



KOREA UNICOM VALVE

Perfect harmony with Technology



■■■ Company Introduction

Since 1983, Korea Unicom Valve co., Ltd. (dba Unicom) has been manufacturing and supplying butterfly valves for a variety of industrial applications.

Unicom valve is specialized in triple offset type butterfly valve (TOD), and we supplied quality products proven on-site in the petrochemical, gas industry, chemical, energy, power plant, shipbuilding and other global markets with its unrivaled technical expertise and highly sophisticated design. TOD valves feature a special sealing mechanism consisting of an inclined conical disc and a laminated seat. TOD's unique characteristics are its low torque operation, reliable sealing and tight shut-off in both directions.

All butterfly valves manufactured by Unicom valve are designed according to API 609 standard. In addition, Unicom valve has wide range of certificates that assist you to use the butterfly valve where you need.

Furthermore, Unicom is striving in the R&D of future butterfly valves. Unicom is striving to develop and manufacture double / triple offset type butterfly valves through ceaseless R&D activities. We look forward to providing you with the highest quality butterfly valves based on our technological know-how and experience, from our modern facilities under stringent quality and HSE systems.



■■■ Company History

Year	Contents
1983	Established the Company as sales Representative of Foreign Valve Manufacturer
1997~1998	Registered the trademark 'Unicom' to the Patent Bureau.
	Construction of Incheon Plant, Korea.
	Manufacturing of 'High Performance' Butterfly Valve named 'High Seal'
	Authorized for ISO 9001 Certificate from B.V.
2000~2001	Authorized for 6D & ISO Certificate by API.
	Manufacturing Triple Offset Butterfly Valve Named 'Neo Seal'.
	Appointed as Qualified Vendor by K.O.C and Q.G.P.C
	Appointed as Qualified Vendor by K.N.P.C
2004	Type Approval Certificate from D.N.V
	Type Approval Certificate from B.V
	Certificate of Type Approval from A.B.S
	Appointed as Qualified Vendor by PETROPARS Ltd., NIOC, KALANAFT in IRAN.
2006~2010	Award 'One of the Most Contributed Exporter' by Korean Government
	Fire Safety ISO: VELOSI
	Acquisition of Environment Management System 'ISO 14001' from B.V.
	Construction of Dangjin plant, Korea
	Certificate of CE-PED from B.V.
	Certificate of Fugitive Emission From B.V
2012~2016	Appointed as Qualified Vendor by PETRONAS, PEMEX, PDVSA.
	Successful Exhibition of valve world 2012 in Australia
	Finely succeeding 5 big Projects in 6 months - SOGT, South Yoloten, IPC EVA, Chambers Works, HCC Orange Project
2014~2019	API 607, API 6FA Fire Safety Certificate from Velosi.
	BV MODE II SCHEME from BUREAU VERITAS
	KNPC Clean Fuels Project, Petronas Rapid MOV Package 5 Appointed as Qualified Vendor by Chevron.
2020~	Authorized for ISO 45001 Certificate from B.V.
	Certificate of Type Approval for Cryogenic butterfly valve From B.V

■ ■ ■ Why Unicom?



1 High quality and Cost effective design

- ▶ Unicom provides the highest quality and most cost effective design available on customer's spec.

2 Finding the best solution

- ▶ Unicom has the best solution to provide the valves in right valve and right place.

3 Various project experience

- ▶ Unicom has been participated many of the world's large projects over the past 30 years.

4 Proven performance

- ▶ Unicom's products had proven its quality, reliability and performance under the most demanding applications.

5 Short-term deliveries and customized valve

- ▶ Unicom offers the valve short-term deliveries available and can customize to customer requirements.

■ ■ ■ Valve Line Up



01 Eccentric Valve - API 609 Category B

1) Triple Offset Valve

- Metal & Graphite Seat
- Solid Metal Seat

2) Double Eccentric Valve

- Soft Seat
- Soft & Metal Seat
- Metal Seat / Metal & Metal Seat

02 Concentric Valve - API 609 Category A

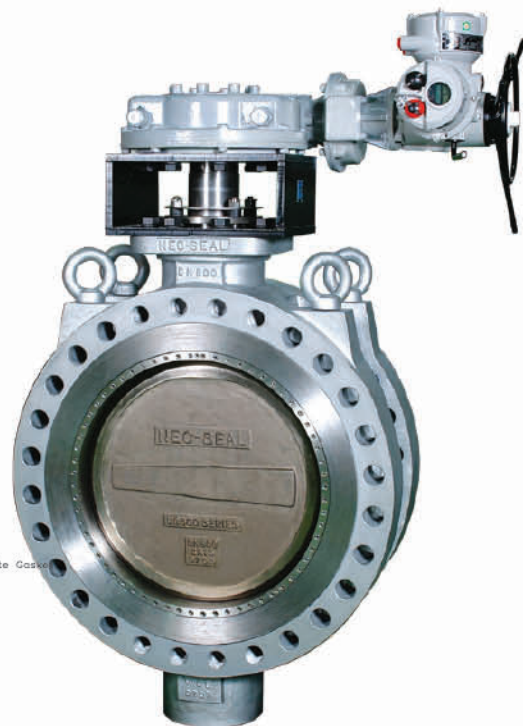
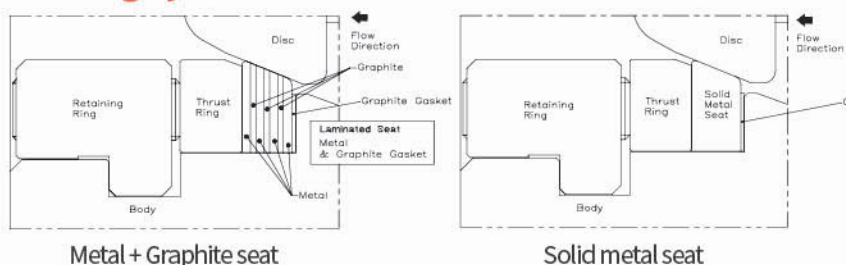
■ ■ ■ Eccentric valve

–API 609 Category B

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)

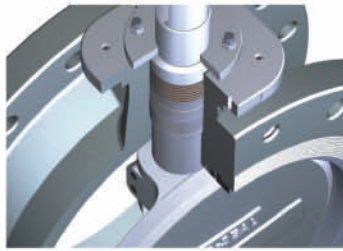
When triple offset Design is introduced to the market, Triple Offset Design (TOD) overcame the limitations of Double Offset Design. Double Offset Design is prone to excessive wear from friction and abrasion between sealing components. To eliminate problems, TOD features a special sealing mechanism that consists of an inclined conical disc and a laminated seat. The unique characteristics of TOD are low torque operation, broad sealing width and bi-directional shut-off.

▶ Sealing System



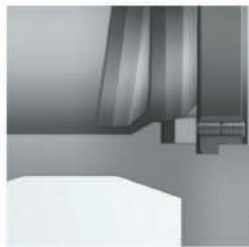
Type	Triple Offset Butterfly Valve
Design	ASME B16.34 / API std. 609
Rating	ASME CL 150,300,600,900,1500 PN10, 16,20,25,40,64,100
Size	DN80(3") to DN2000 (80")
Connection Type	Double Flanged / Lugged & Wafer / Butt Weld End
Temperature Range	-50°C ~450°C
Main Material	Body : WCB, CF8, CF8M etc. Disc : CF8, CF8M (With Stellite or ENP) etc. Shaft : 17-4PH, 316SS etc. Seat : 316ss + Graphite etc.
Operator	Manual Worm Gear Pneumatic Actuator Electric Actuator
Application	General Industrial & Petro Chemical Plant Oil Refinery / Production Gas / Pulp / Paper Industry Steel and Iron Mill / Shipbuilding District Heating / Water and Sewage Combined / Nuclear power plant Hydrocarbon storage and Transportation Sugar Industry / Other Plant engineering
Option	Stellite or ENP on Disc Anti-static device Manual operator with Locking device Bonnet / Stem extension Heating jacket ISO 15848 Fugitive Emission packing NACE MR 0103 / 0175

Sealing System



Double Offset Design uses a sealing mechanism that disc presses on to a metal seat. such design is prone to galling and scratches on sealing components. it eventually causes malfunctions of valves. This is where Unicom's Triple Offset Design has an advantage over Double Offset Design. Triple Offset Design is an elliptical sealing mechanism. it enables a seamless closure at the final position and operates with low torque as all contact surfaces of disc and seat immediately disengage upon opening. therefore, the sealing components are free from galling and scratches. Another important design point is that the seat ring is fixed in body by set screws with a retaining ring. Due to this unique design, the medium flows horizontally to the seat, which minimizes any possibilities of damage from medium.

Seat Mechanism



Laminated metal + graphite seat



Solid metal seat

LAMINATED SEAT RING IS COMPOSED OF ALTERNATING LAYERS OF METAL AND GRAPHITE

Laminated metal + graphite seat enables smooth mating, which makes TOD flawless not only in general application but also in LNG/LPG gas applications. Each individual layer serves a unique and independent sealing purpose. Along with Triple Offset Design, laminated seat ring shows excellent performance and help provide lower operating torque during opening and closing. Different types of materials are selected for laminated metal plate depending on applications.

SOLID METAL SEAT RING IS ALSO AVAILABLE

Solid metal seat can also be selected in Unicom's TOD design.

Currently, Unicom uses solid metal seats in heavy duty and high temperature applications.

FEATURES & BENEFITS

1. Bi-directional tight shut-off
2. Triple Offset Design with inclined conical sealing system.
3. Solid Metal or Laminated Metal + Graphite seat available.
4. Robust single piece shaft with shaft bearing extension to disc.
5. Genuine fire safety feature with Triple Offset Design.
6. One piece structure – No fasteners on disc. : Field repairable.
7. Provides non-friction motion.
8. Efficient with worm gear, electric, pneumatic or hydraulic actuators.
9. Availability for various applications using a wide range of materials.
10. Providing durability within a specific temperature range.
11. Inherit fire safety designed.

GENERAL APPLICATION

1. TOD butterfly valve is a field proven high quality butterfly valve developed based on the technology Unicom has acquired through experiences in the industrial applications.
2. Unicom customize valve to exact requirements of customers, which serve specific operating conditions of size, pressure and materials.
3. Triple Offset Design guarantees zero leakage in bi-directional application and provides a longer product life cycle as it is more resistant to problems of Double Offset Design.
4. While most triple offset designs are using a sealing mechanism of inclined surfaces of disc and seat, Unicom's TOD is designed with a curved seat with an inclined surface of disc to provide bubble tight sealing performance.

■ ■ ■ Eccentric valve

–API 609 Category B

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat) For Cryogenic Service

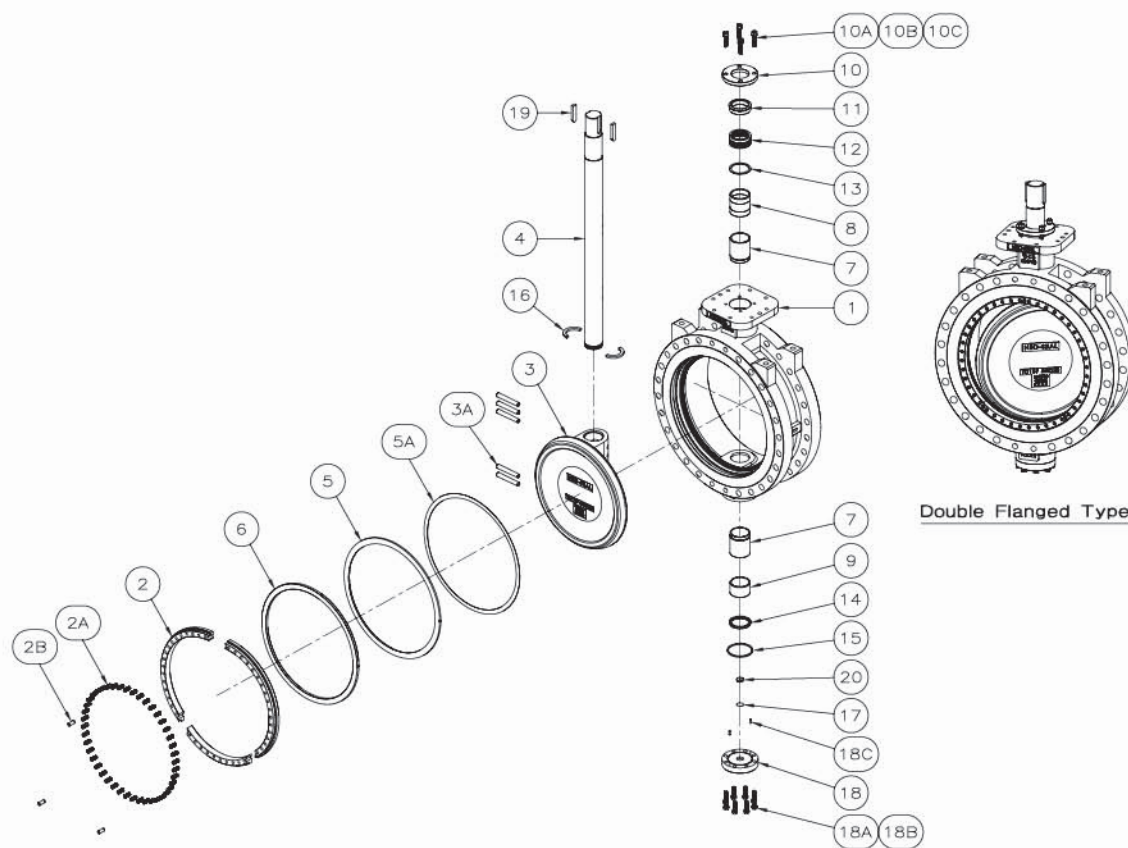
- TOD-CX is suitable for industrial cryogenic applications.
- Robust single piece shaft with shaft bearing extension to disc.
- Absolute Zero-Leakage (0mm³/s) -196°C using Laminated seat.
- Clean booth exclusively for assembly of cryogenic valves.
- Genuine fire safety feature with Triple Offset Design.
- Friction-less design allows a low torque operation.
- Customizing capability of pressure, size and materials.
- Extended bonnet prevents any packing deformations.
- Unicom's stringent quality inspection and testing.
- Manufacturing expertise from casting to assembly.
- Field-proven technology and Superior customer service.



Type	Triple Offset Butterfly Valve for Cryogenic Service
Design	ASME B16.34 / API std. 609 / BS 6364
Rating	ASME CL 150,300,600,900 PN10, 16, 20, 25, 40, 64, 100
Size	DN80(3") to DN1200 (48")
Connection Type	Double Flanged / Lugged & Wafer / Butt Weld End
Temperature Range	-196°C ~250°C
Main Material	Body : CF8, CF8M, CF3, CF3M etc. Extended Bonnet : CF8, CF8M, CF3, CF3M etc. Disc : CF8, CF8M, CF3, CF3M (With Stellite or ENP) etc. Shaft : XM-19, 17-4PH, 316SS etc. Seat : 316ss + Graphite, PCTFE, PTFE etc.
Operator	Manual Worm Gear Pneumatic Actuator Electric Actuator
Application	Cryogenic Application Industry All liquid Gases Gasification Plants and Storage LPG/LNG Storage and Transportation Plant Engineering Petrochemical Plant Gas Industry Ship Building Chemical Plant
Option	Stellite or ENP on Disc Anti-static device Manual operator with Locking device Bonnet / Stem extension Heating jacket ISO 15848 Fugitive Emission packing NACE MR 0103 / 0175

■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)



Double Flanged Type

Parts List

Part No.	Designation
1	Double Flanged Body
2	Retaining Ring
2A	Set Screw
2B	Parallel Pin
3	Disc
3A	Disc Taper Pin
4	Shaft
5	Seat Ring
5A	Seat Gasket
6	Thrust Ring
7	Shaft Bearing
8	Shaft Upper Bush
9	Shaft Lower Bush
10	Gland Flange
10A	Stud Bolt
10B	Hex. Nut
10C	Spring Washer
11	Packing Gland
12	Gland Packing
13	Packing Retainer
14	Shaft Lower Ring
15	Bottom Packing
16	Shaft Retainer
17	Shaft Spacer
18	Bottom Plug
18A	Hex. Bolt
18B	Spring Washer
18C	Parallel Pin
19	Key
20	Thrust Collar

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Carbon Steel Steel Casting	A216 Gr. WCB / WCC A217 Gr. WC6 / WC9
2	Retaining Ring	Carbon Steel Stainless Steel	A515 Gr. 60 / 70 A240 Tp. 304
2A	Set Screw	Stainless Steel	A193 Gr. B8 / A2-70
2B	Parallel Pin	Stainless Steel	A276 Tp. 304
3	Disc	Carbon Steel & Hard Facing Stainless Steel & Hard Facing	A216 Gr. WCB & STELLITE A351 Gr. CF8 / CF8M & STELLITE
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH Inconel 718	A564 Tp. 630 B637 UNS N07718
5	Seat Ring (Laminated Seat)	Stainless Steel & Graphite	A240 Tp. 316L & GRAPHITE
5A	Seat Ring (Solid Metal Seat)	Inconel 625 & Graphite Stainless Steel	B443 UNS N06625 & GRAPHITE A240 Tp. 316L
5A	Seat Gasket	Inconel 625	B443 UNS N06625
6	Thrust Ring	Graphite	GRAPHITE
7	Shaft Bearing	Carbon Steel Stainless Steel	A515 Gr. 60 / 70 A240 Tp. 304
8	Shaft Upper Bush	Stainless Steel	A276 Tp. 316 & Hard Chromium Plating
9	Shaft Lower Bush	Stainless Steel	A276 Tp. 316 & Hard Chromium Plating

Part No.	Designation	Specification	Material ASTM
10	Gland Flange	Stainless Steel	A276 Tp. 304
10A	Stud Bolt	Stainless Steel	A193 Gr. B8 / A2-70
10B	Hex. Nut	Stainless Steel	A194 Gr. 8 / A2-70
10C	Spring Washer	Stainless Steel	A167 Tp. 304
11	Packing Gland	Stainless Steel	A276 Tp. 316
12	Gland Packing	Grafoil	GRAFOIL
13	Packing Retainer	Stainless Steel	A276 Tp. 316
14	Shaft Lower Ring	Stainless Steel	A276 Tp. 316
15	Bottom Packing	Grafoil	GRAFOIL
16	Shaft Retainer	Stainless Steel	A276 Tp. 316
17	Shaft Spacer	Stainless Steel	A276 Tp. 316
18	Bottom Plug	Carbon Steel Stainless Steel	A515 Gr. 60 / 70 A276 Tp. 304
18A	Hex. Bolt	Stainless Steel	A193 Gr. B8 / A2-70
18B	Spring Washer	Stainless Steel	A167 Tp. 304
18C	Parallel Pin	Stainless Steel	A276 Tp. 304
19	Key	Carbon Steel	A576 Gr. 1045
20	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
18C	Parallel Pin	10" ~ 48"	6" ~ 38"	6" ~ 36"
20	Thrust Collar	10" ~ 48"	6" ~ 38"	6" ~ 36"

■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Stainless Steel	A351 Gr. CF8 / CF8M
2	Retaining Ring	Stainless Steel	A240 Tp. 304 / 316
2A	Set Screw	Stainless Steel	A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
2B	Parallel Pin	Stainless Steel	A276 Tp. 304 / 316
3	Disc	Stainless Steel & Hard Facing	A351 Gr. CF8 / CF8M & STELLITE
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH	A564 Tp. 630
		Stainless Steel	A276 Tp. XM-19
		Inconel 718	B637 UNS N07718
5	Seat Ring (Laminated Seat)	Stainless Steel & Graphite	A240 Tp. 316L & GRAPHITE
		Inconel 625 & Graphite	B443 UNS N06625 & GRAPHITE
	Seat Ring (Solid Metal Seat)	Stainless Steel	A240 Tp. 316L
		Inconel 625	B443 UNS N06625
5A	Seat Gasket	Graphite	GRAPHITE
6	Thrust Ring	Stainless Steel	A240 Tp. 304 / 316
7	Shaft Bearing	Stainless Steel	A276 Tp. 316 & Hard Chromium Plating
8	Shaft Upper Bush	Stainless Steel	A276 Tp. 316 & Hard Chromium Plating
9	Shaft Lower Bush	Stainless Steel	A276 Tp. 316 & Hard Chromium Plating
10	Gland Flange	Stainless Steel	A276 Tp. 304 / 316

Part No.	Designation	Specification	Material ASTM
11	Packing Gland	Stainless Steel	A276 Tp. 316
12	Gland Packing	Grafoil	GRAFOIL
13	Packing Retainer	Stainless Steel	A276 Tp. 316
14	Shaft Lower Ring	Stainless Steel	A276 Tp. 316
15	Bottom Packing	Grafoil	GRAFOIL
16	Shaft Retainer	Stainless Steel	A276 Tp. 316
17	Shaft Spacer	Stainless Steel	A276 Tp. 316
18	Bottom Plug	Stainless Steel	A276 Tp. 304 / 316
18A	Hex. Bolt	Stainless Steel	A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
18B	Spring Washer	Stainless Steel	A167 Tp. 304 / 316
18C	Parallel Pin	Stainless Steel	A167 Tp. 304 / 316
19	Key	Carbon Steel	A576 Gr. 1045
20	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

▲ Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
18C	Parallel Pin	10" ~ 48"	6" ~ 38"	6" ~ 36"
20	Thrust Collar	10" ~ 48"	6" ~ 38"	6" ~ 36"

■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)

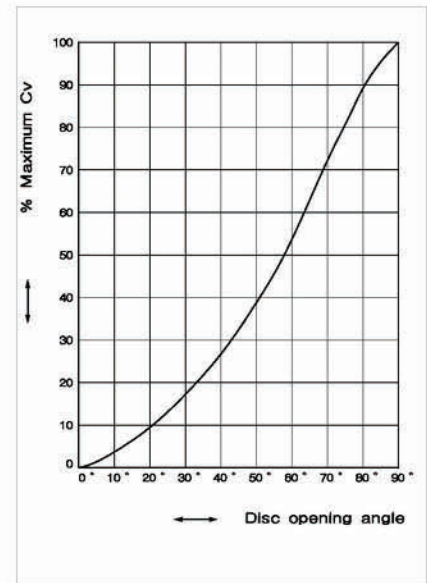
Cv-Value

The Cv flow coefficient, often used for control valves is defined as the flow of water at 60°F (16°C) in gallons per minute, at a pressure drop of 1psi across the valve.

