DeZURIK

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DeZURIK BOS-CL ON-CENTER RESILIENT SEATED BUTTERFLY VALVES

www.dezurik.com

Design and Construction

BOS-CL On-Center Resilient Seated Butterfly Valves are designed to handle a wide variety of liquids and gases. They are available in lugged 2-24" (50-600mm) ductile Iron body design with discs of nylon coated ductile iron, 316 stainless steel or aluminum bronze. BOS-CL valves feature a one-piece body, high performance seat bonded to a solid backing ring, three heavy duty bearings, and a blow-out proof shaft.

Applications

BOS-CL Resilient Seated Butterfly Valves are suitable for many industrial applications such as water treatment, power, mining, pulp and paper, automotive and other general service applications where heavy-duty resilient seated butterfly valves are required.

Pressure Ratings:

Ductile Iron Nylon Coated or 316 Stainless Steel Discs

2-12" (50-300mm) 175 psi (1210 kPa)

14-24" (350-600mm) 150 psi (1030 kPa)

Aluminum Bronze Discs

2-24" (50-600mm) 150 psi (1030 kPa)

Temperature Ratings:

NBR 2-24" (50-600mm): -20 to 180ºF (-29 to 82ºC)

EPDM 2-24" (50-600mm): -20 to 250ºF (-29 to 121ºC)

On-Center Seat Design Provides Bi-Directional Shutoff

On-Center Seat design provides a streamlined disc with high flow capacity. Designed for both on-off and throttling, the BOS-CL provides bi-directional shutoff to the full rating of the valve. BOS-CL Valves provide bubble tight shutoff, and can be used on dead end service with downstream flange attached. For high strength and corrosion resistance, three disc material choices are available: Ductile Iron Nylon Coated, 316 Stainless Steel and Aluminum Bronze.

Ductile Iron Nylon Coated

316 Stainless Steel

Aluminum Bronze

Superior Bonded Seats

The BOS-CL seat bonding process ensures the seat is held firmly in place and provides a long lasting, maintenance free seal. The seat is bonded to a rigid backing ring which reduces flexing and fatigue. The bonded seat also improves performance when the line maintains a vacuum, or when handling viscous liquids – circumstances that tend to dislodge seats that are not solidly retained. BOS Valves have integral flange seals, eliminating the need for flange gaskets.

Heavy-Duty Bearings Ensure Smooth Operation

Three heavy-duty bearings ensure smooth, reliable valve operation and promote a longer cycle life than valve designs without bearings. Shaft seals protect bearings from internal and external corrosion.

Shaft Seals

The BOS-CL shaft sealing technology offers maximum reliability. It uses multiple separate sealing components for continuous protection from leakage. Disc hubs form the primary seal around the shaft. In addition, seals are molded into the seat ring followed by o-rings to ensure reliability.

Blowout Proof Shaft

For user safety, the BOS-CL resilient seated butterfly valve has a proven shaft retaining system that provides a blowout proof shaft per API 609.

Quality Testing and Standards

Every BOS Valve is tested for shell and seat leakage and comes with a 2-year warranty.

Compatible with Standard Actuators

The actuator mounting flange on BOS-CL valves is compatible with the ISO 5211 bolt pattern which increases flexibility and reduces inventory. Actuator options include lever, handwheel, chainwheel, PowerRac® double acting and spring return cylinders, Compak™ double acting and spring return cylinder and G-Series Cylinder actuators.

AM-Series Manual Gear

Manual Gear actuators provide high torque for robust applications and a long service life without maintenance. Handwheel or chainwheel operation is available.

PowerRac® Cylinder Actuators

Double-acting and spring-return PowerRac® actuators feature a proven rack-and-pinion design ideally suited for high cycle applications. PowerRac® actuators provide high output torque for on-off applications and consistently high output torque throughout the full stroke for accurate control. Its durability is backed by a Lifetime Warranty.

Compak™ Cylinder Actuators

The compact, modular design allows the Compak™ actuator to be mounted for a low profile assembly. Compak™ actuators are a versatile double rack-and-pinion design and are available as double-acting or spring-return units.

G-Series Cylinder Actuators

G-Series actuators feature a rack-and-gear design for larger size rotary valves where constant high torque capability throughout the stroke is required. They are available as double-acting with either pneumatic or hydraulic supply.

