Uncompromising commitment to high quality and reliable valve performance.

Virgo Trunnion Ball Valves
Delivering value with a comprehensive range of products that meets your operational demands.
With pressure to improve your bottom line, ever increasing quality and safety measures to implement, and more stringent regulatory requirements to comply with, you need confidence in your valve performance so that you have the ability to spend your time elsewhere. For high-quality, reliable ball valves from a trusted supplier, look to Emerson’s Virgo to meet your needs.

Emerson’s Commitment to Excellence With Virgo Products
Emerson is committed to delivering quality Virgo products that meet or exceed your expectations. We continue to improve our performance levels through the use of innovative technologies and processes, perfect execution principles, and promoting safety and quality among our employees.

The Best Support You May Never Need
The true value of a supplier is about the attention you get before the sale and the support you receive after.

Backed by the global strength of Emerson and our local providers, we deliver superior pre- and post-sales support—including around-the-clock access to inventory and a comprehensive range of services. Our strategic stocking locations ensure short lead times, and product is ready when you need it. Our capability to provide broader solutions allows you to focus attention on keeping your plant operating smoothly.
With the Virgo Valves product line, Emerson has the perfect ball valve to fit your process. Whether your application requires a 2” off-the-shelf soft-seated trunnion ball valve, a custom 60” top entry valve or something in between, Emerson can deliver.

CAST TRUNNION MOUNTED BALL VALVES

FORGED TRUNNION MOUNTED BALL VALVES

Trunnion mounted ball valves are utilized in some of the most demanding processes in practically every industry. Whether you are controlling a chemical process, isolating an upstream oil and gas operation, protecting a midstream pipeline or any of a thousand other applications, the valve safely and effectively manages these demands. Virgo valves are available in several different series to provide unsurpassed performance in all your applications.

PRODUCT REFERENCE STANDARDS

<table>
<thead>
<tr>
<th>Feature</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design and Manufacturing</td>
<td>API 6D, API 6A, ASME B 16.34, BS EN ISO 17292</td>
</tr>
<tr>
<td>Face to Face</td>
<td>ASME B 16.10, API 6D</td>
</tr>
<tr>
<td>Flange Dimensions</td>
<td>ASME B 16.5 (up to 24”), ASME B16.47 Series A (26” and above)</td>
</tr>
<tr>
<td>Butt Weld Valve Ends</td>
<td>ASME B16.25</td>
</tr>
<tr>
<td>Pressure Tests</td>
<td>API 6D, API 598, BS EN 12266 -1 and 2</td>
</tr>
<tr>
<td>Fire Safety Test</td>
<td>API 607, API 6FA, BS EN ISO 10497</td>
</tr>
<tr>
<td>Quality/Product Certifications</td>
<td>ISO 9001, API 6D, PED 2014/68/EU, EAC (Russia), ATEX and OSHAS 18001</td>
</tr>
<tr>
<td>Safety Reliability</td>
<td>SIL3</td>
</tr>
<tr>
<td>Fugitive Emissions</td>
<td>ISO 15848</td>
</tr>
</tbody>
</table>

*Valve conforming to NACE MR 0175 / ISO 15156 / MR 0103 can be supplied. Environmental restrictions may apply.

PRODUCT CONTROL

- Material traceability is maintained on all Virgo ball valves.
- All Virgo ball valves are tested and documented prior to shipment.
- Certificate of Compliance, material and mechanical test reports are provided with all products.
Dependability for Your Process

Maximizing process uptime is critical to your plant achieving maximum output. All the components in the process must perform at their peak to make this to happen. To provide highest performance for isolation valve applications all Virgo ball valve series can be supplied in a variety of materials, body and trim configurations, and end connections to precisely fit your applications. Each valve includes industry-leading features that provide the reliability you are looking for in your process.

DOUBLE BLOCK AND BLEED
Spring loaded floating seats maintain contact with the ball and provide a tight shut off even at low pressure differential. Independent sealing of upstream and downstream sides facilitates draining/venting of the body cavity, thus the double block and bleed operation.

SEALANT INJECTION
In the event of seat or seal damage due to contamination, an emergency seal can be formed using seat sealant injection.

• Forged or Cast Construction
• Production valves are 100% tested
• Dual trunnion plate design for increased ball stability
• Bi-directional zero leakage – maximum life with minimum maintenance
• Self-lubricating stem and trunnion bearings
Virgo trunnion mounted ball valves are manufactured with the highest level of integrity, to provide you with the greatest confidence in their ability to perform. Our engineering team focuses on providing products that meet or exceed industry standards and regulations using the latest engineering design tools. During manufacturing, Emerson utilizes state-of-the-art equipment and techniques to produce Virgo products that meet quality standards, often exceeding those of other valve manufactures. Each Virgo valve is then validated in an industry-leading in-house test facility to ensure it works as advertised.

O-RING STEM SEALING
The O-ring seal arrangement features a triple stem seal with two O-rings and a fire safe gasket. Rigorous fugitive emissions testing requirements are reliably met utilizing this O-ring stem seal.

ADJUSTABLE PACKING STEM SEALING
For applications that benefit from the flexibility of a fully adjustable packing gland, this multi stem seal consists of a layered graphite packing gland set and double shaft O-rings. The adjustable seal permits constant adherence to stringent fugitive emissions testing requirements.

- ISO 5211 mounting allows for easy automation
- Low operating torques for cost effective automation
- Compression springs provide uniform loading of seats, ensuring sealing at low pressures
- Piggable bore

NOTE: Cast 2 Piece NL Series Ball Valve representative drawing only. Consult Emerson Sales for actual product drawings.
Maintain Your Plant Safety

Safety is near the top of everyone’s priority list, protecting your personnel as well as your plant is critical. Virgo trunnion mounted ball valves are designed to make maintaining a safe process easier with features like a blowout-proof stem, API 607/6FA fire safety certification, built in anti-static devices, and extra wall thickness for increased corrosion resistance, to name a few. Virgo valves have been rigorously evaluated and are SIL 3 capable. These valves have been designed to meet rigorous industry certifications such as API 6D.

DOUBLE BODY SEALING
Pipelines often put stress on valve body seals. To overcome these stresses and to ensure a leak free joint, a double body seal is utilized.

FIRE SAFE DESIGN
To increase safety, the valve is certified API 607 / 6FA / ISO 10497 fire safe. If a fire should develop, the valve is designed to provide a metal-to-metal seal.

- Sealant Injection
- Double Block and Bleed
- Extra wall thickness for increased corrosion allowance
- Blowout-proof stem
BUILT-IN ANTI-STATIC DEVICES

Built-in antistatic devices in the valve stem ensure electrical continuity between ball, stem and body providing increased safety.

NOTE: Forged 3 Piece NL Series Ball Valve representative drawing only. Consult Emerson Sales for actual product drawings.

