



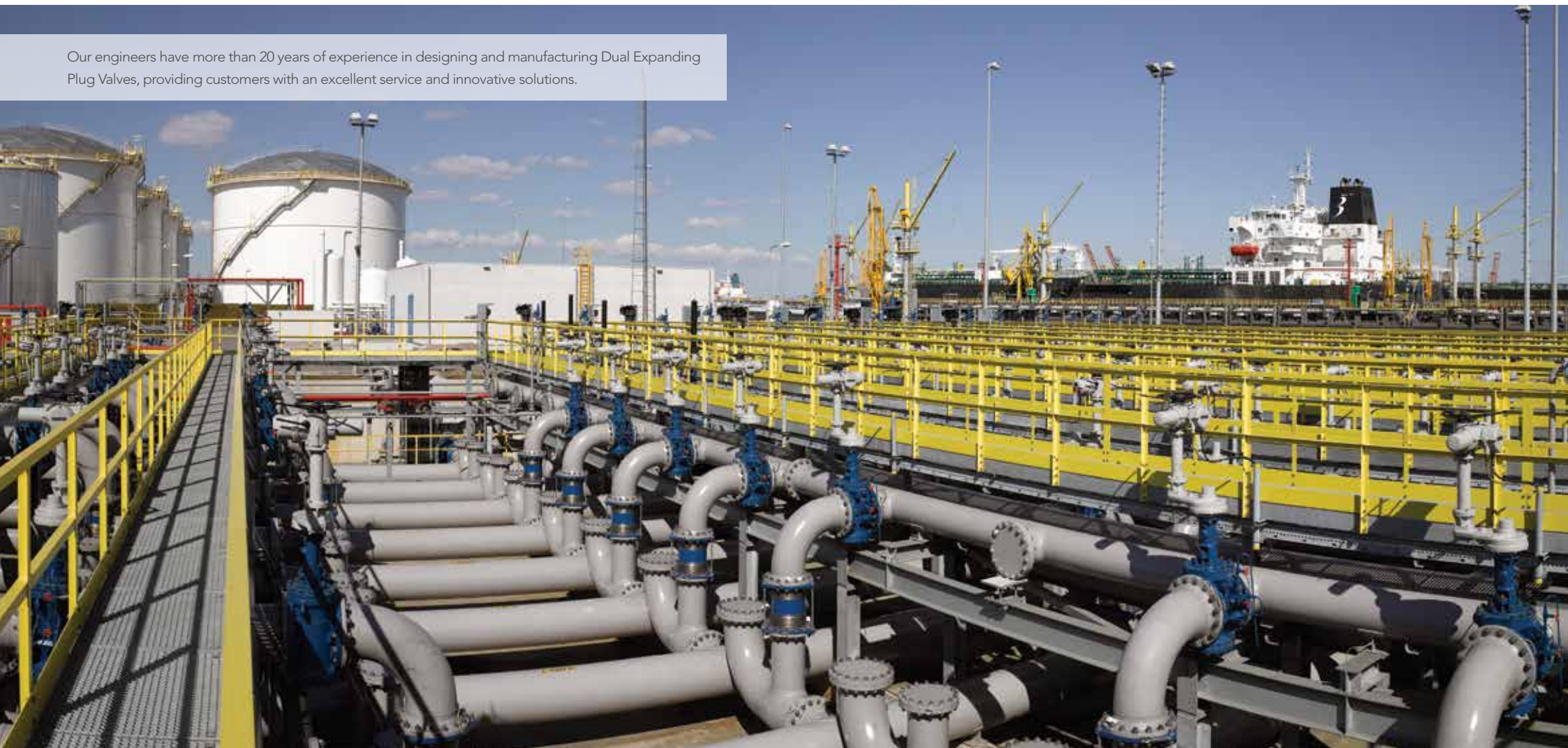
Dual Expanding Plug Valve



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Our engineers have more than 20 years of experience in designing and manufacturing Dual Expanding Plug Valves, providing customers with an excellent service and innovative solutions.



Company profile

ERIKS-VE comprises the innovative design, manufacture and service of high integrity double block & bleed Dual Expanding Plug Valves. The VE® Dual Expanding Plug Valve is a well-recognized brand and accepted by most of the leading industrial companies in the field of tank storage, refinery, bulk loading, naval and aviation, refueling- and metering systems.

The VE® Valves are manufactured by highly skilled personnel in the ERIKS Valve Enterprise factory in Capelle aan den IJssel, the Netherlands, ensuring our customers and the environment a safe and reliable valve solution. ERIKS Valves Enterprise is ISO 9001 licensed, PED/CE certified and designed according API 6D. We are part of the ERIKS group, a leading, innovative supplier and service provider to the process industry and original equipment manufacturers.

The ERIKS Group

ERIKS is a leading, innovative supplier to the process industry and equipment manufacturers, fulfilling the twin roles of specialist and broad MRO supplier. ERIKS has branches in several countries, with a strong position in Western Europe and Asia.

For more information about ERIKS visit www.eriks.com.

Markets and Applications



Tank Storage

Traditional (gate) valves may degrade in time resulting in loss of product or risk of contamination. The VE® Dual Expanding Plug Valve has proven to be a superior solution for such applications whereby valves are frequently operated and zero-leakage is required.

Multi-product Manifolds

Manifolds are operated frequently, zero-leakage is an absolute necessity when switching from one product to another, thus preventing contamination. Increasingly, plants are being operated by a plant management system, automation of the valve is a very important aspect. Unlike some conventional valves the VE® Dual Expanding Plug Valve is highly suitable for automation, due to the low-torque value and the minimum wear of the sealing element. Our experienced engineers in the field of valve automation can help and support you to select the right combination, providing a safe and reliable solution.



