

ENGINEERING DATA

616 / 620 Series



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616/620 SERIES

BUTTERFLY VALVES



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616/620 SERIES

1. SPECIFICATIONS

THE DIFFERENCE BETWEEN 616 SERIES AND 620 SERIES IS AS FOLLOWS:

SERIES	616	620
MAX. SERVICE PRESSURE	16.24kgf/cm ² 232psi	20.00kgf/cm ² 290psi
STEM MATERIAL	SUS 403	SUS 630
ACTUATOR SIZE	lever 50mm~150mm	50mm~150mm
	gear 50mm~300mm	50mm~300mm

MATERIAL	COMPONENT	CHARACTERISTICS
SUS 403	13Cr, Si-0.1C	high temperature proof high stress proof
SUS 630	17Cr-4, Ni-4, Cu-Nb	precipitation hardening- stainless steel

620 Valve uses SUS 630 as stem material.

SUS 630 stem can stand high service pressure, 20.00kgf/cm²(290psi) for 620 valve because it is heat-treated.

MODEL No.		616	620
SIZE		50mm(2"), 65mm(2 1/2"), 80mm(3"), 100mm(4"), 125mm(5"), 150mm(6"), 200mm(8"), 250mm(10"), 300mm(12")	
MAX. SERVICE PRESSURE		200psi (14kgf/cm ²)	18bar (16.24kgf/cm ² /232psi) / 290psi (20.0kgf/cm ²)
MATERIAL	BODY	DUCTILE IRON(JIS FCD450)	
	DISC	ALUMINUM BROZE(ASTM B148C95200)	STAINLESS STEEL(JIS SCS13(ASTM CF8))
	SEAT	NBR(BUNA N RUBBER)	EPDM(ETHYLENE PROPYLENE RUBBER)
	STEM	STAINLESS STEEL(SUS403/403SS)	
MAX. SERVICE TEMP.		80°C	NBR/80°C, EPDM/120°C / 120°C
SERVICE MEDIA		WATER, OIL, ETC.	NBR/WATER, OIL, ETC. / WATER, OIL, ETC.
BODY STYLE		W A F E R	
FLANGE		ANSI 125LB, 150LB, BS4505 PN16 & ETC.	
FACE TO FACE		ISO 5752 SHORT(API 609/MSS SP-67)	
TEST (WATER TEST PRESSURE)	SHELL TEST	300psi (21kgf/cm ²)	24bar (24.36kgf/cm ² /348psi) / 435psi (30.8kgf/cm ²)
	SEAT TEST	220psi (15.4kgf/cm ²)	17.6bar (17.66kgf/cm ² /255psi) / 119psi (22.8kgf/cm ²)
PAINTING		RUST PREVENTIVE PAINT	
ACTUATOR	LEVER OPERATOR	SIZE 50~300mm (50~100mm/1~200mm) (125~200mm/1~300mm)	SIZE 50~150mm (50~100mm/1~200mm) (125~150mm/1~300mm)
	GEAR OPERATOR	SIZE 50~300mm	



1. SPECIFICATIONS

■ DISC COMPONENT(%)

	SCS13	SCS14	SUS316
C	0.08 or less	0.08 or less	0.08 or less
Si	2.00 or less	2.00 or less	2.00 or less
Mn	2.00 or less	2.00 or less	2.00 or less
P	0.04 or less	0.04 or less	0.045 or less
S	0.04 or less	0.04 or less	0.03 or less
Ni	8.00 ~ 11.00	10.00 ~ 14.00	10.00 ~ 14.00
Cr	18.00 ~ 21.00	17.00 ~ 20.00	16.00 ~ 18.00
Mo	—	2.00 ~ 3.00	2.00 ~ 3.00
Cu	—	—	—

NOTE : No difference lies between 616 series and 620 series other than those described above.

■ BODY MATERIAL COMPONENT(%)

	C	Si	Mn	P	S
FCD450	2.5 or more	—	—	—	0.2 or less
FC 250	3.2 or more	1.6 or more	0.4 or more	0.15 or less	0.15 or less

FCD450(ductile cast iron, spheroidal graphite cast iron)

FCD450 has advantages over FC250 as under.

-high elongation ability

-light weight made(about 60% lighter than FC250)

-high pressure proof

■ SEAT MATERIAL

	ADVANTAGES	DISADVANTAGES
NBR	oil-proof	poor ozone proof poor resilience
EPDM	ozone proof chemical corrosion proof high temperature proof insulation ability	poor oil proof

EPDM(terpolymer of ethylene, propylene, and a diene with the residual unsaturated portion of the diene in the side chain)

NBR(NITRILE-BUTADIENE)



BUTTERFLY VALVES ENGINEERING DATA

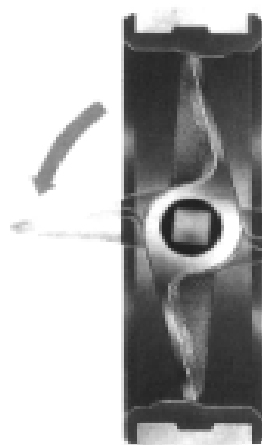
616/620 SERIES

2. ENGINEERING DATA

FEATURE 1

Friction-Free Operation for Low Torque, long Service.

