

# Glossary

## ● Glossary

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# FAST FIND GUIDE

GLOSSARY

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Online at [www.imi-precision.com](http://www.imi-precision.com)

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Solenoids



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### Differential pressure regulator

This regulator initiates cleaning on the basis of the differential pressure\* between the dusty and clean gas sides of the filter. When the pressure drop across the filter reaches the pre-set upper limit, the regulator actuates the cleaning valves by means of the control system. Cleaning is stopped as soon as the lower limit is reached. This type of control extends the life of the filter media and valves. Another bonus is considerably reduced air consumption.

\* The differential pressure indicates how strong the filter is polluted.



### Purge valve

In filter systems coping with high dust levels the measuring lines to the differential pressure regulator can become blocked. The purge valve enables you to avoid this.



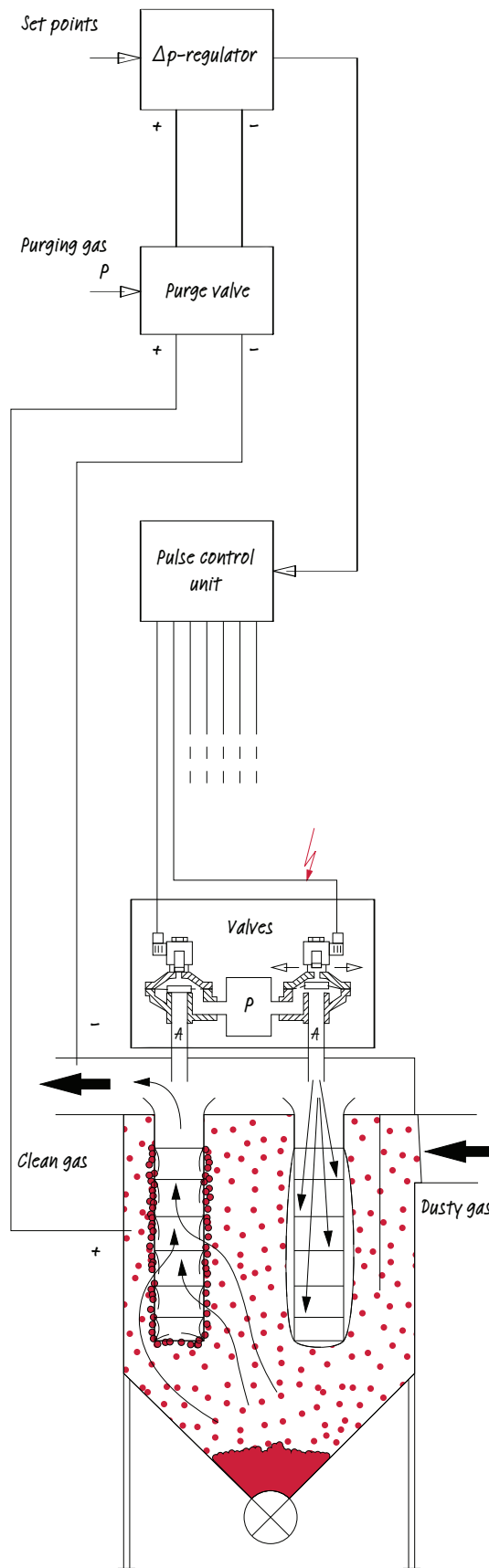
### Control systems

An electronic control unit or pneumatic controller presets the duration of the pulse and interval required of the valves in this application. These control systems actuate the valves directly. The timing can be adjusted if service conditions change.



### Valves

Dust collector valves produce the pressure intensity crucial for effective cleaning of filter media with compressed air. To meet the requirements these valves have to be designed to open and close extremely quick and allow high flow rates. This response also reduces air consumption.



## Filter technology in use

Filter technology can be found in product and dust collector systems. These systems were originally designed for use in product filter systems which filter out the desired product from a stream of gas or air as part of the manufacturing process.

Pneumatic delivery systems (pressure or vacuum) incorporate filter systems to separate the product from the air. Examples include the grain milling, pharmaceutical and cement industries.

Dust collector systems have gained in importance over the years as environmental standards have risen. Air or gas contaminated with dust must nowadays be filtered before it can be discharged into the atmosphere.

Another task performed by dust filter systems is the reduction of gaseous chemical content (e.g. sulphur removal). And not to be forgotten: the cleaning of dust particles from the air used in the combustion processes for electricity generation, e. g. in gas turbine power plants to prevent damage to the turbine blades.

Depending on their application, filters may be classed as:

- > Process filters
- > Outlet filters
- > Inlet filters

The majority of dust collector systems have fabric or cartridge filters that are cleaned with compressed air. The filter elements are cleaned by pulses of compressed air.

IMI Buschjost dust collector valves control these pulses of air from a compressed air reservoir or tank. The dust collection process does not rely on the pulses of compressed air alone; there is also an accompanying secondary air flow (Venturi nozzle or Coander nozzle).

The design of the filter housing, elements and cleaning system influence the dust collection process. IMI Precision Engineering supplies dust collector valves, electronic controls, differential pressure regulators, measuring line purge valves and other accessories for dust collection systems.

IMI Precision Engineering also offers its customers lightweight filter cleaning systems made in profile aluminium that can be customised to meet their specific requirements!



Process filter, lime industry



Process filter, chemical working Industry



Outlet filter, environment



Process filter, environment



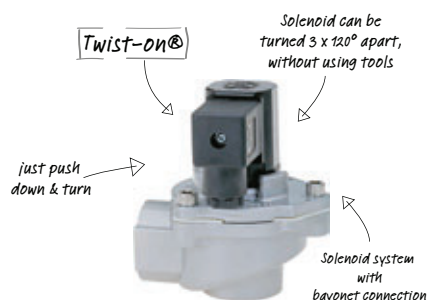
Outlet filter, mining



Process filter, pharmaceutical industry

## Twist-on® solenoids / valves

The solenoid system with bayonet connection is easily mounted – just push down and turn.



The internal components of the pilot system are captive.

The plastic encased solenoid can be turned to 3 different positions, 120° apart, without using tools.

The factory fitted silencer prevents annoying noise and stops ingress of particles into the valve.

The solenoid design of the pilot offers maximum security against icing.

The volume above the diaphragm is minimised for extremely fast opening with optimised peak pressures. The similarly ideal closing time ensures low air consumption.

All of the dynamically loaded valve elements are designed to last.

The various parts of the case are designed for high air flow.

Available with internal BSP or NPT threaded connection to international standards.

## Valves for dust filter cleaning with through-type blow tube

### 2/2-way valve

IMI Precision Engineering has enhanced the existing dust filter cleaning range with a valve with blow tube. This variant offers easy, cost-effective installation and other significant benefits.

Features:

- > Higher peak pressures produced by radial flow
- > Spacing from 75 mm (between pipe centres)
- > No welding or adjustment necessary
- > Simple, economical connection of valve to irregularly shaped tanks
- > Available pipe lengths: 70 to 200 mm
- > High-grade aluminium tube



We will gladly provide you with any further information required.

## Pressure build-up time and diaphragm

An air volume predefined for the cleaning system in question is led as a pressure wave through the filter valve and onto the dust collector media. This is done to achieve a controlled discharge of the dust cake from the filter medium at low compressed air consumption and with minimum stress effect on the filter element. The rated diameter of the dust collector valve and the development of the compressed air jet must be dimensioned to suit the capacity of the cleaning system.

Insufficient compressed air jets result in poor filter cake discharge. This in turn leads to increased energy consumption on the suction side and/or a reduced suction performance within the overall system. If the compressed air burst is too large, the compressed air consumption is increased. This results in greater wear of the filter medium and increased emissions on the clean gas side.

Important parameters determining which valves should be installed in the cleaning system are the kv-factor, the pressure increase time and the closing time of the dust collector valves. The kv-value describes the volumetric flow of a medium through a valve at defined conditions. It thus allows for the comparison of valves of different design. The pressure increase time is a key factor for the quality of the compressed air jet. Short closing times at the end of the burst time help keep the compressed air consumption to a minimum. The characteristics of IMI Buschjost dust collector valves compare favourably with other products on the market and are the result of an innovative housing design based on advanced air technology and the application of TPE diaphragm technology.

The unique TPE diaphragms used in IMI Buschjost dust collector valves are the result of many years of experience in the field and continued high investment in research and development.

