

KITZ

DJ Series Butterfly Valves



European Edition

KITZ CORPORATION

WRAS
APPROVED
PRODUCT

CE

Ex

KITZ DJ Series Butterfly Valves

Flange Table

Connection		Wafer					Lugged	
Standard		BS EN 1092			BS10	ASME B16.5	BS EN 1092	
Size		PN6	PN10	PN16	Table E	Class 150	PN10	PN16
inch	mm							
2	50	●	●	●	●	▲	●	●
2½	65	▲	●	●	●	▲	●	●
3	80	●	●	●	●	●	●	●
4	100	●	●	●	●	●	●	●
5	125	●	▲	▲	▲	●	—	●
6	150	●	●	●	▲	●	—	●
8	200	●	●	●	▲	●	—	●
10	250	●	▲	●	▲	▲	—	●
12	300	●	▲	▲	▲	●	—	●
14	350	▲	▲	▲	▲	●	—	●
16	400	—	—	●	—	●	—	●
18	450	—	—	●	▲	●	—	●
20	500	—	—	●	—	●	—	●
24	600	—	—	●	—	●	—	●

● :Standard mounting

▲ :Special mounting (Proper centering is required)

— :Not covered by standard DJ series

Explanation of Product Code

G – PN16 DJ L M E

1

2

3

4

5

6

1 Valve operation

None: Lever handle
G: Gear

2 Class

PN16: BS4504 PN 16
150: ASME 150 psi
200: ASME 200 psi
10: JIS 10K
16: JIS 16K

3 Valve material and design

DJ: Ductile iron DJ series

4 Connection

None: Wafer
L: Lugged

5 Disc material

None: Ductile iron (Ni-plated)
U: 304 stainless steel
M: 316 stainless steel
A: Aluminum Bronze

6 Seat material

None: NBR (Buna-N)
E: EPDM
Alternative: Available on request, Refer to KITZ Corporation for further information.

This catalog uses **MPa**, a SI unit, for indication of pressures.
For readers' convenience, however, **kgf/cm²** is also used as an additional information.

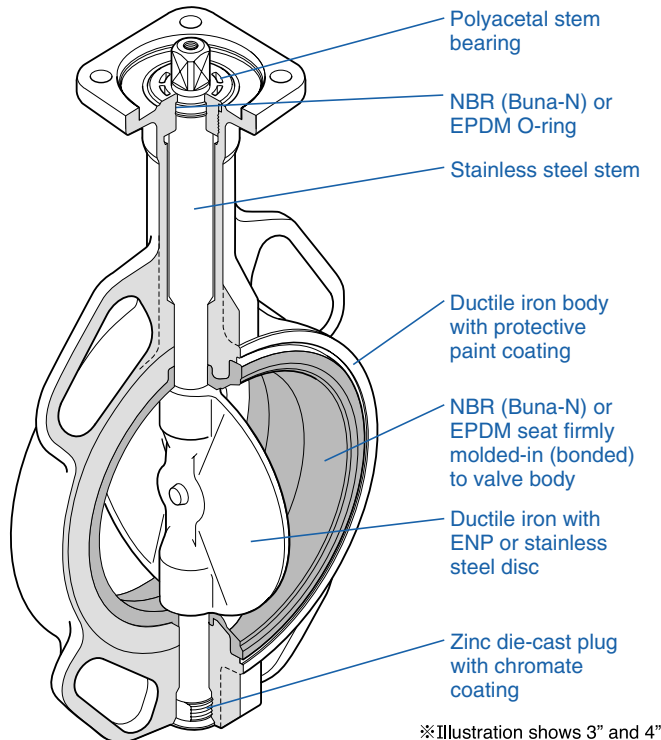
KITZ DJ Series Butterfly Valves

Thorough pursuit of functions required for butterfly valves

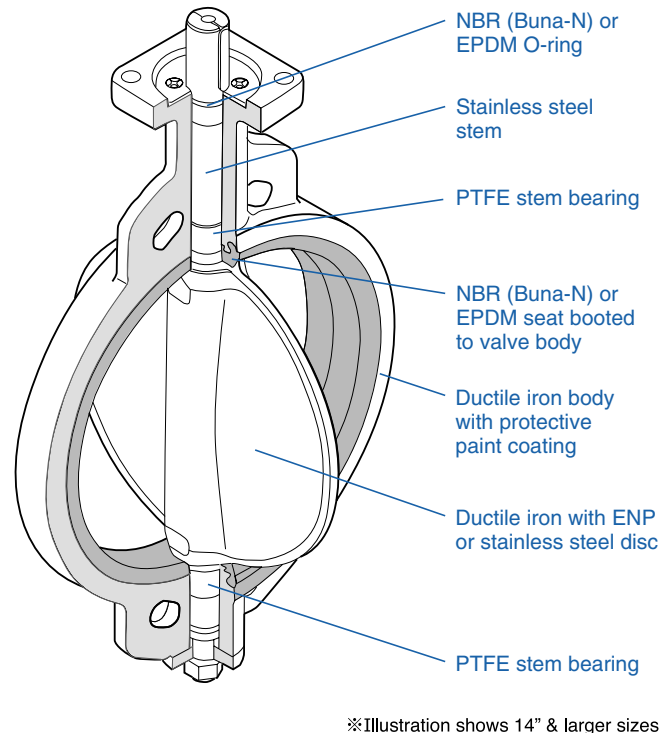
Variety of product ranges to comply with customers' requirements

Design Features

Moulded-in (bonded) seat structure (Size 2" to 12")



Replaceable seat structure (Size 14" to 24")



WRAS Approval

All KITZ EPDM seat materials are fully in accordance with latest WRAS standards.