Accessories

A full line of accessories are also available, including positioners, solenoids, switches, speed controls, floorstands and valves boxes.

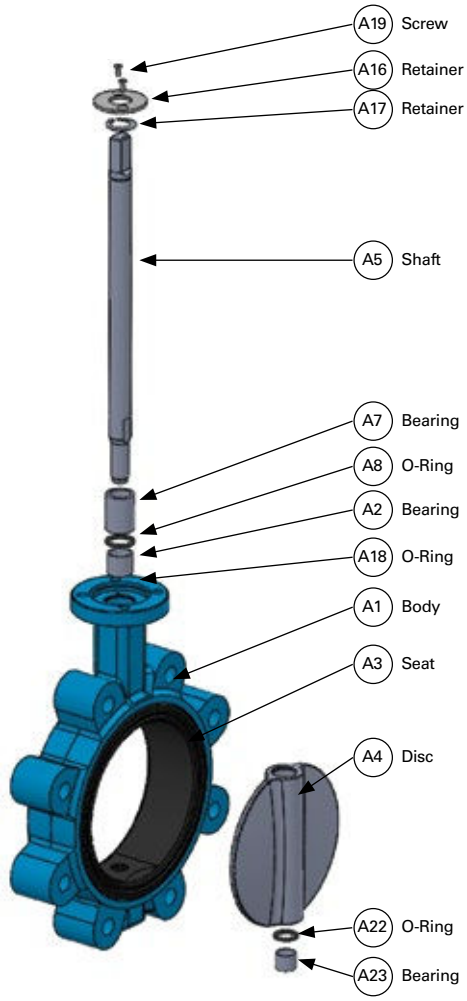
Materials of Construction

2-24" (50-600mm) Valve Sizes

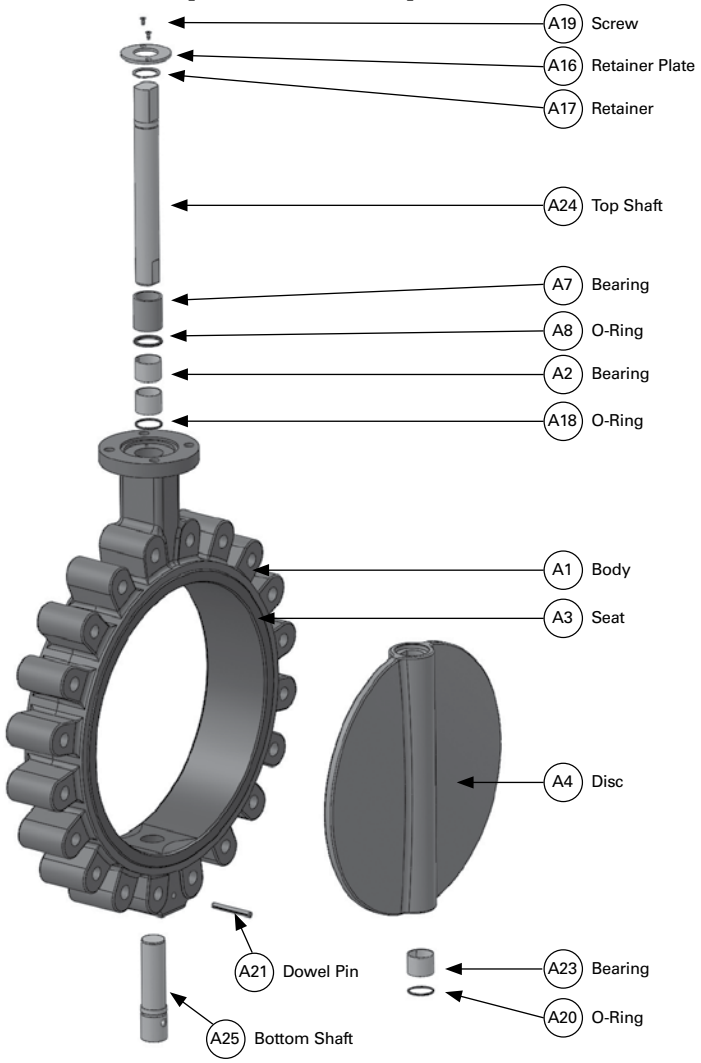
Item	Description	Material
A1	Body	Ductile Iron, ASTM A536, 65-45-12
A2	Bearing	Carbon steel with PTFE sintered bronze composite
A3	Seat*	NBR - Acrylonitrile-Butadiene
		EPDM-Terpolymer of Ethylene Propylene and a Diene
A4	Disc	Ductile Iron, ASTM A536, 65-45-12, Nylon 11 coated
		Stainless Steel, ASTM A351, CF8M
		Aluminum Bronze, ASTM B148, C954
A5	Shaft (2- 12")	420 Stainless Steel, ASTM A582
A7	Bearing (2-18")	Glass Filled Nylon
	Bearing (20" & 24")	Brass
A8	O-Ring**	NBR - Acrylonitrile-Butadiene
		EPDM - Terpolymer of Ethylene Propylene and a Diene
A16	Retainer Plate	Carbon steel, Zinc Plated
A17	Retainer	Spring Steel
A18	O-Ring	NBR - Acrylonitrile-Butadiene
		EPDM - Terpolymer of Ethylene Propylene and a Diene
A19	Screw	Carbon steel, Zinc Plated
A20	O-Ring (14-24")**	NBR - Acrylonitrile-Butadiene
		EPDM - Terpolymer of Ethylene Propylene and a Diene
A21	Dowel Pin (14-24")	Spring Steel
A22	O-Ring (2"-14")**	NBR - Acrylonitrile-Butadiene
		EPDM - Terpolymer of Ethylene Propylene and a Diene
A23	Bearing (2-14")	Carbon steel with PTFE sintered bronze composite
A24	Shaft - Top (14-24")	420 Stainless Steel, ASTM A582
A25	Shaft - Bottom (14-24")	420 Stainless Steel, ASTM A582

