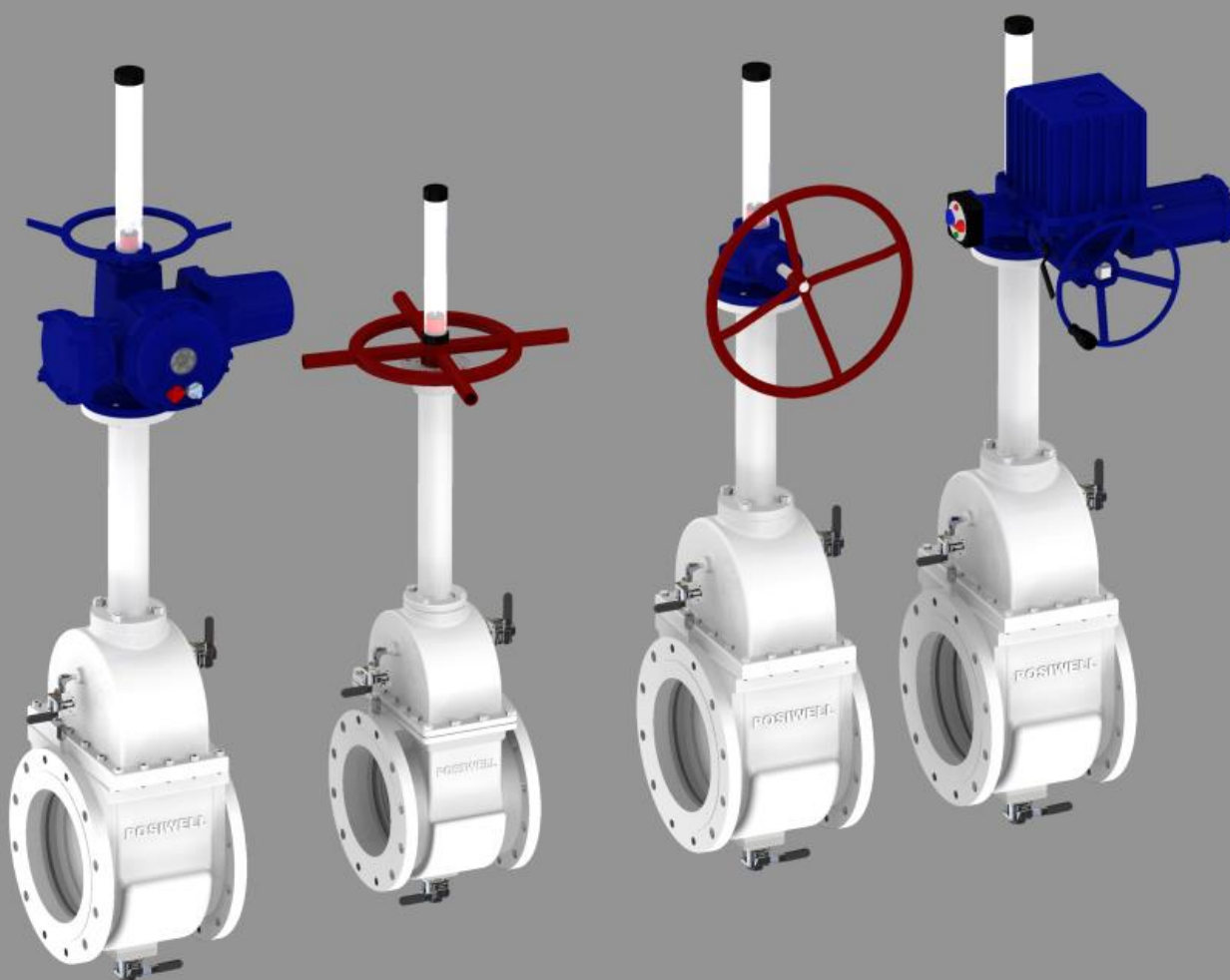


**DBB/DIB-1 Full Bore Gate Valves**

Patent : 8,939,432

*Verifiable and Zero Leakage Design*



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**Innovation by Design**

## Introduction

**PosiWell®** patented Full Bore “dual expanding discs” Gate Valves are DBB – Double Block & Bleed and DIB-1 – Double Insolation & Bleed Valves; designed by engineers with in-depth understanding from over 3 decades of servicing & repairing of traditional Valves as DBB valves and modifying standard valves to DBB type.

With corrosion and chemical additives being one of the main causes of failure within traditional DBB valves design, **PosiWell®** internal trim is manufactured from Stainless Steel and RTFE soft seats as standard with alternative materials available.

**PosiWell®** patented Spring-loaded disc design ensures low friction operation during opening and closing thus increasing the life span of the valves and ensuring lower torque for automation and smaller actuators than traditional DBB valves.

Full Bore design allows for maximum flow rate over traditional reduced bore DBB valves and the in-line Pigeable feature.

User friendly in design, allows ease of in situ seat replacement and repair. **PosiWell®** DBB Valves are designed with lifting gear that eliminates the need for costly Crane hire especially on Tank side and Jetties.

Having completed extensive in-house testing in 2011, Valves were then field tested by major terminal operators in Singapore, Denmark, Malta and USA handling on MTBE, Morgas, Jet Fuel as well as Black and White (mixed) products.

Today Major Oil Terminal operators are adopting **PosiWell®** as their choice for replacement of traditional DBB valves and specifying **PosiWell®** for new projects.

