressure transmitters. The ceramic-capacitive measuring principle with a special support of the measuring diaphragm makes the pressure transmitters immune to overload operation and high pressure peaks.




Long-term stable analogue values ensure reliable monitoring of hydraulic power packs.


PA sensors for industrial applications with analogue outputs

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 0...10 V · DC							
	G ¼ female	–	0...600	800	1200	16...32	PA9060
	G ¼ female	–	0...400	600	1000	16...32	PA9020
	G ¼ female	–	0...250	400	850	16...32	PA9021
	G ¼ female	–	0...100	300	650	16...32	PA9022
	G ¼ female	–	0...25	150	350	16...32	PA9023
	G ¼ female	–	0...10	75	150	16...32	PA9024
	G ¼ female	–	0...2.5	20	50	16...32	PA9026
	G ¼ female	–	0...1	10	30	16...32	PA9027
	G ¼ female	–	0...0.25	10	30	16...32	PA9028
	G ¼ female	–	-1...0	10	30	16...32	PA9029

Adapters

Type	Description	Order no.
	Adapter · G ¼ A - G ¼ A · Housing materials: 1.4404 / sealing ring: FKM	E30143

Accessories

Type	Description	Order no.
	Threshold display · 4...20 mA analogue input · transistor output · IO-Link interface · 4-digit alphanumeric display / alternating indication of red and green · Conversion of analogue measured values to an IO-Link communication · M12 connectors · Housing materials: PA	DP2200



For industrial applications

PS7 – control unit for part seat monitoring



- Adjustment to the required gap distance using the mechanical setting dial
- Ceramic-capacitive measured value acquisition for maximum long-term stability
- Low supply pressures for process-optimised use
- Two switch points: fine / course detection or additional function check
- Non-contact measurement in the micrometre range

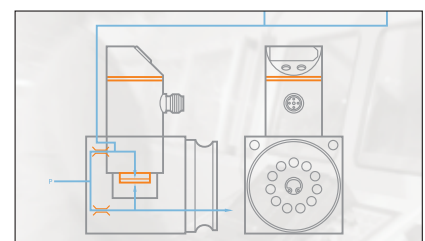


Detection of very small gap distances


Metal forming and machining to assembly automation, workpiece positioning and gap detection in harsh operating conditions (dirt, extreme temperatures) continue to present a challenge for project engineers. Whether workpiece or tool, pallet or conical spindle insert - the success of the machining operation depends on a clear position definition with gap distances sometimes down to 0.01 mm. The pneumatic backpressure measurement system is used to blow the work surface clean. At the same time the required gap distances are clearly detected and converted into good signals.

Advantages and customer's benefits




The integrated pneumatic bridge circuit of the PS7 system effectively “de-couples” the measurement result from the fluctuations in supply pressure. Supported with the electronic display the bridge can be adjusted repeatably and documentably by turning the patented setting dial. Adjustment, menu navigation and saving the values for set-up, operation and maintenance are easy to understand. The PS7 system can be protected both mechanically and electronically against unauthorised access.







Part seat monitoring

Type	Description	Order no.
	Control unit for part seat monitoring · Setting by adjustment of the pneumatic bridge · Integrated pressure sensor with 2 switching outputs · and 4-digit alphanumeric display for trend display or display of current pressure · Cable	PS7570

Accessories

Type	Description	Order no.
	Thread extension · G 1/8 · Housing materials: Brass nickel-plated / sealing: NBR	E30075
	Connector · QS-G 1/8-6 · with hexagonal socket 4 mm a/f · for tube with Ø 6 mm · Housing materials: steel / PBT / Brass / aluminium	E30076
	Connector · QS-G 1/8-8 · with hexagonal socket 5 mm a/f · for tube with Ø 8 mm · Housing materials: steel / PBT / Brass / aluminium	E30077

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC004
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005

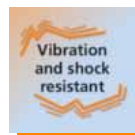


For industrial applications

Electronic pressure sensor PNI with analogue input



- Evaluation of external voltage / current values
- Continuous comparison of set / actual values directly in the sensor
- Integrated special functions for adaptation to specific tasks
- 4-digit LED display, pressure indication in bar, psi and MPa
- Differential pressure monitoring by processing a pressure transmitter signal



Adjustable switch point

Variable pressures in the clamp hydraulics of a machine tool: It is a big advantage if the switch point of the pressure sensor can be adjusted electronically according to the valve position. The clamping pressure is to be within a variable acceptable range (window). If the pressure is outside the preset window, the respective switch point is not active. What is particular is that the range is adjusted automatically depending on the situation using an external analogue signal.

Differential pressure switch

By evaluating the analogue signal of an external pressure transmitter the sensor switches if the pressure is above or below the set differential pressure. Applications are, for example, filter monitoring or airlocks.


Functionality

The two freely configurable switching outputs of the pressure sensor can be continuously adjusted using an analogue input signal (0/4 - 20 mA / 0 - 10 V). The display indicates either the input pressure, the output pressure or the differential pressure.




Differential pressure measurement in filter monitoring.




PNI sensors with analogue input

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN							
	G ¼ female	Display unit	0...250	400	850	18...30	PNI021
	G ¼ female	Display unit	0...100	300	650	18...30	PNI022
	G ¼ female	Display unit	0...25	100	350	18...30	PNI023
	G ¼ female	Display unit	0...10	50	150	18...30	PNI024

Accessories

Type	Description	Order no.
	T splitter · M12 x 1 · Orientation: · connectors A / B horizontal (for a vertical sensor) · Housing materials: PUR	E11566
	T splitter · M12 x 1 · Orientation: · connectors A / B vertical (for a vertical sensor) · Housing materials: PUR	E11696

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002
Socket M12, 8/7-pole, 8-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: PUR	E11231
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: PUR	E11232

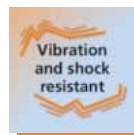


For industrial applications

Compact pressure sensors for pneumatics



- **Extended diagnostics:** minimum and maximum value memory detects pressure fluctuations
- **Slanted display for good readability and handling**
- **Two-colour display for indication of the switching status**
- **Easy installation using integrated mounting holes and accessories**
- **One switching and one analogue output for great flexibility in use**



Pneumatics at a glance

The PQ series pressure sensors are designed to monitor system pressure in pneumatic and compressed-air networks of machines and plants. The sensors can be used for both relative and differential pressure measurement. This makes them particularly suited for monitoring of filters for soiling or clogging. The measuring cell is insensitive to liquids or deposits that might occur in the system. It is overload protected and highly accurate.

A 4-digit LED display, which can be seen from a distance and easily read, and two pushbuttons allow easy set-up, maintenance and operation of the sensor. The display can be switched from the indication of "red" to an alternating indication of "red - green". So, switching states can be highlighted.




Thanks to the two-coloured display, interpreting the indicated values is easy.


Sensors for pneumatic applications

Type	Process connection	Display	Measuring range [bar]	Poverload max. [bar]	Pbursting min. [bar]	U _b DC [V]	Order no.
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M8 connector · Output function 1 x NO / NC programmable + 1 x current output · DC PNP

	G 1/8 female / M5 female	Display unit	-1...1	20	30	18...32	PQ3809
	G 1/8 female / M5 female	Display unit	-1...10	20	30	18...32	PQ3834

M8 connector · Output function 2 x normally open / closed programmable or 1 x normally open / closed programmable + 1 x normally closed (diagnostic function) · DC PNP

	G 1/8 female	Display unit	-1...1	20	30	18...32	PQ7809
	G 1/8 female	Display unit	-1...10	20	30	18...32	PQ7834

Accessories

Type	Description	Order no.
	DIN rail clip · Housing materials: stainless steel	E37340
	Adapter · R1/8 - R1/8 · rotatable · Housing materials: Brass nickel-plated	E37350

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Pro-tection	LEDs	Order no.
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Socket M8, 4-pole, 4-wire

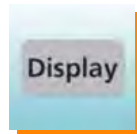
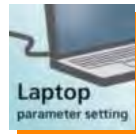
	2 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC150
	5 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC151
	10 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC152
	2 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC153
	5 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC154
	10 m black PUR cable	4 x 0.25 mm ² , Ø 3.7 mm	TPU / Brass	50 AC 60 DC	-25...90	IP 65 / IP 67 / IP 68 / IP 69K	-	EVC155



IO-Link displays: process values at a glance



- Plug & play process value display for ifm IO-Link sensors
- Display for freely defined texts, measured values and messages
- Up to four process values / texts with unit and description
- Two clearly visible LEDs
- Easy integration into each IO-Link structure



More plant transparency

The two IO-Link displays are a flexible solution to display process conditions and messages in plant modules or small plants.

Integration and function



The E30391 IO-Link display is controlled by a PLC via IO-Link. It displays process values, freely defined texts, messages, and QR codes. Clear text and a colour change of text and background guarantee a quick overview. By means of buttons the user can trigger control actions of the PLC or acknowledge messages.

The E30430 IO-Link inline display is installed between sensor and IO-Link master. It receives process values directly from the sensor. No PLC programming is required. It displays up to four process values and two switching states. For ifm units operated in the IO-Link mode, it is a plug & play solution.

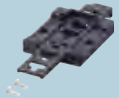
Alternatively, texts and settings can be predetermined via an IO-Link device tool such as LR DEVICE.




IO-Link displays

Type	Description	Order no.
	IO-Link display unit · Connector · Housing materials: stainless steel / PC / PBT-GF 30 / PPS / FKM / PA66 GF30	E30391
	IO-Link display unit · IO-Link inline display for visualising process data of a connected IO-Link sensor; plug & play for ifm devices; internal updatable ifm device catalogue · Connector · Housing materials: stainless steel / PC / PBT-GF 30 / PPS / FKM	E30430

Accessories

Type	Description	Order no.
	DIN rail clip · for IO-Link display unit · Housing materials: PA / stainless steel	E30429

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Protection	LEDs	Order no.
Y splitter , 5-pole								
	M12 connector	–	PUR / diecast zinc	60 DC	-25...85	IP 67	–	E12481

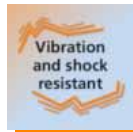


For industrial applications

Flow sensor in robust stainless steel housing



- Increased repeatability across the extended measuring range
- Simplified setting mode for quick set-up
- Variable process connection using adapters
- Reliable monitoring of gases and liquids
- Electronic locking of the set values



Simple, fast and flexible installation

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.

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



A pushbutton is used for flow range and switch point setting. 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.



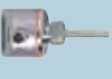
Compact housings for adapters for flow monitoring

Type	Setting range liquids / gases [cm/s]	Material sensor tip	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
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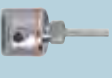
M12 connector · Output function / · DC PNP

	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	30	1...10	19...36	SI5000
	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	300	1...2 / 1...10	18...36	SI5010

M12 connector · Output function 2 x normally open / closed programmable · DC PNP

	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	300	1...10	18...36	SI5002
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M12 connector · Output function 4...20 mA analogue · DC

	3...300 / -	stainless steel 316L / 1.4404	-25...80	300	1...10	19...36	SI5004
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Compact designs for adapter with flow and temperature monitoring

Type	Setting range liquids / gases [cm/s]	Material sensor tip	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
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M12 connector · Output function 2 x normally open / closed programmable · DC PNP

	3...300 / 200...3000	stainless steel 316L / 1.4404	-25...80	300	1...10	18...36	SI5007
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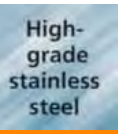


For industrial applications

Calorimetric flow meters for liquids and gases



- Optimised for water, oils, glycol and air
- Fast response time and integrated temperature measurement
- Red/green colour change for process values
- Internal pipe diameter selectable from 15...400 mm
- The process connection can be rotated for optimum alignment



Measurement technique

The SA type flow meter operates on the calorimetric measuring principle. Two measuring elements as well as a heat source are located on the measuring tip. The physical effect that a flowing medium absorbs heat energy and conducts it away is used. The resulting temperature change is an indication of flow.

Device function

The new SA type sensor has been designed to detect and measure flow and temperature even in large internal pipe diameters up to 400 mm. Therefore it serves different applications. Switching outputs, analogue signals and IO-Link provide various options to further process the signals.

Flow meters with integrated temperature measurement

Type	Setting range liquids / gases [cm/s]	Material sensor tip	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
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**M12 connector · Output function OUT1: normally open / normally closed programmable or frequency or IO-Link
OUT2: normally open / normally closed programmable or frequency or analogue (4...20 mA scaleable)**

	0.04...3	stainless steel (316L / 1.4404)	-20...90	100	0.5	18...30	SA2000
	0.04...3	stainless steel (316L / 1.4404)	-20...90	100	0.5	18...30	SA5000
	0.04...3	stainless steel (316L / 1.4404)	-20...100	50	0.5	18...30	SA4100
	0.04...3	stainless steel (316L / 1.4404)	-20...100	50	0.5	18...30	SA4300

M12 connector · Output function OUT1: analogue (4...20 mA scaleable) OUT2: Analogue (4...20 mA scaleable)

	0.04...3	stainless steel (316L / 1.4404)	-20...90	100	0.5	18...30	SA2004
	0.04...3	stainless steel (316L / 1.4404)	-20...90	100	0.5	18...30	SA5004
	0.04...3	stainless steel (316L / 1.4404)	-20...100	50	0.5	18...30	SA4104
	0.04...3	stainless steel (316L / 1.4404)	-20...100	50	0.5	18...30	SA4304

Accessories

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Progressive ring fitting · Ø 8 mm - G1/2 · Housing materials: stainless steel / sealing ring: FKM	E40258
	Progressive ring fitting · Ø 8 mm - G 1/4 · Housing materials: stainless steel / sealing ring: FKM	E40259
	Progressive ring fitting · Ø 8 mm - G 3/4 · Housing materials: stainless steel / sealing ring: FKM	E40260



Magnetic-inductive inline flow meter



- With volumetric flow quantity, total quantity and temperature indication
- High accuracy, repeatability and measurement dynamics
- Suitable for conductive media from 20 $\mu\text{S}/\text{cm}$, flow rate up to 100 l/min
- Binary, analogue and pulse outputs for signal processing
- Different process connections using adapters



Measuring principle

The flow meter is based on Faraday's principle 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.

Device function


This voltage is tapped via electrodes and converted in the evaluation electronics. Analogue, binary and pulse outputs offer various possibilities to process the measured data. Due to the flexible programming via pushbuttons the flow meter can be adapted to different conditions. It is installed using an adapter. The unit features a high protection rating and a robust, compact housing.





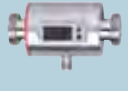
Magnetic-inductive flow meters with integrated temperature measurement (sealing material FKM)

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
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M12 connector · Output function OUT1: normally open / normally closed programmable or pulse or frequency or empty pipe detection or IO-Link OUT2: normally open / normally closed programmable or analogue (4...20 mA; 0...10 V, scalable) or empty pipe detection · DC PNP/NPN

	G2 flat seal	8...600	-10...70	16	< 0.35	18...32	SM2000
	G2 flat seal	6.5...300	-10...70	16	< 0.35	18...32	SM9000



M12 connector · Output function OUT1: normally open / closed programmable or pulse OUT2: normally open / closed programmable or analogue (4...20 mA / 0...10 V, scaleable) · DC PNP/NPN

	G½	0.25...25.00	-10...70	16	< 0.150	18...30	SM6000
	G¾	0.5...50.0	-10...70	16	< 0.150	18...30	SM7000
	G1	0.7...100.0	-10...70	16	< 0.150	18...30	SM8000

M12 connector · Output function OUT1: normally open / closed programmable or pulse or IO-Link OUT2: normally open / closed programmable or analogue (4...20 mA / 0...10 V, scaleable) · DC PNP/NPN

	G ¼ flat seal	20...3000 ml/min	0...60	10	< 0.150	18...30	SM4000
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Cooling water control panels

Type	Description	Order no.
	Cooling water control panel · M22 x 1.5 A · Housing materials: pipes: stainless steel	ZZ0432
	Cooling water control panel · G ½ I · Housing materials: pipes: stainless steel	ZZ0452

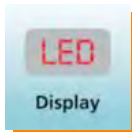


For industrial applications

Ultrasonic flow meter in robust inline design



- With volumetric flow quantity, total quantity and medium temperature display
- Suited for water up to a flow rate of 100 litres per minute
- Binary, analogue and pulse outputs for signal processing
- High measurement dynamics and resolution due to the transit time difference principle
- 4-digit alphanumeric display, LEDs for indication of units and switch points



Measuring principle

The SU type ultrasonic flow meter operates on the transit time difference principle. Two sound transducers are positioned in a defined pipe length. These sound transducers alternately emit sound pulses. The pulse trains emitted with the flow in the pipe length are transported faster to the receiver by the flowing medium. From this transit time difference results the current volumetric flow quantity.

High functionality

In addition to volumetric flow monitoring the SU also monitors the temperature of the medium. It is displayed on the unit and provided for signal processing. Therefore, the system is particularly suited for monitoring cooling circuits.

Sensor functions




Analogue, binary and pulse outputs offer various possibilities to process sensor data. Furthermore, a volumetric flow quantity, total quantity and medium temperature display is integrated.




Ultrasonic flow meters for liquids (water, glycol solutions, oils)

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
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M12 connector · Output function OUT1: normally open / closed programmable or pulse
OUT2: normally open / closed programmable or analogue (4...20 mA / 0...10 V, scaleable) · DC PNP/NPN

	G¾	0.1...50.0	-10...80	16	< 0.250	19...30	SU7000
	G1	0.2...100.0	-10...80	16	< 0.250	19...30	SU8000
	G1¼	0.4...200.0	-10...80	16	< 0.250	19...30	SU9000


M12 connector · Output function 2 x analogue (4...20 mA scalable) · DC

	G1¼	0.0...200.0	-10...80	16	< 0.250	19...30	SU9004
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M12 connector · Output function 2 x normally open / closed programmable · DC PNP

	G¾	0.1...50.0	-10...80	16	< 0.250	19...30	SU7200
	G1	0.2...100.0	-10...80	16	< 0.250	19...30	SU8200

Cooling water control panels

Type	Description	Order no.
	Cooling water control panel · M22 x 1.5 A · Housing materials: pipes: stainless steel	ZZ0057

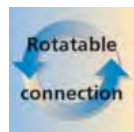


For industrial applications

Inline vortex flow meters with versatile multi-colour display



- Makes the purchase of further sensors superfluous: Measurement and transmission via IO-Link
- Minimum / maximum value memory for extended diagnostics
- Electronically rotatable multi-colour display
- Rotatable G, R or NPT process connections as option
- Can be used for water with and without conductivity (deionised water)



Turbulence as a measure for the flow





Behind a bluff body integrated in the measuring pipe, the flowing medium generates swirling vortices depending on its velocity. These vortices are detected by a piezo-ceramic sensor. If the cross-section is known, the number of the vortices allows to determine the flow rate.

This flow rate measurement principle, known as vortex principle, is virtually independent of pressure and temperature fluctuations of the medium. It allows a simple design and thus a low-cost production of sensors for flow rate measurement.


The current flow and temperature are provided either as standardised current signal (4...20 mA), as frequency signal, switching output or via IO-Link.



Flow meters with integrated temperature measurement

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector							
	G ½	1...20	-10...90	12	< 1	18...30	SV4200
	G ½	1...20	-10...90	12	< 1	18...30	SV4204
	Rc ½	1...20	-10...90	12	< 1	18...30	SV4500
	Rc ½	1...20	-10...90	12	< 1	18...30	SV4504
	G ½	2...40	-10...90	12	< 1	18...30	SV5200
	G ½	2...40	-10...90	12	< 1	18...30	SV5204
	Rc ½	2...40	-10...90	12	< 1	18...30	SV5500
	Rc ½	2...40	-10...90	12	< 1	18...30	SV5504
	G ¾	5...100	-10...90	12	< 1	18...30	SV7200
	G ¾	5...100	-10...90	12	< 1	18...30	SV7204
	Rc ¾	5...100	-10...90	12	< 1	18...30	SV7500
	Rc ¾	5...100	-10...90	12	< 1	18...30	SV7504
	½" NPT	0.26...5.28	14...194	12	< 1	18...30	SV4610
	½" NPT	0.55...10.55	14 ... 194	12	< 1	18...30	SV5610
	¾" NPT	1.3...26.4	14...194	12	< 1	18...30	SV7610

Accessories for flow sensors

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390

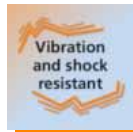


For industrial applications

Robust mechatronic flow sensor



- Volumetric flow quantities: 15 l/min, 25 l/min, 50 l/min, 100 l/min, 200 l/min
- Fast response time ≤ 10 ms
- Easy handling: Switch points can be (pre)set continuously
- Binary switching output
- Pressure range 25 bar



Mechatronic flow sensor

The flow sensor operates on the principle of spring-supported piston: The piston, located in the valve seat in the housing, is lifted by the flowing medium against the spring resistance. The piston position is detected by an inductive sensor and is output as a binary signal.








The spring resistance forces the piston to return to its original position with decreasing flow. This ensures position-independent installation of the flow sensor preventing backflow.

The switch points can be easily set and fixed via a setting screw. The robust mechanical design ensures use in harsh environments. The units are maintenance-free.






Fast response time in cooling circuits to protect welding guns and transformers.