*Seat backing material: 2-6" = Phenolic; 8-24" = Aluminum
** O-ring material matches seat material

2-12" (50-300mm) Valve Size



14-24" (350-600mm) Valve Size



Valve Selection

Shut-Off Capabilities

All Seat Materials	Bubble Tight Shutoff*

* Fully rated bi-directional shutoff; dead end service with downstream flange attached.

Pressure Ratings

Ductile Iron Nylon Coated or 316 Stainless Steel Discs	
2-12" (50-300mm)	175 psi (1210 kPa)
14-24" (350-600mm)	150 psi (1030 kPa)
Aluminum Bronze Discs	
2-24" (50-600mm)	150 psi (1030 kPa)

Temperature Ratings:

NBR	-20 to 180°F (-29 to 82°C)
EPDM	-20 to 250°F (-29 to 121°C)

Applicable Standards

DeZURIK BOS-CL Resilient Seated Butterfly Valves are designed and/or tested to meet the following standards:	
ASME B16.1	Class 125 Flange Drilling
ASME B16.5	Class 150 Flange Drilling, 2-24" (50-600mm)
ASME B16.42	Class 150 Body Wall Thickness
API 609	Butterfly Valve Face to Face, Category A
ASME B16.10 & MSS SP-67	Butterfly Valve Face to Face, 2-14" Narrow body; 16-24" Wide Body
API 609/598 & MSS SP-67	Shell and Seat Pressure Testing
ASME 16.104	Exceeds Class VI Shutoff Requirements (Bubble Tight)
ISO 5211	Actuator Mounting
ISO 7005-2 or BS4504	PN10 and 16 Flange Drilling
NSF/ANSI-61 & NSF/ANSI-372	Sizes 2-24" (50-600mm) Certified for use in drinking water applications

