CAMERON

GROVE
B4, B5, and B7 Side-Entry Ball Valves

TECHNOLOGY

GROVE B7
DESIGN FEATURES

Standard Features

B7.1

- Triple-barrier stem seals
- Factory-positioned external stops
- Emergency grease fitting for stem
- Stem separated from the ball; anti-blowout design
- Plastic polymer insert for seat sealing
- Self-relieving seats
- Metal-backed, self-lubricating bearings/washers
- Nickel plating for trim parts
- Fire-safe graphite rings
- Antistatic device

B7.B

- Triple-barrier stem seals
- Stem separate from the ball; anti-blowout design
- Ball load on the bearing blocks
- Double-barrier sealing in both directions (DPE)
- Body relief valve for overpressure
- Sealant injection system for emergency seal
- Metal-backed, self-lubricating bearings/washers
- Nickel plating for trim parts
- Trunnion mounted ball

Options

B7.1

- PTFE various grades of reinforced gaskets, spring energized, for stem and seat sealing
- Metal-to-metal seats
- Double-barrier sealing in both directions (DPE)
- Body relief valve for overpressure
- Double block-and-bleed capabilities

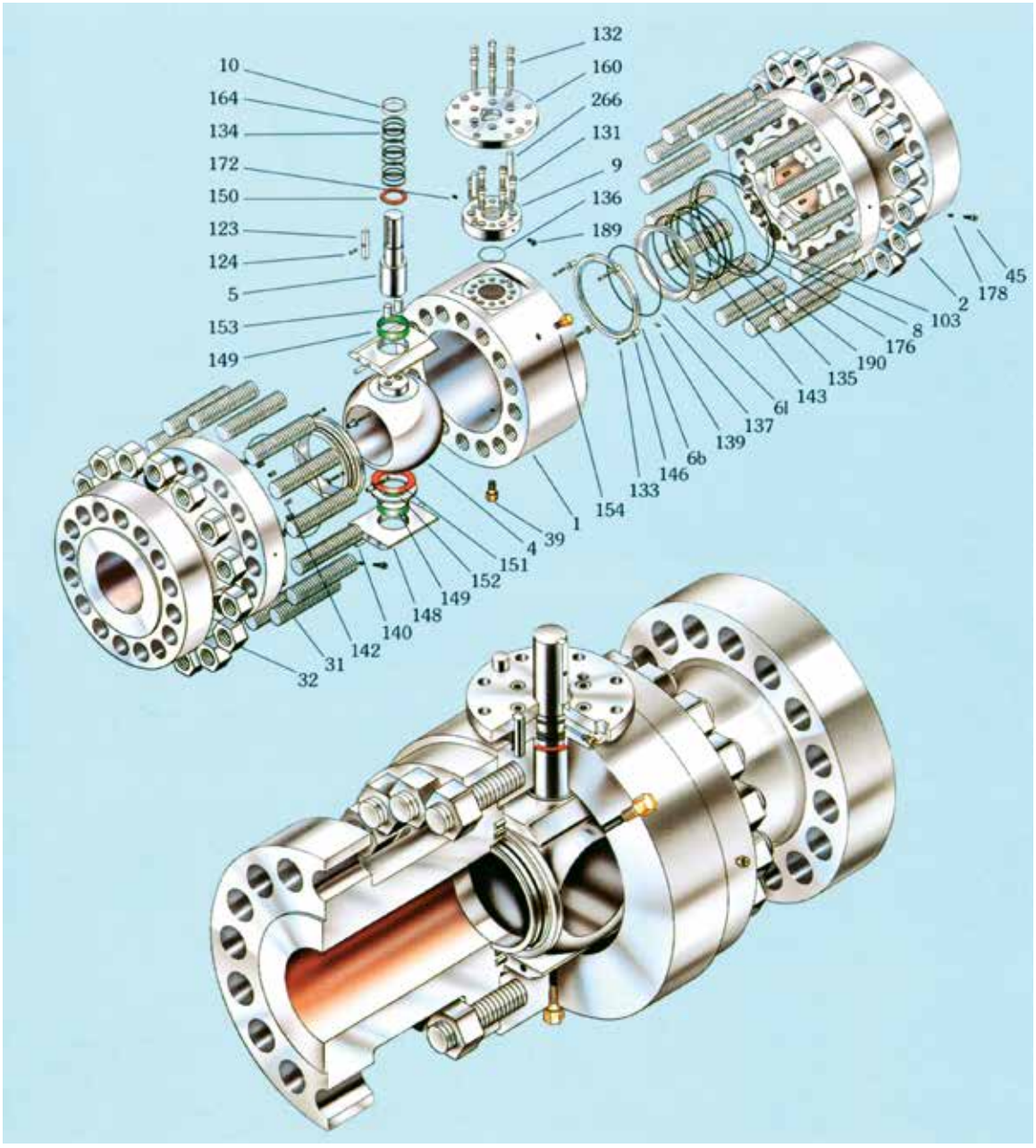
Valve Construction

The B7 denomination identifies the side-entry ball valve ASME Class 2500.