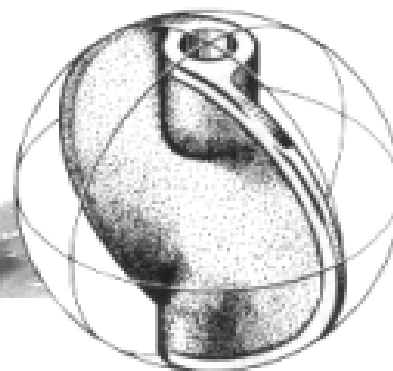
The patented "Touch" seat design permits the disc to close with virtually no frictional contact between the disc and the valve seat. And so, there is virtually no wear and tear on the valve's internal structure. The construction ensures a low torque-to-size ratio and improved in-service performance over a conventional design.

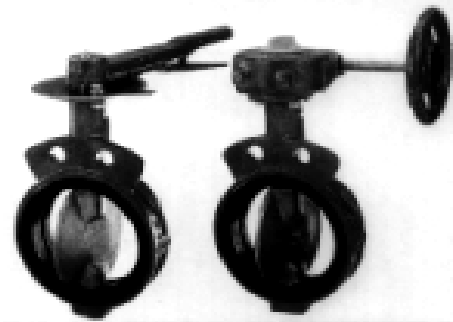


FEATURE 2

S-Shaped Disc Enhances Flow Control.

The S-shaped disc enhances the Cv rating and promotes flow control without turbulence. The valve can be operated at the lowest possible operating torque with bubble-tight shutoff at the maximum operating pressure.



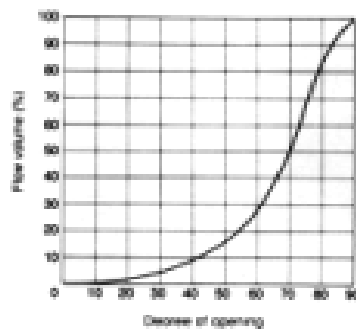


2. ENGINEERING DATA

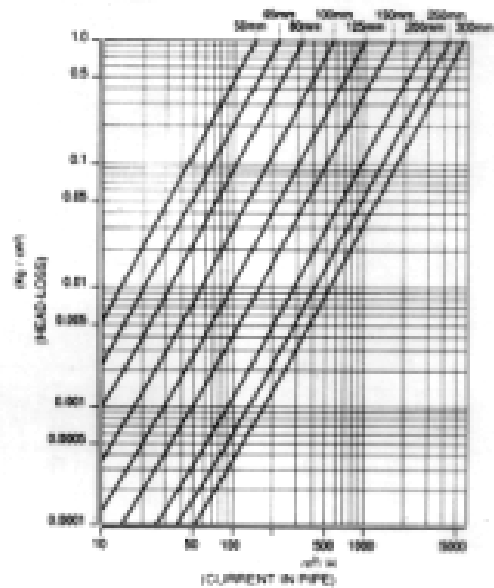
FLOW DATA

Cv Values for Valves

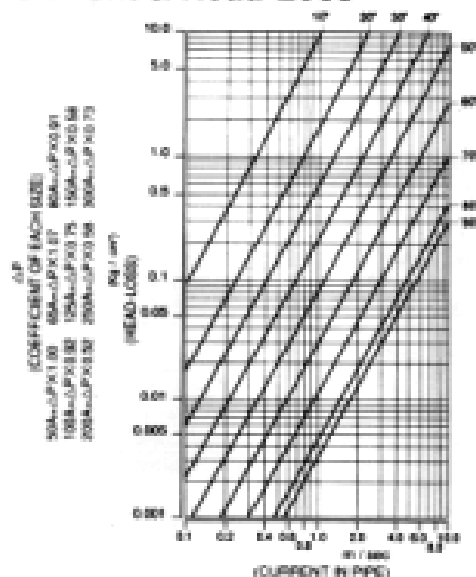
Size	1"	1 1/2"	2"	3"	4"	5"	6"	7 1/2"	8"	9"
50mm	1	3	7	12	20	30	55	90	140	185
65mm	1	5	10	20	35	65	95	155	215	290
80mm	1	7	15	28	50	85	125	185	275	380
100mm	1	14	28	45	75	120	180	300	450	650
125mm	1	14	30	60	100	210	360	570	910	1180
150mm	1	20	40	90	170	280	480	880	1500	1780
200mm	1	30	70	170	300	510	920	1420	2410	3300
250mm	1	50	110	290	480	740	1360	2070	3620	4820
300mm	1	80	140	320	570	900	1740	2680	4620	6200