Metering Stations

The VE® Dual Expanding Plug Valve has proven itself in the most critical applications where “zero-leakage” is required. In highly critical applications such as Metering Stations even a small leak will cause an error in the calibration of the flow-meter, resulting in an incorrect flow measurement which can have major financial impact.

Aviation & Marine Fueling Stations

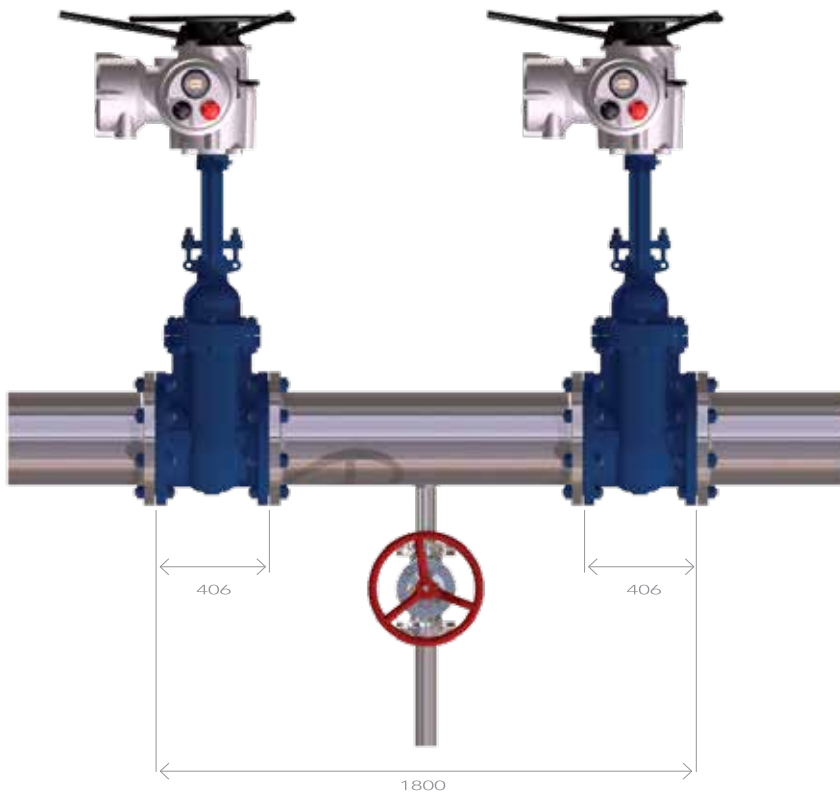
The VE® Dual Expanding Plug Valve provides a “zero leakage” solution, making the valve highly suitable for fueling stations in the aviation and marine industries. It is used on the truck-loading racks, as a tank shut-off valve and on the Jetty loading and unloading docking stations.



Why use a **VE**[®] Dual Expanding Plug Valve

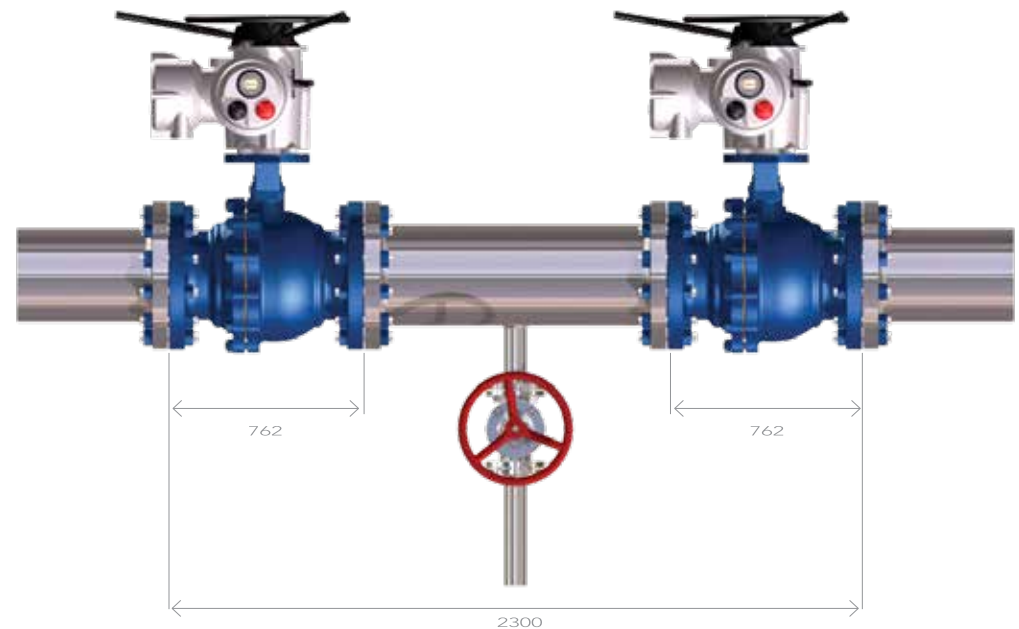
Gate Valves

- No thermal pressure relief, only bleed function
- Seat wearing increase – frequent maintenance intervals
- Large installation space required
- Two actuators, two input/output signal needed to operate the valves
- Two valves, more joints, higher maintenance costs



