

Control valves



Floating Ball Valves

Control valves	General	Habonim Valve Sizing (HVS) software	3 Piece	Flanged	Ordering code system
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Introduction

Habonim control valves are designed to meet industrial demands for flow control systems accurate, flexible, cost efficient and maintenance friendly. The valves provide excellent performance in the harshest environments. They offer a compact, lightweight, long-life solution with: step-less characterized pressure and flow control for fast response times, wide rangeability, and bubble-tight shutoff. Critical performance features include: high pressure drop capacity with straight-through flow, high Cv, and large exhaust capacity. Other design features ensure ease of maintenance and zero backlash.

Technical summary

N47 series	3 pcs, standard and full port
Size range	½"- 2" (DN15 - DN50)
Pressure range	ANSI Class 900 Vacuum 10 ⁻⁶ Tor to 155 bar (2250 psi)
Size range	2½"-6" (DN65 - DN150)
Pressure range	ANSI Class 400 Vacuum 10 ⁻⁶ Tor to 70 bar (1000 psi)
End connections	Threaded, welded, flanged
N31/N32series	Standard port
Size range	½"- 8" (DN15 - DN200)
Pressure range	ANSI Class 150/300 Vacuum 10 ⁻⁶ Tor to 20 bar/50 bar (290 psi /725 psi)
End connections	Flanged
N73/N74series	Full port
Size range	½"- 8" (DN15 - DN200)
Pressure range	ANSI Class 150/300 Vacuum 10 ⁻⁶ Tor to 20 bar/50 bar (290 psi /725 psi)
End connections	Flanged
N77 series	Full port
Size range	3"- 8" (DN80 - DN200)
Pressure range	DIN PN16
End connections	Flanged
N78 series	Full port
Size range	½"- 2" (DN15 - DN50)
Pressure range	DIN PN40
End connections	Flanged
Temperature range	-60 °C to +260 °C (-76 °F to +500 °F)
Materials	Stainless steel A351 CF8M/CF3M, A479 316/316L, carbon steel A216 WCB, A105, A350 LF2, alloy C22, alloy C276, duplex, super duplex, 254SMO, inconel 625, monel 400 and more
Surface treatment and coating for segmented metal seat	LTPN, HVOF Cr3C2 (Chromium Carbide), HVOF WC-Co (Tungsten Carbide) and Stellite
Operation	Lever or gear operated, pneumatic or electric actuated
Service	Chemical, petrochemical, oil and gas, energy, pulp & paper and others



Design features

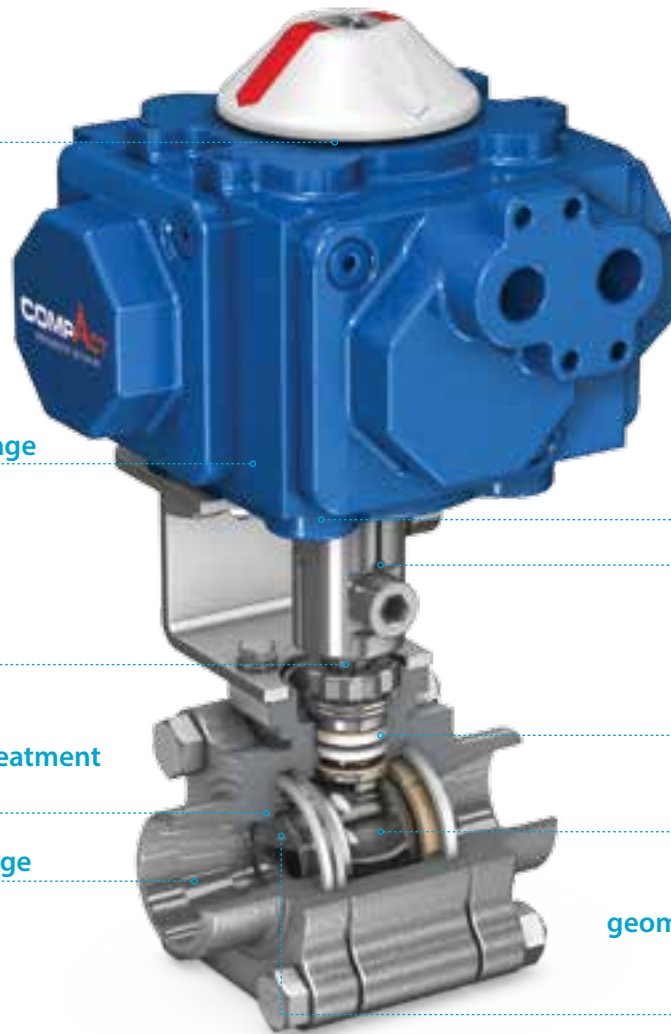
Zero hysteresis
4-piston actuator

Calibrated and tested
complete control package

Tight tolerance trim

Unique LTPN surface treatment
of ball/seat set

Streamlined flow passage



Light weight, compact
control unit with
exceptional hydraulic
performance

Zero backlash adaptor

HermetiX™ stem seal
certified to ISO 15848-1

Lapped ball/seat set
perfect matching

Wide range of ball/seat set
geometries for equal percentage,
linear characteristics and
modified flow solutions

Standards of compliance

Factory certification	ISO 9001-2008	Quality management system
Valve design and tests	ANSI B16.34, API 6D / ISO 14313, ISO 17292	Valve design
	ANSI B1.20.1	NPT - National Pipe Taper thread
	EN 10226-1, ISO 7-1, JIS B0203	BSPT - British Standard Pipe Taper thread
	DIN 3852	BSPP - British Standard Parallel Pipe
	ANSI B16.11, EN 12760	Socket weld end connection
	ANSI B16.25, EN12627-4	Buttweld end connection (schedule 5, 10, 40, 80)
	ANSI B16.5, EN 1092 Pt 1&2	Flange dimensions
	ANSI B16.10, EN 558	Face-to-Face dimensions
	NACE MR-0175, ISO 15156-1/2/3	Materials for use in H ₂ S-containing environments in oil and gas production
	EN 12266-1, API 598	Testing of metallic valves - pressure tests, test procedures and acceptance criteria
Certifications	FCI 70-2	Control valve seat leakage
	API 607, ISO 10497	Testing of valves - fire type-testing requirements
	ISO 15848-1	Industrial valves - measurement, test and qualification procedures for fugitive emissions
	PED 97/23/EC Module H ATEX 94/9/EC	Pressure equipment directive equipment and protective systems intended for use in potentially explosive atmospheres (optional for actuated unit only)
Documentation	EN 10204 2.2 / 3.1 / 3.2	Metallic materials - types of inspection documents

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V-Port & V-Ball valves

V-Port and V-Ball valves offer a viable alternative to other valve types including globe valves, which tend to be large, expensive and cannot always guarantee bubble-tight shut-off.

Habonim's V-design provides the high rangeability and precision throttling required for clean or dirty liquids and gases, as well as fibrous suspension applications. The streamlined flow passage allows for high recovery, maximum efficiency and excellent erosion resistance. Balls come in a variety of slot shapes and can be custom designed to meet any control requirement.

Superior control performance and accuracy is designed into the geometry of the downstream V-port. The precision laser cut 'V' shape enables equal percentage flow characteristics, while the 'slot' design provides linear flow characteristics downstream.

V-Port

A new standard of performance is achieved with Habonim's V-Port valve assembly, comprised of a ball and laser cut metal seat, lapped together into a single seamless component.

Both the ball and metal seat are surface treated and hard coated (LTPN-standard) to resist abrasion and galling.

A nitride coating is applied as standard by a thermo-chemical diffusion process that transforms the outer base-metal layer of the ball and seat to a hard matrix.

A standard profile seat located upstream maintains the preload of the floating ball and metal seat downstream.

The end result is a superior control valve, with bubble-tight factory-tested shut-off, exceeding ANSI FCI 70-2 class VI.

The V-Port design is applicable for rugged environments such as steam control with a maximum pressure drop of 20 bar (290 psi), high differential pressure maximum pressure drop of 35 bar (507 psi), and abrasive media. If control characteristics need to be modified, then changes are also made to the complete ball seat assembly (marked under the same part number).

V-Ball

This control valve solution is suited for less demanding control applications, such as clear liquid at a maximum pressure drop of 6 bar (87 psi), or clean gas at a maximum pressure drop of 10 bar (145 psi), and temperatures of 120 °C (248 °F)max.

The design, comprised of a floating characterized ball mounted between two seats, maintains a trim preload and bubble-tight shut-off. The V-Ball exerts low torque, making it suitable for smaller actuators that reduce weight and space and are more cost-efficient.

V-Balls come in a variety of 'V' and 'slot' shapes, and can be custom designed to meet any control requirement. The V-Ball is available in a wide range of high-alloy materials and coatings for highly corrosive applications.



Flow pattern

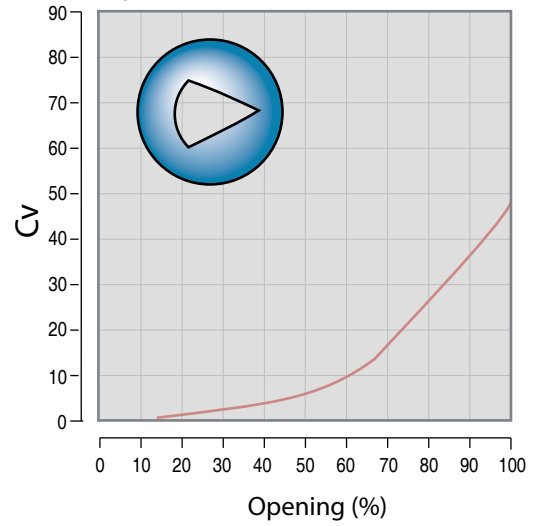
V-Port



V-Ball



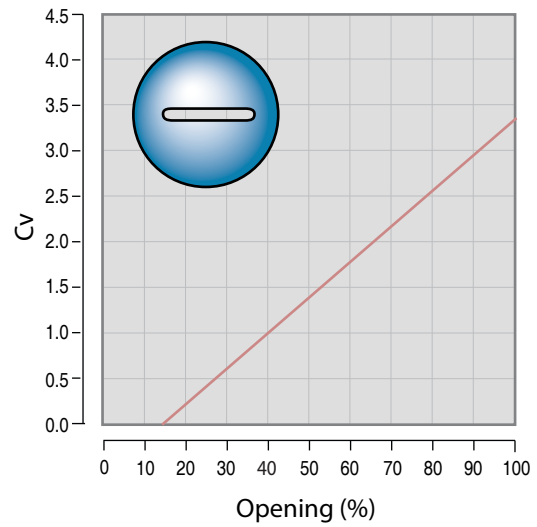
Equal %



Slot Port



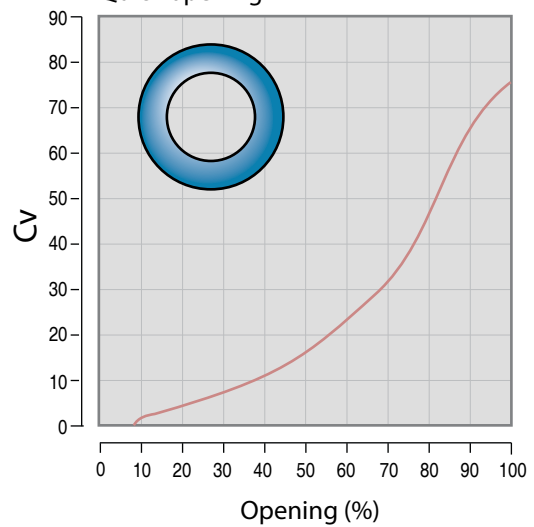
Linear



Round Port



Quick opening



Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

3 Piece

Flanged

Ordering code system

Design simplicity

Converting a standard Habonim quarter-turn ball valve into an accurate and efficient flow control V-ball valve is equivalent to a routine maintenance procedure. Habonim provides a conversion kit that adapts standard valves to flow control operations. The kit includes a V-Ball with a high tensile, tight tolerance stem and a , hard wearing stem seal and thrust bearing, plus seat and seal materials that are suitable for the most demanding flow control operations.

Zero seat leakage

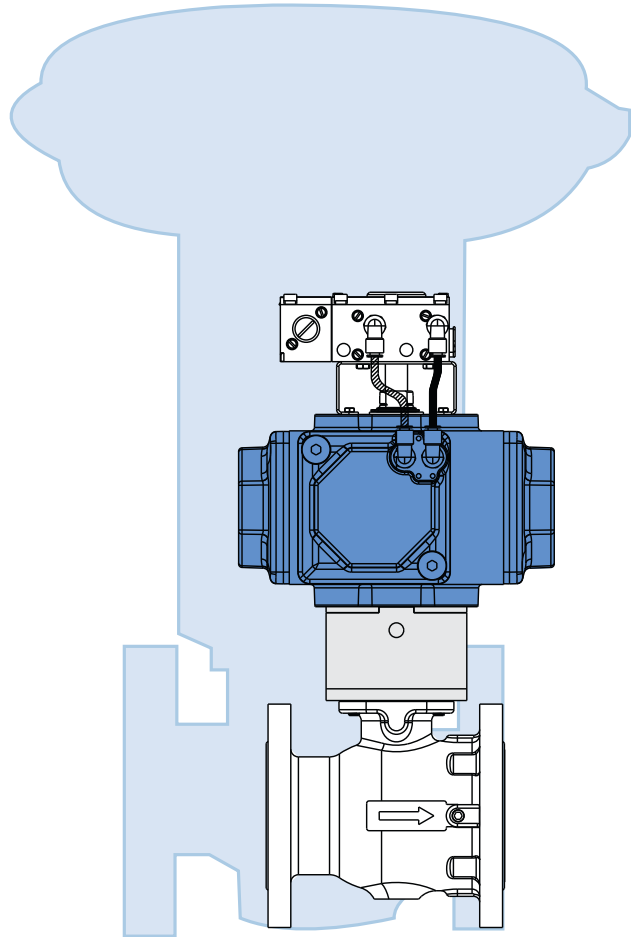
Habonim control valves undergo meticulous machining and stringent factory testing to ensure bubble-tight shut-off for zero leakage. Leak-tight operation is provided by one of two characterized flow control options. The V-Port option is comprised of a characterized metal seat lapped-in with the ball for a perfect fit, and aided by an upstream spring effect soft-seat, for positive preload. The V-Ball option uses a configuration of two soft-seats.

Both 'V' options ensure zero leakage in the most demanding applications and across a wide range of temperature and pressure requirements. Other valve types, such as globe valves, have been proven completely ineffective in providing bubble-tight shut off without a secondary shut-off valve assembly.