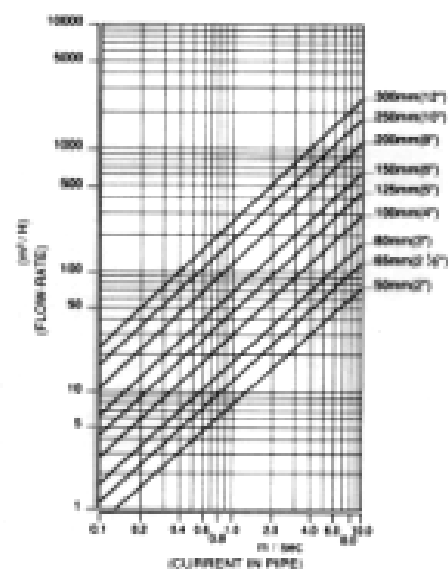
Flow-rate & Head-Loss



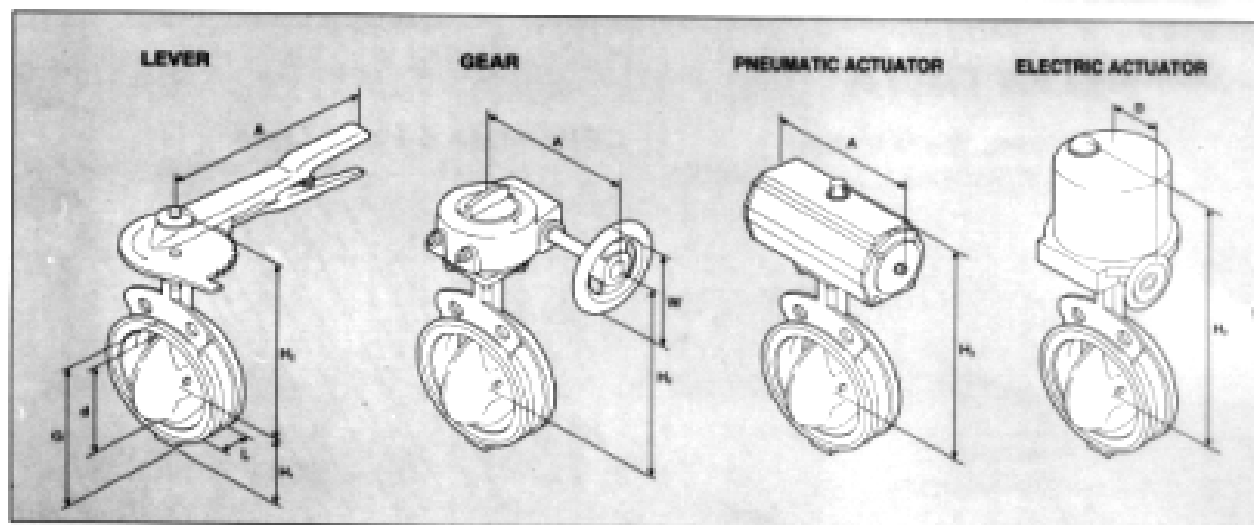
Current & Head-Loss



Current & Flow-Rate



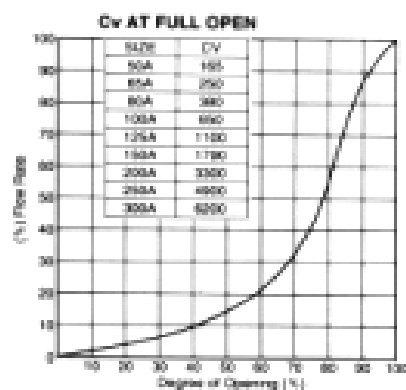
3. DIMENSIONS



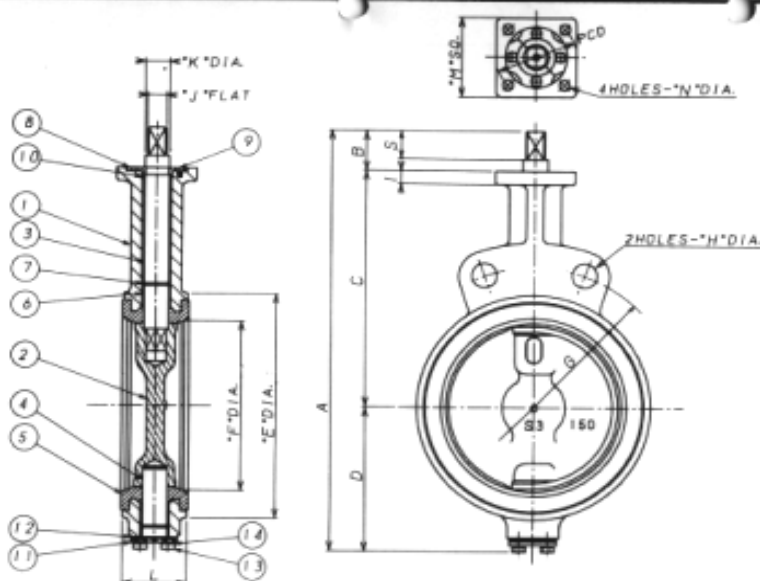
Nominal Bore		L	d	G	H ₁	LEVER		GEAR			PNEUMATIC ACTUATOR		ELECTRIC ACTUATOR	
inch	mm					H ₂	A	H ₂	A	W	H ₂	A	H ₂	B
2	50	43	55	90	85	179	200	172	132	100	246	133	400	120
2½	65	46	66	108	84	192	200	182	132	100	256	133	410	120
3	80	46	84	124	92	202	200	192	132	100	276	133	420	120
4	100	52	100	146	98	217	200	207	132	100	281	133	435	120
5	125	56	130	179	115	253	360	228	170	125	353	185	490	135
6	150	56	154	204	130	268	400	244	197	160	368	185	505	135
8	200	60	200	256	167	—	—	284	255	200	421	236	560	185
10	250	68	246	313	203	—	—	319	255	200	456	236	595	185
12	300	78	295	364	253	—	—	349	255	200	525	270	1138	195