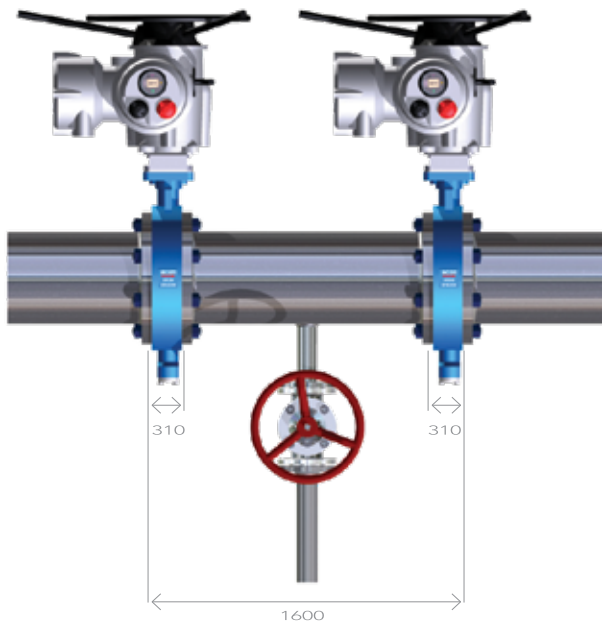
Ball Valves

- No thermal pressure relief, only bleed function
- Seat deterioration due to abrasion increase maintenance intervals
- Large installation space required
- Two actuators, two input/output signal needed to operate the valves
- High operating torque requires larger actuation
- Expensive valve execution



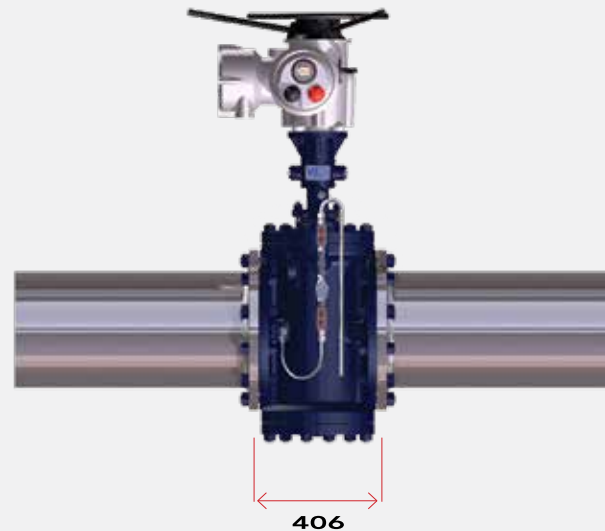
Butterfly Valves

- No thermal pressure relief, only bleed function
- Not piggable
- Large installation space required
- Two actuators, two input/output signal needed to operate the valves



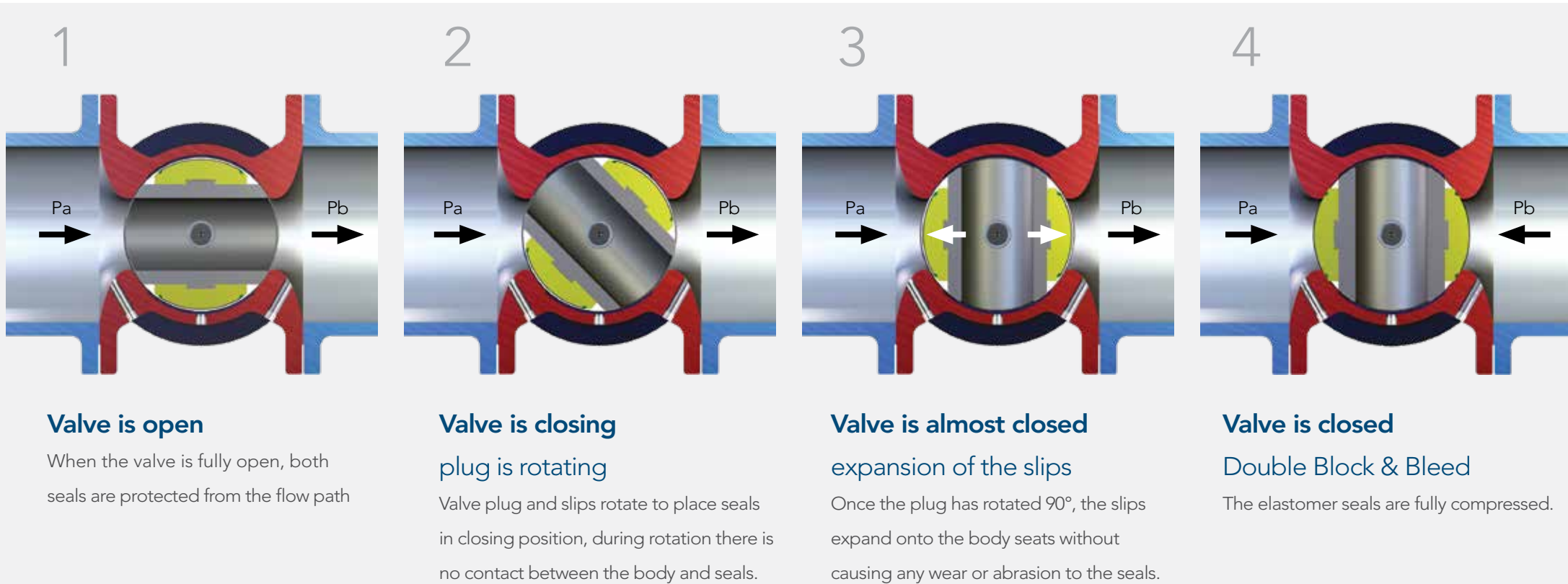
Double Block and Bleed Solutions

- **Permanent integral thermal relief and bleed function**
- **In-line maintenance in case of seal replacement**
- **Very short installation space required**
- **Double Isolation function, according API-6D/ISO14313**
- **Only 1 actuator required to operate the valve**

