



Engineered to provide  
the performance you expect.

**KTM™ Virgo™ Series Floating Ball Valves**

Isolation valves engineered to provide reliability,  
safety and keep your process operating.



## You face more than your share of challenges in achieving the most from your processes.

Your job is always a balancing act, making sure your operation is safe, regulatory compliant, realizes maximum uptime, and at the same time keeping a close eye on operational expenses.

In order to succeed in maintaining the balance between all of these elements you must select the proper equipment for your operation. Important questions that you should ask yourself when selecting isolation valves for your process are: With all the product claims on the market, do these valves perform as advertised? Can I purchase and maintain them at a cost that does not break the bank? Does this product help me achieve the results I am looking for in my processes?

“43% of valve failures in oil and gas sector are caused by inadequate design and material deficiencies.”

–TÜV SÜD



“60% of all fugitive emissions come from valve stem packing.”

–US Environmental Protection Agency



“Recent study indicates the most important factor in choosing an on/off valve is having proper industry certifications.”

–EPM

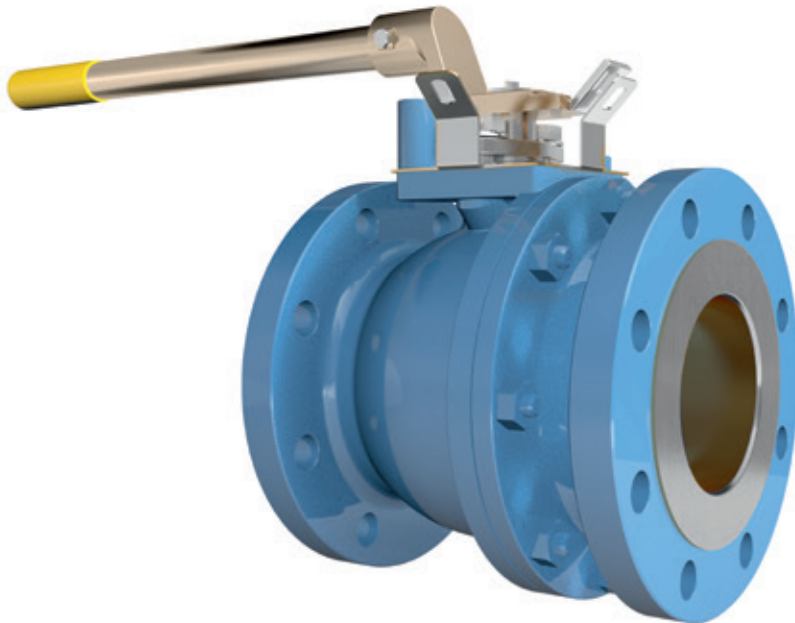






What if you could have valves that are cost-competitive, industry certified and engineered to provide the safety and reliability you expect?

## KTM Virgo Series floating ball valves deliver reliability to your process.



KTM Virgo floating ball valves are designed and tested to meet or exceed many industry standards, including API 6D and BS EN ISO 17292. The reliability of ball valves starts at the design process where Emerson engineers utilize the latest tools to design the optimal product. KTM Virgo valves are then tested in our advanced test facility using cutting edge instruments to ensure the products delivered to you are safe, reliable and perform as advertised. Finally, Emerson has third party agencies that review the product, ensuring that it meets stringent industry standards and performs as specified.

### KTM™

Integrating components to provide the ideal automation system can be a daunting task. At Emerson, we offer a complete range of products, as well as the expertise to design the optimum solution for your process. Emerson can combine the **KTM Virgo Series Floating Ball Valve** with products from Bettis, Asco, Fisher, and Topworks to optimize your valve automation requirements.

Actuation • Control Valves • Isolation Valves

**Regulators & Relief Valves • Valve Instrumentation & Accessories**





“The failure of even one small isolation valve can result in catastrophic losses including damage to critical plant assets, impact to the environment or the unthinkable loss of life. Demonstrated product reliability must be key in selecting the on-off valves.”  
–Reliability Engineer, Major USA Refinery

## Meeting industry standards is an important part of producing quality products.

**KTM** Virgo Series valves are designed and tested to meet the requirements of many important industry standards, such as API 6D and BS EN ISO 17292. To support this process, Emerson has in place a robust quality system and meticulous manufacturing practices to continually certify that these standards are met in the making of every product.

## Protecting the safety of your personnel and your plant is top priority.

Protecting your personnel as well as your plant is critical. **KTM** Virgo Series floating ball valves help you make this possible with features like a blowout-proof stem, fire safe design, built in anti-static device, and extra wall thickness for increased corrosion resistance, to name a few.

## Reliable products do not have to cost more.

Reliability should be built into the product, not something you have to pay extra for. **KTM** Virgo Series ball valves are designed and tested to achieve some of the highest performance levels in the industry. Emerson is able to deliver this outstanding performance while providing exceptional value with global manufacturing and quality sourcing.

## Products should perform as well in the real world as they do in the lab.

**KTM** Virgo Series floating ball valves are designed to reduce the impact of fugitive emissions from stem packings. **KTM** Virgo Series valves are offered with different stem seal configurations to best fit your process requirements. **KTM** Virgo Series floating ball valves are able to meet ISO 15848 and withstand the rigors of a process environment.





## Designed to dependably isolate all your processes

Process uptime is critical to your plant achieving maximum throughput. Products that require excessive maintenance or cause unscheduled downtime can kill your productivity. Emerson delivers the quality and performance you expect from an industry leading ball valve manufacturer. **KTM Virgo Series Floating Ball Valves** are designed and manufactured to provide dependability while remaining cost-effective. They are offered in a wide range of sizes and materials to cover all your process applications.

### What's your challenge?



"Every hour a 120,000 BPD refinery is down cost \$40,000 to \$50,000. That works out to about \$1 million dollars per day." –ARC Advisory Group

### What's your opportunity?



**KTM Virgo Series** floating ball valves meet or surpass critical industry standards and certifications, providing the quality you need to keep your process operating.

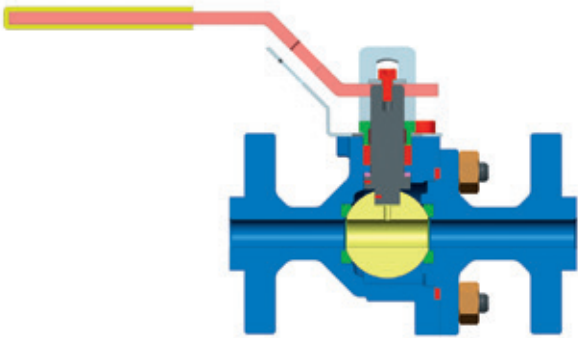
## Full ranges of sizes to meet your needs



2 Piece Cast Body  
Size – ½” to 8”  
Pressure – 150# to 2500#  
Bore – Full and Reduced  
Actuation – Manual and Automated

**KTM** Virgo Series floating ball valves are available in a full range of sizes and pressure classes to support your process requirements.

## Material options to suit your process



Standard Body / Ball Materials – Carbon / Stainless, Stainless / Stainless, Low Temp Carbon / Stainless

Optional Body and Ball Material including Duplex, Inconel®, Super Duplex

Your process needs are covered with standard material configurations available in short lead times and optional materials configurations available to support demanding process conditions.

## Industry leading performance and quality



Design and Manufacturing – API 6D, ASME B 16.34, BS EN ISO 17292  
Face to Face – ASME B 16.10, API 6D  
Flange Dimensions – ASME B 16.5  
Pressure Tests – API 598, API 6D, BS EN 12266-1 and 2  
Leakage Test – API 598 “Zero” Leakage  
Quality Certifications – ISO 9001  
Fugitive Emissions – ISO 15848 Class B

**KTM** Virgo Series floating ball valves are designed and tested to meet critical industry standards, helping to ensure performance and quality you expect from your valves.



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## Designed to provide process flexibility while maintaining safety

The processes in your facility are potentially harmful and must be contained in order to keep your personnel and your plant safe. However, there are leak potentials throughout your process, including your valves. The right valve can make your job easier by helping to eliminate this potential. **KTM** Virgo Series floating ball valves are designed and tested to meet the stringent ISO 15848 fugitive emissions standard. These valves include multiple stem sealing options to best fit your process and minimize seat leak potential. Multiple material seal options are available to maintain an effective seal regardless of process fluid.

### What's your challenge?



"It is estimated that over 70K tons per year of VOCs and 9K tons per year of HAPs are emitted from equipment leaks." –EPA



### What's your opportunity?

**KTM** Virgo Series floating ball valves utilize live loaded, adjustable packing or multi O-ring seals that best fit your process to provide a leak-resistant seal and to minimize fugitive emissions.



# Reliability for all your process applications



## Refining

- Atmospheric distillation
- Vacuum distillation
- Continuous catalytic reforming
- Fixed bed hydrotreating
- Fixed bed hydrocracking
- Delayed coking
- Visbreaking
- Deasphalting
- Gasification

## Chemical and petrochemical

- Ethylene plants
- Ethylene crackers

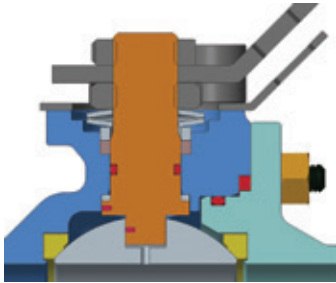
- Propylene plants
- Hydrogen gas service
- Propane gas service
- Brine, CO2 vapor and steam service
- Cryogenic services
- Thermal fluids
- Tail gas
- Hydrocarbon gas service
- Flare inlet and manifold isolation
- PSA and molecular sieves
- Coker plants
- Pump isolation

## Other applications

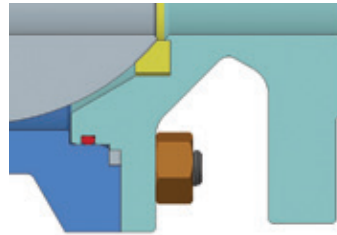
- Power generation
- Storage and distribution
- Tanks and terminals
- Cooling water
- Equipment isolation

Emerson's full range of floating ball valves allows for the optimum valve to be selected to maximize uptime and deliver unsurpassed performance.

## Reduce the risk of leaks and fugitive emissions



Live loaded, adjustable packing or multi O-ring seals are available to best fit your process to provide a leak-proof seal and minimize fugitive emissions.



Multiple body seals are available to ensure positive body joint sealing regardless of process.

