

# KLINGER Fluid Control's Way to Success in Oil and Gas Refinery Applications





# Application of KLINGER Fluid Control Valves within oil and gas refineries

## **Place of installation: Heat tracing system**

### **Applied types of valves:**

- KVN piston valves made of carbon steel, with KX-GT valve rings.
  - KVRKN piston valves made of carbon steel, with KX-GT valve rings.
- Equipped with a special kind of piston for regulation of flow rate

### **Sizes of valves:**

DN 20 and DN 25

### **Operated media:**

Steam

### **Working pressure:**

10-22 bar

### **Working temperature:**

max. 220° C



**KVN piston valves are providing the process heat**

*The refineries of the MOL company had problems with valves constructed according to other designs than the piston valve concept. Pressure drops occurred in the heating systems. Since the engineers installed Klinger KVN piston valves no steam pressure gets lost anymore.*

*More than 4000 pieces of KVN piston valves are already equipped for heat tracing systems within the processing facilities of the MOL group.*

*Consignement stocks like in the Duna refinery in Hungary that are used for valves and spare parts increase safety of plant operation and decrease the downtime in case of an facility failure.*



## Application of KLINGER Fluid Control Valves within oil and gas refineries

**Place of installation:**  
**Pipelines for heavy fuel oil**

**Applied types of valves:**  
KVN piston valves  
made of carbon steel

**Sizes of valves:**  
DN 200

**Operated media:**  
Heavy fuel oil

**Working pressure:**  
12 bar

**Working temperature:**  
380° C



**Hard service conditions for Klinger KVN piston valves. The high temperature affects the blue laquer.**



*The refineries of the MOL company used to install gate valves for this sort of application, but after 3-4 months leakages occurred at the stuffing box.*

*20 pieces of KVN piston valves were installed and work properly. Due to the quality and the constructive design it is possible to renew a valve that has already been in service for 15-20 years. For this maintenance the valve can remain in line.*

*This kind of application certainly offers the most challenging service conditions for Klinger valves.*





## Application of KLINGER Fluid Control Valves within oil and gas refineries

**Place of installation:**  
**Pipelines for gases and liquid gases**

**Applied types of valves:**

- Klinger Ballostar KHA ball valves made of carbon steel
- Klinger Ballostar KHI ball valves made of carbon steel

**Sizes of valves:**

- KHA: DN 10 - 100
- KHI: DN 150 - 250

**Operated media:**

Propane, Butane, Propylene

**Working pressure:**

26 bar

**Working temperature:**

from -25° C up to +40° C

The main task for KLINGER valves is to provide a safe and reliable shut-off for different types of gases. Smallest internal and external leakage rates are required.

FDM O-rings equipped in KLINGER Ballostar KHI ball valves have proof themselves also at low operating temperatures.

The refineries of the MOL company have already installed more than 500 pieces of Ballostar KHA and 70 pieces of Ballostar KHI for this kind of application.



**Hand lever operated Klinger Ballostar KHA ball valves with flange connection**



**Klinger Ballostar KHI ball valves with flange connection. The gear is attached onto an operating stem extension**



# Application of KLINGER Fluid Control Valves within oil and gas refineries

**Place of installation: Transport of bitumen, paraffin and mineral oil**

**Applied types of valves:**

*Klinger Ballostar KHI ball valves made of carbon steel*

**Sizes of valves:**

*DN 150 and DN 200*

**Operated media:**

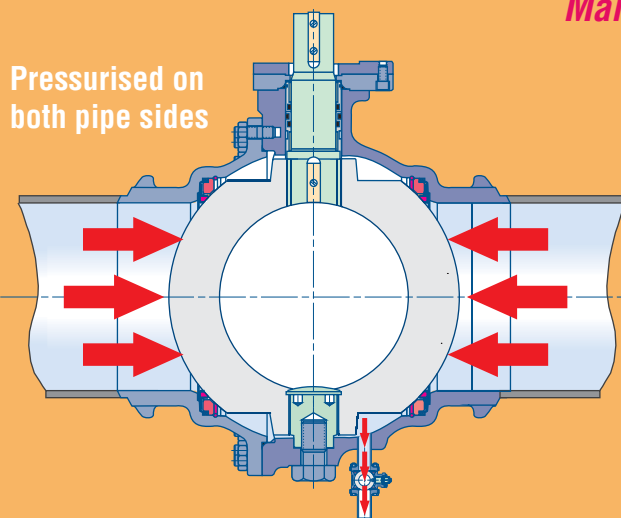
*Bitumen, paraffin and mineral oil*

**Working pressure:**

*26 bar*

**Working temperature:**

*up to +180° C*



Pressurised on both pipe sides

**KHA valve for:**

1. Draining of ball clearance volume
2. Testing of sealing

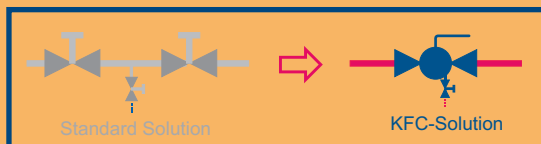
**Main Argument for Ballostar ball valves:**