Non-peeling seat-to-body construction

Moulded-in (bonded) seat structure is employed for **2" to 12"**. Larger sized valves are provided with replaceable seat. This non-peeling seat-to-body construction assures maintenance-free application for **high fluid velocity service**,^{*1} **vacuum service**^{*2} and handling surging fluid velocity. It also guarantees peel-free valve mounting on pipelines.

^{*1} 4 meter / second maximum for on-off liquid handling.

^{*2} Up to 30 torr.

Spherical design for discs and seats

Rubber seats are spherically designed where they contact top and bottom stems. This protects widely designed rubber seats from peeling or deformation for prolonged service life of valves. Thinly streamlined metal discs are the results of elaborate laboratory study to ultimately minimize the pressure loss.

Choice of materials and operating devices

Choice among 4 disc and 2^{*} seat materials and manual, pneumatic or electric valve operating devices makes service applications highly versatile.

^{*3} Additional seat materials available subject to requirements.

Integral ISO 5211 actuator mounting flange

Any pneumatic or electric valve actuators provided with ISO 5211 valve mounting flanges can be easily mounted for actuation of valves in the field.

Low valve operating torque

Low operating torques are designed low for extension of valve service life and economic consideration in selection of valve operating devices.

Light-designed for operation efficiency

Designed much lighter than our conventional series for operation efficiency in piping

Emission-free stem sealing mechanism

Prevention of external fluid leakage is maximized with a rubber O-ring assembled around the top stem and tight contact between spherically designed rubber seat and spherically designed top and bottom end of the disc.

Index plate

Index plate has 10 locking positions as standard.

Condensation-proof

Condensation-proof type is optionally available with heat insulating plate (size 2" to 8") or stainless steel stand (size 10" to 24").

Technical Specifications

● Maximum service pressure

BS PN16	1.6MPa (16kgf/cm ²)
ASME 150 psi	1.38MPa (14kgf/cm ²)
ASME 200 psi	1.03MPa (11kgf/cm ²)
JIS 10K	0.98MPa (10kgf/cm ²)
JIS 16K	1.57MPa (16kgf/cm ²)

KITZ lugged type butterfly valves are rated for dead end service to full working pressure of the valve with the downstream flange removed. In dead end service exceeding 96 hours, a downstream flange is recommended.

● Body material

Ductile iron	EN-GJS-450-10, Equivalent to ASTM A536 Gr. 65-45-12, BS 2789 Gr. 40/10*1
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*1 Obsolete Standard.

● Service temperature range

NBR (Buna-N) seat	0°C to +70°C
EPDM seat	−20°C to +130°C*2
Continuous service temperature range	0°C to +100°C

*2 There are some fluid type restrictions for the service at 130°C. Contact KITZ for the details.

● Applicable standards

Valve design	BS EN 593:2004, API 609, MSS-SP67, MSS-SP25
Face to face dimensions	EN 558-1 (Basic series 20), MSS-SP67, BS 5155 (Short pattern), ISO 5752-20, JIS B 2002 46 Series

● Coupling flanges

Wafer type	BS EN 1092 PN10/PN16 ASME Class 150 BS 10 Table D/Table E JIS 10K/16K
Lugged type	BS EN 1092 PN16 ASME Class 150 JIS 10K

● Test pressure

BS PN16	Shell test	2.4 MPa (24.5kgf/cm ²)	[Hydrostatic]
	Seat test	1.76MPa (17.9kgf/cm ²)	[Hydrostatic]
		0.6 MPa (6.1kgf/cm ²)	[Pneumatic]
ASME 150 psi	Shell test	1.55MPa (15.8kgf/cm ²)	[Hydrostatic]
	Seat test	1.14MPa (11.6kgf/cm ²)	[Hydrostatic]
		0.59MPa (6.0kgf/cm ²)	[Pneumatic]
ASME 200 psi	Shell test	2.07MPa (21.1kgf/cm ²)	[Hydrostatic]
	Seat test	1.52MPa (15.5kgf/cm ²)	[Hydrostatic]
		0.59MPa (6.0kgf/cm ²)	[Pneumatic]
JIS 10K	Shell test	1.47MPa (15kgf/cm ²)	[Hydrostatic]
	Seat test	1.08MPa (11kgf/cm ²)	[Hydrostatic]
		0.59MPa (6kgf/cm ²)	[Pneumatic]
JIS 16K	Shell test	2.36MPa (24kgf/cm ²)	[Hydrostatic]
	Seat test	1.73MPa (17.6kgf/cm ²)	[Hydrostatic]
		0.59MPa (6kgf/cm ²)	[Pneumatic]

Flow coefficient (Cv)