Smaller size - less weight

Habonim's streamlined design dissipates less energy and hence has a higher flow coefficient (Cv) compared with other valve designs such as the tortuous globe valve design). This means that Habonim's smaller size ball valve can be used to handle the same flow as the larger size globe valve.

An entire flow system comprised of smaller valves doing the same job as larger ones will require less space on the line, will weigh less and will provide a more cost efficient and maintenance friendly solution.



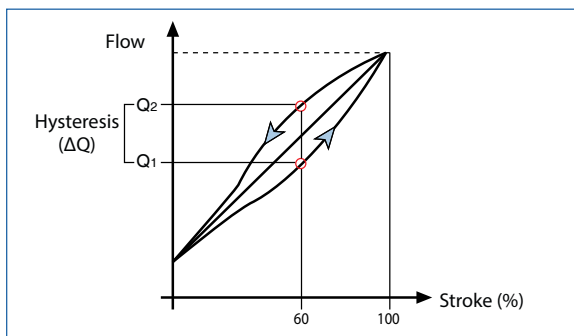
Minimum hysteresis / outstanding repeatability

Optimum control loop performance often hinges on a few carefully designed moving parts within the valve assembly, and how well they work together. The most vulnerable areas in a standard quarter-turn valve are the torque transmission shaft between the positioner and the segmented ball (ball-stem, stem-adaptor, adaptor-actuator, actuator-positioner).

Considerable engineering expertise goes into the design and manufacture of these connecting surfaces to provide the tightest fit possible, which in turn provides uniform movement of all parts along the line of rotation.

Habonim carefully engineers all the adjoining parts to eliminate problems such as backlash, leakage and hysteresis. The result is that the overall control unit has a maximum tolerance of no more than 2%.

Test results measuring identical flow input from both directions illustrates the negligible difference between up-scale and down-scale load.

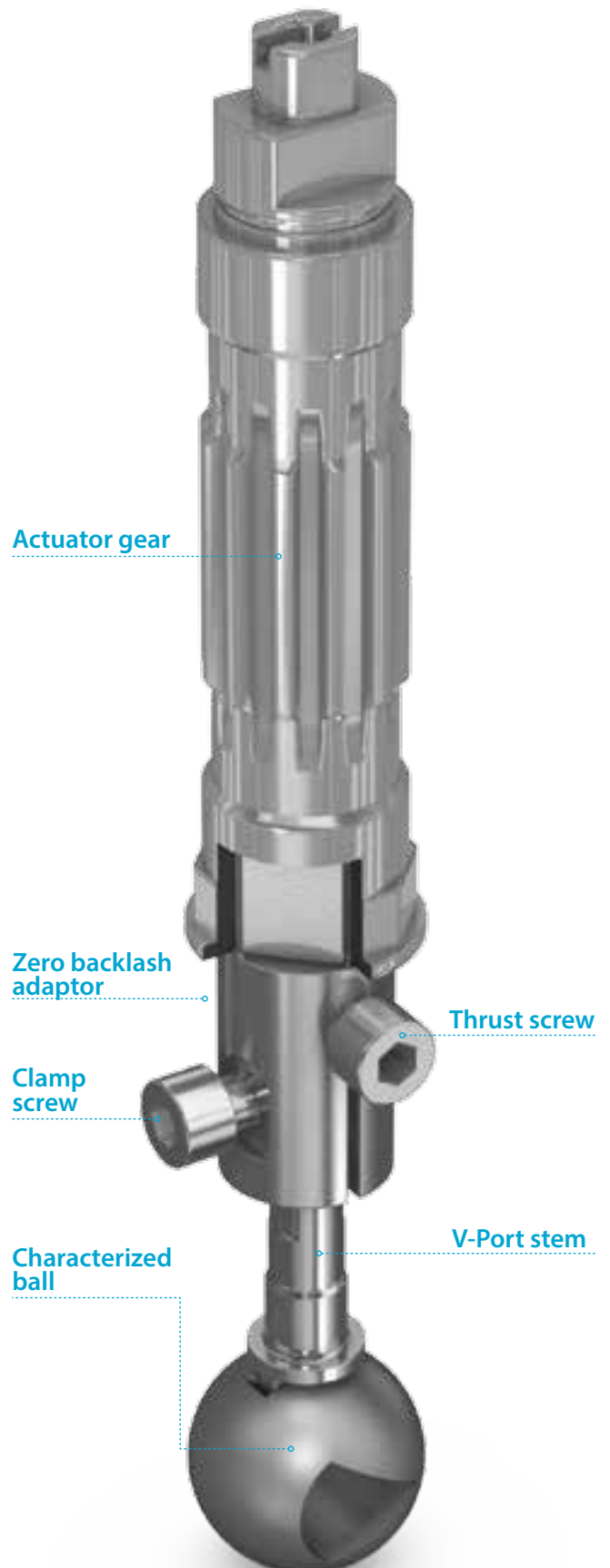
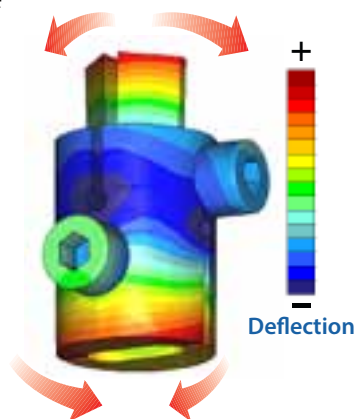


Exclusive Habonim adaptor

Habonim's adaptor design is based on the inherent flexibility of stainless steel.

Two grooves allow the adaptor to clamp the valve stem on one side, while locking the actuator gear in place on the other side.

The adaptor ensures repeatability, zero backlash, and virtually no hysteresis for the complete control unit.



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Control valves

General

Habonim Valve Sizing (HVS) software

3 Piece

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Less stem seal wear

The Habonim quarter-turn ball valve operation is far less prone to leakage due to resilient seat and seal designs that deliver tighter shut-off, and a stem sealing that requires less torque output from the actuator. This translates into longer lasting, continuous valve operation with minimum upkeep. The rotary movement of Habonim's valves make them safe and simple to automate and they are ideal for flow control operations. In contrast, linear- movement globe valves have a tendency to seize up, are susceptible to blockages, and require constant maintenance to deal with stem leakage problems.

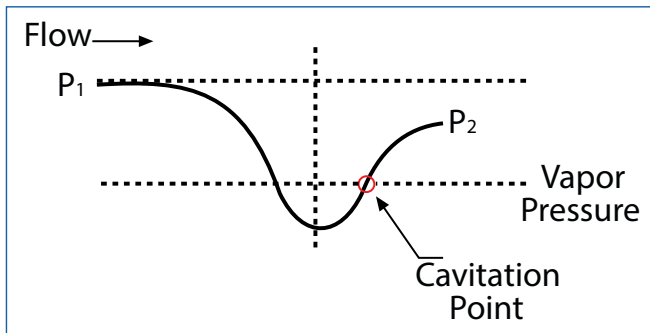
The Habonim valve is fitted with specially designed packing configurations. A variety of packing materials are available to meet the needs of demanding control applications including aggressive media, extreme temperature, and pressure conditions that range from deep vacuum to high pressure. The end result is a high-endurance control valve assembly that is more cost-effective and maintenance-friendly than any other type of actuated valve.

Less cavitation damage

The Habonim valve offers a streamlined configuration that is less prone to cavitation damage. As liquid passes through the vena contracta velocity increases and pressure decreases. If the pressure in this area falls below the vapor pressure of the flowing liquid, vaporization (boiling) occurs. Vapor bubbles continue downstream where velocity decreases and pressure recovers. The vapor bubbles then collapse or implode.

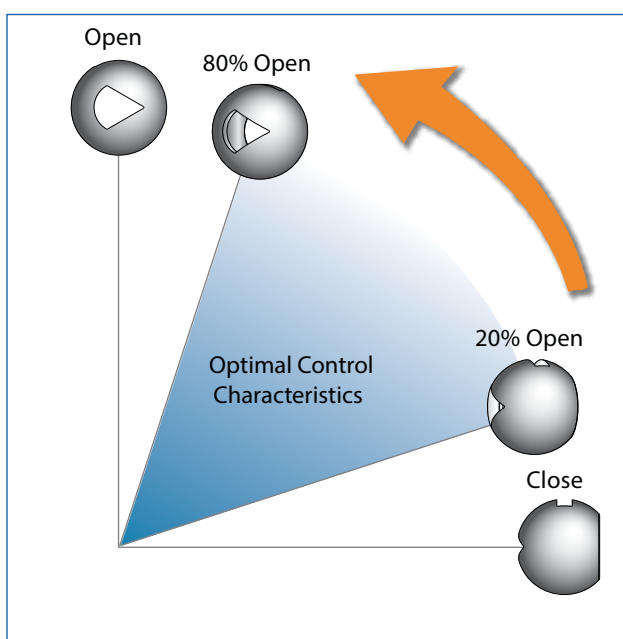
Imploding vapor bubbles can cause serious cavitation damage, i.e., pitting of the valve metal surfaces. In globe valves this damage occurs inside the valve casing, causing an erosive effect that may eventually result in costly valve replacement. However, with a Habonim ball valve, no damage occurs to the valve itself in the event of cavitation, as it occurs downstream of the valve seat area and beyond the valve outlet.

Habonim R&D engineers have developed a new line of anti-cavitation trims for extreme applications. A grid of tubular holes facilitates linear or equal flow percentage characteristics that greatly reduce noise and vibration, as well as limiting cavitation damage. The grid is electro-eroded into the downstream metal seat and then lapped for a perfect match with the ball. The complete set is hardened to eliminate galling and increase erosion resistance.



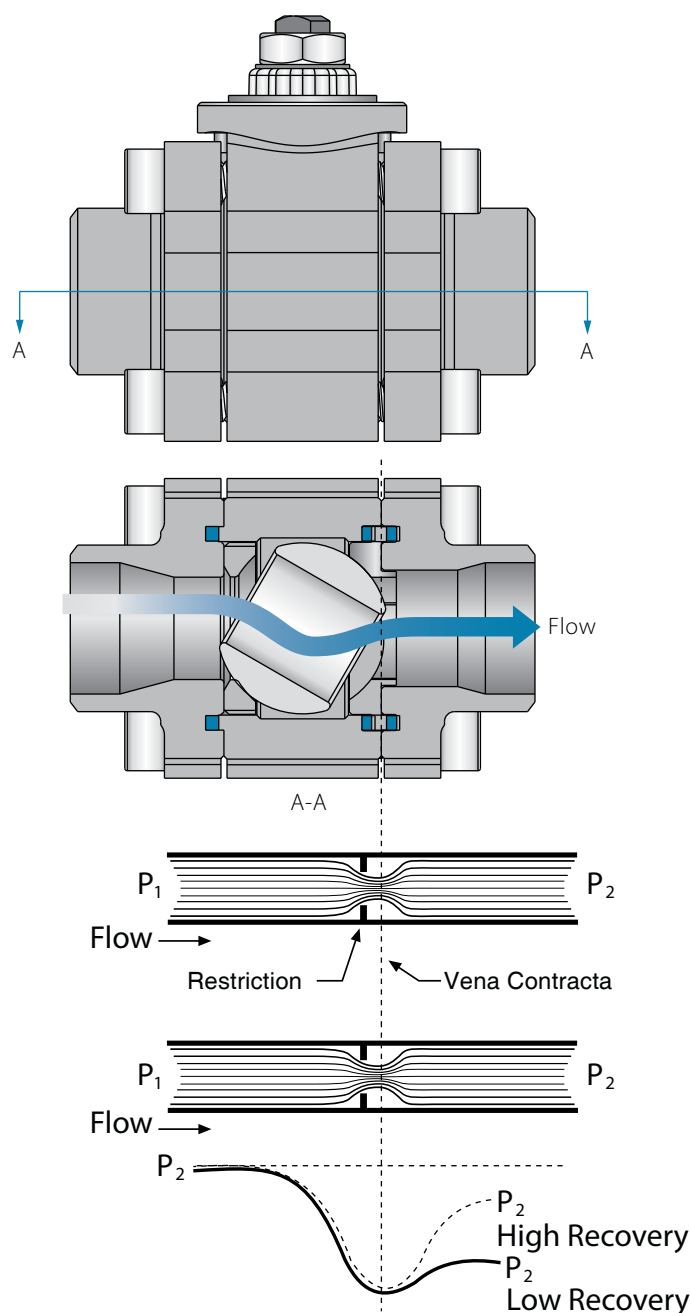
Wide rangeability and stability

Control valve rangeability is the ratio of maximum controllable flow to minimum controllable flow. The Habonim ball valve has an inherently high flow ratio of 1:50. This unique advantage allows diverse process parameters with the same control unit. However, optimum flow control through the valve is achieved within the 20-80% range of rotation because the hydraulic flow curve is unstable outside the limits of this range. The Habonim design offers exceptionally wide rangeability with maximum stability of process conditions.



High recovery

A high recovery valve is designed with streamlined internal contours and minimal flow turbulence that dissipates relatively little flow stream energy. Therefore pressure downstream of the valve's vena contracta recovers to a high percentage of its inlet value. The streamlined interior design of the Habonim valve dissipates little energy, resulting in higher recovery and a more cost efficient flow process, especially when compared with the tortuous flow globe valve.



