

# Explosion Protection to ATEX 95 and 137

## The 4 important selection parameters of explosion-proof devices

### Standard Programme with Hazardous Area Protection

**8111**  
Level sensor – vibrating principle of operation



**6519 Ex-i NAMUR**  
Pneumatic valve for single- or double-acting actuators with NAMUR interface



**8030 Ex-i**  
Flow sensor with paddlewheel



**8635/2712**  
Process valve with integral position controller



**8643**  
I/O-Box Binary switchbox for FF H1 signals



**8650**  
Remote I/O system pneumatic outputs; based on Siemens SIMATIC ET 200iSP®



**8640**  
Valve block with modular construction in various sizes and functions



**0780**  
Pivoted armature valve for aggressive or contaminated media



**5281**  
2/2-way valve



**8137**  
Radar level transmitter, level measurement up to 30m, 4...20 mA/Hart - 2 wires, ATEX Cat.1/2G



### Component manufacturer ATEX 95

<b>Standards:</b>	Equipment
<b>Responsibility:</b>	Manufacturer
<b>EU guidelines:</b>	94 / 9 / EC
<b>Responsibilities for Standards:</b>	Type approval, quality assurance, manufacturing control
<b>Documentation:</b>	EU Type approval certification, conformance review



### Installation company ATEX 137

Workplace	
Operator	
99 / 92 / EC	
Risk analysis, classification of zones, conformance testing, measurements	
Explosion protection document	

## 1 Zone Classifications

### Atmosphere: Gas, fumes or mist

#### Zone 0 (Device category 1G)

Area in which an explosive atmosphere with an excessive mixture of air and combustible gases, fumes or mist is present over long periods or is frequently present.

#### Zone 1 (Device category 2G)

Area in which there is an explosive atmosphere with an excessive mixture of air and combustible gases, fumes or mist which can occasionally build up during normal operation.

#### Zone 2 (Device category 3G)

Area in which explosive atmosphere is not likely to occur in normal operation and if it occurs will exist only for a short time.

### Atmosphere: Combustible dust

#### Zone 20 (Device category 1D)

Area in which combustible dust, in the form of a cloud, is present continuously or frequently during normal operation.

#### Zone 21 (Device category 2D)

Area in which an explosive atmosphere, in the form of a cloud of combustible dust in the air, can build up occasionally during normal operation.

#### Zone 22 (Device category 3D)

Area in which combustible gas, as a cloud, is not normally present and persists only for a short period.

### More concrete guidance on the terms long, frequently, occasional and short

#### Long/frequent (Zone 0/20):

Incidence of explosive atmosphere (annual): higher than Zone 1 (e.g. >1000 times)  
Incidence of explosive atmosphere (periodic): higher than Zone 1 (e.g. >2 times/day)  
Duration of explosive atmosphere (annual): longer than 10 hours

#### Occasional (Zone 1/21):

Incidence of explosive atmosphere (annual): 10 times, <1000 times  
Incidence of explosive atmosphere (periodic): 1 time/month, <3 times/day  
Duration of explosive atmosphere (annual): >0.5 hours, <10 hours

#### Short (Zone 2/22):

Incidence of explosive atmosphere (annual): 1 time/year, <10 times  
Incidence of explosive atmosphere (periodic): 1 time/year, <1 time/month  
Duration of explosive atmosphere (annual): <0.5 hours

## 2. Gas Group

Example of classification of gases and fumes in explosion groups and temperature classes

GAS GROUP	T1	T2	T3	T4	T5	T6
<b>Ignition temperature of mixture</b>	> 450°C	> 300°C	> 200°C	> 135°C	> 100°C	> 85°C
<b>II A</b>	Acetone, ethane, ethyl acetate, ammonia, benzene (pure), acetic acid, carbon oxide, methane, methanol, propane, toluene	Ethyl alcohol i-Amyl acetate n-Butane N-Butyl alcohol	Benzene, diesel, aviation fuel, heating oil, n-hexane	Acetaldehyde, ethyl ether	Devices with higher temperature classes can also always be accepted for use in applications in which lower temperature classes are required	Devices with higher temperature classes can also always be accepted for use in applications in which lower temperature classes are required
<b>II B</b>	Town gas (coal gas)	Ethylene				
<b>II C*</b>	Hydrogen	Acetylene				Carbon disulphide

\*Encapsulated devices without declaration of gas group are suitable for gas group IIC

## 3. Temperature Classes and Ambient Temperatures

Where the maximum ambient temperature is not defined a value of 40°C is assumed

Gas group:	T6	T5	T4	T3	T2	T1
Approved surface temperature of electrical equipment:	0° C to 85° C	85° C to 100° C	100° C to 135° C	135° C to 200° C	200° C to 300° C	300° C to 450° C

## 4. Electrical Connection

Ex-i input via barrier; Ex-e 24V or 115/230V via junction box or moulded-in cable

### The relevance of Ex-protection rating plates

	<b>II</b>	<b>2 (1) G</b>	<b>Ex</b>	<b>emb</b>	<b>[ia]</b>	<b>IIC</b>	<b>T4</b>
Conforms to appropriate Directive 94 / 9 / EC	Device group I = Mining II = All except mining	Category 2 for installation in Zone 0, (1) = connection of sensors and actuators out of Zone 0	Explosion-proof electrical equipment	Type of protection of device mb = encapsulation e = increased protection	Intrinsically safe sensor and actuator connection	Assigned for gas groups IIA, IIB and IIC	Maximum surface temperature of the device