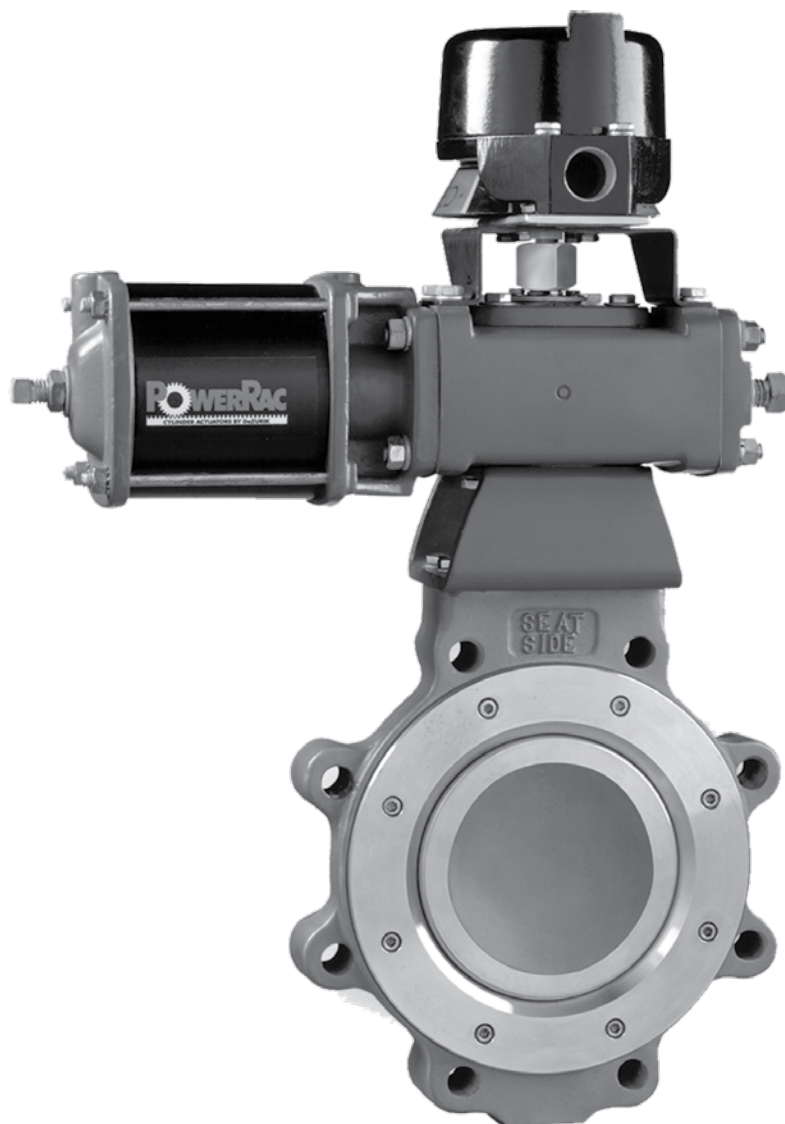




## **BHP HIGH PERFORMANCE BUTTERFLY VALVES TECHNICAL SPECIFICATIONS**

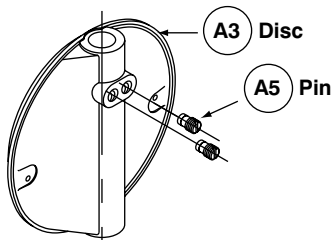
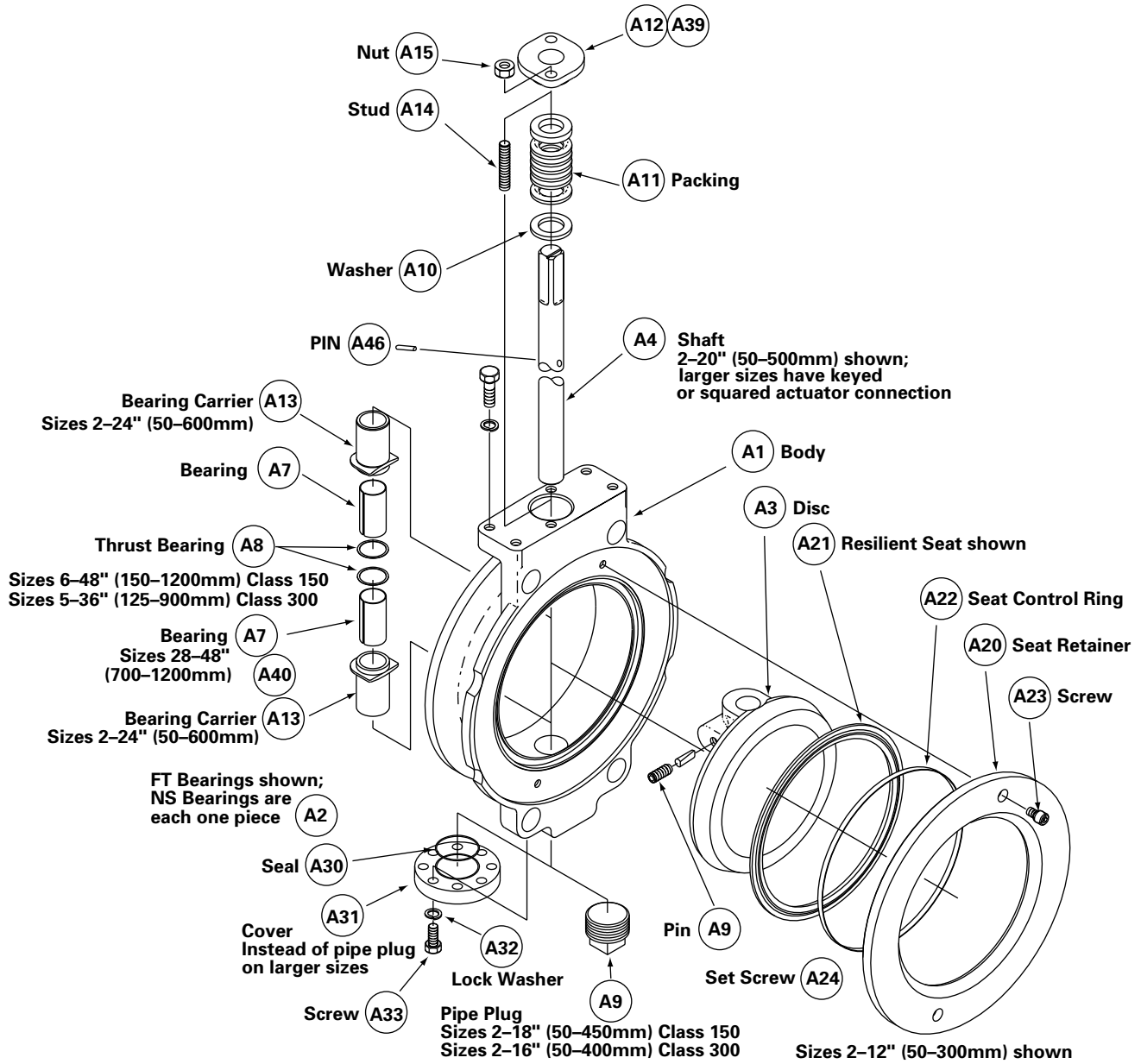