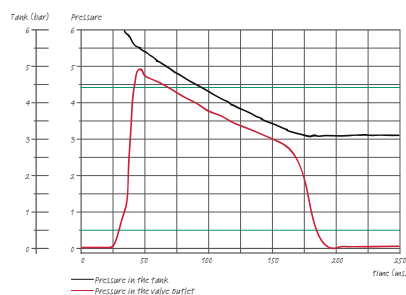
## The heart of the dust collector valve is the TPE diaphragm



The TPE diaphragm is the key component in any dust collector valve designed to provide short pressure decay times and high kv-values. Service life is 4-5 times longer than that of comparable, conventional fabric diaphragms. Our product filter systems eliminate the danger that rubber particles could enter the product. The TPE material used has FDA approval (Food and Drug Administration, USA).

Temperature range - fluid temperature:  
Standard diaphragm: -40 ... 85°C  
For higher temperatures: -10 ... 140°C

## Pressure developing chart



Type:  
8296600.8171.02400

Connection:	G1 1/2
Tank volume:	32 dm <sup>3</sup>
Tank pressure:	6 bar
Electrical impulse time:	50 ms
Impulse length:	165 ms
Max. pressure:	4,9 bar
Pressure quotient:	82.0%
Tank pressure drop:	2,9 bar
Volume/impulse:	85.3 Ndm <sup>3</sup>
Pressure rise time:	13 ms
Opening time:	38,5 ms
Closing time:	133,7 ms

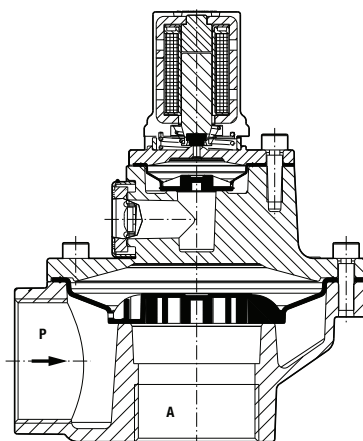
## Dust collector valves & frost

When operated with damp compressed air, even at negative temperatures, the 82960 series of dust collector pulse valves should not be expected to malfunction as a result of the plunger and/or diaphragm freezing solid.

Laboratory tests have shown that diaphragms frozen onto the seat open even at operating pressure under 0.5 bar, and confirm that no malfunctions have yet become known as a result of use at minus temperatures.

In the case of the diaphragms this is attributable to the high opening force and the very small sealing area of the seat.

The reason the plunger does not ice up is that the plunger tube is not under pressure and no moisture can arise as a result of the temperature falling below the dew point during exhausting of the compressed air during an operating cycle.



## Differential pressure regulators

The 83491 10 series of regulators can be used in combination with the 83490 series of electronic pulse control units to automatically adapt the cleaning to the dust loading.

A dust-resistant piezoresistive pressure sensor measures the differential between the clean and dust sides of the filter system, which depends on the build-up, and provides a continuous digital readout.

All of the settings can be programmed with the buttons.

The host pulse control unit continues to operate until cleaning has progressed to the extent where the preset limit is reached. Any after-cleaning programmed is then started. Its duration is adjustable.

Two other switching points, Alarm 1 and Alarm 2, set above or below the set points as required, can be used to give an alarm in the event of faults.

The switching outputs can also be operated manually.

The regulator can be switched between 0 to 10 V, 0 to 20 mA or 4 to 20 mA analogue output signals and can be operated off 230 V a.c. or 24 V d.c.

The unit conforms to the Electromagnetic Compatibility Directive 2014/30/EU and the Low Voltage Directive 2014/35/EU.

## Pressure Equipment Directive (PED)

The Pressure Equipment Directive (PED) is generally applicable to equipment with a working pressure greater than 0,5 bar. Valves as components of this equipment come under the scope of the directive. However, only valves above a certain nominal size are required to bear CE markings.

Valves suitable for different (e. g. neutral, toxic or flammable) fluids only require CE markings above a nominal size of DN 25. Smaller valves must not bear a CE mark in accordance with the Pressure Equipment Directive. This equipment must be designed in line with standard engineering practice so that it meets the requirements of the directive.

Almost all of the valves over DN 25 in size requiring marking should be assigned to Categories I and II. This means that design and testing is the manufacturer's responsibility, i.e. a company of the IMI Precision Engineering Group. Module H has been chosen as the related method of evaluating conformity and certified by the "nominated body" (TÜV Nord).

The products are also subject to other EU Directives such as EMC, Low Voltage, etc. The products bear a CE mark as a declaration of conformity with all of these. Where applicable (sizes > DN 25) this mark also serves as a declaration of conformity with the Pressure Equipment Directive. Category II valves are also marked with the identification number of the nominated body, CE 0045 for TÜV Nord.

### DGRL 1 Applies to the following series: 82960/82970, 83320, 83920, 83670

#### Note to Pressure Equipment Directive (PED):

The valves of this series are according to Art. 4 § 3 of the Pressure Equipment Directive (PED) 2014/68/EU. This means interpretation and production are in accordance to engineers practice wellknown in the member countries. The CE-sign at the valve does not refer to the PED. Thus the declaration of conformity is not longer applicable for this directive.

#### Note to Electromagnetic Compatibility Guideline (EEC):

The valves shall be provided with an electrical circuit which ensures the limits of the harmonised standards EN 61000-6-3 and EN 61000-6-1 are observed, and hence

the requirements of the Electromagnetic Compatibility Guideline (2014/30/EU) satisfied.

#### Note to EAC marking:

The EAC-marked products comply with the applicable requirements stated in the technical regulations of the Eurasian Economic Union.

### DGRL 2 Applies to the following series: 82870, 82900/82910, 83300/83310, 83930, 83640

#### Note to Pressure Equipment Directive (PED):

The valves of this series are according to Art. 4 § 3 of the Pressure Equipment Directive (PED) 2014/68/EU. This means interpretation and production are in accordance to engineers practice well-known in the member countries. A certificate of conformity is not designated.

#### Note to EAC marking:

The EAC-marked products comply with the applicable requirements stated in the technical regulations of the Eurasian Economic Union

### DGRL 3 Applies to the following series: 8587xxx, 8588xxx, 8589xxx

#### Note to Pressure Equipment Directive (PED):

The filter cleaning systems of this series with a pressure-volume product  $PS \times V$  up to max. 50 bar \* L complies with Art. 4 (3) of the Pressure Equipment Directive (PED) 2014/68 / EU. This means interpretation and production are in accordance to engineers practice wellknown in the member countries. Insofar as a CE marking is available, this does not refer to the PED but to other applicable EU directives. Thus the declaration of conformity is not longer applicable for this directive.

#### For systems with a pressure-volume product $PS \times V > 50 \text{ bar} * \text{Ltr. Art. 4 (1) (a) (i) second indent applies.}$

The basic requirements of the Enclosure I of the PED must be fulfilled. The CE-sign on the filter cleaning system includes the

PED. The operating limits and the volume can be found on the nameplate and in the operating instructions. A certificate of conformity of this directive will be available on request.

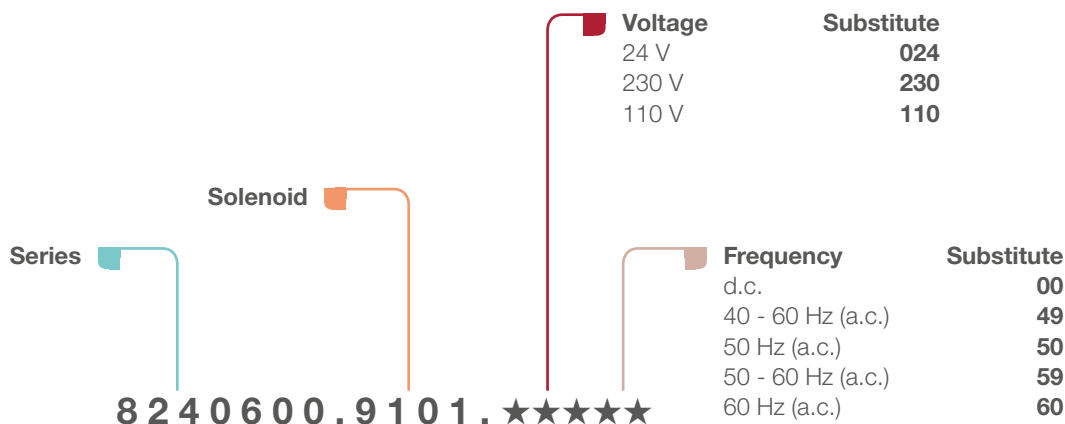
#### Note to Electromagnetic Compatibility Guideline (EEC):

The dust collector valves shall be provided with an electrical circuit which ensures the limits of the harmonised standards EN 61000-6-3 and EN 61000-6-1 are observed, and hence the requirements of the Electromagnetic Compatibility Guideline (2014/30/EU) satisfied.

