

BUTTERFLY VALVE DOUBLE OFFSET

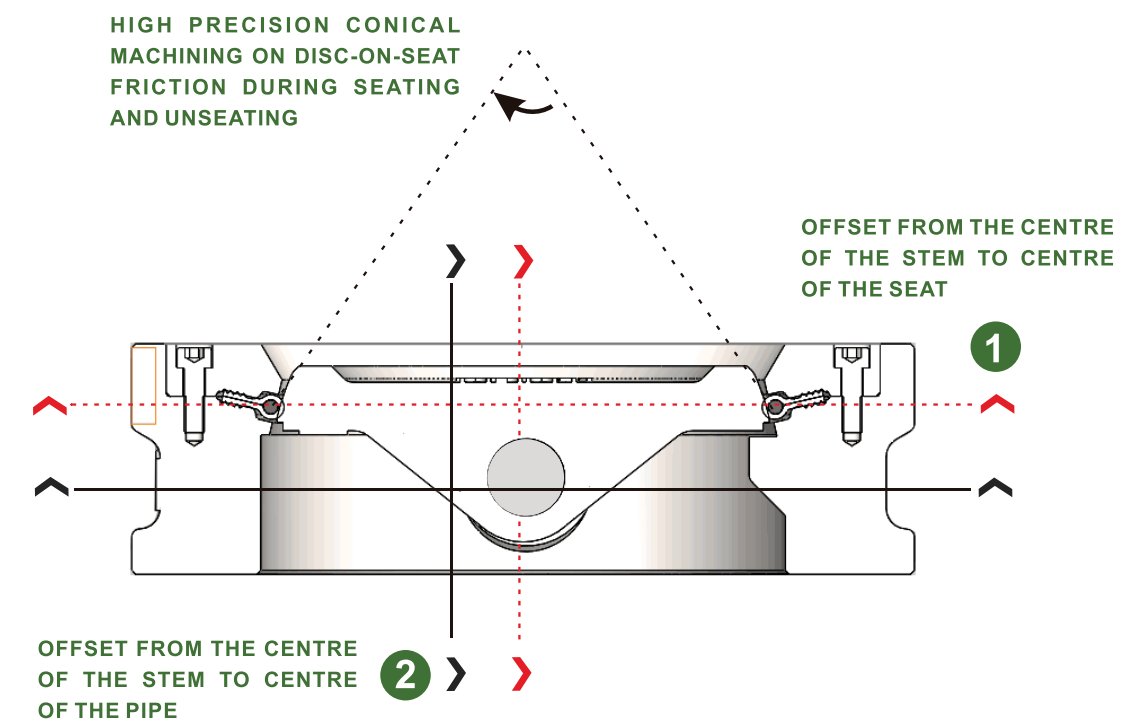


SUMMARY

- Pressure Rating: PN10, PN16, 150–900LB
- Size Range: DN50–DN1200(2"–48")
- Body Material: Carbon Steel, Stainless Steel, Duplex S.S., Bronze and Special Alloy
- Seat Material: Standard with RPTFE (energized), Optional with metal seated or fire safe tested design
- Mounting Pad & Stem: ISO 5211
- Standard Lockable Hand Lever
- Temperature Range: –30 to 260°C
- Design: API 609; ASME B16.34
- Valve Inspection & Testing: Standard: API 598
- Shutoff Rating: Bi-directional Bubble Tight
- Blowout Proof Stem
- Fire Safe Tested Design (optional design)

FEATURES

The NUTORK double offset butterfly valve is a high performance valve that offers superior service life and is trouble-free to maintain. The second offset in the design promotes effortless operation by virtually eliminating disc-on-seat friction during seating and unseating. The disc lifts quickly out of the seat in the first few degrees of travel, and does not make contact with the seat again until it is nearly closed, reducing seat wear and the overall operating torque of the valve. The integrally cast disc travel stop perfectly locates the disc and seat, preventing over-travel and consequent seat damage. This design promotes the self-alignment of the disc and seat, and therefore compensates for change in pressures and temperatures always ensuring of the disc and seat, and therefore compensates for change in pressures and temperatures always ensuring bi-directional bubble tight shutoff. Its double offset design minimize the wears points at the top and bottom seat. It has performed 100,000 mechanical cycle type testing and meet with zero leakage with high pressure air.



