

# WARREN MORRISON UK LTD



BUTTERFLY VALVE  
TG SERIES

# Warren-Morrison Valves

Established in 1949 in the United Kingdom, Warren-Morrison UK Ltd. has been manufacturing its own unique range of industrial valves and actuators for over 65 years. Benefiting from our own internal rubber mould department, machine shop and development and test facilities, we maintain total control over production and quality through continuous 'in process inspection'. Our dedication towards future development has continued to ensure our market position as a select industrial valve and accessories manufacturer and supplier.

## Warren-Morrison Butterfly Valves:

The Warren Morrison TG Series Butterfly Valve is a well-engineered valve to suit various industries and applications from oil and gas, water treatment, HVAC, petrochemical, power and others. Designed with a replaceable seat and dry shaft to meet fully rated PN 16 with an option to meet fully rated ASME 150 pressure class. TG series butterfly valves are tested for Zero leakage bubble tight shut off.

## Butterfly Valves Features:

- Engineered field replaceable seat with integral flange gasket.
- Dry shaft with anti-blowout proof shaft design.
- Extended body neck allows for ease of insulation material if required.
- Advanced bushing to achieve low torque to suit smaller sizes of actuators.
- Dual purpose stem seal.
- Bi-directional fully rated PN 16 standard with ANSI 150 option available.
- End of service applications possible.
- Vacuum service applications possible.
- Designed to meet ISO 5211 for direct mounting of actuators and gearboxes.
- Different Materials for body/disc/stem and seat to suit a wide range of industries.
- Various paint options available upon request.
- Compatibility to International Standards.

## Design Features

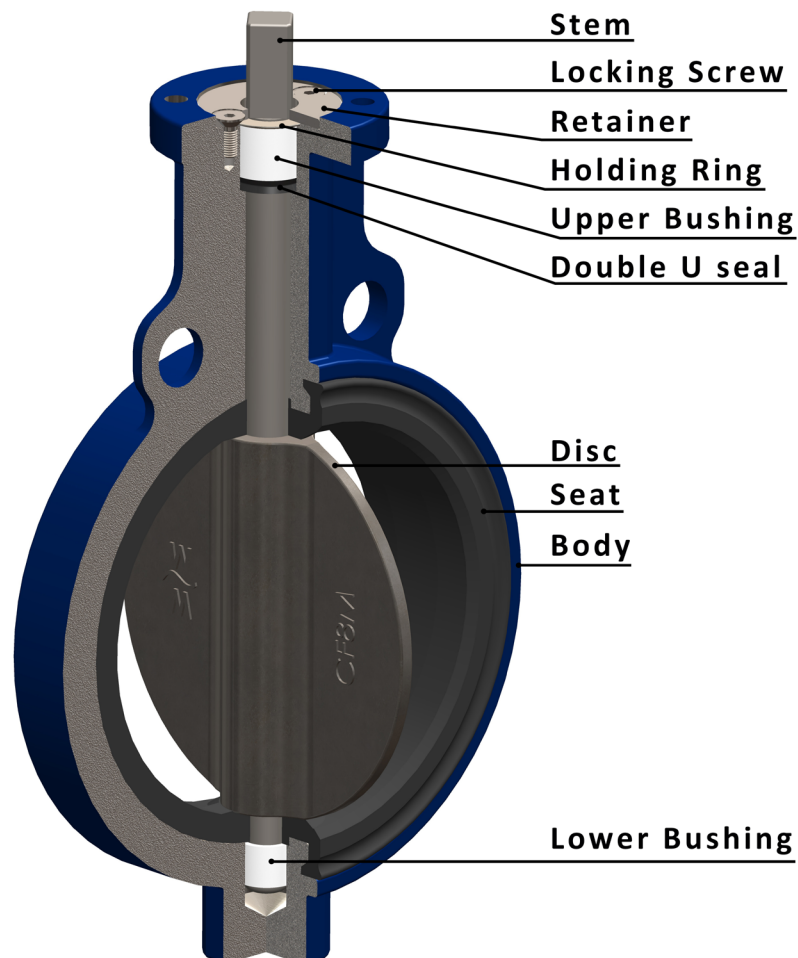
**Body.** Single piece body with integral actuator mounting flange to ISO 5211 standard. Wafer type design with multi-drilled holes which fits between PN10, PN16 and ASME 150 flanges with ease.

Lugged designs drilled to PN 10 or PN 16 or ASME 150. Lugged design can be used for end of service applications.

