



EXPANDING THROUGH CONDUIT GATE VALVES

valves and actuators

introduction

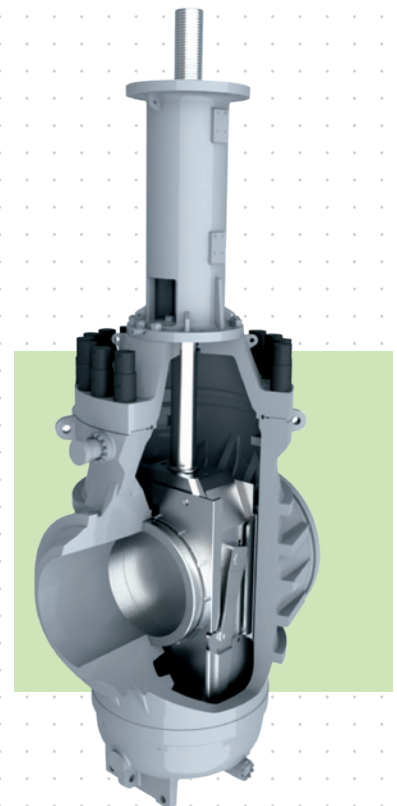
PETROLVALVES is a leading manufacturer of valves for the oil and gas industry.

Formed in 1956, **PETROLVALVES** has grown to a company with sales, services and manufacturing facilities throughout the world with direct presence in the United States, Norway, United Kingdom, Italy, Singapore and Australia.

The continuous investment in development of new technology has resulted in the growth and ongoing success of our company. **PETROLVALVES'** line of production includes some of the most sophisticated valve products in the world, with a strong focus on the development of custom or niche products designed according to customer's specific requirements.

PETROLVALVES has been manufacturing double expanding gate valves since the late 1970s, supplying critical valves to the largest oil and gas projects.

PETROLVALVES' experience in the double expanding gate valve design grew quickly, meeting our clients' increasingly challenging applications, with more complex products, such as large diameter i.e. 48" ASME 1500 for the Nord Stream Project.



expanding gate valve BASIC INFORMATION

PETROL VALVES' DEG Valves range of production includes sizes up to 56" and pressure classes up to API 15000.

RANGE OF PRODUCTION (*)				
API 6D class size	150 to 600 2" to 56"	900 2" to 48"	1500 2" to 48"	2500 2" to 30"
API 6A class size	API 3000 1 ³ / ₁₆ " to 48"	API 5000** 1 ³ / ₁₆ " to 30"	API 10000 1 ³ / ₁₆ " to 12"	API 15000 1 ³ / ₁₆ " to 8"
(*) for non listed dimensions contact PV				
(**) and uprated				

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STANDARD SERVICE: natural gas, crude oil, refined products transmission lines as well as in many other general industrial and oil&gas applications.

For example:

- ▶ wellhead service
- ▶ pig-trap service

SPECIAL SERVICE

- ▶ HPHT
(High Pressure/High Temperature)
- ▶ DIRTY / ABRASIVE SERVICE

	DESIGN	PRESSURE CLASS	MODEL
EXPANDING GATE	OS&Y	API 6D	610
	Internal screw	API 6D	917
	Cast body	API 6A	952
	Forged body	API 6A	953
	Internal screw	API 6A	928