Mechatronic flow sensors for liquids

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector · Output function  · DC PNP							
	Rp 1/2	2...20	0...85	25	< 0.01	10...30	SBY323
	Rp 3/4	1...15	0...85	40	< 0.01	10...30	SBY332
	Rp 3/4	1...25	0...85	40	< 0.01	10...30	SBY333
	Rp 3/4	2...50	0...85	40	< 0.01	10...30	SBY334
	Rp 1	5...100	0...85	25	< 0.01	10...30	SBY346
	Rp 1 1/2	20...200	0...85	25	< 0.01	10...30	SBY357

Mechatronic flow sensors for machine tools

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector · Output function  · DC PNP							
	G 1/2	0.3...25	0...60	200	< 0.01	10...30	SBU323
M12 connector · Output function analogue · DC							
	G 1/2	0.3...25	0...60	200	< 0.01	24	SBU623
	G 1/2	0.3...50	0...60	200	< 0.01	24	SBU624

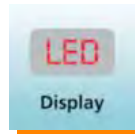


For industrial applications

Inline mechatronic flow meters with display



- Makes the purchase of further sensors superfluous: Measurement and transmission via IO-Link
- Integrated temperature measurement
- No inlet and outlet pipe lengths required
- Red/green colour change for process values
- Very fast response time of < 10 ms









Mechatronic flow sensor

The flow sensor works according to the spring-supported piston principle: The piston, located in the valve seat in the housing, is lifted by the flowing medium against the spring resistance.

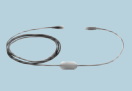
The piston position is monitored via a magnetic field sensor and is output as an analogue signal. The spring resistance forces the piston to return to its original position with decreasing flow. This ensures position-independent installation of the flow sensor preventing backflow.

The sensor head can be rotated by 360 °C so that it can be read in any position.

Mechatronic flow sensors with display

Type	Process connection	Measuring range [l/min]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
	Rp 3/4	0.3...15	-10...100	40	0.01	18...30	SBY232
	Rp 3/4	0.5...25	-10...100	40	0.01	18...30	SBY233
	Rp 3/4	1...50	-10...100	40	0.01	18...30	SBY234
	Rp 1	2...100	-10...100	25	0.01	18...30	SBY246
	Rp 1 1/2	4...200	-10...100	25	0.01	18...30	SBY257
	G 1/2	0.3...15	-10...100	40	0.01	18...30	SBG232
	G 1/2	0.5...25	-10...100	40	0.01	18...30	SBG233
	G 1/2	1...50	-10...100	40	0.01	18...30	SBG234
	G 3/4	2...100	-10...100	25	0.01	18...30	SBG246
	G 1 1/4	4...200	-10...100	25	0.01	18...30	SBG257

Accessories for flow sensors

Type	Description	Order no.
	IO-Link interface · for parameter setting and analysis of units with max. 65 mA current consumption · Supported communication protocols: IO-Link (4800 and 38400 bits/s) EPS protocol (19200 bits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30396

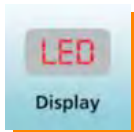


For industrial applications

Compressed air meters with display and totaliser function



- For compressed air in industrial use as well as argon (Ar), carbon dioxide (CO₂), nitrogen (N₂)
- Large measuring range up to 700 Nm³/h, detection of very small leaks
- Fast response time and high response sensitivity
- With volumetric flow quantity, total quantity and temperature indication
- Analogue, switching and pulse outputs for signal processing



Calorimetric measuring principle

The compressed air meter detects the standard volume flow directly (according to ISO 2533). This makes corrections, in case of temperature or pressure fluctuations, unnecessary. The high measurement dynamics of the system enables the reliable detection of even minute quantities, e.g. leakage. High accuracy and repeatability are ensured by the integration of the sensor's measuring elements into a defined pipe length.

All information at hand




The integral 4-digit LED display plus the status LEDs allow information to be available at the point of monitoring. Whether peak consumption, present or accumulated consumption: Set switching or alarm values can be programmed and read simply by pressing a pushbutton. All settings can be protected using the electronic lock function.

Signal processing




Switching outputs, analogue outputs and pulse outputs are available for signal processing. Parameters are set in the user menu.




Compressed air meters

Type	Process connection	Setting range [Nm ³ /h]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector · Output function OUT1: normally open / closed programmable or pulse OUT2: normally open / closed programmable or analogue (4...20 mA scaleable) · DC PNP						
	G ¼ (DN8)	0.12...15.00	16	< 0.1	18...30	SD5000
	R½ (DN15)	0.6...75.0	16	< 0.1	18...30	SD6000
	R1 (DN25)	1.8...225.0	16	< 0.1	18...30	SD8000
	R1½ (DN40)	3.5...410.0	16	< 0.1	18...30	SD9000
	R2 (DN50)	5...700	16	< 0.1	18...30	SD2000
	G 1 1	18...2110	16	< 0.1	18...30	SD0523

Compressed air meter for special gases

Type	Process connection	Setting range [Nm ³ /h]	Medium temperature [°C]	Pressure rating [bar]	Response time [s]	U _b [V]	Order no.
M12 connector · Output function OUT1: normally open / closed programmable or pulse OUT2: normally open / closed programmable or analogue (4...20 mA scaleable) · DC PNP							
	G ¼ (DN8)	N ₂ : 0.04...15.00 Ar: 0.08...24.04 CO ₂ : 0.04...14.36	0...60	16	< 0.1	18...30	SD5100
	R½ (DN15)	N ₂ : 0.2...75.0 Ar: 0.4...122.0 CO ₂ : 0.2...74.7	0...60	16	< 0.1	18...30	SD6100
	R1 (DN25)	N ₂ : 0.8...225.0 Ar: 1.2...366.6 CO ₂ : 0.8...223.6	0...60	16	< 0.1	18...30	SD8100

Adapters

Type	Description	Order no.
	Welding adapter · for compressed air meter type SD · stainless steel 316L / 1.4404	E40195



For industrial applications

Electronic point level sensors for liquid media



- Easy pushbutton adjustment in the application
- Overflow protection or normally closed / normally open programmable
- Clearly visible switching status indication
- Extended setting range for increased application reliability
- Modular mounting concept for flexible use



Application

The point level sensors have been optimised for use in hydraulic oils and coolants. They are used to monitor the minimum level, leakage or overflow of tanks. The extended setting range increases the application reliability.

Easy set-up




The new operating concept enables setting and adjustment of the output function by pressing just one pushbutton. Deposits can be suppressed during operation without carrying out a complete new adjustment.

Reliable



The LI21 series is approved to the German Federal Water Act (WHG) section 19. For the LI51 series the output function (normally open / normally closed) is programmable.



Point level sensors for oils and lubricants

Type	Probe length [mm]	Output	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
M12 connector · Output function  /  · DC PNP							
	132	normally open / closed programmable	10...36	0...35 (LI5141 + E43103: 0...65)	0...65	200	LI5141
	273	normally open / closed programmable	10...36	0...35 (LI5142 + E43100: 0...65)	0...65	200	LI5142
	481	normally open / closed programmable	10...36	0...35 (LI5143 + E43101: 0...60)	0...65	200	LI5143
	737	normally open / closed programmable	10...36	0...35 (LI5144 + E43102: 0...55)	0...65	200	LI5144

Point level sensors for oils and coolants,
approval to the German Federal Water Act (WHG), section 19

Type	Probe length [mm]	Output	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
M12 connector · Output function  · DC PNP							
	132	Normally closed	10...36	0...35	0...65	200	LI2141
	273	Normally closed	10...36	0...35	0...65	200	LI2142
	481	Normally closed	10...36	0...35	0...65	200	LI2143
	132	Normally closed	10...36	0...35	0...65	200	LI2241
	273	Normally closed	10...36	0...35	0...65	200	LI2242
	481	Normally closed	10...36	0...35	0...65	200	LI2243



For industrial applications

Electronic point level sensors LMT



- Quicker adaptation to changing conditions: transmission of the process value instead of reprogramming
- Adjustment to the medium is either preset (LMT100 / 110 / 121) or can be done using IO-Link
- Hygienic design with maintenance-free sealing concept
- Resistant to foam and deposits
- Easy mounting thanks to orientation-independent installation



Level under control

The LMT point level sensor reliably monitors the level in storage tanks or protects pumps against running dry. Its compact sensor tip allows integration even in small DN25 pipes.

“Plug & Play”

The factory setting to different types of media makes adjustment unnecessary, even for viscous and sticky products. The selection of units is based on a comprehensive list of media, i.e. one sensor for all media.

LMT121 differentiates between different media

The LMT121 can be simply adjusted to virtually any liquid and viscous medium or bulk material thanks to IO-Link. Each of the two switching outputs can be set independently of each other, so it is also possible to differentiate between two different media.






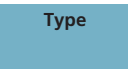


Point level monitoring of liquids even in the case of a high degree of soiling.





Point level sensors

Type	Process connection	Process pressure max. [bar]	Application	Protection	Order no.
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M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN

	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT102
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT104
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT105
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT121
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT100
	G ½ male	-1...40	liquids, viscous media and powders	IP 68 / IP 69K	LMT110



Adapters

Type	Description	Order no.
	Welding adapter · G ½ - Ø 30 mm · for tanks · Housing materials: stainless steel 316L / 1.4435	E43300
	Welding adapter · G ½ - Ø 29 mm · for pipes · Housing materials: stainless steel 316L / 1.4435	E43301
	Adapter · G ¾ · Housing materials: stainless steel 316L / 1.4435	E43302
	Adapter · G 1 · Housing materials: stainless steel 316L / 1.4435	E43303

Connectors

Type	Description	Order no.
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Socket M12, 5/4-pole, 4-wire

	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC004



For industrial applications

LMT point level sensors for maintenance-free overflow prevention to WHG*



- Flexible installation independent of the orientation
- Shock and vibration resistant in a robust stainless steel housing
- Plug & Play – Factory default setting to hydrous media
- Can be set to other media such as oil using IO-Link
- Suppression of deposits



Reliable and flexible

The LMTx9x sensor family provides dependable overflow protection. Different lengths and process connections allow versatile and position-independent installation.

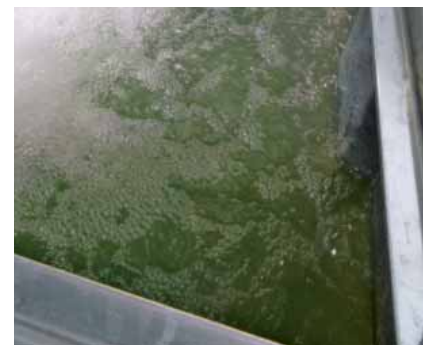
IO-Link creates transparency

The sensors can be adjusted to all liquids that are hazardous to water. Parameters are conveniently set on the PC or via IO-Link and USB interface. The digital transmission of measured values creates maximum transparency.

Robust






The high-quality high-grade stainless steel housing is shock and vibration resistant.

* (WHG = German Federal Water Act)









In spite of harsh conditions such as foam or deposits LMT194 reliably prevents overflow of the tank.

Point level sensors for oils and coolants, approval to the German Federal Water Act (WHG), section 19

Type	Process connection	Output	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
M12 connector · Application liquids							
	G 1/2 male	1 x NO / 1 x NC (WHG) PNP	18...30	-40...85 / 0...85	-40...100 / 0...100	100	LMT191
	G 1/2 male	1 x NO / 1 x NC (WHG) PNP	18...30	-25...85 / 0...85	-25...100 / 0...100	100	LMT192
	G 3/4 male	1 x NO / 1 x NC (WHG) PNP	18...30	-25...85 / 0...85	-25...100 / 0...100	100	LMT292
	G 1 male	1 x NO / 1 x NC (WHG) PNP	18...30	-25...85 / 0...85	-25...100 / 0...100	100	LMT392
	G 1/2 male	1 x NO / 1 x NC (WHG) PNP	18...30	-25...85 / 0...85	-25...100 / 0...100	100	LMT194
	G 1/2 male	1 x NO / 1 x NC (WHG) PNP	18...30	-25...85 / 0...85	-25...100 / 0...100	100	LMT195

Accessories for LMT level sensors

Type	Description	Order no.
	Adapter · G 3/4 · Housing materials: stainless steel 316L / 1.4435	E43302
	Adapter · G 1 · Housing materials: stainless steel 316L / 1.4435	E43303
	Adapter · 3/4" NPT · Housing materials: stainless steel 316L / 1.4404	E43313
	Welding adapter · G 1/2 - Ø 30 mm · for tanks · Housing materials: stainless steel 316L / 1.4435	E43300
	Welding adapter · G 1/2 - Ø 29 mm · for pipes · Housing materials: stainless steel 316L / 1.4435	E43301
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

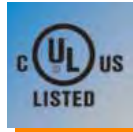


For industrial applications

Point level sensors for general use



- Most reliable deposit suppression on the market
- Flexible installation independent of the orientation
- Quicker adaptation to changing conditions: transmission of the process value instead of reprogramming
- Factory set for simple "plug & play"
- Differentiation of media by switch point setting



Level under control








The LMC family of sensors reliably monitor limit levels, e.g. in tool machines or wastewater management, and protect pumps from running dry. Rear installation permits variable installation depths and application-specific installation.

Versatile sensor for all media





The LMC can be set to almost any liquid or viscous medium and bulk materials. Permanent medium temperatures up to 100 °C or a heavy build-up are no problem. The distinction of two media is possible due to the two switching outputs which can be set independently. The parameters can be set via IO-Link and USB interface accessory.



Point level sensors for oils and lubricants

Type	Process connection	Output	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
M12 connector · Application water, water-based media						
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP/NPN	18...30	-25...100	50	LMC100
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP/NPN	18...30	-25...100	50	LMC400
M12 connector · Application oils, oil-based media						
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP/NPN	18...30	-25...100	50	LMC110
	G ½ male	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP/NPN	18...30	-25...100	50	LMC410
	½" NPT	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP/NPN	18...30	-25...100	50	LMC510
M12 connector · Application water, water-based media						
	½" NPT	OUT1: normally open / closed programmable / IO-Link OUT2: normally open / closed programmable PNP/NPN	18...30	-25...100	50	LMC500
M12 connector · Application liquids, viscous media and powders						
	½" NPT	2 x normally open / closed programmable PNP/NPN	18...30	-	100	LMC502

Accessories for LMC level sensors

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	Jumper · straight / straight · Free from halogen · 0.3 m · Housing materials: PUR	E12432
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

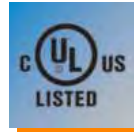


For oils and coolants

Level sensors LK



- No sticking of moving parts, e.g. floats
- Level measurement for water / oil-based media
- Integrated overflow prevention
- 4 x switching outputs, 2 x switching outputs or 1 x analogue and 1 x switching output
- Available in 3 lengths (264 mm, 472 mm and 728 mm)



Capacitive level sensor

The LK capacitive level sensor evaluates the capacitance of the medium. This measuring principle requires no moving parts and is therefore not affected by foam and soiling in the medium.

The ideal sensor for industrial applications

The LK is suitable for water/oil-based media and can therefore be used in hydraulic and coolant tanks. Thanks to the integrated overflow prevention the workshop remains dry and the tanks to be monitored remain filled.




Besides conventional set-up via pushbuttons and display, the LK family can also be configured quickly and easily via IO-Link (e.g. USB interface). IO-Link continuously transmits the level, independently of the output function of the sensor.




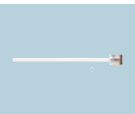

Electronic level sensors for oils and coolants

Type	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
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M12 connector (according to EN 61076-2-101) · Output function OUT1: NO / NC programmable / IO-Link
OUT2: analogue 4...20 mA / 0...10 V (invertible) · DC PNP/NPN

	264	195	18...30	0...35 / 35...65	0...70	200	LK3122
	472	390	18...30	0...35 / 35...60	0...70	200	LK3123
	728	585	18...30	0...35 / 35...55	0...70	200	LK3124


M12 connector (according to EN 61076-2-101) · Output function OUT1: normally open / closed programmable / IO-Link
OUT2: normally open / closed programmable · DC PNP/NPN

	264	195	18...30	0...35 / 35...65	0...70	200	LK1022
	472	390	18...30	0...35 / 35...60	0...70	200	LK1023
	728	585	18...30	0...35 / 35...55	0...70	200	LK1024

M12 connector (according to EN 61076-2-101) · Output function OUT1: NO / NC programmable / IO-Link
OUT2...4: NO/NC programmable · DC PNP/NPN

	264	195	18...30	0...35 / 35...65	0...70	200	LK8122
	472	390	18...30	0...35 / 35...60	0...70	200	LK8123
	728	585	18...30	0...35 / 35...55	0...70	200	LK8124

Accessories

Type	Description	Order no.
	Protective cover · for LK / LL / LR / LT sensors · Housing materials: PP	E43910

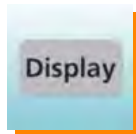


For industrial applications

Modular guided-wave radar level sensors



- Improved processes due to digital transmission of process values
- One sensor for different tank heights thanks to modular sensor concept (sensor lengths up to 160 cm)
- The probe can be cut to length, if needed
- Reduced stock-keeping
- Direct indication of the current level by LED display



Application

The LR level sensor operates according to the guided microwave principle and measures the level using electromagnetic pulses in the nanosecond range. The sensor is suitable for continuous level monitoring of almost all liquids. Deposits on the probe, quick pressure and temperature changes do not affect the measurement.

Installation

The sensor is installed in the tank using a process connection or flange. If necessary, the probe can be easily shortened and adapted to the tank by the user.




Setting

The setting of all parameters and programming of the switch points and indication of the current level can be made via two programming buttons and a 4-digit alphanumeric display or more conveniently via IO-Link.



The probe length can be individually adapted to the application.

Variable level sensors, guided wave radar

Type	Process connection	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature [°C]	I _{load} [mA]	Order no.
M12 connector (according to EN 61076-2-101) · Output function normally open / closed programmable; 4...20 mA or 0...10 V · DC PNP							
	G 3/4 male	–	L-40 (L-60)	18...30	0...80	200	LR3000
M12 connector (according to EN 61076-2-101) · Output function 2 x normally open / closed programmable · DC PNP							
	G 3/4 male	–	L-40 (L-60)	18...30	0...80	200	LR7000
M12 connector (according to EN 61076-2-101) · Output function 4 x normally open / closed programmable · DC PNP							
	G 3/4 male	–	L-40 (L-60)	18...30	0...80	200	LR8000

Accessories for level sensors LR

Type	Description	Order no.
	Probe · Probe length: 240 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43203
	Probe · Probe length: 450 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43204
	Probe · Probe length: 700 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43205
	Probe · Probe length: 1000 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43207
	Probe · Probe length: 1200 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43208
	Probe · Probe length: 1600 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43210
	Flange plate · 65-80 / G 3/4 · for level sensors LR · Housing materials: flange: stainless steel	E43202

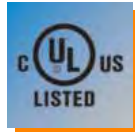


For industrial applications

Level sensors LT with integrated temperature measurement



- Level and temperature measurement for water- and oil-based media
- Integrated overflow prevention
- Select level or temperature output
- 4 x switching outputs or 1 x analogue and 1 x switching output
- Available in 3 lengths (264 mm, 472 mm and 728 mm)



One sensor, two measured values

Typical applications are hydraulic power packs and machine tools. The advantage of this sensor: the combined level and temperature monitoring with only one unit reduces the number of sensors, mounting locations, stock-keeping and the installation complexity.

Advantage IO-Link

IO-Link transmits both parameters (level, temperature) as digital process values via one single cable. This means that only one input port is required on the controller. Simple and time-saving parameter setting via IO-Link.

Easy installation




Variable installation length for flexible installation.




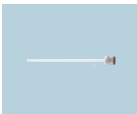

Compact sensors for level and temperature monitoring

Type	Probe length [mm]	Active zone [mm]	U _b [V]	Medium temperature water [°C]	Medium temperature oil [°C]	I _{load} [mA]	Order no.
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M12 connector (according to EN 61076-2-101) · Output function OUT1: NO / NC programmable / IO-Link
OUT2: analog 0...20 mA / 0...10 V (invertable; scaleable analogue signal for temperature) · DC PNP/NPN

	264	195	18...30	0...35 / 35...65	0...70	200	LT3022
	472	390	18...30	0...35 / 35...60	0...70	200	LT3023
	728	585	18...30	0...35 / 35...55	0...70	200	LT3024

M12 connector (according to EN 61076-2-101) · Output function OUT1: NO / NC programmable / IO-Link
OUT2...4: NO/NC programmable · DC PNP/NPN

	264	195	18...30	0...35 / 35...65	0...70	200	LT8022
	472	390	18...30	0...35 / 35...60	0...70	200	LT8023
	728	585	18...30	0...35 / 35...55	0...70	200	LT8024

Accessories

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	Jumper · straight / straight · Free from halogen · 0.3 m · Housing materials: PUR	E12432
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



For industrial applications

Modular temperature sensors



- **Extended diagnostics:** minimum and maximum value memory detects temperature fluctuations
- **Improved measuring accuracy** due to digital transmission of the temperature value via IO-Link.
- **Clearly indicate the acceptable ranges:** programmable red / green display
- **Flexible installation** thanks to modular concept
- **Versions with analogue (4...20 mA/0...10 V) or switching output (2 x PNP/NPN)**



One unit for many sensors

The TR evaluation unit is suited 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.