Due to the high pressure and strong force involved, the materials selection is carried out by paying particular attention to the anti-extrusion features of the gaskets and to the resistance of the ball and stem materials.

GROVE B7.B

VALVE ASSEMBLY AND CROSS SECTION

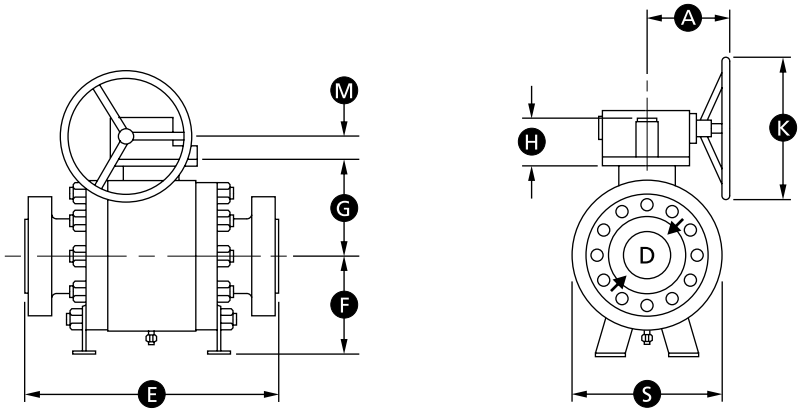


Item	Description	Item	Description	Item	Description
1	Body	123	Stem Key	149	Bearing
2	Closure	124	Stem Key Capscrew	150	Upper Thrust Washer
4	Ball	131	Gland Plate Capscrew	151	Lower Thrust Washer
5	Stem	132	Adapter Plate Capscrew	152	Spacer
6b	Outer Seat Ring	133	Puller Bushing Capscrew	153	Drive Pin
6l	Inner Seat Ring	134	Stem O-ring	154	Relief Valve
8	Body O-ring	135	Seat O-ring	160	Adapter Plate
9	Gland Plate	136	Gland Plate O-ring	164	Stem Backup Ring
10	Gland Bushing	137	Seal O-ring	172	Vent Plug
31	Body Stud	139	Seat Spring Pin	176	U-cup Packing
32	Body Stud Nut	140	Bearing Retainer Pin	178	Check Valve
39	Drain Valve	142	Spring	189	Gland Vent
45	Grease Fitting	143	Seat Lock Ring	190	Seat Backup Ring
103	Closure Backup Ring	146	Puller Bushing	299	Stop Spring Pin
		148	Bearing Retainer		

GROVE B7.1 and B7.B

DIMENSIONS AND WEIGHTS

ASME CLASS 2500



ASME CLASS 2500 – B7.1

SIZE in. (mm)	D	E WE	E RF	E RTJ	F	G	S	H	L	A	K	M	WEIGHT WE	lb (kg) RF/RTJ
1-1/2 (40)	1-1/4 (32)	15-1/8 (384)	15-1/8 (384)	15-1/4 (387)	3-7/8 (98)	5-1/2 (140)	6-7/8 (175)	2-3/8 (60)	-	7-1/2 (191)	7-7/8 (200)	1-3/4 (44)	80 (36)	130 (59)
2 x 1-1/2 x 2 (50 x 40 x 50)	1-1/4 (32)	17-3/4 (451)	17-3/4 (451)	17-7/8 (454)	3-7/8 (98)	5-1/2 (140)	6-7/8 (175)	2-3/8 (60)	-	7-1/2 (191)	7-7/8 (200)	1-3/4 (44)	90 (41)	180 (82)
2 (50)	1-3/4 (44)	17-3/4 (451)	17-3/4 (451)	17-7/8 (454)	4-3/8 (111)	6-1/4 (159)	7-7/8 (200)	2-3/8 (60)	-	7-1/2 (191)	7-7/8 (200)	1-3/4 (44)	150 (68)	260 (118)
3 x 2 x 3 (80 x 50 x 80)	1-3/4 (44)	22-3/4 (578)	22-3/4 (578)	23 (584)	4-3/8 (111)	6-1/4 (159)	7-7/8 (200)	2-3/8 (60)	-	7-1/2 (191)	7-7/8 (200)	1-3/4 (44)	210 (95)	330 (150)
3 (80)	2-1/2 (64)	22-3/4 (578)	22-3/4 (578)	23 (584)	5-1/2 (140)	7-1/8 (181)	9-7/8 (251)	2-1/2 (64)	-	8-3/4 (222)	13-3/4 (349)	2-5/8 (67)	350 (159)	480 (218)
4 x 3 x 4 (100 x 80 x 100)	2-1/2 (64)	26-1/2 (673)	26-1/2 (673)	26-7/8 (683)	5-1/2 (140)	7-1/8 (181)	9-7/8 (251)	2-1/2 (64)	-	8-3/4 (222)	13-3/4 (349)	2-5/8 (67)	370 (168)	620 (281)
4 (100)	3-1/2 (89)	26-1/2 (673)	26-1/2 (673)	26-7/8 (683)	9-7/8 (251)	7-7/8 (200)	14-5/8 (372)	3 (76)	-	11-1/2 (292)	13-3/4 (349)	3 (76)	700 (318)	790 (358)
6 x 4 x 6 (150 x 100 x 150)	3-1/2 (89)	36 (914)	36 (914)	36-1/2 (927)	9-7/8 (251)	7-7/8 (200)	14-58 (372)	3 (76)	-	11-1/2 (292)	13-3/4 (349)	3 (76)	730 (331)	1250 (567)
6 (150)	5-1/4 (133)	36 (914)	36 (914)	36-1/2 (927)	11-3/8 (289)	9-1/4 (235)	16-7/8 (429)	4-5/8 (118)	-	11-1/2 (292)	13-3/4 (349)	3 (76)	1480 (671)	1650 (748)
8 x 6 x 8 (200 x 150 x 200)	5-1/4 (133)	40-1/4 (1022)	40-1/4 (1022)	40-7/8 (1038)	11-3/8 (289)	9-1/4 (235)	16-7/8 (429)	4-5/8 (118)	-	11-1/2 (292)	13-3/4 (349)	3 (76)	1890 (857)	2180 (989)