## Design and Specifications

Design	: API 6D, Dual Expanding Discs - DBB-DIB Gate Valves
Size Range	: 2" to 40" ANSI Class 150 – Class 300 : ANSI 600 on request.
Pressure & Temperature	: ASME B16.34
Face to Face	: ANSI B16.10 RF Smoot Finish, 125-250AARH
Flanged Connection	: ASME B16.5, MSS-SP-44-B16.47
Testing	: API 6D, API598, <b>PosiWell®</b> Standards
Certification	: API 6FA – 3 <sup>rd</sup> ed. 1999 (Firesafe) : EN ISO 15848-1 (Fugitive Emission)
Standard Operating	: Handwheel Operated for 2" to 10" (Gearbox: Optional) : TGM Gearbox for 12" and above as Standard : Automation "all types" available to specification
Bottom Drain	: SS 316 Ball Valve, NPT Threaded (Flanged end optional)
Bonnet Vent	: SS 316 Ball Valve with SS 316 Tubing – as Standard
Thermal Relief	: SS 316 Thermal Relief Valve – Cavity pressure relief with SS 316 Tubing – 25 PSI differential pressure to relief.
Stem & Discs	: SS 304 – as Standard (other Material on request)
Soft Seat	: RTFE (15% Glass Reinforced) – PTFE optional
Stem Seals	: Graphite – Live Load Packing Seals
Bonnet Gasket	: Graphite
Anti-corrosion	: Phosphate "Bath" Treatment as standard : Epoxy lining for aggressive products available on request
Painting	: 2 Part Epoxy Coating (to customer specification)