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Calculations

Flow equation		
Fluid	Service condition	Equation
Liquid	Sub-critical condition $\Delta P < FL^2 (P_1 - P_V)$	$C_v = 1.17 \cdot Q_L \cdot \sqrt{\frac{G_L}{\Delta P}}$ or $C_v = \frac{1.17 \cdot W_L}{\sqrt{\Delta P \cdot G_L}}$
	Critical condition $\Delta P < FL^2 (P_1 - P_V)$	$C_v = \frac{1.17 \cdot Q_L}{F_L} \cdot \sqrt{\frac{G_L}{(P_1 - P_V)}}$ or $C_v = \frac{1.17 \cdot W_L}{F_L \cdot \sqrt{(P_1 - P_V) \cdot G_L}}$
Gas	$X < F_K \cdot X_T$	$C_v = \frac{Q_g}{387 \cdot P_1 \cdot Y} \cdot \sqrt{\frac{G_g \cdot T_1 \cdot Z}{X}}$ or $C_v = \frac{W_g}{27.1 \cdot Y \cdot \sqrt{X \cdot P_1 \cdot \gamma_1}}$
	$X \geq F_K \cdot X_T$	$C_v = \frac{Q_g}{258 \cdot P_1} \cdot \sqrt{\frac{G_g \cdot T_1 \cdot Z}{F_K \cdot X_T}}$ or $C_v = \frac{W_g}{18.1 \cdot \sqrt{F_K \cdot X_T \cdot P_1 \cdot \gamma_1}}$
Saturated steam	$X < F_K \cdot X_T$	$C_v = \frac{W_g}{19.3 \cdot P_1 \cdot Y \cdot \sqrt{X}}$
	$X \geq F_K \cdot X_T$	$C_v = \frac{W_g}{12.9 \cdot P_1 \cdot \sqrt{F_K \cdot X_T}}$
Superheated steam	$X < F_K \cdot X_T$	$C_v = \frac{W_g \cdot (1 + 0.00126 \cdot \Delta t)}{19.3 \cdot P_1 \cdot Y \cdot \sqrt{X}}$
	$X \geq F_K \cdot X_T$	$C_v = \frac{W_g \cdot (1 + 0.00126 \cdot \Delta t)}{12.9 \cdot P_1 \cdot \sqrt{F_K \cdot X_T}}$

Glossary

C_v :	Valve flow coefficient
F_L :	Liquid pressure recovery factor of a valve without attached fittings (dimensionless) - Refer to Table 1
G_L :	Liquid specific gravity (1.0 for water @ 15°C)
P₁ :	Upstream absolute static pressure (kgf/cm ² A)
P₂ :	Downstream absolute static pressure (kgf/cm ² A)
P_V :	Absolute vapour pressure of liquid at inlet temperature (kgf/cm ² A) - Refer to Table 2
ΔP :	Differential pressure (P ₁ -P ₂) (kgf/cm ²)
Q_L :	Volumetric flow rate of liquid (m ³ /h)
W_L :	Weight or mass flow rate of liquid (t/h)
G_g :	Gas specific gravity - Refer to Table 3
Q_g :	Volumetric flow rate of gas (m ³ /h)
X :	Ratio of pressure drop (ΔP/P ₁)
X_T :	Pressure drop ratio factor (dimensionless) - Refer to Table 1
W_g :	Gas or steam mass flow rate (kg/h)
γ₁ :	Specific gravity, upstream conditions (kg/m ³).
F_K :	Ratio of specific heat factors, (dimensionless) - Refer to Table 3
Y :	Expansion factor = $1 - \frac{X}{3 \cdot F_K \cdot X_T}$
T₁ :	Absolute upstream temperature (K)
Δt :	Upstream superheated steam temperature (°C)
Z :	Compressibility factor, dimensionless = 1

Table 1

		Percent of valve rotation (degree of rotation)										
		0(0)	10(9)	20(18)	30(27)	40(36)	50(45)	60(54)	70(63)	80(72)	90(81)	100(90)
Equal %	F _L	0.00	0.96	0.95	0.94	0.93	0.92	0.90	0.88	0.86	0.82	0.75
	X _T	0.00	0.72	0.65	0.60	0.54	0.48	0.42	0.36	0.28	0.16	0.12
Round port	F _L	0.00	0.92	0.91	0.91	0.90	0.86	0.80	0.72	0.61	0.61	0.50
	X _T	0.00	0.78	0.74	0.71	0.67	0.62	0.56	0.49	0.38	0.26	0.15

Table 2

Pv factor		
Liquid	Formula	Pv
Acetone	C ₂ H ₄	47.861
Acetic acid	C ₂ H ₄ O ₂	0.0273
Ammonia	NH ₃	0.7310
Benzene	C ₆ H ₆	0.1621
Butane	C ₄ H ₁₀	2.89
Carbon dioxide	CO ₂	58.420
Ethene	C ₂ H ₆	47.861
Ethanol	C ₂ H ₆ O	0.1029
Ethylene glycol	C ₂ H ₄ (OH) ₂	69.58 e-6
Glycerin	C ₃ H ₅ (OH) ₃	110.50 e-9
Nitrogen	-	0.988
OIL WT32	-	205.48 e-6
OIL WT46	-	306.59 e-6
Sulfur dioxide	SO ₂	3.3929
Water	H ₂ O	0.0238

Table 3

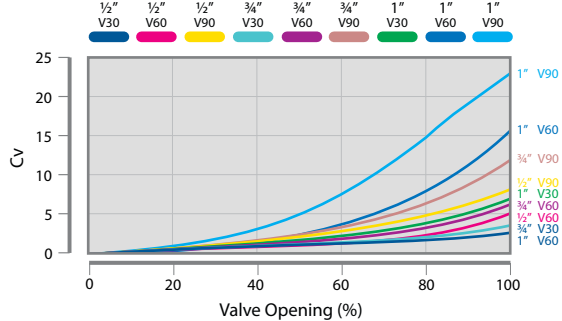
Gg and Fk factors			
Gas	Formula	Gg	Pk
Air	-	1.00	1.00
Ammonia	NH ₃	0.59	0.92
Argon	Ar	1.38	1.19
Carbon dioxide	CO ₂	1.52	0.91
Carbon monoxide	CO	0.97	1.01
Ethylene	C ₂ H ₄	0.97	0.87
Chlorine	Cl ₂	2.49	0.96
Ethane	C ₂ H ₆	1.05	0.87
Helium	He	0.14	1.19
Hydrogen	H ₂	0.07	1.00
Methane	CH ₄	0.55	0.90
Oxygen	O ₂	1.10	1.00
Nitrogen	N ₂	0.97	1.00
Saturated steam	H ₂ O	-	0.94
Superheated steam	H ₂ O	-	0.94

Habonim's valve sizing software (HVS) is available to support sizing your application.

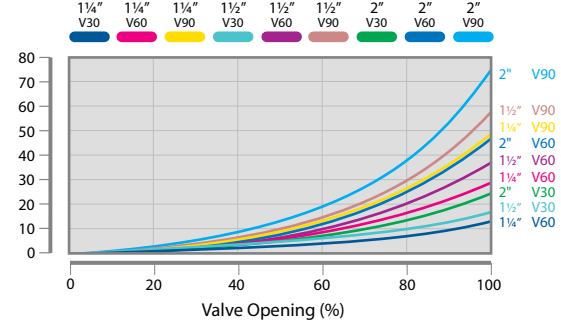
Flow coefficient - Cv

Equal %

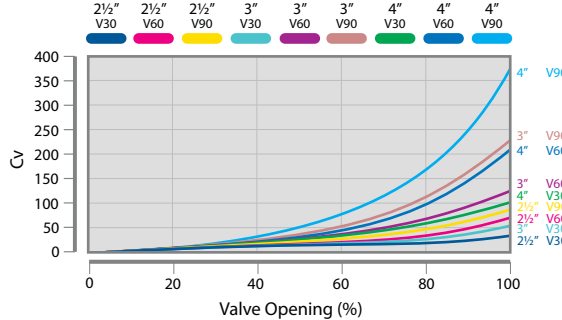
1/2" - 1"



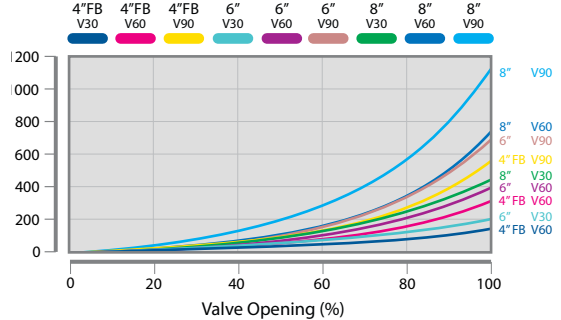
1 1/4" - 2"



2 1/2" - 4"



4"FB - 8"



Valve size	V shape	Percent of valve rotation (degree of rotation)										
		0(0)	10(9)	20(18)	30(27)	40(36)	50(45)	60(54)	70(63)	80(72)	90(81)	100(90)
1/2"	V30	0.00	0.05	0.118	0.236	0.405	0.624	0.880	1.200	1.550	1.954	2.380
	V60	0.00	0.07	0.161	0.378	0.670	1.000	1.450	2.050	2.780	3.710	4.960
	V90	0.00	0.10	0.230	0.570	1.050	1.770	2.710	3.740	4.940	6.270	8.100
3/4"	V30	0.00	0.02	0.130	0.270	0.440	0.650	0.940	1.300	1.750	2.370	3.200
	V60	0.00	0.10	0.270	0.570	1.040	1.550	2.210	2.930	3.850	5.040	6.480
	V90	0.00	0.10	0.400	0.860	1.620	2.600	3.730	5.220	6.870	8.800	11.200
1"	V30	0.00	0.06	0.178	0.420	0.840	1.460	2.230	3.160	4.130	5.300	6.900
	V60	0.00	0.13	0.350	0.924	1.720	2.640	4.070	5.780	8.150	10.950	15.170
	V90	0.00	0.22	0.810	1.680	3.050	4.600	6.960	9.950	13.720	18.590	23.200
1 1/4"	V30	0.00	0.11	0.344	0.811	1.621	2.818	4.304	6.099	7.971	10.229	13.317
	V60	0.00	0.24	0.676	1.783	3.320	5.095	7.855	11.155	15.730	21.134	29.278
	V90	0.00	0.43	1.563	3.242	5.887	8.878	13.433	19.204	26.480	35.879	50.200
1 1/2"	V30	0.00	0.17	0.598	0.989	1.679	2.875	4.600	6.670	9.856	13.513	17.733
	V60	0.00	0.26	0.713	2.036	3.611	6.440	9.890	13.800	19.320	27.945	37.375
	V90	0.00	0.48	1.281	3.335	6.095	10.350	14.835	21.160	29.210	41.200	58.200
2"	V30	0.00	0.19	0.800	1.900	3.100	4.900	6.860	9.540	13.160	17.900	24.400
	V60	0.00	0.34	0.970	2.880	5.400	8.200	12.100	17.700	25.100	34.300	48.400
	V90	0.00	0.55	1.571	4.200	8.100	12.600	18.300	26.900	37.600	53.200	74.600
2 1/2"	V30	0.00	0.38	1.010	2.470	4.200	6.400	9.240	13.320	18.260	24.300	32.300
	V60	0.00	0.54	1.340	4.180	8.400	11.300	17.300	25.100	36.000	52.200	70.000
	V90	0.00	0.77	2.140	6.340	11.900	16.700	24.800	34.000	48.000	64.000	84.000
3"	V30	0.00	0.50	1.600	3.700	7.200	11.600	17.600	24.700	32.400	42.300	52.900
	V60	0.00	0.81	1.860	6.340	12.700	20.400	32.200	47.900	67.000	93.100	122.000
	V90	0.00	1.22	3.040	9.370	19.100	28.600	47.300	73.900	112.500	162.000	225.000
4"	V30	0.00	1.00	1.000	4.500	11.500	20.500	31.500	43.700	58.000	79.000	102.000
	V60	0.00	1.47	2.660	8.500	18.290	31.800	43.000	68.000	104.000	148.600	206.000
	V90	0.00	2.18	4.890	13.400	28.000	45.400	73.000	111.100	166.000	240.000	360.000
4" FB	V30	0.00	1.53	2.590	6.885	17.595	31.365	48.195	66.861	88.740	120.870	156.060
	V60	0.00	2.25	4.070	13.005	27.984	48.654	65.790	104.040	159.120	227.358	315.180
	V90	0.00	3.34	7.482	20.502	42.840	69.462	111.690	169.983	253.980	367.200	550.800
6"	V30	0.00	1.91	3.200	8.595	21.965	39.155	60.165	83.467	110.780	150.890	194.820
	V60	0.00	2.81	5.081	16.235	34.934	60.738	82.130	129.880	198.640	283.826	393.460
	V90	0.00	4.16	9.340	25.594	53.480	86.714	139.430	212.201	317.060	458.400	687.600
8"	V30	0.00	3.15	4.200	14.175	36.225	64.575	88.000	137.655	218.000	298.000	421.000
	V60	0.00	4.63	8.379	26.775	57.614	91.000	135.450	214.200	327.600	468.090	723.000
	V90	0.00	6.87	15.404	42.210	88.200	143.010	229.950	349.965	522.900	756.000	1134.000

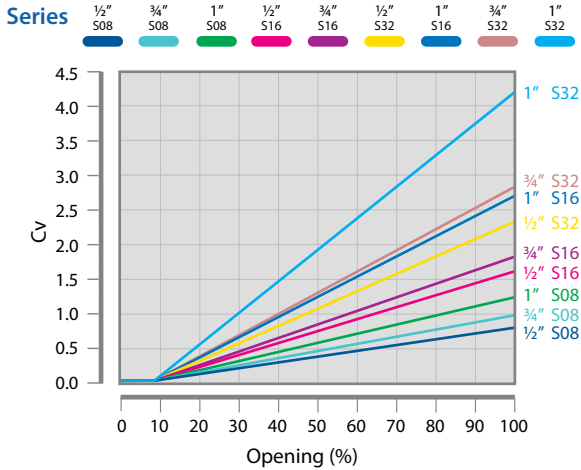
Floating Ball Valves

Control valves	General	Habonim Valve Sizing (HVS) software	3 Piece	Flanged	Ordering code system
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Flow coefficient - Cv

Linear characteristics

1/2"- 1"

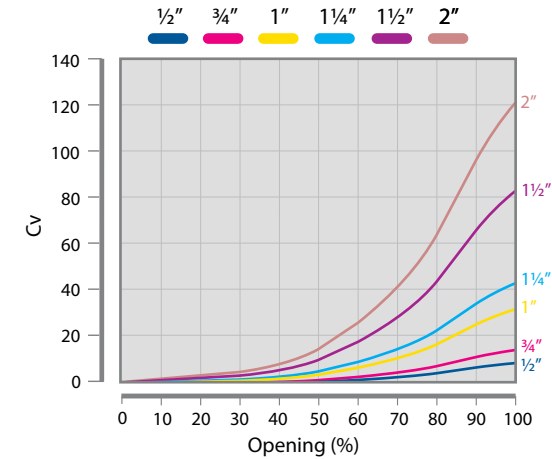


Valve size	Slot shape	Percent of valve rotation (degree of rotation)					
		0(0)	10(9)	20(18)	30(27)	40(36)	50(45)
1/2"	0.8	0.00	0.00	0.038	0.078	0.120	0.162
	1.6	0.00	0.00	0.107	0.224	0.347	0.475
	3.2	0.00	0.00	0.187	0.383	0.583	0.770
3/4"	0.8	0.00	0.00	0.05	0.11	0.16	0.21
	1.6	0.00	0.00	0.14	0.28	0.43	0.57
	3.2	0.00	0.00	0.23	0.47	0.73	0.98
1"	0.8	0.00	0.00	0.080	0.152	0.225	0.304
	1.6	0.00	0.00	0.238	0.495	0.739	0.988
	3.2	0.00	0.00	0.374	0.765	1.170	1.600

