KITO®
Armaturen GmbH

Applications for KITO® products





WWW.KITO.DE

KITO Armaturen GmbH

QUALITY · PROTECTION · SAFETY

As a future-oriented company with a long tradition, we leverage our extensive experience spanning over 90 years to enhance the protection and security of businesses.

As a certified manufacturer of flame arresters and safety fittings, KITO® adheres to a quality assurance system in accordance with DIN EN ISO 9001:2015 and DIN EN ISO 14001:2015. Our standard products, as well as customized solutions for customers, undergo rigorous testing, and their conformity is declared in alignment with current guidelines.

On the following pages, you will discover a comprehensive overview of the potential applications for our valves. Our focus extends beyond safeguarding and ensuring the safety of your process plants; we also prioritize ease of valve maintenance and strive to minimize product losses and emissions through an optimal application approach.

We will be happy to work with you to find the right solution for you!

MADE IN GERMANY

Explosion protection for the process industry

Green handling of hydrogen: Ensuring safety requirements for explosion and overpressure protection

KITO® - Explosion protection concepts for agricultural biogas plants

KITO® - Spring-loaded valves User-friendly valves for applications with set pressures up to 450 mbar

Special accessories for KITO® products

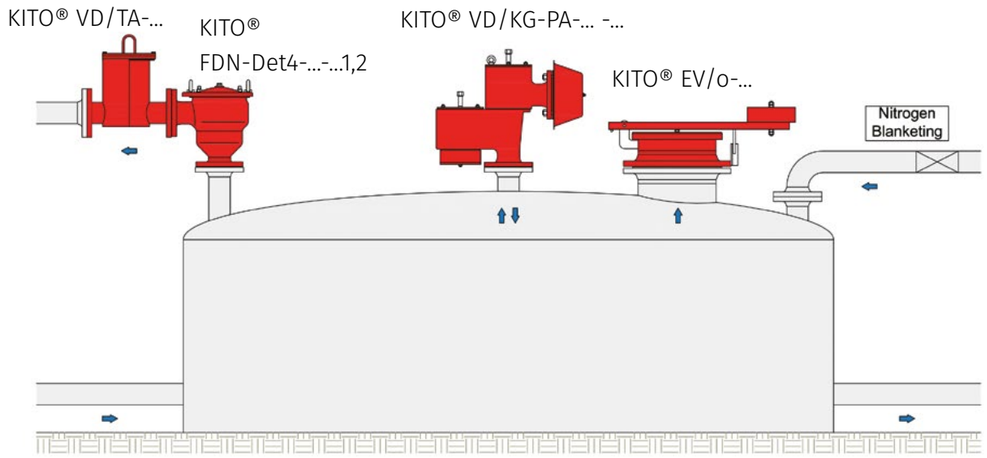
Corrosion-resistant solutions for difficult process conditions

Explosion protection for the process industry

When planning industrial plants in the process industry, managing risks associated with flammable substances is essential. The handling, storage, and transportation of these flammable liquids, as well as the treatment of the vapors they release, require extremely reliable and efficient solutions to protect personnel and equipment.

A fundamental approach to reducing such risks is to prevent the formation of flammable mixtures of flammable vapors/gases and air. However, there are situations in which it is not possible to prevent the formation of such mixtures. In such cases, it becomes necessary to prevent the ignition of these explosive mixtures. Ignition sources, such as lightning strikes or electrical discharges, can occur at any time. This means that constructive explosion protection measures, such as flame arresters, are required wherever a hazardous explosive atmosphere is present, and its ignition cannot be safely prevented.

Flame arresters are devices that allow gas or liquid to pass through but stop the flame to prevent a major fire or explosion.



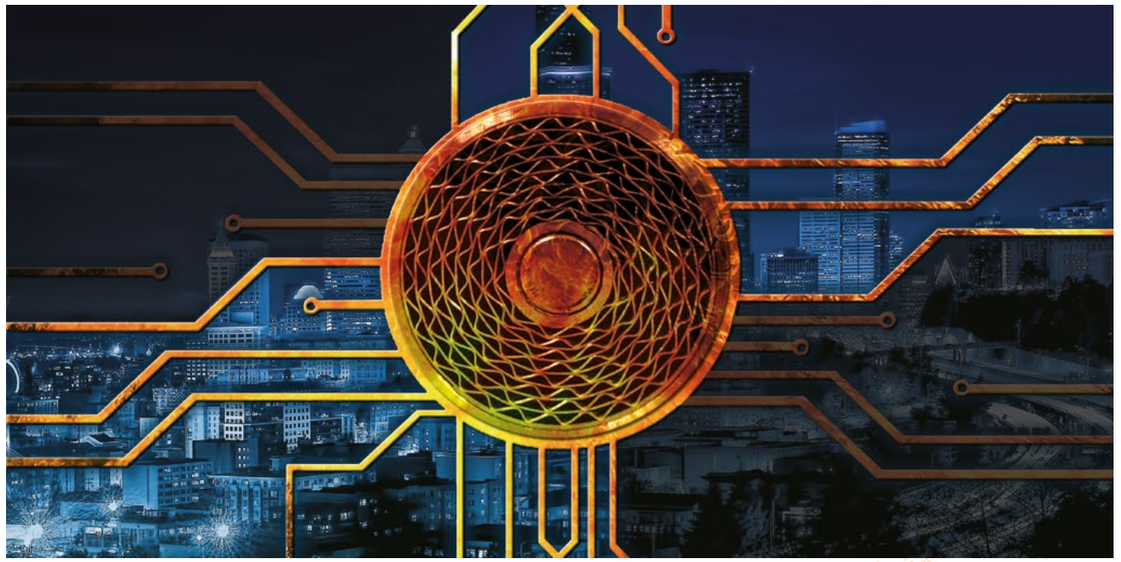
This crucial protective function enhances safety in industrial process areas and plays an essential role in fire containment and explosion prevention. The flame extinguishing principle is employed within a narrow gap in nearly all KITO® flame arresters.

