The Ultimate TOP-ENTRY BALL VALVE

RESILIENT AND METAL-SEATED

ASME CLASS 150, 300, 600
Sizes \( \frac{3}{8} \text{ to } 6" \), 10–150 mm
Velan is one of the world’s leading manufacturers of industrial valves, supplying forged and cast steel gate, globe, check, ball, butterfly and knife gate valves for critical applications in the chemical, petrochemical, oil and gas, fossil and nuclear power, cogeneration, pulp and paper and cryogenic industries.

Founded in 1950, Velan earned a reputation for excellence as a major supplier of forged valves for nuclear power plants and the U.S. Navy. Velan Inc., pioneered many designs which became industry standards, including bellows seal valves, all stainless steel knife gate valves and forged valves up to 24”.

Velan valves are manufactured in 12 specialized plants, including five in Canada, two in Korea and one each in the U.S., France, U.K., Portugal and Taiwan. We have a total of 1,091 employees in North America and 384 overseas.

Top-entry, TE-600 ball valves are manufactured in plant 5 Montreal, Canada.

Velan has Sales offices and distributors located worldwide.
Visit the Velan website at www.velan.com for an updated contact list.

NOTE: The material in this catalog is for general information. For specific performance data and proper material selection, consult your Velan representative. Although every attempt has been made to ensure that the information contained in this catalog is correct, Velan reserves the right to change designs, materials or specifications without notice.
SEALING MEMORY
The Velan sealing memory is induced into the seats during the assembly process. When the ball is inserted into the valve body during assembly, it partially flattens the seat, creating a tensile stress in the center of the seat.

As a result, the seat core increases in diameter from $D_1$ to $D_2$ and like a stretched elastic band pushes against the ball. This ensures reliable sealing even at vacuum or low pressures.

SEAT STRENGTH
A seat in tension is stronger than a seat in compression because the tensile strength of PTFE in tension is 3600 psi versus only 1800 psi for PTFE in compression. Greater strength means less fatigue, superior sealing ability and longer cycle life.

CAVITY PRESSURE RELIEF
Memory seal seats are designed to relieve overpressure in the ball/body cavity. This capability is influenced by many variables including: fluid characteristics, variations in pressure, seat materials, seat compression, temperature and thermal cycles.

Positive release of cavity overpressure to the upstream side is assured in bypassing the upstream seat through a drilled hole in the ball. This option is preferred in certain services such as liquid chlorine.

For specific details on Cavity Relief Performance contact Velan.

LOWERS TORKUES
Velan “in-tension” seats produce more uniform torque because the seat deflects into the cavity behind it to accommodate slight differences in machining tolerances or the normal expansion of PTFE as temperature increases. PTFE expands approximately seven times as much as metal.

SUMMARY OF MEMORY SEAL BENEFITS

- **SEATS “IN-TENSION”**
  - Greater strength
  - Less fatigue
  - Positive bi-directional shutoff
  - Compensate for temperature fluctuations
  - Uniform torque
  - High cycle life
  - Eliminate cold flow effects

- **LARGER SEATING AREA**
  - Superior sealing
VELAN TOP-ENTRY BALL VALVES
SUPERIOR TO THREE-PIECE BALL VALVES

VELAN FIRE SAFE TOP-ENTRY

1. Two-leakage paths (gasket and packing).
2. Fully guided stem.
3. In lab tests 0 ppm emissions to 100,000 cycles, 500,000 with live-loading.
4. Easy to weld the one-piece body into the line without disassembly. The integrity of the valve is not affected.
5. All parts can be easily serviced or replaced in-line.

THREE-PIECE FIRE SAFE VALVES

1. Three-leakage paths (2 gaskets and packing).
2. Stem can wobble, cause leakage.
3. Larger emissions, lower cycle life.
4. Welding can affect the integrity of the valve due to tendency to separate the three-bolted body parts during the welding.
5. Valve can not be serviced in-line, because of the fire safe design with spiral wound gaskets which requires internal guiding of the two end pieces. The guiding prevents the centerpiece to swing out.

