

# ***Hafner-Pneumatik presents:***



**Including Pneumatic Valves**

***General information on ATEX 95  
&***

***Products for explosion hazardous environment from the Hafner range***



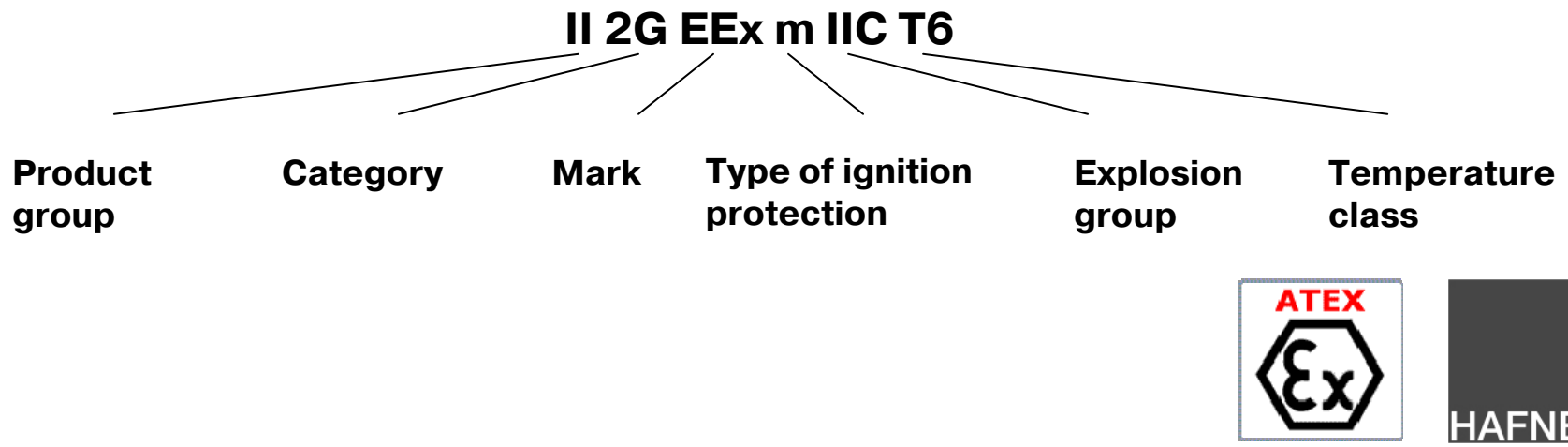
# General information - 1

A product that is supposed to be used in an explosion hazardous environment can only be brought into the market if it is in accordance to the standard 94/9/EC.

In comparison to former standards this is not only true for electrical parts but also for mechanical components such as valves.

Products are classified in categories and groups. Those are to be marked on the product and can look like the following:

