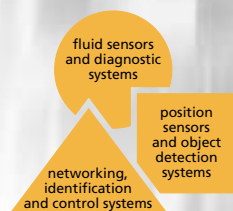


ATEX explosion protection



Catalogue
2006



... for automation.

Position sensors and object detection systems

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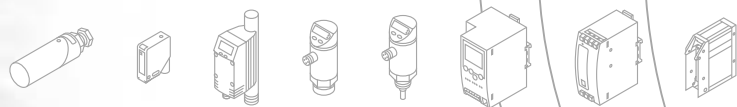
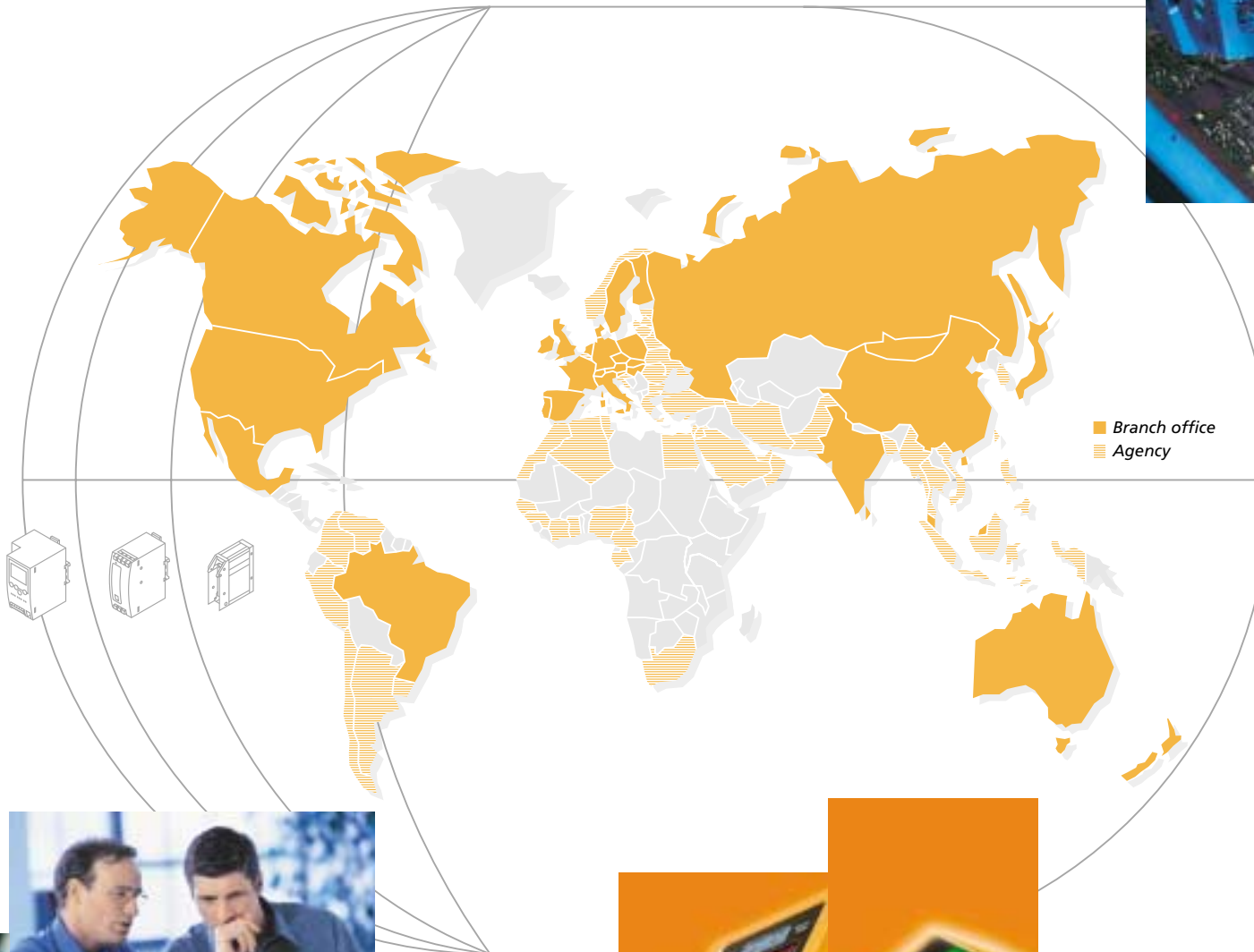
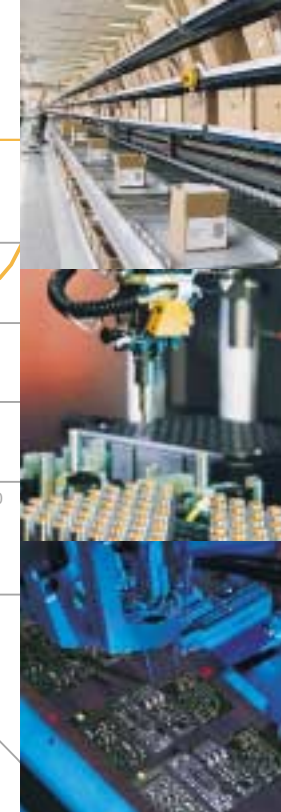
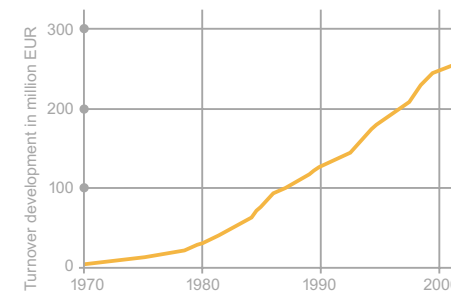
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Security through success

Since its foundation in 1969 ifm electronic has constantly grown and in 2004 reached a turnover of approx. 300 million EUR with more than 2,600 people world-wide. This success gives you the certainty of having found 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.

We are there for you

Close contact with our customers is part of our success. Therefore we have consistently developed our sales network. Today ifm electronic is represented in more than 70 countries – close to you! With application advice and service 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.

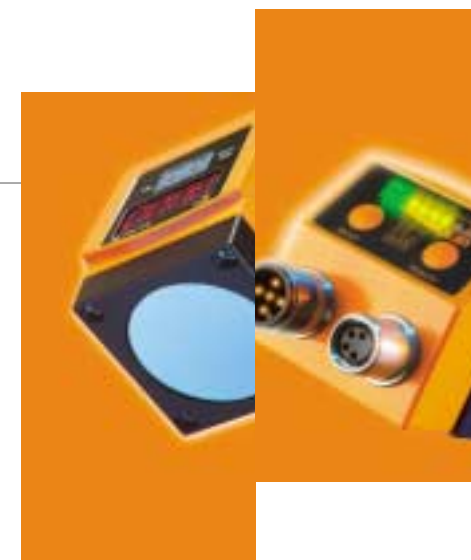


Availability guaranteed

Your deadlines are of importance for us. That is why we are constantly optimising our production processes. For the fast and flexible production even of large quantities while maintaining the high product quality – thus further improving our delivery times.

Quality as part of our philosophy

The quality standard of our products is an integral part of our company philosophy. And we guarantee it. Thus giving you as the user maximum certainty: With our own production technology, the ifm film technology as well as extensive quality assurance actions and the 100 % final inspection. By quality we also understand e.g. an ecologically conscious production – Made in Germany.



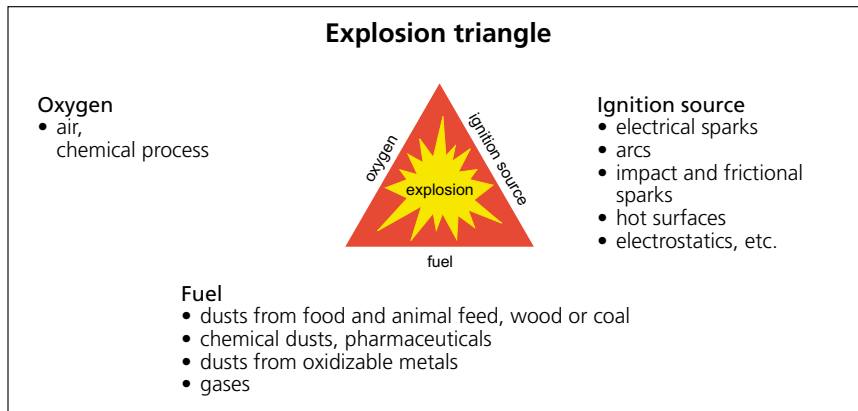
The development of innovative products is one of our core competences. Under the name of i-step we have come up with a new product generation which implements sophisticated technologies in industrially compatible and easy to handle products.



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- General information
- Inductive sensors
- Capacitive sensors
- Electronic cylinder switches
- Fail-safe inductive switches
- Inductive sensors for valves
- Evaluation systems
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Definitions of ATEX

ATEX stands for **atmosphère explosible**. In common language use the EU directives 94/9/EC and 1999/92/EC are also called "ATEX directives"

What does 94/9/EC mean?

These are the directives to harmonise the legal provisions of the EU member states for equipment and protective systems for intended use in hazardous areas.

- ▶ Concerns the manufacturers of electrical equipment

What does 1999/92/EC mean?

These are minimum provisions of the EU member states to improve the health protection and safety of the employees who can be jeopardised by explosive atmospheres.

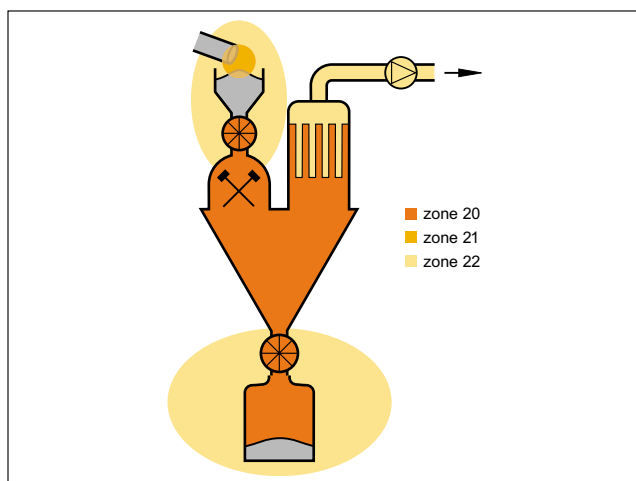
- ▶ Concerns the machine operators

Note: The user or the operator of a machine is responsible for the zone classification.

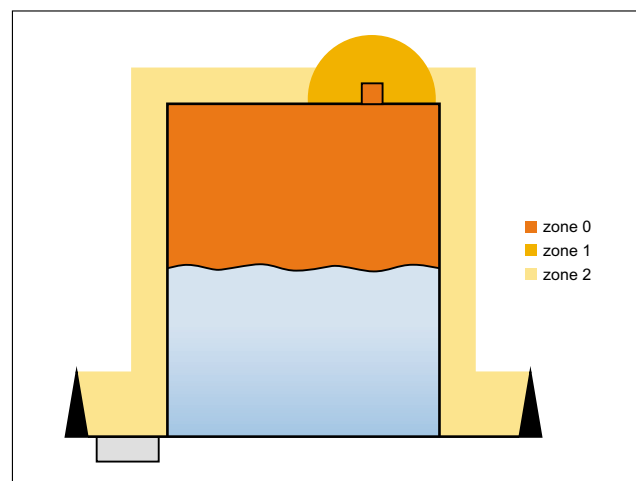
Where necessary, the machine operator marks the accesses to a hazardous area by means of a warning sign.



Warning sign for places where explosive atmospheres may occur.



Example of zoning for combustible dusts.*



Example of zoning for a tank for combustible liquids.*

Scope of ATEX

The ATEX directives apply to all industries in the EU.

They do not apply to:

- ▶ medical devices
- ▶ equipment for areas in which explosive substances are present
- ▶ domestic environments
- ▶ personal protective equipment
- ▶ seagoing vessels etc.
- ▶ means of transport (except in hazardous areas)
- ▶ use by the armed forces

Classification into equipment categories and zones for equipment group II

Equipment group	Zone		Presence of explosive atmospheres
	Gas (G)	Dust (D)	
1	0	20	continuously or for long periods
2	1	21 22 (conductive dust)	occasionally in normal operation
3	2	22 (non-conductive dust)	where explosive atmospheres are unlikely to occur in normal operation, but if so, only infrequently and of short duration

Classification into equipment groups

Equipment group I: for gassy mines

Equipment group II: for other explosive atmospheres

Equipment categories

A category represents the classification within an equipment group with regard to the required level of safety.

Category 1:

For rare unit failures the safety of the equipment is ensured by at least two independent apparatus providing protective functions or with two separate faults.

Category 2:

The protection in the case of frequently occurring unit failures is ensured by an adequate safety measure.

Category 3:

Sufficient safety is ensured in normal operation (a normal level of safety).

Hazardous atmospheres

G (gas): gas, mist, vapours

D (dust): non-conductive dusts, conductive dusts (electrical resistance $\leq 10^3 \Omega \cdot m$ to EN 50281-1-2)

* Source: Guide of Good Practice for implementing Council Directive 1999/92/EC.

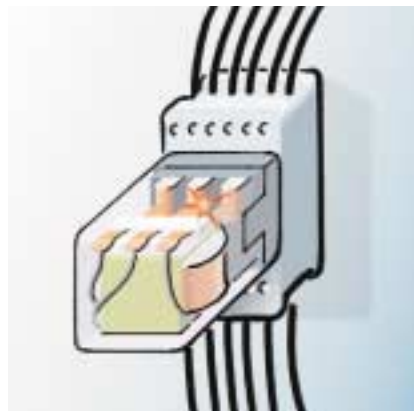
Example of ignition sources

Sparking

by friction, impact and machining operations, e.g. grinding. For electrical systems electric break sparks can occur, e.g. when electric circuits are opened or closed – even in case of low voltages.



Sparking when pressing a light switch.



Break sparks when electric circuits are opened/closed in a relay/contactor.

Static charge

caused by the friction of gaseous or solid particles, e.g. for filling operations or fast separation operations, e.g. rolling foils over rollers.



Pouring bulk material from bags or containers.



Non-conductive soles or floor covering increase static charge.



Roller used to roll off foil.



Transport and filling of bulk or granular substances.

Smoldering solid particles

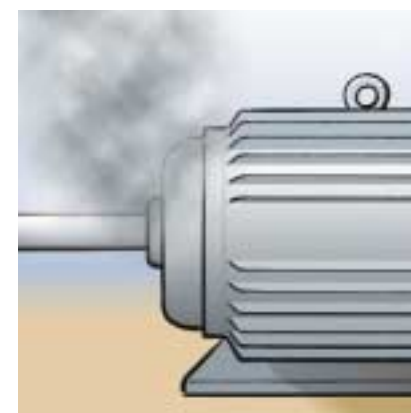
(e.g. when welding) or flames – even very small dimensions – can ignite a hazardous atmosphere.



Small smoldering solid particles that are produced during welding and scattered.

Hot surfaces

can lead to explosion if the surface temperature reaches the ignition temperature of the hazardous atmosphere.



Damage to bearings of motors and drive sets result in overheating and local heating of the housing surface.

* Source: Guide of Good Practice for implementing Council Directive 1999/92/EG.

The company

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Electronic cylinder switches

Fail-safe inductive switches

Inductive sensors for valves

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Chemical industry

Flammable gases, liquids and solids are converted and processed in many different processes in the chemical industry. These processes may give rise to explosive mixtures.



Landfill tips and civil engineering

Flammable landfill gases may arise in landfill tips. Elaborate technical arrangements are needed to avoid uncontrolled gas emission and possible ignition. Flammable gases from various sources may collect in poorly ventilated tunnels, cellars, etc.



Power generating companies

Lump coal, which is not explosive in mixture with air, may be converted in the conveying, grinding and drying processes into coal dusts capable of forming explosive dust / air mixtures.



Waste disposal companies

When waste waters are treated in clarification plants, the gases generated may form explosive gas / air mixtures.



Gas supplies

Explosive gas / air mixtures may be formed when natural gas is released, e.g. by leakage.



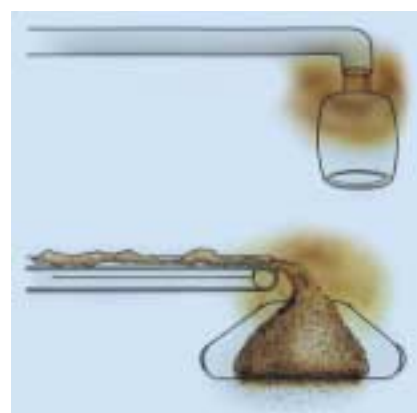
Wood-working industry

Wood-working gives rise to wood dusts. These can form explosive dust / air mixtures, e.g. in filters or silos.



