

UV790 Soft Seated Floating Ball Valve

The UV790 ball valve from Univals incorporates an advanced innovation concept, featuring an unique design and high quality manufacturing processes. Engineered for durability and superior sealing performance, it meets stringent safety, emission, and performance standards in the Oil & Gas, Petrochemical and Chemical industries. Its versatility makes it ideal for diverse applications, including emergency shutdown valves (ESDV), high frequency operation, and cryogenic service.



Features

Proven for exceptional reliability, the UV790 delivers a long service life with outstanding low-leakage performance and smooth, low operating torque— even in the most demanding applications.

- Integral emission control system
 - Integral Fugitive emission packing kits
 - Double packing design
 - Spring Elastic Loaded packing design
- Unique long-lasting seat sealing
 - Dual-Contact Seat Design
 - Double Elastic Seat Construction
- Performance Optimization Ball design
- Fire-safe Certified
- Anti-blow-out stem
- Anti-static protection

Technical Summary

- Size: 0.5~4 inch
- Rating: Class 150 ~ Class 300
- Body: Carbon Steel, Alloy Steel, Stainless Steel
- Trim: Stainless Steel, Alloy Steel
- Seat: PTFE

Additional configurations material are available, contact UNIVALS engineering for specialized requirement

Advantages

- Tight shut-off sealing
- Extended service life
- Heavy-duty design
- Failed-safe reliability

Design Standards

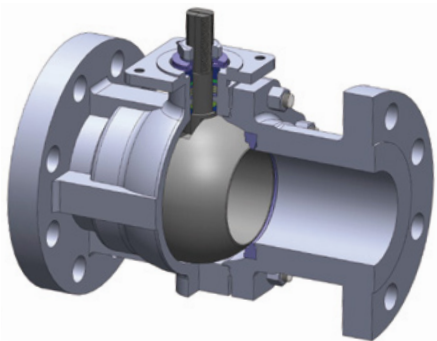
- **Design**
 - ISO 17292 or API 608
- **Pressure / Temperature Rating**
 - ASME B16.34 or DIN EN 12516-1
- **Face-to-face Dimensions**
 - ASME B16.10 or DIN EN 558
- **Flange End Dimensions**
 - ASME B16.5 or DIN EN 1092
- **NACE**
 - MR 0103 or MR 0175
- **Fugitive Emission**
 - ISO15848, TA-LUFT
- **Fire-safe Type Test**
 - API 607

Available Configurations

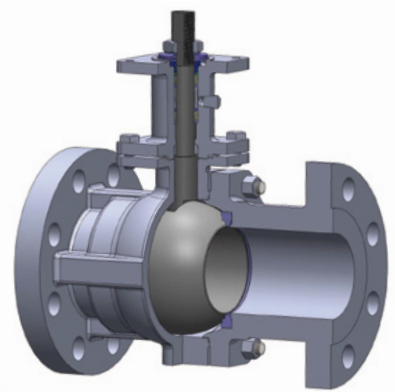
The UV790 ball valve is engineered for seamless integration into both standard and severe service environments. Its highly configurable design supports a wide range of specialized requirements, including:

- Extended stem options
- Cryogenic service
- Multi-way options
- Customized solutions

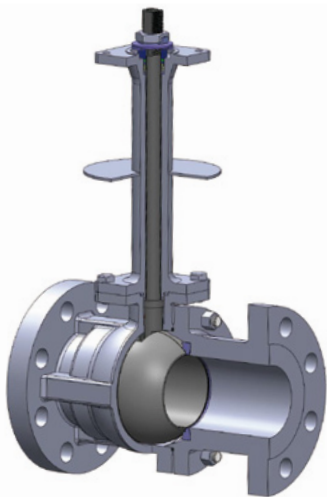
Configurations



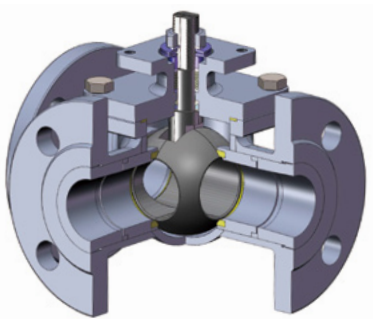
STANDARD



EXTENDED STEM



CRYOGENIC



MULTI-WAY

Size and Pressure Range

Product Supply Scope for ASME B16.5 Flange									
ASME	NPS								
Class	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4
150Lb	✓	✓	✓	✓	✓	✓	✓	✓	✓
300Lb	✓	✓	✓	✓	✓	✓	✓	✓	✓

