

# TBV Series 1800 Split-Body, Flanged Ball Valve

From forgings or barstock

TECHNOLOGY



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### TBV SERIES 1800

#### SPLIT-BODY, FLANGED BALL VALVE

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## TBV Series 1800 Split-Body, Flanged Ball Valve



Millbury, Mass., USA

Cameron is a leading provider of valves and measurement systems to the oil and gas industry. Our products are primarily used to control, direct and measure the flow of oil and gas as it is moved from individual wellheads through flowlines, gathering lines and transmission systems to refineries, petrochemical plants and industrial centers for processing.

We provide a wide range of valves for use in natural gas, LNG, crude oil and refined products transmission lines. The traditional CAMERON® fully welded ball valve product line has been combined with the GROVE®, RING-O®, TOM WHEATLEY®, ENTECH™ and TK® product lines. This broad offering has strengthened Cameron's ability to serve as a single source for a wide scope of customer requirements. Cameron also provides critical service valves for refinery, chemical and petrochemical processing businesses, and for associated storage terminal applications, particularly through its ORBIT® and GENERAL VALVE® brands. These brands are complemented by WKM®, TBV™ and TEXSTEAM™ valve products and considerably expand the scope of our product offerings.

TBV valve products are manufactured and assembled at Cameron's facility in Millbury, Mass. The TBV facility offers 100,000 sq ft of space, of which 80,000 sq ft is dedicated to manufacturing, assembling, testing, shipping and quality assurance. The increased manufacturing space has given Cameron the opportunity to expand its product offerings and size range. The TBV brand is now competitive in the LNG, mining and petrochemical markets with its ability to offer larger size ranges in its line of product.

## OVERVIEW



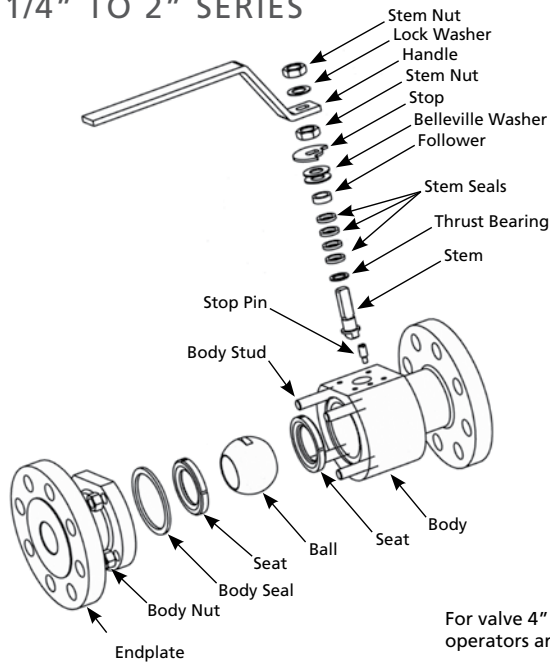
- Split body design
- ASME Classes 150, 300 and 600 (1/4" to 8")
- Full material traceability
- Fire-safe design in accordance to API 607
- Can be fabricated from any commercially available materials
- Machined from wrought materials
- Lock-out capability
- Larger sizes are available – consult Cameron
- ASME Classes 900 and 1500 are available – consult Cameron on availability

Cameron's TBV Series 1800 split-body, flanged ball valve is specifically designed to tackle severe service applications. The TBV Series 1800 valve offers reliability with a body machined from solid wrought materials, providing maximum strength and virtually eliminating porosity. Materials include any commercially available materials, including Monel®, Hastelloy®, titanium, alloy 20, nickel and others as required.

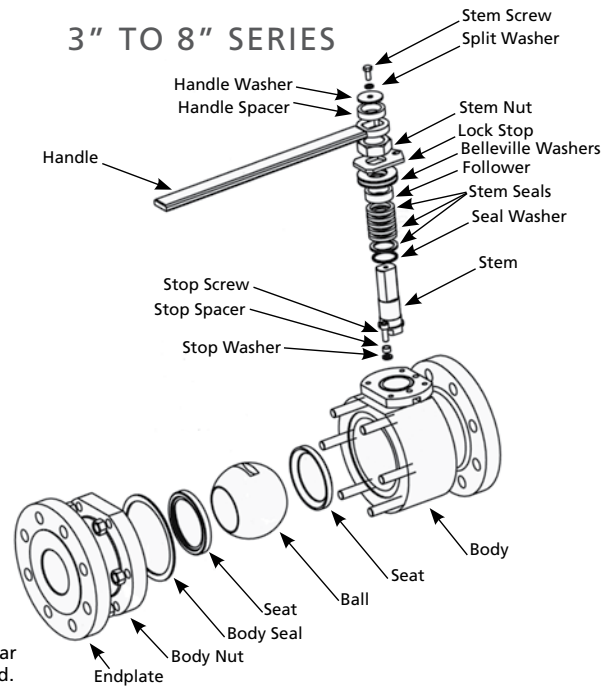
The TBV Series 1800 split-body, flanged ball valve combines its sealing technology and design expertise, with the versatility to solve even the most demanding applications. This technology is widely used in the chemical, petrochemical and refining industries, as well as many others where valve reliability is of the utmost importance. As with all TBV valves, quality, flexibility, long service life, and safety make the TBV Series 1800 split-body, flanged ball valve the ultimate choice for your critical applications.