Control monitors for temperature sensors, IO-Link

Type	Measuring range [°C / °F]	Process connection	Display	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
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M12 connector · Output function 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V, scalable) · DC PNP/NPN

	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR2439
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M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN

	-100...600 / -148...1112	G ½ male	Display unit	18...32	50	250	TR7439
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Cable sensors for industrial applications

Type	Measuring range [°C]	Diameter [mm]	Cable material	Sensor element	Dynamic response T05 / T09 [s]	Order no.
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Cable with connector 2 m · high-grade stainless steel

	-100...600	Ø 6 / L = 100	PTFE cable	–	12 / 34	TS2451
	-100...600	Ø 6 / L = 150	PTFE cable	–	12 / 34	TS2452
	-100...600	Ø 6 / L = 200	PTFE cable	–	12 / 34	TS2453
	-100...600	Ø 6 / L = 250	PTFE cable	–	12 / 34	TS2454

Accessories

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



For industrial applications

Pt100 / Pt1000 temperature sensors



- 4-wire Pt100 / Pt1000, 6 or 10 mm, PTFE cable with M12 connector
- Temperature sensors for installation in clamp fittings
- Temperature measurement from -50...250 °C
- Connection to the evaluation unit via M12 connector



Temperature sensors for evaluation unit

Different requirements in a variety of applications demand temperature sensors which differ in the required accuracy, materials used and design. Furthermore the connection to existing evaluation units is as requested as the connection to PLCs or AS-i modules. The listed Pt100 / Pt1000 temperature sensors can be directly connected to the ifm evaluation unit TR or the temperature plug TP. Connection is conveniently made via M12 connectors.

The right sensor for every application



The sensors TS2056 and TS2256 can be used at temperatures much above 200 °C. In conjunction with the evaluation unit TR2432 they are a sensible combination for use in higher temperature areas.



Cable sensors for standard applications

Type	Measuring range [°C]	Diameter [mm]	Cable material	Sensor element	Dynamic response T05 / T09 [s]	Order no.
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Cable with connector 2 m · high-grade stainless steel

	-40...90	Ø 10	PUR cable	1 x Pt 100	6 / 25	TS2089
	-50...250	Ø 10 / L = 42	PTFE cable	1 x Pt 100	12 / 39	TS2056



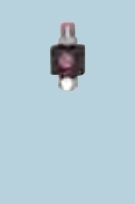
Cable with connector 2 m · stainless steel

	-40...90	12 x 8.7 x 51	PUR cable	1 x Pt 100	9 / 15	TS2229
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Cable with connector 2 m · high-grade stainless steel

	-40...90	Ø 6	PUR cable	1 x Pt 100	3 / 10	TS2289
	-50...250	Ø 6 / L = 50	PTFE cable	1 x Pt 100	11 / 37	TS2256
	-40...90	M6	PUR cable	1 x Pt 100	3 / 9	TS2689

Accessories

Type	Description	Order no.
	Evaluation unit for temperature sensors · G ½ male · for Pt100 and Pt1000 measuring elements · Housing materials: stainless steel / 304 / 1.4301 / PBT+PC-GF 30 / PBT-GF 20 / PC	TR2439
	Evaluation unit for temperature sensors · G ½ male · for Pt100 and Pt1000 measuring elements · Housing materials: stainless steel / 304 / 1.4301 / PBT+PC-GF 30 / PBT-GF 20 / PC	TR7439
	Measured signal converter for temperature sensors · for Pt100 and Pt1000 measuring elements · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	TP3237
	Measured signal converter for temperature sensors · for Pt100 and Pt1000 measuring elements · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	TP3231
	Measured signal converter for temperature sensors · for Pt100 and Pt1000 measuring elements · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	TP3232



For industrial applications

Pt100 / Pt1000 probe sensors with 4-wire connection



- Ideal response times of $T_{05} = 1 \text{ s}$ and $T_{09} = 3 \text{ s}$
- Precise temperature measurement using an integrated Pt100 / Pt1000 sensor element
- Robust stainless steel housing with IP 68 and IP 69K protection ratings, 8 or 10 mm probe diameter
- Pressure resistance of 160 bar for different application areas
- Variable installation depth thanks to different probe lengths



Long lasting precision

The TTxx81 type probe sensors ensure very precise temperature measurement using a Pt100 element of precision class A.

In addition, long life is guaranteed by the high protection ratings IP 68 / IP 69K and the stainless steel housing.

Even faster response times

Using the latest technologies, the response time is extremely fast. This sensor is suited for all high-precision and rapid processes.


A wide range of applications

The sensors are available in 8 and 10 mm diameters as well as in different lengths. So they can be integrated into almost any application using process adapters and standardised M12 connectors.


The listed Pt100 / Pt1000 temperature sensors can be directly connected to the ifm evaluation unit TR or the temperature plug TP.






Pt100 probe sensors for standard applications

Type	Measuring range [°C]	Diameter [mm]	Installation length [mm]	Sensor element	Dynamic response T05 / T09 [s]	Order no.
M12 connector · high-grade stainless steel						
	-40...150	10	160	1 x Pt 100	1 / 3	TT1081
	-40...150	10	260	1 x Pt 100	1 / 3	TT2081
	-40...150	10	360	1 x Pt 100	1 / 3	TT3081
	-40...150	10	560	1 x Pt 100	1 / 3	TT5081

Pt1000 probe sensors for standard applications

Type	Measuring range [°C]	Diameter [mm]	Installation length [mm]	Sensor element	Dynamic response T05 / T09 [s]	Order no.
M12 connector · high-grade stainless steel						
	-40...150	10	160	1 x Pt 1000	1 / 3	TT1050
	-40...150	10	260	1 x Pt 1000	1 / 3	TT2050
	-40...150	10	360	1 x Pt 1000	1 / 3	TT3050
	-40...150	10	560	1 x Pt 1000	1 / 3	TT5050

Accessories

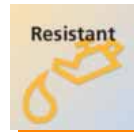
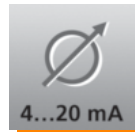
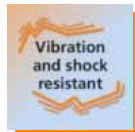
Type	Description	Order no.
	Evaluation unit for temperature sensors · G ½ male · for Pt100 and Pt1000 measuring elements · Housing materials: stainless steel / 304 / 1.4301 / PBT+PC-GF 30 / PBT-GF 20 / PC	TR2439
	Evaluation unit for temperature sensors · G ½ male · for Pt100 and Pt1000 measuring elements · Housing materials: stainless steel / 304 / 1.4301 / PBT+PC-GF 30 / PBT-GF 20 / PC	TR7439
	Measured signal converter for temperature sensors · for Pt100 and Pt1000 measuring elements · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	TP3237
	Measured signal converter for temperature sensors · for Pt100 and Pt1000 measuring elements · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	TP3231



TP temperature plug – modular transmitter



- Small, light housing with M12 connections
- Minimised installation and error sources
- Pt100 / Pt1000 evaluation from -50...300 °C scalable via IO-Link
- Status LED signals the operating status
- Full potting and ecolink M12 technology guarantee high vibration resistance



Minimised installation and error sources

Using two standardised M12 connections, the installation complexity of the TP temperature plug is reduced to a minimum as compared to a common head / DIN rail transmitter. Furthermore, error sources such as cable clamps are eliminated.

Versatile use

Thanks to 4-wire Pt100 / Pt1000 evaluation, the transmitter can also be connected to a Pt element using connection cables. Due to its small size, it is also suited for harsh applications, because it can be installed in a safe position. In addition the scalability of the TP between -50 and 300 °C, using the USB interface E30396 allows individual adaptation of the measuring range to almost any application.




Use of a modular TP transmitter instead of a common head / DIN rail transmitter.


Modular temperature transmitters

Type	Factory setting [°C / °F]	Process connection	U _b [V]	Ambient temperature [°C]	Measuring element	Order no.
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M12 connector · Output function 4...20 mA analogue · DC

	0...100 / -	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3237
	-50...150 / -	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3231
	-50...300 / -	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3232
	- / 0...300	M12	20...32	-25...70	for Pt100 and Pt1000 measuring elements	TP3233

M12 connector · Output function 0...10 V analogue · DC

	0...100 / -	M12	18...32	-25...70	for Pt100 and Pt1000 measuring elements	TP9237
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Software

Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390

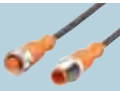

Connectors

Type	Description	Order no.
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Socket M12, 5/4-pole, 4-wire

	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC004
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005

Jumper M12 plug / M12 socket, 4/5-pole, 4-wire

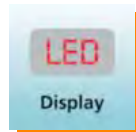
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC013
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC033
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC034



Temperature sensors with temperature probe and display



- **Extended diagnostics:**
Minimum / maximum value memory detects temperature fluctuations
- **Improved measuring accuracy due to digital transmission of the temperature value via IO-Link.**
- **Measuring range of -50...150 °C, response time T05 / T09 = 1s / 3s**
- **Clearly indicate the acceptable ranges: programmable red / green display**
- **Versions with analogue (4...20 mA/0...10 V) or switching output (2 x PNP/NPN)**



Quick and resistant












The compact TN type temperature sensors are distinguished by excellent response times, high pressure resistance and adaptive 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.

More convenience and clarity

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.



Compact temperature sensors with display, IO-Link

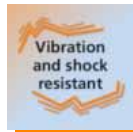
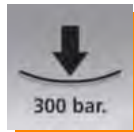
Type	Measuring range [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
M12 connector · Output function 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V, scalable) · DC PNP/NPN						
	-50...150 / -58...302	M18 x 1.5	45	18...32	1 / 3	TN2511
M12 connector · Output function 2 x normally open / closed programmable · DC PNP/NPN						
	-50...150 / -58...302	M18 x 1.5	45	18...32	1 / 3	TN7511
M12 connector · Output function 2 x normally open / closed programmable or 1 x normally open / closed programmable + 1 x analogue (4...20 mA / 0...10 V) · DC PNP/NPN						
	-50...150 / -58...302	G 1/2	30	18...32	1 / 3	TN2405
	-50...150 / -58...302	G 1/2	50	18...32	1 / 3	TN2415
	-50...150 / -58...302	G 1/2	100	18...32	1 / 3	TN2435
	-50...150 / -58...302	G 1/2	150	18...32	1 / 3	TN2445
	-50...150 / -58...302	1/2" NPT	30	18...32	1 / 3	TN2303
	-50...150 / -58...302	1/2" NPT	50	18...32	1 / 3	TN2313
	-50...150 / -58...302	G 1/4	25	18...32	1 / 3	TN2105
	-50...150 / -58...302	G 1/4	50	18...32	1 / 3	TN2115
	-50...150 / -58...302	1/4" NPT	25	18...32	1 / 3	TN2603
	-50...150 / -58...302	1/4" NPT	50	18...32	1 / 3	TN2613



Temperature sensors with easy-turn operating concept



- Simple switch point setting via two setting rings with optimum readability
- Excellent response time: T05 = 1 s and T09 = 3 s
- Mechanical locking prevents unintentional maladjustment
- Switch points freely adjustable from -25 to 140 °C
- Switching independent of operating temperatures



Fit – set – that's it

The first switching temperature sensor with intuitive handling, combined with an excellent response time and a compact housing.

Easy to fit

The easy handling via two radial setting rings on the sensor enables quick and precise setting of the switch points for the users, also without system temperature being applied. Thanks to mechanical locking unintentional manipulation is excluded. The protective cap, which can be obtained as an option, ensures protection against tampering.





Intuitive setting of target values.



Compact temperature sensors

Type	Measuring range [°C / °F]	Process connection	Installation length [mm]	U _b [V]	Dynamic response T05 / T09 [s]	Order no.
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M12 connector · Output function · DC PNP

	-20...140 / -4...284	G 1/4	50	9.6...32	1 / 3	TK6110
	-20...140 / -4...284	1/4" NPT	50	9.6...32	1 / 3	TK6310


M12 connector · Output function · DC PNP

	-25...140 / -13...284	G 1/4	50	9.6...32	1 / 3	TK7110
	-25...140 / -13...284	1/4" NPT	50	9.6...32	1 / 3	TK7310

M12 connector · Output function 1 x normally open / 1 x normally closed · DC PNP

	-25...140 / -13...284	G 1/2	250	9.6...32	1 / 3	TK7460
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Accessories

Type	Description	Order no.
	Protective cover · with lead seal option · for pressure sensors type PK · for temperature sensors type TK · for vibration sensors type VK · Housing materials: PP transparent	E30094

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002

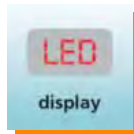


For industrial applications

Infrared temperature sensor with IO-Link and LED pilot light



- IO-Link, analogue output 4...20 mA and switching output, freely programmable
- Adjustable for different target materials
- Scratch-resistant precision lenses for minimum sensitivity to ambient light
- LED pilot light for alignment and control
- Simulation function: activated on the sensor or by external control signal



Non-contact temperature measurement

For the precise temperature measurement of particularly hot objects or objects which are difficult to access, e.g. in the steel, plastics or glass industries. The measured value is provided via the analogue output. In addition, a switching output and an IO-Link interface are provided.

Integrated LED pilot light






The pilot light shows the user the exact position and size of the measuring segment. The green light is visible very well even on glowing surfaces. Besides a low current consumption, the LED is distinguished by a virtually unlimited lifetime.

Batch-related programming






Thanks to the integrated IO-Link communication interface, the parameters can be dynamically adjusted to the application from the control room. Local parameter setting on the unit is not necessary, but can optionally be done via the buttons and the display.





Infrared temperature sensors

Type	Temperature range [°C]	Wave length range [µm]	Material lens	Response time [ms]	Order no.
M12 connector · Output function  /  · Switching output, Analogue output · DC PNP					
	0...999.5	8...14	Infrared transparent crystal lens with anti-reflex coating	< 100	TW2000
	0...999.5	8...14	Infrared transparent crystal lens with anti-reflex coating	< 100	TW2100
	250...1600	1.0...1.7	tempered optical glass	< 2	TW2001
	250...1600	1.0...1.7	tempered optical glass	< 2	TW2101
	500...2500	0.78...1.06	tempered optical glass	< 2	TW2002
	300...1600	1.0...1.7	tempered optical glass	< 2	TW2011

Accessories

Type	Description	Order no.
	Air purge · for infrared temperature sensors TWxxxx, M30 design · for type TW · Housing materials: stainless steel / Brass / sealing ring: aluminium	E35063
	Cooling jacket · for infrared temperature sensors TWxxxx, M30 design · for type TW · Housing materials: 304 / 1.4301	E35068
	Insulating tube · for infrared temperature sensors TWxxxx, M30 design · for type TW · Housing materials: POM	E35067
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

Connectors

Type	Cable	Wire specification	Material housing / nut	U [V]	T _a [°C]	Pro-tection	LEDs	Order no.
Socket M12, halogen-free, screened, screen connected to the socket, 5-pole, 5-wire								
	2 m black PUR cable	5 x 0.25 mm ² , Ø 4.9 mm	TPU / Brass	30 AC 36 DC	-25...90	IP 65 / IP 67	-	EVC547
	2 m black PUR cable	5 x 0.25 mm ² , Ø 4.9 mm	TPU / Brass	30 AC 36 DC	-25...90	IP 65 / IP 67	-	EVC544



Evaluation unit for flow sensors



- Integrated flow, temperature and wire-break monitoring
- Switch point, flow and temperature setting via potentiometer
- Multicolour LED bar graph display for quick setting
- Signal output via potential-free relay contacts, changeover contacts
- Connection options: insulation displacement terminal, screw terminal and cage clamp



Evaluation unit for sensors

The evaluation unit ensures high functionality in a space-saving housing for control cabinet mounting. The connection options (Combicon) provide flexibility for different connection concepts. In addition to flow indication via the multicolour LED bar graph, the adjustable limit temperature of the medium as well as, for safety reasons, a wire break between the sensor and the evaluation unit are signalled via LEDs and a relay output. The operating elements are located on the front and can be set using a screw driver. The evaluation units are available in two versions (AC or DC) and form a system for flow monitoring together with the SF type flow sensors.

Local evaluation unit SR5900


The evaluation unit SR5900 is used for connection of SF type flow sensors with different immersion depths. Standardised M12 connections are used for connecting the evaluation unit and sensor as well as for the supply. The evaluation and display unit SR5900 can be used in different applications, e.g. for various immersion depths and a wide range of aggressive liquids. Flow and switch point are indicated by LEDs directly on the unit.





The evaluation is carried out outside the measurement location.


Control monitors for industrial applications

Type	U _b / Tolerance [V] / [%]	Current consumpt. [mA]	Power consumpt. [VA]	Power-on delay time [s]	Output when flow is present	Output when temperature is exceeded	Output in case of wire break	Order no.
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
Combicon connector · Output function  · DC

	24 DC / +10 / -20	90	-	10...80	relay energised	relay energised	relay de-energised	SR0150*
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Combicon connector · Output function  · AC

	90...240 AC / -5 / +10	-	4	10...80	relay energised	relay energised	relay de-energised	SN0150*
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M12 connector · Output function  /  · DC PNP

	19...36 DC	70	-	10	no / nc programmable	-	-	SR5900
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* Note on use of miniature fuses for electrical connection

Miniature fuse to IEC60127-2 sheet 1, ≤ 5 A (fast acting)

Recommendation: check the unit for reliable function after a short circuit.



Flow sensors for connection to control monitors, industrial applications

Type	Setting range liquids / gases [cm/s]	Greatest sensitivity [cm/s]	Medium temperature [°C]	Response time [s]	Max. T ₀ gradient [K/min]	Pressure rating [bar]	Order no.
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M12 connector

	3...300 / 200...3000	3...60 / 200...800	-25...80	1...10	300	300	SF5200
	3...300 / 200...3000	3...60 / 200...800	-25...80	1...10	300	100	SF5700

Cable 6 m

	3...300 / 200...3000	3...60 / 200...800	0...120 / 0...100	1...10	300	300	SF5300
	3...300 / 200...3000	3...60 / 200...800	-25...80	1...10	300	300	SF5350



For industrial applications

Inductive dual sensors for valve actuators



- Quick and secure mounting using only three screws
- Units with M12 connector or terminal chamber
- Non-contact and self-cleaning system
- Resistant to mechanical stress such as vibration and shocks
- Large selection of switching cams



Electronic valve position monitoring

In industrial processes where liquids, air or gases are used, valves are needed for dosing and control. Pneumatic valve actuators are normally used for mechanical positioning. The valve position must be monitored electronically.

Dual sensor for valve actuators

ifm offers a compact dual inductive sensor with two integral sensors for position feedback on valve actuators.



A round target, also called a 'puck', with two metal screws offset by 90° is mounted on the actuator shaft. The screws are located at a different height. A compact dual inductive sensor (type IND) with two integral sensors detects the upper or lower metal screw depending on the valve position and thus the two switch positions. This system operates reliably with no wear at all. It is virtually resistant to external influence and insensitive to mechanical stress such as vibration and shock.




Sensors for industrial applications

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f AC / DC [Hz]	I _{load} AC / DC [mA]	Order no.
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M12 connector · Output function / · DC PNP

	40 x 26 x 26	4 nf	PBT	10...36	IP 67	1300	250	IN5225
	40 x 26 x 47	4 nf	PBT	10...36	IP 67	1300	250	IN5327

Terminals · Output function / · DC PNP

	33 x 60 x 92	4 nf	PA (polyamide)	10...30	IP 67	500	100	IN5409
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f = flush / nf = non flush / qf = quasi-flush

Switching cams for sensors with quarter-turn actuators

Type	Description	Order no.
	Target puck · Ø 102 mm · adjustable target screws · Housing colour: black · Housing materials: Target puck: PVC / screws: stainless steel 316Ti / 1.4571	E17119
	Target puck · Ø 102 mm · 3 possible switching flag positions · Housing colour: black · Housing materials: Target puck: PA 6 / screws: V2A	E17328
	Target puck · Ø 53 mm · 3 possible switching flag positions · Housing colour: black · Housing materials: Target puck: PA 6 black / screws: V2A	E17320
	Target puck · Ø 53 mm · Housing materials: Target puck: PA 6 black / Metal parts: stainless steel	E12517
	Target puck · Ø 65 mm · 3 possible switching flag positions · Housing colour: black · Housing materials: Target puck: PA 6 / screws: V2A	E17327
	Spacer · Housing materials: PA 6 black / screw: stainless steel	E12526

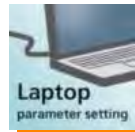


For industrial applications

Continuous position feedback and diagnostics



- Great all-round position visibility from a distance
- Continuous position feedback
- Easy setting via teach button or IO-Link
- Diagnostic functions: cycle time and count, seal monitoring



Flexible configuration

The smart valve sensor matches settings to the application software (LR Device) or inductive teach button. Any end position of the valve and the size of the sensing range can be set. A third switch point can be selected, for example for three-way valves or for switching off the pump to avoid pressure peaks.

Diagnostic functions


The IO-Link communication interface allows the identification of different wear conditions. On the one hand, the sensor features seal monitoring indicating a change of the closed position, which can point to deposits or wear of the seal, for example. On the other hand, the different positions can be counted and the time taken can be measured.





Position sensors for rising stem valves

Type	Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	Protection	f AC / DC [Hz]	I _{load} AC / DC [mA]	Order no.
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M12 connector · Output function 3 x NO / NC (selectable) · DC PNP

	56.6 x 50 x 95	–	PA (polyamide)	10...30	IP 65 / IP 67	–	100	MVQ101
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Accessories

Type	Description	Order no.
	Montageplatte · for type MVQ · Housing materials: POM black	E12569
	Montageplatte · for type MVQ · Housing materials: POM black	E12573

Accessories for IO-Link

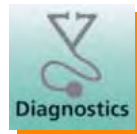
Type	Description	Order no.
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	Memory plug · Parameter memory for IO-Link sensors · Storage capacity: 2 Kbytes · Housing materials: PA PACM 12 / PET / sealing: FPM / nut: stainless steel 316L / 1.4404 / connector: TPU	E30398
	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · Housing materials: housing: polyamide / socket: Brass nickel-plated	AL1100
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



AS-Interface gateways with AS-i master profile M4



- Supports all slaves of the AS-i specification 1.0 to 3.0
- Extended diagnosis in the device display and via the fieldbuses
- Flexible handling of analogue values
- For different fieldbuses: Profibus DP, EtherNet/IP



AS-Interface

The actuator-sensor interface (AS-i) sets new technological standards in plant design and automation.

