www.vivenc.com

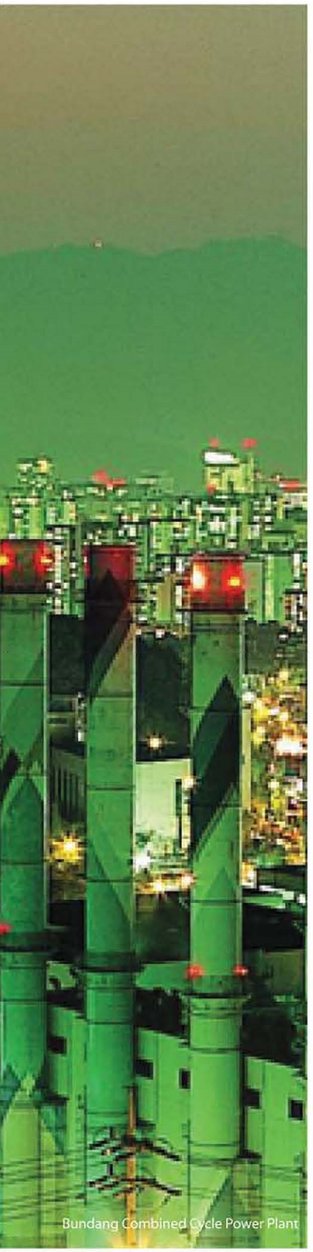
VIV

Value in Valve

Best Technology

Best Service

Through **VIV**



Bundang Combined Cycle Power Plant

Valve is Energy

Through VIV

Yeongheung Thermal Power Plant

"Valve is Energy". Keeping the belief in mind, VIV has been accumulating technical skills through field experiences and R&D efforts for decades and committed to register more than 30 patents in the field of manufacture and maintenance of control valves for severe services. Based on these technologies, VIV has acquired New Excellent Product (NEP) certification from Ministry of Trade, Industry & Energy of Korea and KEPIC MN certification (equivalent to ASME N Stamp) from Korea Electric Association. In recognition of these achievements, the national Public Procurement Service designated VIV 's Helical Trim® control valve as an excellent product.

After being registered as a qualified supplier for control valves and various type of valves in plants and constructions, VIV is stably supplying control valves and various type of valves as well as engineering services to domestic and foreign plants including UAE Barakah nuclear power plant. Currently, VIV is leading the valve industry as the first domestic valve maker qualified to supply nuclear safety class (Q class) control valves.

Contents

HISTORY

VIV is leading the world valve market with high quality and price competitiveness.

2003
- Established System D&D as a venture company in KEPCO Research Institute.

2005
- Registered as a venture company (No. 0515220931-1-0122).
- Registered as an engineering entity (Fluid machinery and nuclear power generation).

2006
- Selected as a technology-innovative company (INNO-BIZ).

2008
- Acquired ISO 9001 certification (Design & manufacture of power generation facilities and engineering services).

2009
- Developed control valve actuator (Q class) sponsored by KHNP.
- Acquired New Excellent Product (NEP) certification for air-operated Helical Trim® control valve by national government.
- Acquired KEPIC MN Valve certification (equivalent to ASME N Stamp).

2010
- Registered as a KHNP's qualified supplier for improvement design of mechanical facilities in operating nuclear power plants (Q class).
- Registered as a qualified supplier of 5 major utilities operating thermal power plants for maintenance works.

2012
- Registered as a KHNP's qualified supplier for Q class control valve.
- Selected as an excellent invention for Helical Trim® control valve by Korea Invention Promotion Association.
- Designated as an excellent product for Helical Trim® control valve by national Public Procurement Service.

2013
- Changed corporate name from System D&D to SDD.
- Established 2nd factory in Busan.
- Acquired API 602 & Q1 certifications.

* KEPCO: Korea Electric Power Co., Ltd.
* KEPIC: Korea Electric Power Industry Code
* KHNP: Korea Hydro & Nuclear Power Co., Ltd.