BLOWOUT PROOF STEM

The blowout-proof stem provides positive stem retention.

- SIL 3 capable
- Anti-static device maximizes safety
- API 607 / 6FA / ISO 10497 fire safe certification
- Low fugitive emissions
# Materials of Construction

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part Name</th>
<th>Carbon/Carbon</th>
<th>Carbon/Stainless</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>BODY</td>
<td>ASTM A216 GR. WCB</td>
<td>ASTM A216 GR. WCB</td>
</tr>
<tr>
<td>02</td>
<td>ADAPTER</td>
<td>ASTM A216 GR. WCB</td>
<td>ASTM A216 GR. WCB</td>
</tr>
<tr>
<td>03</td>
<td>BALL</td>
<td>ASTM A105 WITH 1 MIL ENP</td>
<td>ASTM A182 GR.F316/ASTM A351 GR. CF8M</td>
</tr>
<tr>
<td>04</td>
<td>STEM</td>
<td>ASTM A322 GR. A140 WITH 1 MIL ENP</td>
<td>ASTM A479 TYPE 316</td>
</tr>
<tr>
<td>05</td>
<td>SEAT</td>
<td>ASTM A105 WITH 1 MIL ENP+DEVLONTM</td>
<td>ASTM A182 GR.F316+DEVLONTM</td>
</tr>
<tr>
<td>06</td>
<td>HOUSING</td>
<td>ASTM A216 GR. WCB/ASTM A105</td>
<td>ASTM A216 GR. WCB/ASTM A105</td>
</tr>
<tr>
<td>07</td>
<td>ISO PAD</td>
<td>ASTM A216 GR. WCB/ASTM A105</td>
<td>ASTM A216 GR. WCB/ASTM A105</td>
</tr>
<tr>
<td>08</td>
<td>FASTENER (ISO PAD-HOUSING)</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A193 GR. B7M</td>
</tr>
<tr>
<td>09</td>
<td>FASTENER (HOUSING-BODY)</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A193 GR. B7M</td>
</tr>
<tr>
<td>10</td>
<td>O-RING (BODY SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
</tr>
<tr>
<td>11</td>
<td>GASKET (BODY SEAL)</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
</tr>
<tr>
<td>12</td>
<td>O-RING (STEM SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
</tr>
<tr>
<td>13</td>
<td>GASKET (STEM SEAL)</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
</tr>
<tr>
<td>14</td>
<td>O-RING (HOUSING SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
</tr>
<tr>
<td>15</td>
<td>GASKET (HOUSING SEAL)</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
</tr>
<tr>
<td>16</td>
<td>O-RING (SEAT SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
</tr>
<tr>
<td>17</td>
<td>O-RING (SEAT SEALANT)</td>
<td>HNBR</td>
<td>HNBR</td>
</tr>
<tr>
<td>18</td>
<td>STUD (BODY-ADAPTER)</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A193 GR. B7M</td>
</tr>
<tr>
<td>19</td>
<td>NUT (BODY-ADAPTER)</td>
<td>ASTM A194 GR. 2HM</td>
<td>ASTM A194 GR. 2HM</td>
</tr>
<tr>
<td>20</td>
<td>KEY</td>
<td>ASTM A321 GR.1040</td>
<td>ASTM A321 GR.1040</td>
</tr>
<tr>
<td>21</td>
<td>CAP SCREW (KEY-STEM)</td>
<td>ASTM A193 GR. B8M</td>
<td>ASTM A193 GR. B8M</td>
</tr>
<tr>
<td>22</td>
<td>DRAIN &amp; VENT PLUG</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
</tr>
<tr>
<td>23</td>
<td>BEARING (STEM)</td>
<td>SS316+PTFE</td>
<td>SS316+PTFE</td>
</tr>
<tr>
<td>24</td>
<td>THRUST WASHER (STEM)</td>
<td>SS316+PTFE</td>
<td>SS316+PTFE</td>
</tr>
<tr>
<td>25</td>
<td>SEAT SPRING</td>
<td>ASTM B637 UNS N07750</td>
<td>ASTM B637 UNS N07750</td>
</tr>
<tr>
<td>26</td>
<td>SEALANT FITTING FOR NPS 4 CLASS 600 AND ABOVE</td>
<td>ASTM A479 TYPE 316</td>
<td>ASTM A479 TYPE 316</td>
</tr>
<tr>
<td>27</td>
<td>LIFTING HOOK FOR NPS 4 CLASS 600 AND ABOVE</td>
<td>CARBON STEEL</td>
<td>CARBON STEEL</td>
</tr>
<tr>
<td>28</td>
<td>TRUNNION PLATE</td>
<td>ASTM A216 GR. WCB/ASTM A105</td>
<td>ASTM A216 GR. WCB/ASTM A105</td>
</tr>
<tr>
<td>29</td>
<td>BEARING (TRUNNION PLATE)</td>
<td>SS316+PTFE</td>
<td>SS316+PTFE</td>
</tr>
<tr>
<td>30</td>
<td>THRUST WASHER (TRUNNION)</td>
<td>SS316+PTFE</td>
<td>SS316+PTFE</td>
</tr>
<tr>
<td>31</td>
<td>DOWEL (BODY-HOUSING)</td>
<td>ASTM A321 GR.1040</td>
<td>ASTM A321 GR.1040</td>
</tr>
<tr>
<td>32</td>
<td>DOWEL (TRUNNION PLATE-BODY/ADAPTER)</td>
<td>ASTM A276 TYPE 316</td>
<td>ASTM A276 TYPE 316</td>
</tr>
<tr>
<td>33</td>
<td>DOWEL (ISO PAD-HOUSING)</td>
<td>ASTM A321 GR.1040</td>
<td>ASTM A321 GR.1040</td>
</tr>
</tbody>
</table>