#### Note to EAC marking:

The EAC-marked products comply with the applicable requirements stated in the technical regulations of the Eurasian Economic Union.

# Key to valve catalogue numbers



## Thread size / Nominal diameter

Thread	DIN	Flange	Substitute
G1/4	8		0
G3/8	10		1
G1/2	12	15	2
G3/4	20	20	3
G1	25	25	4
G1 1/4	32	32	5
G1 1/2	40	40	6
G2	50	50	7
		65	8
		80	9
		100	10

## Additional equipment

Standard	00
Normally open (NO)	01
Manual override	02
FPM seals	03
PTFE seals	06
EPDM seals	14
Higher operating pressure	22
FPM seals for higher viscosity	25
and other...	
Additional equipment, applicable for all series, <b>but not available in every series.</b>	01 ... 49

**Catalogue numbers of the special valves:**  
 beginning with 849★★★★.XXXX.XXXXX  
 and 859★★★★.XXXX.XXXXX,  
 the ★★★★★-block is numbered consecutively.

Additional equipment, only applicable for one series. **50 ... 99**

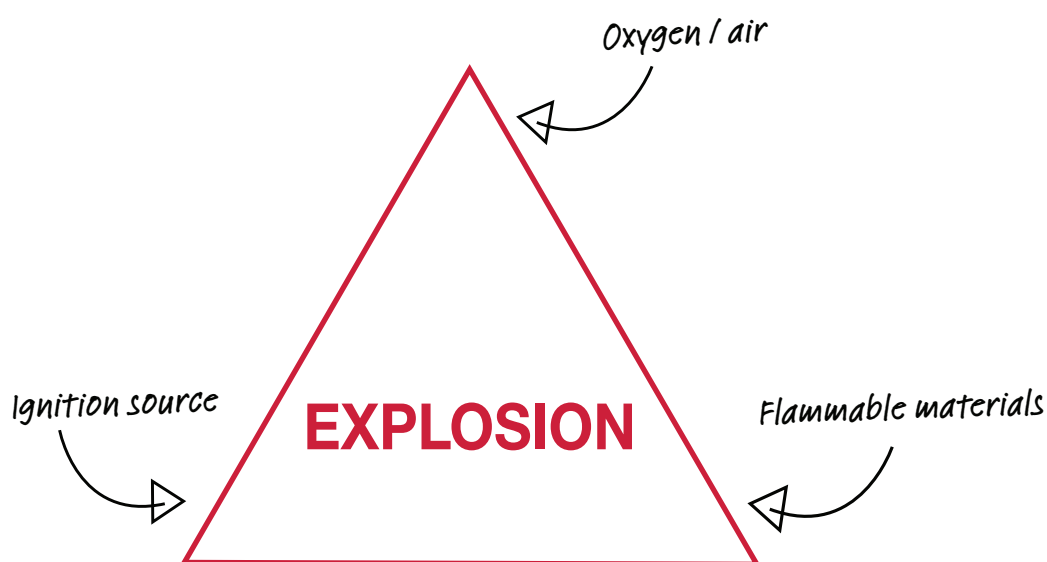
- Series
- Solenoid
- Voltage
- Frequency
- Thread size / Nominal diameter
- Additional equipment



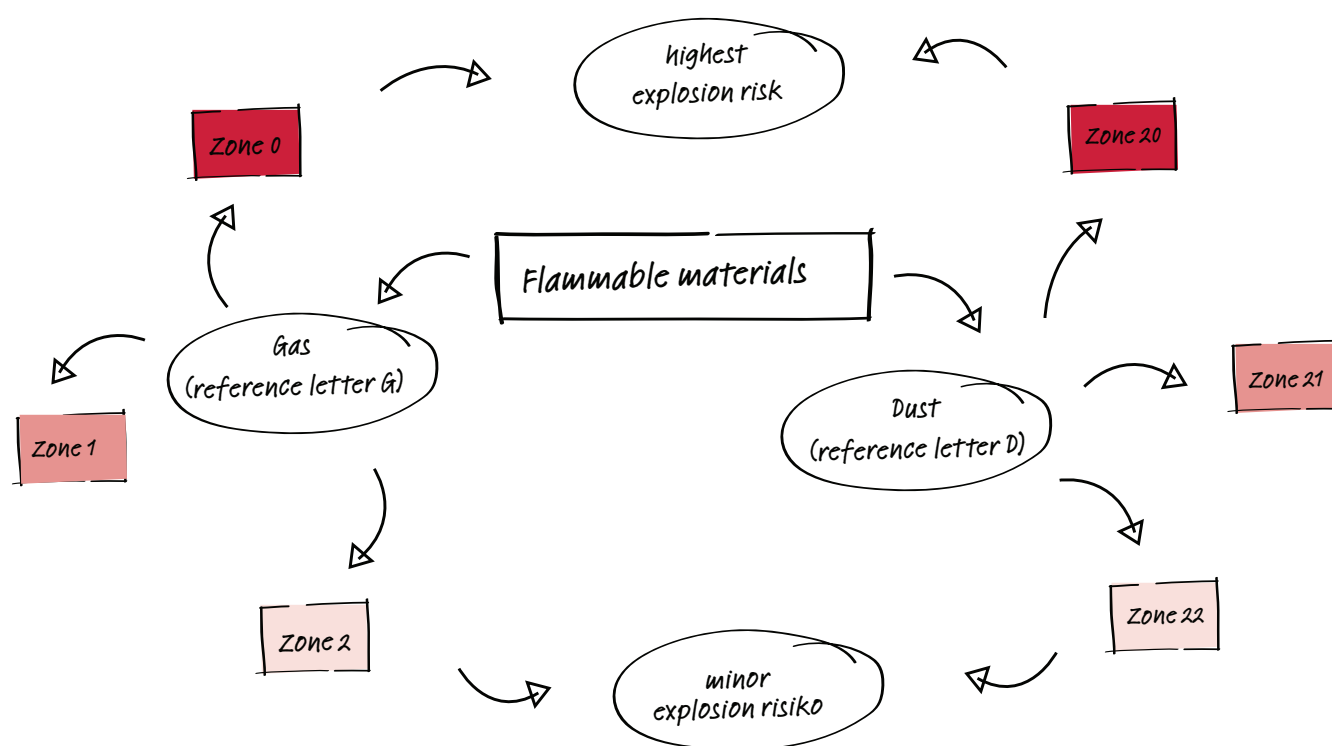
## Clear explosion protection – safe in transit in potentially explosive areas

Wherever a small spark or a hot surface can lead to a serious explosion, comprehensive explosion protection for machinery and systems is indispensable. IMI Precision Engineering has developed special IMI Buschjost ex proof solenoids for environments such as these. They have proven themselves in practice many times and are almost universally applicable in explosive atmospheres. But what is an explosive atmosphere and how does it lead to an explosion?

Whether in the chemical or petrochemical industry, the pharmaceutical or food industry: Where flammable substances are manufactured or processed, vapours, mists, gases and dusts occur. They come into contact with the oxygen from the air, creating an explosive atmosphere. Should this ignite an explosion occurs that can severely endanger people and the environment.

