

Special-Sensors for Automation



ATEX Dust- 

- Air flow sensors
- Inductive sensors
- Capacitive sensors
- Level sensors



**ISO 9001
certified**

Dust -

ATEX 100a

This term indicates compliance with the 94/9/EU directive, which prescribes European-wide guidelines for handling equipment and protective systems in potentially explosive atmospheres. As of 1 July 2003, these regulations will be binding and thereby guarantee free movement of EX products in the EU. From this date on, products that were developed and manufactured in accordance with national EX standards may no longer be traded. This ends the transitional period for operators of facilities. From this date on only facilities that have been approved under ATEX may be operated. One provision, in particular, that is new is that now areas that are subject to dust exposure are included in the ATEX. Operations where dust accumulates or is processed must therefore come to terms with the new directives.

Dust as a hazardous substance

Roughly 80% of all dust that accrues during industrial manufacturing is combustible and can, if a potentially explosive dust-air mixture is present, lead to an explosion. Widely encountered combustible dusts include e.g. sawdust, grain dust, cellulose, baking flour and fish meal and materials such as laundry detergents, toner, vitamin C or metallic dust as well. Even a seemingly harmless material such as lactose can explode under the right conditions.

ATEX must be observed wherever such dusts are created as waste products during processing or are generated as an end product in relevant quantities. Only those items of equipment that have protection ratings for the prevention of sparks or high temperatures may be operated in hazardous areas. The implementation of these protection classes is defined in the EU standards.

A special risk obtains in various industrial branches:

- Potentially explosive dust-air mixtures can be produced during the fragmentizing of materials in crushers, which can cause severe damage.
- There is also a risk of explosion in bucket conveyor plants when dust is transported. Whether sawdust, flour, coal or metallic dust is the load - all sensors set up in the hazard zone, perhaps for monitoring off-track running or for counting the buckets, must carry an ATEX approval.
- ATEX must be adhered to in wood processing operations as well: dust deposition at wood cutting saws, for which a speed of 20 m/s must be ensured, may only be safety monitored with Ex-approved sensors.
- Vacuum conveying facilities in grain elevators in the food processing industry or other sectors are required to have ATEX-compliant equipment.
- Agitators and mixers in the food processing industry, for the manufacture of pharmaceutical products or in the chemical industry and pelleting presses laden with dust are also affected.

Zone classification in the Ex dust area

Facilities in which combustible dusts can be generated are divided into three zones.

These zones establish the differences in the periods of occurrence of a cloud of combustible dust in the air during normal operations.

- Zone 20 EX atmosphere present frequently or constantly or long-term
- Zone 21 EX atmosphere occasionally present
- Zone 22 EX atmosphere present very seldom and then only for a short period.

The operator is responsible for zoning for which he can receive support from institutions such as the TÜV or the factory inspectorate.

Example of zoning for a silo facility

When storing grain as well as during the loading and unloading of transport vehicles for these products, it is possible for potentially explosive dust-air mixtures to be produced. Zoning allocations must be undertaken for the selection of the approved monitoring devices. A potentially explosive atmosphere is constantly present on the inside of silos filled with grain (zone 20). Outside of the silo and in the loading duct this condition occurs only occasionally, e.g. during filling and empty (zone 21). Zone 21 is enclosed by Zone 22, in which hazardous dust-air mixtures can be found only during breakdowns, which in this case is estimated to be very seldom.

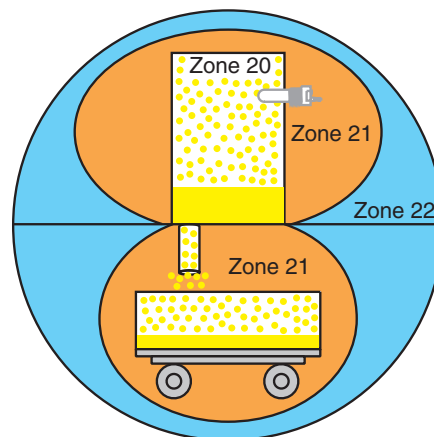




Diagram of a possible zoning allocation for a grain operation

Dust -

Product identification

ATEX 100a prescribes a uniform identification of the equipment approved for use in potentially explosive areas. For dust Ex this consists of:

- the EX mark 
- the equipment group: II (all areas except mining)
- the equipment category: 1D = use in zones 20, 21, 22
2D = use in zones 21, 22
3D = use in zone 22
- the maximum surface temperature: Txxx°C
- the name of the examination authority
- the number of the examination certificate

Example:  II 1D T 100 °C
designates a piece of equipment belonging to equipment group II, which can be used for dust in zones 20, 21 and 22 and which even in the case of a breakdown does not become hotter than 100 °C.

Terms

Maximum surface temperature

This is the maximum temperature that can be reached on the surface of a sensor if it is operated under installation conditions within the specifications prescribed in the data sheet. This value is not exceeded even if the sensor is defective. The maximum surface temperature is a criterion for the application of a sensor, since various maximum values may not be exceeded according to the type of dust. A distinction must be made between a dust cloud and accumulated dust.

Dust cloud

The term dust cloud describes dust particles that along with air form a potentially explosive mixture. Each dust cloud has a specific ignition temperature - that of sulfur amounts to 240 °C, for example. A piece of equipment that is to be used in this environment may reach a maximum surface temperature of 2/3 of the ignition temperature. In the case of sulfur dust this therefore yields a maximum approved surface temperature of 160 °C.

Dust deposits

Dust layers can ignite on hot surfaces. This can result in a dust explosion if the ignited dust is stirred up. Each type of dust has its specific glow temperature, which depends on the thickness of the layer. For a 5-mm thick layer of sulfur this temperature is 250 °C. If a sensor is supposed to be used in an area in which deposits can occur, the surface temperature may reach a maximum of the glow temperature minus 75K. For sulfur this would mean 175 °C would be permitted.

Selection of the sensor

The selection of a sensor that is suitable for an EX area that is exposed to dust cannot be made until after the zoning allocation carried out by the operator. In addition, the type of dust and the ambient temperature must be taken into consideration. Both the area of deployment and the maximum surface temperature of the sensor are considered as criteria to the same extent. If dust layers can also

occur in addition to dust clouds in an application, the lower of the two relevant limiting temperatures are used as the maximum value for the selection of the sensor. In the case of sulfur the maximum approved surface temperature of the sensor comes to 160 °C.

Sensors under ATEX for Ex dust

Airflow sensors STS 21..

The airflow sensors in series STS 21.. are conceived for use in extraction systems and conveyor systems. They belong to equipment category 1D and are therefore approved for use in zone 20, the most demanding. Technical data page 9.04

Zone 20 compact sensors

Sensors of the series IGEX20/ IDEX20 are certified for use in dust-explosion hazardous areas (Zone 20). They can be operated directly on a standard 24 V power supply without the need for an additional switching device. They are provided with a PNP switching output. The series IGEX20/ IDEX20 is highly suitable for retrofitting existing systems. Technical data page 9.08 and page 9.14

Inductive sensors IGEX and IDEX

Sensors for detecting metals in the Ex area zone 20 or zone 22. Devices can be delivered in the standard configurations M12, M18 and M30. For large switching distances there are configurations with diameters of 80 mm to 160 mm. Technical data page 9.09 - 9.13 and page 9.15 - 9.16

Capacitive sensors KGEX and KDEX

Sensors for almost all materials in the Ex area zone 20 or zone 22 can be delivered as proximity switches up to 80 mm diameter or as used as level monitor with G1 thread. Technical data page 9.17 - 9.20

Amplifier SS 400..