Paint-spraying operations

The overspray generated in paint spray bays and the solvent vapours released may give rise to explosive atmospheres when mixed with air.



Example of arising dust / air mixtures in filling and transport processes of solids.



Agriculture

Biogas production plants are operated on some farms. Explosive biogas / air mixtures may arise if the gas is released, e.g. by leakage.



Metal-working operations

When shaped parts are manufactured from metals, explosive metal dusts may be produced during surface treatment (grinding). This particularly applies to light metals. These metal dusts may give rise to an explosion hazard in dust collectors.



Mills

Explosive dusts may arise when grains are ground in mills, for example. The consecutive transport or filling processes may give rise to an explosion hazard if static charge occurs.



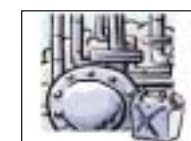
Food and feedstuffs industry

Explosive dusts may arise during transport and storage of grain, sugar, etc. If they are exhausted and collected by filtering, explosive atmospheres may arise in the filter.



Pharmaceutical industry

Alcohols are often used as solvents in the production of pharmaceuticals. This may give rise to hazardous gas / air mixtures. Agents and auxiliary materials that give rise to dust explosions, such as lactose, may also be used.



Refineries

The hydrocarbons handled in refineries are all flammable and, depending on their flash point, may give rise to explosive atmospheres even at ambient temperature. The area around oil processing plant is generally regarded as a place where explosive atmospheres may occur.



Recycling operations

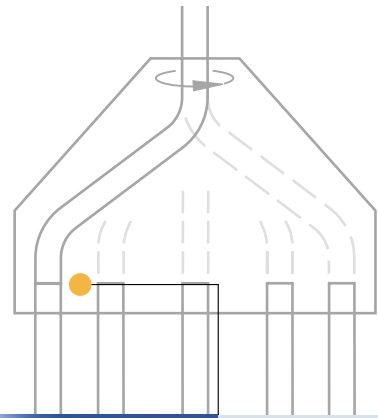
Waste in the form of dust and residues of flammable liquids can give rise to explosive atmospheres.



Examples of the rise of explosive atmospheres during filling and transport processes of gases and liquids.

* Source: Guide of Good Practice for implementing Council Directive 1999/92/EG.

Flow plate ('Dial-a-pipe')

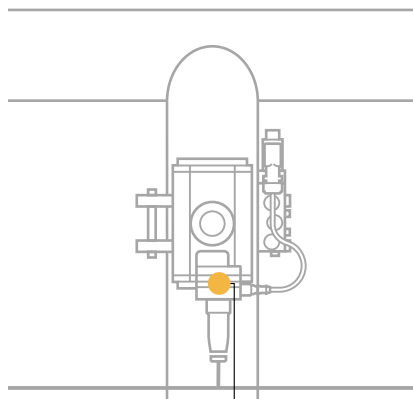


Flow plate with swing bend for the manual change between different lines. Inductive proximity switches detect the position of the swing bend.



II series
Inductive proximity switches with IP 67 and high-grade stainless steel housing.
See pages 22-23

Quarter-turn actuators



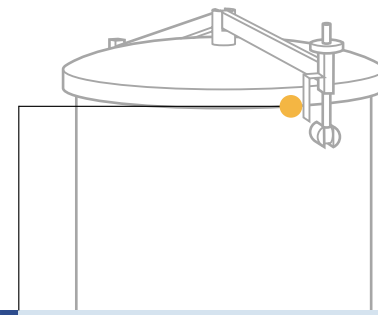
Quarter-turn actuators for the automatic triggering of valves. Inductive dual sensors type IND are used for position feedback.



Type IND
Inductive dual sensors for valve feedback on quarter-turn actuators.
See pages 44-47

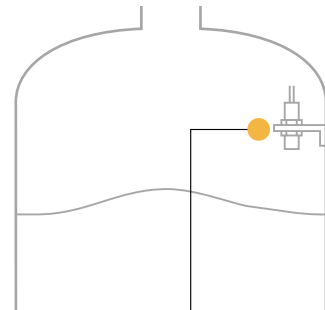
Tank lid monitoring

Fail-safe inductive proximity switch category 3 detects the stainless steel tank lid without contact and without any specific counterpart (man-way monitoring).



GI series
Fail-safe inductive proximity switches to EN 954-1, category 3.
See pages 40-41

Grain silos

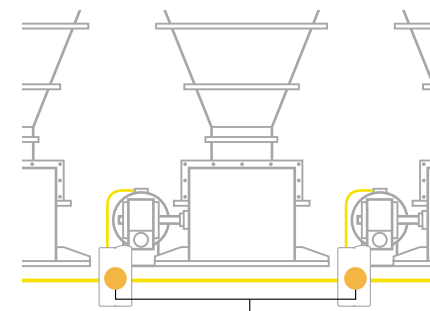


Capacitive sensors can be directly installed in the silo or tank wall for limit level indication (in contact with the medium).



KI series
Capacitive proximity switch with increased noise immunity for level indication.
See pages 32-33

Rising stem valves

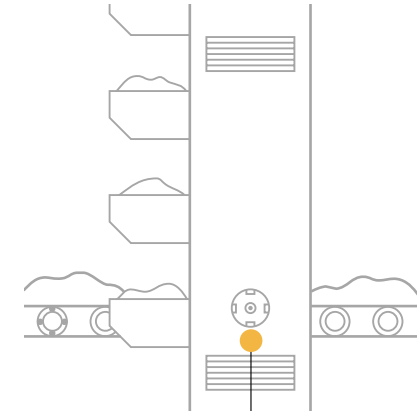


Easy bus wiring by means of AS-interface in zone 22 areas in mills or animal feed plants.



AS-interface
ClassicLine modules and pneumatic modules (AirBoxes) for hazardous areas.
See pages 58-61

Bucket elevators

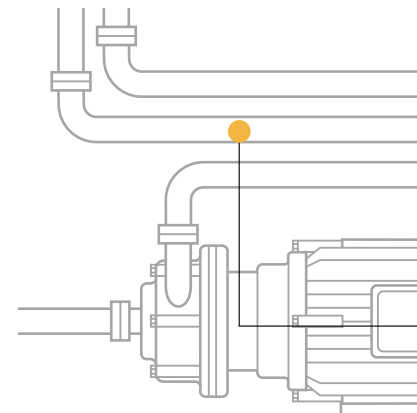


The speed monitor monitors the speed of the bucket elevator. In case of blockage or slip of the belt, the speed monitor switches off the drive.

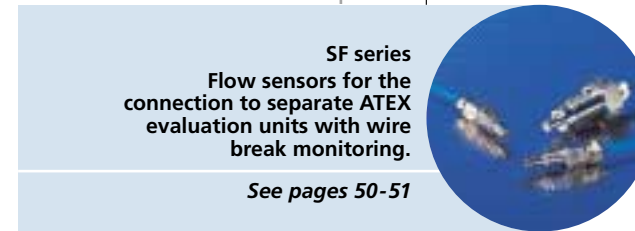


DIA series
Evaluation system with integrated sensor. Compact speed monitor type M18 or M30.
See pages 48-49

Pump monitoring

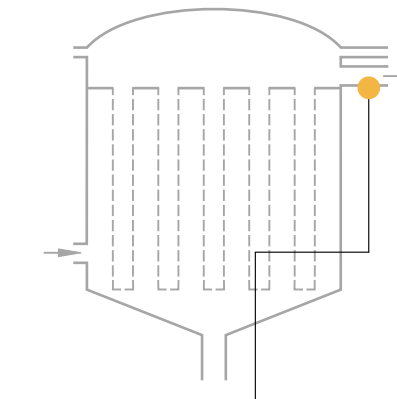


ifm electronic offers sensors with the corresponding ATEX approval to 94/9/EC group II category 1/2 G and 2 G for monitoring the flow of liquids and gases in hazardous areas. So, processes, systems and pumps can be reliably monitored.



SF series
Flow sensors for the connection to separate ATEX evaluation units with wire break monitoring.
See pages 50-51

Pneumatics

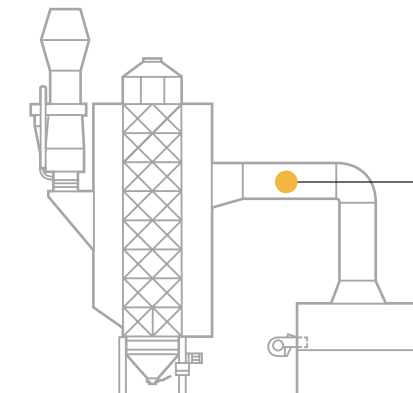


Pressure sensors with high long-term stability are used in dusty areas, for example in mills and malhouses, among others for monitoring the compressed air supply of machines and plants as well as for compressed air monitoring of product filters. The units are also an excellent choice for hydraulic applications.

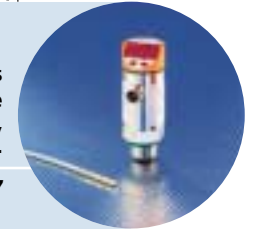


PN series
Pressure and vacuum sensors. Compact and robust pressure sensors with high repeatability.
See pages 54-55

Temperature monitoring Grain dryer



Grain is dried by means of a hot air flow because it must not exceed a certain level of humidity during storage. The temperature of the air flow is detected by means of temperature sensors and controlled according to the requirements.



TS series
Temperature sensors, 3-wire Pt100 class B, stainless steel, with protection rating IP 67.
See pages 56-57

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For dust atmosphere (certified to "protection by enclosure")

For dust atmosphere (certified to "IEC standards")

For gas atmosphere

Marking for dust atmosphere

Marking for dust atmosphere

Marking for gas atmosphere

II 3 D IP 65 T 80°C x

II 1 D Ex iaD 20 T 90°C x

II 1 G E Ex ia IIC T6 x

X marking (optional)
Special conditions for the reliable operation according to the operating instructions.

Temperature indication
max. surface temperature

Degree of protection
1st figure:
Protection against contact and foreign objects
1 = foreign object > 50 mm
2 = foreign object > 12 mm
3 = foreign object > 2.5 mm
4 = foreign object > 1.0 mm
5 = dust protected
6 = dust-tight

2nd figure:
Protection against water
1 = vertically falling water drops
2 = vertically falling water drops when tilted
3 = spraying water
4 = splashing water
5 = water jets
6 = powerful water jets
7 = temporary immersion
8 = continuous immersion
9K = high pressure / steam jet
XK = with increased pressure

Equipment category
1 D = dust zone 20
2 D = dust zone 21 / zone 22 (conductive dusts)
3 D = dust zone 22 (non-conductive dusts)

Equipment category
I = for firedamp mines
II = for other hazardous areas

Marking
Explosion protection mark

X marking (optional)
Special conditions for the reliable operation according to the operating instructions.

Temperature indication
max. surface temperature

Zone indication
Reference to the zone where the equipment is allowed for use.

Type of protection
pd = pressurisation
td = protection by enclosure (to IEC)
iaD = intrinsic safety safety with two faults
ibD = intrinsic safety safety with one fault
mD = encapsulation

Ex symbol
Indicator that the equipment was developed and tested according to international IEC standards.

Equipment category
1 D = dust zone 20
2 D = dust zone 21 / zone 22 (conductive dusts)
3 D = dust zone 22 (non-conductive dusts)

Equipment category
I = for firedamp mines
II = for other hazardous areas

Marking
Explosion protection mark

X marking (optional)
Special conditions for the reliable operation according to the operating instructions.

Temperature class
T1 = 450 °C
T2 = 300 °C
T3 = 200 °C
T4 = 135 °C
T5 = 100 °C
T6 = 85 °C

Classification of the gases
IIA = e.g. propane
IIB = e.g. ethylene
IIC = e.g. hydrogen

Principle of protection
d = flameproof enclosure
e = increased safety
i = intrinsically safe electrical systems
ia = intrinsically safe circuit, safety with two faults
ib = intrinsically safe circuit, safety with one fault
m = encapsulation
nA = different protection principles for zone 2 (non-sparking equipment)
o = oil immersion
p = pressurisation
q = powder filling

Marking
Equipment protected against explosion

Marking
Made according to European standards.

Equipment category
1G = gas zone 0
2G = gas zone 1
3G = gas zone 2

Equipment category
I = for firedamp mines
II = for other hazardous areas

Marking
Explosion protection mark

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IA500A	3D	23
IA501A	3D	23
IB500A	3D	23
IC000A	3D	25
IC500A	3D	25
ID000A	3D	25
ID500A	3D	25
ID501A	2D	21
IF500A	3D	23
IF501A	3D	23
IFS20A	3D	23
IFS21A	3D	23
IFT20A	3D	23
IFT21A	3D	23
IFT22A	3G	29
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IG010A	3D	23
IG500A	3D	23
IG501A	3D	23
IG502A	3D	23
IG503A	3D	23
IG504A	3D	23
IG505A	3D	23
IG506A	3D	23
IG507A	3D	23
IGS20A	3D	23
IGS21A	3D	23
IGS22A	3D	23
IGT20A	3D, 3G	23, 29
IGT21A	3D, 3G	23, 29
I1000A	3D	23
I1T20A	3D	23
I1T21A	3D	23
I1T22A	3G	29
I1T23A	2D	21
IM000A	3D	25
IM500A	3D	25
IM501A	3D	25
IM502A	3D	25
IN502A	3D	25
IN503A	3D	25
IN504A	3D	25
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NF5001	1D, 2G	19, 27
NF5002	1D, 2G	19, 27
NF5003	1D, 2G	19, 27
NF5004	1D, 2G	19, 27

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NF500A	1D, 1G	19, 27
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NF5012	1D	19
NF501A	1D, 1G	19, 27
NF5030	1D, 2G	19, 27
NG5001	1D, 2G	19, 27
NG5002	1D, 2G	19, 27
NG5003	1D, 2G	19, 27
NG5004	1D, 2G	19, 27
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NG5011	1D	19
NG5019	1D, 2G	19, 27
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NG5021	1D, 2G	19, 27
NI5001	1D, 2G	19, 27
NI5002	1D, 2G	19, 27
NI5003	1D, 2G	19, 27
NI5004	1D, 2G	19, 27
NI500A	1D, 1G	19, 27
NI5011	1D	19
NI5012	1D, 2G	19, 27
NI501A	1D, 1G	19, 27
NM500A	1D, 2G	19, 27
NM501A	1D, 2G	19, 27
NN5001	1D, 2G	19, 27
NN5002	1D, 2G	19, 27
NS5002	1D, 2G	19, 27
NS5003	1G	27
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KD500A	3D	33
KI0042	3D	33
KI5030	1G	35
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KI5065	3D	33
KX5001	1D, 1G	33, 35
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KX5004	1D, 1G	33, 35
Amplifiers inductive / capacitive		
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N0031A	(1) D, (1) G	31,37
N0032A	(1) D, (1) G	31,37
N0033A	(1) D, (1) G	31,37

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N0533A	(1) D, (1) G	31,37
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MK501A	3D	39
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N95002	1D, 2G	45, 47
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SF120A	2G	51
SF121A	2G	51
SF211A	1G	51
SF220A	2G	51
SF221A	2G	51
SF223A	2G	51
SF311A	1G	51
SF320A	2G	51
SF321A	2G	51
SF323A	2G	51
SF521A	2G	51
SN2301	(1) G	53
SN2302	(1) G	53
SR2301	(1) G	53
Pressure sensors		
PF003A	3D	55
PF008A	3D	55

Order no.	Equipment category	Catalogue page
Pressure sensors		
PN004A	3D	55
PN006A	3D	55
PN007A	3D	55
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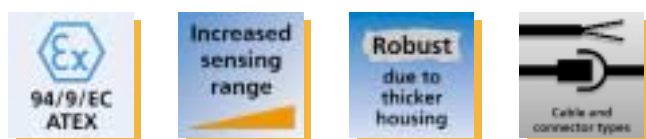
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- EC type test certificate according to the EC directive 94/9/EC (ATEX).
- Different designs with sensing ranges of 1...35 mm.
- Increased sensing range for more operational reliability.
- Voltage range of 7.5...30 V DC.
- Cylindrical designs with 4-port LED.



Applications

These units are suited for use in areas where explosive gases can occur. The design of the proximity switches is based on the standards EN50014, EN50020, EN50284, prEN61241-0, 31H/171/CDV (IEC 61241-11) and EN 60947-5-6. Outside the hazardous areas the sensors can be operated in the voltage range of 7.5...30 V DC.