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# Materials of Construction



**Disc Pinning**  
 14" & larger (350mm & larger)

Item	Description	Characteristic/Material
A1	Body	CS, 2–8" (50–175mm), Class 150, 2–8" (50–175mm), Class 300; Carbon Steel, ASTM A 516, Grade 70, Pressure Vessel Plate
		CS, 10–48" (250–1200mm), Class 150, 10–36" (250–900mm), Class 300; Carbon Steel, ASTM A 216, Grade WCB
		S2, 2–48" (50–1200mm), Class ANSI 150, 2–36" (50–900mm), Class ANSI 300, 316 Stainless Steel, ASTM A 351, Grade CF8M
		S3, 2–12" (50–300mm), Class 150 Lugged, 317 Stainless Steel, ASTM A 351, Grade CG-3M except with .03% max. carbon
A2	Locator Bearing	NS, 2–48" (50–1200mm), Non-galling Nickel Alloy
A3	Disc	S2, 2–48" (50–1200mm), 316 Stainless Steel, ASTM A 351, Grade CF8M
		S2NH, 2–48" (50–1200mm), 316 Stainless Steel, Nickel Overlay, Heat Treated, ASTM A 351, Grade CF8M
		S3, 3–12" (80–300mm) Except 5" (125mm), Class 150 Lugged, 317 Stainless Steel, ASTM A 351, Grade CF8M
A4	Shaft	S2, 2–48" (50–1200mm), 316 Stainless Steel, ASTM A 479
		S3, 3–12" (80–300mm) Except 5" (125mm), Class 150 Lugged, 317 Stainless Steel, ASTM A 276
		S5, 2–48" (50–1200mm), 17-4PH Stainless Steel, ASTM A 564, Type 630, Condition H1150, per NACE MR-01-75
A5	Disc Pin	2–12" (50–300mm), Nitronic 50, ASTM A 479, Type XM-19, Condition "A", per NACE MR-01-75 14–48" (350–1200mm), 316 Stainless Steel, ASTM A 276
A6	Gasket Seat	TT, RT, TI and RI, 5–10" (125–250mm), Virgin Teflon
A7 & A40	Bearing Liner	FT, 2–48" (50–1200mm), PTFE/317 Stainless Steel
A8	Thrust Washer	FT, 6–48" (150–1200mm), Class 150, 5–48" (125–1200mm), Class 300, PTFE/317 Stainless Steel
A9	Pipe Plug	CS, 2–18" (50–450mm), Class 150, 2–16" (50–400mm), Class 300 Carbon Steel, ASTM A 216, Grade WCB
		S2, 2–18" (50–450mm), Class 150, 2–16" (50–400mm), Class 300, 316 Stainless Steel, ASTM A 351, Grade CF8M
		S3, 3–12" (80–300mm) Except 5" (125 mm), Class 150 Lugged, 317 Stainless Steel, ASTM A 240
A10	Washer, Packing	CS, S2, 2–16" (50–400mm) Class 150, 2–12" (50–300mm) and 16" (400mm) Class 300, ASTM A 240, Type 316
		CS, S2, 18" (450mm) and 20" (500mm) Class 150, 14" (350mm) and 18" (450mm) Class 300, ASTM A 276, Type 316, Condition A
		CS, S2, 24–48" (600–1200mm) Class 150, 20–36" (500–900mm) Class 300, ASTM A 511, Type 316
		S3, 3–4" (75–100mm) and 6–12" (150–300mm) Class 150 Lugged, ASTM A 167, Type 317
A11 & A26	Packing	TC, 2–48" (50–1200mm), V-Flex Virgin PTFE
		G1, 2–48" (50–1200mm), Graphoil Ring, Carbon Filament Rings
		G2, 2–36" (50–900mm), Graphoil, Inconel-Graphite Core
		TMD Primary, 2–36" (50–900mm), V327, Top Ring: 10% Polyester-Filled PTFE; Other Rings: 5% Glass-Filled PTFE; Bottom Ring includes Elgiloy Spring
		TMD Secondary Packing, 2–36" (50–900mm), Virgin Teflon
A12	Gland	2-36" (50–900mm) Class 150, 2–24" (50–600mm) Class 300, 317 Stainless Steel, ASTM A 351, Type 317 30" (750mm) and 36" (900mm) Class 150, 42" (1050mm) and 48" (1200mm) Class 300, 316 Stainless Steel, ASTM A 511, Grade MT 316
A13	Bearing Carrier	FT, 2–12" (50–300mm), Class 150 CS and S2 Bodies, 316 Stainless Steel, ASTM A 276 FT, 2–24" (50–600mm), Class 150 S3 Body and 2–12" (50–300mm),
A14	Gland Stud	Class 300 C2, S2 and S3 Body, 317 Stainless Steel, ASTM A 351, Grade CG3M
A15	Gland Nut	CS, S2 and S3, 2–48" (50–1200mm), 316 Stainless Steel
A20	Seat Retainer	CS, Carbon Steel, ASTM A 516, Grade 70
		S2, 316 Stainless Steel, ASTM A 240, Type 316
		S3, 3–12" (80–300mm), Class 150 Lugged, 317 Stainless Steel, ASTM A 240
A21	Seat	PTFE (TT, TI, TTS2, TIS2) Virgin PTFE
		RTFE (RT, RI, RTS2, RIS2) Reinforced PTFE
A22	Control Ring	RT, TT, RTS2, TTS2, Titanium, ASTM B 265, Grade 3
		RI, TI, TIS2, RIS2, Inconel 625
A23	Seat Retainer Screw	CS, S2, 2–48" (50–1200mm), 316 Stainless Steel
		S3, 3–12" (50–300mm), Except 5" (125mm), Class 150 Lugged, 317 Stainless Steel
A24	Disc Pin Set Screws	2–12" (50–300mm), CS and S2 Disc, 316 Stainless Steel
		2–12" (50–300mm), Except 5" (125mm), S3 Disc, 317 Stainless Steel, ASTM A 167
A27	Gasket, Seat	TIS2, RIS2, RTS2, TTS2, and S2, Graphoil, Commercial Grade GTB
A28	Seat, Metal (Not Shown)	TIS2, RIS2, RTS2, TTS2, 2–48" (50–1200mm), 316 Stainless Steel, ASTM A 240
		S2, 2–48" (50–1200mm), 316 Stainless Steel, Nickel Overlay, Heat Treated, ASTM A 240, Type 316
		S2 Shaft, 20–48" (500–1200mm) Class 150, 18–36" (450–900mm) Class 300, PTFE
A30	Bottom Cover Seal	S4 Shaft, 24–48" (600–1200mm), PTFE
		S5 Shaft, 20–24" (500–600mm) Class 150, 18–36" (450–900mm) Class 300, Graphoil, Commercial Grade GTB
		CS, 20–48" (500–1200mm), Class 150, Carbon Steel, ASTM A 516, Grade 70
A31	Bottom Cover	S2, 18–36" (450–900mm), Class 300, 316 Stainless Steel, ASTM A 240 Condition A
		20–36" (500–900mm), Class 150, 18 (450mm) and 20" (500mm), Class 300, 410 Stainless Steel
A32	Bottom Cover Lockwasher	42 (1050mm) and 48" (1200mm), Class 150, 24–36" (600–900mm), Class 300, 316 Stainless Steel
		20–48" (500–1200mm), Class 150, 18–36" (450–900mm), Class 300, Stainless Steel, ASTM A 193, Grade B8M, Class 1 or 2
A33	Bottom Cover Screw	20–48" (500–1200mm), Class 150, 18–36" (450–900mm), Class 300, Stainless Steel, ASTM A 193, Grade B8M, Class 1 or 2
A39	Gland Plate	S2, 30" (750mm) and 36" (900mm) Class 150, 42" (1050mm) and 48" (1200mm) Class 300, 316 Stainless Steel, ASTM A 240, Type 316
A46	Pin	300 Series Stainless Steel

