

# Valves

## for explosion hazardous environment

With HAFNER you have a partner with many years of experience in the field of explosion-proof products. Benefit from our extensive product range and numerous special solutions. With our selection guide for solenoid valves, you can quickly and easily find the right HAFNER Ex-valve for your application.

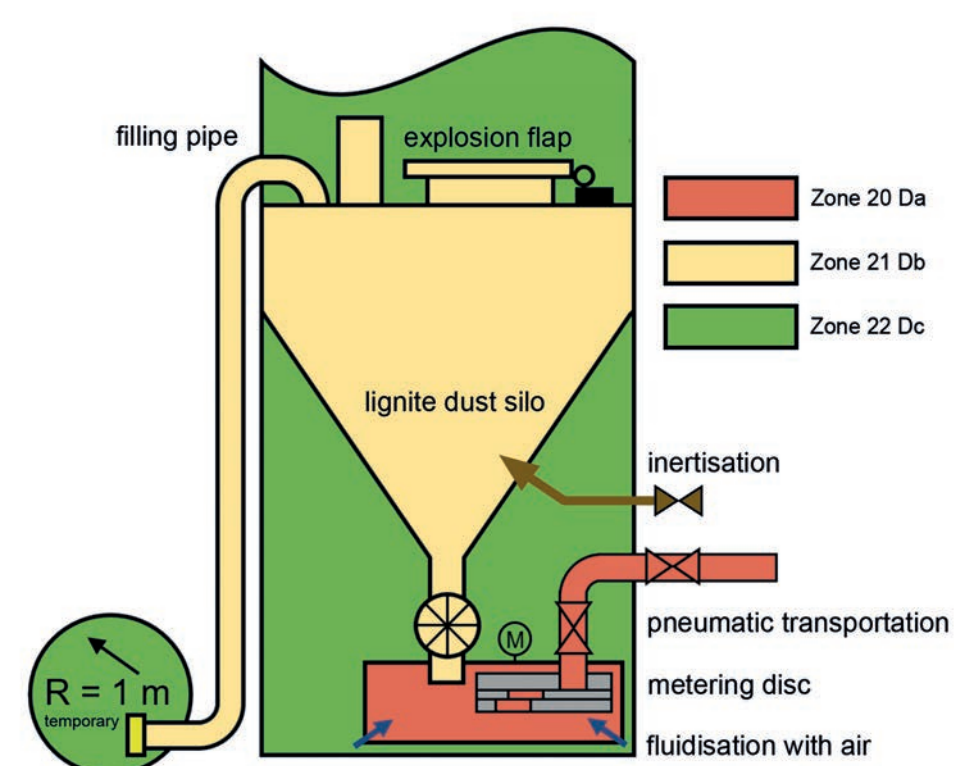
HAFNER

### Example marking of an Ex-product

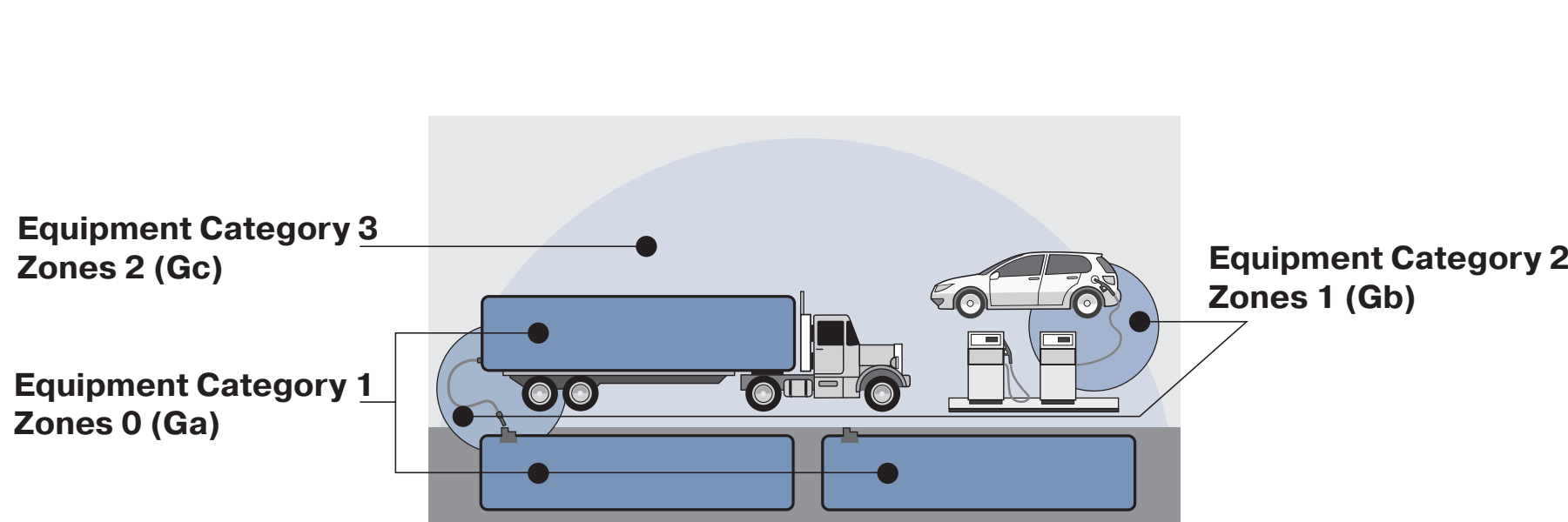
CE Ex II	2G / 2D	Ex m	IIC / IIIC	T6	Gb / Db						
Product group	Category / Zones	Ignition protection	Explosion group	Temperature class	Protection Level						
Group	Category	Zone	Type	HAFNER Typnr.	Product Labeling	Dust	Class	Temperature range of the mix	Max. surface temperature	Zone	
I Products for mining applications. Not part of HAFNER product range.	1 Very high level of protection and very high level of safety. Not part of HAFNER product range.	0 (Ga) 20 (Da)	Increased safety	e	ec	ec	IIC: Conductive dust IIIB: Non-conductive dust IIIA: Combustible lint	T1	≥ 450°C	450°C	Ga, Gb and Gc for gases Da, Db and Dc for dusts
			Intrinsically safe	i	ia	ia*		T2	≥ 300 - 450°C	300°C	
			Encapsulation	m	m	mb		T3	≥ 200 - 300°C	200°C	
II All other products for explosion hazardous environment.	2 High level of protection and therefore a high level of safety.	1 (Gb) 21 (Db)	Increased safety / Encapsulation	e m	e mb	e mb	Typical gas IIC: Hydrogen IIIB: Ethylene IIA: Propane	T4	≥ 135 - 200°C	135°C	Equipment Protection Level (EPL) according to IEC 60079. Specification similar to zones according to 2014/34/EU (ATEX).
			Encapsulation / Flameproof	d m	dm	db mb		T5	≥ 100 - 135°C	100°C	