Valve size	Slot shape	Percent of valve rotation (degree of rotation)				
		60(54)	70(63)	80(72)	90(81)	100(90)
1/2"	0.8	0.202	0.242	0.284	0.324	0.366
	1.6	0.595	0.720	0.840	0.970	1.111
	3.2	0.957	1.152	1.360	1.574	1.800
3/4"	0.8	0.27	0.33	0.38	0.44	0.49
	1.6	0.71	0.86	1.01	1.16	1.33
	3.2	1.24	1.50	1.76	2.00	2.30
1"	0.8	0.380	0.463	0.545	0.618	0.710
	1.6	1.232	1.473	1.728	1.965	2.210
	3.2	2.035	2.450	2.900	3.316	3.700

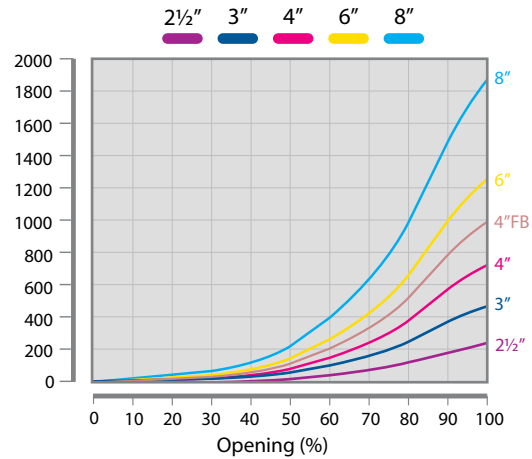
Quick opening characteristics

1/2"- 2"



Quick opening characteristics

2 1/2"- 8"



Valve size	Percent of valve rotation (degree of rotation)										
	0(0)	10(9)	20(18)	30(27)	40(36)	50(45)	60(54)	70(63)	80(72)	90(81)	100(90)
1/2"	0.00	0.15	0.29	0.46	0.70	1.09	1.76	2.60	4.30	6.40	8.00
3/4"	0.00	0.21	0.43	0.70	1.05	1.62	2.64	4.00	6.40	9.60	12.00
1"	0.00	0.58	1.15	1.90	2.80	4.30	7.00	10.50	17.00	26.00	32.00
* 1 1/4"	0.00	0.83	1.65	2.67	4.05	6.50	10.00	15.20	24.60	36.00	42.80
1 1/2"	0.00	1.48	2.95	4.75	7.20	11.00	18.00	27.00	44.00	65.50	82.00
2"	0.00	2.16	4.33	6.95	10.50	16.20	26.40	39.60	64.00	96.00	120.00
* 2 1/2"	0.00	4.30	9.10	15.60	23.70	34.60	52.50	83.00	126.00	185.00	256.00
3"	0.00	8.20	16.20	26.00	40.00	61.00	100.00	148.00	240.00	360.00	450.00
4"	0.00	13.10	26.00	42.10	63.10	97.20	159.00	238.00	385.00	575.00	720.00
* 4" FB	0.00	16.00	31.00	51.00	76.00	117.00	192.00	288.00	465.00	695.00	870.00
** 6"	0.00	18.40	36.70	59.00	90.00	138.00	224.00	338.00	545.00	815.00	1020.00
** 8"	0.00	34.00	68.00	109.00	165.00	254.00	415.00	620.00	1010.00	1500.00	1880.00

* Available with N47 Series only

** Available with N31/N32 Series only

Manual control

Habonim has developed a convenient and economical manual operation control valve package that provides a cost effective flow control solution for process applications that do not demand dynamic adjustment or the use of a fully automated control unit with sensors, positioners and various additional control devices.

If the flow process is stable and accurate dynamic adjustment is not an issue, then Habonim's manual control package permits manual setting of the process parameters to a specified angular ball position.



Habonim's angular positioning device is comprised of a polished stainless steel 'Scale' (0°- 90°), mounted on top of the valve's ISO pad. The oval handle is designed with an integrated pointer that indicates the angle of the opening position. .

To avoid unintentional rotation of the valve stem, Habonim offers a special multi-position lockable handle.

D series

3-way control valve

"Habonim" D Series 3-way control valve, fitted with a V-Port characterized metal seat, provides accurate diverting or mixing over a wide range of flow rates for various applications.

Diverting

Diverter valves direct flow from the inlet towards two outlets simultaneously. The opening of each outlet port is determined by the process requirement translated into a PLC signal. A T-Port ball lapped with a V-notch metal seat on one side provides equal percentage hydraulic characteristics for the flow process loop. The round port on the other side of the ball re-circulates the surplus flow while eliminating increased pressure in the valve inlet.

Mixing

Mixing valves are designed to combine the flow of two inlets into a single outlet. They are used in industrial applications where specific concentrations must be combined and regulated or their temperature maintained. Optimum performance is achieved with equal pressure on both inlets.

Applications for the D Control Valve Series for both flow configurations (diverting or mixing) include: refineries, chemical plants and oil production, all of which use boilers, coolers, heaters and condensers. They are also ideal for engines, turbines, gear boxes and heat exchanges, where air cooling, fuel and lube oil preheating, co-generation and engine jacket water demand precise control.

The D Series can also be fitted with a range of accessories from position feedback to full control capabilities.



Control valves

General | **Habonim Valve Sizing (HVS) software** | 3 Piece | Flanged | Ordering code system

Habonim's Valve Sizing (HVS) software

Habonim Valve Sizer (HVS) is a unique software tool which simplifies the task of selecting the perfect control valve package for most services. HVS has access to a database of over 5,800 different media. Accurate calculations of process Cv, valve opening percentages, velocity, critical condition warnings and predicted noise levels are just some of the many features provided by HVS in a variety of output formats. Operating in accordance with International Standards of IEC60534 and ISA 575-17 1989, HVS can be used for multiple requirements as well as individual packages.

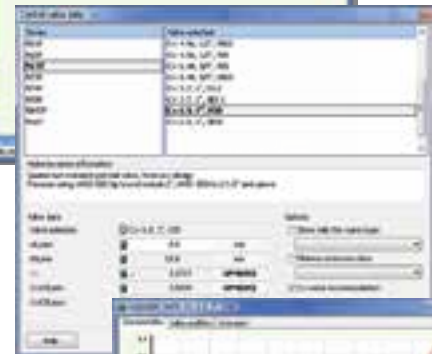


Define the process

HVS leads the engineer step-by-step through all the parameters needed to accurately define the process from the first operating point. Simultaneously, HVS calculates the flow rate according to IEC 60534 and ISA 575-17 1989, including gases and vapors.

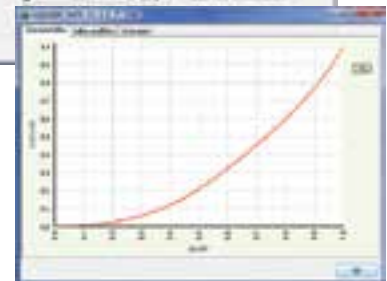


HVS provides the industry's most comprehensive database of coefficient parameters for more than 5,800 flow media, including density, vapor pressure, critical pressure, and saturated steam temperature at a given pressure.



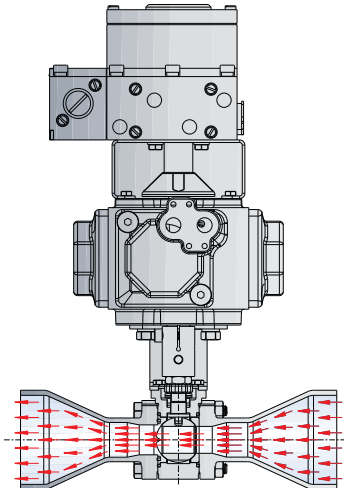
Select the control valve

With the process now defined, HVS displays a list of all the control valves that meet the process acceptance criteria. Once the desired valve is chosen, HVS indicates the velocity through the valve, angle of rotation, valve modifiers and more.



Dynamic Cv correction

Unique among industry software tools, HVS automatically performs a correction of the flow rate calculation, taking into account the resistance of installed fittings.



Noise level calculation

Unlike most control sizing software programs, HVS calculate the sound pressure level for both liquids and gases. HVS provides sound pressure level at a distance of 1 m from the valve surface, and then presents the spectrum of sound levels, by frequency, in both table and bar graph format.



Define multiple operating points (min, mean, max)

It is easy to add up to two additional operating points. There is no need to re-type the parameters for each additional point - either accept the default values for the maximum flow rate or modify them as needed.



A complete control package!

In the Accessories section you can select the best pneumatic actuator and positioner for safe operation, in accordance with site standards.

HVS guides you with simple, drop-down menus to complete the definition of the service point.

Download HVS at www.habonim.com

You can download a FREE copy of the newest version of HVS from the Habonim website. Follow the installation instructions and save the program to your local workstation.

Once the installation is complete, just click the HVS icon on your desktop or run it from the Windows® Start menu. Email the simple registration form and you will soon receive a personal license code from the HVS support team.

Save the license to your computer and you now have access to this powerful engineering tool.

As an HVS registered user you will benefit from free future software updates, Habonim newsletters, new product announcements and success stories.

HVS Registration format



Please enter the required information to register

HABONIM
Industrial Valves & Actuators
Inspired By Challenge
www.habonim.com

ACCOUNT DETAILS

No. / Qty. *	1
Last Name*	ACIBELI
First Name*	Salim
E-mail address*	salim@habonim.com
Portfolio e-mail address*	salim@habonim.com
Company*	Habonim
Department	Marketing & Sales
Job title	Manager
Address	27th Floor
Zip or postal code*	1157000
City*	ESSEX, Dallas
Country*	United States
Full phone number	

(*) Required fields

Back Next Cancel

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

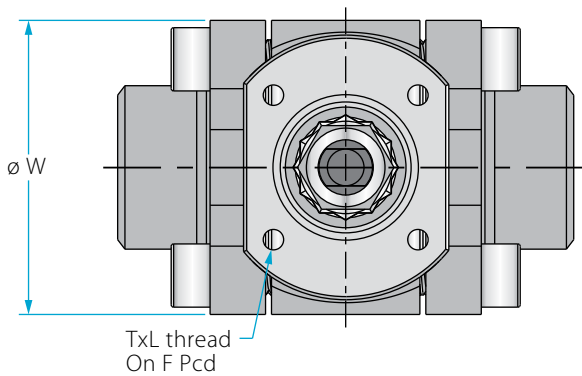
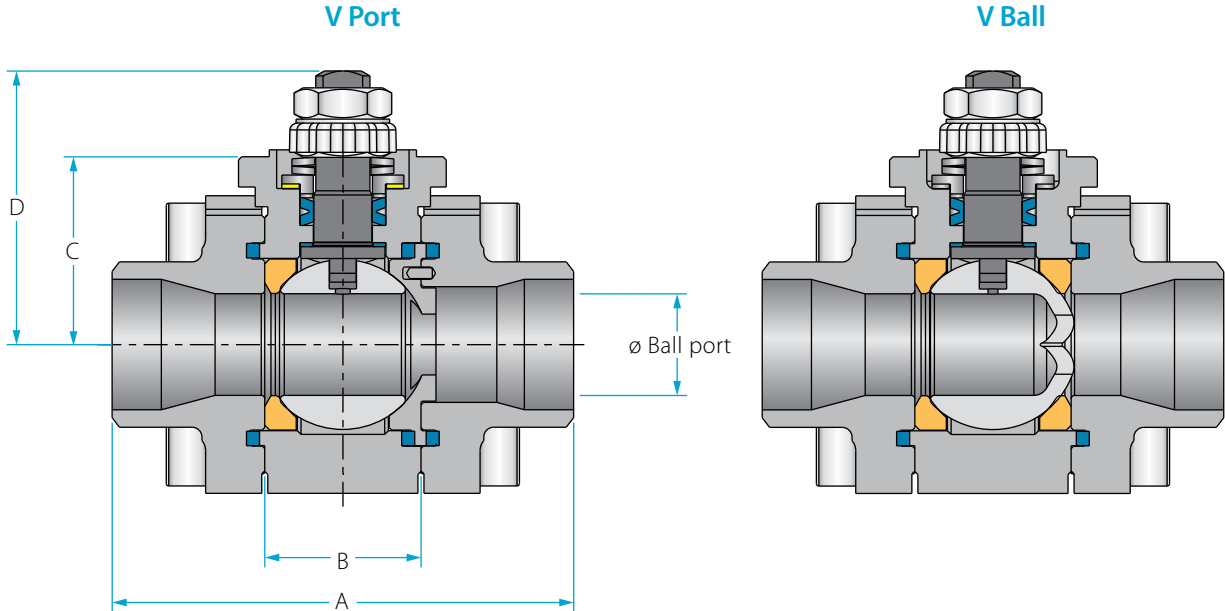
3 Piece