*Usage as double acting shut-off device with intermediate relaxation*

*Because of the “double block and bleed”-ability, proven by a TÜV certificate, one Klinger Ballostar KHI is able to substitute two gate valves. This saves both money for purchasing and space for installation.*

*The pipeline systems are cleaned with steam (220° C). This short exposure to high temperature is no problem for the standard version of the Ballostar KHI. The special type “WI” could even be applied up to 260° C service temperature (media: steam or hot water).*

**1 Klinger Ballostar KHI = 2 standard shut-off valves:**



**Double Block and Bleed  
TÜV approved!**



## Application of KLINGER Fluid Control Valves within oil and gas refineries

### **Place of installation:** **Supply lines for flare system**

#### **Applied types of valves:**

- Klinger KVN piston valves
- Klinger Ballostar KHA ball valves

#### **Sizes of valves:**

- KVN: DN 15 - 100
- KHA: DN 15 - 100

#### **Operated media:**

Flare gas

#### **Working pressure:**

10 bar

#### **Working temperature:**

Up to +250° C



***Klinger KVN DN 50 piston valve made of steel casting, fully insulated***

*The supply of the flares by gas is always a problematic and dangerous task.*

*Finding a reliable and technical safe solution for the refineries is a great challenge for the manufacturers of industrial valves.*

*KLINGER Fluid Control accepts this challenge. Customers like the MOL-Group have made good experiences with Klinger Ballostar KHA ball valves and Klinger KVN piston valves. More than 400 valves are already installed in the MOL refineries for this kind of application!*





## Application of KLINGER Fluid Control Valves within oil and gas refineries

**Place of installation:**  
**Train filling station**

**Applied types of valves:**

- Klinger Ballostar KHI ball valves
- Klinger Ballostar KHA ball valves
- Klinger Ballostar KHE ball valves

**Sizes of valves:**

- KHI: DN 150
- KHA: DN 15 - 100
- KHE: DN 15 - 100

**Operated media:**

C3, C4, C5, Pb

**Working pressure:**

0-6 bar

**Working temperature:**

Ambient temp.



*Klinger Ballostar KHA ball valves with flange connection, manual and automated by electro-mechanical actuators*



*Klinger Ballostar KHA and KHE ball valves with flange connection, manually operated*



## Application of KLINGER Fluid Control Valves within oil and gas refineries

**Place of installation:**  
**Purification plant for gas products**

**Applied types of valves:**  
*Klinger Ballostar KHA-FL and KHA-G ball valves made of carbon steel*

**Sizes of valves:**  
*DN 15 - 125*

**Operated media:**  
*C3, C4, Pb*

**Working temperature:**  
*280°C*



*Klinger Ballostar KHA ball valves with flange connection, manual and automated by electro-mechanical actuators*



*Klinger Ballostar KHA and KHE ball valves with flange connection, manually operated*





# KLINGER KVN Piston Valve

## Piston Valve - The Improvement to Globe and Bellows Seal Valves

### **Field of Application:**

- Steam and hot water
- Cooling systems
- Heat transfer fluids
- Oxygen service
- Shutt-off and regulating valve

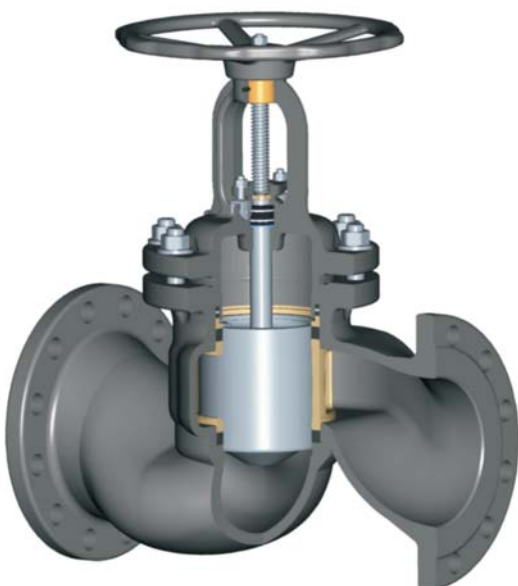


### **Range of Product:**

- Nominal Sizes:** DN 10–200  
NPS 1/2"–8"
- Pressure Range:** PN 6, PN 16, PN 40 and PN 63  
Class 150, Class 300 and CWP 900
- Temperature Range:** from -196°C up to 400°C
- Materials of Body:** Cast iron, spheroidal iron, carbon steel and stainless steel
- Connections:** Flanges acc. to EN 1092-1 and EN 1092-2  
Female Screwed Ends acc. to ISO 228-1 and NPT-thread ANSI B 2.1  
Socket welding ends acc. to EN 12 760 and butt welding ends acc. to EN 12627
- Accessory:** Actuators (electro mechanical, pneumatic), heating jacket, etc.