# Material Selections for use with Seat Options

Item	Material	Seat Options			
		PTFE/Titanium (RT and TT)	PTFE/Inconel (TI and RI)	Fyre-Block® (TIS2, TTS2, RTS2 and RIS2)	Metal (S2 and S2L)
Body (A1)	Carbon Steel (CS)	Recommended	Recommended	Recommended	Recommended
	316 Stainless Steel (S2)	Recommended	Recommended	Recommended	Recommended
	317 Stainless Steel (S3)*	Recommended	Recommended	Not Allowed	Not Allowed
Packing (A11)	PTFE (TC, TMD) 2-36" (50-900mm)	Recommended	Recommended	Allowed if Fire Safety Not Concern	Allowed to 450°F (232°C)
	Carbon Graphite (G1) 2-24" (50-600mm)	Allowed	Allowed	Recommended	Recommended
	Graphoil (G2, G2L, G2DL) 2-36" (50-900mm)	Recommended	Recommended	Recommended	Recommended
Disc (A3)	316 Stainless Steel (S2)	Recommended	Recommended	Not Allowed	Not Allowed
	316 Stainless Steel, Plated & Heat Treated (S2NH)	Allowed	Allowed	Recommended	Recommended
	317 Stainless Steel (S3)*	Recommended	Allowed	Not Allowed	Not Allowed
Shaft (A4)	316 Stainless Steel (S2) 2" (50mm) & Larger	Recommended	Recommended	Not Allowed	Not Allowed
	317 Stainless Steel (S3)*	Recommended	Recommended	Not Allowed	Not Allowed
	17-4 PH Stainless Steel (S5)	Allowed	Allowed	Recommended	Recommended
Bearing (A2), (A7)	PTFE/317 (FT)	Recommended	Recommended	Recommended	Allowed to 450°F (232°C)
	Nickel Stainless Steel (NS)	Allowed	Allowed	Allowed	Recommended

\* 317 Stainless Steel Body, Disc, and Shaft on 3–4" (80–100mm), 6–12" (150–300mm), Class 150 Lugged

## Applicable Standards

DeZURIK BHP Butterfly Valves are designed and/or tested to meet the following standards:

- ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings. Class 150 valves are designed to mate with Class 125 pipe flanges, and Class 300 valves are designed to mate with Class 250 pipe flanges.
- ANSI B16.5 Pipe Flanges and Flanged Fittings. 2–24" (80–300mm) valves are designed to mate with Class 150 or 300 flanges.
- ANSI B16.34 Valves-Threaded and Welded End. All BHP Butterfly Valves comply with requirements of this standard.
- ANSI/FCI 70-2 Control Valve Seat Leakage. The high temperature valve (metal seated) meets ANSI Class IV or V shutoff requirements. All valves are tested to Class IV. (If Class V is required, it must be specified as an option to allow for test differences.) PTFE and RTFE seats meet Class VI requirements.
- ANSI B16.20 Metallic Gaskets for Piping, Double-Jacket Corrugated and Single Spiral Wound, 5<sup>th</sup> Edition. Standard construction provides effective sealing with API 601 gaskets. Optional undrilled seat retainer (UR) construction available to provide full seal area contact with API 601 gaskets.
- ANSI B16.47 Pipe Flanges and Flanged Fittings. 28" (700mm) and larger are designed to mate with Class 150 or 300 flanges.
- API 598 Resilient Seated and Fyre Block® Valves meet the leak rate requirements of this standard.
- API 607 Fire Test for Soft Seated, Quarter-Turn Valves, 3rd and 4th Editions. Fyre-Block® style BHP Butterfly Valves only.
- BS 5146 Inspection and Test of Steel Valves for the Petroleum, Petrochemical and Allied Industries. Fyre-Block® style BHP Butterfly Valves only with fire portion of standard.
- BS 6755 Part 1 Seat & Shell Test. Resilient Seated, and Fyre-Block® Valves meet the leak rate requirements of this standard.
- BS 6755 Part 2 Fire Test. Fyre-Block® Valves comply with this standard.
- BS 4504 Conforms to flange bolt guide and pressure ratings.
- JIS B2212 Conforms to flange bolt guide and pressure ratings.
- MSS-SP-61 Pressure Testing of Steel Valves.
- MSS-SP-25 Standard Marking System for Valves, Fittings, Flanges, and Unions. All valves comply with requirements of this standard.
- DIN 3230 Leak Rate 1 Requirement. Resilient Seated and Fyre-Block® Valves meet the leak rate requirements of this standard.
- DIN 2632- Conforms to flange bolt guides and pressure 2635 ratings.
- EN 29001 DeZURIK manufacturing processes comply with this quality standard.
- ISA D79.01 Level 2 Leak Rates Cryogenic Tests ISA A75.02 Standard Control Valve Capacity Test Procedure.
- ISO 7005 Conforms to flange bolt guide and pressure ratings.
- ISO 5208 Conforms to pressure testing requirements of this standard.
- ISO 5211 Conforms to flange bolt guide and pressure ratings.
- ISO 5752 All valves designed to comply with face-to-face dimensions.
- ISO 9001 DeZURIK manufacturing processes certified to this quality standard.
- MSS-SP-68 High Pressure-Offset Seat Butterfly Valves. All valves comply with the requirements of SP68.
- NACE Sulfide Stress Cracking Resistant Metallic MR-01-75 Material for Oil Field Equipment. NACE trim is standard with PTFE/Titanium, PTFE/Inconel and Fyre-Block® seats. This construction available as an option with metal seated valves.

# Valve Selection

## Flow Coefficients

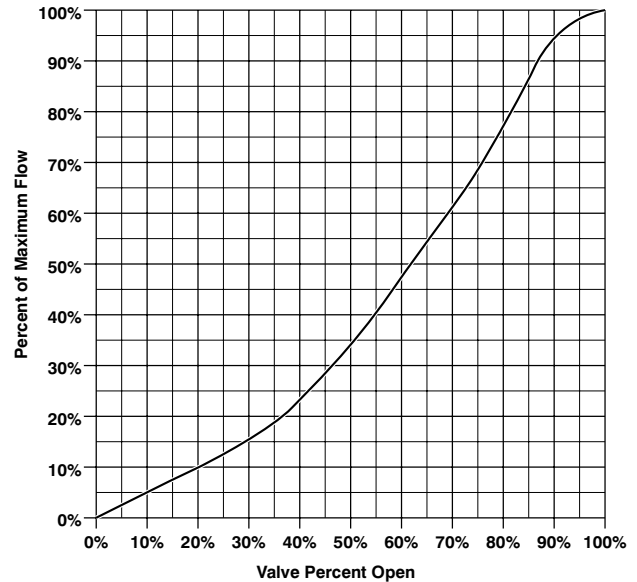
Cv Values (Flow in GPM of water at 1 psi pressure drop)

Kv Values (Flow in m<sup>3</sup>/hr. of water at 100 kPa pressure drop)