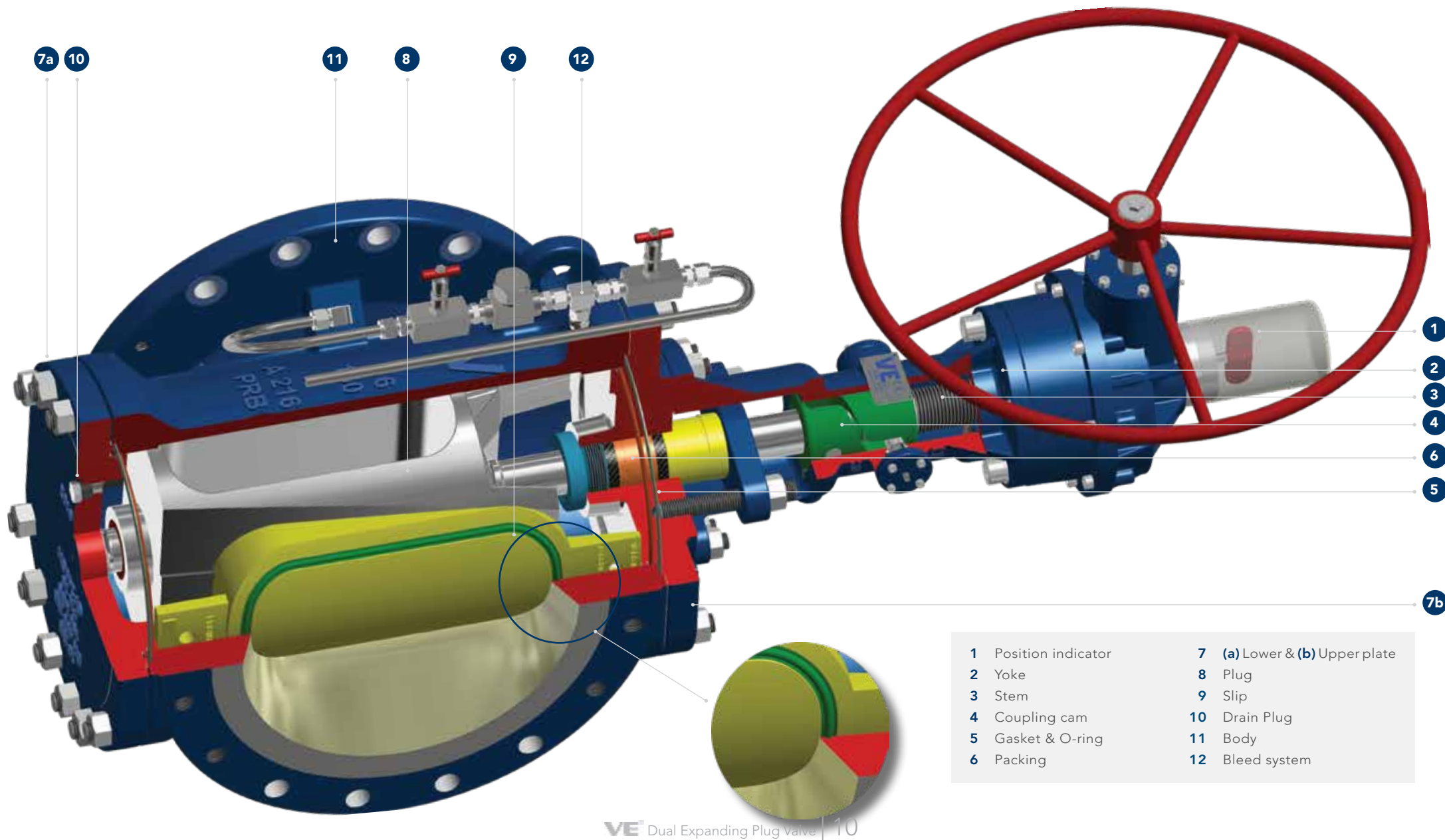


For many years different valves and valve combinations have been used as a solution for blocking and bleeding, sampling or draining lines. Traditional valves (gate) or valve combinations can degrade over time and result in loss of product and frequent maintenance. Unlike other valve types, the VE® Dual Expanding plug valve creates an optimum seal without causing any abrasion and wear. Providing a “zero-leakage” solution, upstream and downstream, securing a long life-time of the seals and valve, as well as a low opening- and closing torque. This unique design is combined with a bleed function, all in one valve, saving space as well as providing a reliable, safe and economical solution.

Working principle



Cross Section – View and Features





VE® Dual Expanding Plug Valve

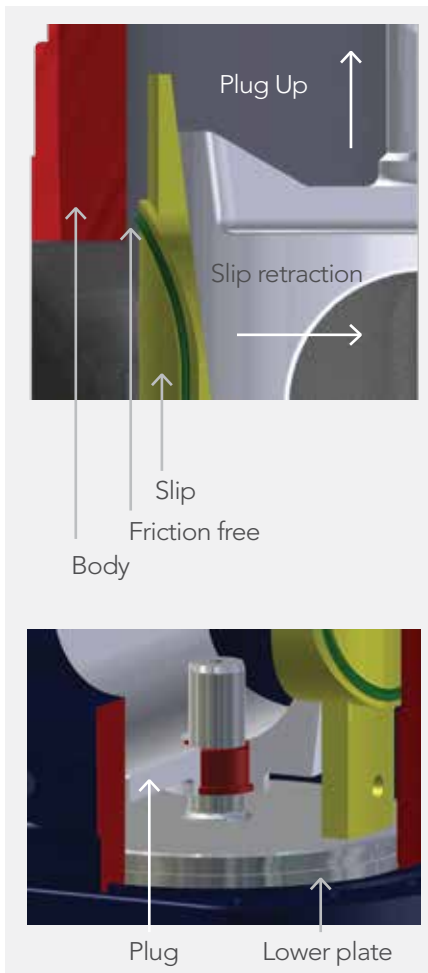
The dual expanding plug valve has been developed to substitute the principle of two in-line valves with a drain and or bleed valve, as further described and shown in the previous page. The special design of the sealing mechanism minimizes wear, securing a long lasting safe and reliable flow control solution.

