



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 conta-  
minated media



5281  
2/2-way valve



8030 SE30 Ex-i  
Oval gear flow sensor  
for viscous media



# Explosion Protection to ATEX 95 and 137

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

| Components manufacturer ATEX 95 |                                                         |  |
|---------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------|
| Standards:                      | Equipment                                               |                                                                                     |
| Responsibility:                 | Producer                                                |                                                                                     |
| EU guidelines:                  | 94 / 9 / EG                                             |                                                                                     |
| Responsibilites for Standards:  | Type approval, quality assurance, manufacturing control |                                                                                     |
| Documentation:                  | EU Type approval certification, conformance review      |                                                                                     |

| Installation company ATEX 137                                         |  |  |
|-----------------------------------------------------------------------|--|-------------------------------------------------------------------------------------|
| Workplace                                                             |  |                                                                                     |
| Operator                                                              |  |                                                                                     |
| 99 / 92 / EG                                                          |  |                                                                                     |
| Risk analysis, classification of zones, conformance testing, measures |  |                                                                                     |
| Explosion protection document                                         |  |                                                                                     |

## 1 Zone Classifications

### Atmosphere: Gas, fumes or mist

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

Area in which there is 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 (Equipment 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 (Equipment 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 during 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):                                                                                                                                                                                                                  | Occasional (Zone 1/21):                                                                                                                                                                                           | Short (Zone 2/22):                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Incidence of explosive atmosphere (annual): higher than Zone 1 (e.g. >1000 times<br>Incidence of explosive atmosphere (periodic): higher than Zone 1 (e.g. >2 times/day)<br>Duration of explosive atmosphere (annual): longer than 10 hours | Incidence of explosive atmosphere (annual): 10 times, <1000 times<br>Incidence of explosive atmosphere (periodic): 1 time/month, <3 times/day<br>Duration of explosive atmosphere (annual): >0.5 hours, <10 hours | Incidence of explosive atmosphere (annual): 1 time/year, <10 times<br>Incidence of explosive atmosphere (periodic): 1 time/year, <1 time/month<br>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                                                                                                                                          |
|---------------------------------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Ignition temperature of mixture | > 450°C                                                                                                                 | > 300°C                                                        | > 200°C                                               | > 135°C                 | > 100°C                                                                                                                                     | > 85°C                                                                                                                                      |
| II A                            | Acetone, ethane, ethyl acetate, ammonia, benzene (pure), acetic acid, carbon oxide, methane, methanol, propane, toluene | Ethyl alcohol<br>i-Amyl acetate<br>n-Butane<br>N-Butyl alcohol | Benzene, diesel, aviation fuel, heating oil, n-hexane | Acetalhyde, 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 |
| II B                            | Town gas (coal gas)                                                                                                     | Ethylene                                                       |                                                       |                         |                                                                                                                                             |                                                                                                                                             |
| II C*                           | 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<br>to 85° C | 85° C<br>to 100° C | 100° C<br>to 135° C | 135° C<br>to 200° C | 200° C<br>to 300° C | 300° C<br>to 450° C |

## 4. Electrical connection

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

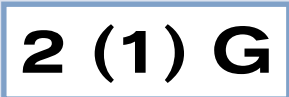
### The relevance of Ex-protection rating plates



Conforms to appropriate Directive 94 / 9 / EG



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