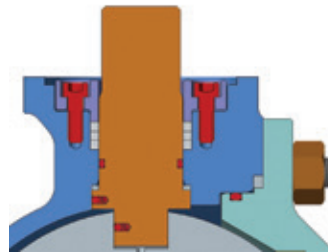


Positive shut off with bi-directional "Zero" leakage

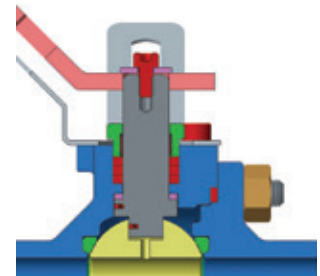
## Quality and safety designed in



Extra wall thickness for increased corrosion allowance



Large diameter blowout proof shouldered stem for added protection and reliable automation



Antistatic devices in the valve stem ensure electrical continuity between ball, stem and body, providing increased safety



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# KTM Virgo Series Floating Ball Valves: Designed to exceed your expectations

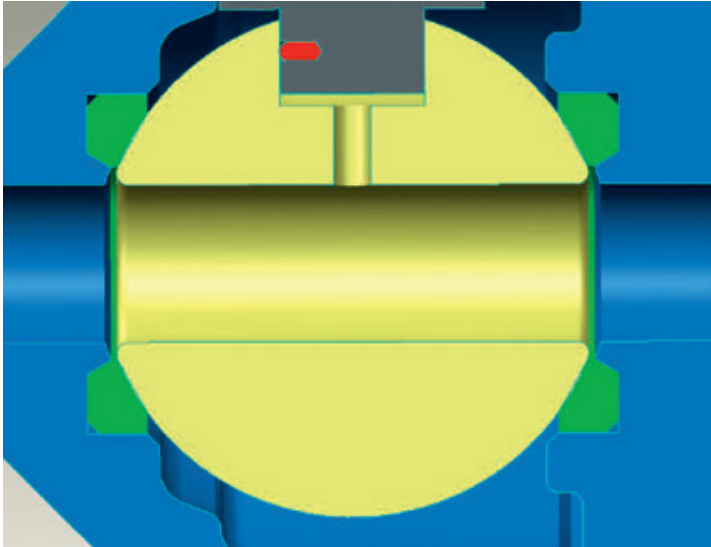


## KTM Virgo Series Floating Ball Valve Overview

**KTM** Virgo Series floating ball valves are designed using the latest engineering tools including Pro-E / Creo, Computational Fluid Dynamics (CFD), and Finite Element Analysis (FEA) to ensure our products provide the performance you are looking for in your valves. During manufacturing, Emerson utilizes state-of-the-art equipment and techniques to produce **KTM** Virgo Series products cost-effectively, with quality standards that often exceed those of other valve manufactures. Our exceptional design and manufacturing is validated with an industry leading in-house test facility. Not only do we ensure **KTM** Virgo Series products are made using the highest quality specifications, our facility can certify that our products are compliant to the latest standards and regulations.



### Engineered seat for positive shutoff



**KTM** Virgo Series floating ball valves are engineered to provide positive shutoff with “Zero” leakage and reliable sealing. This innovative design helps you increase process uptime while keeping your personnel and plant as safe as possible. This is achieved through a unique seat design that maintains a large contact area between the ball and seat. At the same time, because of its shape, this seat design reduces torque when operating the valve.

**KTM** Virgo Series seats feature a large cross-section to absorb energy without deformation to increase its dependability and life. To ensure every seat is precisely installed, Emerson utilizes a proprietary seat installation process to maintain consistency valve after valve.

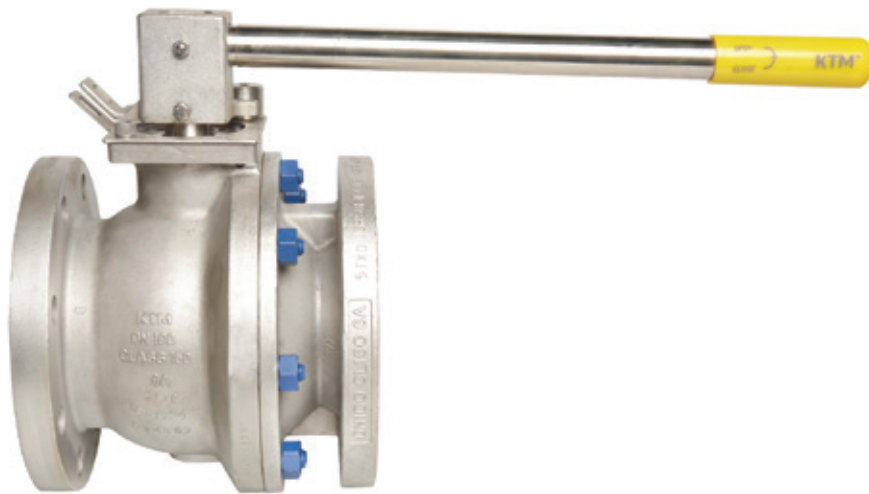
### Integrated design features



#### **Integrated Design Features include:**

- ISO 5211 mounting pads – Simplifies actuator or gear mounting
- Extra wall thickness on valve bodies – Increased corrosion allowance for added dependability
- NACE MR 01-75 / ISO 15156 compliant
- Built-in anti-static devices – Prevents static buildup and provides added safety
- Some valves feature a built-in locking device, allowing for easy valve lockout

## KTM Virgo Series S Floating Ball Valve: Engineered to your process requirements



## KTM Virgo Series S Floating Ball Valve: Configurable to your process requirements

Over one million **KTM** Virgo Series ball valves have been supplied for use in many different applications around the globe. This vast amount of industry experience is utilized in the development of new **KTM** Virgo Series floating ball valves. Emerson understands that each process in your facility is unique and in order for a product to perform at its optimum level, it must be designed and configured for that type of process. This can save cost, increase uptime, and reduce maintenance requirements. Emerson has various models of **KTM** Virgo Series valves designed to best fit your process. Beyond size and pressure classes, valves can be ordered with different bores, body materials, ball and stem materials, seat materials, seals, packing materials and operators. If you are looking for a valve that combines reliability and the ability to save money in one package, look no further than Emerson.

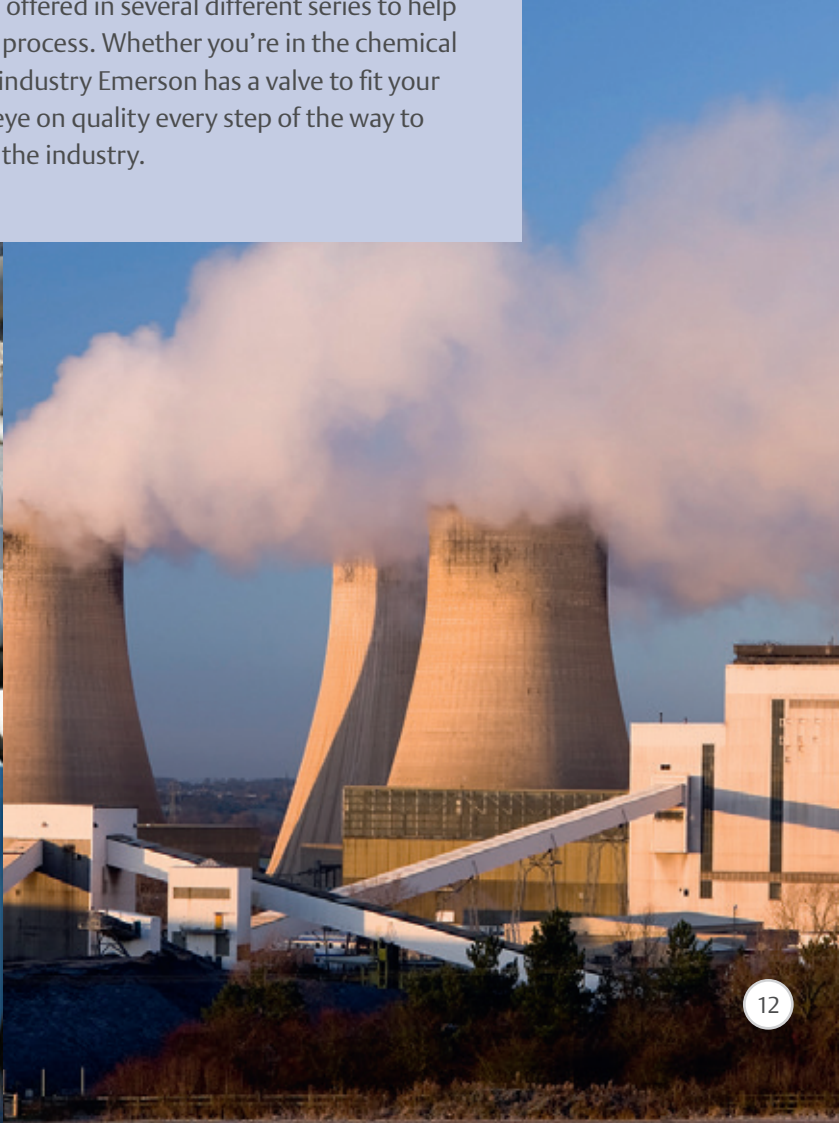




## **KTM Virgo Series Floating Ball Valves**

Built to excel in all your applications

KTM Virgo Series Floating Ball Valves are offered in several different series to help you achieve maximum results from your process. Whether you're in the chemical industry, refining, oil & gas, or any other industry Emerson has a valve to fit your applications. Each series is built with an eye on quality every step of the way to provide you the most reliable product in the industry.

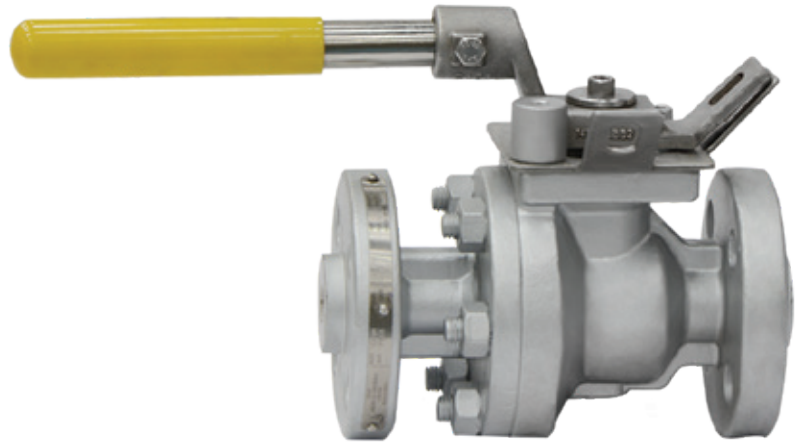




## Series SS

### Soft Seated Side Entry Floating Ball Valve

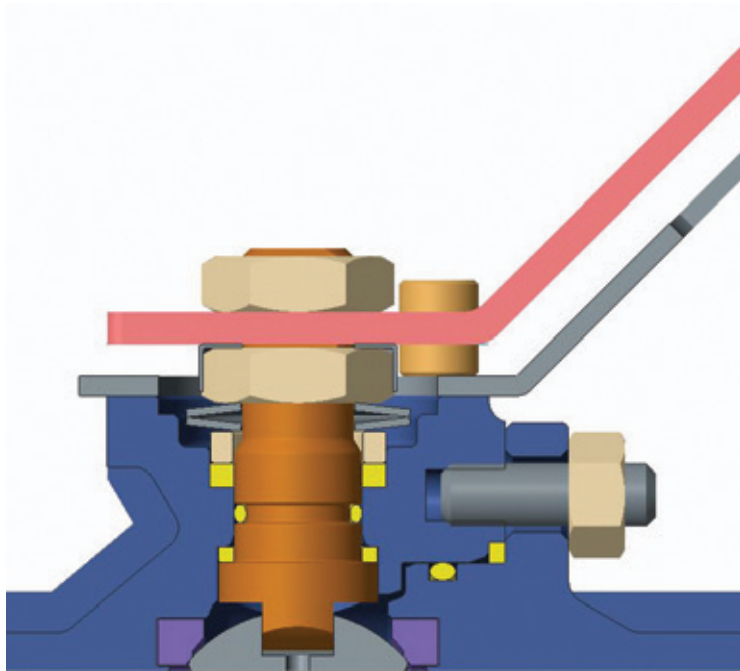
**KTM** Virgo Series SS floating ball valve utilizes a live loaded packing gland design that provides additional protection for your process against leakage, even at very low pressures. A spring disk washer arrangement maintains load on the packing gland to deliver a leak-proof seal and minimize fugitive emissions, even with changes in temperature and process pressure.