The amplifiers for flow sensors are installed directly in zone 21 and can be adjusted and read on site. Technical data page 9.21, 9.22

Amplifier SZA..

Amplifiers for flow sensors in series SZA are intended for installation on a mounting rail. The devices can be delivered as switches with adjustable limiting values or as an analog device with 4..20 mA output as a trend display. Technical data page 9.23

Amplifier EGE 90..

The amplifiers EGE 90.. instruments for inductive and capacitive sensors are intended for rail mounting installation. Technical data page 9.24

Amplifier IKM 122..

The space-saving amplifiers IKM 122.. are suited for the connection of 2- lead intrinsically safe inductive Sensors. Technical data page 9.25

Housing for screw terminals GK..

These terminal boxes make it possible to set up terminal clamping points in intrinsically safe and in not intrinsically safe electric circuits within zone 21. The boxes are manufactured with type "e" (increased safety) or type "i" (intrinsic safety) protection. Technical data page 9.26

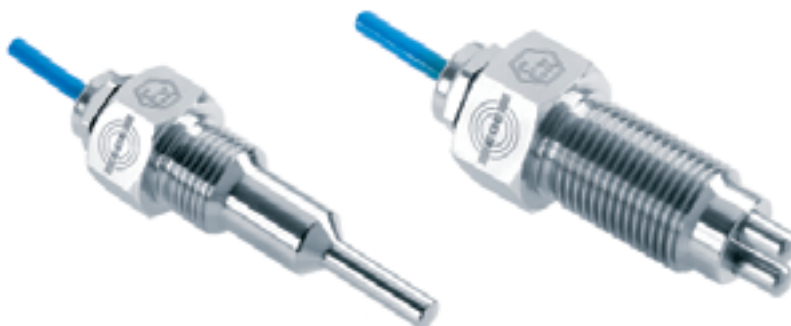
Dust / Gas - Ex Intrinsically safe • Zone 0/20

Series STS - Air flow probe

Category 1

Dust Ex Zone 20

Gas Ex Zone 0



Design	STS 212		STS 215	
Dimensions				
Detection range [m/s]	2...25			
ID-No.	fixed cable P11152	plug P11206	fixed cable P11153	plug P11207
Type	STS 212 K	STS 212 S	STS 215 K	STS 215 S
Medium temperature [°C]	-20...+60			
Ex marking	Dust: II 1D Ex ia IIIC T137 °C Da IP 67 Gas: II 1G Ex ia IIC T4 Ga		Dust: II 1D Ex ia IIIC T100 °C Da IP 67 Gas: II 1G Ex ia IIC T6 Ga	
Certificate No.	TÜV 02 ATEX 1816X			
Ambient temperatures for temperature classes	T4: 45 °C T3: 60 °C		T6: 35 °C T5: 45 °C T4: 60 °C T3: 60 °C	
Maximum values	Ci = negligibly small Li = negligibly small Ii = 200 mA Ui = 13.65 V Pi = 690 mW			
Only for the connection to certified intrinsically safe circuits with the following maximum values:				
Sensor material	AISI 316 Ti • different materials on request			
Protection [EN 60529]	IP 67			
Connection	2 m PUR-cable 4x0.25 mm ² / M12 connector			
Note	for the connection to amplifiers SS..., SZA..., page 9.21 - 9.23			

Dust - Compact model • Zone 22

Series LG - Air flow controller

Dust Zone 22

DC 24 V

PNP output

Analog output

Detection range 0,5...15 m/s



Design	M18x1	
Dimensions		
Detection range [m/s]	0,5...15	
Output	PNP	4...20 mA
ID- No.	P11311	P11312
Type	LG 518 GSP-EX22 *	LG 518 GA-EX22 *
Ex marking	II 3D Ex mc IIIC T120 °C Dc IP 65	II 3D Ex mc IIIC T120 °C Dc IP 65
Supply voltage [V]	24 DC ±20%	24 DC ±20%
Switching current [mA]	200	-
Load R _L [Ω]	-	200...500
Current consumption [mA]	70	
Ambient temperature [°C]	-20...+70	
Temperature gradient [K/min]	200	
Start-up time [s]	20...40	
Reaction time typ. [s]	2	3
Housing material	PBT / Br-Ni	PBT / Br-Ni
Display flow	LED	
Protection [EN 60529]	IP 67	
Connection	2 m PVC-cable 3x0.5 mm ²	
* US LISTED		
Accessories	flange Ø20 (Z01106)	

Dust - Compact model • Zone 22

Series LNZ - Air flow controller

Dust Zone 22

AC 230 V • AC 115 V

DC 24 V

Relay output

Analog output

Detection range 0.5...30 m/s



Design	G1/2		G1/2	
Dimensions				
Detection range [m/s]	0.5...30		0.5...30	0.5...30
Output				
ID-No.	P11303	P11304	P11305	P11306 *
Type	LNZ 450 WR1-EX22	LNZ 450 WR2-EX22	LNZ 450 GR-EX22	LNZ 450 GA-EX22
Ex marking	II 3D Ex mc IIIC T90 °C Dc IP 65		II 3D Ex mc IIIC T90 °C Dc IP 65	
Supply voltage [V]	115 AC ±15%	230 AC ±15%	24 DC ±20%	24 DC ±15%
Current consumption [mA]	60	30	80	80
Current output [mA]	-		-	4...20
Load R _L [Ω]	-		-	200...500
Switching voltage [V]	250 AC / 60 DC		250 AC / 60 DC	
Switching current [A]	4 AC / 4 DC		4 AC / 4 DC	
Switching power max.	1000 VA / 60 W		1000 VA / 60 W	
Ambient temperature [°C]	-20...+70		-20...+70	
Medium temperature [°C]	-20...+80		-20...+80	
Temperature gradient [K/min]	20		20	
Start-up time typ. [s]	10...90		10...90	
Reaction time typ. [s]	2...30		2...30	
Compressive strength [bar]	30		30	
Material	Housing: PBT Sensor 1.4305		Housing: PBT Sensor 1.4305	
Display flow	LED-array		LED-array	
Protection [EN 60529]	IP 67		IP 67	
Connection	2 m PVC-cable 5x0.5 mm ²		2 m PVC-cable 5x0.5 mm ²	2 m PVC-cable 3x0.5 mm ²
* US LISTED				

Dust - Compact model • Zone 22

Series LN - Air flow controller

Dust  Zone 22

AC 230 V • AC 115 V

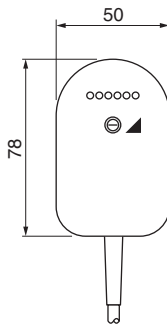
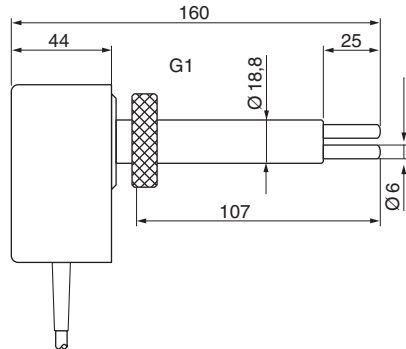

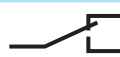


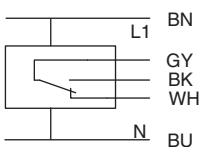
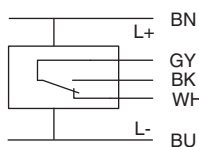
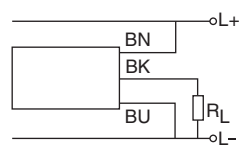
DC 24 V