ASME Class 150

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc								
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
3in	DN80	CV KV	4.7 4	16.6 14.2	33.1 28.4	52.1 44.6	78.3 67.1	110 95	190 165	210 180	240 210
4in	DN100	CV KV	8.4 7.2	29.3 25.1	58.6 50.2	92 78.7	140 120	200 175	330 285	370 320	420 360
5in	DN125	CV KV	13.8 11.8	48.4 41.5	96.5 82.7	160 140	230 200	330 285	550 475	610 525	700 600
6in	DN150	CV KV	20.9 17.9	73.7 65	150 130	230 200	350 300	500 430	820 705	930 800	1050 900
8in	DN200	CV KV	38.2 32.7	140 120	270 235	420 360	640 550	900 775	1500 1285	1690 1450	1920 1645
10in	DN250	CV KV	59 50.6	210 180	410 355	650 560	970 835	1370 1175	2280 1955	2570 2205	2920 2505
12in	DN300	CV KV	88.4 75.7	310 270	620 535	980 840	1460 1255	2080 1785	3450 2960	3890 3335	4420 3790
14in	DN350	CV KV	110 94.3	390 335	770 660	1200 1030	1800 1545	2570 2205	4260 3650	4800 4115	5460 4680
16in	DN400	CV KV	150 130	530 455	1060 910	1660 1425	2490 2135	3540 3035	5870 5030	6620 5675	7520 6445
18in	DN450	CV KV	200 175	700 600	1390 1195	2180 1870	3260 2795	4640 3980	7700 6600	8690 7450	9870 8460
20in	DN500	CV KV	270 235	930 800	1850 1585	2900 2485	4350 3730	6190 5305	10300 8830	11600 9940	13200 11300
22in	DN550	CV KV	341 292	1183 1014	2366 2027	3718 3186	5577 4779	7943 6806	13182 11296	14872 12744	16900 14482
24in	DN600	CV KV	420 360	1450 1245	2890 2480	4530 3885	6800 5830	9680 8295	16100 13800	18100 15500	20600 17700
26in	DN650	CV KV	490 420	1720 1475	3430 2940	5390 4620	8090 6935	11500 9875	19100 16400	21600 18500	24500 21000
28in	DN700	CV KV	570 490	1990 1705	3980 3410	6260 5365	9380 8040	13400 11500	22200 19000	25000 21400	28400 24300
30in	DN750	CV KV	660 570	2300 1975	4600 3945	7230 6195	10800 9290	15400 13200	25600 22000	28900 24800	32800 28100
32in	DN800	CV KV	810 695	2820 2420	5630 4825	8840 7575	13300 11400	18900 16200	31400 26900	35400 30300	40200 34400
34in	DN850	CV KV	950 815	3300 2830	6590 5650	10400 8900	15500 13300	22100 19000	36700 31500	41400 35500	47000 40300
36in	DN900	CV KV	1080 925	3780 3240	7550 6470	11900 10200	17800 15300	25300 21700	42100 36100	47400 40700	53900 46200
38in	DN950	CV KV	1210 1040	4200 3600	8400 7200	13200 11300	19800 17000	28200 24200	46800 40100	52800 45200	60000 51400
40in	DN1000	CV KV	1380 1185	4810 4125	9610 8235	15100 12900	22600 19400	32300 27600	53600 46000	60400 51800	68600 58800
42in	DN1050	CV KV	1480 1270	5150 4415	10300 8830	16200 13900	24300 20800	34600 29600	57400 49200	64700 55500	73500 63000
44in	DN1100	CV KV	1710 1465	5970 5120	11900 10200	18800 16100	28100 24100	40100 34400	66600 57100	75000 64300	85300 73100
46in	DN1150	CV KV	1940 1665	6800 5830	13600 11700	21400 18300	32100 27500	45600 39100	75700 64900	85400 73200	97000 83100
48in	DN1200	CV KV	2040 1750	7140 6120	14300 12300	22400 19200	33700 28900	48000 41100	79500 68100	89700 76900	102000 87400

FLOW CHARACTERISTIC



■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)

Cv-Value

The Cv flow coefficient, often used or control valves is defined as the flow of water at 60°F(16°C) in gallons per minute, at a pressure drop of 1psi across the valve.

ASME Class 300

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc									
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°	
3in	DN80	CV	4.4	15.6	31.5	47.6	74.5	110	180	200	230	
		KV	3.4	13.3	26.9	40.7	63.8	95	155	170	200	
4in	DN100	CV	8	27.9	55.8	90	130	190	310	350	400	
		KV	6.8	23.9	47.8	77.1	110	160	270	300	340	
5in	DN125	CV	13.1	46	92	150	220	310	520	580	670	
		KV	11.2	39.4	80	128	190	260	450	500	570	
6in	DN150	CV	19.9	70	140	220	330	480	780	890	1000	
		KV	17	59.9	120	190	280	410	670	760	870	
8in	DN200	CV	36.3	130	260	400	610	860	1430	1600	1830	
		KV	31	110	220	340	520	740	1220	1370	1670	
10in	DN250	CV	56	200	390	620	920	1300	2170	2450	2780	
		KV	47.9	170	330	530	790	1100	1860	2100	2380	
12in	DN300	CV	84	290	590	930	1400	1980	3290	3700	4200	
		KV	71.9	250	500	800	1200	1700	2820	3170	3600	
14in	DN350	CV	100	370	730	1140	1700	2500	4060	4570	5200	
		KV	85.6	320	620	980	1460	2140	3480	3900	4450	
16in	DN400	CV	140	480	960	1500	2300	3220	5340	6020	6840	
		KV	120	410	820	1280	1970	2760	4580	5160	5860	
18in	DN450	CV	180	640	1260	2000	3000	4220	7000	7900	9000	
		KV	150	550	1080	1710	2570	3620	6000	6770	7710	
20in	DN500	CV	240	840	1680	2600	3950	5630	9300	10500	12000	
		KV	205	720	1440	2230	3380	4820	8000	9000	11280	
24in	DN600	CV	380	1300	2630	4200	6200	8800	14600	16500	18700	
		KV	325	1110	2250	3600	5300	7540	12500	14000	16000	
26in	DN650	CV	450	1560	2860	4900	7350	10400	17300	19600	22300	
		KV	385	1340	2450	4200	6300	8900	14800	16800	19100	
28in	DN700	CV	520	1800	3620	5690	8530	12100	20200	22700	25800	
		KV	445	1540	3100	4900	7300	10400	17300	19400	22100	
30in	DN750	CV	600	2090	3800	6600	9800	14000	23300	26200	29800	
		KV	510	1790	3260	5700	8400	12000	20000	22400	25500	
32in	DN800	CV	740	2600	5220	8040	12000	17200	28500	32200	36500	
		KV	630	2230	4470	7000	10800	14700	24400	27600	31300	
34in	DN850	CV	860	3000	6000	9400	14000	20000	33400	37600	42700	
		KV	740	2570	5140	8050	12000	17100	28600	32200	36600	
36in	DN900	CV	980	3440	6900	10800	16100	23000	38300	43000	49000	
		KV	840	2950	5900	9250	13800	19700	32800	36800	42000	
38in	DN950	CV	1100	3820	7640	12000	18000	25600	42500	48000	54500	
		KV	940	3270	6550	10300	15400	22000	36400	41100	46700	
40in	DN1000	CV	1150	4000	8000	12600	18800	26900	44700	50300	57200	
		KV	990	3430	6850	10800	16100	23000	38300	43100	49000	
42in	DN1050	CV	1230	4200	8580	13500	20200	28800	47800	53900	61200	
		KV	1050	3600	7350	11600	17300	24700	41000	46100	52400	
44in	DN1100	CV	1430	5000	9920	15700	23400	33400	55500	62800	71000	
		KV	1220	4280	8500	13500	20000	28600	47500	53400	60800	
46in	DN1150	CV	1620	5660	7500	17800	26700	38000	63000	71100	80800	
		KV	1390	4850	6430	15300	22900	32600	54000	60900	69200	
48in	DN1200	CV	1700	5950	12000	18700	28000	40000	66200	74700	85000	
		KV	1460	5100	10300	16000	24000	34300	57000	64000	72800	

ASME Class 600

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc									
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°	
3in	DN80	CV	3.5	10.2	18.3	29.3	43.9	61.5	102	115	130	
		KV	3	8.7	15.6	25	37.5	52.6	87.2	98.3	111	
4in	DN100	CV	5	15.9	28.6	45.9	68.9	96.4	160	205	230	
		KV	4.3	13.6	24.4	39.2	58.9	82.4	137	175	197	
5in	DN125	CV	9.3	29	51.3	80	120	170	285	370	480	
		KV	7.9	24.8	43.8	68.4	102.7	145.5	244	316	410	
6in	DN150	CV	17.4	61.4	120	190	290	420	680	770	870	
		KV	14.8	60	100	160	250	360	580	660	750	
8in	DN200	CV	27.2	100	200	300	460	640	1070	1200	1370	
		KV	23.3	9	170	260	390	550	920	1030	1170	
10in	DN250	CV	42	150	290	460	690	980	1630	1840	2090	
		KV	36	90	250	390	590	840	1340	2205	1800	
12in	DN300	CV	58.9	200	410	650	970	1390	2300	2600	2950	
		KV	50.4	170	350	560	830	1190	1970	2230	2530	
14in	DN350	CV	73	260	510	800	1200	1710	2840	3200	3640	
		KV	62.5	220	440	680	1030	1460	2430	2740	3200	
16in	DN400	CV	100	350	700	1100	1660	2360	3910	4410	5010	
		KV	90	300	600	940	1420	2020	3350	3780	4300	
18in	DN450	CV	120	440	870	1360	2040	2900	4810	5430	6170	
		KV	100	380	750	1160	1750	2490	4120	4650	5290	
20in	DN500	CV	170	580	1160	1810	2720	3870	6440	7250	8250	
		KV	150	500	990	1550	2330	3320	5520	6200	7070	
24in	DN600	CV	260	900	1800	2830	4250	6050	10000	11300	12900	
		KV	220	780	1500	2420	3640	5180	8570	9680	11000	
26in	DN650	CV	300	1070	2140	3370	5060	7200	11900	13500	15300	
		KV	260	920	1830	2890	4330	6170	10200	11600	13000	
28in	DN700	CV	340	1170	2340	3700	5520	7880	13000	14700	16700	
		KV	290	1000	2020	3170	4730	6750	11100	12600	14300	
30in	DN750	CV	390	1350	2700	4250	6350	9060	15000	17000	19300	
		KV	330	1160	2300	3640	5440	7760	12800	14600	16500	
32in	DN800	CV	470	1660	3310	5200	7820	11100	18400	20800	23600	
		KV	400	1420	2840	4450	6700	9500	15800	17800	20200	
34in	DN850	CV	540	1880	3760	5940	8860	12600	21000	23600	26900	
		KV	460	1610	3220	5090	7600	10800	18000	20200	23000	
36in	DN900	CV	620	2160	4300	6800	10200	14500	24000	27000	30800	
		KV	530	1850	3700	6070	8740	12400	20600	23100	26400	

■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)

Pressure – Temperature Rating

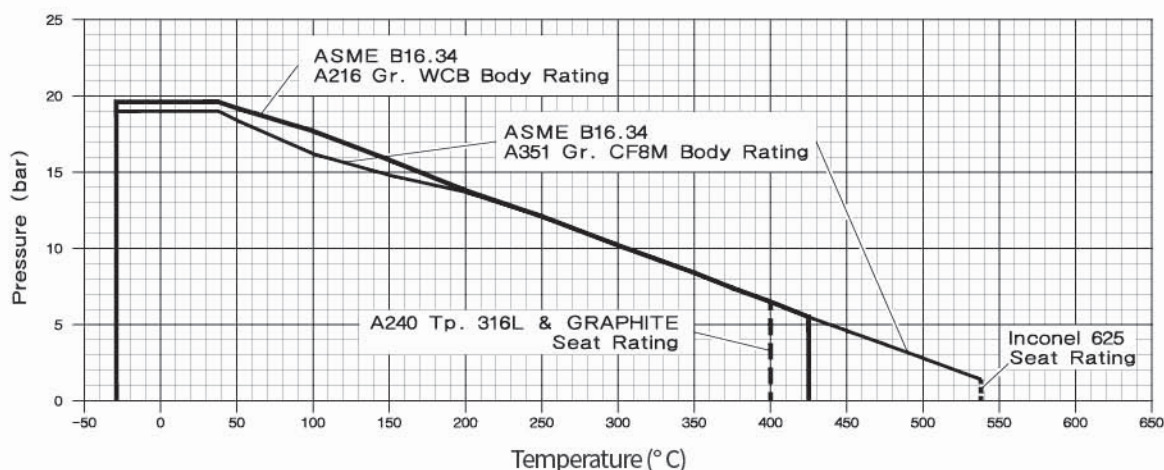
ASME Class 150

Temperature	°F	-20	100	122	212	302	392	482	572	617	662	707	752	797	842	887	932	1000
	°C	-29	38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538
Working Pressures (bar)	A216 Gr. WCB ¹⁾	19.6	19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.4	6.5	5.5	4.6	3.7	2.8	1.4
	A351 Gr. CF8M ²⁾	19	19	18.4	16.2	14.8	13.7	12.1	10.2	9.3	8.4	7.4	6.5	5.5	4.6	3.7	2.8	1.4

1) Upon prolonged exposure to temperatures above 425 °C, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 425 °C.

2) At temperatures above 538 °C, use only when the carbon content is 0.04% or higher.

3) Not to be used over 645 °C. Alloy N06625 in the annealed condition is subject to severe loss of impact strength at room temperatures after exposure in the range of 538 °C to 760 °C.



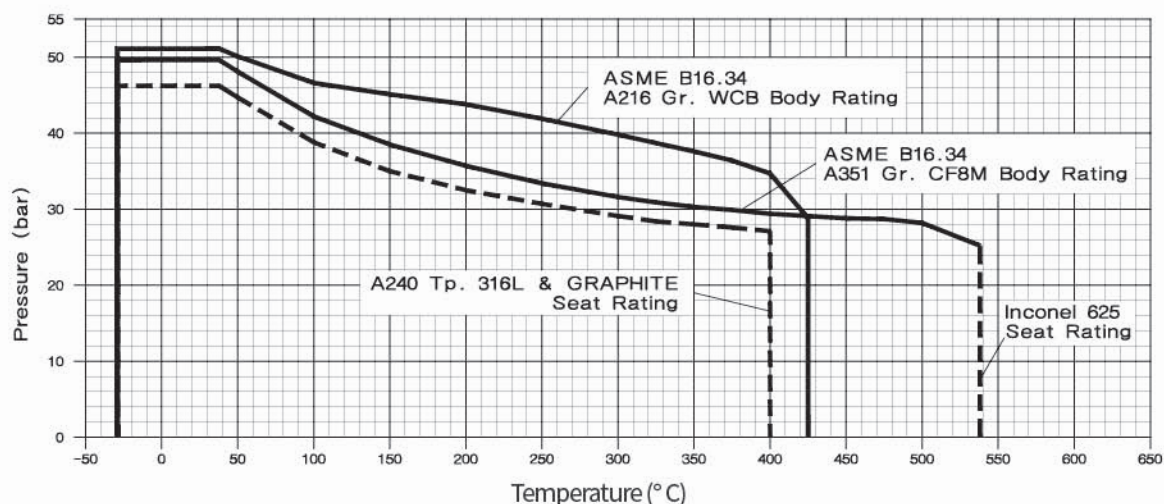
ASME Class 300

Temperature	°F	-20	100	122	212	302	392	482	572	617	662	707	752	797	842	887	932	1000
	°C	-29	38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538
Working Pressures (bar)	A216 Gr. WCB ¹⁾	51.1	51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6	36.4	34.7	28.8	23	17.4	11.8	5.9
	A351 Gr. CF8M ²⁾	49.6	49.6	48.1	42.2	38.5	35.7	33.4	31.6	30.9	30.3	29.9	29.4	29.1	28.8	28.7	28.2	25.2

1) Upon prolonged exposure to temperatures above 425 °C, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 425 °C.

2) At temperatures above 538 °C, use only when the carbon content is 0.04% or higher.

3) Not to be used over 645 °C. Alloy N06625 in the annealed condition is subject to severe loss of impact strength at room temperatures after exposure in the range of 538 °C to 760 °C.



■ ■ ■ Data Sheet

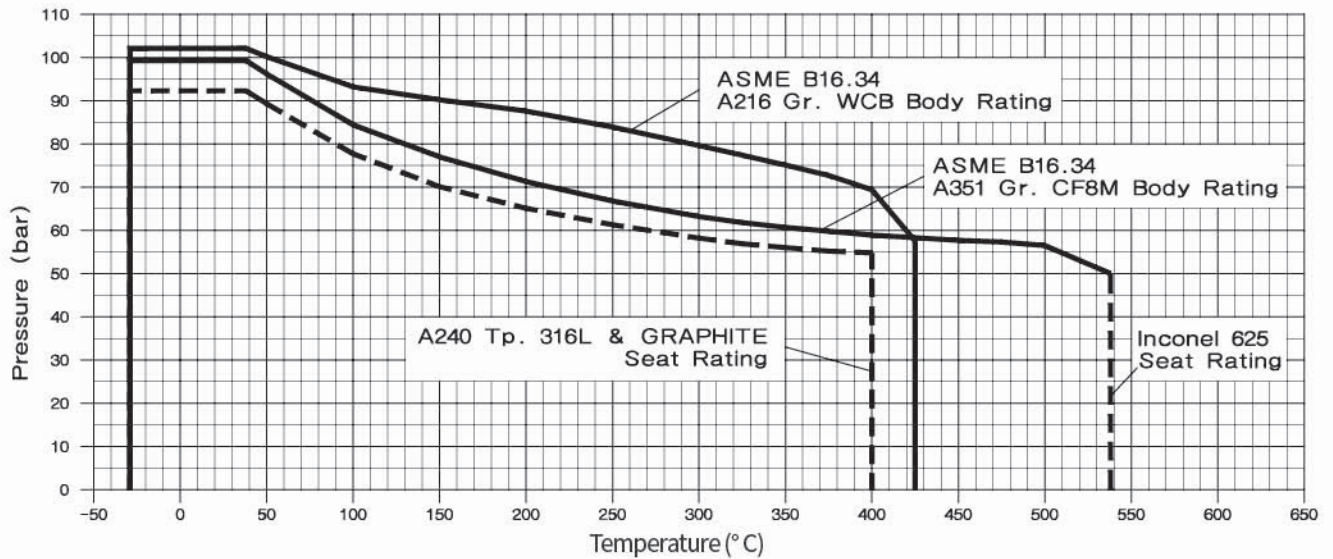
▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat)

Pressure – Temperature Rating

ASME Class 600

Temperature	°F	-20	100	122	212	302	392	482	572	617	662	707	752	797	842	887	932	1000
	°C	-29	38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538
Working Pressures (bar)	A216 Gr. WCB ¹⁾	102.1	102.1	100.2	93.2	90.2	87.6	83.9	79.6	77.4	75.1	72.7	69.4	57.5	46	34.9	23.5	11.8
	A351 Gr. CF8M ²⁾	99.3	99.3	96.2	84.4	77	71.3	66.8	63.2	61.8	60.7	59.8	58.9	58.3	57.7	57.3	56.5	50

- 1) Upon prolonged exposure to temperatures above 425 °C, the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 425 °C.
 2) At temperatures above 538 °C, use only when the carbon content is 0.04% or higher.
 3) Not to be used over 645 °C. Alloy N06625 in the annealed condition is subject to severe loss of impact strength at room temperatures after exposure in the range of 538 °C to 760 °C.