HISTORY

HELICAL TRIM®
CONTROL VALVE

As a high performance control valve for severe services, Helical Trim® control valve has been developed for the first time in the world applying patented trim technology and Korean government certified it as a New Excellent Product (NEP).

| Application |

Power Plants	Petrochemical Plants
Boiler Feed Water CV	- Production chokes CV
Boiler Feed Pump Mini. CV	- Separator-level CV
Turbine Bypass CV	- Gas lift/injection CV
Aux. Steam Pressure CV	- Injection pump recycle CV
Feed Water Heater LCV	- Hot gas bypass CV
Main Steam Condensate Drain CV	- Feedwater pump recirculation CV
Deareator LCV, etc.	- Steam header PCV, etc.

| Technologies Applied | NEP Certification Ministry of Trade, Industry & Energy

Development of high performance control valve and performance improvement technique
Power Industry R&D project sponsored by national government

↓

Localization development of nuclear control valve actuator
Sponsored by KHNP

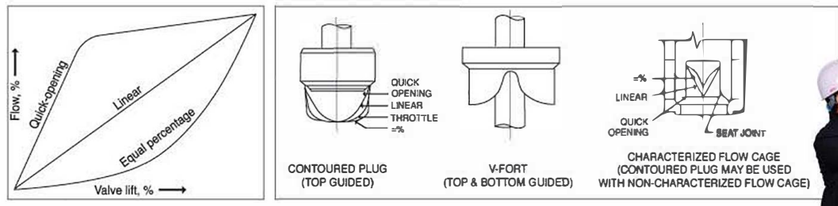
↓

Development of ultra high pressure control valve for export
Cooperative R&D project of 5 major utilities operating thermal power plants

Korea patents	0280893 0438047 0477004 0477005 0527918 0894430 1010746 1136280 0112956 0120556 0099762 0069098 0069095
International patents	PCT/KR1999/000352 PCT/KR2000/001102 PCT/KR2009/004806 PCT/KR2010/001847
U.S. patents	6,394,134, B1 13518991
China patents	ZL 99 8 07760.7 201080000826.8
India patent	5572/DELNP/2012
Europe patent	10848505.3
Utility model	0415452
Trademark	0039222(Helical Trim®)

| Flow Characteristics Curve and Trim Characteristics of Control Valve |

Selection of optimum trim considering flow change and pressure drop of valves and piping facilities in control system



Linear Flow Characteristic

Flowrate is directly proportional to the amount of valve plug travel.

- At 50% of rated travel, flowrate is 50% of maximum flow.
- At 80% of rated travel, flowrate is 80% of maximum flow.
- Liquid level control
- Flow control within specific range
- D/A level control valve, etc

Equal Percentage Characteristic

For equal increment (%) of valve plug travel, equal percentage of the flow changes.

- At 50% of rated travel, flowrate is 18% of maximum flow.
- At 80% of rated travel, flowrate is 50% of maximum flow.
- Pressure control
- In case of high pressure drop
- Boiler feed water control valve, etc

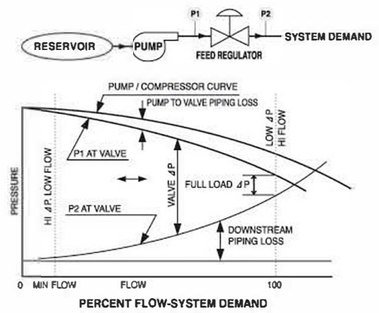
Modified Parabolic

- Between linear and equal percentage
- Precise throttled action at low flow and similar flow to linear characteristic at high flow
- Feed water heater LCV, etc

Quick Opening Flow Characteristic

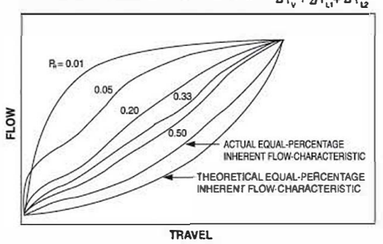
- Valve that needs quick opening
- At 50% of rated travel, flowrate is 80% of maximum travel.
- At 80% of rated travel, flowrate is 95% of maximum travel.
- Steam condensate drain valve, etc

| Application of Trim Characteristics Considering System |



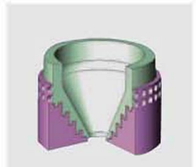
Installed Valve Flow Characteristic with Equal Percentage Actual Inherent Flow Chatacteristics

VALVE PRESSURE - DROP RATIO $P_R = \frac{\Delta P_v}{\Delta P_v + \Delta P_{L1} + \Delta P_{L2}}$