## MATERIALS LIST

### 1/4" TO 2" SERIES



### 3" TO 8" SERIES



For valve 4" full port or higher, gear operators are highly recommended.

Part Description	Alloy 20	Hastelloy C	Monel	Nickel	316 Stainless	Titanium
Body	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr. 2
Endplate	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr. 2
Ball	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr. 2
Stem	ASTM B473	ASTM B574	ASTM B164	ASTM B160	ASTM A479	ASTM B348 Gr. 2
Follower	Same parent material as selected item					
Seat	PEEK, PTFE, 25% graphite-filled PTFE, ultrafil, UHMWPE and metal					
Stem Seal	PTFE, grafoil or as specified					
Body Seal	PTFE or spiral wound, with same parent material as body and graphite or PTFE laminations					
Stop	AISI 300 series stainless steel					
Handle	Carbon steel, galvanized or 300 series stainless steel as specified					
Thrust Bearing	25% glass-filled PTFE or as specified					
Stop Pin	AISI 300 series stainless steel					
Stem Nut	AISI 300 series stainless steel					
Belleville Washer	17 - 7 PH stainless steel or Inconel <sup>®</sup> X750 – as specified					
Lock Washer	AISI 410 stainless steel					
Body Nuts	As specified					
Body Studs	As specified					
Stop Bolt	AISI 300 series stainless steel					
Seal Washer	Same parent materials as stem					
Handle Spacer	AISI 300 series stainless steel					
Retaining Washer	AISI 300 series stainless steel					
Lock Washer	AISI 410 stainless steel					
Stem Screw	AISI 300 series stainless steel					

Note: Repair kit items include seats, stem seals, body seal and thrust bearing.

When ordering a repair kit, customer must provide valve code and sales order number stamped on the body of the valve.

Example: Repair kit for: 10S 18 150 6L36TT 2 (part number); PR#111222333 (sales order number).