Flame arresters also serve a vital purpose in safeguarding storage tanks filled with flammable liquids (required for flash points below 60 °C or 140 °F, as per ISO 28300/API 2000). They facilitate safe ventilation and venting, preventing flashback from the atmosphere or connected piping systems.

When flammable gases or vapors escape into the atmosphere, overpressure and vacuum valves equipped with integrated flame arresters come into play. These valves serve to minimize emissions and prevent product losses. All KITO® flame arresters are approved in accordance with the ISO 16852 standard for specific combustion processes and various explosion groups, both under atmospheric conditions and beyond.

Regarding storage tanks for liquids, they feature openings that allow compensation for excess or negative pressure—such as during filling or emptying—as well as thermal effects. Additionally,

in cases involving toxic, odorous, and flammable product vapors, valves are increasingly used to maintain a closed system during operation.



When storing flammable liquids that can form explosive mixtures, KITO® recommends using a pressure and vacuum relief valve with an integrated flame arrester.

One example is the deflagration proof pressure/vacuum relief valve, KITO® VD/KG-PA-IIB3. This valve is tested and approved for atmospheric deflagrations and for products in explosion group IIB3. For emergency venting scenarios, such as an external fire, KITO® recommends using an emergency venting valve, type EV/o. A detonation flame arrester, like the KITO® type FDN, protects against possible flashback caused by an ignition source from a pipe system, such as an exhaust pipe.

In the case of nitrogen overlay, additional pressure maintenance in the flue gas pipe is advisable. The KITO® VD/TG pressure and vacuum relief valve is recommended for this purpose.

Product overview

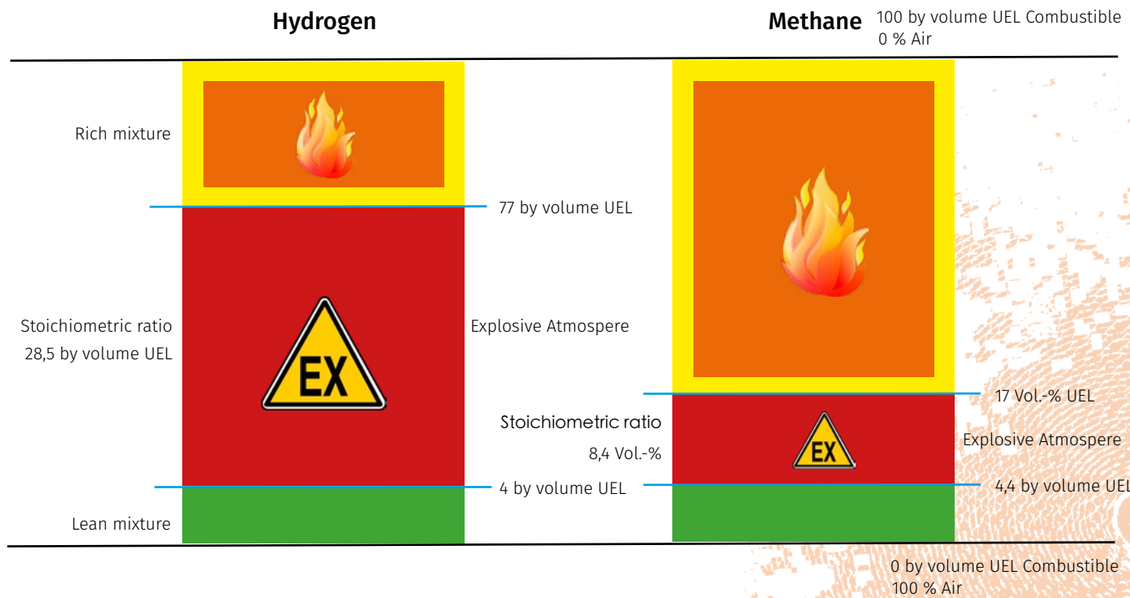
Model	VD/TG	VD/KG-PA-IIB3*	FDN	VH-IIB3	EV/o
	in line pressure and vacuum valve	Pressure and vacuum relief valve, deflagration proof	Detonation flame arrester, short-time burning proof	Ventilation hood deflagration proof	Pressure relief valve (emergency venting)
Application	Non-flammable vapor/air or gas/air mixtures	Vapor/air or gas/air mixtures Explosion groups IIA1, IIA, IIB1, IIB3	Vapor/air or gas/air mixtures Explosion groups IIA1, IIA, IIB1, IIB3	Vapor/air or gas/air mixtures Explosion groups IIA1, IIA, IIB1, IIB3	Non-flammable vapor/air or gas/air mixtures
Nominal diameter	DN 25 (1“) to DN 150 (6“) DIN or ASME	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 25 (1“) to DN 100 (4“) DIN or ASME	DN 50 (2“) to DN 800 (32“) DIN and ASME	DN 100 (4“) to DN 600 (24“) DIN and ASME
Material	steel, stainless steel 1.4571	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619 (from DN 350 steel), cast stainless steel 1.4408 (from DN 350; 1.4571)	steel, stainless steel 1.4301
Operating conditions	P: 1,7 to 200 mbar V: 1,7 to 148 mbar	P: 2 to 60 mbar V: 2 to 60 mbar	1.2 bar. abs, 60 °C	180 °C	P: 5 to 100 mbar
Accessories	Proximity switch, electrical trace heating	Proximity switch, Electrical heating sleeve	Electrical Heating Sleeve, Temperature sensor	Electrical trace heating	Proximity switch