**NOTE:** Information shown for NL-Series Trunnion Mounted Ball Valve Sizes NPS 2, 3, 4, 6 FB Class 600, 900; NPS 8-18, Class 150-600; NPS 20, FB Class 150-900; NPS 24, FB Class 150-600. For other sizes and materials, contact your local Emerson sales office or Emerson Automation Solutions representative.
<table>
<thead>
<tr>
<th>Item No.</th>
<th>Part Name</th>
<th>11L BODY - A105 TRIM-CS WITH ENP INSERT DEVILON</th>
<th>16L BODY - A105 TRIM-SS WITH ENP INSERT DEVILON</th>
<th>8LL BODY -LF2 TRIM-CS WITH ENP INSERT DEVILON</th>
<th>86L BODY -LF2 TRIM-SS WITH ENP INSERT DEVILON</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>BODY</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
<td>ASTM A350 GR. LF2</td>
<td>ASTM A350 GR. LF2</td>
</tr>
<tr>
<td>02</td>
<td>ADAPTER</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
<td>ASTM A350 GR. LF2</td>
<td>ASTM A350 GR. LF2</td>
</tr>
<tr>
<td>03</td>
<td>BALL</td>
<td>ASTM A105 WITH ENP</td>
<td>ASTM A182 GR. F316</td>
<td>ASTM A350 LF2 WITH ENP</td>
<td>ASTM A182 GR. F316</td>
</tr>
<tr>
<td>04</td>
<td>STEM</td>
<td>ASTM A182 GR. F51</td>
<td>ASTM A182 GR. F51</td>
<td>ASTM A182 GR. F51</td>
<td>ASTM A182 GR. F51</td>
</tr>
<tr>
<td>05</td>
<td>SEAT</td>
<td>ASTM A105 WITH ENP+DEVLO</td>
<td>ASTM A182 GR.F316+DEVLO</td>
<td>ASTM A350 GR. LF2 WITH ENP+DEVLO</td>
<td>ASTM A182 GR.F316+DEVLO</td>
</tr>
<tr>
<td>06</td>
<td>HOUSING</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
<td>ASTM A350 GR. LF2</td>
<td>ASTM A350 GR. LF2</td>
</tr>
<tr>
<td>07</td>
<td>ISO PAD</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
<td>ASTM A350 GR. LF2</td>
<td>ASTM A350 GR. LF2</td>
</tr>
<tr>
<td>08</td>
<td>FASTENER (ISO PAD-HOUSING)</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A320 GR. L7M</td>
<td>ASTM A320 GR. L7M</td>
</tr>
<tr>
<td>09</td>
<td>FASTENER (HOUSING-BODY)</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A320 GR. L7M</td>
<td>ASTM A320 GR. L7M</td>
</tr>
<tr>
<td>10</td>
<td>O-RING (BODY SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
<td>HNBR (LOW TEMPERATURE)</td>
<td>HNBR (LOW TEMPERATURE)</td>
</tr>
<tr>
<td>11</td>
<td>GASKET (BODY SEAL)</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
</tr>
<tr>
<td>12</td>
<td>O-RING (STEM SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
<td>HNBR (LOW TEMPERATURE)</td>
<td>HNBR (LOW TEMPERATURE)</td>
</tr>
<tr>
<td>13</td>
<td>GASKET (STEM SEAL)</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
</tr>
<tr>
<td>14</td>
<td>O-RING (HOUSING SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
<td>HNBR (LOW TEMPERATURE)</td>
<td>HNBR (LOW TEMPERATURE)</td>
</tr>
<tr>
<td>15</td>
<td>GASKET (HOUSING SEAL)</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
<td>GRAPHITE</td>
</tr>
<tr>
<td>16</td>
<td>O-RING (SEAT SEAL)</td>
<td>HNBR</td>
<td>HNBR</td>
<td>HNBR (LOW TEMPERATURE)</td>
<td>HNBR (LOW TEMPERATURE)</td>
</tr>
<tr>
<td>17</td>
<td>O-RING (SEAT SEALANT)</td>
<td>HNBR</td>
<td>HNBR</td>
<td>HNBR (LOW TEMPERATURE)</td>
<td>HNBR (LOW TEMPERATURE)</td>
</tr>
<tr>
<td>18</td>
<td>STUD (BODY-ADAPTER)</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A193 GR. B7M</td>
<td>ASTM A320 GR. L7M</td>
<td>ASTM A320 GR. L7M</td>
</tr>
<tr>
<td>19</td>
<td>NUT (BODY-ADAPTER)</td>
<td>ASTM A194 GR. 2HJM</td>
<td>ASTM A194 GR. 2HJM</td>
<td>ASTM A194 GR. 7JM</td>
<td>ASTM A194 GR. 7JM</td>
</tr>
<tr>
<td>20</td>
<td>KEY</td>
<td>ASTM A321 GR. 1040</td>
<td>ASTM A321 GR. 1040</td>
<td>ASTM A182 GR. F51</td>
<td>ASTM A182 GR. F51</td>
</tr>
<tr>
<td>21</td>
<td>CAP SCREW (KEY-STEM)</td>
<td>ASTM A193 GR. B8M</td>
<td>ASTM A193 GR. B8M</td>
<td>ASTM A193 GR. B8M</td>
<td>ASTM A193 GR. B8M</td>
</tr>
<tr>
<td>22</td>
<td>DRAIN &amp; VENT PLUG</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
<td>ASTM A350 GR. LF2</td>
<td>ASTM A350 GR. LF2</td>
</tr>
<tr>
<td>23</td>
<td>BEARING (STEM)</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
</tr>
<tr>
<td>24</td>
<td>THRUST WASHER (STEM)</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
</tr>
<tr>
<td>25</td>
<td>SEAT SPRING</td>
<td>ASTM B637 UNS N07750</td>
<td>ASTM B637 UNS N07750</td>
<td>ASTM B637 UNS N07750</td>
<td>ASTM B637 UNS N07750</td>
</tr>
<tr>
<td>26</td>
<td>SEALANT FITTING FOR NPS 4 CLASS 600 AND ABOVE</td>
<td>ASTM A479 TYPE 316</td>
<td>ASTM A479 TYPE 316</td>
<td>ASTM A479 TYPE 316</td>
<td>ASTM A479 TYPE 316</td>
</tr>
<tr>
<td>27</td>
<td>LIFTING HOOK FOR NPS 3 CLASS 1500 AND ABOVE</td>
<td>CARBON STEEL</td>
<td>CARBON STEEL</td>
<td>LOW TEMPERATURE CARBON STEEL</td>
<td>LOW TEMPERATURE CARBON STEEL</td>
</tr>
<tr>
<td>28</td>
<td>TRUNNION PLATE</td>
<td>ASTM A105</td>
<td>ASTM A105</td>
<td>ASTM A350 GR. LF2</td>
<td>ASTM A350 GR. LF2</td>
</tr>
<tr>
<td>29</td>
<td>BEARING (TRUNNION PLATE)</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
</tr>
<tr>
<td>30</td>
<td>THRUST WASHER (TRUNNION)</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
<td>S3316+PTFE</td>
</tr>
<tr>
<td>32</td>
<td>DOWEL (TRUNNION PLATE-BODY ADAPTER)</td>
<td>ASTM A276 TYPE 316</td>
<td>ASTM A276 TYPE 316</td>
<td>ASTM A276 TYPE 316</td>
<td>ASTM A276 TYPE 316</td>
</tr>
</tbody>
</table>
Pressure Temperature Ratings

Common Applications

TRUNNION VALVE APPLICATIONS

GATHERING
- Onshore
- Offshore
- Headers and Manifolds
- Isolation
- ESDV and SDV and BDV
- Safety Systems
- Metering