■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat) Torque Table

ASME Class 150

VALVE SIZE		5 bar	10 bar	15 bar	20 bar
NPS	DN	N·m	N·m	N·m	N·m
3 in	DN80	105	105	138	161
4 in	DN100	155	161	227	292
6 in	DN150	257	270	379	504
8 in	DN200	653	682	885	1146
10 in	DN250	897	1474	1626	2032
12 in	DN300	1178	2178	2892	3427
14 in	DN350	1212	2424	3232	4202
16 in	DN400	1980	2730	3740	4891
18 in	DN450	2840	3976	5264	6986
20 in	DN500	3329	4586	6859	9100
22 in	DN550	3830	6561	9852	13709
24 in	DN600	4332	8536	12845	18318
28 in	DN700	7414	13851	20783	24416
30 in	DN750	9452	17671	26512	31223
32 in	DN800	10945	20436	30645	36085
34 in	DN850	13055	24373	36561	42957
36 in	DN900	16074	29974	44470	52796
38 in	DN950	17716	32971	49397	58018
40 in	DN1000	21224	39466	59131	69290
42 in	DN1050	25475	47330	70908	82949
48 in	DN1200	37209	69014	103378	120555

Shaft Material			
A564 Tp.630	A276 Tp.XM-19	B637 UNS N07718	A276 UNS S31803
N·m	N·m	N·m	N·m
467	245	666	289
1010	529	1440	624
1757	921	2506	1086
3100	1625	4421	1915
5467	2865	7797	3378
5467	2865	7797	3378
10852	5688	15477	6706
10852	5688	15477	6706
22392	11736	31936	13837
22392	11736	31936	13837
37509	19660	53496	23178
37509	19660	53496	23178
55845	29271	79647	34509
93047	48770	132705	57497
93047	48770	132705	57497
127869	67021	182368	79015
127869	67021	182368	79015
127869	67021	182368	79015
165709	86854	236335	102397
216294	113368	308481	133655
338789	177572	483183	209348

ASME Class 300

VALVE SIZE		10bar	20 bar	30 bar	40 bar	50 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m
3 in	DN80	92	183	275	366	458
4 in	DN100	157	312	467	622	767
6 in	DN150	330	657	984	1312	1641
8 in	DN200	657	1307	1958	2609	3264
10 in	DN250	1616	2262	3151	3717	4848
12 in	DN300	2156	2816	3168	3740	5945
14 in	DN350	2616	4399	5945	6540	7253
16 in	DN400	3093	6142	9192	11361	13747
18 in	DN450	4092	8122	12152	16182	20240
20 in	DN500	7238	13609	17661	20949	25651
24 in	DN600	12221	19095	23169	25715	31061
28 in	DN700	13835	22865	33611	40767	52675
30 in	DN750	16773	29755	43783	53019	68533
38 in	DN950	29756	52834	77839	94054	121631

Shaft Material			
A564 Tp.630(H1150)	A276 Tp.XM-19	B637 UNS N07718	A276 UNS S31803
N·m	N·m	N·m	N·m
1010	529	1440	624
1757	921	2506	1086
5467	2865	7797	3378
5467	2865	7797	3378
10852	5688	15477	6706
10852	5688	15477	6706
22392	11736	31936	13837
22392	11736	31936	13837
37509	19660	53496	23178
55845	29271	79647	34509
93047	48770	132705	57497
127869	67021	182368	79015
165709	86854	236335	102397
338789	177572	483183	209348

■ ■ ■ Data Sheet

▶ Triple Offset Valve (Metal & Graphite Seat / Solid Metal Seat) Torque Table

ASME Class 600

VALVE SIZE		30bar	50 bar	70 bar	90 bar	110 bar	Shaft Material			
NPS	DN	N·m	N·m	N·m	N·m	N·m	A564Tp.630(H1150)	A276 Tp.XM-19	B637 UNS N07718	A276 UNS S31803
		N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m
6 in	DN150	690	966	1200	1504	1573	5467	2865	7797	3378
8 in	DN200	1142	1642	1964	3035	3213	10852	5688	15477	6706
10 in	DN250	1750	2275	2625	4200	5075	22392	11736	31936	13837
12 in	DN300	3185	4331	5096	6115	7262	37509	19660	53496	23178
14 in	DN350	3745	4587	6314	7160	8204	37509	19660	53496	23178
16 in	DN400	4304	4842	7532	8205	9146	55845	29271	79647	34509
18 in	DN450	6874	9166	11457	13748	15276	93047	48770	132705	57497
20 in	DN500	11969	18919	20077	22780	25869	127869	67021	182368	79015
24 in	DN600	23891	34379	41581	53040	64540	216294	113368	308481	133655
28 in	DN700	31441	45105	54118	58940	83814	338789	177572	483183	209348
30 in	DN750	33251	48365	55922	64990	89173	338789	177572	483183	209348
32 in	DN800	41908	60193	72135	91920	111772	453732	237818	647115	280375
36 in	DN900	53960	77486	92852	118308	143853	453732	237818	647115	280375

Contact for TOD CX valve torque value.

■ ■ ■ Eccentric valve

–API 609 Category B

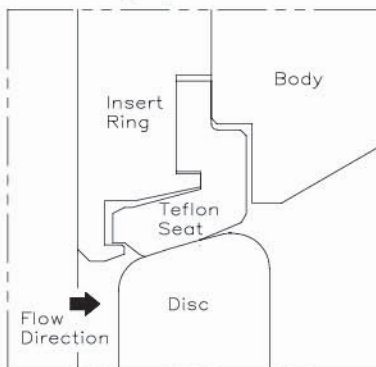
► Double Offset Valve

Soft Seat Valve (GTD Valve)

Soft Seat designed for critical requirements has proven its reliability and efficiency in a wide range of application for more than 25 years. Mechanism with an eccentric structure minimizes an on-off torque at high pressure, providing tight shut-off.

Carbon steel and stainless steel are standard materials for body and trim with a Teflon seat. Other special materials or particular treatment on trim and body are available as per the application and service.

► Sealing System



Type	Double Offset Butterfly Valve – Soft Seat
Design	ASME B16.34 / API std. 609
Rating	ASME Cl. 150 / Cl. 300 / Cl. 600 PN 10, 16, 25, 40, 60, 64 JIS 10K, 16K, 20K
Size	DN50(2") to DN1800 (72")
Connection Type	Double Flanged / Lugged & Wafer
Temperature Range	-40°C to 250°C
Main Material	Body : WCB, CF8, CF8M etc. Disc : CF8, CF8M etc. Shaft : 17-4PH, 316SS etc. Seat : PTFE, RPTFE, CTFE, UHMW-PE etc.
Operator	Manual Hand lever / Manual Worm Gear Pneumatic Actuator Electric Actuator
Application	General & Petro Chemical Oil Refinery / Production Steel and Iron Mill Shipbuilding Combined / nuclear power plant Water / Sewage Other Plant engineering
Option	Anti-static device Manual operator with Locking device Bonnet / Stem extension Internal Teflon / Velzona coating Low temperature design ISO 15848 Fugitive Emission packing NACE MR 0103 / 0175

■ ■ ■ Eccentric valve

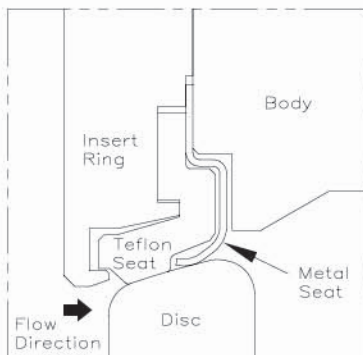
–API 609 Category B

► Double Offset Valve

Soft + Metal Seat (FSD Valve)

Having a combined function of Soft seat and Metal seat, Soft +Metal seat gives a tight shut-off at nominal pressure and temperature rating. Soft +Metal seat sealing system consists of reinforced Teflon and Metal seat. Although Soft +Metal seat has double seat structure, it requires relatively low operating torque. Soft +Metal seat valve works with the metal seat when a Teflon seat has been burned out. Soft +Metal seat provides the more reliability for steam and hot air line among its applications.

► Sealing System



Type	Double Offset Butterfly Valve – Soft and Metal Seat
Design	ASME B16.34 / API std. 609
Rating	ASME Cl. 150 / Cl. 300 / Cl. 600 PN 10, 16, 25, 40, 60, 64 JIS 10K, 16K, 20K
Size	DN50(2") to DN1800 (72")
Connection Type	Double Flanged / Lugged & Wafer
Temperature Range	-40°C to 250°C
Main Material	Body : WCB, CF8, CF8M etc. Disc : CF8, CF8M etc. Shaft : 17-4PH, 316SS etc. Seat : A240-316 + PTFE, A240-316 + RPTFE etc.
Operator	Manual Hand lever / Manual Worm Gear Pneumatic Actuator Electric Actuator
Application	General & Petro Chemical Oil Refinery / Production Steel and Iron Mill Shipbuilding Combined / nuclear power plant Other Plant engineering Inherit fire safety feature
Option	Anti-static device Manual operator with Locking device Bonnet / Stem extension Heating jacket ISO 15848 Fugitive Emission packing NACE MR 0103 / 0175

■ ■ ■ Eccentric valve

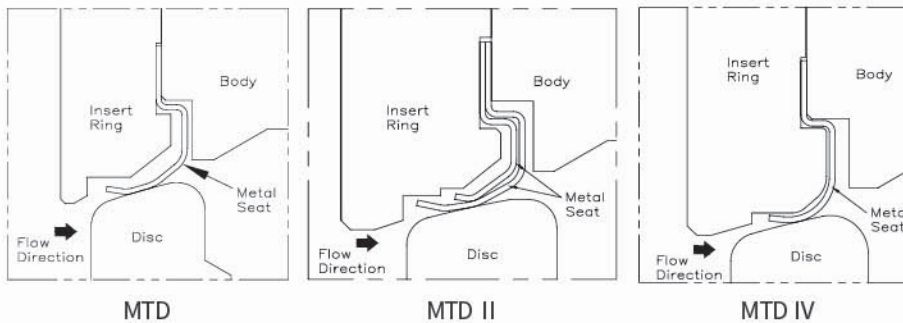
–API 609 Category B

► Double Offset Valve

Metal Seat / Metal to Metal Valve(MTD Valve)

Precious metal seated butterfly valve, Metal seat is applicable to high temperature as well as nominal pressure and temperature. Eccentric sealing system assures a low operating torque and positive sealing. Wide selection of valve materials ensures efficient performance in various industries. All UNICOM butterfly valves are tested hydraulically and pneumatically in shop in order to secure perfect sealing and certified by third party at request of clients.

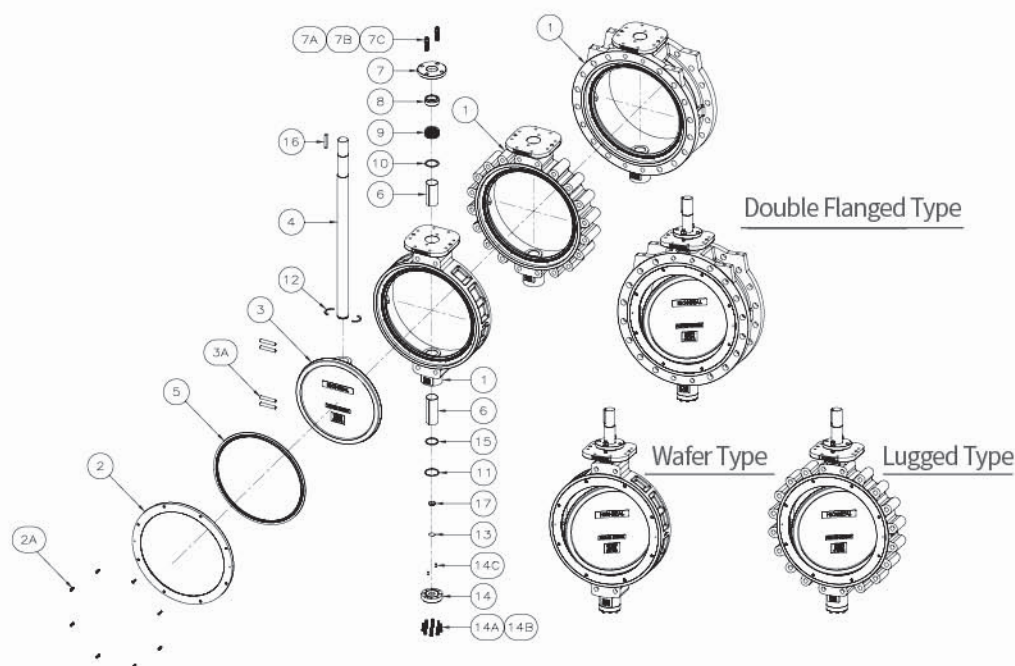
► Sealing System



Type	Double Offset Butterfly Valve – Metal Seat / Metal to Metal Seat
Design	ASME B16.34 / API std. 609
Rating	ASME Cl. 150 / Cl. 300 / Cl. 600 PN 10, 16, 25, 40, 60, 64 JIS 10K, 16K, 20K
Size	DN50(2") to DN1600 (64")
Connection Type	Double Flanged / Lugged & Wafer
Temperature Range	-50°C to 650°C
Main Material	Body : WCB, CF8, CF8M etc. Disc : CF8, CF8M etc. Shaft : 17-4PH, 316SS, Inconel 625 etc. Seat : A240-316, Inconel 625 etc.
Operator	Manual Hand lever / Manual Worm Gear Pneumatic Actuator, Electric Actuator
Application	General & Petro Chemical Oil Refinery / Production Steel and Iron Mill Shipbuilding Combined / nuclear power plant Other Plant engineering Inherit fire safety feature
Option	Stellite or ENP on Disc Anti-static device Manual operator with Locking device Bonnet / Stem extension Heating jacket ISO 15848 Fugitive Emission packing NACE MR 0103 / 0175

■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat)



Parts List	
1	Wafer Body
	Lugged Body
	Double Flanged Body
2	Insert Ring
2A	Wrench Bolt
3	Disc
3A	Disc Taper Pin
4	Shaft
5	Soft Shaft
6	Shaft Bearing
7	Grand Flange
7A	Stud Bolt
7B	Hex. Nut
7C	Spring Washer
8	Packing Gland
9	Gland Packing
10	Packing Retainer
11	Bottom Packing
12	Shaft Retainer
13	Shaft Retainer
14	Bottom Plug
14A	Hex. Bolt
14B	Spring Washer
14C	Parallel Pin
15	Shaft Lower Ring
16	Key
17	Thrust Collar

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Carbon Steel	A216 Gr. WCB / WCC
		Steel Casting High-Temperature Service	A217 Gr. WC6 / WC9
2	Insert Ring	Steel	SS400 (Jis)
		Carbon Steel	A515 Gr. 60 / 70
2A	Wrench Bolt	Stainless Steel	A240 Tp. 304
		Alloy Steel	A193 Gr. B7 / B7M
3	Disc	Carbon Steel	A216 Gr. WCB
		Stainless Steel	A351 Gr. CFS / CFBM
3A	Disc Taper Pin	13 Cr	A217 Gr. CA15
		Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH	A564 Tp. 630
		Stainless Steel	A276 Tp. XM-19 A276 Tp. 304 / 316
5	Soft Seat	Teflon	PTFE
		Reinforced Teflon	R.TFE
6	Shaft Bearing	Stainless Steel	A240 Tp. 316
		Stainless Steel & Reinforced Teflon	A240 Tp. 316 & R. TFE
7	Gland Flange	Stainless Steel	A276 Tp. 316 & Hard Chromium Plating
		Alloy Steel	A240 Tp. 304
7A	Stud Bolt	Alloy Steel	A193 Gr. B7 / B7M
		Stainless Steel	A193 Gr. B8 A2-70 (ISO3506)
7B	Hex. Nut	Alloy Steel	A194 Gr. 2H / 2HM
		Stainless Steel	A194 Gr. 8 A2-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Carbon Steel	A510
8	Packing Gland	Stainless Steel	A167 Tp. 304
9	Gland Packing	Grafoil / Teflon	A276 Tp. 316
10	Packing Retainer	GRAFOIL / PTFE	GRAFOIL / PTFE
11	Bottom Packing	Stainless Steel	A276 Tp. 316
12	Shaft Retainer	Grafoil / Teflon	GRAFOIL / PTFE
13	Shaft Spacer	Stainless Steel	A276 Tp. 316
14	Bottom Plug	Carbon Steel	A240 Tp. 316
		Stainless Steel	S45C (Jis) A515 Gr. 60 / 70
14A	Hex. Bolt	Alloy Steel	A276 Tp. 304
		Stainless Steel	A193 Gr. B7 / B7M A193 Gr. B8 A2-70 (ISO3506)
14B	Spring Washer	Carbon Steel	A510
14C	14C Parallel Pin	Stainless Steel	A167 Tp. 304
15	Shaft Lower Ring	Stainless Steel	A276 Tp. 304
16	Key	Stainless Steel	A276 Tp. 316
17	Thrust Collar	Carbon Steel	A576 Gr. 1045
		Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

▲ Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat)

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Stainless Steel	A351 Gr. CFS/CF8M A351 Gr. CF3 / CF3M
2	Insert Ring	Stainless Steel	A240 Tp. 304 / 316 A240 Tp. 304L / 316L
2A	Wrench Bolt	Stainless Steel	A193 Gr. BB / BBM A2-70 / A4-70 (ISO3506)
3	Disc	Stainless Steel	A351 Gr. CFS / CF8M A351 Gr. CF3 / CF3M
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH	A564 Tp. 630
		Stainless Steel	A276 Tp. XM-19 A276 Tp. 304 / 316
		Duplex Stainless Steel	A276 UNS S31803 / S32760
5	Soft Seat	Teflon	PTFE
		Reinforced Teflon	R.TFE
6	Shaft Bearing	Stainless Steel	A240 Tp. 316
		Stainless Steel & Reinforced Teflon	A240 Tp. 316 & R. TFE
		Stainless Steel & Hard Chromium Plating	A276 Tp. 316 & Hard Chromium Plating
		Stainless Steel	A240 Tp. 304 / 316
7	Gland Flange	Stainless Steel	A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
7A	Stud Bolt	Stainless Steel	A194 Gr. 8 / 8M
7B	Hex. Nut	Stainless Steel	A2-70 / A4-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Duplex Stainless Steel	A995 Gr. 4A / 5A / 6A
2	Insert Ring	Duplex Stainless Steel	A240 UN S S31803 / S32750 / S32760
2A	Wrench Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
3	Disc	Duplex Stainless Steel	A995 Gr. 4A / 5A / 6A
3A	Disc Taper Pin	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
4	Shaft	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
		Teflon	PTFE
		Reinforced Teflon	R.TFE
5	Soft Seat	Stainless Steel & Reinforced Teflon	A240 Tp. 316 & R. TFE
		Duplex Stainless Steel	A240 UNS S31803
		Duplex Stainless Steel & Hard Chromium Plating	A276 UN S S31803 / S32750 / S32760 & Hard Chromium Plating
		Monel 400	B127 UNS N04400 B164 UNS N04400
		Stainless Steel	A240 Tp. 304 / 316
6	Shaft Bearing	Duplex Stainless Steel	A276 UN S S31803 / S32750 / S32760
		Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
7	Gland Flange	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
7A	Stud Bolt	Stainless Steel	A194 Gr. 8M
7B	Hex. Nut	Stainless Steel	A4-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Stainless Steel	A167 Tp. 304 / 316
8	Packing Gland	Stainless Steel	A276 Tp. 316
9	Gland Packing	Teflon	PTFE
10	Packing Retainer	Stainless Steel	A276 Tp. 316
11	Bottom Packing	Teflon	PTFE
12	Shaft Retainer	Stainless Steel	A276 Tp. 316
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Stainless Steel	A276 Tp. 304 / 316 A276 Tp. 304L / 316L
		Stainless Steel	A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
14A	Hex. Bolt	Stainless Steel	A167 Tp. 304 / 316
14B	Spring Washer	Stainless Steel	A276 Tp. 304 / 316
14C	Parallel Pin	Stainless Steel	A276 Tp. 304 / 316
15	Shaft Lower Ring	Stainless Steel	A276 Tp. 316
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel	A276 Tp. 316 & STELLITE
		& Hard Facing	