Double Block & Bleed and Double Isolation (according to API-6D/ISO14313)

The VE® Dual Expanding Plug Valve provides two seating surfaces, each of which, seal to both directions. When the valve is in closed position, each individual seal is fully isolating not allowing any leakage, either from downstream or upstream or from the body cavity. In case of body cavity overpressure, venting/bleeding is provided by a thermal relief. Therefore the downstream pipeline is fully isolated from upstream pressure without the need for pressure balancing.

The VE® Dual Expanding Plug Valve provides several different bleed systems and a pressure relief device according to the requirements of API 6D. Page 20 and 21 show an overview and description of all the different options. Custom solutions can also be produced on request.

VE® Dual Expanding Plug Valve



Zero leakage | nonabrasive sealing

The sealing principle of most valves, e.g. gate, butterfly and ball valves, is based on shear or friction force. This causes gradual wear of the sealing material and increases the required torque to open or close the valve, especially when the valve is automated.

The unique sealing mechanism on the dual expanding plug valve is designed so, the slips retract, preventing abrasion of the elastomer seals during operation. This ensures long seal life as well as a lower opening and closing torque requirement and prolongs the overall life of the valve.

Fugitive emission certified



The VE® Dual Expanding Plug Valve is TA-LUFT FUGITIVE EMISSION Certified, complying with the stringent ISO 15848-1 2006 Annex B, to the highest stability grade C03. The VE® Dual Expanding Plug Valve provides not only a “zero-leakage” solution but also safe-guards the environment, in full compliance with the latest emission regulations.

Innovative lower trunnion design

The VE® Dual Expanding Plug Valve has a special designed lower trunnion, which prevents accumulation of particles and dirt in the lower part of the valve body. This accumulation could otherwise cause malfunction of the plug-system. Our unique lower trunnion design minimizes this effect securing a consistent and reliable operation of the valve.

Special “fugitive emission” packing-system

This unique packing design provides special sealing properties even under the most stringent conditions. Due to the special packing system the VE® Dual Expanding Plug Valve is awarded the FUGITIVE EMISSION Certification according to ISO 15848-1 2006 Annex B.

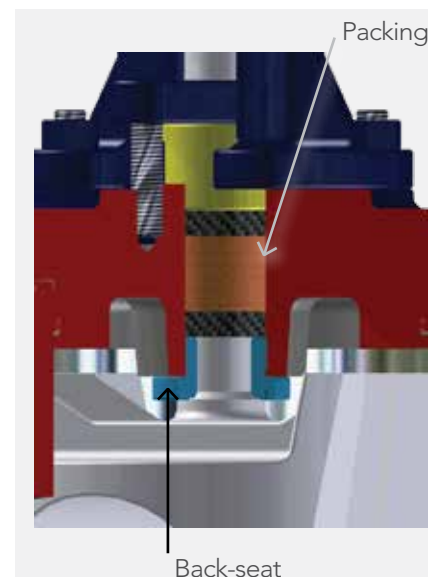
Back seat design

In case of stem-leakage the special “back seat” design provides the possibility to re-adjust the packing-gland or add additional gland packing-rings during field operation.

WARNING: take all the necessary safety measures, follow the instructions according to our “installation and operation manual”, which is included with every valve or downloadable from our website www.eriks-ve.com.

Slips

The special slip-design provides the VE® Dual Expanding Plug Valve a unique sealing-system. The primary seals is an elastomer which is fully vulcanized on to the metal. An additional safety seal is achieved by a metal-to-metal contact between the metal-slip and internal valve-body. The sealing and contact area of valve-body is fully ENP-coated ensuring a corrosion-free contact with the slips. The slips have a Manganese Phosphate anti-corrosion treatment. There is complete spare-part program available. Used slips can easily be removed and replaced.



Painting – Standard Dark Blue

In addition to the ENP-protection of the body and the upper- and lower pate, the VE® Dual Expanding Plug Valves are protected with a primer layer and a dark-blue painting. Other colors, paint combinations or paint thicknesses are available on customer request.



VE® Dual Expanding Plug Valve

Easy in-line maintenance

The VE® Dual Expanding Plug Valve can be serviced in-line ensuring minimum down-time and saving cost. Make sure all necessary precautions are taken for the media involved. Servicing can be done from the top or the bottom of the valve. Disassembling the lower-plate allows the slips to be easily be extracted and replaced by new slips.