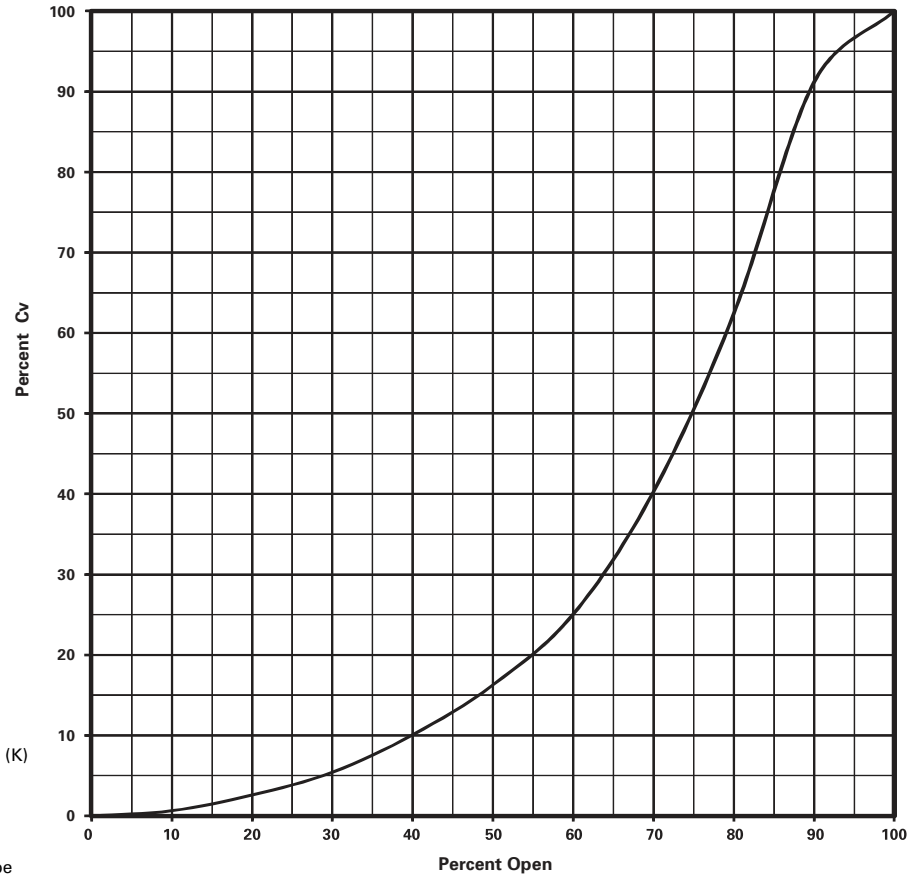
Flow Parameters

Valve Size	Cv* / Kv* 100% Open	K Factor**
2" 50mm	115 / 99	0.86
2.5" 65mm	195 / 169	0.81
3" 80mm	300 / 260	0.77
4" 100mm	600 / 519	0.72
5" 125mm	1020 / 882	0.70
6" 150mm	1580 / 1367	0.68
8" 200mm	3135 / 2712	0.63
10" 250mm	5340 / 4619	0.47
12" 300mm	8250 / 7136	0.46
14" 350mm	11915 / 10306	0.44
16" 400mm	16390 / 14177	0.30
18" 450mm	21705 / 18775	0.29
20" 500mm	27910 / 24142	0.28
24" 600mm	43115 / 37294	0.26

*Cv = Flow in GPM of water at 1 psi pressure drop.
Kv = Flow in m3/hr. of water at 100 kPa pressure drop.
** K = The resistance coefficient of the valve. The constant (K) can be used to determine the equivalent length of pipe.

$L = \frac{KxD}{f}$ Where L = Equivalent length of pipe in feet
K = Resistance coefficient
D = Pipe diameter in feet
f = Friction factor, related to type of pipe

BOS-CL Flow Curve
Percent Open vs. Percent Cv



Valve Selection (Cont.)

Valve and Actuator Weights

Valve Size	Basic Valve	Valve with Lever	Valve with Handwheel	Valve with Chainwheel
2" / 50mm	8 / 4	11 / 6	19 / 9	32 / 15
2.5" / 65mm	9 / 5	12 / 6	20 / 10	33 / 16
3" / 80mm	11 / 5	14 / 7	22 / 10	35 / 16
4" / 100mm	16 / 8	19 / 9	27 / 13	40 / 19
5" / 125mm	19 / 9	22 / 10	30 / 14	42 / 20
6" / 150mm	23 / 11	26 / 12	34 / 16	47 / 22
8" / 200mm	39 / 18	N/A	52 / 24	68 / 31
10" / 250mm	64 / 29	N/A	77 / 35	92 / 42
12" / 300mm	93 / 43	N/A	126 / 58	148 / 68
14" / 350mm	132 / 61	N/A	165 / 75	187 / 85
16" / 400mm	209 / 96	N/A	262 / 120	294 / 134
18" / 450mm	260 / 119	N/A	313 / 143	345 / 157
20" / 500mm	329 / 150	N/A	381 / 174	413 / 188
24" / 600mm	573 / 261	N/A	683 / 311	715 / 325

Ordering

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

Valve Style
Give valve style code as follows:

BOS = Resilient Seated Butterfly Valve

Valve Size
Give valve size code as follows:

2	=	2"	50mm	10	=	10"	250mm
2.5	=	2.5"	65mm	12	=	12"	300mm
3	=	3"	80mm	14	=	14"	350mm
4	=	4"	100mm	16	=	16"	400mm
5	=	5"	125mm	18	=	18"	450mm
6	=	6"	150mm	20	=	20"	500mm
8	=	8"	200mm	24	=	24"	600mm

Body Style
Give body style code as follows:

CL = Center Line Seat

End Connection
Give end connection code as follows:

L1 = ASME Class125/150 Lugged Drilling

Body Material
Give body material code as follows:

DI = Ductile Iron

Seat, Shaft Material Combination
Give material code as follows:

NBR,NBR	=	Acrylonitrile-Butadiene -20° to 180°F (-29 to 82°C)
EPDM,EPDM	=	Terpolymer of Ethylene Propylene & A Diene -20° to 250°F (-29 to 121°C)

Trim Combination
Give Disc-Shaft material code as follows:

ALB-S15	=	Aluminum Bronze Disc and 420 Stainless Steel Shaft
DINY-S15	=	Ductile Iron Nylon 11 Coated Disc and 420 Stainless Steel Shaft
S2-S15	=	316 Stainless Steel Disc and 420 Stainless Steel Shaft

Ordering Example:

BOS,6,CL,L1,DI,NBR,NBR,DINY-S15*actuator

Manual Actuators

DeZURIK BOS-CL On-Center Resilient Seated Butterfly Valves are available with lever, handwheel or chainwheel manual operators.

Lever Actuators

Lever actuators are available on 2-6" (50-150mm) valve sizes, and feature mounting hole for installing lockout device. Lever actuators may be mounted at standard or 180° from standard. To order, add code LT to valve order code.

Valve Size	Order Code	Maximum Pressure Differential psi/kPa	
		Ductile Iron Nylon Coated (DINY) or Stainless Steel (S2) Disc	Aluminum Bronze (ALB) Disc
2-6" 50-150mm	LT	175 1210	150 1030

Ordering Example:
BOS,4,CL,L1,DI,NBR,NBR,DINY-S15*LT

Manual Gear Actuators

Manual gear actuators provide high torque for robust applications and a long service life without maintenance. Actuators provide visible indication of disc position. Adjustable open and closed position travel stops ensure proper disc seating.

Handwheel Actuator, 2-24" (50-600mm)

Valve Size	Order Code	Maximum Pressure Differential psi/kPa	
		Ductile Iron Nylon Coated (DINY) or Stainless Steel (S2) Disc	Aluminum Bronze (ALB) Disc
2-6" 50-150mm	AM-QT35-HD12	175 1210	150 1030
8 & 10" 200 & 250mm	AM-QT50-HD12	175 1210	150 1030
12" 300mm	AM-QT100-HD16	175 1210	150 1030
14" 350mm	AM-QT100-HD16	150 1030	150 1030
16-20" 400-500mm	AM-QT250-HD20	150 1030	150 1030
24" 600mm	AM-QT500-HD20	150 1030	150 1030

Chainwheel Actuator, 2-24" (50-600mm)

Valve Size	Order Code	Maximum Pressure Differential psi/kPa	
		Ductile Iron Nylon Coated (DINY) or Stainless Steel (S2) Disc	Aluminum Bronze (ALB) Disc
2-6" 50-150mm	AM-QT35-CW12	175 1210	150 1030
8 & 10" 200 & 250mm	AM-QT50-CW12	175 1210	150 1030
12" 300mm	AM-QT100-CW16	175 1210	150 1030
14" 350mm	AM-QT100-CW16	150 1030	150 1030
16-20" 400-500mm	AM-QT250-CW20	150 1030	150 1030
24" 600mm	AM-QT500-CW20	150 1030	150 1030

Ordering Example:
BOS,6,CL,L1,DI,NBR,NBR,DINY-S15*AM-QT35-HD12

Manual Actuator Accessories

Lockout Device

Manual gear actuators are available with an optional lockout on 2-24" (50-600mm) valves. Lockout is standard on sizes 26" (650mm) and larger. The lockout allows the handwheel to be locked with a padlock at any 1/8th turn increment. Lockouts may be ordered with a valve or separately as a kit. Padlock not included. To order, add code LK after the actuator order code.