TRIM FOR SEVERE SERVICE

HARMONY 1000

- Applicable to valves for high flow and medium & low pressure services
- Improved durability in shut-off condition
- Prevention of seat and plug damage with flow limit at initial valve opening

Korea patents 0280893, 0894430, 0069098
International patents PCT/KR1999/000352, PCT/KR2009/004806
U.S. patent 6, 394, 134, B1
China patent ZL 99 8 07760.7

HARMONY 2000


- Applicable to valves of high flow and high differential pressure services
- Multi-stage and multi-path trim of cylinder type
- Anti-noise and anti-cavitation valve

Korea patents 0280893, 0894430, 0069098
International patents PCT/KR1999/000352, PCT/KR2009/004806
U.S. patent 6, 394, 134, B1
China patent ZL 99 8 07760.7

HARMONY 3000


- Suitable to valves for ultra high pressure and high differential pressure services
- Multi-stage and multi-path trim of disk stack type
- Prevention of noise, erosion, and corrosion with structural design of flow path cross section

Korea patents 0280893, 0438047, 0477004, 0477005, 0894430, 0112956, 0120556, 0099762, 0069098, 0069095
International patents PCT/KR1999/000352, PCT/KR2000/001102, PCT/KR2009/004806
U.S. patent 6, 394, 134, B1
China patent ZL 99 8 07760.7

HARMONY 4000


- Multi-stage and multi-path trim of cylinder type
- Compact design with optimum performance at various differential pressure conditions
- Prevention of cavitation and erosion damage

Korea patents 0527918/0894430/1010746/1136280/0069098
International patents PCT/KR2009/004806, PCT/KR2010/001847
U.S. patent 13518991
India patent 5572/DELNP/2012
Europe patent 10848505.3

RETROFIT & UPGRADE

▶ What is Retrofit & Upgrade?

It improves the performance of control valves by re-designing their major components such as the trim part and the actuator to obtain performance superior to that of existing control valves by applying the latest structural and hydrodynamic technologies. This is state-of-the-art maintenance technique improving thermal efficiency and extending the lifetime and maintenance interval of valves.

▶ Targets

- Most of the valves designed prior to 1990s
- Valves whose service condition such as flowrate and differential pressure have been changed
- Valves having short replacement interval of their components
- Valves going through severe erosion, wear, and damages
- When requested of improvement by customers
- Valves expected to have better performance when applying new design technology

▶ Necessity

- To satisfy the needs of customers for new products having high quality
- To increase the reliability required for the equipment to cope with the obsolescence of existing products
- To improve the performance of valves with optimum design of trim parts
- To improve the performance of valves with evaluation, improvement, and replacement of actuators

▶ Applicability

- Acquisition of excellent performance by optimum design
- Structural design to prevent the inflow of foreign materials
- Realization of leakage blockage with plug & seat design having double-blocking structure
- Reduction of maintenance cost by being compatible with the body and the actuator of existing valves
- Improvement of durability by solving the existing problems such as leakage, noise, and vibration, etc.

▶ Result

- Improvement of reliability and controlling performance
- Reduction of life cycle cost and maintenance personnel
- Energy saving and improvement of efficiency

MATERIALS AND DIMENSIONS

Piston Type Control Valve

Diaphragm Type Control Valve

Specification

Size	½"~48"
Pressure	ANSI Class 150~4500
Temperature	-165~+565℃
Body Style	Globe or Angle
Trim	Helical Trim® (Multi-stage, Multi-path)
Pressure Drop	2-50 Stage
Leakage	ANSI Class IV, V, VI
Connection	RF, BW, SW, RJT, Thread
Material	Carbon Steel, Stainless Steel, Alloy Steel

Face-to-face Length

Nominal Diameter, inch(mm)	Face-to-face Length, L (mm)						
	ANSI 150	ANSI 300	ANSI600	ANSI 900	ANSI 1500	ANSI 2500	ANSI 4500
1 (25)	127	203	216	254	254	308	SPECIAL CLASS
1 1/2 (40)	165	229	241	305	305	384	SPECIAL CLASS
2 (50)	203	267	292	368	368	451	SPECIAL CLASS
3 (80)	241	318	356	381	470	578	SPECIAL CLASS
4 (100)	292	356	432	457	546	673	SPECIAL CLASS
6 (150)	406	444	559	610	705	914	SPECIAL CLASS
8 (200)	495	559	660	737	832	1,022	SPECIAL CLASS
10 (250)	622	622	787	838	991	1,270	SPECIAL CLASS
12 (300)	698	711	838	965	1,130	1,422	SPECIAL CLASS
16 (400)	914	SPECIAL CLASS	991	1,130	1,384	SPECIAL CLASS	SPECIAL CLASS
20 (500)	978	SPECIAL CLASS	1,194	1,321	1,664	SPECIAL CLASS	SPECIAL CLASS

※ In case of SPECIAL CLASS, it is determined based on the agreement between the customer and the supplier.