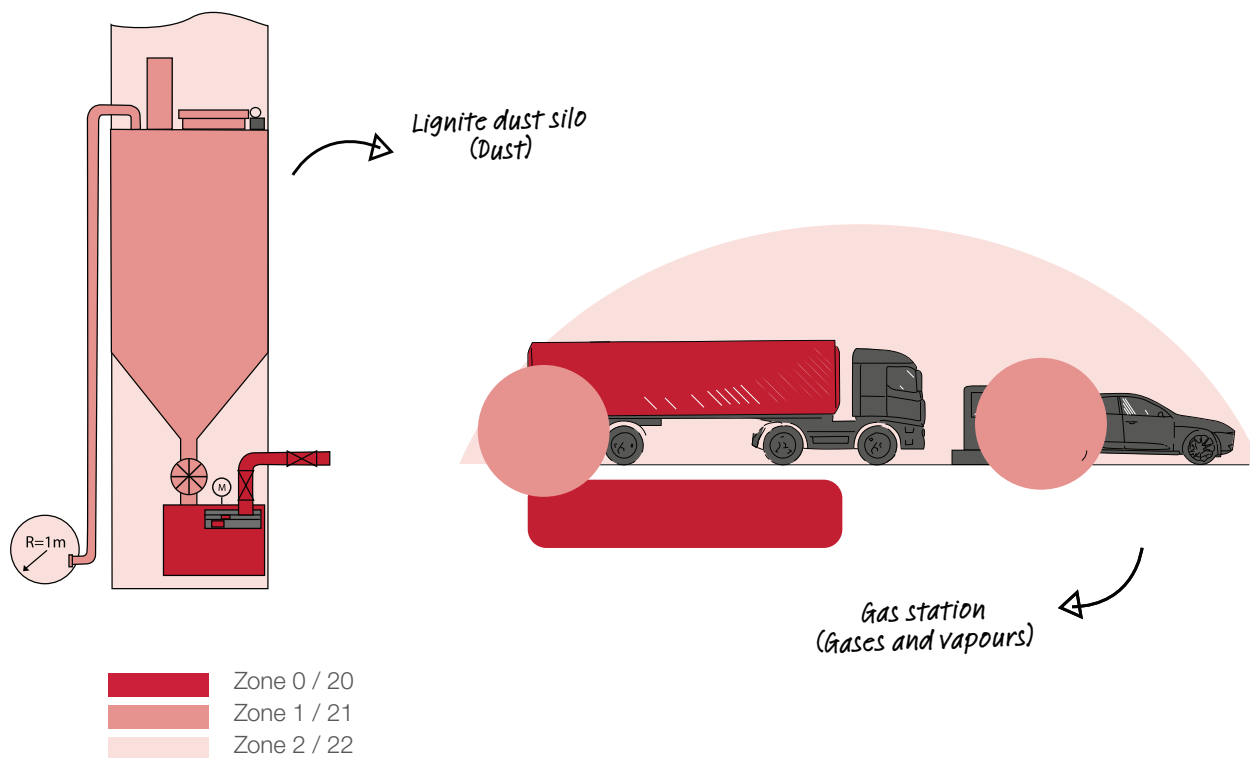


In order to avoid explosions, or at least control these immediately after they occur, there are numerous standards, laws and regulations that apply to ensure the highest possible level of safety. In Europe the ATEX Directive 2014/34/EU sets the necessary level of safety, while the IECEx Regulations apply internationally. Both require plant operators to have a comprehensive protection concept in which potential hazards are analysed and suitable protective measures defined. This also includes the classification of individual areas into different ex-zones. A distinction is made according to the type of flammable substance and the probability of an explosive atmosphere occurring.



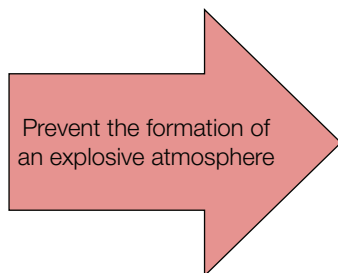
- Zone 0 / 20:** Is permanent, long-term or frequent  
**Zone 1 / 21:** Forms occasionally in normal operation  
**Zone 2 / 22:** Does not normally occur in normal operation or only briefly

**Explosive areas**

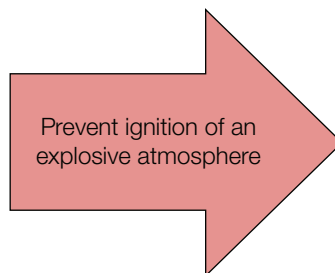


The more hazardous the zone, the more extensive the explosion protection must be. Successive primary, secondary and tertiary protective measures minimise the risk of explosion. The primary explosion protection prevents the formation of an explosive atmosphere. Measures such as the prevention of flammable substances and the limitation of their concentration belong, for example, in this area. Secondary explosion protection concerns preventing existing sources of ignition becoming active in order to prevent the ignition of the atmosphere. Tertiary explosion protection intervenes when an explosion has already occurred, and reduces its effects as far as possible. System depressurisation or the use of pressure-resistant components are suitable protective measures that fall into this category.

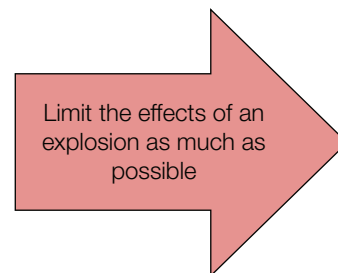
**Primary explosion protection**



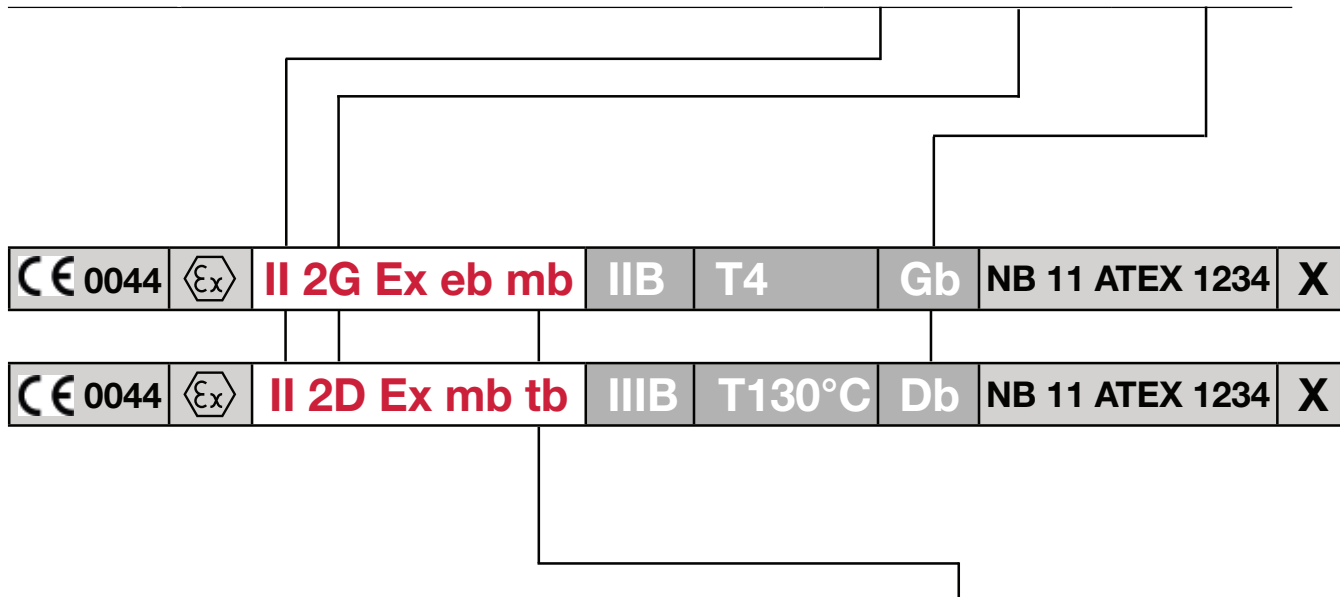
**Secondary explosion protection**



**Tertiary explosion protection**

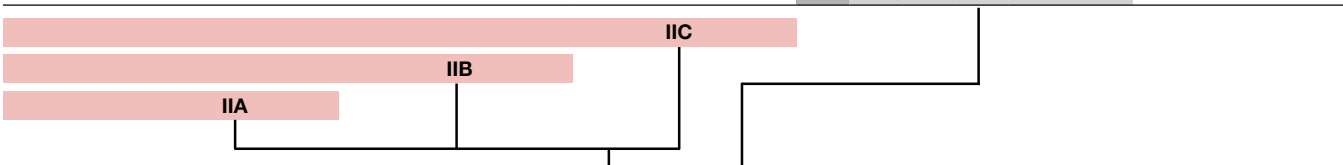


Conditions and subdivisions			Required marking on the usable operating equipment		
Flammable materials	Temporary behaviour of flammable substances in hazardous places	Classification of hazardous areas	Group	Equipment category	Equipment protection level (EPL) as defined in EN 60079-0
Gases, vapours	Is present continuously or for long periods or frequently	Zone 0	II	1G	Ga
	Arises in normal operation occasionally	Zone 1	II	2G or 1G	Gb or Ga
	Is not likely to arise in normal operation, or if it does, will persist for a short time only	Zone 2	II	3G or 2G or 1G	Gc or Gb or Ga
Dusts	Is present in the form of a cloud continuously, or for long periods or frequently	Zone 20	II	1D	Da
	Occasionally develops into a cloud during normal operation	Zone 21	II	2D or 1D	Db or Da
	Is not likely to develop into a cloud during normal operation, or if it does, for a short time only	Zone 22	II	3D or 2D or 1D	Dc or Db or Da
Methane, carbon dust	Operation where there is a risk of explosion	-	I	M1	Ma
	Disconnection where there is a risk of explosion	-	I	M2 or M1	Mb or Ma