Relay output

Analog output

Detection range 0.5...30 m/s



Design	G1		G1	
Dimensions				
Detection range [m/s]	0.5...30		0.5...30	0.5...30
Output				
ID-No.	P11307		P11308	P11309
Type	LN 450 WR1-EX22		LN 450 WR2-EX22	LN 450 GR-EX22
Ex marking	II 3D Ex mc IIIC T90 °C Dc IP 65		II 3D Ex mc IIIC T90 °C Dc IP 65	
Supply voltage [V]	115 AC ±15%		230 AC ±15%	24 DC ±20%
Current consumption [mA]	60		30	80
Current output [mA]	-		-	4...20
Load R _L [Ω]	-		-	200...500
Switching voltage [V]	250 AC / 60 DC		250 AC / 60 DC	
Switching current [A]	4 AC / 4 DC		4 AC / 4 DC	
Switching power max.	1000 VA / 60 W		1000 VA / 60 W	
Ambient temperature [°C]	-20...+70		-20...+70	
Medium temperature [°C]	-20...+80		-20...+80	
Temperature gradient [K/min]	20		20	
Start-up time typ. [s]	10...90		10...90	
Reaction time typ. [s]	2...30		2...30	
Compressive strength [bar]	3		3	
Material	Housing: PBT Sensor 1.4305 / Delrin		Housing: PBT Sensor 1.4305 / Delrin	
Display flow	LED-array		LED-array	
Protection [EN 60529]	IP 67		IP 67	
Connection	2 m PVC-cable 5x0.5 mm ²		2 m PVC-cable 5x0.5 mm ²	2 m PVC-cable 3x0.5 mm ²
*  US LISTED				

Dust - Ex Compact model • Zone 20

Series IGEX20 - Proximity switches

Category 1

Dust Ex Zone 20

Direct connection to DC 24 V
PNP switching output



Design	DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions				
Installation flush (f) non flush (nf)				
Operating distance [mm]	5 f	8 nf	10 f	15 nf
Switching output PNP				
ID-No.	P31178	P31179	P31180	P31181
Type	IGEX20 05 GSP	IGEX20 08 GSP	IGEX20 10 GSP	IGEX20 15 GSP
Ex marking	II 1D Ex ma IIIC T 80 °C Da IP 67			
Certificate No.	TÜV 05 ATEX 2845 X			
Supply voltage [V]	10...30 DC			
Switching current [mA]	100			
Short circuit proof	•			
Reverse protection	•			
Voltage drop max. [V]	2			
Residual current [mA]	-			
Current consumption [mA]	7			
Switching frequency [Hz]	200			
Ambient temperature [°C]	-20...+70			
EMC-class	A			
Protection [EN 60529]	IP 67			
LED display	•			
Housing material	Br-Ni / PA			
Connection	2 m PVC-cable 3x0.5 mm ²			
Accessories	housing for screw terminals series GK..., page 9.26			

Series IGEX - Proximity switches

Category 1

Dust Ex Zone 20

Gas Ex Zone 0

NAMUR (EN 60947-5-6)



Design	M12x1		M18x1		M30x1.5	
Dimensions						
Installation flush (f) non flush (nf)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
ID-No.	P31196	P31197	P31198	P31199	P31200	P31201
Type	IGEXU 02	IGEXU 04	IGEXU 05	IGEXU 08	IGEXU 10	IGEXU 15
Ambient temperature [°C]	-25...+60 (Zone 0) -25...+75 (Zone 1 / 2 / 20 / 22)					
Ex marking	Ex-Sensors for higher ambient temperatures on request Dust: II 1D Ex ia IIC T100°C Da IP 67 / Gas: II 1G Ex ia IIC T6 Ga					
Certificate No.	TÜV 03 ATEX 2036					
Ambient temperatures for temperature classes [°C]	T6 : 75 T5 : 90					
Maximum values	Ci = 22.0 nF Li = 3.0 mH Ii = 15.9 mA Ui = 12.6 V Pi = 50.0 mW					
Only for the connection to certified intrinsically safe circuits with the following maximum values						
Housing material	Br-Ni / PA					
Protection [EN 60529]	IP 67					
Connection	M12 connector					
For the connection to amplifiers EGE 90 Ex1... or IKM 122 Ex...	<p>explosionsgefährdeter Bereich hazardous area</p> <p>nicht explosionsgefährdeter Bereich non hazardous area</p>					
Accessories	connecting cable SLG 3-2 (Z01076), plug-lock type PL-M12 (Z01182)					

Series IGEX - Proximity switches

Category 1

Dust Ex Zone 20

Gas Ex Zone 0

NAMUR (EN 60947-5-6)



Design	M12x1		M18x1		M30x1.5	
Dimensions						
Installation flush (f) non flush (nf)	f, nf		f, nf		f, nf	
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
ID-NO.	P31151	P31152	P31153	P31154	P31155	P31156
Type	IGEX 02	IGEX 04	IGEX 05	IGEX 08	IGEX 10	IGEX 15
Ambient temperature [°C]	-25...+60 (Zone 0) -25...+75 (Zone 1 / 2 / 20 / 22) Ex-sensors for higher ambient temperatures on request					
Ex marking	Dust: II 1D Ex ia IIIC T 100 °C Da IP 67 / Gas: II 1G Ex ia IIC T6 Ga					
Certificate No.	TÜV 03 ATEX 2036					
Ambient temperatures for temperature classes [°C]	T6 : 75 T5 : 90					
Maximum values	Ci = 22.0 nF Li = 3.0 mH Ii = 15.9 mA Ui = 12.6 V Pi = 50.0 mW					
Only for the connection to certified intrinsically safe circuits with the following maximum values:						
Housing material	Br-Ni / PA					
Protection [EN 60529]	IP 67					
Connection	2 m PVC-cable 2x0.5 mm ²					
For the connection to amplifiers EGE 90 Ex1... or IKM 122 Ex...						

Dust - Compact model • Zone 22

Series IGEX22 - Proximity switches

Category 3

Dust Zone 22

DC 24 V

PNP switching output



Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions						
Installation flush (f) non flush (nf)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
Switching output PNP						
ID-No.	P31187	P31188	P31189	P31190	P31191	P31192
Type	IGEX22 02 GSPU	IGEX22 04 GSPU	IGEX22 05 GSPU	IGEX22 08 GSPU	IGEX22 10 GSPU	IGEX22 15 GSPU
Ex marking	II 3D Ex mc IIIC T 80 °C Dc IP 67 X					
Supply voltage [V]	10...30 DC					
Switching current [mA]	200					
Short circuit proof	•					
Overcurrent release [mA]	250					
Reverse protection	•					
Voltage drop max. [V]	2					
Residual current [mA]	-					
Current consumption [mA]	7					
Switching frequency [Hz]	500					
Ambient temperature [°C]	-25...+70					
EMC-class	A					
Protection [EN 60529]	IP 67					
LED display	•					
Housing material	Br-Ni / PBT					
Connection	M12 connector					
Note: Do not use in the presence of conductive dusts						
Accessories	connection cable SLG 3-2 (Z01076), plug-lock type PL-M12 (Z01182)					

