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SYSTEMS AND PARTS

FAST SHUTTING GATE VALVE FSGV

Background

An explosion involves not only the immediate process item, but can also propagate to the rest of the process. This propagation can be avoided if the affected process item is quickly isolated (compartmentation), thus limiting the consequences of the explosion to the process item in which it occurred (compartmentation). In a number of cases, the explosion can even be prevented by quickly closing the inlet to process equipment such as a filter or a silo when a spark or a flame is detected.

Product

There are several ways to isolate equipment, but one principle rises head and shoulders above all others: the *fast shutting gate valve*. Such a gate valve offers remarkable advantages:

- The process's product stream (dust, gas or hybrid mixtures) is not hindered, as the conduit's flow is not reduced or obstructed.
- When triggered, the gate valve very quickly and with great force cuts the product flow, thereby ensuring isolation of the process equipment.
- In the case of triggering, the product is not contaminated.

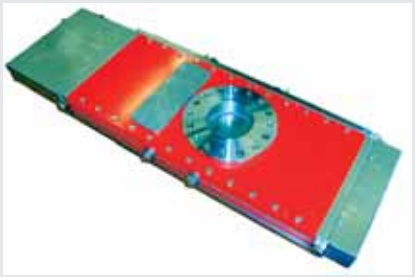
The fast shutting gate valve FSGV is an ATEX *safety system* for explosion isolation.
Consequently, the valve closes very fast at detection. Furthermore, it is able to withstand the pressure resulting from the explosion pressure and once closed, it prevents propagation of the flame. The gate valve's effectiveness as a safety system depends largely on correct positioning in the process and the selection of a suitable detector and control unit.

Functioning

Fast shutting as safety function
The gate valve is equipped with a small gas generator (similar to those used in cars for safety belt tighteners). When triggered by the control unit, the gas generator produces an enormous amount of gas within a few milliseconds, which drives the valve blade with great force and closes the valve. The blade's travel is slowed at the end of the stroke. Afterwards, the valve can be slowly re-opened. A manual lock prevents the valve from fast closing during service if the gas generator were to be triggered unexpectedly.

Slow opening and closing
In addition to the safety function, the valve can be slowly opened and closed in various ways by means of compressed air.

- By simple local intervention.
- From the user's PLC. This control can be extended with a function that closes the valve automatically when control power drops.
- Completely controlled by an optional interface available from StuvEx. In addition to the opening and closing functions, this interface monitors the time taken to open and close. If the time for slow opening and closing is too long, a fault is indicated (insufficient compressed air, blocked gasket etc...). The interface is also connected to the control unit, which excludes incorrect actions.



Fast shutting gate valve type RSV-D

Fast shutting gate valve "Pharma"

Position indication
In addition to the signalling contacts from the control unit and the interface, the gate valve has its own mechanical position indicator. An electronic indicator is available as an option.

Advantages of the fast shutting gate valve FSGV

- The apparatus is virtually maintenance free. Inspection and reconditioning after triggering can be done by the customer. A maintenance contract is not required.
- The European Directive on pressurized vessels is not applicable to the gate valve; consequently, no periodic checks have to be done. Leakage of pressurised gas is also impossible.
- The gas generator has an extended life span.

System description

The fast shutting gate valve can be supplied in several versions and options, allowing it to be used in quite varied applications.

Suitable for various process conditions

- It is suitable for product flow in powder/gas or hybrid in vacuum or overpressure.
- The inner parts are made of stainless steel, the valve blade in very high quality stainless steel.
- The gaskets are suitable for high temperatures, food grade (FDA approved) and good for use in a hygienic environment.
- In the open position, the conduit is not obstructed and when shut, the tube is completely closed.

Suitable for various installation and environmental conditions

- Flanges in DIN or ANSI
- External parts of the gate valve in steel or stainless steel
- Can be installed in all positions

Specific "Pharma" version

- TRICLAMP flanges
- The fast shutting gate valve is equipped with entire casing in polished stainless steel
- Available on trolley

Intended use

This product is an ATEX certified “safety system”.
Consequently, any application must be based on the instructions contained in the ATEX certificate, the product specifications and the user manual.
The standard fast shutting gate valve is suitable for installation in Ex zone 22, optionally also for zones 1 and 21. The internal part is suitable for zones 0 and 20.

Technical specifications

For more details on this product, we refer to the technical datasheet.