**Example for an electrical product:**



## General information 2 Product group, category

II 2G EEx m IIC T6

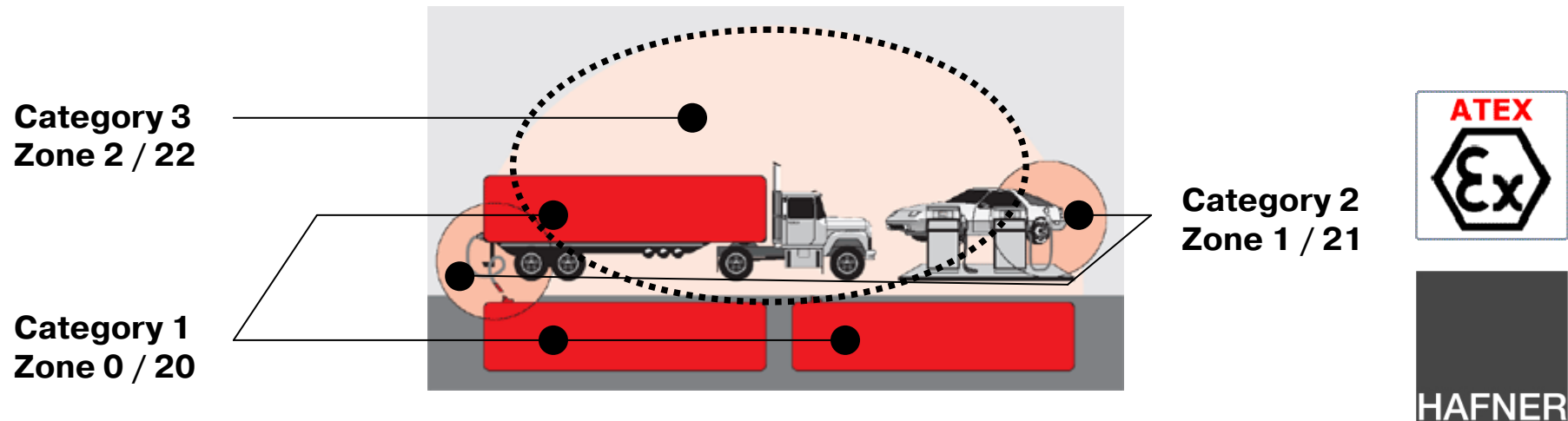
### The Product group

Two product groups are existing

The products of **group I** are to be used in **mining** operations below and above the surface. Hafner's products can not be used in this environment, therefore the group is not covered by this documentation. All the other explosion hazardous environments are summarised in **group II**.

### The category

Displayed in an example of a gas-station. The designer and the operator of the gas station are in charge of defining the categories and zones following ATEX 137.



## General information - 3 Categories 1 and 2

II 2G EEx m IIC T6

### Category 1

For products that offer a **very high degree** of security in an area where an explosive atmosphere is **present for long periods**. Products of this category can also be used in category 2 and 3.

#### Danger due to gas Zone 0 equals cat. 1G

Defined as an area, where during normal operation, permanently or over longer periods of time a mixture of air and inflammable gases or vapor is present.

#### Danger due to dust Zone 20 equals cat. 1D

Defined as an area, where during normal operation, permanently or over longer periods of time a cloud of air and dust is present.

### Category 2

For products that offer a **high degree** of security in an area where an explosive atmosphere is **frequently present during normal operation**. Products of this category can also be used in category 3.

#### Danger due to gas Zone 1 equals cat. 2G

Defined as an area, where during normal operation, a mixture of air and inflammable gases or vapor is frequently present.

#### Danger due to dust Zone 21 equals cat. 2D

Defined as an area, where during normal operation, a cloud of air and dust is frequently present.



# General information - 4

## Category 1 and 2, Mark, Type of ignition protection

II 2G EEx m IIC T6

### Category 3

For products that offer a **normal degree** of security in an area where an explosive atmosphere is **occasionally** anticipated only in an **event of a fault or failure** .

#### Danger due to gas Zone 2 equals cat. 3G

Defined as an area, where in case of a failure, a mixture of air and inflammable gases or vapor can be anticipated.

#### Danger due to dust Zone 22 equals cat. 3D

Defined as an area, where in case of a failure, a mixture of air and dust can be anticipated.

### The Mark

The **EEx** indicates that it is an **electrical manufacturing equipment**.

An other mark, also used for mechanical parts that are designed to prevent explosions is:



### The Types of Ignition Protection

By these letters it is indicated with which means the protection against explosion is realised. Hafner utilised:

**For solenoids:** **m** = Encapsulation, **ia** = intrinsically safe, **na** = non-incentive component.

**For valves:** **c** = safety based on construction.

Important for ignition protection type **ia** is that it is only to be used in combination with a certified intrinsically safe electrical circuit.

Other types of ignition protection such as: **d** = “flameproof enclosure”, **p** = “pressurized enclosure” and others are existing but not part of the Hafner range.



# General information - 4

## Explosion groups, Temperature classes

II 2G EEx m IIC T6

### The Explosion Groups

For various substances the explosive and spark ignition capability of a potentially explosive mixture are characteristics. Vapors and gases are classified in groups. The criteria for the subdivision are the maximum experimental safe gap and the minimum ignition current. Those are determined under precisely defined test conditions for various vapors and gases. Please refer to IEC60079-1A and IEC60079-3.

The hazard increases from group IIA to IIC, therefore the requirements applicable to electrical equipment become more strict. Consequently products classified IIC can also be used in IIB and IIA.

### The Temperature Classes

The user of a product used in a potentially explosion hazardous environment has to make sure that no equipment exceeds the ignition temperature of a flammable gas or liquid. The maximum surface temperature must be indicated on any electrical equipment used in such an environment. For **gas environment** the **classes** are to be used, for **dust the effective temperature** has to be indicated on the coil.