Green use of hydrogen: Ensuring the safety requirements for explosion and overpressure protection

Hydrogen, the oldest, lightest, and most abundant element in the universe, is proving to be a key clean energy source when harnessed through renewable methods (power-to-gas). Its potential to replace fossil fuels in industries such as steel, cement, and petrochemicals, as well as its applications in shipping, aviation, and the automotive sector, make it a key factor in reducing carbon dioxide emissions.

Due to its high flammability in air (4 to 77% by volume) and its remarkably low minimum ignition energy (0.017 mJ), the safe handling of hydrogen is a major challenge. To avoid explosive mixtures, it is essential that air or oxygen be mixed with hydrogen in closed or insufficiently ventilated rooms. The following figure compares the safety characteristics of hydrogen and methane. The wide range of flammability of hydrogen makes it difficult to handle in the various processes in which hydrogen is produced, transported, and stored.

The standard gap width, also known as MESG (Maximum Experimental Safe Gap), is a decisive safety-related parameter for classifying products into device groups in accordance with IEC/TC 31. The standard gap width is determined under laboratory conditions according to the method DIN EN ISO/IEC 80079-20-01, 2020:090079-1, whereby the flame transmission capacity of the product is evaluated. Hydrogen, a highly reactive gas, has an MESG of 0.29 mm and is therefore assigned to explosion group IIC. In comparison, methane has a corresponding MESG of 1.14 mm and is therefore assigned to explosion group IIA1.



When introducing green hydrogen into the existing natural gas supply network, it is essential to check the current protective measures. The addition of hydrogen to natural gas affects the flame speed and the reactivity of the hydrogen/natural gas mixture.

For various combustion processes, explosion groups, and operating conditions (P, T), protective systems such as flame arresters play a decisive role. Flame arresters are specially designed to prevent flame transmission while allowing the flow of gases and liquids. These protection systems undergo testing and certification in accordance with the international standard EN ISO 16852. When integrating water into an existing system, it is essential to assess the operating conditions and ensure safety.

For example, if 25% by volume of hydrogen is added to natural gas, the Minimum Explosive Concentration (MESG) of the mixture changes to 0.96 mm, which still corresponds to explosion group IIA. If flame arresters approved for explosion group IIA1 are already installed for natural gas applications, they must be replaced by approved flame arresters for explosion group IIA.

When producing green hydrogen with electrolyzers, it is important to analyze how oxygen and hydrogen are released into the atmosphere during commissioning, maintenance, and emergency venting. Monitoring the trace concentration of hydrogen in the oxygen vent line is critical, as exceeding 4% by volume can lead to an explosive mixture. Figure 1 shows a deflagration proof venting hood as an end fitting, which would be installed at the end of the oxygen gas discharge line. Figure 2 illustrates a detonation flame arrester installed in a piping system.

If the oxygen and water deaeration lines operate at higher pressures due to the electrolysis process, pressure relief valves must be used. The setting pressure for these valves can vary depending on the technical design of the electrolyzer.

Normal spring-loaded pressure relief valves are suitable for achieving the required setting pressures. Additionally, these valves can be equipped with proximity switches to ensure real-time monitoring of the valve disc position during operation.

Figure 3 depicts a KITO® VD/Sc-1 pressure or vacuum relief valve with a proximity switch. The corresponding sectional drawing, illustrating its connection and position, is presented in Figure 4.

Fig.. 1: KITO® VH...

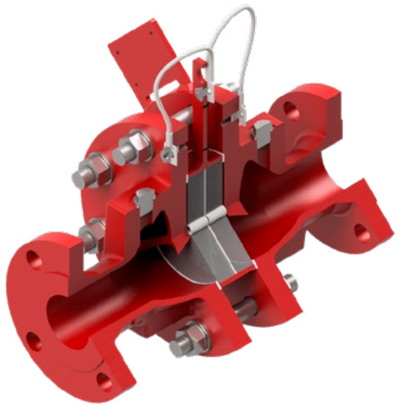


Fig. 2: KITO® EFA...-Det4-IIC P1,2

Fig. 3: KITO® VD/Sc-1

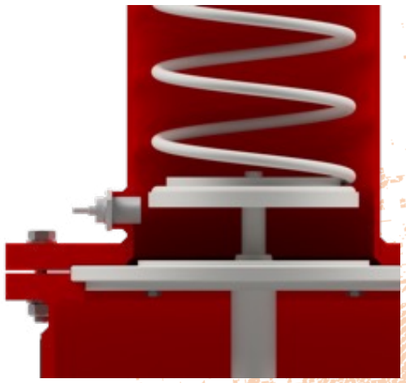
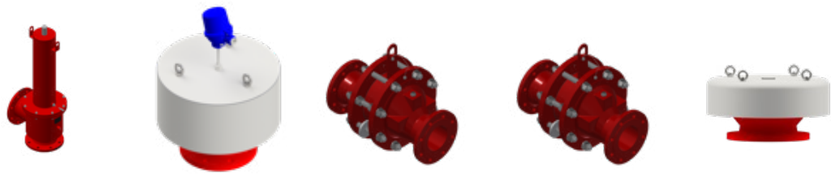