expanding gate valve

DESIGN FEATURES

MAIN DESIGN FEATURES	SPECIAL FEATURES	ACCESSORIES
<ul style="list-style-type: none"> ▶ API 6D or API 6A ▶ ASME B16.34 ▶ Seat to gate and gate to gate metal-to-metal seal ▶ Fire Safe ▶ Full bore ▶ Negligible pressure drop ▶ Bidirectional ▶ Double Block & Bleed ▶ Bubble-Tight sealing in both direction ▶ Anti Blow-Out stem ▶ Rising stem design ▶ Anti static device 	<ul style="list-style-type: none"> ▶ NACE Requirement ▶ Piggability ▶ Special bore ▶ Full/partial cladding ▶ Extended stem ▶ Extended bonnet ▶ Non-Rising stem design ▶ Single expanding construction ▶ Ad hoc design for horizontal stem installation and or vertical pipeline installation (*) ▶ Ad hoc engineering to suit customer projects requirements <p>(*) inclusive of any special tooling that may be needed to maintain the valve in situ</p>	<p>Vent & Drain:</p> <ul style="list-style-type: none"> ▶ Plugged ▶ Flanged ▶ With valve ▶ Any type of connection upon request <p>Seat / Stem Injection:</p> <ul style="list-style-type: none"> ▶ Plugged ▶ Flanged ▶ With isolation valve ▶ Any type of connection upon request

PETROLVALVES' engineering department is specialized in fulfilling all customer's requirements and project specifications.

operation

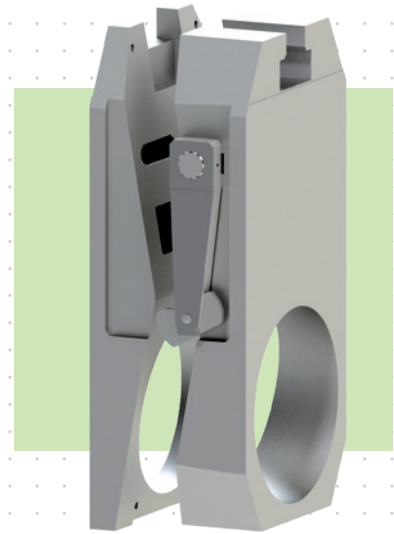
The Double Expanding gate valve is equipped with a two-segment gate; each segment is machined with a double slope (a male and a female).

The slopes are designed to cause the expansion of the gate in both open and closed positions

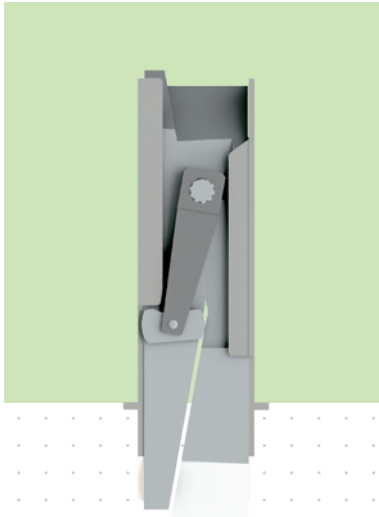
- ▶ with the valve closed, the gate provides a double barrier
- ▶ with the valve open, a full-bore conduit is isolated from cavity

The thrust exerted by the stem causes an expansion of the gate which, through the expansion itself, achieves a tight seal across the seats.

A cam mechanism prevents the expansion of the two segments during the stroke, thus the gate can slide "free of friction", avoiding wear of seats and gate.



CLOSED POSITION



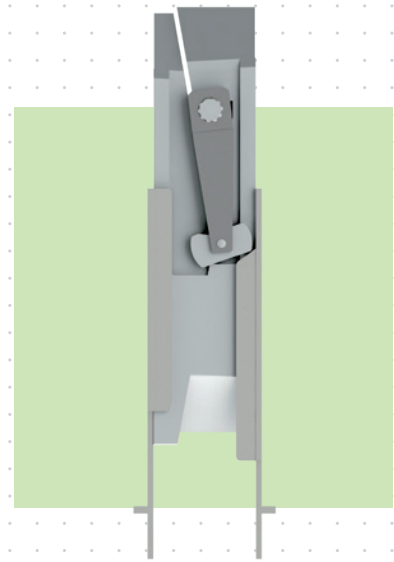
The left guide allows the arm to rotate: the gate can expand