BHP Cv/Kv & K Factor

Valve Size	ANSI Class 150		ANSI Class 300	
	Cv Kv 100% Open	K Factor	Cv Kv 100% Open	K Factor
2" 50mm	85 74	2.25	85 74	1.74
2.5" 65mm	180 156	1.02	180 156	1.01
3" 80mm	275 238	1.04	260 225	0.93
4" 100mm	520 450	0.87	475 411	0.85
5" 125mm	860 744	0.78	770 666	0.81
6" 150mm	1360 1180	0.65	1130 977	0.77
8" 200mm	2260 1960	0.71	2110 1830	0.68
10" 250mm	3550 3070	0.71	3350 2900	0.66
12" 300mm	5000 4330	0.72	4800 4150	0.65
14" 350mm	6800 5880	0.57	6390 5530	0.53
16" 400mm	9000 7790	0.56	8460 7320	0.52
18" 450mm	11800 10200	0.52	11100 9600	0.49
20" 500mm	14400 12500	0.54	13500 11700	0.51
24" 600mm	20000 17300	0.58	17700 15300	0.61
28" 700mm	27000 17300	0.67	—	—
30" 750mm	33300 28800	0.53	180 156	0.74
36" 900mm	56500 48900	0.40	180 156	0.51
42" 1050mm	67000 58000	0.53	—	—
48" 1200mm	10300 89100	0.39	—	—

## Flow Characteristic



## Shutoff Class

(Per FCI 70-2/ANSI B16.104-DIN 3230 Leak Rate1)

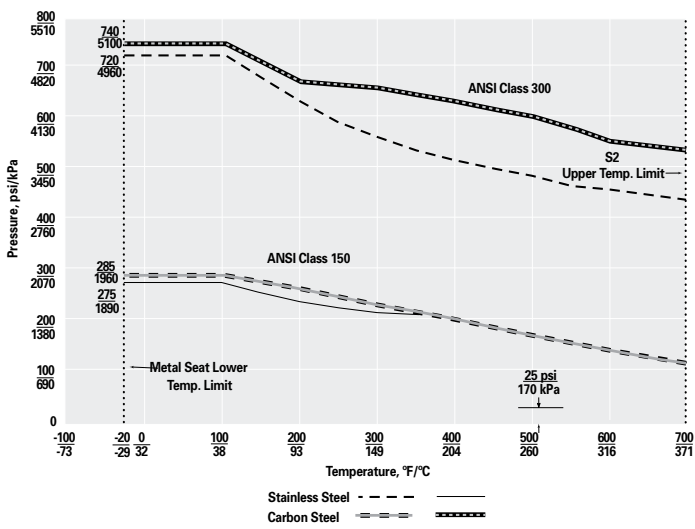
PTFE and RTFE Seated	(Bubble tight) with pressure on either side of the disc.
Fyre-Block® Seated	Class VI - DIN 1 (Bubble tight)
Metal Seated	ANSI Class 150 & 300-Class IV, Uni-Directional on seat side
	ANSI Class 150 & 300-Class V (opt), Uni-Directional on seat side

## Pressure Ratings (Ambient Temperature)

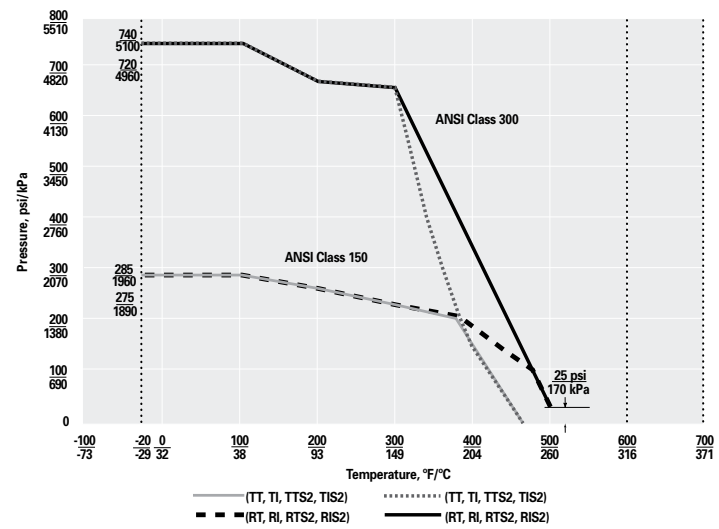
Carbon Steel, Class 150	=	285 psi (1960 kPa)
Carbon Steel, Class 300	=	740 psi (5100 kPa)
Stainless Steel, Class 150	=	275 psi (1890 kPa)
Stainless Steel, Class 300	=	720 psi (4960 kPa)

## Pressure/Temperature Ratings:

### Metal Seat



### Soft Seats



# Valve Weights

Valve Weights, Class 150

BHP Cv/Kv & K Factor

Valve Size	Wafer Body		Lugged Body	
	Stainless Steel Lbs/Kg	Carbon Steel Lbs/Kg	Stainless Steel Lbs/Kg	Carbon Steel Lbs/Kg
2" 50mm	$\frac{3}{1}$	$\frac{7}{3}$	$\frac{7}{3}$	$\frac{7}{3}$
2.5" 65mm	$\frac{4}{2}$	$\frac{10}{5}$	$\frac{9}{4}$	$\frac{10}{5}$
3" 80mm	$\frac{10}{5}$	$\frac{15}{7}$	$\frac{11}{5}$	$\frac{20}{9}$
4" 100mm	$\frac{11}{5}$	$\frac{17}{8}$	$\frac{19}{9}$	$\frac{32}{15}$
5" 125mm	$\frac{18}{8}$	$\frac{27}{12}$	$\frac{26}{12}$	$\frac{42}{19}$
6" 150mm	$\frac{22}{10}$	$\frac{38}{17}$	$\frac{45}{21}$	$\frac{50}{23}$
8" 200mm	$\frac{36}{16}$	$\frac{65}{29}$	$\frac{46}{21}$	$\frac{10}{5}$
10" 250mm	$\frac{61}{28}$	$\frac{86}{39}$	$\frac{67}{31}$	$\frac{140}{64}$
12" 300mm	$\frac{100}{46}$	$\frac{100}{46}$	$\frac{145}{66}$	$\frac{145}{66}$
14" 350mm	$\frac{142}{65}$	$\frac{142}{65}$	$\frac{188}{86}$	$\frac{188}{86}$
16" 400mm	$\frac{192}{87}$	$\frac{192}{87}$	$\frac{243}{111}$	$\frac{243}{111}$
18" 450mm	$\frac{314}{143}$	$\frac{314}{143}$	$\frac{363}{165}$	$\frac{363}{165}$
20" 500mm	$\frac{411}{187}$	$\frac{411}{187}$	$\frac{335}{152}$	$\frac{335}{152}$
24" 600mm	$\frac{665}{302}$	$\frac{665}{302}$	$\frac{800}{363}$	$\frac{800}{363}$
28" 700mm	Contact DeZURIK			
30" 750mm	$\frac{975}{442}$	$\frac{975}{442}$	$\frac{1175}{553}$	$\frac{1175}{553}$
36" 900mm	$\frac{1560}{708}$	$\frac{1560}{708}$	$\frac{1900}{862}$	$\frac{1900}{862}$
42" 1050mm	Contact DeZURIK		$\frac{4507}{2045}$	$\frac{4507}{2045}$
48" 1200mm	$\frac{4015}{1821}$	$\frac{4015}{1821}$	$\frac{4545}{2062}$	$\frac{4545}{2062}$

