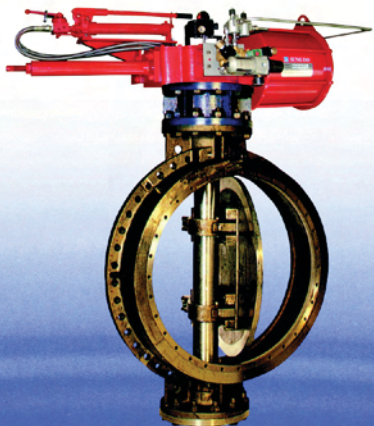




SUNG DO VALVE &

HIGH-PERFORMANCE BUTTERFLY VALVE



Technological Agreement by
inter valve co. of Neth

SUNG DO VALVE CO., LTD.

TÜV NEDERLAND B.V.

SOBA TEST INSTITUTE
Nusterweg 125
6136 KT SITTARD

FIRE SAFE TEST CERTIFICATE

Registration / Report N°.: 91.090.32

The SOBA Test Institute
hereby grants

: INTERVALVE B.V.
Marconistraat 36
NL - 7570 AG Oldenzaal

the right to publish this certificate verbatim and unabridged.
Considering the successful testing by SOBA Test Institute in
compliance with the **British Standard 6755, part 2, edition 1987**
" Fire Type-Testing of Valves " of

VALVE TYPE : H.P.BUTTERFLY - VALVE, Range IVEX
"BI-DIRECTIONAL TESTED"
: NPS 8"
: ANSI Class 150
: Austenitic Stainless Steel (Rolled Plate - T 316)
: Austenitic Stainless Steel (T 316)
: PTFE/Inconel 625
: Ferritic Stainless Steel (17 Cr.)
: Graphite
: Graphite
: Type VGC - 3

Drawing number : D 910002, dd. 10.09.'91

VALVE QUALIFICATION.

This certificate represents the validity for valves qualified as,

VALVE TYPE : H.P.BUTTERFLY - VALVE, Range IVEX, Gear-operated
for Bi-Directional application.

Qualification Range : NPS 8", 10", 12", 14" and 16"
(DN 200, DN 250, DN 300, DN 350 and DN 400)

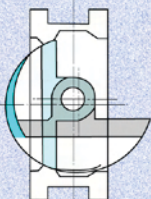
Pressure Rating : ANSI Class 150, and Class 300
(PN 16, PN 25 and PN 40)

Sittard, December 10 th., 1991
TÜV Nederland B.V./ SOBA Test Institute

Ing. J.Kesting, Managing Director



SUNG DO VALVE



MULTI-PURPOSE IVEX RANGE

The intervalve IVEX-Range is based on a unique quarter-turn design. The double offset shaft and disc configuration as to the seat together with the advanced high technology seat systems brings in a multi-purpose IVEX-butterfly valve range.

MAIN DESIGN FEATURES

Double offset disc design.

At the initial point of disc opening, the double offset disc provides a camlike action. Thus preventing excessive seat wear and creating the possibility for frequent operation.

Size 2" - 48"
Class 150 & 300lbs.
Asbestos free design

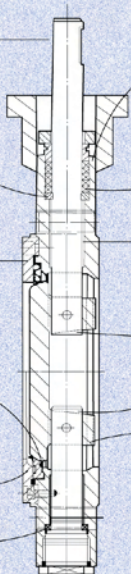
Metal header prevents cold flow of packing and centers the disc exactly in the seat (trust bearing)

Metal to Metal seat for high temperature service

Reinforced PTFE seat-ring with secondary metal seat for fire -safe protection

Body insert protects seat from abrasion and erosion

Grafoil seal-ring



Body.