Height

Nominal Diameter, inch(mm)	Height, H(mm)			
	Diaphragm Type Control Valve		Piston Type Control Valve	
	Excluding Handle	Including Handle	Excluding Handle	Including Handle
1 (25)	830	1,110	630	910
1 1/2 (40)	870	1,150	770	1,050
2 (50)	940	1,350	840	1,250
3 (80)	1030	1,430	930	1,340
4 (100)	1,150	1,560	1,050	1,460
6 (150)	1,220	1,630	1,150	1,560
8 (200)	1,400	1,950	1,250	1,800
10 (250)	1,430	1,980	1,350	1,900
12 (300)	1,520	2,070	1,450	2,000
16 (400)	1,800	2,350	1,550	2,100
20 (500)	1,900	2,450	1,750	2,300

VIV VALVE
SOLUTION GROUP

To satisfy the market diversification and various needs of customers, VIV concluded agreements with domestic valve companies producing excellent products. All the items from the group companies are supplied under the control of our quality assurance system.

Control Valve

Cryogenic PSV, SRS, SOL, Shut-off Valve

Industrial Valve (Butterfly, Ball, Check, Gate, Globe Valve)

Large-sized Butterfly Valve

High Performance Butterfly Valve

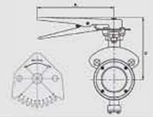
MAX-SEAL BUTTERFLY VALVES

NO. **A630-L**

Wafer Style

NO. **A930-L**

Lug Style



Latch Lock Handle

10 degree Increments with off stop to prevent over travel can also be used with a padlock.
Optional : infinite throttling plate

Lock-Lever Type Handle

(Unit : mm)

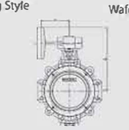
Size	50	65	80	100	125	150	200 and larger
H	159	180	190	210	229	249	Gear Operator is recommended.
A	223	223	223	223	263	263	

NO. **A930-G**

Lug Style

NO. **A630-G**

Wafer Style



Max-Seal offers a broad line of automation systems for precise proportioning or on-off control in either pneumatic or electrically powered units.

Worm Gear Type Operator

(Unit : mm)

Size	50	65	80	100	125	150	200	250	300	350	400
H	216	237	247	267	314	334	415	440	523	547	607
C	120	120	120	120	175	175	250	250	350	350	350
A	118	118	118	118	220	220	230	230	280	280	280

NO. **MS-A630-D OR S**

HPBFV+PNEUMATIC ACTUATOR

NO. **MS-A930-E**

HPBFV+ELECTRIC ACTUATOR

NO. **MS-A630-HD OR HS**

HPBFV+HEAVY DUTY PNEUMATIC ACTUATOR

NO. **MS-A3E**

3WAY HPBFV+ELECTRIC ACTUATOR

MAX-SEAL BUTTERFLY VALVES

Maxseal A-Series CV Value

SIZE		CLASS	Angle of Opening						
INCH	MM		90°	70°	60°	50°	40°	30°	10°
2	50	150	93	65	46	31	21	13	2
		300	93	65	46	31	21	13	2
2 1/2	65	150	153	106	76	52	35	21	4
		300	152	106	76	52	35	21	4
3	80	150	263	184	133	89	61	36	6
		300	263	184	133	89	61	36	6
4	100	150	465	329	237	164	107	65	14
		300	465	329	237	164	107	65	14
5	125	150	768	545	394	263	177	106	22
		300	768	545	394	263	177	106	22
6	150	150	1162	813	606	404	268	167	40
		300	1162	813	606	404	268	167	40
8	200	150	2121	1505	1091	742	490	293	66
		300	1919	1364	990	672	444	268	61
10	250	150	3232	2293	1697	1131	742	449	101
		300	2828	2005	1485	990	651	394	91
12	300	150	4747	3419	2545	1661	1091	667	152
		300	4141	2985	2222	1449	954	581	131
14	350	150	5858	4101	2879	1970	1348	818	192
		300	5555	3889	2732	1869	1278	778	182
16	400	150	8080	5727	3939	2747	1838	1121	253
		300	7676	5439	3742	2611	1747	1066	237
18	450	150	10605	7474	5353	3555	2288	1475	343
		300	9999	7050	5050	3353	2192	1389	323
20	500	150	14140	9999	7070	4848	3232	1959	434
		300	13130	9582	6565	4505	3000	1818	404
24	600	150	21210	15049	10807	7373	4878	2969	657
		300	19695	13978	10039	6848	4530	2757	611