IN-LINE SERVICE

STEP 1
Remove cover assembly.

STEP 2
Remove ball. Turn ball 90° and remove.

STEP 3
Remove seats. Once ball is out, a simple jolt with fingers or tool removes seat.
A UNIQUE PACKING CHAMBER WITH A FULLY GUIDED STEM AND FLANGED PACKING GLAND TESTED FOR 0 PPM EMISSIONS

1. **Fully-guided stem.**
   Stem bearings in cover and in the gland follower prevent wobbling and packing leakage due to side thrust on stem.

2. **Two piece flanged gland design**
   For low fugitive emissions and severe service applications.

3. **Low emission stem seal.**
   Precompressed (2000 psi) solid PTFE packing rings, a two-piece flanged gland and fine finish of stem and I.D. of packing chamber provides 0-20 ppm tightness for low emissions.

4. **Stem thrust washer**
   Prevents galling, reduces operating torque and provides a secondary stem seal.

5. **Blowout-proof.**
   The internally-backseated stem provides blowout-proof safety.

6. **Antistatic devices.**
   The stem is grounded against body by contact with Belleville washers or coil springs.

7. **Optional Live-loading.**
   For temperature cycling applications and/or for conformance to TA-Luft, additional steady compression load can be provided by installing sets of Belleville washers.

VELAN NOW OFFERS STANDARD BALL VALVES QUALIFICATION TESTED FOR “0” PPM EMISSIONS

**TEST PROCEDURE**

The purpose of cycle testing was to determine cycle life for 0 ppm tightness of stem seal and body gasket with propane at 115 psi, 740 psi and 1400 psi.

**The testing consists of:**
- Precycling evaluation.
- Gland and body gasket emissions measured every 500 cycles.
- Tested to 100,000 cycles; 500,000 cycles with live-loaded packing.

**TEST RESULTS**

0 ppm tightness during tests shown on the right. **Definition of 0 ppm is no detectable leakage registered on our organic vapor analyzer which has a range of 1–10,000 ppm.**
**ALTERNATIVE STEM & PACKING CHAMBER DESIGNS**

**LIVE-LOADING**

**DOUBLE PACKED**
- Double packing with leak-off.
  Two sets of packing rings, precompressed to 2,000 psi (PTFE) or 4,000 psi (graphite). A lantern ring and leak-off allow removal of leakage, if any, from bottom packing set.
- **Live-loaded.**
- **Tested to 500,000 cycles with “0” ppm emissions.**

**EXTENDED BONNET**
- Designed for insulated and steam jacketed lines where access to packing is required.
- **Optional side mounting holes** for actuation.
- **Primary graphite packing** for high-temperature service.
- **Secondary packing** is isolated from the process.
- **Standard locking device.**

**BELLOWS SEAL**
- Hermetically sealed.
- **Bellows** in Hastelloy C.
- **Secondary PTFE or graphite packing seal.**
- **A unique bellows seal design** tested to 100,000 cycles with stainless steel driver unit allows installation of standard, pneumatic or electric actuator.
TE-150/300/600 TOP-ENTRY REGULAR OR FULL PORT
MEMORY SEAL BALL VALVES
CARBON OR STAINLESS STEEL AND OTHER MATERIALS
REGULAR PORT ½–6” (15–150 mm)  FULL PORT ¾–6” (10–150 mm),
THREADED, SOCKET WELD, BUTT WELD OR FLANGED, CLASSES 150, 300, 600

LOW FUGITIVE EMISSIONS

DESIGN FEATURES:

- Memory seal seats compensate automatically for wear and fluctuations of pressure and temperature.
- Multiple solid cup and cone type PTFE or graphite packing – adjustable.
- Stem bearings in cover and gland bushing eliminate side thrust. No wobbling.
- Longer cycle life.
- Lower torques.
- Blowout-proof stem.
- Live-loaded thrust washer prevents galling and provides a secondary stem seal.
- Meets ASME B16.5 and B16.34, API 608, 598, 607 and BS 6755.
- High sealing integrity of body-cover joint due to fully-enclosed spiral wound graphite gasket design.
- Permits in-line access for seat replacement.
- Flanged gland.
- Body-cover joint not affected by pipe stresses.
- Wall thickness complies with ASME B16.34.
- Can be welded into line without disassembly in accordance with Velan installation instructions.
- Stainless steel trim on all valves including handle.
- Oval handles with locking device, as well as extensions available.
- Ball-to-stem and stem-to-body static grounding.
- Locking devices standard.
- Tapping for mounting actuators standard.
- AGA and CGA approved, regular port, threaded ends. (upon request)
- Valves comply with Nace MR0175 for sour gas service when required (refer to page 11).
- Optional topworks (page 5):
  1. Live-loaded single or double packing.
  2. TA-Luft certified when supplied with PTFE live-loading packing.
  3. Bellows seal design.

APPLICATIONS:

A superior quality, rugged, and universal purpose valve for all fluids, slurries, semi-solids and corrosive services in endless industrial, chemical and original equipment applications.

- Dimensions and weights on page 12 and 13.
- Automation page 15.
**PRESSURE-TEMPERATURE RATING**

<table>
<thead>
<tr>
<th>MEDIUM</th>
<th>SEAT CONDITIONS</th>
<th>SERVICE</th>
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<tbody>
<tr>
<td>WOG</td>
<td>PTFE &amp; RPTFE</td>
<td>1480 psig @ 100°F (102 bar @ 38°C)</td>
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<tr>
<td></td>
<td>PTFE</td>
<td>100 psig @ 400°F (7 bar @ 204°C)</td>
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<tr>
<td></td>
<td>RPTFE</td>
<td>100 psig @ 450°F (7 bar @ 232°C)</td>
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<tr>
<td>Steam</td>
<td>RPTFE</td>
<td>250 psig @ 406°F (17 bar @ 208°C)</td>
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<tr>
<td></td>
<td>C-RPTFE</td>
<td>450 psig @ 456°F (31 bar @ 235°C)</td>
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</tbody>
</table>

(2) For graphite seats consult the factory.
(3) See pressure-temperature rating chart for details by size.
SPECIAL SERVICES

VACUUM SERVICE
Standard ball valves can be used to 0.02 mm Hg or 20 micron at -50° to 400°F. For special high vacuum valves up to 0.01 micron at 0° to +300°F, please contact the factory.

HIGH VACUUM SERVICE
A. DESIGN – PRODUCTION
1. Strict inspection procedure to avoid porosity.
2. A 1/8" hole drilled through stem slot to ensure evacuation of cavity in open valve position.
3. Seats and seals must be PTFE.
4. All mating surfaces sprayed with Teflon.
5. Seats and balls individually selected for finish.
6. All metal parts vapor degreased.
7. Body seat surfaces lapped to 16–32 RMS.

B. TESTING: Helium leak detector.

C. PACKAGING: All valve ends sealed off.

CHLORINE SERVICE
Chlorine is extremely corrosive and toxic. Corrosion increases with the percentage of water moisture. Up to 50 parts per million or 0.005% water, chlorine is considered dry. Above this level, it is wet. The liquid gas curve of chlorine is shown in the diagram below. There is also danger due to a high coefficient of thermal expansion. When cold liquid chlorine is trapped in the non-expanding space of the ball valve cavity, high destructive pressures can develop.

1. RELEASE OF CAVITY PRESSURE
Positive release to the upstream side is assured in bypassing the upstream seat through a drilled hole in the ball. These valves will shut off in one direction only. An arrow indicates the direction. Self-relieving seats are also available.

2. STANDARD MATERIALS
Please see page 7 for material selection.

3. CLEANING
All parts are carefully cleaned and are black light tested to assure they are free of hydrocarbons, alcohol or moisture. Valves are dried after hydrotest and packed in plastic bags with a dessicant.