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SYSTEMS AND PARTS

FAST SHUTTING GATE VALVE FSGV

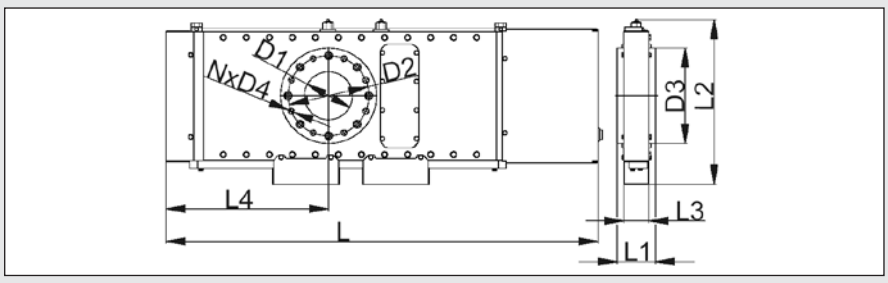
Characteristics			
Type	**RSV-D**	**RSV-G**	**Option "Pharma"**
Application			
Process pressure	Only for underpressure	Gastight, suitable for under and overpressure with the possibility of air tightness control	
Explosion direction	Uni or bidirectional	Bidirectional	
Product	Powder	Powder, gas and hybrid mixtures	
Max. K value for metal dust and organic dust	600 bar.m.s^{-1}		
Max. K value for hybrid mixtures	500 bar.m.s^{-1}		
Max. K value for gas (group II B)	100 bar.m.s^{-1}		
Max. explosion pressure at +20°C	Between 20 and 30 bar absolute, according to size		
Operating temperature	+ 5°C up to +120°C. On demand up to +200°C		
Construction			
Sizes	DN 65 - DN 80 - DN 100 - DN 125 - DN 150 - DN 200 - DN 250 - DN 300		
Casing (complete)			SS 304 or SS 316 L
Body Parts	St 37 painted, SS 304 or SS 316 L		
	SS 304		
Product passage	SS 304 or SS 316 L		
Valve blade	Up to DN 80 : SS 316Ti, Bigger sizes: SS 630		
Sealing	PTFE 200°C up to 260°C, with FDA approval	Silcoflon up to 200°C, with FDA approval and suitable for CIP (hygiene)	
Installation			
Environmental temperature	+5°C up to +40°C, other ranges on demand		
Installation distances	Dependent on size, kind of product and the regulation of the controls.		
Positioning	Installation possible in all positions		Installation possible in all positions Valve available on trolley
Flanges	DIN 2576 PN 10 or ANSI 150#		Tri Clamp according to DIN 11850 R1
Electrical connections	A central junction box, mounted on the valve		
Compressed air	Supply 6-8 bar. Consumption DN 65 - 200: 100 Nl/min; DN 250 - 300: 200 Nl/min. The valve is equipped standard with one nipple for 'opening' and one for 'closing'.		
ATEX Certification	FSA 05 ATEX 15 X		
ATEX Certification CE Ex	As a safety system: II DG Gas group IIB As an apparatus II 1DG /.... (interior/exterior) Suitable for zone 22 (standard) or for zone 1, 21		
Functionality			
Fast closing time	Between 8 and 30 milliseconds in function of the size		
Slow closing time Slow opening time.	< 8 seconds		
Gas generators	DN 65 - 200: 1 piece DN 250 - 300: 2 pieces		

Options	
Earth clamps	
A Position detectors open/closed	3 wires, 10 - 30 V DC, PNP - NO, output charge max 200 mA
B Opening and closing slowly	2 electro valves 3/2, 24 V DC
C Automatic slow closing in case of power loss	2 electro valves 3/2, 24 V DC The clients PLC can steer the electro valves in a failsafe way.

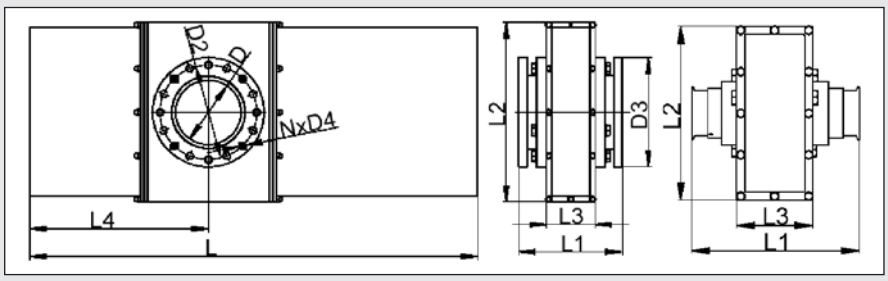
Accessories	
Detector	- A pressure detector or an optical detector with a potential free output contact. Please consult the technical datasheet for the detector. - A free contact (e.g. for the users' PLC) subject to consultation.
Control unit	Please consult the control unit's technical datasheets.
Interface for slow automatic closing and opening at reset after incident or activation	**StuvEx type RJ-84- R** For ATEX zone 22: Ex CE II 3D tD T85°C IP55 Works in combination with a control unit and options A and C. Controls the opening and closing functions, and simultaneously monitors the time taken to open and close. It is connected to the control unit, thus preventing incorrect actions. Please consult the technical datasheet for the interface.
Buffer vessel for compressed air	When the required supply of compressed air cannot be guaranteed. Please consult the technical datasheet for the buffer vessels.
Compressed air booster system	When the required flow rate of compressed air cannot be delivered. Please consult technical datasheet for the air booster system.

This document provides an overview of the product's characteristics and possibilities. These are not necessarily part of the standard version and may not always be realised together. A detailed offer will be made for each specific application.

A comprehensive technical datasheet is available from the manufacturer on request.



RSV-D and RSV-G



Version 'Pharma'

StuvEx®