ADJUSTABLE STEM PACKING

NUTORK has a raised mounting pad allowing for the packing to be adjusted with the operator in place and preventing fugitive emissions into the operator in case of a leak. There utilizes a premium PTEE Chevron packing system as standard on resilient seated valves, and a graphite packing system on fire safe & metal seated valves. All packing systems have a ph rang of 0–14.

BLOW-OUT PROOF STEM

In the event of a stem failure the circlip installed between the machined stem groove and gland retainer step will ensure that the stem is retained, and cannot be forced out. The stem connection is standard ISO 5211.

SPACER RING

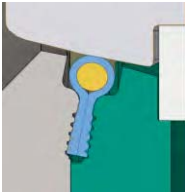
The anti–extrusion spacer ring acts as a packing protector and allows for packing flexibility. As an option, the anti–extrusion spacer ring can be substituted for a lantern ring for leak–off testing.

BEARINGS

PTFE lined Stainless Steel top and bottom bearing simultaneously offer superior corrosion resistance and lower coefficient of friction. The bearings support and secure the stem, preventing distortion from severe forces and temperatures acting on the disc and stem. The locating rings provide further disc/stem support.

SEAT

NUTORK high performance butterfly valve has a silicone energized RPTFE seat as standard. The silicone provides the resiliency required for a bubble tight seal whilst the 15% glass filled PTFE offers exceptional frictional properties and corrosion resistance. Optional firesafe & Metal seats are available.



Non Fire Safe



Fire Safe

PINS

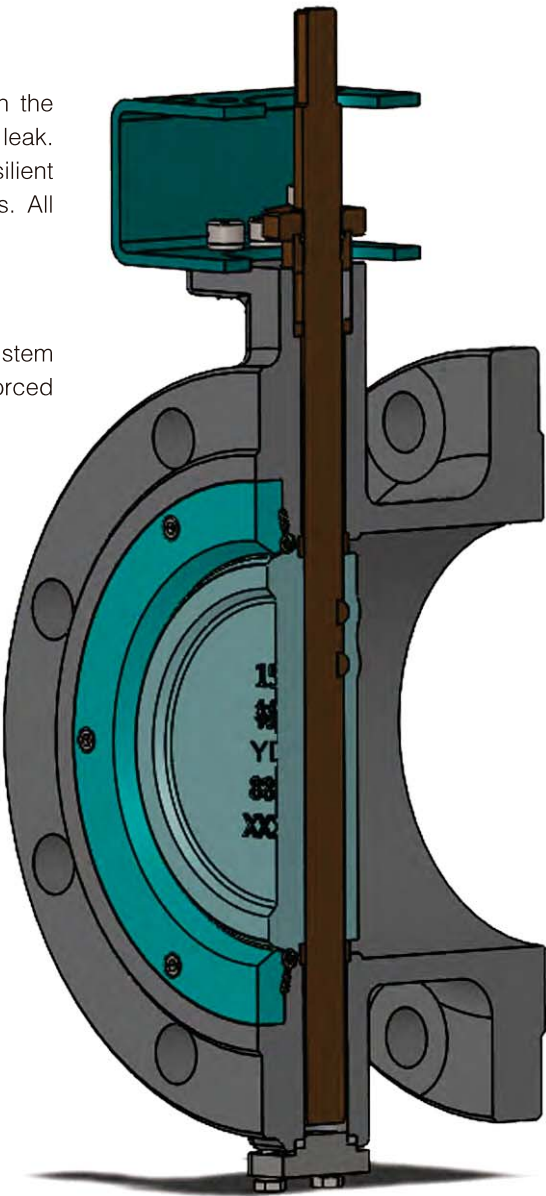
Only after valve assembly and precision alignment are the shaft fixture holes drilled, ensuring precision alignment are shaft fixture holes drilled, ensuring perfect location. The disc is fixed to the shaft using a unique tangential taper pin that transmits the load under compression, and not in shear.