ASME CLASS 2500 – B7.B

SIZE in. (mm)	D	E WE	E RF	E RTJ	F	G	S	H	L	A	K	M	WEIGHT WE	lb (kg) RF/RTJ
8 (200)	7-1/8 (181)	40-1/4 (1022)	40-1/4 (1022)	40-7/8 (1038)	15-1/8 (384)	15-1/2 (394)	26 (660)	4-5/8 (118)	-	15-3/4 (400)	23-5/8 (600)	4-3/8 (111)	3650 (1656)	4340 (1969)
10 (250)	8-7/8 (226)	50 (1270)	50 (1270)	50-7/8 (1292)	17-1/8 (435)	18-1/4 (464)	31-1/8 (790)	5-1/2 (140)	-	21-5/8 (549)	31-1/2 (800)	4-3/8 (111)	5480 (2486)	6590 (2989)
12 (300)	10-1/2 (267)	56 (1422)	56 (1422)	56-7/8 (1445)	19-5/8 (499)	20-1/2 (521)	34-1/4 (870)	5-1/2 (140)	-	21-5/8 (549)	31-1/2 (800)	4-3/8 (111)	7600 (3447)	9100 (4128)
14 (350)	12-1/4 (311)	(1)	(1)	(1)	22-7/8 (581)	24-3/4 (629)	39 (991)	8-1/8 (206)	-	21-3/4 (552)	23-5/8 (600)	5-3/8 (137)	9390 (4259)	11,220 (5089)
16 (400)	13-7/8 (353)	(1)	(1)	(1)	26-3/8 (670)	28-3/8 (721)	43-1/4 (1099)	8-1/8 (206)	-	21-3/4 (552)	23-5/8 (600)	5-3/8 (137)	11,330 (5139)	13,580 (6160)
18 (450)	15-5/8 (397)	(1)	(1)	(1)	29-1/8 (740)	31-7/8 (810)	47-7/8 (1216)	11 (279)	-	22-7/8 (581)	23-5/8 (600)	6-1/4 (159)	15,870 (7199)	19,020 (8627)
20 (500)	17-1/4 (438)	(1)	(1)	(1)	32-1/2 (826)	35-3/8 (899)	52-1/8 (1324)	11 (279)	-	22-7/8 (581)	23-5/8 (600)	6-1/4 (159)	21,420 (9716)	25,660 (11,639)

Flanges in accordance with ASME B16.5
Shaded bore sizes (D) according to API 6D
Shaded end-to-end dimensions (E) according to API 6D

Butt welding ends according to ASME B16.25
Outlined end-to-end dimensions (E) according to ASME B16.10

Quality System

Quality Assurance Program

ISO 9001:2000 and API Q1 Standards

All valves are designed in accordance with the most stringent industry procedures and standards and are built according to the European Directives PED and ATEX upon request.

Approvals

Cameron is an authorized licensee to use the American Petroleum Institute (API) monogram for specification API 6D and API 6A.