Type of protection	Protection principle	Flammable materials	Marking in accordance with the equipment protection level			Norm
			a Very high level of protection	b High level of protection	c Enhanced level of protection	
General requirements	-	Gases, vapours and dusts (G)	-	-	-	EN60079-0
Flameproof enclosure	Propagation of an explosion inside to the outside is excluded	Gases and vapours (G)	Ex da	Ex db	Ex dc	EN60079-1
Increased safety	Avoidance of arcs, sparks and excessive temperature	Gases and vapours (G)	-	Ex eb	Ex ec	EN60079-7
Protection by enclosure	Explosive dust atmosphere keep at a distance from the ignition source	Dusts (D)	Ex ta	Ex tb	Ex tc	EN60079-31
Encapsulation	Explosive atmosphere keep at a distance from the ignition source	Gases and vapours (G)	Ex ma	Ex mb	Ex mc	EN60079-18
		Dusts (D)				
Intrinsic safety	Limitation of energy as well as arcs and temperature	Gases and vapours (G)	Ex ia	Ex ib	Ex i	EN60079-11
		Dusts (D)				

Subdivisions of gases and vapours			Temperature class	Maximum surface temperature of equipment
acetone, ammonia, benzene - pure, acetic acid, ethane, ethyl acetate, ethyl chloride, carbon monoxide, methane, methanol, methylene chloride, naphthalene, phenol, propane, toluene	town gas, acrylnitril	hydrogen	T1	450°C
ethyl alcohol, i-amyl acetate, n-butane, n-butyl alcohol, cyclohexane, acetic acid anhydrit	ethylene, ethylene oxide	ethine (acetylene)	T2	300°C
benzines - general, diesel fuel, jet fuel, heating oil DIN 51603, n-hexane	ethylene glycol hydrogen		T3	200°C
acetaldehyde	ethyl-ether		T4	135°C
-	-	-	T5	100°C
		sulphide of carbon	T6	85°C



CE 0044	Ex	<b>II 2G Ex eb mb</b>	IIB	T4	Gb	NB 11 ATEX 1234	X
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CE 0044	Ex	<b>II 2D Ex mb tb</b>	IIIB	T130°C	Db	NB 11 ATEX 1234	X
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Official notified bodies		
Code number	Notified bodies	Country
0589	BAM	Germany
0158	DEKRA EXAM	Germany
0637	IBExU	Germany
0344	KEMA	Netherlands
0081	LCIE	France
0102	PTB	Germany
<b>0044</b>	<b>TÜV (NORD CERT)</b>	<b>Germany</b>

Use of the operating equipment	
Conditions	Marking
Without	Operating equipment can be used without restriction
X	Special conditions of use
U	Operating equipment with partial certificate, CE-conformity is certified when it is installed into a complete item of operating apparatus

Dust groups	
Dust groups	Dusts
IIIA	Flammable fluff
IIIB	Non-conductive dust
IIIC	Conductive dust

# Our new range of solenoids... ...available from April 2018!

Order-No. valid until 01.04.2018	Series "new"	Order "new"		Output	Temperature classes		Max. ambient temperature	Max. fluid temperature	Voltage d.c.		Voltage a.c.		Frequency
		Temp. Ambient -20°C	-40°C		Gas	Dust			Min.	Max.	Min.	Max.	
		6109	-	5 W	T4	T125°C	60°C	60°C					
	6100	6100	-	8 W	T3	T135°C	60°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
9136		6106	6116	8 W	T4	T125°C	45°C	80°C					
		6129	-	10 W	T4	T125°C	60°C	70°C					
	6120	6123	-	14 W	T3	T125°C	60°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
9186		6126	6136	14 W	T4	T125°C	40°C	80°C					
9191		6120	6130	18 W	T3	T130°C	40°C	80°C					
		6149	-	10 W	T4	T125°C	60°C	80°C					
	6140	6143	-	14 W	T3	T135°C	60°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
9350		6146	6156	14 W	T4	T125°C	50°C	80°C					
9356		6140	6150	18 W	T3	T135°C	40°C	80°C					
		6179	-	7 W	T4	T135°C	60°C	80°C					
	6170	6173	-	9 W	T3	T140°C	60°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
8186		6176	-	9 W	T4	T135°C	50°C	80°C					
8191		6170	-	12 W	T3	T140°C	40°C	80°C					
		6199	-	7 W	T4	T135°C	60°C	80°C					
	6190	6193	-	9 W	T3	T150°C	60°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
8136		6196	6197	9 W	T4	T135°C	45°C	80°C					
8141		6190	6191	12 W	T3	T150°C	40°C	80°C					
		6209	-	7 W	T4	T135°C	60°C	80°C					
		6203	-	9 W	T3	T150°C	60°C	80°C					
8036	6200	6206	6216	9 W	T4	T135°C	45°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
8042		6202	6212	12 W	T3	T150°C	40°C	80°C					
8041		6200	6210	12 W	T3	T150°C	40°C	80°C					
		6223	-	14 W	T3	T135°C	60°C	80°C					
	6220	6229	-	14 W	T4	T125°C	60°C	80°C	12 V	250 V	12 V	250 V	40 - 60 Hz
8336		6226	6236	16 W	T4	T125°C	55°C	80°C					
8341		6220	6230	22 W	T3	T135°C	40°C	80°C					
		6249	-	23 W	T4	T125°C	60°C	80°C					
	6240	6243	-	29 W	T3	T140°C	60°C	80°C	12 V	250 V	24 V	250 V	40 - 60 Hz
8436		6246	6256	32 W	T4	T125°C	50°C	80°C					
8441		6240	6250	40 W	T3	T140°C	40°C	80°C					



Terminal box cable  
outlet with 180° rotation!



Type examination certificate  
PTZ 16 ATEX 0011 X  
IECEx PTZ 17.0001X

# Our new range of solenoids... ...available from April 2018!



Solenoid 6100



Solenoid 6120



Solenoid 6140



Solenoid 6170



Solenoid 6190



Solenoid 6200



Solenoid 6220















Solenoid 6240 S

## *Your benefits at a glance*

- > ATEX and IECEx approvals
- > Explosion group IIC (previously IIB):  
no restriction in the gas areas
- > IP66
- > Simple installation with spring-loaded terminals
- > Cover can be rotated 180° -  
variable cable connection side
- > One central cover screw  
(previously four screws)
- > Extension of the versions available
- > -40 °C and other power levels  
on request

# Solenoid

<b>Category 2</b>						
	6100	6120	6140	6170	6200	6220
<b>Category 3</b>						
	9116	9176	9326	8176	8026	8326
<b>Tube diameter</b>	10 mm	14,4 mm	16 mm	-	-	20 mm
<b>Fastening</b>	Click on®	Click on®	Screw	Twist on®	4 x Screws	Screw

Series	Description	6100	6120	6140	6170	6200	6220
Diaphragm design							
82400	Indirectly actuated	•	•				
82730	Indirectly actuated – stainless steel	•	•				
82540	With forced lifting		•	•			•
82530	With forced lifting					•	
82560	With forced lifting – stainless steel					•	
82510	Directly actuated	•	•				
82610	Indirectly actuated	•	•				
83030	Indirectly actuated	•	•				
Piston design							
85360	Indirectly actuated		•	•			
86700	With forced lifting						•
86740	With forced lifting, stainless steel						•
86540	With forced lifting, stainless steel						•
86500	With forced lifting						•
86480	With forced lifting						•
86580	With forced lifting – stainless steel – with inspection certificate DIN EN 10204 - 3.1						•
85660	Indirectly actuated		•	•			
Sealed core tube with PTFE-bellows							
82080	Directly actuated with sealed core tube					•	
Pilot valve 3/2-way							
84660	Directly actuated	•					
84680	Directly actuated		•				
Dust cleaning valves							
82960	Indirectly actuated				•	•	