DISC

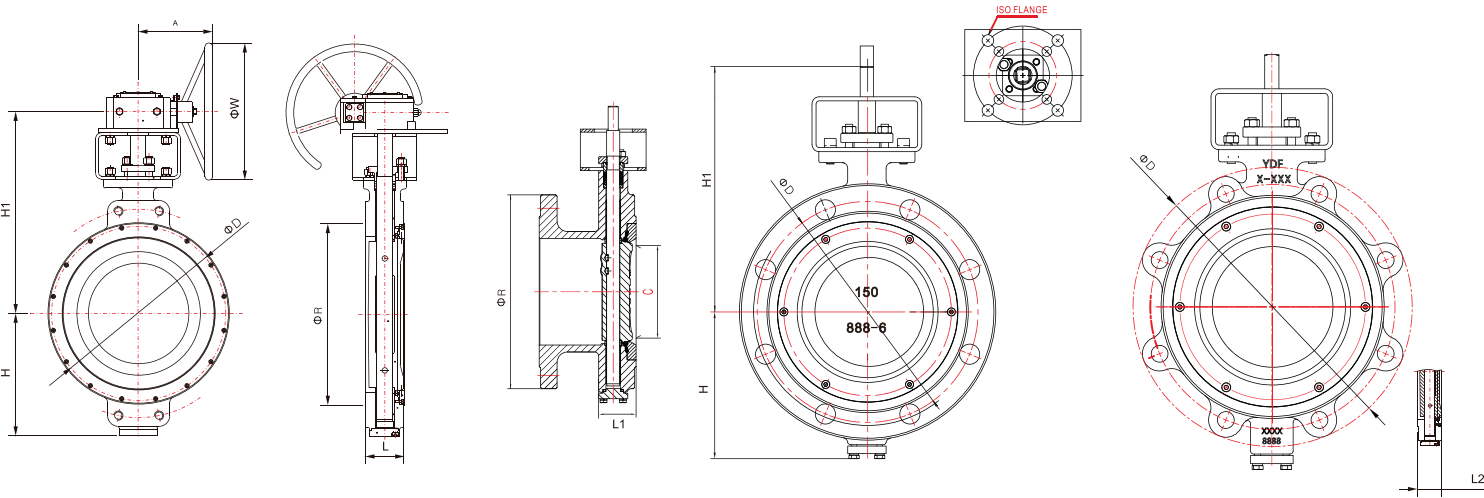
A full port and optimized hydrofoil disc shape maximizes the flow efficiency of the valve. The disc edge is precision polished ensuring a zero leakage seal and minimal seat wear. Unlike centerline valves, the sealing face is not located on the disc leading edge where initial wear occurs.

RETAINER RING

The retaining ring allows for easy seat replacement and also acts as built in deflector cone to divert flow away from the seat. The body is recessed to enclose and support the retaining ring.