Valve Weights, Class 300

BHP Cv/Kv & K Factor

Valve Size	Wafer Body		Lugged Body	
	Stainless Steel Lbs/Kg	Carbon Steel Lbs/Kg	Stainless Steel Lbs/Kg	Carbon Steel Lbs/Kg
2" 50mm	$\frac{4}{2}$	$\frac{8}{4}$	$\frac{11}{5}$	$\frac{14}{6}$
2.5" 65mm	$\frac{6}{3}$	$\frac{8}{4}$	$\frac{18}{8}$	$\frac{18}{8}$
3" 80mm	$\frac{8}{4}$	$\frac{19}{9}$	$\frac{21}{10}$	$\frac{25}{11}$
4" 100mm	$\frac{14}{6}$	$\frac{21}{10}$	$\frac{35}{16}$	$\frac{36}{16}$
5" 125mm	$\frac{25}{11}$	$\frac{36}{17}$	$\frac{49}{22}$	$\frac{57}{26}$
6" 150mm	$\frac{28}{13}$	$\frac{85}{39}$	$\frac{64}{29}$	$\frac{98}{45}$
8" 200mm	$\frac{49}{22}$	$\frac{75}{34}$	$\frac{110}{50}$	$\frac{111}{50}$
10" 250mm	$\frac{79}{36}$	$\frac{96}{44}$	$\frac{175}{80}$	$\frac{185}{84}$
12" 300mm	$\frac{124}{57}$	$\frac{124}{57}$	$\frac{230}{105}$	$\frac{230}{105}$
14" 350mm	$\frac{182}{83}$	$\frac{182}{83}$	$\frac{232}{105}$	$\frac{232}{105}$
16" 400mm	$\frac{246}{112}$	$\frac{246}{112}$	$\frac{312}{106}$	$\frac{312}{106}$
18" 450mm	$\frac{402}{182}$	$\frac{402}{182}$	$\frac{465}{211}$	$\frac{465}{211}$
20" 500mm	$\frac{525}{238}$	$\frac{525}{238}$	$\frac{613}{278}$	$\frac{613}{278}$
24" 600mm	$\frac{736}{334}$	$\frac{736}{334}$	$\frac{1025}{465}$	$\frac{1025}{465}$
30" 750mm	Contact DeZURIK		$\frac{3006}{1365}$	$\frac{3006}{1365}$
36" 900mm	Contact DeZURIK		$\frac{4350}{1975}$	$\frac{4350}{1975}$



# Ordering

To order, simply complete the valve order code from the information shown. An ordering example is shown for your reference.

## Valve Style

Give valve style code as follows:

BHP = High Performance Butterfly Valve

## Valve Size

Give valve size code as follows:

2 = 2" (50mm)	16 = 16" (400mm)
2.5 = 2.5" (65mm)	18 = 18" (450mm)
3 = 3" (80mm)	20 = 20" (500mm)
4 = 4" (100mm)	24 = 24" (600mm)
5 = 5" (125mm)	28 = 28" (700mm)
6 = 6" (150mm)	30 = 30" (750mm)
8 = 8" (200mm)	36 = 36" (900mm)
10 = 10" (250mm)	42 = 42" (1050mm)
12 = 12" (300mm)	48 = 48" (1200mm)
14 = 14" (350mm)	

## End Connection/Face-To-Face

Give end connection and face-to-face code as follows:

### Class 150 Wafer

W1 = ANSI	Class 150 Lugged
W110 = DIN 10 or BS4504/10 Drilling	L110 = DIN 10 or BS4504/10 Drilling
W116 = DIN 16 or BS4504/16 Drilling	L116 = DIN 16 or BS4504/16 Drilling
W1D = B.S. Table D Drilling	L1D = B.S. Table D Drilling
W1E = B.S. Table E Drilling	L1E = B.S. Table E Drilling
W1J1 = JIS 10 Drilling	L1J1 = JIS 10 Drilling

### Class 300 Wafer

W2 = ANSI	Class 300 Lugged
W225 = DIN 25 or BS4505/25 Drilling	L225 = DIN 25 or BS4505/25 Drilling
W240 = DIN 40 or BS4505/40 Drilling	L240 = DIN 40 or BS4505/40 Drilling
W2F = B.S. Table F Drilling	L2F = B.S. Table F Drilling
W2H = B.S. Table H Drilling	L2H = B.S. Table H Drilling
W2J = B.S. Table J Drilling	L2J = B.S. Table J Drilling
W2J2 = JIS 20 Drilling	L2J2 = JIS 20 Drilling

Note: Standard flange bolt threads on 18" (450mm) and larger Class 150 valves and 12" (300mm) and larger Class 300 valves are 8 U.N.; conforming to MSS-SP-68, MSS-SP-67, API 609 and ASTM F704-81. Contact the factory for non-standard flange bolt threads, i.e. 7 UNC.

## Body Material

Give body material code as follows:

CS = Carbon Steel
S2 = 316 Stainless Steel
S3 = 317 Stainless Steel-Available Class 150 Lugged Only 3-12" (80-300mm)

## Packing Material

Give packing material code as follows:

TC = PTFE V-Flex, to 500°F (260°C)
G1 = Carbon Graphite to 700°F (371°C)
G2 = Graphoil to 1000°F (538°C)
TCD = PTFE V-Flex, Dual Seat, Low Cycle to 5001 ptF (260°C).
TCDL = PTFE V-Flex, Dual Seat, Live Loaded, Low Cycle to 500°F (260°C).
TCL = PTFE V-Flex, Live Loaded, Low Cycle to 500°F (260°C).
TMD = PTFE with Mechanical Spring, Dual Seat, High Cycle to 500°F (260°C).
G2D = Graphoil, Dual Seal, High Cycle to 1000°F (538°C).
G2L = Graphoil, Live Loaded, High Cycle to 1000°F (538°C).
G2DL = Graphoil, Dual Seal, Live Loaded, High Cycle to 1000°F (538°C).

\*Note: The limiting factor in valve selection is the lowest temperature of the packing or seat.  
Note: G1 and G2 packing on Fyre-Block® valves have been tested to API607, 4th Edition.

## Trim Combination

Give disc, shaft, bearing and seat codes as follows:

### Disc Material

S2 = 316 Stainless Steel - Note 2
S2NH = 316 Stainless Steel Nickel Overlay Heat Treated -Note 1
S3 = 317 Stainless Steel - Note 3

### Shaft Material

S2 = 316 Stainless Steel
S3 = 317L Stainless Steel
S5 = 17-4 PH Stainless Steel

### Bearing Material

FT = Fabric PTFE/317 Stainless Steel to 500°F (260°C)
NS = Nickel Stainless Steel - Used with S2 Seats to 700°F (230°C)

### Seat Material\*

Give seat material code as follows:

TT = PTFE/Titanium (Contact DeZURIK if application is for oxygen service) to 450°F (232°C).
TI = PTFE/Inconel to 450°F (232°C).
TIS2 = PTFE with Inconel and 316 Stainless Steel, to 450°F (230°C).
TTS2 = PTFE/Titanium and 316 Stainless Steel-must use G1 packing, to 450°F (232°C).
S2 = 316 Stainless Steel, to 700°F (371°C).
RT = Reinforced PTFE/Titanium, to 500°F (260°C).
RI = Reinforced PTFE/Inconel, to 500°F (260°C).
RIS2 = Reinforced PTFE with Inconel and 316 Stainless Steel, to 500°F (260°C).
RTS2 = Reinforced PTFE/Titanium and 316 Stainless Steel, to 500°F (260°C).

#### Notes:

- Heat Treated Discs are for use with S5 Shafts, and TTS2, TIS2, RIS2, RTS2 or S2 Seats.
- 316 Stainless Steel Disc with 316 Stainless Steel Shaft must use FT Bearings.
- With 317 Stainless Steel Disc use 317 Stainless Steel Shaft with FT Bearing and either TT or TI Seat. 317 Stainless Steel available in sizes 3-12" (80-300mm) Class 150 only.