### **Special Designs:**

- Piston valve for Fire-Safe application
- Piston valve for TA-Luft (clean air act) and EPA application
- Piston valve for liquid gas
- Regulating piston valve DN 10–50 with regulation piston (KVRKN)
- Regulating piston valve DN 65–200 with regulation lantern bush (KVRLN)



**Quarter-section of a KVN piston valve**

### **KVN Advantages:**

- Reliably tight - across the port and to the atmosphere
- Environmentally safe and energy efficient
- Asbestos-free
- No erosion on the sealing surface
- Insensitive to impurities due to maintenance-free sealing system
- Unbeatable in a comparison of profitability
- Maintenance-free
- Valve rings are replaceable in the line
- Excellent control characteristics
- Inspected according to EPA-emission-test
- Suitable for oxygen (BAM)



# KLINGER Ballostar® KHI Ball Valves

## High Quality Split Body Ball Valves with Variable End Connection Designs

### Field of Application:

- Valve for gases
- Steam applications
- Metallic sealing elements for abrasive fluids
- Oxygen service
- Valve for vacuum application



### Range of Product:

|   |  |
|---|--|
| <b>Nominal Sizes:</b>                   | DN 150 – 800   |
| <b>Type of bore:</b>                    | Full and reduced bore  |
| <b>Pressure Range:</b>                  | PN 16, PN 25 and PN 40   |
| <b>Temperature Range:</b>               | from -85°C up to 260°C   |
| <b>Materials of Body and End Piece:</b> | Cast iron, carbon steel and stainless steel  |
| <b>End Connections:</b>                 | Flanges acc. to EN 1092-1<br>Butt welding ends to EN 12627, optional with reducing cones |
| <b>Accessory:</b>                       | Regulation blind, heating jacket, drain-, air-relief-, flushing-connections, Actuators   |

### Special Designs:

- KHVI special design for district heating
- Bentonite (valves for mud transport at tunnel drilling machines)
- Oxygen valves
- Metal sealing element for abrasive media
- Bypass design
- Fully welded for pre-insulated valves
- Valves for underground/shaft installation



**Quarter-section of a KHI ball valve equipped with an actuator**

### KHI Advantages:

- Applicable as double acting shut off device with intermediate relaxation
- "Double block and bleed"-ability
- Suitable for automatic actuators
- Bi-directional in line tightness
- Internal and external leak-tightness
- Installation in any position
- Compact design
- Insensitive to pipeline forces
- Resistant against media contamination
- Maintenance free



# KLINGER KHE Ball Valves

## Split Body Ball Valves with Flange Connections and Elastic Sealing System

### Field of Application:

- Valve for gases  
(e.g. flare gas, propane, butane)
- Cooling systems
- Reprocessed water and chemicals
- Oxygen service
- Valve for petrols and oils
- Shutt-off and automated valves



### Range of Product:

#### Nominal Sizes:

DN 15–200

#### Pressure Range:

NPS 1/2"–DN 8"

#### Temperature Range:

PN 16, PN 40, Class 150 and Class 300

#### Materials of Body and Flange Ends:

from -85°C up to 300°C

#### End Connections:

Carbon steel and stainless steel

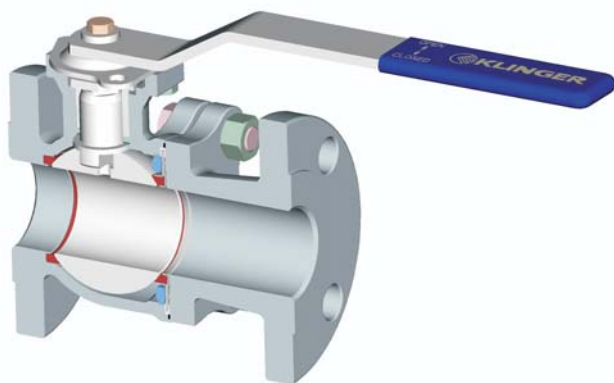
#### Accessory:

Flanges acc. to EN 1092-1 and ANSI B16.5

Actuators (directly or via mounting kit), regulation blinds, operating stem extension (protection pipe available), heating jacket, etc.