DISTRIBUTION AND TRANSMISSION
- Compressor Stations
- Metering and Regulating Stations
- Bypass Lines
- Isolation
- ESDV and SDV and BDV
- Safety Systems
- AOV and ROV
- Trunk and Lateral Lines
- Tanks and Terminals

PROCESSING
- Separators and Treaters
- Metering
- Isolation
- ESDV and SDV and BDV
- Safety Systems
- Bypass lines

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, CO, 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

Temperature Limits

Typical values for commonly used materials

<table>
<thead>
<tr>
<th>Body Material</th>
<th>Lower limit Deg.F (Deg.C)</th>
<th>Upper limit Deg.F (Deg.C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WCB</td>
<td>-20 (-29)</td>
<td>797 (425)</td>
</tr>
<tr>
<td>A105</td>
<td>-20 (-29)</td>
<td>797 (425)</td>
</tr>
<tr>
<td>LCB / LCC</td>
<td>-50 (-46)</td>
<td>653 (345)</td>
</tr>
<tr>
<td>LF2</td>
<td>-50 (-46)</td>
<td>797 (425)</td>
</tr>
<tr>
<td>CF8M</td>
<td>-425 (-254)</td>
<td>1000 (538)</td>
</tr>
<tr>
<td>F316</td>
<td>-325 (-198)</td>
<td>1000 (538)</td>
</tr>
<tr>
<td>DEVLONM</td>
<td>-40 (-40)</td>
<td>As per graph</td>
</tr>
<tr>
<td>PEEKTM</td>
<td>-50 (-46)</td>
<td>As per graph</td>
</tr>
<tr>
<td>PCTFE</td>
<td>-320 (-196)</td>
<td>As per graph</td>
</tr>
<tr>
<td>HNBR</td>
<td>-20 (-29)</td>
<td>300 (149)</td>
</tr>
<tr>
<td>Low Temp HNBR</td>
<td>-40 (-40)</td>
<td>300 (149)</td>
</tr>
<tr>
<td>FKM</td>
<td>-4 (-20)</td>
<td>400 (204)</td>
</tr>
<tr>
<td>Low Temp FKM</td>
<td>-40 (-40)</td>
<td>350 (177)</td>
</tr>
<tr>
<td>FFKM</td>
<td>-4 (-20)</td>
<td>620 (327)</td>
</tr>
</tbody>
</table>

These ratings are a general guide. 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.
Virgo Valves can be automated to meet your unique system requirements. With our low operating torque and universal ISO mounting design, we can provide solutions for isolation, emergency shutdown, remote operated SDVs and safety instrumented systems (SIS-SIL3 certified).

Lower stem torques can reduce actuator sizes to save space and lower cost. 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
- HIPPS
- SIS
The Virgo NL Series is available with a large variety of body, seat and seal materials arrangements to best fit your process requirements. Stem seal leak resistance and stringent fugitive emissions compliance are maintained through a multiple stem seal design that includes two O-rings and a fire-safe gasket. This stem seal arrangement maintains sealing performance without the need for adjustments.

- **Body Configurations:** 2 Piece Cast, 3 piece Forged
- **Available Size:** 2” to 60”
- **Pressure Classes:** ASME 150# to 2500#
- **Featured Certifications:** API 6D, API 607, API 6FA, API 598, BS EN ISO 17292, BS EN ISO 10497, ISO 15848, SIL3 capable
- **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
# Product Selection Code – NL Series

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>End Connection</th>
<th>Ratings</th>
<th>Bore</th>
<th>Body</th>
<th>Ball / Seat Ring / Stem</th>
<th>Coating (Ball &amp; Seat)</th>
<th>Seat Insert (Ball Seal)</th>
<th>Seals (O-ring, Lip Seal, Gasket)</th>
<th>Operator (If Applicable)</th>
<th>Other (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>NL</td>
<td>2</td>
<td>RF</td>
<td>1</td>
<td>F</td>
<td>C</td>
<td>1 L 6 7 2 1 9 N Z</td>
<td></td>
<td>G L P E Z A B C D E F G L Z</td>
<td>SI SE BE DP SD MF ZZ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>NL</td>
<td>2</td>
<td>RS</td>
<td>2</td>
<td>R</td>
<td>D</td>
<td>1 A105 / A105 / 11400</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>NL</td>
<td>2</td>
<td>FF</td>
<td>3</td>
<td>5</td>
<td>E</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>NL</td>
<td>2</td>
<td>FS</td>
<td>6</td>
<td>9</td>
<td>F</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>NL</td>
<td>2</td>
<td>RT</td>
<td>9</td>
<td>1</td>
<td>G</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>NL</td>
<td>2</td>
<td>BW</td>
<td>4</td>
<td>6</td>
<td>H</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>NL</td>
<td>2</td>
<td>BP</td>
<td>7</td>
<td>2</td>
<td>I</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>NL</td>
<td>2</td>
<td>6B</td>
<td>8</td>
<td>1</td>
<td>J</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>NL</td>
<td>2</td>
<td>HB</td>
<td>9</td>
<td>9</td>
<td>K</td>
<td>1 L 2 3 6 4 5 9 P M 1 N Z</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Series
- **NL**: Soft seated Trunnion Side Entry with O-ring seal mating - API 6D

## Construction
- 2: Two Piece - Cast: <= 24’
- 3: Three Piece - Forged: =>30’
- R: Two Piece - Forged

## 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
- 6B: Flanged RTJ (API 6A)
- HB: Hub connection
- ZZ: Other than above

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

## Bore
- F: Full
- R: Reduced/Regular

## Body
- WCB
- LCB
- WCC
- LCC
- CF8M or F316
- CF3M or F316L
- CF8 or F304
- CF3 or F304L

## Ball / Seat Ring / Stem
- A: A105 / A105 / 11400
- B: L 2 3 6 4 5 9 P M 1 N Z
- C: L 2 3 6 4 5 9 P M 1 N Z
- D: D 1 L 2 3 6 4 5 9 P M 1 N Z
- E: E 1 L 2 3 6 4 5 9 P M 1 N Z
- F: F 1 L 2 3 6 4 5 9 P M 1 N Z
- G: G 1 L 2 3 6 4 5 9 P M 1 N Z

## Coating (Ball & Seat Rings)
- ENP 1 mil (25 Micron)
- EP 3 mil (75 Micron)
- EP 1 mil (30 Micron)
- Other than above

## Seat Insert (Ball Seal)
- A: RTFE
- B: Devlon®
- C: PEEK
- D: PCTFE (Kel F)
- E: Viton®
- F: Not Applicable
- G: Other than above

## Seals (O-ring, Lip Seal, Gasket)
- A: HNBR
- B: HNBR 90 Durometer
- C: HNBR AED (90D)
- D: HNBR Low Temp
- E: FKM/Viton®
- F: FKM AED/Viton® AED
- G: FKM Low Temp
- H: EPDM
- I: PTFE
- J: Lip Seals (Material As Specified)
- K: PTFE sealing (No graphite)
- L: Other than above