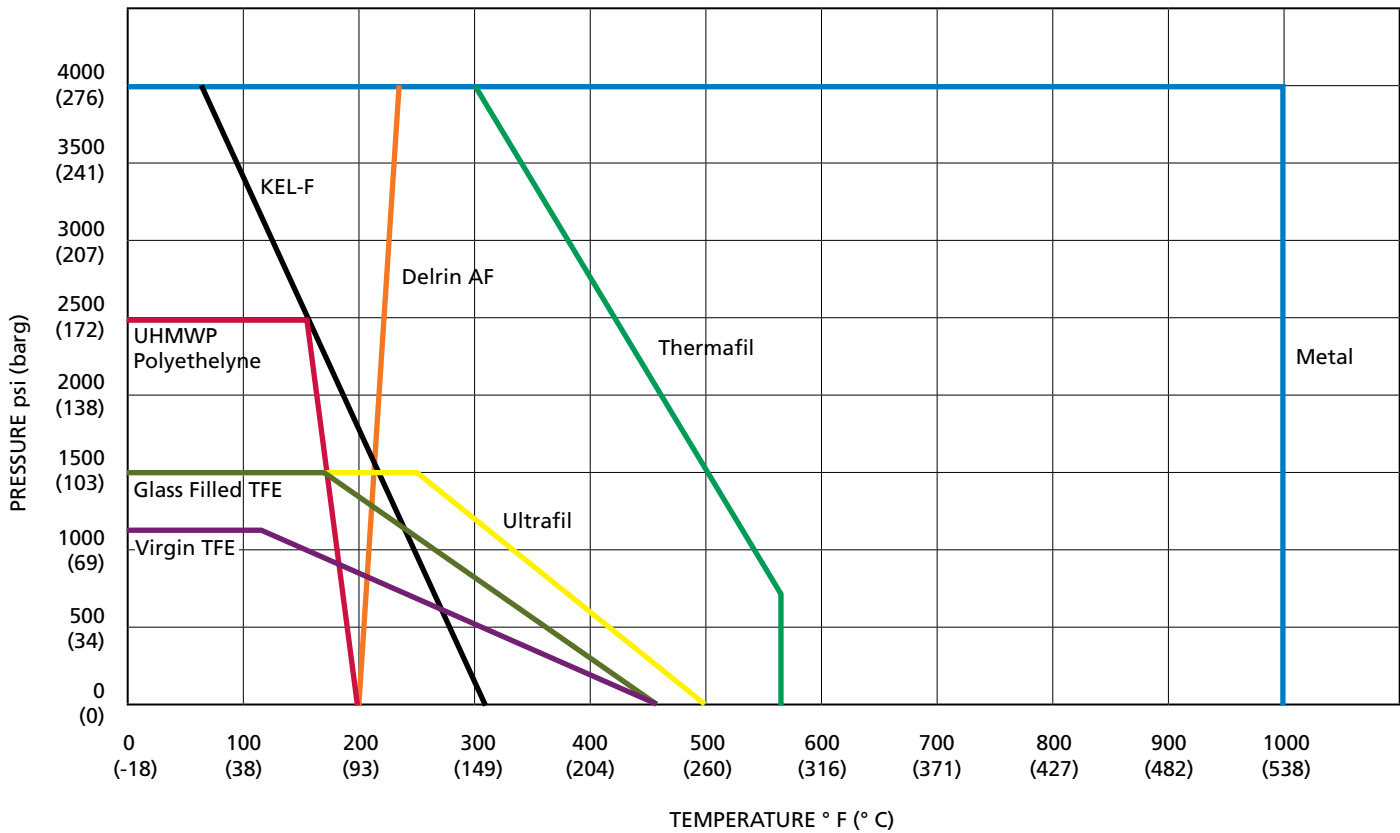
## ENGINEERING DATA

### C<sub>v</sub> Flow Coefficients

Size (in.)	Standard port	Full port
1/2	8	30
3/4	13	50
1	33	100
1-1/2	85	170
2	133	450
3	370	1200
4	720	2300
6	1050	5600
8	1800	10000

C<sub>v</sub> values are based on the flow of water at 60° F (16° C) and 14.7 psig through the valve in US gal/min at a pressure drop of 1 psi.

### SEAT RATING CHART



- Extended pressures and temperatures can be achieved by altering design for specific applications. Consult Cameron with service conditions.
- The valve rating is the lesser of the body rating and the seat rating.
- Cameron's TBV brand features an extensive line of high-pressure valves capable of the full seat ratings shown. Consult Cameron for details.

### Seat Material Identification Code

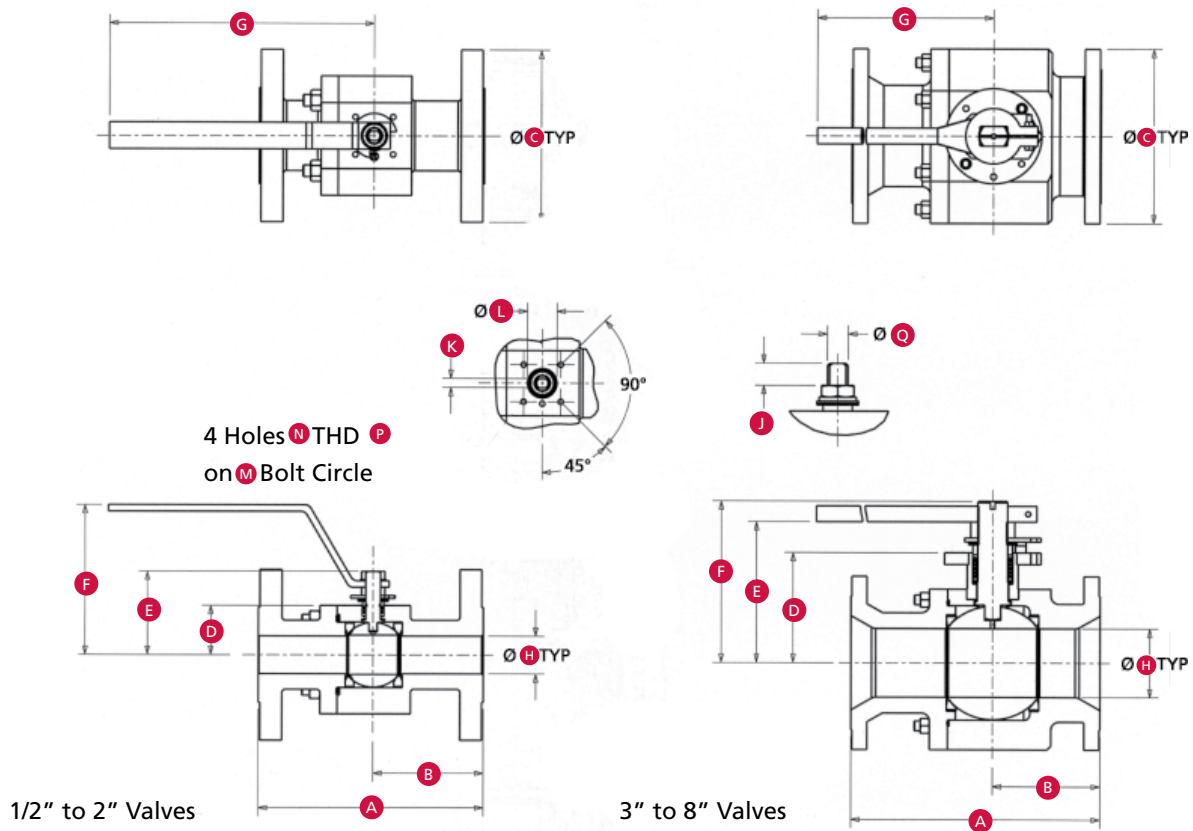
T – Virgin PTFE..... White	P – UHMWP ..... Translucent White
G – Reinforced PTFE ..... White with Red Speckles	D – Delrin..... Dark Brown
U – Ultrafil ..... Black	K – CTFE ..... Translucent
F – Thermafil (Carbon Filled PEEK) .. Black	M – Metal..... Silver