Sensing range

The increased sensing range is ensured over the whole temperature range. This provides additional protection against failures caused by mechanical damage. Compared to standard switches it corresponds in practice to a value up to 2 times higher. Gold-plated contacts ensure a long life of the sensors even in demanding applications. Thanks to laser labeling for the cylindrical housings the units can still be clearly identified even after several years.

Connection options

Connection is made via a robust, easy-to-mount and maintenance-friendly M12 connector or via a PVC cable. In addition, the cylindrical units have a 4-port LED. Connection to certified intrinsically safe circuits with the maximum values U = 15 V, I = 50 mA and P = 120 mW.

Accessories

Type	Description	Order no.
	Angle bracket for type M8	E10734
	Angle bracket for type M12	E10735
	Angle bracket for type M18	E10736
	Angle bracket for type M30	E10737
	Clamp for type M12	E11533
	Clamp for type M18	E11534

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m blue, PUR / PVC cable	E10357
	M12 socket 5 m blue, PUR / PVC cable	E10358

II 1D Ex iaD 20 T 90 °C

Dimensions [mm]	Sensing range [mm]	Material	Internal capacitance [nf]	Internal inductance [uH]	f [Hz]	Connection	Order no.
Category 1D · II 1D Ex iaD 20 T 90 °C · Protection rating IP 67							
Ø 6.5 / L = 30	1 f	CuZn, PBT	80	70	2000	2 m, PVC cable	NT5001
Ø 6.5 / L = 30	1 f	CuZn, PBT	81	74	2000	6 m, PVC cable	NT5005
M8 / L = 30	1 f	CuZn, PBT	80	70	2000	2 m, PVC cable	NE5001
M12 / L = 30	2 f	PBT	140	340	1200	2 m, PVC cable	NF5001
M12 / L = 30	4 nf	PBT	140	130	1500	2 m, PVC cable	NF5003
M12 / L = 30	2 f	CuZn, PC	140	340	1200	2 m, PVC cable	NF5002
M12 / L = 30	4 nf	CuZn, PC	140	130	1500	2 m, PVC cable	NF5004
M12 / L = 30	4 nf	PBT	141	134	1500	6 m, PVC cable	NF5010
M12 / L = 30	2 f	CuZn, PC	141	344	1200	6 m, PVC cable	NF5012
M12 / L = 30	4 nf	stainless steel, PBT	141	134	1500	6 m, PVC cable	NF5030
M12 / L = 45	4 f	CuZn, PBT	210	115	700	M12 plug	NF501A
M12 / L = 50	7 nf	CuZn, PBT	210	145	700	M12 plug	NF500A
M18 / L = 33	5 f	PBT	145	45	720	2 m, PVC cable	NG5001
M18 / L = 33	8 nf	PBT	155	50	300	2 m, PVC cable	NG5003
M18 / L = 33	5 f	CuZn, PBT	145	45	720	2 m, PVC cable	NG5002
M18 / L = 33	8 nf	CuZn, PBT	155	50	300	2 m, PVC cable	NG5004
M18 / L = 33	5 f	PBT	146	49	720	6 m, PVC cable	NG5019
M18 / L = 33	8 nf	CuZn, PBT	156	54	300	6 m, PVC cable	NG5021
M18 / L = 33	5 f	CuZn, PBT	147	53	720	10 m, PVC cable	NG5011
M18 / L = 33	8 nf	CuZn, PC	157	58	300	10 m, PVC cable	NG5010
M18 / L = 46	8 f	CuZn, PBT	200	190	400	M12 plug	NG501A
M18 / L = 51	12 nf	CuZn, PBT	200	85	300	M12 plug	NG500A
M30 / L = 41	10 f	PBT	145	140	450	2 m, PVC cable	NI5001
M30 / L = 41	15 nf	PBT	145	110	200	2 m, PVC cable	NI5003
M30 / L = 41	10 f	CuZn, PBT	145	140	450	2 m, PVC cable	NI5002
M30 / L = 41	15 nf	CuZn, PBT	145	110	200	2 m, PVC cable	NI5004
M30 / L = 41	10 f	CuZn, PBT	147	148	450	10 m, PVC cable	NI5012
M30 / L = 41	15 nf	PBT	147	118	200	10 m, PVC cable	NI5011
M30 / L = 50	15 f	CuZn, PBT	230	210	100	M12 plug	NI501A
M30 / L = 50	22 nf	CuZn, PBT	250	120	100	M12 plug	NI500A
28 x 10 x 16	2 f	PBT	80	110	800	2 m, PVC cable	NS5002
40 x 12 x 26	2 f	PBT	110	135	800	2 m, PVC cable	NN5001
40 x 12 x 26	4 nf	PBT	110	135	400	2 m, PVC cable	NN5002
40 x 40 x 66	20 f	PPE, PPS	250	450	200	M12 plug	NM500A
40 x 40 x 66	35 nf	PPE, PPS	220	710	100	M12 plug	NM501A

Common technical data

Nominal voltage: 8.2 V DC (1kOhm)
 In hazardous areas Ub max. = 15 V
 Operating voltage: 7.5...30 V DC
 Operating temperature: -20...70 °C
 Current consumption undamped: > 2.1 mA
 Current consumption damped: < 1 mA
 Output function: NC

CuZn: brass plated with white bronze

For switching amplifiers please see pages 30 / 31

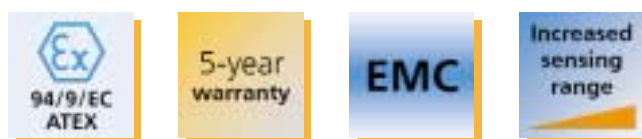
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- Approved for use in zone 21 according to 94/9/EC (ATEX).
- Different designs with sensing ranges of 14...60 mm.
- Voltage range of 10...36 V DC.
- No switching amplifier required.
- Increased sensing range for higher uptime.



Application in hazardous dust areas

Hazardous dust areas place high demands on the units used there. These sensors are suitable and approved for use in hazardous zone 21 and 22 areas according to the category 2D.

Increased sensing range

The increased sensing range is ensured across the whole temperature range (type IIT23A): 0...60 °C, type ID501A: -20...60 °C). As a result of this the units are particularly well suitable for monitoring of elevators, for example.

Connection options

The M30 unit of the tried-and-tested *efector_m* series features a robust M12 connector. For the units with M12 connector a securing clip (separate order no. E11532) is available which ensures that the connector can only be loosened with the aid of a tool. The rectangular sensor with the standard measurements of 105 x 80 x 40 mm features a terminal chamber and an ATEX-approved cable entry.

Accessories

Type	Description	Order no.
	Angle bracket for M30 types	E10737

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 5 m orange, PVC cable	E10662
	M12 socket 10 m orange, PVC cable	E10663
	M12 socket 25 m orange, PVC cable	E10899
	Securing clip for M12 connectors	E11532

- ⊕ II 2D IP 65 T 90 °C
- ⊕ II 2D IP 67 T 90 °C

Dimensions [mm]	Sensing range [mm]	Material	U _b DC [V]	f [Hz]	I _{load} * [mA]	I ₀ [mA]	Connection	Output function	Order no.
Category 2D · ⊕ II 2D IP 65 T 90 °C · Protection rating IP 65									
105 x 80 x 40	60 nf	PPE	10...36	100	25	< 15 (24 V)	terminals	no / nc prog.	ID501A
Category 2D · ⊕ II 2D IP 67 T 90 °C · Protection rating IP 67									
M30 / L = 70	14 f	stainless steel*, PEEK	10...36	100	30	< 10 (24 V)	M12 connector	no	IIT23A

*high-grade stainless steel

Common technical data

Electrical design: 3-wire PNP
 Operating temperature: -20...60 °C
 (IIT23A: 0...60 °C)
 EMC: EN 60947-5-2

*The remaining current rating I_{load} is calculated:
 40 mA minus current consumption I₀ of the sensor.
 In hazardous dust areas of the category 2D the unit must be protected with a 40 mA time-lag fuse.

For scale drawings and connection diagrams please see www.ifm-electronic.com

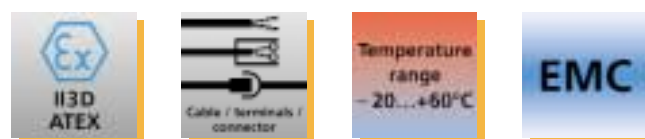
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- Approved for use in zone 22 according to 94/9/EC (ATEX).
- Cylindrical designs with sensing ranges of 2...22 mm.
- Units with cable, M12 connector or terminal chamber.
- Various voltage ranges in DC or AC.



Area of applications

These units are suitable for use in zone 22 hazardous areas with non-conductive dusts according to the category 3D. The design of the proximity switches complies, among others, with the requirements of the standards EN 50014 and EN 50281-1-1.

The family of units

M12, M18 and M30 housings with metal thread as well as two smooth-body plastic housings with a diameter of 20 and 34 mm are available. The units range from units with a terminal chamber that can be angled to the tried-and-tested designs of the *efector_m* series for demanding applications.

Connection options

Cable units have a 2 m or 6 m PVC cable. For the units with M12 connector a securing clip (order no. E11532) is available which allows loosening of the connector only with the aid of a tool. Units with terminal chamber are fitted with an ATEX-approved cable gland.

Accessories

Type	Description	Order no.
	Angle bracket for M12 types	E10735
	Angle bracket for M18 types	E10736
	Angle bracket for M30 types	E10737
	Clamp for M12 types	E11533
	Clamp for M18 types	E11534
	Clamp for Ø 20 mm types	E10192
	Clamp for Ø 34 mm types	E10193

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 5 m orange, PVC cable	E10662
	M12 socket 10 m orange, PVC cable	E10663
	Securing clip for M12 connectors	E11532

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- ⊕ II 3D IP 65 T 80 °C X
- ⊕ II 3D IP 67 T 80 °C X

Dimensions [mm]	Sensing range [mm]	Material	U _b DC [V]	Operating temperature [°C]	f AC/DC [Hz]	I _{load} AC/DC [mA]	Connection	Output function	Order no.
Category 3D · ⊕ II 3D IP 65 T 80 °C X · Protection rating IP 65									
Ø 20 / L = 92	10 nf	PBT, PC	10...55	-20...60	- / 300	- / 150	terminals	no / nc prog.	IA500A
Ø 20 / L = 92	10 nf	PBT, PC	10...36	-20...60	- / 300	- / 250	terminals	no	IA501A
Ø 20 / L = 92	10 f	PBT, PC	20...250*	-20...60	25 / 70	200 / 100	terminals	no / nc prog.	IA000A
Ø 34 / L = 98	20 nf	PBT, PC	10...36	-20...60	- / 350	- / 250	terminals	no / nc prog.	IB500A
Category 3D · ⊕ II 3D IP 67 T 80 °C X · Protection rating IP 67									
M12 / L = 36	2 f	CuZn, PC-HT	10...36	-20...60	- / 1500	- / 150	2 m, PVC cable	no	IF501A
M12 / L = 40	2 f	CuZn, Co-PC	10...36	-20...60	- / 1200	- / 150	2 m, PVC cable	no (2-wire)	IF500A
M12 / L = 45	4 f	stainl. steel**, PEEK	10...36	0...60	- / 700	- / 100	M12 plug	nc	IFT20A
M12 / L = 45	4 f	CuZn, PBT	10...36	-20...60	- / 700	- / 100	M12 plug	no	IFS20A
M12 / L = 45	4 f	stainl. steel**, PEEK	10...36	0...60	- / 700	- / 100	M12 plug	no	IFT21A
M12 / L = 50	7 nf	CuZn, PBT	10...36	-20...60	- / 700	- / 100	M12 plug	no	IFS21A
M18 / L = 38	5 f	CuZn, PC-HT	18...36	-20...60	- / 500	- / 150	2 m, PVC cable	no	IG504A
M18 / L = 45	8 nf	CuZn, PBT	10...30	-20...60	- / 300	- / 100	M12 plug	no	IG501A
M18 / L = 45	8 f	CuZn, PBT	10...30	-20...60	- / 250	- / 100	M12 plug	no	IG503A
M18 / L = 45	10 nf	stainl. steel**, PBT	10...30	-20...60	- / 300	- / 100	M12 plug	no / nc	IG502A
M18 / L = 46	8 f	CuZn, PBT	10...36	-20...60	- / 400	- / 100	M12 plug	no	IGS20A
M18 / L = 46	8 f	stainl. steel**, PEEK	10...36	0...60	- / 500	- / 100	M12 plug	no	IGT20A
M18 / L = 46	8 f	stainl. steel**, PEEK	10...36	0...60	- / 500	- / 100	M12 plug	nc	IGT21A
M18 / L = 51	12 nf	CuZn, PBT	10...36	-20...60	- / 300	- / 100	M12 plug	no	IGS21A
M18 / L = 70	8 f	CuZn, PBT	10...30	-20...60	- / 400	- / 100	M12 plug	no	IGS22A
M18 / L = 80	8 nf	CuZn, PC-HT	10...55	-20...60	- / 300	- / 250	2 m, PVC cable	no	IG500A
M18 / L = 80	8 nf	CuZn, PC-HT	20...250*	-20...60	25 / 50	200 / 100	2 m, PVC cable	no	IG000A
M18 / L = 80	5 f	CuZn, PC	20...250*	-20...60	25 / 50	200 / 100	10 m, PVC cable	no	IG010A
M18 / L = 80	8 nf	CuZn, PC-HT	10...55	-20...60	- / 300	- / 150	2 m, PUR cable	no / nc prog.	IG506A
M18 / L = 80	8 nf	CuZn, PC	10...55	-20...60	- / 300	- / 150	6 m, PUR cable	no / nc prog.	IG507A
M18 / L = 89	8 nf	CuZn, PC-HT	10...36	-20...60	- / 300	- / 250	M12 plug	no	IG505A
M30 / L = 50	14 f	stainl. steel**, PEEK	10...36	0...60	- / 100	- / 100	M12 plug	no	IIT20A
M30 / L = 50	22 nf	stainl. steel**, PEEK	10...36	0...60	- / 100	- / 100	M12 plug	no	IIT21A
M30 / L = 81	15 nf	CuZn, PBT	20...250*	-20...60	25 / 50	200 / 100	6 m, PVC cable	no	IIO00A

CuZn: brass plated with white bronze *AC/DC
**high-grade stainless steel

Common technical data

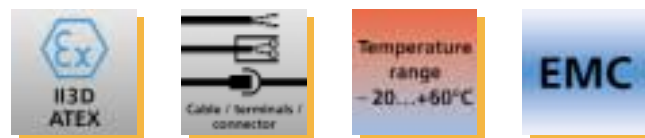
Electrical design: 3-wire DC PNP
(except for IA000A, IG000A, IG010A and IIO00A: 2-wire AC/DC)

For scale drawings and connection diagrams please see www.ifm-electronic.com

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- Approved for use in zone 22 according to 94/9/EC (ATEX).
- Rectangular designs with sensing ranges of 2...60 mm.
- Units with cable, M12 connector or terminal chamber.
- Voltage range 10...36 V DC or 20...250 V AC/DC.



Area of applications

These units are suitable for use in zone 22 hazardous areas with non-conductive dusts according to the category 3D. The design of the proximity switches complies, among others, with the requirements of the standards EN 50014 and EN 50281-1-1.

The family of units

The rectangular sensors in tried-and-tested plastic housings are available in different sizes from 40 x 12 x 26 mm to 105 x 80 x 40 mm. The units range from dual switches to sensors with extra long sensing ranges.

Connection options

Cable units have a 2 m or 10 m PVC cable. For the units with M12 connector a securing clip (order no. E11532) is available which allows loosening of the connector only with the aid of a tool. Units with terminal chamber are fitted with an ATEX-compliant cable gland.