TRAVEL



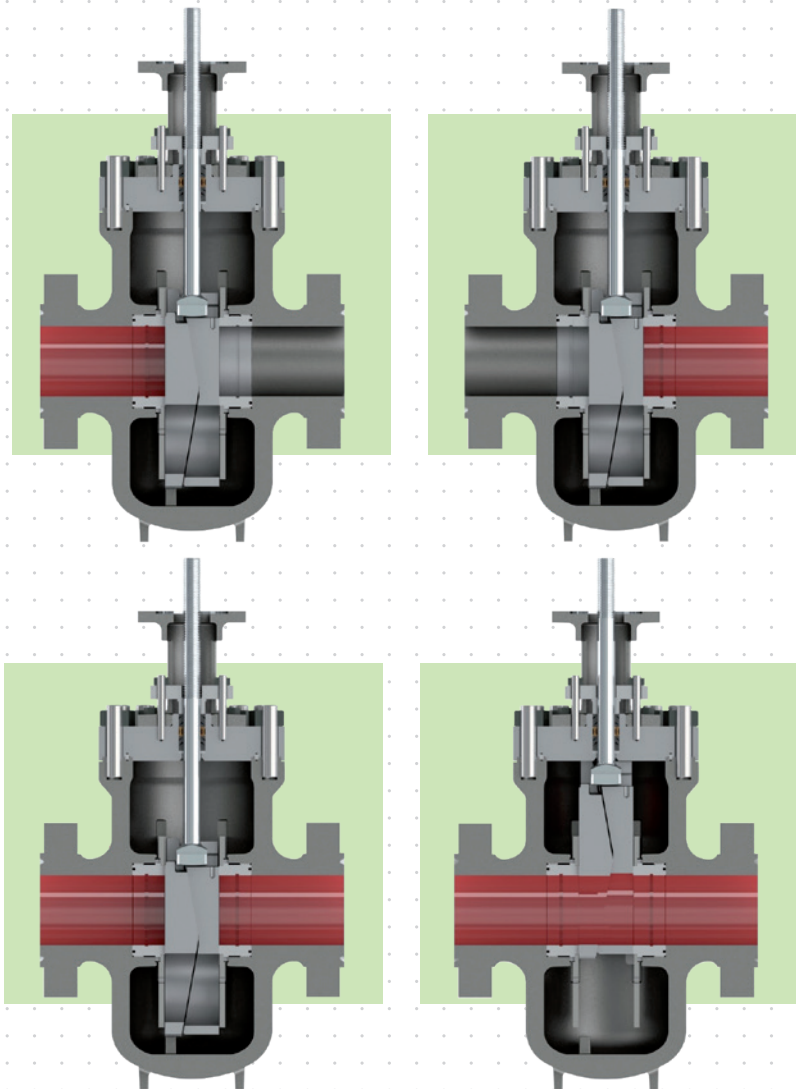
The guides do not allow the arm to rotate: the gate is prevented to expand