# Solenoid



<b>Category 2</b>	6240	-	8900 / 8920	9540 / 9560	4200	4600
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<b>Category 3</b>	8426	9426	-	9526	-	-
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<b>Tube diameter</b>	30 mm	25 mm	30 mm	48 mm	16 mm	13/16 mm
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<b>Fastening</b>	Screw	Screw	Screw	Screw	Screw	Screw
------------------	-------	-------	-------	-------	-------	-------

Series	Description						
Diaphragm design							
82400	Indirectly actuated						•
82730	Indirectly actuated – stainless steel						•
82540	With forced lifting	•	•	•		•	•
82530	With forced lifting						
82560	With forced lifting – stainless steel						
82510	Directly actuated						
82610	Indirectly actuated						
83030	Indirectly actuated						•
Piston design							
85360	Indirectly actuated						•
86700	With forced lifting	•	•	•			
86740	With forced lifting, stainless steel	•	•	•			
86540	With forced lifting, stainless steel	•	•	•	•		
86500	With forced lifting	•	•	•	•		
86480	With forced lifting				•		
86580	With forced lifting – stainless steel – with inspection certificate DIN EN 10204 - 3.1	•		•			
85660	Indirectly actuated						•
Sealed core tube with PTFE-bellows							
82080	Directly actuated with sealed core tube						
Pilot valve 3/2-way							
84660	Directly actuated						
84680	Directly actuated						•
Dust cleaning valves							
82960	Indirectly actuated						•

## xxxxxxx.9116.xxxxx

Solenoid

Click-on®

- Category III
- The solenoids (Click-on®) can be easily installed
- The solenoid system is closed at the top

## Technical Data

**Protection class:**  
IP65

**Cable gland:**  
PG 9

**Cable diameter:**  
Ø 4,5 ... 7 mm

**Cable:**  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

**Conductor cross section:**  
Max. 1,5 mm<sup>2</sup>

**Fastening:**  
Click-on®

**Tube diameter:**  
Ø = 10 mm

**Weight:**  
m = 0,15 kg

**ATEX-marking:**  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIIC T130°C Dc  
ATEX Zone 2/2

## Materials

**Body:**  
Duroplast



## ● Technical data - standard models

Type	Power consumption		$T_{\text{amb}}$ (°C)	$T_{\text{fluid max.}}$ (°C)	Gas	Temperature class		$U_{\text{nom}}$ (V)
	Inrush	Holding				Dust		
9116	8 W	8 W	50	≤ 110	T4	T130°C	12 ... 250 ±10% DC	
9116	15 VA	15 VA	50	≤ 110	T4	T130°C	12 ... 250 ±10% AC	

## xxxxxxx.6100.xxxxx

Solenoid

- Category II
- ATEX and IECEx approvals
- Cover can be rotated 180°
- Simple installation with spring-loaded terminals

## Technical Data

Protection class:  
IP66

Cable gland:  
M16 x 1,5

Cable diameter:  
Ø 7 ... 9 mm ( $T_{amb}$  min. = -20°C)  
Ø 5 ... 9 mm ( $T_{amb}$  min. = -40°C)

Cable:

$T_{permissible} \geq 85^\circ\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:

Click-on®

Tube diameter:

Ø = 10 mm

Weight:

m = 0,2 kg

Type examination certificate:

PTZ 16 ATEX 0011 X

IECEx PTZ 17.0001X

ATEX-marking:

II 2G Ex eb mb IIC T4 - T3 Gb

II 2D Ex mb tb IIIB T125°C - T135°C

ATEX Zone 1/21

## Materials

Body:  
Duroplast

Click-on®



## ● Technical data - standard models

T <sub>amb</sub> min. -20°C	Type		P <sub>nom</sub> (W)	T <sub>amb</sub> max. (°C)	T <sub>fluid</sub> (°C)	Gas	Temperature class	U <sub>nom</sub> (V AC / V DC)
	T <sub>amb</sub> min. -40°C						Dust	
6100			8	60	≤ 80	T3	T135°C	12 ... 250 ±10%
6106	6116		8	45	≤ 80	T4	T125°C	12 ... 250 ±10%
6109			5	60	≤ 80	T4	T125°C	12 ... 250 ±10%

## xxxxxxx.9176.xxxxx

Solenoid

- The solenoids (Click-on®) can be easily installed
- Large ambient temperature range
- The solenoid system is closed at the top
- Approvals:  
Available in an explosion-proof design following EU Directive 2014/34/EU

## Technical Data

**Protection class:**  
IP65

**Cable gland:**  
PG 9

**Cable diameter:**  
Ø 4,5 ... 7 mm

**Cable:**  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

**Conductor cross section:**  
Max. 1,5 mm<sup>2</sup>

**Fastening:**  
Click-on®

**Tube diameter:**  
Ø = 14,4 mm

**Weight:**  
m = 0,34kg

**ATEX-marking:**  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIC T130°C Dc  
ATEX Zone 2/22

## Materials

**Body:**  
Duroplast

Click-on®



## ● Technical data - standard models

Type	Power consumption		$T_{\text{amb max.}} (^{\circ}\text{C})$	$T_{\text{fluid}} (^{\circ}\text{C})$	Gas	Temperature class		$U_{\text{nom}} (\text{V})$
	Inrush	Holding				Dust		
$T_{\text{amb min.}} -20^{\circ}\text{C}$ 9176	18 W	18 W	-25 ...50	≤ 110	T4	T130°C	12 ... 250 ±10% DC	
9176	45 VA	35 VA	-25 ...50	≤ 110	T4	T130°C	12 ... 250 ±10% AC	

## xxxxxxx.6120.xxxxx

Solenoid

- Category II
- ATEX and IECEx approvals
- Cover can be rotated 180°
- Simple installation with spring-loaded terminals

## Technical Data

Protection class:  
IP66

Cable gland:  
M16 x 1,5

Cable diameter:  
Ø 7 ... 9 mm ( $T_{amb}$  min. = -20°C)  
Ø 5 ... 9 mm ( $T_{amb}$  min. = -40°C)

Cable:  
 $T_{permissible} \geq 85^{\circ}\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:  
Click-on®

Tube diameter:  
Ø = 14,4 mm

Weight:  
m = 0,43 kg

Type examination certificate:  
PTZ 16 ATEX 0011 X  
IECEx PTZ 17.0001X

ATEX-marking:  
II 2G Ex eb mb IIC T4 - T3 Gb  
II 2D Ex mb tb IIIB T125°C - T140°C

ATEX Zone 1/21

## Materials

Body:  
Duroplast

Click-on®



## ● Technical data - standard models

Type		P <sub>nom</sub> (W)	T <sub>amb</sub> max. (°C)	T <sub>fluid</sub> (°C)	Gas	Temperature class		U <sub>nom</sub> (V AC / V DC)
T <sub>amb</sub> min. -20°C	T <sub>amb</sub> min. -40°C					Dust		
6120	6130	18	40	≤ 80	T3	T140°C	12 ... 250 ±10%	
6123	-	14	60	≤ 80	T3	T140°C	12 ... 250 ±10%	
6123	6136	14	40	≤ 80	T4	T125°C	12 ... 250 ±10%	
6129		10	60	≤ 70	T4	T125°C	12 ... 250 ±10%	

## xxxxxxx.9326.xxxxx

Solenoid

- Category III
- Large ambient temperature range
- Compact design

## Technical Data

**Protection class:**  
IP65

**Cable gland:**  
PG 9

**Cable diameter:**  
Ø 4,5 ... 7 mm

**Cable:**  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

**Conductor cross section:**  
Max. 1,5 mm<sup>2</sup>

**Fastening:**  
Nut

**Tube diameter:**  
Ø = 16 mm

**Weight:**  
m = 0,4 kg

**ATEX-marking:**  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIIC T130°C Dc  
ATEX Zone 2/22

## Materials

**Body:**  
Duroplast



● Technical data - standard models

Type	Power consumption		$T_{\text{amb}}$ (°C)	$T_{\text{fluid max.}}$ (°C)	Gas	Temperature class		$U_{\text{nom}}$ (V)
	Inrush	Holding				Dust		
$T_{\text{amb min.}} -20^{\circ}\text{C}$ 9326	18 W	18 W	60	≤ 90	T4	T130°C	12 ... 250 ±10% DC	
9326	106 VA	35 VA	60	≤ 90	T4	T130°C	12 ... 250 ±10% AC	