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 5 m orange, PVC cable	E10662
	M12 socket 10 m orange, PVC cable	E10663
	M12 socket 5 m orange, PVC cable	E10700
	M12 socket 10 m orange, PVC cable	E10701
	Securing clip for M12 connectors	E11532

- ⊕ II 3D IP 65 T 80 °C X
- ⊕ II 3D IP 67 T 80 °C X

Dimensions [mm]	Sensing range [mm]	Material	U _b DC [V]	f AC/DC [Hz]	I _{load} AC/DC [mA]	I ₀ [mA]	Connection	Output function	Order no.
Category 3D · ⊕ II 3D IP 65 T 80 °C X · Protection rating IP 65									
40 x 40 x 121	20 nf	PPE	10...36	- / 350	- / 250	15	terminals	no / nc prog.	IM502A
40 x 40 x 121	15 f	PPE	20...250*	25 / 70	200 / 100	-	terminals	no / nc prog.	IM000A
60 x 90 x 40	40 nf	PPE	10...36	- / 10	- / 250	15	terminals	no / nc prog.	IC500A
60 x 90 x 40	40 nf	PPE	20...250*	10 / 10	200 / 100	-	terminals	no / nc prog.	IC000A
80 x 105 x 40	60 nf	PPE	10...36	- / 4	- / 250	15	terminals	no / nc prog.	ID500A
80 x 105 x 40	60 nf	PPE	20...250*	4 / 4	200 / 100	-	terminals	no / nc prog.	ID000A
Category 3D · ⊕ II 3D IP 67 T 80 °C X · Protection rating IP 67									
40 x 12 x 26	2 f	PBT	10...36	- / 1400	- / 250	15	2 m, PVC cable	no	IN502A
40 x 12 x 26	4 nf	PBT	10...36	- / 1300	- / 250	15	2 m, PVC cable	no	IN503A
40 x 12 x 26	4 nf	PBT	10...36	- / 1300	- / 250	15	10 m, PVC cable	no	IN504A
40 x 40 x 66	20 f	PPE, PPS	10...36	- / 200	- / 200	20	M12 plug	no + nc	IM501A
40 x 40 x 66	35 nf	PPE, PPS	10...36	- / 100	- / 200	20	M12 plug	no + nc	IM500A
40 x 40 x 118	15 f	PBT	10...60	- / 300	- / 200	20	terminals	no + nc	IV5014

*AC/DC

Common technical data

Electrical design: 3-wire DC PNP
(except IM000A, IC000A and ID000A)
2-wire AC/DC
Operating temperature: -20...60 °C

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- Cylindrical and rectangular designs with sensing ranges from 1 to 35 mm.
- NAMUR output stage to EN 60947-5-6.
- Units with connection cable or M12 connector.
- Units with metal and plastic housing.



Area of applications

The inductive NAMUR sensors can be used in hazardous zone 0 and zone 1 areas in conjunction with the corresponding certified switching amplifiers. The design of the proximity switches complies, among others, with the requirements of the standards EN 50014, EN 50020, (EN 50284 only for 1G) and EN 60947-5-6. Outside the hazardous areas the sensors can be operated in the voltage range of 7.5...30 V DC.

Increased sensing range

Some of the cylindrical housings have an increased sensing range which is ensured across 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 2 times higher.

Connection

Connection to certified intrinsically safe circuits with the maximum values $U = 15 \text{ V} / I = 50 \text{ mA}$ and $P = 120 \text{ mW}$. One or two-channel switching amplifiers in AC or DC version are available. Further options are relay, PNP transistor or optocoupler outputs.

Accessories

Type	Description	Order no.
	Mounting clamp for $\varnothing 6.5 \text{ mm}$ types	E10014
	Angle bracket for M8 types	E10734
	Angle bracket for M12 types	E10735
	Angle bracket for M18 types	E10736
	Angle bracket for M30 types	E10737
	Clamp for M12 types	E11533
	Clamp for M18 types	E11534

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m blue, PUR / PVC cable	E10357
	M12 socket 5 m blue, PUR / PVC cable	E10358

For switching amplifiers please see pages 30 / 31

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II 1G EEx ia IIB T6
II 1G EEx ia IIC T6

II 2G EEx ia IIC T6

Dimensions [mm]	Sensing range [mm]	Material	Operating temperature [°C]	Internal capacitance [nf]	Internal inductance [uH]	f [Hz]	Connection	Order no.
Category 1G · II 1G EEx ia IIB T6 · Protection rating IP 67								
M30 / L = 50	15 f	CuZn, PBT	-20...55	230	210	100	M12 plug	NI501A
M30 / L = 50	22 nf	CuZn, PBT	-20...55	250	120	100	M12 plug	NI500A
28 x 16 x 10	2 f	PBT	-20...60	80	110	800	2 m, PVC cable	NS5003
Category 1G · II 1G EEx ia IIC T6 · Protection rating IP 67								
M12 / L = 45	4 f	CuZn, PBT	-20...55	210	115	700	M12 plug	NF501A
M12 / L = 50	7 nf	CuZn, PBT	-20...55	210	145	700	M12 plug	NF500A
M18 / L = 46	8 f	CuZn, PBT	-20...55	200	190	400	M12 plug	NG501A
M18 / L = 51	12 nf	CuZn, PBT	-20...55	200	85	300	M12 plug	NG500A
Category 2G · II 2G EEx ia IIC T6 · Protection rating IP 67								
$\varnothing 6.5 / L = 30$	1 f	CuZn, PBT	-20...70	80	70	2000	2 m, PVC cable	NT5001
$\varnothing 6.5 / L = 30$	1 f	CuZn, PBT	-20...70	81	74	2000	6 m, PVC cable	NT5005
M8 / L = 30	1 f	CuZn, PBT	-20...70	80	70	2000	2 m, PVC cable	NE5001
M12 / L = 30	2 f	PBT	-20...70	140	340	1200	2 m, PVC cable	NF5001
M12 / L = 30	4 nf	PBT	-20...70	140	130	1500	2 m, PVC cable	NF5003
M12 / L = 30	2 f	CuZn, PBT	-20...70	140	340	1200	2 m, PVC cable	NF5002
M12 / L = 30	4 nf	CuZn, PBT	-20...70	140	130	1500	2 m, PVC cable	NF5004
M12 / L = 30	4 nf	CuZn, PC	-20...70	141	134	1500	6 m, PVC cable	NF5008
M12 / L = 30	4 nf	stainless steel, PBT	-20...70	141	134	1500	6 m, PVC cable	NF5030
M18 / L = 33	5 f	PBT	-20...70	145	45	720	2 m, PVC cable	NG5001
M18 / L = 33	8 nf	PBT	-20...70	155	50	300	2 m, PVC cable	NG5003
M18 / L = 33	5 f	CuZn, PBT	-20...70	145	45	720	2 m, PVC cable	NG5002
M18 / L = 33	8 nf	CuZn, PBT	-20...70	155	50	300	2 m, PVC cable	NG5004
M18 / L = 33	5 f	PBT	-20...70	146	49	720	6 m, PVC cable	NG5019
M18 / L = 33	8 nf	CuZn, PBT	-20...70	156	54	300	6 m, PVC cable	NG5021
M30 / L = 41	10 f	PBT	-20...70	145	140	450	2 m, PVC cable	NI5001
M30 / L = 41	15 nf	PBT	-20...70	145	110	200	2 m, PVC cable	NI5003
M30 / L = 41	10 f	CuZn, PBT	-20...70	145	140	450	2 m, PVC cable	NI5002
M30 / L = 41	15 nf	CuZn, PBT	-20...70	145	110	200	2 m, PVC cable	NI5004
M30 / L = 41	10 f	CuZn, PBT	-20...70	147	148	450	10 m, PVC cable	NI5012
28 x 10 x 16	2 f	PBT	-20...70	80	110	800	2 m, PVC cable	NS5002
40 x 12 x 26	2 f	PBT	-20...70	110	135	800	2 m, PVC cable	NN5001
40 x 12 x 26	4 nf	PBT	-20...70	110	135	400	2 m, PVC cable	NN5002
40 x 40 x 66	20 f	PPE, PPS, CuZn	-20...70	250	450	200	M12 plug	NM500A
40 x 40 x 66	35 nf	PPE, PPS, CuZn	-20...70	220	710	100	M12 plug	NM501A

CuZn: brass plated with white bronze

Common technical data

Nominal voltage: 8.2 V DC (1kOhm)
Operating voltage: 7.5...30 V DC, valid only outside the hazardous area, within the hazardous area: $U_b \text{ max.} = 15 \text{ V}$
Current consumption undamped: $> 2.1 \text{ mA}$
Current consumption damped: $< 1 \text{ mA}$
Output function: NC

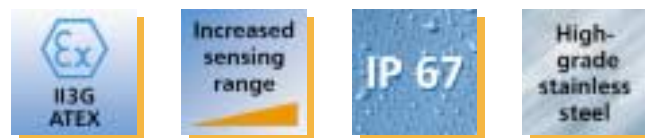
For scale drawings and connection diagrams please see www.ifm-electronic.com

Other cable lengths available on request

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- Approved for use in zone 2 according to 94/9/EC (ATEX).
- Increased sensing range for higher uptime.
- High-grade stainless steel housing (316L) with the protection rating IP 67.
- Robust M12 connector with gold-plated contacts.



Area of applications

These units are suitable for use in zone 2 hazardous areas according to the category 3G. The design of the proximity switches complies, among others, with the standard EN 60079-15.

Increased sensing range

The increased sensing range is ensured across the whole temperature range thus giving better protection against failure due to mechanical damage. In practice it corresponds to a value up to 2 times higher compared to standard switches.

Materials

The tried-and-tested efector m design and the use of high-quality materials such as high-grade stainless steel and PEEK as well as gold-plated contacts ensure a long life of the sensors in demanding applications. Due to the laser labelling the unit can still be clearly identified even after several years.

M12 connector

Connection is made via a robust, easy-to-mount and maintenance-friendly M12 connector. Using the securing clip (order no. E11532) allows loosening of the connector only with the aid of a tool.

Accessories

Type	Description	Order no.
	Angle bracket for M12 types	E10735
	Angle bracket for M18 types	E10736
	Angle bracket for M30 types	E10737
	Mounting clamp for M12 types	E11533
	Clamp for M18 types	E11534

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 5 m orange, PVC cable	E10662
	M12 socket 10 m orange, PVC cable	E10663
	M12 socket 5 m orange, PVC cable	E10700
	M12 socket 10 m orange, PVC cable	E10701
	Securing clip for M12 connectors	E11532

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II 3G EEx nA II T6 X

Dimensions [mm]	Sensing range [mm]	Material	U _b DC [V]	f [Hz]	I _{load} [mA]	I ₀ [mA]	Connection	Output function	Order no.
Category 3G · II 3G EEx nA II T6 X · Protection range IP 67									
M12 / L = 45	3.5 f	stainless steel, PEEK	10...36	700	100	10	M12 plug	no	IFT22A
M18 / L = 46	8 f	stainless steel, PEEK	10...36	500	100	10	M12 plug	no	IGT20A
M18 / L = 46	8 f	stainless steel, PEEK	10...36	500	100	10	M12 plug	nc	IGT21A
M30 / L = 50	14 f	stainless steel, PEEK	10...36	100	100	10	M12 plug	no	IIT22A

Common technical data

Electrical design: 3-wire DC PNP
 Operating temperature: 0...60 °C
 Voltage drop: < 2.5 V

For scale drawings and connection diagrams please see www.ifm-electronic.com

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- 1- or 2-channel NAMUR switching amplifiers to DIN EN 60947-5-6.
- Mounting on DIN rail.
- Short circuit and wire break monitoring.
- Programmable output function.
- Relay, transistor or optocoupler outputs.



Switching amplifiers

The one or two-channel NAMUR switching amplifiers evaluate the sensor signal and control the output. They meet all requirements of the ATEX directives. Switching amplifiers with relay and active transistor output are available. The control circuits hold the approval Ex II (1) GD [EEx ia] IIC. The amplifiers are designed for the connection of NAMUR sensors according to DIN EN 60947-5-6 and mechanical switches. They provide the supply voltage for the intrinsically safe circuit.

Other features:

- Programmable effective direction of the output.
- Relay output designed as changeover contact. Max. contact rating at 250 V AC, 2 A at a cos > 0.7 or at 30...40 V DC, 2 A and ohmic load.
- Short-circuit protected transistor outputs, voltage range 10...30 V DC, output current max. 100 mA.
- The sensor cables are monitored for wire break and short circuit. In case of a fault the output is blocked or the relay is de-energised.

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Ex II (1) G D [EEx ia] IIC

U _b [V]	Power / current consumption [VA] / [mA]	f [Hz]	Operating temperature [°C]	Output	Channels	Order no.
Categorie (1) D and (1) G · Ex II (1) G D [EEx ia] IIC · Protection rating IP 20						
230 AC	1.0 / –	10	-20...60	relay (1 changeover contact)	1	N0031A
230 AC	1.3 / –	10	-20...60	relay (1 changeover contact per channel)	2	N0033A
115 AC	1.0 / –	10	-20...60	relay (1 changeover contact)	1	N0030A
115 AC	1.3 / –	10	-20...60	relay (1 changeover contact per channel)	2	N0032A
24 DC	- / < 23	10	-20...60	relay (1 changeover contact)	1	N0530A
24 DC	- / < 50	10	-20...60	relay (1 changeover contact per channel)	2	N0533A
24 DC	- / < 50	5000	-20...60	2 transistor outputs PNP (100 mA, short-circuit protected)	1	N0531A
24 DC	- / < 50	5000	-20...60	2 transistor outputs PNP (100 mA, short-circuit protected)	2	N0534A
24 DC	- / < 50	5000	-20...60	2 outputs (optocoupler, bipolar, 100 mA, max. 40 V DC, short-circuit protected)	2	N0532A

For scale drawings and connection diagrams please see www.ifm-electronic.com

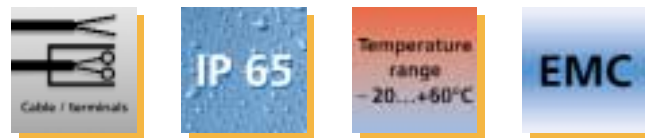
You can find inductive NAMUR sensors that can be connected to these switching amplifiers on the pages 18 + 26

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- According to 94/9/EC annex VIII (ATEX).
- Cable gland mountable straight or angled.
- Sensing range up to 60 mm, adjustable via potentiometer.
- Voltage range 10...30 V DC or 20...250 V AC/DC.
- Compensation for condensation or moisture.



Applications

These units are specially suitable for use in hazardous areas of the category 1D or 3D (here only non-conductive dusts). The design of the proximity switches complies, among others, with the standards EN 50014 and EN 50281-1-1. So the units are suitable for use in mills or silos to detect metallic or non-metallic media.

Accessories

ifm electronic offers mounting accessories for almost all applications. Mounting adapters in different materials, locknuts and protective covers facilitate sensor mounting in the application. Special fixtures are no longer necessary.

Increased noise immunity

All capacitive proximity switches from ifm electronic operate with a patented circuit concept which makes the units immune to electromagnetic interference sources such as switched-mode power supplies, frequency inverters or stepper-motor controllers. Thus the units meet the highest demands on functional safety, ensure machine uptime and minimise maintenance.

Connection options

Some sensors have a terminal chamber and are fitted with an ATEX type test certified cable gland or they have a potted PVC cable.

Accessories

Type	Description	Order no.
	Mounting adapter, G 1 1/2, POM	E11033
	Mounting adapter, G 1 1/2, PVDF	E11034
	Locknut G 1 1/2, POM	E11031
	Locknut G 1 1/2, PVDF	E11032
	Protective cover G 1 1/4 for mounting adapter	E11078

For switching amplifiers please see pages 36 / 37

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II 1D IP 65 T90 °C

Dimensions [mm]	Sensing range [mm]	Material	U _{nominal} at 1KΩ [V]	U _b * [V]	Internal capacit. [nf]	Internal inductance [uH]	f [Hz]	Connection	Order no.
Category 1D · II 1D IP 65 T90 °C · Protection rating IP 65									
M34 / L = 92	15 nf	CuZn, PTFE	8.2 DC	7.5...15	375	1	40	2 m, PVC cable	KX5001
M34 / L = 92	15 nf	CuZn, PTFE	8.2 DC	7.5...15	376	3	40	6 m, PVC cable	KX5002
M34 / L = 92	15 nf	CuZn, PTFE	8.2 DC	7.5...15	378	10	40	20 m, PVC cable	KX5004

CuZn: brass plated with white bronze
*NAMUR power supply

II 3D IP 65 T80 °C X

Dimensions [mm]	Sensing range [mm]	Material	U _b [V]	I _{load} AC/DC [mA]	U _{drop} AC/DC [V]	Connection	Output function	Order no.
Category 3D · II 3D IP 65 T80 °C X · Protection rating IP 65								
M30 / L = 151	15 nf	PBT	10...30 DC	- / 250	- / 2.5	terminals	no / nc prog.	KI5065
M30 / L = 151	15 nf	PBT	30...250 AC/DC	250 / 250	10 / 8	terminals	no / nc prog.	KI0042
105 x 80 x 40	60 nf	PPO, PA	10...36 DC	- / 250	- / 2.5	terminals	no / nc prog.	KD500A
105 x 80 x 40	60 nf	PPO, PA	30...250 AC/DC	250 / 250	10 / 8	terminals	no / nc prog.	KD000A

Common technical data

Operating temperature: -20...60 °C

For scale drawings and connection diagrams please see www.ifm-electronic.com

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- NAMUR sensors for hazardous gas areas.
- For the category 1G.
- Increased EMC immunity.
- Detection of metallic and non-metallic media.
- Compensation for condensation or moisture.