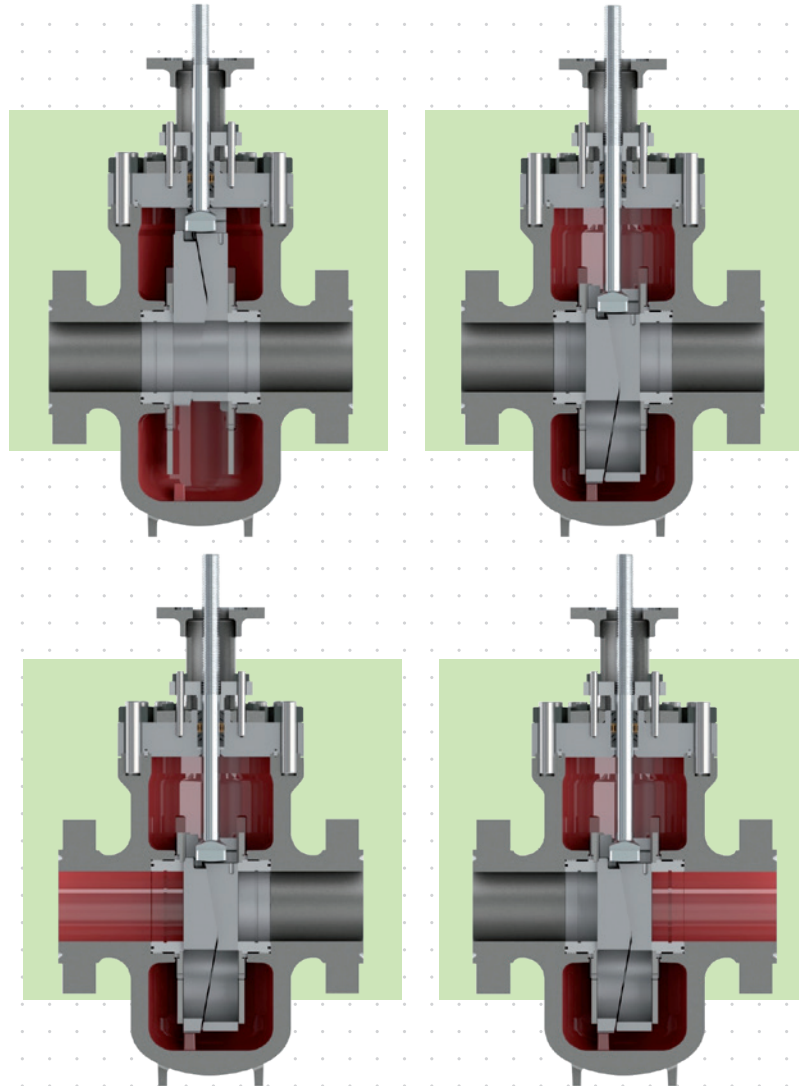
OPEN POSITION



The right guide allows the arm to rotate: the gate can expand

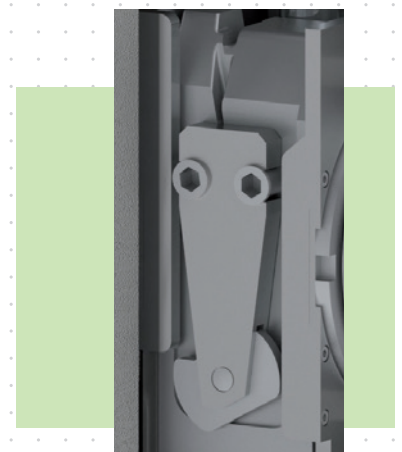
PETROLVALVES Double Expanding gate valve provides tight isolation simultaneously at upstream and downstream seat and in both open and closed position. Tight seal is achieved and controlled through stem thrust only: no pressure energizing action required.





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The driving mechanism of the gate is designed to guarantee full bi-directional performance of the valve. **PETROLVALVES** Double Expanding gate design permits full operability in any service and design condition.