Fig. 4: Sectional drawing of an in line pressure or vacuum valve with proximity switch

Product overview



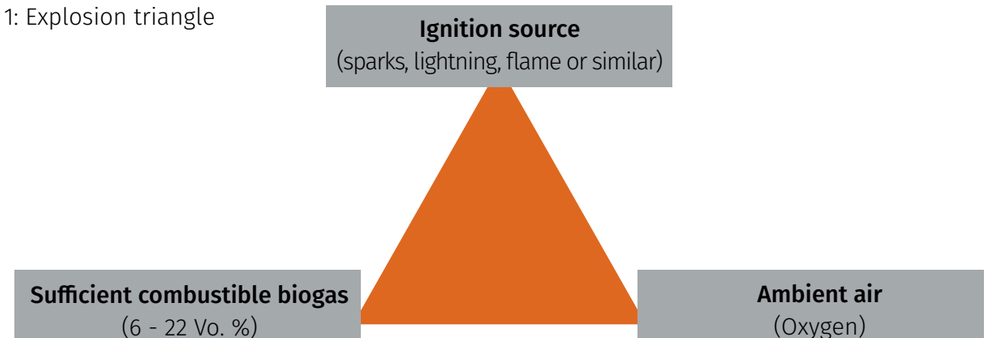
Model	VD/Sc-1	VH-IIC-T	EFA-Def0*	EFA-Det4*	VH-IIC
	In line pressure- or vacuum relief valve	Ventilation hood deflagration-, short-time burning proof	Deflagration flame arrester, short-time burning proof	Detonation flame arrester, short-time burning proof	Ventilation hood deflagration proof
Application	Non-flammable vapor/air or gas/air mixtures	Vapor/air or gas/air mixture Explosion groups IIA1, IIA, IIB1, IIB3, IIC	Vapor/air or gas/air mixture Explosion groups IIA1, IIA, IIB1, IIB3, IIC	Vapor/air or gas/air mixture Explosion groups IIA1, IIA, IIB1, IIB3, IIC	Vapor/air or gas/air mixture Explosion groups IIA1, IIA, IIB1, IIB3, IIC
Nominal diameter	DN 25 (1“) to DN 200 (8“) DIN or ASME	DN 50 (2“) to DN 800 (32“) DIN or ASME	DN 25 (1“) to DN 400 (16“) DIN or ASME	DN 25 (1“) to DN 400 (16“) DIN or ASME	DN 50 (2“) to DN 800 (32“) DIN or ASME
Material	steel and stainless steel 1.4571	cast steel 1.0619 (from DN 350 steel), cast stainless steel 1.4408 (from DN 350 1.4571)	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619 (from DN 350 steel), cast stainless steel 1.4408 (from DN 350 1.4571)
Operating conditions	P: 100 to 350 mbar V: 100 bis 350 mbar	60 °C	1.2, 1.6, 2.5 or 6.0 bar abs / 60, 100 or 160 °C	1.2, 2.5 oder 3.0 bar abs 60, 100, 160 or 250°C	60 °C
Accessories	Electrical Heating Sleeve	Eletrical trace heating	Electrical Heating Sleeve, temperature sensor, di . pressure-measuring system	Electrical Heating Sleeve, temperature sensor, di . pressure-measuring system	Electrical trace heating

KITO® - Explosion protection concepts for agricultural biogas plants

Biogas plants play a decisive role in the production of biogas or biomethane through the fermentation of biomass. These plants are important producers of electricity and heat from renewable energies.

Biogas, mainly consisting of methane and carbon dioxide, forms a gas mixture with water vapor and various trace gases, including the combustible gas hydrogen sulfide. The composition varies between 50 - 75 vol. % methane and 25 - 45 vol. % carbon dioxide depending on the input gas and production process. Biogas can form explosive mixtures when mixed with air, where an explosive mixture occurs between 6% by volume (LEL) and approximately 22% by volume (OEL). The explosion triangle, as shown in Fig. 1, is used for safety analysis.

Fig. 1: Explosion triangle



To prevent explosions, certain components must be removed or controlled by suitable measures. If the formation of an explosive mixture cannot be safely prevented, protective systems such as flame arresters should be used to reduce the spread of the explosion to a safe level.

In accordance with ATEX Directive 99/92 EC, potentially explosive atmospheres are divided into hazardous areas. The hazardous areas indicates the probability of an explosive atmosphere occurring. A distinction is made between zones for flammable gases (zones 0, 1, 2), where in zone 0, the explosive atmosphere occurs constantly, over long periods or frequently; in zone 1, it occurs occasionally during normal operation; and in zone 2, it normally does not occur or only for a short time.

The continuously operated digesters in agricultural biogas plants are classified as Zone 1 according to the Commission for Plant Safety (KAS - 12). Certain operating conditions, such as commissioning, startup, shutdown, repair, and cleaning work, can cause explosive atmospheres in accordance with hazardous zones 0 or 1. KITO® recommends classifying the fermenter in zone 1 due to the lack of inertization during commissioning, and the air supply during startup, shutdown processes, and repair work.

Pressure and vacuum relief valves on the tank must be designed to be flameproof and meet the requirements of standard EN ISO 16852 or EU Directive 2014/34/EU.