AS-i considerably reduces wiring complexity since conventional parallel wiring of each sensor or actuator to the controller is no longer necessary. This saves the user a great number of terminals, splitter boxes, input/output cards and cable lines.

AS-i masters, gateways and controllers

AS-i masters and gateways are basic components of AS-i networks. They are usually placed in the control cabinet and ensure data communication and power supply of the connected slaves, sensors and actuators.

The AS-i master assumes the most important function in every AS-Interface network. It is responsible for the control of the complete communication.






AS-i gateways make a connection from AS-Interface to a higher-level bus system. Thus the advantages of both systems can be combined.

Via fieldbus gateways, e.g. to Profibus DP, several AS-i installation islands can be connected to a control room across longer distances, e.g. in an assembly hall.




Gateways allow connection of AS-i to different fieldbuses.

Controllers / Gateways

Type	Number of AS-i masters	Description	Order no.
	1	AS-i Profinet gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profinet RT device class B · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1401
	2	AS-i Profinet gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profinet RT device class B · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1402
	1	AS-i Profibus gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profibus DP (DPV0 + DPV1) · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1411
	2	AS-i Profibus gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profibus DP (DPV0 + DPV1) · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1412
	1	AS-i EtherNet/IP gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1421
	2	AS-i EtherNet/IP gateway · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1422
	1	SmartPLC DataLine with EtherCAT slave interface · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1433
	2	SmartPLC DataLine with EtherCAT slave interface · AS-i master · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Device supply either via 24 V or AS-i (AS-i bus 1) · Housing materials: aluminium powder-coated / steel sheet galvanised / Makrolon	AC1434

Accessories

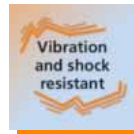
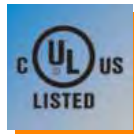
Type	Description	Order no.
	CoDeSys for Automation Alliance · Software CD for controller E Version 2.3 in several languages · Single user licence · Compatible operating systems: Win2000 (32 bits), WinXP (32/64 bits), WinVista (32/64 bits), Win7 (32/64 bits)	AC0340



Power supplies



- Particularly space-saving design
- High efficiency, low heating of the control cabinet
- High power reserves
- Safe switch-off by circuit breakers in case of short circuit
- Low inrush current



Efficient and reliable





Due to innovative technology the new ifm power supplies require considerably less space in the control cabinet, as compared to common cabinet power supplies. Another advantage of the efficient design is the above average degree of efficiency of up to 94 per cent. This saves energy costs and reduces waste heat in the control cabinet.

In the development of the power supplies, particular importance was attached to a sufficient dimensioning of the components, so that operation is permanently ensured even in the limit areas of the specification. This results in an excellent MTBF value of about 1.4 million hours.




Moreover, all ifm power supplies feature sufficient power reserves to reliably handle even short current spikes.



AS-i power supplies

Type	Output current AS-i [A]	Description	Order no.
	4	Power supply · AS-i power supply 115/230 V AC · Integrated data decoupling · steel sheet	AC1254
	8	Power supply · AS-i power supply 115/230 V AC · Integrated data decoupling · steel sheet	AC1258
	4	Power supply · DC convertor 24 V DC for AS-i system voltage · Integrated data decoupling · steel sheet	AC1257
	8	Power supply · Three-phase AS-i power supply 380...480 V AC · Integrated data decoupling · steel sheet	AC1253

24 V DC power supplies

Type	Current [A]	Output voltage [V]	Nominal voltage [V]	Mains buffering time [ms]	Efficiency typ. [%]	Order no.
	5	24...28 DC	2 x 400 AC	27 (400 V AC; 50 Hz) / 48 (480 V AC; 60 Hz)	90.4	DN4032
	10	24...28 DC	115 / 230 AC	46 (120 V AC; 60 Hz) / 47 (230 V AC; 50 Hz)	91	DN4013
	20	24...28 DC	115 / 230 AC	26 (120 V AC; 60 Hz) / 26 (230 V AC; 50 Hz)	92.7	DN4014
	10	24...28 DC	3 x 400 AC	34 (400 V AC; 50 Hz) / 54 (480 V AC; 60 Hz)	92.8	DN4033
	20	24...28 DC	3 x 400 AC	22 (400 V AC; 50 Hz) / 22 (480 V AC; 60 Hz)	95	DN4034
	40	24...28 DC	3 x 400 AC	25 (400 V AC; 50 Hz) / 25 (480 V AC; 60 Hz)	95.3	E84036
	40	24...28 DC	115 / 230 AC	27 (120 V AC; 60 Hz) / 27 (230 V AC; 50 Hz)	93.6	E84016

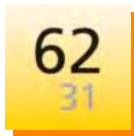


For industrial applications

SmartLine modules for control cabinets



- Powerful relay switches up to 6 A
- 4 relays in slim design of only 25 mm
- Low-profile transistor module
- Plug supplied with the unit
- Double terminals for the supply



Even for small local control cabinets

The new SmartLine modules feature a housing that is only 25 mm wide, so they will easily fit into a small panel.

The transistor module is only 52 mm deep, so requires very little space, making it ideal for local control panels. At just 108 mm deep and 25 mm wide the relay module also won't take up much space in a classic control cabinet.

Powerful and flexible

The supplied cage clamps allow easy and efficient universal wiring. Double terminals help the user to loop through the power supply.








Sensor supply and the outputs of the transistor version are rated with 1 A, the relay modules switch up to 6 A.

Extended addressing mode



Up to 62 units can be connected to a master of specification 3.0 with M4 profile as A or B slaves. The modules can be addressed either prior to installation without voltage or when connected and wired via the addressing socket.



I/O modules for control cabinets

Type	Inputs / outputs	Description	Order no.
	4 inputs / 4 outputs	Active AS-i module · String mounting possible · Version 3.0 with extended addressing mode · Only for operation with AS-i masters with the profile M4 · plastics / PC GF20	AC3200
	4 inputs / 4 outputs	Active AS-i module · String mounting possible · Version 3.0 with extended addressing mode · Only for operation with AS-i masters with the profile M4 · plastics / PC GF20	AC3201
	4 inputs / 4 outputs	Active AS-i module · String mounting possible · Addressing socket · Version 3.0 with extended addressing mode · Only for operation with AS-i masters with the profile M4 · plastics / PC GF20	AC3220
	4 inputs / 4 outputs	Active AS-i module · String mounting possible · Addressing socket · Version 3.0 with extended addressing mode · Only for operation with AS-i masters with the profile M4 · plastics / PC GF20	AC3221
	4 analogue inputs 4...20 mA	Active AS-i module · Supply either from AS-i or an external 24 V source · Combicon connector for sensor connection · PC GF20	AC3216
	4 analogue inputs 0...10 V	Active AS-i module · Supply either from AS-i or an external 24 V source · Combicon connector for sensor connection · PC GF20	AC3217
	4 analogue outputs 0...20 mA	Active AS-i module · Supply either from AS-i or an external 24 V source · Combicon connector for actuator connection · PC GF20	AC3218
	4 analogue outputs 0...10 V	Active AS-i module · Supply either from AS-i or an external 24 V source · Combicon connector for actuator connection · PC GF20	AC3219
	4 inputs Pt100	Active AS-i module · Combicon connection · PC GF20	AC3222

Accessories

Type	Description	Order no.
	Addressing cable · for AS-i slaves · 1.6 m	E70213
	AS-i addressing unit · AS-i version 3.0 with extended addressing mode	AC1154



CompactLine modules



- **Module and connection technology: especially shock and vibration-resistant**
- **Full potting for use in harsh environments, protection IP 67**
- **ecolink technology in each port ensures secure connection**
- **Bus connection of the module via AS-i flat cable**
- **Up to 2 A current rating on the output (AC2452)**



For limited space

CompactLine modules feature particularly high ingress protection, shock and vibration resistance. This is achieved by fully potting the unit.


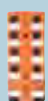


The flat compact design is particularly suited where space is at a premium. The M12 sockets are made of stainless steel.

Addressing is done either via the AS-i interface or infrared adapter. The yellow AS-i communication cable and the black 24 V flat cable (for auxiliary energy) are simply inserted in the supplied lower part. Insulation displacement technology ensures safe contacting.

Bore holes on the top and on the side allow horizontal or vertical mounting of the module.



Field modules IP 67

Type	Inputs / outputs	Description	Order no.
	4 inputs	Active CompactLine module · fully potted housing · IR addressing possible · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / threaded inserts in the lower part: Brass nickel-plated / O-Ring : Viton / Piercing contacts: CuSn6 surface nickel and tin-plated	AC2410
	4 inputs	Active CompactLine module · IR addressing possible · Metal parts from stainless steel · Digital inputs · Sockets M12 x 1 · PA / socket: stainless steel 316L / 1.4404 / threaded inserts in the lower part: stainless steel 316L / 1.4404 / screws: stainless steel / Piercing contacts: CuSn6 surface nickel and tin-plated / O-Ring : EPDM	AC2451
	4 inputs	Active CompactLine module · IR addressing possible · Version 2.11 and 3.0 with extended addressing mode · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / threaded inserts in the lower part: Brass nickel-plated / O-Ring : Viton / Piercing contacts: CuSn6 surface nickel and tin-plated	AC2457
	4 outputs	Active CompactLine module · IR addressing possible · Digital outputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / threaded inserts in the lower part: Brass nickel-plated / O-Ring : Viton / Piercing contacts: CuSn6 surface nickel and tin-plated	AC2417
	4 inputs / 4 outputs	Active CompactLine module · IR addressing possible · Metal parts from stainless steel · Digital inputs and outputs · Sockets M12 x 1 · PA / socket: stainless steel 316L / 1.4404 / threaded inserts in the lower part: stainless steel 316L / 1.4404 / screws: stainless steel / Piercing contacts: CuSn6 surface nickel and tin-plated / O-Ring : EPDM	AC2452
	4 inputs / 4 outputs	Active CompactLine module · 60 x 152 x 27 · IR addressing possible · Digital inputs and outputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / threaded inserts in the lower part: Brass nickel-plated / O-Ring : Viton / Piercing contacts: CuSn6 surface nickel and tin-plated	AC2412
	4 inputs / 4 outputs	Active CompactLine module · IR addressing possible · Digital inputs and outputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / threaded inserts in the lower part: Brass nickel-plated / O-Ring : Viton / Piercing contacts: CuSn6 surface nickel and tin-plated	AC2459
	4 inputs / 4 outputs; bidirectional	Active CompactLine module · IR addressing possible · Version 3.0 with extended addressing mode · Only for operation with AS-i masters with the profile M4 · Metal parts from stainless steel · Sockets M12 x 1 · PA 6.6 / socket: stainless steel 316L / 1.4404 / threaded inserts in the lower part: stainless steel 316L / 1.4404 / O-Ring : EPDM / Piercing contacts: CuSn6 surface nickel and tin-plated / screws: stainless steel	AC2455
	2 outputs / 2 inputs	Compact M8 AS-i module · 90.5 x 30 x 23.5 · Digital inputs and outputs supplied via AS-i · AS-i connection via M12 connector · Version 2.11 and 3.0 with extended addressing mode · M8 ecolink interface · Sockets M8 x 1 · PBT	AC2482
	8 inputs	Compact M8 AS-i module · 134.5 x 30 x 23.5 · Digital inputs · AS-i connection via M12 connector · Version 3.0 with extended addressing mode · M8 ecolink interface · Only for operation with AS-i masters with the profile M4 · Sockets M8 x 1 · PBT	AC2488



For industrial applications

ClassicLine modules



- Field modules with digital and analogue inputs / outputs, optional with IO-Link
- AirBoxes: AS-i pneumatic valves with quick mounting technology
- Flexible orientation of the flat cable in three directions.
- Innovative insulation displacement technology means no tools needed for connection
- Integrated addressing socket allows setup while connected

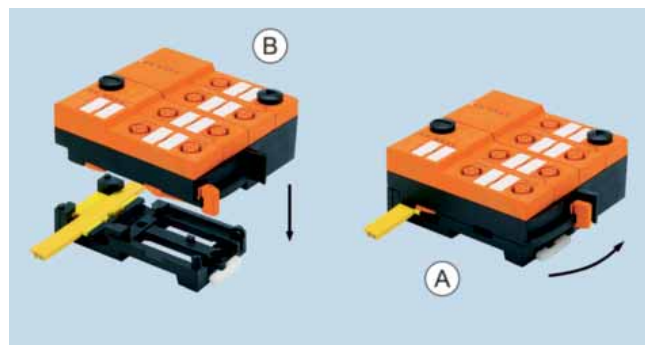


Easy connection due to toolless mounting.

ClassicLine modules can be connected to the yellow AS-i flat cable without tools using insulation displacement technology. The integrated DIN rail mounting allows easy installation in the control cabinet.

The ClassicLine module can accept an AS-i flat cable in three different directions to provide flexible cable routing. The integrated addressing socket allows addressing while connected to the system. All connections are located on the front display. LEDs indicate signal status, operating voltage and possible periphery faults.

ClassicLine modules include the so-called "AirBoxes". These are pneumatic valves triggered via AS-i. In addition to pneumatic connections they also feature digital inputs and outputs for the connection of sensors and actuators.





Quick mounting thanks to insulation displacement technology: A sliding mechanism (A) quickly connects the module's upper and lower parts (B).

Field modules IP 67

Type	Inputs / outputs	Description	Order no.
	4 inputs	Active ClassicLine module · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · Three orientations of the flat cable are possible · Digital inputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5215
	2 outputs / 2 inputs	Active ClassicLine module · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · Three orientations of the flat cable are possible · Digital outputs and inputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5214
	4 inputs / 3 outputs	Active ClassicLine module · Addressing socket · Three orientations of the flat cable are possible · Version 2.11 and 3.0 with extended addressing mode · Digital inputs and outputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5204
	4 inputs / 4 outputs	Active ClassicLine module · Only for operation with AS-i masters with the profile M4 · Addressing socket · Three orientations of the flat cable are possible · Version 3.0 with extended addressing mode · Digital inputs and outputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5235
	2 inputs 4...20 mA	Active ClassicLine module · 2 analogue inputs 4...20 mA · For the connection of 2-wire and 3-wire sensors · Addressing socket · Three orientations of the flat cable are possible · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5222
	2 IO-Link ports	Active ClassicLine module · 2 IO-Link ports · For the connection of IO-Link sensors and actuators, binary sensors and binary actuators · Addressing socket · Three orientations of the flat cable are possible · Only for operation with AS-i masters with the profile M4 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5225
	4 inputs / 4 outputs	Active ClassicLine module · Addressing socket · Three orientations of the flat cable are possible · Digital inputs and outputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5209
	4 inputs	Active ClassicLine module · Addressing socket · Three orientations of the flat cable are possible · Digital inputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5205
	4 outputs	Active ClassicLine module · Addressing socket · Three orientations of the flat cable are possible · Digital outputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5208
	8 digital inputs (2 slaves)	Active ClassicLine module · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · Three orientations of the flat cable are possible · Digital inputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5210
	4 inputs	Active ClassicLine module · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · Three orientations of the flat cable are possible · Digital inputs · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5245

Accessories

Type	Description	Order no.
	Addressing cable · for AS-i slaves · 1.6 m	E70213
	AS-i addressing unit · AS-i version 3.0 with extended addressing mode	AC1154

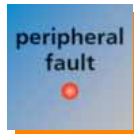
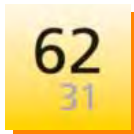


For industrial applications

AirBoxes: AS-i pneumatics with quick mounting technology



- Slide valves free from overlapping
- Pressure peak resistance up to 12 bar
- 3 freely selectable directions of rotation of the flat cable
- Extended addressing mode
- Quick toolless mounting of upper and lower parts



Introduction

After successfully launching the ClassicLine modules for field applications we are now introducing the AirBoxes with various new features.









The AirBoxes are now easier to use with their novel assembly technology, additional valve functions and many other new features.

Special features





- slide valves free from overlapping
- 2 x 3/2-way valves, 1 x 5/2-way valve (monostable / bistable)
- 1 x 5/3-way valve with blocked middle position
- quick mounting of upper and lower parts
- flat cable can be inserted from 3 different directions
- extended addressing mode



AS-i AirBoxes

Type	Inputs / outputs	Description	Order no.
	4 inputs / 2 outputs; AirBox supply via AS-i	AS-i AirBox · 2 x 3/2-way slide valves free from overlapping · monostable · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5228
	4 inputs / 1 output ; AirBox supply via AS-i	AS-i AirBox · 5/2-way slide valve free from overlapping · monostable · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5246
	4 inputs / 2 outputs; AirBox supply via AS-i	AS-i AirBox · 5/2-way bistable slide valve free from overlapping · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5251
	2 inputs / 2 outputs; AirBox supply via AS-i	AS-i AirBox · 2 x 3/2-way slide valves free from overlapping · monostable · Three orientations of the flat cable are possible · AS-i flat cable connection · Addressing socket · AS-i profile S-3.F.F · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5227
	4 inputs / 2 outputs; AirBox supply via external 24 V DC	AS-i AirBox · 2 x 3/2-way slide valves free from overlapping · monostable · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5243
	4 inputs / 2 outputs; AirBox supply via external 24 V DC	AS-i AirBox · 5/2-way bistable slide valve free from overlapping · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5253
	4 inputs / 2 outputs; AirBox supply via AS-i	AS-i AirBox · 5/3-way slide valve free from overlapping · closed · Three orientations of the flat cable are possible · AS-i flat cable connection · Version 2.11 and 3.0 with extended addressing mode · Addressing socket · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5270
	4 inputs / 2 outputs; AirBox supply via AS-i	AS-i AirBox · 2 x 3/2-way slide valves free from overlapping · monostable · Three orientations of the flat cable are possible · AS-i flat cable connection · Addressing socket · AS-i profile S-7.F.F · PA / POM / Piercing contacts: CuSn6 surface nickel and tin-plated	AC5285

Accessories

Type	Description	Order no.
	Silencer · Housing materials: connection piece: PP / filter: PE	E75232
	Push-in T-fitting · Housing materials: housing: Nickel-plated brass / PA66 / tooth lock washer: stainless steel	E75227
	Push-in L-fitting · Diameter reduction from Ø8 mm to Ø6 mm · Housing materials: housing: Nickel-plated brass / PA66 / tooth lock washer: stainless steel	E75229
	Sealing plug for AirBox · Housing materials: housing: PA66	E75231



Safety at Work



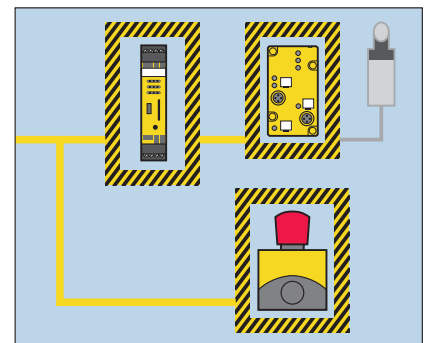
- AS-i safety monitor, 1 or 2 channels
- Safety function freely configurable
- Positively driven relay contacts for the enabling of drives, etc.
- Replaces traditional safety relays
- Toolless DIN rail mounting










Safety on the AS-i bus

The AS-i safety monitor functions according to the Safety at Work specification. It monitors the data exchange between safe modules and the AS-i controllers. Should data transmission be disrupted, the module fail or a wire break occur, the monitor ensures the safe state. The same happens when the safety system is activated. The safety monitor receives a module address to enable direct diagnosis via the AS-i master. It can be mounted anywhere on the network.

The safety monitor features one or two independent OSSDs which can be configured via PC software. The parameter setting includes functions like emergency stop, start button, stop category 0 or 1, two-hand operation and muting. It can thus replace many different units. In addition, ifm offers a variety of safety AS-i modules, illuminated e-stop buttons and wiring solutions.