Maxseal A-Series Torque Value, Class 150

(Unit :in-lb)

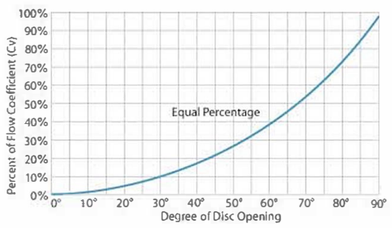
SIZE		Soft Seated				Metal Seated			
INCH	MM	70psi	150psi	210psi	285psi	70psi	150psi	210psi	285psi
2	50	218	244	261	270	435	479	487	496
2 1/2	65	318	341	365	400	636	671	682	735
3	80	387	429	456	525	787	829	856	927
4	100	458	536	615	720	1008	1099	1151	1193
5	125	785	882	962	1250	1458	1634	1746	2067
6	150	978	1215	1417	1535	1890	2007	2125	2262
8	200	1327	1857	1960	2270	2535	2786	3095	3417
10	250	2099	2657	3200	3700	3599	4199	4956	5549
12	300	2918	3824	4729	5635	4528	5837	7144	8375
14	350	4325	5610	7165	9100	7913	10385	12858	13813
16	400	5624	7652	9734	12775	9464	13248	15614	21523
18	450	8130	10904	13356	17350	13380	17846	21811	25062
20	500	1022	15818	17182	2400	17454	22909	29454	37028
24	600	15195	20894	26117	31340	23268	30391	37513	47009

Maxseal A-Series Torque Value, Class 300

(Unit :in-lb)

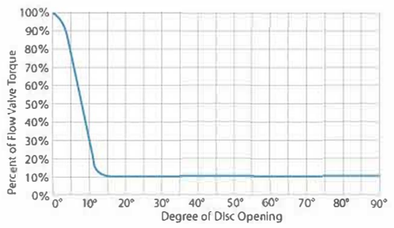
SIZE		Soft Seated				Metal Seated			
INCH	MM	150psi	350psi	600psi	740psi	150psi	350psi	600psi	740psi
2	50	353	444	466	478	671	727	773	784
2 1/2	65	444	554	596	610	846	915	970	1025
3	80	475	601	654	685	894	1006	1048	1160
4	100	674	980	1072	1180	1379	1608	1900	2007
5	125	975	1388	1618	1800	1866	2229	2543	2725
6	150	1138	1611	1862	1965	1891	2438	2777	2999
8	200	2055	2805	3278	3538	3309	4533	5266	5511
10	250	2888	4470	5282	5892	4571	6965	7952	8489
12	300	3992	6666	8039	8627	6092	12604	15237	17856
14	350	5891	11577	14472	15925	10136	17366	22190	24119
16	400	8847	16774	20323	22356	14227	25404	33534	35566
18	450	11749	13447	27769	29904	19225	36313	48060	52874
20	500	18577	33119	39141	42152	26872	53744	72938	79336
24	600	24193	41399	51232	54845	35190	65980	89074	98970

Flow Data Rated Cv



The volume of water in United States gallons per minute that will pass through a given valve opening with a pressure drop of 1pound per square inch. (water at temp=60 degF.)

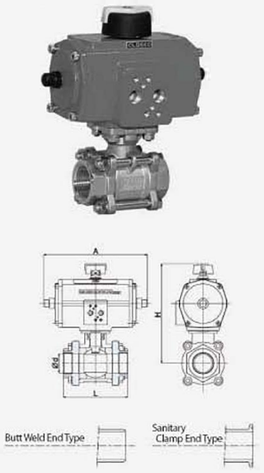
Valve Torque vs. Degree of Disc Opening



The torque in the table above is rated for maximun pressure drop when valve is in the closed position. Butterfly valve torque varies from full close to full open. It generally follows as indicated in the chart on the right.