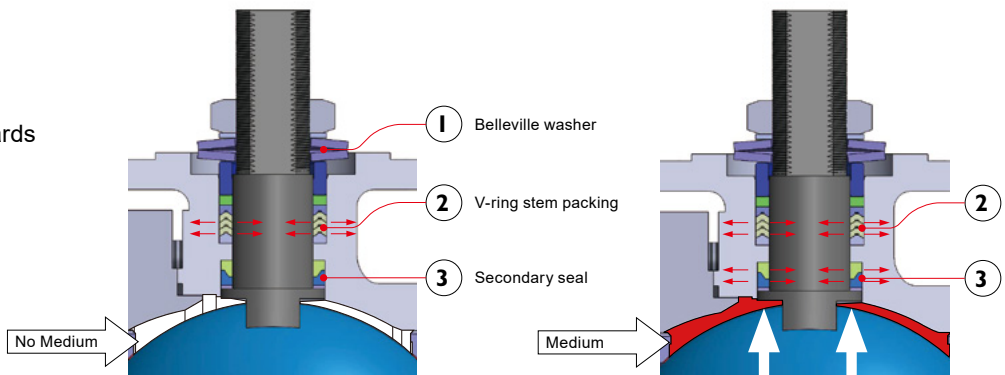
Product Supply Scope for DIN-EN-1092 Flange									
DIN	DN								
PN	15	20	25	32	40	50	65	80	100
10	✓	✓	✓	✓	✓	✓	✓	✓	✓
16	✓	✓	✓	✓	✓	✓	✓	✓	✓
25	✓	✓	✓	✓	✓	✓	✓	✓	✓
40	✓	✓	✓	✓	✓	✓	✓	✓	✓

Technical Specifications

Integral Emission Control System - Stem Sealing

Benefit

With integral emission control system design, UV790 exceeds stringent fugitive emission standards and delivers extended leak-proof operation.

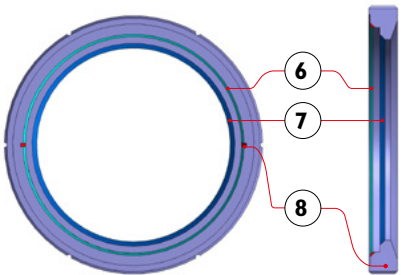


With the pressure of medium, the stem will generate extra force against the secondary seal and V-ring packing to create dynamic bubble-tight closure. While, when the medium pressure relieved, the stem packing will return to the pre-tight condition to avoid over pressurizing on packing and extra torque force.

Seat Designs - Unique Long-lasting Seat

Benefit

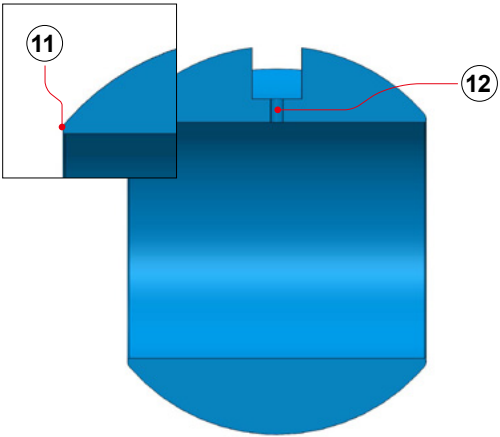
This unique design can provide excellent torque performance, tight sealing performance and long-lasting service life.



Medium Status		6 First ball-seat Contacting Surface	7 Secondary Ball – seat Contacting Surface	8 Pressure Relief Hole	9 Elastic Support Surface	10 Body Support Boss	Details
Before		Contacting with ball. Sealing	No contacting No elastic	/	Slight elastic deformation force	/	/
Pressurizing		Contacting with ball. Pressurized sealing	Contacting with ball. Offering extra supporting force to ball	Relief medium from relief hole	Fully elastic deformation under pressurized medium	Offer support to fully elastic deformed seat	Secondary ball-seat contacting surface support ball Body support boss offer support force to seat to avoid destructive deformation
Pressure relief		Contacting with ball. Pre-tight sealing	No contacting with ball No elastic deformation	/	Back to slight elastic deformation by pre-tight force	/	Seat back to pre-tight status.