Safety at Work

Type	Description	Order no.
	Safe active AS-i module · Connection via M12x1 sockets or cage clamps · For connection of an electro-sensitive protective equipment (ESPE) type 4 to EN 61496-1 · PA 6 · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC007S
	Illuminated E-STOP with integrated AS-i connection · fool-proof E-STOP to EN ISO 13850 · Pull to reset · AS-i interface via AS-i flat cable IP 67 · PC GF20 · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC010S
	AS-i Safety at Work · Safe AS-i input module 2SI - 2LO · Addressing socket · Three orientations of the flat cable are possible · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 62061: SILcl 3	AC505S
	AS-i Safety at Work · Safe AS-i input module 4SI / 2DO T / 2LO · Addressing socket · Three orientations of the flat cable are possible · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated · Complies with the requirements: ISO 13849-1: category 3 · ISO 13849-1: PL d · IEC 62061: SILcl 2	AC506S
	AS-i Safety at Work · Addressing socket · Three orientations of the flat cable are possible · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3 · IEC 62061: SILcl 3	AC507S
	AS-i Safety at Work · Addressing socket · Three orientations of the flat cable are possible · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3 · IEC 62061: SILcl 3	AC508S
	AS-i Safety at Work · Sockets M12 x 1 · PA / Piercing contacts: CuSn6 surface nickel and tin-plated · Complies with the requirements: ISO 13849-1: category 3 · ISO 13849-1: PL d · IEC 62061: SILcl 2	AC509S
	Safe active AS-i output module · SIL 3 to EN 62061, IEC 61508 / SIL 3 and EN ISO 13849 - 1 / PL e · for the safe triggering of actuators · Combicon connection · PA · Complies with the requirements: ISO 13849-1: PL e · IEC 61508: SIL 3	AC030S
	Safe active AS-i module · Performance Level e to EN ISO 13849-1 et IEC 61508 / SIL 3 for the connection of mechanical contacts · Combicon connection · PA · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC009S
	AS-i safety monitor · 2 safe semi-conductor outputs · SIL 3 to EN 62061, IEC 61508 / SIL 3 and EN ISO 13849 - 1 / PL e · Chip card to save the configuration data · Configuration and setup by configuration software ASIMON V3 G2 · USB 2.0 interface · Chip card and Combicon screw terminals supplied with the device · Screw terminal	AC041S
	AS-i safety monitor · Extended functionality · 2-channel · Configuration and setup by configuration software ASIMON · Screw terminal · polyamide black · Complies with the requirements: ISO 13849-1: PL e · IEC 61508: SIL 3	AC004S

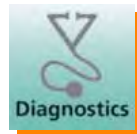


For industrial applications

SafeLine SmartPLC: fail-safe automation system



- Quick and easy set-up
- Flexible and future-proof thanks to connective hardware and CODESYS V3
- High machine uptime due to sophisticated diagnostics
- Safe up to SIL 3, PL e
- Unbeatable price / performance ratio



All-in-one: more than just a PLC

Just as a smartphone is more than just a phone, the new SmartPLC is more than just a simple PLC. It has the flexibility for different tasks, even in safety-related applications up to SIL 3, PL e.





For example as:

- fail-safe PLC
- standard PLC
- AS-i gateway
- visualisation system
- protocol converter
- data logger
- intelligent evaluation unit (ifm system solutions)


Two integrated PLCs (1 x fail-safe, 1 x standard), powerful processors, a large memory and a multitude of supported protocols allow the control of sophisticated systems – and this at an unbeatable price!



SmartPLCs

Type	Description	Order no.
	AS-i Profinet gateway with safe preprocessing · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profinet RT device class B · LCD colour display · Integrated safety and non safety PLC · Configuration and setup by CODESYS V3 configuration software · aluminium powder-coated / steel sheet galvanised / Makrolon · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC402S
	AS-i Profibus gateway · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · Profibus DP (DPV0 + DPV1) · LCD colour display · Configuration and setup by CODESYS V3 configuration software · aluminium powder-coated / steel sheet galvanised / Makrolon · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC412S
	AS-i EtherNet/IP gateway with safe preprocessing · Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Integrated safety and non safety PLC · Configuration and setup by CODESYS V3 configuration software · aluminium powder-coated / steel sheet galvanised / Makrolon · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC422S
	Ethernet configuration interface with dynamic web interface for configuration and diagnosis including remote maintenance · LCD colour display · Configuration and setup by CODESYS V3 configuration software · aluminium powder-coated / steel sheet galvanised / Makrolon · Complies with the requirements: ISO 13849-1: category 4 · ISO 13849-1: PL e · IEC 61508: SIL 3	AC432S

Accessories

Type	Description	Order no.
	AS-i data decoupling module · Combicon connection · Housing materials: Makrolon	AC1250



IO-Link master: Connection for intelligent sensors



- 4 or 8 IO-Link ports with full V1.1 functionality
- Profinet or EtherNet/IP
- Master and devices configurable via the LR DEVICE software
- Industry 4.0 ready via LR AGENT EMBEDDED
- Voltage supply via standard M12 sensor cable, A-coded



Robust field bus modules with safe connection








The decentralised IO-Link master modules are used as gateways between intelligent IO-Link sensors and the fieldbus. They are the perfect choice, even in the most difficult environments: The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVC product series. The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.

Energy limitation for UL class 2 units




Many sensors require an energy-limited supply with UL class 2 approval. The limitation of energy is usually achieved via a corresponding power supply. With the AL series IO-Link master, sensors can be supplied according to UL class 2 without using an energy-limited power supply approved to UL class 2.



IO-Link components

Type	Inputs / outputs	Description	Order no.
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1100
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1120
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1102
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1122
	4 x 2 inputs	Active CompactLine module (IO-Link device) · 4 way · Supply via IO-Link M12 connector · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / O-Ring : Viton	AL2400
	8 x 2 inputs	Active CompactLine module (IO-Link device) · 8 way · Supply via IO-Link M12 connector · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / O-Ring : Viton	AL2401
	6 x 2 outputs	Active CompactLine module (IO-Link device) · I/O modules for field applications · Sockets M12 x 1 · housing: polyamide orange / socket: Brass nickel-plated	AL2330

Accessories and software

Type	Description	Order no.
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied); E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011
	Y splitter · M12 plug - 2 M12 sockets · Free from silicone · Free from halogen · Gold-plated contacts · Housing materials: housing: PA orange / sealing: FKM	EBC113
	Protective cap · M12 · for M12 sockets of ClassicLine modules, CompactLine modules and AirBoxes · Housing materials: PA black	E73004



IO-Link master: Connection of sensors to the PLC and to the IT world



- Industry 4.0 ready via new IoT core
- Separation between automation and IT network
- 4 or 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 LR DEVICE software



IO-Link master for the automation and IT world









The decentralised IO-Link master modules 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.

Robust field bus modules for demanding applications





Thanks to their special housing materials and high ingress resistance (IP 67 or IP 69K), they can be used in coolant applications or directly in wet areas. The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.



IO-Link components

Type	Inputs / outputs	Description	Order no.
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1300
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1320
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with EtherCat interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1330
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with Modbus TCP interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1340
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · housing: polyamide grey / socket: Brass nickel-plated	AL1302
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for field applications · M12 connector · housing: polyamide grey / socket: Brass nickel-plated	AL1322
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with EtherCat interface · I/O modules for field applications · M12 connector · housing: polyamide grey / socket: Brass nickel-plated	AL1332
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with Modbus TCP interface · I/O modules for field applications · M12 connector · housing: polyamide grey / socket: Brass nickel-plated	AL1342

Connectors

Type	Description	Order no.
Jumper M12 plug / RJ45 plug, 4/8-pole, 4-wire		
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 0.5 m · Housing materials: TPU / PA	E12490
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 2 m · Housing materials: TPU / PA	E12090
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 5 m · Housing materials: TPU / PA	E12491
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 10 m · Housing materials: TPU / PA	E12492



For industrial applications

IO-Link master with extra power



- 4 or 8 IO-Link ports with full V1.1 functionality
- Feed-through of the power supply possible
- Master and devices configurable via the LR DEVICE software
- Industry 4.0 ready via LR AGENT EMBEDDED
- Voltage supply via power cable, M12, T-coded



Robust field bus modules with safe connection

The decentralised IO-Link masters are used as gateways between intelligent IO-Link sensors and the fieldbus. They are the perfect choice, even in the most difficult environments: The materials and production methods are identical to the ifm jumper cables of the tried-and-tested EVC product series. The ecolink technology guarantees reliable, permanently ingress-resistant M12 connections of the connection cables.








Extra power

The IO-Link masters are equipped with two T-coded M12 connections for voltage supply. With this power cabling, the current path can simply be daisy-chained.





The B ports of the 8-port IO-Link master allow direct connection of IO-Link actuators, such as valve islands.



IO-Link components

Type	Inputs / outputs	Description	Order no.
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1200
	max. 8 IO-Link ports / max. 12 digital inputs / max. 8 digital outputs	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1202
	max. 4 IO-Link ports / max. 8 digital inputs / max. 4 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1220
	max. 8 IO-Link ports / max. 12 digital inputs / max. 8 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for field applications · M12 connector · housing: polyamide / socket: Brass nickel-plated	AL1222
	4 x 2 inputs	Active CompactLine module (IO-Link device) · 4 way · Supply via IO-Link M12 connector · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / O-Ring : Viton	AL2400
	8 x 2 inputs	Active CompactLine module (IO-Link device) · 8 way · Supply via IO-Link M12 connector · Digital inputs · Sockets M12 x 1 · PA / socket: Brass nickel-plated / O-Ring : Viton	AL2401
	6 x 2 outputs	Active CompactLine module (IO-Link device) · I/O modules for field applications · Sockets M12 x 1 · housing: polyamide orange / socket: Brass nickel-plated	AL2330

Connectors

Type	Description	Order no.
Socket M12, 4-pole, 4-wire		
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 0.5 m · Housing materials: PP	E12494
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 2 m · Housing materials: PP	E12430
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 5 m · Housing materials: PP	E12495
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 10 m · Housing materials: PP	E12496



For industrial applications

M8 input module converts digital signals to IO-Link signals



- To expand IO-Link master modules by digital inputs
- Compact due to M8 sockets
- Robust plastic housing in a small design for limited space
- Short-circuit and overload detection



Digital inputs for IO-Link



The new IO-Link input modules provide an easy and cost-effective way to expand the IO-Link master modules for field use by digital inputs. The compact M8 version is used when digital signals have to be collected in a very small space.

Up to eight overload and short-circuit protected M8 ports are available. They collect 8 digital sensor signals in a decentralised manner and convert them to IO-Link communication. The connection to the master is established via an M12 connection cable. Fault analysis is available via IO-Link.

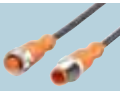

Robust

The robust plastic housing resists the harsh requirements in the field.




IO-Link components

Type	Inputs / outputs	Description	Order no.
	4 inputs	Active CompactLine module (IO-Link device) · Supply via IO-Link M12 connector · Sockets M8 x 1 · PBT / socket: Brass nickel-plated / O-Ring : Viton	AL2410
	8 inputs	Active CompactLine module (IO-Link device) · Supply via IO-Link M12 connector · Sockets M8 x 1 · PBT / socket: Brass nickel-plated / O-Ring : Viton	AL2411

Connectors

Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC717
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC719

Accessories and software

Type	Description	Order no.
	IO-Link master with Profinet interface · I/O modules for field applications · M12 connector · Housing materials: housing: polyamide / socket: Brass nickel-plated	AL1100
	USB IO-Link master · for parameter setting and analysis of units · Supported communication protocols: IO-Link (4.8, 38.4 and 230 Kbits/s) · for operation with FDT framework software "ifm Container" or software "LR SENSOR"	E30390
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011



For industrial applications

IO-Link master for the control cabinet



- 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 LR DEVICE software







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.




IO-Link masters

Type	Inputs / outputs	Description	Order no.
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with Profinet interface · I/O modules for use in the control cabinet · Screw terminal · housing: polyamide	AL1900
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with EtherNet/IP interface · I/O modules for use in the control cabinet · Screw terminal · housing: polyamide	AL1920
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with EtherCat interface · I/O modules for use in the control cabinet · Screw terminal · housing: polyamide	AL1930
	max. 8 IO-Link ports / max. 16 digital inputs / max. 8 digital outputs	IO-Link master with Modbus TCP interface · I/O modules for use in the control cabinet · Screw terminal · housing: polyamide	AL1940

Software

Type	Description	Order no.
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011

Accessories

Type	Description	Order no.
	Active CompactLine module (IO-Link device) · I/O modules for field applications · Sockets M12 x 1 · Housing materials: housing: polyamide orange / socket: Brass nickel-plated	AL2330
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 0.5 m · Housing materials: TPU / PA	E12490
	Adapter · angled · Connector	E21140



For industrial applications

LR DEVICE Parameter setting software via IO-Link master



- Easy and fast IO-Link master parameter setting
- Clear representation
- Easy and fast device parameter setting (point-to-multipoint connection)
- Transferable parameter sets



Features


- Online and offline parameter setting
- Supports all IO-Link devices
- Software and parameter description in all supported languages
- Detailed description texts of all parameter contents
- Parameter sets grouped according to topics
- Parameter setting of IO-Link master (AL11XX-series)
- Supports the latest ifm IO-Link devices
- Supports IO-Link actuators
- Parameter setting of devices via network

Customer benefits

- Optimised by means of graphic visualisation of the process values
- Shortened set-up time
- Optimised device replacement process
- Paperless recording of parameter sets



Software

Type	Description	Order no.
	LR DEVICE (USB stick) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0011
	LR DEVICE (download) · Parameter setting of the units via the network · Software for clear online and offline parameter setting of IO-Link sensors via USB adapter · Use via USB connection cable (drivers are supplied): E30396 IO-Link interface or E30390 IO-Link master (note the respective data sheet) · IODD import and update from ifm's homepage · Reading of IODDs via storage media · Automatic sensor identification · Graphic representation of the process values and history incl. export function · Documentation and archiving · Transferable parameter sets · Full memory plug support for IO-Link 1.1	QA0012



RFID with AS-i



- Industrially compatible identification system in 125 kHz technology
- Coding of workpiece carriers in routing conveyors
- Quick and easy set-up: plug & play
- Read / write head requiring little space due to slim design
- Compact and at a low cost: antenna and evaluation in one housing



RFID and AS-Interface for identification



The ID tags (code carriers) are mounted on the objects to be identified such as tanks, goods or workpiece carriers. When they come into the detection range of the read / write heads, the information is read at up to 0.5 m/s. The read / write heads are used in the AS-i network as analogue slaves according to the profile 7.4 or 7.3 with an M4 master controlling up to 31 RFID systems.

The transmission of energy between the ID tag and the read / write head is based on the physical principle of inductive coupling with a frequency of 125 kHz.






The compact RFID systems include, in addition to the antenna, the complete evaluation and the interface to AS-i. The devices can be operated directly at the AS-Interface, enabling the data transmission to the controller, e.g. check a defined number of characters within a code.




RFID system 125 kHz with AS-Interface

Type	Dimensions [mm]	Travel speed read / write [m/s]	Process interface	Order no.
M12 connector				
	55 x 24 x 41	read: ≤ 0.5 (distance to the ID tag 15 mm) write: only static	AS-i	DTA100
	55 x 24 x 41	read: ≤ 0.5 (distance to the ID tag 15 mm)	AS-i	DTA101
	40 x 40 x 54	read: ≤ 0.5 (distance to the ID tag 30 mm) write: only static	AS-i	DTA200
	40 x 40 x 54	read: ≤ 0.5 (distance to the ID tag 30 mm)	AS-i	DTA201
	92 x 80 x 40	read: ≤ 0.5 (distance to the ID tag 40 mm) write: only static	AS-i	DTA300
	92 x 80 x 40	read: ≤ 0.5 (distance to the ID tag 40 mm)	AS-i	DTA301

Accessories

Type	Description	Order no.
	ID tag · ID-TAG/M5x16.5/01 · M5 x 16.5 mm · Screw mounting · Housing materials: PA black (RAL 9005)	E80301
	ID tag · ID-TAG/TRIANGLE HOUSING/01 · with ID tag E80301 · Housing materials: PBT orange (RAL 2003) / PA black (RAL 9005)	E80302
	ID tag · ID-TAG/D30x2.15/01 · Ø 30 x 2.15 mm · Housing materials: polycarbonate black	E80318
	ID tag · ID-TAG/D50x2.2/01 · Ø 50 x 2.2 mm · Housing materials: polycarbonate black	E80319
	ID tag · ID-TAG/D26x4/01 · Ø 26 x 4 mm · Housing materials: PA High Temperature	E80322

Connectors

Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC012
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC013



RFID for production and conveying



- RFID evaluation unit with PROFIBUS, PROFINET, Ethernet or TCP/IP
- Evaluation unit with 4 antenna connections or digital I/Os
- Read / write antennas in industrially compatible housing
- Transponder with memory sizes from a few bits up to several Kbytes
- Protection rating IP 67 meets the requirements for harsh environments



Flexible RFID system with evaluation unit, antennas and transponders.





The DTE100 RFID system was designed especially for identification tasks in production and conveying. It is often used for quality assurance and serves as "electronic route card".

Parameters can be easily set via a laptop. Due to the high protection rating IP 67 and a large temperature range, the unit also meets the requirements of harsh industrial environments.







The new evaluation unit features four antenna connections or digital I/Os. The antenna concept guarantees easy and quick connection of the LF and HF RFID antennas to the evaluation unit by means of M12 connectors. Besides the LF transponder with a memory size of up to 2 Kbits, the product portfolio from ifm electronic also offers HF transponders with 16 Kbits as a FRAM variant which can be rewritten an unlimited number of times.



RFID system 13.56 MHz

Type	Description	Order no.
M12 connector		
	RFID evaluation unit · for up to 4 read/write heads type ANT41x/ANT51x · Housing materials: Upper part: PA Grivory GV-5H orange / Upper part: TPE / lower part: GD-AISi12	DTE100
	RFID evaluation unit · for up to 4 read/write heads type ANT41x/ANT51x · Housing materials: Upper part: PA Grivory GV-5H orange / Upper part: TPE / lower part: GD-AISi12	DTE101
	RFID evaluation unit · for up to 4 read/write heads type ANT41x/ANT51x · Housing materials: Upper part: PA Grivory GV-5H orange / Upper part: TPE / lower part: GD-AISi12	DTE102
	RFID evaluation unit · for up to 4 read/write heads type ANT41x/ANT51x · Housing materials: Upper part: PA Grivory GV-5H orange / Upper part: TPE / lower part: GD-AISi12	DTE104

RFID antennas 125 kHz / 13.56 MHz

Type	Description	Order no.
	Read/write head · M12 connector · 5 positions of the sensing face selectable · Housing materials: housing: PA / Metal parts: stainless steel	ANT512
	Read/write head · M12 connector · 5 positions of the sensing face selectable · Housing materials: housing: PA / Metal parts: stainless steel	ANT513
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	ANT410
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	ANT411
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	ANT430
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	ANT431

Jumpers for hygienic and wet areas

Type	Description	Order no.
Jumper M12 plug / M12 socket, 5-pole, 5-wire		
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT062



For industrial applications

RFID antennas with IO-Link



- Nine unit versions for different applications
- Flexible parameter setting, diagnostics and data handling thanks to IO-Link
- Perfect for identification tasks with small data volumes
- Easy visualisation of the antenna parameters with LR DEVICE or IO-Link master via the IODD



Applications

Thanks to the easy integration via IO-Link the new RFID antennas are suitable for a wide range of applications.








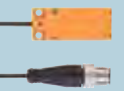
They are perfect for use for the identification of workpiece carriers in conveyor technology, as only a small amount of data needs to be transmitted.

In machine tools, magazines and moulded parts can be detected via RFID and IO-Link. This reduces cycle times and increases the production quantity.




In automotive production, body components or engines are compared to order numbers via RFID in order to control processing steps or check the final assembly.



RFID 13.56 MHz antenna

Type	Description	Order no.
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	DTI410
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	DTI411
	Read/write head · M18 x 1 · M12 connector · Housing materials: housing: stainless steel / Top: PPS / connector housing: PEI	DTI420
	Read/write head · M18 x 1 · M12 connector · Housing materials: housing: stainless steel / Top: PPS / connector housing: PEI	DTI421
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	DTI430
	Read/write head · M12 connector · Housing materials: housing: stainless steel / Top: PPS	DTI431
	Read/write head · M12 connector · 5 positions of the sensing face selectable · Housing materials: housing: PA / Metal parts: stainless steel	DTI513
	Read/write head · M12 connector · Cable with connector · 1 m · Housing materials: PBT / TPE-U / stainless steel	DTI515
	Read/write head · M12 connector · Cable with connector · 2 m · Housing materials: PBT / TPE-U / stainless steel	DTI516

Accessories

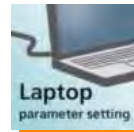
Type	Description	Order no.
	Antenna adapter to increase the ranges · Housing materials: PVC	E80390
	Antenna adapter to increase the ranges · Housing materials: PVC	E80391
	Antenna adapter for a wider sensing field · Housing materials: POM	E80392



Multicode readers for identification of codes



- Reading of DataMatrix codes according to ECC200 and other 1D / 2D codes
- Very small housing for flexible use
- Simple, menu-guided parameter setting
- Integrated lighting
- Adjustable code comparator in the sensor



DataMatrix code readers

Throughout industry one code is becoming more and more popular: the DataMatrix code to ECC200. The DataMatrix code is a two-dimensional code containing much more information with the same structure size than comparable codes like bar code or stacked codes. Several thousand characters can be stored in one code. Other advantages are the high reading speed and very high reading security even if the code is soiled or damaged. In addition to the DataMatrix code the ifm sensor reads many other 1D or 2D codes.

Orientation-independent reading



Independent of the orientation and the number of codes, the high-performance algorithms automatically decode 1D or 2D codes.

Code comparator system in the sensor

Complex application programming is no longer necessary due to adjustable, selective code identification and comparison in the sensor.