* Option - Packing : Grafoil

▶ Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

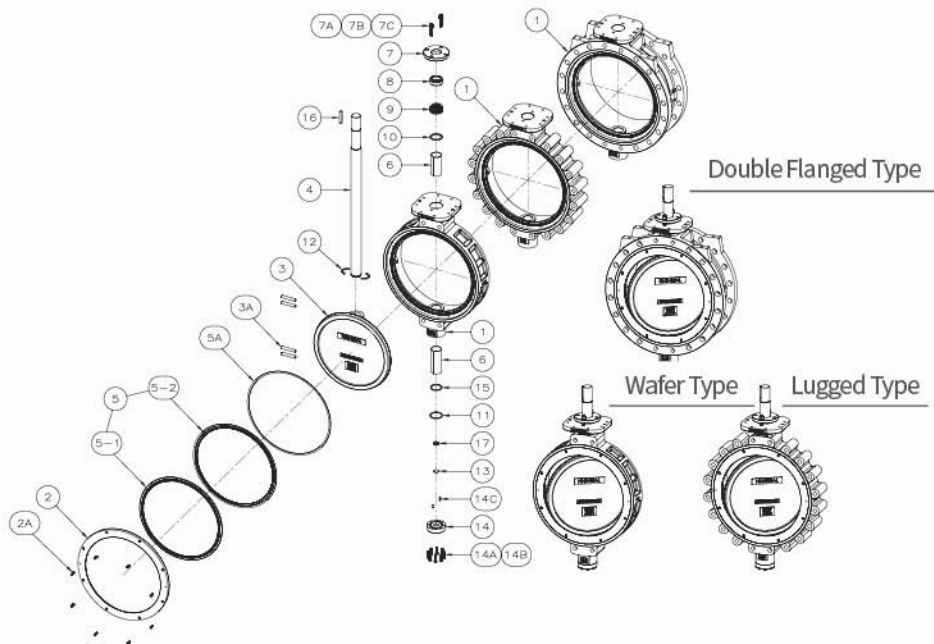
Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Stainless Steel	A167 Tp. 316
8	Packing Gland	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
9	Gland Packing	Grafoil / Teflon	GRAFOIL / PTFE
10	Packing Retainer	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
11	Bottom Packing	Grafoil / Teflon	GRAFOIL / PTFE
12	Shaft Retainer	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
14A	Hex. Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
		Stainless Steel	A167 Tp. 316
14B	Spring Washer	Stainless Steel	A276 Tp. 316
14C	Parallel Pin	Stainless Steel	A276 Tp. 316
15	Shaft Lower Ring	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel	A276 Tp. 316 & STELLITE
		& Hard Facing	

▶ Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft + Metal Seat)



Parts List	
1	Wafer Body Lugged Body Double Flanged Body
2	Insert Ring
2A	Wrench Bolt
3	Disc
3A	Disc Taper Pin
4	Shaft
5	FSD Seat
5-1	Soft Seat
5-2	Metal Seat
5A	Gasket
6	Shaft Bearing
7	Gland Flange
7A	Stud Bolt
7B	Hex. Nut
7C	Spring Washer
8	Packing Gland
9	Gland Packing
10	Packing Retainer
11	Bottom Packing
12	Shaft Retainer
13	Shaft Spacer
14	Bottom Plug
14A	Hex. Bolt
14B	Spring Washer
14C	Parallel Pin
15	Shaft Lower Ring
16	Key
17	Thrust Collar

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Carbon Steel	A216 Gr. WCB / WCC
		Steel Casting	A217 Gr. WC6 / WC9
		High - Temperature Service	
		Steel	SS400 (Jis)
2	Insert Ring	Carbon Steel	A515 Gr. 60 / 70
		Stainless Steel	A240 Tp. 304
		Alloy Steel	A193 Gr. B7 / B7M
2A	Wrench Bolt	Stainless Steel	A193 Gr. B8
			A2-70 (ISO3506)
3	Disc	Carbon Steel	A216 Gr. WCB
		Stainless Steel	A351 Gr. CFS / CF8M
		13 Cr	A217 Gr. CA15
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH	A564 Tp. 630
		Stainless Steel	A276 Tp. XM-19
			A276 Tp. 304 / 316
5	Fire-Safe Seat	Stainless Steel & Teflon	PTFE
		Stainless Steel & Reinforced Teflon	R.TFE
		Inconel 625 & Teflon	B443 UNS N06625 & PTFE
		Inconel 625 & Reinforced Teflon	B443 UNS N06625 & R.TFE
5A	Gasket	Graphite	GRAPHITE
6	Shaft Bearing	Stainless Steel	A240 Tp. 316
		Stainless Steel & Hard Chromium Plating	A276 Tp. 316 & Hard Chromium Plating
7	Gland Flange	Stainless Steel	A240 Tp. 304
		Alloy Steel	A193 Gr. B7 / B7M
7A	Stud Bolt	Stainless Steel	A193 Gr. B8
			A2-70 (ISO3506)
7B	Hex. Nut	Alloy Steel	A194 Gr. 2H / 2HM
		Stainless Steel	A194 Gr. 8
			A2-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Carbon Steel	A510
		Stainless Steel	A167 Tp. 304
8	Packing Gland	Stainless Steel	A276 Tp. 316
9	Gland Packing	Grafoil / Teflon	GRAFOIL
10	Packing Retainer	Stainless Steel	A276 Tp. 316
11	Bottom Packing	Grafoil / Teflon	GRAFOIL
12	Shaft Retainer	Stainless Steel	A276 Tp. 316
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Carbon Steel	S45C (Jis)
		Stainless Steel	A515 Gr. 60 / 70
		Alloy Steel	A276 Tp. 304
14A	Hex. Bolt	Stainless Steel	A193 Gr. B7 / B7M
			A193 Gr. B8
			A2-70 (ISO3506)
14B	Spring Washer	Carbon Steel	A510
		Stainless Steel	A167 Tp. 304
14C	Parallel Pin	Stainless Steel	A276 Tp. 304
15	Shaft Lower Ring	Stainless Steel	A276 Tp. 316
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

▶ Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

■ ■ ■ Data Sheet

► Double Offset Valve (Soft + Metal Seat)

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Stainless Steel	A351 Gr. CFS / CF8M A351 Gr. CF3 / CF3M
2	Insert Ring	Stainless Steel	A240 Tp. 304 / 316 A240 Tp. 304L / 316L
2A	Wrench Bolt	Stainless Steel	A193 Gr. BB / BBM A2-70 / A4-70 (ISO3506)
3	Disc	Stainless Steel	A351 Gr. CFS / CF8M A351 Gr. CF3 / CF3M
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH	A564 Tp. 630
		Stainless Steel	A276 Tp. XM-19 A276 Tp. 304 / 316
		Duplex Stainless Steel	A276 UNS S31803 / S32760
5	Fire-Safe Seat	Stainless Steel & Teflon	A240 Tp. 304L / 316L & PTFE
		Stainless Steel & Reinforced Teflon	A240 Tp. 304L / 316L & RTFE
		Inconel 625 & Teflon	B443 UNS N06625 & PTFE
		Inconel 625 & Reinforced Teflon	B443 UNS N06625 & RTFE
5A	Gasket	Graphite	GRAPHITE
6	Shaft Bearing	Stainless Steel	A240 Tp. 316
		Stainless Steel & Hard Chromium Plating	A276 Tp. 316 & Hard Chromium Plating
7	Gland Flange	Stainless Steel	A240 Tp. 304 / 316
7A	Stud Bolt	Stainless Steel	A193 Gr. B8 / B8M
			A2-70 / A4-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
7B	Hex. Nut	Stainless Steel	A194 Gr. 8 / 8M A2-70 / A4-70 (ISO3506)
7C	Spring Washer	Stainless Steel	A167 Tp. 304 / 316
8	Packing Gland	Stainless Steel	A276 Tp. 316
9	Gland Packing	Grafoil	GRAFOIL
10	Packing Retainer	Stainless Steel	A276 Tp. 316
11	Bottom Packing	Grafoil	GRAFOIL
12	Shaft Retainer	Stainless Steel	A276 Tp. 316
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Stainless Steel	A276 Tp. 304 / 316 A276 Tp. 304L / 316L
			A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
14A	Hex. Bolt	Stainless Steel	A167 Tp. 304 / 316
14B	Spring Washer	Stainless Steel	A276 Tp. 304 / 316
14C	Parallel Pin	Stainless Steel	A276 Tp. 304 / 316
15	Shaft Lower Ring	Stainless Steel	A276 Tp. 316
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

► Recommend Spare Parts

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Duplex Stainless Steel	A995 Gr. 4A / 5A / 6A
2	Insert Ring	Duplex Stainless Steel	A240 UNS S31803 / S32750 / S32760
2A	Wrench Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
3	Disc	Duplex Stainless Steel	A995 Gr. 4A / 5A / 6A
3A	Disc Taper Pin	Duplex Stainless Steel	A276 UN S S31803 / S32750 / S32760
4	Shaft	Duplex Stainless Steel	A276 UN S S31803 / S32750 / S32760
5	Fire-Safe Seat	Duplex Stainless Steel & Teflon	A276 UN S S31803 / S32750 / S32760 & PTFE
		Duplex Stainless Steel & Reinforced Teflon	A276 UN S S31803 / S32750 / S32760 & RTFE
5A	Gasket	Graphite	GRAPHITE
6	Shaft Bearing	Duplex Stainless Steel	A240 UN S S31803 A276 UNS S31803 / S32750 / S32760
		Monel 400	B127 UNS N04400 B164 UNS N04400
		Stainless Steel	A240 Tp. 304 / 316
7	Gland Flange	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
		Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
7A	Stud Bolt	Stainless Steel	A194 Gr. 8M A4-70 (ISO3506)
7B	Hex. Nut	Stainless Steel	A194 Gr. 8M A4-70 (ISO3506)

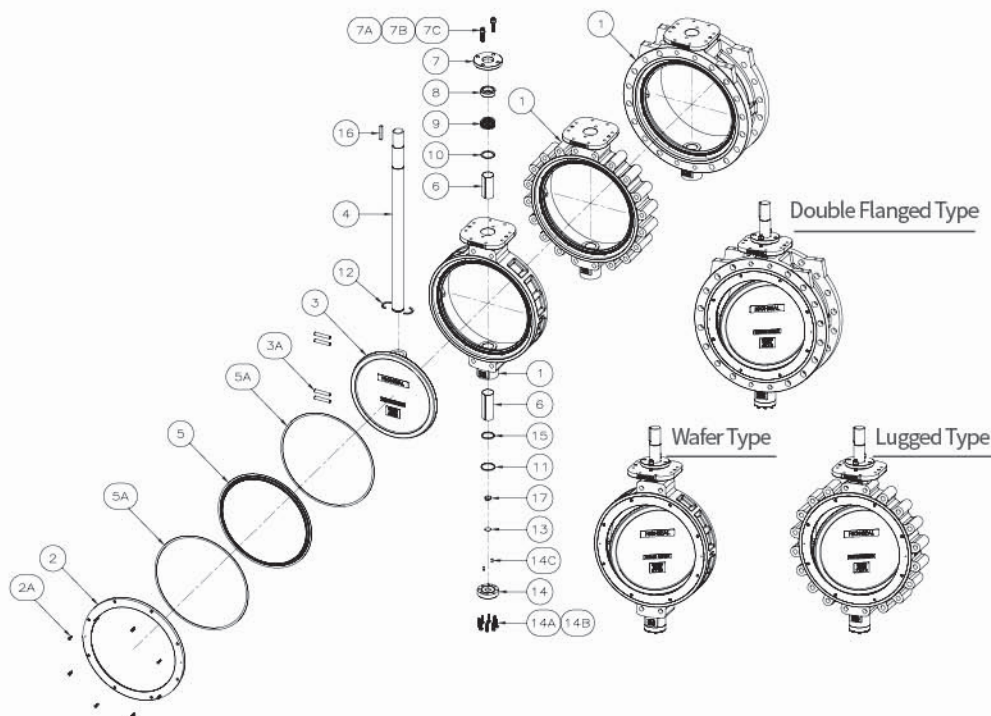
Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Stainless Steel	A167 Tp. 316
8	Packing Gland	Duplex Stainless Steel	A276 UN S S31803 / S32750 / S32760
9	Gland Packing	Grafoil	GRAFOIL
10	Packing Retainer	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
11	Bottom Packing	Grafoil	GRAFOIL
12	Shaft Retainer	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
14A	Hex. Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
14B	Spring Washer	Stainless Steel	A167 Tp. 316
14C	Parallel Pin	Stainless Steel	A276 Tp. 316
15	Shaft Lower Ring	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

► Recommend Spare Parts

■ ■ ■ Data Sheet

▶ Double Offset Valve (Metal Seat / Metal to Metal Seat)



Parts List

1	Wafer Body Lugged Body Double Flanged Body
2	Insert Ring
2A	Wrench Bolt
3	Disc
3A	Disc Taper Pin
4	Shaft
5	Metal Seat
5A	Gasket
6	Shaft Bearing
7	Gland Flange
7A	Stud Bolt
7B	Hex. Nut
7C	Spring Washer
8	Packing Gland
9	Gland Packing
10	Packing Retainer
11	Bottom Packing
12	Shaft Retainer
13	Shaft Spacer
14	Bottom Plug
14A	Hex. Bolt
14B	Spring Washer
14C	Parallel Pin
15	Shaft Lower Ring
16	Key
17	Thrust Collar

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Carbon Steel Steel Casting High-Temperature Service	A216 Gr. WCB / WCC A217 Gr. WC6 / WC9
2	Insert Ring	Steel	SS400 (Jis)
		Carbon Steel	A515 Gr. 60 / 70
		Stainless Steel	A240 Tp. 304
2A	Wrench Bolt	Alloy Steel	A193 Gr. B7 / B7M
		Stainless Steel	A193 Gr. B8 A2-70 (ISO3506)
3	Disc	Carbon Steel & Hard Facing	A216 Gr. WCB & STELLITE
		Stainless Steel & Hard Facing	A351 Gr. CFS / CFBM & STELLITE
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
		17-4PH	A564 Tp. 630
4	Shaft	Stainless Steel	A276 Tp. XM-19 A276 Tp. 304 / 316
5	Metal Seat	Stainless Steel	A240 Tp. 304L / 316L
		Inconel 625	B443 UNS N06625
5A	Gasket	Graphite	GRAPHITE
		Stainless Steel	A240 Tp. 316
6	Shaft Bearing	Stainless Steel & Hard Chromium Plating	A276 Tp. 316 & Hard Chromium Plating
7	Gland Flange	Stainless Steel	A240 Tp. 304
		Alloy Steel	A193 Gr. B7 / B7M
7A	Stud Bolt	Stainless Steel	A193 Gr. B8 A2-70 (ISO3506)
		Alloy Steel	A194 Gr. 2H / 2HM
7B	Hex. Nut	Stainless Steel	A194 Gr. 8 A2-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Carbon Steel	A510
		Stainless Steel	A167 Tp. 304
8	Packing Gland	Stainless Steel	A276 Tp. 316
9	Gland Packing	Grafoil	GRAFOIL
10	Packing Retainer	Stainless Steel	A276 Tp. 316
11	Bottom Packing	Grafoil	GRAFOIL
12	Shaft Retainer	Stainless Steel	A276 Tp. 316
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Carbon Steel	S45C (Jis)
		Stainless Steel	A515 Gr. 60 / 70
		Alloy Steel	A276 Tp. 304
14A	Hex. Bolt	Stainless Steel	A193 Gr. B7 / B7M
		Stainless Steel	A193 Gr. B8 A2-70 (ISO3506)
14B	Spring Washer	Carbon Steel	A510
		Stainless Steel	A167 Tp. 304
14C	Parallel Pin	Stainless Steel	A276 Tp. 304
15	Shaft Lower Ring	Stainless Steel	A276 Tp. 316
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

▲ Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

■ ■ ■ Data Sheet

▶ Double Offset Valve (Metal Seat / Metal to Metal Seat)

STANDARD MATERIAL

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Stainless Steel	A351 Gr. CFS/CF8M A351 Gr. CF3 / CF3M
2	Insert Ring	Stainless Steel	A240 Tp. 304 / 316 A240 Tp. 304L / 316L
2A	Wrench Bolt	Stainless Steel	A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
3	Disc	Stainless Steel	A351 Gr. CFS / CFBM A351 Gr. CF3 / CF3M
3A	Disc Taper Pin	Stainless Steel	A276 Tp. 316
4	Shaft	17-4PH	A564 Tp. 630
		Stainless Steel	A276 Tp. XM-19 A276 Tp. 304 / 316
		Duplex Stainless Steel	A276 UNS S31803 / S32760
5	Metal Seat	Stainless Steel	A240 Tp. 304L / 316L & PTFE
		Inconel 625	B443 UNS N06625 & R.TFE
5A	Gasket	Graphite	GRAPHITE
6	Shaft Bearing	Stainless Steel	A240 Tp. 316
		Stainless Steel & Hard Chromium Plating	A276 Tp. 316 & Hard Chromium Plating
7	Gland Flange	Stainless Steel	A240 Tp. 304 / 316
7A	Stud Bolt	Stainless Steel	A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
7B	Hex. Nut	Stainless Steel	A194 Gr. 8 / 8M
			A2-70 / A4-70 (ISO3506)

Part No.	Designation	Specification	Material ASTM
1	Valve Body	Duplex Stainless Steel	A995 Gr. 4A / 5A / 6A
2	Insert Ring	Duplex Stainless Steel	A240 UNS S31803 / S32750 / S32760
2A	Wrench Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
3	Disc	Duplex Stainless Steel & Hard Facing	A995 Gr. 4A / 5A / 6A & STELLITE
3A	Disc Taper Pin	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
4	Shaft	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
5	Metal Seat	Duplex Stainless Steel	A240 UNS S31803 / S32750 / S32760
5A	Gasket	Graphite	GRAPHITE
6	Shaft Bearing	Duplex Stainless Steel	A240 UNS S31803 A276 UNS S31803 / S32750 / S32760
		Monel 400	B127 UNS N04400 B164 UNS N04400
7	Gland Flange	Stainless Steel	A240 Tp. 304 / 316
		Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
7A	Stud Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
7B	Hex. Nut	Stainless Steel	A194 Gr. 8M A4-70 (ISO3506)
7C	Spring Washer	Stainless Steel	A167 Tp. 316
8	Packing Gland	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760

Part No.	Designation	Specification	Material ASTM
7C	Spring Washer	Stainless Steel	A167 Tp. 304 / 316
8	Packing Gland	Stainless Steel	A276 Tp. 316
9	Gland Packing	Grafoil	GRAFOIL
10	Packing Retainer	Stainless Steel	A276 Tp. 316
11	Bottom Packing	Grafoil	GRAFOIL
12	Shaft Retainer	Stainless Steel	A276 Tp. 316
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Stainless Steel	A276 Tp. 304L / 316L A193 Gr. B8 / B8M A2-70 / A4-70 (ISO3506)
14A	Hex. Bolt	Stainless Steel	A167 Tp. 304 / 316
14B	Spring Washer	Stainless Steel	A276 Tp. 304 / 316
14C	Parallel Pin	Stainless Steel	A276 Tp. 316
15	Shaft Lower Ring	Stainless Steel	A576 Gr. 1045
16	Key	Carbon Steel	A276 Tp. 316 & STELLITE
17	Thrust Collar	Stainless Steel & Hard Facing	

Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

Part No.	Designation	Specification	Material ASTM
9	Gland Packing	Grafoil	GRAFOIL
10	Packing Retainer	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
11	Bottom Packing	Grafoil	GRAFOIL
12	Shaft Retainer	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
13	Shaft Spacer	Stainless Steel	A240 Tp. 316
14	Bottom Plug	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
14A	Hex. Bolt	Stainless Steel	A193 Gr. B8M A4-70 (ISO3506)
14B	Spring Washer	Stainless Steel	A167 Tp. 316
14C	Parallel Pin	Stainless Steel	A276 Tp. 316
15	Shaft Lower Ring	Duplex Stainless Steel	A276 UNS S31803 / S32750 / S32760
16	Key	Carbon Steel	A576 Gr. 1045
17	Thrust Collar	Stainless Steel & Hard Facing	A276 Tp. 316 & STELLITE

Recommend Spare Parts

Part No.	Designation	Pressure Rating & Valve Size		
		ASME Class 150	ASME Class 300	ASME Class 600
14C	Parallel Pin	20" ~ 48"	16" ~ 48"	12" ~ 48"
15	Shaft Lower Ring	16" ~ 48"	14" ~ 48"	8" ~ 48"
16	Key	16" ~ 48"	14" ~ 48"	8" ~ 48"
17	Thrust Collar	20" ~ 48"	16" ~ 48"	12" ~ 48"

■ ■ ■ Data Sheet

► Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat)

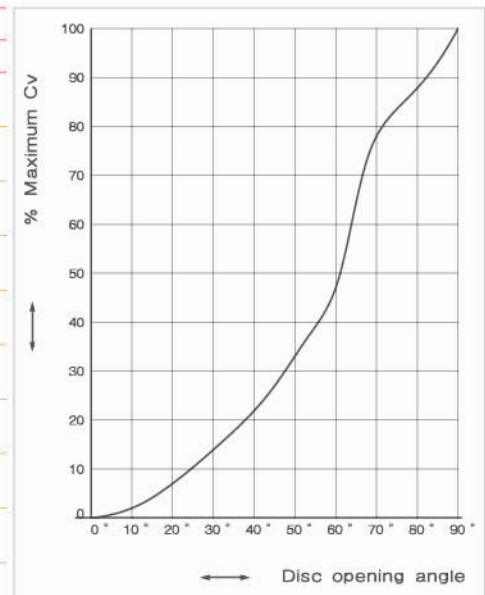
Cv-Value

The Cv flow coefficient, often used or control valves is defined as the flow of water at 60°F (16°C) in gallons per minute, at a pressure drop of 1psi across the valve.