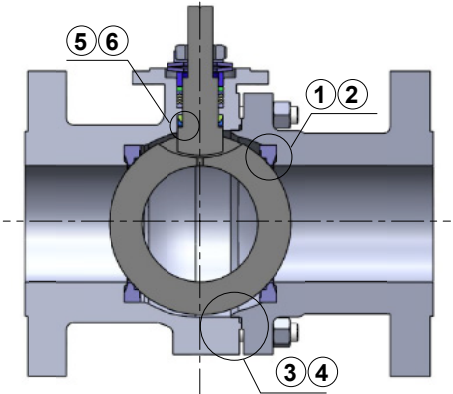
Optimized Ball Designs

- ⑪ Specially designed bi-angles rounded ball can improve seat usage.
- ⑫ Pressure balanced hole design, to avoid over pressure in bore area.



Fire Tested API 607 Edition

Univals UV790 ball valve features an advanced fire-safe design that ensures zero through-leakage (both internal and external) during and after fire events. During a fire, the soft seats burn away, allowing the ball to shift downstream then comes into contacts with the integral fire-safe lip on the end cap, creating an automatic metal-to-metal seal. The precision-machined clearance between the ball and fire-safe lip ensures complete isolation, preventing leakage. See figure 1 and 2.



Cross section view for fire safe

Stem Packing for Fire Safe

Stem packing, seal arrangement remain unaffected due to Grafoil fire resistance property.

Anti-blow-out Stem

Designed with Anti-blow-out Stem. See figure 5

Anti-static Protection

This structure is very important in the explosive and flammable media handling. See figure 6

Fire Safe Seats



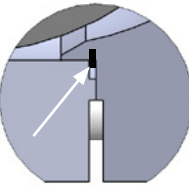
Before Fire
Figure 1.



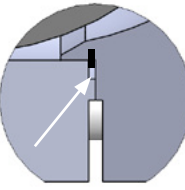
After Fire
Figure 2.

Fire Safe Body

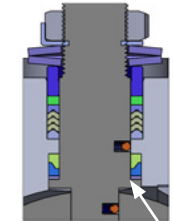
To ensure the maximum integrity between end cap and body, the independent flange bolts or studs are directly threaded into the body to prevent joint failure. from thermal expansion / contraction during fire events. Also, the encapsulated grafoil gasket maintains pressure boundary integrity under extreme heat, blocks fluid permeation and eliminates external leakage risks. See figure 3 and 4.



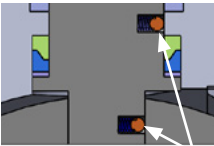
Before Fire
Figure 3.



After Fire
Figure 4.