# Operating Principles

## Rising Stem Valves

Fig 1

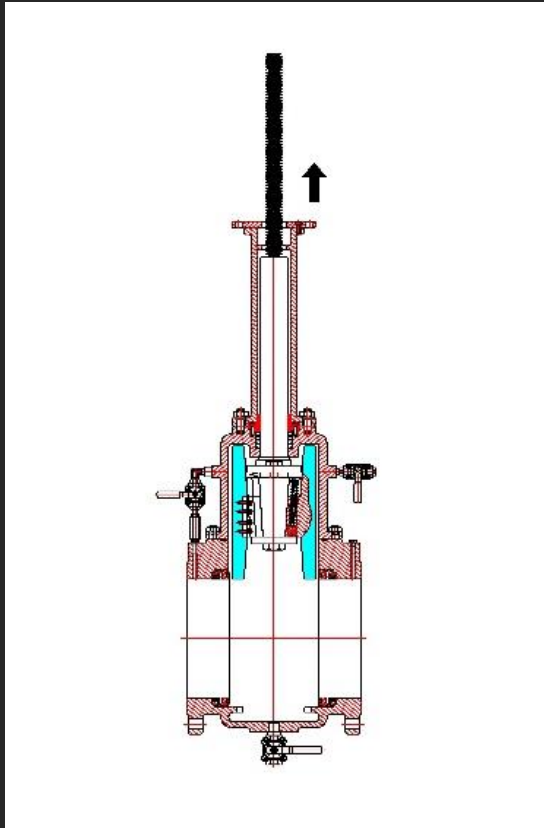


Fig 2

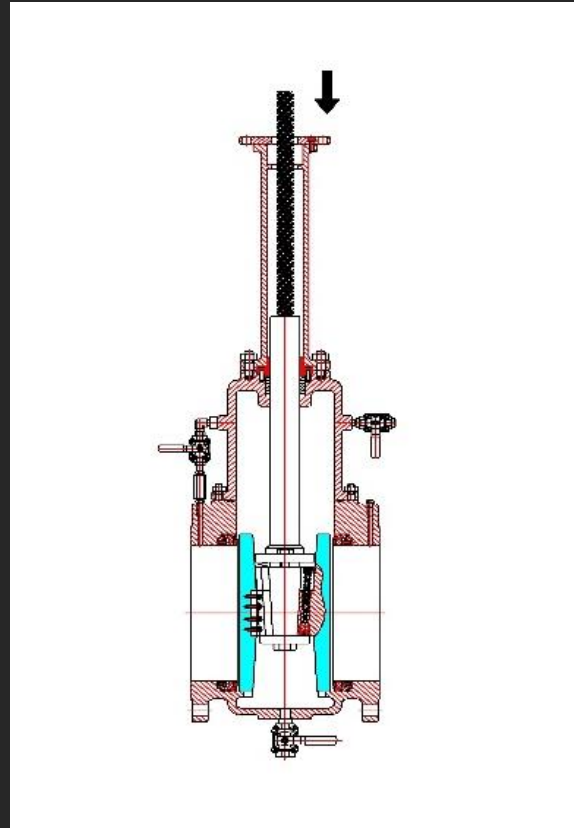


Fig 3

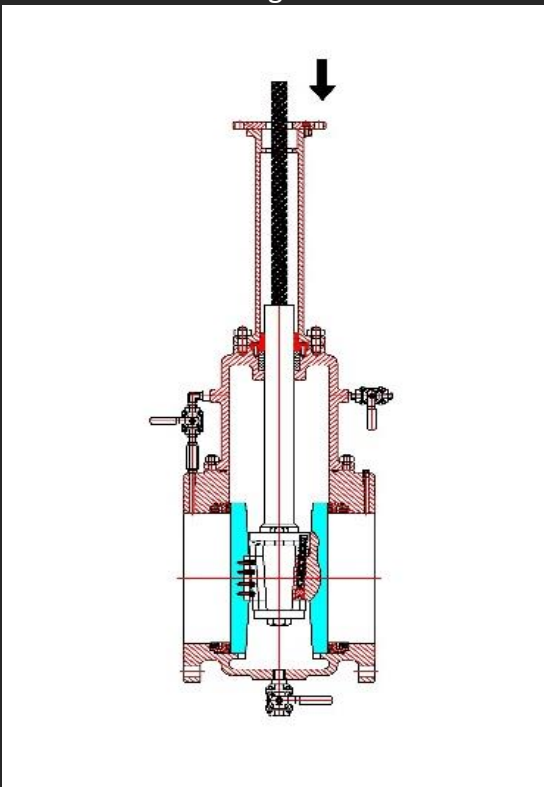


Fig 1

Valve in fully open position with Discs fully retracted in bonnet ensures **FULL BORE = FULL FLOW = PIGEABLE**

Fig 2

Valve in closed position, discs retracted and located on disc shoulder. Discs-Seat clearances depending on Valve sizes are 1.5 to 2.5mm

Fig 3

Valve in fully closed position with discs expanded sealing on Metal to Metal and Soft Seat achieving **ZERO** leakage per API 6D – DBB/DIB-1

# Operating Principles

## Non-Rising Stem Valves

Fig 1

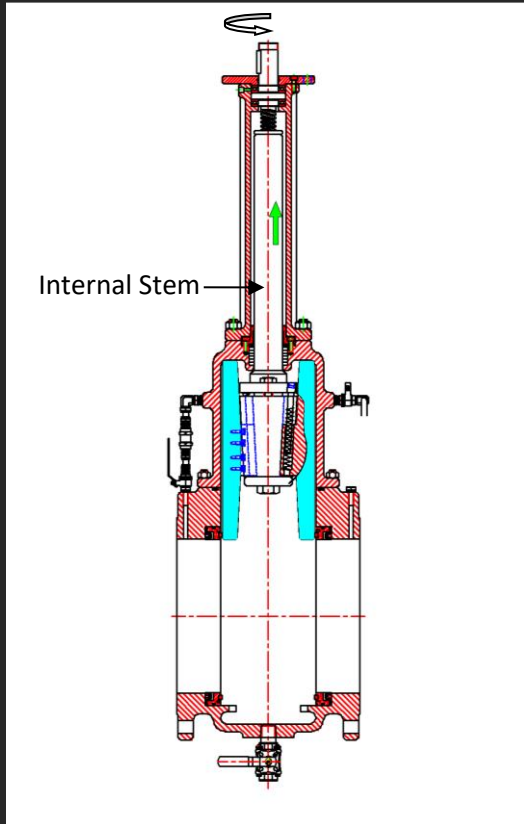


Fig 2

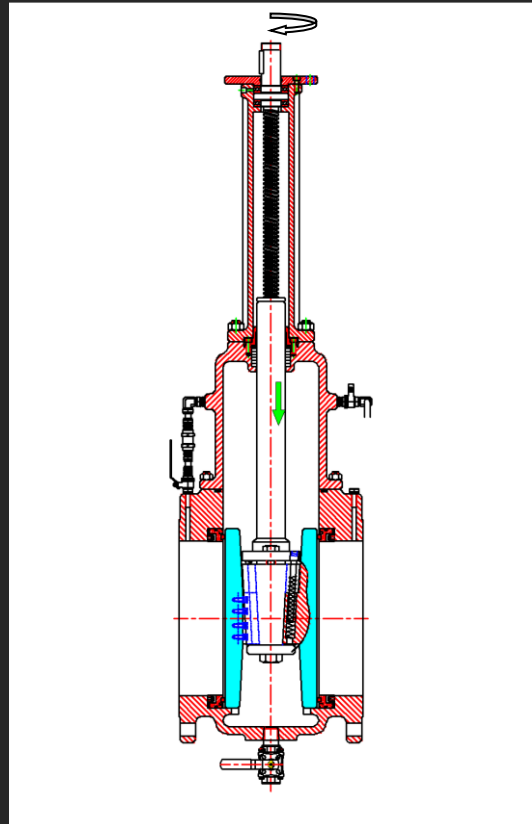
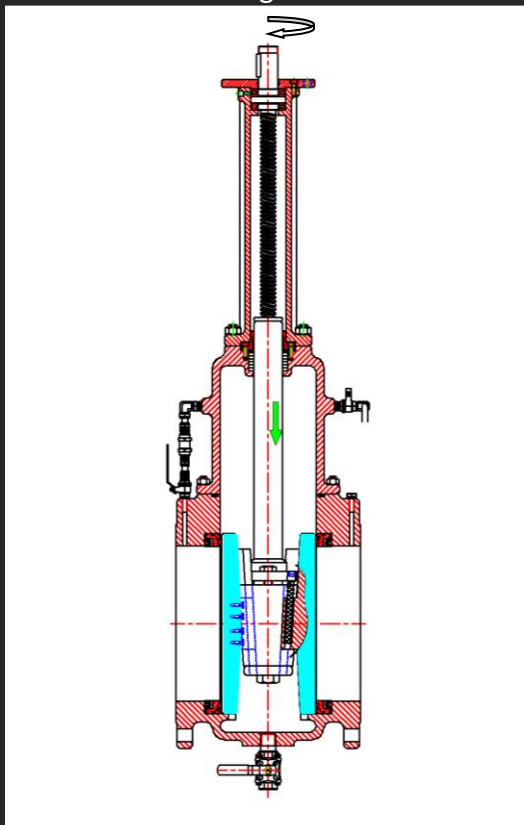
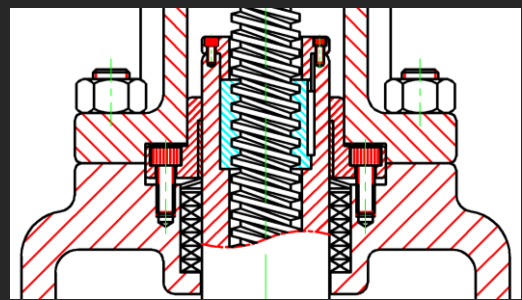