Size		Open degree								
inch	mm	10°	20°	30°	40°	50°	60°	70°	80°	90°
2	50	0	5	10	18	29	47	75	107	124
2½	65	0	12	22	39	64	102	163	232	270
3	80	0	17	33	57	94	149	240	341	397
4	100	0	29	55	96	158	252	404	577	671
5	125	0	44	83	145	239	381	610	871	1013
6	150	0	66	126	219	362	576	922	1318	1532
8	200	0	125	230	400	660	1050	1680	2400	2792
10	250	0	160	325	575	950	1514	2423	3462	4024
12	300	0	258	493	859	1418	2260	3618	5168	6010
14	350	0	324	617	1076	1776	2829	4530	6472	7525
16	400	0	433	826	1441	2378	3760	6068	8669	10080
18	450	0	564	1076	1876	3096	4933	7898	11283	13120
20	500	0	588	1311	2286	3774	6012	9626	13751	15990
24	600	0	1018	1942	3388	5590	8907	14688	22742	23690

*Cv is defined as the flow in GPM that a valve will carry with a pressure drop of 1.0 psi, when the media is 60° F (15.6°C) water.

Liquid flow:

$$Q = C_v \sqrt{\Delta P / S}$$

Q = Liquid flow rate (gallons per minute)

ΔP = Pressure drop across valve (psi)

S = Specific gravity of media

Gas flow:

$$Q = 1360 C_v \sqrt{\Delta P \times P_1 / S T}$$

Q = Gas flow rate (SCFH—std. cu.ft./hr.)

S = Specific gravity of gas (air=1.0)

T = Temp.—degrees Rankin (°F+460)

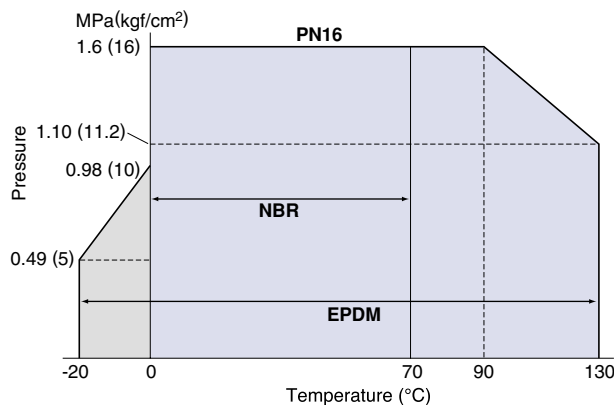
ΔP = Pressure drop across valve (psi)

P₁ = Upstream pressure (psia) absolute

Note that ΔP must be less than .5

(Flow is critical when ΔP is greater than .5 P₁)

P-T rating



Notes1: There are some fluid type restrictions for the service at 130°C. Contact KITZ for the details.

Notes2: P-T rating for sub-zero application is optionally available. Contact KITZ for technical advice when service conditions may exceed the P-T rating range limited here.

Trim material coding

Fig. suffix	Disc	Seat
None	Ductile iron (Ni-plated)	NBR (Buna-N)
E	Ductile iron (Ni-plated)	EPDM
U	304 stainless steel	NBR (Buna-N)
UE	304 stainless steel	EPDM
M	316 stainless steel	NBR (Buna-N)
ME	316 stainless steel	EPDM
A	Aluminum bronze	NBR (Buna-N)
AE	Aluminum bronze	EPDM

* Alternative seats are available on request.

Materials

Parts	Material
Body	Ductile iron
Stem	410 stainless steel* ¹
Disc	See "Trim material coding"
Seat	
O-ring	NBR (Buna-N) or EPDM
Bearing	Polyacetal and glass filled PTFE* ²
Plug (size 2" to 8")	Zinc die-cast* ³
Bottom stem	410 stainless steel* ⁴
Operator	Lever
	Gear
	Aluminum die-cast* ⁵
	Aluminum die-cast* ⁶

*¹ 420 stainless steel for 16" and larger

*² Metal backed PTFE for 6" and larger

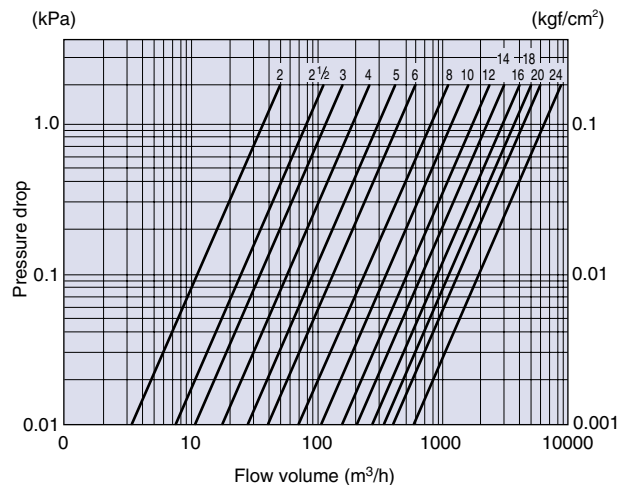
*³ Chromate coating

*⁴ 420 stainless steel for 16" and larger

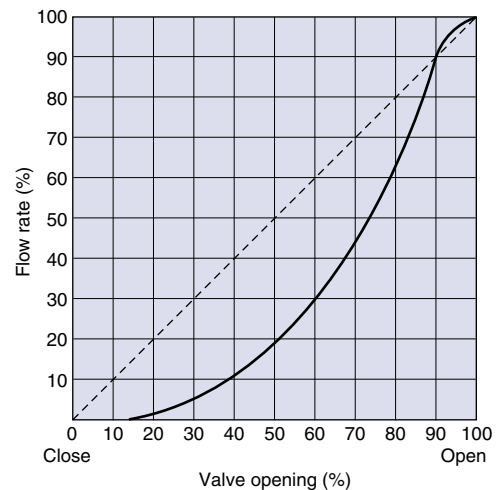
*⁵ Ductile iron for size 8"