Dust - Ex Compact model • Zone 22

Series IGEX22 - Proximity switches

Category 3
Dust Ex Zone 22

DC 24 V
PNP switching output



Design	DC PNP • M12x1		DC PNP • M18x1		DC PNP • M30x1.5	
Dimensions						
Installation flush (f) non flush (nf)						
Operating distance [mm]	2 f	4 nf	5 f	8 nf	10 f	15 nf
Output PNP						
ID-No.	P31165	P31166	P31167	P31168	P31169	P31170
Type	IGEX22 02 GSP	IGEX22 04 GSP	IGEX22 05 GSP	IGEX22 08 GSP	IGEX22 10 GSP	IGEX22 15 GSP
Ex marking	II 3D Ex mc IIIC T 80°C Dc IP 67 X					
Supply voltage [V]	10...30 DC					
Switching current [mA]	200					
Short circuit proof	•					
Overcurrent release [mA]	250					
Reverse protection	•					
Voltage drop max. [V]	2					
Residual current [mA]	-					
Current consumption [mA]	7					
Switching frequency [Hz]	500					
Ambient temperature [°C]	-25...+70					
EMC-class	A					
Protection [EN 60529]	IP 67					
LED display	•					
Housing material	Br-Ni / PBT					
Connection	2 m PVC-cable 3x0.34 mm ²					
Note: Do not use in the presence of conductive dusts						

Dust - Compact model • Zone 22

Series IGVE22 - Proximity switches

Stainless steel

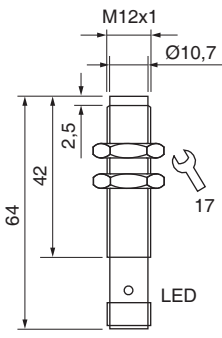
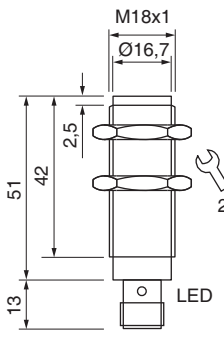
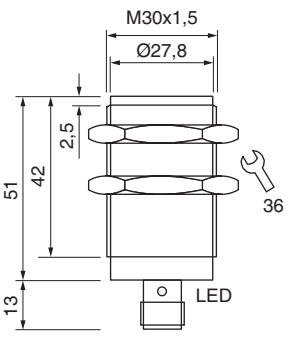



Category 3

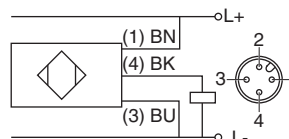
Dust  Zone 22

DC 24 V

PNP switching output



Design	DC PNP • M12x1	DC PNP • M18x1	DC PNP • M30x1,5
Dimensions			
Operating distance [mm]	2	5	10
Switching output PNP			
ID-No.	P31285	P31286	P31287
Type	IGVE22 02 GSPU	IGVE22 05 GSPU	IGVE22 10 GSPU
Ex marking	II 3D Ex mc IIIC T 95 °C Dc IP 67 X		
Supply voltage [V]	10...30 DC		
Switching current [mA]	200		
Short circuit proof	•		
Reverse protection	•		
Voltage drop max. [V]	1,5		
Current consumption [mA]	12		
Switching frequency [Hz]	180		
Ambient temperature [°C]	-25...+70		
EMC class	A		
Protection [EN 60529]	IP 67		
LED display	•		
Housing material	AISI 316 L		
Connection	M12 connector		



Accessories connection cable SLG 3-2 (Z01076), plug-lock type PL-M12 (Z01182)

Dust - Compact model • Zone 20

Series IDEX20 - Proximity switches

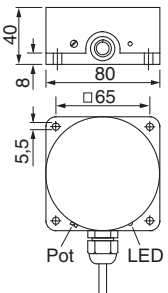
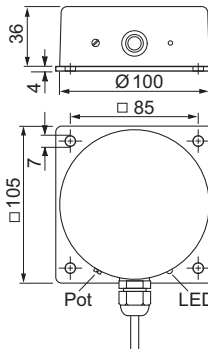
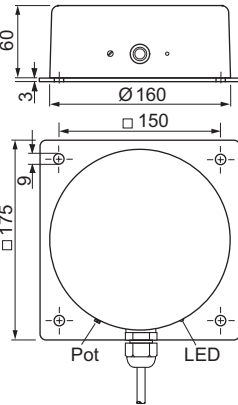
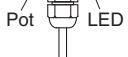
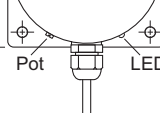
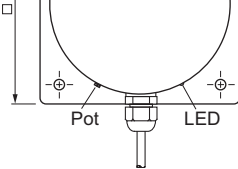



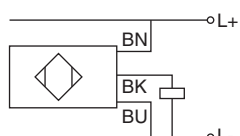
Category 1

Dust Zone 20

DC 24 V

PNP switching output



Design	DC PNP • Ø80 mm	DC PNP • Ø100 mm	DC PNP • Ø160 mm
Dimensions			
Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	55 nf (10...80)	70 nf (10...110)	120 nf (20...150)
Switching output PNP			
ID-No.	P31182	P31183	P31184
Type	IDEX20 080 GSP	IDEX20 100 GSP	IDEX20 160 GSP
Ex marking	II 1D Ex ma IIIC T 80 °C Da IP 67		
Certificate No.	TÜV 05 ATEX 2845 X		
Supply voltage [V]	10...30 DC		
Switching current [mA]	100		
Short circuit proof	•		
Reverse protection	•		
Voltage drop max. [V]	2		
Residual current [mA]	-		
Current consumption [mA]	7		
Switching frequency [Hz]	20		
Ambient temperature [°C]	-25...+70		
EMC-class	A		
Protection [EN 60529]	IP 67		
LED display	•		
Housing material	PA	PA / Aluminium	PA / Aluminium
Connection	2 m PVC-cable 3x0.5 mm ²		
			
Accessories	housing for screw terminals series GK..., page 9.26		

Series IDEX - Proximity switches

Category 1

Dust Ex Zone 20

Gas Ex Zone 0



Design	Ø 80 mm	Ø 100 mm	Ø 160 mm
Dimensions			
Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	55 nf (10...70)	70 nf (10...100)	120 nf (20...150)
ID-No.	P31157	P31158	P31159
Type	IDEX 080	IDEX 100	IDEX 160
Ambient temperature [°C]	-25...+75		
Ex marking	Ex-Sensors for higher ambient temperatures on request		
Certificate No.	Dust: II 1D Ex ia IIIC T100 °C Da IP 67 / Gas: II 1G Ex ia IIC T6 Ga TÜV 03 ATEX 2037		
Ambient temperatures for temperature classes [°C]	T6 : 75 T5 : 90		
Maximum values	Ci = 120 nF Li = negligibly small Ii = 80 mA Ui = 12.6 V Pi = 252 mW		
Only for the connection to certified intrinsically safe circuits with the following maximum values:			
Housing material	PA / Aluminium		
Protection [EN 60529]	IP 67		
Connection	2 m PVC-cable 3x0.5 mm ²		
For the connection to amplifiers EGE 903 Ex...			