- Body Configurations: 2 Piece Cast
- Available Size: ½” to 2½” Full Bore
- Pressure Classes: ASME 150# to 1500#
- Valve Design: API 6D, ASME B 16.34, BS EN ISO 17292
- Body Materials: Carbon Steel, Stainless Steel, Low Temp Carbon Steel, Duplex, Alloys
- Activation Options: Manual, Bare Stem, Gear, Hand Lever, Fully Automated
- Bore: Full, Reduced



## Belleville Spring Stem Sealing

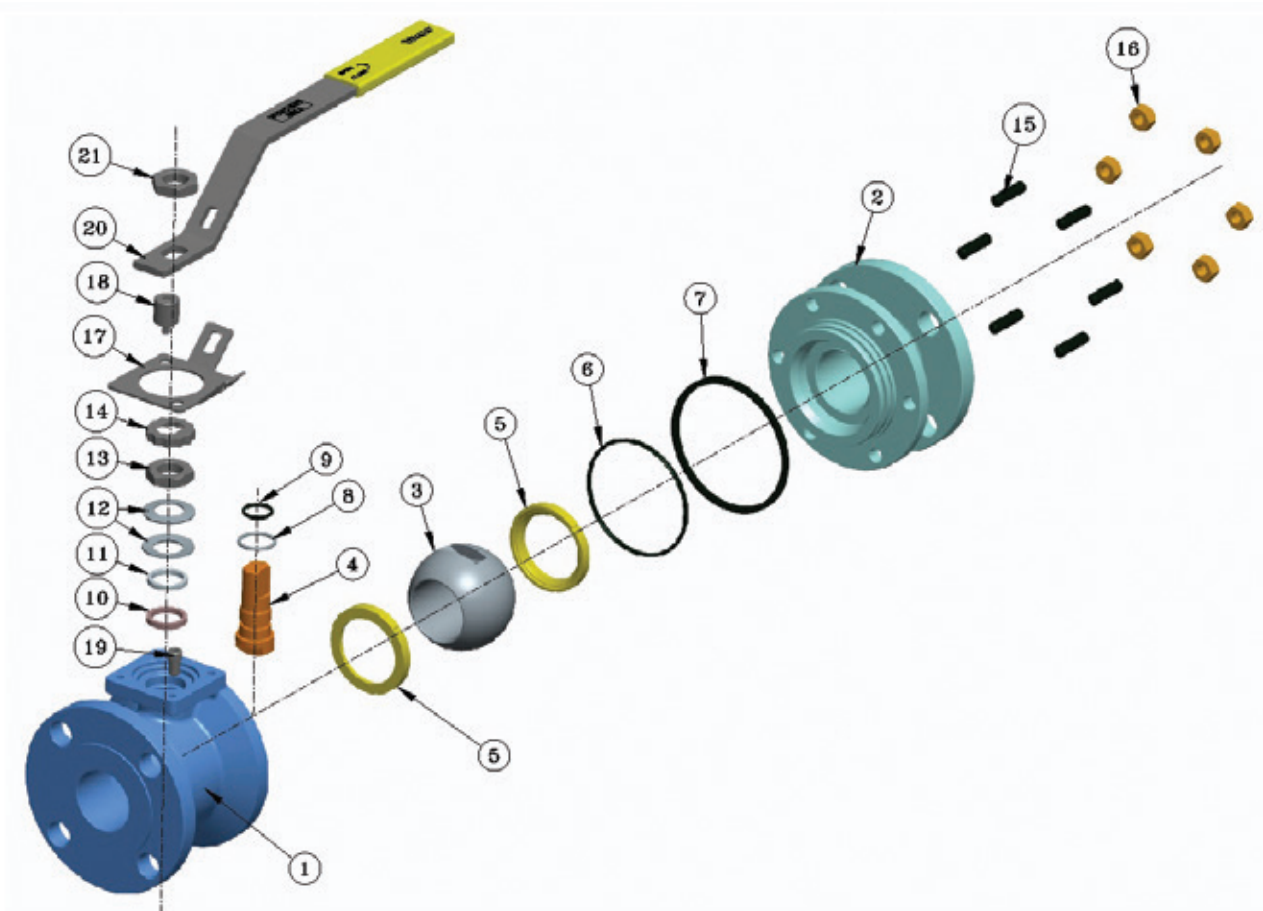


**KTM** Virgo Series SS valve utilizes a triple seal design that includes a combination of O-rings and packing materials to provide a leak-proof seal and to minimize fugitive emissions. Live loaded stem design ensures additional protection against leakage through the stem housing even at very low pressures.

## Series SS Size Availability

| Class 150 |           | Class 300 |           | Class 600 |           | Class 900/1500 |           |
|-----------|-----------|-----------|-----------|-----------|-----------|----------------|-----------|
| FB (NPS)  | RB (NPS)  | FB (NPS)  | RB (NPS)  | FB (NPS)  | RB (NPS)  | FB (NPS)       | RB (NPS)  |
| 1/2       | 3/4 x 1/2 | 1/2       | 3/4 x 1/2 | 1/2       | 3/4 x 1/2 | 1/2            | 3/4 x 1/2 |
| 3/4       | 1 x 3/4   | 3/4       | 1 x 3/4   | 3/4       | 1 x 3/4   | 3/4            | 1 x 3/4   |
| 1         | 1-1/2 x 1 | 1         | 1 1/2 x 1 | 1         | 1 1/2 x 1 | 1              | 1 1/2 x 1 |
| 1 1/2     | 2 x 1 1/2 | 1-1/2     | 2 x 1 1/2 | 1-1/2     | 2 x 1 1/2 | 1 1/2          | 2 x 1 1/2 |
| 2         | 3 x 2     | 2         | 3 x 2     | -         | -         | -              | -         |
| 2 1/2     | -         | 2 1/2     | -         | -         | -         | -              | -         |

# Materials of Construction



| Item No. | Part Name                      | C6G<br>Body-WCB<br>Trim-SS<br>Seat-modified PTFE/ RFTE | 66G<br>BODY-CF8M<br>Trim-SS<br>Seat-modified PTFE/ RFTE | 26G<br>Body-LCC<br>Trim-SS<br>Seat-modified PTFE/ RFTE |
|----------|--------------------------------|--|---|--|
| 1        | Body                           | ASTM A216 GR. WCB                                      | ASTM A351 GR. CF8M                                      | ASTM A352 GR. LCC                                      |
| 2        | Adapter                        | ASTM A216 GR. WCB                                      | ASTM A351 GR. CF8M                                      | ASTM A352 GR. LCC                                      |
| 3        | Ball                           | ASTM A182 GR.F316                                      | ASTM A182 GR.F316                                       | ASTM A182 GR.F316                                      |
| 4        | Stem                           | ASTM A479 TYPE 316                                     | ASTM A479 TYPE 316                                      | ASTM A479 TYPE 316                                     |
| 5        | Seat                           | Modified PTFE/ RTFE                                    | Modified PTFE/ RTFE                                     | Modified PTFE/ RTFE                                    |
| 6        | O-ring (body seal)             | VITON-B  | VITON-B   | VITON-B  |
| 7        | Gasket (body seal)             | Graphite   | Graphite  | Graphite   |
| 8        | Thrust washer                  | RPTFE  | RPTFE   | RPTFE  |
| 9        | O-ring (stem seal)             | VITON-B  | VITON-B   | VITON-B  |
| 10       | Packing (stem seal)            | Graphite   | Graphite  | Graphite   |
| 11       | Gland spacer                   | ASTM A479 TYPE 316                                     | ASTM A479 TYPE 316                                      | ASTM A479 TYPE 316                                     |
| 12       | Disc spring                    | ASTM A240 TYPE 316                                     | ASTM A240 TYPE 316                                      | ASTM A240 TYPE 316                                     |
| 13       | Stem nut                       | ASTM A194 GR8M   | ASTM A194 GR8M  | ASTM A194 GR8M   |
| 14       | Stem nut lock plate            | ASTM A666 TYPE 301                                     | ASTM A666 TYPE 301                                      | ASTM A666 TYPE 301                                     |
| 15       | Stud                           | ASTM A193 GR. B7M                                      | ASTM A193 GR. B8M                                       | ASTM A320 GR. L7M                                      |
| 16       | Nut                            | ASTM A194 GR. 2HM                                      | ASTM A194 GR. 8M  | ASTM A194 GR. 7M                                       |
| 17       | Lock plate                     | ASTM A516 GR70   | ASTM A240 TYPE 316                                      | ASTM A240 TYPE 316                                     |
| 18       | Stop pin                       | AISI 1040  | ASTM A479 TYPE 316                                      | ASTM A479 TYPE 316                                     |
| 19       | Cap screw (lock plate+ISO PAD) | ASTM A193 GRB8M  | ASTM A193 GR. B8M                                       | ASTM A193 GR. B8M                                      |
| 20       | Handle                         | ASTM A516 GR70   | ASTM A240 TYPE 316                                      | ASTM A240 TYPE 316                                     |
| 21       | Handle lock nut                | ASTM A194 GR8M   | ASTM A194 GR8M  | ASTM A194 GR8M   |