Fig 3



Operating principle are the same as the Standard Rising Stem Valves except stem travels internally in the yoke (Fig 1).



*Internal Stem and Stem Nut Assembly*

**PosiWell®** non-rising stem valves maintain all functionalities and ZERO leakage performance.

Fig 2 shows valve on close position with discs still retracted, and Fig 3 shows discs expanded and compressing the seat.

## Patented Spring-Loaded Discs Design

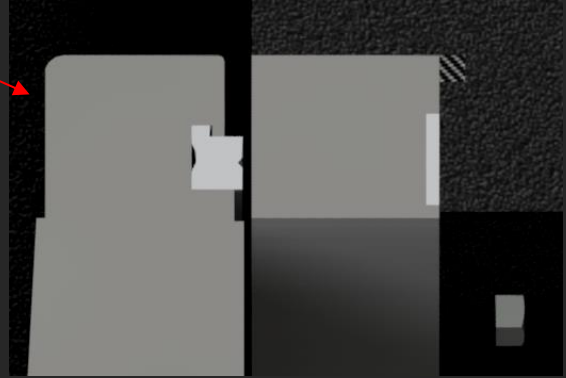
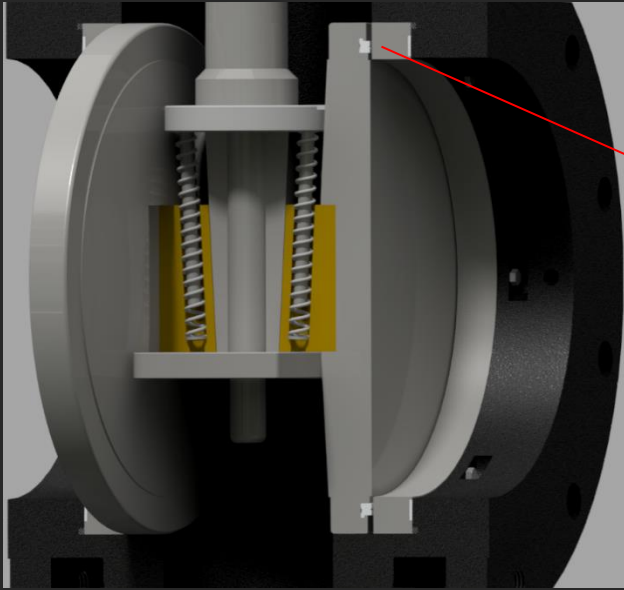


Fig.1: Valve in closed position, springs decompressed, discs located on disc shoulders and retracted from Valve seats.

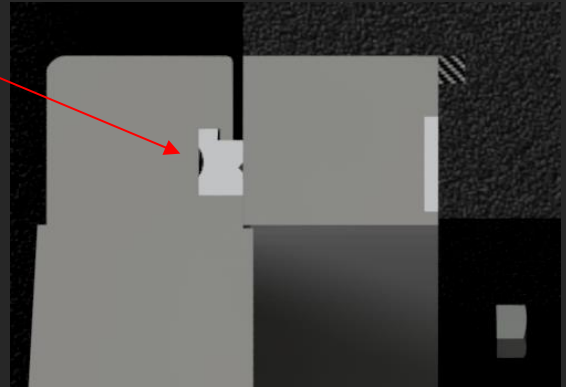
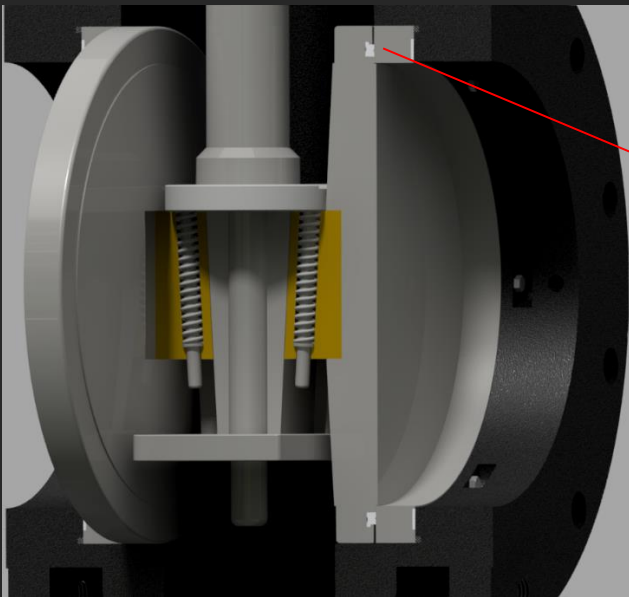
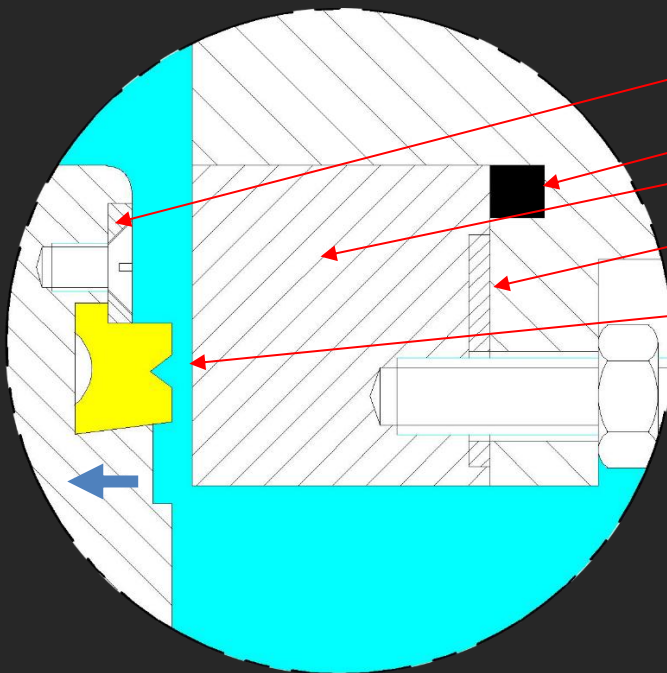