In the case of gas desulphurization, the formation of an explosive atmosphere should be investigated separately for the different desulphurization processes. Protective measures to prevent an explosion must be in place if the addition of air can create an explosive atmosphere. Biogas also tends to corrode strongly due to the moisture present in connection with hydrogen sulfide and other impurities. It is very important to carefully monitor the conditions in the biogas plant and use suitable materials to extend the service life of the plant components and ensure safety. Regular inspections and maintenance measures are recommended. Protection against operational ignition sources such as the emergency flare system, gas engines, and the CHP is provided by deflagration flame arresters. These should be tested in accordance with the EN ISO 16852 standards and installed considering the maximum permissible L/D ratio (L= distance from the ignition source to the installation location of the deflagration flame arrester, D= diameter of the pipe). The maximum permissible L/D ratio can be found in the operating instructions.

Figure 2 shows an example of the protection of an agricultural biogas plant. The KITO® fittings for use in agricultural biogas plants are listed below in accordance with Figure 2.

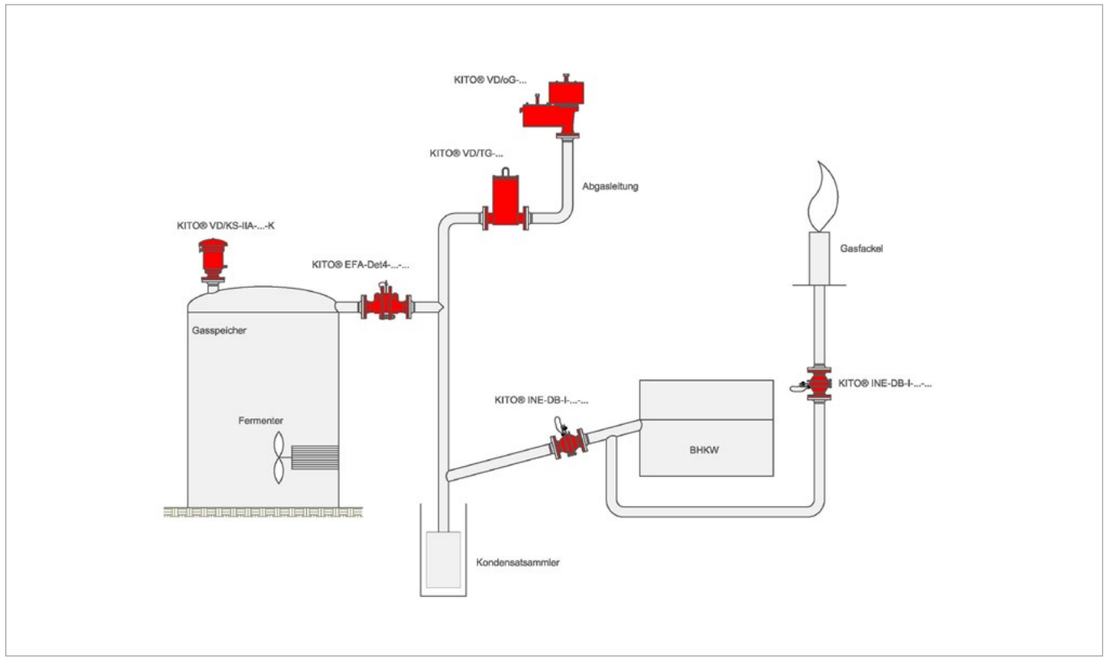


Fig. 2: Exemplary protection concept for an agricultural biogas plant

Product overview

Model	VD/oG	EFA-Def0*	VD/KG-PA-IIB3	INE-I	VD/TG
	Pressure and vacuum relief valve	Deflagration flame arrester, short-time burning proof	Pressure and vacuum relief valve, deflagration proof	Deflagration flame arrester, short-time burning proof	In line pressure and vacuum valve
Application	Non-flammable vapor/air or gas/air mixtures	Vapor/air or gas/air mixture Explosion groups IIA1, IIA, IIB1, IIB3, IIC	Vapor/air or gas/air mixtures Explosion groups IIA1, IIA, IIB1, IIB3	Vapor/air or gas/air mixtures Explosion group IIA1	Non-flammable vapor/air or gas/air mixtures
Nominal diameter	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 25 (1“) to DN 400 (16“) DIN or ASME	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 25 (1“) to DN 150 (6“) DIN or ASME
Material	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619, cast stainless steel 1.4408	steel and stainless steel 1.4571
Operating conditions	P: 2 to 60 mbar V: 2 to 60 mbar	1.2, 1.6, 2.5, or 6.0 bar abs 60, 100 or 160 °C	P: 2 to 60 mbar V: 2 to 60 mbar	1.2 bar abs 60 °C	P: 1,7 to 200 mbar V: 1,7 to 148 mbar
Accessories	Proximity switch, Electrical Heating Sleeve	Electrical Heating Sleeve, temperature sensor, di .pressure-measuring system	Proximity switch, Electrical heating sleeve	Electrical Heating Sleeve temperature sensor,	Electrical trace heating, Heating jacket

ITO® - Spring-loaded valves User-friendly valves for applications with set pressures up to 450 mbar

KITO® pressure and vacuum relief valves are generally used to prevent impermissible pressure and vacuum in closed systems. These valves protect storage tanks containing liquids or gas pipe systems. Pressure and vacuum can build up during the filling or emptying process, as well as due to thermal effects in changing weather conditions. KITO® valves are known for their high tightness, which exceeds the leakage rate requirements of API 2000 and ISO 28300, enabling a reduction in vapor emissions.