## ENGINEERING DATA (CONT.)

### Design Specifications Available

ASME B16.5	Pipe Flanges and Flanged Fitting
ASME B16.10	Face-to-Face Dimensions of Ferrous Valves
ASME B16.34	Steel Valves (Performance and Design)
ASME B31.1	Power Piping (Application)
ASME B31.3	Process Piping (Application)
BS EN 12266-1	British Standard Inspection and Test Valves
Chlorine Institute Pamphlet 6	Piping System, Dry Chlorine
NACE MR0175	Sour Gas Service Applications
MSS. SP72	Federal Tested Spec. WW-V-35 for Ball Valves
API 607	Fire-Test for Soft-Seated Valves

## DIMENSIONS



## DIMENSIONS (CONT.)

### Standard Port ASME Class 150

Size in.	A	B	C	D	E	F	G	ØH	J	K	L	M	N	P	ØQ	Weight lb
1/2	4.25	1.98	3.5	0.81	1.53	3.6	5.5	0.38	0.3	0.230	0.75	0.59	#10-32 UNC	0.29	3/8	4
3/4	4.62	2.1	3.88	1.09	1.81	3.88	5.5	0.41	0.3	0.230	0.75	1.34	#10-24 UNC	0.29	3/8	6
1	5	2.36	4.25	1.25	2.29	4.89	8.5	0.75	0.5	0.296	0.88	1.56	1/4-20 UNC	0.31	7/16	9
1-1/2	6.5	3.02	5	1.69	2.99	5.51	9.9	1.18	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	16
2	7	3.4	6	1.88	3.18	5.7	9.9	1.44	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	24
3	8	3.38	7.5	4.18	6.26	6.58	17.88	2.5	0.82	0.995	2.75	4.02	3/8-16 UNC	through	1-3/8	60
4	9	3.63	9	4.79	6.89	7.21	17.88	3.25	0.82	0.995	2.75	4.02	3/8-16 UNC	through	1-3/8	100
6	15.5	6.68	11	7	10.08	GO	GO	4.38	1.06	1.246	3.25	4.92	7/16-14 UNC	through	1-3/4	240
8	18	8	13.5	8.07	11.81	GO	GO	6	1.31	1.246	3.75	5.44	1/2-13 UNC	through	1-3/4	410

GO = Gear Operator Required

### Standard Port ASME Class 300

Size in.	A	B	C	D	E	F	G	ØH	J	K	L	M	N	P	ØQ	Weight lb
1/2	5.5	2.51	3.75	0.81	1.53	3.6	5.5	0.38	0.3	0.230	0.75	0.59	#10-32 UNC	0.29	3/8	5
3/4	6	2.45	4.62	1.09	1.81	3.88	5.5	0.41	0.3	0.230	0.75	1.34	#10-24 UNC	0.29	3/8	10
1	6.5	3.08	4.88	1.25	2.29	4.89	8.5	0.75	0.5	0.296	0.88	1.66	1/4-20 UNC	0.31	7/16	12
1-1/2	7.5	3.52	6.12	1.69	2.99	5.51	9.9	1.18	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/15	23
2	8.5	4.15	6.5	1.88	3.18	5.7	9.9	1.44	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	29
3	11.2	4.27	8.25	4.18	6.26	6.58	17.88	2.5	0.82	0.995	2.75	4.02	3/8-16 UNC	through	1-3/8	90
4	12	4.88	10	4.79	6.89	7.21	17.88	3.25	0.82	0.995	2.75	4.02	3/8-16 UNC	through	1-3/8	140
6	15.88	7.06	12.5	7	10.08	GO	GO	4.38	1.06	1.246	3.25	4.92	7/16-14 UNC	through	1-3/4	280
8	19.75	8.87	15	8.07	11.81	GO	GO	6	1.31	1.246	3.75	5.44	1/2-13 UNC	through	1-3/4	510