## Options

Give options code as follows:

UR = Undrilled Seat Retainer - Available on 2-12" (50-300mm) only. Lugged style not available for dead end service.
NT = NACE Trim - Required on metal seated valves only. (Standard on valves with RT, RI, TT, TI, TIS2, RIS2 and TTS2 seats.)
C5 = Class 5 Seat Test - For use with S2 metal seated valves.
15 = 150 psi Disc - 36" (900mm) & Larger.
PED = Pressure Equipment Directive (CE Mark) Category I Assessment Module A.
PEDL = Pressure Equipment Directive (Lloyd's CE Mark) Category II and III Assessment Module H.
API = Conformance to API-609. Not available on 2.5" and 5" for CL150 and CL300. Valves with (S2) metal seats do not meet the required leak rates for PI 598. (S2) metal seats meet the Class V (optional C5) ANSI B16.104/FCI 70.2 requirements.

## Ordering Example:

BHP,3,L1,S2,TC,S2-S2-FT-TT,UR\*

# Lever Actuators

## 10-Position Levers

A 10-position dial provides positive latching in open, closed and eight intermediate positions. A pointer indicates position of disc plus a notch in the handle allows use of a padlock to prevent unauthorized valve operation. An optional adjustable memory stop is available to allow the valve to be closed and reopened to the same position.

## Mounting

Lever actuators can be mounted at standard and 180° clockwise from standard. Specify mounting positions other than standard below the valve and actuator identification.

## Ordering Levers

To order, add lever code "LT" to basic valve identification. Lever actuators available on 2–8" (50–200mm) Class 150 and Class 300 valve sizes only. Handwheel actuators are recommended for valve sizes over 6" (150mm) and where water hammer may occur due to a sudden valve closure. Maximum pipeline velocity for lever operated valve is 20 feet (6 meters) per second.

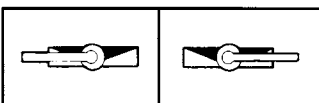
## Memory Stop

An adjustable memory stop is available which allows return of the valve to preset open position after shutoff. Order the memory stop as part of a complete valve, by adding "ST" after the actuator code.

Ordering Example:

BHP,3,L1,S2,TC,S2-S2-FT-TT\*LT,ST

## Lever Mounting Positions



Standard Mounting

180° Clockwise

Note: 90°, 180° and 270° Lever Mounting Position provided if requested on order.



## Lever Actuator Sizing

### Class 150

Valve Size	Order Code	psi/kPa		
		TT/TI RT/RI	TTS2/TIS2 RTS2/RIS2	S2
2-6" 50-150mm	LT	285 1960	285 1960	285 1960
8" 200mm	LT	285 1960	285 1960	50 340

Note: Stainless Steel valves are rated to 275 psi (1890 kPa).

### Class 300

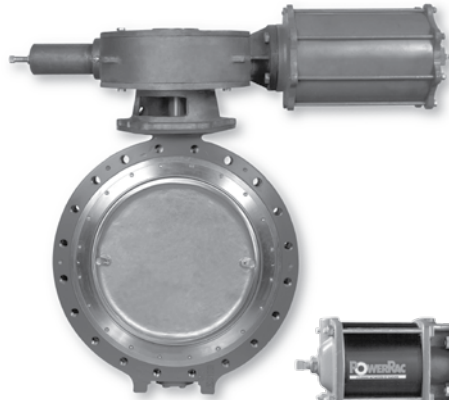
Valve Size	Order Code	psi/kPa		
		TT/TI RT/RI	TTS2/TIS2 RTS2/RIS2	S2
2&4" 50&100mm	LT	740 5100	740 5100	740 5100
6" 150mm	LT	740 5100	650 4480	300 2070
8" 200mm	LT	740 5100	450 3100	50 340

Ordering Example:

BHP,3,L1,S2,TC,S2-S2-FT-TT\*LT

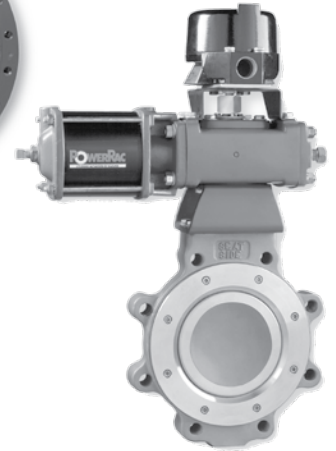
### Rotary Manual Actuators

Rotary manual actuators feature a cast iron housing with bearings on each end of the input shaft for durability and performance. The ductile iron gear provides strength for robust applications and a long service life without maintenance. Rotary manual actuators are available with handwheel, chainwheel, or a 2" (50mm) square nut input option. Actuators feature external position indication and are available with safety lockout devices.



### PowerRac® Cylinder Actuators

PowerRac double-acting and spring-return actuators feature a proven rack-and-pinion design. PowerRac® provides high torque output throughout the full stroke for accurate control.



### Spring-Diaphragm Actuators

DeZURIK spring-diaphragm actuators feature all steel, cast iron and stainless steel construction with no aluminum parts to corrode in caustic environments. The output shaft is supported at the top and bottom with bronze bearings that absorb side thrust and ensure smooth, efficient throttling control. Diaphragm actuators provide on-off or modulating control with either spring-to-spring or spring-to-close operation. All diaphragm actuators feature external position indication and are available with safety lockout devices.



### Handwheel and Chainwheel Actuators

Manual gear actuator housings are constructed of high strength metal and feature sintered bronze bearings on each end of the input shaft for durability and performance. The high strength gear provides strength for robust applications and a long service life without maintenance. All manual gear actuators feature external position indication and are available with safety lockout devices. Actuators for buried service are available as an option.



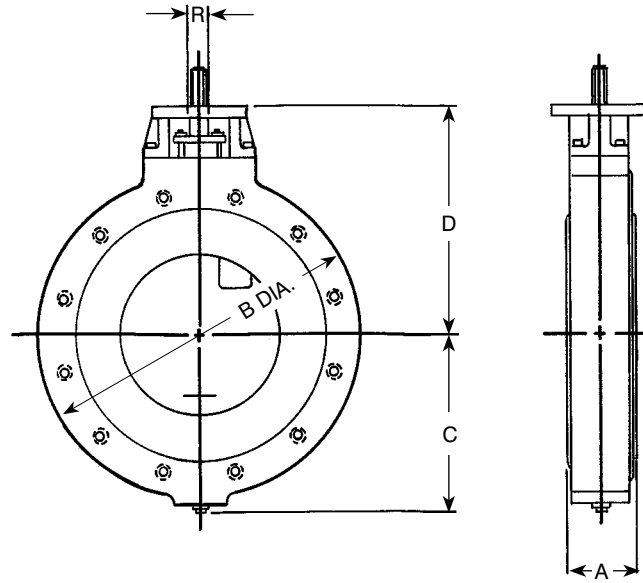
### Compak™ Cylinder Actuators

Compak actuators are a versatile rack-and-pinion design and are available as double-acting or spring-return units. The compact, modular design allows the actuator to be mounted for a low profile assembly. Compak actuators are matched to each valve's torque requirements to ensure that the most economical valve and actuator package is specified.