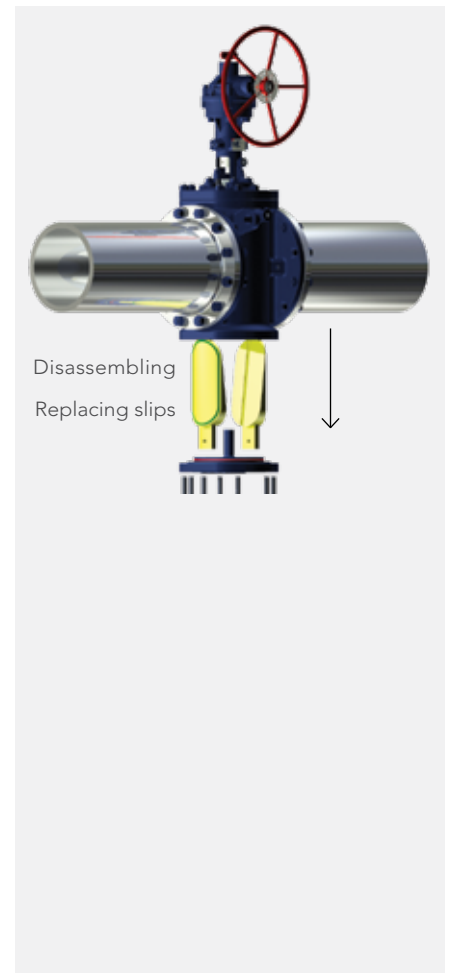
WARNING: make sure the line is depressurized and follow the instructions according to our “installation and operation manual”, which is included with every valve or down-loadable from our website www.eriks-ve.com.

Fire-safe certified

The VE® Dual Expanding Plug Valves not only provides a fire safe solution to the outside environment, but due to the innovative combination of a primary elastomer sealing system and a unique secondary metal-to-metal seal design, ensures a fire-safe solution down-stream as well as up-stream. The VE® Dual Expanding Plug Valve is certified according to ASME/API Standard 607, Fifth Edition-2005 and ISO 10497-2010.

All wetted parts – ENP protection

To prevent corrosion in the valve and ensure a long-life functioning, all the crucial parts are “Electroless Nickel Plated”. In the VE® Dual Expanding Plug Valve the body and plug have an ENP anti-corrosion layer, including the upper- and lower plate. Securing herewith a proper anti-corrosion protection of the trunnion and prevent malfunction of the plug-sealing system.



Elastomer Sealing and O-rings



The elastomer sealing-system is a crucial part of the valve which may be subject to toxic or aggressive media and high pressures or temperatures. To secure the proper function of this part and ensure a long service-life of the sealing-system, special moldings have been created to ensure an optimum vulcanizing-process of the elastomer on-to the metal surface of the slip.

This vulcanizing-process becomes even more crucial when highly chemical resistant elastomers are required due to toxic and aggressive media. The right selection of the elastomer is vital for the proper function of the seal, our highly experienced engineers can help and advise you with the selection.

Multi-seal ERT – suitable for MTBE

Fuels with high contents of solvents, MTBE or other additives can cause deterioration of the elastomer seal. Together with the Elastomer Research & Development engineers of the ERIKS group, the VE® valves meets these challenges with its new and innovative sealing solutions.

Research Laboratory Chemical-Resistance

The engineers at “Elastomer Research Laboratory” of ERIKS, can help you to provide a custom-made sealing solution. Providing us with a sample of your media, our laboratory engineers can determine and advise you the most suitable elastomer solution.

Selection Guide

Chemical and process environment	NBR	HNBR	Viton® A	Viton® B	Multi-Seal ERT
Crude Oil	3	2	1	1	1
Automotive and Aviation Fuels	3	2	1	1	1
Automotive Fuels Oxygenated with MEOH, ETOH, MTBE, etc.	NR	NR	NR	2	1
Engine Lubricating Oil, SE and SF grades	3	3	2	1	1
Engine Lubricating Oil, SG and SH grades	3	3	3	2	1
Aliphatic Hydrocarbon Process - Fluids, Chemicals	1	1	1	1	1
Aromatic Hydrocarbon Process - Fluids, Chemicals	NR	NR	2	2	1
Aqueous Fluids, Steam, Mineral Acids	NR	NR	3	2	1
Strong Base, High pH, Caustic, Amines	NR	NR	NR	NR	1
Low Molecular Weight Carbonyls (MTBE, MEK, MIBK, etc.)	NR	NR	NR	NR	2

This selection guide is a guideline. Always consult our technical engineers, as different concentrations of media could have a negative effect on the physical properties of the elastomer.

1 = Excellent- minimal volume increase and/or change in physical properties

2 = Good-small volume increase and/or change in physical properties

3 = Moderate-acceptable amount of volume increase and/or change in physical properties

NR = Not Recommended/Excessive volume increase and/or change in physical properties

Viton® is a registered trademark of DuPont Performance Elastomers L.L.C.

Pressure Relief & Bleed System



The VE® Dual Expanding Plug Valve provides several different bleed systems and a pressure relief device according to the requirements of API 6D. Due to the Double Block function of the VE® Dual Expanding Plug Valve, thermal expansion of the liquid in the body cavity can cause a significant increase of the pressure. To prevent this effect all VE® Dual Expanding Plug Valves must be installed with a pressure relief device.

In order to satisfy customers demand, ERIKS-VE® has developed several types of Bleed systems. All these systems can be customized with additional equipment like gauges, electronic flow-sensors etc.

MBB: Manual Body Bleed.

Hand operated bleed valve. The VE® Dual Expanding Plug Valve must always be bled in closed position. Bleed outlet should be plumbed for drainage to a reservoir.

TRB: Thermal Relief to Body.

This system includes a thermal relief valve in order to relieve pressure build up which might occur in the body cavity from thermal expansion. The thermal relief valve automatically operates when the pressure in the body cavity goes 1.5 Bar (22psi) above pipeline pressure, unless the isolation valve is closed.

MBTR: Manual Bleed and Thermal Relief.