	3 Normal level of protection and therefore increased level of safety.	2 (Gc) 22 (Dc)	Flameproof	d	d	db		T6	≥ 85 - 100°C	85°C	
			Protection by housing (only dust)	t	t	tb		Flammable gases and vapours are classified into temperature classes according to their inflammability. The maximum surface temperature of electrical equipment must always be lower than the ignition temperature of the gas/air or vapour/air mixture in which it is used.			
Measured [hours/year] in which there is a risk of explosion.		Constructional safety (non-electrical devices)		h	h	Gases and dust-gas mixtures have different ignition capabilities. These are differentiated groups IIA, IIB and IIC, according to IEC 60079-1A and IEC 60079-3. The danger increases from group A to C.			Equipment of a higher temperature class (e.g. T6) can therefore also be used for lower temperature classes (T1-T5).		
Equipment categories according to EU Directive 2014/34/EU (ATEX): • Zones 0, 1 and 2 for gases • Zones 20, 21 and 22 for dusts		These are exemplary ignition protection types in pneumatics. The letter after the ignition protection type indicates in which zone the product can be used. a = zone 0, 20, 1, 21, 2, 22    b = zone 1, 21, 2, 22    c = zone 2, 22 Example: „ec“ = limited to zone 2 and 22. *Please note that the electrical interface of the HAFNER Ex ia 1.6 watts coil is designed for „ia“, but is restricted by the manufacturer to zone 1, 2, 21 and 22.		Consequently, products classified IIC/IIIC can also be used in IIB/IIIB and IIA/IIIA.			„Ta“ on non-electric valves stand for „ambient temperature“ and indicate the temperature the valve can be used in (for example -10 °C ≤ Ta ≤ +50 °C).				