Certifications

- ISO 10423/API 6A
- ISO 14313/API 6D
- ISO 17423/API 6DSS

Inspection

Inspection is done per the Quality System requirements based on ISO 9001:2000 and API Q1. Cameron verifies all processes from material receipt to final customer inspection, including the liaison with third-party inspection and certifying authorities.

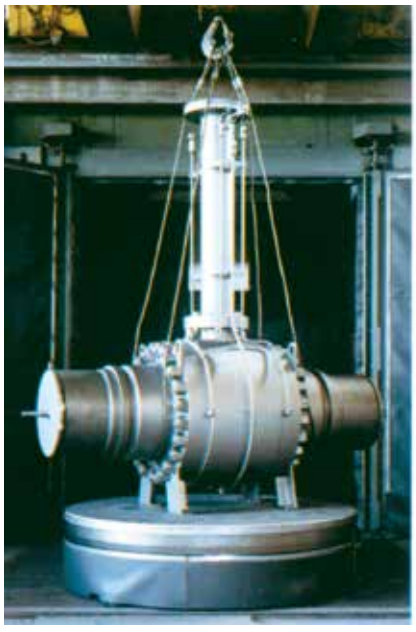
All products can be supplied with certified test reports, which include pressure testing, NDT, and chemical and physical analysis, along with any other specified special test requirements.

The material certification of the valve parts can be furnished in accordance with DIN 50049-EN 10204 3.1 (at least) or 3.2.

Special Process

Cameron operates its own in-house electroless nickel plating (ENP) facility.

ASTM B656 and ASTM B733 are the reference standards for plating process and control. Strict quality control procedures for critical process conditions and for the plated components maintain plating consistency.



Qualification Testing

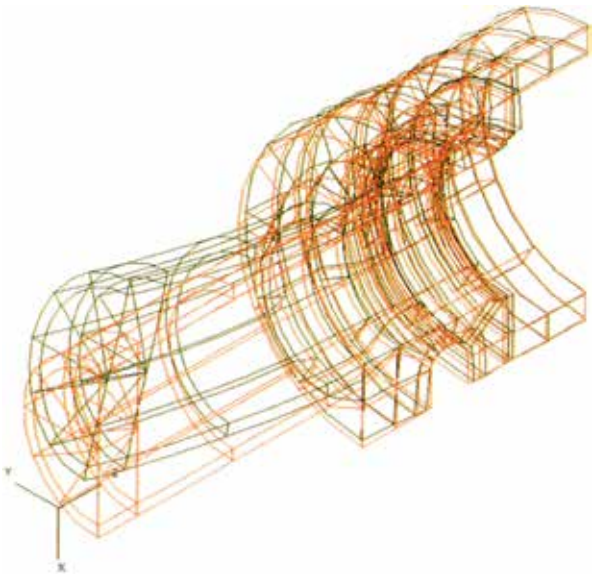
Research and Development Lab

Cameron's GROVE valves are designed in accordance with the applicable or requested codes and are subjected to full in-house qualification testing. Our in-house testing facilities, with the participation of the major oil and gas companies' R&D programs, allow Cameron to supply high-quality products.

Hydraulic and gas sealing tests, functional tests, and cycling and torque tests all are carried out on prototype valves. These test procedures ensure that the design safety factors, the maximum allowable leakage rates, and the expected valve service life are achieved.

Structural Verification

Cameron's engineering department operates an advanced 3D CAD system and conducts finite element analysis (FEA) to simulate various load conditions to determine a component's suitability for the intended service.



Fire-Safe Tests and Certifications

Cameron conducts in-house fire-safe testing, and its GROVE valves are certified in compliance with API 6FA and BS 6755 Part 2 fire-safe standards.

A complete reference list of qualified and certified valves can be made available upon customer's request.

Cycle Testing Under Flow Conditions

Through its in-house flow facility, Cameron verifies the behavior of valves subjected to cycle testing under dynamic flow conditions with the presence of abrasive particles. This test loop has the capacity to test valves up to 6" nominal bore with a maximum service pressure of 2900 psi (200 bar).

The main test parameters are PC entered and recorded for future design reference.

High-Pressure Gas Testing

Customers' specifications may dictate more severe testing in addition to conventional hydrostatic testing.

Cameron is fully equipped to carry out enhanced gas testing at ambient, low and high temperatures using specially equipped bunkers. External leakage rates (if any) are verified by means of a mass spectrometer. Leakage through the seats (if any) is verified by means of calibrated flow meters.

For low- and high-temperature service, gas testing can be performed to customer-specified critical dimensions. Cameron has test facilities for various valve dimensions. Testing can be performed at a range of temperatures from -184° F to 752° F (-120° C to 400° C).

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 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

Trademark Information

GROVE is a registered trademark of Cameron.

This document contains references to registered trademarks or product designations, which are not owned by Cameron.

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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.

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