PNEUMATIC 2-WAY BALL VALVE

NO. **DJR-2(S)**



Dimension

(Unit :mm)

Nominal SIZE (Inch)		L	A	d	H
10A	3/8"	64	134	12.5	125
15A	1/2"	64	134	15	125
20A	3/4"	73	134	20	135
25A	1"	81	165	25	160
32A	1 3/4"	95	195	32	175
40A	1 1/2"	108	195	38	190
50A	2"	122	225	50	210
65A	2 1/2"	158	230	65	250
80A	3"	190	275	80	275
100A	4"	225	300	100	320

Specification

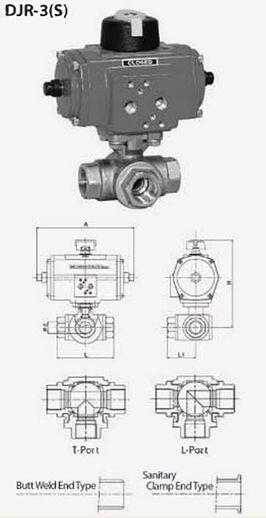
- Material Body : SCS14
  Ball : SC514
  Seat : PTFE
- Max Pressure : 10 ~ 40 Kgf/cm
- Fluid applied : Water, Air, Gas, Oil
- Temperature applied : Under 140℃
- Ambient temperature : -10 ~ 80℃

Accessory

- Solenoid Valve
- Limit Switch
- Air-Set
- Positioner
- Speed Controller

PNEUMATIC 3-WAY BALL VALVE

NO. **DJR-3(S)**



Dimension

(Unit :mm)

Nominal SIZE (inch)		L	A	d	H	L1
10A		72	134	11	145	36
15A	1/2"	72	165	11	175	36
20A	3/4"	83	165	15	175	42
25A	1"	99	195	20	205	50
32A	1 3/4"	112	225	25	225	56
40A	1 1/2"	125	230	32	240	63
50A	2"	149	275	38	290	75

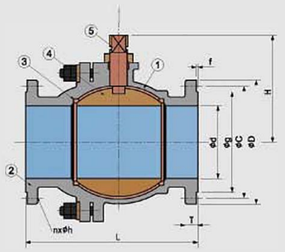
Specification

- Material Body : SCS14
  Ball : SCS14
  Seat : PTFE
- Max Pressure : 10 ~ 40 Kgf/cm
- Fluid applied : Water, Air, Gas, Oil
- Temperature applied : Under 140℃

Accessory

- Solenoid Valve
- Limit Switch
- Air-Set
- E/P, P/P Positioner
- Speed Controller

METAL SEAT BALL VALVE



Features

- Our Metal Seat Ball Valves are designed for high pressure and high temperature.
- "No Leak" and "Fire Safe" design helps to extend life cycle of valves at all lines of plant.

Specification

VALVE SIZE	15A ~ 400A(1/2B ~ 14B)
WORKING PRESSURE	KS, JIS 10K-20K, ANSI CLASS 150-300Lb
WORKING TEMPERATURE	-100 ~ +600℃
END CONNECTION	SCREW, FLANGE
FLUID	Dust, Cement, Sand, Coal dust, Water, Oil, Gas, Chemical, etc.

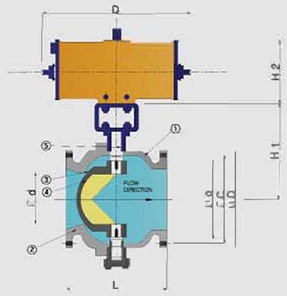
Dimension

size		H	L	ks, JIS 10kg/cm²							
mm	inch			Ød	ØD	Øg	ØC	T	f	n	Øh
15	1/2	60	110	15	95	52	70	12	1	4	15
20	3/4	63	120	20	100	58	75	14	1	4	15
25	1	75	130	25	125	70	90	14	1	4	19
32	1.1/4	86	140	32	135	80	100	16	2	4	19
40	1.1/2	98	166	40	140	85	105	16	2	4	19
50	2	108	178	50	155	100	120	16	2	4	19
65	2.1/2	145	190	65	175	120	140	18	2	4	19
80	3	152	203	80	185	130	150	18	2	8	19
100	4	180	230	100	210	155	175	18	2	8	19
125	5	254	255	125	250	185	210	20	2	8	23
150	6	274	270	150	280	215	240	22	2	8	23
200	8	342	458	200	330	265	290	22	2	12	23
250	10	382	533	250	400	325	355	24	2	12	25
300	12	582	606	253	445	370	400	24	3	16	25
400	14	870	760	335	560	475	510	28	3	15	27