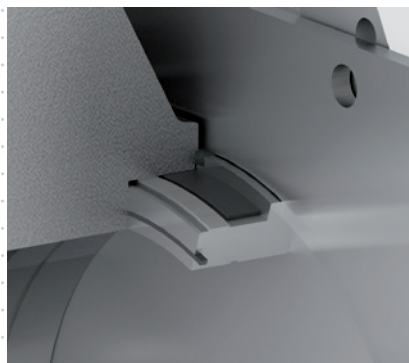


seat SEALING

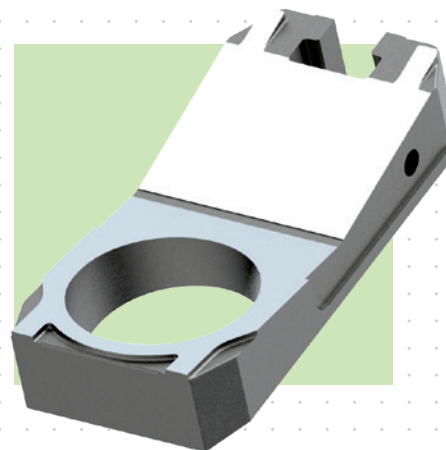
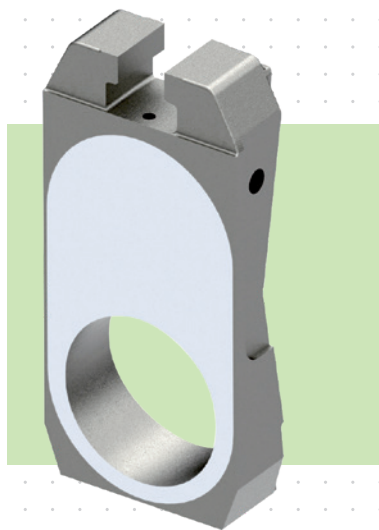
PETROLVALVES exclusive design provides excellent seat flexibility in extension to follow the gate deflections, while the seat is extremely rigid in compression to withstand the massive pressure thrust on gate segments.

PETROLVALVES SEAT DESIGN GUARANTEES:

- ▶ Bubble tight seal capability in Double Block and Bleed
- ▶ Low stem thrust demand to operate the valve under any operating load
- ▶ Extended operating life by virtue of low average contact stresses and limited peak stress values

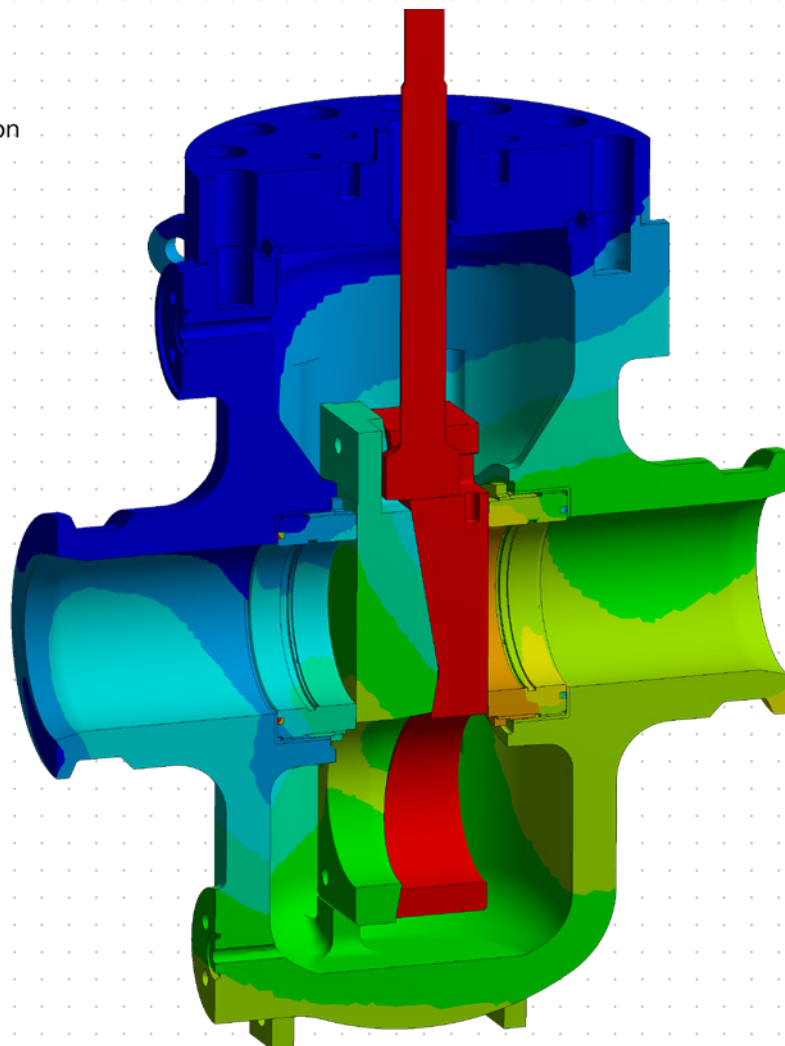
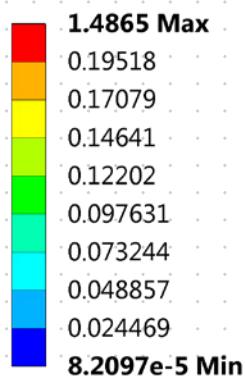


The whole sliding faces of the gate (not just the sealing surfaces) are carbide coated.
The seal surface is capable to withstand erosion, abrasion and scratching.