Applications

Capacitive sensors are used for monitoring defined levels also in hazardous areas. The different thread versions and the matching accessories allow a quick and economical adaptation to the shape of the respective tank.

Increased noise immunity

The sensors feature an exceptionally high noise immunity to electromagnetic interference. Malfunctions, for example caused by interfering signals of frequency inverters, are a thing of the past.

Accessories

Type	Description	Order no.
	Angle bracket for M30 types	E10737
	Mounting adapter, M30 x 1.5 - G 1 1/2	E11033
	Mounting adapter, M30 x 1.5 - G 1 1/2	E11035
	Locknut G 1 1/2 for mounting adapter	E11031
	Locknut G 1 1/4 for mounting adapter	E11030

For switching amplifiers please see pages 36 / 37

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II 1G EEx ia IIB T6

Dimensions [mm]	Sensing range [mm]	Material	U _{nominal} at 1KΩ [V]	U _b * [V]	Internal capacit. [nf]	Internal inductance [uH]	f [Hz]	Connection	Order no.
Category 1G · II 1G EEx ia IIB T6 · Protection rating IP 65									
M30 / L = 81	15 nf	PBT	8.2 DC	7.5...15	375	1	40	2 m, PVC cable	KI5030
M30 / L = 81	15 nf	PBT	8.2 DC	7.5...15	376	3	40	6 m, PVC cable	KI5031
M34 / L = 92	15 nf	CuZn, PTFE	8.2 DC	7.5...15	375	1	40	2 m, PVC cable	KX5001
M34 / L = 92	15 nf	CuZn, PTFE	8.2 DC	7.5...15	376	3	40	6 m, PVC cable	KX5002
M34 / L = 92	15 nf	CuZn, PTFE	8.2 DC	7.5...15	378	10	40	20 m, PVC cable	KX5004

CuZn: brass plated with white bronze
*NAMUR power supply

Common technical data

Operating temperature: -20...60 °C
Current consumption undamped: > 2.1 mA
Current consumption damped: < 1 mA
Output function: NC

For scale drawings and connection diagrams please see www.ifm-electronic.com

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- 1- or 2-channel NAMUR switching amplifiers to DIN EN 60947-5-6.
- Mounting on DIN rail.
- Short circuit and wire break monitoring.
- Programmable output function.
- Relay, transistor or optocoupler outputs.



Switching amplifiers

The one or two-channel NAMUR switching amplifiers evaluate the sensor signal and control the output. They meet all requirements of the ATEX directives. Switching amplifiers with relay and active transistor output are available. The control circuits hold the approval Ex II (1) GD [EEx ia] IIC. The amplifiers are designed for the connection of NAMUR sensors according to DIN EN 60947-5-6 and mechanical switches. They provide the supply voltage for the intrinsically safe circuit.

Other features:

- Programmable effective direction of the output.
- Relay output designed as changeover contact. Max. contact rating at 250 V AC, 2 A at a cos > 0.7 or at 30...40 V DC, 2 A and ohmic load.
- Short-circuit protected transistor outputs, voltage range 10...30 V DC, output current max. 100 mA.
- The sensor cables are monitored for wire break and short circuit. In case of a fault the output is blocked or the relay is de-energised.

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Ex II (1) G D [EEx ia] IIC

U _b [V]	Power / current consumption [VA] / [mA]	f [Hz]	Operating temperature [°C]	Output	Channels	Order no.
Category (1) D and (1) G · Ex II (1) G D [EEx ia] IIC · Protection rating IP 20						
230 AC	1.0 / –	10	-20...60	relay (1 changeover contact)	1	N0031A
230 AC	1.3 / –	10	-20...60	relay (1 changeover contact per channel)	2	N0033A
115 AC	1.0 / –	10	-20...60	relay (1 changeover contact)	1	N0030A
115 AC	1.3 / –	10	-20...60	relay (1 changeover contact per channel)	2	N0032A
24 DC	- / < 23	10	-20...60	relay (1 changeover contact)	1	N0530A
24 DC	- / < 50	10	-20...60	relay (1 changeover contact per channel)	2	N0533A
24 DC	- / < 50	5000	-20...60	2 transistor outputs PNP (100 mA, short-circuit protected)	1	N0531A
24 DC	- / < 50	5000	-20...60	2 transistor outputs PNP (100 mA, short-circuit protected)	2	N0534A
24 DC	- / < 50	5000	-20...60	2 outputs (optocoupler, bipolar, 100 mA, max. 40 V DC, short-circuit protected)	2	N0532A

For scale drawings and connection diagrams please see www.ifm-electronic.com

You can find capacitive NAMUR sensors that can be connected to these switching amplifiers on the pages 32 - 35

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- Self-locking fixing for easy adjustment and quick mounting.
- Practical: Easy fit 'drop from the top' into a T-slot.
- Mounting adapters for clean line, integrated profile, tie rod cylinders
- Excellent dynamic response.
- High protection rating IP 67, thus suitable for many applications.



Quick adjustment and easy mounting

The cylinder switch can be easily inserted from above into the T-slot where it clicks home. For easy positioning of the correct switch point the switch can now be moved in the slot. It is then permanently secured by tightening the slotted / hexagonal socket screw – that's it!

Long life

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

Robust design and good fixing

The switch is locked in the slot and is flush with it. The moulded cable at the end of the switch provides excellent strain relief.

Five different cylinder profiles

We have developed special mounting adapters in order to make the advantages of the new T-slot cylinder switch also available for all other common cylinder types. The switch can be fixed to clean line cylinders, tie rod cylinders, T-slot cylinders, integrated profile cylinders and cylinders with trapezoidal slot using only one screw.

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 5 m orange, PVC cable	E10662
	M12 socket 10 m orange, PVC cable	E10663
	M12 - M12 jumper 2 m, PVC	E11643
	M12 socket 2 m black, PUR cable	E10906
	M12 socket 5 m black, PUR cable	E10907

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II 3D IP 67 T80 °C X

Dimensions [mm]	Housing material	Operating voltage [V]	Operating temperature [°C]	f [Hz]	I _{load} AC/DC [mA]	Connection	Order no.
Category 3D · II 3D IP 67 T80 °C X · Protection rating IP 67							
25 x 5 x 6	PA, stainless steel*	10...30 DC	-20...60	10.000	100	0.3 m, PVC cable with M12 connector	MK501A
25 x 5 x 6	PA, stainless steel*	10...30 DC	-20...60	10.000	100	2 m, PVC cable	MK500A

*high-grade stainless steel

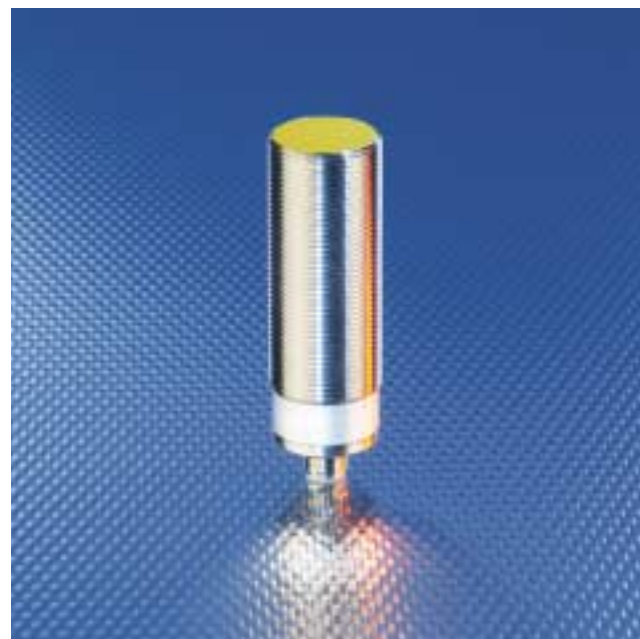
Common technical data

Electrical design: 3-wire PNP
Travel speed: max. 10 m/s

Cylinder type	Mounting adapter	Selection criterion Piston diameter / material	Order no.
Clean line cylinders			
		Ø 8...12 mm / high-grade stainless steel	E11816
		Ø 16...20 mm / high-grade stainless steel	E11817
		Ø 25...32 mm / high-grade stainless steel	E11818
		Ø 40 mm / high-grade stainless steel	E11819
		Ø 50 mm / high-grade stainless steel	E11820
		Ø 63 mm / high-grade stainless steel	E11821
		Ø 80 mm / high-grade stainless steel	E11822
		Ø 100 mm / high-grade stainless steel	E11823
Integrated profile or tie rod cylinders			
		Integrated profile or tie rod cylinder Clamping range 5...11 mm Accessory material: Al	E11797
		Integrated profile or tie rod cylinder Clamping range 9...15 mm Accessory material: Al	E11799
		Integrated profile or tie rod cylinder Clamping range 14...20 mm Accessory material: Al	E11801
Trapezoidal slot cylinders			
		For trapezoidal slot Accessory material: Al	E11796

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- Non-contact fail-safe inductive switch.
- Certified to EN 954-1, category 3 PDF-S to EN 60947-5-3.
- Cannot easily be defeated.
- No additional magnets, actuators, targets, etc.
- Series connection together with mechanical switches possible.



Non-contact operation without separate actuator

GI5002 is a fail-safe inductive switch reacting to metal. A specially coded, precisely positioned target is not required. Installation is thus reduced to a minimum.

Manipulation prevented

The enable zone of the GI5002 is monitored for target position and dwell time. An LED switching status indication was not implemented for the GI5002 on purpose, so that it is not easy to defeat the switch.

Direct connection to the plc

The input and output signals of the GI5002 correspond to DIN EN 61131-2 and are therefore compatible with the inputs and outputs of a plc.

Monitoring of protective systems

Several GI5002 can be connected in series. Thus large protective systems can be implemented with a minimum of wiring.

Certified to EN954-1, category 3

Faults such as coil break, short circuit, wire break or faulty components are detected by means of self-monitoring. Therefore the GI5002 is, among others, certified to EN954-1, category 3.

Accessories

Type	Description	Order no.
	Adjustment unit for fail-safe sensors	G15000

Connectors and splitter boxes

Type	Description	Order no.
	2 m (PUR), angled, without LED	E10900
	5 m (PUR), angled, without LED	E10901
	2 m (PUR), straight, without LED	E10906
	5 m (PUR), straight, without LED	E10907
	T-piece M12	E11569
	Jumper, 2 m PUR cable M12 plug straight - M12 socket angled	E11459
	Jumper, 5 m PUR cable M12 plug straight - M12 socket angled	E11460
	Securing clip for M12 connectors	E11532

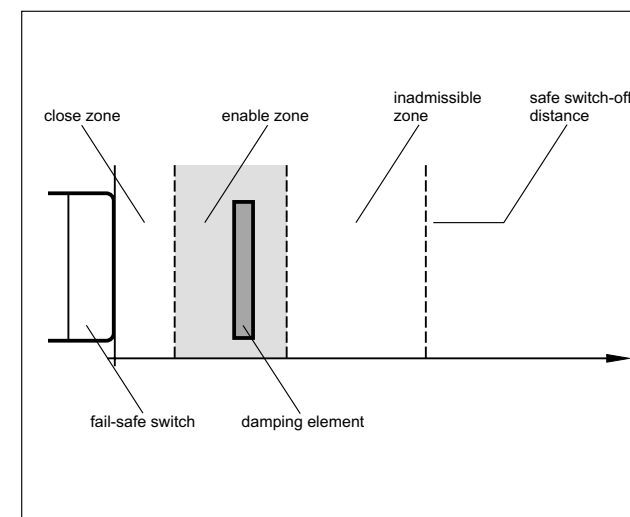
For evaluation units please see pages 42 / 43

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- ⊕ II 3D IP 67 T 80 °C X
- ⊕ II 3G EEx nA II T6 X

Dimensions [mm]	Enable zone [mm]	Housing material	Operating voltage [V]	Category to EN 954-1	Response time on removal [ms]	Response time on approach [ms]	Order no.
Category 3D · ⊕ II 3D IP 67 T 80 °C X · Protection rating IP 67							
M30 / L = 97	3...7 f	stainless steel / PBT	18...30 DC	3 TÜV	< 20	≤ 2500 + T*	GI5002
Category 3G · ⊕ II 3G EEx nA II T6 X · Protection rating IP 67							
M30 / L = 97	3...7 f	stainless steel / PBT	18...30 DC	3 TÜV	< 20	≤ 2500 + T*	GI5002

T*: Period of the clock input signal



Window technology

The fail-safe inductive sensors from ifm electronic operate using the "window technology". This technology is the basis for the fail-safe sensors without additional counterparts such as coded targets or magnets. The damping element is reliably detected in the enable zone. The output is enabled with a delay.

For scale drawings and connection diagrams please see www.ifm-electronic.com

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- Evaluation units for connection of fail-safe switches.
- Certified to EN 954-1, category 4.
- Solid-state outputs NPN/PNP or relay outputs.
- Connection of up to 10 fail-safe switches possible.
- Feedback contacts for external relays.



Function

The evaluation unit is a redundant diverse system for processing up to 3 chains of fail-safe switches. Up to 10 fail-safe switches can be connected. The evaluation unit supplies / monitors the connected fail-safe switches and evaluates their switching status. If all fail-safe switches are fully operational and correctly damped, the evaluation unit switches the output. The safe state is the state when the output is switched off (principle of normally closed operation, zero-current state).

Connection to Safety at Work

Safety at Work is the extension of the existing AS-interface system for safety applications. The ifm fail-safe switches can be integrated in conjunction with mechanical contacts into the AS-i network. The great advantage is that standard and safety-related components can be used in one system. Only a safety slave (G1506S) is added to the existing components. The safety slaves are certified to EN954-1 with category 4.

Accessories

Type	Description	Order no.
Type DN	Power supply 24 V DC 30 W output power	DN1020

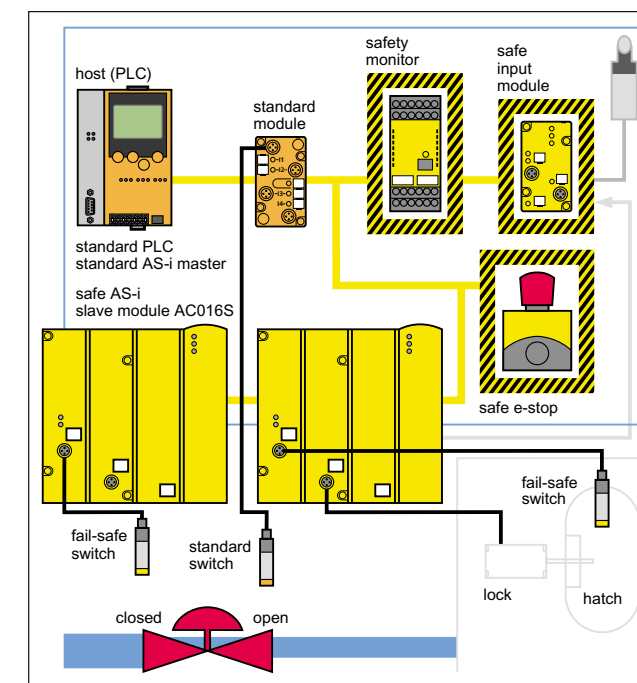
Connectors and splitter boxes

Type	Description	Order no.
2 m (PUR), angled, without LED		E10900
T-piece M12		E11569
Securing clip for M12 connectors		E11532

Connection Fail-safe switches / safety chains	Output	Output function	I _{load} [mA]	Additional functions	I ₀ [mA]	Material	Protection	Order no.
The control monitors are only allowed for operation outside hazardous areas								
10 / 3	semiconduct.	PNP (no) and NPN (no)	200	–	250	PA	IP 30 / IP 20	G15001
10 / 6	relay	3 x no, 2 x nc	6000	–	300	PA	IP 30 / IP 20	G15002
10 / 6	relay	3 x no, 2 x nc	6000	muting	300	PA	IP 30 / IP 20	G15004
10 / 6	relay	3 x no, 2 x nc	6000	e-stop	300	PA	IP 30 / IP 20	G15005
8 / 1 (AS-i)	AS-i	AS-i and 1 x DO	500	–	250	PBTP	IP 67	AC0165



Safety at Work manway monitoring with safety valve position detection

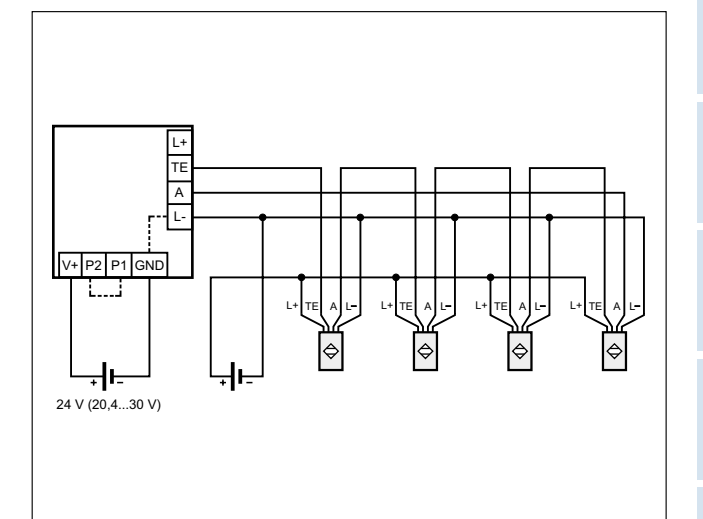


Common technical data

Operating voltage: 20.4...30 V DC
(AC016S: 26.5...31.5 V DC AS-i)
Operating temperature: 0...60 °C
(AC016S: -25...55 °C)

For scale drawings and connection diagrams please see www.ifm-electronic.com

Series connection of fail-safe sensors



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- Inductive dual sensors with NAMUR interface.
- For all valves according to VDI / VDE 3845.
- 20 % cost reduction due to more plant uptime.
- Connection via cable or connector.