Part Name

NO	PART NAME	MATERIAL	QTY
1	BODY	SCS13, 14, SCPH2	1
2	BODY CAP	SCS13, 14, SCPH2	1
3	SEAT	SUS304, 316	2
4	BALL	SCS13, 14	1
5	STEM	SUS304, 316	1

3-WAY BALL VALVE



Specification

VALVE SIZE	40A, S0A(1.1/2B ~ 2B)
WORKING PRESSURE	KS, JIS 10K-20K, ANSI CLASS 150-300Lb
WORKING TEMPERATURE	-100 ~ +600℃
END CONNECTION	SCREW, FLANGE
FLUID	Dust, Cement, Sand, Coal dust, Water, Oil, Gas, Chemical, etc.

Dimension

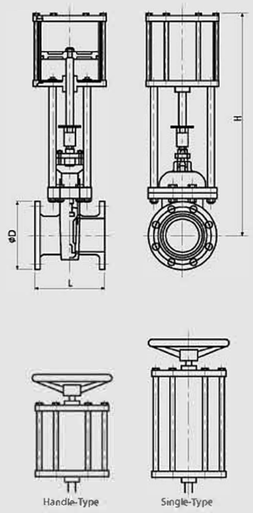
Size		H1	H2	L	D	ØD	Øg	ØC	MODEL NO.
mm	Inch								
40	1.1/2	155	145.5	210	301	140	85	105	DVA-TW40
50	2	171.5	161	224	390	155	100	120	DVA-TW50

Part Name

NO	PART NAME	MATERIAL	QTY
1	BODY	SCS13, 14, SCPH2	1
2	BODY CAP	SCS13, 14, SCPH2	1
3	SEAT	SUS304, 316	2
4	BALL	SCS13, 14	1
5	STEM	SUS304, 316	1

PNEUMATIC KNIFE GATE VALVE

NO. **DJGT-2**



- It minimizes the damage of seat or disc and regualte flux minutely and popularly used for quick or EQ%.
- It has shorter range to move disc and faster operating time than another valves.
- It is suitable to use in high temperature and high pressure.

Dimension

(Unit : mm)

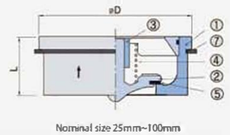
Nominal SIZE (inch)		L	H	PCD	Weight
50A	2"	178	520	155	38
65A	2 1/2"	190	550	175	44
80A	3"	203	580	185	56
100A	4"	229	675	210	68
125A	5"	254	770	250	78
150A	6"	267	830	280	96
200A	8"	292	980	330	110
250A	10"	330	1170	400	120
300A	12"	356	1340	445	132
350A	14"	381	1460	490	148
400A	16"	406	1600	560	165
450A	18"	432	1900	620	187
500A	20"	457	2200	675	215

Accessory

- E/p, P/P Positioner
- Limit switches
- Solenoid valve
- Speed controller
- Air-Set
- Applicable Flange : KS, JIS 10K-20K, ANSI-150, 300
- Material
  Body : SCPH2, SCS13, SCS14
  Disc : STS304, STS316
  Seat : Metal

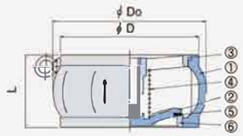
PAN Check Valve (Center Guided Disc / WAFER type)

NO. **PA12**



Nominal size 25mm~100mm

NO. **PA32**



Nominal size 125mm~250mm

Application

Booster pumping system

Features

- Cone type disc secures little pressure drop.
- Disc rubber ensures silence and no leakage.