Ordering Example:
BOS,6,CL,L1,DI,NBR,NBR,DINY-S15*AM-QT35-HD12,LK

Chain for Chainwheel Actuators

Chain for chainwheel actuators is sold as a separate item. To order, specify code from chart below and length.

Description	Usage	Order Code
Chain, Babbitt #1/0	AM-QT35	ACC*CN104
Chain, Babbitt #4/0	AM-QT50, AM-QT100, AM-QT250, AM-QT500	ACC*CN105

Ordering Example:
ACC*CN105
Chain: 1 piece 10 feet long

Cylinder Actuators

Compatible with Standard Actuators

The actuator mounting flange on BOS-CL valves is compatible with the ISO 5211/1 bolt pattern which increases flexibility and reduces inventory. Actuator options include PowerRac® double acting or spring return cylinders, Compak™ double acting and spring return cylinder, and G-Series cylinder actuators.

PowerRac® Cylinder Actuators

Double-acting and spring-return PowerRac® actuators feature a proven rack-and-pinion design ideally suited for high cycle applications. PowerRac® actuators provide high output torque for on-off applications and consistently high output torque throughout the full stroke for accurate control. Its durability is backed by a Lifetime Warranty.

Compak™ Cylinder Actuators

The compact, modular design allows the Compak™ actuator to be mounted for a low profile assembly. Compak™ actuators are a versatile double rack-and-pinion design and are available as double-acting or spring-return units.

G-Series Cylinder Actuators

G-Series actuators feature a rack-and-gear design for larger size rotary valves where constant high torque capability throughout the stroke is required. This double-acting actuator is available with either pneumatic or hydraulic supply.

Accessories

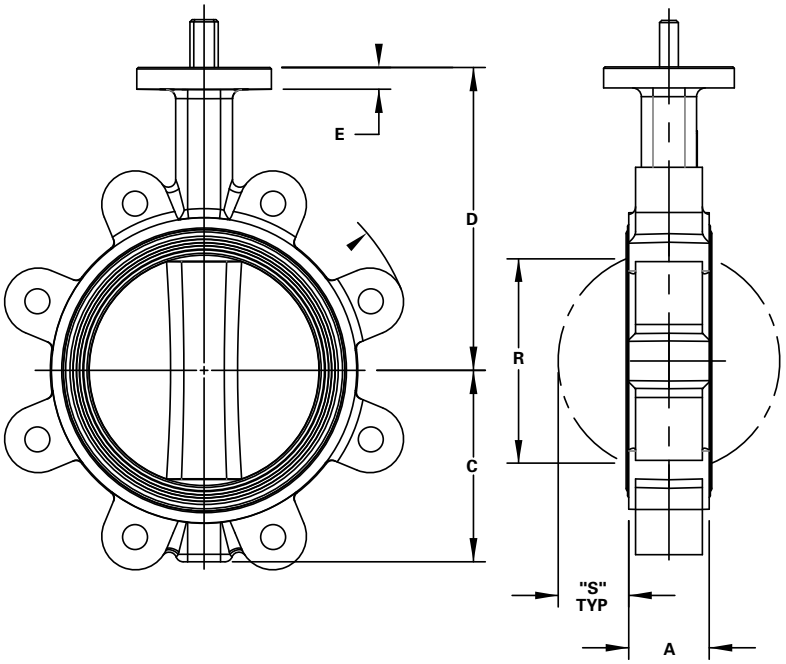
A full line of accessories are also available, including positioners, solenoids, switches, speed controls, floorstands and valves boxes.

Dimensions

Basic Valve, 2-24" (50-600mm)