The body can be lug (single flanged) and wafer design

Grafoil packing

Shaft Bearing in PTFE or AISI 316

2 piece stem for extra flow

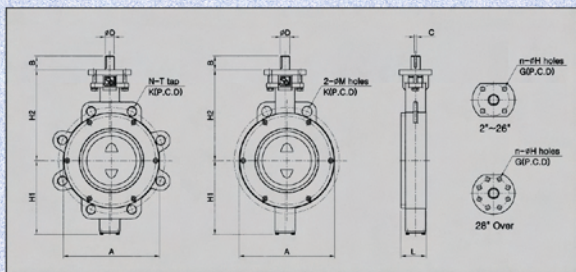
Seat removal without disassembly of shaft and disc

Face to face dimension acc. ISO 5752-5H



SUNG DO VALVE

DIMENSIONAL



DIMENSION CHART FOR ANSI CLASS 150

Size inch/mm	H1	H2	A	B	C	φD	L	ANSI CL. 150				JIS 10k				ISO 5210 (top flange)			
								K	φM	N	Y	I	K	φM	N	Y	I	Type	G
2 50	110	100	98	20	5	13	58	121	19	4	5/8-11	120	19	4	M18	F07	70	4	10
3 80	133	123	132	20	5	16	48	152	19	4	5/8-11	150	19	4	M19	F07	70	4	10
4 100	145	135	161	20	6	19	54	191	19	8	5/8-11	175	19	8	M18	F07	70	4	10
5 125	165	154	186	35	6	19	58	216	22	8	3/4-10	210	23	8	M20	F07	70	4	10
6 150	175	168	217	35	8	22	58	241	22	8	3/4-10	240	23	8	M20	F07	70	4	10
8 200	200	195	272	50	8	28	64	299	22	8	3/4-10	290	23	12	M20	F10	102	4	12
10 250	265	244	327	65	10	32	72	362	25	12	7/8-9	355	25	12	M22	F10	102	4	12
12 300	290	284	378	75	12	38	81	432	25	12	7/8-9	400	25	16	M22	F14	140	4	18
14 350	310	290	437	75	14	45	92	478	29	12	1-8	445	25	16	M22	F14	140	4	18
16 400	370	350	488	90	14	50	102	540	29	16	1-8	510	27	16	M24	F16	165	4	22
18 450	390	367	538	100	16	55	114	578	32	16	1 1/8-8	565	27	20	M24	F16	165	4	22
20 500	420	400	593	100	18	60	127	635	32	20	1 1/8-8	620	27	20	M24	F16	165	4	22
24 600	470	468	694	100	18	65	154	749	35	20	1 1/4-8	730	33	24	M30	F25	254	8	18
28 700	545	515	772	100	20	70	229	864	35	28	1 1/4-8	840	33	24	M30	F25	254	8	18
30 750	570	540	823	130	22	75	239	914	35	28	1 1/4-8	900	33	24	M30	F25	254	8	18
32 800	595	565	876	130	22	75	241	978	41	28	1 1/2-8	950	33	28	M30	F30	298	8	22
36 900	700	670	983	130	22	80	241	1086	41	32	1 1/2-8	1050	33	28	M30	F30	298	8	22
42 1050	820	790	1142	130	25	85	300	1257	41	36	1 1/2-8	1275	39	28	M36	F30	298	8	22
48 1200	900	870	1302	140	25	90	350	1422	41	44	1 1/2-8	1380	39	32	M36	F35	356	8	32