GO = Gear Operator Required

### Standard Port ASME Class 600

Size in.	A	B	C	D	E	F	G	ØH	J	K	L	M	N	P	ØQ	Weight lb
1/2	6.5	2.5	3.75	0.81	1.53	3.6	5.5	0.5	0.3	0.230	0.75	1.34	#10-24 UNC	0.19	3/8	7
3/4	7.5	3.28	4.62	1.09	1.81	3.88	5.5	0.5	0.3	0.230	0.75	1.34	#10-24 UNC	0.19	3/8	17
1	8.5	3.3	4.88	1.25	2.31	4.89	8.5	0.75	0.45	0.300	0.88	1.66	1/4-20 UNC	0.31	7/16	20
1-1/2	9.5	4.52	6.12	1.7	2.99	5.73	10	1.18	0.5	0.340	1.13	2	1/4-20 UNC	0.31	9/16	32
2	11.5	4.9	6.5	3	4.36	6.9	10	1.44	0.55	0.340	1.13	2	1/4-20 UNC	0.31	9/16	50
3	14	4.6	8.25	4.18	7.27	6.33	18	2.5	0.75	1	2.75	4.02	3/8-16 UNC	0.5	1-3/8	120
4	17	6.87	10.75	4.79	7.79	7	18	3.25	0.75	1	2.75	4.02	3/8-16 UNC	0.5	1-3/8	236
6	22	8.25	14	8.3	11.5	GO	GO	4.38	1.25	1.25	3	4.92	7/16-14 UNC	0.75	1-3/4	590
8	26	11.5	16.5	7.56	11.53	GO	GO	6	1.75	1.25	4	5.44	1/2-13 UNC	0.75	1-3/4	850

GO = Gear Operator Required



### Full Port ASME Class 150

Size in.	A	B	C	D	E	F	G	ØH	J	K	L	M	N	P	ØQ	Weight lb
1/2	4.25	1.75	3.5	1.09	1.81	3.88	5.5	0.5	0.3	0.230	0.75	1.34	#10-24 UNC	0.31	3/8	5
3/4	4.62	1.96	3.88	1.25	2.29	4.89	8.5	0.75	0.5	0.296	0.88	1.66	1/4-20 UNC	0.31	7/16	8
1	5	2.13	4.25	1.47	2.81	5.51	9.9	1	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	12
1-1/2	6.5	2.78	5	1.88	3.18	5.70	9.9	1.44	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	20
2	7	3.14	6	2.5	4.44	6.95	11.4	2	0.98	0.500	1.5	2.63	1/4-20 UNC	0.31	3/4	38
3	8	3.69	7.5	4.69	6.69	7.01	17.88	3	0.82	0.995	2.75	4.02	3/8-16 UNC	through	1-3/8	75
4	9	4.5	9	6.73	9.81	9.98	21.5	4	1.12	1.246	3	4.92	2/16-14 UNC	through	1-3/4	135
6	15.5	6.88	11	8.07	11.87	GO	GO	6	1.38	1.246	4	5.44	1/2-13 UNC	through	1-3/4	290
8	18	8.29	13.5	11	16.5	GO	GO	8	1.75	1.745	5	7.44	3/4-10 UNC	through	2-1/2	660

GO = Gear Operator Required

### Full Port ASME Class 300

Size in.	A	B	C	D	E	F	G	ØH	J	K	L	M	N	P	ØQ	Weight lb
1/2	5.5	2.21	3.75	1.09	1.81	3.88	5.5	0.5	0.30	0.230	0.75	1.34	#10-32 UNC	0.31	3/8	6
3/4	6	2.6	4.62	1.25	2.29	4.89	8.5	0.75	0.50	0.296	0.88	1.66	1/4-20 UNC	0.31	7/16	11
1	6.5	2.75	4.88	1.47	2.81	5.51	9.9	1	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	19
1-1/2	7.5	3.78	6.12	1.88	3.18	5.7	9.9	1.44	0.63	0.340	1.13	2	1/4-20 UNC	0.31	9/16	27
2	8.5	3.38	6.5	2.5	4.44	6.95	11.4	2	0.98	0.500	1.5	2.6	1/4-20 UNC	0.31	3/4	48
3	11.12	4.75	8.25	4.69	6.69	7.01	17.88	3	0.82	0.995	2.75	4.02	3/8-16 UNC	through	1-3/8	110
4	12	5	10	6.73	9.81	9.98	21.5	4	1.12	1.246	3	4.92	7/16-14 UNC	through	1-3/4	205
6	15.88	6.88	12.5	8.07	11.81	GO	GO	6	1.38	1.246	4	5.44	1/2-13 UNC	through	1-3/4	400
8	19.75	8.97	15	11	16.5	GO	GO	8	1.75	1.745	5	7.44	3/4-10 UNC	through	2-1/2	760