ASME Class 150

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc								
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
2in	DN50	Cv Kv	2.1 1.8	6.4 5.5	12.9 11.0	20.2 17.3	30.4 26.0	43.2 37.1	72 62	81 70	92 80
2.5in	DN65	Cv Kv	3.0 2.6	10.5 9.0	21.0 18.0	33.0 28.3	49.5 42.4	71 61	117 100	132 115	150 130
3in	DN80	Cv Kv	5.2 4.5	18.2 15.6	36.4 31.2	57.2 49.0	86 75	112 105	203 175	230 200	260 225
4in	DN100	Cv Kv	9.2 7.9	32.2 27.6	64.4 55.2	101 87	152 130	216 185	360 310	405 350	460 395
5in	DN125	Cv Kv	15.2 13.0	53.2 45.6	106 91	167 145	251 215	357 306	595 510	670 580	760 655
6in	DN150	Cv Kv	23.0 19.7	81 70	161 140	253 220	380 325	540 465	897 770	1015 870	1150 985
8in	DN200	Cv Kv	42 36	147 126	295 255	462 396	695 600	987 845	1640 1410	1850 1590	2100 1800
10in	DN250	Cv Kv	64 55	225 195	450 390	705 605	1056 905	1505 1290	2496 2140	2816 2415	3200 2745
12in	DN300	Cv Kv	94 81	330 285	660 570	1035 890	1551 1330	2210 1895	3666 3145	4136 3545	4700 4030
14in	DN350	Cv Kv	116 100	406 350	815 700	1276 1095	1915 1645	2726 2335	4525 3880	5105 4380	5800 4970
16in	DN400	Cv Kv	160 137	560 480	1120 960	1760 1510	2640 2265	3760 3225	6240 5350	7040 6035	8000 6855
18in	DN450	Cv Kv	210 180	735 630	1470 1260	2310 1980	3465 2970	4935 4230	8190 7020	9240 7920	10500 9000
20in	DN500	Cv Kv	280 240	980 840	1960 1680	3080 2640	4620 3960	6580 5680	10920 9360	12320 10560	14000 12000
22in	DN550	Cv Kv	365 315	1275 1095	2550 2190	4005 3435	6006 5150	8555 7330	14196 12165	16016 13730	18200 15595
24in	DN600	Cv Kv	420 360	1470 1260	2940 2520	4620 3960	6930 5940	9870 8460	16380 14040	18480 15835	21000 17995
26in	DN650	Cv Kv	500 430	1750 1500	3500 3000	5500 4715	8250 7070	11750 10070	19500 16710	22000 18855	25000 21425
28in	DN700	Cv Kv	580 500	2030 1740	4060 3480	6380 5470	9570 8200	13630 11680	22620 19385	25520 21870	29000 24850
30in	DN750	Cv Kv	670 575	2345 2010	4690 4020	7370 6315	11055 9480	15745 13495	26130 22390	29480 25265	33500 28710
32in	DN800	Cv Kv	820 705	2870 2460	5740 4920	9020 7730	13530 11595	19270 16515	31980 27405	36080 30920	41000 35135
34in	DN850	Cv Kv	960 825	3360 2880	6720 5760	10560 9050	15840 13575	22560 19335	37440 32085	42240 36195	48000 41135
36in	DN900	Cv Kv	1100 945	3850 3300	7700 6600	12100 10370	18150 15555	25850 22150	42900 36760	48400 41475	55000 47130
38in	DN950	Cv Kv	1225 1050	4285 3675	8570 7350	13465 11540	20200 17310	28765 24650	47736 40905	53856 46150	61200 52445
40in	DN1000	Cv Kv	1400 1200	4900 4200	9800 8400	15400 13200	23100 19795	32900 28195	54600 46790	61600 52785	70000 59985
42in	DN1050	Cv Kv	1505 1290	5255 4505	10510 9010	16511 14150	24770 21230	35275 30230	58540 50165	66045 56595	75050 64310
44in	DN1100	Cv Kv	1740 1495	6090 5220	12180 10440	19140 16405	28710 24605	40890 35040	67860 58150	76560 65605	87000 74550
46in	DN1150	Cv Kv	1980 1700	6930 5940	13860 11880	21780 18665	32670 27995	46530 39875	77220 66170	87120 74655	99000 84835
48in	DN1200	Cv Kv	2080 1785	7280 6240	14560 12480	22880 19605	34320 29410	48880 41890	81120 69515	91520 78425	104000 89120

FLOW CHARACTERISTIC



■ ■ ■ Data Sheet

► Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat)

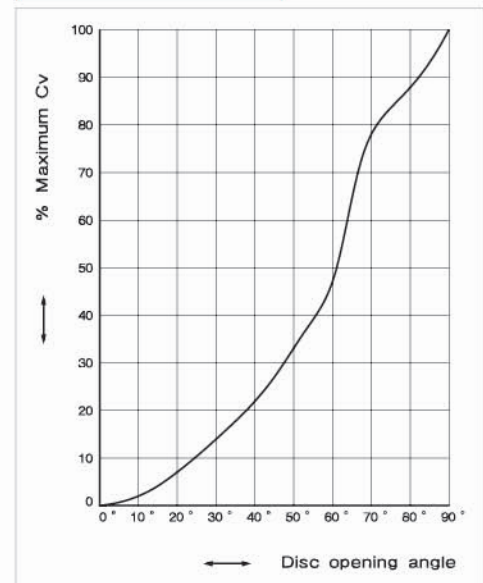
ASME Class 300

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc								
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
2in	DN50	Cv	1.8	6.4	12.9	20.2	30.4	43.2	72	81	92
		Kv	1.6	5.5	11.0	17.3	26.0	37.1	62	70	80
2.5in	DN65	Cv	3	10.5	21.0	33.0	49.5	71	117	132	150
		Kv	2.6	9.0	18.0	28.3	42.5	61	100	115	130
3in	DN80	Cv	5.2	18.2	36.5	57.2	86	122	203	230	260
		Kv	4.5	15.6	31.5	49.0	75	105	175	200	225
4in	DN100	Cv	9.2	32.2	64.5	101	152	216	360	405	460
		Kv	7.9	27.6	55.5	87	130	185	310	350	395
5in	DN125	Cv	15.2	53.2	106	167	251	357	595	670	760
		Kv	13.0	45.6	91	145	215	306	510	580	655
6in	DN150	Cv	23	81	161	253	380	540	897	1015	1150
		Kv	19.7	70	140	220	325	460	770	870	985
8in	DN200	Cv	38	133	266	418	627	895	1485	1675	1900
		Kv	33	115	230	360	540	770	1270	1440	1630
10in	DN250	Cv	56	196	392	616	925	1316	2185	2465	2800
		Kv	48	170	336	530	795	1130	1875	2115	2400
12in	DN300	Cv	82	287	575	905	1355	1930	3200	3610	4100
		Kv	70	246	495	780	1160	1660	2740	3095	3515
14in	DN350	Cv	110	385	770	1210	1815	2585	4290	4840	5500
		Kv	95	330	660	1040	1555	2215	3680	4150	4715
16in	DN400	Cv	152	532	1065	1675	2510	3575	5930	6690	7600
		Kv	130	456	915	1440	2150	3060	5080	5730	6515
18in	DN450	Cv	198	695	1390	2180	3270	4655	7725	8715	9900
		Kv	170	600	1190	1870	2800	3990	6620	7470	8485
20in	DN500	Cv	260	910	1820	2860	4290	6110	10140	11440	13000
		Kv	225	780	1560	2450	3680	5235	8690	9805	11140
22in	DN550	Cv	325	1138	2275	3575	5363	7655	12701	14326	16250
		Kv	278	975	1949	3063	4595	6559	10883	12276	13925
24in	DN600	Cv	390	1365	2730	4290	6435	9165	15210	17160	19500
		Kv	335	1170	2340	3680	5515	7855	13035	14705	16710
26in	DN650	Cv	480	1680	3360	5280	7920	11280	18720	21120	24000
		Kv	415	1445	2890	4540	6810	9700	16100	18160	20640
28in	DN700	Cv	572	2005	4005	6295	9440	13445	22310	25170	28600
		Kv	490	1720	3435	5395	8080	11520	19120	21570	24510
30in	DN750	Cv	675	2360	4720	7415	11125	15840	26290	29660	33700
		Kv	580	2025	4045	6360	9530	13575	22530	25420	28880
32in	DN800	Cv	815	2845	5658	8935	13400	19085	31670	35730	40600
		Kv	700	2440	4870	7660	11480	16360	27140	30620	34790
34in	DN850	Cv	929	3252	6503	10219	15329	21880	36304	40949	46450
		Kv	796	2786	5572	8757	13135	18749	31109	35089	39803
36in	DN900	Cv	1050	3665	7325	11510	17260	24585	40795	46025	52300
		Kv	900	3140	6280	9860	14790	21070	34960	39440	44815
38in	DN950	Cv	1160	4210	8130	13110	19750	28600	46050	53080	60500
		Kv	995	3600	6970	11235	16625	24510	39460	45490	51900
42in	DN1050	Cv	1470	5135	10265	16130	24190	34455	57175	64505	73300
		Kv	1260	4400	8800	13820	20730	29530	48995	55280	62810
48in	DN1200	Cv	2060	7210	14420	22660	33990	48410	80340	90640	103000
		Kv	1765	6180	12360	19420	29130	41485	68845	77670	88260

ASME Class 600

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc								
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
3in	DN80	Cv	3.1	10.9	21.7	34.1	51.2	72.9	120	137	155
		Kv	2.7	9.3	18.6	29.2	43.8	62.4	105	120	135
4in	DN100	Cv	5.1	17.9	35.7	56.1	84.2	120	200	225	255
		Kv	4.4	15.3	30.6	48.1	72.1	105	170	195	220
5in	DN125	Cv	11.6	40.6	81.2	130	192	275	455	510	580
		Kv	9.9	34.8	69.6	110	165	235	390	440	500
6in	DN150	Cv	20.4	71.4	143	225	340	480	795	900	1020
		Kv	17.5	61.2	125	195	290	410	685	770	875
8in	DN200	Cv	27	95	190	297	450	635	1055	1190	1350
		Kv	23	81	165	25	390	545	905	1020	1160
10in	DN250	Cv	41	144	290	451	680	965	1600	1805	2050
		Kv	35	125	250	390	580	830	1370	1550	1760
12in	DN300	Cv	56	196	395	616	925	1316	2185	2465	2800
		Kv	48	170	340	530	795	1130	1875	2115	2400
14in	DN350	Cv	78	273	550	860	1290	1835	3045	3435	3900
		Kv	67	235	470	740	1110	1570	2610	2940	3345
16in	DN400	Cv	102	357	715	1125	1685	2400	3980	4490	5100
		Kv	87	305	615	965	1445	2055	3410	3850	4370
18in	DN450	Cv	110	385	770	1210	1815	2585	4290	4840	5500
		Kv	95	330	660	1040	1555	2215	3680	4150	4715
20in	DN500	Cv	158	555	1110	1740	2610	3715	6165	6955	7900
		Kv	135	475	950	1490	2235	3185	5280	5960	6770
24in	DN600	Cv	222	780	1555	2445	3665	5220	8660	9770	11100
		Kv	190	670	1335	2095	3140	4470	7420	8370	9515
28in	DN700	Cv	319	1120	2230	3510	5260	7500	12400	14000	15900
		Kv	279	981	1960	3070	4610	6560	10900	12300	14000
30in	DN750	Cv	371	1299	2598	4083	6125	8723	14477	16333	18560
		Kv	318	1113	2227	3499	5248	7475	12405	13996	15904
32in	DN800	Cv	422	1478	2957	4646	6970	9926	16474	18586	21120
		Kv	362	1267	2534	3981	5972	8506	14116	15926	18098

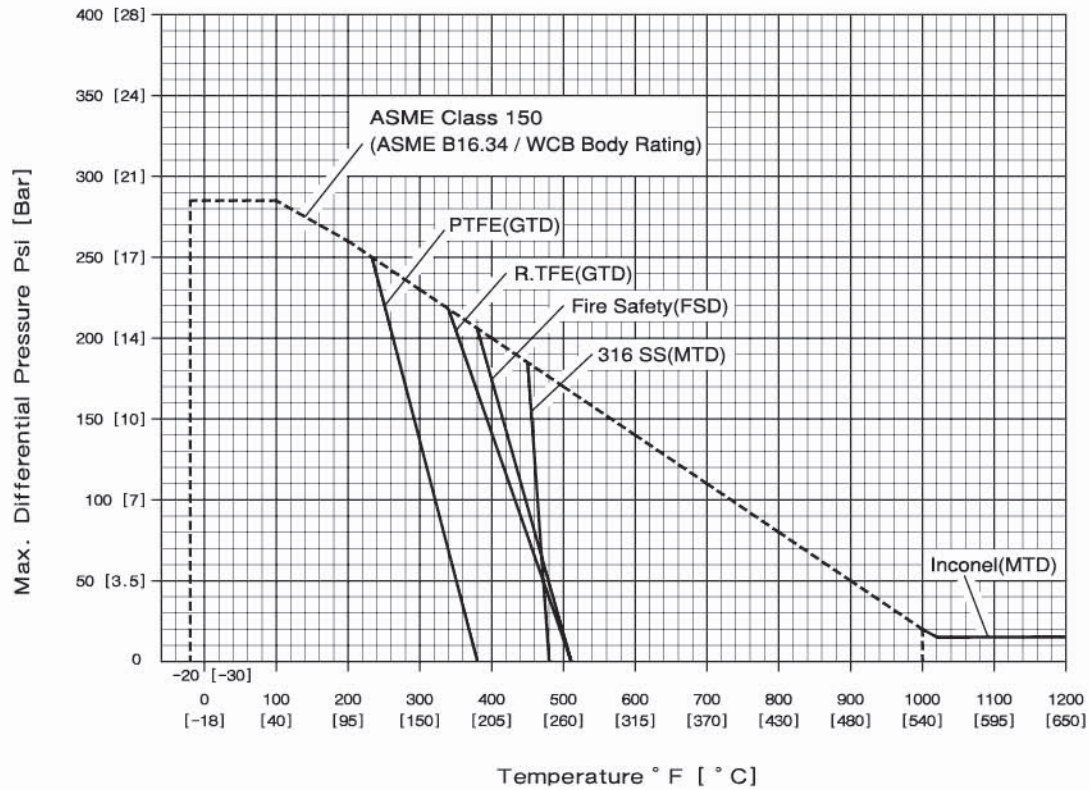
FLOW CHARACTERISTIC



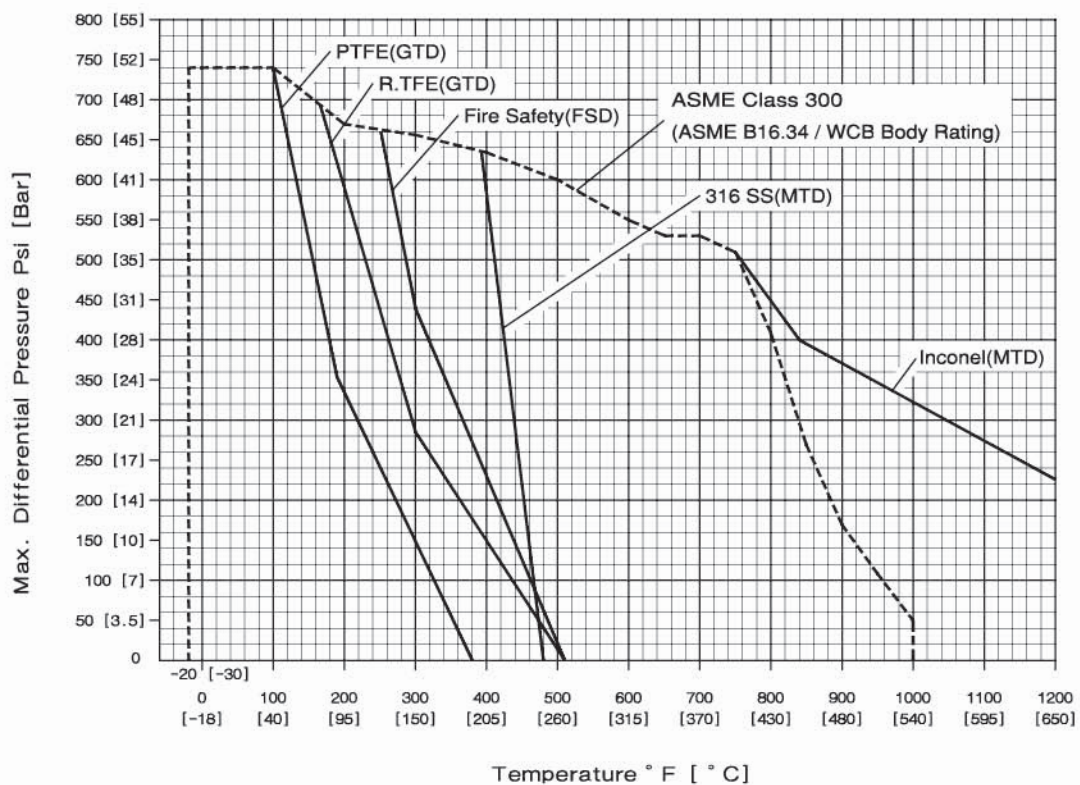
■ ■ ■ Data Sheet

► Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat) Pressure-Temperature Rating