LPG LIQUIFIED PETROLEUM GAS SERVICE
ALL STANDARD VELAN BALL VALVES ARE SUITABLE FOR THIS SERVICE

MATERIALS

<table>
<thead>
<tr>
<th>BODY MATERIALS</th>
<th>SS 316, carbon steel</th>
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<tr>
<td>TRIM MATERIAL</td>
<td>Standard is 316 SS</td>
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<tr>
<td>SEATS AND SEALS</td>
<td>PTFE only</td>
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<tr>
<td>BODY-COVER GASKET</td>
<td>Spiral wound</td>
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<tr>
<td></td>
<td>SS 316 + graphite</td>
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</table>
SPECIAL SERVICES

SOUR GAS SERVICE

All Velan valves meet the material requirements of NACE MR0175 when required.

NON-EXPOSED SERVICE: Velan ball valves are manufactured according to NACE where the bolting is not directly exposed to sour environments and is not to be buried, insulated, equipped with flange protectors, or otherwise denied direct atmospheric exposure, shall be specified as shown in the chart below.

EXPOSED SERVICE: Velan ball valves are manufactured according to NACE where components and bolting will be directly exposed to the sour environments or that will be buried, insulated, equipped with flange protectors, or otherwise denied direct atmospheric exposure, shall be specified as shown in the chart below.

STANDARD MATERIALS OF CONSTRUCTION FOR NACE SERVICE

<table>
<thead>
<tr>
<th>Valve</th>
<th>Size</th>
<th>Body Cover and Body</th>
<th>Ball</th>
<th>Stem(1)</th>
<th>Gland Ring</th>
<th>Non-exposed Service(3)(4)</th>
<th>Exposed Service(2)</th>
<th>Body Bolting(2)</th>
<th>Gland Bolting(2)</th>
<th>Belleville Washers / Coil Springs</th>
</tr>
</thead>
<tbody>
<tr>
<td>TE-150/300/600</td>
<td>¾ – 2”</td>
<td>CS Max. HRC 22</td>
<td>A 351-CF8M</td>
<td>A 276-316</td>
<td>SS 304</td>
<td>“E”</td>
<td>“I”</td>
<td>B7M</td>
<td>B7M</td>
<td>SS 302</td>
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<tr>
<td>TE-150/300/600</td>
<td>3 –6”</td>
<td>CS Max. HRC 22</td>
<td>A 351-CF8M</td>
<td>A 276-316</td>
<td>SS 304</td>
<td>“I”</td>
<td>“I”</td>
<td>B7M</td>
<td>B7M</td>
<td>SS 302</td>
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</table>

(1) Valves with SS trim may have SS 316, 630 or XM-19 stems at manufacturer’s option.
(2) Other bolting materials are available upon request.
(3) As required specify either “E” or “I” at end of figure number.
(4) Standard bolting as shown on the product pages.

ON-OFF STEAM SERVICE

Steam and a mixture of steam and condensate containing dissolved gases like carbon dioxide and oxygen are more corrosive than water. High velocity during cycling can damage valve parts – especially resilient seats. Valve materials must be carefully selected.

ADDITIONAL DESIGN FEATURES

All balls are provided with a ½” hole drilled into the T-slot to prevent excessive pressure build-up in the cavity from trapped liquid when the valve is in the open position. Special handles are available to meet safety and insulation requirements.

STANDARD VALVES (MAX. PRESSURE 150 psi-10 bar)

<table>
<thead>
<tr>
<th>Steam(1)</th>
<th>Type &amp; Size(2)</th>
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<tr>
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<td>All</td>
<td>RPTFE</td>
<td>PTFE</td>
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<tr>
<td>250 psig</td>
<td>TE-300/600 All sizes</td>
<td>RPTFE</td>
<td>PTFE</td>
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<tr>
<td>450 psig</td>
<td>TE-300/600 ¾–3”</td>
<td>C-RPTFE</td>
<td>Graphite</td>
</tr>
</tbody>
</table>

(1) Saturated steam, on/off operation.
(2) Consult ASME B 16.34 for body pressure-temperature rating.