# Product Selection Code - Series SS

|               |                      |                     |  |                       |             |   |  |                       |                                 |  |                            |                              |                   |
|---------------|----------------------|---------------------|--|-----------------------|-------------|---|--|-----------------------|---------------------------------|--|----------------------------|------------------------------|-------------------|
| <b>Series</b> | <b>Configuration</b> | <b>Construction</b> | <b>End Connection</b>                        | <b>Ratings</b>        | <b>Bore</b> | <b>Body</b>   | <b>Ball / Stem</b>   | <b>Coating (Ball)</b> | <b>Seat Insert (Ball Seal)</b>  | <b>Seals (O-ring, Lipseal, Gasket)</b>                             | <b>Operator</b>            | <b>Other (If Applicable)</b> | <b>Sub series</b> |
| S             | S                    | 2<br>R              | RF<br>RS<br>FF<br>FS<br>RT<br>BW<br>BP<br>ZZ | 1<br>2<br>3<br>6<br>9 | F<br>R      | C<br>1<br>L<br>8<br>7<br>2<br>6<br>5<br>4<br>3<br>9<br>A<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 6<br>2<br>7<br>P<br>5<br>3<br>4<br>A<br>U<br>Y<br>9<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 1<br>2<br>3<br>N      | T<br>G<br>L<br>D<br>P<br>E<br>Z | 1<br>2<br>3<br>4<br>5<br>6<br>7<br>A<br>K<br>E<br>F<br>L<br>T<br>Z | A<br>B<br>C<br>G<br>L<br>Z | SE<br>BE<br>NF<br>ZZ         | C1                |

## Series

S Soft seated Floater Side Entry

## Configuration

S Standard (Floater-Soft Seated) - API 6D

## Construction

2 Two Piece - Cast

R Two Piece - Forge

## End Connection

RF Flanged Raised Face Serrated

RS Flanged Raised Face Smooth

FF Flanged Flat Face Serrated

FS Flanged Flat Face Smooth

RT Flanged RTJ

BW Butt Weld

BP Butt Weld with pup piece

ZZ Other than above

## Ratings

1 150#

2 1500#

3 300#

6 600#

9 900#

## Bore

F Full

R Reduced/ Regular

## Body

C WCB

1 A105

L LCB

8 LF2

7 WCC

2 LCC

6 CF8M or F316

5 CF3M or F316L

4 CF8 or F304

3 CF3 or F304L

9 F60 (Carbon Steel)

A F6A

D Duplex (4A or F51)

E Super Duplex (5A or F53)

F Super Duplex (6A or F55)

G Duplex F60

M Inconel ( 825 or Cu5MCuC)

N Inconel(625 or CW6MC)

Z Other than above

## Ball / Stem

6 316 / 316

2 316 / 17-4 PH

7 316 / Duplex

P 316 / Inconel

5 316L / 316L

3 316 / XM-19

4 304 / 304

A F6A / 410

U Duplex /316

Y Duplex /17-4 PH

9 F60 (Carbon Steel)

D Duplex (4A or F51)

E Super Duplex (5A or F53)

F Super Duplex (6A or F55)

G Duplex F60

M Inconel (825 or Cu5MCuC)

N Inconel (625 or CW6MC)

Z Other than above

## Coating (Ball)

1 ENP 1 mil (25 micron)

2 ENP 2 mil (50 micron)

3 ENP 3 mil (75 micron)

N Not Applicable

## Seat Insert (Ball Seal)

T PTFE

G RTFE

L Devlon

D Delrin

P PEEK

E PCTFE (Kel F)

Z Other than above

## Seals (O-ring \*, Lip Seal, Gasket)

1 HNBR

2 HNBR 90 Durometer

3 HNBR AED (90D)

4 HNBR Low Temp

5 FKM / Viton

6 FKM AED / Viton AED

7 FKM Low Temp

A FEPM

K FFKM

E EPDM

F EPDM AED

L Lip Seals (Material As Specified)

T PTFE sealing (No graphite) \*

Z Other than above

\* Non Fire Safe sealing

\* AED Orings mandatory for ASME Class 600 and above

## Operator

A Actuator

B Bare Stem

C Gear with Chain Wheel

G Gear with Hand Wheel

L Lever/ Wrench

Z Other than above

## Other (If Applicable)

SE Stem Extension

BE Bonnet Extension

NF Non Fire Safe

ZZ Other than above

## Sub series

C1 09 Series

**EXAMPLE:** 2 S - S 2 - RF 1 - F - C 6 N - T - 5 - L - C1

2" Soft seated floating side entry ball valve, Standard (Floater)- API 6D, 2 piece cast body, RF flanged ends, 150 class, Full port, WCB body, 316 Ball & Stem, PTFE Seat, FKM / Viton O-rings, Lever, 09 Series.

**EXAMPLE:** 1.5 S - S R - RT 9 - R - 1 D N - P - 6 - L - SE - C1

1.5" Soft seated floating side entry ball valve, Standard (Floater)- API 6D, 2 piece Forged body, RTJ flanged ends, 900 class, Reduced port, A105 body, Duplex 4A Ball & F51 Stem, PEEK Seat, FKM / Viton AED O-rings, Lever, Stem extension, 09 Series.

## Series SA

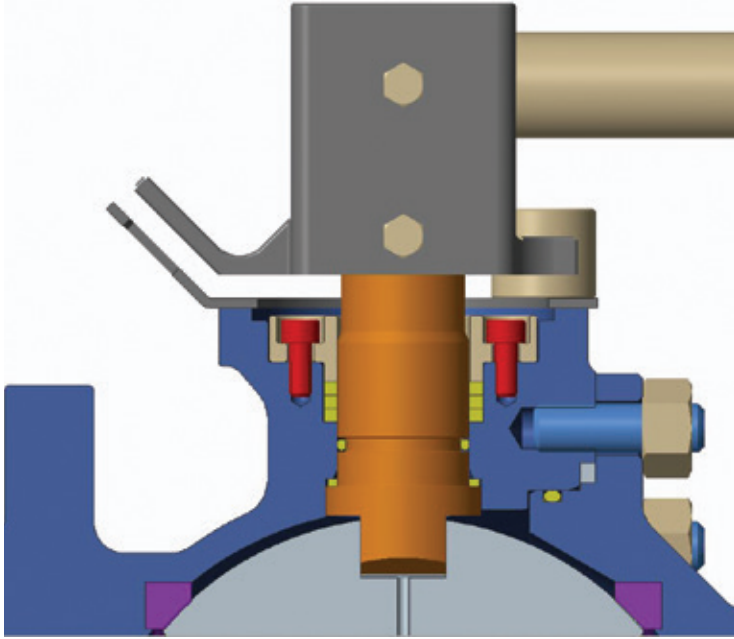
### Soft Seated Side Entry Floating Ball Valve

Stem leaks and fugitive emissions are some of the industry's leading environmental struggles. To help reduce issues with these, Series SA floating ball valve uses a combination of an adjustable packing gland and O-ring seals. This valve also features a large assortment of seat materials for optimal performance in a variety of operating conditions.



- Body Configurations: 2 Piece Cast
- Available Size: ½" to 1½" (ASME 2500#), 2" to 8"
- Pressure Classes: ASME 150# to 600#
- Valve Design: API 6D, ASME B 16.34, BS EN ISO 17292
- Body Materials: Carbon Steel, Stainless Steel, Low Temp Carbon Steel, Duplex, Alloys
- Activation Options: Manual, Bare Stem, Gear, Hand Lever, Fully Automated
- Bore: Full, Reduced

## Adjustable Packing Stem Sealing



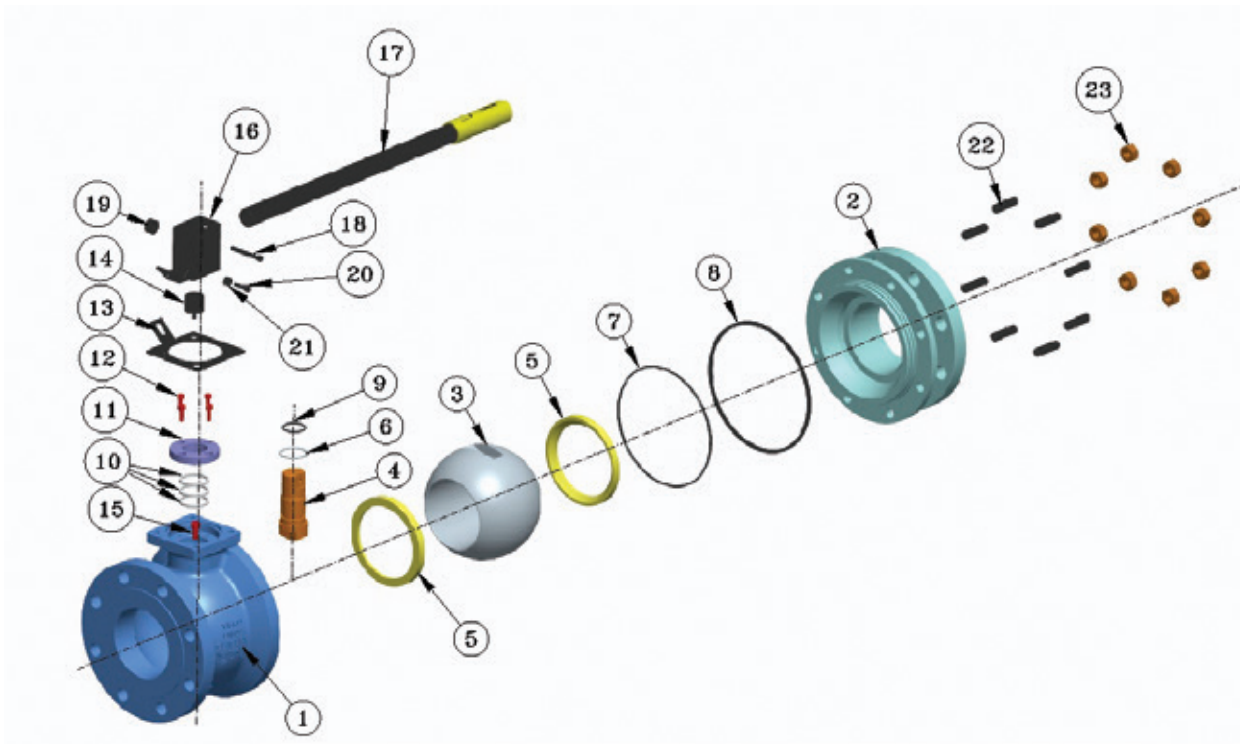
**KTM** Virgo Series SA floating ball valve is designed to provide optimum sealing through a combination of an adjustable packing gland and O-ring seals to provide the ideal seal and low fugitive emissions. Oversized stem is ideal for automation.