*⁶ Cast iron for 14" and larger

Pressure loss (for handling static clean water with valve fully open)



Flow characteristics



Lever Operated

Wafer Type

BS PN16 Design

PN16DJ□□

ASME 150/200 psi Design

150/200DJ□□

JIS 10K Design

10DJ□□

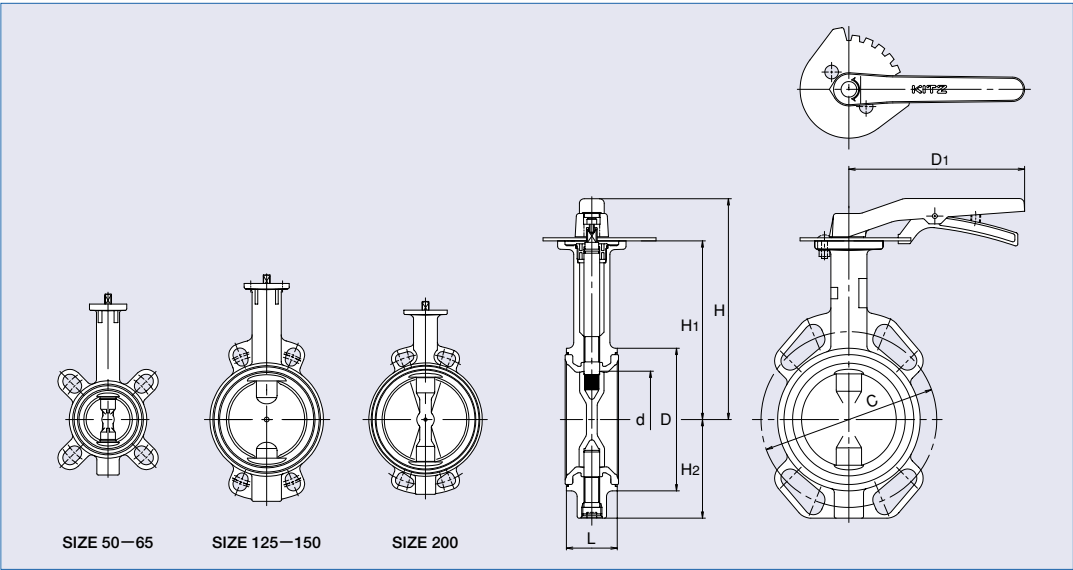
JIS 16K Design

16DJ□□



□□ of product coding
are trim material coding

For trim material coding,
please refer to page 3.



BS PN16 Design

Dimensions

(mm)

Valve Size		d	H	H1	H2	L	D	C	H1
inch	mm								
2	50	50	191	147	67	43	90	125	180
2½	65	65	199	155	75	46	104	145	180
3	80	80	217	173	91	46	124	160	180
4	100	100	227	183	101	52	146	180	180
5	125	125	265	211	127	56	176	210	230
6	150	150	277	223	139	56	206	240	230
8	200	197	287	248	169	60	257	295	350

Gear Operated

Wafer Type

BS PN16 Design

G-PN16DJ □□

ASME 150/200 psi Design

G-150/200DJ □□

JIS 10K Design

G-10DJ □□

JIS 16K Design

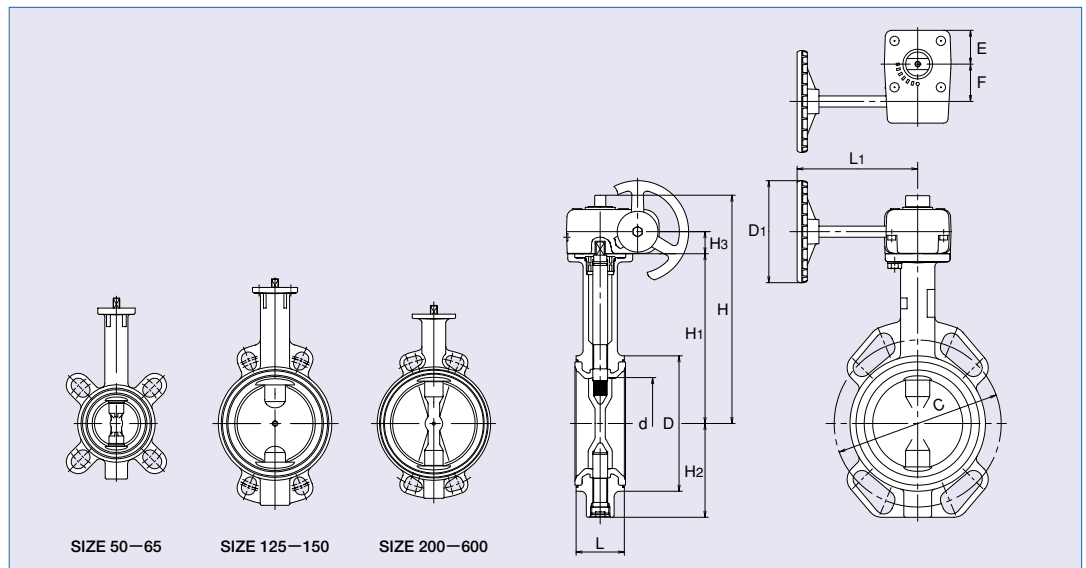
G-16DJ □□

□□ of product coding
are trim material coding

For trim material coding,
please refer to page 3.