(Operation pressure for a cylinder shall be kg/cm²G or larger)

4. PERFORMANCE DATA



Nominal Bore		JIS 16K		JIS 20K		ANSI 125/150Lb	
inch	mm	Qty	Hexagonal Bolt & Nut	Qty	Hexagonal Bolt & Nut	Qty	Hexagonal Bolt & Nut
2	50	8	M16 × 100 × 38	8	M16 × 100 × 38	4	M16 × 100 × 38
2½	65	8	M16 × 110 × 38	8	M16 × 110 × 38	4	M16 × 100 × 38
3	80	8	M20 × 120 × 46	8	M20 × 120 × 46	4	M16 × 110 × 38
4	100	8	M20 × 130 × 52	8	M20 × 130 × 52	8	M16 × 120 × 38
5	125	8	M20 × 130 × 56	8	M20 × 140 × 56	8	M20 × 130 × 52
6	150	12	M22 × 140 × 56	12	M22 × 140 × 56	8	M20 × 130 × 52
8	200	12	M22 × 150 × 56	12	M22 × 150 × 56	8	M20 × 140 × 52
10	250	12	M24 × 160 × 60	12	M24 × 170 × 60	12	M22 × 160 × 56
12	300	16	M24 × 170 × 60	16	M24 × 180 × 60	12	M22 × 170 × 56



NO.	PARTS NAME	MATERIAL	QTY	REMARKS
1	BODY	FCD450	1	DUCTILE
2	DISC	SCS13	1	CF8
3	UPPER STEM	SUS403	1	403 S.S.
4	LOWER STEM	SUS403	1	403 S.S.
5	SEAT RING	NBR	1	BODY LINING
		EPDM		
6	BUSH	PLASTIC	2	250mm/300mm
7	RING	SUS304	2	304 S.S.
8	BUSH	PLASTIC	1 set	
9	SCREWS	SWRCH17K	4	MILD STEEL PLATED
10	O-RING	NBR	1	BUNA-N
11	COVER	SPCC	1	MILD STEEL PLATED
12	GASKET		1	
13	BOLT	SWRCH17K	2	MILD STEEL PLATED
14	SPRING WASHER	SWRH57	2	MILD STEEL PLATED

#1 "G" "H" : JIS10K FLANGE

VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	S	L	M	N	PCD	WEIGHTS
50mm	256	26	145	85	90	55	120	18	12	9	12	17	43	70	10	70	2.5Kg
65mm	265	26	155	84	108	66	140	18	12	11	14	17	46	70	10	70	3.2Kg
80mm	283	26	165	92	124	84	150	18	12	11	14	17	46	70	10	70	3.6Kg
100mm	304	26	180	98	146	100	175	18	12	12	16	17	52	70	10	70	4.9Kg
125mm	351	36	200	115	179	130	210	22	12	16	20	25	56	70	10	70	6.7Kg
150mm	381	36	215	130	204	154	240	22	12	17	22	25	56	70	10	70	8.0Kg
200mm	457	45	245	167	256	200	290	22	15	22	26	31	60	96	12	102	13.5Kg
250mm	528	45	280	203	313	246	355	24	15	24	29	31	68	96	12	102	23.5Kg
300mm	618	55	310	253	364	295	400	24	18	24	32	40	78	114	14.5	125	35.0Kg