Flanged

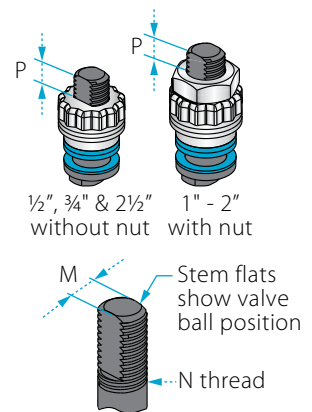
Ordering code system

Size 1/2" - 2 1/2" | DN15-DN65 | N47 Series

Valve dimensions

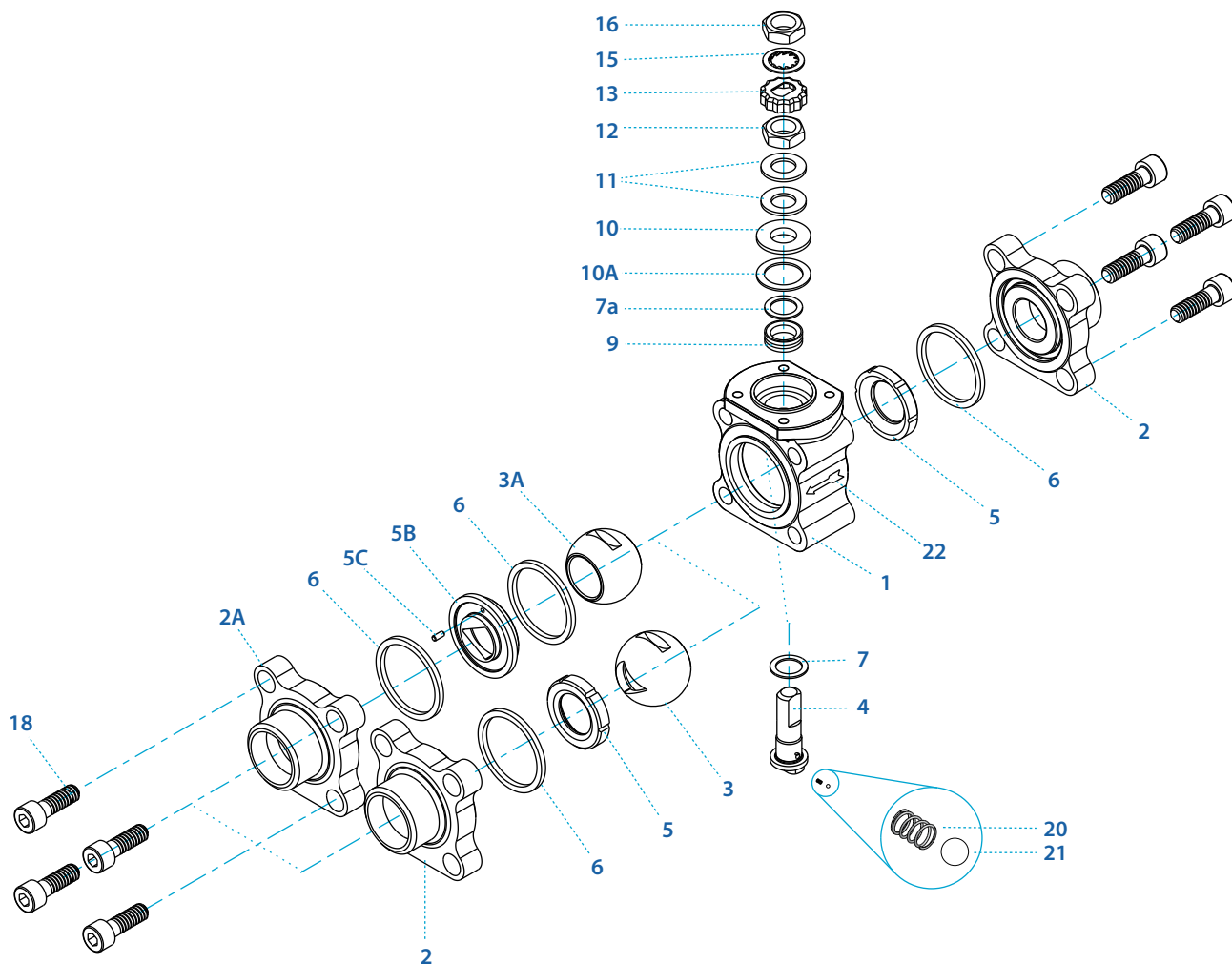


Preparation for actuation



Std. port	Full port	Unit	Ball port	A	B	C	D	W	M	N	P	F	TxL	Weight kg/lb	
DN15	DN10	mm	11.15	66.00	20.60	29.00	38.70	47.00	5.50	3/8" UNF	7.20	(F03)	36.00	M5X10	0.6
1/2"	3/8"	inch	0.44	2.60	0.81	1.14	1.52	1.85	0.22		0.28	1.42	1.33		
DN20	DN15	mm	14.30	70.60	24.50	31.40	40.30	53.70	5.50	3/8" UNF	7.20	(F03)	36.00	M5X10	0.8
3/4"	1/2"	inch	0.56	2.78	0.97	1.24	1.59	2.11	0.22		0.28	1.42	1.77		
DN25	DN20	mm	20.60	93.70	31.70	38.20	55.60	63.70	7.54	7/16" UNF	7.20	(F04)	42.00	M5X10	1.6
1"	3/4"	inch	0.81	3.69	1.25	1.50	2.19	2.51	0.30		0.28	1.65	3.54		
DN32	DN25	mm	25.40	108.00	41.30	42.70	60.20	71.70	7.54	7/16" UNF	7.20	(F04)	42.00	M5X10	2.5
1 1/4"	1"	inch	1.00	4.25	1.62	1.68	2.37	2.82	0.30		0.28	1.65	5.53		
DN40	DN32	mm	31.80	115.50	48.40	43.60	73.00	86.70	8.71	9/16" UNF	8.00	(F05)	50.00	M6X12	Kg 3.6
1 1/2"	1 1/4"	inch	1.25	4.55	1.91	1.72	2.87	3.41	0.34		0.32	1.97	7.96		
DN50	DN40	mm	38.10	128.00	56.30	48.30	77.80	96.90	8.71	9/16" UNF	8.00	(F05)	50.00	M6X12	Kg 4.5
2"	1 1/2"	inch	1.50	5.04	2.22	1.90	3.06	3.82	0.34		0.32	1.97	9.95		
DN50	DN50	mm	50.80	158.00	72.60	70.00	88.10	108.00	8.71	9/16" UNF	13.50	(F07)	70.00	M8X12	Kg 9.5
2 1/2"	2"	inch	2.00	6.22	2.86	2.76	3.47	4.25	0.34		0.53	2.76	21.0		

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995CE3MN 5A	1
2	End	A351 CF3M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1-2
2A	V- Port End	A351 CF3M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
3	V ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
3A	Ball	A351 CF8M	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, CF PEEK, DELRIN, PCTFE (KEL-F)	1-2
5B	V seat	A479 316L	1

Item	Description	Material specification	Qty.
5C	Dowel Pin	A479 316L	1
6*	Body seal	PTFE, Graphite	2-3
7*	Stem thrust seal	PEEK, CF PEEK, PCTFE (KEL-F)	1
7a**	Anti-abrasion ring	PEEK, CF PEEK, PCTFE (KEL-F)	1
9*	Stem packing	CF PTFE, TFM, Graphite	2
10	Follower	B783 316L	1
10A*	Slide bearing	TF316	1
11	Disc spring	A693 631 17-7PH	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Locking clip	A164 8, 8A	1
16	Handle nut	A194 8M, EN3506-2 A4-80	1
18	Body bolts	C.St 8.8 ZP, A193 B8, EN3506-1 A2-70	8
22	Arrow flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Repair kit components

** Only with Hermetix™ stem seal

*** Only with graphite body seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

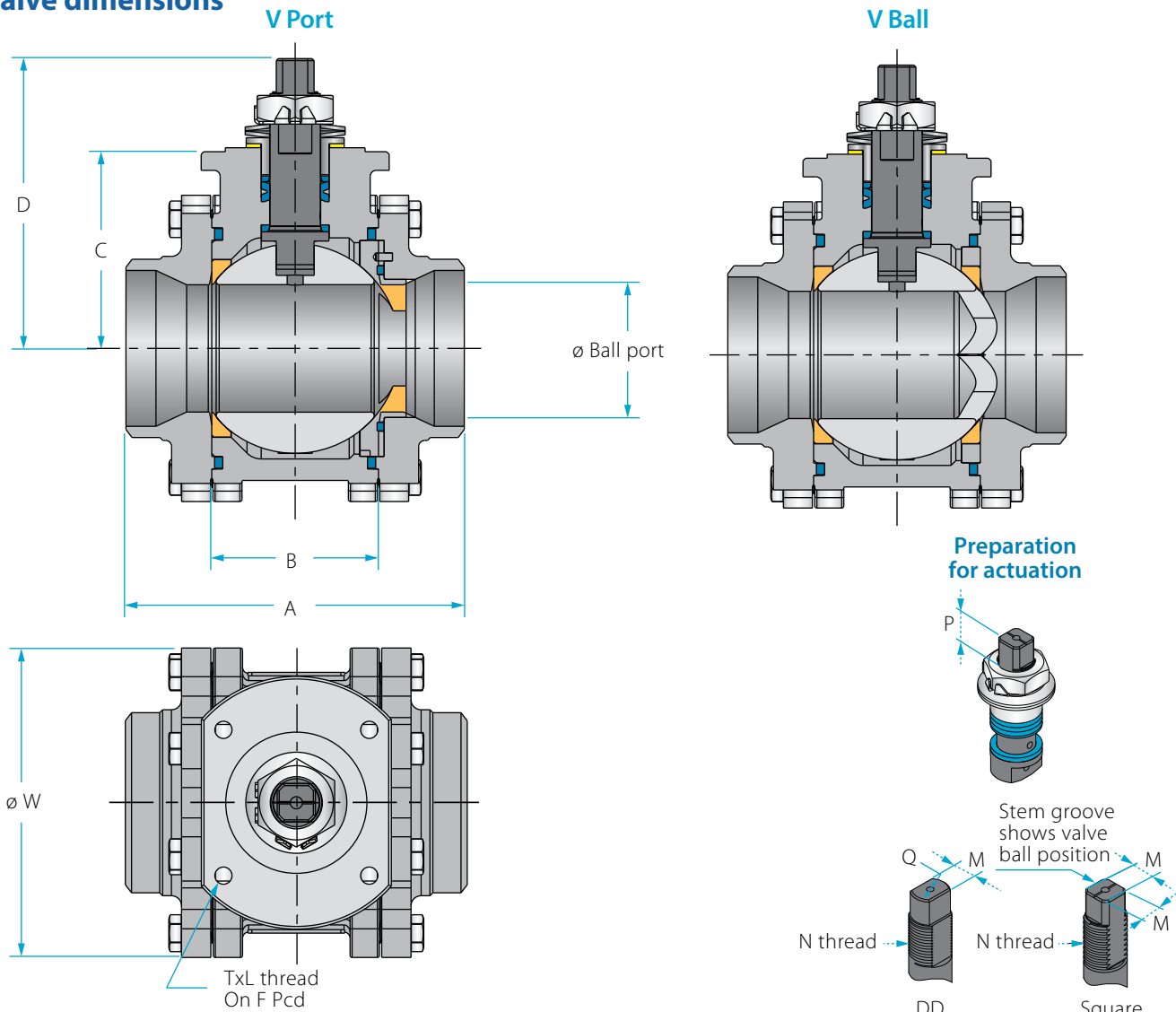
3 Piece

Flanged

Ordering code system

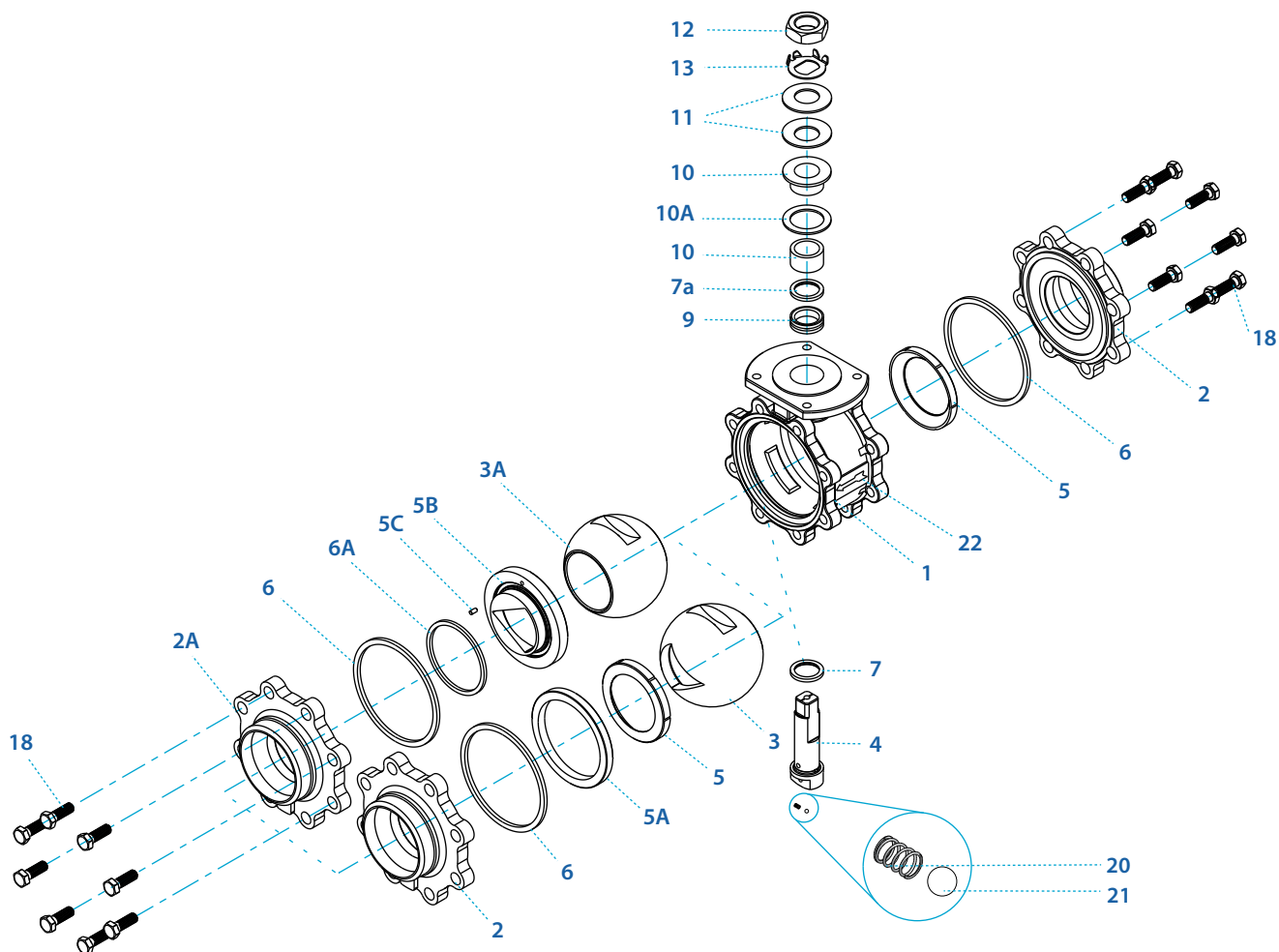
Size 3"- 4" | DN80-DN100 | N47 Series

Valve dimensions



Std. port	Full port	Unit	Ball port	A	B	C	D	W	M	N	P	Q	F	TxL	Weight kg/lb
DN80	DN65	mm	63.50	169.00	83.30	98.30	144.90	140.00	18.90	1"-14	16.70	22.70	(F10)	102.00	13.70
3"	2½"	inch	2.50	6.65	3.28	3.87	5.71	5.50	0.74	UNS-2A	0.66	0.89		M10x20	30.30
DN100	DN80	mm	82.60	214.00	108.80	114.10	160.70	177.00	18.90	1"-14	16.70	22.70	(F10)	102.00	23.70
4"	3"	inch	3.25	8.43	4.28	4.49	6.33	6.97	0.74	UNS-2A	0.66	0.89		M10x20	52.40
	DN100	mm	100.00	239.00	123.00	124.00	170.50	217.00	18.90	1"-14	16.70	22.70	(F10)	102.00	30.00
	4"	inch	3.94	9.41	4.84	4.88	6.71	8.54	0.74	UNS-2A	0.66	0.89		M10x20	66.30