## Series SA Size Availability

| Class 150 |          | Class 300 |          | Class 600 |          | Class 900/1500 |          | Class 2500 |          |
|-----------|----------|-----------|----------|-----------|----------|----------------|----------|------------|----------|
| FB (NPS)  | RB (NPS) | FB (NPS)  | RB (NPS) | FB (NPS)  | RB (NPS) | FB (NPS)       | RB (NPS) | FB (NPS)   | RB (NPS) |
| 3         | 4 x 3    | 3         | 4 x 3    | 2         | 3 x 2    | 2              | -        | ½          | ¾ x ½    |
| 4         | 6 x 4    | 4         | 6 x 4    | 3         | 4 x 3    | -              | -        | ¾          | 1 x ¾    |
| 6         | 8 x 6    | 6         | 8 x 6    | 4         | -        | -              | -        | 1          | 1½ x 1   |
| 8 LP      | -        | 8 LP      | -        | -         | -        | -              | -        | 1½         | -        |



# Materials of Construction



| Item No. | Part Name                 | C8G<br>Body-WCB<br>Trim-SS<br>Seat-modified PTFE/ RFTE | 66G<br>BODY-CF8M<br>Trim-SS<br>Seat-modified PTFE/ RFTE | 26G<br>Body-LCC<br>Trim-SS<br>Seat-modified PTFE/ RFTE |
|----------|---------------------------|--|---|--|
| 1        | Body                      | ASTM A216 GR. WCB                                      | ASTM A351 GR. CF8M                                      | ASTM A352 GR. LCC                                      |
| 2        | Adapter                   | ASTM A216 GR. WCB                                      | ASTM A351 GR. CF8M                                      | ASTM A352 GR. LCC                                      |
| 3        | Ball                      | ASTM A182 GR.F316                                      | ASTM A182 GR.F316                                       | ASTM A182 GR.F316                                      |
| 4        | Stem                      | ASTM A479 TYPE 316                                     | ASTM A479 TYPE 316                                      | ASTM A479 TYPE 316                                     |
| 5        | Seat                      | Modified PTFE/ RTFE                                    | Modified PTFE/ RTFE                                     | Modified PTFE/ RTFE                                    |
| 6        | Thrust washer             | RPTFE  | RPTFE   | RPTFE  |
| 7        | O-ring (body seal)        | VITON-B  | VITON-B   | VITON-B  |
| 8        | Gasket (body seal)        | Graphite   | Graphite  | Graphite   |
| 9        | O-ring (stem seal)        | VITON-B  | VITON-B   | VITON-B  |
| 10       | Packing (stem seal)       | Graphite   | Graphite  | Graphite   |
| 11       | Gland                     | ASTM A479 TYPE 316                                     | ASTM A479 TYPE 316                                      | ASTM A479 TYPE 316                                     |
| 12       | Gland scap screw          | ASTM A193 GR B8M                                       | ASTM A193 GR B8M  | ASTM A193 GR B8M                                       |
| 13       | Lock plate                | ASTM A516 GR70   | ASTM A240 Type 316                                      | ASTM A240 Type 316                                     |
| 14       | Stop pin                  | AISI 1040  | ASTM A 479 Type 316                                     | ASTM A 479 Type 316                                    |
| 15       | Cap screw (lock plate)    | ASTM A193 GR B8M                                       | ASTM A193 GR B8M  | ASTM A193 GR B8M                                       |
| 16       | Coupler                   | ASTM A216 GR. WCB                                      | ASTM A351 GR. CF8M                                      | ASTM A351 GR. CF8M                                     |
| 17       | Pipe (coupler)            | ASTM A 106 GR B  | ASTM A 312 TP316  | ASTM A 312 TP316                                       |
| 18       | Hex bolt (coupler + pipe) | ISO 3506-1 GR A4-70                                    | ISO 3506-1 GR A4-70                                     | ISO 3506-1 GR A4-70                                    |
| 19       | Nut (coupler + pipe)      | ISO 3506-1 GR A4-70                                    | ISO 3506-1 GR A4-70                                     | ISO 3506-1 GR A4-70                                    |
| 20       | Hex bolt (stem + coupler) | ISO 3506-1 GR A4-70                                    | ISO 3506-1 GR A4-70                                     | ISO 3506-1 GR A4-70                                    |
| 21       | Nut (stem + coupler)      | ISO 3506-1 GR A4-70                                    | ISO 3506-1 GR A4-70                                     | ISO 3506-1 GR A4-70                                    |
| 22       | Stud                      | ASTM A193 GR. B7M                                      | ASTM A193 GR. B8M                                       | ASTM A320 GR. L7M                                      |
| 23       | Nut                       | ASTM A194 GR. 2HM                                      | ASTM A194 GR. 8M  | ASTM A194 GR. 7M                                       |

# Product Selection Code - Series SA

| Series | Configuration | Construction | End Connection                               | Ratings                    | Bore   | Body  | Ball / Stem  | Coating (Ball)   | Seat Insert (Ball Seal)         | Seals (O-ring, Lipseal, Gasket)                                    | Operator                   | Other (If Applicable)      | Sub series |
|--------|---------------|--------------|--|----------------------------|--------|---|--|------------------|---------------------------------|--|----------------------------|----------------------------|------------|
| S      | A             | 2<br>R       | RF<br>RS<br>FF<br>FS<br>RT<br>BW<br>BP<br>ZZ | 1<br>2<br>3<br>5<br>6<br>9 | F<br>R | C<br>1<br>L<br>8<br>7<br>2<br>6<br>5<br>4<br>3<br>9<br>A<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 6<br>2<br>7<br>P<br>5<br>3<br>4<br>A<br>U<br>Y<br>9<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 1<br>2<br>3<br>N | T<br>G<br>L<br>D<br>P<br>E<br>Z | 1<br>2<br>3<br>4<br>5<br>6<br>7<br>A<br>K<br>E<br>F<br>L<br>T<br>Z | A<br>B<br>C<br>G<br>L<br>Z | SE<br>BE<br>SP<br>NF<br>ZZ | C1         |

## Series

S Soft seated Floater Side Entry

## Configuration

A Standard with gland packing (Floater) - API 6D

## Construction

2 Two Piece - Cast  
R Two Piece - Forge

## End Connection

RF Flanged Raised Face Serrated  
RS Flanged Raised Face Smooth  
FF Flanged Flat Face Serrated  
FS Flanged Flat Face Smooth  
RT Flanged RTJ  
BW Butt Weld  
BP Butt Weld with pup piece  
ZZ Other than above

## Ratings

1 150#  
2 1500#  
3 300#  
5 2500#  
6 600#  
9 900#

## Bore

F Full  
R Reduced/ Regular

## Body

C WCB  
1 A105  
L LCB  
8 LF2  
7 WCC  
2 LCC  
6 CF8M or F316  
5 CF3M or F316L  
4 CF8 or F304  
3 CF3 or F304L

9 F60 (Carbon Steel)

A F6A  
D Duplex (4A or F51)  
E Super Duplex (5A or F53)  
F Super Duplex (6A or F55)  
G Duplex F60  
M Inconel ( 825 or Cu5MCuC)  
N Inconel(625 or CW6MC)  
Z Other than above

## Ball / Stem

6 316 / 316  
2 316 / 17-4 PH  
7 316 / Duplex  
P 316 / Inconel  
5 316L / 316L  
3 316 / XM-19  
4 304 / 304  
A F6A / 410  
U Duplex / 316  
Y Duplex / 17-4 PH  
9 F60 (Carbon Steel)  
D Duplex (4A or F51)  
E Super Duplex (5A or F53)  
F Super Duplex (6A or F55)  
G Duplex F60  
M Inconel (825 or Cu5MCuC)  
N Inconel (625 or CW6MC)  
Z Other than above

## Coating (Ball)

1 ENP 1 mil (25 micron)  
2 ENP 2 mil (50 micron)  
3 ENP 3 mil (75 micron)  
N Not Applicable

## Seat Insert (Ball Seal)

T PTFE  
G RTFE  
L Devlon  
D Delrin

P PEEK

E PCTFE (Kel F)

Z Other than above

## Seals (O-ring\*, Lip Seal, Gasket)

1 HNBR  
2 HNBR 90 Durometer  
3 HNBR AED (90D)  
4 HNBR Low Temp  
5 FKM / Viton  
6 FKM AED / Viton AED  
7 FKM Low Temp  
A FEPM  
K FFKM  
E EPDM  
F EPDM AED  
L Lip Seals (Material As Specified)  
T PTFE sealing (No graphite) •  
Z Other than above  
• Non Fire Safe sealing  
\* AED Orings mandatory for ASME Class 600 and above

## Operator

A Actuator  
B Bare Stem  
C Gear with Chain Wheel  
G Gear with Hand Wheel  
L Lever / Wrench  
Z Other than above

## Other (If Applicable)

SE Stem Extension  
BE Bonnet Extension  
SP Short Pattern  
NF Non Fire Safe  
ZZ Other than above

## Sub series

C1 09 Series

**EXAMPLE:** 2 S - A 2 - RT 2 - F - C 3 N - L - 6 - L - SE - C1

2" Soft seated floating side entry ball valve, Standard with gland packing- API 6D, 2 piece Cast body, RTJ Flanged ends, 1500 class, Full port, WCB body, 316 Ball & XM-19 Stem, Devlon Seat, FKM AED / Viton AED O-rings, Lever, Stem Extension, 09 Series.

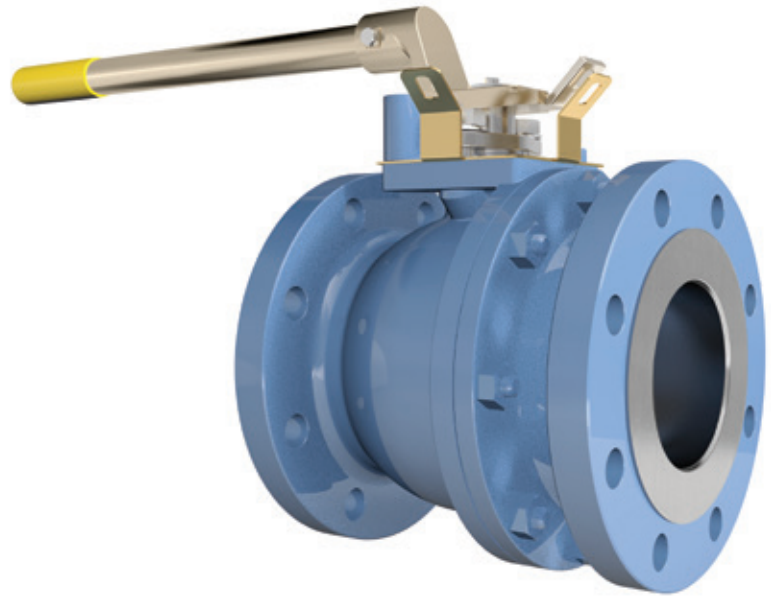
**EXAMPLE:** 3 S - A R - RT 1 - R - 1 D N - P - 5 - L - C1

3" Soft seated floating side entry ball valve, Standard with gland packing- API 6D, 2 piece Forged body, RF Flanged ends, 150 class, Reduced port, A105 body, Duplex 4A Ball & F51 Stem, PEEK Seat, FKM / Viton O-rings, Lever, 09 Series.