## Other (If Applicable)
- SI: Sealant Injection
- SE: Stem Extension
- BE: Bonnet Extension
- DP: Double Piston Effect (Non-Relieving)
- SD: Single Piston Effect (U/S); Double Piston Effect (D/S)
- MF: Multiple Features - e.g., stem extension with DP seats
- ZZ: Other than above

**EXAMPLE:**

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>End Connection</th>
<th>Ratings</th>
<th>Bore</th>
<th>Body</th>
<th>Ball / Seat Ring / Stem</th>
<th>Coating (Ball &amp; Seat)</th>
<th>Seat Insert (Ball Seal)</th>
<th>Seals (O-ring, Lip Seal, Gasket)</th>
<th>Operator (If Applicable)</th>
<th>Other (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>NL</td>
<td>2</td>
<td>F</td>
<td>1</td>
<td>3</td>
<td>C</td>
<td>1 L 6 7 2 1 9 N Z</td>
<td></td>
<td>G L P E Z A B C D E F G L Z</td>
<td>SI SE BE DP SD MF ZZ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- D Duplex (4A or F51)
- E Super Duplex (5A or F53)
- F Super Duplex (6A or F55)
- M Inconel® (825 or CuSMCuC)
- N Inconel® (625 or CW6MC)
- 1 A105
- 8 LF2
- 9 F60 (Carbon Steel)
- A F6A
- G Duplex F60
- 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
- 8: EPDM
- 9: PTFE
- 0: Lip Seals (Material As Specified)
- **: PTFE sealing (No graphite)
- Z: Other than 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):**
- SI: Sealant Injection
- SE: Stem Extension
- BE: Bonnet Extension
- DP: Double Piston Effect (Non-Relieving)
- SD: Single Piston Effect (U/S); Double Piston Effect (D/S)
- MF: Multiple Features - e.g., stem extension with DP seats
- ZZ: Other than above

**Coating (Ball & Seat Rings):**
- ENP 1 mil (25 Micron)
- EP 3 mil (75 Micron)
- NF 1 mil (25 Micron)
- Other than above

**EXAMPLE:**

8’ Soft seated trunnion side entry ball valve, O-ring seal configuration API 6D, 2 piece cast body, RF flanged ends, 300# class, Full port, WCB body, A105 ball, seat rings and 4140 stem w/ 1 mil ENP, Devlon seat inserts, HNBR O-rings, gear with Handwheel, with sealant injection
The Virgo NG Series ball valve is optimized for your applications benefiting from an adjustable packing gland. This Virgo NG Series valve offers a fully adjustable layered graphite packing gland and a double O-ring seal to provide the utmost leak integrity and adherence to demanding fugitive emissions standards for your processes.

- **Body Configurations:** 2 Piece Cast
- **Available Size:** 2” to 30”
- **Pressure Classes:** ASME 150# to 1500#
- **Featured Certifications:** API 6D, API 607, API 6FA, API 598, BS EN ISO 17292, BS EN ISO 10497, ISO 15848, SIL3 capable
- **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
# Product Selection Code – NG Series

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>End Connection</th>
<th>Ratings</th>
<th>Bore</th>
<th>Body</th>
<th>Ball/Seat Ring</th>
<th>Coating (Ball &amp; Seat)</th>
<th>Seat Insert (Ball Seal)</th>
<th>Seals (O-ring, Lip Seal, Gasket)</th>
<th>Operator (If Applicable)</th>
<th>Other (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>NG</td>
<td>2</td>
<td>RF</td>
<td>1</td>
<td>F</td>
<td>C</td>
<td>L</td>
<td>Z</td>
<td>G</td>
<td>A</td>
<td>SI, SE</td>
<td>BE, DP, SD, MF, ZZ</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>F</td>
<td>RS</td>
<td>2</td>
<td>R</td>
<td>L</td>
<td>G</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
<td>3</td>
<td>FF</td>
<td>3</td>
<td></td>
<td>E</td>
<td>N</td>
<td>D</td>
<td>V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>R</td>
<td>FS</td>
<td>4</td>
<td></td>
<td>D</td>
<td>A</td>
<td>M</td>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>R</td>
<td>RT</td>
<td>5</td>
<td></td>
<td>A</td>
<td>F</td>
<td>N</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>B</td>
<td>BW</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>P</td>
<td>BP</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>B</td>
<td>RTJ</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>H</td>
<td>BU</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>B</td>
<td>BU with pup piece</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>B</td>
<td>HB</td>
<td>10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>2</td>
<td>ZZ</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Series
- **NG**: Soft seated Trunnion Side Entry with Gland Packing and O-ring stem sealing - API 6D

## Construction
- **2**: Two Piece - Cast: <= 30”
- **F**: Three Piece - Forged: => 30”
- **3**: Three Piece - Cast
- **R**: Two Piece - Forged

## 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
- **6B**: Flanged RTJ (API 6A)
- **HB**: Hub connection
- **ZZ**: Other than above

## Ratings
- **1**: 150#  
- **2**: 1500#  
- **3**: 3000#  
- **9**: 900#  
- **5**: 2500#

## Bore
- **F**: Full
- **R**: Reduced/ Regular

## Body
- **C**: WCB
- **L**: LCB
- **7**: WCC
- **2**: LCC
- **6**: CF8M or F316

## Ball/Seat Ring

<table>
<thead>
<tr>
<th>Size</th>
<th>Ball/Seat Ring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A105/ A105/ 4140</td>
</tr>
<tr>
<td>2</td>
<td>LF2/ LF2/ 17-4 PH</td>
</tr>
<tr>
<td>3</td>
<td>LF2/ LF2/ LF2</td>
</tr>
<tr>
<td>4</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>5</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>6</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>7</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>8</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>9</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>10</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>11</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>12</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>13</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>14</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>15</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>16</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>17</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>18</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>19</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>20</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>21</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>22</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>23</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
<tr>
<td>24</td>
<td>316/ 316/ 17-4 PH</td>
</tr>
</tbody>
</table>

## Seat Insert (Ball Seal)
- **G**: RTFE
- **L**: Devlon
- **P**: PEEK
- **E**: PTFE (Kel F)
- **V**: Viton
- **N**: Not Applicable
- **Z**: Other than above