TYPE AND NAME
TYPE B 616
Bare Body 50mm-300mm

DATE 1994.07.05 SCALE NONE

WORKING PRESSURE 10 Bar WORKING TEMP. °C

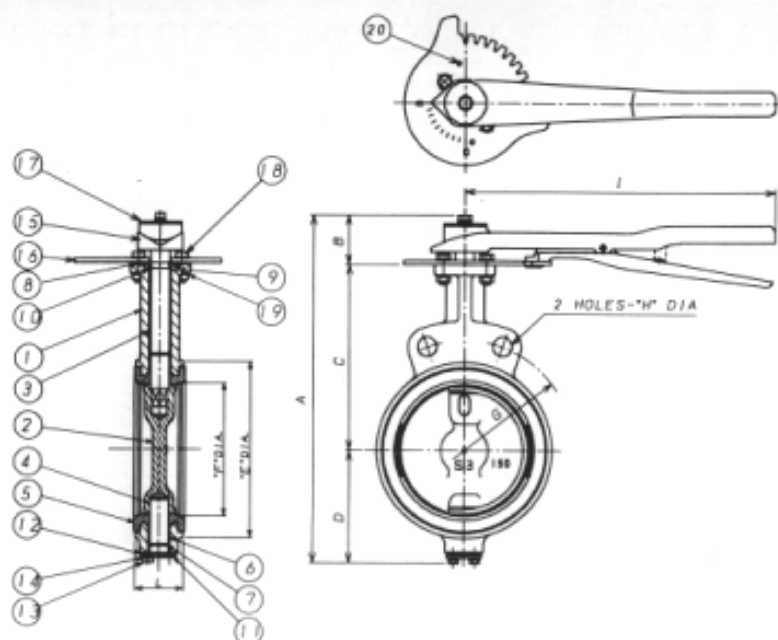
BODY TEST 15 Bar TEST FLUID WATER

SEAT TEST 11 Bar LEAKAGE 0 %

DRAWN CHECKED APPROVED

OKM 株式会社オーケム
OKUMA ENGINEERING CO., LTD.

DRAWING NO. 6160N 0115E PLOP NO. 503



NO.	PARTS NAME	MATERIAL	QTY	REMARKS
1	BODY	FCD450	1	DUCTILE
2	DISC	SCS13	1	CF8
3	UPPER STEM	SUS403	1	403 S.S.
4	LOWER STEM	SUS403	1	403 S.S.
5	SEAT RING	NBR	1	BODY LINING
		EPDM		
6	BUSH	PLASTIC	2	
7	RING	SUS304	2	304 S.S.
8	BUSH	PLASTIC	1 set	
9	SCREWS	SWRCH17K	4	MILD STEEL PLATED
10	O-RING	NBR	1	BUNA-N
11	COVER	SPCC	1	MILD STEEL PLATED
12	GASKET		1	
13	BOLT	SWRCH17K	2	MILD STEEL PLATED
14	SPRING WASHER	SWRH57	2	MILD STEEL PLATED
15	LEVER	FCMB	1	
16	INDICATOR	SS400	1	MILD STEEL PLATED
17	NAME PLATE	A1070P	1	
18	BOLT NUT	SWRCH17K	2	MILD STEEL PLATED
19	WASHER	SWRH57	2	MILD STEEL PLATED
20	PIN	SK5	2	

#1 "G" "H" : JIS10K FLANGE

VALVE SIZE	A	B	C	D	E	F	G	H	I	L	WEIGHTS
50mm	264	34	145	85	90	55	120	18	200	43	3.2Kg
65mm	276	37	155	84	108	66	140	18	200	46	3.9Kg
80mm	294	37	165	92	124	84	150	18	200	46	4.3Kg
100mm	315	37	180	98	146	100	175	18	200	52	5.6Kg
125mm	368	53	200	115	179	130	210	22	360	56	9.0Kg
150mm	398	53	215	130	204	154	240	22	360	56	10.2Kg
200mm	470	58	245	167	256	200	290	22	360	60	15.6Kg

* Driven Di Square-Head Stem

TYPE AND NAME
TYPE L 616
Lever Type 50mm-200mm

DATE 1994.07.05 SCALE NONE

WORKING PRESSURE 10 Bar WORKING TEMP. °C

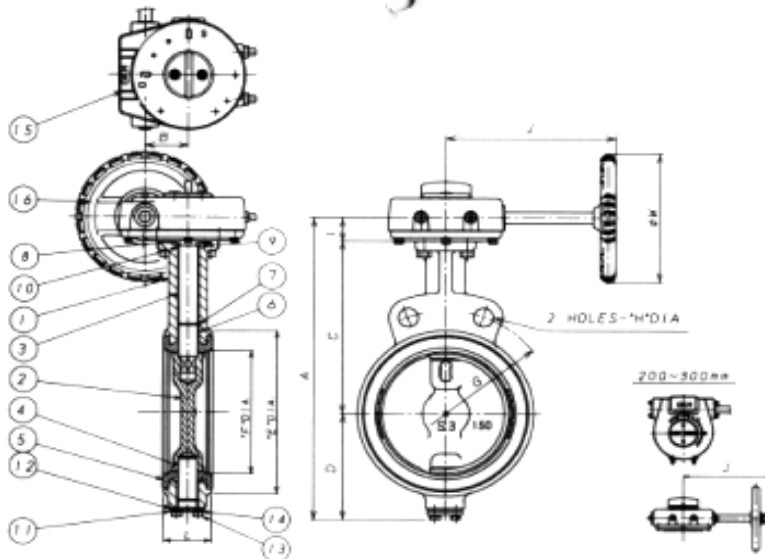
BODY TEST 15 Bar TEST FLUID WATER

SEAT TEST 11 Bar LEAKAGE 0 %

DRAWN CHECKED APPROVED

OKM 株式会社オーケム
OKUMA ENGINEERING CO., LTD.