## Series SD

### Soft Seated Side Entry Floating Ball Valve, Gasket Design

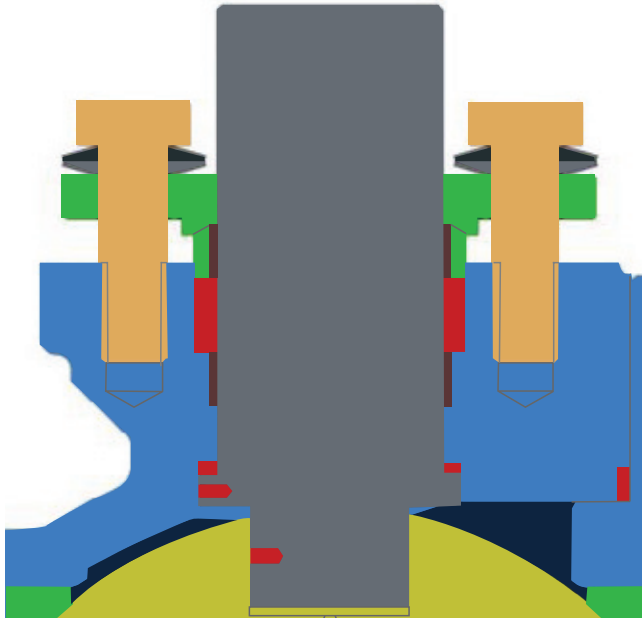
**KTM** Virgo Series SD ball valve was developed to meet or exceed some of the most stringent industry standards. This design was then tested in an advanced test facility to ensure the products delivered to you are safe, dependable and perform as advertised. If your process needs performance and reliability the Series SD is a perfect solution. SD series is specifically used in service where elastomeric seals are not accepted or are not compatible with the application; typically process industry, chemical, power, pharma, etc.



- Body Configurations: 2 Piece Cast
- Available Size: 1/2" to 8"
- Pressure Classes: ASME 150# to 600#
- Design and Manufacturing: API 6D, ASME B 16.34
- Body Materials: Carbon Steel, Stainless Steel, Low Temp Carbon Steel, Duplex, Alloys
- Activation Options: Manual, Bare Stem, Gear, Hand Lever, Fully Automated
- Bore: Full, Reduced



## Live Loaded Adjustable Packing Stem Sealing



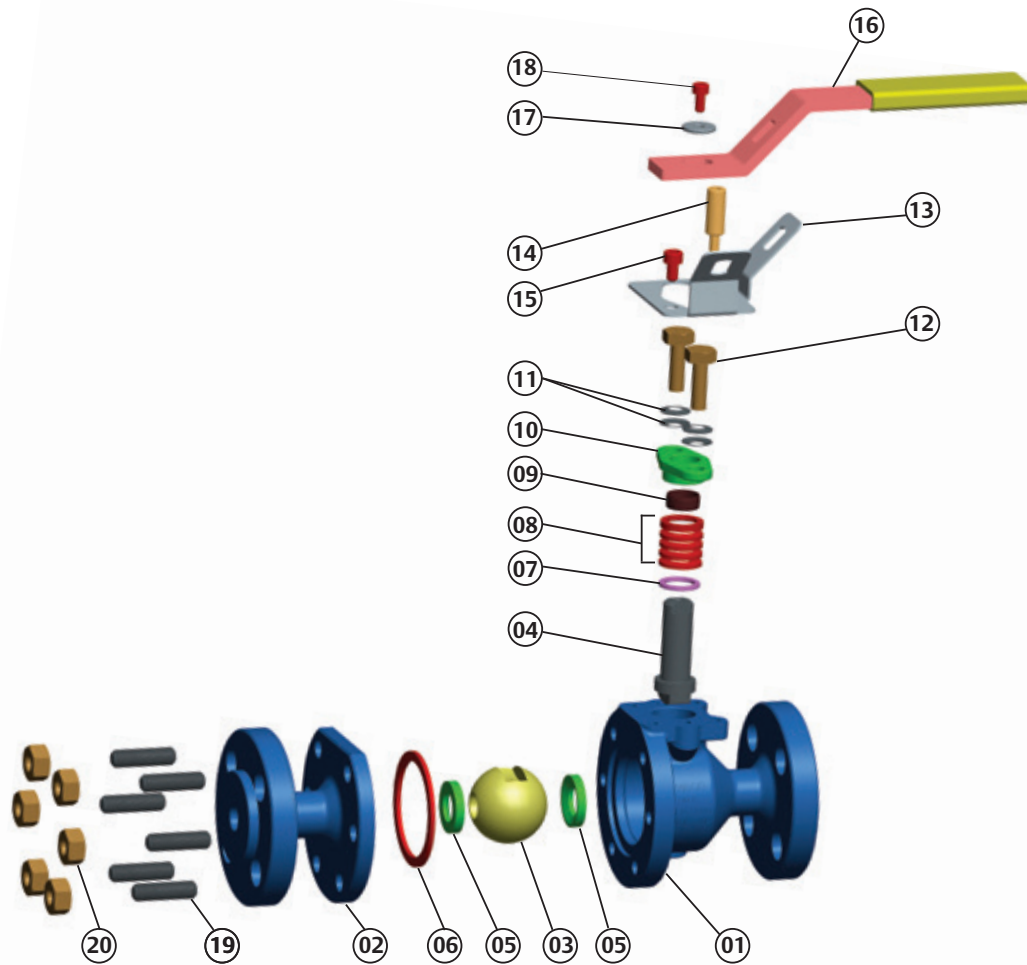
KTM Virgo Series SD utilizes a thoroughly tested live loaded adjustable packing gland, graphite gasket, and a PEEK® gland bearing to maintain leak resistance and minimize fugitive emissions. This sealing arrangement maintains sealing performance with changes in temperature and process pressure.

## Series SD Size Availability

| Class 150 |          | Class 300 |          | Class 600 |          |
|-----------|----------|-----------|----------|-----------|----------|
| FB (NPS)  | RB (NPS) | FB (NPS)  | RB (NPS) | FB (NPS)  | RB (NPS) |
| ½         | ¾ x ½    | ½         | ¾ x ½    | ½         | ¾ x ½    |
| ¾         | 1 x ¾    | ¾         | 1 x ¾    | ¾         | 1 x ¾    |
| 1         | 1.5 x 1  | 1         | 1.5 x 1  | 1         | 1.5 x 1  |
| 1½        | 2 x 1½   | 1½        | 2 x 1½   | 1-½       | 2 x 1½   |
| 2         | 3 x 2    | 2         | 3 x 2    | 2         | 3 x 2    |
| 3         | 4 x 3    | 3         | 4 x 3    | 3         | 4 x 3    |
| 4         | 6 x 4    | 4         | 6 x 4    | 4         | -        |
| 6         | 8 x 6    | 6         | 8 x 6    | -         | -        |
| 8 LP      | -        | 8 LP      | -        | -         | -        |



# Materials of Construction



| Item No. | Part Name            | Carbon/Stainless                                | Stainless/Stainless                             | LT Carbon/Stainless                             |
|----------|----------------------|---|---|---|
| 1        | Body                 | ASTM A216 GR. WCB                               | ASTM A351 GR. CF8M                              | ASTM A352 GR. LCC                               |
| 2        | Adapter              | ASTM A216 GR. WCB                               | ASTM A351 GR. CF8M                              | ASTM A352 GR. LCC                               |
| 3        | Ball                 | ASTM A182 GR. F316                              | ASTM A182 GR. F316                              | ASTM A182 GR. F316                              |
| 4        | Stem                 | ASTM A479 type 316                              | ASTM A479 type 316                              | ASTM A479 type 316                              |
| 5        | Seat                 | Modified PTFE/RTFE for 150#/300# PEEK™ for 600# | Modified PTFE/RTFE for 150#/300# PEEK™ for 600# | Modified PTFE/RTFE for 150#/300# PEEK™ for 600# |
| 6        | Gasket (body seal)   | Graphite  | Graphite  | Graphite  |
| 7        | Thrust washer        | RPTFE   | RPTFE   | RPTFE   |
| 8        | Stem packing         | Graphite or Teflon                              | Graphite or Teflon                              | Graphite or Teflon                              |
| 9        | Gland bearing        | PEEK™   | PEEK™   | PEEK™   |
| 10       | Gland                | ASTM A351 GR. CF8M                              | ASTM A351 GR. CF8M                              | ASTM A351 GR. CF8M                              |
| 11       | Cup spring           | ASTM A240 type SS316                            | ASTM A240 type 316                              | ASTM A240 type 316                              |
| 12       | Gland bolting        | ASTM A193 GR. B8M                               | ASTM A193 GR. B8M                               | ASTM A193 GR. B8M                               |
| 13       | Lock plate           | ASTM A516 GR. 70                                | ASTM A240 type 316                              | ASTM A240 type 316                              |
| 14       | Stop pin             | AISI 1040                                       | ASTM A479 type 316                              | ASTM A479 type 316                              |
| 15       | Lock plate cap screw | ASTM A193 GR. B8M                               | ASTM A193 GR. B8M                               | ASTM A193 GR. B8M                               |
| 16       | Handle               | ASTM A516 GR. 70                                | ASTM A240 SS316                                 | ASTM A240 SS316                                 |
| 17       | Washer               | ASTM A479 type 316                              | ASTM A479 type 316                              | ASTM A479 type 316                              |
| 18       | Cap screw            | ASTM A193 GR. B8M                               | ASTM A193 GR. B8M                               | ASTM A193 GR. B8M                               |
| 19       | Stud                 | ASTM A193 GR. B7M                               | ASTM A193 GR. B8M                               | ASTM A320 GR. L7M                               |
| 20       | Nut                  | ASTM A194 GR. 2HM                               | ASTM A194 GR. 8M                                | ASTM A194 GR. 7M                                |

# Product Selection Code - Series SD

| Series | Configuration | Construction | End Connection                   | Ratings     | Bore   | Body  | Ball / Stem   | Coating (Ball)   | Seat Insert (Ball Seal)    | Seals (Gasket) | Operator              | Other (If Applicable) |
|--------|---------------|--------------|----------------------------------|-------------|--------|---|---|------------------|----------------------------|----------------|-----------------------|-----------------------|
| S      | D             | 2<br>R       | RF<br>RS<br>FF<br>FS<br>RT<br>ZZ | 1<br>3<br>6 | F<br>R | C<br>1<br>L<br>8<br>7<br>2<br>6<br>5<br>4<br>3<br>9<br>A<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 2<br>7<br>P<br>3<br>A<br>C<br>H<br>J<br>Y<br>9<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 1<br>2<br>3<br>N | T<br>G<br>L<br>D<br>P<br>Z | G<br>T         | A<br>B<br>G<br>L<br>Z | SE<br>NF<br>SP<br>ZZ  |

## Series

S Soft seated Floater Side Entry

## Configuration

D Standard API 6D gasket design (Floater-Soft Seated)

## Construction

2 Two Piece - Cast

R Two Piece - Forge

## End Connection

RF Flanged Raised Face Serrated

RS Flanged Raised Face Smooth

FF Flanged Flat Face Serrated

FS Flanged Flat Face Smooth

RT Flanged RTJ

ZZ Other than above

## Ratings

1 150#

3 300#

6 600#

## Bore

F Full

R Reduced/ Regular

## Body

C WCB

1 A105

L LCB

8 LF2

7 WCC

2 LCC

6 CF8M or F316

5 CF3M or F316L

4 CF8 or F304

3 CF3 or F304L

9 F60 (Carbon Steel)

A F6A

D Duplex (4A or F51)

E Super Duplex (5A or F53)