PETROLVALVES Double Expanding gate valves are manufactured with the help of the most updated technologies to find the optimal selection of flexibility and stiffness of both gate and seat rings. Numerical simulations are carried out to optimize any project solution.

E: PE_mod00
Total Deformation
Type: Total Deformation
Unit: mm
Time: 3

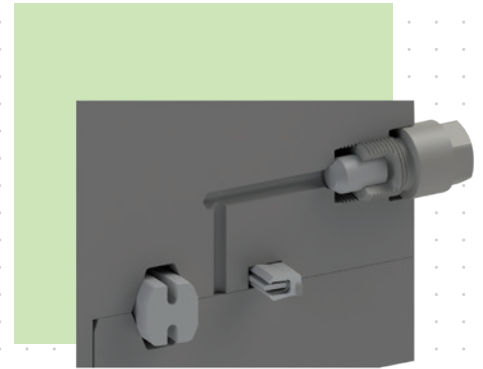


BODY SEALING

All primary body gaskets are metal to metal, **spiral wound type** or **ring joint type**.

Available upon request:

- ▶ Secondary soft gasket to introduce a redundant barrier
- ▶ Leak port detector

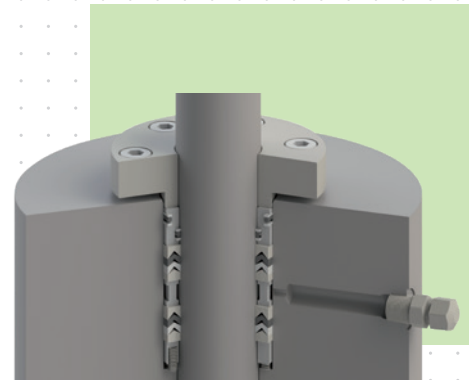


STEM SEALING

PTFE Chevron Type: Thermoplastic multiple V-rings, with or without lantern ring.

Available upon request:

- ▶ Graphite sealing
- ▶ Metal-to-metal stem seal in series to the standard thermoplastic seals
- ▶ Sealant injection facility (optional)
- ▶ Redundant elastomeric (AED) stem gasket
- ▶ Leak port detector



materials

PETROLVALVES expanding gate valves have been designed for use with various combinations of materials which are selected to better suit service conditions.

AVAILABLE BODY MATERIAL SELECTION	AVAILABLE OBTURATOR MATERIAL SELECTION	AVAILABLE SEAT MATERIAL SELECTION
<ul style="list-style-type: none">▶ CS, LTCS (*)▶ Low Alloy Steel (*)▶ Stainless Steel▶ Ni Alloy <p>(*) CRA weld overlay option available</p>	<ul style="list-style-type: none">▶ CS, LTCS (*)▶ Low Alloy Steel (*)▶ Austenitic / Ferritic / Martensitic Stainless Steel▶ Duplex, Superduplex, Ni Alloy <p>(*) CRA weld overlay option available</p> <p>Hardfacing</p> <ul style="list-style-type: none">▶ Tungsten / Chromium carbide coating	<ul style="list-style-type: none">▶ Low Alloy Steel▶ Austenitic / Ferritic / Martensitic Stainless Steel▶ Duplex, Superduplex, Ni Alloy <p>Hardfacing</p> <ul style="list-style-type: none">▶ Tungsten / Chromium carbide coating



MANUFACTURING PLANT

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