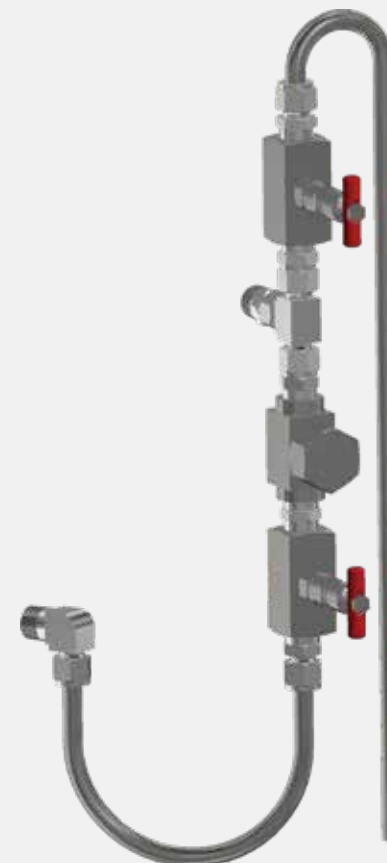
This system is a combination of an MBV and a TRB. Combining an automatic bleed of the body and also check the seal integrity of the Dual Expanding Plug Valve.



Manual **B**ody **B**leed



Thermal **R**elief to **B**ody



Manual **B**leed and **T**hermal **R**elief

Gear Operated

The VE® Dual Expanding Plug Valve is standard provided with a gear. On request the valve can also be handwheel operated, up to 6".

Position Indication

The VE® Dual Expanding Plug Valve can be provided with limit switches or sensors, providing a signal to indicate the position of the valve. It is also possible to mount a visual indicator, showing the open- or close position of the valve.

These is an option to provide these gear operators with couplings for electric actuators in accordance with ISO 5210.

Type	Ratio	Efficiency factor	Thrust Capacity		Output Torque
			Br-Al NUT	Ni-resist NUT	
FL-0	4:1	3,2	8000 N	8000 N	500 Nm
FL-1	4:1	3,2	18200 N	13600 N	1030 Nm
FL-2	4:1	3,2	36300 N	25000 N	2070 Nm
FL-3	4:1	3,2	45400 N	45400 N	4140 Nm
FL-4	6:1	4,8	82500 N	82500 N	7750 Nm

Input speed	12	20	40	60	80	100	120	140	160	180	
Correcting factor	1	0,99	0,96	0,93	0,90	0,87	0,84	0,81	0,78	0,75	



Actuator Operated

The VE® Dual Expanding Plug Valve is suitable for most commonly used multi-turn electric actuators. The unique design of the valve provides a very low opening- and closing torque, beneficial when sizing the actuator. The ERIKS-VE engineers can help you select the right actuator size and support you with technical advice.

Information required to select the correct size actuator:

- Pressure in the installation, both design and operating
- Opening/closing time, preventing water hammer
- Environmental protection (e.g. Ex-area, IP-classification)
- Electrical power, AC/DC voltage
- Duty cycle
- Communication protocol (e.g. Bus, HART)
- Pressure relief system*

** Thermal expansion in the valve cavity can cause difficulties when opening the valve, therefore automated valves always require a pressure relief system.*

See page 21 for the different types of pressure relief and bleed systems.



General data | **VE**[®] Dual Expanding Plug Valve

Extensions

The VE[®] Dual Expanding Plug Valve can easily be supplied with vertical and/or horizontal extensions. These are custom made and our sales team will require detailed customer information when the valve is ordered.



1 Design, dimensions and marking according to:

- Design as per API 599 & API 6D
- Face to face as per ASME B16.10 & API 6D
- Flanged ended as per ASME B16.5 / EN-1092-1

2 Characteristics:

- Friction free
- Dual expanding
- Double block & bleed and double isolation & bleed (according to API-6D/ISO14313)

3 Construction:

- 3 Parts construction: body, lower plate, upper plate
- Trunnion mounted
- Antistatic design
- Seating slips (slips are replaceable through the lower or upper plate)
- Reduce bore
- Low emission packing & gaskets according to ISO 15848-1
- Electroless Nickel plating - ENP
- Stud & nuts: anticorrosion treatment

4 Standard execution:

- ISO 9001:08
- PED 2014/68/EU
- Fugitive emission certificate according to ISO 15848-1
- Fire safe according to API 607

5 Flanged connections according to:

- ASME B16.5:
 - Raised face smooth finish, stock finish or ring type joint
- ASME B16.47 Serie A (MSS-SP-44) or Serie B:
 - Raised face smooth finish, stock finish or ring type joint (applicable for valves ≥ 30")
- Top of flange as per ISO 5210 (f10 / f14 / f25...)

6 Marking in accordance with:

- European directive PED 2014/68/EU
- API 6D
- MSS-SP-25

7 Casting material

- According to API 6D / ASME B16.34 / EN 1092-1 / PED 2014/68/EU

8 Elastomers material:

- Viton A / B / GF
- HNBR
- Multi Seal ERT

9 Testing according to:

- API 6D
- API 598
- EN-12266-1 / EN-12266-2
- BS 6755 part 1

10 Operation devices:

- Handwheel
- Gear box
- Actuator linear / multi turn

11 Bleed systems:

- Manual body bleed
- Thermal relief upstream
- Manual body bleed with thermal relief upstream
- Automatic body bleed
- Remote leak detection system
- Bi-directional body bleed with thermal relief

12 Bottom drain plug:

- Standard included

13 Optional

- Limits switches
- Locking device
- Cable gland
- Extensions

There are several possible extensions, please contact our technical engineers to help you with the right option and dimensions. Where valves are located in an elevated, difficult to access position, the VE® Dual Expanding Plug Valve can be provided with chain-wheels for easy operation.