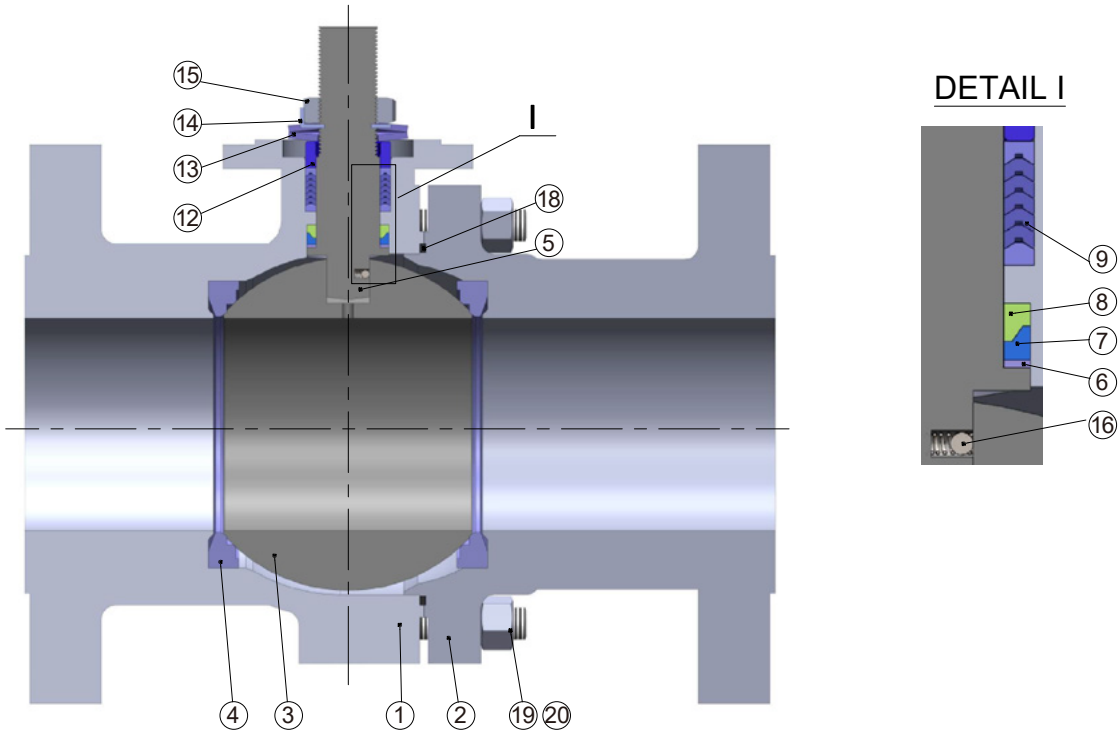


Anti-blow-out stem
Figure 5.



Anti-static device
Figure 6.

Section Drawing



No.	Description	No.	Description
1	Body	12	Follower
2	End Connector	13	Belleville Washer
3	Ball	14	Stop Lock
4	Seat	15	Nut-Metric
5	Stem	16	Antistatic Device
6	Bearing	18	Gasket
7	Spacer	19	Stud
8	Packing	20	Nut
9	Packing		

Materials of Construction

Max. Temperature	200°C	200°C	200°C
Min. Temperature	-29°C	-29°C	-29°C
Body	A216 WCB	A351 CF8M	A351 CF3M
End Connector	A216 WCB	A351 CF8M	A351 CF3M
Ball	A182 F316	A182 F316	A182 F316L
Seat	PTFE ^a	PTFE ^a	PTFE ^a
Stem	A182 F51	A182 F51	A182 F51
Bearing	PTFE	PTFE	PTFE
Spacer	A276 316L	A276 316L	A276 316L
Packing/F	PTFE ^b	PTFE ^b	PTFE ^b
	Graphite	Graphite	Graphite
Packing	PTFE ^b	PTFE ^b	PTFE ^b
	Graphite	Graphite	Graphite
Follower	A276 316L	A276 316L	A276 316L
Belleville Washer	Stainless Steel	Stainless Steel	Stainless Steel
Stop Lock	Stainless Steel	Stainless Steel	Stainless Steel
Nut-Metric	A4	A4	A4
Antistatic Device	A276 316L	A276 316L	A276 316L
Gasket	PTFE ^b	PTFE ^b	PTFE ^b
	Graphite	Graphite	Graphite
Stud and Nut	A193 B7M	A193 B8M	A193 B8M
	A194 2HM	A194 8M	A194 8M

NOTE: ^a RPTFE, PEEK, PPL etc. are optional
^b “PTFE” Only applicable to non fire rated valves

Torque—MAST(Ambient temperature)

NPS	Material(F51)		Materia(17-4PH)	
	Class150	Class300	Class150	Class300
	MAST(N*M)	MAST(N*M)	MAST(N*M)	MAST(N*M)
1/2	33	33	54	54
3/4	95	95	153	153
1	95	95	153	153
1-1/4	95	95	153	153
1-1/2	160	160	257	257
2	283	283	456	456
2-1/2	511	511	824	824
3	511	511	824	824
4	877	877	1415	1415

Torque (Nm)

Class 150, Class 300, PN10, PN16, PN25, PN40 (PTFE Packing)

SIZE		10 bar		20 bar		30 bar		40 bar		50 bar	
NPS	DN	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC
1/2	15	9	9	9	9	10	10	13	13	14	14
3/4	20	13	13	13	13	14	14	15	15	16	16
1	25	16	16	16	16	16	16	18	18	22	22
1-1/4	32	23	23	23	23	25	25	28	28	30	30
1-1/2	40	25	25	25	25	26	26	30	30	33	33
2	50	33	33	33	33	41	41	46	46	55	55
2-1/2	65	50	38	52	39	65	49	72	54	78	59
3	80	60	45	70	53	81	61	98	74	105	79
4	100	70	53	80	60	125	94	152	114	177	133

Assumptions:

- Seat sealing: PTFE
- Stem sealing: ISO 15848
- Operating temperature: -29 to 38°C
- Medium characteristic: Lubricating

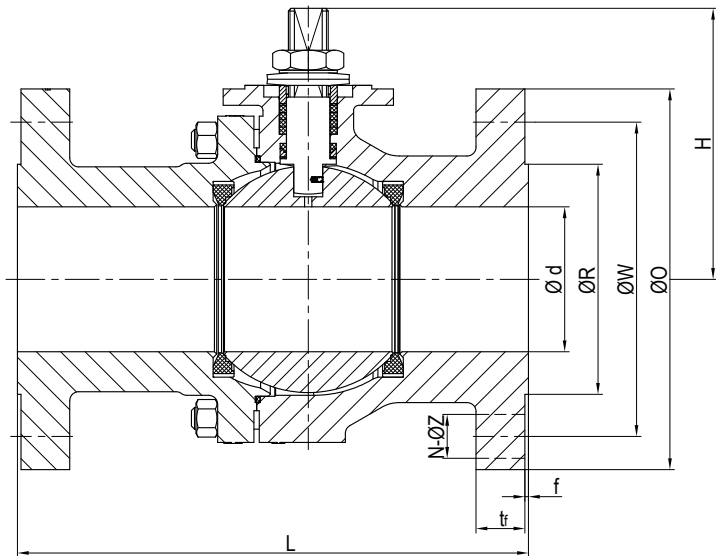
Class 150, Class 300, PN10, PN16, PN25, PN40 (Graphite Packing)

SIZE		10 bar		20 bar		30 bar		40 bar		50 bar	
NPS	DN	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC	BTO,ETC	ETO,BTC
1/2	15	10	10	10	10	11	11	14	14	15	15
3/4	20	16	16	16	16	17	17	18	18	19	19
1	25	19	19	19	19	19	19	21	21	25	25
1-1/4	32	27	27	27	27	29	29	32	32	34	34
1-1/2	40	29	29	29	29	30	30	34	34	37	37
2	50	38	38	38	38	46	46	51	51	60	60
2-1/2	65	59	44	61	46	74	56	81	61	87	65
3	80	71	53	71	53	92	69	109	82	116	87
4	100	89	67	99	74	144	108	171	128	196	147

Assumptions:

- Seat sealing: PTFE
- Stem sealing: ISO 15848
- Operating temperature: -29 to 38°C
- Medium characteristic: Lubricating

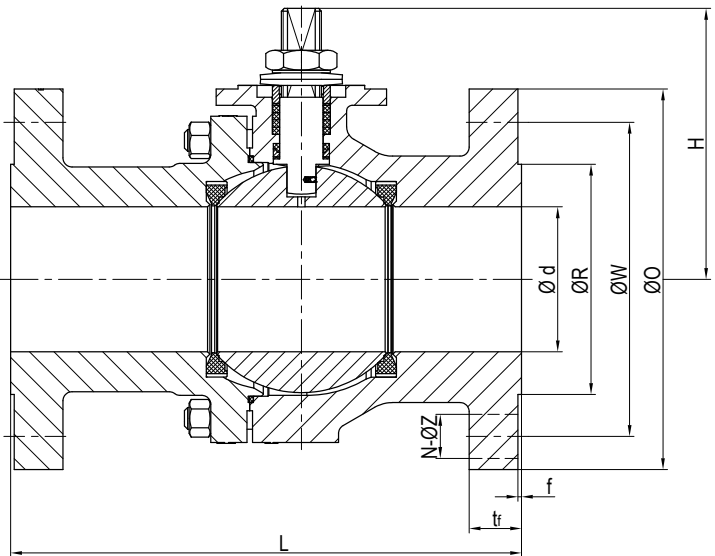
Ball Valve Dimension



Size		ASME Class 150 Approximate Dimensions in mm									Weight (kg)
NPS	L	Ø d	Ø O	Ø W	Ø R	N	Ø Z	f	t _r	H	
1/2	108	15	89	60.5	35.1	4	16	2	7.9	57	1.82
3/4	117	20	99	69.8	42.9	4	16	2	8.6	75	2.12
1	127	25	108	79.2	50.8	4	16	2	9.7	77	3.2
1-1/4	140	32	117	88.9	63.5	4	16	2	11.2	82	4.45
1-1/2	165	38	127	98.6	73	4	16	2	12.7	96	5.9
2	178	50	152	120.6	91.9	4	19	2	14.2	108	8.9
2-1/2	190	65	178	139.7	104.6	4	19	2	15.7	135	15
3	203	80	190	152.4	127	4	19	2	19	150	19.3
4	229	100	229	190.5	157.2	8	19	2	22.4	183	33.5