Temperature class	Maximum permitted surface temperature of equipment
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C



## General information - 5

### Additional information for products used in dust (D)

For **electrical products** used in explosion hazardous environment that is based on inflammable dust (zone 20, 21 or 22) the following rules have to be obeyed:


- 1.) **Maximum surface temperature** has to be marked **effective** not in temperature class
- 2.) The **IP-class** has to be marked

**Example: Mark of a coil used with Hafner valves for dust environment:**

 II 2D IP 65 T130°C







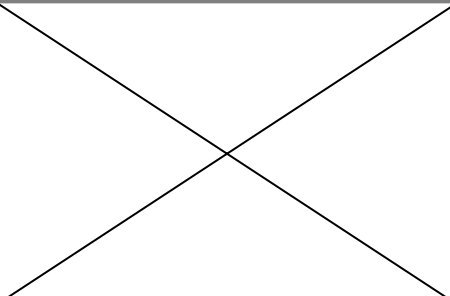
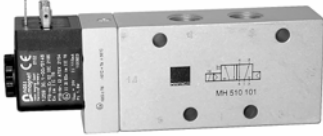






For **mechanical products** used in explosion hazardous environment that is based on inflammable dust the temperature range where the product can be used in has to be indicated.

**Example: Mark of a Hafner valve for dust environment:**

 II 2D c T4 -10° ≤ Ta ≤ 50°C



# Take advantage of the wide range of possibilities to use Hafner solenoid valves.

Zone	Category	Ignition protection	Gasenvironment (G)	Dustenvironment (D)	Sample of a product
1/ 21	II	m	Solenoid  II 2 G EEx m II T4	Solenoid  II 2 D IP65 T130°C	
		c	Valve  II2G c T4 -10°C ≤ Ta ≤ 50°C	Valve  II2D c T4 -10°C ≤ Ta ≤ 50°C	
		ia	Solenoid  II2G EEx ia IIC T6		
		c	Valve  II2G c T6 -10°C ≤ Ta ≤ 50°C		
2/ 22	III	na	Solenoid  II 3 G EEx nA II T5	Solenoid  II 3 D IP65 T95°C	
		c	Valve  II3G c T5 -10°C ≤ Ta ≤ 50°C	Valve  II3D c T5 -10°C ≤ Ta ≤ 50°C	



## The products can be used in different environments

**Solenoid**



**Valve**

For **zone 1**, **gas** environment,  
**intrinsically safe (ia)**,  
24 DC only, coil is 30 mm wide.



Valve designed for the use in **gas-**  
atmosphere **zone 1** with **intrinsically safe**  
solenoid system, use only up to 8 bar max.

For **zone 1**, **gas-** and **dust** environment,  
**Encapsulation (m)**, standard voltages:  
24 DC and 230 AC, coils is 22 mm wide.  
Can also be used in zone 2.



Valves designed for the use in **gas-**  
and **dust-**atmosphere **zone 1 and 2**.

For **zone 2**, **gas-** and **dust** environment,  
with special connector, standard voltages:  
24 DC and 230 AC, coil is 30 mm wide.

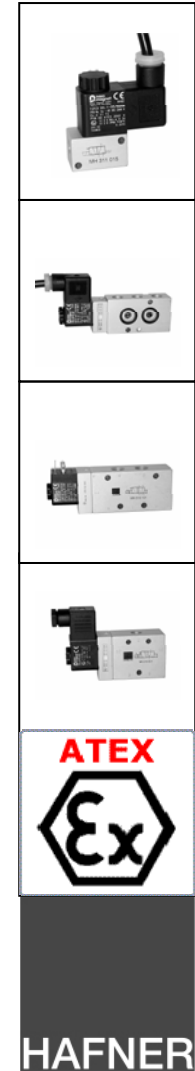
The same valve can be equipped with  
both types of coils!



**Many products can be used in explosion hazardous environment.**

Solenoid valves - inline	Namurvalves
3/2-way direct actuated	3/2-way
3/2- way single solenoid	5/2- way single solenoid
5/2- way double solenoid	ports G1/4"
5/3- way, 3 different ones	5/3- way
3/2- way double solenoid	ports G1/2"
5/2-way single solenoid	5/2- way double solenoid
ports M5, G1/8", G1/4", G3/8", G1/2"	

**To be used in Zone 1 und 2, in gas und dust, ia gas only**



**HAFNER**

**Operating Instructions**

Thanks for choosing a Hafner valve. To assure the function and for your own safety please read the following operating instructions carefully, before installing the product. If there are any further questions, please do not hesitate to contact us:

Phone: 0036 96 210 601

Fax: 0036 96 210 615

Info@hafner-pneumatik.de

**The operating instructions are valid for the following valve-types:**

MH 310 501, MOH 310 501, MH 320 501, MH 510 501, MH 510 511, MH 520 501, MH 531 501, MH 532 501, MH 533 501      MH 311 012, MH 311 015  
 MH 310 701, MOH 310 701, MH 320 701, MH 510 701, MH 510 711, MH 520 701, MH 531 701, MH 532 701, MH 533 701      MH 312, MH 315  
 MH 310 801, MOH 310 801, MH 320 801, MH 510 801, MH 520 801, MH 531 801, MH 532 801, MH 533 801  
 MH 310 101, MOH 310 101, MH 320 101, MH 510 101, MH 520 101, MH 531 101, MH 532 101, MH 533 101  
 MH 310 121, MOH 310 121, MH 320 121, MH 510 121, MH 520 121, MH 531 121, MH 532 101, MH 533 121  
 MNH 310 701, MNH 310 711, MNH 510 701, MNH 510 711, MNH 520 701, MNH 531 701, MNH 532 701, MNH 533 701  
 MNH 310 801, MNH 510 801, MNH 520 801, MNH 531 801, MNH 532 801, MNH 533 801,      MNH 310 121, MNH 510 121, MNH 520 121, MNH 531 121, MNH 532 121, MNH 533 121

These valves can be used – if they are marked appropriately (please refer to the declaration of conformity) - in potentially explosive atmospheres. Zones and product categories the valves and the solenoid systems can be used in are defined and explained in the declaration of conformity. Use in other areas or in different combination as mentioned below is not allowed !

The operating instructions are to be used together with the manual of Nass Magnet GmbH, Hannover. The manual of Nass is relevant for the electrical part of the product, this manual for the non-electrical.

**In General:**

Please notice that not following these instructions or any kind of inappropriate engagement lead to the end of any kind of warranty and liability from our side. Please notice the means of use described in these instructions and print-on on the product itself.

Application and operation of the device must ensue in accordance to general terms of technology.

Please undertake any means to avoid unintended actuation and inappropriate use.

Always take into consideration that pressurised fittings, tubes and systems are not to be opened.

Observe all national and international regulation of relevance.

The solenoid valves are designed for controlling pneumatic actuators with compressed air. The valves are not intended for the use with fluids or gases.

**Installation:**

When taking the product out of the packaging take care that no dirt or other particles are coming into the product.

Only use appropriate fittings that do not cause or lead to any dirt in the system. Only use clean fittings and tubing.

The valve can be installed in any desirable position, preferably upwards.

Install the product in a way that regular cleaning is possible. Do not over-bend the air supplies .

Installation only through educated work-force and under consideration of the relevant operating instructions.

Avoid statical charge of product and attached accessories including tubes and cables. Tubes and bundles of tubing must not have an outer diameter of not more than 20 mm. Connect conductive metal parts together for potential equation and ground the entire system.

For the electrical installation observe the instruction of Nass Magnet GmbH

Close unused ports. Avoid potentially explosive atmosphere inside the valve, pipe exhaust to outside.

Only use the valve with the enclosed coils. Systems for EExM II T4 oder EEx i.A. II T6 (for detailed information please refer to the declaration of conformity) as marked on the valve and on the coil, mixing of components is not allowed.

**Operation:**

Only use cleaned and lubricated or cleaned and unlubricated compressed air quality level 5 following ISO 8573-1. If using lubricated air in an explosive gas atmosphere make sure that it is taken out of this atmosphere by appropriate means. Compressed air must not be drawn from an explosive atmosphere.

The temperature rise of the product is linked to the used media and the temperature rise of the coils.

The temperature of the compressed air must be between -10°C and +50°C. Using the valve below 0°C make sure to use dried air.

The environment where the valve is used has to be in a temperature range between -10° and +50°C, if used below 0°C only use dried air.

Please observe the temperature class printed onto the coil. The valve body generally remains colder than the coils.

Avoid that the valve gets in contact with liquids or corrosive media.

The maximum operating pressure of EEx II 2 G c T4 systems is 10 bar

The maximum operating pressure of EEx II 2 G c T6 systems is 8 bar

Over-pressurising of the valve might lead to function failures.

The minimum operating pressure is 2 bar.

Do not bend the product.

Do not over-bend hoses or cables.

Check the function of the product regularly, minimum every 6 month or after 5 million switches.