Multicode reader

Type	Dimensions [mm]	Max. field of view size [mm]	Type of light LED	Motion speed [m/s]	Process interface	Order no.
Multicode Reader · M12 plug, 8 poles · M12 socket, 4 poles						
	60 x 42 x 53.5	64 x 48	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I300
	60 x 42 x 53.5	64 x 48	infrared	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I301
	60 x 42 x 53.5	132 x 94	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I302
	60 x 42 x 53.5	132 x 94	infrared	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I303
	60 x 42 x 59	400 x 300	red light	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I304
	60 x 42 x 59	400 x 300	infrared	≤ 7	Ethernet TCP/IP, EtherNet/IP, RS-232	O2I305

Accessories

Type	Description	Order no.
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 12 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D110
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 14 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D112
	Glass protective pane · O2D / O2I · Housing materials: housing: diecast zinc black / lens: float glass	E2I168

Connectors

Type	Description	Order no.
Socket M12, 8/7-pole, 8-wire		
	Socket · straight · Free from halogen · M12 connector · 2 m · Housing materials: PUR	E11950
	Socket · straight · Free from halogen · M12 connector · 5 m · Housing materials: PUR	E11807
	Socket · straight · Free from halogen · M12 connector · 10 m · Housing materials: PUR	E11311
Jumper M12 plug / RJ45 plug, 4/8-pole, 4-wire		
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 2 m · Housing materials: PUR / PC	E11898



For industrial applications

Vibration sensors for VSE diagnostic unit



- Permanent vibration monitoring
- Three designs
- Temperature range -30 to 125 °C
- Integrated self-test
- Wide frequency range up to 10 kHz



Avoid machine damage

Vibration sensors monitor machines and plants and are designed for fixed mounting on a machine. The sensor measures the rms vibration velocity on a non-rotating component surface and is used for measured data acquisition, especially for the octavis diagnostic unit, type VSE.

Vibration sensor VSA001

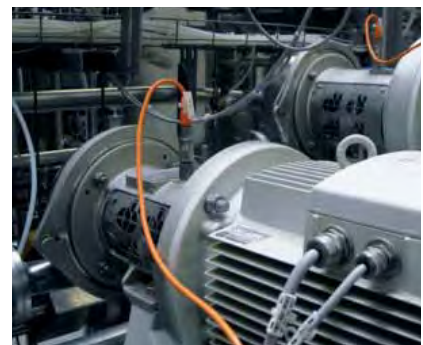
The accelerometer VSA001 ensures the correct transmission of high-frequency vibration signals even over distances of up to 30 m. The compact and extremely robust design provides good long-term stability and independence of temperature even under adverse environmental conditions.

Vibration sensor VSA002

The special mechanical design as well as the integrated pigtail enable an almost flush integration in the machine surface. The vibration sensor type VSA002 permits vibration monitoring where the installation of a sensor has not been previously possible due to lack of space.




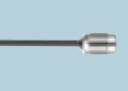
Vibration sensor VSA004

Thanks to the flat design of about 12 mm and the lateral entry of the shielded cable the unit can be installed in locations which are difficult to access.








Long-term stability, independence of temperature and noise immunity thanks to state-of-the-art silicon sensors.

Vibration sensors for external diagnostic electronics type VSE

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · M8 x 1.25 · Connector · Housing materials: housing: stainless steel 316L / 1.4404	VSA001
	Accelerometer · for connection to external diagnostic electronics type VSE · M16 x 1.5 · Cable with connector · 0.8 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA002
	Accelerometer · for connection to external diagnostic electronics type VSE · Mounting screw · Cable · 3 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA004
	Accelerometer · for connection to external diagnostic electronics type VSE · Mounting screw · Cable · 10 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA005
	Accelerometer · for connection to external diagnostic electronics type VSE · M16 x 1.5 · Cable · 6 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA006

Diagnostic electronics – control cabinet modules for vibration diagnosis type VSE

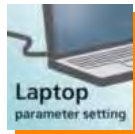
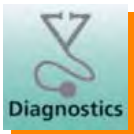
Type	Description	Order no.
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Mounting on DIN rail · Combicon connection · Housing materials: PA	VSE002
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Mounting on DIN rail · Combicon connection · Housing materials: PA	VSE100
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · Profinet IO data interface · Mounting on DIN rail · Housing materials: PA	VSE150
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · EtherNet/IP data interface · Mounting on DIN rail · Housing materials: PA	VSE151
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · Modbus TCP data interface · Mounting on DIN rail · Housing materials: PA	VSE153



Diagnostic unit for vibration sensors



- Low system costs for an optimised machine uptime
- Frequency-selective machine diagnosis of up to four measuring points
- Ethernet interface for integration into operational data logging systems
- Integrated history memory with real-time clock
- Correlation possible with two operating parameters (e.g. speed and power)



Diagnostic unit VSE002

Using the diagnostic unit it is possible to continuously and simultaneously analyse and evaluate the measured signals of up to four vibration sensors with the octavis technology. Pre-alarm and alarm are electrically signalled via switching outputs. The trend can be electrically signalled via the analogue output. 2000 values can be stored in the diagnostic unit.






Diagnostic unit VSE100

In addition to the standard alarm and analogue outputs VSE100 can signal up to eight other freely configurable I/O states of diagnosis objects. Also, the I/Os can be used as inputs, electronically trigger diagnosis (e.g. in a reference run of a machine tool spindle), collect switching states of other sensors and transmit them to the operational data logging system via the OPC standard. The integrated FIFO history memory can store 33,000 values with time stamp.






Using the Ethernet interface the decentralised diagnostic unit can also be integrated into higher-level systems. Due to the compatibility of the data (OPC) the diagnostic values can be easily integrated into all usual visualisation environments and can be made accessible to remote diagnosis within the framework of teleservice concepts.



Diagnostic electronics – control cabinet modules for vibration diagnosis type VSE

Type	Description	Order no.
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Mounting on DIN rail · Combicon connection · Housing materials: PA	VSE002
	Diagnostic electronics for vibration sensors · Integrated history memory with real-time clock · Counter function · TCP/IP Ethernet interface · Active wire break detection and self-test (only MEMS) of the connected acceleration sensors · Parameter setting via PC software VES004 · Mounting on DIN rail · Combicon connection · Housing materials: PA	VSE100
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · Profinet IO data interface · Mounting on DIN rail · Housing materials: PA	VSE150
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · EtherNet/IP data interface · Mounting on DIN rail · Housing materials: PA	VSE151
	Diagnostic electronics for vibration sensors · Parameter setting via PC software VES004 · TCP/IP Ethernet interface · Modbus TCP data interface · Mounting on DIN rail · Housing materials: PA	VSE153

Vibration sensors for external diagnostic electronics type VSE

Type	Description	Order no.
	Accelerometer · for connection to external diagnostic electronics type VSE · M8 x 1.25 · Connector · Housing materials: housing: stainless steel 316L / 1.4404	VSA001
	Accelerometer · for connection to external diagnostic electronics type VSE · M16 x 1.5 · Cable with connector · 0.8 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA002
	Accelerometer · for connection to external diagnostic electronics type VSE · Mounting screw · Cable · 3 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA004
	Accelerometer · for connection to external diagnostic electronics type VSE · Mounting screw · Cable · 10 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA005
	Accelerometer · for connection to external diagnostic electronics type VSE · M16 x 1.5 · Cable · 6 m · Housing materials: housing: stainless steel 316L / 1.4404	VSA006



Vibration sensors and transmitters



- Permanent vibration monitoring to ISO 10816
- Transmitter signal 4...20 mA for direct display at the control desk
- LED display on the unit
- VK sensors combine switching function and transmitter in one unit



Avoid machine damage

Vibration sensors type VT and VK monitor machines and plants to ISO 10816 and are designed for fixed mounting on a machine. The sensor measures the rms vibration velocity (true rms) on a non-rotating component surface. It transfers the characteristic value as current signal (4...20 mA) to the process control system.

Vibration monitor VK

Vibration sensors type VK additionally have a switching output. When an adjustable limit value is exceeded the device sets to alarm via a switching contact.

The easy set-up via two radial setting rings allows quick setting of the switch point and response delay. The protective cap, which can be obtained as an option, ensures protection against tampering.



Set-up

The units are easy to set up without an additional parameter setting software.




Monitoring of the overall vibration of rotating parts (fans, centrifuges, etc.).


Vibration sensors for vibration monitoring of machines and plants to ISO 10816

Type	Description	Order no.
	Vibration monitor · Connection via M12 connector · Vibration monitor to DIN ISO 10816 · Measuring range RMS: 0...25 mm/s · Switching output NC DC PNP and analogue output 4...20 mA · M8 x 1.25 · Housing materials: PBT / PC / FPM / stainless steel 316L / 1.4404	VKV021
	Vibration sensor · Connection via M12 connector · Vibration monitor to DIN ISO 10816 · Measuring range RMS: 0...50 mm/s · Switching output NC DC PNP and analogue output 4...20 mA · M8 x 1.25 · Housing materials: PBT / PC / FPM / stainless steel 316L / 1.4404	VKV022
	Vibration transmitter · Connection via M12 connector · Vibration transmitter to ISO 10816 · Measuring range RMS: 0...25 mm/s · Analogue output 4...20 mA · 2-wire connection technology · set screw · Housing materials: stainless steel 316L / 1.4404	VTV122
	Vibration transmitter · Connection via M12 connector · Vibration transmitter to ISO 10816 · Measuring range RMS: 0...25 mm/s · Analogue output 4...20 mA · 2-wire connection technology · ATEX approval · Group II, category 3D/3G · set screw · Housing materials: stainless steel 316L / 1.4404	VTV12A
	Vibration transmitter · Connection via M12 connector · Vibration transmitter to ISO 10816 · Measuring range RMS: 0...50 mm/s · Analogue output 4...20 mA · 2-wire connection technology · set screw · Housing materials: stainless steel 316L / 1.4404	VTV121

Accessories VK

Type	Description	Order no.
	Protective cover · with lead seal option · for pressure sensors type PK · for temperature sensors type TK · for vibration sensors type VK · Housing materials: PP transparent	E30094

Connectors

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC003

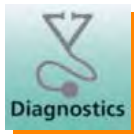


For industrial applications

Combined oil moisture and temperature sensor



- Continuous condition monitoring of oils
- Two analogue outputs (4...20 mA) for relative moisture and temperature
- Wide input voltage range 9...33 V DC
- Medium temperature -20...100 °C
- Process connection G 3/4 for direct installation



Application

Water is generally not wanted in hydraulic liquids and lubricants. High concentrations of water can seriously affect operation or even cause damage.

Measuring principle

The sensor measures the relative moisture in the oil in the range of 0...100 % by means of a capacitive measuring element. At 0 % the oil is absolutely without any water content. At 100 %, however, the medium is completely saturated. No more water is dissolved and is then present as free water.

Besides the relative moisture the sensor also outputs the medium temperature as an analogue signal.




LDH100 – to ensure that oil remains dry!

Oil moisture sensor


Type	Process connection	Pressure rating [bar]	Protection	Medium temperature oil [°C]	Ambient temperature [°C]	Order no.
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M12 connector · Output function 4...20 mA analogue

	G 3/4	50	IP 67	-40...105	-40...85	LDH100
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Accessories for oil moisture sensor LDH


Type	Description	Order no.
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	Adapter block · D33 / G 3/4 · for oil moisture sensor LDH100 · Housing materials: aluminium	E43400
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Connectors

Type	Description	Order no.
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Socket M12, 8/7-pole, 8-wire

	Socket · angled · M12 connector · 2 m · Housing materials: TPU	E80022
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Socket M12, screened, screen connected to the socket, 8/7-pole, 8-wire

	Socket · straight · M12 connector · 2 m · Housing materials: TPU	E80021
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For industrial applications

Configurable signal lamps



- Perfect visibility
- Modern LED RGB technology – long life, reduced stock-keeping
- Different modes configurable via IO-Link or setting menu
- Also as standard version with digital inputs
- Easy installation



High performance









Signal lamps are used for status indication or as warning device everywhere in factories on machines, conveyors and installations. ifm's innovative signal lamps offer several advantages over conventional signal lamps and are therefore suitable for demanding applications.

Flexible configuration






In general signal lamps must be adapted to the application. Instead of spending time and effort on screwing modules of different colours together, the new LED RGB technology makes it possible to adjust the signal lamp as needed via IO-Link or setting button (e.g. permanently on, low flash rate, high flash rate, different colours, siren). This reduces type variety and stock-keeping.



Signal lamps

Type	Dimensions [Ø x H]	Communication	Items supplied	Protection rating	Order no.
	70 x 344	Digital inputs / IO-Link	Mounting base	IP 65	DV1500
	70 x 384	Digital inputs / IO-Link	Mounting base / buzzer	IP 54	DV1510
	70 x 244	Digital inputs / IO-Link	–	IP 65	DV1520
	70 x 284	Digital inputs / IO-Link	buzzer	IP 54	DV1530
	70 x 344	IO-Link	Mounting base	IP 65	DV2500
	70 x 384	IO-Link	Mounting base / buzzer	IP 54	DV2510
	70 x 244	IO-Link	–	IP 65	DV2520
	70 x 284	IO-Link	buzzer	IP 54	DV2530

Accessories

Type	Description	Order no.
	Base · Housing materials: aluminium black	E89060
	Wall bracket · Housing materials: aluminium black	E89061
	Mounting tube · Length: 100 mm · Housing materials: aluminium black	E89065
	Mounting tube · Length: 300 mm · Housing materials: aluminium black	E89066
	Mounting tube · Length: 800 mm · Housing materials: aluminium black	E89067



For industrial applications

ecolink connection technology



- Connection technology meets the M8/M12 standard (EN 61076)
- Optimum sealing even when mounted without tools
- Mechanical end stop protects the O-ring against destruction
- Nut secured against shock and vibration due to saw tooth vibration protection
- LEDs clearly visible even in cases of high light exposure



ecolink connection technology for demanding applications

Most applications require special solutions. Only high-quality materials, assured production processes and faultless assembly lead to success in the long run.

The innovative profiled sealing ring seals radially and axially, guaranteeing a high protection rating. No tools needed for installation and removal.

The asymmetrically acting vibration protection holds the nut tight in its position, guaranteeing optimum and permanent sealing.

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








EVW type sockets are designed for welding applications. They have a weld-slag resistant PUR cable, a nut with weld-slag resistant special coating, are suitable for drag chains and torsion resistant.

EVT type sockets are designed for wet areas and can be used at ambient temperatures up to 100 °C.



The secure connection even in difficult applications.

Sockets for industrial applications










Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC001
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC002
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC003
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC004
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC005
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC006
Socket M12, 5/4-pole, 4-wire, LED, PNP		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC644
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC645
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC646
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC007
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC008
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC009
Socket M12, 5-pole, 5-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC070
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC071
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC072



For industrial applications











Type	Description	Order no.
Socket M8, 3-pole, 3-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC141
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC142
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC143
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC144
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC145
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC146
Socket M8, 3-pole, 3-wire, LED, PNP		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC147
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC148
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVC149
Socket M8, 4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC150
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC151
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC152
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC153
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC154
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC155

Cable plugs for industrial applications


Type	Description	Order no.
Jumper M12 plug / M12 socket, 3/5-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC040
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC041
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC042
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC043
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC102
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC044
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC493
Jumper M12 plug / M12 socket, 3/5-pole, 3-wire, LED, PNP		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC050
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC051
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC052
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC053
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC104
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC054
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC025



Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC026
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC027
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC028
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC140
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC029
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC342
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC030
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC031
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC032
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC033
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC617
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC034
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC404
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC010
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC011
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC012
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC013











Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC100
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC014
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC108
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC015
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC016
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC017
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC018
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC101
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC019
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC109







Jumper cables

Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire, LED, PNP		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC020
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC021
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC022
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC023



For industrial applications
















Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire, LED, PNP		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC096
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC024
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC135
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC035
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC036
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC037
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC038
	Jumper · angled / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVC039
Jumper M8-plug / M8-socket, 3-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC265
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC266
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC267
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC268
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC320
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC269
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC467
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC275

Type	Description	Order no.
Jumper M8-plug / M8-socket, 3-pole, 3-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC276
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC277
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC278
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC462
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC279
Jumper M8-plug / M8-socket, 4-pole, 4-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC310
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC311
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC312
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC313
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC314
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC455
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC456
	Jumper · angled / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC457
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC300
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC301
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC302



For industrial applications

Type	Description	Order no.
Jumper M8-plug / M8-socket, 4-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC303
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC304
Jumper M12 plug / M8 socket, 3-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC215
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC216
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC217
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC218
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC630
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC219
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC412
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC230
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC231
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC232
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC233
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC234
Jumper M12 plug / M8 socket, 4-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC235
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC236

Type	Description	Order no.
Jumper M12 plug / M8 socket, 4-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC237
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC238
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC239
Jumper M12 plug / M12 socket, 3/5-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC566
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC042
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC043
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC044
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC493
Jumper M8-plug / M12-socket, 3/5-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC255
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC256
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC257
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC258
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC415
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC259
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC466




For industrial applications

Type	Description	Order no.
Jumper M8-plug / M12-socket, 3/5/4-pole, 3-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC245
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVC246
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVC247
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC248
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVC463
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC249
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC410




Cable plugs for industrial applications

Type	Description	Order no.
Cable plug M12, 4-pole, 4-wire		
	Cable plug · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 0.3 m · Housing materials: housing: TPU orange	EVC112
	Cable plug · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 0.5 m · Housing materials: housing: TPU orange	EVC184
	Cable plug · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange	EVC076
	Cable plug · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 3 m · Housing materials: housing: TPU orange	EVC384
	Cable plug · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange	EVC077
	Cable plug · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange	EVC078

Valve - plug jumpers for industrial applications



Type	Description	Order no.
Jumper M12 plug / valve plug type B (according to DIN EN 175301-803), 3-pole, 3-wire, LED		
	Jumper · straight / angled · Free from silicone · Free from halogen · with protective circuitry · 0.3 m · Housing materials: PUR	E11421
	Jumper · straight / angled · Free from silicone · Free from halogen · with protective circuitry · 0.6 m · Housing materials: PUR	E11422
	Jumper · straight / angled · Free from silicone · Free from halogen · with protective circuitry · 1 m · Housing materials: PUR	E11423
	Jumper · straight / angled · Free from silicone · Free from halogen · with protective circuitry · 2 m · Housing materials: PUR	E11424
	Jumper · straight / angled · Free from silicone · Free from halogen · with protective circuitry · 5 m · Housing materials: PUR	E11425

Sockets for industrial applications








Type	Description	Order no.
Socket M12, 8/7-pole, 8-wire		
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 1 m · Housing materials: PUR	E12362
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: PUR	E11231
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: PUR	E11232
	Socket · straight · Free from halogen · M12 connector · 2 m · Housing materials: PUR	E11950
	Socket · straight · Free from halogen · M12 connector · 5 m · Housing materials: PUR	E11807
	Socket · straight · Free from halogen · M12 connector · 10 m · Housing materials: PUR	E11311
Socket M23, 12-pole, 12-wire		
	Socket · angled · Free from halogen · M23 connector · 5 m · Housing materials: PUR black	E11739
	Socket · angled · Free from halogen · M23 connector · 10 m · Housing materials: PUR black	E11740





For industrial applications



Type	Description	Order no.
Socket M23, 12-pole, 12-wire		
	Socket · angled · Free from halogen · M23 connector · 15 m · Housing materials: PUR black	E11741
	Socket · straight · Free from halogen · M23 connector · 5 m · Housing materials: PUR black	E11736
	Socket · straight · Free from halogen · M23 connector · 10 m · Housing materials: PUR black	E11737
	Socket · straight · Free from halogen · M23 connector · 15 m · Housing materials: PUR black	E11738

M12 sockets for industrial applications








Type	Description	Order no.
Wirable socket M12, 4-pole		
	Wirable socket · straight · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11508
	Wirable socket · angled · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11509
Wirable socket M12, 4-pole, LED, PNP		
	Wirable socket · angled · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11510
Wirable plug M12, 4-pole		
	Wirable plug · straight · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11504
	Wirable plug · angled · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11505
Wirable socket M12, 5-pole		
	Wirable socket · straight · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11511
	Wirable socket · angled · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11512

Type	Description	Order no.
Wirable plug M12, 5-pole		
	Wirable plug · straight · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11506
	Wirable plug · angled · Free from silicone · Free from halogen · wirable · Gold-plated contacts · M12 connector · Housing materials: PA	E11507

M23 sockets for industrial applications

Type	Description	Order no.
Wirable M23 socket, 12 poles		
	Wirable socket · angled · wirable · M23 connector · Housing materials: Brass nickel-plated	E10447
	Wirable socket · straight · wirable · M23 connector · Housing materials: Brass nickel-plated	E10448







Connection cables for industrial imaging

Type	Description	Order no.
Jumper M12 plug / M12 plug, 4-pole, 4-wire		
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 0.5 m · Housing materials: TPU	E12422
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 2 m · Housing materials: TPU	E21138
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 5 m · Housing materials: TPU	E21139
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 10 m · Housing materials: TPU	E21137
	Jumper · straight / straight · Ethernet · Gold-plated contacts · 20 m · Housing materials: TPU	E12423
Jumper M12 plug / RJ45 plug, 4/8-pole, 4-wire		
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 2 m · Housing materials: PUR / PC	E11898
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 0.5 m · Housing materials: TPU / PA	E12490