Fig. 2: Springs are compressed, discs expanded sealing on soft seat and metal to metal seat achieving bubble tight shut-off to API 6D – DBB/DIB-1 standard.

The **PosiWell®** patented spring-loaded discs design ensures that seat tightness is maintained during Thermal Expansion and Contraction, and ensures that both the discs are adequately retracted before the discs start their uplifting motion. See “Patented Seat Design” page for more details about the patented seat design.



## Patented Seat Design



Retainer Ring & SS Screws

Graphite Seal

Stainless Steel Seat Ring

PTFE Gasket

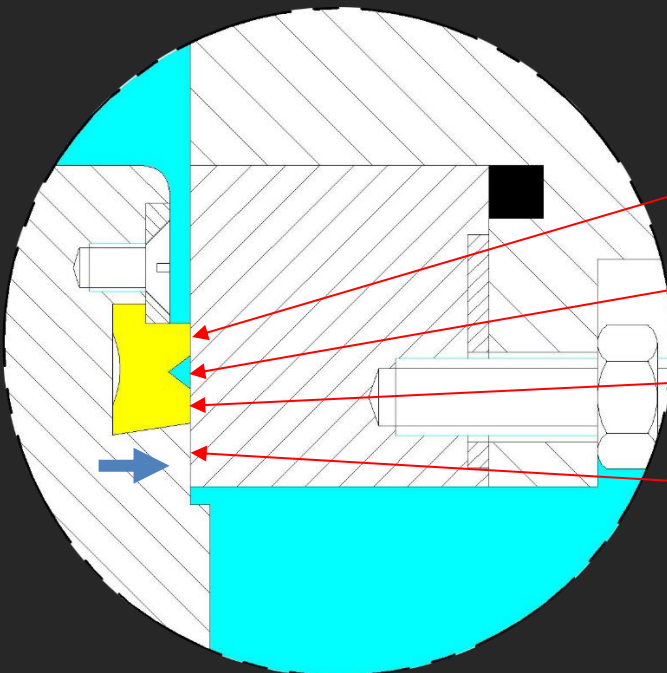
Unique Soft Seat Design

V-Notch Seat Face

Twin Lip Seal

Dove-Tailed seat and retainer plate fixing allow easy replacement.

**DISC RETRACTED**



Resilient Sealing (S2)

Pressure Sealing (S3)

Resilient Sealing (S2)

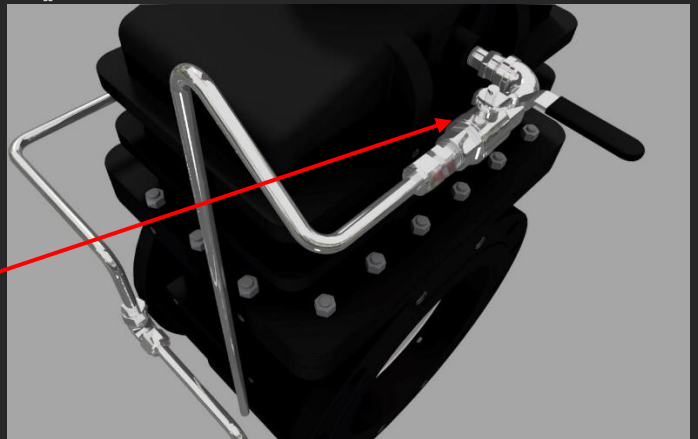
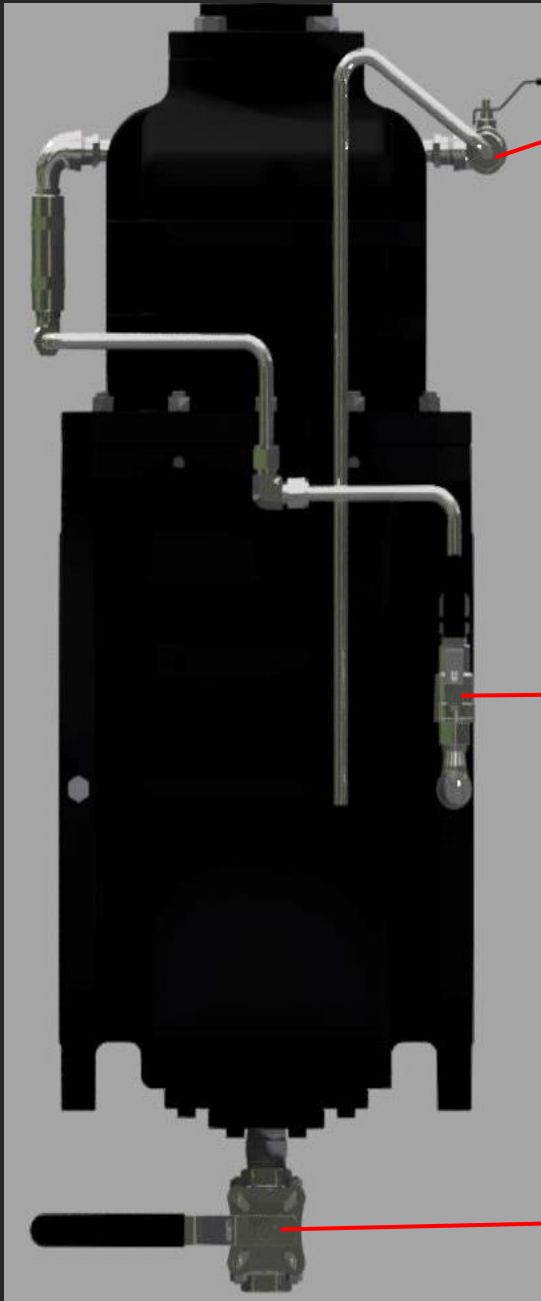
Metal to Metal Sealing (S1)