DIMENSION CHART FOR ANSI CLASS 300

Size inch/mm	H1	H2	A	B	C	φD	L	ANSI CL. 300				JIS 20k				ISO 5210 (top flange)			
								K	φM	N	Y	I	K	φM	N	Y	I	Type	G
2 50	67	162	98	32	5	16	48	127.0	19	8	5/8-11	120	19	8	M18	F07	70	4	10
3 80	104	168	133	32	5	16	48	168.0	22	8	3/4-10	160	23	8	M20	F07	70	4	10
4 100	120	191	171	32	5	16	52	200.0	22	8	3/4-10	185	23	8	M20	F07	70	4	10
5 125	130	203	210	32	6	19	57	235.0	22	8	3/4-10	225	25	8	M22	F07	70	4	10
6 150	159	222	226	32	8	22	61	270.0	22	12	3/4-10	260	25	12	M22	F12	125	4	14
8 200	192	254	278	51	10	30	72	330.0	25	12	7/8-9	305	25	12	M22	F12	125	4	14
10 250	239	269	337	51	10	35	83	387.0	29	16	1-8	380	27	12	M22	F12	125	4	14
12 300	277	343	396	51	10	35	92	451.0	32	16	1 1/8-8	430	27	16	M24	F12	125	4	14
14 350	318	464	455	64	16	50	118	514.5	32	20	1 1/8-8	480	33	16	M30	F16	165	4	22
16 400	353	533	506	102	18	64	136	571.5	35	20	1 1/4-8	540	33	16	M30	F16	165	4	22
18 450	392	549	559	102	18	64	152	628.5	35	24	1 1/4-8	605	33	20	M30	F25	254	8	18
20 500	427	565	612	102	22	76	161	666.0	35	24	1 1/4-8	660	33	20	M30	F25	254	8	18
24 600	503	667	734	133	25	89	182	813.0	41	24	1 1/2-8	770	39	24	M36	F30	298	8	22
30 750	594	849	892	133	32	114	228	977.0	48	28	1 3/4-8	900	48	24	M45	F35	356	8	32
36 900	689	971	1067	152	32	127	271	1168.5	54	32	1 5/8-8	1140	56	28	M52	F35	356	8	32
42 1050	756	1029	1289	165	40	152	292	1266.5	45	32	1 5/8-8	-	-	-	F40	406	8	38	
48 1200	842	1137	1467	190	45	178	318	1400.0	51	32	1 7/8-8	-	-	-	F48	406	12	38	

Dimensions are subject to change without notice



ACTUATORS

The IVEX-Butterfly Valve range will be supplied with an actuator bracket according to ISO 5211, which allows replacement of the stem seals without removal of the actuator

Every required actuator can be supplied:

- Wrench -10 positions.
- Gearbox -Weatherproof. / Buried service.
- Pneumatic actuators, double or single action.
- Electric actuators.

Furthermore Intervalve produces high-duty oil-filled stem executions as required for fire fighting lines.

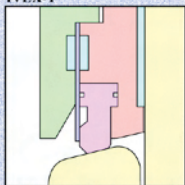
POWER-SEAL VALVE PRODUCES THE IVEX RANGE IN THREE MAIN EXECUTIONS:

IVEX-T : PTFE Seat-system.

IVEX-F : PTFE/Metal seat-system, bi-directional sealing and fire-safe design.

IVEX-M : Metal to metal seat-system High temperature service

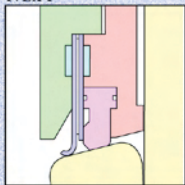
IVEX-T



PTFE-SEAT-SYSTEM

In the preferred flow-direction, as indicated, the PTFE-Seat-System will bring its optimum performance. In this design, the line pressure act as positive force in the seat-system even at fluctuating working condition. The seat-ring is well-protected by the valve-body, thus preventing distortion at negative, non-preferred flow direction.

IVEX-F



PTFE-METAL-SEAT SYSTEM

Bi-directional sealing and fire safe design.

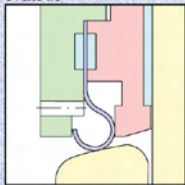
Bi-directional.

The primary PTFE-seat-ring will be replenished with a secondary metal back-up ring. This metal seat provides a mechanical load to energize the PTFE-seat. In combination with the line pressure a Bi-directional sealing against the design pressure is obtained.

Fire Safe Design.

After a fire, when the PTFE-seating has burned away, the secondary metal seat gives bi-directional sealing. This sealing systems meets the fire test requirements (API 607 and BS5146)

IVEX-M



METAL TO METAL SEAT DESIGN

High temperature service

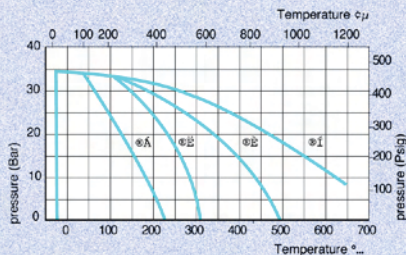
The primary metal seal enables this execution to be used up to 670 grade C.