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
2	End	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1-2
2A	V-End	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
3	V-Ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
3A	Ball	A351 CF8M	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, TFM, DELRIN, PCTFE (KEL-F)	1-2
5A	Seat support	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
5B	V seat	A479 316L	1

Item	Description	Material specification	Qty.
5C	Dowel pin	A479 316L	1
6*	Body seal	PTFE, Graphite	2
6A	Seat seal	PTFE, Graphite	1
7*	Stem thrust seal	PEEK, CF PEEK, PCTFE	1
7a**	Anti-abrasion ring	PEEK, CF PEEK, PCTFE	1
9*	Stem packing	CF PTFE, TFM™	2
10	Follower	B783 316L	1
10A	Slide bearing	TF316	1
11	Disc spring	A693 631 (17-7PH)	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Tab lock washer	A240 304	1
18	Body bolts	A193 B8, EN3506-1 A2-70	6-10
19	Body nuts	A193 B8, EN3506-2 A2-70	6-10
20	Anti static spring	A313 302	2
21	Anti static plunger	A479 304	2
22	Arrow flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Standard items supplied in repair kits

** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

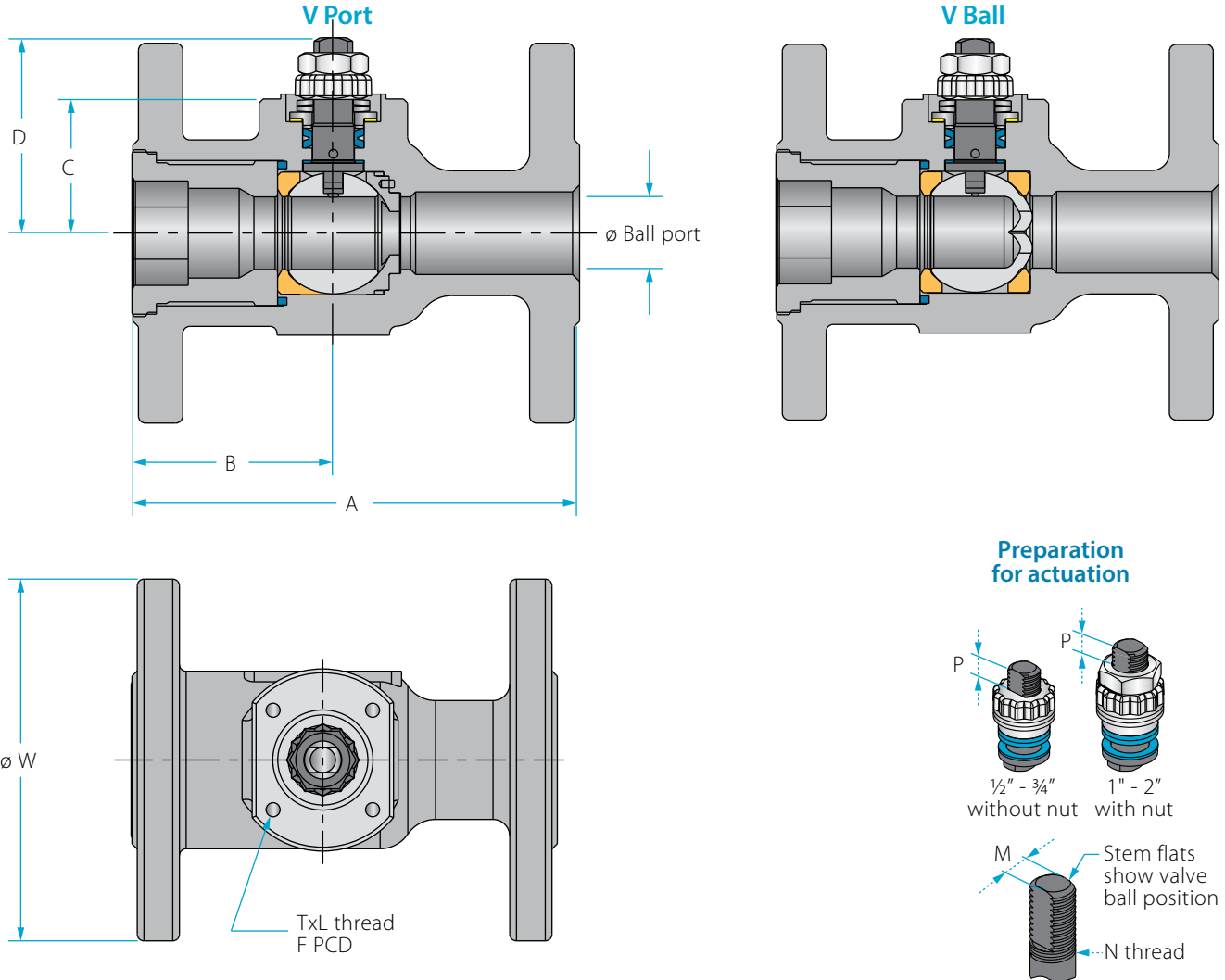
3 Piece

Flanged

Ordering code system

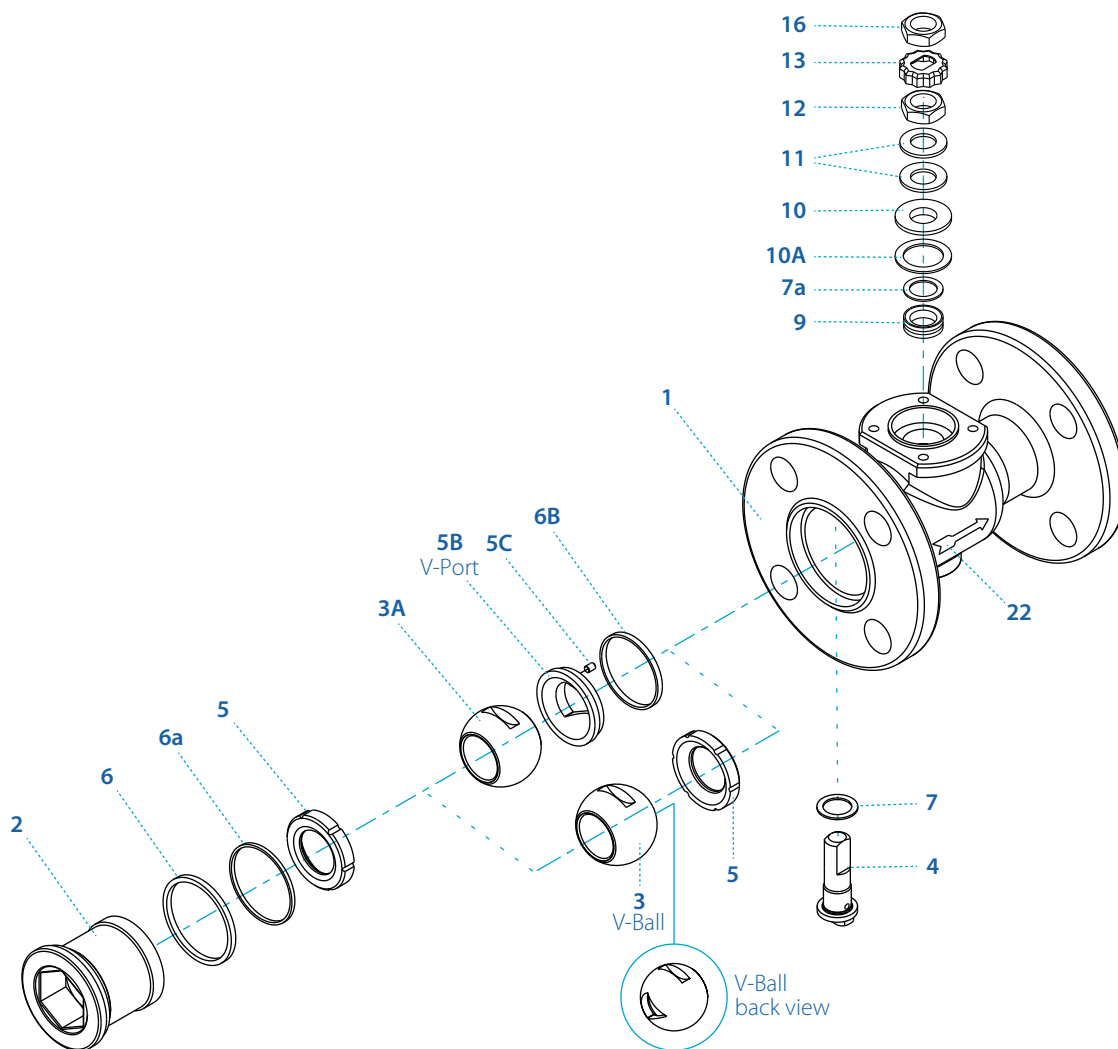
Size 1/2" - 2" | DN15-DN50 | ANSI Class 150/300 | N31/N32 Series

Valve dimensions



Std. port	Unit	Ball port	A		B	C	D	W		M	N	P	F	TxL	Weight kg/lb		
			150	300				150	300						150	300	
DN15	mm	11.15	108.00	140.00	46.00	29.00	38.00	88.90	95.25	5.54	3/8" UNF	11.10	(F03)	36.00	M5x10	1.70	2.40
1/2"	inch	0.44	4.25	5.50	1.81	1.14	1.50	3.50	3.75	0.22	3/8" UNF	0.43		1.42	M5x10	3.80	5.30
DN20	mm	14.30	117.00	152.00	49.00	31.40	40.30	98.55	163.07	5.54	3/8" UNF	11.10	(F03)	36.00	M5x10	2.30	3.30
3/4"	inch	0.56	4.61	6.00	1.93	1.24	1.59	3.88	6.42	0.21	3/8" UNF	0.43		1.42	M5x10	5.10	7.30
DN25	mm	20.60	127.00	165.00	57.00	38.20	55.60	107.95	123.95	7.54	7/16" - 16 UNF	15.40	(F04)	42.00	M5x10	3.10	4.60
1"	inch	0.81	5.00	6.50	2.25	1.50	2.19	4.25	4.88	0.29	7/16" - 16 UNF	0.60		1.65	M5x10	7.30	10.20
DN40	mm	31.80	165.00	190.00	62.00	43.60	73.10	127.00	155.52	8.70	9/16" UNF	19.60	(F05)	50.00	M6x12	5.50	8.70
1 1/2"	inch	1.25	6.50	7.50	2.44	1.72	2.88	5.00	6.10	0.34	9/16" UNF	0.77		1.97	M6x12	12.20	19.30
DN50	mm	38.20	178.00	216.00	68.00	48.30	77.80	152.40	165.10	8.70	9/16" UNF	19.60	(F05)	50.00	M6x12	8.10	10.80
2"	inch	1.50	7.00	8.50	2.67	1.90	3.06	6.00	6.50	0.34	9/16" UNF	0.77		1.97	M6x12	18.00	24.00

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
2	Plug	A351 CF3M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
3	V ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
3A	Ball	A351 CF8M	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, CF PEEK, DELRIN, PCTFE (KEL-F)	1-2
5B	V seat	A479 316L	1
5C	Dowel Pin	A479 316L	1
6*	Body seal	PTFE, Graphite	1

Item	Description	Material specification	Qty.
6a***	Body ring	A479 316L, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
6B*	Seat seal	PTFE, Graphite	1
7*	Stem thrust seal	PEEK, CF PEEK, PCTFE (KEL-F)	1
7a**	Anti-abrasion ring	PEEK, CF PEEK, PCTFE (KEL-F)	1
9*	Stem packing	CF PTFE, TFM, Graphite ⁽¹⁾	2
10	Follower	B783 316L	1
10A*	Slide bearing	TF316	1
11	Disc spring	A693 631 17-7PH	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Locking clip	A164 8, 8A	1
16	Handle nut	A194 8M, EN3506-2 A4-80	1
22	Arrow flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Repair kit components
 ** Only with Hermetix™ stem seal
 *** Only with graphite body seal

⁽¹⁾ This material can only be used as part of the N31P/N32P design.