**DISC FULLY EXPANDED**

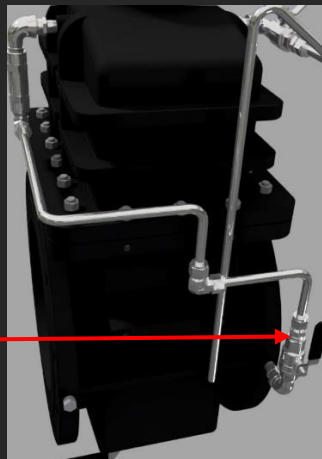
**PosiWell®** DBB-DIB valves are designed with a unique patented sealing concept (S1, S2 and S3). Expanding Discs primary seal will be Metal to Metal contact (S1). For secondary seal, Soft V notch seat ring with twin lip sealing points (S2) and Pressure Sealing (S3), the concave back of the resilient seat allows for the expansion and compression of the seat face. Foreign debris will be flushed through by flow pressure before the expanding discs compress the Resilient & Metal Seat. Seat is designed for fast and easy in situ replacement.

## Features

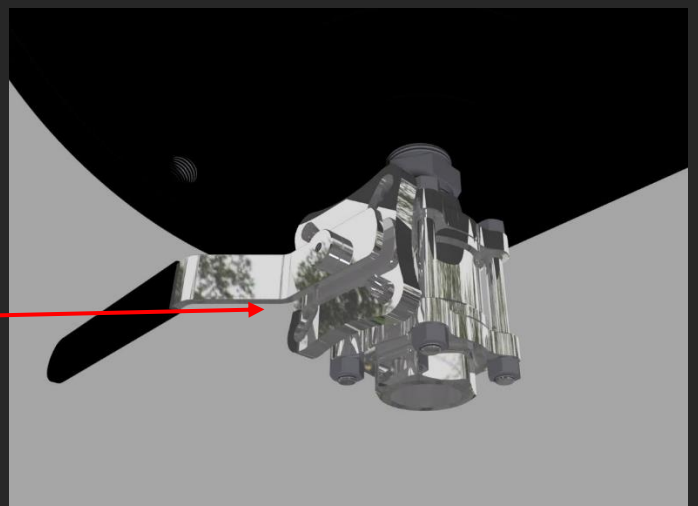
Bonnet Vent, Thermal Relief and Bottom Bleed



Bonnet Vent Valve for verifying leakage



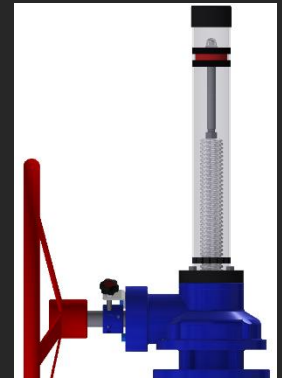
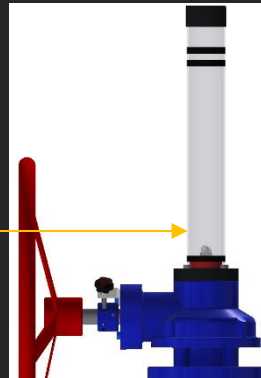
Thermal Relief Valve Set @ 25 PSI – with Isolation Valve that can be installed on either of the Valve's End Flanges



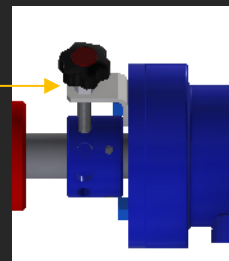
Large bottom bleed valve for cavity draining