CRYOGENIC SERVICE

Valves to be used in cryogenic service have extended stems located in a sufficiently long tube to provide an insulating gas column above the cold fluid to prevent shrinkage of the stem packing and to prevent the formation of an ice ball around the gland and packing.

A ¼” vent hole is provided in balls for cryogenic ball valves. Standard material for cryogenic service is austenitic stainless steel for all parts and bolting, offering excellent impact strength, minimizing heat loss and protecting against corrosion. When welded, Inconel electrodes are used for all austenitic stainless steel valves.

LIVE-LOADED BODY BOLTING (OPTIONAL)

For applications where rapid temperature fluctuations (example: LNG loading platform) can cause joint leakage, body-bonnet bolting is live-loaded with Belleville spring washers.

TESTING

Valves can be qualification tested at cryogenic temperatures with nitrogen gas.

SPECIAL CLEANING

All cryogenic valves are thoroughly degreased, cleaned, and pipe ends sealed to prevent contamination.
DESIGN FEATURES:
- Permits in-line access for seat replacement.
- Can be welded into line without disassembly.
- Full port reduces risk of clogging in slurries and solids applications.
- Body-cover joint not affected by pipe stresses.
- High sealing integrity of body-cover joint due to fully-enclosed spiral-wound stainless steel graphite gasket design.
- Solid Stellite 6 seats with large seating faces.
- Backup seal: Graphite to 1,000°F (538°C).
- Operation automatically wipes ball clean.
- Wall thickness complies with ASME B16.34.
- Stainless steel ball, hard chrome plated as standard. Other coatings available on request (see page 17).
- Blowout-proof stem.
- Low emission stem seal.
- Live-loaded two-piece flanged gland.
- Fully-guided stem reduces side thrust effect - no wobbling.
- Thrust washer prevents galling, reduces torque and provides secondary seal.
- Oval handles and extension handles available.

APPLICATIONS:
The Velan Top-Entry metal seated ball valve is one of the most universally used valves on the market today. As a standard design it is ideally suited for manual, automatic and throttling control for a wide range of applications for pressure up to 1480 psig and temperatures up to 1000°F (104 bars, 538°C) depending upon size, metallurgy and end connections.

Typical Applications:
- FCCU catalyst oil slurries in oil refineries
- FCCU catalyst
- Hot hydrocarbons and resids
- LDPE and HDPE catalyst
- Saturated and superheated steam
- Thermal fluids
- VCM
- PIA and PTA in chemical processing
- Gas Off, steam blow back, instrument isolation in Pulp & Paper
- General purpose Water, Oil and Gas applications
### TE-600 TOP-ENTRY THREADED, SOCKET WELD

#### MANUAL (REGULAR PORT)

<table>
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<tr>
<th>SIZE</th>
<th>A</th>
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<th>D</th>
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### TE-150/300/600 TOP-ENTRY FLANGED

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#### FULL PORT

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### TE-600 TOP-ENTRY BUTT WELD

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#### MANUAL (FULL PORT)

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<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>184</td>
<td>302</td>
<td>92</td>
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</table>
## DIMENSIONS