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

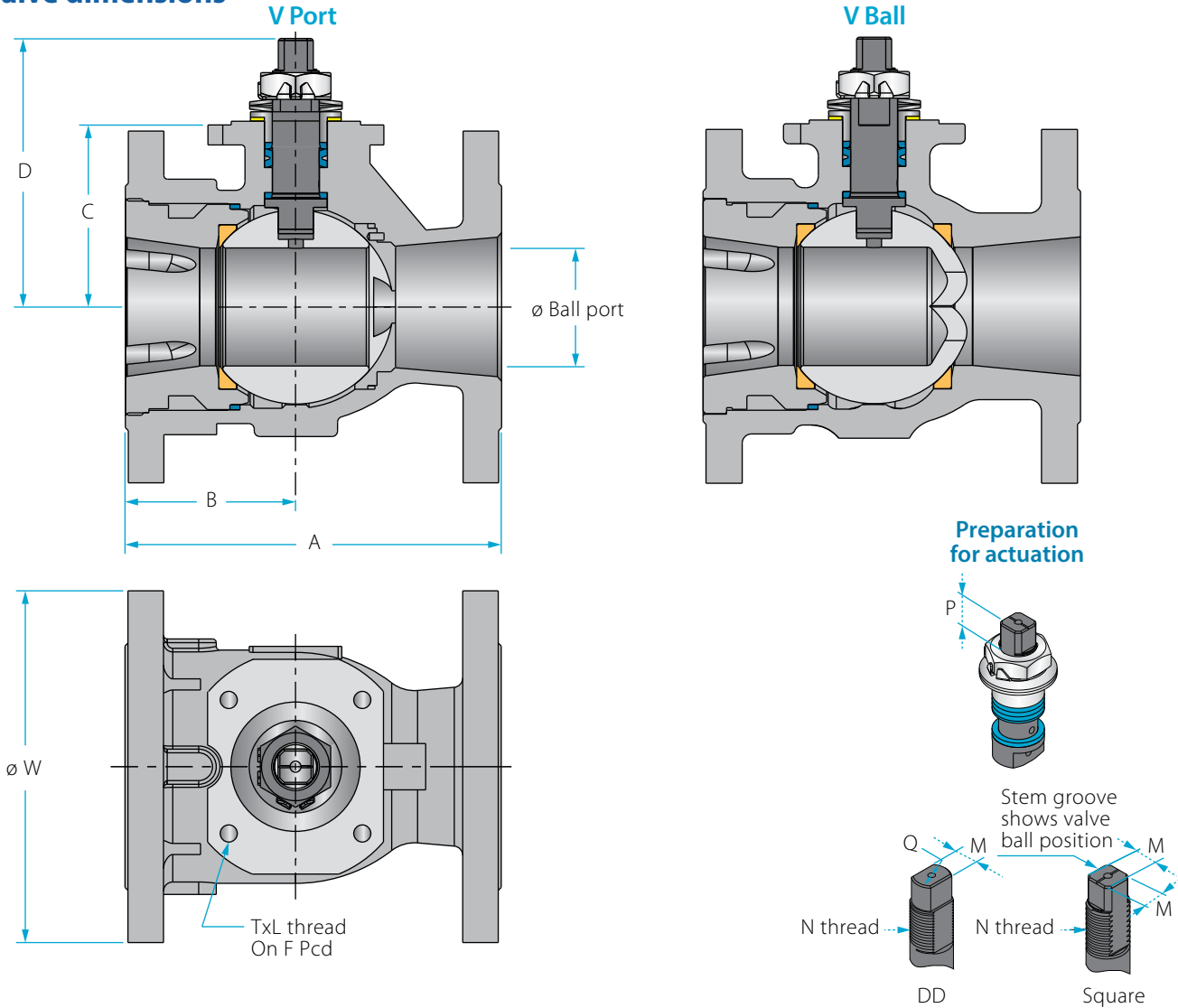
3 Piece

Flanged

Ordering code system

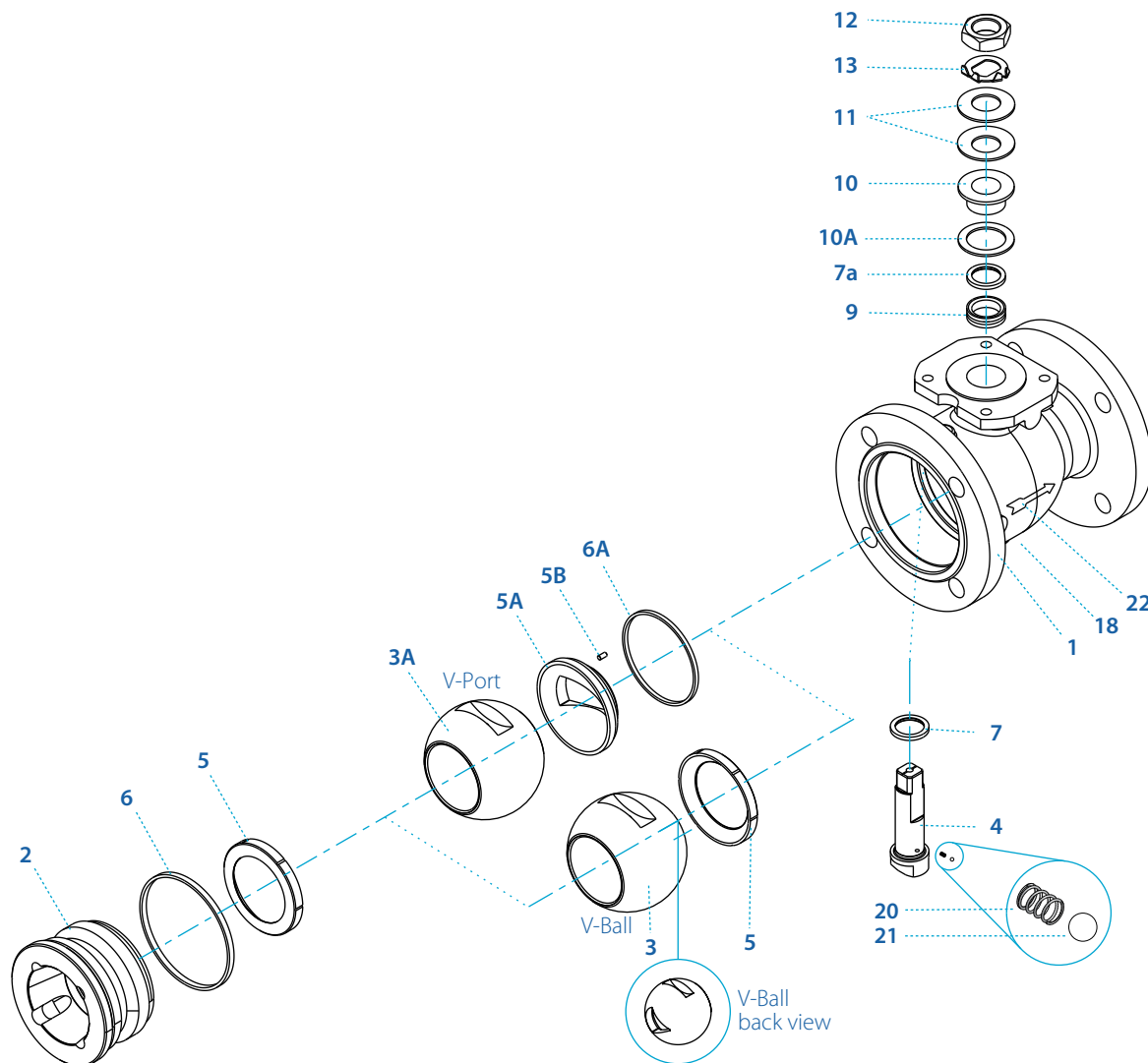
Size 3"- 8" | DN80-DN200 | ANSI Class 150/300 | N31/N32 Series

Valve dimensions



Std. port	Unit	Ball port	A		B	C	D	W		M	N	P	Q	F	TxL	Weight kg/lb		
			150	300				150	300							150	300	
DN80	mm	63.50	203.00	284.00	92.00	98.40	145.00	190.50	209.55	18.90	1" - 14 UNS-2A	16.70	22.70	(F10)	102.00	M10x20	18.00	22.70
3"	inch	2.50	8.00	11.18	3.62	3.88	5.72	7.50	8.25	0.74		0.66	0.89		4.02		40.00	50.40
DN100	mm	82.60	229.00	305.00	102.00	114.10	161.00	228.60	254.00	18.90	1" - 14 UNS-2A	16.70	22.70	(F10)	102.00	M10x20	28.20	36.30
4"	inch	3.25	9.00	12.00	4.00	4.49	6.34	9.00	10.00	0.74		0.66	0.89		4.02		62.80	80.60
DN150	mm	111.10	267.00	403.20	108.00	157.40	226.00	279.40	317.50	28.40	1½" - 12 UNF-1A	26.20	22.70	(F12)	125.00	M12x20	41.00	69.00
6"	inch	4.38	10.50	15.88	4.25	6.20	8.91	11.00	12.50	1.11		1.03	0.89		4.92		91.00	153.00
DN200	mm	144.40	292.00	419.00	163.50	185.20	254.00	342.90	381.00	28.45	1½" - 12 UNF-1A	26.20	32.10	(F12)	125.00	M12x20	82.00	105.00
8"	inch	5.68	11.50	16.50	5.37	7.30	10.00	13.50	15.00	1.11		1.03	1.37		4.92		182.00	233.00

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995CE3MN 5A	1
2	Plug	A351 CF3M, A216 WCB, A105, A351 CN7M, A494 M35-1, A494 CW-12MW, A494 CX-2MW, A351 CK3MCuN, A995 CD3MN 4A, A995 CE3MN 5A	1
3	V ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
3A	Ball	A351 CF8M	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, CF PEEK, DELRIN, PCTFE (KEL-F)	1-2
5A	V seat	A479 316L	1
5B	Dowel Pin	A479 316L	1

Item	Description	Material specification	Qty.
6*	Body seal	PTFE, Graphite	1
6A*	Seat seal	PTFE, Graphite	1
7*	Stem thrust seal	PEEK, CF PEEK, PCTFE (KEL-F), TFM	1
7a**	Anti-abrasion ring	PEEK, CF PEEK, PCTFE (KEL-F), TFM	1
9*	Stem packing	CF PTFE, TFM, Graphite	2
10	Follower	B783 316L	1
10A*	Slide bearing	TF316	1
11	Disc spring	A693 631 17-7PH	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Tab lock washer	A240 304	1
22	Arrow flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Repair kit components

** Only with Hermetix™ stem seal

*** Only with graphite body seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

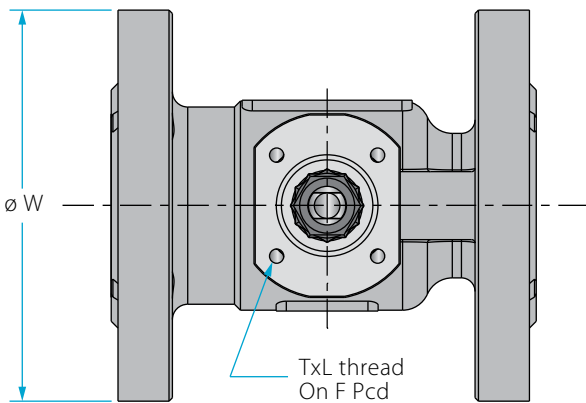
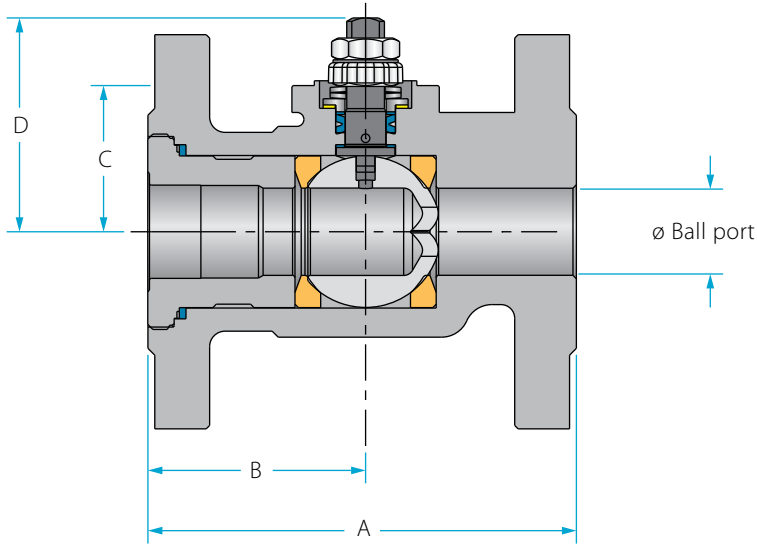
3 Piece

Flanged

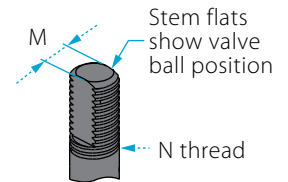
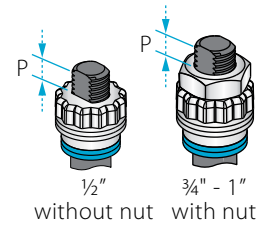
Ordering code system

Size 1/2" - 1" | DN15-DN25 | DIN PN40 | N78 Series

Valve dimensions

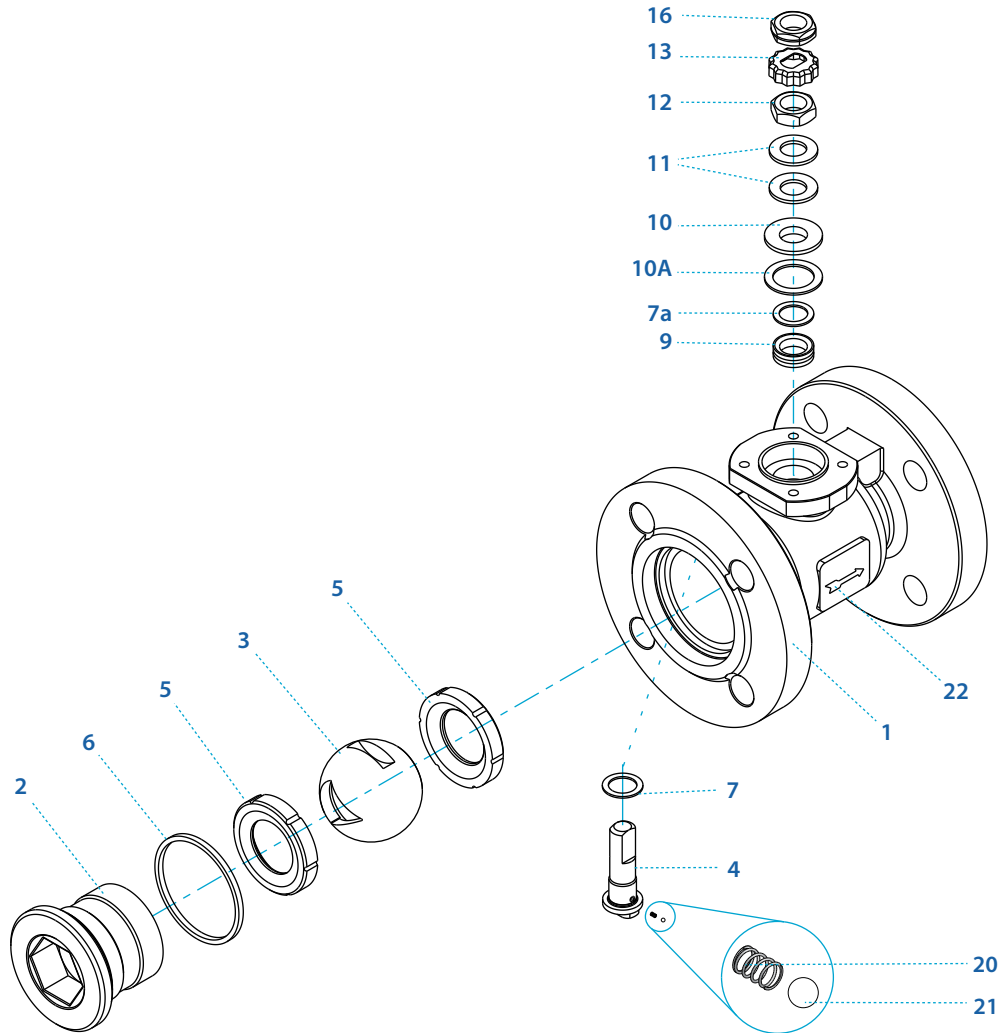


Preparation for actuation



Std. port	Unit	Ball port	A		B	C	D	W	M	N	P	Q	F	TxL	Weight kg/lb		
			F1	F2											F1	F2	
DN15	mm	14.30	130.00	115.00	48.00	31.50	40.50	5.54	5.50	3/8" UNF	11.10	95.00	(F03)	36.00	M5x10	2.2	2.1
1/2"	inch	0.56	5.12	4.53	1.89	1.24	1.59	0.22	0.22		0.44	3.74		1.42		4.80	4.60
DN20	mm	20.60	150.00	120.00	58.00	38.30	56.50	7.54	5.50	7/16" UNF	15.40	105.00	(F04)	42.00	M5x10	3.2	3
3/4"	inch	0.81	5.91	4.72	2.28	1.51	2.22	0.30	0.22		0.61	4.13		1.65		7.00	6.60
DN25	mm	25.40	160.00	125.00	63.50	41.80	61.00	7.54	8.71	7/16" UNF	15.40	115.00	(F04)	50.00	M5x10	4.2	4
1"	inch	1.00	6.30	4.92	2.50	1.65	2.40	0.30	0.34		0.61	4.53		1.97		9.20	8.8