## Features

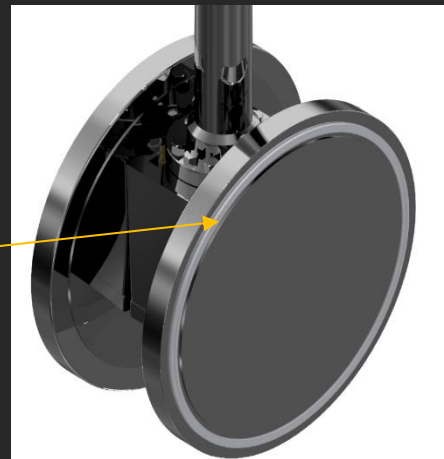


**Prominent visual “Orange” Indicator Showing Valve Position on Fully Closed and Fully Open Position**



**Hand Wheel Locking device to secure movement from pipeline vibrations during pumping.**

**Stainless Steel Discs with patented in-Line replaceable Soft Seat Insert.**



# Valve Feature Summary

- **Key feature of PosiWell® DBB/DIB-1 Valves**
  - Full Bore – MAX FLOW – increase Flow Rate vs. Plug Valves
  - Full bore allowing pipeline pigging
  - Large bottom cavity and drain for easy release of foreign particles entrapment.
  - Full compliance to API 6D – ISO14313 dd. Aug 2015 Valves for DBB and DIB
- **Product castings**
  - Body and Bonnet – components cast in Taiwan
    - Body as Bonnet Zinc Phosphate treated – NO electroless Nickel plating.
      - NO peeling, NO flaking, NO cracking.
- **Internal components**
  - Wedge, disc, and Stem – Stainless Steel – NO electroless Nickel plating.
    - NO peeling, NO flaking, NO cracking
- **Dual expanding discs [patented spring-loaded design]**
  - Discs – Stainless Steel
  - Metal to Metal contact with Seat Ring
  - Solid wedge
- **Seat Ring**
  - Stainless Steel
    - c/w back up graphite seat
    - c/w RTFE back up ring
- **Soft Seat-Patented**
  - Standard RTFE alternative PTFE
    - Twin lip seal
    - Centre “V” notch pressure seal
  - Soft seat “in-situ” - “in-line” replaceable
- **Stem Packing**
  - Live loading
  - Graphite Packing
- **Fire Safe**
  - Primary seal is Metal to Metal tested to API 6FA
  - Secondary seal RTFE/PTFE alt. (see above soft seat)
- **Thermal relief – Bonnet Bleed – Body drain – as standard feature**
  - Valves and piping Stainless Steel
  - Thermal relief valve drain can be installed either side of flange
- **Low friction – Lower Torque**
  - Use of smaller actuators
- **Other Key Features**
  - **Davit Crane (optional feature)**
    - The valve’s Body has a cast in design feature to adapt our unique lifting arm “**Davit type Crane**” potentially eliminates the need of costly heavy lifting cranes in extreme difficult accessible areas.

## Other Key Features

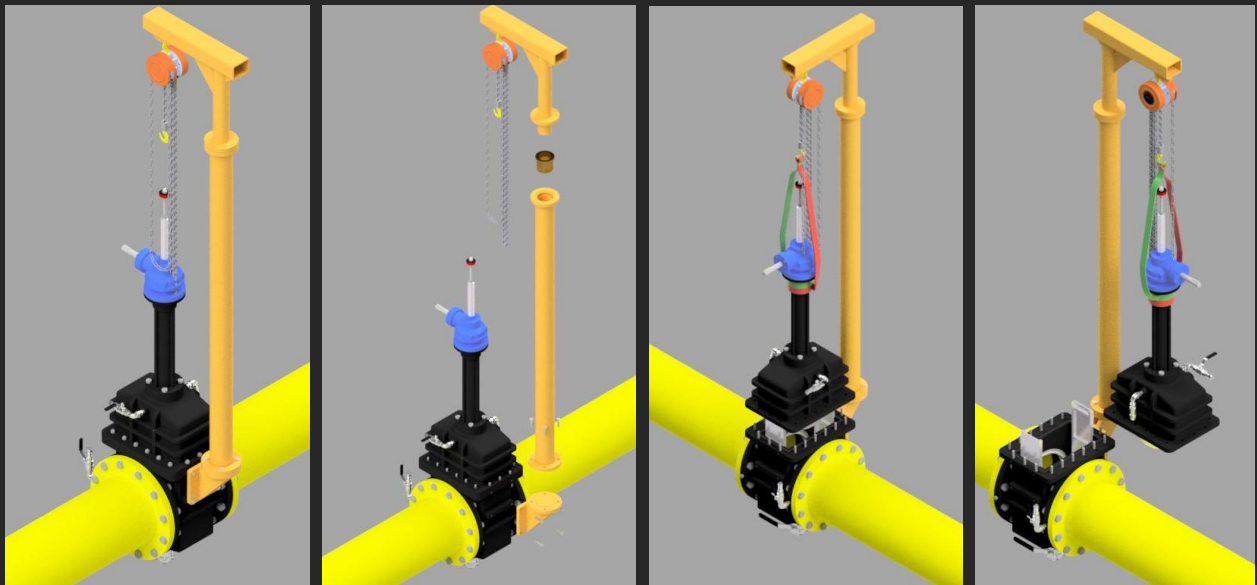
### Davit-Type Crane Lifting Arm

When a valve requires maintenance or repair, accessibility is always a problem.

**PosiWell®** DBB-DIB valves as standard are fitted with Stainless Steel Trim and in line replaceable Teflon seat.

In the event of a seat failure, **PosiWell®** engineers have made it a simple task for inspection and replacement.