GO = Gear Operator Required

### Full Port ASME Class 600

Size in.	A	B	C	D	E	F	G	ØH	J	K	L	M	N	P	ØQ	Weight lb
1/2	6.5	2.29	3.75	1.09	1.81	3.9	5.5	0.5	2.81	2.3	0.75	1.24	#10-24 UNC	0.19	3/8	8.8
3/4	7.5	3.33	4.62	1.25	2.29	4.92	8.5	0.75	4.38	2.96	0.875	1.66	1/4-20 UNC	0.31	7/16	14.7
1	8.5	4.2	4.88	1.47	2.81	5.45	9.9	1	0.24	0.34	1.125	2	1/4-20 UNC	0.31	9/16	18.45
1-1/2	9.5	3.9	6.12	2.62	3.98	6.6	9.9	1.5	0.52	0.34	1.125	2	1/4-20 UNC	0.31	9/16	49.19
2	11.5	4.48	6.5	2.5	4.44	5.39	11.55	2	0.75	0.5	2.5	2.63	1/4-20 UNC	0.31	3/4	68
3	14	5.25	8.25	4.5	7.01	6.7	17.88	3	0.8	0.995	2.75	4.016	3/8-16 UNC	0.5	1-3/8	164
4	17	6/75	10.75	7.93	11.19	10.95	25	4	0.9	1.246	3.25	4.92	7/16-14 UNC	1	1-3/4	363
6	22	9.5	14	7.65	11.8	GO	GO	6	2	1.246	4	5.44	1/2-13 UNC	0.75	1-3/4	744
8	26	10.78	16.5	11	16.5	GO	GO	8	1.75	1.75 sq	5	7.44	3/4-10 UNC	1.5	N/A	1100

GO = Gear Operator Required

## FEATURES AND BENEFITS

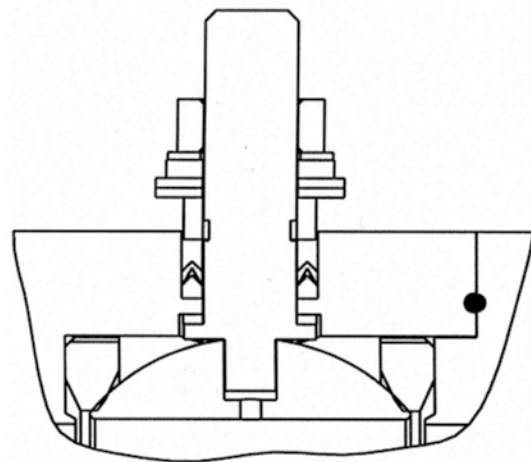
In addition to the options and features shown, the TBV brand specializes in designing and manufacturing ball valves for a wide variety of special applications. The TBV brand is known for its ability to solve difficult applications with severe service valves that perform where others have failed. Extended bonnets are available to meet stringent fugitive emissions requirements. A wide variety of special materials are also available for severe or exotic services. Special material testing, such as corrosion evaluation, is available. Complete material certification packages can be provided to meet extensive specification requirements. A wide variety of other product configurations and sizes, up to 8" line size, are available on application.

Features	Benefits
Total encapsulated body seals	Elimination of cold flow; high performance over wide temperature and pressure range
Actuation base	Ease of automation
Variety of seating materials	Wide range of process media and service conditions
Live loaded stem	Pressure and temperature recovery; stem seal integrity with a low operating torque
API wall thickness	Extra corrosion allowance for long life
Forged body and end	High integrity
Fully traceable materials	Certification of all pressure-retaining parts available for stringent specification requirements

For more than 35 years, the TBV brand has been providing solutions for difficult process valve applications. The TBV Series 1800 valve incorporates all of this experience and proven technology in a rugged, state-of-the-art valve designed for severe service. The use of all wrought material construction allows unlimited flexibility of design, greatly reduces lead times and virtually eliminates porosity. The wide range of body, trim and seat materials, ease of automation, and extensive selection of options features make the TBV Series 1800 valve the choice for your critical applications.

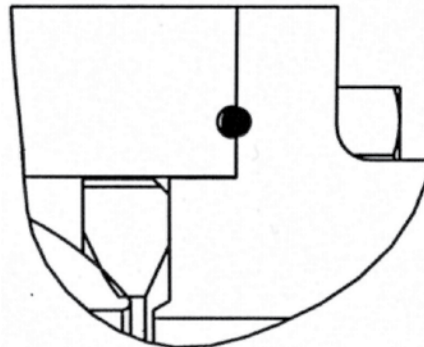
### Stem Seal

Leak-free stem sealing of the TBV Series 1800 valve is provided by a unified stem sealing system. The standard, multiple V-ring packing sits on a shoulder machined on the blowout-proof stem, allowing the packing and stem to move as a unit during thermal cycles. In addition, the packing is live-loaded, retained by self-compensating Belleville washers and a packing adjustment nut that is captured between two stem-keyed components, virtually guaranteeing that the nut cannot loosen. These features coupled with close tolerance machining of the dimension and finish of the packing bore, provide maximum stem seal life with minimum maintenance. Graphite packing also is available for fire-safe and high-temperature applications.