Size		ASME Class 300 Approximate Dimensions in mm									Weight (kg)
NPS	L	Ø d	Ø O	Ø W	Ø R	N	Ø Z	f	t _r	H	
1/2	140	15	95	66.5	35.1	4	16	2	12.7	57	2.2
3/4	152	20	117	82.6	42.9	4	19	2	14.2	75	3.25
1	165	25	124	88.9	50.8	4	19	2	15.7	77	4.8
1-1/4	178	32	133	98.6	63.5	4	19	2	17.5	82	5.8
1-1/2	190	38	155	114.3	73	4	22	2	19	96	9.3
2	216	50	165	127	91.9	8	19	2	20.6	108	11.8
2-1/2	241	65	190	149.4	104.6	8	22	2	23.9	135	19
3	283	80	210	168.1	127	8	22	2	26.9	150	28
4	305	100	254	200.2	157.2	8	22	2	30.2	183	46.9

Ball Valve Dimension



Size		DIN-EN PN10/PN16 Approximate Dimensions in mm									Weight (kg)
DN	L	Ø d	Ø O	Ø W	Ø R	N	Ø Z	f	t _r	H	
15	115	15	95	65	45	4	14	2	16	57	2.46
20	120	20	105	75	58	4	14	2	18	75	3.08
25	125	25	115	85	68	4	14	2	18	77	4.18
32	130	32	140	100	78	4	18	2	18	82	5.62
40	140	38	150	110	88	4	18	3	18	96	7.95
50	150	50	165	125	102	4	18	3	18	108	10.5
65	170	65	185	145	122	8	18	3	18	135	17
80	180	80	200	160	138	8	18	3	20	150	21.5
100	190	100	220	180	158	8	18	3	20	183	34

Size		DIN-EN PN25/PN40 Approximate Dimensions in mm									Weight (kg)
DN	L	Ø d	Ø O	Ø W	Ø R	N	Ø Z	f	t _r	H	
15	115	15	95	65	45	4	16	2	16	57	2.46
20	120	20	105	75	58	4	18	2	18	75	3.08
25	125	25	115	85	68	4	18	2	18	77	4.18
32	130	32	140	100	78	4	18	2	18	82	5.62
40	140	38	150	110	88	4	18	3	18	96	7.95
50	150	50	165	125	102	4	18	3	20	108	10.5
65	170	65	185	145	122	8	18	3	22	135	18.3
80	180	80	200	160	138	8	18	3	24	150	24.9
100	190	100	235	190	162	8	22	3	24	183	37.2

Bolting Torque

Packing Nut Torque (Nm)						
MATERIAL ASTM	Stud Size					
	M10×1	M14×1.5	M16×1.5	M18×1.5	M22×1.5	M27×2
A193 B8M	6	15	20	22	25	78

Body Nut Torque (Nm)								
MATERIAL ASTM	Stud Size							
	M8	M10	M12	M14	M16	M20	M24	M27
A193 B7	20	38	64	103	157	305	527	768
A193 B8M	23	44	74	118	181	354	513	613

Flow Rates (Cv and Kv) - Full Bore

NPS	DN	Cv 90°	Kv 90°
1/2	15	25	21
3/4	20	50	43
1	25	80	68
1-1/2	40	240	204
2	50	460	391
2-1/2	65	820	697
3	80	1250	1062
4	100	2230	1896

Data for Calculation of Flow
The coefficient of flow Cv expresses the rate of flow in gallons per minute at 60°F water with a pressure drop 1 psig across the valve.The Cv coefficients for the various types and sizes. Shown in the tables, have been determined from actual flow tests.
NOTE: The relationship between Cv and Kv can be express as: Cv=1.156Kv