**Seat.** The resilient seats are field replaceable and available in a variety of soft materials. The unique seat design protects the entire internal valve body from the media, allowing cost effective selection of valve body and shaft materials. The moulded-in seat flange ring completely eliminates the need for any additional flange gaskets during valve installation. Our seat design provides an interference fit between the shaft and seat guiding area. The top and bottom portion of the seat through which the stem passes are flattened which provides an interference fit with the disc. These two specially designed interference areas of the seat function as primary and secondary barriers respectively to avoid fluid contact with the valve body interior and stem.

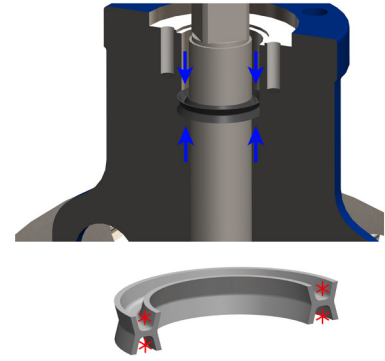
**Disc.** The disc is machined to reduce the friction with the seat to provide a longer life expectancy of the seat as well as reducing the torque of the valve. The disc is machined internally to suit the shaft. The disc can come with different variety of material.

**Stem.** Single piece anti-blowout shaft design. No holding screws or pins between the disc and the shaft. Stem is machined matching the internal of the disc to secure continuous operation



# Stem seal, Bushing design and Parts list

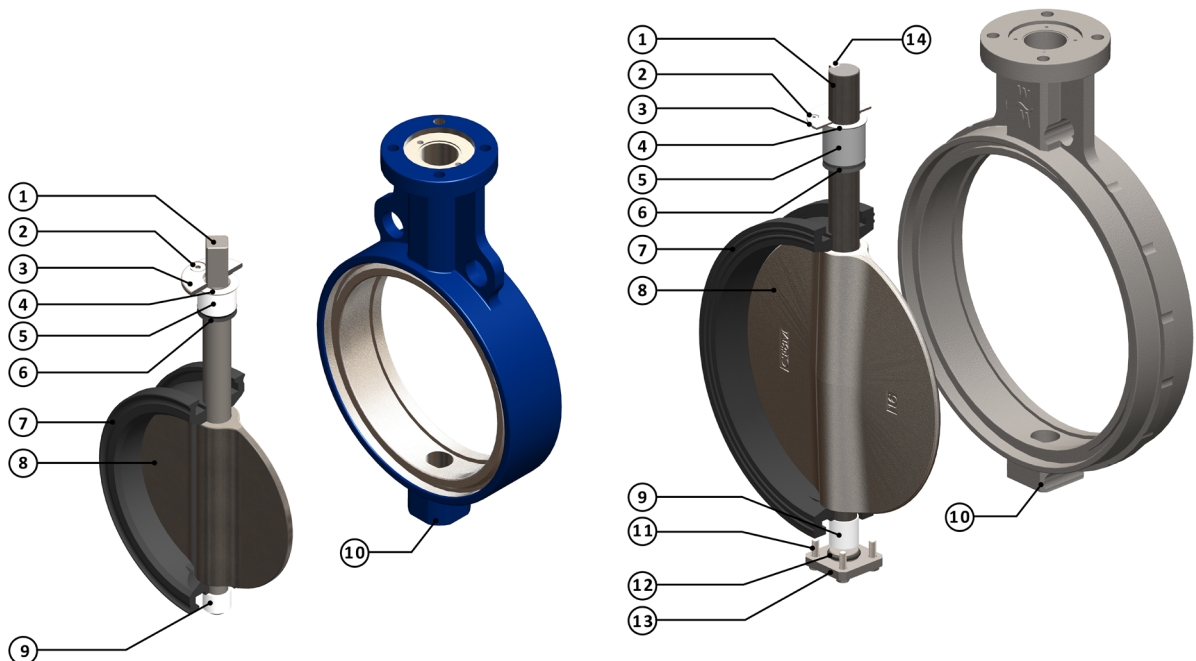
**Dual purpose stem seal.** Warren-Morrison TG series butterfly valves are designed for longer life span and reliability. Considering these factors, the butterfly valves employ a highly sophisticated dual purpose seal ring. These seals are completely engineered in-house to ensure continuous and reliable performance. In regular valves, wear and tear causes the possibility of leakage through the stem. The primary function of the dual purpose seal is to prevent leakage propagating from the bottom of the stem. The seal also prevents any ingress from the outside. This is an added advantage especially for valves which are used in vacuum services.



**Advanced bushing design.** To eliminate the effect of side thrusts, the stem is properly supported by our advanced bushing design. This acts as a controlled location guide for the proper operation of the valve. Support is provided throughout the full rotation of the valve and actuator side thrusts to minimise wear and tear.