ASME Class 150



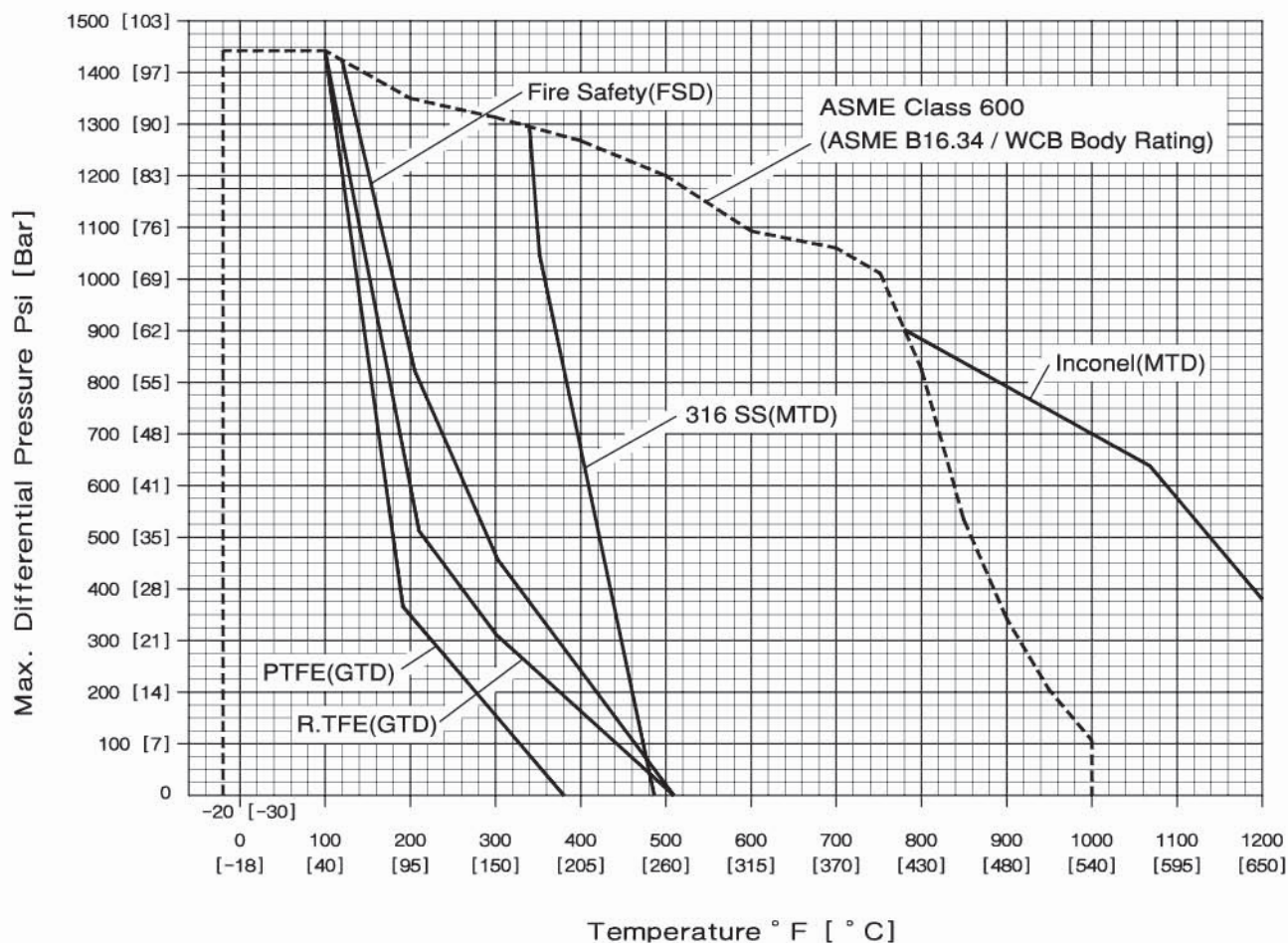
ASME Class 300



■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat) Pressure-Temperature Rating

ASME Class 600



■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat) Torque Table

ASME Class 150

VALVE SIZE		GTD			FSD			MTD			Shaft Material					
		0~10 bar	15 bar	20 bar	0~10 bar	15 bar	20 bar	0~10 bar	15 bar	20 bar	A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m	N·m
2in	DN50	30	45	54	39	59	70	45	68	81	57	76	201	191	82	124
2.5in	DN65	34	51	61	44	66	80	51	77	92	74	99	261	248	106	161
3in	DN80	38	57	68	49	74	89	57	86	103	74	99	261	248	106	161
4in	DN100	44	66	79	57	86	103	66	99	119	74	99	261	248	106	161
5in	DN125	55	83	99	72	107	129	83	124	149	175	234	618	588	251	382
6in	DN150	72	108	130	94	140	168	108	162	194	175	234	618	588	251	382
8in	DN200	125	188	225	163	244	293	188	281	338	292	392	1034	984	421	639
10in	DN250	185	278	333	241	361	433	278	416	500	454	609	1606	1528	653	992
12in	DN300	270	378	454	351	491	590	405	567	680	839	1126	2968	2825	1208	1834
14in	DN350	400	560	672	520	728	874	600	840	1008	1151	1544	4071	3875	1657	2516
16in	DN400	570	798	958	741	1037	1245	855	1197	1436	1772	2376	6265	5963	2549	3871
18in	DN450	770	1078	1294	1001	1401	1682	1155	1617	1940	1772	2376	6265	5963	2549	3871
20in	DN500	1160	1624	1949	1508	2111	2533	1740	2436	2923	3505	4702	12396	11797	5044	7660
22in	DN550	1440	2016	2419	1872	2621	3145	2160	3024	3629	6078	8154	21497	20459	8747	13283
24in	DN600	1760	2464	2957	2288	3203	3844	2640	3696	4435	6078	8154	21497	20459	8747	13283
26in	DN650	2000	2800	3360	2600	3640	4368	3000	4200	5040	6078	8154	21497	20459	8747	13283
28in	DN700	2280	3192	3830	2964	4150	4980	3420	4788	5746	14442	19373	51075	48609	20782	31561
30in	DN750	2720	3808	4570	3536	4950	5940	4080	5712	6854	14442	19373	51075	48609	20782	31561
32in	DN800	3280	4592	5510	4264	5970	7164	4920	6888	8266	14442	19373	51075	48609	20782	31561
34in	DN850	3840	5376	6451	4992	6989	8387	5760	8064	9677	17470	23436	61785	58802	25140	38179
36in	DN900	4400	6160	7392	5720	8008	9610	6600	9240	11088	17470	23436	61785	58802	25140	38179
38in	DN950	5040	7056	8467	6552	9173	11007	7560	10584	12701	17470	23436	61785	58802	25140	38179
40in	DN1000	5840	8176	9811	7592	10629	12755	8760	12264	14717	17470	23436	61785	58802	25140	38179
42in	DN1050	6400	8960	10752	8320	11648	13978	9600	13440	16128	15791	21183	55845	53149	22723	34509
44in	DN1100	6960	9744	11693	9048	12667	15201	10440	14616	17539	17470	23436	61785	58802	25140	38179
46in	DN1150	7600	10640	12768	9880	13832	16598	11400	15960	19152	50637	67928	179083	170438	72868	110661
48in	DN1200	8800	12320	14784	11440	16016	19219	13200	18480	22176	50637	67928	179083	170438	72868	110661

■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat) Torque Table

ASME Class 300 (Soft Seat)

VALVE SIZE		GTD					
		0~10 bar	20bar	25bar	35bar	40 bar	50 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m
2in	DN50	31	54	65	91	100	120
2.5in	DN65	34	61	73	103	113	136
3in	DN80	38	68	82	115	126	152
4in	DN100	45	79	95	133	146	176
5in	DN125	60	99	119	166	183	220
6in	DN150	80	130	156	218	240	287
8in	DN200	135	225	270	378	416	499
10in	DN250	205	336	403	564	621	745
12in	DN300	305	504	605	847	931	1118
14in	DN350	500	828	994	1391	1530	1836
16in	DN400	715	1218	1462	2046	2251	2701
18in	DN450	960	1584	1901	2661	2927	3513
20in	DN500	1430	2244	2693	3770	4147	4976
22in	DN550	1690	2805	3366	4712	5184	6220
24in	DN600	2080	3370	4039	5655	6247	7464
26in	DN650	2455	3929	4724	6597	7270	8709
28in	DN700	2830	4488	5386	7540	8294	9953
30in	DN750	3468	5100	6120	8568	9425	11310
32in	DN800	4188	6324	7589	10624	11687	14024
34in	DN850	4902	7395	8874	12424	13666	16399
36in	DN900	5616	8466	10159	14223	15645	18774
38in	DN950	6790	9843	11812	16536	18190	21828
42in	DN1050	8160	12240	14688	20563	22620	27143
48in	DN1200	11220	16830	20196	28274	31102	37322

Shaft Material					
A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
N·m	N·m	N·m	N·m	N·m	N·m
57	76	201	191	82	124
74	99	261	248	106	161
74	99	261	248	106	161
74	99	261	248	106	161
175	234	618	588	251	382
175	234	618	588	251	382
454	609	1606	1528	653	992
839	1126	2968	2825	1208	1834
1151	1544	4071	3875	1657	2516
1772	2376	6265	5963	2549	3871
3505	4702	12396	11797	5044	7660
6078	8154	21497	20459	8747	13283
6078	8154	21497	20459	8747	13283
14442	19373	51075	48609	20782	31561
14442	19373	51075	48609	20782	31561
14442	19373	51075	48609	20782	31561
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
50637	67928	179083	170438	72868	110661
50637	67928	179083	170438	72868	110661
81140	108846	286959	273106	116763	177321
81140	108846	286959	273106	116763	177321
173024	232106	611915	582375	248986	378122

ASME Class 300 (Soft + Metal Seat)

VALVE SIZE		FSD					
		0~10 bar	20bar	25bar	35bar	40 bar	50 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m
2in	DN50	40	70	84	118	130	156
2.5in	DN65	44	80	95	134	147	176
3in	DN80	49	89	107	149	164	197
4in	DN100	59	103	124	173	190	228
5in	DN125	78	129	154	216	238	285
6in	DN150	104	168	202	283	311	374
8in	DN200	176	293	351	491	541	649
10in	DN250	267	437	524	734	807	969
12in	DN300	397	655	786	1101	1211	1453
14in	DN350	650	1076	1292	1808	1989	2387
16in	DN400	930	1583	1900	2660	2926	3511
18in	DN450	1248	2059	2471	3459	3805	4566
20in	DN500	1859	2917	3501	4901	5391	6469
22in	DN550	2197	3647	4376	6126	6739	8086
24in	DN600	2704	4381	5251	7351	8121	9704
26in	DN650	3192	5108	6141	8577	9452	11321
28in	DN700	3679	5834	7001	9802	10782	12938
30in	DN750	4508	6630	7956	11138	12252	14703
32in	DN800	5444	8221	9865	13812	15193	18231
34in	DN850	6373	9614	11536	16151	17766	21319
36in	DN900	7301	11006	13207	18490	20339	24406
38in	DN950	8827	12796	15355	21497	23647	28376
42in	DN1050	10608	15912	19094	26732	29405	35286
48in	DN1200	14586	21879	26255	36757	40432	48519

Shaft Material					
A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
N·m	N·m	N·m	N·m	N·m	N·m
57	76	201	191	82	124
74	99	261	248	106	161
74	99	261	248	106	161
74	99	261	248	106	161
175	234	618	588	251	382
175	234	618	588	251	382
454	609	1606	1528	653	992
839	1126	2968	2825	1208	1834
1151	1544	4071	3875	1657	2516
1772	2376	6265	5963	2549	3871
3505	4702	12396	11797	5044	7660
6078	8154	21497	20459	8747	13283
6078	8154	21497	20459	8747	13283
14442	19373	51075	48609	20782	31561
14442	19373	51075	48609	20782	31561
14442	19373	51075	48609	20782	31561
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
50637	67928	179083	170438	72868	110661
50637	67928	179083	170438	72868	110661
81140	108846	286959	273106	116763	177321
81140	108846	286959	273106	116763	177321
173024	232106	611915	582375	248986	378122

■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat) Torque Table

ASME Class 300 (Metal Seat)

VALVE SIZE		MTD					
		0~10 bar	20bar	25bar	35bar	40 bar	50 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m
2in	DN50	47	81	97	136	150	180
2.5in	DN65	51	92	110	154	170	204
3in	DN80	57	103	123	172	190	228
4in	DN100	68	119	143	200	220	263
5in	DN125	90	149	178	249	274	329
6in	DN150	120	194	233	327	359	431
8in	DN200	203	338	405	567	624	748
10in	DN250	308	504	605	847	931	1118
12in	DN300	458	756	907	1270	1397	1677
14in	DN350	750	1242	1490	2087	2295	2754
16in	DN400	1073	1827	2192	3069	3376	4052
18in	DN450	1440	2376	2851	3992	4391	5269
20in	DN500	2145	3366	4039	5655	6220	7464
22in	DN550	2535	4208	5049	7069	7775	9331
24in	DN600	3120	5055	6059	8482	9371	11197
26in	DN650	3683	5894	7086	9896	10906	13063
28in	DN700	4245	6732	8078	11310	12441	14929
30in	DN750	5202	7650	9180	12852	14137	16965
32in	DN800	6282	9486	11383	15936	17530	21036
34in	DN850	7353	11093	13311	18635	20499	24599
36in	DN900	8424	12699	15239	21334	23468	28161
38in	DN950	10185	14765	17717	24804	27285	32742
42in	DN1050	12240	18360	22032	30845	33929	40715
48in	DN1200	16830	25245	30294	42412	46653	55983

Shaft Material					
A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
N·m	N·m	N·m	N·m	N·m	N·m
57	76	201	191	82	124
74	99	261	248	106	161
74	99	261	248	106	161
74	99	261	248	106	161
175	234	618	588	251	382
175	234	618	588	251	382
454	609	1606	1528	653	992
839	1126	2968	2825	1208	1834
1151	1544	4071	3875	1657	2516
1772	2376	6265	5963	2549	3871
3505	4702	12396	11797	5044	7660
6078	8154	21497	20459	8747	13283
6078	8154	21497	20459	8747	13283
14442	19373	51075	48609	20782	31561
14442	19373	51075	48609	20782	31561
14442	19373	51075	48609	20782	31561
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
50637	67928	179083	170438	72868	110661
50637	67928	179083	170438	72868	110661
81140	108846	286959	273106	116763	177321
81140	108846	286959	273106	116763	177321
173024	232106	611915	582375	248986	378122

■ ■ ■ Data Sheet

▶ Double Offset Valve (Soft Seat / Soft + Metal Seat / Metal Seat / Metal to Metal Seat) Torque Table

ASME Class 600 (Soft Seat)

VALVE SIZE		GTD					
		0~10 bar	35 bar	55 bar	70 bar	85 bar	100 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m
3in	DN80	45	116	185	240	288	346
4in	DN100	45	79	95	133	146	176
5in	DN125	60	99	119	166	183	220
6in	DN150	80	130	156	218	240	287
8in	DN200	135	225	270	378	416	499
10in	DN250	205	336	403	564	621	745
12in	DN300	305	504	605	847	931	1118
14in	DN350	500	828	994	1391	1530	1836
16in	DN400	715	1218	1462	2046	2251	2701
18in	DN450	960	1584	1901	2661	2927	3513
20in	DN500	1430	2244	2693	3770	4147	4976
24in	DN600	2080	3370	4039	5655	6247	7464
28in	DN700	2830	4488	5386	7540	8294	9953
30in	DN750	3468	5100	6120	8568	9425	11310
32in	DN800	4188	6324	7589	10624	11687	14024

Shaft Material					
A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
N·m	N·m	N·m	N·m	N·m	N·m
175	234	618	588	251	382
292	392	1034	984	421	639
454	609	1606	1528	653	992
839	1126	2968	2825	1208	1834
1037	1391	3666	3489	1492	2265
1772	2376	6265	5963	2549	3871
3505	4702	12396	11797	5044	7660
6078	8154	21497	20459	8747	13283
6078	8154	21497	20459	8747	13283
14442	19373	51075	48609	20782	31561
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
50637	67928	179083	170438	72868	110661
81140	108846	286959	273106	116763	177321
81140	108846	286959	273106	116763	177321

ASME Class 600 (Soft + Metal Seat)

VALVE SIZE		FSD					
		0~10 bar	35 bar	55 bar	70 bar	85 bar	100 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m
3in	DN80	59	150	249	312	375	450
4in	DN100	78	176	292	365	438	526
5in	DN125	101	233	388	485	582	699
6in	DN150	125	291	484	606	727	872
8in	DN200	182	501	832	1041	1249	1499
10in	DN250	289	738	1227	1536	1843	2212
12in	DN300	507	1268	2106	2636	3164	3796
14in	DN350	811	1989	3305	4137	4965	5957
16in	DN400	1030	2703	4491	5622	6746	8095
18in	DN450	1451	3475	5774	7228	8673	10408
20in	DN500	1885	4633	7698	9637	11564	13877
24in	DN600	2808	7293	12118	15169	18203	21844
28in	DN700	4047	10511	17464	21862	26235	31482
30in	DN750	4959	12894	21424	26820	32183	38620
32in	DN800	5989	15571	25872	32388	38865	46638

Shaft Material					
A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
N·m	N·m	N·m	N·m	N·m	N·m
175	234	618	588	251	382
292	392	1034	984	421	639
454	609	1606	1528	653	992
839	1126	2968	2825	1208	1834
1037	1391	3666	3489	1492	2265
1772	2376	6265	5963	2549	3871
3505	4702	12396	11797	5044	7660
6078	8154	21497	20459	8747	13283
6078	8154	21497	20459	8747	13283
14442	19373	51075	48609	20782	31561
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
50637	67928	179083	170438	72868	110661
81140	108846	286959	273106	116763	177321
81140	108846	286959	273106	116763	177321

ASME Class 600 (Metal Seat)

VALVE SIZE		GTD					
		0~10 bar	35 bar	55 bar	70 bar	85 bar	100 bar
NPS	DN	N·m	N·m	N·m	N·m	N·m	N·m
3in	DN80	68	173	277	360	432	519
4in	DN100	90	203	324	421	505	607
5in	DN125	117	269	431	560	672	806
6in	DN150	144	336	538	699	839	1006
8in	DN200	210	578	924	1201	1441	1730
10in	DN250	333	852	1363	1772	2127	2552
12in	DN300	585	1463	2340	3042	3650	4380
14in	DN350	936	2295	3672	4774	5728	6874
16in	DN400	1188	3119	4990	6486	7784	9341
18in	DN450	1674	4010	6415	8340	10008	12009
20in	DN500	2175	5346	8554	11120	13344	16012
24in	DN600	3240	8415	13464	17503	21004	25205
28in	DN700	4670	12128	19404	25226	30271	36325
30in	DN750	5722	14878	23804	30946	37135	44562
32in	DN800	6910	17967	28746	37370	44844	53813

Shaft Material					
A276 Tp.316	A276 Tp.410	A564 Tp.630	MONEL K500	B150-C63000	A276-S31803
N·m	N·m	N·m	N·m	N·m	N·m
175	234	618	588	251	382
292	392	1034	984	421	639
454	609	1606	1528	653	992
839	1126	2968	2825	1208	1834
1037	1391	3666	3489	1492	2265
1772	2376	6265	5963	2549	3871
3505	4702	12396	11797	5044	7660
6078	8154	21497	20459	8747	13283
6078	8154	21497	20459	8747	13283
14442	19373	51075	48609	20782	31561
17470	23436	61785	58802	25140	38179
17470	23436	61785	58802	25140	38179
50637	67928	179083	170438	72868	110661
81140	108846	286959	273106	116763	177321
81140	108846	286959	273106	116763	177321

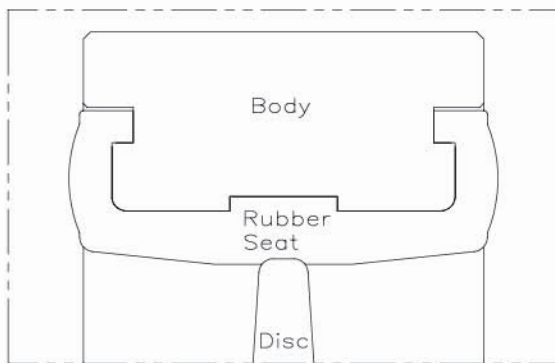
Concentric valve

–API 609 Category A

► General Rubber Seat Valve

GRS (General Rubber Seat) type is elastomer seated butterfly valve used for the process demanding positive shut-off and effective flow control.