Specification

Specification		PA 12	PA 32
Nominal Size		25mm(1')~100mm (4')	125mm(5')~250mm(10')
Max. Permissible Working Press.		16 Bar	10 Bar
Test Press.	Body	24 Bar	15 Bar
	Disc Seat	18Bar	11 Bar
Connection		Wafer type · KS 10K Flange	
Material	1. Body	Forged Brass(100A:Bronze)	Ductile Cast Iron
	2. Cone Disc	Stainless Steel	
	3. Guide	Stainless Steel	
	4. Spring	Stainless Steel	
	5. Disc Rubber	EPDM, VITON	
	6. Valve Seat	-	Bronze ring
	7. Center Rubber	NBR (25~80)	-
Soft Seal	EPDM(E)	-10C ~ +130C	
	Viton(V)	- 20C ~ +150C	

Dimension

Size mm(inch)	D (mm)	Do (mm)	L (mm)	Wt. (Kg)
25 (1)	60	-	22	0.35
32 (1 1/4)	72	-	28	0.55
40 (1 1/2)	86	-	32	0.8
50 (2)	102	-	40	1.1
65 (2 1/2)	120	-	46	1.6
80 (3)	133	-	50	2.3
100 (4)	153	170	60	3.8
125 (5)	186	212	90	9
150(6)	215	247	106	13.5
200 (8)	265	295	140	28.3
250 (10)	330	355	170	44

Opening Press.

(Unit : bar)

With spring			Without spring
↑	→	↓	↑
0.055	0.051	0.043	0.006
0.052	0.048	0.041	0.005
0.055	0.050	0.042	0.006
0.055	0.050	0.041	0.007
0.056	0.050	0.040	0.008
0.057	0.050	0.039	0.009
0.058	0.051	0.038	0.010
0.060	0.051	0.035	0.012
0.060	0.050	0.032	0.014
0.062	0.049	0.027	0.018
0.064	0.050	0.025	0.019

- L : Din 3202, Sheet 3, Series K4
- Above dimensions are subject to change for improvement.

Nomination

PA12 – 25 | E

- E : M : Metal to Metal; E : EPDM Rubber; V : Viton Rubber
- 25 : Nominal size
- PA12 : Disc Material : 2. Stainless Steel; Body Material : 1. Brass 2. Stainless; Model Name (WAFER Type)

PRECISION MEASUREMENT

PRECISION MEASUREMENT

PRECISION MEASUREMENT OF VALVE INTERNAL LEAKAGE RATE

Necessity

- Normally closed valves are vulnerable to high temperature and high differential pressure condition.
- Internal leakage leads to energy loss and equipment damage.
- Energy loss degrades the efficiency of plants and generator output.

Purpose

- To establish maintenance plan, leakage rate of valves are measured right before the start of overhaul.
- To verify maintenance quality, leakage rate of valves are measured right after the completion of overhaul.

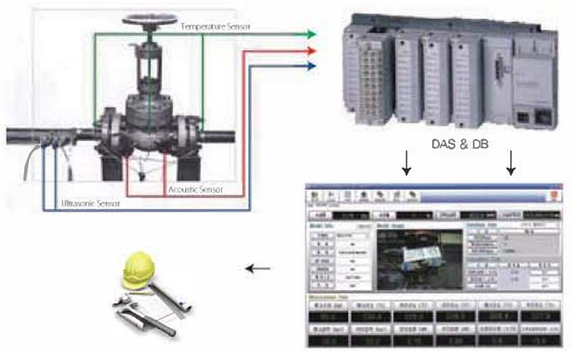
Characteristics of Equipment

- The world's first patent technology developed under the sponsorship of national government
- High precision measurement of steam, water, and 2-phase fluid (Accuracy: ±3%)
- Improved precision applying multi-measuring technique of acoustic, ultrasonic, and temperature
- Precise measurement of leakage rate compared to existing systems detecting the existence of the valve leakage only

Expected Effect

- Prevention of power loss and equipment damage by in-time maintenance of leaking valves
- Reduction of overhaul period by selecting target equipment through prior inspection and prediction
- Prevention of fluid leakage and realization of condition-based preventive maintenance

Measurement Path



Maintenance and Improvement Design for Equipment Damage

Calculation of Leakage Rate, Damage Rate, and Loss Amount

CERTIFICATIONS

API 602

API Q1

KEPIC Certification

Certificate of Designation of Excellent Product

Excellent Invention

Quality Management System (ISO 9001)

Control Valve Trim for High-Pressure Fluid Flow(USA)

NEP Certification

Venture Company

Global Excellent Company

Korean Master Technician

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