## Parts list

Sl. No.	Description	Sl. No.	Description
1	Stem	8	Disc
2	Locking Screw	9	Lower bushing
3	Retainer	10	Body
4	Holding ring	11	Bottom cover bolts
5	Upper bushing	12	O-ring
6	Double U seal	13	Bottom Cover
7	Seat	14	Locking Key



From Sizes 2" - 14"

From Sizes 16" - 24"

**Compliance with International Standards.** TG Series Butterfly Valves are designed, manufactured and tested successfully to meet the following International Standards: (but not limited to) ISO 16031, ASME B 16.34, ASME 16.42 , EN 12516 , API 609, ASME B 16.5, BS 4504 / EN 1092, API 598, ISO 5208, ANSI-FCI 70.2, ISO 5211, ISO 5752

**Pressure rating.** Sizes 2” - 24” are bi-directional bubble -tight shut off (Zero Leakage) at their design pressure rating.

The valves are fully rated 16 bar with disc in the closed position, with option of ASME 150 available upon request.

**End of Service Rating.** The Lugged style valve can be used as a dead end service valve with pressure rating of 16 bar.

**Operator combinations offered.** The Warren-Morrison TG series valves are offered with a wide range of actuators for all types of industrial applications:

- Manual hand lever.
- Gear operated hand wheel (with chain drive option if required).
- Pneumatic single acting spring return actuator, fail open, fail close.
- Pneumatic double acting actuator.
- Electric actuator.



Valve with lever



Pneumatic actuator and switchbox

## Temperature of Seat Material

Seat Material	Temperature Limits	
	Lower	Higher
EPDM	-40 °C	121 °C
BUNA-N	-18 °C	100 °C
FKM (VITON)	-18 °C	204 °C

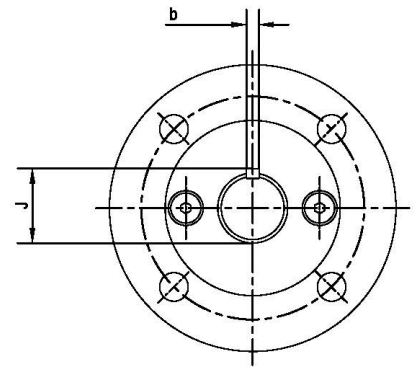
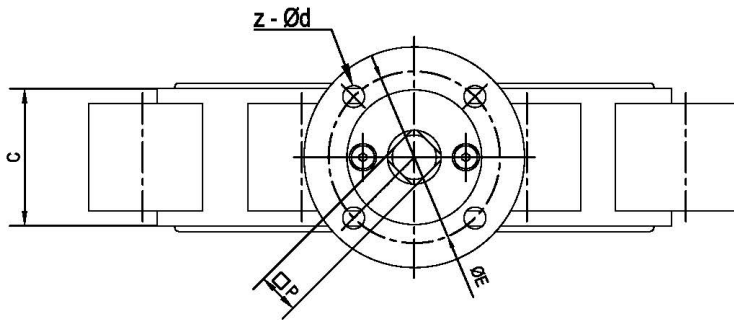
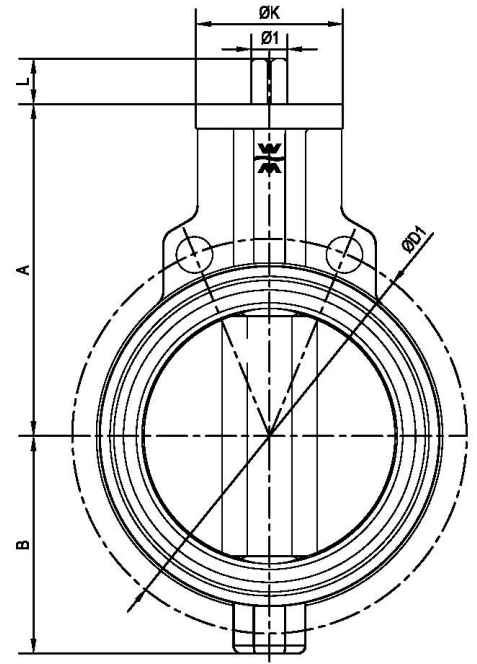
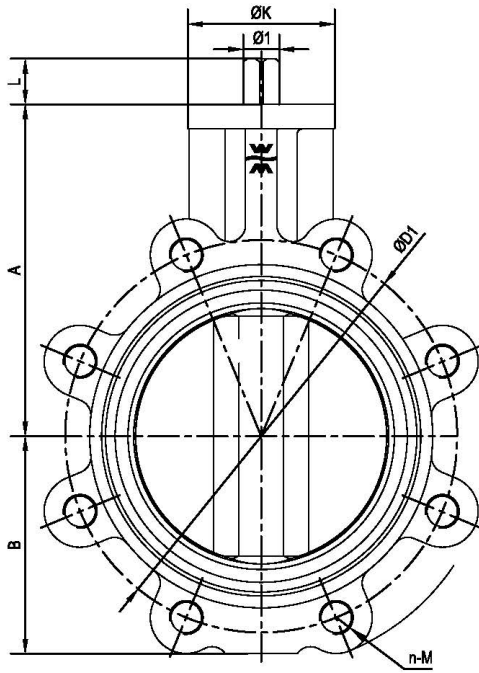
Seating Unseating Torque (N-m) for TG Series Valves