# Dimensions

## Basic Valve



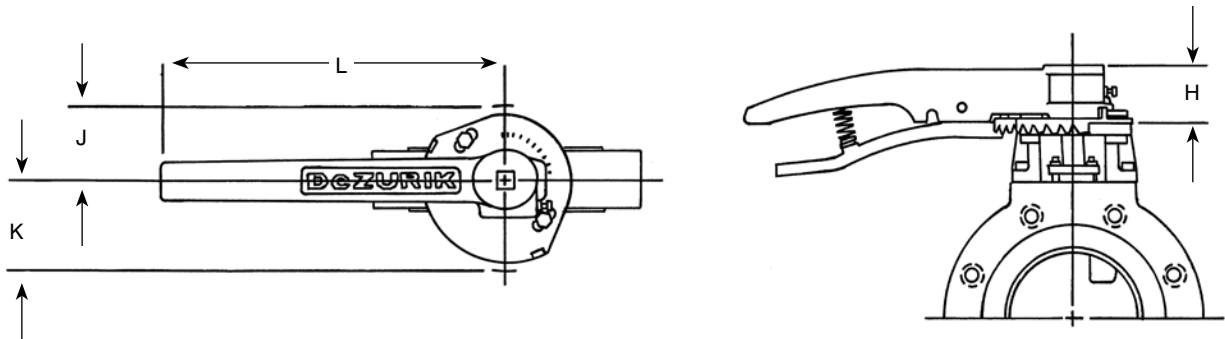
Valve Size	Dimensions											
	A		B				C		D		R (Dia.)	
	Class 150	Class 300	Class 150		Class 300		Class 150	Class 300	Class 150	Class 300	Class 150	Class 300
			Wafer	Lugged	Wafer	Lugged						
2" 50mm	1.75 44	1.75 44	4.31 110	6.06 154	4.31 110	6.44 164	3.31 84	3.50 89	5.50 140	5.50 140	0.371 9	0.371 9
2.5" 65mm	1.88 48	1.88 48	5.00 127	7.00 178	5.00 127	7.44 189	3.44 87	4.00 102	5.75 146	6.00 152	0.371 9	0.434 11
3" 80mm	1.88 48	1.88 48	5.66 144	7.62 194	5.66 144	8.19 208	3.97 101	4.38 102	6.00 152	6.38 162	0.434 11	0.496 13
4" 100mm	2.12 54	2.12 54	6.78 172	9.00 229	6.78 172	9.75 248	4.75 121	5.06 129	6.75 171	7.75 197	0.496 13	0.621 16
5" 125mm	2.31 59	2.31 59	7.69 195	10.00 254	7.75 197	10.94 278	5.50 140	5.94 151	7.75 197	8.25 210	0.621 16	0.746 19
6" 150mm	2.31 59	2.44 62	8.88 226	11.00 279	9.00 229	12.44 316	6.50 165	7.16 182	8.25 210	9.00 229	0.746 19	0.995 25
8" 200mm	2.50 64	2.88 73	11.00 279	13.50 343	11.12 282	14.88 378	7.59 193	8.47 215	9.50 241	10.75 273	0.995 25	1.245 32
10" 250mm	2.93 74	3.36 85	13.75 349	16.12 409	13.25 337	17.50 445	8.78 223	10.06 256	11.19 284	12.62 321	1.245 32	1.495 38
12" 300mm	3.28 83	3.72 95	15.50 394	19.12 486	15.50 394	20.38 518	10.19 259	11.38 289	12.75 324	13.75 349	1.495 38	1.745 44
14" 350mm	3.61 92	4.64 118	16.50 419	21.00 533	16.62 422	22.25 565	11.81 300	12.84 326	14.00 356	16.88 429	1.495 38	1.870 48
16" 400mm	3.99 101	5.26 134	18.75 476	23.50 597	18.69 475	24.50 622	12.94 329	13.81 351	15.75 400	14.25 362	1.620 41	1.995 51
18" 450mm	4.43 113	5.89 150	21.25 540	25.00 635	21.38 543	27.00 686	14.31 329	16.00 406	18.62 473	15.50 394	1.870 48	2.245 57
20" 500mm	4.92 125	6.26 159	23.25 591	27.75 705	23.50 597	29.25 743	15.81 402	16.81 427	20.56 522	16.75 425	2.245 57	2.449 63
24" 600mm	6.12 155	7.22 183	27.25 692	32.00 813	27.50 699	34.50 876	17.31 440	20.06 510	17.75 451	19.69 500	2.499 63	3.624 92
28" 700mm	6.50 165	—	—	36.50 927	—	—	19.88 505	—	20.00 508	—	2.998 76	—
30" 750mm	6.50 165	9.88 251	33.75 857	38.75 984	34.12 867	43.00 1092	21.06 535	25.84 656	21.12 536	25.00 635	2.999 76	4.499 114
36" 900mm	7.88 83	10.88 276	40.25 1022	46.00 1168	40.88 1038	50.00 1270	25.38 645	28.75 730	25.00 635	28.50 724	3.624 92	5.000 127
42" 1050mm	9.88 251	—	53.00 1346	47.25 1200	—	—	28.94 735	—	30.00 762	—	4.499 114	—
48" 1200mm	10.88 276	—	59.50 1511	53.81 1367	—	—	32.50 826	—	31.68 805	—	5.000 127	—

Inch  
Millimeter

Note: All dimensions are subject to change without notice. For piping layouts, request certified drawings.