No.	Part	Standard	Low Temperature	Stainless Steel	Sour Service
1	Body	ASTM A216 WCB	ASTM A352 LCB	ASTM A351 CF8M	ASTM A216 WCB
2	Disc	ASTM A351 CF8M	ASTM A352 LCB	ASTM A351 CF8M	ASTM A216 WCB
3	Stem	ASTM A564 630	ASTM A182 F316	ASTM A564 630	ASTM A182 F6a NC
4	Seat retainer	ASTM A105N	ASTM A350 LF2	ASTM A182 F316	ASTM A105N
5	Down Bearing Bushing	SS304+PTFE	SS316+PTFE	SS316+PTFE	SS316+PTFE
6	Seat ring	PTFE	PCTFE	PTFE	PTFE
7	Locating ring	SS304	SS316	SS316	SS316
8	Stem Packing	SS304	SS316	SS316	SS316
9	Gland Bush	PTFE	PCTFE	PTFE	PTFE
10	Bottom Cover	ASTM A105N	ASTM A350 Lf2	ASTM A182 F316	ASTM A105N
11	Bolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8	ASTM A193 B7M
12	Gasket	PTFE	PCTFE	PTFE	PTFE
13	Bolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8	ASTM A193 B7M
14	Bevel pin	ASTM A564 630	ASTM A182 F316	ASTM A564 630	ASTM A182 F6a NC
15	Axle sleeve	SS304+PTFE	SS316+PTFE	SS316+PTFE	SS316+PTFE
16	Set pressure	SS304	SS316	SS316	SS316
17	Plate	ASTM A216 WCB	ASTM A352 LCB	ASTM A351 CF8M	ASTM A216 WCB
18	Bolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8	ASTM A193 B7M
19	Nut	ASTM A194 2H	ASTM A194 4	ASTM A194 8	ASTM A194 2HM
20	Bracket	AISI 1020	AISI 1020	AISI 1020	AISI 1020
21	Bolt	ASTM A193 B7	ASTM A320 L7	ASTM A193 B8	ASTM A193 B7M
22	Nut	ASTM A194 2H	ASTM A194 4	ASTM A194 8	ASTM A194 2HM



Wafer Type

Double Flange Type

Lug Type

150LB

Size		R		D		W		L/L2		L1		H		H1		A		t (Body thickness)		Weight		
																				Wafer	Lug	RF
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	kg	kg	kg
2"	50	3.60	92	4.80	121	8.00	203	1.70	43	4.30	108	2.52	64	7.70	195	7.10	180	0.20	6	4	6	8
3"	80	5.00	127	6.00	152	8.00	203	1.90	48	4.50	114	3.35	85	8.50	215	7.10	180	0.20	6	7	9	12
4"	100	6.20	157	7.50	191	8.00	203	2.10	54	5.00	127	3.62	92	9.50	242	7.10	180	0.30	7	10	12	16
6"	150	8.50	216	9.50	241	11.81	*300	2.20	57	5.50	140	5.79	147	12.00	305	7.30	185	0.30	7	11	14	21
8"	200	10.60	270	11.80	299	11.81	*300	2.50	64	6.00	152	7.28	185	13.80	350	7.30	185	0.30	8	25	32	54
10"	250	12.80	324	14.30	362	11.81	*300	2.80	71	6.50	165	7.87	200	14.60	370	8.50	215	0.30	9	39	48	82
12"	300	15.00	381	17.00	432	15.75	*400	3.20	81	7.00	178	8.74	222	16.70	425	8.50	215	0.40	10	51	70	136
14"	350	16.30	413	18.80	476	15.75	*400	3.60	92	7.50	190	9.72	247	18.10	460	8.50	215	0.40	10	80	102	151
16"	400	18.50	470	21.30	540	19.68	*500	4.00	102	8.50	216	12.44	316	20.10	510	9.60	245	0.40	11	104	144	213
18"	450	21.00	533	22.80	578	19.68	*500	4.50	114	8.70	222	13.46	342	21.50	545	9.60	245	0.50	12	153	188	313
20"	500	23.00	584	25.00	635	23.62	*600	5.00	127	9.00	229	14.65	372	22.20	565	9.60	245	0.50	13	192	244	386
24"	600	27.30	692	29.50	749	23.62	*600	6.10	154	10.50	267	17.32	440	26.60	675	15.40	390	0.60	15	288	378	552
28"	700	31.50	800	34.00	864	27.56	*700	6.50	165	11.50	292	19.88	505	30.30	770	15.40	390	0.60	16	340	486	578
32"	800	36.00	914	38.50	978	27.56	*700	7.50	190	12.50	318	23.62	600	33.30	845	16.80	427	0.70	18	595	755	929
36"	900	40.30	1022	42.80	1086	27.56	*700	8.00	203	13.00	330	25.39	645	34.40	875	16.80	427	0.80	19	680	820	1015