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

<table>
<thead>
<tr>
<th>Size</th>
<th>Seals (O-ring)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HNBR</td>
</tr>
<tr>
<td>2</td>
<td>HNBR 90 Durometer</td>
</tr>
<tr>
<td>3</td>
<td>HNBR AED (900#)</td>
</tr>
<tr>
<td>4</td>
<td>HNBR Low Temp</td>
</tr>
<tr>
<td>5</td>
<td>FKM/ Viton*</td>
</tr>
<tr>
<td>6</td>
<td>FKM AED/ Viton AED</td>
</tr>
<tr>
<td>7</td>
<td>FKM Low Temp</td>
</tr>
<tr>
<td>8</td>
<td>FEP</td>
</tr>
<tr>
<td>9</td>
<td>FFKM</td>
</tr>
<tr>
<td>10</td>
<td>EPDM</td>
</tr>
<tr>
<td>11</td>
<td>L Lip Seals (Material As Specified)</td>
</tr>
<tr>
<td>12</td>
<td>T PTFE sealing (No graphite) **</td>
</tr>
<tr>
<td>13</td>
<td>Z Other than above</td>
</tr>
</tbody>
</table>

** & **: 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**: Sealant Injection
- **ST**: Stem Extension
- **BE**: Bonnet Extension
- **DP**: Double Piston Effect (Non-Relieving)
- **SD**: Single Piston Effect (U/S); Double Piston Effect (D/S)
- **MF**: Multiple Features - eg., stem extension with DP seats
- **ZZ**: Other than above

---

**EXAMPLE:**

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>End Connection</th>
<th>Ratings</th>
<th>Bore</th>
<th>Body</th>
<th>Ball/Seat Ring</th>
<th>Coating (Ball &amp; Seat Rings)</th>
<th>Seat Insert (Ball Seal)</th>
<th>Seals (O-ring, Lip Seal, Gasket)</th>
<th>Operator (If Applicable)</th>
<th>Other (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>NG</td>
<td>2</td>
<td>RT</td>
<td>9</td>
<td>F</td>
<td>C</td>
<td>1</td>
<td>L</td>
<td>3</td>
<td>G</td>
<td>SI</td>
<td></td>
</tr>
</tbody>
</table>

12” Soft seated trunnion side entry ball valve, gland packing and O-ring seal configuration API 6D, 2 piece cast body, RTJ flanged ends, 900# class, Full port, WCB body, A105 ball, seat rings and 4140 stem w/ 1 mil ENP, Devlon seat inserts, HNBR AED O-rings, gear with Handwheel, with sealant injection.
MG Series
Side Entry Metal Seated Trunnion Mounted Ball Valve with Adjustable Packing Gland Seal

The Virgo MG Series metal seated trunnion ball valves are designed and built to provide outstanding performance in your higher-temperature applications. The ball and seat are mate-lapped through a proprietary process to provide “zero” leakage* and then they are hard faced with tungsten carbide or chrome carbide using an in-house High Velocity Oxygen Fuel (HVOF) process to improved performance and increased life of the valve.

*Note: Leakage shutoff per international standards like API 6D.

- Body Configurations: 2 Piece Cast, 3 piece Forged
- Available Size: 2” to 60”
- Pressure Classes: ASME 150# to 2500#
- Featured Certifications: API 6D, API 607, API 6FA, API 598, BS EN ISO 17292, BS EN ISO 10497, ISO 15848, SIL3 capable
- 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
# Product Selection Code – MG Series

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>End Connection</th>
<th>Ratings</th>
<th>Bore</th>
<th>Body</th>
<th>Ball Seat Ring</th>
<th>Stem</th>
<th>Coating</th>
<th>Seals</th>
<th>(Ball &amp; Seat)</th>
<th>Operator</th>
<th>Other (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>MG</td>
<td>F</td>
<td>RF</td>
<td>1</td>
<td>F</td>
<td>C</td>
<td>L</td>
<td>1</td>
<td>C</td>
<td>N</td>
<td></td>
<td>A</td>
<td>SI</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>2</td>
<td>RS</td>
<td>2</td>
<td>R</td>
<td>L</td>
<td>2</td>
<td>2</td>
<td>T</td>
<td>1</td>
<td></td>
<td>B</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>3</td>
<td>FS</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
<td>2</td>
<td></td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>4</td>
<td>RT</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
<td>3</td>
<td></td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>6</td>
<td>BW</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td></td>
<td>4</td>
<td></td>
<td>E</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>8</td>
<td>BP</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td>6</td>
<td></td>
<td>5</td>
<td></td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>10</td>
<td>6B</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td>7</td>
<td></td>
<td>6</td>
<td></td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>12</td>
<td>HB</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td></td>
<td>7</td>
<td></td>
<td>N</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>14</td>
<td>ZZ</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td>9</td>
<td></td>
<td>8</td>
<td></td>
<td>G</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>10</td>
<td></td>
<td>9</td>
<td></td>
<td>Z</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Series**
- MG: Soft seated Trunnion Side entry with gland packing and O-ring stem sealing - API 6D

**Construction**
- F: Three Piece - Forged: =>30"
- 2: Two Piece - Cast: <= 30"
- 3: Three Piece - Cast
- R: Two Piece - Forged

**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
- 6B: Flanged RTJ (API 6A)
- HB: Hub connection
- ZZ: Other than above

**Ratings**
- 1: 150#
- 2: 1500#
- 3: 3000#
- 5: 2500#
- 6: 6000#
- 9: 9000#

**Bore**
- F: Full
- R: Reduced/ Regular

**Body**
- C: WCB
- 2: LCB
- 7: WCC
- 2: LCC
- 6: CF8M or F316L
- 5: CF3M or F316L
- 4: CF8 or F304
- 3: CF3 or F304L

**Ball / Seat Ring**
- 1: A105/ A105/ 4140
- 8: LF2/ LF2/ 17-4 PH
- L: LF2/ LF2/ LF2
- 6: 316/ 316/ 316
- 2: 316/ 316/ 17-4 PH
- 7: 316/ 316/ Duplex
- P: 316/ 316/ Inconel®
- 5: 316/ 316/ 316L
- A: F6A/ F6A/ 410
- D: Duplex (4A or F51)
- E: Super Duplex (5A or F53)
- F: Super Duplex (6A or F55)
- M: Inconel® (825 or Cu5MCuC)
- N: Inconel® (625 or CW6MC)
- Z: Other than above

**Seals (O-ring, Lip Seal, Gasket)**
- 1: HNBR
- 2: HNBR 90 Durometer
- 3: HNBR AED *
- 4: HNBR Low Temp
- 5: FKM/ Viton®
- 6: FKM AED/ Viton® AED
- 7: FKM Low Temp
- A: FEPM
- K: FFKM
- E: EPDM
- L: Lip Seals (Material As Specified)
- Z: Other than above

**Coating (Ball & Seat Rings)**
- C: Chrome Carbide
- T: Tungsten Carbide
- Z: Other than above

* Also from stem, if in Carbon steel material

**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)**
- SI: Sealant Injection
- SE: Stem Extension
- BE: Bonnet Extension
- DP: Double Piston Effect (Non-Relieving)
- SD: Single Piston Effect (U/S); Double Piston Effect (D/S)
- MF: Multiple Features - eg., stem extension with DP seats
- ZZ: Other than above

**Example:**
6 MG F RT 9 F C1 C N 3 G SI

6” Metal seated trunnion mounted ball valve, side entry, Gland packing & O-ring seal configuration API 6D, 3 piece forged body, RTJ flanged ends, 9000# class, Full port, WCB body, carbon steel ball, seat rings with chrome carbide coating and 4140 stem w/ 1 mil ENP, HNBR O-rings, gear with Handwheel, with sealant injection.
The Virgo EL Series top entry soft seated ball valves are designed to provide extended operation in many demanding processes. However, should maintenance be required, the EL Series helps you simplify maintenance and reduce your downtime with inline field repairability. The EL Series also incorporates multiple safety features such as anti-static devices, blowout-proof stem, and fire safe gaskets to help you protect your people and processes.