DRAWING NO. 6160LA 0116E PLOP NO. 503



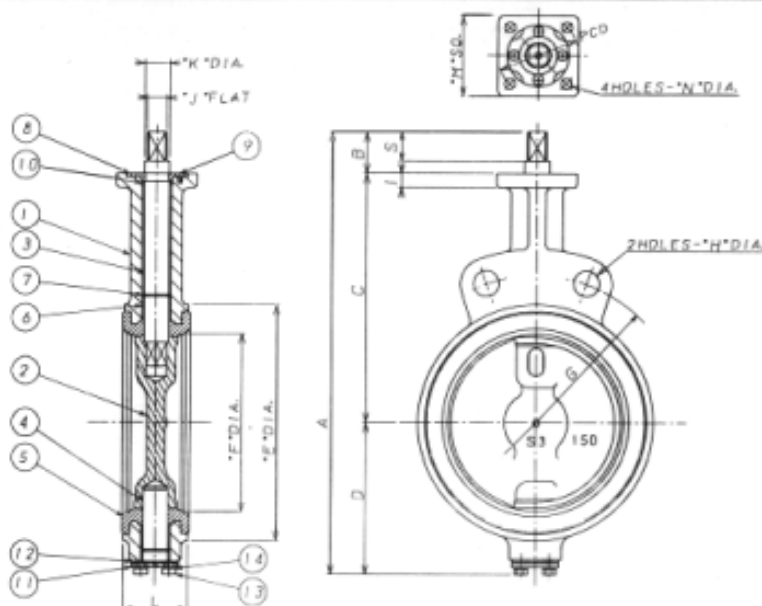
VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	L	WEIGHTS
50mm	257	35	145	85	90	55	120	18	27	133	100	43	4.8Kg
65mm	266	35	155	84	108	66	140	18	27	133	100	46	5.5Kg
80mm	284	35	165	92	124	84	150	18	27	133	100	46	5.9Kg
100mm	305	35	180	98	146	100	175	18	27	133	100	52	7.2Kg
125mm	343	41	200	115	179	130	210	22	28	172	125	56	10.1Kg
150mm	374	51	215	130	204	154	240	22	29	197	160	56	13.4Kg
200mm	450.5	74	245	167	256	200	290	22	38.5	255	200	60	24.7Kg
250mm	521.5	74	280	203	313	246	355	24	38.5	255	200	68	34.7Kg
300mm	601.5	74	310	253	364	295	400	24	38.5	255	200	78	46.2Kg

* Driven G1 Shoulder Head Stem

NO.	PARTS NAME	MATERIAL	Qty	REMARKS
1	BODY	FC450	1	DUCTILE
2	DISC	SCS13	1	CF8
3	UPPER STEM	SUS403	1	403 S.S.
4	LOWER STEM	SUS403	1	403 S.S.
5	SEAT RING	NBR	1	BODY LINING
		EPDM		
6	BUSH	PLASTIC	2	250mm/300mm ONLY
7	RING	SUS304	2	250mm ONLY 1 224 S.S.
8	BUSH	PLASTIC	1set	
9	SCREWS	SWRCH17K	4	MILD STEEL PLATED
10	O-RING	NBR	1	BUNA-N
11	COVER	SPCC	1	MILD STEEL PLATED
12	GASKET		1	
13	BOLT	SWRCH17K	2	MILD STEEL PLATED
14	SPRING WASHER	SWRHS7	2	MILD STEEL PLATED
15	WORM GEAR		1	
16	HAND WHEEL	AI FC250	1	150-180mm 1200-2500mm

#1 "G" "H" : JIS10K FLANGE

TYPE AND NAME	
TYPE G 616	
Gear Type	50mm-300mm
DATE 1994.07.05	SCALE NONE
WORKING PRESSURE 10 Bar	WORKING TEMP.
TEST 15 Bar	TEST FLUID WATER
SEAT TEST 11 Bar	LEAKAGE 0
DRAWN	CHECKED
APPROVED	
OKM 株式会社オーケーエム OKURA ENGINEERING CO., LTD.	
DRAWING NO.	6160N 0117E
FLOP NO.	