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*EPDM seat



BS PN16 Design

Dimensions

(mm)

Valve Size		d	H	H ₁	H ₂	H ₃	L	D	C	D ₁	L ₁	E	F
inch	mm												
2	50	50	194	147	67	19	43	90	125	80	122	29	28
2½	65	65	202	155	75	19	46	104	145	80	122	29	28
3	80	80	236	173	91	24	46	124	160	110	135	36	40
4	100	100	246	183	101	24	52	146	180	110	135	36	40
5	125	125	274	211	127	24	56	176	210	110	150	36	40
6	150	150	286	223	139	24	56	206	240	110	150	36	40
8	200	197	325	248	169	32	60	257	295	170	180	51	63
10	250	246	381	304	219	32	68	312	355	250	250	60	63
12	300	295	406	329	244	32	78	364	410	250	250	60	63
14	350	333	461	360	309	60	78	407	470	360	350	68	89
16	400	385	516	415	348	60	102	466	525	360	350	68	89
18	450	434	540	439	372	60	114	522	585	360	350	68	89
20	500	482	623	488	423	65	127	575	650	500	400	90	134
24	600	579	671	536	472	65	154	680	770	500	400	90	134

Lever Operated

Lugged Type

BS PN16 Design

PN16DJL ☐

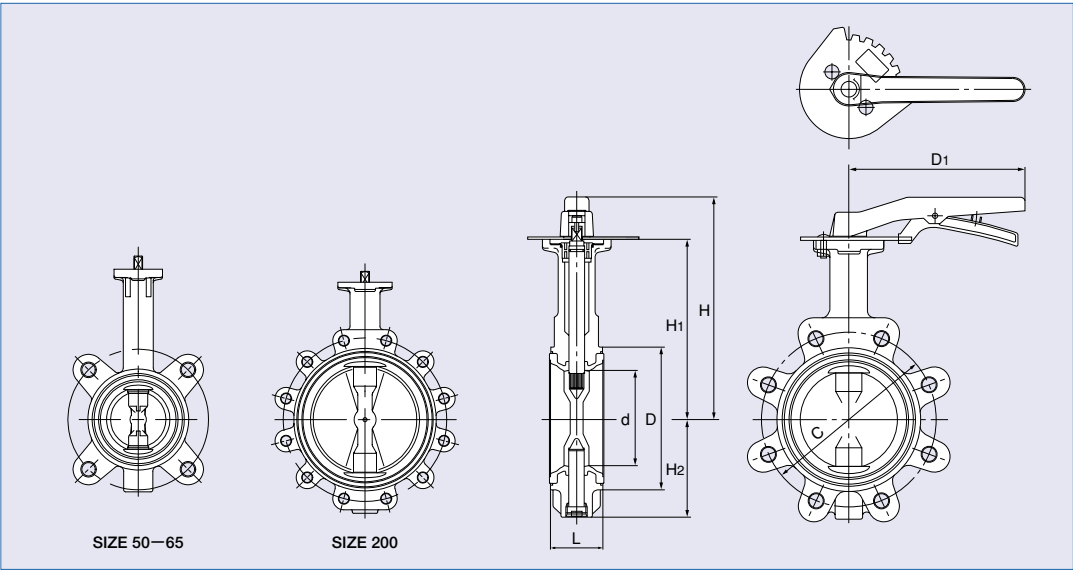
ASME 150/200 psi Design

150/200DJL ☐

☐ of product coding
are trim material coding

For trim material coding,
please refer to page 3.

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*EPDM seat



BS PN16 Design

Dimensions

(mm)

Valve Size		d	H	H1	H2	L	D	C	D1
inch	mm								
2	50	50	191	147	67	43	90	125	180
2 1/2	65	65	199	155	75	46	104	145	180
3	80	80	217	173	91	46	124	160	180
4	100	100	227	183	104	52	146	180	180
5	125	125	265	211	127	56	176	210	230
6	150	150	277	223	139	56	206	240	230
8	200	197	287	248	169	60	257	295	350