The aim of KITO® valves is to minimize product losses and emissions. Depending on the required pressure settings, the valve discs for KITO® overpressure and vacuum valves are either weight-loaded or spring-loaded. Additionally, KITO® valves can be configured with different valve seals to ensure a low leakage rate between the valve seat and valve disk across various pressure ranges, surpassing the leakage rate requirements of API 2000 and ISO 28300.

In many process industries, the need for protection against impermissible pressure can arise in special applications where conventional weight-loaded valves cannot cover the operating conditions. For such demanding scenarios, KITO® offers a range of spring-loaded valves, including deflagration proof and endurance burning proof versions. The standard cartridge design of the spring-loaded

KITO® valves ensures that the setting pressure (spring tension) does not need to be readjusted on a test bench after disassembly, which reduces maintenance time and operating costs. Additionally, the valve seat and valve disk of spring-loaded valves can be inspected on-site or on the tank for smaller or medium nominal sizes.

The application limits regarding the set pressure vary for the spring-loaded KITO® valves, depending on size and type, up to a maximum setting value of 450 mbar.

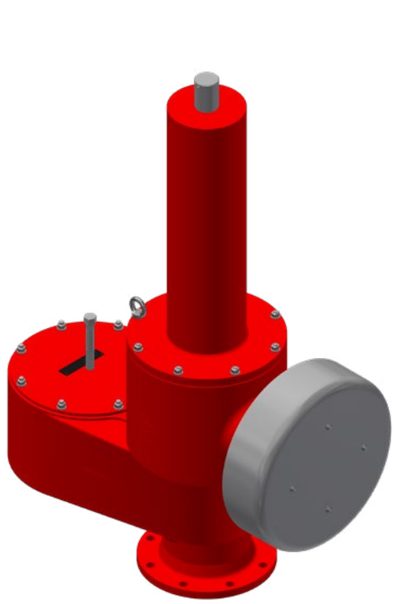
Advantages of spring-loaded KITO® valves:

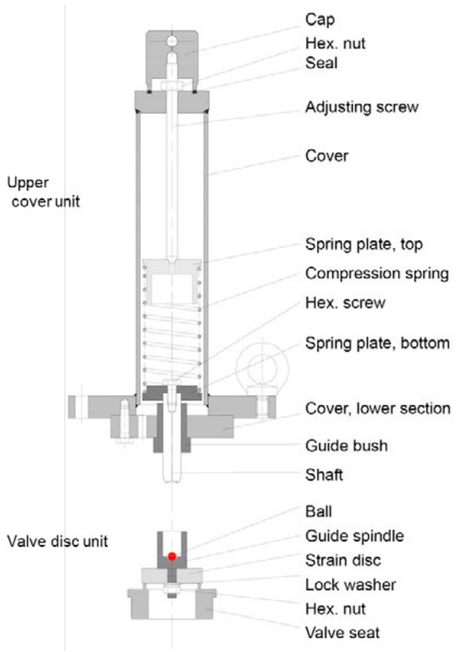
User-friendly maintenance: The cartridge design largely eliminates the need for further adjustment of the setting pressure, saving time and reducing operating costs.

Safety: With deflagration proof and endurance burning proof designs, KITO® valves offer reliable protection against explosions, impermissible pressure and/or vacuum, as well as unwanted gas losses or impermissible emissions.

Customization: For special requirements, the KITO® team offers tailor-made solutions that meet specific needs.

KITO® spring-loaded valves provide reliable and efficient protection against pressure and/or vacuum in a wide range of industries and applications, ensuring safe operation in critical processes. For special requirements, please contact the KITO® team.





Product overview

Model	VD/TG-1	DS/oG-PA-DR	VD/KG-PA-IIB3-DE	VD/KS-1	VD/Sc-1
	In line pressure- and vacuum relief valve	In line pressure relief valve	Pressure and vacuum relief valve, deflagration proof	Pressure relief valve, deflagration/ endurance burning proof	In line pressure and vacuum relief valve
Application	Non-flammable vapor/air or gas/air mixtures	Non-flammable vapor/air or gas/air mixtures	Vapor/air or gas/air mixtures Explosion groups IIA1, IIA, IIB1, IIB3	Vapor/air or gas/air mixtures Explosion group IIA	Non-flammable vapor/air or gas/air mixtures
Nominal diameter	DN 25 (1“) to DN 150 (6“) DIN or ASME	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 50 (2“) to DN 100 (4“) DIN or ASME	DN 25 (1“) to DN 200 (8“) DIN or ASME
Material	steel and stainless steel 1.4571	cast steel 1.0619, cast stainless steel 1.4408	cast steel 1.0619, cast stainless steel 1.4408	steel and stainless steel 1.4571	steel and stainless steel 1.4571
Operating conditions	P: 150 to 350 mbar V: 6 to 158 mbar	P: > 60 to 415 mbar V: 2 to 60 mbar	P: > 60 to 415 mbar V: 2 to 60 mbar	P: > 200 to 350 mbar V: 3 to 100 mbar	P: 100 to 350 mbar V: 100 -350 mbar
Accessories	Proximity switch, Electrical Heating Sleeve	Proximity switch, Electrical Heating Sleeve	Proximity switch, Electrical Heating Sleeve	Proximity switch, Electrical Heating Sleeve	Proximity switch, Electrical Heating Sleeve

Special accessories for KITO® products

KITO® products have been produced in Braunschweig for over 100 years. We specialize in protection systems. In addition to flame arresters, the product portfolio also includes ventilation hoods, vent valves with and without integrated flame arresters, plastic valves, pressure and vacuum relief valves for portable tanks, and sampling devices. Additionally, these devices can be supplemented with heating jackets, electrical trace heating, condensate drainage safety devices, proximity switches, difference transmitters, and temperature sensors for the respective application.