Standard bill of material

Part	Description
Body	ASTM A 216 WCB + ENP
Lower plate	ASTM A 216 WCB + ENP
Upper plate	ASTM A 216 WCB + ENP
Plug	ASTM A 216 WCB + ENP
Slip	ASTM A 536 80-55-06 + Multi-seal ERT + Mang. Phosp. Coating
Yoke	ASTM A 216 WCB
Backseat	ASTM A 182 f6A
Gland	ASTM A 182 f6A
Packing	Graphite
Gland flange	S355J0G3
Gland stud	ASTM A193 B7 + Anti-corrosion treatment
Gland nut	ASTM A194 2H + Anti-corrosion treatment
Gasket	PSW. AISI 316L + Graphite
O-ring	Multi-seal ERT
Friction bearing	AISI 316L
Body plate studs	ASTM A 193 B7 + Anti-corrosion treatment
Body plate nuts	ASTM A 194 2H + Anti-corrosion treatment
Coupling cam	F158 cemented
Stem	ASTM A 182 F6A
Cam pin	17-4PH H900
Guide pin	17-4PH H900
Radial bearing	Standard
Pin plate	ASTM A 105
Pin plate bolt	Steel
Grease fitting	Stainless steel
Yoke stud	ASTM A 193 B7 + Anti-corrosion treatment
Yoke nut	ASTM A 194 2H + Anti-corrosion treatment
Drain plug	ASTM A 105
Bleeds	Stainless steel
ERIKS VE name plates	Stainless steel

Technical Data | Dimensions - figure 2300 - Reduced Bore

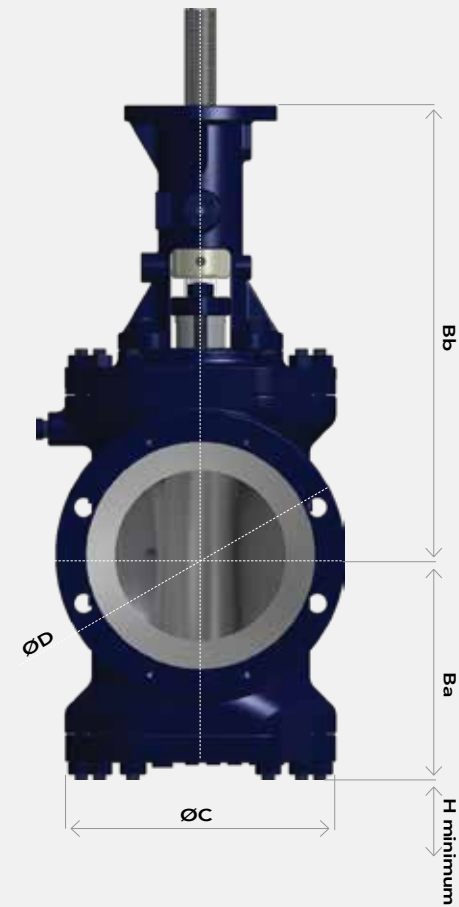
Bare stem valves - Class 150

Dimensions	3"	4"	6"	8"	10"	12"	14"	16"	18"	20"	
A	203	229	266	292	330	355	381	406	432	813	
e**	10,5	11	12	12,7	14,5	16	16,6	17,5	18,2	19	
Ba	130	155	205	260	205	330	370	480	480	492	
Bb	275	305	390	453	489	705	803	940	965	1063	
C	190	225	260	305	320	405	510	570	605	630	
D	191	229	279	343	406	483	535	595	635	699	
H*	200	250	300	350	400	500	550	600	680	780	
Turn open/close	7	7	9	9	9	9	11 1/2	11 1/2	11 1/2	10 1/2	
ISO 5210	F10	F10	F14	F14	F14	F14	F16	F16	F16	F25	
CV	452	810	1456	2519	3990	5097	6532	7556	9432	13652	
Weight (Kg.)	50	61	130	195	268	348	463	529	870	1370	

e^{**} = Shell wall thickness by API 6D

H^{*} = Minimum space required under the valve in order to replace slips.

NOTE: Flanged ended as per ASME B16,5 / EN-1092-1. The dimensions are shown in ASME.



Additional Information

Spare parts

ERIKS-VE stock a complete range of spare parts for the VE® Dual Expanding Plug Valve. All VE® Valves have a unique traceability charge number mentioned on the body of the valve and on the tag-plate. With this unique number ERIKS-VE engineers are able to identify and supply you with the correct parts.

Complete Spare-Kit

- 2 Slips
- 2 O-rings Elastomer
- 2 Body seal spiral wound gaskets
- 1 Gland packing-set

Spare-Kit (Soft parts)

- 2 O-rings Elastomer
- 2 Body seal spiral wound gaskets
- 1 Gland packing-set

Slip Renewal Program

ERIKS-VE have a Slip Renewal Program available whereby used slips can be reconditioned and vulcanized again with a new elastomer seal. This way used slips can be re-used. Where large numbers of valves are used in the field, customers are advised to order some additional spare slips to ensure a continual supply for easy maintenance. The elastomer sealing material of the slip is mentioned on the tag-plate of the valve body.

Field Service and Technical Support

ERIKS also has a Field-Service Team available which can support you in field repairs, commissioning and other required services.

How to order

To ensure the fastest response to your enquiry, the information below should be supplied to our Sales Team.

- Size and pressure class, e.g. size 6" – class 150
- Manual operated (handwheel up to 6", >8" gear) or actuator operated (e.g. electrical)
- Figure no. 2300 (Reduced Bore – Standard Version)
- Materials – Standard Version or Special Materials
- Elastomer Sealing Materials Slips
- Pressure Relief & Bleed System
- Paint specification – in case not according to Standard Version

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Dual Expanding Plug Valve