F Super Duplex (6A or F55)

G Duplex F60

M Inconel (825 or Cu5MCuC)

N Inconel (625 or CW6MC)

Z Other than above

## Ball / Stem

2 316 / 17-4 PH

7 316 / Duplex

P 316 / Inconel

3 316 / XM-19

A F6A / 410

C 316L / 17-4 PH

H 304 / 17-4 PH

J 304L / 17-4 PH

Y Duplex / 17-4 PH

9 F60 (Carbon Steel)

D Duplex (4A or F51)

E Super Duplex (5A or F53)

F Super Duplex (6A or F55)

G Duplex F60

M Inconel (825 or Cu5MCuC)

N Inconel (625 or CW6MC)

Z Other than above

## Coating (Ball)

1 ENP 1 mil (25 micron)

2 ENP 2 mil (50 micron)

3 ENP 3 mil (75 micron)

N Not Applicable

## Seat Insert (Ball Seal)

T PTFE

G RTFE

L Devlon

D Delrin

P PEEK

Z Other than above

## Seals (Gasket)

G Graphite sealing

T PTFE sealing (No graphite) #

# Non Fire Safe sealing

## Operator

A Actuator

B Bare Stem

G Gear with Hand Wheel

L Lever / Wrench

Z Other than above

## Other (If Applicable)

SE Stem Extension

NF Non Fire Safe

SP Short Pattern

ZZ Other than above

**EXAMPLE:** 2 S D 2 - RF 1 - F - C 2 N - G - G - L

2" Soft seated floating side entry ball valve, Standard API 6D gasket design, 2 piece cast body, RF flanged ends, 150 class, Full port, WCB body, 316 Ball & 17-4 PH Stem, RTFE Seat, Graphite sealing, Lever.

**EXAMPLE:** 1.5 S D R - RT 6 - R - 1 D N - L - G - B

1.5" Soft seated floating side entry ball valve, Standard API 6D gasket design, 2 piece forged body, RTJ flanged ends, 600 class, Reduced port, A105 body, F51 Ball & Stem, Devlon Seat, Graphite sealing, Bare stem.



## Series PH

### Metal Seated Side Entry Floating Ball Valve

KTM Virgo Series PH metal seated floating ball valve is designed for dependable performance in your elevated temperature applications. The metal seat in the Series PH effectively operates from (-) 50°C to 425°C temperature while the mate-lapped ball and seat provides “leakage shutoff per international standards like API 6D, API 598, FCI 70-2”.

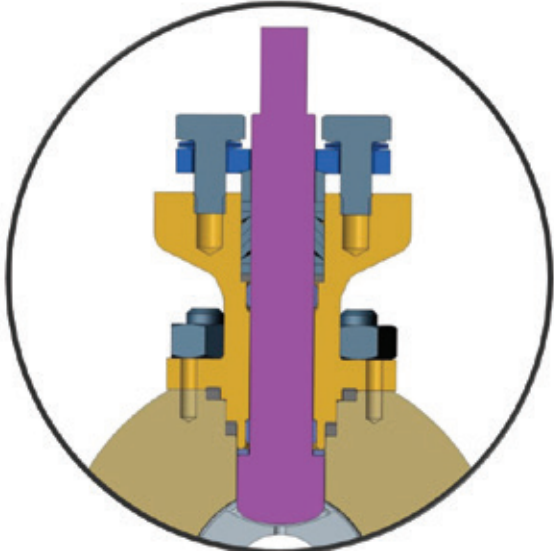
To minimize wear and extend life, the ball and seat are hard faced with tungsten carbide or chrome carbide in house facility using a High Velocity Oxygen Fuel (HVOF) process.



- Body Configurations: 2 Piece Forged
- Available Size: ½” to 1½”
- Pressure Classes: ASME 150# to 1500#
- Valve Design: API 6D, ASME B 16.34, BS EN ISO 17292
- Body Materials: Carbon Steel, Stainless Steel, Low Temp Carbon Steel, Duplex, Alloys
- Activation Options: Manual, Bare Stem, Gear, Hand Lever, Fully Automated
- Bore: Full, Reduced

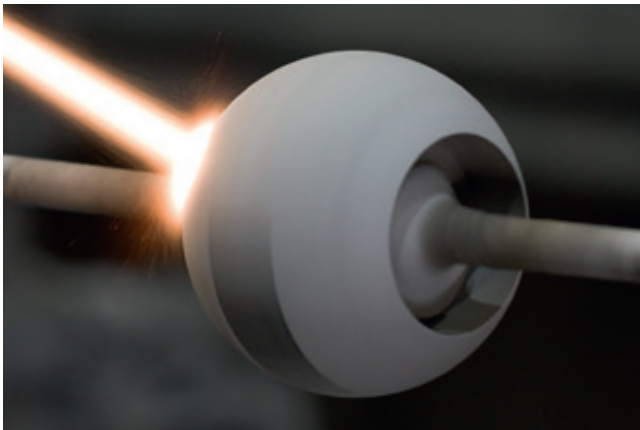
## Design Features

### Live Loaded Adjustable Packing Stem Sealing



KTM Virgo Series PH valve utilizes a live loaded and gland packing stem design to ensure additional protection against leakage even at very low and high pressures as well as low and high temperature.

### Hard Facing for Improved Reliability

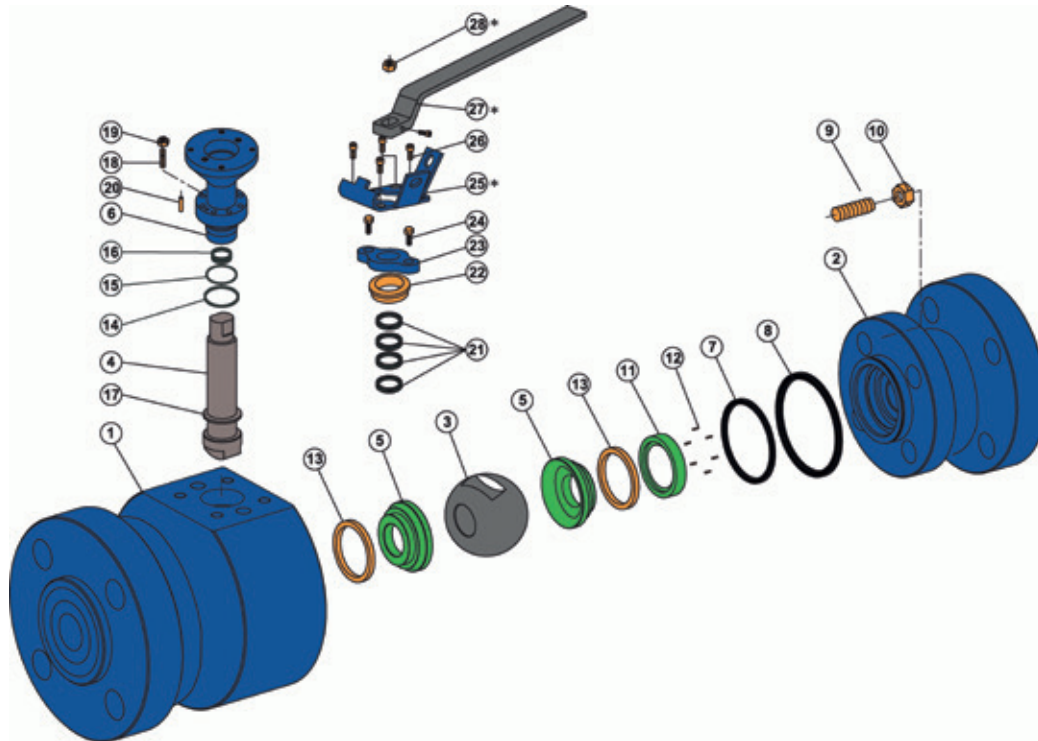


Metal-seated valves are excellent choice for high temperature applications. Both the ball and seat are hard faced with tungsten carbide or chrome carbide using a High Velocity Oxygen Fuel (HVOF) surface spray, one of the industry's most advanced coating process developed in house.

### Series PH Size Availability

| Class 150 |           | Class 300 |           | Class 600 |           | Class 900/1500 |           |
|-----------|-----------|-----------|-----------|-----------|-----------|----------------|-----------|
| FB (NPS)  | RB (NPS)  | FB (NPS)  | RB (NPS)  | FB (NPS)  | RB (NPS)  | FB (NPS)       | RB (NPS)  |
| 1/2       | 3/4 x 1/2 | 1/2       | 3/4 x 1/2 | 1/2       | 3/4 x 1/2 | 1/2            | 3/4 x 1/2 |
| 3/4       | 1 x 3/4   | 3/4       | 1 x 3/4   | 3/4       | 1 x 3/4   | 3/4            | 1 x 3/4   |
| 1         | 1 1/2 x 1 | 1         | 1 1/2 x 1 | 1         | 1 1/2 x 1 | 1              | 1 1/2 x 1 |
| 1 1/2     | 2 x 1 1/2 | 1 1/2     | 2 x 1 1/2 | 1 1/2     | 2 x 1 1/2 | 1 1/2          | 2 x 1 1/2 |