BUTTERFLY VALVE
DOUBLE OFFSET

Diminsions

ENGINEERING DATA

Operating Torque
Flow Coefficient (Cv value)

Double Offset Butterfly Valve

300LB

Size		R		D		W		L/L2		L1		H		H1		A		t (Body thickness)		Weight		
																				Wafer	Lug	RF
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	kg	kg	kg
2"	50	3.60	92	5.00	127	8.00	203	1.70	43	4.30	108	2.50	64	7.70	195	7.10	180	0.20	6	6	10	13
3"	80	5.00	127	6.60	168	8.00	203	1.90	48	4.50	114	3.30	85	8.50	215	7.10	180	0.30	7	9	13	17
4"	100	6.20	157	7.90	200	8.00	203	2.10	54	5.00	127	3.60	92	9.50	242	7.10	180	0.30	8	11	16	21
6"	150	8.50	216	10.60	270	11.81	*300	2.30	59	5.50	140	7.00	178	12.60	320	7.30	185	0.40	9	18	24	34
8"	200	10.60	270	13.00	330	11.81	*300	2.90	73	6.00	152	8.30	210	14.40	365	7.30	185	0.40	11	33	45	63
10"	250	12.80	324	15.30	387	11.81	*300	3.30	83	6.50	165	9.30	235	16.90	430	8.50	215	0.50	13	26	49	73
12"	300	15.00	381	17.80	451	15.75	*400	3.60	92	7.00	178	11.10	282	18.50	470	8.50	215	0.60	14	40	74	108
14"	350	16.30	413	20.30	514	15.75	*400	4.60	117	7.50	190	12.30	312	21.50	545	8.50	215	0.60	16	125	194	264
16"	400	18.50	470	22.50	572	19.68	*500	5.20	133	8.50	216	13.70	349	22.80	580	9.60	245	0.70	18	139	245	335
18"	450	21.00	533	24.80	629	19.68	*500	5.90	149	8.70	222	15.20	386	24.40	620	9.60	245	0.80	19	252	393	533
20"	500	23.00	584	27.00	686	23.62	*600	6.30	159	9.00	229	16.10	410	26.40	670	9.60	245	0.80	21	284	490	674
24"	600	27.30	692	32.00	813	23.62	*600	7.10	181	10.50	267	18.90	480	28.10	715	15.40	390	1.00	24	509	834	1121

600LB

Size		R		D		W		L/L2		L1		H		H1		A		t (Body thickness)		Weight		
																				Wafer	Lug	RF
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	kg	kg	kg
3"	80	5.00	127	6.60	168	8.00	203	2.10	54	7.10	180	4.10	105	10.80	275	7.10	180	0.30	8	11	14	24
4"	100	6.20	157	8.50	216	11.81	*300	2.50	64	7.50	190	5.40	138	10.80	275	7.10	180	0.40	10	20	35	49
6"	150	8.50	216	11.50	292	15.75	*400	3.10	78	8.30	210	7.90	200	15.20	385	7.30	185	0.50	13	50	70	100
8"	200	10.60	270	13.80	349	15.75	*400	4.00	102	9.10	230	9.10	232	17.10	435	7.30	185	0.60	16	70	90	126
10"	250	12.80	324	17.00	432	19.68	*500	4.60	117	9.80	250	10.90	277	20.10	510	8.50	215	0.80	20	112	162	220
12"	300	15.00	381	19.30	489	19.68	*500	5.50	140	10.60	270	11.90	302	21.10	535	8.50	215	0.90	23	163	218	305
14"	350	16.30	413	20.80	527	23.62	*600	6.10	155	11.40	290	13.00	329	24.30	617	8.50	215	1.00	26	350	543	739
16"	400	18.50	470	23.80	603	23.62	*600	7.00	178	12.20	310	17.00	432	26.20	665	9.60	245	1.20	30	389	686	938
18"	450	21.00	533	25.80	654	23.62	*600	7.90	200	13.00	330	18.20	463	28.10	715	9.60	245	1.30	33	706	900	1360
20"	500	23.00	584	28.50	724	23.62	*600	8.50	216	13.80	350	19.40	492	28.70	730	9.60	245	1.40	37	795	1372	1700
24"	600	27.30	692	33.00	838	27.56	*700	9.10	232	15.40	390	20.70	525	35.20	895	15.40	390	1.70	43	1300	2100	2700