Operating principle

As early as 1992 ifm electronic developed a standard which is now used by many leading actuator manufacturers. 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. Depending on the valve position a compact dual proximity switch with two integral sensors detects the upper or lower metal screw and thus the two valve positions. Because of the simple construction the system operates safely with no wear at all. It is virtually resistant to external influence and meets the protection rating IP 67. Under certain conditions the unit operates in a self-cleaning manner. Compared to conventional solutions the sensor weight is low. The sensors are also resistant to mechanical vibration and shocks. For use in hazardous areas ifm offers a special solution. It consists of two NAMUR sensors for position feedback and control of the Ex solenoid valve. Both sensor and valve are connected to the controller via a 7-pole cable.

Accessories

Type	Description	Order no.
	Switching cams, Ø 53	E10661
	Switching cams, Ø 53	E17105
	Switching cams, Ø 65	E10327
	Switching cams, Ø 102	E10328

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m blue, PUR / PVC cable	E10355
	M12 socket 5 m blue, PUR / PVC cable	E10356
	M12 socket 2 m blue, PUR / PVC cable	E10357
	M12 socket 5 m blue, PUR / PVC cable	E10358

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II 1D Ex iaD 20 T 90 °C

Dimensions [mm]	Sensing range [mm]	Material	Internal capacit. [nf]	Internal inductance [uH]	f [Hz]	Connection	Order no.
Category 1D · II 1D Ex iaD 20 T 90 °C · Protection rating IP 67							
40 x 26 x 40	4 nf	PBT, PC	140	130	1800	M12 connector	NN5008
40 x 26 x 30	4 nf	PBT, PC	140	130	1800	2 m, silicone cable	NN5009
40 x 26 x 26	4 nf	PBT, PC	140	140	1800	10 m, silicone cable	NN5011
40 x 26 x 49	4 nf	PBT, PC	140	130	1800	M18 connector	NN5013
40 x 26 x 49	4 nf	PBT, PC	140	130	1800	M18 connector	NN5015*
55 x 35 x 78	4 nf	PBT, PC	150	150	250	RD 24 x 1/8; M12 connector	N95001
55 x 35 x 78	4 nf	PBT, PC	100	150	1300	RD 24 x 1/8; M12 connector	N95002*

*power-on delay time: < 1 ms

Common technical data

Nominal voltage: 8.2 V DC (1 kΩ)
 Operating voltage: 7.5...15 V DC
 Operating temperature: -20...70 °C
 Current consumption undamped: > 2.1 mA
 Current consumption damped: < 1 mA
 Output function: 2 x NC

For scale drawings and connection diagrams please see www.ifm-electronic.com

You can find inductive sensors for valves with AS-i interface on page 62

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- Inductive dual sensors with NAMUR interface.
- For all valves according to VDI / VDE 3845.
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Operating principle

As early as 1992 ifm electronic developed a standard which is now used by many leading actuator manufacturers. 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. Depending on the valve position a compact dual proximity switch with two integral sensors detects the upper or lower metal screw and thus the two valve positions. Because of the simple construction the system operates safely with no wear at all. It is virtually resistant to external influence and meets the protection rating IP 67. Under certain conditions the unit operates in a self-cleaning manner. Compared to conventional solutions the sensor weight is low. The sensors are also resistant to mechanical vibration and shocks. For use in hazardous areas ifm offers a special solution. It consists of two NAMUR sensors for position feedback and control of the Ex solenoid valve. Both sensor and valve are connected to the controller via a 7-pole cable.

Accessories

Type	Description	Order no.
	Switching cams, Ø 53	E10661
	Switching cams, Ø 53	E17105
	Switching cams, Ø 65	E10327
	Switching cams, Ø 102	E10328

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m blue, PUR / PVC cable	E10355
	M12 socket 5 m blue, PUR / PVC cable	E10356
	M12 socket 2 m blue, PUR / PVC cable	E10357
	M12 socket 5 m blue, PUR / PVC cable	E10358

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- ⊕ II 1G EEx ia IIB T6
- ⊕ II 2G EEx ia IIB T6

Dimensions [mm]	Sensing range [mm]	Material	Internal capacit. [nf]	Internal inductance [uH]	f [Hz]	Connection	Order no.
Category 1G · ⊕ II 1G EEx ia IIB T6 · Protection rating IP 67							
40 x 26 x 40	4 nf	PBT, PC	140	130	1800	M12 connector	NN5008
40 x 26 x 30	4 nf	PBT, PC	140	130	1800	2 m, silicone cable	NN5009
40 x 26 x 26	4 nf	PBT, PC	140	140	1800	10 m, silicone cable	NN5011
40 x 26 x 49	4 nf	PBT, PC	140	130	1800	M18 connector	NN5013
40 x 26 x 49	4 nf	PBT, PC	140	130	1800	M18 connector	NN5015*
Category 2G · ⊕ II 2G EEx ia IIB T6 · Protection rating IP 67							
55 x 35 x 78	4 nf	PBT, PC	150	150	250	RD 24 x 1/8; M12 connector	N95001
55 x 35 x 78	4 nf	PBT, PC	100	150	1300	RD 24 x 1/8; M12 connector	N95002*

*power-on delay time: < 1 ms

Common technical data

Nominal voltage: 8.2 V DC (1 kΩ)
 Operating voltage: 7.5...15 V DC
 Operating temperature: -20...70 °C
 Current consumption undamped: > 2.1 mA
 Current consumption damped: < 1 mA
 Output function: 2 x NC

For scale drawings and connection diagrams please see www.ifm-electronic.com

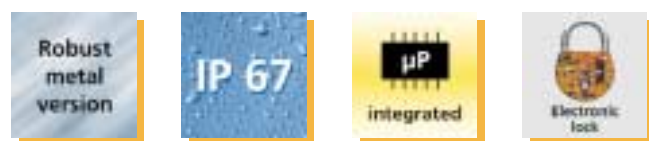
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- Compact speed monitor type M18 or M30.
- Evaluation system with integrated sensor.
- Parameter setting via potentiometer or teach button.
- Either in 2-wire or 3-wire technology.
- Ideal in combination with a PLC.



Applications

The compact speed monitor is an evaluation system for monitoring rotating or linear movements. It can be used for a wide range of conveying applications, in particular for monitoring belt conveyors or bucket elevators. Here it is typically used to monitor if a speed has fallen below a preset value and to monitor blockage or standstill. It is also suited for smaller machines with only little space for mounting sensors. The units can be used in zone 22 (non-conductive dusts) according to group II, category 3D.

Advantages

The compact speed monitor incorporates the sensor and the speed monitoring in one housing. The switch point is set using the multi-turn potentiometer or the teach function. For the μ P controlled DI601A the start-up delay and the output function (NO / NC) can also be adapted to the application.

The 3-wire units can be preferably used for the direct connection to a PLC, whereas the 2-wire units can also switch small relays and contactors with 230 V AC.

Accessories

Type	Description	Order no.
	Target wheel with 1 - 8 cams	E89010
	Clip with cam to fix on a shaft	E89013

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m black, PUR cable	E10906
	M12 socket 5 m black, PUR cable	E10907
	M12 socket 2 m black, PUR cable	E10900
	M12 socket 5 m black, PUR cable	E10901
	Securing clip for M12 connectors	E11532

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II 3D IP 67 T 80 °C X

Dimensions [mm]	Sensing range [mm]	Material	U _b DC [V]	Setting range [pulses/min]	Start-up delay [s]	Output function	Connection	Order no.
Category 3D · II 3D IP 67 T 80 °C X · Protection rating IP 67								
M18 / L = 77	12 nf	stainless steel / PBT	10...36	3...6000	0...15 prog.	no / nc prog.	M12 plug	DI601A
M30 / L = 81	10 f	CuZn / PBT	20...250*	5...300	12	no	2 m, cable	DI001A
M30 / L = 81	10 f	CuZn / PBT	10...36	5...300	15	no	2 m, cable	DI501A
M30 / L = 92	10 f	CuZn / PBT	10...36	5...300	15	no	M12 plug	DI502A
M30 / L = 92	10 f	CuZn / PBT	10...36	5...300	5	no	M12 plug	DI503A

CuZn: brass plated with white bronze
*AC/DC

Common technical data

Operating temperature: -20...60 °C
Electrical design: 3-wire PNP
(DI001A: 2-wire AC/DC)

Functions

The integrated sensor is damped by passing cams or other metallic targets.

On the basis of the time interval between the damping operations the evaluation calculates the period duration or the frequency (actual rotational speed value) and compares it to the set switch point. The output switches depending on the set parameters such as switching function and start-up delay. A yellow LED signals that the output is switched, a green LED that the sensor is damped.

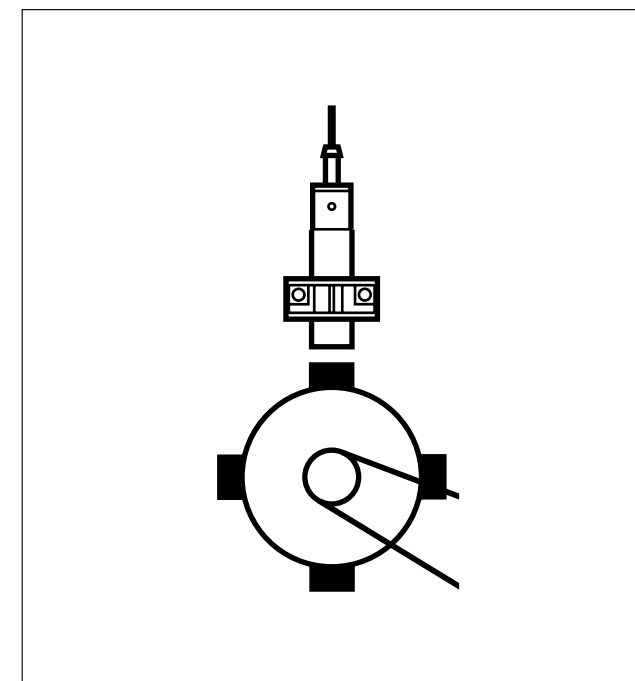
Type M18 with teach button:

By pressing the teach button it is possible to measure the actual rotational speed value, to store a switch point and to set the start-up delay and the output function.

Type M30 with potentiometer:

The switch point is set using a multi-turn potentiometer. Hysteresis and start-up delay are fixed.

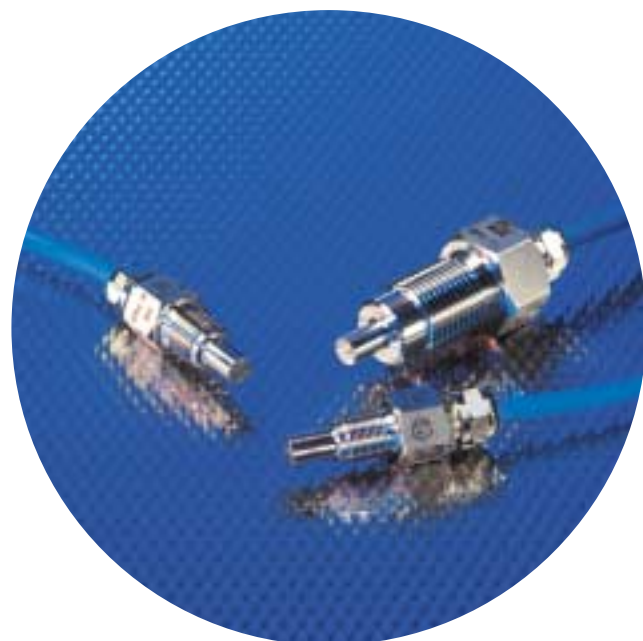
Application



For scale drawings and connection diagrams please see www.ifm-electronic.com

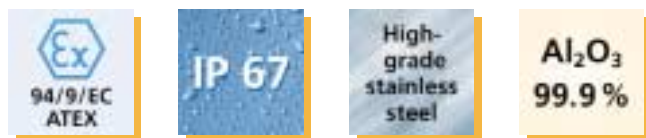
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Sensors for category 1/2G with cable, for category 2G with cable or connector.

- High-grade stainless steel or ceramic housing (aluminium oxide 99.9%).
- Process connection thread M12 x 1, G 1/4, G 1/2 or ANSIB16.5.
- Temperature class T4.
- Connector and cable version.




Description

The sensors type SFx1xA are for flow monitoring in hazardous areas and have an EC type test certificate according to the category 1/2G. In combination with the control monitors VS2000 Ex-i the sensors can be used in zone 0 of pipes and tanks of the explosion groups II A, II B and II C. The sensor tip must be in zone 0 and the housing in zone 1. The housings are made of stainless steel (316S12) and have a potted cable connection.

The sensors type SFx2xA are used for flow monitoring in zone 2 and have an EC type test certificate according to the category 2G in combination with the control monitor VS2000 Ex-i. The units meet the requirements of the directive 94/9/EC as well as the applicable standards and the requirements of intrinsic safety "i". The electrical data and the Ex marking are indicated in the data sheet, the type test certificate and the operating instructions.

For further information see our website www.ifm-electronic.com.

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m blue, PUR / PVC cable	E40075
	M12 socket 5 m blue, PUR / PVC cable	E40076

For control monitors please see pages 52 / 53

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- ⊕ II 1/2G EEx ia IIC T4
- ⊕ II 2G EEx ia IIC T4

Setting range liquid / gaseous [cm/s]	Greatest sensitivity [cm/s]	Medium temp. [°C]	Response time [s]	Max. T ₀ gradient [K/min]	Pressure resistance [bar]	Process connection / material	Order no.
Category 1/2G · ⊕ II 1/2G EEx ia IIC T4 · cable 6 m							
3...300 / 200...2000	3...60 / 200...800	-20...60	1...10	15	300	M12 / stainless steel*	SF111A
3...300 / 200...2000	3...60 / 200...800	-20...60	1...10	15	300	G 1/4 / stainless steel*	SF211A
3...300 / 200...2000	3...60 / 200...800	-20...60	1...10	15	300	G 1/2 / stainless steel*	SF311A
Category 2G · ⊕ II 2G EEx ia IIC T4 · cable 6 m							
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	M12 / stainless steel*	SF121A
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	G 1/4 / stainless steel*	SF221A
0...60 / -	3...40 / -	5...70 / -	2...20	7	30	G 1/4 / Al ₂ O ₃	SF223A
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	G 1/2 / stainless steel*	SF321A
0...60 / -	3...40 / -	5...70 / -	2...20	7	30	G 1/2 / Al ₂ O ₃	SF323A
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	ANSIB16.5 / stainl. steel*	SF521A
Category 2G · ⊕ II 2G EEx ia IIC T4 · M12 connector							
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	M12 / stainless steel*	SF120A
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	G 1/4 / stainless steel*	SF220A
3...300 / 200...2000	3...60 / 200...800	-20...70	1...10	15	30	G 1/2 / stainless steel*	SF320A

*(316S12)

Common technical data

Max. cable length: 100 m / 5 x 0.5 mm²
 Protection rating: IP 67
 Capacitance for sensors category 1G:
 10 nF / 6 m cable, 5 x 0.34 mm²
 Capacitance for sensors category 2G:
 0.4 nF / 6 m cable, 5 x 0.34 mm²
 Inductance for sensors category 1G:
 70 µH / 6 m cable, 5 x 0.34 mm²
 Inductance for sensors category 2G:
 2 µH / 6 m cable, 5 x 0.34 mm²
 Temperature class: T4

For scale drawings and connection diagrams please see www.ifm-electronic.com

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Control monitors for the connection of flow sensors SF1..A / SF2..A / SF3..A / SF5..A

- Housing for DIN rail mounting.
- Multi-coloured LED bar graph for switch point and flow.
- Integrated wire monitoring from the sensor to the control monitor.