Gear Operated

Lugged Type

BS PN16 Design

G-PN16DJL □□

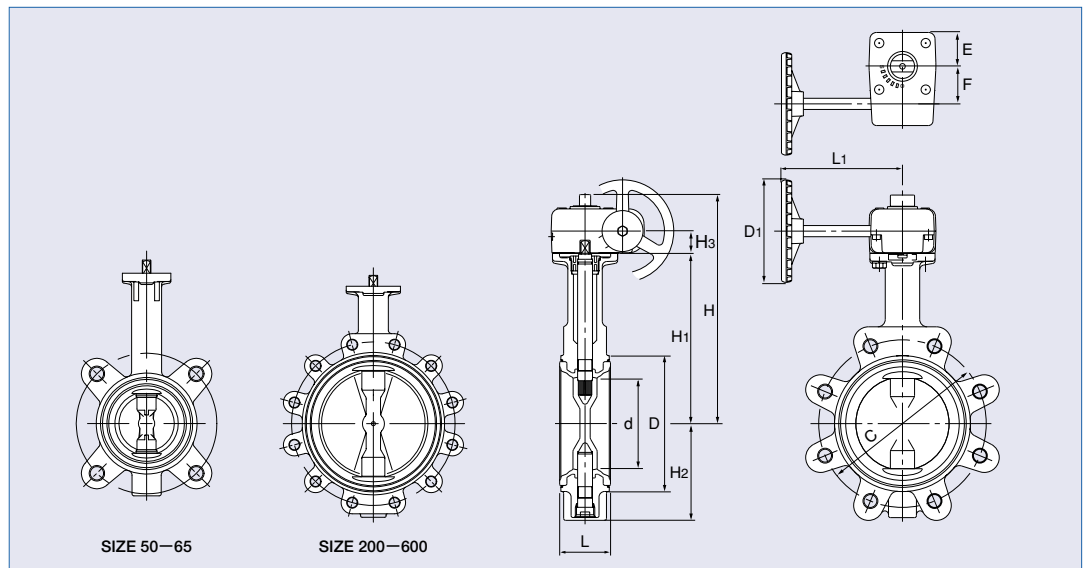
ASME 150/200 psi Design

G-150/200DJL □□

□□ of product coding
are trim material coding

For trim material coding,
please refer to page 3.

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*EPDM seat



BS PN16 Design

Dimensions

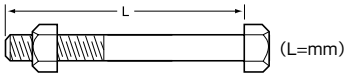
(mm)

Valve Size		d	H	H ₁	H ₂	H ₃	L	D	C	D ₁	L ₁	E	F
inch	mm												
2	50	50	194	147	67	19	43	90	125	80	122	29	28
2½	65	65	202	155	75	19	46	104	145	80	122	29	28
3	80	80	236	173	91	24	46	124	160	110	135	36	40
4	100	100	246	183	104	24	52	146	180	110	135	36	40
5	125	125	274	211	127	24	56	176	210	110	150	36	40
6	150	150	286	223	139	24	56	206	240	110	150	36	40
8	200	197	325	248	169	32	60	257	295	170	180	51	63
10	250	246	381	304	219	32	68	312	355	250	250	60	63
12	300	295	406	329	244	32	78	364	410	250	250	60	63
14	350	333	461	360	309	60	78	407	470	360	350	68	89
16	400	385	516	415	348	60	102	466	525	360	350	68	89
18	450	434	540	439	372	60	114	522	585	360	350	68	89
20	500	482	623	488	423	65	127	575	650	500	400	90	134
24	600	579	671	536	472	65	154	680	770	500	400	90	134

Bolting Data

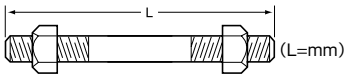
Wafer type (Either type of below bolting is required)

Hexagon head bolt+Hexagon nut



Flange	PN10			PN16			JIS10K			JIS16K		
inch	Size	L	No.	Size	L	No.	Size	L	No.	Size	L	No.
2	M16	105	4	M16	105	4	M16	95	4	M16	95	8
2½	M16	105	4	M16	105	4	M16	105	4	M16	100	8
3	M16	105	4	M16	105	4	M16	105	8	M20	110	8
4	M16	115	4	M16	115	8	M16	110	8	M20	120	8
5	M16	115	8	M16	115	8	M20	120	8	M22	125	8
6	M20	120	8	M20	120	8	M20	125	8	M22	130	12
8	M20	130	8	M20	140	8	M20	130	12	M22	140	12
10	M20	140	12	M24	155	12	M22	150	12	M24	150	12
12	M20	155	12	M24	170	12	M22	160	16	M24	170	16
14	M20	155	16	M24	180	16	M22	160	16	M30×3	180	16
16	M24	185	16	M27	215	16	M24	190	16	M30×3	210	16
18	M24	200	20	M27	230	20	M24	210	20	M30×3	230	20
20	M24	215	20	M30	250	20	M24	220	20	M30×3	250	20
24	M27	250	16	M33	290	16	M30	260	20	M36×3	290	20

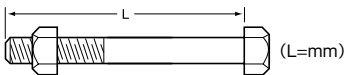
Stud bolt+Hexagon nut



Flange	PN10			PN16			JIS10K			JIS16K		
inch	Size	L	No.	Size	L	No.	Size	L	No.	Size	L	No.
2	M16	125	4	M16	125	4	M16	115	4	M16	120	8
2½	M16	130	4	M16	130	4	M16	120	4	M16	120	8
3	M16	130	4	M16	130	4	M16	120	8	M20	140	8
4	M16	135	4	M16	135	8	M16	130	8	M20	140	8
5	M16	140	8	M16	140	8	M20	145	8	M22	150	8
6	M20	145	8	M20	145	8	M20	150	8	M22	160	12
8	M20	155	8	M20	165	8	M20	155	12	M22	160	12
10	M20	170	12	M24	185	12	M22	170	12	M24	180	12
12	M20	185	12	M24	200	12	M22	180	16	M24	190	16
14	M20	185	16	M24	210	16	M22	180	16	M30×3	210	16
16	M24	215	16	M27	245	16	M24	220	16	M30×3	240	16
18	M24	230	20	M27	260	20	M24	230	20	M30×3	260	20
20	M24	245	20	M30	285	20	M24	250	20	M30×3	280	20
24	M27	280	16	M33	325	16	M30	290	20	M36×3	320	20