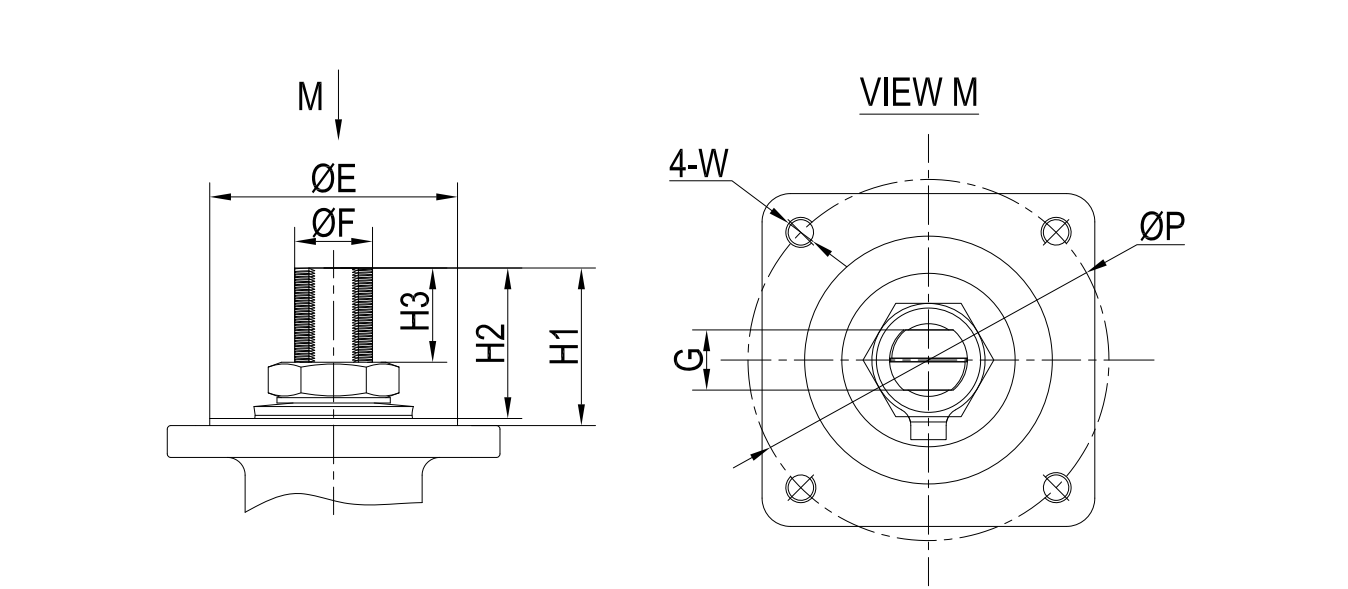
Leakage Allowable

Size		ISO 5208			API 598		
NPS	DN	Rate A Water (ml/min)	Rate A Gas (ml/min)	Testing Time(s)	Test Water (ml/min)	Test Gas (ml/min)	Testing Time(s)
1/2	15	0	0	15	0	0	15
3/4	20	0	0	15	0	0	15
1	25	0	0	15	0	0	15
1-1/4	32	0	0	15	0	0	15
1-1/2	40	0	0	15	0	0	15
2	50	0	0	15	0	0	15
2-1/2	65	0	0	60	0	0	60
3	80	0	0	60	0	0	60
4	100	0	0	60	0	0	60

Test Procedures

ISO 5208	Rate A water	Water	1.1 PN
ISO 5208	Rate A gas	Air-N2	1.1 PN or 5.5 bar
API 598	Test water	Water	1.1 PN
API 598	Test gas	Air-N2	1.1 PN or 5.5 bar

Ball Valve Install Dimensions



Size		Dimensions for Mounting Pad in mm							
NPS	DN	G	ΦF	W	ΦE	ΦP	H1	H2	H3
1/2	15	6.3	10	M5	/ ^a	42	19.5	/ ^a	8
3/4	20	9	14	M6	/ ^a	54 x 28 ^b	27	/ ^a	9.3
1	25	9	14	M6	35	50	20.5	19.5	7.3
1-1/4	32	9	14	M6	35	50	20.5	19.5	8.5
1-1/2	40	11	16	M8	55	70	31.5	30	14.6
2	50	14	18	M8	55	70	34.5	33	16.4
2-1/2	65	17	22	M10	/ ^a	84 x52 ^b	51.5	/ ^a	24.5
3	80	17	22	M10	70	102	46.5	44.5	23
4	100	20	27	M10	70	102	56.5	54.5	30

NOTE: ^a No Parameters For ΦE and H2
^b ΦP Arranged in a rectangle

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