### TE-600 TOP-ENTRY LIVE-LOADED WITH DOUBLE PACKING AND LEAK-OFF

<table>
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<tr>
<th>SIZE</th>
<th>MANUAL (REGULAR PORT)</th>
<th>MANUAL (FULL PORT)</th>
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<td></td>
<td>in mm</td>
<td>A</td>
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<td>4.88</td>
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<td>152</td>
<td>6.00</td>
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<td>3</td>
<td>184</td>
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<td>205</td>
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<table>
<thead>
<tr>
<th>SIZE</th>
<th>MANUAL (REGULAR PORT)</th>
<th>MANUAL (FULL PORT)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>in mm</td>
<td>A</td>
</tr>
<tr>
<td>1/4</td>
<td>68</td>
<td>2.63</td>
</tr>
<tr>
<td>1/2</td>
<td>83</td>
<td>3.25</td>
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<tr>
<td>3/4</td>
<td>95</td>
<td>3.75</td>
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<td>1</td>
<td>124</td>
<td>4.88</td>
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<tr>
<td>1 1/2</td>
<td>152</td>
<td>6.00</td>
</tr>
<tr>
<td>2</td>
<td>184</td>
<td>7.25</td>
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<td>205</td>
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![Diagram of TE-600 dimensions](image-url)
CALCULATION OF THE ACTUATOR TORQUE REQUIREMENT

When determining the required actuator torque, seat material, fluid and frequency of operation should be considered according to experience and judgement. For actual required torques, for your application or valve automation, contact Velan or the authorized Velan automation center of your choice.

Velan is not responsible directly nor indirectly for actuator selection by third parties.
The higher cycle rates resulting from the automation of ball valves for either remote operations or throttling control requires superior stem packing designs. The Velan stem packing design as well as the optional designs shown on page 4 are intended for automated valve service.

The integrity of these designs has been verified by our own laboratory testing, operating experience and in qualification tests by inspection agencies. This assures trouble free service in automated and throttling control and the best in stem packing integrity.
HOW TO ORDER

MEMORY SEAL
TOP ENTRY RESILIENT SEATED BALL VALVES

The figure numbers shown on this key are designed to cover essential features of Velan valves. Please use figure numbers to ensure prompt and accurate processing of your order. A detailed description must accompany any special orders.

**A** TYPE OF CONNECTION

- A – Special
- B – Butt weld
- C – Combination
- F – Flanged
- S – Threaded

**B** SIZE OF CONNECTION*

Customers have the choice of specifying valve size as part of the valve figure (“B”) using the numbers below, or indicating valve size separately.

Examples:
- \( \frac{3}{8}“ \) S-G0602-SSGE (valve size is part of the figure number)
- \( \frac{1}{2}“ \) S-G0602-SSGE (valve size is shown separately)

**C** MODEL NUMBER OR CLASS

Threaded, socket weld or butt weld valves

<table>
<thead>
<tr>
<th>MODEL NUMBER(5)</th>
<th>G – TE-600</th>
</tr>
</thead>
</table>

Flanged valves

<table>
<thead>
<tr>
<th>CLASS(1)</th>
<th>0 – 150 ASME</th>
<th>2 – 600 ASME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 – 300 ASME</td>
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</tr>
</tbody>
</table>

**D** PORT

- 0 – Regular port
- 1 – Full port

**E** TYPE

- 0 – Special
- 1 – A105, WCB
- 2 – Monel

**F** BODY MATERIAL

<table>
<thead>
<tr>
<th>01 – Special</th>
<th>13 – Stainless steel, F316, CF8M</th>
</tr>
</thead>
<tbody>
<tr>
<td>02 – A105, WCB</td>
<td>14 – Stainless steel, F316L, CF3M</td>
</tr>
<tr>
<td></td>
<td>19 – Monel</td>
</tr>
<tr>
<td></td>
<td>21 – Hastelloy</td>
</tr>
<tr>
<td></td>
<td>22 – Titanium</td>
</tr>
<tr>
<td></td>
<td>23 – Alloy 20</td>
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**G** TRIM MATERIAL - Resilient Seats

<table>
<thead>
<tr>
<th>CODE</th>
<th>BALL</th>
<th>STEM</th>
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<tbody>
<tr>
<td>AY</td>
<td>Alloy 20</td>
<td>AY</td>
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<tr>
<td>HC</td>
<td>Hastelloy C(4)</td>
<td>HC</td>
</tr>
<tr>
<td>IN</td>
<td>Inconel(4)</td>
<td>IN</td>
</tr>
<tr>
<td>MO</td>
<td>Monel(4)</td>
<td>MO</td>
</tr>
<tr>
<td>AF</td>
<td>FEP</td>
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<tr>
<td>GG</td>
<td>Glass-reinforced PTFE</td>
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<tr>
<td>PE</td>
<td>PFA</td>
<td>PE</td>
</tr>
<tr>
<td>Z</td>
<td>Tefzel</td>
<td>Z</td>
</tr>
</tbody>
</table>

