

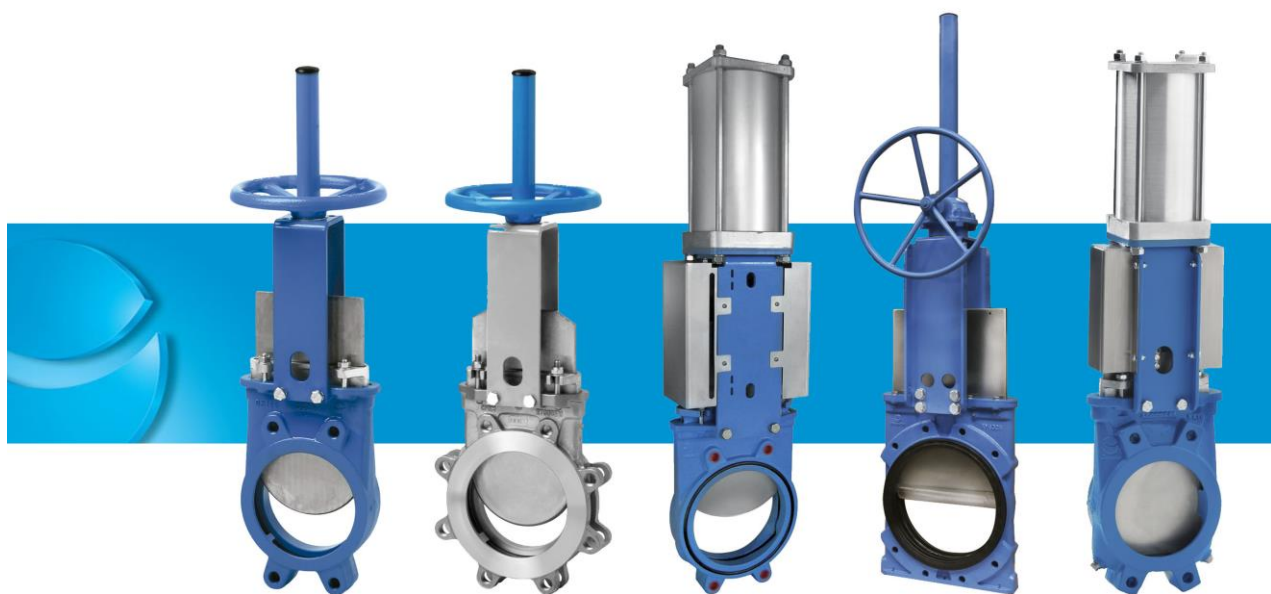
**MODEL**

**Knife Gate Valves**



## **DIRECTIVES & CERTIFICATES COMPLIANCE - KNIFE GATE VALVES**

### **INSTALLATION, OPERATION & MAINTENANCE MANUAL**




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### INSTALLATION, OPERATION & MAINTENANCE MANUAL

#### 0. INTRODUCTION


##### EUROPEAN DIRECTIVES

- 2006/42/EC (MACHINERY)
- 2014/68/EU (PED)
- 2014/34/EU (ATEX) 


#### 1. INSTALLATION

- 2014/34/EU (ATEX) 

#### 2. ACTUATORS

- 2006/42/EC (MACHINERY)
- 2014/34/EU (ATEX) 

#### 3. MAINTENANCE

- 2014/34/EU (ATEX) 

## 0. INTRODUCTION

The ORBINOX Knife Gate Valves comply with the following European directives:

- 2006/42/EC: Machinery Directive

When applicable it can also comply with the following additional directives:

- 2014/68/EU: Pressure Equipment Directive
- 2014/34/EU: Potentially Explosive Atmospheres (ATEX)

It is the user's liability to clearly inform the maximum working conditions (PS, TS), medium (gas or liquid), dangerousness group (1 or 2) and if the fluid is unstable to properly classify the valve according to the 2014/68/EU PED directive.

ORBINOX offers, supplies and certifies valves according to the information received from the customer. The customer is liable to make sure this information is accurate and according to specific working conditions requirements where the valve will be installed.



### Special requirements for ATEX valves:

The ORBINOX valves may also comply with the directive regarding equipment and protective systems for their use in explosive atmospheres. In these cases, the logotype (see below) shall appear on the identification label of the valve. This label shows the exact classification of the zone where the valve can be used. The user will be liable for its use in any other zone.

This directive only applies in the following atmospheric conditions:

- $0,8 \text{ bar} \leq P \leq 1,2 \text{ bar}$
- $- 20^{\circ}\text{C} < T < 60^{\circ}\text{C}$

Any increase in temperature due to frictional warmth is negligible, since the relative speed of the moving parts is extremely low.