The following accessories are available for KITO® products:

1. Temperature sensor for temperature monitoring on the flame arrester

If the safety assessment determines that a short-time burning with a burning time of more than one minute or a continuous fire may occur, the following must be carried out: A temperature sensor can be used to detect possible fires. The temperature sensor should be attached to the unprotected side of the flame arrester where the flame is likely to occur or where the ignition source is present. Another important factor is the reaction time of the temperature sensor.

The temperature sensors must be integrated into the plant‘s process control system so that countermeasures can be initiated automatically when a critical temperature rise is detected by the sensor. According to the standard, the temperature sensor has a time window of 0.5 times the burning time of the flame arrester, in this case, 30 seconds, to emit a signal. The trigger temperature should be set as low as possible, according to the recommendation of the Physikalisch Technische Bundesanstalt (PTB) ≤ 80 °C or 20K above the maximum operating temperature.

2. Differential pressure measuring system for monitoring the degree of fouling in the flame arrester

Contamination and subsequent clogging of the flame arrester are possible causes of failure, leading to increased pressure loss. Pressure sensors are fitted on both sides of each half of the housing, both before and after the actual flame arrester. During installation, the pressureloss is measured under clean conditions. If the pressure loss subsequently increases due to contamination, the increase in pressure drop is detected and recorded by the differential pressure measurement. A maximum pressure drop must be set by the operator. As soon as this limit value is reached, the flame arrester should be cleaned to ensure proper function and safety.

3. 3. Proximity switches for monitoring valves

Valves can fail due to various factors, such as mechanical problems with components, damaged valve discs and seats, and flutter. Flutter is the rapid, repeated opening and closing of a valve due to fluctuating operating pressure or flow conditions. The correct valve design, dimensioning, control, and installation location are crucial to avoid fluttering and ensure smooth operation.

Other causes of failure include valves that do not open due to pressure surges or improper commissioning, as well as heavy soiling that prevents proper closing. To solve these problems, proximity switches can be used to monitor the valve pallet position in real-time, providing valuable insights into performance. Proximity switches emit a signal when the valve pallet has reached the fully open position and later when it is closed again. Proximity switches are used for both weight- and spring-loaded valves and can be used in ATEX zones.

4. Heating solutions for KITO® products

In industrial processes, heat losses to the environment or through internal heat dissipation can pose safety risks. One possible scenario is operation in winter with moist and warm gases, where temperature differences can lead to the formation of ice that blocks valves and flame arresters. In such situations, a frost protection heater is essential.

Products that are prone to crystallization also require improved thermal insulation and the heating of valves and flame arresters.

Electric heating:

With this solution, thermal insulation surrounds the fitting, which is adapted to the contours of the KITO® fitting without impairing its functions. Additional heating cables are attached to the outer housing to compensate for the thermal insulation losses. The cables are either laid directly or combined in a heating sleeve. It is ensured that all ventilation openings remain free and the functions are not restricted.

Steam or hot water heating jacket:

In cases where electricity is not available, hot water and steam heaters are used for frost protection or to maintain certain temperatures in the appliance housings in accordance with the operating process conditions.

The decisive factor is ensuring that the maximum temperature of the heating medium is taken into account:

For KITO® flame arresters, this temperature should not exceed 25 K above the permissible operating temperature, but it must not surpass 80% of the ignition temperature.

For other KITO® devices handling flammable products, the temperature should not exceed 80% of the self-ignition temperature. For non-flammable products, the temperature limit depends on the design and the materials used.

Product overview

Temperature sensor

Service	Application	Specification
Detection of a flame	Temperature monitoring in the event of a possible short-time burning (>1min) or endurance burning. Installation on unprotected side / temperature monitoring of the flame arresters on the system side with potential ignition source	Model: TR10-C Protection class: Ex-i Sensor Pt100 Installation length: 60 mm or 100 mm Nominal voltage: 8-28 V 1x4 wire
Material	**Operating conditions**	**Accessories**
Sensor tube: Stainless steel (1.4571) Alternative Hastelloy C22 (2.4602)	The release temperature should be ≤ 80 °C or 20K above the maximum operating temperature	Digital temperature transmitter Thermowell

Electrical trace heating

Service	Application	Specification
As frost protection heating or for temperature maintenance	Prevent the valve pallets from freezing and the flame arresters from becoming blocked	Mounting heating tape HBRC/EEX Protection class: IP65 Nominal power per meter: 31W/m Nominal temperature: 85 °C
Material	**Operating conditions**	**Accessories**
Conductive, self-limiting heating tape 85°C in PTFE fabric film installed. Outer material: Fluorpolymer	Nominal voltage: 230V,50HZ Min. installation temperature: -40 °C Max. temperature: 85 °C permanently switched on	-

Product overview

Heating jacket

Service	Application	Specification
As frost protection or to maintain the temperature in the housings with hot water / steam heating	Prevention of condensation or freezing of warm or humid gases in appropriate weather conditions. Maintaining process temperatures.	depending on the design conditions for pressure and temperature
Material	**Operating conditions**	**Accessories**
Steel Stainless steel Alternative materials on request	For flame arresters: max. 25 K above the permissible operating temperature, but not more than 80 % of the ignition temperature	-