► Sealing System

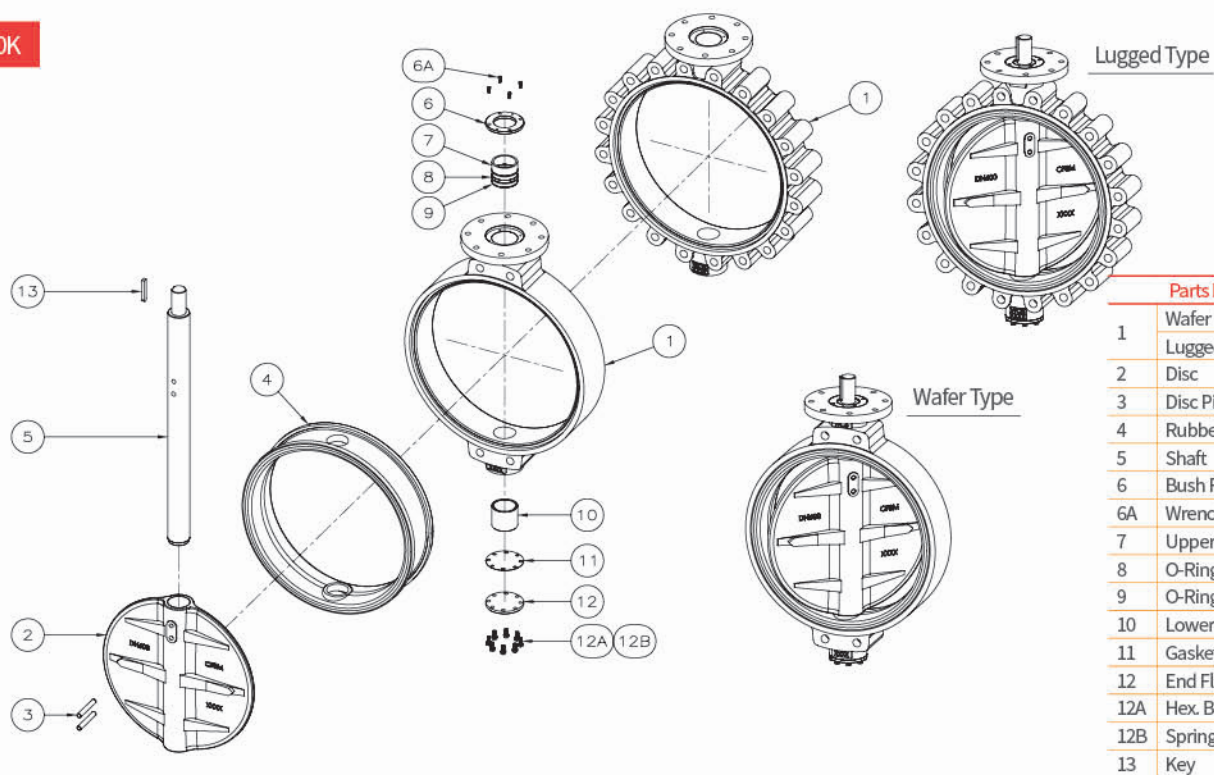


Type	General Rubber Seat Valve
Design	API std. 609
Rating	ASME Cl. 150 PN 10, 16 JIS 10K, 16K
Size	DN50(2") to DN1000 (40")
Connection Type	Lugged & Wafer
Temperature Range	-20°C to 120°C
Main Material	Body : WCB, CF8, CF8M, B148-C95800 etc. Disc : CF8, CF8M, B148-C95800 etc. Shaft : 17-4PH, 316SS, B150-C63000 etc. Seat : EPDM, NBR, VITON etc.
Operator	Manual Hand lever / Manual Worm Gear Pneumatic Actuator Electric Actuator
Application	- General & Petro Chemical - Oil Refinery / Production - Steel and Iron Mill - Shipbuilding - Water Treatment - Sea Water
Option	Teflon V-packing Anti-static device Stem extension Monel / Al-bronze Body and Disc

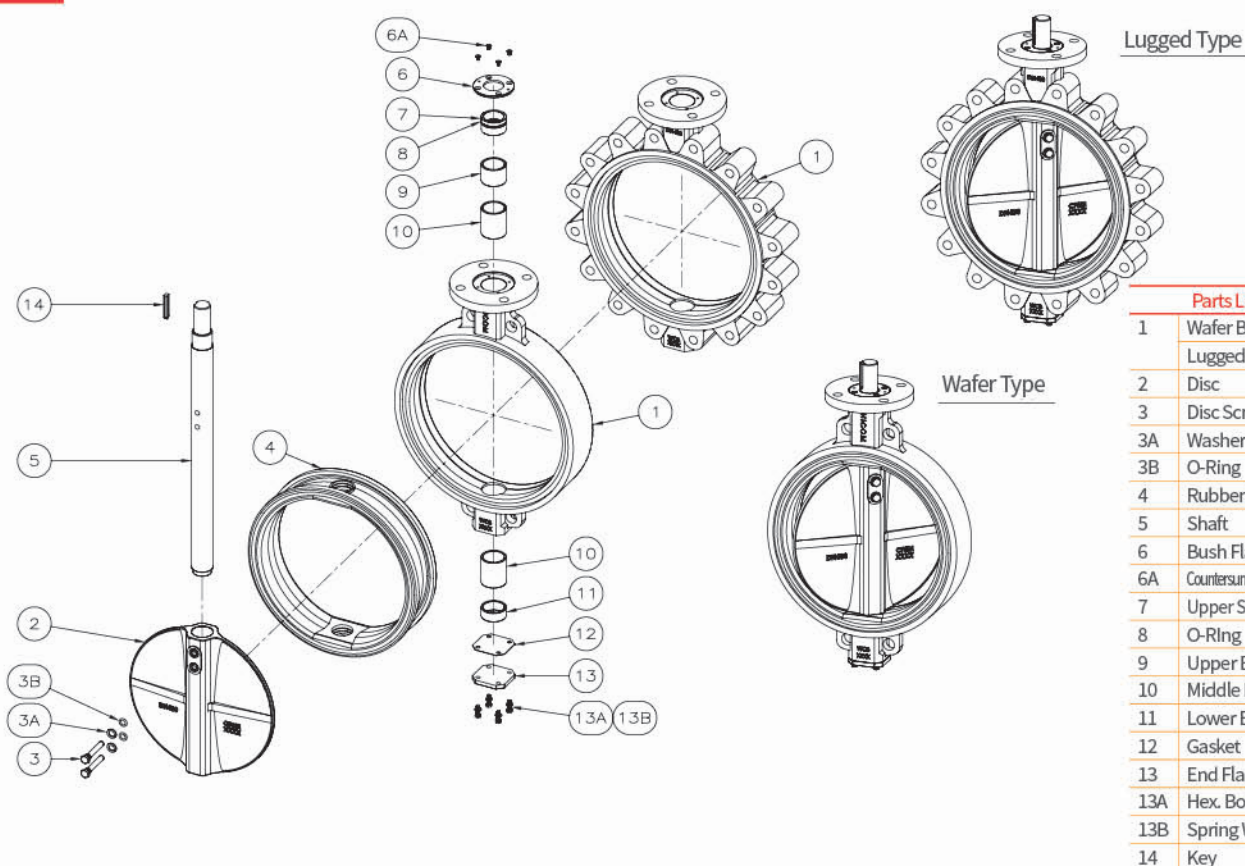
■ ■ ■ Data Sheet

▶ General Rubber Seat Valve

10K



16K



■ ■ ■ Data Sheet

▶ General Rubber Seat Valve

STANDARD MATERIAL

Part No.	Designation	Specification	Material	
			ASTM	
1	Valve Body	Cast Iron	A126 Cl B	
		Ductile Cast Iron	A395	A536
		Carbon Steel	A216 Gr. WCB	
		304 Stainless Steel	A351 Gr. CFS	
		316 Stainless Steel	A351 Gr. CF8M	
2	Disc	Carbon Steel	A216 Gr. WCB	
		304/304L Stainless Steel	A351 Gr. CF8/CF3	
		316/316L Stainless Steel	A351 Gr. CF8M/CF3M	
		13 Cr	A217 Gr. CA15	
		Monel 400	A494 Gr. M35-1	
3	Disc Pin	Aluminum Bronze	B148	
		316 Stainless Steel	A276 Tp. 316	
4	Rubber Seat	Nitrile Butadiene Rubber	NBR	
		Ethylene Propylene Diene Monomer	EPDM	
		Fluorine Rubber	VITON	
		CR(Neoprene)	NEOPRENE	
		Silicone	SILICONE	
5	Shaft	304 Stainless Steel	A276 Tp. 304	
		316 Stainless Steel	A276 Tp. 316	
		13 Cr	A276 Tp. 410	
		17-4PH	A564 Tp. 630	
		Monel K500	B865 UN S N05500	
6	Bush Flange	304 Stainless Steel	A240 Tp. 304	
6A	Wrench Bolt	304 Stainless Steel	A2-70	
7	Upper Bush	Bronze	BRONZE	
8	O-Ring	Nitrile Butadiene Rubber	NBR	
		Ethylene Propylene Diene Monomer	EPDM	
9	O-Ring Retainer	304 Stainless Steel	A276 Tp. 304	
10	Lower Bush	Bronze	BRONZE	
11	Gasket	Non-Asbestos	NON-ASBESTOS	
12	End Flange	Carbon Steel	AISI 1045	
		316 Stainless Steel	A276 Tp. 316	
12A	Hex. Bolt	Carbon Steel	A307 Gr. B	
		304 Stainless Steel	A2-70(Std)	
		316 Stainless Steel	A4-70(Std)	
12B	Spring Washer	Carbon Steel	A510	
		304 Stainless Steel	A167 Tp. 304	
		316 Stainless Steel	A167 Tp. 316	
13	Key	Carbon Steel	AISI 1045	

▲ Recommend Spare Parts

Part No.	Designation	Specification	Material	
			ASTM	
1	Valve Body	Aluminum Bronze	B148	
2	Disc	Aluminum Bronze	B148	
		Monel 400	A494 Gr. M35-1	
		316/316L Stainless Steel	A351 Gr. CF8M/CF3M	
3	Disc Pin	316 Stainless Steel	A276 Tp. 316	
4	Rubber Seat	Nitrile Butadiene Rubber	NBR	
		Ethylene Propylene Diene Monomer	EPDM	
		CR(Neoprene)	NEOPRENE	
		Silicone	SILICONE	
5	Shaft	Aluminum Bronze	B150-C63000	
		Duplex Stainless Steel	A276- S31803	
		Monel K500	B865 UNS N05500	
6	Bush Flange	Aluminum Bronze	B150-C63000	
6A	Wrench Bolt	316 Stainless Steel	A4-70	
7	Upper Bush	Bronze	BRONZE	
8	O-Ring	Nitrile Butadiene Rubber	NBR	
		Ethylene Propylene Diene Monomer	EPDM	
9	O-Ring Retainer	Monel 400	B127 UNS N04400	
10	Lower Bush	Bronze	BRONZE	
11	Gasket	Non-Asbestos	NON-ASBESTOS	
12	End Flange	Aluminum Bronze	B150-C63000	
12A	Hex. Bolt	316 Stainless Steel	A4-70	
12B	Spring Washer	316 Stainless Steel	A167 Tp. 316	
13	Key	Carbon Steel	AISI 1045	

▲ Recommend Spare Parts

■ ■ ■ Data Sheet

► General Rubber Seat Valve

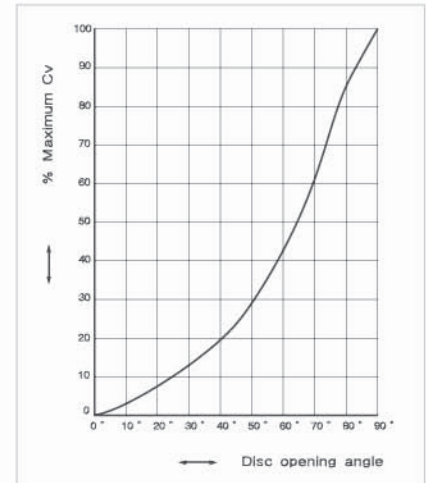
Cv-Value

The Cv flow coefficient, often used or control valves is defined as the flow of water at 60°F (16°C) in gallons per minute, at a pressure drop of 1psi across the valve.

10K

VALVE SIZE		unit	Cv relating to the disc opening angle of the disc								
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
2in	DN50	Cv	3.9	9.8	16.9	25.4	37.7	55.3	79.3	111	130
		Kv	3.3	8.4	14.5	21.7	32.3	47.3	68	95	112
2.5in	DN65	Cv	5.7	14.3	24.7	37.1	55.1	80.8	116	162	190
		Kv	4.9	12.2	21.2	31.7	47.2	69.2	100	140	163
3in	DN80	Cv	10.8	27	46.8	70.2	105	153	220	306	360
		Kv	9.3	23	40.1	60.2	90	131	190	262	310
4in	DN100	Cv	19.5	49	84.5	127	190	276	397	555	650
		Kv	16.7	42	72.4	110	165	238	340	480	560
5in	DN125	Cv	42	105	182	273	406	595	855	1190	1400
		Kv	36	90	156	235	350	510	735	1020	1200
6in	DN150	Cv	57	143	247	370	551	810	1160	1615	1900
		Kv	50	122	212	317	475	700	995	1385	1630
8in	DN200	Cv	99	248	430	645	957	1405	2015	2805	3300
		Kv	85	212	370	555	820	1205	1725	2405	2830
10in	DN250	Cv	150	375	650	975	1450	2125	3050	4250	5000
		Kv	130	321	560	835	1245	1820	2615	3645	4285
12in	DN300	Cv	225	563	975	1465	2175	3190	4575	6375	7500
		Kv	195	485	835	1255	1865	2740	3920	5465	6430
14in	DN350	Cv	285	715	1235	1855	2755	4040	5795	8075	9500
		Kv	245	610	1060	1590	2360	3460	4965	6920	8140
16in	DN400	Cv	402	1005	1745	2615	3890	5695	8175	11390	13400
		Kv	345	865	1495	2240	3330	4880	7005	9760	11485
18in	DN450	Cv	516	1290	2240	3355	4990	7310	10495	14620	17200
		Kv	445	1110	1920	2875	4275	6265	8990	12530	14740
20in	DN500	Cv	640	1600	2770	4155	6180	9055	12995	18105	21300
		Kv	550	1370	2375	3560	5300	7760	11140	15515	18255
22in	DN550	Cv	750	1875	3250	4875	7250	10625	15250	21250	25000
		Kv	645	1610	2785	4180	6215	9105	13070	18210	21425
24in	DN600	Cv	900	2250	3900	5850	8700	12750	18300	25500	30000
		Kv	775	1930	3345	5015	7455	10925	15685	21850	25710
26in	DN650	Cv	1080	2700	4680	7020	10440	15300	21960	30600	36000
		Kv	925	2315	4010	6015	8950	13110	18820	26225	30850
28in	DN700	Cv	1245	3115	5395	8095	12035	17640	25315	35275	41500
		Kv	1070	2670	4625	6935	10315	15120	21695	30230	35565
30in	DN750	Cv	1440	3600	6240	9360	13920	20400	29280	40800	48000
		Kv	1235	3085	5350	8020	11930	17480	25090	34965	41135
32in	DN800	Cv	1620	4050	7020	10530	15660	22950	32940	45900	54000
		Kv	1390	3470	6015	9025	13420	19665	28230	39335	46275
34in	DN850	Cv	1860	4650	8060	12090	17980	26350	37820	52700	62000
		Kv	1595	3985	6910	10360	15410	22580	32410	45160	53130
36in	DN900	Cv	2070	5175	8970	13455	20010	29325	42090	58650	69000
		Kv	1775	4435	7690	11530	17150	25130	36070	50260	59130
40in	DN1000	Cv	2550	6375	11050	16575	24650	36125	51850	72250	85000
		Kv	2185	5465	9470	14205	21125	30955	44430	61910	72840

FLOW CHARACTERISTIC



16K

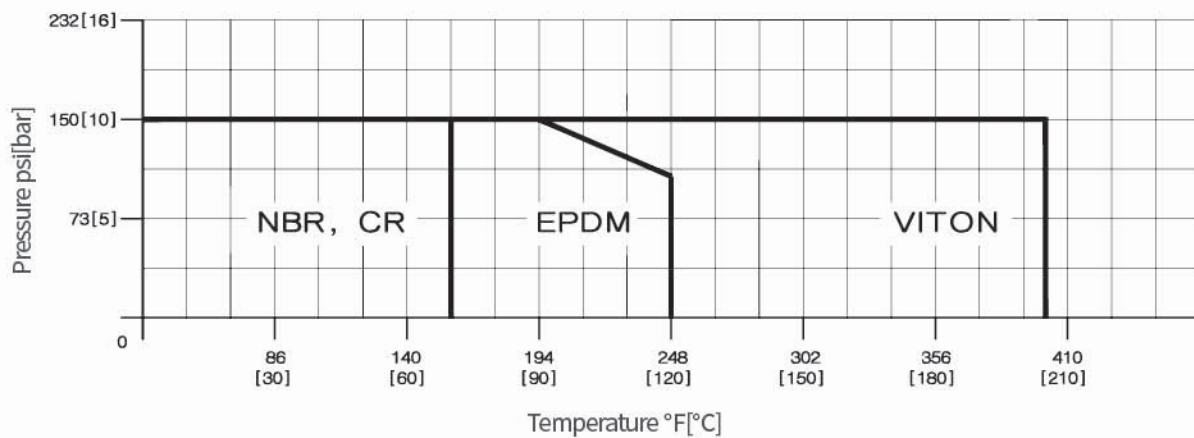
VALVE SIZE		unit	Cv relating to the disc opening angle of the disc								
NPS	DN		10°	20°	30°	40°	50°	60°	70°	80°	90°
2in	DN50	Cv	3.9	9.8	16.9	25.4	37.7	55.3	79.3	111	130
		Kv	3.3	8.4	14.5	21.7	32.3	47.3	68	95	112
		Cv	5.7	14.3	24.7	37.1	55.1	80.8	116	162	190
2.5in	DN65	Kv	4.9	12.2	21.2	31.7	47.2	69.2	100	140	163
		Cv	10.8	27	46.8	70.2	105	153	220	306	360
		Kv	9.3	23	40.1	60.2	90	131	190	262	310
3in	DN80	Cv	19.5	49	84.5	127	190	276	397	555	650
		Kv	16.7	42	72.4	110	165	238	340	480	560
		Cv	42	105	182	273	406	595	855	1190	1400
4in	DN100	Kv	36	90	156	235	350	510	735	1020	1200
		Cv	57	143	247	370	551	810	1160	1615	1900
		Kv	50	122	212	317	475	700	995	1385	1630
Bin	DN200	Cv	99	248	430	645	957	1405	2015	2805	3300
		Kv	85	212	370	555	820	1205	1725	2405	2830
		Cv	150	375	650	975	1450	2125	3050	4250	5000
10in	DN250	Kv	130	321	560	835	1245	1820	2615	3645	4285
		Cv	225	563	975	1465	2175	3190	4575	6375	7500
		Kv	195	485	835	1255	1865	2740	3920	5465	6430
14in	DN350	Cv	285	715	1235	1855	2755	4040	5795	8075	9500
		Kv	245	610	1060	1590	2360	3460	4965	6920	8140
		Cv	402	1005	1745	2615	3890	5695	8175	11390	13400
16in	DN400	Kv	345	865	1495	2240	3330	4880	7005	9760	11485
		Cv	516	1290	2240	3355	4990	7310	10495	14620	17200
		Kv	445	1110	1920	2875	4275	6265	8990	12530	14740
20in	DN500	Cv	640	1600	2770	4155	6180	9055	12995	18105	21300
		Kv	550	1370	2375	3560	5300	7760	11140	15515	18255
		Cv	750	1875	3250	4875	7250	10625	15250	21250	25000
22in	DN550	Kv	645	1610	2785	4180	6215	9105	13070	18210	21425
		Cv	900	2250	3900	5850	8700	12750	18300	25500	30000
		Kv	775	1930	3345	5015	7455	10925	15685	21850	25710
26in	DN650	Cv	1080	2700	4680	7020	10440	15300	21960	30600	36000
		Kv	925	2315	4010	6015	8950	13110	18820	26225	30850
		Cv	1245	3115	5395	8095	12035	17640	25315	35275	41500
28in	DN700	Kv	1070	2670	4625	6935	10315	15120	21695	30230	35565
		Cv	1440	3600	6240	9360	13920	20400	29280	40800	48000
		Kv	1235	3085	5350	8020	11930	17480	25090	34965	41135
30in	DN750	Cv	1620	4050	7020	10530	15660	22950	32940	45900	54000
		Kv	1390	3470	6015	9025	13420	19665	28230	39335	46275
		Cv	1860	4650	8060	12090	17980	26350	37820	52700	62000
34in	DN850	Kv	1595	3985	6910	10360	15410	22580	32410	45160	53130
		Cv	2070	5175	8970	13455	20010	29325	42090	58650	69000
		Kv	1775	4435	7690	11530	17150	25130	36070	50260	59130

■ ■ ■ Data Sheet

► General Rubber Seat Valve Pressure – Temperature Rating

10K

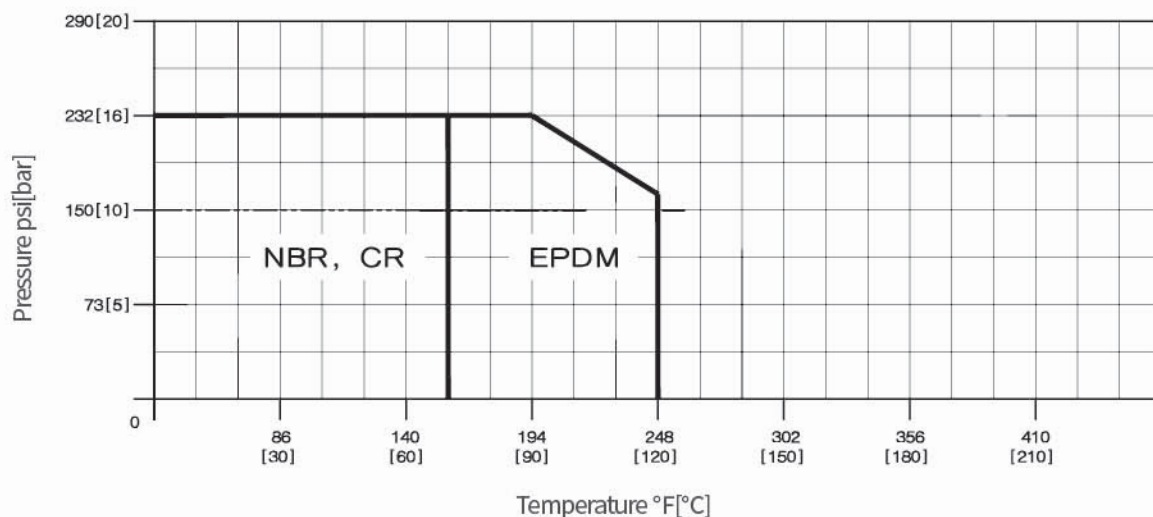
Maximum Allowable Pressure		10 bar	7 bar
Working Temperature	NBR(BUNA-N)	0 ~ 70°C	
	CR(NEOPRENE)	0 ~ 70°C	
	EPDM	0 ~ 90°C	Max 120 °C
	VITON	0 ~ 205°C	



* Rubber seat material and usage at below 0 °C it must be discussed between consignee, deliverer and person in charge.