Size	Pressure Drop (N-m)			
	16Bar	10Bar	7Bar	0Bar
2"	9	6	6	6
2.5"	15	9	9	9
3"	17	12	9	9
4"	36	30	27	24
5"	48	39	33	30
6"	84	66	54	42
8"	142	128	120	110
10"	220	205	185	176
12"	270	245	228	215
14"	700	550	472	454
16"	1050	810	620	585
18"	1450	1120	885	732
20"	1820	1440	986	874
24"	2750	2130	1410	1287

CV Values for TG Series Valves

Size	Flow in GPM @ 1psi Pressure Drop @ Various Disc Angles								
	10°	20°	30°	40°	50°	60°	70°	80°	90°
2"	0.1	1.6	10	22	45	74	91	114	125
2.5"	0.2	4.6	18	38	76	128	180	225	248
3"	0.3	9.4	31	63	124	209	313	410	451
4"	0.5	20	62	119	229	383	565	733	806
5"	0.7	28	85	166	323	544	824	1145	1260
6"	1.7	56	153	285	543	908	1381	2056	2261
8"	5.4	108	274	504	951	1577	2371	3371	3708
10"	13	173	433	788	1481	2453	3705	5548	6103
12"	21	258	634	1145	2143	3551	5378	8248	9125
14"	27	318	783	1414	2649	4386	6640	10170	11187
16"	32	429	1063	1936	3630	6009	9098	13914	15305
18"	55	583	1400	2520	4697	7744	11668	17332	19065
20"	70	733	1758	3163	5890	9711	14661	22381	24620
24"	89	973	2346	4228	7884	13016	19667	30212	33287

# Dimensions and Weight



## Dimensions and Weight

SIZE		A	B	C	L	P	KEY	J	1	UPPER FLANGE			ANSI 150		PN 10/16		WAFER	LUGGED
in	DN						b			K	E	z-d	D1	n-M	D1	n-M		
2"	DN50	140	70	43	28	14	-	-	18	90	70	4-9	120.5	4-5/8"	125	4-M16	4	5
2.5"	DN65	152	75	46	28	14	-	-	18	90	70	4-9	139.5	4-5/8"	145	4-M16	5	5
3"	DN80	160	85	46	28	14	-	-	18	90	70	4-9	152.5	4-5/8"	160	8-M16	5	6
4"	DN100	177	106	52	28	17	-	-	22	90	70	4-9	190.5	8-5/8"	180	8-M16	7	9
5"	DN125	191	119	56	28	17	-	-	22	90	70	4-9	216	8-3/4"	210	8-M16	8	11
6"	DN150	203	133	56	28	17	-	-	22	90	70	4-9	241.5	8-3/4"	240	8-M20	9	12
8"	DN200	241	165	60	28	22	-	-	28	125	102	4-11	298.5	8-3/4"	295	8-M20/12-M20	18	22
10"	DN250	273	197	68	30	22	-	-	28	125	102	4-11	362	12-7/8"	350/355	12-M20/M24	25	31
12"	DN300	311	240	78	30	27	-	-	36	150	125	4-13.5	432	12-7/8"	400/410	12-M20/M24	38	47
14"	DN350	350	259	78	39	-	10	39	36	150	125	4-13.5	476	12-1"	460/470	16-M20/M24	48	62
16"	DN400	380	314	102	58	-	12	45	42	175	140	4-17.5	540	16-1"	515/525	16-M24/M27	70	90
18"	DN450	410	341	114	58	-	14	53.5	50	210	165	4-22	578	16-1 1/8"	565/585	20-M24/M27	102	128
20"	DN500	450	378	127	80	-	14	53.5	50	210	165	4-22	635	20-1 1/8"	620/650	20-M24/M30	128	162
24"	DN600	510	443	154	80	-	18	64	60	210	165	4-22	749.5	20-1 1/4"	725/770	20-M27/M33	213	275



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