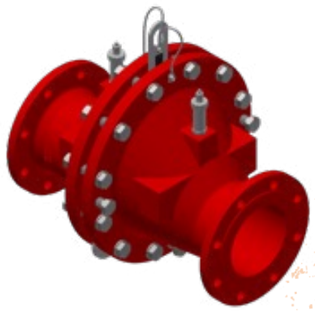
Proximity switch

Service	Application	Specification
Signal output when opening and closing the valve disk	Monitoring the valve pallets position (opening/closing)	Inductive sensor Protection class: 67IP Operating voltage: 10-30VDC
Material	**Operating conditions**	**Accessories**
Stainless steel	For continuous operating temperatures up to 150 °C	-

Product overview

Differential pressure transmitter

Service	Application	Specification
Monitoring the degree of obstruction in the flame arrester	Detection of potential problems of unwanted pressure increases and to ensure the safety of the system	Type of protection: Ex i Output signal: 4-20 mA, 2 conductors, HART
Material	**Operating conditions**	**Accessories**
Housing material: Aluminum - Dual chamber process connection: 316L	Measuring range: depending on application Seal (temperature range): FKM (-20 to 85 °C)	-



Corrosion-resistant solutions for difficult process conditions

Corrosion poses a significant challenge across various industries, often due to specific process conditions and substances. While standard materials like stainless steel, carbon steel, and aluminum are not always corrosion-resistant under these conditions, special solutions become necessary.

Plastics such as polypropylene (PP), polyethylene (PE), polyvinylidene fluoride (PVDF), and ethylene chlorotrifluoroethylene (ECTFE)-coated components serve as excellent alternatives, providing enhanced corrosion resistance. Additionally, special alloys like Hastelloy, Tantalum, and Duplex offer solutions against corrosion in critical process environments.

These materials prove particularly effective where acids, alkalis, and other aggressive chemicals are present. Beyond their chemical resistance, PP, PE, PVDF, and ECTFE linings also operate at a molecular level, significantly reducing the risk of corrosion even under atmospheric conditions. This advantage underscores the value of using plastics as a material choice.

Corrosion is also a critical concern for liquid tanks, especially when vapors from stored liquids come into contact with air and other gases during pumping or atmospheric cooling, creating a corrosive environment. In the complex realm of atmospheric storage and venting applications, material selection for safety valves and flame arresters becomes pivotal. The strategic use of polypropylene (PP), polyethylene (PE), polyvinylidene fluoride (PVDF), and ECTFE-lined valves and flame arresters results in higher corrosion resistance compared to carbon and stainless steel. Special plastics, Hastelloy, and titanium also serve as viable alternatives for valve stem materials.

By employing these corrosion-resistant materials and alloys, industries can ensure the reliability and durability of their devices and systems, even in challenging environments—whether dealing with aggressive chemicals, high humidity, or elevated temperature and pressure conditions. These anti-corrosion solutions provide the necessary protection and longevity. However, one risk factor associated with plastics and ECTFE linings, especially in explosive atmospheres, is electrostatic charging. Therefore, their use should be carefully evaluated based on risk analysis, considering country-specific rules and regulations. The applied ECTFE coating must effectively dissipate or disperse electrostatic charges, particularly in environments conducive to such charging, as it can lead to potentially dangerous discharges.

Regular inspections and maintenance of vent valves and flame arresters also aid in identifying and rectifying corrosion issues before they cause significant damage.

Product overview

Model	VD/oG (ECTFE)	VD/Sc (ECTFE)	DS/ScS	VS/ScS	VD/oSA
Service	Pressure and vacuum relief valve	In line pressure or vacuum relief valve	Pressure relief valve	Vacuum valve	Pressure and vacuum relief valve
Application	Non-flammable vapor/air or gas/air mixtures	Non-flammable vapor/air or gas/air mixtures	Non-flammable vapor/air or gas/air mixtures	Non-flammable vapor/air or gas/air mixtures	Non-flammable vapor/air or gas/air mixtures
Nominal diameter	DN 50 (2“) to DN 300 (12“) DIN or ASME	DN 25 (1“) to DN 200 (8“) DIN or ASME	DN 25 (1“) to DN 200 (8“) DIN and ASME	DN 25 (1“) to DN 200 (8“) DIN and ASME	DN 25 (1“) to DN 200(8“)
Material	Cast steel 1.0619, stainless steel 1.4408, aluminum (DN100/4“-300/12“) ECTFE coated	steel, stainless steel 1.4571 ECTFE coated	Polyethylene (PE) Polypropylene (PP)	Polyethylene (PE) Polypropylene (PP)	Polyethylene (PE) Polypropylene (PP)
Operating conditions	P: 2 to 60 mbar V: 2 to 60 mbar	P: 1,7 to 200 mbar V: 1,7 to 200 mbar	P: 2,3 to 100 mbar	V: 2,3 to 30 mbar	P: 2,3 to 100 mbar V: 2,3 to 30 mbar
Accessories	Proximity switch, Electrical Heating Sleeve	Proximity switch, Electrical trace heating	-	-	-

KITO®
Armaturen GmbH

Grotrian-Steinweg-Strasse 1c
38112 Braunschweig
Germany

+49 (0) 531 23000-0
sales@kito.de

WWW.KITO.DE