Dust - Compact model • Zone 22

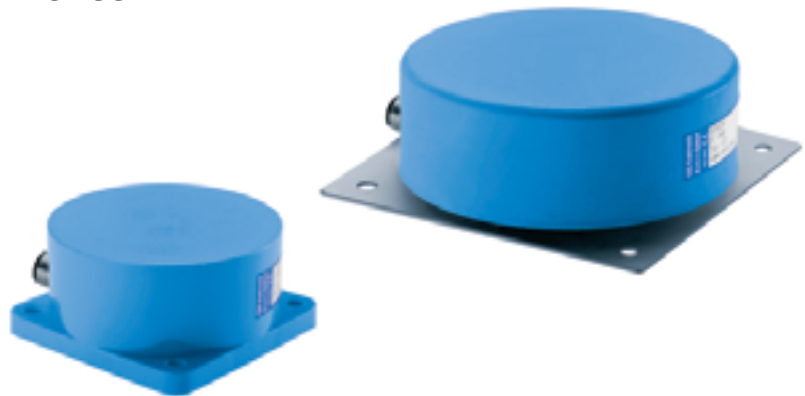
Series IDEX22 - Proximity switches

Category 3

Dust Zone 22

DC 24 V

PNP switching output



Design	DC PNP • Ø80 mm	DC PNP • Ø105 mm	DC PNP • Ø160 mm
Dimensions			
Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	55 nf (10...80)	100 nf (10...110)	120 nf (20...150)
Switching output PNP			
ID-No.	P31329	P31330	P31331
Type	IDEX22 080 GSPU	IDEX22 105 GSPU	IDEX22 160 GSPU
Ex marking	II 3D Ex mc IIIC T 80 °C Dc IP 67 X		
Supply voltage [V]	10...30 DC		
Switching current [mA]	200		
Short circuit proof	•		
Overcurrent release [mA]	450		
Reverse protection	•		
Voltage drop max. [V]	2		
Residual current [mA]	-		
Current consumption [mA]	7		
Switching frequency [Hz]	20		
Ambient temperature [°C]	-20...+70		
EMC-class	A		
Protection [EN 60529]	IP 67		
LED display	•		
Housing material	PBT	PBT	PBT / Aluminium
Connection	M12 connector	M12 connector	M12 connector
Note: Do not use in the presence of conductive dusts			

Dust - Ex Intrinsically safe • Zone 20

Series KGEX - Level controller

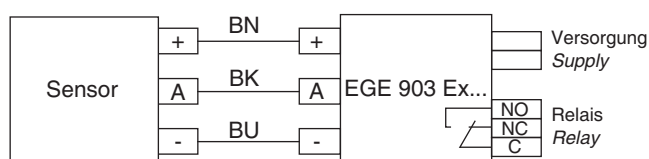
Category 1
Dust Ex Zone 20

Proximity sensors
Level sensors



Design	M18x1	M30x1.5	G1	G3/4
Dimensions				
Installation flush (f) non flush (nf)				
Nominal sensitivity [mm]	8 nf	10 nf	-10	-5
ID-No.	P21157	P21158	P21159	P21160
Type	KGEX 018	KGEX 030	KGEX 100	KGEX 107
Ambient temperature [°C]	-25...+75			
Ex marking	II 1D Ex ia IIIC T 95 °C Da IP 67			
Certificate No.	TÜV 03 ATEX 2046			
Maximum values	Ci = negligibly small Li = negligibly small Ii = 80 mA Ui = 12.6 V Pi = 252 mW			
Only for the connection to certified intrinsically safe circuits with the following maximum values:				
Housing material	PVDF	PTFE	PTFE	PTFE/AISI 316 Ti FPM
Protection [EN 60529]	IP 67			
Connection	2 m PVC-cable 3x0.5 mm ²			

For the connection to amplifiers EGE 903 Ex...



Note fixing nuts are part of delivery

Dust - Ex Compact model • Zone 22

Series KGEX - Level controller

Category 3
Dust Ex Zone 22

DC 24 V
PNP switching output

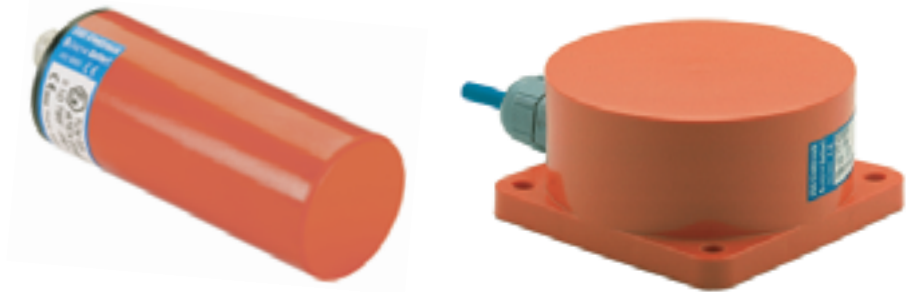


Design	M18x1	M30x1.5	DC PNP • G1	DC PNP • G3/4
Dimensions				
Installation flush (f) non flush (nf)				
Switching point sp [mm] (Adjustable range) Switching output	5 f (1...7) 	10 f (3...15) 	-6 	-3
ID-No.	P21170	P21171	P21172	P21173
Type	KGEX 018 GSP	KGEX 030 GSP	KGEX 100 GSP	KGEX 107 GSP
Ex marking	II 3D Ex mc IIIC T 80 °C Dc IP 67			
Supply voltage	10...55 DC			
Switching current [mA]	300			
Short circuit proof	•			
Overcurrent release [mA]	800			
Reverse protection	•			
Voltage drop max. [V]	1.5			
Current consumption [mA]	4			
Switching frequency [Hz]	25	25	10	10
Ambient temperature [°C]	-25...+70			
EMC-class	A			
LED display	•			
Housing material	Br-Ni / PPO	Br-Ni / PPO	PTFE	PTFE / AISI 316 Ti FPM
Protection [EN 60529]	IP 67			
Connection	2 m PVC-cable 3x0.5 mm ²			
Note: Do not use in the presence of conductive dusts				
Note	fixing nuts are part of delivery			

Dust - Intrinsically safe • Zone 20

Series KDEX - proximity switches

Category 1 Dust Zone 20



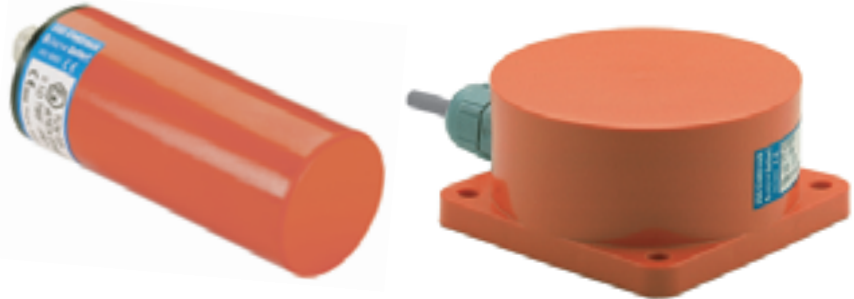
Design	Ø20 mm	Ø34 mm	Ø80 mm
Dimensions Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	10 nf (1...15)	20 nf (1...30)	55 nf (10...70)
ID-No.	P41313	P41314	P41311
Type	KDEX 020	KDEX 034	KDEX 080
Ambient temperature [°C]	-25...+75		
Ex marking	II 1D Ex ia IIIC T95°C Da IP67		
Certificate No.	TÜV 03 ATEX 2046		
Maximum values	Ci = negligibly small Li = negligibly small Ii = 80 mA Ui = 12.6 V Pi = 252 mW		
Only for the connection to certified intrinsically safe circuits with the following maximum values:			
Housing material	PBT		
Protection [EN 60529]	IP 67		
Connection	M12 connector		2 m PVC-cable 3x0.5 mm ²
For the connection to amplifiers EGE 903 Ex...			
	1: BN 2: - 3: BU 4: BK		