- **Body Configurations:** 1 Piece Cast or Forged
- **Available Size:** 2” to 60”
- **Pressure Classes:** ASME 150# to 2500#
- **Featured Certifications:** API 6D, API 607, API 6FA, API 598, BS EN ISO 17292, BS EN ISO 10497, ISO 15848, SIL3 capable
- **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
# Product Selection Code – EL Series

<table>
<thead>
<tr>
<th>Size</th>
<th>EL</th>
<th>Construction</th>
<th>Series Code</th>
<th>Rating</th>
<th>Bore</th>
<th>Body</th>
<th>Coating (Ball &amp; Seat)</th>
<th>Seat Insert (Ball Seat)</th>
<th>Seals (O-ring, Lip Seal, Gasket)</th>
<th>Operator (if Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>34</td>
<td>6</td>
<td>F</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>63</td>
<td>10</td>
<td>D</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>48</td>
<td>14</td>
<td>E</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>36</td>
<td>18</td>
<td>F</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>24</td>
<td>20</td>
<td>G</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>22</td>
<td>24</td>
<td>H</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>20</td>
<td>28</td>
<td>I</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>26</td>
<td>30</td>
<td>J</td>
<td>1</td>
<td>C</td>
<td>L</td>
<td>1 L P E</td>
<td>1</td>
<td>A</td>
<td>1</td>
</tr>
</tbody>
</table>

**Example:**

- **Size:** 24
- **Series:** EL
- **Construction:** 1
- **End Connection:** RT
- **Rating:** 6
- **Bore:** F
- **Body:** C
- **Coating:** 1
- **Seat Insert:** 1
- **Seals:** A
- **Operator:** 1

---

24” Soft seated trunnion top entry ball valve, O-ring seal configuration API 6D, 1 piece cast body, RTJ flanged ends, 600# class, Full port, WCB body, A105 ball, seat rings and 4140 stem w/ 1 mil ENP. Devlon seat inserts, HNBR AED O-rings, gear with Handwheel, with sealant injection.

---

**Seals (O-ring, Lip Seal, Gasket):**

- HNBR
- HNBR 90 Durometer
- HNBR AED (90D)*
- HNBR Low Temp
- FKM/Viton®
- FKM AED/ Viton® AED
- FKM Low Temp
- EPDM
- Lip Seals (Material As Specified)
- PTFE seal (No graphite)**
- Other than above

**Operator:**

- Actuator
- Bare Stem
- Gear with Chain Wheel
- Gear with Hand Wheel
- Lever/Wrench

**Other (if Applicable):**

- Sealant Injection
- Stem Extension
- Bonnet Extension
- Double Piston Effect (Non-Relieving)
- Double Piston Effect (D/S)
- Multiple Features - eg., stem extension
- Other than above

---

**Other than above:***

* Non Fire Safe sealing
* AED Orings mandatory for ASME Class 600 and above
The Virgo UL Series top entry metal seated ball valve combines the high temperature handling capabilities of a metal seated valve and the straightforward maintenance capabilities of a top entry valve into one package. “Zero” leakage* is achieved through a proprietary ball and seat mate lapping process. The ball and seat are then hard faced with tungsten carbide or chrome carbide using a High Velocity Oxygen Fuel (HVOF) process to improve performance and extend service life.

*Note: Leakage shutoff per international standards like API 6D.

• **Body Configurations:** 1 Piece Cast or Forged
• **Available Size:** 2” to 60”
• **Pressure Classes:** ASME 150# to 2500#
• **Featured Certifications:** API 6D, API 607, API 6FA, API 598, BS EN ISO 17292, BS EN ISO 10497, ISO 15848, SIL3 capable
• **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
### Product Selection Code – UL Series

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>-</th>
<th>End Connection</th>
<th>Rating</th>
<th>Bore</th>
<th>Body</th>
<th>Ball/Seat Ring</th>
<th>Coating</th>
<th>Ball &amp; Seat</th>
<th>Seat (Ball Seal)</th>
<th>Seals (O-ring*, Lip Seal, Gasket)</th>
<th>Operator (If Applicable)</th>
<th>Other (If Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>22</td>
<td>N</td>
<td>A</td>
<td>SI, SE, BE, DP, SD, MF, ZZ</td>
</tr>
</tbody>
</table>

#### Series
- UL Metal seated Trunnion Top Entry with O-ring stem sealing - API 6D

#### Construction
- 1 One Piece - Cast
- G One Piece - Forged

#### 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
- 6B Flanged RTJ (API 6A)
- HB Hub connection
- 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
- L LCB
- 7 WCC
- 2 LCC
- 6 CF8M or F316
- 5 CF3M or F316L
- 4 CF8 or F304
- 3 CF3 or F304L

#### Ball/Seat Ring
- 1 A105/A105/4140
- 2 LF2/LF2/17-4 PH
- 3 316/316/316
- 4 304/304/304
- 5 316/316/Inconel®
- 6 316L/316L/316L
- 7 304/304/304
- 8 F6A/F6A/410
- 9 Duplex (4A or F51)

#### Coating (Ball & Seat Rings)
- C Chrome Carbide
- T Tungsten Carbide
- Z Other than above

#### Example:
4 Metal seated trunnion top entry ball valve, O-ring seal configuration API 6D, 1 piece cast body, RTJ flanged ends, 600# class, Full port, WCB body, A105 ball, seat rings with chrome carbide coating and 4140 stem w/ 1 mil ENP, HNBR AED O-rings, bare stem

#### Seat (Ball Seal)
- N Not Applicable

#### Seals (O-ring*, Lip Seal, Gasket)
- 1 HNBR
- 2 HNBR 90 Durometer
- 3 HNBR AED *
- 4 HNBR Low Temp
- 5 FKM/ Viton®
- 6 FKM AED/ Viton® AED
- 7 FKM Low Temp
- A FEPM
- K FFKM
- E EPDM
- L Lip Seals (Material As Specified)
- Z Other than above