## xxxxxxx.6140.xxxxx

Solenoid

- Category II
- ATEX and IECEx approvals
- Cover can be rotated 180°
- Simple installation with spring-loaded terminals

## Technical Data

Protection class:  
IP66

Cable gland:  
M16 x 1,5

Cable diameter:  
Ø 7 ... 9 mm ( $T_{amb}$  min. = -20°C)  
Ø 5 ... 9 mm ( $T_{amb}$  min. = -40°C)

Cable:  
 $T_{permissible} \geq 85^{\circ}\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:  
Nut

Tube diameter:  
Ø = 16 mm

Weight:  
m = 0,49kg

Type examination certificate:  
PTZ 16 ATEX 0011 X  
IECEx PTZ 17.0001X

ATEX-marking:  
II 2G Ex eb mb IIC T4 - T3 Gb  
II 2D Ex mb tb IIIB T125°C - T135°C

ATEX Zone 1/21

## Materials

Body:  
Duroplast



## ● Technical data - standard models

Type		P <sub>nom</sub> (W)	T <sub>amb</sub> (°C)	T <sub>fluid</sub> max.(°C)	Gas	Temperature class		U <sub>nom</sub> (V AC/DC)
T <sub>amb</sub> min. -20°C	T <sub>amb</sub> min. -40°C					Dust		
6140	6150	18	40	≤ 80	T3	T135°C	12 ... 250 ±10%	
6143	-	14	60	≤ 80	T3	T135°C	12 ... 250 ±10%	
6146	6156	14	50	≤ 80	T4	T125°C	12 ... 250 ±10%	
6149	-	10	60	≤ 80	T4	T125°C	12 ... 250 ±10%	

## xxxxxxx.9426.xxxxx

Solenoid

Click-on®



- The solenoids (Click-on®) can be easily installed
- Large ambient temperature range
- The solenoid system is closed at the top
- Approvals:  
Available in an explosion-proof design following EU Directive 2014/34/EU

## Technical Data

**Protection class:**  
IP65

**Cable gland:**  
PG 9

**Cable diameter:**  
Ø 4,5 ... 9 mm

**Cable:**  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

**Conductor cross section:**  
Max. 1,5 mm<sup>2</sup>

**Fastening:**  
Click-on®

**Tube diameter:**  
Ø = 25 mm

**Weight:**  
m = 1,5 kg

**ATEX-marking:**  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIIC T130°C Dc IP65  
ATEX Zone 2/22

## Materials

**Body:**  
Duroplast

## ● Technical data - standard models

Type	Power consumption		$T_{\text{amb}}$ (°C)	$T_{\text{fluid max.}}$ (°C)	Gas	Temperature class		$U_{\text{nom}}$ (V DC)
	Inrush	Holding				Dust		
$T_{\text{amb min.}} -20^{\circ}\text{C}$ 9426	38 W	38 W	50	≤ 110	T4	T130°C		12 ... 250 ±10%



## xxxxxxx.6190.xxxxx

Solenoid

- Category II
- ATEX and IECEx approvals
- Cover can be rotated 180°
- Simple installation with spring-loaded terminals

## Technical Data

Protection class:  
IP66

Cable gland:  
M16 x 1,5

Cable diameter:  
Ø 7 ... 9 mm ( $T_{amb}$  min. = -20°C)  
Ø 5 ... 9 mm ( $T_{amb}$  min. = -40°C)

Cable:  
 $T_{permissible} \geq 85^{\circ}\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:  
4 Screws

Tube diameter:  
Ø = 11,4 mm

Weight:  
m = 0,28 kg

Type examination certificate:  
PTZ 16 ATEX 0011 X  
IECEx PTZ 17.0001X

ATEX-marking:  
II 2G Ex eb mb IIC T4 - T3 Gb  
II 2D Ex mb tb IIIB T135°C - T150°C

ATEX Zone 1/21

## Materials

Body:  
Duroplast



## ● Technical data - standard models

$T_{amb}$ min. -20°C	Type		$P_{nom}$ (W)	$T_{amb}$ (°C)	$T_{fluid}$ max.(°C)	Gas	Temperature class		$U_{nom}$ (V AC/ V DC)
	$T_{amb}$ min. -40°C						Dust		
6190	6191		12	40	≤ 80	T3	T150°C		12 ... 250 ±10%
6193	-		9	60	≤ 80	T3	T150°C		12 ... 250 ±10%
6196	6197		9	45	≤ 80	T4	T135°C		12 ... 250 ±10%
6199	-		7	60	≤ 80	T4	T135°C		12 ... 250 ±10%

## xxxxxxx.8326.xxxxx

Solenoid

- Category III
- Large ambient temperature range
- Compact design

## Technical Data

Protection class:  
IP65

Cable gland:  
PG 9

Cable diameter:  
Ø 7 ... 9 mm

Cable:  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

Conductor cross section:  
Max. 1,5 mm<sup>2</sup>

Fastening:  
Click-on®

Tube diameter:  
Ø = 20 mm

Weight:  
m = 0,75 kg

ATEX-marking:  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIIC T130°C Dc  
ATEX Zone 2/22

## Materials

Body:  
Duroplast

Click-on®



## ● Technical data - standard models

Type	Power consumption		$T_{\text{amb}}$ (°C)	$T_{\text{fluid max.}}$ (°C)	Gas	Temperature class		$U_{\text{nom}}$ (V DC)
	Inrush	Holding				Dust		
$T_{\text{amb min.}} -20^{\circ}\text{C}$ 8326	22 W	22 W	50	≤ 110	T4	T130°C		12 ... 250 ±10%

## xxxxxxx.6220.xxxxx

Solenoid

- Category II
- ATEX and IECEx approvals
- Cover can be rotated 180°
- Simple installation with spring-loaded terminals

## Technical Data

Protection class:  
IP66

Cable gland:  
M16 x 1,5

Cable diameter:  
Ø 7 ... 9 mm ( $T_{amb}$  min. = -20°C)  
Ø 5 ... 9 mm ( $T_{amb}$  min. = -40°C)

Cable:  
 $T_{permissible} \geq 85^{\circ}\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:  
Nut

Tube diameter:  
Ø = 20 mm

Weight:  
m = 0,75 kg

Type examination certificate:  
PTZ 16 ATEX 0011 X  
IECEx PTZ 17.0001X

ATEX-marking:  
II 2G Ex eb mb IIC T4 - T3 Gb  
II 2D Ex mb tb IIIB T135°C - T150°C

ATEX Zone 1/21

## Materials

Body:  
Duroplast



● Technical data - standard models

Type		P <sub>nom</sub> (W)	T <sub>amb</sub> (°C)	T <sub>fluid</sub> max.(°C)	Gas	Temperature class	U <sub>nom</sub> (V AC/ V DC)
T <sub>amb</sub> min. -20°C	T <sub>amb</sub> min. -40°C					Dust	
6220	6230	22	40	≤ 80	T3	T135°C	12 ... 250 ±10%
6223	-	14	60	≤ 80	T3	T135°C	12 ... 250 ±10%
6226	6236	16	55	≤ 80	T4	T125°C	12 ... 250 ±10%
6229	-	14	60	≤ 80	T4	T125°C	12 ... 250 ±10%

## xxxxxxx.8426.xxxxx

Solenoid

- Category III
- Large ambient temperature range
- Compact design

## Technical Data

Protection class:  
IP65

Cable gland:  
PG 9

Cable diameter:  
Ø 4,5 ... 7 mm

Cable:  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

Conductor cross section:  
Max. 1,5 mm<sup>2</sup>

Fastening:  
Nut

Tube diameter:  
Ø = 29,8 mm

Weight:  
m = 1,8 kg

ATEX-marking:  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIIC T130°C Dc  
ATEX Zone 2/22

## Materials

Body:  
Duroplast



## ● Technical data - standard models

Type	Power consumption		$T_{\text{amb}}$ (°C)	$T_{\text{fluid max.}}$ (°C)	Gas	Temperature class		$U_{\text{nom}}$ (V DC)
	Inrush	Holding				Dust		
$T_{\text{amb min.}}$ -20°C								
8426	40 W	40 W	50	≤ 110	T4	T130°C		12 ... 250 ±10%