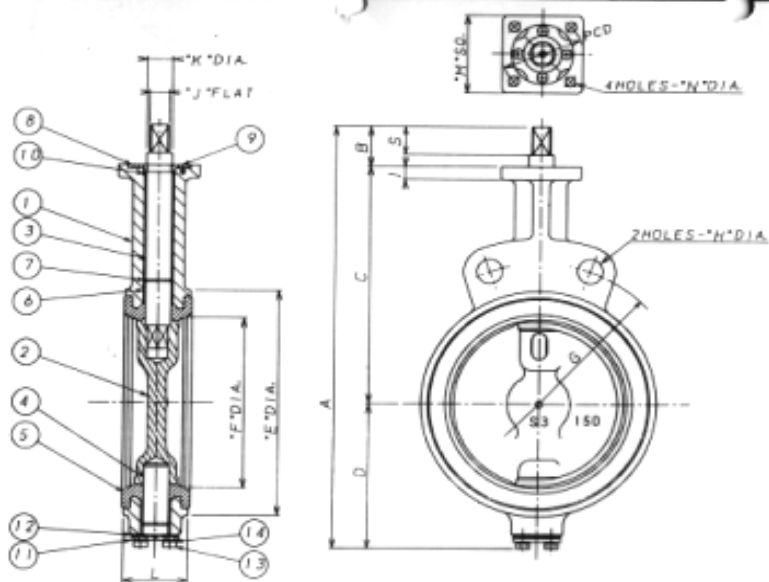


VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	PCD	WEIGHTS
50mm	256	26	145	85	90	55	120.5	18	12	9	12	17	43	70	9	2.5Kg
65mm	265	26	155	84	108	66	139.5	18	12	11	14	17	46	70	9	3.2Kg
80mm	283	26	165	92	124	84	152.5	18	12	11	14	17	46	70	9	3.6Kg
100mm	304	26	180	98	146	100	190.5	18	12	12	16	17	52	70	9	4.9Kg
125mm	351	36	200	115	179	130	216	21	12	16	20	25	56	70	9	6.7Kg
150mm	381	36	215	130	204	154	241.5	21	12	17	22	25	56	70	9	8.0Kg
200mm	457	45	245	167	256	200	298.5	21	15	22	26	31	60	96	11	13.5Kg
250mm	528	45	280	203	313	246	362	24	15	24	29	31	68	96	11	23.5Kg
300mm	618	55	310	253	364	295	432	24	18	24	32	40	78	114	13	35.0Kg

NO.	PARTS NAME	MATERIAL	Qty	REMARKS
1	BODY	FC450	1	DUCTILE
2	DISC	SCS13	1	CF8
3	UPPER STEM	SUS403	1	403 S.S.
4	LOWER STEM	SUS403	1	403 S.S.
5	SEAT RING	NBR	1	BODY LINING
		EPDM		
6	BUSH	PLASTIC	2	250mm/300mm ONLY
7	RING	SUS304	2	250mm ONLY 1 224 S.S.
8	BUSH	PLASTIC	1set	
9	SCREWS	SWRCH17K	4	MILD STEEL PLATED
10	O-RING	NBR	1	BUNA-N
11	COVER	SPCC	1	MILD STEEL PLATED
12	GASKET		1	
13	BOLT	SWRCH17K	2	MILD STEEL PLATED
14	SPRING WASHER	SWRHS7	2	MILD STEEL PLATED

#1 "G" "H" : ANSI 125/150LB FLANGE

TYPE AND NAME	
TYPE B 616	
Bare Body	50mm-300mm
DATE 1993.05.20	SCALE NONE
WORKING PRESSURE 16 Bar	WORKING TEMP.
TEST 24 Bar	TEST FLUID WATER
SEAT TEST 17.6 Bar	LEAKAGE 0
DRAWN	CHECKED
APPROVED	
OKM 株式会社オーケーエム OKURA ENGINEERING CO., LTD.	
DRAWING NO.	6160N 0097E
FLOP NO.	



NO.	PARTS NAME	MATERIAL	QTY	REMARKS
1	BODY	FC450	1	DUCTILE
2	DISC	SCS13	1	CF8
3	UPPER STEM	SUS403	1	403 S.S
4	LOWER STEM	SUS403	1	403 S.S
5	SEAT RING	NBR EPDM	1	BODY LINING
6	BUSH	PLASTIC	2	255mm/300mm ONLY 4
7	RING	SUS304	2	255mm ONLY 1 304 S.S
8	BUSH	PLASTIC	1 each	
9	SCREWS	SWRCH17K	4	MILD STEEL PLATED
10	O-RING	NBR	1	BUNA-N
11	COVER	SPCC	1	MILD STEEL PLATED
12	GASKET		1	
13	BOLT	SWRCH17K	2	MILD STEEL PLATED
14	SPRING WASHER	SWRHS7	2	MILD STEEL PLATED

#1 "G"H" : AS TABLE-E FLANGE

VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	PCD	WEIGHTS	
50mm	256	26	145	85	90	55	114	18	12	9	12	17	43	70	9	70	2.5Kg
65mm	265	26	155	84	108	66	127	18	12	11	14	17	46	70	9	70	3.2Kg
80mm	283	26	165	92	124	84	146	18	12	11	14	17	46	70	9	70	3.6Kg
100mm	304	26	180	98	146	100	178	18	12	12	16	17	52	70	9	70	4.9Kg
125mm	351	36	200	115	179	130	210	18	12	16	20	25	56	70	9	70	6.7Kg
150mm	381	36	215	130	204	154	235	22	12	17	22	25	56	70	9	70	8.0Kg
200mm	457	45	245	167	256	200	292	22	15	22	26	31	60	96	11	102	13.5Kg
250mm	528	45	280	203	313	246	356	22	15	24	29	31	68	96	11	102	23.5Kg
300mm	618	55	310	253	364	295	406	26	18	24	32	40	78	114	13	125	35.0Kg