Valve Size	Dimensions					
	A	C	D	E	R	S
2"	1.67	2.36	5.53	0.57	1.34	0.24
50mm	42	60	140	14	34	6
2.5"	1.79	2.76	6.02	0.57	1.85	0.39
65mm	45	70	153	14	47	10
3"	1.79	3.15	6.20	0.57	2.60	0.67
80mm	45	80	157	14	66	17
4"	2.02	3.54	6.93	0.57	3.62	1.06
100mm	51	90	176	14	92	27
5"	2.18	4.40	7.52	0.57	4.65	1.46
125mm	55	112	191	14	118	37
6"	2.18	5.04	7.97	0.57	5.75	1.97
150mm	55	128	202	14	146	50
8"	2.34	6.31	9.59	0.59	7.68	2.91
200mm	59	160	244	15	195	74
10"	2.65	7.76	10.75	0.59	9.65	3.70
250mm	67	197	273	15	245	94
12"	3.06	9.17	12.42	0.59	11.62	4.53
300mm	78	233	315	15	295	115
14"	3.06	10.51	13.78	0.59	12.78	5.12
350mm	78	267	350	15	325	130
16"	4.02	11.89	15.94	0.99	15.00	5.71
400mm	102	302	405	25	381	145
18"	4.41	12.99	16.61	0.99	16.85	6.50
450mm	112	330	422	25	428	165
20"	5.00	14.45	19.29	0.99	16.66	7.17
500mm	127	367	490	25	423	182
24"	5.98	17.56	22.54	0.99	22.83	8.62
600mm	152	446	573	25	580	219

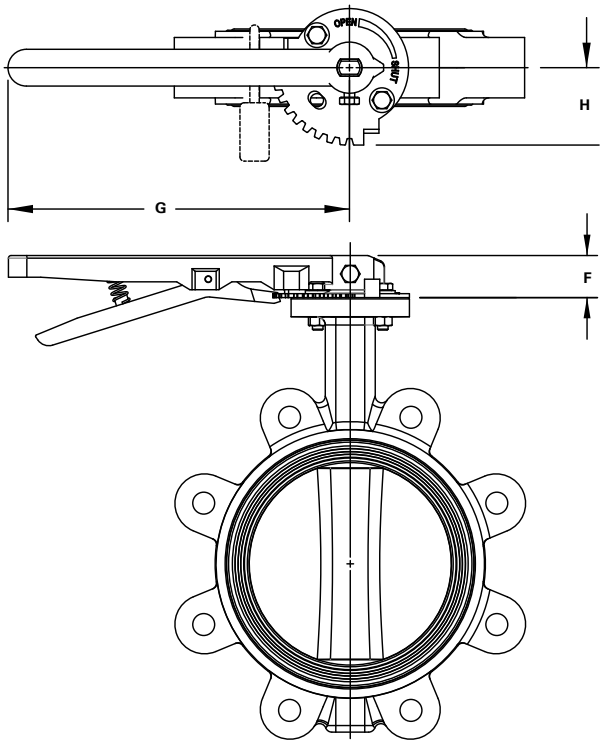
Inches
Millimeters



Lever Actuator

Valve Size	Dimensions		
	F	G	H
2-6"	1.26	10.24	2.32
50-150mm	32	260	59

Inches
Millimeters

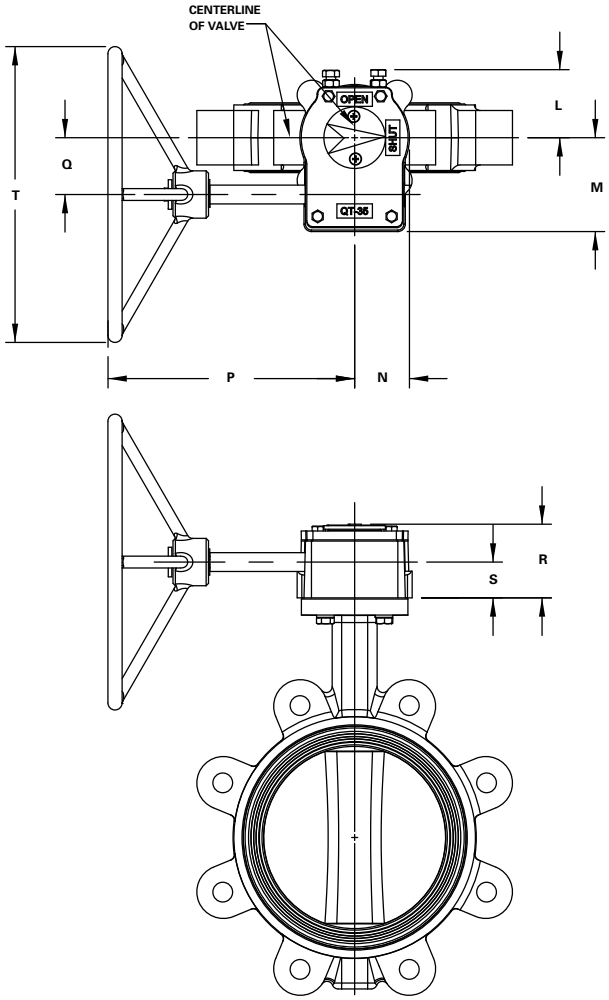


Dimensions

Handwheel Actuator, 2-24" (50-600mm)