**Malfunctioning:**

Check the electrical and pneumatical connections, operating pressure and voltage.

If the problems are not solved by these means make sure the pressure is taken off the system and dismantle the product from the electrical source. Address authorised and educated personnel

**Warnings:**

Repair-work of any means inside the product are only to be made by authorised and educated personnel and with appropriate tools. Any warranty and liability of the manufacturer expires with unauthorised engagement.

Avoid injury!!! The product, especially the coil might be hot during or shortly after operation.

Only use the product in combination with the approved products of Nass-Magnet, the permission expires when other solenoids are used.

Impacts involving rusty or light metal and their alloys might cause sparks. Do not use tools with corroded surfaces and protect product from falling objects.

Dust on hot surfaces are highly inflammable, please clean regularly.

	<b>Declaration of conformity</b>	066/04
	<b>Explosion-proof-directive</b>	english

The company **Hafner Pneumatika Kft.**  
**Püski út 3**  
**H-9228 Halászi Ungarn**

as the sole responsible part hereby declares that under the provision of EC directive 94/9/EU Council directive ... in potentially explosive atmospheres in its current form that the above enlisted products as referred to in this declaration complies with the following standards and normative documents in their valid form:

EN 13463-1:2001 non-electrical equipment in explosion-hazard areas, part 1: Fundamentals and requirements

PrEN 13463-5:2000 non-electrical equipment in explosion-hazard areas, part 5: Protection through safe design

The documents are stored as required by RL94/9/EG Artikel 8(1) bei at: IBExU, Institut für Sicherheitstechnik GmbH Freiberg (Sachsen)





Die valves are marked at the head defining the zone they are to be used in, valve-solenoid-combinations are to be chosen as follows. Other use and combination is not allowed !

	Allowed area / degree of hazard	Mark on valve	Mark on solenoid	Short description of solenoid
EEx m II T4	Zone 1 (G) Gerätekategorie 2 (II2G) Zone 21 (D) Gerätekategorie 2 (II2D)	I2G c T4 -10°C ≤ Ta ≤ 50°C II2G c T5 -10°C ≤ Ta ≤ 50°C	II 2 G EEx m II T4 II 2 D IP65 T130°C	width 22 mm, different voltages, type 1213 (DC) 0513 (AC)
EEx nA II T5	Zone 2 (G) Gerätekategorie 3 (II3G) Zone 22 (D) Gerätekategorie 3 (II3D)	I2G c T4 -10°C ≤ Ta ≤ 50°C II3G c T5 -10°C ≤ Ta ≤ 50°C	II 3 G EEx nA II T5 II 3 D IP65 T95°C	width 30 mm, different voltages, type 0558 50.1-00/5146 (DC) -00/5140 und -00/6395 (AC)
EEx i.A. IIC T6	Zone 1 (G) Gerätekategorie 2	I2G c T6 -10°C ≤ Ta ≤ 50°C	I2G EEx ia IIC T6	width 30 mm 24DC, different voltages, type 1259 30.1-00/5146

Halászi, March 2004

Novák Ernő, General Manager

**Pneumatically actuated valves can be used in gas- and dust-atmosphere of zone 1 (21) and 2 (22).**

Zone	Category	Gasenvironment (G)	Dustenvironment (D)
1/ 21	II	<b>Zone 1:</b>  II2G/D c T6 -10°C ≤ Ta ≤ 50°C	<b>Zone 21:</b>  II2G/D c T6 -10°C ≤ Ta ≤ 50°C
2/ 22	III	<b>Zone 2:</b>  II2G/D c T6 -10°C ≤ Ta ≤ 50°C	<b>Zone 22:</b>  II2G/D c T6 -10°C ≤ Ta ≤ 50°C

**Including Pneumatic Valves**

**One type of valves for different zones!**



The image shows three different models of pneumatic valves. The top two are smaller, compact units labeled P 831 501 and P 810 701. The bottom one is a larger, more complex unit labeled P 810 601. Each valve has a solenoid coil and various ports for pneumatic actuation and process media.