Dust - Ex Compact model • Zone 22

Series KDEX - proximity switches

Category 3
Dust Ex Zone 22

DC 24 V
PNP switching output



Design	Ø20 mm	Ø34 mm	Ø80 mm
Dimensions			
Installation non flush (nf)			
Operating distance [mm] (Adjustable range)	10 nf (1...15)	20 nf (1...30)	55 nf (1...70)
Switching output			
ID-No.	P41315	P41316	P41317
Type	KDEX 020 GSP	KDEX 034 GSP	KDEX 080 GSP
Ex marking	II 3D Ex mc IIIC T 80 °C Dc IP 67		
Supply voltage [V]	10...55 DC		
Switching current [mA]	400		
Short circuit proof	•		
Overcurrent release [mA]	800		
Reverse protection	•		
Voltage drop max. [V]	1.5		
Residual current [mA]	0.2		
Current consumption [mA]	4		
Switching frequency [Hz]	25		
Ambient temperature [°C]	-25...+70		
EMC-class	A		
Protection [EN 60529]	IP 67		
LED display	•		
Housing material	PBT		
Connection	M12 connector		2 m PVC-cable 3x0.5 mm ²
Note: Do not use in the presence of conductive dusts			
Accessories	connection cable SLG 3-2 (Z01076), plug-lock type PL-M12 (Z01182)		

- Amplifier unit • Zone 1

Series SSAE

Amplifier unit dust + Gas

For flow sensors in Zone 0/20

For air flow sensors in Zone 0/20

Adjustment and display in Zone 1/21

Installation and wiring in Zone 1/21

Protective housing with inspection glass



Design	Amplifier unit SSAE	Protective housing GAM
Dimensions		
ID-No.	P11302	Z01184
Type	SSAE 400	GAM 2030
Ex marking	Dust: II 2D Ex mb IIIC T92°C Db IP65 Gas: II (1) 2G Ex emb [ia IIC Ga] IIC T6 Gb	
Certificate No.	TÜV 04 ATEX	
Components of amplifier unit		Protective housing overview
Amplifier	Typ SS 400 Ex-24	
Technical data	data sheet dust-Ex	
Supply voltage	24 DC	
Ex marking	Dust: II (1) 2D Ex mb [ia IIIC Da] IIIC T90°C Db IP65 Gas: II (1) 2G Ex mb [ia IIC Ga] IIC T6 Gb	
Certificate No.	TÜV 04 ATEX 2554	
Connection box sensors	Type GKI 60	
Technical data	data sheet dust-Ex	
Ex marking	Dust: II 2D Ex tb IIIC T75°C Db IP65 Gas: II 2G Ex ia IIC T6 Gb	
Certificate No.	BVS 05 ATEX E022 X	
Connection box current output	Type GKE 100	
Technical data	data sheet dust-Ex	
Ex marking	Dust: II 2D Ex tb IIIC T75°C Db IP65 Gas: II 2G Ex e IIC T6 Gb	
Protection [EN 60529]	IP 65	IP 66
Housing material	aluminium	sheet steel case, lacquered
Cable diameter [mm]	4-8	4-8

Note:

The components of the amplifier unit SSAE 400 are mounted on an aluminium plate ready for connection and can be installed without a protective housing within Zone 1/21. The supply cables must be laid in increased safety. A suitable protective housing (GAM 2030 type) can be included in the delivery as an accessory. The mounting plate is designed to fit precisely.

Ex - Amplifier • Zone 1

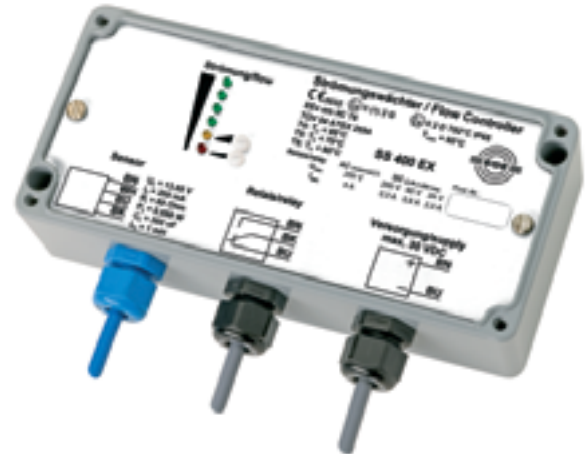
Series SS

Dust Zone 21

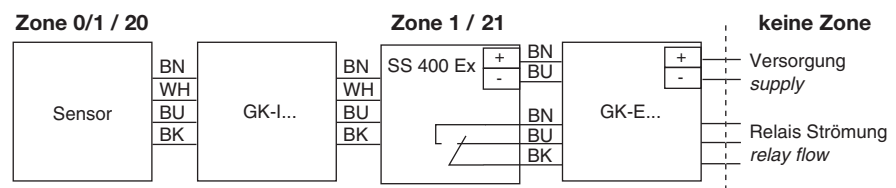
Gas 1

Installation in Zone 1/21

Adjustment in Zone 1/21



Design	SS 400 Ex				
Dimensions					
ID-No.	P11292				
Type	SS 400 Ex-24				
Supply voltage [V]	24 DC $\pm 15\%$				
Ex marking	Dust: II (1) 2D Ex mb [ja IIIC Da] IIIC T90°C Db IP65 / Gas: II (1) 2G Ex mb [ja IIC Ga] IIC T6 Gb				
Certificate No.	TÜV 04 ATEX 2554				
Ambient temperature for temperature classes [°C]	T6 : 60 T5 : 70 T4 : 85				
Maximum values	U _O = 13.65 V I _O = 200 mA P _O = 688 mW				
External capacitance C _o	IIC: 360 nF		IIB: 1300 nF		IIA: 3000 nF
External inductance L _o	IIC: 1 mH		IIB: 4.7 mH		IIA: 10 mH
Output relay	increased safety				intrinsically safe
Switching voltage [V]	250 AC	250 DC	60 DC	24 DC	Ex ib IIC 30 V
Switching current [A]	2 AC	0.3 DC	0.8 DC	2 DC	IIC: 0.1 DC IIB: 0.25 DC IIA: 0.34 DC
Switching power	cos $\varphi \geq 0.7$ / L/R ≤ 200 ms				
Ambient temperature [°C]	-20...+60				
Protection [EN 60529]	IP 65				
Connection	sensor: 2 m PUR-cable, blue, 4x0.25 mm ² relay / supply: 2 m PVC-cable, 3x0.5 mm ² , 2x0.5 mm ²				



Accessories housing for screw terminals series GK..., page 9.26

- Amplifier

Series SZA

Dust

Gas

AC 230 V • AC 115 V • DC 24 V

Relay output

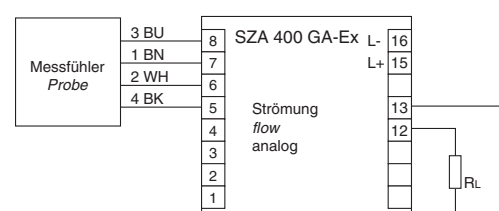
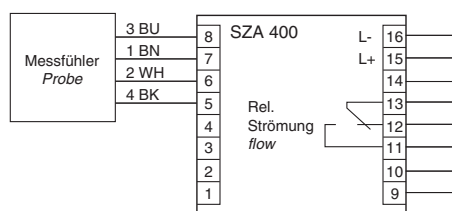
Analog output