Stands for special conditions

### Example dust atmosphere



### Example gas atmosphere



The marking of electrical and non-electrical equipment has the same structure. A distinction is only made in the type of ignition protection.

Many HAFNER valves are available with SIL3 certificate, for low temperature and in stainless steel.

Electrical part: solenoid coil and operator system

Non-electrical part: valve body



### Overview of the HAFNER Ex-range

Ex	Non-electric Valves		Electric Valves (Solenoid Valves)						
	Ignition protection								
	h	Ex ec	Ex ia 1.6W	Ex ia 0.7W	Ex m	Ex e mb	Ex dm	Ex d	Ex m CSA/FM
	Constructional safety	Increased safety	Intrinsically safe	Intrinsically safe	Encapsulation	Increased safety / encapsulation	Encapsulation / flameproof	Flameproof	Encapsulation
Approval / Certificate	ATEX	✓	✓	✓	✓	✓	✓	✓	-
	IECEX	-	-	✓	✓	✓	-	✓	-
	CSA/FM	-	-	-	-	-	-	-	✓
	UKCA	-	✓	-	-	-	-	-	-
	CCC	-	-	on request	-	-	-	on request	-
Zone	1 (Gb)	-	✓	✓	✓	✓	✓	✓	✓
	21 (Db)	-	✓	✓	✓	✓	✓	✓	✓
	2 (Gc)	✓	✓	✓	✓	✓	✓	✓	✓
	22 (Dc)	✓	✓	✓	✓	✓	✓	✓	✓
Category	3G/D	2G/D	3G/D	2G/D	2G/D	2G/D	2G/D	2G/D	-
Temperature class	T6 (includes T1-T5)	T6 (includes T1-T5)	T6 (includes T1-T5)	T6 (includes T1-T5)	T4 (includes T1-T3)	T6 (includes T1-T5)	T5 (includes T1-T4)	T6 (includes T1-T5)	T4 (includes T1-T3)
Explosion group	IIC and IIIC	IIC and IIIC	IIC and IIIC	IIC and IIIC	IIC and IIIC	IIC and IIIC	IIC and IIIC	IIC and IIIC	IIC and IIIC
Product Group	II (not included)	II (not included)	II (not included)	II (not included)	II (not included)	II (not included)	II (not included)	II (not included)	II (not included)
Temperature ranges	-50°C - +50°C (higher on request)	-10°C - +50°C	-40°C - +50°C	-10°C - +50°C	-20°C - +50°C	-40°C - +50°C	-20°C - +50°C	-40°C - +50°C	-20°C - +60°C
Electrical connection	-	Plug for 6 - 8 mm cable excl. connector	Plug for 6 - 8 mm cable incl. connector	Plug for 3.5 - 6 mm cable incl. connector	Encapsulated cable 3 metre standard (other lengths on request)	Junction box M20x1.5 Plug for 6 - 13 mm	Junction box M20x1.5 Plug for 6 - 8 mm	Junction box M20x1.5 or 1/2" NPT Cable gland not included	Conduit 1/2" NPT 60 cm strands
IP protection class	-	IP 65	IP 65	IP 65	IP 65	IP 65 (IP 67 optional)	IP 66	IP 67	IP 65
Power consumption	-	3.0 Watts (24DC) 5 VA (24AC, 110AC, 230AC)	1.6 Watts (24DC)	0.7 Watts (24DC)	5.0 Watts (24DC) 4.6 VA (24AC) / 4.5 VA (110AC) 5.1 VA (230 AC)	4.8 Watts (24, 110, 230) same coil for DC and AC	3.0 Watts (12DC, 24DC) 4.8 VA (24AC, 110AC, 230AC)	2.0 Watts (24DC) 3.0 VA (110AC, 230AC)	4.5 Watts (12DC) / 4.6 Watts (24DC) 6.8 VA (110AC) / 7.7 VA (220AC, 240AC)

### Selection guide - Find your HAFNER Ex-system