### Special Designs:

- Gas ball valve
- Metal sealed ball valve
- Fire-safe ball valve



Half-section of a Ballostar®  
KHE ball valve

### KHE Advantages:

- Split valve body
- Floating ball construction design
- Elastic sealing system
- Spring-loaded labyrinth stuffing box, optional stem sealing with O-rings
- Modular system with variable components
- Antistatic design
- Maintenance free
- CE-marking
- Suitable for automation with actuators
- Top flange acc. to EN ISO 5211
- Fulfills the international requirements of Clean Air Regulations (TA-Luft)





# KLINGER KHA Ball Valves

## Ball Valves with Modular System Components and Variable End Connection Designs

### Field of Application:

- Valve for gases  
(e.g. flare gas, propane, butane)
- Cooling systems
- Reprocessed water and chemicals
- Oxygen service
- Shutt-off and automated valves

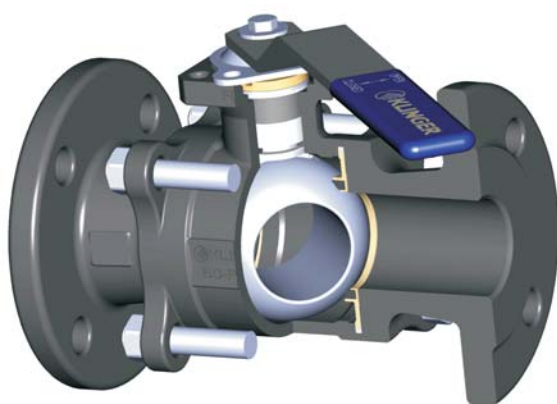


### Range of Product:

|                           |   |
|---------------------------|---|
| <b>Nominal Sizes:</b>     | DN 10–150   |
| <b>Type of bore:</b>      | Full and reduced bore   |
| <b>Pressure Range:</b>    | PN 16, PN 40, PN 63 and PN 100  |
| <b>Temperature Range:</b> | from -196°C up to 400°C   |
| <b>Materials of Body:</b> | Carbon steel and stainless steel  |
| <b>End Connections:</b>   | Flanges acc. to EN 1092-1 and EN 1092-2<br>Welding ends acc. to DIN 3239 (EN 12627)<br>Threaded ends acc. to DIN/ISO 228/1                                |
| <b>Accessory:</b>         | Actuators (directly or via mounting kit installed),<br>cryogenic extension, handle interlocking device,<br>operating stem extension, heating jacket, etc. |

### Special Designs:

- Gas ball valve
- Metal sealed ball valve
- Fire-safe ball valve
- High-temperature ball valve
- Cryogenic ball valve
- Ball valve for tank wagons



Quarter-sections of a KHA ball valve

### KHA Advantages:

- Modular system components
- 6 sorts of sealing elements (KFC-25, PTFE, metal, specialized metal, viton and fresafe) for different applications
- 3 stuffing box types (PTFE labyrinth, graphite compact, viton)
- “Block and bleed”-ability
- Bidirectional, automatic sealing chamber
- CE-Marking
- Antistatic equipment according
- Reliably tight to the atmosphere
- Maintenance free
- Actuator connection according to EN ISO 5211



# A Story of Success within the Petrol Industry

## Range of products for applications within the petrol industry:

### **Ballostar® KHA**

3-piece ball valve made of grey cast iron, steel and stainless cast steel

### **Ballostar® KHI**

2-piece ball valve with trunnion mounted ball, made of cast steel, steel and stainless steel

### **Ballostar® KHE**

2-piece ball valve with floating ball, made of steel and stainless steel

### **Piston valves KVN**

made of grey cast iron, nodular cast iron, steel and stainless cast steel

### **Shut-off cocks AB**

Straight way, drain, indicator and pressure gauge cocks made of brass, carbon and stainless steel

### **Liquid level gauges**

Transparent, reflex and magnetic level gauges

### **Borosilicate Glasses**

Gauge and sight glasses

## Reference list of oil and gas companies:

### **Austria**

OMV

### **Hungary**

MOL

### **Saudi Arabia**

Riyadh Refinery

### **Slovakia**

Slovnaft

### **Turkey**

T.P.A.O.

### **Worldwide**

BP

Elf

Eni SPA

Esso

Mobil

Shell

Total

### **Bulgaria**

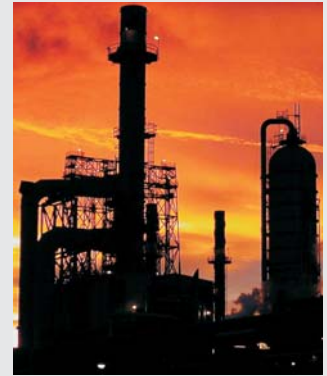
Lukoil

### **Portugal**

Petrogal

### **Serbia**

NIS Naftagas



**K**ey role  
**L**ink  
**I**nnovation  
**N**avigation  
**G**rowth  
**E**fficiency  
**R**outine

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