16K

Maximum Allowable Pressure		16 bar	11 bar
Working Temperature	NBR(BUNA-N)	0 ~ 70°C	
	CR(NEOPRENE)	0 ~ 70°C	
	EPDM	0 ~ 90°C	Max 120 °C



* Rubber seat material and usage at below 0 °C it must be discussed between consignee, deliverer and person in charge.

■ ■ ■ Data Sheet

▶ General Rubber Seat Valve Torque Table

10K

VALVE SIZE		0~5 (bar)	0~75 (psi)	10 (bar)	150 (psi)	Material															
						A276 Tp.304&316/A276Tp.304L&316L				A276 Tp.410		A564Tp.630(H1150)		MONEL K500		B150-C63000		A276-S31803			
NPS	DN	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in		
2in	DN50	20	180	23	210	67	595	56	496	89	794	235	2085	224	1985	95	844	145	1290		
2.5in	DN65	23	205	29	260	67	595	56	496	89	794	235	2085	224	1985	95	844	145	1290		
3in	DN80	30	270	38	345	67	595	56	496	89	794	235	2085	224	1985	95	844	145	1290		
4in	DN100	43	385	60	535	169	1502	141	1251	226	2003	594	5257	565	5007	240	2128	367	3254		
5in	DN125	64	575	79	700	169	1502	141	1251	226	2003	594	5257	565	5007	240	2128	367	3254		
6in	DN150	84	745	97	860	169	1502	141	1251	226	2003	594	5257	565	5007	240	2128	367	3254		
8in	DN200	130	1155	155	1375	356	3155	297	2629	475	4206	1247	11043	1188	10517	505	4469	772	6836		
10in	DN250	190	1685	250	2215	587	5202	489	4335	783	6936	2057	18208	1959	17341	832	7370	1273	11271		
12in	DN300	260	2305	344	3050	587	5202	489	4335	783	6936	2057	18208	1959	17341	832	7370	1273	11271		
14in	DN350	465	4120	625	5535	1046	9257	871	7714	1394	12343	3660	32401	3486	30858	1481	13114	2266	20058		
16in	DN400	580	5135	865	7660	1787	15820	1489	13183	2383	21093	6256	55370	5958	52733	2532	22411	3872	34276		
18in	DN450	850	7525	1110	9825	1787	15820	1489	13183	2383	21093	6256	55370	5958	52733	2532	22411	3872	34276		
20in	DN500	969	8585	1300	11510	3536	31300	2947	26084	4715	41734	12377	109552	11788	104335	5010	44342	7662	67818		
22in	DN550	1360	12040	1900	16820	3536	31300	2947	26084	4715	41734	12377	109552	11788	104335	5010	44342	7662	67818		
24in	DN600	1755	15535	2330	20625	6133	54281	5110	45234	8177	72375	21465	189984	20443	180938	8688	76898	13288	117609		
26in	DN650	2145	18990	2840	25140	6133	54281	5110	45234	8177	72375	21465	189984	20443	180938	8688	76898	13288	117609		
28in	DN700	2720	24075	3350	29655	14571	128969	12143	107474	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434		
30in	DN750	3005	26600	3760	33280	14571	128969	12143	107474	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434		
32in	DN800	3345	29610	4370	38680	14571	128969	12143	107474	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434		
34in	DN850	4095	36250	5330	47180	14571	128969	12143	107474	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434		
36in	DN900	4780	42310	6150	54440	14571	128969	12143	107474	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434		
40in	DN1000	6150	54440	8190	72490	17627	156014	14689	130012	23503	208019	61695	546052	58757	520049	24972	221021	38192	338032		

16K

VALVE SIZE		0~5	0~75	10	150	16	230	Material											
		(bar)	(psi)	(bar)	(psi)	(bar)	(psi)	A276Tp.304&316		A276 Tp.410		A564Tp.630(H1150)		MONEL K500		B150-C63000		A276-S31803	
NPS	DN	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in	N·m	lb·in
2in	DN50	22	195	24	220	28	250	67	595	89	794	235	2085	224	1985	95	844	145	1290
2.5in	DN65	24	220	31	275	33	300	67	595	89	794	235	2085	224	1985	95	844	145	1290
3in	DN80	31	275	41	370	45	405	67	595	89	794	235	2085	224	1985	95	844	145	1290
4in	DN100	45	405	61	540	67	600	169	1502	226	2003	594	5257	565	5007	240	2128	367	3254
5in	DN125	71	630	84	745	101	900	169	1502	226	2003	594	5257	565	5007	240	2128	367	3254
6in	DN150	88	785	105	930	163	1450	169	1502	226	2003	594	5257	565	5007	240	2128	367	3254
8in	DN200	136	1205	162	1435	214	1900	356	3155	475	4206	1247	11043	1188	10517	505	4469	772	6836
10in	DN250	198	1760	262	2320	354	3140	587	5202	783	6936	2057	18208	1959	17341	832	7370	1273	11271
12in	DN300	271	2405	354	3140	508	4500	587	5202	783	6936	2057	18208	1959	17341	832	7370	1273	11271
14in	DN350	479	4245	640	5665	830	7350	1046	9257	1394	12343	3660	32401	3486	30858	1481	13114	2266	20058
16in	DN400	594	5265	889	7875	1291	11435	1787	15820	2383	21093	6256	55370	5958	52733	2532	22411	3872	34276
18in	DN450	875	7745	1140	10090	1977	17500	1787	31300	4715	41734	12377	109552	11788	104335	5010	44342	7662	67818
20in	DN500	997	8830	1334	11815	2598	23000	3536	54281	8177	72375	21465	189984	20443	180938	8688	76898	13288	117609
24in	DN600	1842	16312	2446	21656	2936	25988	6133	54281	8177	72375	21465	189984	20443	180938	8688	76898	13288	117609
26in	DN650	2252	19940	2982	26397	3578	31676	6133	54281	8177	72375	21465	189984	20443	180938	8688	76898	13288	117609
28in	DN700	2856	25279	3518	31138	4221	37365	14571	128969	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434
30in	DN750	3155	27930	3948	34944	4737	41933	14571	128969	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434
32in	DN800	3512	31091	4588	40614	5506	48737	14571	128969	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434
34in	DN850	4300	38063	5597	49539	6716	59447	14571	128969	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434
36in	DN900	5019	44426	6458	57162	7750	68594	14571	128969	19428	171959	51000	451393	48572	429898	20643	182706	31571	279434
40in	DN1000	6458	57162	8599	76115	10319	91337	17627	156014	23503	208019	61695	546052	58757	520049	24972	221021	38192	338032

Test Facilities

► Shell Test

Test Standard	API 598 / ASME B16.34 / EN 12266 / ISO 5208
Test Medium	Water, Nitrogen Gas
Allowable leakage	No Leakage

► Seat Test

Test Standard	API 598 / ASME B16.34 / EN 12266 / ISO 5208
Test Medium	Water, Air, Nitrogen Gas
Allowable leakage	Tight Shut-off(Zero Leakage) / API 598(MTD,TOD)

- All valves go through pressure and operation tests in Unicom facilities.
- Test is conducted under the specific acceptance criteria of customers.
- Additionally, we apply Unicom test standards which are more stringent than the generally accepted test criteria in the industry.
- Test is conducted gradually from low pressure to high pressure to ensure the perfect seal in all the pressure within the design pressure.
- Since both gas test and hydro test are conducted as Unicom's internal test criteria, a perfect seal is guaranteed under any conditions, gas or liquid.



► CRYOGENIC TEST

Test Standard	BS 6364 / SHELL SPE 77/306 / KOGAS-GSM-1015	Coolant	Liquid Nitrogen
Test Temperature	-196°C ± 1°C	Acceptance Standard	Seat Leakage : BS 6364 (100mm ³ /s x DN) Outside Leakage : Shell SPE 77/306
Test Medium	Helium Gas		

- Unicom conducts the most stringent quality inspection in the test lab. Specially designed for cryogenic valves.
- Cryogenic valves are tested by soaking in the liquid nitrogen and cooling down all components to -196°C.
- The valve is tested by increasing the pressure gradually to comply with the requirements of BS6364 to assure the sealing from low pressure to high pressure.



■ ■ ■ Certificates

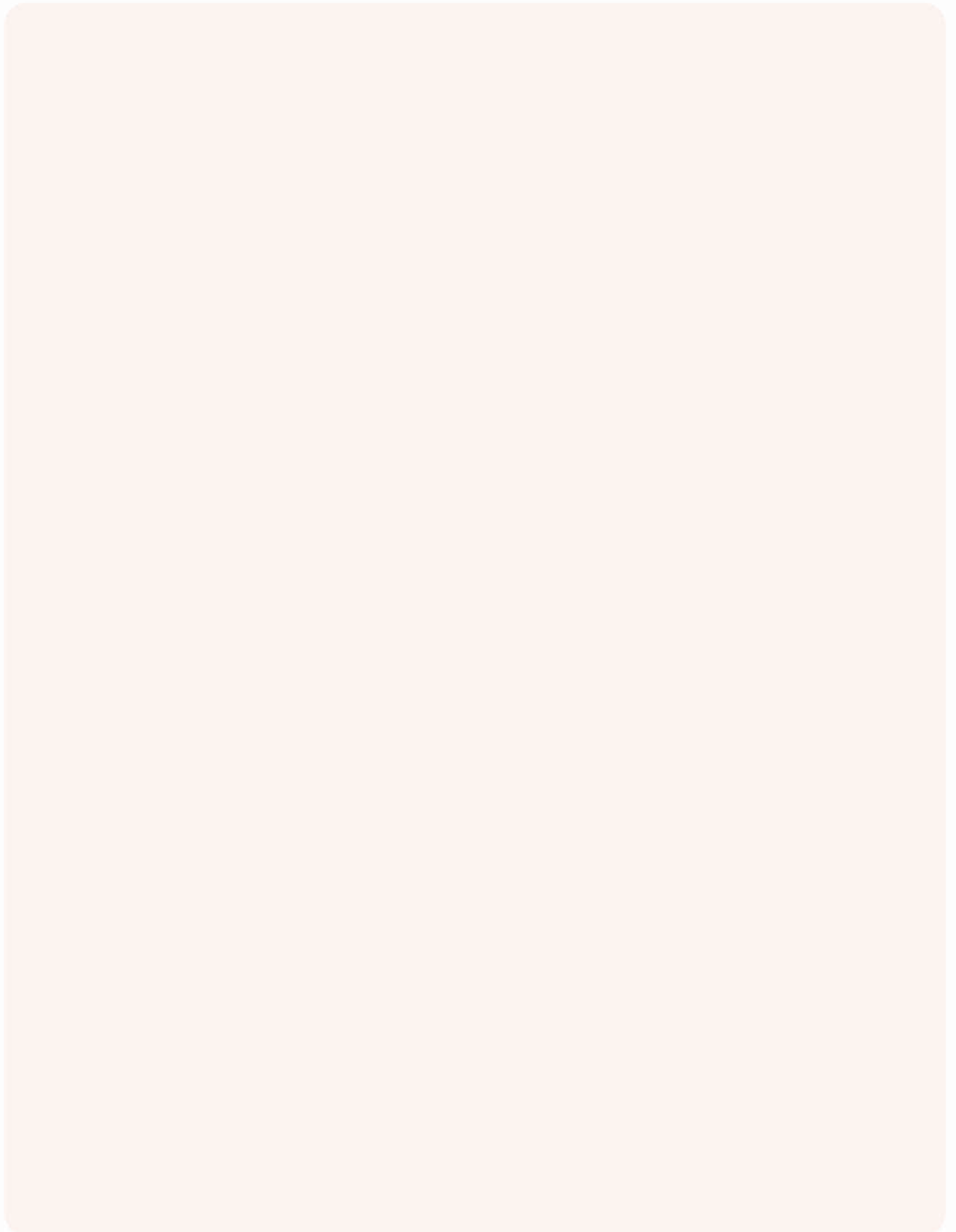
▶ System Certificate

Certificate	Institution	Scope
 BUREAU VERITAS	ISO 9001:2015	Quality Management
	ISO 14001:2015	Environmental Management
	ISO 45001:2018	Safety & Health Management

▶ Product Certificate

Certificate	Institution	Scope	
	API 609 MONOGRAM	AMERICAN PETROLEUM INSTITUTE	API 609 License
	CE-PED	BUREAU VERITAS	All valves of Unicom production
	TYPE APPROVAL	BUREAU VERITAS	Butterfly Valves (TOD CX BUTTERWELD / TOD CX DOUBLE FLANGE)
	TYPE APPROVAL	BUREAU VERITAS	Butterfly Valves (HP, GRS)
	MODE II SCHEM	BUREAU VERITAS	Factory acceptance
	FUGITIVE EMISSION	BUREAU VERITAS	High performance Valves
	TYPE APPROVAL	DNV GL	High performance Valves
	SIL 3 CAPABLE	EXIDA	HP, TOD Valves
	FIRE PROTECTION	UL	GRSU
	FIRE TEST (API 607 / 6FA)	APPLUS	HP(FSD), TOD
	LIFE CYCLE TEST	ABS	High performance Valves

■ ■ ■ MEMO



■■■ MEMO

■■■ Company Introduction

Since 1983, Korea Unicom Valve co., Ltd. (dba Unicom) has been manufacturing and supplying butterfly valves for a variety of industrial applications.

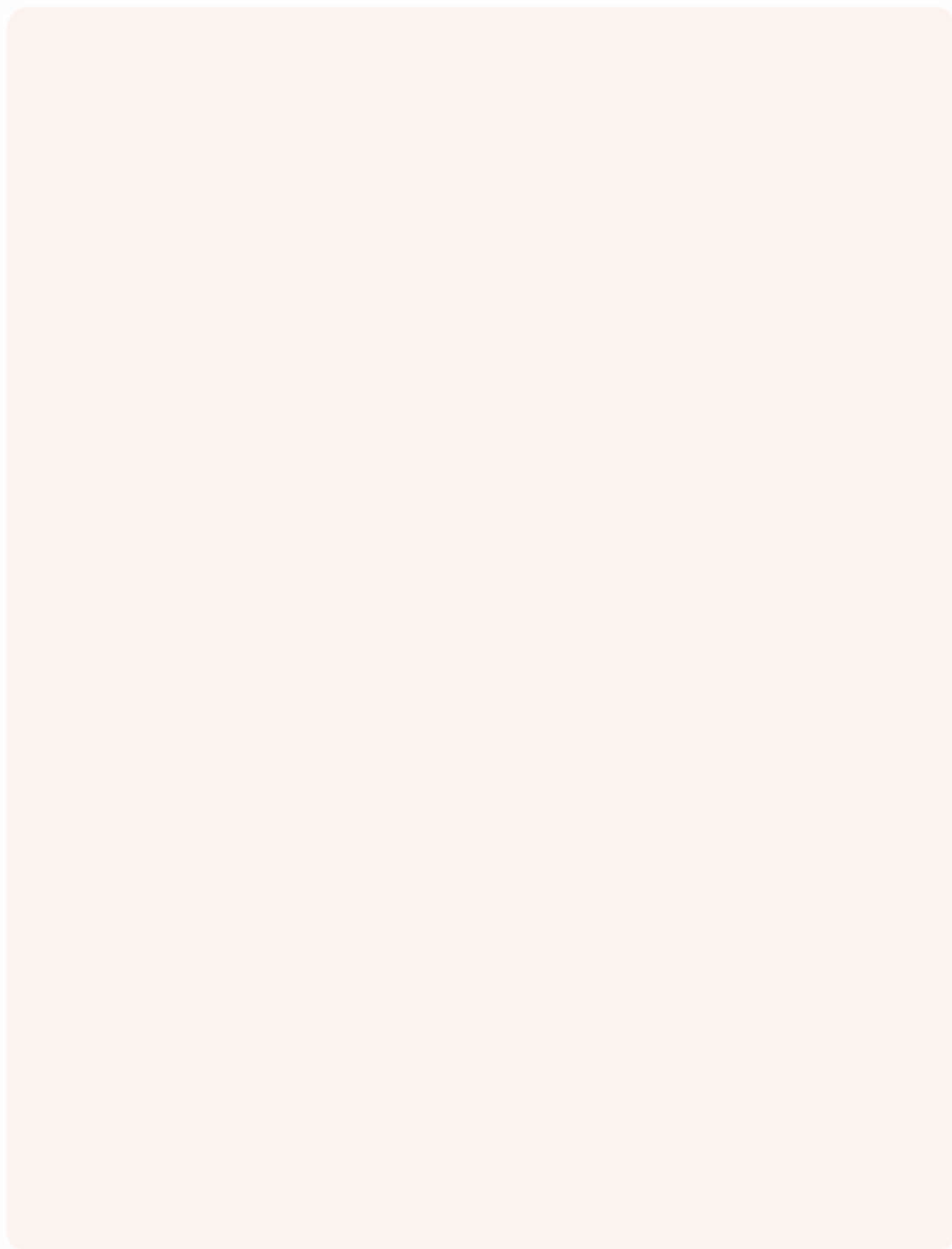
Unicom valve is specialized in triple offset type butterfly valve (TOD), and we supplied quality products proven on-site in the petrochemical, gas industry, chemical, energy, power plant, shipbuilding and other global markets with its unrivaled technical expertise and highly sophisticated design. TOD valves feature a special sealing mechanism consisting of an inclined conical disc and a laminated seat. TOD's unique characteristics are its low torque operation, reliable sealing and tight shut-off in both directions.

All butterfly valves manufactured by Unicom valve are designed according to API 609 standard. In addition, Unicom valve has wide range of certificates that assist you to use the butterfly valve where you need.

Furthermore, Unicom is striving in the R&D of future butterfly valves. Unicom is striving to develop and manufacture double / triple offset type butterfly valves through ceaseless R&D activities. We look forward to providing you with the highest quality butterfly valves based on our technological know-how and experience, from our modern facilities under stringent quality and HSE systems.



■ ■ ■ MEMO

A large, empty, light orange rectangular area with rounded corners, intended for writing a memo. It occupies the majority of the page below the header and section title.



KOREA UNICOM VALVE CO., Ltd

28-175 Bugokgongdan 4-gil, Songak-eup, Dangjin-si,
Chungcheongnam-do, 31721, Korea

TEL : +82-41-350-6000 **FAX :** +82-41-350-6009

Website : unicomvalve.com

E-mail : sales@unicomvalve.com

domestic.sales@unicomvalve.com

Copyright© by KOREA UNICOM VALVE Co., Ltd. All right reserved. 2022.09.