Valve Size	Dimensions							
	L	M	N	P	Q	R	S	T
2-6"	2.26	3.12	1.82	8.21	1.89	2.45	1.19	12.00
50-150mm	57	79	46	209	48	62	30	305
8 & 10"	3.03	3.41	2.03	8.21	2.20	2.64	1.35	12.00
200 & 250mm	77	87	52	209	56	67	34	305
12 & 14"	4.19	4.65	3.37	12.54	3.09	3.31	1.65	16.00
300 & 350mm	106	118	86	319	78	84	42	406
16-20"	4.62	5.82	4.13	13.43	4.13	4.23	2.34	20.00
400-500mm	117	148	105	341	105	107	59	508
24"	5.57	10.06	5.57	15.93	8.15	4.95	2.15	20.00
600mm	141	256	141	405	207	126	55	508

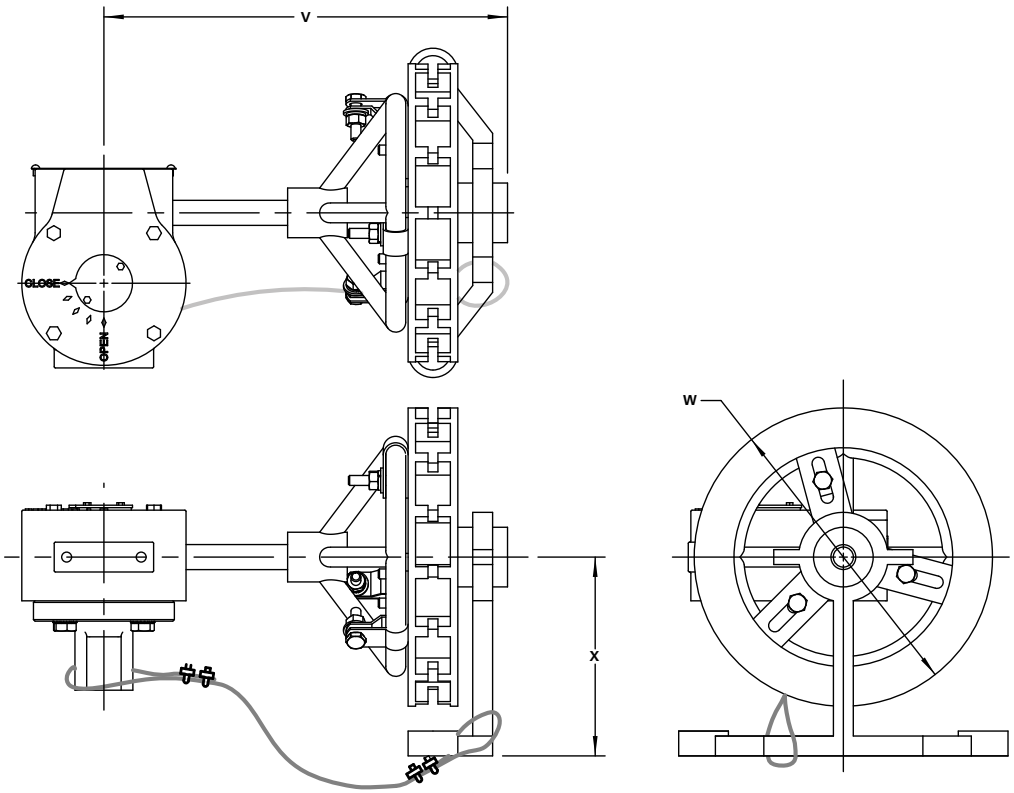
Inches
Millimeters



Chainwheel Actuator

Valve Size	Dimensions		
	V	W	X
2 & 10"	11.28	12.50	6.38
50 & 250mm	287	318	162
12-14"	15.53	15.50	8.38
300-350mm	394	394	213
16-20"	16.42	19.00	9.50
400-500mm	417	483	241
24"	16.75	19.00	9.50
600mm	425	483	241

Inches
Millimeters



Sales and Service

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