## Body Seal

The leak tight integrity of the TBV Series 1800 valve is further enhanced through the use of a fully-encapsulated, O-ring body seal. The body seal is contained on all four sides, preventing cold flow or blowout. Correct seal compression is ensured through positive metal-to-metal contact of the body and endplate. No special assembly tools or techniques are required. A spiral wound body gasket is available as an option. The TBV Series 1800 valve also is available in a configuration fire-safe to API 607.



## Actuation

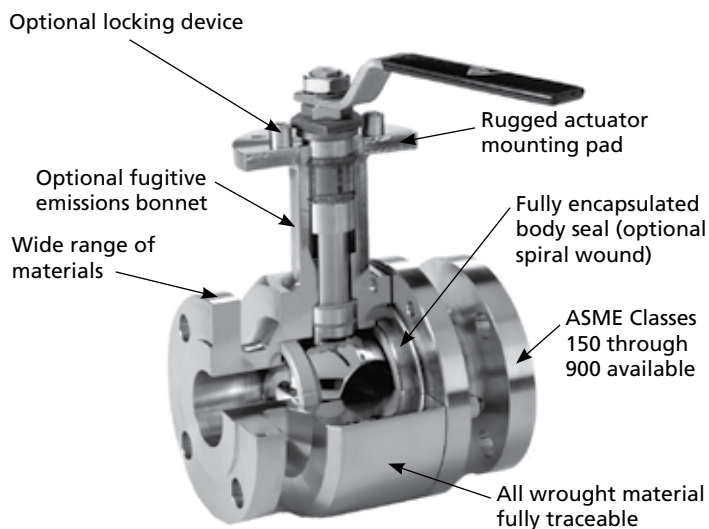
The TBV Series 1800 valve includes a rugged actuator mounting pad as standard, allowing pneumatic or electric actuators to be easily and securely installed utilizing a four-bolt mounting pattern. The TBV Series 1800 valve also becomes a cost effective, quarter-turn control valve package when utilized with an actuator, positioner, characterized seats and low-hysteresis ball and stem combination.

## Fugitive Emissions Bonnet

The TBV fugitive emissions bonnet is commonly specified not only for fugitive emissions services, but also for high-temperature or insulated services. The additional height allows for the use of a variety of packing arrangements such as a lantern ring with a monitoring port.

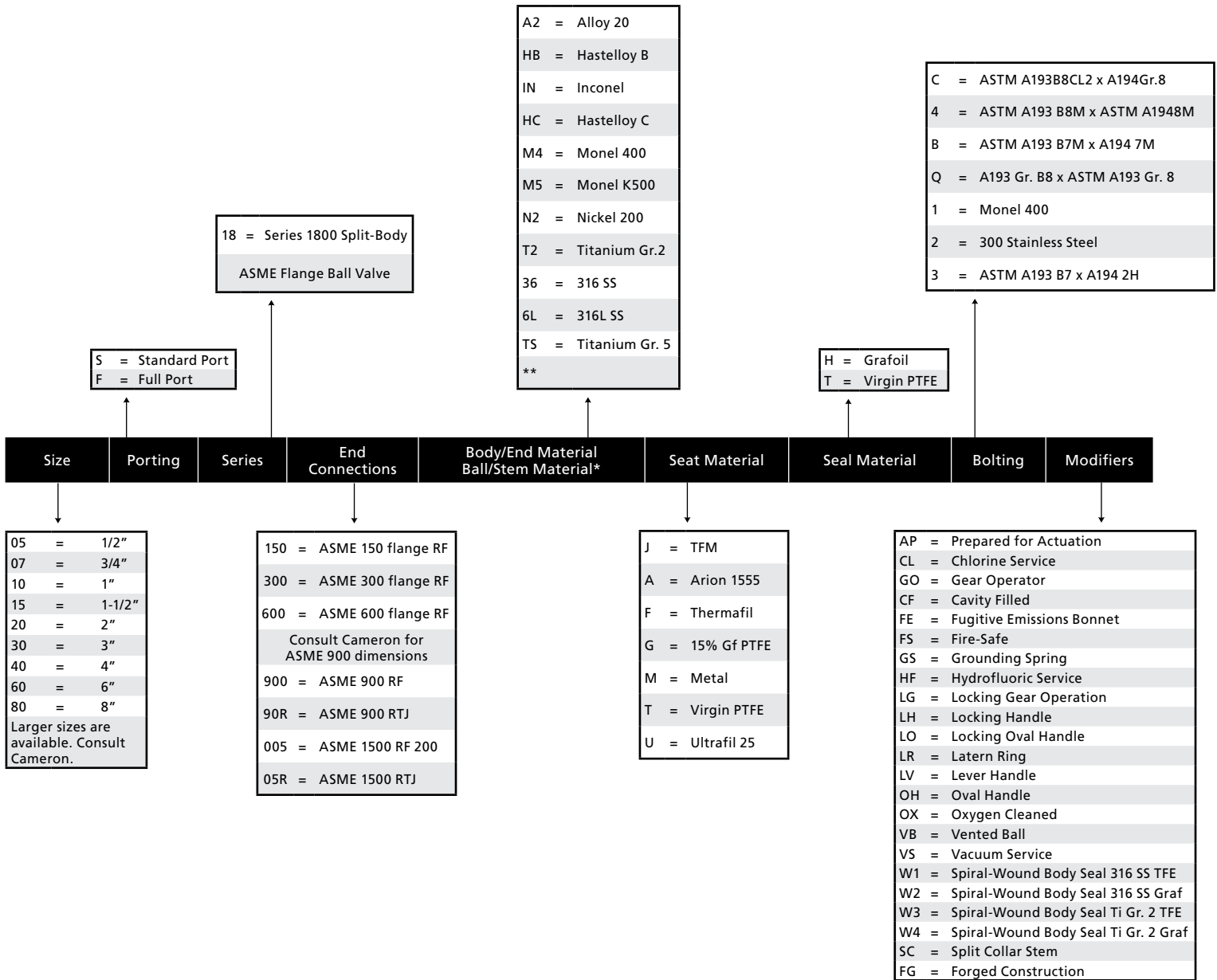
In high-temperature applications, the packing is distanced from the line, increasing stem seal life.