**H** SEAT MATERIAL - Resilient Seats

- B – Bronze-filled PTFE
- C – Carbon graphite reinforced PTFE
- E – Modified PTFE
- F – FEP
- G – Glass-reinforced PTFE
- K – PFA
- P – PEEK
- R – Graphite
- T – Teflon PTFE
- U – UHMWPE
- Z – Tefzel

**I** SPECIAL SERVICE OR DESIGN(2)

- C – Chlorine
- E – TE-600 Standard(2)
- G – Oxygen
- H – Cryogenic
- I – NACE sour gas(3)
- J – Vacuum
- N – Nuclear
- T – Bonnet, double packing
- V – Bellows seal
- X – Special
- Z – Fire tested API 607 Rev. 4 (graphite packing)

---

(1) Actual valve pressure/temperature ratings depend on choice of materials.
(2) If no special service or design is specified use “E” for standard service.
(3) Valves for NACE service with “SS” trim may have SS316, 630 or Nitronic 50 stems at manufacturer’s option.
(4) Must specify grade.
(5) For 3-6” use ASME pressure rating for butt weld end valves.
HOW TO ORDER
SECURASEAL
TOP ENTRY METAL-SEATED BALL VALVES

The figure numbers shown on this key are designed to cover essential features of Velan valves. Please use figure numbers to ensure prompt and accurate processing of your order. A detailed description must accompany any special orders.

<table>
<thead>
<tr>
<th>TYPE OF CONNECTION</th>
<th>SIZE OF CONNECTION</th>
<th>MODEL NUMBER OR CLASS</th>
<th>PORT</th>
<th>TYPE</th>
<th>METAL SEAT: T</th>
<th>BODY MATERIAL</th>
<th>TRIM MATERIAL</th>
<th>COATINGS</th>
<th>SPECIAL SERVICE</th>
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<tbody>
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<td>A</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**EXAMPLE:** Flanged, 3”, Class 300, full port, Type T design, CF8M body, SS 316 Cr plated ball, SS 316 stem, Stellite scraper seat with graphite seat

**A TYPE OF CONNECTION**
- A – Special
- F – Flanged
- B – Butt weld
- R – Flanged, ring joint
- W – Socket weld
- C – Combination

**B SIZE OF CONNECTION**
Customers have the choice of specifying valve size as part of the valve figure (“B”) using the numbers below, or indicating valve size separately.

- 02 – ½”
- 04 – ¾”
- 07 – 1¼”
- 10 – 1½”
- 14 – 2”
- 12 – 2½”
- 14 – 3”
- 16 – 3½”
- 18 – 4”
- 20 – 4½”

**C MODEL NUMBER OR CLASS**
- Threaded or socket weld
  - MODEL NUMBER: G – TE-600
- Flanged or butt weld
  - CLASS (L):
    - 0 – 150 ASME
    - 1 – 300 ASME
    - 2 – 600 ASME

**D PORT**
- 0 – Regular port
- 1 – Full port
- 2 – Special port or Reduced port

**E TYPE**

**F BODY MATERIAL**

**G BALL & SEAT MATERIAL**

**H STEM MATERIAL**

**I COATINGS**

**J SPECIAL SERVICE**
- A – Standard
- G – Oxygen
- H – Cryogenic
- I – NACE sour gas
- X – Special
- Z – Firesafe

(1) Actual valve pressure/temperature ratings depend on choice of materials.
(2) If no special service or design is specified use “A” for standard service.
(3) Valves for NACE service with “SS” trim may have SS316, 630 or Nitronic 50 stems at manufacturer’s option.
(4) Must specify grade.
(5) Seat and ball same unless noted.