#### Other (If Applicable)
- SI Sealant Injection
- SE Stem Extension
- BE Bonnet Extension
- DP Double Piston Effect (Non-Relieving)
- SD Single Piston Effect (U/S); Double Piston Effect (D/S)
- MF Multiple Features - eg., stem extension with DP seats
- ZZ Other than above

* Also from stem, if in Carbon steel material

* * Non Fire Safe sealing

* AED Orings mandatory for ASME Class 600 and above

---

**Note:** The document contains a table with product selection criteria for UL Series metal seated trunnion top entry ball valves. The table outlines various parameters such as size, series, construction, end connection, rating, bore, body, ball/seat ring, coating, and seat configuration. It also includes options for seals, operator, and other applicable features. The example provided demonstrates how to select a valve configuration using the selection code.
WL Series
Welded Body Soft Seated Trunnion Mounted Ball Valve

The Virgo WL Series welded body ball valve utilizes a heavy-duty forged body design that adheres to ASME B16.34 wall thickness requirements, providing increased resistance to pipeline pressures and stresses. The welded body design eliminates body flanges and reduces potential leak paths, making the valve lighter and safer. These valves are engineered to provide superior service in your buried applications.

- Body Configurations: 2 / 3 piece Forged
- Available Size: 2” to 60”
- Pressure Classes: ASME 150# to 2500#
- Featured Certifications: API 6D, API 607, API 6FA, API 598, BS EN ISO 17292, BS EN ISO 10497, ISO 15848, SIL3 capable
- 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
**Product Selection Code – WL Series**

<table>
<thead>
<tr>
<th>Size</th>
<th>Series</th>
<th>Construction</th>
<th>End Connection</th>
<th>Rating</th>
<th>Bore</th>
<th>Body</th>
<th>Ball/Seat Ring / Stem</th>
<th>Coating (Ball &amp; Seal)</th>
<th>Seals (O-ring*, Lip Seal, Gasket)</th>
<th>Operator (if Applicable)</th>
<th>Other (if Applicable)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>G</td>
<td>A</td>
<td>SI</td>
</tr>
<tr>
<td>10</td>
<td>150#</td>
<td>1500#</td>
<td>3000#</td>
<td>5000#</td>
<td>9000#</td>
<td>1500#</td>
<td>316/316/316/316/316</td>
<td>316/316/316/316/316</td>
<td>316/316/316/316/316/316</td>
<td>316/316/316/316/316/316</td>
<td>9000#</td>
</tr>
<tr>
<td>18</td>
<td>12</td>
<td>10</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>24</td>
<td>30</td>
<td>36</td>
<td>40</td>
<td>48</td>
<td>54</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
</tbody>
</table>

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

- HNBR
- HNBR 90 Durometer
- HNBR AED (90D)*
- HNBR Low Temp
- FKM/Viton®
- FKM AED/Viton® AED
- FKM Low Temp
- AEPDM
- Other than above

*Non Fire Safe sealing
*AED Orings mandatory for ASME Class 600 and above

**Operator (if Applicable)**

- Actuator
- Bare Stem
- Gear with Chain Wheel
- Gear with Hand Wheel
- Lever/Wrench
- Other than above

**Other (if Applicable)**

- Sealant Injection
- Stem Extension
- Bonnet Extension
- Double Piston Effect (Non-Relieving)
- Single Piston Effect (U/S); Double Piston Effect (D/S)
- Multiple Features - eg., stem extension with DP seats
- Other than above

**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
- 6B Flanged RTJ (API 6A)
- HB Hub connection
- ZZ Other than above

**Bolts**

- F Full
- R Reduced / Regular

**Body**

- 1 A105
- 8 LF2
- 9 F60 (Carbon Steel)
- D Duplex (4A or F51)
- E Super Duplex (5A or F53)
- F Super Duplex (6A or F55)
- G Duplex F60
- Z Other than above

**Ball/Seat Ring / Stem**

- 3 316/316/316/316/316
- 9 F60 (Carbon Steel)
- U Duplex / 316 / 316
- Y Duplex / 316 / 17-4 PH
- D Duplex (4A or F51)
- E Super Duplex (5A or F53)
- F Super Duplex (6A or F55)
- G Duplex F60
- Z Other than above

*Use on Cast 6’ 1500# and 8’ 9000# and higher instead of 316

**Coating (Ball & Seat Rings)**

- 1 ENP 1 mil (25 micron)*
- 3 ENP 3 mil (75 micron)*
- N Not Applicable
- Z Other than above

*Also from stem, if in Carbon steel material

**Seat Insert (Ball Seal)**

- G RTFE
- L Devcon®
- P PEEK
- E PCTFE (Kel F)
- V Viton®
- N Not Applicable
- Z Other than above

**Examples:**

- 6·WL·R·BW·9·F·9·9·1·L·3·B·SI

6’ Soft seated trunnion welded body ball valve, O-ring seal configuration API 6D, 2 piece forged body, butt weld ends, 9000# class, Full port, F60 body, Carbon steel ball, seat rings and carbon steel stem w/ 1 mil ENP, Devcon seat inserts, HNBR AED O-rings, bare stem, with sealant injection
Why Virgo Valves?
Reliable Products at a Competitive Price

Emerson’s investment in superior manufacturing equipment, an ongoing commitment to keep employees well-trained, and the quest for upper quartile performance are just a few items that drive our mission for the highest in-class quality. At the same time, our global supply chain and manufacturing allow us to supply products at very competitive prices when compared to other high-quality valve manufacturers.

Expert Project Management

Virgo valves have been supplied to over 2,300 projects around the globe, both large and small. We help our customers maintain project certainty by pre-sale design collaboration, a structured project execution process and maintaining flexibility throughout the manufacturing process. The result is a responsive supplier that supports you throughout the process and meets the promised delivery dates.

Single Point Accountability

Emerson owns the complete process from design, manufacturing, assembly, automation, proof testing, integration, and lifecycle coverage. Emerson goes to great lengths to maintain full process accountability that only a few industry-leading manufacturers can provide. This includes having our own in-house foundry, which enables Emerson to uphold the highest quality standards on all Virgo products.

Local Support and a Global Presence

Our vast network of sales offices and Local Business Partners (LBPs) are available to support our customers around the globe. We provide our customers superior pre- and post-sales support, local inventory, as well as a comprehensive range of other services.

Safe, Proven Products

We are committed to delivering quality products that meet or exceed our customers’ expectations. This commitment starts with thorough testing of our products to ensure they comply with the latest standards and maintain the highest safety ratings. These products are then certified by respected third party organizations. Our commitment is backed by years of experience in many of the most demanding applications around the globe. We have supplied over 1 million valves to more than 150 of the world’s leading EPCs, OEMs, and end users and they keep coming back to Emerson over and over.

For more information about Virgo, contact your local Emerson sales office or Emerson Automation Solutions representative.