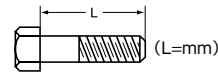
Lugged type

Hexagon head bolt+Hexagon nut



Flange	PN10			PN16		
inch	Size	L	No.	Size	L	No.
2	M16	35	8	M16	35	8
2½	M16	35	8	M16	35	8
3	M16	35	8	M16	35	8
4	M16	40	8	M16	40	16
5	M16	40	16	M16	40	16
6	M20	40	16	M20	40	16
8	M20	45	16	M20	50	16
10	M20	45	24	M24	55	24
12	M20	50	24	M24	60	24
14	M20	50	32	M24	65	32
16	M24	60	32	M27	80	32
18	M24	60	32	M27	80	40
20	M24	60	40	M30	80	40
24	M27	70	40	M33	90	40

Size 24" requires additional hexagon head bolts.



PN10/JIS10K			PN16/JIS16K		
Size	L	No.	Size	L	No.
M30	70	8	M36	90	8

Precautions for Trouble-free Operation of KITZ Butterfly Valves

Valve Selection

1. Ensure to select a valve with design specifications which meet the fluid type and the pressure and temperature conditions required.
2. Lubricants are applied to discs, rubber seats and PTFE seats as standard to protect their surfaces. Oil-free treated types are available as option. Contact KITZ Corporation or its local distributors for the details.
3. Contact KITZ Corporation or its local distributors for service with pulverulent bodies.

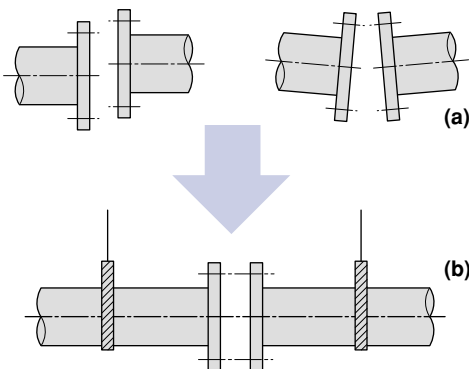
Storage and Handling

Valves must be stored in dry, clean and corrosion-free environment with no direct exposure to the sun, leaving valves open by 10° for prevention of permanent distortion of resilient seats. Refrain from overloading valves and their actuators, such as storing them in piles or placing other objects on them.

Mounting on Pipelines

1. Valves must be mounted on flanges only after flanges have been welded to pipes and cooled down to the atmospherical temperature. Otherwise, welding heat may affect the quality of resilient seats.
2. Edges of welded flanges must be machined for smooth surface finish so that they may not damage resilient seats during valve mounting. Flange faces must be free from damage or deformation, and be cleaned to remove rust or any other foreign objects so that there will be no concern of external leakage through valve and flange connections. Gaskets are not required for mounting KITZ DJ series butterfly valves.
3. Clean flanges and pipe bores to thoroughly remove welding spatters, scales and other foreign objects which may have been left inside.
4. Accurate centering of each couple of upstream and downstream pipes is essential for trouble-free operation of valves mounted between them. Incorrect centering shown in **Fig. 1** must be by all means avoided.

Fig. 1



5. For valve mounting, set jack bolts under the pipes for flat support at the same height, and adjust the flange-to-flange distance so that some 6 mm to 10 mm room may be allowed beside the both sides of the valve body.

Remember that valves here must be left open only by 10° from the fully closed position.

6. Set two bolts into the lower mounting guides of a valve and mount it carefully so that flange faces may not damage resilient seats. (**Fig. 2**)
7. Then set another two bolts into the upper mounting guides of a valve, ensuring the correct centering between pipes and the valve.
8. Trial open the valve to check to see if there is no disturbing contact between the valve disc and the flanges.

9. Remove the jack bolts, set all bolts around the valve body and tighten them alternately and diagonally till the flanges contact the valve body (**Fig. 3 and 4**). Refer to the table shown right for recommended torque values.