The TBV Series 1800 valve with a fugitive emissions bonnet also can be easily insulated while the packing adjustment, actuator mounting pad and locking device remain accessible above the insulation.



Fire-Safe to API 607 4th Edition

## HOW TO ORDER



### Example:

20S 18 300 T2T2T5 TT 2LH = 2" standard port, Series 1800 valve, Class 300, with titanium grade 2 body and end (endplate), titanium grade 2 ball, titanium grade 5 stem, virgin PTFE seats and stem seals, stainless bolting and locking handle.

\* If ball and stem are different materials, expand code to show ball first, stem second (as shown).

\*\* Consult Cameron for other materials.

For additional ordering information, see the TBV valves brochure, corrosion-resistant and cryogenic valves.

## HOW TO ORDER (CONT.)

Service Related Options
<p><b>Steam Service –</b>                      Saturated steam can be handled within the following limits:                      250 psi/406° F with Ultrafil seats                      450 psi/459° F with Thermafil seats                      Super heated steam up to 489° F can be handled at lower pressures.</p>
<p><b>Vacuum Service –</b>                      Standard TBV valves rated up to 20 microns of absolute pressure,                      specially prepared valves rated to 0.01 microns.</p>
<p>Oxygen, chlorine cleaning and other special service cleanings are available.</p>
<p>Actuation and actuator prepping available – consult Cameron.</p>
<p><b>Leakage Rates –</b>                      Soft seats are bubble tight exceeding API 598 and Class VI requirements of ASME B16.104.</p>
<p><b>Cryogenic service to -425° F</b>  <b>Diverter Valves –</b>                      For normal and cryogenic application 90° or 180° operation with side or bottom porting</p>
<p><b>Fugitive Emission –</b>                      Bonnet for critical applications</p>
<p>For valves 4" Full port and higher, gear operators are highly recommended.</p>

Special Services
Oxygen service
Hydrofluoric acid
High temp. to 1000° F
Block-and-bleed
Slurries
Throttling control with characterized seats
Body cavity fillers
Vacuum sealing
Toxic service
Erosive media
Monomers
Category M

## CAMSERV™ Aftermarket Services for Valves and Actuation

WE BUILD IT. WE BACK IT.



### Global Network and Local Support

Cameron is well-positioned to deliver total aftermarket support, quickly and efficiently, with unmatched OEM expertise. Our highly skilled engineers and technicians are available around the clock, seven days a week, to respond to customer queries, troubleshoot problems and offer reliable solutions.

### Easily Accessible Parts and Spare Valves

- OEM spare valves, actuators and parts (including non-Cameron brands)
- Handling, storage, packaging and delivery
- Dedicated stocking program



### Comprehensive Aftermarket Services Portfolio

- Parts and spare valves
- Repair
- Field services
- Preventative maintenance
- Equipment testing and diagnostics
- Remanufacturing
- Asset preservation
- Customer property management
- Training and recertification services
- Warranty



### Customized Total Valve Care™ (TVC) Programs

Customized asset management plans that optimize uptime, availability and dedicated services.

- Engineering consultancy
- Site management
- Flange management
- Startup and commissioning
- Spare parts and asset management
- Operational support





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Learn more about TBV valves at:  
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#### **HSE Policy Statement**

At Cameron, we are committed ethically, financially and personally to a working environment where no one gets hurt and nothing gets harmed.