* Gear box

Note:900 lb size data can be supplied according to customer requirements

Size	150LB (2.0MPa)						300LB (5MPa)						600LB (10.0MPa)					
	N.m		Flange No.	Stem Diamete		Cv	N.m		Flange No.	Stem Diamete		Cv	N.m		Flange No.	Stem Diamete		Cv
	Stem Downstream	Stem Upstream		Wafer	RF		Stem Downstream	Stem Upstream		Wafer	RF		Stem Downstream	Stem Upstream		Wafer	RF	
2"	21	30	F07	43	108	65	/	/	F07	43	108	65	/	/	F07	54	150	48
2.5"	24	34	F07	46	112	113	53	76	F07	46	112	113	78	88	F07	54	170	86
3"	26	36	F07	48	114	172	55	78	F07	48	114	172	113	164	F07	54	180	132
4"	36	52	F07	54	127	385	79	113	F07	54	127	385	215	305	F07	64	190	270
6"	95	136	F07&F10	57	140	1050	237	339	F10	59	140	1050	463	655	F12	78	210	850
8"	177	237	F07&F10	64	152	2180	418	599	F12	73	152	1895	1107	1582	F14	102	230	1400
10"	324	463	F10 or F14	71	165	3280	791	1130	F14	83	165	3050	1898	2712	F16	114	250	2010
12"	514	735	F12	81	178	5100	1186	1695	F16	92	178	4800	2373	3390	F25	140	270	2980
14"	751	1074	F14	92	190	5800	1740	2486	F16	117	190	5395	3390	4858	F25	155	290	3900
16"	1187	1480	F16	102	216	9287	3005	4293	F25	133	216	7900	5141	7344	F25	178	310	5000
18"	1740	2486	F16	114	222	11400	3559	5084	F25	149	222	10086	7276	10390	F25	200	330	6000
20"	2136	3051	F16&F25	127	229	13800	4824	6892	F25	159	229	11300	9830	14010	F30	216	350	8000
24"	3480	4972	F16&F25	154	267	21600	7513	10734	F25	181	267	16980	13897	19772	F30	232	390	11000
26"	4580	5980	F25&F30	154	267	21600	/	/	F25	181	267	16980	/	/	F30	232	390	11000
28"	5029	7176	F25&F30	165	292	28080	/	/	F30	229	292	2300	/	/	F35	292	430	13000
30"	5933	8475	F25&F30	190	318	38740	16609	23727	F35	229	318	26520	24518	35025	F35	318	450	15400
32"	6644	9492	F25&F30	190	318	44070	/	/	F35	241	318	31200	/	/	F40	318	470	17500
36"	8701	12430	F25&F30	203	330	55800	22936	32766	F35	241	330	39450	/	/	F48	330	510	22360
40"	15375	16560	F30	216	410	68860	31478	44968	F40	300	410	50160	/	/	F48	410	550	27600
48"	29870	31415	F30	254	470	99200	45555	65079	F40	350	470	74500	/	/	F60	470	630	39750
56"	45767	47195	F35	318	530	138000	/	/	F40	390	530	107450	/	/	F60	530	710	57261
60"	51277	52995	F35	318	530	164300	/	/	F48	440	530	124300	/	/	F60	600	710	65800

- Note: 1. Above Torque value are calculated based on room temperature, if other size torque required, please contact with **NUTORK**.
2. When sizing the actuator, please consider safety fact 1.2~1.5.
3. For more details, the valve torque will be changed under different working temperature, and the torque will be changed for different seat materials. please contact with **NUTORK**.
4. Cv value is based on 90° disc open angle.