For industrial applications

Type	Description	Order no.
Jumper M12 plug / RJ45 plug, 4/8-pole, 4-wire		
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 5 m · Housing materials: TPU / PA	E12491
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 10 m · Housing materials: TPU / PA	E12492
Jumper M12 plug / RJ45 plug, screened, screen not connected to the socket, 4/8-pole, 4-wire		
	Jumper · straight / straight · Ethernet · 10 m · Housing materials: PUR / PC	E12204
	Jumper · straight / straight · Ethernet · 20 m · Housing materials: PUR / PC	E12205
	Jumper · straight / straight · Ethernet · Cross-over patch cable · 5 m · Housing materials: PUR / PC	E12283
Adapter , 4/8-pole		
	Adapter · angled · Connector	E21140
Socket M12, 4-pole, 4-wire		
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 0.5 m · Housing materials: PP	E12494
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 2 m · Housing materials: PP	E12430
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 5 m · Housing materials: PP	E12495
	Socket · straight · Power cable · T-coded · Gold-plated contacts · M12 connector · 10 m · Housing materials: PP	E12496
M12 sockets with increased cross-section		
Type	Description	Order no.
Socket M12, 5-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC706
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC707















Type	Description	Order no.
Socket M12, 5-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC708
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 20 m · Housing materials: housing: TPU orange / sealing: FKM	EVC709
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVC711
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVC712
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVC713
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · M12 connector · 20 m · Housing materials: housing: TPU orange / sealing: FKM	EVC714

Connectors weld slag resistant

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW001
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW002
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVW003
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW004
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW005
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVW006
Socket M12, 5/4-pole, 4-wire, LED, PNP		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW167









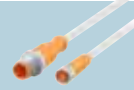



For industrial applications

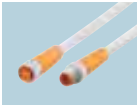



Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire, LED, PNP		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW168
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 10 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW169
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW007
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW008
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 10 m · Housing materials: housing: TPU black transparent / sealing: FKM	EVW009
Socket M12, 5/4-pole, 5-wire		
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW010
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW011
	Socket · straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVW012
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW013
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW014
	Socket · angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · M12 connector · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVW015
Jumpers weld slag resistant		
Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW036
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW022
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW030

Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW031
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW032
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW034
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVW035
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW037
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVW144
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW024
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 2 m · Housing materials: housing: TPU orange / sealing: FKM	EVW025
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW026
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW028
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 10 m · Housing materials: housing: TPU orange / sealing: FKM	EVW029
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire, LED, PNP		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.6 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVW139
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVW038
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 2 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVW039
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 3 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVW040
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 5 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVW041


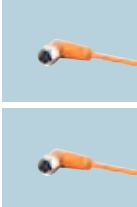
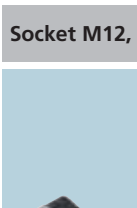
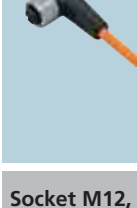







For industrial applications

Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire, LED, PNP		
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 10 m · Housing materials: housing connector: TPU orange / housing socket: TPU black transparent / sealing: FKM	EVW042
Jumper M12 plug / M8 socket, 3-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW076
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVW077
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW078
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW079
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW080
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW081
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVW082
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW083
	Jumper · straight / angled · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW084
Jumper M12 plug / M8 socket, 4-pole, 4-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW085
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVW086
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW087
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW088
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW089








Type	Description	Order no.
Jumper M8-plug / M8-socket, 4-pole, 3-wire		
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.3 m · Housing materials: housing: TPU orange / sealing: FKM	EVW102
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 0.6 m · Housing materials: housing: TPU orange / sealing: FKM	EVW103
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1 m · Housing materials: housing: TPU orange / sealing: FKM	EVW104
	Jumper · straight / straight · Free from silicone · Free from halogen · Gold-plated contacts · For welding applications · 1.5 m · Housing materials: housing: TPU orange / sealing: FKM	EVW105



Connectors for wet areas

Type	Description	Order no.
Socket M12, 5/4-pole, 4-wire		
	Socket · straight · Free from silicone · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT001
	Socket · straight · Free from silicone · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT002
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT004
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT005
Socket M12, 5/4-pole, 4-wire, LED, PNP		
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: PVC black transparent / sealing: EPDM	EVT007
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: PVC black transparent / sealing: EPDM	EVT008
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 15 m · Housing materials: housing: PVC black transparent / sealing: EPDM	EVT096
Socket M12, 5-pole, 5-wire		
	Socket · straight · Free from silicone · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT010
	Socket · straight · Free from silicone · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT011



For industrial applications

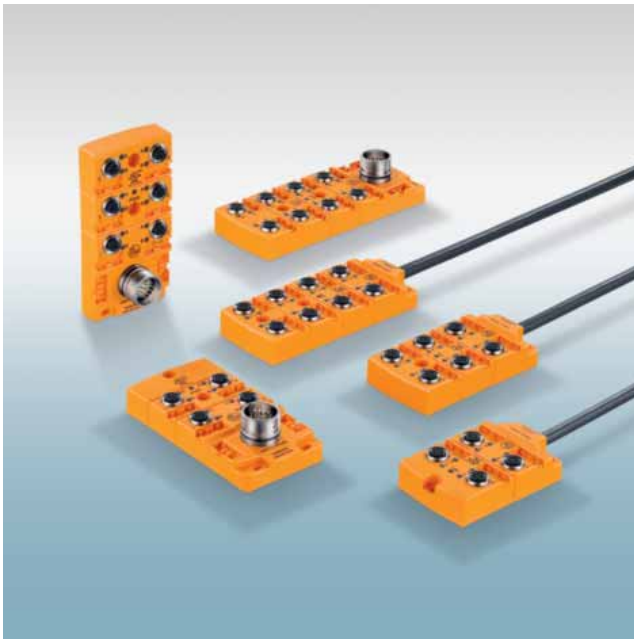
Type	Description	Order no.
Socket M12, 5-pole, 5-wire		
	Socket · straight · Free from silicone · Gold-plated contacts · M12 connector · 25 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT012
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT013
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT014
	Socket · angled · Free from silicone · Gold-plated contacts · M12 connector · 25 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT015
Socket M8, 4-pole, 4-wire		
	Socket · straight · Free from silicone · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT134
	Socket · straight · Free from silicone · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT135
	Socket · straight · Free from silicone · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT136
	Socket · straight · Free from silicone · Gold-plated contacts · M8 connector · 15 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT274
	Socket · straight · Free from silicone · Gold-plated contacts · M8 connector · 25 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT137
	Socket · angled · Free from silicone · Gold-plated contacts · M8 connector · 2 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT138
	Socket · angled · Free from silicone · Gold-plated contacts · M8 connector · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT139
	Socket · angled · Free from silicone · Gold-plated contacts · M8 connector · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT140
	Socket · angled · Free from silicone · Gold-plated contacts · M8 connector · 15 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT275
	Socket · angled · Free from silicone · Gold-plated contacts · M8 connector · 25 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT141
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 0.3 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT046

Type	Description	Order no.
Jumper M12 plug / M12 socket, 4/5-pole, 4-wire		
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 0.6 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT047
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 1 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT048
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 2 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT049
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT050
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT051
	Jumper · straight / angled · Free from silicone · Gold-plated contacts · 3 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT445
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 0.3 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT040
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 0.6 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT041
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 1 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT042
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 2 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT043
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 5 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT044
	Jumper · straight / straight · Free from silicone · Gold-plated contacts · 10 m · Housing materials: housing: PVC orange / sealing: EPDM	EVT045



For industrial applications

Central splitter M12 with ecolink technology



- The mechanical end stop protects the O-ring against destruction
- Optimum sealing even when mounted without tools
- Connection technology meets the M12 standard (EN 61076)
- High-quality materials for a high plant uptime



Splitter with ecolink technology for demanding applications.

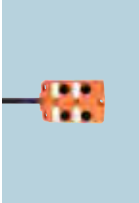
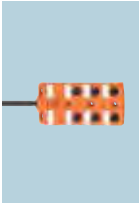
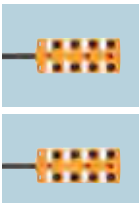
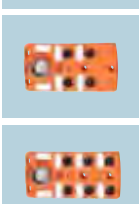

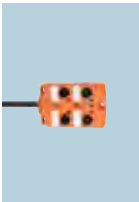
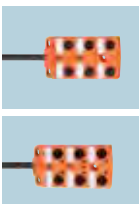
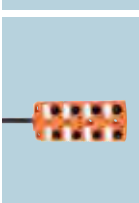
Most applications require special solutions.

Only high-quality materials, assured production processes and faultless installation lead to success in the long run. The new ecolink technology prevents incorrect mounting. An integrated mechanical end stop protects the O-ring from destruction. So rapid and secure installation is possible without an expensive torque wrench.






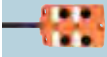






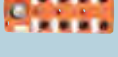

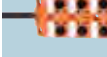
Splitter with ecolink technology, the secure connection.

Splitter boxes for industrial applications

Type	Description	Order no.
M12 splitter box for 1 signal		
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC013
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC025
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC017
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC029
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC021
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC033
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC001
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC005
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC009
M12 splitter box for 1 signal, LED		
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC015
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC027
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC019
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC031
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC023
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC035



For industrial applications

Type	Description	Order no.
M12 splitter box for 1 signal, LED		
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC002
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC006
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC010
M12 splitter box for 2 signals		
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC014
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC026
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC018
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC030
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC022
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC034
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC003
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC007
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC011
M12 splitter box for 2 signals, LED		
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC016
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC028
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC020

Type	Description	Order no.
M12 splitter box for 2 signals, LED		
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC032
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 5 m · Housing materials: PA	EBC024
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Cable · 10 m · Housing materials: PA	EBC036
	Splitter box · 4 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC004
	Splitter box · 6 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC008
	Splitter box · 8 way · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PA	EBC012
Y splitter M12-plug / 2 x M12-socket, 5-pole		
	Y splitter · M12 plug - 2 M12 sockets · Free from silicone · Free from halogen · Gold-plated contacts · Housing materials: housing: PA orange / sealing: FKM	EBC113
	Y splitter · M12 plug - 2 M12 sockets · Free from silicone · Free from halogen · Gold-plated contacts · Housing materials: housing: PA orange / sealing: FKM	EBC114
Y splitter , 5-pole		
	Y splitter · M12 plug - 2 M12 sockets · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PUR	E12481
Y splitter , 4/3-pole		
	Y splitter · M12 plug - 2 M8 sockets · Free from halogen · Free from silicone · Gold-plated contacts · Housing materials: PUR	E10802
T splitter		
	T splitter · M12 x 1 · Orientation: · connectors A / B horizontal (for a vertical sensor) · Housing materials: PUR	E11566
	T splitter · M12 x 1 · Housing materials: PUR	E11627



Basic mounting accessories, adjustable mounting systems



- Basic mounting accessories
- Adjustable mounting systems
- Accessories for photoelectric sensors
- Accessories for cylinder sensors
- Accessories for vision sensors

Mounting accessories

The correct mounting of the sensor is decisive for the machine function. ifm offers a complete range of accessories for simple and secure mounting.

In addition to individual components such as angle brackets, nuts and mounting clamps, special mounting sets and adjustable mounting systems allow low-cost, fast and flexible mounting solutions.

Accessories for photoelectric sensors

Especially for photoelectric sensors the quality of fastening and accessories used is of great importance for the reliability of the complete sensor system.















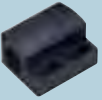
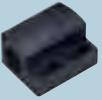
Here you find the suitable reflectors, angle brackets, mounting sets, diaphragms and lenses.

Accessories for cylinder sensors

For cylinder sensors ifm provides tailor-made accessories for fastening the sensors to the different pneumatic cylinder types.







Accessories mounting components




Type	Description	Order no.
	Mounting sleeve · M12 x 1 - Ø 8 mm · 28 mm · with end stop · for type M8 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12587
	Mounting sleeve · M16 x 1 - Ø 12 mm · 33.5 mm · with end stop · for type M12 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12452
	Mounting sleeve · M16 x 1 - Ø 12 mm · 34 mm · with end stop · for type M12 · Housing materials: Brass nickel-plated	E10806
	Mounting sleeve · M22 x 1 - Ø 18 mm · 33.5 mm · with end stop · for type M18 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12453
	Mounting sleeve · M24 x 1.5 - Ø 18 mm · 36 mm · with end stop · for type M18 · Housing materials: Brass nickel-plated	E10807
	Mounting sleeve · M36 x 1.5 - Ø 30 mm · 33.5 mm · with end stop · for type M30 · Housing materials: Brass anti-spatter / nut: Brass anti-spatter	E12454
	Mounting sleeve · M36 x 1.5 - Ø 30 mm · 36 mm · with end stop · for type M30 · Housing materials: Brass nickel-plated	E10808
	Mounting sleeve · M12 x 1 - Ø 8 mm · 32 mm · with end stop · for type M8 · Housing materials: Brass special coating	E10848
	Mounting sleeve · M12 x 1 - Ø 8 mm · 42 mm · with end stop · for type M8 · Housing materials: Brass special coating	E10849
	Mounting sleeve · M16 x 1 - Ø 12 mm · with end stop · for type M12 · Housing materials: Brass nickel-plated	E11114
	Mounting sleeve · M22 x 1 - Ø 18 mm · with end stop · for type M18 · Housing materials: Brass white bronze coated	E11115
	Mounting sleeve · M16 x 1 - Ø 12 mm · 45 mm · with end stop · for type M12 · Housing materials: Brass nickel-plated	E10741
	Mounting sleeve · M24 x 1.5 - Ø 18 mm · 58 mm · with end stop · for type M18 · Housing materials: Brass nickel-plated	E10742
	Mounting sleeve · M36 x 1.5 - Ø 30 mm · 58 mm · with end stop · for type M30 · Housing materials: Brass nickel-plated	E10743
	Mounting clamp · Ø 8 mm · with end stop · for type M8 · Housing materials: PC	E11521
	Mounting clamp · Ø 12 mm · with end stop · for type M12 · Housing materials: PC	E11047




For industrial applications

Type	Description	Order no.
	Mounting clamp · Ø 18 mm · with end stop · for type M18 · Housing materials: PC	E11048
	Mounting clamp · Ø 30 mm · with end stop · for type M30 · Housing materials: PC	E11049
	Angle bracket · for type M8 · Housing materials: stainless steel	E10734
	Angle bracket · for type M12 · Housing materials: stainless steel	E10735
	Angle bracket · for type M18 · Housing materials: stainless steel	E10736
	Angle bracket · for type M30 · Housing materials: stainless steel	E10737

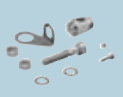
Accessories for sensors with smooth sleeve


Type	Description	Order no.
	Mounting clamp · Ø 12 mm · Housing materials: PBT	E10015
	Mounting clamp · Ø 20 mm - Ø 18 mm · with reducing bush · for type M18 · Housing materials: PBT	E10076
	Mounting clamp · Ø 34 mm - Ø 30 mm · with reducing bush · for type M30 · Housing materials: PBT	E10077
	Mounting clamp · Ø 8 mm · Housing materials: aluminium black anodised	E10221

Accessories for threaded M8 housings

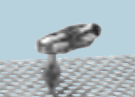






Type	Description	Order no.
	Limit plungers · for types M8 x 1 · with Sn = 1 mm f, 2 mm f and 3 mm f · Housing materials: Limit plungers: free cutting steel / plunger: C45K hardened on front / nut: Brass nickel-plated	E10154

Accessories for threaded M12 housings





Type	Description	Order no.
	Mounting set · Ø 12.2 mm · Clamp mounting · free-standing M8 · for type OF, IF · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20856

Type	Description	Order no.
	Mounting set · Ø 12.2 mm · Clamp mounting · free-standing M8 · for type OF, IF · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20860

Accessories for threaded M18 housings

Type	Description	Order no.
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20718
	Mounting set · Ø 18.5 mm · Clamp mounting · Free-standing M10 · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20719
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20720
	Mounting set · Ø 18.5 mm · Clamp mounting · aluminium profile · for type OG, IG, KG · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc / Cube: diecast zinc	E20867
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: high-grade stainless steel / fixture: high-grade stainless steel	E21206
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: high-grade stainless steel / fixture: high-grade stainless steel	E21207
	Mounting set · Ø 18.5 mm · Clamp mounting · rod mounting Ø 12 mm · for type OG, IG, KG · Housing materials: clamp: diecast zinc / fixture: steel	E20721

Accessories for rectangular housings

Type	Description	Order no.
	Mounting bracket · with integrated snap-on rail · for type IDC · Housing materials: stainless steel	E10730
	Mounting plate · for type IMC · Housing materials: Mounting plate: stainless steel / washer: stainless steel / screws: stainless steel	E12106
	Mounting set · angled · only for flush-mountable sensors · Clamp mounting · rod mounting Ø 14 mm · for type IME, IMC · Housing materials: clamp: stainless steel / fixture: stainless steel 316Ti / 1.4571	E11119
	Mounting set · straight · only for flush-mountable sensors · Clamp mounting · rod mounting Ø 14 mm · for type IME, IMC · Housing materials: clamp: stainless steel / fixture: stainless steel 316Ti / 1.4571	E11120



For industrial applications





Accessories for ultrasonic sensors




Type	Description	Order no.
	Sound Tube · for type UG, UG-Cube · Housing materials: POM	E23000
	Sound deflector · for type UG, UG-Cube · Housing materials: stainless steel	E23001
	Sound deflector · for type UG, UG-Cube · Housing materials: stainless steel	E23002

Accessories O1 housing

Type	Description	Order no.
	Protective bracket · O1D · for type O1D · Housing materials: Angle bracket: stainless steel 316 / 1.4401 / screws: stainless steel / housing: polyamide	E21236
	Mounting set · Clamp mounting · rod mounting Ø 12 mm · for type O1D · Housing materials: fixture: stainless steel / clamp: stainless steel / screws: stainless steel / nut: high-grade stainless steel	E2D101
	Protective cover · O1D · Housing materials: bezel: ZnAl4Cu1 finish black / window: glass transparent and colourless / sealing: FPM 75+/-5 Shore A black / screws: stainless steel	E21171
	Protective cover · O1D · Housing materials: bezel: ZnAl4Cu1 finish black / window: PMMA transparent and colourless / sealing: FPM 75+/-5 Shore A black / screws: stainless steel	E21133
	Cooling box · Protective housing with an active cooling system for the O1D design · for type O1D · Housing materials: housing: aluminium transparent anodised / cover: aluminium black anodised / bezel: aluminium black anodised / window: float glass / cable gland: Brass nickel-plated / nozzle: Brass nickel-plated / sealing: FPM	E21248

Accessories O5 housing

Type	Description	Order no.
	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21085
	Angle bracket · for type O5 · Housing materials: stainless steel 316Ti / 1.4571	E21087
	Mounting set · Clamp mounting · With protective cover · rod mounting Ø 14 mm · for type O5 · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: stainless steel	E21142
	Mounting set · Clamp mounting · With protective cover · rod mounting Ø 12 mm · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21210

Type	Description	Order no.
	Mounting set · Clamp mounting · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21083
	Mounting set · Clamp mounting · With protective cover · Free-standing M10 · for type O5 · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21084
	Mounting set · Clamp mounting · rod mounting Ø 12 mm · for type O5, O5D · Housing materials: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E21211

Accessories OJ housing







Type	Description	Order no.
	Mounting set · OJ · for side lens · Clamp mounting · free-standing M8 · Housing materials: fixture: stainless steel 316Ti / 1.4571 / clamp: diecast zinc	E20968
	Swivel-mount clip · for type OJ · Housing materials: diecast zinc	E20974
	Mounting and fine adjustment bracket for laser units · for front lens · for type OJ · Housing materials: diecast zinc	E20975
	Mounting and fine adjustment bracket for laser units · for side lens · for type OJ · Housing materials: diecast zinc	E20976
	Angle bracket · for type OJ · Housing materials: high-grade stainless steel	E20984
	Mounting set · OJ · for side lens · rod mounting Ø 10 mm · Housing materials: clamp: diecast zinc / fixture: stainless steel 316Ti / 1.4571	E21095

Fixing components


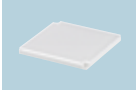


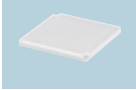




Type	Description	Order no.
	mounting rod · Ø 14 / M12 · Length: 130 mm · straight · Housing materials: stainless steel 316Ti / 1.4571	E20939
	mounting rod · Ø 12 / M10 · Length: 130 mm · straight · Housing materials: stainless steel 316Ti / 1.4571	E20938
	mounting rod · Ø 12 / M10 · Length: 200 mm · angled · Housing materials: stainless steel 316Ti / 1.4571	E20940
	mounting rod · Ø 14 / M12 · Length: 200 mm · angled · Housing materials: stainless steel 316Ti / 1.4571	E20941



For industrial applications







Type	Description	Order no.
	Cube · M8 · aluminium profile · Housing materials: diecast zinc	E20950
	Cube · M10 · aluminium profile · Housing materials: diecast zinc	E20951
	Cube · M12 · aluminium profile · Housing materials: diecast zinc	E20952
	clamp · Ø 14 mm · rod mounting Ø 14 mm · Housing materials: clamp: stainless steel	E21109
	clamp · Ø 12 mm · rod mounting Ø 12 mm · Housing materials: clamp: stainless steel	E21110
	Connection piece · Ø 20 mm · for the connection of two clamps with Ø 20 mm · Housing materials: stainless steel 316L / 1.4404	E21076