# Materials of Construction



| Item No. | Part Name               | 1PC<br>Body-A105<br>Trim-SS      | 6PC<br>Body-F316<br>Trim-SS      | 8PC<br>Body-LF2<br>Trim-SS       |
|----------|-------------------------|----------------------------------|----------------------------------|----------------------------------|
| 1        | Body                    | ASTM A182 A105                   | ASTM A182 GR. F316               | ASTM A350 LF2                    |
| 2        | Adapter                 | ASTM A182 A105                   | ASTM A182 GR. F316               | ASTM A350 LF2                    |
| 3        | Ball                    | ASTM A182 GR. F316 + CrC Coating | ASTM A182 GR. F316 + CrC Coating | ASTM A182 GR. F316 + CrC Coating |
| 4        | Stem                    | INCONEL 718 (API 6A)             | INCONEL 718 (API 6A)             | INCONEL 718 (API 6A)             |
| 5        | Seat                    | ASTM A182 GR. F316 + CrC Coating | ASTM A182 GR. F316 + CrC Coating | ASTM A182 GR. F316 + CrC Coating |
| 6        | Housing                 | ASTM A182 A105                   | ASTM A182 GR. F316               | ASTM A350 LF2                    |
| 7        | Gasket (body seal)      | Graphite (die molded ring)       | Graphite (die molded ring)       | Graphite (die molded ring)       |
| 8        | Gasket (body seal)      | Graphite (die molded ring)       | Graphite (die molded ring)       | Graphite (die molded ring)       |
| 9        | Stud                    | ASTM A193 GR. B7M                | ASTM A193 GR. B8M                | ASTM A320 GR. L7M                |
| 10       | Nut                     | ASTM A194 GR. 2HM                | ASTM A194 GR. 8M                 | ASTM A194 GR. 7M                 |
| 11       | Pusher ring             | ASTM A479 type 316               | ASTM A479 type 316               | ASTM A479 type 316               |
| 12       | Spring                  | UNS N07750                       | UNS N07750                       | UNS N07750                       |
| 13       | Gasket (seat seal)      | Graphite (die molded ring)       | Graphite (die molded ring)       | Graphite (die molded ring)       |
| 14       | Gasket (housing seal)   | Graphite (die molded ring)       | Graphite (die molded ring)       | Graphite (die molded ring)       |
| 15       | Gasket (housing seal)   | Graphite (die molded ring)       | Graphite (die molded ring)       | Graphite (die molded ring)       |
| 16       | Bearing                 | INCONEL 625 + SP. Coating        | INCONEL 625 + SP. Coating        | INCONEL 625 + SP. Coating        |
| 17       | Thrust washer           | INCONEL 625 + SP. Coating        | INCONEL 625 + SP. Coating        | INCONEL 625 + SP. Coating        |
| 18       | Stud                    | ASTM A193 GR. B7M                | ASTM A193 GR. B8M                | ASTM A320 GR. L7M                |
| 19       | Nut                     | ASTM A194 GR. 2HM                | ASTM A194 GR. 8M                 | ASTM A194 GR. 7M                 |
| 20       | Dowel pin               | ASTM A321 Gr. 1040               | ASTM A479 Type 316               | ASTM A479 type 316               |
| 21       | Packing set (stem seal) | Graphite                         | Graphite                         | Graphite                         |
| 22       | Gland bush              | ASTM A479 type 316               | ASTM A479 type 316               | ASTM A479 type 316               |
| 23       | Gland flange            | ASTM A351 GR. CF8M               | ASTM A351 GR. CF8M               | ASTM A351 GR. CF8M               |
| 24       | Gland bolt              | ASTM A193 GR. B8M                | ASTM A193 GR. B8M                | ASTM A193 GR. B8M                |
| 25       | Lock plate              | ASTM A240 type 316               | ASTM A240 type 316               | ASTM A240 type 316               |
| 26       | Lock plate screw        | ASTM A193 GR. B8M                | ASTM A193 GR. B8M                | ASTM A193 GR. B8M                |
| 27       | Lever / handle          | Carbon steel                     | Stainless steel                  | Stainless steel                  |
| 28       | Handal lock nut         | ASTM A194 GR. 8M                 | ASTM A194 GR. 8M                 | ASTM A194 GR. 8M                 |



# Product Selection Code - Series PH

|               |                      |   |  |                       |                |   |  |             |   |                    |  |                                |                       |                 |                              |                   |
|---------------|----------------------|---|--|-----------------------|----------------|---|--|-------------|---|--------------------|--|--------------------------------|-----------------------|-----------------|------------------------------|-------------------|
| <b>Series</b> | <b>Configuration</b> |   | <b>End Connection</b>                        |                       | <b>Ratings</b> | <b>Bore</b>   | <b>Body</b>  |             |   | <b>Ball / Stem</b> | <b>Coating (Ball &amp; Seat Rings)</b> | <b>Seat Insert (Ball Seal)</b> | <b>Seals (Gasket)</b> | <b>Operator</b> | <b>Other (If Applicable)</b> | <b>Sub series</b> |
| P             | H                    | R | RF<br>RS<br>FF<br>FS<br>RT<br>BW<br>BP<br>ZZ | 1<br>2<br>3<br>6<br>9 | F<br>R         | 1<br>8<br>6<br>5<br>4<br>3<br>9<br>A<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | 2<br>7<br>P<br>3<br>A<br>Y<br>9<br>D<br>E<br>F<br>G<br>M<br>N<br>Z | C<br>T<br>Z | N | G                  | A<br>B<br>C<br>G<br>L<br>Z             | SE<br>BE<br>ZZ                 | F1                    |                 |                              |                   |

## Series

**P** Metal seated Floating Side Entry

## Configuration

**H** High Temperature- Ambient to 425°C (Metal seated) - API 6D

## Construction

**R** Two Piece - Forge

## End Connection

**RF** Flanged Raised Face Serrated  
**RS** Flanged Raised Face Smooth  
**FF** Flanged Flat Face Serrated  
**FS** Flanged Flat Face Smooth  
**RT** Flanged RTJ  
**BW** Butt Weld  
**BP** Butt Weld with pup piece  
**ZZ** Other than above

## Ratings

**1** 150#  
**2** 1500#  
**3** 300#  
**6** 600#  
**9** 900#

## Bore

**F** Full  
**R** Reduced/ Regular

## Body

**1** A105  
**8** LF2  
**6** F316  
**5** F316L  
**4** F304

**3** F304L

**9** F60 (Carbon Steel)

**A** F6A

**D** Duplex F51

**E** Super Duplex F53

**F** Super Duplex F55

**G** Duplex F60

**M** Inconel 825

**N** Inconel 625

**Z** Other than above

## Ball / Stem

**2** 316 / 17-4 PH

**7** 316 / Duplex

**P** 316 / Inconel

**3** 316 / XM-19

**A** F6A / 410

**Y** Duplex / 17-4 PH

**9** F60 (Carbon Steel)

**D** Duplex (4A or F51)

**E** Super Duplex (5A or F53)

**F** Super Duplex (6A or F55)

**G** Duplex F60

**M** Inconel (825 or Cu5MCuC)

**N** Inconel (625 or CW6MC)

**Z** Other than above

## Coating (Ball & Seat Rings)

**C** Chrome Carbide

**T** Tungsten Carbide

**Z** Other than above

## Seat Insert (Ball Seal)

**N** Not Applicable

## Seals (Gasket)

**G** Graphite sealing (No O-rings / Lip seals)

## Operator

**A** Actuator

**B** Bare Stem

**C** Gear with Chain Wheel

**G** Gear with Hand Wheel

**L** Lever/ Wrench

**Z** Other than above

## Other (If Applicable)

**SE** Stem Extension

**BE** Bonnet Extension

**ZZ** Other than above

## Sub series

**F1** Forging Series-India

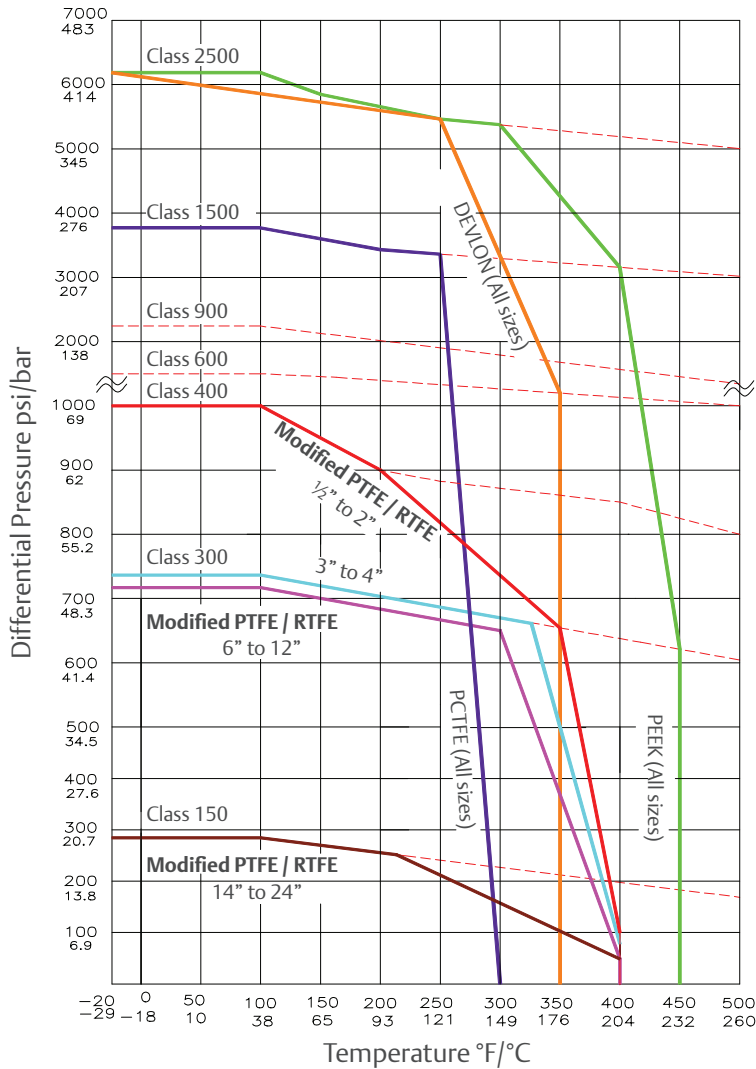
**EXAMPLE:** 0.75 P - H R - RF 1 - F - D D T - N - G - L - F1

0.75" Metal seated Floater Side entry ball valve, High Temp. configuration API 6D, 2 piece forged, RF flanges, 150 class, Full bore, duplex body, duplex ball and seat with tungsten carbide coating, duplex stem, Graphite seals, Lever.

**EXAMPLE:** 2 P - H R - RT 2 - R - 8 D C - N - G - G - F1

2" Metal seated Floater Side entry ball valve, High Temp. configuration API 6D, 2 piece forged, RTJ flanges, 1500 class, Reduced bore, LF2 body, duplex ball and seat with Chrome Carbide coating, duplex stem, Graphite seals, Gear with Hand wheel.

## Pressure/Temperature Ratings



## Temperature Limits

Typical values for commonly used materials

|                      |                      | Lower limit<br>°F (°C) | Upper limit<br>°F (°C) |
|----------------------|----------------------|------------------------|------------------------|
| <b>Body Material</b> | WCB                  | -20 (-29)              | 797 (425)              |
|                      | A105                 | -20 (-29)              | 797 (425)              |
|                      | LCC                  | -50 (-46)              | 653 (345)              |
|                      | LF2                  | -50 (-46)              | 797 (425)              |
|                      | CF8M                 | -425 (-254)            | 1000 (538)             |
|                      | F316                 | -325 (-198)            | 1000 (538)             |
| <b>Seat Material</b> | Modified PTFE / RTFE | -321 (-196)            | As per graph           |
|                      | PEEK                 | -166 (-110)            | As per graph           |
|                      | Devlon® V-API        | -40 (-40)              | As per graph           |
|                      | PCTFE                | -321 (-196)            | As per graph           |

These ratings are a general guide. It is important that you analyze all aspects of your application. Due to the variety of operating conditions and applications for these products, the user, through his / her own analysis and testing, is solely responsible for making the final selection of the products and assuming that all performance, safety and warning requirements of the application are met.

## Complete automation packages



### Available automation packages include:

- Pneumatic actuators
- Gas or gas over oil actuators
- Line break systems
- Fireproof actuator systems
- Motor-operated valves
- Hydraulic / electro hydraulic-operated systems
- Valves with digital partial stroking
- SIS

**KTM** Virgo Series ball valves can be automated to meet your unique system requirements. Automated valve solutions are available for isolation, emergency shutdown, remote operated SDVs and safety instrumented systems (SIS-SIL3 certified).



Delivers the quality, reliability  
and performance you expect.



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