ENGINEERING DATA

Pressure Temperature Chart
Operation Mode

Notes

1. All the sizes are in full port.
2. Pressure Ratings are according to B 16.34.

Method of Calculating Flow

The Flow Coefficient Cv of a valve is the flow rate of water (gallons/minute) through a fully opened valve, with a pressure drop of 1 psi across the valve. To find the flow of liquid through the valve from the Cv, use the following formulas:

Liquid Flow:

$$Q_L = C_v(P/G)^{1/2}$$

QL=Flow rate of liquid (gal./min)

P=Differential pressure across the valve

G=Specific gravity of liquid (for water, G=1)

Gas Flow:

$$Q_g = 61 C_v (P_2/P)^{1/2}$$

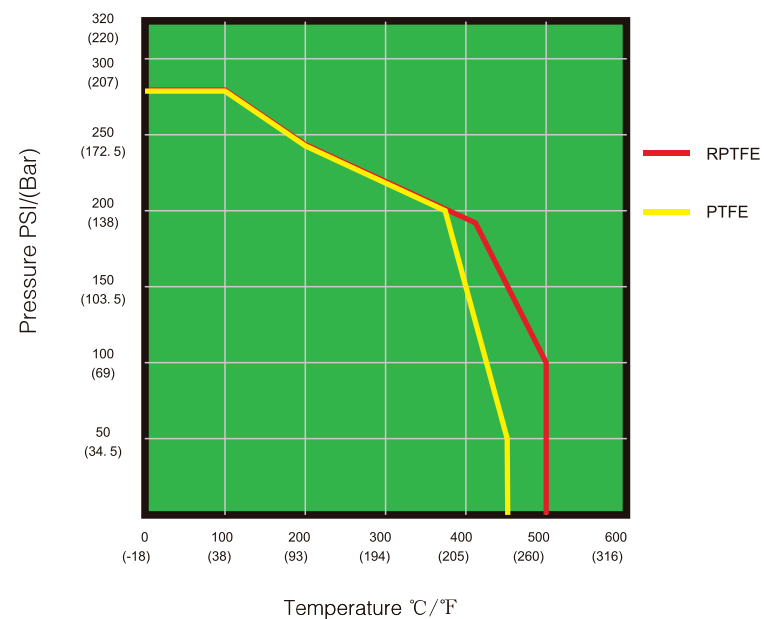
(For non-critical flow, P/P<1.0)

QL=Flow rate of gas (CFH at STP)

P2=Outlet pressure(psia)

G=specific gravity of gas (for air, g=1.0)

Pressure Temperature Chart



OPERATORS

We offer the NUTORK butterfly valve with standard epoxy coated WCB or ductile iron gearbox. The gearbox is available with an acid resistant or offshore coating on request.

HAND LEVERS

The NUTORK butterfly valve has a standard lockable epoxy coated ductile iron hand lever. For added corrosion resistance, Stainless steel levers are also available on request.



PNEUMATIC ACTUATORS

The NUTORK butterfly valve can be fitted with NUTORK rack & pinion or scotch yoke actuator. NUTORK Scotch yoke actuators can deliver up to 263,894 Nm torque and the standard material offered is ductile iron. NUTORK rack & pinion actuators are both hard anodized and epoxy coated as standard and can deliver up to 13,000 Nm torque. And it also can be supplied with PTFE protective coating on request.



NUTORK® Your Partner of Flow Control System

Product Warranty

Seller will replace without charge or refund the purchase price of products provided by seller which prove to be defective in material or workmanship, provided in each case that the product is proper installed and is used in the service for which Seller recommends it and that written claim, specifying the alleged defect, is presented to the seller within 18 months from the date of shipment or 12 months after installation, whichever occurs first. Seller shall in no event bear any labor, equipment, engineering or other costs incurred in connection with repair or replacement.

The warranty stated in this paragraph is in line of all other warranties, either expressed or implied. With respect to warranties, this paragraph states Buyer's exclusive remedy and seller's exclusive liability.