**PosiWell®** DBB-DIB valves are designed as standard with a cast in feature to adapt a unique designed built lifting arm “Davit Crane” that eliminates the need for costly heavy lifting cranes in difficult accessible areas.





# Manufacturing Plant

CNC Machines in Manufacturing Plant





## Assembly and Testing Plant

Hydrostatic Body Test, Actuation and Inspection



Hydrostatic Body Test



Inspection & Stroke Limit  
Setting



Valve Actuation & Automation



Physical Inspection and Paint Inspection



## Sample Valve Assemblies



Rising Stem Valves with TGM Gear Operators



Non-Rising Stem Valve with TGM Gear Operator



DBB Valve with Proximity Sensors



**PosiWell®** Valves in Showroom

**PosiWell®** has a Manufacturing Plant where valves are manufactured and an Assembly Plant dedicated in doing assembly and inspection of the valves produced, to ensure high quality and best performance of the DBB-DIB Valves.



## Applications

- **Multi Product Manifold**
- **Metering Stations**
- **Tank Storage Isolation**
- **Hydrant Isolation**
- **Battery Limit Isolation**
- **Commercial & Military grade Jet Fuelling Systems**
- **Any application requiring Zero Leakage Performance**



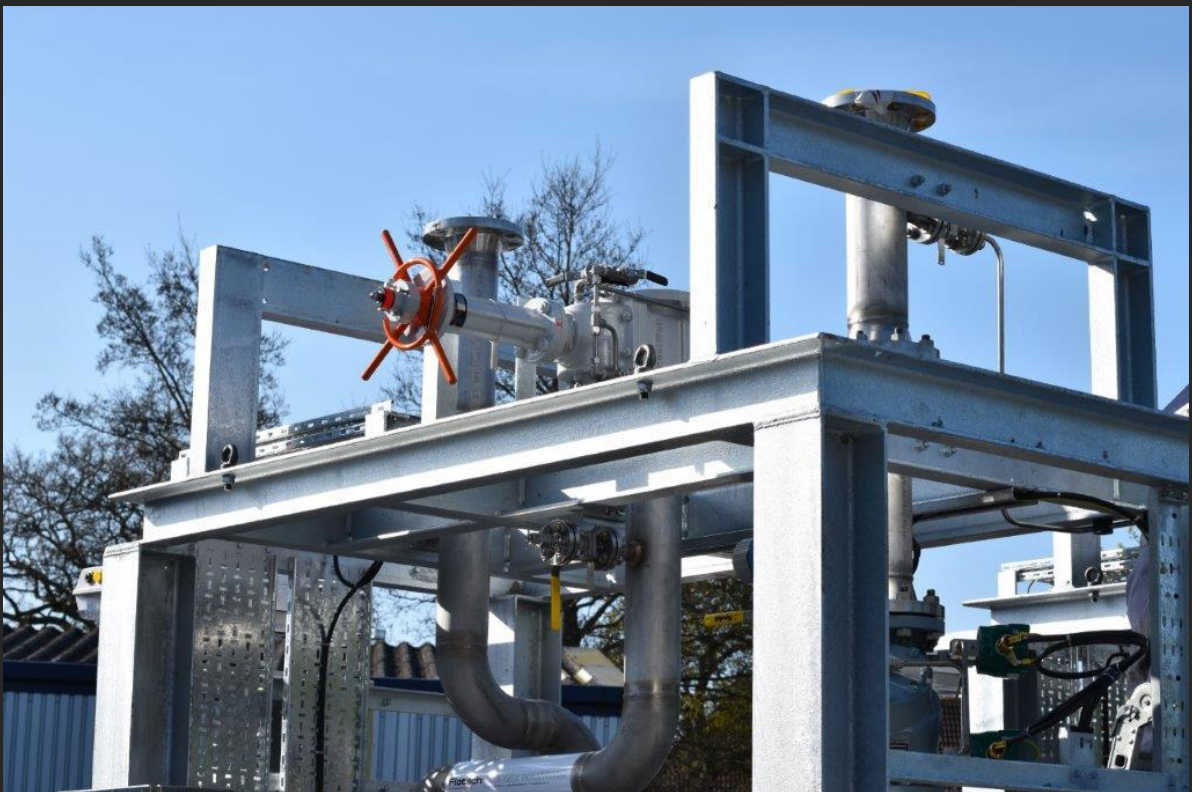
**PosiWell®**

*Posiwell®* DBB-DIB Valve in use



**Innovation by Design**





## USER REFERENCE LIST

- Oiltanking Singapore
- Oiltanking Malta
- Oiltanking Copenhagen
- Oiltanking Oman
- Oiltanking Houston
- Vitol – VTTV - Cyprus
- Vitol – VTTI – Fujairah (UAE)
- Vitol – ATB Malaysia
- Tankstore – Singapore
- TANKMED – Tunisia
- Concord Energy – Fujairah Oil Terminal (UAE)
- Vopak Algeciras – Spain
- Vopak Singapore (Sebarok & Banyan)
- Petrol Seraya – Singapore
- Changi Airport Singapore – Jet Fuel Storage
- Republic of Singapore Air Force – Jet Fuel Storage
- Port of Fujairah
- Tanzania – Africa
- Philippines Coastal Storage & Pipeline Corporation  
(formerly US Navy Base)
- London Heathrow Airport UK
- Kangerlussuag Airport Greenland
- Manchester Airport UK
- Keflavik Airport Iceland
- RAF Akrotiri Cyprus Base