Recommended torque values

DN	N·m (kgf·m)	DN	N·m (kgf·m)
50	63(6)	250	177(18)
65		300	
80		350	265(27)
100		400	
125	111(11)	450	392(39)
150		500	
200		600	539(54)

Fig. 2

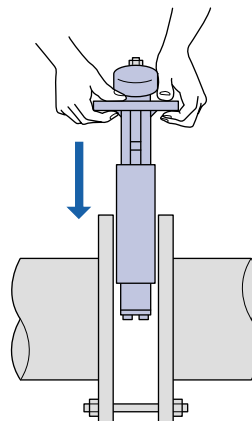


Fig. 3

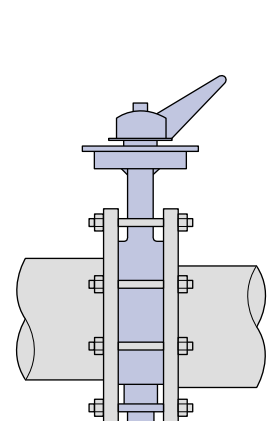
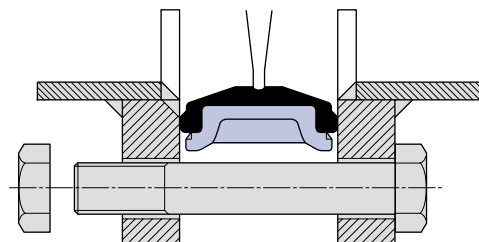


Fig. 4



10. For mounting actuated valves, provide valve supports to prevent bending of valve necks and reduce valve and pipe vibration.
11. Don't step on valve necks or valve handwheels.
12. Don't mount valves of DN350 and larger with their operations upside down.
13. Don't mount butterfly valves directly to check valves or pumps, which may cause damage to them by the disc contacts.
14. Don't mount valves to downstream sides of elbows, reducers or regulating valves where fluid velocity changes. It is recommended to install valves approximately 10 times of the valve nominal sizes away from them for such cases.
15. Mount valves taking consideration of the effects which discs are given by fluid velocity or pressure changes in the pipings. Refer to the illustrations. (Fig.5)
Contact KITZ Corporation or its local distributors for the details.

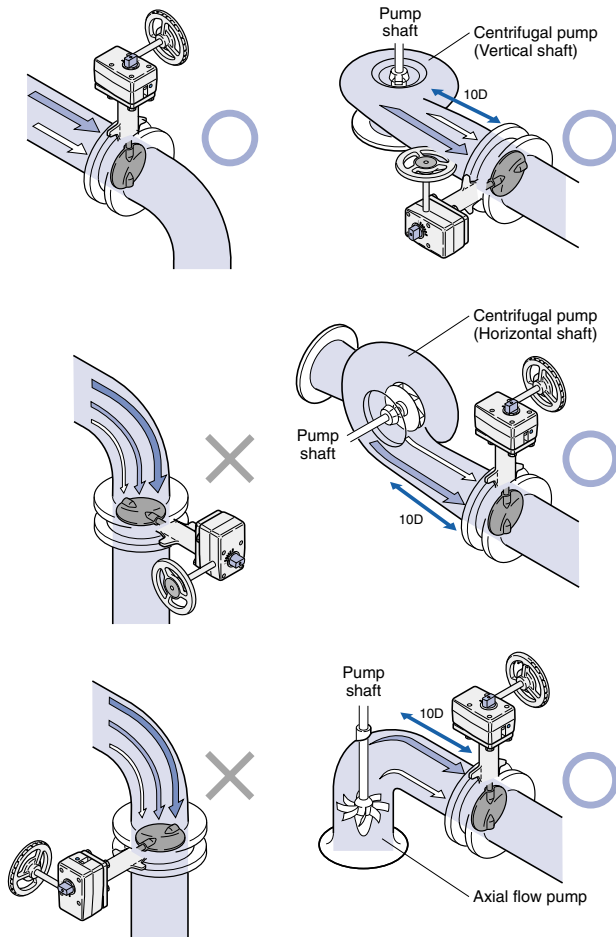
Valve Operation

1. Valves equipped with manual operators such as levers, and handles of gears must be ONLY MANUALLY operated. Application of an excessive external force to operate valves may result in malfunction of valves and their operators.
2. Ensure to fully open valves before a loop test of the piping system is carried out with line pressure higher than the nominal pressure of tested valves. Never use closed valves in place of blind flanges.
3. When valves need to be dismantled from pipes for maintenance or any other cause, ensure to thoroughly release the line pressure beforehand. Loosening piping bolts under line pressure causes a danger. Any residual fluid left inside the pipeline must be completely drained.
4. Users should contact KITZ Corporation or its local distributors for technical advice, when valves should be continuously pressurized while left open by 30° or less.
5. Don't use position indicators to operate valves, or overload position indicators. This may cause damage to indicators.
6. Ensure to use blind flanges when butterfly valves are mounted at the end of pipelines.
7. Standard actuators are referenced in this catalog for actuated valve operation. Contact KITZ Corporation or its local distributors for mounting optional actuators.
8. Contact KITZ Corporation for service at hopper or pump outlets.
9. Avoid touching gear operators and actuator stopper bolts accidentally.
10. It is recommended to perform periodical inspection for
 - Making sure of valve opening degree
 - Checking loosened bolts and leakage at each connection
 - Checking vibration and noise
11. Refer to instruction manual for other precautions. Also refer to actuator catalogs and instruction manuals for actuated valves.

Fig.5

● Mounting to bent pipe

● Mounting to pump outlet



10D: 10 Times Length of bore size.



CAUTION

Pressure-temperature ratings and other performance data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications. They are good only to cover typical applications as a general guideline to users of KITZ products introduced in this catalog.

For any specific application, users are kindly requested to contact KITZ Corporation for technical advice, or to carry out their own study and evaluation for proving suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

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