TYPE AND NAME
TYPE B 616
Bare Body 50mm-300mm

DATE 1993.05.20 SCALE NONE

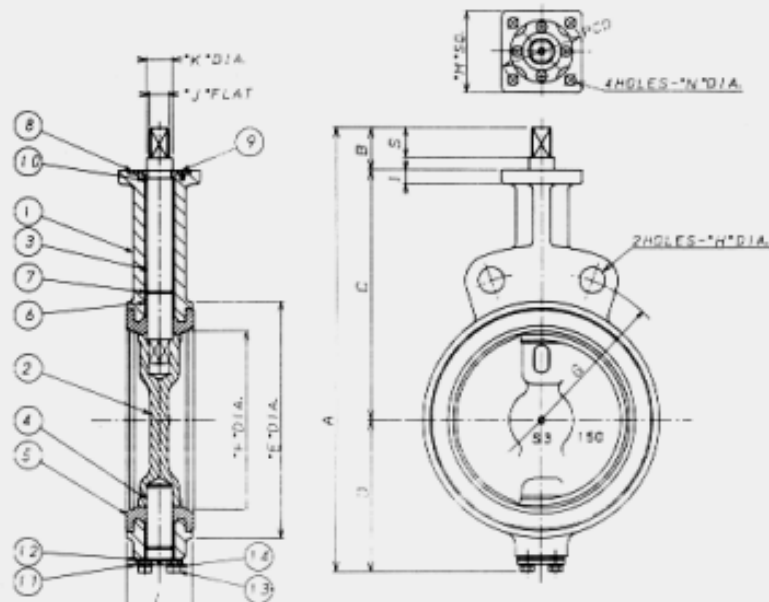
WORKING PRESSURE 10 bar WORKING TEMP. TEST FLUID WATER

TEST 24 bar TEST 17.6 bar LEAKAGE 0

DRAWN CHECKED APPROVED

OKM 株式会社オーケーエム
OKURA ENGINEERING CORP.

DRAWING NO. 6160N 0100E FLOP NO. 472



NO.	PARTS NAME	MATERIAL	QTY	REMARKS
1	BODY	FC450	1	DUCTILE
2	DISC	SCS13	1	CF8
3	UPPER STEM	SUS403	1	403 S.S
4	LOWER STEM	SUS403	1	403 S.S
5	SEAT RING	NBR EPDM	1	BODY LINING
6	BUSH	PLASTIC	2	255mm/300mm ONLY 4
7	RING	SUS304	2	255mm ONLY 1 304 S.S
8	BUSH	PLASTIC	1 each	
9	SCREWS	SWRCH17K	4	MILD STEEL PLATED
10	O-RING	NBR	1	BUNA-N
11	COVER	SPCC	1	MILD STEEL PLATED
12	GASKET		1	
13	BOLT	SWRCH17K	2	MILD STEEL PLATED
14	SPRING WASHER	SWRHS7	2	MILD STEEL PLATED

#1 "G"H" : 150 NP 10 FLANGE

VALVE SIZE	A	B	C	D	E	F	G	H	I	J	K	L	M	N	PCD	WEIGHTS	
50mm	256	26	145	85	90	55	125	18	12	9	12	17	43	70	9	70	2.5Kg
65mm	265	26	155	84	108	66	145	18	12	11	14	17	46	70	9	70	3.2Kg
80mm	283	26	165	92	124	84	160	18	12	11	14	17	46	70	9	70	3.6Kg
100mm	304	26	180	98	146	100	180	18	12	12	16	17	52	70	9	70	4.9Kg
125mm	351	36	200	115	179	130	210	18	12	16	20	25	56	70	9	70	6.7Kg
150mm	381	36	215	130	204	154	240	22	12	17	22	25	56	70	9	70	8.0Kg
200mm	457	45	245	167	256	200	295	22	15	22	26	31	60	96	11	102	13.5Kg
250mm	528	45	280	203	313	246	350	22	15	24	29	31	68	96	11	102	23.5Kg
300mm	618	55	310	253	364	295	400	22	18	24	32	40	78	114	13	125	35.0Kg

TYPE AND NAME
TYPE B 616
Bare Body 50mm-300mm

DATE 1993.05.20 SCALE NONE

WORKING PRESSURE 10 bar WORKING TEMP. TEST FLUID WATER

TEST 15 bar TEST 17.6 bar LEAKAGE 0

DRAWN CHECKED APPROVED

OKM 株式会社オーケーエム
OKURA ENGINEERING CORP.

DRAWING NO. 6160N 0098E FLOP NO. 47