Cable break and short circuit monitoring

Turn off delay



Design	SZA 400 Ex...			SZA 400 GA-Ex
Dimensions				
ID-No.	P10706	P10707	P10708	P11257
Type	SZA 400 Ex-230	SZA 400 Ex-115	SZA 400 Ex-24	SZA 400 GA-Ex
Output	Relay	Relay	Relay	4...20 mA
Supply voltage [V]	230 AC $\pm 10\%$	115 AC $\pm 10\%$	24 DC $\pm 15\%$	24 DC $\pm 15\%$
Ex marking	Dust: Gas:	II (1) D [Ex ia Da] IIIC II (1) G [Ex ia Ga] IIC		II (1) D [Ex ia Da] IIIC II (1) G [Ex ia Ga] IIC
Certificate No.		TÜV 96 ATEX 1097		TÜV 02 ATEX 1821
Maximum values		U _o = 12.6 V I _o = 200 mA R _i = 68.5 Ω		U _o = 13.65 V I _o = 200 mA P _o = 690 mW
External capacitance		170 nF		170 nF
External inductance		0.5 mH		0.5 mH
Turn off delay [s]		0...25		-
Output		relay / change-over		analog
Switching voltage [V]		250 AC 60 DC		-
Switching current [A]		4 AC 0,5 DC		-
Switching power		cos φ >0,7 L/R <200 ms		-
Current output [mA]		-		4...20 DC
Load resistance R _L [Ω]		-		50...500
Ambient temperature [°C]		-20...+60		
Protection [EN 60529]		terminal IP 20 / housing IP 40		
Connection		terminal screws		



Ex - Amplifiers

Series EGE 90 Ex
Series EGE 903 Ex

Dust Ex

Gas Ex

Cable break and
short circuit monitoring



Design	EGE 90 Ex1		EGE 903 Ex	
Dimensions				
ID-No.	P30340	P31035	P21141	P21143
Type	EGE 90 Ex1-230	EGE 90 Ex1-24	EGE 903 Ex-230	EGE 903 Ex-24
Supply voltage [V]	230 AC +15/-10%	24 DC \pm 15%	230 AC +15/-10%	24 DC \pm 15%
Certificate No.	TÜV 97 ATEX 1148	TÜV 97 ATEX 1148	TÜV 01 ATEX 1663	TÜV 01 ATEX 1663
Ex marking	Dust: II (1) D [Ex ia Da] IIIC / Gas: II (1) G [Ex ia Ga] IIC			
Maximum values	$U_o = 12.6 \text{ V}$ $I_o = 15.9 \text{ mA}$ $P_o = 50 \text{ mW}$ $C_o = 1.15 \mu\text{F}$ $L_o = 120 \text{ mH}$		$U_o = 12.6 \text{ V}$ $I_o = 80 \text{ mA}$ $P_o = 252 \text{ mW}$ $C_o = 270 \text{ nF}$ $L_o = 5.4 \text{ mH}$	
Output	relay / change-over			
Switching voltage max. [V]	250 AC 24 DC			
Switching current max. [A]	4 AC 4 DC			
Switching power	$\cos \varphi > 0,7$ L/R < 200 ms			
Ambient temperature [°C]	-20...+60			
Protection [EN 60529]	IP 20			
Connection	terminal screws			
Notes:	<p>The installation of the amplifiers has to be executed outside of the hazardous area</p> <p>The amplifier EGE 90 Ex1 is also suited for connection of NAMUR sensors.</p>			
	<p style="text-align: center;">EGE 90 Ex 1 Ex</p> <p style="text-align: center;">For 2-wire sensors</p>		<p style="text-align: center;">EGE 903 Ex Ex</p> <p style="text-align: center;">For 3-wire sensors</p>	

- Amplifiers

Series IKM

Dust

Gas

Cable break and short circuit monitoring

Connection to 2-lead intrinsically safe sensors

Output function programmable



Design	IKM 122 Ex-230	
Dimensions		
ID-No.	P31332	
Type	IKM 122 Ex-230	
Supply voltage [V]	230 AC $\pm 10\%$	
Certificate No.	TÜV 11 ATEX 556280	
Ex marking	II (1)G [Ex ia Ga] IIC / II (1)D [Ex ia Da] IIIC	
Maximum values	$U_o = 9.6\text{ V}$ $I_o = 12.1\text{ mA}$ $P_o = 29\text{ mW}$ $C_o = 0.83\text{ }\mu\text{F}$ $L_o = 5.00\text{ mH}$	
Output	relay / change-over	
Switching voltage max. [V]	250 AC	24 DC
Switching current max. [A]	4 AC	4 DC
Switching power	$\cos \varphi \geq 0,7$ L/R $\leq 200\text{ ms}$	
Ambient temperature [°C]	-20...+60	
Special function	cable break monitoring	
Protection [EN 60529]	terminals: IP 20 / housing: IP 40	
Connection	terminal screws	
<p>Note: The installation of the amplifier has to be executed outside of the hazardous area.</p>		

Ex-Housing Zone 1/21



for screw terminals

Series GK...

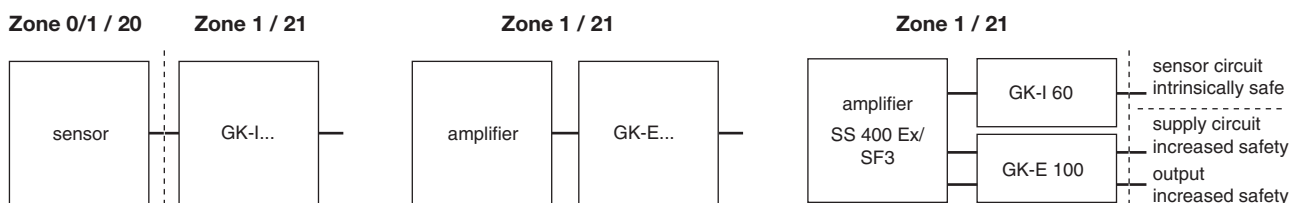
- II 2G Ex e IIC T6 Gb
- II 2G Ex ia IIC T6 Gb
- II 2G Ex e ia IIC T6 Gb
- II 2D Ex tb IIIC T75 °C Db IP65



For the connection of supply and signal lines in Zone 1/21

Design	GK...				
Dimensions					
ID-No.	Z01168	Z01169	Z01170	Z01171	Z01172
Type	GK-E 60	GK-E 100	GK-I 60	GK-I 100	GK-EI 100
Amount of terminals	4	8	4	8	4 Ex e + 4 Ex ia
Dimensions [mm]	58x64	98x64	58x64	98x64	98x64
Electric circuits	increased safety		intrinsically safe		intrinsically safe + increased safety
Ex marking	Dust: II 2D Ex tb IIIC T75 °C Db IP65	Gas: II 2G Ex e IIC T6 Gb	II 2D Ex tb IIIC T75 °C Db IP65 II 2G Ex ia IIC T6 Gb		II 2D Ex tb IIIC T75 °C Db IP65 II 2G Ex e ia IIC T6 Gb
Certificate No.	BVS 05 ATEX E 022 X				
Ambient temperature [°C]	-20...+70				
für temperature classes [°C]	T4, T5, T6 : 70				
Rated voltage [V]	275				
Rated current [A]	2				
Cross section wires	single wire multistrand		0.5...2.5 mm ² 0.5...1.5 mm ²		
Cable diameter [mm]	4...8				
Housing material	aluminium				
Protection [EN 60529]	IP 65				
Connection	terminal space				

The housing for screw terminals type GK... is designed for the connection of intrinsically safe and/or non-intrinsically safe circuits in explosion-hazardous areas of category 2 (Zone 1 and 21).