VS 2000 Ex-i in standard DIN housing

Type SF flow sensors are rated for connection to a separate control monitor type VS 2000 Ex-i. Flow sensor and control monitor together form the flow monitor. Based on the calorimetric principle these units are used for monitoring liquid and gaseous media. The systems are preferably used where environmental conditions or regulations do not permit local installation of the control monitors.

The control monitor in a DIN rail housing must be mounted outside the hazardous area. The limit values for gaseous and liquid media can be set by means of a slide switch and potentiometer. The current status is indicated via an 11-digit LED display.

In all versions the intrinsically safe heating and sensor circuit, the flow and monitoring circuit are electrically separated from each other and from the supply circuit.

As standard, the control monitor monitors a jumper cable to the sensor for wire break and short circuit.

In case of a fault an additional monitoring relay is de-energised and a red LED indicates the fault. At the same time the flow relay is de-energised and the 11-digit LED display indicates "no flow" (red LED lights).

For installation and operation the applicable regulations for the installation of electrical equipment in hazardous areas as well as the certificates of conformity must be observed.

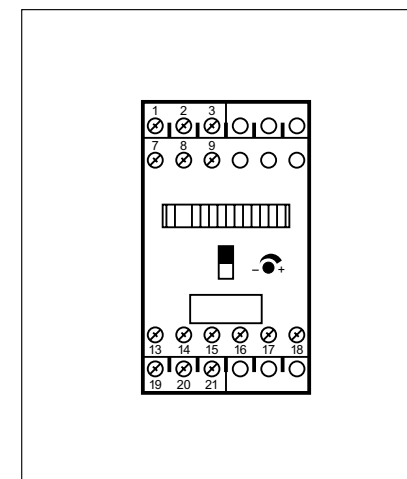
Further data: operating temperature: 0...60 °C, housing material: plastic, contact rating of the relays: max. 4 A (250 V AC, cos Phi ≥ 0.7); 0.2 A (250 V DC); 4 A (24 V DC).

More details on the control circuit are given in the data sheets on our website www.ifm-electronic.com.

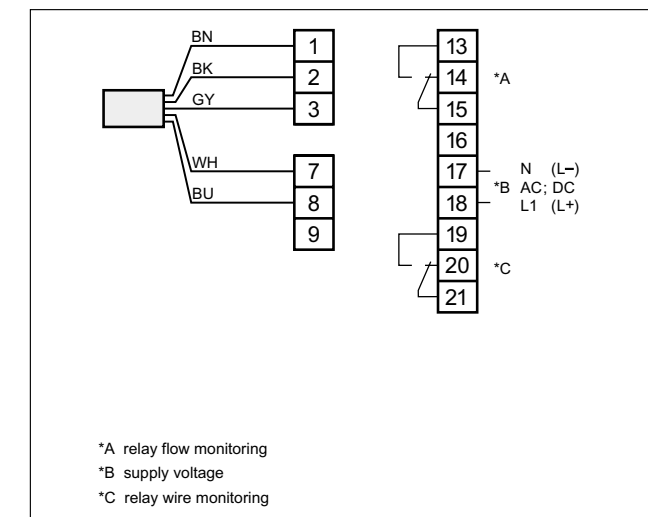
II (1) G [Ex ia] IIC

U _b / tolerance [V] / [%]	Current consumption [mA]	Power consumption [VA]	Availability time [s]	Output for flow	Output if temperature is exceeded	Output for wire break	Order no.
Category (1) G · II (1) G [Ex ia] IIC · 15 terminals up to 2.5 mm · output function							
230 AC / ± 10	–	5	30	relay energised	–	relay deenergised	SN2301
110 AC / ± 10	–	5	30	relay energised	–	relay deenergised	SN2302
24 DC / ± 10	125	–	30	relay energised	–	relay deenergised	SR2301

Front view



Terminal connection



Common technical data

Connection terminals: IP 40
Switch point setting via potentiometer

For scale drawings and connection diagrams please see www.ifm-electronic.com

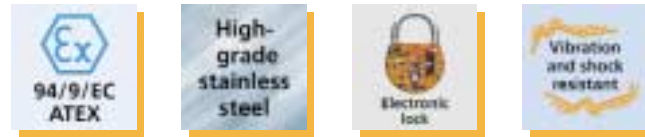
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- Pressure sensors for industrial and aseptic applications.
- Ceramic-capacitive measuring principle ensures maximum robustness.
- Drift-free operation for more than 100 million pressure cycles.
- Optimum reading of the display even at long distances.



Pressure sensors in hazardous areas

The pressure sensors are suitable for monitoring non-explosive liquids and gases in hazardous dust areas in accordance with group II, category 3D. The parts of the sensors which are in contact with the medium are made of high-grade stainless steel (316S12) and ceramics (Al₂O₃, 96 %).

Sensors for hygienic areas

The sensors of the PF series for liquid or viscous media monitor the pressure in applications in the food, beverage, and pharmaceutical industries where they meet the 3A, FDA, and EHEDG requirements.

The ceramic measuring cell (Al₂O₃, 99.9 %) is mounted flush into the high-grade stainless steel housing (316S12). This enables optimum cleaning of the sensor so that it is suitable for hygienic areas with a medium temperature of up to 60 °C.

Sensors for pneumatic and hydraulic applications

The robust pressure sensors of the PN series ensure trouble-free and reliable operation. The tried-and-tested ceramic-capacitive measuring principle makes this series immune to overload operation and high pressure peaks. Furthermore it guarantees maximum life. The structured menu navigation and the 4-digit alphanumeric 10-segment display allow easy operation. Depending on the version, the units of the PN series are available with switching output or as combined pressure sensors with switching and analogue output.

Accessories

Type	Description	Order no.
	Adapter, G 1/4 A - G 1/2 A	E30000
	Adapter, G 1/4 A - G 1/4 A	E30007
	G 1/4 flange adapter, 31.1 mm hole spacing	E30003
	Adapter G 1 - DIN 11851/1.5" / DN40	E33612
	Welding adapter, G 1 - Ø 50 mm	E30013

Connectors and splitter boxes

Type	Description	Order no.
	M12 socket 2 m black, PUR cable, free from halogen	E10900
	M12 socket 5 m black, PUR cable, free from halogen	E10901
	M12 socket 2 m black, PUR cable, free from halogen	E10906
	M12 socket 5 m black, PUR cable, free from halogen	E10907

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- ⊕ II 3D IP 65 T 95 °C X
- ⊕ II 3D IP 67 T 80 °C X

Meas. range rel. pressure [bar]	Overload max. [bar]	Switch-on point / set [bar]	Switch-off point / reset [bar]	Switch point accuracy [%]	Step increment [bar]	Protection rating	Process connection	Order no.
Category 3D · ⊕ II 3D IP 65 T 95 °C X · M12 connector · output function 4...20 mA or 0...10 V analogue								
0...10	50	-0.90...10.00	-0.95...9.95	< ± 0.5	0.05	IP 65	G 1/4 I	PN004A
0...2.5	20	0.02...2.50	0.01...2.48	< ± 0.5	0.01	IP 65	G 1/4 I	PN006A
0...1	10	-0.01...1.00	0.005...0.995	< ± 0.5	0.005	IP 65	G 1/4 I	PN007A
-1...0	10	-0.99...-0.00	-0.995...-0.005	< ± 0.5	0.005	IP 65	G 1/4 I	PN009A
Category 3D · ⊕ II 3D IP 65 T 95 °C X · M12 connector · output function 2 x 								
-1...10	50	-0.90...10.00	-0.95...9.95	< ± 0.5	0.05	IP 65	G 1/4 I	PN014A
0...2.5	20	0.02...2.50	0.01...2.48	< ± 0.5	0.01	IP 65	G 1/4 I	PN016A
Category 3D · ⊕ II 3D IP 67 T 80 °C X · M12 connector · output function 2 x 4...20 mA or 0...10 V analogue								
-1...25	100	-0.8...25.0	-0.9...24.9	< ± 0.6	0.1	IP 67	G 1 A	PF003A
-0.013...0.25	10	-0.011...0.25	-0.012...0.249	< ± 0.6	0.001	IP 67	G 1 A	PF008A

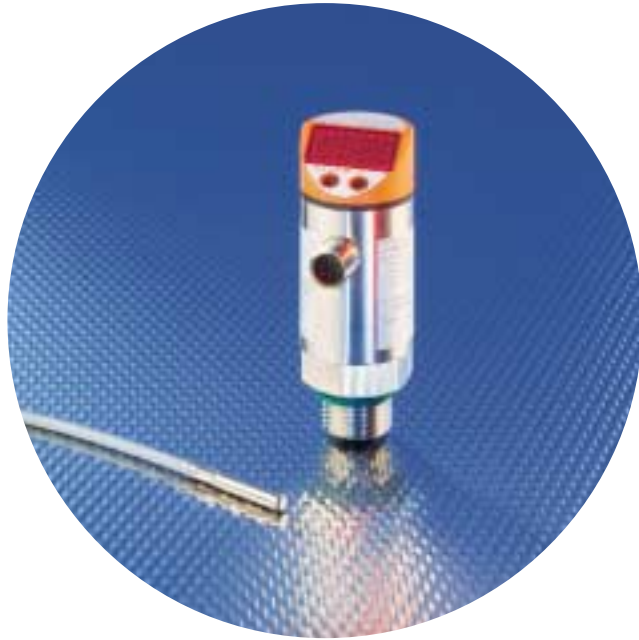
Common technical data

Operating voltage: 20...30 V DC
 Current consumption: < 60 mA
 Current rating: 250 mA
 Operating temperature: -20...60 °C
 Shock resistance: 50 g
 Vibration resistance: 20 g (10...2000 Hz)

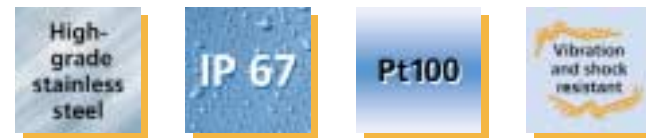
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- 3-wire Pt100 class B, ATEX classification II 3D, 3 m silicone cable.
- Direct connection to control monitors, AS-i modules and PLCs.
- Protection rating IP 67 for different applications and measuring ranges.



Temperature sensors in hazardous areas

The temperature sensor monitors temperatures in hazardous areas of -20...80 °C. The Pt100 measuring element to DIN EN 60751 corresponds to the accuracy class B. It is integrated in a stainless steel housing (320S17). Using a wirable connector the sensor can be connected to a standard control monitor type TR installed outside the hazardous area. The measured value is then indicated on an LED display that is clearly visible at greater distances. Depending on the control monitor the measured value can be provided as analogue value (0...10 V / 4...20 mA) or as a binary switching signal for further processing.

Connection options

The connection to existing control monitors is just as requested as the connection to PLCs or AS-i modules. The indicated Pt100 temperature sensor can be directly connected to AS-i modules with Pt100 inputs.

Accessories

Type	Description	Order no.
	Clamp, Ø 34 mm	E10193
	Protective cover	E30006
	Clamp fitting Ø 6 / 8 / 10 mm – G 1/2 for temperature sensors TS / TT	E30018

Connectors and splitter boxes

Type	Description	Order no.
	M12 connector 4-pole, wirable	E11504
	M12 connector 5-pole, wirable	E11506

II 3D IP 67 T 100 °C X

Pt100 sensor element

Dimensions [mm]	Measuring range [°C]	Material sensor	Connection	Sensor element	Accuracy class	Dynamic response time T05 / T09 [s]	Order no.
Category 3D · II 3D IP 67 T 100 °C X · Protection rating IP 67							
Ø 5 mm	-20...80	stainl. st. (320S17)	3 m, silicone cable	Pt100	B	6 / 18	TS335A

Control monitor* with integrated display

Setting range switch point [°C]	Analogue output resolution [°C]	Display and switching status	U _b [V]	Current consumption [mA]	I _{load} [mA]	Order no.
M12 connector · output function 2 x 						
-39.5...150	–	3 digits, 7 segments, 2 x red	18...30	< 50	250	TR7430
M12 connector · output function 4 x 						
-39.8...150	–	4 digits, 10 segments, 4 x yellow	18...28	< 90	< 500	TR8430
M12 connector · output function 4...20 mA or 0...10 V						
-39.8...300	0.1	4 digits, 10 segments, yellow	20...30	< 55	250	TR2432

*The control monitors are only allowed for operation outside hazardous areas.

Common technical data of the control monitors

Electrical design: DC PNP
(TR2432: NPN/PNP)
Switch point accuracy: ± 0.2 K
(TR2432: ± 0.3 K)
Accuracy of the analogue output (only TR2432): ± 0.3 K
Resolution of the switching output: 0.2 °C
(TR2432: ± 0.1 K)
Resolution of the analogue output (only TR2432): ± 0.1 K
Operating temperature: -25...70 °C

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Technical information and customer service



- ClassicLine modules for field applications.
- Digital inputs and outputs for the hazardous area II 3D.
- Modules with standardised EMS interface for AS-i and 24 V.
- Indication of periphery and communication faults.
- Robust DIN rail mounting via FC lower parts.



ATEX I/O modules



Like the standard modules, the ATEX ClassicLine modules are also based on the standardised AS-i interface. The ATEX modules can be mounted directly in the corresponding environments. This eliminates the need for complex control cabinets with conventional wiring. The remaining AS-i system consisting of AS-i master, power supply, cable, etc. can be used unchanged. Due to a combined periphery fault and communication error LED the user is provided with two important signals during set-up and operation.

A "permanent red" light signals a communication error, e.g. the address is still set to "0".

A "flashing red" light indicates a problem with the connected periphery, e.g. overload.

This information can be evaluated by the AS-i master 2.1 at any time. Further LEDs indicate the signal states of the inputs and outputs and the operating voltage on the front display.

Accessories and connectors

Type	Description	Order no.
	AS-i flat cable	AC4000
	FC lower part	AC5000

II 3D IP 67 T 60 °C X

Number of inputs	Number of outputs	Input voltage from AS-i	Output voltage to PELV	Max. input current / module [mA]	Output current / channel (total) [A]	AS-i profile	Total current consumption from AS-i [mA]	Order no.
Category 3D · II 3D IP 67 T 60 °C X · ClassicLine · Digital inputs and outputs								
4 DI	–	yes	–	200	–	S-0.0.E	< 240	AC005A
–	4 DOT	–	yes	–	1 (2)	S-8.0.E	< 50	AC008A
2 DI	2 DOT	yes	yes	100	1 (2)	S-3.0.E	< 150	AC007A

Common technical data

Operating temperature: 0...40 °C
Version 2.1, single slaves

Note:
Addressing via the addressing unit
AC 1144 or controller e
Use flat cable AC4000 or 4002
Use flat cable lower parts AC5000 or 5003
Use M12 connectors with hexagonal nut
(tightening torque 0.8 Nm)

For scale drawings and connection diagrams please see
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- **AirBoxes: Decentralised valves for field applications.**
- **Digital inputs and pneumatic outputs for the hazardous area II 3D.**
- **Standardised EMS interface for AS-i.**
- **4/2-way or 2 x 3/2-way valves in monostable design.**
- **Robust DIN rail mounting via FC lower part.**





ATEX valves

Like the standard AS-i AirBoxes, the ATEX AirBoxes for category 3D zone 22 (non-conductive dusts) are also based on the standardised AS-i interface. The ATEX AirBoxes can be mounted directly in the corresponding environment. This eliminates the need for complex control cabinets with conventional wiring. The remaining AS-i system consisting of AS-i master, power supply, cable, etc. can be used unchanged.