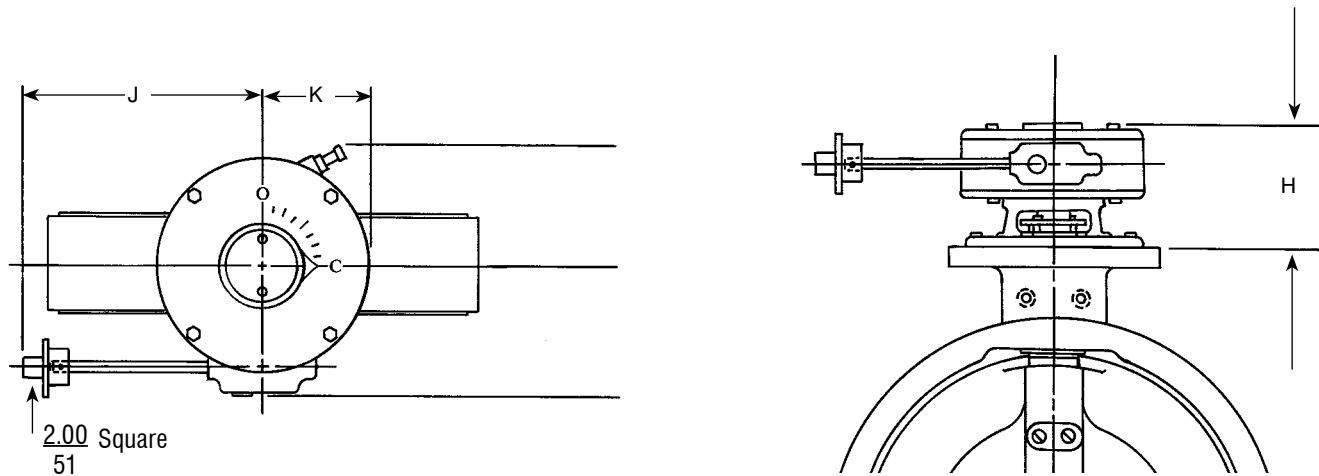
# Dimensions

## Lever



Valve Size	Dimensions										
	H	J		K		L					
		Class 150	Class 300	Class 150	Class 300	PTFE Seats (RT, RI, TT & TI)		Fyre-Block® (TTS2, TIS2, RTS2 & RIS2)		Metal Seat (S2)	
						Class 150	Class 300	Class 150	Class 300	Class 150	Class 300
2" 50mm	<u>2.00</u> 51	<u>2.00</u> 51	<u>2.00</u> 51	<u>2.44</u> 62	<u>2.44</u> 62	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254
2.5" 65mm	<u>2.00</u> 51	<u>2.00</u> 51	<u>2.00</u> 51	<u>2.44</u> 62	<u>2.44</u> 62	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254
3" 80mm	<u>2.00</u> 51	<u>2.00</u> 51	<u>2.00</u> 51	<u>2.44</u> 62	<u>2.44</u> 62	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254
4" 100mm	<u>2.00</u> 51	<u>2.00</u> 51	<u>3.00</u> 72	<u>2.44</u> 62	<u>3.56</u> 90	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254	<u>10.00</u> 254
5" 125mm	<u>2.00</u> 51	<u>2.00</u> 51	<u>3.00</u> 72	<u>2.44</u> 62	<u>3.56</u> 90	<u>10.00</u> 254	<u>14.00</u> 356	—	—	—	—
6" 150mm	<u>2.25</u> 57	<u>3.00</u> 72	<u>3.00</u> 72	<u>3.56</u> 90	<u>3.56</u> 90	<u>14.00</u> 356	<u>22.00</u> 559	<u>14.00</u> 356	<u>22.00</u> 559	<u>22.00</u> 559	<u>22.00</u> 559
8" 200mm	<u>2.25</u> 57	<u>3.00</u> 72	<u>3.00</u> 72	<u>3.56</u> 90	<u>3.56</u> 90	<u>22.00</u> 559	<u>22.00</u> 559	<u>22.00</u> 559	<u>22.00</u> 559	<u>22.00</u> 559	<u>22.00</u> 559

## 2" (50mm) Square Nut, G-Series Actuator



Actuator Code	Dimensions				
	H	J	K	L	M
GS-12-N	$\frac{10.37}{263}$	$\frac{16.38}{416}$	$\frac{7.88}{200}$	$\frac{9.25}{235}$	$\frac{9.50}{241}$
GS-16-N	$\frac{10.94}{278}$	$\frac{27.69}{703}$	$\frac{22.00}{559}$	$\frac{11.00}{279}$	$\frac{13.50}{343}$

Inch

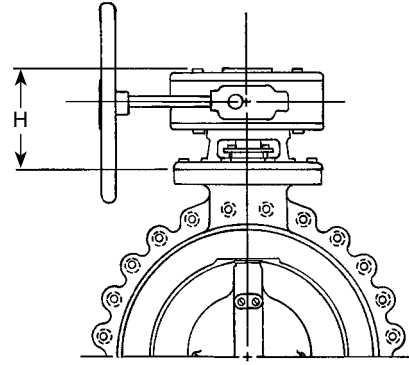
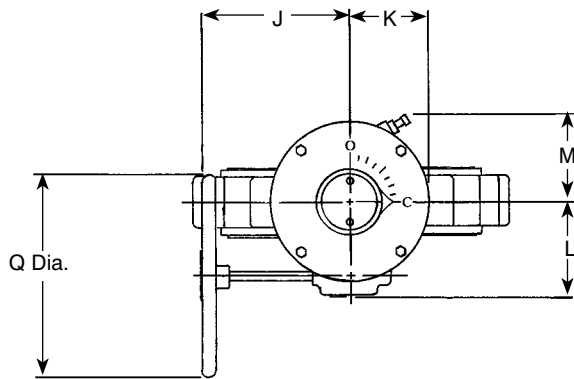
Millimeter

Note: H dimension on 14" (350mm) valve with GS-12-N is  $\frac{11.25}{286}$

Note: All dimensions are subject to change without notice. For piping layouts, request certified drawings.

# Dimensions

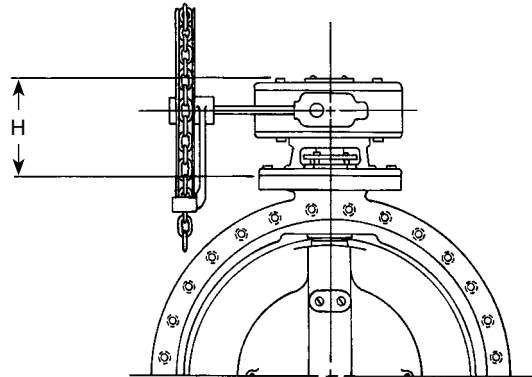
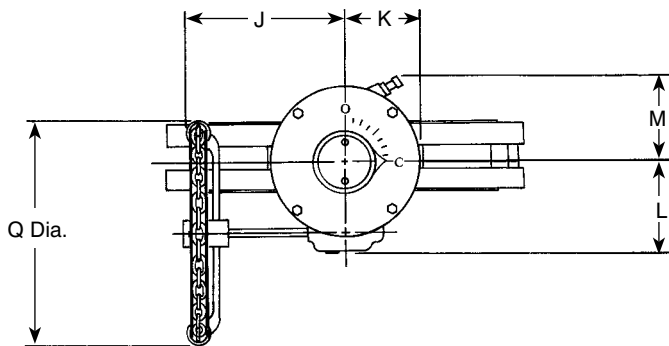
## Handwheel, G-Series Actuator



Actuator Code	Dimensions					
	H	J	K	L	M	Q
GS-12-HD16	$\frac{10.37}{263}$	$\frac{13.50}{343}$	$\frac{7.88}{200}$	$\frac{9.25}{235}$	$\frac{9.50}{241}$	$\frac{16.00}{406}$
GS-12-HD24	$\frac{10.37}{263}$	$\frac{17.50}{445}$	$\frac{7.88}{200}$	$\frac{9.25}{235}$	$\frac{9.50}{241}$	$\frac{24.00}{610}$
GS-12-HD30	$\frac{10.37}{263}$	$\frac{17.50}{445}$	$\frac{7.88}{200}$	$\frac{9.25}{235}$	$\frac{9.50}{241}$	$\frac{30.00}{762}$
GS-16-HD20	$\frac{10.94}{278}$	$\frac{24.88}{632}$	$\frac{22.00}{559}$	$\frac{11.00}{279}$	$\frac{13.50}{343}$	$\frac{20.00}{508}$
GS-16-HD24	$\frac{10.94}{278}$	$\frac{28.25}{718}$	$\frac{22.00}{559}$	$\frac{11.00}{279}$	$\frac{13.50}{343}$	$\frac{24.00}{610}$
GS-16-HD30	$\frac{10.94}{278}$	$\frac{28.38}{721}$	$\frac{22.00}{559}$	$\frac{11.00}{279}$	$\frac{13.50}{343}$	$\frac{30.00}{762}$

Note: H dimension on 14" (350mm) valve with GS-12-HD24 is  $\frac{11.25}{286}$

## Chainwheel, G-Series Actuator



Actuator Code	Dimensions					
	H	J	K	L	M	Q
GS-12-CW20	$\frac{10.37}{263}$	$\frac{13.50}{343}$	$\frac{7.88}{200}$	$\frac{9.25}{235}$	$\frac{9.50}{241}$	$\frac{16.00}{406}$
GS-12-CW30	$\frac{10.37}{263}$	$\frac{17.50}{445}$	$\frac{7.88}{200}$	$\frac{9.25}{235}$	$\frac{9.50}{241}$	$\frac{24.00}{610}$
GS-16-CW20	$\frac{10.94}{278}$	$\frac{24.88}{632}$	$\frac{22.00}{559}$	$\frac{11.00}{279}$	$\frac{13.50}{343}$	$\frac{20.00}{508}$

Note: H dimension on 14" (350mm) valve with GS-12-CW20 is  $\frac{11.25}{286}$

## **Sales and Service**

For information about our worldwide locations, approvals, certifications and local representative:

Web Site: [www.dezurik.com](http://www.dezurik.com) E-Mail: [info@dezurik.com](mailto:info@dezurik.com)



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