CERTIFICATE 

**Management system as per
DIN EN ISO 9001 : 2008**

In accordance with TÜV NORD CERT procedures, it is hereby certified that

 **EGE-Elektronik Spezial-Sensoren GmbH**
Ravensberg 34
24214 Gettorf
Germany

applies a management system in line with the above standard for the following scope

Design, production and sales of sensors for flow, level, temperature, pressure, proximity switches, infrared detectors and custom designed special sensors.

Certificate Registration No. SE 100 869771 Valid until 2015-05-09
Audit Report No. 3503 7819 Initial certification 1996-03-21


Certification Body
at TÜV NORD CERT GmbH Essen, 2010-12-07

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification subject to regular surveillance audits.

TÜV NORD CERT GmbH Langemannstrasse 30 45141 Essen


TUV 20 47 00-00

Translation
Production Quality Assessment
Notification



(1) **Equipment and protective systems intended for use in potentially explosive atmospheres, Directive 94/9/EC**

(2) **Notification Number: TÜV 96 ATEX 1096 Q**

(3) **Product category:**
Sensors for flow, level, temperature, pressure, proximity sensors, infrared detectors, sensors for special applications

Protective principle:
Intrinsic safety
Increased safety
Encapsulation
Protection by enclosures

(4) **Applicant:** EGE-Elektronik Spezial-Sensoren GmbH
Ravensberg 34
24214 Gettorf
Germany

(5) **Manufacturer:** s. Applicant **Manufacturing location:** s. Applicant

Order number: 800378496
Date of issue: 2011-03-23
First certification: 1996-07-02

(6) The TÜV NORD CERT GmbH notified body No. 0044 in accordance with Article 9 of the Council Directive 94/9/EC of March 23, 1994, notifies the applicant that the manufacturer has a production quality system which complies with Annex IV of the Directive.

(7) This notification is based on audit report No. 35037819 issued 2010-03-12. This notification can be withdrawn if the manufacturer no longer satisfies to the requirements of Annex IV. Results of periodical production quality reassessments are a part of this notification.

(8) In accordance with Article 10 (1) of the Directive 94/9/EC the CE marking shall be followed by the identification number 0044 of the notified body TÜV NORD CERT GmbH.
The EC-Type Examination Certificates based on this notification are listed by the notified body.

TÜV NORD CERT GmbH, Langemannstrasse 30, 45141 Essen, accredited by the central office of the countries for safety engineering (ZUS), Markt Nr. 0044, legal successor of the TÜV NORD CERT GmbH & Co. KG Ident. Nr. 0032

The head of the certification body


Schwab

Harver office, Am TÜV 1, 30519 Harver, Fax +49 (0)511 986 1455, Fax +49 (0)511 986 1080

This certification may only be reproduced without any change.
Examples or changes shall be allowed by the TÜV NORD CERT GmbH

PT 1.7-427-09-09

Seite 1/1



Headquarters
EGE-Elektronik
Spezial-Sensoren GmbH

Ravensberg 34
D-24214 Gettorf
Tel. +49 (0) 4346 / 41580
Fax +49 (0) 4346 / 5658

Internet: www.ege-elektronik.com



EGE-Elektronik ApS
Forstallé 79
DK-6200 Aabenraa
Tel. +45 70207271
Fax +45 70207272



EGE-Specialsensorer AB
Box 137
S-51223 Svenljunga
Tel. +46 32512060
Fax +46 32512064



Stork AS
Brynsveien 100
N-1352 Kolsås
Tel. +47 67176400
Fax +47 67176401



Vision Systems OY
PL353
FI-40101 Jyväskylä
Tel. +358 (0)10 322 7100
Fax +358 (0)10 322 7119



Molex France
18 Parc Burospace
F-91571 Bièvres Cedex
Tel. +33 2 32 96 04 28
Fax +33 2 32 96 04 21



Cematic-Electric B.V.
Postbus 777
NL-7550 AT Hengelo
Tel. +31 742433422
Fax +31 742913333



ICM Ital Control Meters Srl
Via della Valle 67
I-20048 Carate Brianza (Mi)
Tel. +39 0362 8052 00
Fax +39 0362 8052 01



Bibus Spain, S. L.
Rúa do Arroncal, Vial C – Nave 4A
ES-36350 Nigran
Tel. +34 986 247286
Fax +34 986 209247



Powelectrics Limited
Sandy Hill Park, Sandy Way
Amington, Tamworth
GB-Staffordshire B77 4DU
Tel. +44 1827310666
Fax +44 1827310999



Bachofen AG
Ackerstraße 42
CH-8610 Uster
Tel. +41 449441111
Fax +41 449441233



VWR International GmbH
Graumannsgasse 7
A-1150 Wien
Tel. +43 1 97 002 - 0
Fax +43 1 97 002 - 600



Countapulse Controls (PTY) LTD.
P.O.B. 40393
ZA-2022 Cleveland
Tel. +27 116157556
Fax +27 116157513



HITECH Ltd.
1-35-2 Simouma, Setagaya,
JPN-Tokyo 154-0002
Tel. +81 35430 2301
Fax +81 35430 2302



Micromax S&A P/L
Unit 2 106-110 Beaconsfield Street
AUS-Silverwater NSW 2128
Tel. +61 1300 362626
Fax +61 1300 017100



Protek Teknik Elektrik Ticaret ve Sanayi Ltd. Sti.
Okçumusa Cad. Kismet Han 94/2
TR-80020 Karaköy/Istanbul
Tel. +90 2122377982
Fax +90 2122354609



IAC & Associates
2180 Fasan Drive
Oldcastle
CDN-Ontario N0R 1L0
Tel. +1 519 7370311
Fax +1 519 7370314
TF +1 800 711 1900



Yuden-Tech Co., Ltd.
5F., No. 121, Lide St.,
Zhonghe City, Taipei County 235,
Taiwan (R.O.C.)
Tel. +886 2 8221 2958
Fax +886 2 8221 2492



Shanghai Beishidietian Business Trade Co., Ltd.
4F, No. 88-1, Lane 7039,
Zhongchun Rd., Minhang Area
Shanghai City
Tel. +86 21 54887307
Fax +86 21 54887305



CSE-W. Arthur Fischer Ltd.
15 Polaris Place, Greenmount
NZ-East Tamaki, Auckland
Tel. +64 9271 3810
Fax +64 9265 1362



Kolektor Synatec d.o.o.
Vojkova ul. 8b,
PO Box 57
SI-5280 Idrija
Tel. +386 5 3720650
Fax +386 5 3720660



Introl Sp. z o.o.
ul. Kościuszki 112
40-519 Katowice
Tel. +48 32 789 00 00
Fax +48 32 205 33 77



Bibus Portugal, Lda
Rua 5 de Outubro, 5026
4465-079 S.M. Infesta,
Porto
Tel. +351 22 906 50 50
Fax +351 22 906 50 53



Futron Electronics PTE Ltd.
1004 Toa Payoh North
#04-08/09/10
Singapore 318995
Tel. +65 6250 2456
Fax +65 6250 6592



Useong Electrade Co.,
D-1006, Technopark
No. 1345, Soha-dong, Gwangmyeong-si
Gyeonggi-do,
Korea
Tel. +82 (0) 2 2686 7314
Fax +82 (0) 2 2686 7316