The risk analysis associated to this directive does not take into account the fluid that goes through the valve, even when such fluid produces an explosive atmosphere. The user must take into account the risks that the fluid generates, such as:

- Heating of the valve surface
- Generation of electrostatic charges caused by displacement of the fluid
- Shock waves caused by the installation (water hammer), internal crashes generated by the pellets or the risks due to foreign bodies susceptible of being present in the installation

## 1. INSTALLATION



- Make sure the valve is ATEX marked according to the requested zone and it includes all anti-static devices.
- During installation and maintenance operations, use hand tools (non -electric) which do not generate any potential ignition source such as sparks
- Personnel shall have a Working Authorization for explosive classified areas
- Check continuity between the body of the valve and the pipe (test in accordance with EN 12266-2 Standard, annex B, points B.2.2.2. and B.2.3.1).
- This check must be done every time the valve has been removed from the line, serviced, and put back to the line.
- The knife gate valve, included hand operated valves, must be always earthed, i.e., the electrical resistance to earth must be  $< 10^6 \Omega$ . The integration of the slide knife in the electrically conducting circuit should be checked regularly as required by the operation instruction

## 2. ACTUATORS



The operation of automated valves is limited only with fitted gate covers to fulfil 2006/42/EC (machinery Directive).



- Allowed actuator for ATEX zones: pneumatic, hydraulic and electric motor. Hand operated and bare shaft valves are out of the scope of this Directive, but for installation and maintenance same requirements for explosive areas valves shall apply
- Make sure these actuators are ATEX marked according to the requested zone
- Maximum travel speed of the gate must be equal or below 1 m/s

## 3. MAINTENANCE



- Make sure the valve is ATEX marked according the requested zone and it includes all anti-static devices
- Those in charge of handling and maintenance of the valve must be qualified and trained regarding ATEX
- During installation and maintenance operations, use hand tools (non-electric) which do not generate any potential ignition source such as sparks
- Personnel shall have a Working Authorization for explosive classified areas
- Periodicity of check and evaluation of valve electrical conductivity must be determined by end user according to valve working conditions. In any case, once the valve is put into operation, the packing area must be revised after the valve has been stroked 100 times or after 3 months of operation, whatever happens first. After this preliminary check, new checking periods must be determined by end user based on the results of this first check
- Clean the valve periodically to prevent dust accumulation. Do not sweep or dump the dust. Always use a vacuum cleaner system
- Dead end service is not allowed
- Do not apply any new coating to the valve. Should it require new coating, please contact our closest representative

- Allowed seals: EPDM, FKM-FPM, NBR, PTFE(\*), VMQ (\*), GRAPHITE and METAL (no seal). (\*) PTFE and VMQ seals have some size restrictions. Please check with ORBINOX Technical department
- Allowed packing: ST, stainless steel, copper and graphite
- To keep the ATEX approval, always use original spares from ORBINOX. Original order number is mandatory to receive the correct spares.
- Washer DIN 6798A (This washer guarantees continuity among carbon steel parts, coated in epoxy, yoke and body and stainless-steel guards for coating thicknesses up to 200 microns)
- After any maintenance it is mandatory to check that the valve is correctly earthed, included hand operated valves. Continuity between the valve body, the pipe, the gate, supports and guards must be tested (in accordance with EN 12266-2 Test F21 Annex B, B.2.2.2 and B.2.3.1). Packing shall be checked and pressurized for Zero leakage

MAXIMUM FLUID TEMPERATURES

Atmosphere	
Gas/air, steam/air, and mist/air	Dust/air
80% of minimum fluid ignition temperature in °C	2/3 of minimum dust cloud ignition temperature minus 10°K, or minimum dust layer ignition temperature minus 85 °K (for layers up 5mm)

*Note: these maximum fluid temperatures apply to all categories. The differences between categories are the consideration of foreseeable malfunction cases and rare malfunctions cases*

MAXIMUM SEAL AND PACKING TEMPERATURES

Max Temperature (°C)	SEAL					
	EPDM	FKM-FPM	NBR	GRAPHITE	PTFE	VMQ
	120	200	120	600	250	250

Max Temperature (°C)	PACKING	
	ST	GRAPHITE
	250	600

*Note: Most of the times seals maximum temperature capacity is the key limitation factor when evaluating valve maximum working temperatures. In ATEX zones these temperatures must be compared to those above related to limitation of fluids temperatures.*

*Always consider the most restrictive as maximum valve working temperature.*

**Replacement of the valve:**

1. The same valve with exactly the same certificates must be ordered to ORBINOX. When placing this order, it is customer liability to clearly indicate that the new ordered valve is a replacement of a certified valve
2. It is user's liability to ensure that all requirements in the "maintenance" chapter are fulfilled
3. Loosen the bolts that connect the actuator to the slide
4. Loosen the bolts that connect the yoke to the body
5. Reassemble the valve

**Replacement of the actuator:**

1. The same actuator with exactly the same certificates must be ordered to ORBINOX. When placing this order, it is customer liability to clearly indicate that the new actuator is a replacement of a certified valve
2. It is user's liability to ensure that all requirements in the "maintenance" chapter are fulfilled
3. Loosen the bolts that connect the actuator to the yoke
4. Reassemble the valve