Seat-rings available are stainless steel AISI 316 L-chromium plated, (maximum allowable temperature: 310 grade C.) and Inconel 625 (maximum temperature 670 grade C.)

As a result the IVEX-M-Metal-to-Metal range meets the full pressure temperature rating according to the ANSI class 150 and class 300 rules.



PRESSURE-TEMPERATURE LIMITS BY SEATS



MATERIALS

- Ⓐ Reinforced PTFE seat.
- Ⓑ Stainless steel AISI 316L seat.
- Ⓒ INCONEL® / Body steel.
- Ⓓ INCONEL® / Body stainless steel.

BODY PRESSURE-TEMPERATURE RATINGS

Body	ANSI Class	Dear gr.C										
		-29	38	94	149	204	250	315	371	427	482	538
Materials	Class	Dear gr.F										
		-20	100	200	300	400	500	600	700	800	900	1000
Carbon Steel	150	285	295	260	230	200	170	140	110	80		
	300	740	740	675	655	635	600	550	535	410		
Stainless Steel	150	275	275	240	215	195	170	140	110	80	50	20
	300	720	720	620	560	515	480	450	430	415	395	365

MATERIALS

By offering a wide range of materials the IVEX-Butterfly valves can be used for a large number of applications as a result of chemical as well as temperature resistance.

Part	Material	Material specification	Temperature Range																	
			330°	150°	32°	212°	316°	570°	750°	900°	1110°	200°	-100°	0°	100°	200°	300°	400°	500°	600°
Body/Disc	1 Cast carbon steel	ASTM A216 WCB																		
	2 Cast carbon steel	ASTM A216 WCB																		
	3 Low temp. cast c. steel	ASTM A216 LCB																		
	4 plate carbon steel	ASTM A516 Gr60																		
	5 Low temp. plate c. steel	ASTM A516 Gr70																		
	6 Cast stainless steel	ASTM A351 Gr CF8M																		
	7 6 MO/SMO St steel	ASTM A182 UNS S31254																		
	8 Alu-Bronze	ASTM B148																		
	9 Monel																			
	10 Inconel 625																			
Shuttl	11 Stainless St. ANSI316	ASTM A276-316																		
	12 Inconel 625																			
	13 Monel K500																			
Seat	14 PTFE																			
	15 Reinforced PTFE																			
	16 Stainless Steel AISI 316																			
	17 Inconel 625																			
Seat/Shell	19 PTFE																			
	20 Grafoil																			

Please consult our technical sales staff for further information on other(exotic) materials.



SUNG DO VALVE

Valve Operating Torques for PTFE Seat (N·m)

SIZE	P = 10bar	P = 20 bar
21e	22	27
31e	46	55
41e	92	110
51e	115	154
61e	176	253
81e	330	452
101e	520	710
121e	665	960
141e	1020	1460
161e	1180	1980
181e	1540	2300
201e	2420	3300
241e	3400	4880

* - Break away

- Including safety factor 15%

For IVEX-F (fire safe) take an extra factor 20%

For IVEX-M (metal seat) take an extra factor 30%

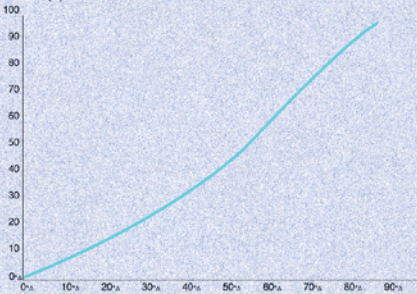
Cv-valves for High Performance butterfly valves

type IVEX-F, M & T.

Cv=flow in US-gallons per minute at a pressure drop of 1 PSI and 60°Cμ

Size	21e	31e	41e	51e	61e	81e	101e	121e	141e	161e	181e	201e	241e
Cv	105	210	440	605	900	1900	3100	4800	6100	8100	10800	13700	21000

Max. Cv(%)



Disc opening Angle

*yThe manufacturer reserves the right to change product designs and specifications without notice



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