## xxxxxxx.6240.xxxxx

Solenoid

- Category II
- ATEX and IECEx approvals
- Cover can be rotated 180°
- Simple installation with spring-loaded terminals

## Technical Data

Protection class:  
IP66

Cable gland:  
M16 x 1,5

Cable diameter:  
Ø 7 ... 9 mm ( $T_{amb}$  min. = -20°C)  
Ø 5 ... 9 mm ( $T_{amb}$  min. = -40°C)

Cable:  
 $T_{permissible} \geq 85^{\circ}\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:  
Nut

Tube diameter:  
Ø = 29,8 mm

Weight:  
m = 1,83 kg

Type examination certificate:  
PTZ 16 ATEX 0011 X  
IECEx PTZ 17.0001X

ATEX-marking:  
II 2G Ex eb mb IIC T4 - T3 Gb  
II 2D Ex mb tb IIIB T125°C - T140°C

ATEX Zone 1/21

## Materials

Body:  
Duroplast



## ● Technical data - standard models

Type		P <sub>nom</sub> (W)	T <sub>amb</sub> (°C)	T <sub>fluid</sub> max.(°C)	Gas	Temperature class		U <sub>nom</sub> (V AC/ V DC)
T <sub>amb</sub> min. -20°C	T <sub>amb</sub> min. -40°C					Dust		
6240	6250	40	40	≤ 80	T3	T140°C	24 ... 250 ±10%	
6243	-	29	60	≤ 80	T3	T140°C	24 ... 250 ±10%	
6246	6256	32	50	≤ 80	T4	T125°C	24 ... 250 ±10%	
6249	-	23	60	≤ 80	T4	T125°C	24 ... 250 ±10%	

## xxxxxxx.8900.xxxxx

Solenoid

- Category III
- Ambient temperature range to +75°C
- Compact design
- Flame-proof enclosure (d)

## Technical Data

Protection class:  
IP65

Cable gland:  
M20 x 1,5

Cable diameter:  
Ø 8 ... 11,5 mm

Cable:  
 $T_{\text{permissible}} \geq 85^{\circ}\text{C}$

Conductor cross section:  
0,08 ... 2,5 mm<sup>2</sup>

Fastening:  
Nut

Tube diameter:  
Ø = 29,8 mm

Weight:  
m = 6,6 kg

Type examination certificate:  
ATEX: BVS\_19\_ATEX\_E\_014\_X  
IECEx: BVS\_19.0017x

ATEX-marking:  
II 2G Ex de IIC T4/T5  
II 2D Ex tD A21 IP65 T130°C/ 95°C

## Materials

Body:  
Steel



● Technical data - standard models

Type	P <sub>nom</sub> (W)	T <sub>amb</sub> (°C)	T <sub>fluid max.</sub> (°C)	Gas	Temperature class		U <sub>nom</sub> (V)
						Dust	
T <sub>amb min.</sub> -20°C							
8900	29	40/60	≤ 90/110	T5/T4		T95/130°C	12 ... 400 ±10% DC
8900	29	40/60	≤ 90/110	T5/T4		T95/130°C	24 ... 400 ±10% AC

# xxxxxxx.8920.xxxxx

Solenoid

- Category III
- Ambient temperature range to +75°C
- Compact design
- Flame-proof enclosure (d)

## Technical Data

**Protection class:**  
IP65

**Cable gland:**  
M20 x 1,5

**Cable diameter:**  
Ø 8 ... 11,5 mm (T<sub>amb</sub> min. = -40°C)

**Cable:**  
T<sub>permissible</sub> ≥ 85°C

**Conductor cross section:**  
0,08 ... 2,5 mm<sup>2</sup>

**Fastening:**  
Nut

**Tube diameter:**  
Ø = 29,8 mm

**Weight:** m = 6,6 kg

**Type examination certificate:**  
ATEX: BVS\_19\_ATEX\_E\_013X  
IECEX: BVS\_19.0016x

**ATEX-marking:**  
II 2G Ex db eb IIC T4 /T5 Gb  
II 2D Ex tb IIIC T130°C/ T95°C Db

## Materials

**Body:**  
Steel



## ● Technical data - standard models

Type	P <sub>nom</sub> (W)	T <sub>amb</sub> (°C)	T <sub>fluid</sub> max.(°C)	Temperature class		U <sub>nom</sub> (V)
				Gas	Dust	
T <sub>amb</sub> min. -40°C						
8920	29	40/75	≤ 90/100	T5/T4	T95/130°C	12 ... 400 ±10% DC
8920	29	40/75	≤ 90/100	T5/T4	T95/130°C	24 ... 400 ±10% AC

## xxxxxxx.9526.xxxxx

Solenoid

- Category II
- Compact design
- For use with flange valves

## Technical Data

**Protection class:**  
IP65  
**Cable gland:**  
PG 9  
**Cable diameter:**  
Ø 4,5 ... 7 mm  
**Cable:**  
T<sub>permissible</sub> ≥ 85°C  
**Conductor cross section:**  
Max. 1,5 mm<sup>2</sup>  
**Fastening:**  
Nut  
**Tube diameter:**  
Ø = 47,7 mm  
**Weight:**  
m = 6 kg  
**ATEX-marking:**  
II 3G Ex ec IIC T4 Gc  
II 3D Ex tc IIIC T130°C Dc IP65  
ATEX Zone 2/22

## Materials

**Body:**  
Steel



● Technical data - standard models

Type	P <sub>nom</sub> (W)	T <sub>amb</sub> (°C)	T <sub>fluid max.</sub> (°C)	Gas	Temperature class		U <sub>nom</sub> (V AC/ V DC)
						Dust	
T <sub>amb min.</sub> -40°C 9526	80	50	≤ 110	T4		T130°C	24 ... 250 ±10%



## xxxxxxx.9540/ 9560.xxxxx

Solenoid

- Category II
- Compact design
- For use with flange valves

## Technical Data

**Protection class:**  
IP66

**Cable gland:**  
M16 x 1,5

**Cable diameter:**  
Ø 6 ... 12 mm ( $T_{amb}$  min. = -40°C)

**Cable:**  
 $T_{permissible} \geq 85^\circ\text{C}$

**Conductor cross section:**  
0,08 ... 2,5 mm<sup>2</sup>

**Fastening:**  
Nut

**Tube diameter:**  
Ø = 47,7 mm

**Weight:**  
m = 7,4 kg

**Type examination certificate:**  
TUV 07 ATEX 553412X  
IECEx (coming soon)

**ATEX-Kennzeichnung:**  
II 2G Ex e mb II T4/ T3  
II 2D Ex tD A21 IP65 T140°C

## Materials

**Body:**  
Steel



● Technical data - standard models

Type	$P_{nom}$ (W)	$T_{amb}$ (°C)	$T_{fluid}$ max.(°C)	Gas	Temperature class		$U_{nom}$ (V AC/ V DC)
					Dust		
9540	65	40/40	≤ 60/100	T4/T3	T130/140°C		24 ... 400 ±10%
9560	47	60/70	≤ 100/100	T4/T3	T140°C		24 ... 400 ±10%

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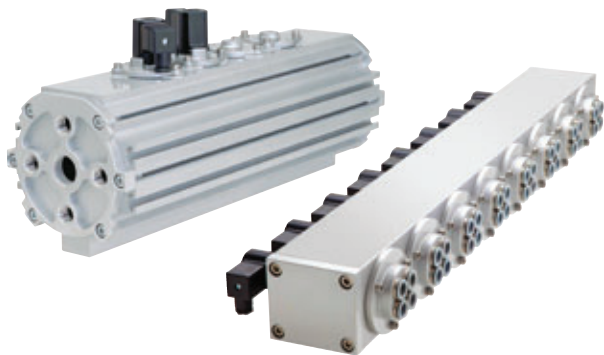
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FLANGE VERSIONS



2

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SYSTEMS FOR DUST COLLECTORS



3

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4

**ACCESSORIES**

PURGE VALVES  
PILOT VALVES  
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SOLENOIDS  
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SERVICE KITS SOLENOIDS



5

**PNEUMATICS**

GENERAL PURPOSE FILTERS  
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6

**GLOSSARY**

TECHNICAL INFORMATION  
PRESSURE EQUIPMENT DIRECTIVE (PED)  
KEY TO VALVE CATALOGUE NUMBERS  
ATEX  
SOLENOIDS



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