The AirBoxes can be used in a wide range of different applications. The simple bus wiring is especially cost-effective in process installations and conveyor technology. The ATEX AirBoxes are available as 1 x 4/2-way valves or for the connection of two single-acting cylinders as 2 x 3/2-way valve.

Accessories and connectors

Type	Description	Order no.
	AS-i flat cable	AC4000
	FC lower part	AC5000

II 3D IP 65 T 65 °C X

Number of inputs	Number of outputs	Input voltage from AS-i	Output voltage to PELV	Max. input current / module [mA]	Air flow / channel [l/min.]	AS-i profile	Total current consumption from AS-i [mA]	Order no.
Category 3D · II 3D IP 65 T 65 °C X · AirBox 42 · 2 digital inputs · 1 pneumatic output NO/NC selectable · Prot. rating IP 65								
2 DI-Y	1 PO	yes	–	100	500	S-3.F	< 165	AC046A
Category 3D · II 3D IP 65 T 65 °C X · AirBox 32 · 4 digital inputs · 2 pneumatic outputs · Protection rating IP 65								
4 DI	2 PO	yes	–	100	350	S-7.F	< 170	AC042A

Common technical data

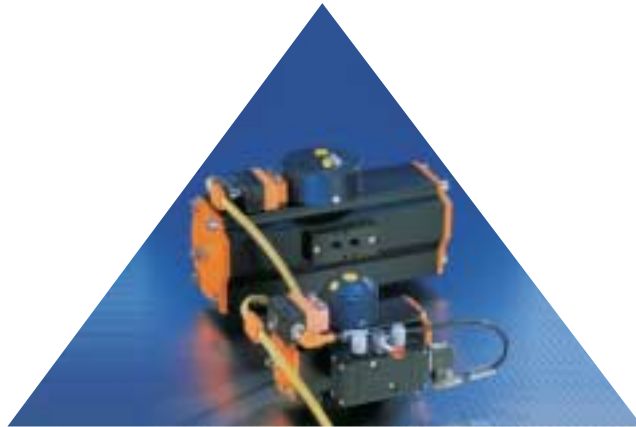
Operating temperature: 0...40 °C

Note:
Addressing via the AC 1144 addressing unit or controller e
Use flat cable AC4000
Use flat cable lower parts AC5000
Use M12 connectors with hexagonal nut (tightening torque 0.8 Nm)

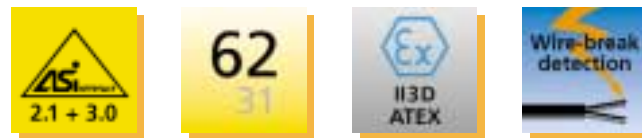
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- AS-i IND/T : Quarter-turn modules for hazardous dust areas Ex II 3D.
- Inductive sensors for position detection, outputs for solenoid valves.
- Periphery/communication fault indication with wire break monitoring.
- Up to 62 quarter-turn actuators can be controlled per AS-i network.
- Supply from the AS-i line, 24 V supply not required.



Introduction

The tried-and-tested IND/T modules for field applications in process technology are now also available for category 3D to EU directive 94/9/EC (ATEX). They are suitable for use in zone 22 (non-conductive dusts). The modules are software compatible with the existing units. They operate in conjunction with AS-i 2.0 and 2.1 masters.

The T5 family contains two inductive sensors for open / close detection of a rotational movement by means of a target puck. The digital output controls the pilot valve of the pneumatic quarter-turn actuator.

The AS-i connection allows direct connection to the yellow flat cable via an M12 isolation displacement connector.

All LEDs are located above the AS-i connection. Besides the status indications for the switching states of the inputs and outputs a power LED as well as an improved periphery fault indication have been added. A short-circuit or wire break on the actuator cable is detected reliably and signalled to the master.

Application


The AS-i IND/T modules can be used in a wide range of different applications in hazardous areas of category 3D such as silos, fodder concentrate plants. The simple bus wiring is especially cost-effective in process installations with many valves and actuators where space is restricted. Thanks to the high protection rating and direct mounting on the actuator the mounting times are reduced compared to conventional control boxes.

The wear-free proximity switches and the diagnosis via AS-interface ensure operation with a minimum of maintenance and long plant uptimes.

Accessories

Type	Description	Order no.
	Target puck, Ø 53 mm	E10320
	Target puck, Ø 65 mm	E10327
	Target puck, Ø 102 mm	E10328
	Addressing unit for version 2.1	AC1144

Connectors and splitter boxes

Type	Description	Order no.
	Addressing cable M12 / M12, 2 m	E11404

- ⊕ II 3D IP 67 T 80 °C X
- ⊕ II 3D IP 67 T 90 °C X

Type / Dimensions [mm]	Sensing range [mm]	Material	Electrical design	Current consumption [mA]	Current rating [mA]	Order no.
Category 3D · ⊕ II 3D IP 67 T 80 °C X · Protection rating IP 67						
T4	4 nf	PBT	2 DI	< 40	–	AC315A
Category 3D · ⊕ II 3D IP 67 T 90 °C X · Protection rating IP 67						
T5	4 nf	PBT, PC	2 DI, 1 output PNP	< 160	100	AC316A
T6	4 nf	PBT, PC	2 DI, 2 outputs PNP	< 160	100	AC317A

Common technical data

Operating temperature: -10...60 °C
 AS-i version: 2.1
 Indication AS-i voltage: LED green
 Indication periphery fault: LED red
 Indication communication error: LED red
 Indication switching status: LED yellow
 Connection AS-i flat cable and M12 connector

Additional diagnosis

Due to a combined periphery fault and communication error LED at the module the user is provided with two important signals during set-up and operation. A "permanent red" light signals a communication error, e.g. the address is still set to "0". "Flashing red" indicates a problem of the connected valve. This information can be evaluated by the AS-i master 2.1 at any time.

For the first time two data bits allow separate evaluation of the short-circuit and wire-break situations to generate even more selective service information.

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- Indication of periphery and communication faults.
- Robust DIN rail mounting via FC lower parts.



ATEX I/O modules



Like the standard modules, the ATEX ClassicLine modules are also based on the standardised AS-i interface. The ATEX modules can be mounted directly in the corresponding environments. This eliminates the need for complex control cabinets with conventional wiring. The remaining AS-i system consisting of AS-i master, power supply, cable, etc. can be used unchanged. Due to a combined periphery fault and communication error LED the user is provided with two important signals during set-up and operation.

A "permanent red" light signals a communication error, e.g. the address is still set to "0".

A "flashing red" light indicates a problem with the connected periphery, e.g. overload.

This information can be evaluated by the AS-i master 2.1 at any time. Further LEDs indicate the signal states of the inputs and outputs and the operating voltage on the front display.

Accessories and connectors

Type	Description	Order no.
	AS-i flat cable	AC4000
	FC lower part	AC5000

II 3G EEx nA II T6 X

Number of inputs	Number of outputs	Input voltage from AS-i	Output voltage to PELV	Max. input current / module [mA]	Output current / channel (total) [A]	AS-i profile	Total current consumption from AS-i [mA]	Order no.
Category 3G · II 3G EEx nA T6 X · ClassicLine · Digital inputs and outputs								
4 DI	–	yes	–	200	–	S-0.0.E	< 240	AC005A
–	4 DOT	–	yes	–	1 (2)	S-8.0.E	< 50	AC008A
2 DI	2 DOT	yes	yes	100	1 (2)	S-3.0.E	< 150	AC007A

Common technical data

Operating temperature: 0...40 °C
Version 2.1, single slaves

Note:
Addressing via the addressing unit
AC 1144 or controller e
Use flat cable AC4000 or 4002
Use flat cable lower parts AC5000 or 5003
Use M12 connectors with hexagonal nut
(tightening torque 0.8 Nm)

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Type	Cable	Wire specification	Materials housing / nut	U [V]	Operating temperature [°C]	Protection rating	Gold-plated contacts	Order no.
Category 1D / 1G (with blue connection cable)								
	2 m blue PUR / PVC	4 x 0.34 mm ² Ø 5 mm	TPU, CuZn	...15 DC	-25...90	IP 67	–	E10355
	5 m blue PUR / PVC	4 x 0.34 mm ² Ø 5 mm	TPU, CuZn	...15 DC	-25...90	IP 67	–	E10356
	2 m blue PUR / PVC	4 x 0.34 mm ² Ø 5 mm	TPU, CuZn	...15 DC	-25...90	IP 67	–	E10357
	5 m blue PUR / PVC	4 x 0.34 mm ² Ø 5 mm	TPU, CuZn	...15 DC	-25...90	IP 67	–	E10358
	2 m blue PUR / PVC	5 x 0.34 mm ² Ø 5 mm	TPU, CuZn	...15 DC	-25...90	IP 67	–	E11693
	5 m blue PUR / PVC	5 x 0.34 mm ² Ø 5 mm	TPU, CuZn	...15 DC	-25...90	IP 67	–	E11694
Category 1D / 1G (wirable M18 sockets) ·  II 1D Ex iaD 20 T 85 °C ·  II 1G EEx ia IIC T6								
	wirable	4 x 0.75 mm ² Ø 6...8 mm	PA	20...250 AC/DC	-40...85	IP 65	–	E1002A*
	wirable	4 x 0.75 mm ² Ø 6...8 mm	PA	20...250 AC/DC	-40...85	IP 65	–	E1003A*
Category 1D / 1G (wirable RD24 sockets) ·  II 1D Ex iaD 20 T 85 °C ·  II 1G EEx ia IIC T6								
	wirable	7 x 0.25 mm ² Ø 10...12 mm	PBT	250 AC 300 DC	-40...100	IP 67	•	E1001A*
	wirable	7 x 0.25 mm ² Ø 6...8 mm	PBT, PA	250 AC 300 DC	-40...100	IP 67	•	E1004A*
Category 2D (with successful impact test)								
	5 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10662
	10 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10663
	25 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10899

CuZn: brass plated with white bronze

*with type test certificate number BVS 05 ATEX E 106

**(316S12)









When using sockets in explosion-protected areas (ATEX) there are special requirements regarding wiring.

The requirements of the applicable installation regulations must be absolutely adhered to by the user on his own responsibility.

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Other cable lengths available on request

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Type	Cable	Wire specification	Materials housing / nut	U [V]	Operating temperature [°C]	Protection rating	Gold-plated contacts	Order no.
Category 3D / 3G								
	2 m black PUR, halogen-free	4 x 0.34 mm ² Ø 4.7 mm	TPU, CuZn	250 AC 300 DC	-40...90	IP 68 / IP 69 K	•	E10900
	5 m black PUR, halogen-free	4 x 0.34 mm ² Ø 4.7 mm	TPU, CuZn	250 AC 300 DC	-40...90	IP 68 / IP 69 K	•	E10901
	10 m black PUR, halogen-free	4 x 0.34 mm ² Ø 4.7 mm	TPU, CuZn	250 AC 300 DC	-40...90	IP 68 / IP 69 K	•	E10902
	2 m black PUR, halogen-free	4 x 0.34 mm ² Ø 4.7 mm	TPU, CuZn	250 AC 300 DC	-40...90	IP 68 / IP 69 K	•	E10906
	5 m black PUR, halogen-free	4 x 0.34 mm ² Ø 4.7 mm	TPU, CuZn	250 AC 300 DC	-40...90	IP 68 / IP 69 K	•	E10907
	10 m black PUR, halogen-free	4 x 0.34 mm ² Ø 4.7 mm	TPU, CuZn	250 AC 300 DC	-40...90	IP 68 / IP 69 K	•	E10908
	5 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10662
	25 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10899
	5 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10700
	10 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10701
	25 m orange PVC	4 x 0.25 mm ² Ø 5 mm	PVC, high-grade stainless steel**	250 AC 300 DC	-25...100	IP 68 / IP 69 K	•	E10800
Accessories								
	Securing clip for M12 connectors							E11532

CuZn: brass plated with white bronze
**(316S12)

Sockets with coupling nut only in connection with E11532 securing clip.

Sockets with hexagonal nut must either be tightened so that they cannot be unscrewed manually (tightening torque of the nut = 0.7...0.9 Nm). Otherwise the E11532 securing clip has to be mounted.

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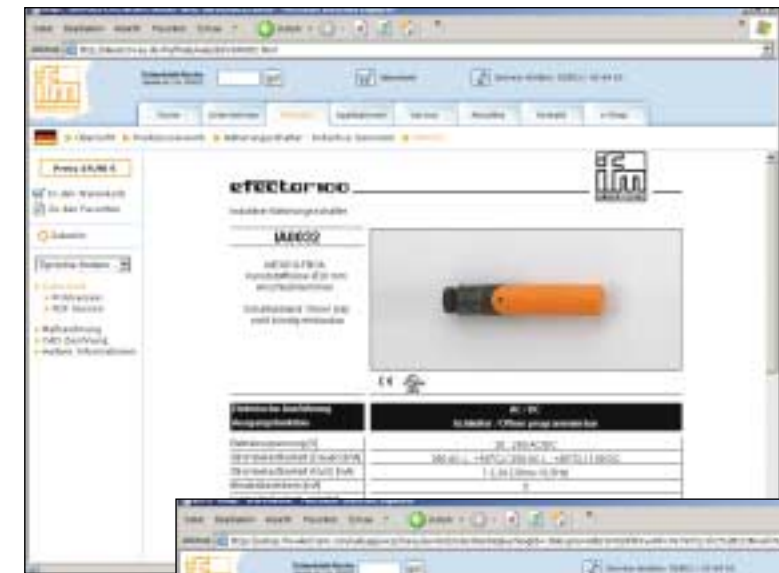
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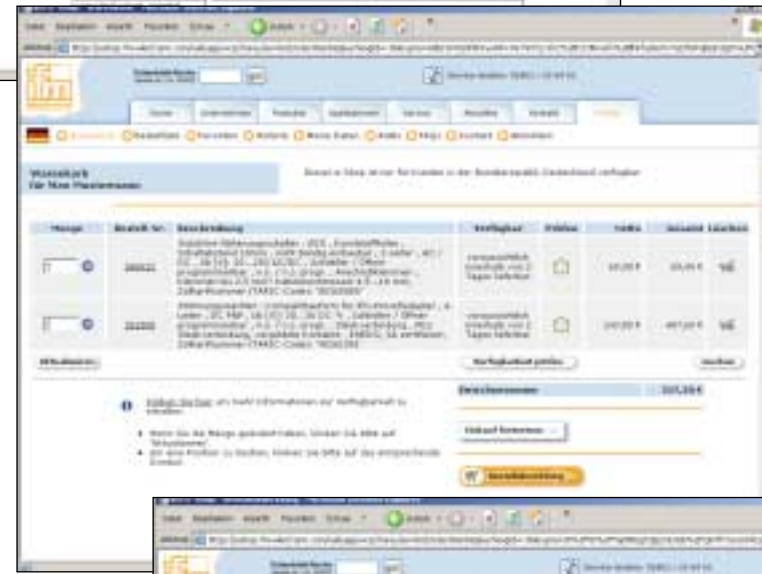
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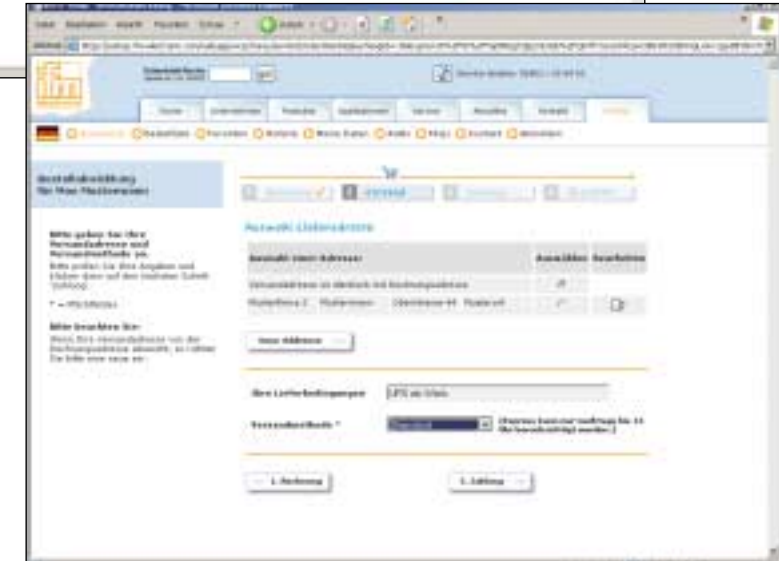
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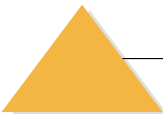
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