### Operating Instructions

Thanks for choosing a Hafner valve. To assure the function and for your own safety please read the following operating instructions carefully, before installing the product. If there are any further questions, please do not hesitate to contact us:

Phone: 0036 96 210 615

Fax: 0036 96 210 615

Info@hafner-pneumatik.de

#### The operating instructions are valid for the following valve-types:

P 310 501 P 320 501 P 510 501 P 520 501 P 531 501 P 532 501 P 533 501 P 310 701 P 320 701 P 510 701 P 520 701 P 531 701 P 532 701 P 533 701  
P 310 801 P 320 801 P 510 801 P 520 801 P 531 801 P 532 801 P 533 801 P 310 101 P 320 101 P 510 101 P 520 101 P 531 101 P 532 101 P 533 101  
P 310 121 P 320 121 P 510 121 P 520 121 P 531 121 P 532 121 P 533 121  
PN 310 701 PN 510 701 PN 520 701 PN 531 701 PN 310 121 PN 510 121 PN 520 121 PN 531 121

These valves can be used – if they are marked appropriately (please refer to the declaration of conformity) - in potentially explosive atmospheres. Zones and product categories the valves can be used in are defined and explained in the declaration of conformity. Use in other areas as mentioned below is not allowed!

#### In General:

Please notice that not following these instructions or any kind of inappropriate engagement lead to the end of any kind of warranty and liability from our side. Please notice the means of use described in these instructions and print-on on the product itself.

Application and operation of the device must ensue in accordance to general terms of technology.

Please undertake any means to avoid unintended actuation and inappropriate use.

Always take into consideration that pressurised fittings, tubes and systems are not to be opened.

Observe all national and international regulation of relevance.

The valves are designed for controlling pneumatic actuators with compressed air. The valves are not intended for the use with fluids or gases.

#### Installation:

When taking the product out of the packaging take care that no dirt or other particles are coming into the product.

Only use appropriate fittings that do not cause or lead to any dirt in the system. Only use clean fittings and tubing.

The valve can be installed in any desirable position.

Install the product in a way that regular cleaning is possible. Do not over-bend the air supplies.

Installation only through educated work-force and under consideration of the relevant operating instructions.

Avoid static charge of product and attached accessories including tubes and cables. Tubes and bundles of tubing must not have an outer diameter of not more than 20 mm.

Connect conductive metal parts together for potential equation and ground the entire system.

Close unused ports. Avoid potentially explosive atmosphere inside the valve, pipe exhaust out of explosion hazardous environment.

#### Operation:

Only use cleaned and lubricated or cleaned and unlubricated compressed air quality level 5 following ISO 8573-1. If using lubricated air in an explosive gas atmosphere make sure that it is taken out of this atmosphere by appropriate means. Compressed air must not be drawn from an explosive atmosphere.

The temperature rise of the product is linked to the temperature of the used media.

The temperature of the compressed air must be between -10°C and +50°C. Using the valve below 0°C make sure to use dried air.

The environment where the valve is used has to be in a temperature range between -10° and +50°C, if used below 0°C only use dried air.

Please observe the temperature class printed on the product.

Avoid that the valve gets in contact with liquids or corrosive media.

The maximum operating pressure is 10 bar.

Over-pressurising of the valve might lead to function failures.

The minimum operating pressure is 2 bar.

Do not bend the product.

Do not over-bend hoses.

Check the function of the product regularly, minimum every 6 month or after 5 million switches.

#### Malfunctioning:

Check the pneumatical connections, actuation and operating pressure.

If the problems are not solved by these means make sure the pressure is taken off the system and dismantle the product from the pneumatic source. Address authorised and educated personnel.

#### Warnings:

Repair-work of any means inside the product are only to be made by authorised and educated personnel and with appropriate tools. Any warranty and liability of the manufacturer expires with unauthorised engagement.

Avoid injury!!! The product might be warm during of shortly after operation.

Impacts involving rusty or light metal and their alloys might cause sparks. Do not use tools with corroded surfaces and protect product from falling objects.

Dust on hot surfaces are highly inflammable, please clean regularly.

	<b>Declaration of conformity</b>	066/04
	<b>Explosion-proof-directive</b>	english

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The documents are stored as required by RL94/9/EG Artikel 8(1)bii at: IBExU, Institut für Sicherheitstechnik GmbH Freiberg (Sachsen)

Die valves are marked at the head defining the zone they are to be used in:

The valves are marked:



Use is possible in the following zones:

zone 1 (G) Gerätekategorie 2 (II2G)  
zone 21 (D) Gerätekategorie 2 (II2D)  
zone 2 (G) Gerätekategorie 3 (II3G)  
zone 22 (D) Gerätekategorie 3 (II3D)

Halászi, November 2006

Novák Ernő, General Manager

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