Accessories for photoelectric sensors

Type	Description	Order no.
	Prismatic reflector · 45 x 28 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20452
	Prismatic reflector · 96 x 96 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20454
	Prismatic reflector · 48 x 48 mm · rectangular · for retro-reflective laser sensors and glass and film detection · Housing materials: plastics	E20722
	Prismatic reflector · Ø 40 mm · round · push-fit fastener · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20851
	Prismatic reflector · 80 x 80 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20739
	Prismatic reflector · 48 x 48 mm · rectangular · For red light and infrared light retro-reflective sensors · Housing materials: front plate: PMMA / base: ABS	E20744
	Prismatic reflector · Ø 25 mm · round · fixing by screw · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20953
	Prismatic reflector · Ø 35 mm · round · fixing by screw · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20954
	Prismatic reflector · Ø 50 mm · round · fixing by screw · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20956




Type	Description	Order no.
	Spacer · 10 mm · for type IMC / GMC · for centred mounting on metal · Housing materials: plastics	E12528
	Prismatic reflector · Ø 20 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20003
	Prismatic reflector · Ø 42 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20004
	Prismatic reflector · Ø 80 mm · round · For red light and infrared light retro-reflective sensors · Housing materials: plastics	E20005
	Prismatic reflector · Ø 10 mm · round · fixing by screw · M3 · for retro-reflective laser sensors · Housing materials: screw: stainless steel 316 / 1.4401 / spring washer: stainless steel 316 / 1.4401 / nut: stainless steel 316 / 1.4401 / front plate: PMMA / base: ABS	E20990
	Prismatic reflector · Ø 15 mm · round · fixing by screw · M3 · for retro-reflective laser sensors · Housing materials: screw: stainless steel 316 / 1.4401 / spring washer: stainless steel 316 / 1.4401 / nut: stainless steel 316 / 1.4401 / front plate: PMMA / base: ABS	E20992
	Prismatic reflector · Ø 19 mm · round · fixing by screw · M3 · for retro-reflective laser sensors · Housing materials: screw: stainless steel 316 / 1.4401 / spring washer: stainless steel 316 / 1.4401 / nut: stainless steel 316 / 1.4401 / front plate: PMMA / base: ABS	E20993
	Prismatic reflector · 30 x 20 mm · rectangular · for retro-reflective laser sensors · Housing materials: front plate: PMMA / base: ABS	E20994
	Reflective tape · TS-02 · 50 x 1000 mm · For red light and infrared light retro-reflective sensors · Housing materials: plastics / acrylic	E21015

Accessories for vision sensors




Type	Description	Order no.
	Plastic diffuser · O2D / O2I · Housing materials: housing: diecast zinc black / lens: PMMA	E21165
	Plastic protective pane for the food industry · O2D / O2I · Housing materials: housing: diecast zinc black / lens: PMMA	E21166
	Glass protective pane · O2D / O2I · Housing materials: housing: diecast zinc black / lens: float glass	E21168
	Laser protection pane plastic · O2D / O2I · Housing materials: housing: diecast zinc black / lens: PMMA / filter: polycarbonate	E21169
	Daylight filter · O2D · Housing materials: housing: diecast zinc black / lens: PMMA / Metal ring: aluminium black anodised / sealing: FPM 75+/-5 Shore A black	E21172
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 12 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D110



For industrial applications

Type	Description	Order no.
	Mounting set · O2D, O2M, O2I, O2V · Clamp mounting · rod mounting Ø 14 mm · Housing materials: fixture: stainless steel / clamp: stainless steel	E2D112
	Mounting bracket · for Touch Panel PC · for wall mounting · VESA standard 100 x 100 mm · Housing materials: fixture: metal	E2D401
	Mounting set · for Touch Panel PC · for control cabinet mounting · Housing materials: fixture: metal / End cap: plastics	E2D402

Accessories safety light curtains / safety light grids

Type	Description	Order no.
	Corner mirror · Length: 250 mm · for safety light curtains · Protected area height · 160 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1001
	Corner mirror · Length: 400 mm · for safety light curtains · Protected area height · 310 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1002
	Corner mirror · Length: 540 mm · for safety light curtains · Protected area height · 460 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1003
	Corner mirror · Length: 715 mm · for safety light curtains · Protected area height · 610 mm · for safety light grids · 2 beams · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1004
	Corner mirror · Length: 885 mm · for safety light curtains · Protected area height · 760 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1005
	Corner mirror · Length: 1060 mm · for safety light curtains · Protected area height · 910 mm · for safety light grids · 3 beams · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1006
	Corner mirror · Length: 1230 mm · for safety light curtains · Protected area height · 1060 mm · for safety light grids · 4 beams · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1007
	Corner mirror · Length: 1400 mm · for safety light curtains · Protected area height · 1210 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1008
	Corner mirror · Length: 1450 mm · for safety light curtains · Protected area height · 1360 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1009
	Corner mirror · Length: 1600 mm · for safety light curtains · Protected area height · 1510 mm · for type OY · Housing materials: aluminium epoxy-powder coated / plastics / Accessories: steel galvanised	EY1010
	Vibration damper · for type OY · Housing materials: rubber / metal galvanised	EY3001
	Vibration damper · for type OY · Housing materials: rubber / metal galvanised	EY3002
	Adjustable brackets · axial ± 7° · for type OY · Housing materials: metal galvanised	EY3004

Product selectors and further information can be found at: ifm.com

Type	Description	Order no.
	Adjustable brackets · axial $\pm 7^\circ$ · for type OY · Housing materials: metal galvanised	EY3005
	Test rod · \varnothing 14 mm · Probe length: 150 mm · for safety light curtains · for type OY · Housing materials: aluminium	EY3006
	Test rod · \varnothing 20 mm · Probe length: 150 mm · for safety light curtains · for type OY · Housing materials: aluminium	EY3007
	Test rod · \varnothing 30 mm · Probe length: 150 mm · for safety light curtains · for type OY · Housing materials: aluminium	EY3008
	Test rod · \varnothing 40 mm · Probe length: 150 mm · for safety light curtains · for type OY · Housing materials: aluminium	EY3009
	Laser adjustment aid · for safety light curtains · for type OY · Housing materials: plastics	EY3099

Accessories for process sensors

Type	Description	Order no.
	Adapter · G $\frac{1}{4}$ - G $\frac{1}{2}$ · Housing materials: stainless steel / sealing: FPM	E30000
	Flange adapter · G $\frac{1}{4}$ · Hole spacing · 31.1 mm · Housing materials: sealing: NBR, acrylonitrile-butadiene-rubber / flange: aluminium / hollow screw: Brass	E30003
	Adapter · G $\frac{1}{4}$ A - G $\frac{1}{4}$ A · Housing materials: 1.4404 / sealing ring: FKM	E30143
	Welding adapter · G $\frac{3}{4}$ - \varnothing 50 mm · Housing materials: stainless steel 316L / 1.4404	E30009
	Welding adapter · G 1 - \varnothing 50 mm · Housing materials: stainless steel 316L / 1.4404	E30013
	Damping screw · for pressure sensors type Typ PA, PB, PN, PY, PZ	E30044
	Adapter · G $\frac{1}{4}$ - G $\frac{1}{2}$ · Housing materials: stainless steel / sealing: FPM	E30050
	Adapter · $\frac{1}{4}$ " NPT - G $\frac{1}{4}$ · Housing materials: stainless steel 316Ti / 1.4571	E30058
	Adapter · G 1 - G $\frac{1}{2}$ · Housing materials: stainless steel 316L / 1.4404 / sealing: FPM	E30116



For industrial applications

Type	Description	Order no.
	Mounting clamp · Ø 16 mm · for capacitive level sensors LK, LI, LT, LL · Housing materials: PP	E43000
	Mounting clamp · Ø 34 mm · Housing materials: PA	E10193
	Flange plate · 73-90 D16 · for capacitive level sensors LK, LI, LT, LL · according to DIN 24557 · Housing materials: aluminium anodised / nut: stainless steel / Spacer: Brass / rubber ring: FPM / sealing: NBR	E43001
	Welding adapter · Ø 50 D16 · D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: stainless steel / nut: stainless steel / Spacer: Brass / rubber ring: FPM	E43002
	Mounting adapter · G ¾ D16 · D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: stainless steel / nut: stainless steel / Spacer: Brass / rubber ring: FPM / sealing: Tesnit	E43003
	Mounting adapter · G 1 D16 · D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: stainless steel / nut: stainless steel / Spacer: Brass / rubber ring: FPM / sealing: Tesnit	E43004
	Flange plate · 100-125 D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: aluminium anodised / nut: stainless steel / Spacer: Brass / rubber ring: FPM	E43005
	Flange plate · 65-80 D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: aluminium anodised / nut: stainless steel / Spacer: Brass / rubber ring: FPM	E43006
	Mounting adapter · ¾" NPT D16 · D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: stainless steel / nut: stainless steel / Spacer: Brass / rubber ring: FPM	E43012
	Mounting adapter · 1" NPT D16 · D16 · for capacitive level sensors LK, LI, LT, LL · Housing materials: flange: stainless steel / nut: stainless steel / Spacer: Brass / rubber ring: FPM	E43013
	Mounting set · Ø 16 mm · for capacitive level sensors LK, LI, LT, LL · Housing materials: PP / Metal parts: steel galvanised	E43016
	Flange plate · 73-90 / G ¾ · for level sensors LR · according to DIN 24557 · Housing materials: flange: stainless steel / sealing: NBR	E43201
	Flange plate · 65-80 / G ¾ · for level sensors LR · Housing materials: flange: stainless steel	E43202
	Protective cover · for LK / LL / LR / LT sensors · Housing materials: PP	E43910
	Probe · Probe length: 150 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43225
	Probe · Probe length: 240 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43203
	Probe · Probe length: 300 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43226

Type	Description	Order no.
	Probe · Probe length: 450 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43204
	Probe · Probe length: 500 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43227
	Probe · Probe length: 700 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43205
	Probe · Probe length: 1000 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43207
	Probe · Probe length: 1200 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43208
	Probe · Probe length: 1400 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43209
	Probe · Probe length: 1600 mm · for level sensors LR · Housing materials: stainless steel 316L / 1.4404	E43210


Accessories for flow sensors

Type	Description	Order no.
	Adapter · G 1/4- G 1/2 · Housing materials: stainless steel 316L / 1.4404	E40266
	Adapter · G 1¼ - R 1 · for flow monitor type SU9 · Housing materials: stainless steel 316L / 1.4404	E40205
	Adapter · G 1 - ¾" NPT · for flow monitor type SM8 / SU8 · Housing materials: stainless steel 316L / 1.4404	E40193
	Adapter · G 1 - R ½ · for flow monitor type SM8 / SU8 · Housing materials: stainless steel 316L / 1.4404	E40179
	Adapter · G 1 - R ¾ · for flow monitor type SM8 / SU8 · Housing materials: stainless steel 316L / 1.4404	E40180
	Adapter · G ¾ - ½" NPT · for flow monitor type SM7 / SU7 · Housing materials: stainless steel 316L / 1.4404	E40191
	Adapter · G ¾ - R ½ · for flow monitor type SM7 / SU7 · Housing materials: stainless steel 316L / 1.4404	E40178
	Adapter · M18 x 1.5 - G ½ · Insertion depth of the probe of SID, SFD, TN: · 21 mm · Housing materials: CW614N	E40097










For industrial applications

Type	Description	Order no.
	Adapter · M18 x 1.5 - G 1/4 · Insertion depth of the probe of SID, SFD, TN: · 13.5 mm · Housing materials: CW614N	E40098
	Adapter · M18 x 1.5 - G 1/2 · Insertion depth of the probe of SID, SFD, TN: · 21 mm · Housing materials: stainless steel 316L / 1.4404	E40096
	Adapter · M18 x 1.5 - G 3/4 · Insertion depth of the probe of SID, SFD, TN: · 13.5 mm · Housing materials: stainless steel 316L / 1.4404	E40099
	Adapter · M18 x 1.5 - M12 x 1 · Insertion depth of the probe of SID, SFD, TN: · 13.5 mm · Housing materials: stainless steel 316L / 1.4404	E40101
	Adapter · M18 x 1.5 - L18 · for mounting in T-pieces · Insertion depth of the probe of SID, SFD, TN: · 28.5 mm · Housing materials: nut: stainless steel 316Ti / 1.4571 / adapter: stainless steel 316L / 1.4404 / O-ring: FKM 16 x 1.5 gr 70° Shore A	E40104
	Mounting clamp · Ø 23 mm · for air flow monitor SLG · Housing materials: PBT	E40048
	Grounding clamp · Housing materials: stainless steel 316L / 1.4404	E40234
	Protective cover · for flow sensors type SI5xxx, SI6xxx, SR59xx · Housing materials: PP uncoloured	E40203
	Adapter · G 1/2 - R 1/2 · for flow monitor type SM6 · flat seal · Housing materials: stainless steel 316Ti / 1.4571	E40199
	Adapter · G 3/4 - G 3/4 · for flow monitor type SM7 / SU7 · Housing materials: stainless steel 316L / 1.4404	E40216
	Progressive ring T-piece DIN 2353 · QL 18-18-18 · for sensors and adapters with process connection M26 x 1.5 · Recommendation: precision steel pipes 18 x 1.5 to DIN 2391/ISO 3304 · Housing materials: stainless steel 316Ti / 1.4571	E40078
	Progressive ring T-piece DIN 2353 · QL 22-18-22 · for sensors and adapters with process connection M26 x 1.5 · Recommendation: precision steel pipes 22 x 1.5 to DIN 2391/ISO 3304 · Housing materials: stainless steel 316Ti / 1.4571	E40079
	Progressive ring T-piece DIN 2353 · QL 28-18-28 · for sensors and adapters with process connection M26 x 1.5 · Recommendation: precision steel pipes 28 x 1.5 to DIN 2391/ISO 3304 · Housing materials: stainless steel 316Ti / 1.4571	E40080
	T-piece · R3/4 - M26 x 1.5 - R3/4 · for sensors and adapters with process connection M26 x 1.5 · Flow rate: 0...20 l/min · Housing materials: stainless steel 316Ti / 1.4571	E40137
	Welding adapter · M18 x 1.5 - Ø 24 mm · Insertion depth of the probe of SID, SFD, TN: · 15 mm · Housing materials: stainless steel 316L / 1.4404	E40124
	Flow adapter (for low flow rates) · M12 x 1 - G 1/8 · for flow sensors and compact flow monitors with adapter · Housing materials: stainless steel 316L / 1.4404	E40129
	Flow adapter (for low flow rates) · M12 x 1 - G 1/8 · for type SA5 · Housing materials: stainless steel 316L / 1.4404	E40434

Type	Description	Order no.
	Mounting plate · Housing materials: stainless steel 316L / 1.4404	E40249
	label tag · for fluid sensors · Housing materials: PA	E30422

Accessories for temperature sensors

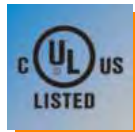
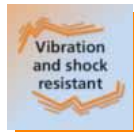
Type	Description	Order no.
	Progressive ring fitting for temperature sensors · Ø 6 mm - G ½ · Housing materials: stainless steel 316Ti / 1.4571	E30047
	Progressive ring fitting for temperature sensors · Ø 10 mm - G ½ · Housing materials: stainless steel 316Ti / 1.4571	E30016
	Mounting set · for direct connection of temperature sensors TT to control monitors TR · Housing materials: stainless steel	E30017
	Clamp fitting · Ø 6/8/10 mm - G ½ · for temperature sensors · Housing materials: stainless steel / FPM	E30018
	Adapter · M18 x 1,5 - G ½ · Housing materials: stainless steel 316L / 1.4404 / O-ring: FPM (fitted)	E30073
	Thermowell for temperature sensors · Ø 10 mm - G ½ · Probe length: 82 mm · Housing materials: stainless steel 316L / 1.4404	E35010
	Thermowell for temperature sensors · Ø 10 mm - G ½ · Probe length: 182 mm · Housing materials: stainless steel 316L / 1.4404	E35020
	Thermowell for temperature sensors · Ø 10 mm - G ½ · Probe length: 282 mm · Housing materials: stainless steel 316L / 1.4404	E35030
	Thermowell for temperature sensors · Ø 10 mm - G ½ · Probe length: 482 mm · Housing materials: stainless steel 316L / 1.4404	E35050
	Protective cover · for fluid sensors with M12 connector · Housing materials: Polypropylene homopolymer	E30420



24 V power supplies



- Regulated, particularly space-saving design
- High efficiency, low heating of the control cabinet
- High power reserves
- Safe switch-off of circuit breakers in the event of a short circuit
- Low inrush current



Primary switched-mode power supplies

Switched-mode power supplies are an economic solution to supply sensors, actuators and sensitive electronic components. They are distinguished by their compact, light weight, slim design ensuring reliable installation on the rail. A stable output voltage, under different loads and at fluctuating input voltages, ensures operational reliability and plant uptime.










Two LEDs and a DCok output indicate and signal operating states.

The units can be used worldwide due to their wide-range input and cULus approval.



ifm offers an extensive range of switched-mode power supplies.

Switched-mode power supplies

Type	Current [A]	Output voltage [V]	Nominal voltage [V]	Mains buffering time [ms]	Efficiency typ. [%]	Order no.
	1.25	24...28	115 / 230 AC	120 (230 V AC; 24 V DC; 1.25 A)	84	DN1030
	2.5	24...28	115 / 230 AC	90 (230 V AC; 24 V DC; 2.5 A)	88	DN1031
	3.3	24...28 DC	115 / 230 AC	30 (120 V AC; 60 Hz) / 128 (230 V AC; 50 Hz)	88	DN4011
	5	24...28 DC	115 / 230 AC	80 (120 V AC; 60 Hz) / 78 (230 V AC; 50 Hz)	89.4	DN4012
	10	24...28 DC	115 / 230 AC	46 (120 V AC; 60 Hz) / 47 (230 V AC; 50 Hz)	91	DN4013
	20	24...28 DC	115 / 230 AC	26 (120 V AC; 60 Hz) / 26 (230 V AC; 50 Hz)	92.7	DN4014
	5	24...28 DC	2 x 400 AC	27 (400 V AC; 50 Hz) / 48 (480 V AC; 60 Hz)	90.4	DN4032
	10	24...28 DC	3 x 400 AC	34 (400 V AC; 50 Hz) / 54 (480 V AC; 60 Hz)	92.8	DN4033
	20	24...28 DC	3 x 400 AC	22 (400 V AC; 50 Hz) / 22 (480 V AC; 60 Hz)	95	DN4034
	40	24...28 DC	3 x 400 AC	25 (400 V AC; 50 Hz) / 25 (480 V AC; 60 Hz)	95.3	E84036
	40	24...28 DC	115 / 230 AC	27 (120 V AC; 60 Hz) / 27 (230 V AC; 50 Hz)	93.6	E84016

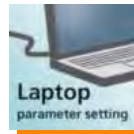


For industrial applications

Electronic 24 V circuit breakers



- Indication of the trigger enables quick diagnostics
- Current and voltage measurement of each load circuit for more plant transparency
- Modular and selective protection in plants and machinery
- Reliable circuit protection allows reduction of wire cross-sections
- Fast replacement using innovative connection technology
















Safety on the 24 V side

As opposed to the 230 V primary side, the circuit protection in the secondary circuit is often neglected. Another issue is that in the event of a failure of the 24 V DC voltage supply, standard mechanical circuit breakers often do not trigger. This may happen with long cables, for example.

The electronic circuit breakers from ifm monitor the circuit ideally and, if required, disconnect reliably. Individual branch circuits can be selectively disconnected. This allows a reduction of wire cross-sections in the load circuit of the switched-mode power supplies. The system has a modular structure and can be ideally adapted to the circuits of plant and machinery.



Electronic circuit protection modules

Type	Description	Order no.
	Supply module, standard · Input current (max. total current) 40 A · for circuit protection modules DF12xx	DF1100
	Supply module, IO-Link · Input current (max. total current) 40 A · for circuit protection modules DF22xx	DF2100
	Supply module, IO-Link · Input current (max. total current) 40 A · for circuit protection modules DF22xx	DF2101
	Circuit protection module, standard · Nominal current (Fail-safe element) 2 x 2 A · for supply module DF1100	DF1212
	Circuit protection module, standard · Nominal current (Fail-safe element) 2 x 4 A · for supply module DF1100	DF1214
	Circuit protection module, standard · Nominal current (Fail-safe element) 2 x 6 A · for supply module DF1100	DF1216
	Circuit protection module, standard · Nominal current (Fail-safe element) 1 x 8 A · for supply module DF1100	DF1208
	Circuit protection module, standard · Nominal current (Fail-safe element) 1 x 10 A · for supply module DF1100	DF1210
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 1 x 8 A · for supply module DF2100	DF2208
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 1 x 10 A · for supply module DF2100	DF2210
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 2 x 2 A · for supply module DF2100	DF2212
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 2 x 4 A · for supply module DF2100	DF2214
	Circuit protection module, IO-Link · Nominal current (Fail-safe element) 2 x 6 A · for supply module DF2100	DF2216

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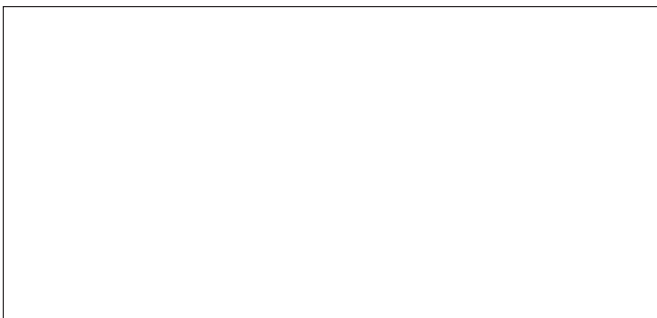
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