Components & materials



Item	Description	Material specification	Qty.
1	Body	X 2 CrNiMo 17 13 2 (1.4404); GS-C25 (DIN1.0619); NiCr20CuMo (2.4660); NiCu30Fe (2.4360); NiCr16Mo15W(2.4819); NiCr21Mo14W(2.4602); X1CrNiMoCuN20-18-7 (1.4547); X2CrNiMoN 22-5-3 (1.4462); X2CrNiMoN25-7-4 (1.4410)	1
2	End	X 2 CrNiMo 17 13 2 (1.4404); GS-C25 (DIN1.0619); NiCr20CuMo (2.4660); NiCu30Fe (2.4360); NiCr16Mo15W(2.4819); NiCr21Mo14W(2.4602); X1CrNiMoCuN20-18-7 (1.4547); X2CrNiMoN 22-5-3 (1.4462); X2CrNiMoN25-7-4 (1.4410)	1
3	Ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, TFM, DELRIN, PCTFE (KEL-F)	2

Item	Description	Material specification	Qty.
6*	Body seal	PTFE, Graphite	1
T	Stem thrust seal	CF PEEK, PCTFE, CF PTFE	1
7a**	Anti-abrasion ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem packing	CF PTFE, TFM	2
10	Follower	Expanded Graphite	1
10A	Slide bearing	TF316	1
11	Disc spring	X5 CrNiMo 17-12-2(1.4401)	2
12	Stem nut	X7CrNiA117-7 (1.4568)	1
13	Locking clip	X5 CrNiMo 17-12-2(1.4401)	1
16	Handle nut	X6 Cr17 (1.4016)	1
20	Anti static spring	A313 302	1
21	Anti static plunger	A479 304	1
22	Arrow Flow	A167 304	2
23	Tag (not shown)	X5CrNi 18-10 (1.4301)	1

* Standard items supplied in repair kits

** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

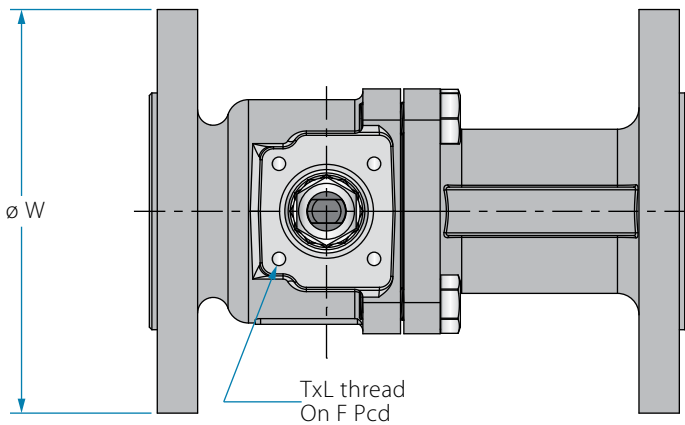
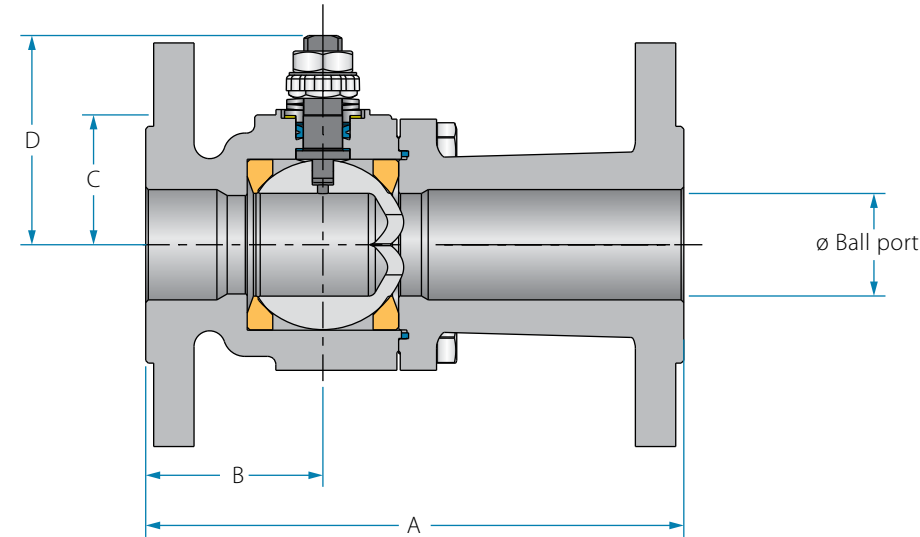
3 Piece

Flanged

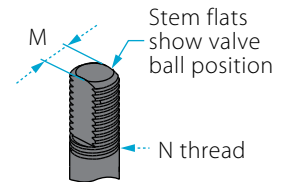
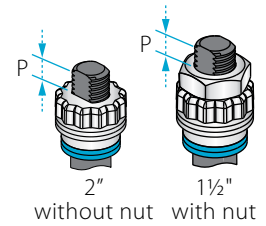
Ordering code system

Size 1½"- 2" | DN40-DN50 | DIN PN40 | N78 Series

Valve dimensions

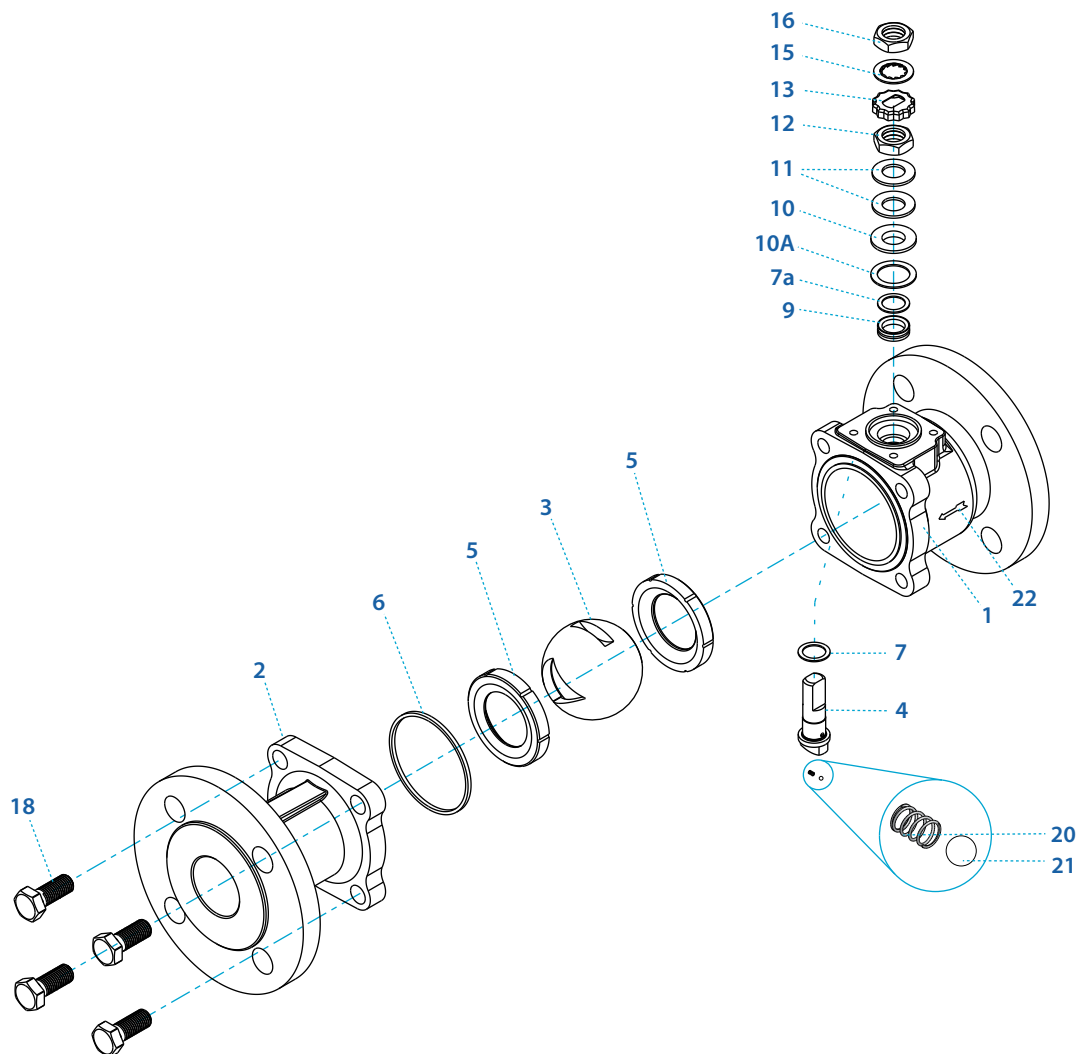


Preparation for actuation



Std. port	Unit	Ball port	A		B	C	D	W	M	N	P	F	TxL	Weight kg/lb		
			F1	F4										F1	F4	
DN40	mm	38.10	200.00	140.00	48.30	65.90	77.80	150.00	8.70	½" UNF	19.60	(F05)	50.00	M6x12	10.90	10.30
1½"	inch	1.50	7.87	5.51	1.90	2.59	3.06	5.91	0.34		0.77		1.97			24.00
DN50	mm	50.00	230.00	150.00	78.00	60.70	119.00	165.00	8.70	M16	11.00	(F07)	70.00	M8x12	15.00	13.00
2"	inch	2.00	9.06	5.91	3.07	2.39	4.69	6.50	0.34		0.43		2.76			33.00

Components & materials



Item	Description	Material specification	Qty.
1	Body	X 2 CrNiMo 17 13 2 (1.4404); GS-C25 (DIN1.0619); NiCr20CuMo (2.4660); NiCu30Fe (2.4360); NiCr16Mo15W (2.4819); NiCr21Mo14W (2.4602); X1CrNiMoCuN20-18-7 (1.4547); X2CrNiMoN 22-5-3 (1.4462); X2CrNiMoN25-7-4 (1.4410)	1
2	End	X 2 CrNiMo 17 13 2 (1.4404); GS-C25 (DIN1.0619); NiCr20CuMo (2.4660); NiCu30Fe (2.4360); NiCr16Mo15W (2.4819); NiCr21Mo14W (2.4602); X1CrNiMoCuN20-18-7 (1.4547); X2CrNiMoN 22-5-3 (1.4462); X2CrNiMoN25-7-4 (1.4410)	1
3	V-Ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, TFM, DELRIN, PCTFE (KEL-F)	2
6*	Body seal	PTFE, Graphite	1

Item	Description	Material specification	Qty.
7*	Stem thrust seal	CF PEEK, PCTFE, CF PTFE	1
7a**	Anti-abrasion ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem packing	CF PTFE, TFM	2
10	Follower	Expanded Graphite	1
10A	Slide bearing	TF316	1
11	Disc spring	X5 CrNiMo 17-12-2 (1.4401)	2
12	Stem nut	X7 CrNiAl 17-7 (1.4568)	1
13	Locking clip	X5 CrNiMo 17-12-2 (1.4401)	1
15	Serrated washer	A194 6	1
16	Handle	X6 Cr17 (1.4016)	1
18	Body bolt	EN3506-1 A2-70	4-8
20	Anti static spring	A313 302	1
21	Anti static plunger	A479 304	1
22	Arrow Flow	A167 304	2
23	Tag (not shown)	X5 CrNi 18-10 (1.4301)	1

* Standard items supplied in repair kits
 ** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

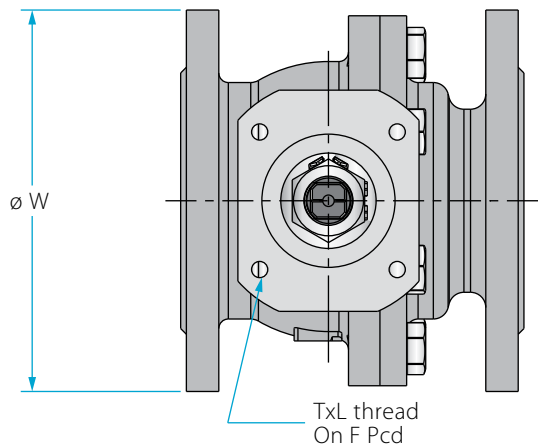
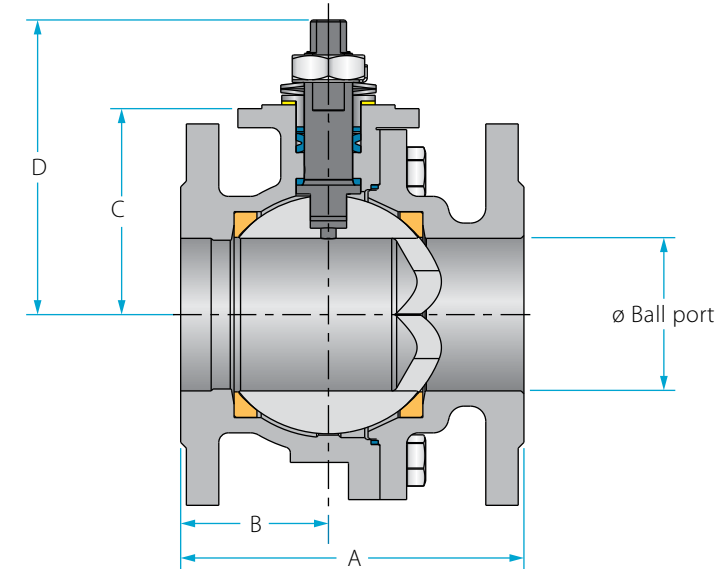
3 Piece

Flanged

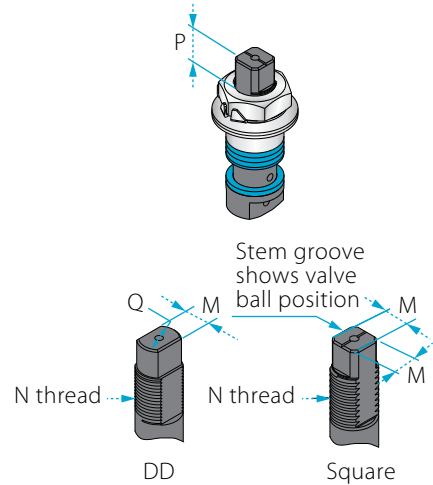
Ordering code system

Size 3"- 6" | DN80-DN150 | DIN PN16 | N78 Series

Valve dimensions

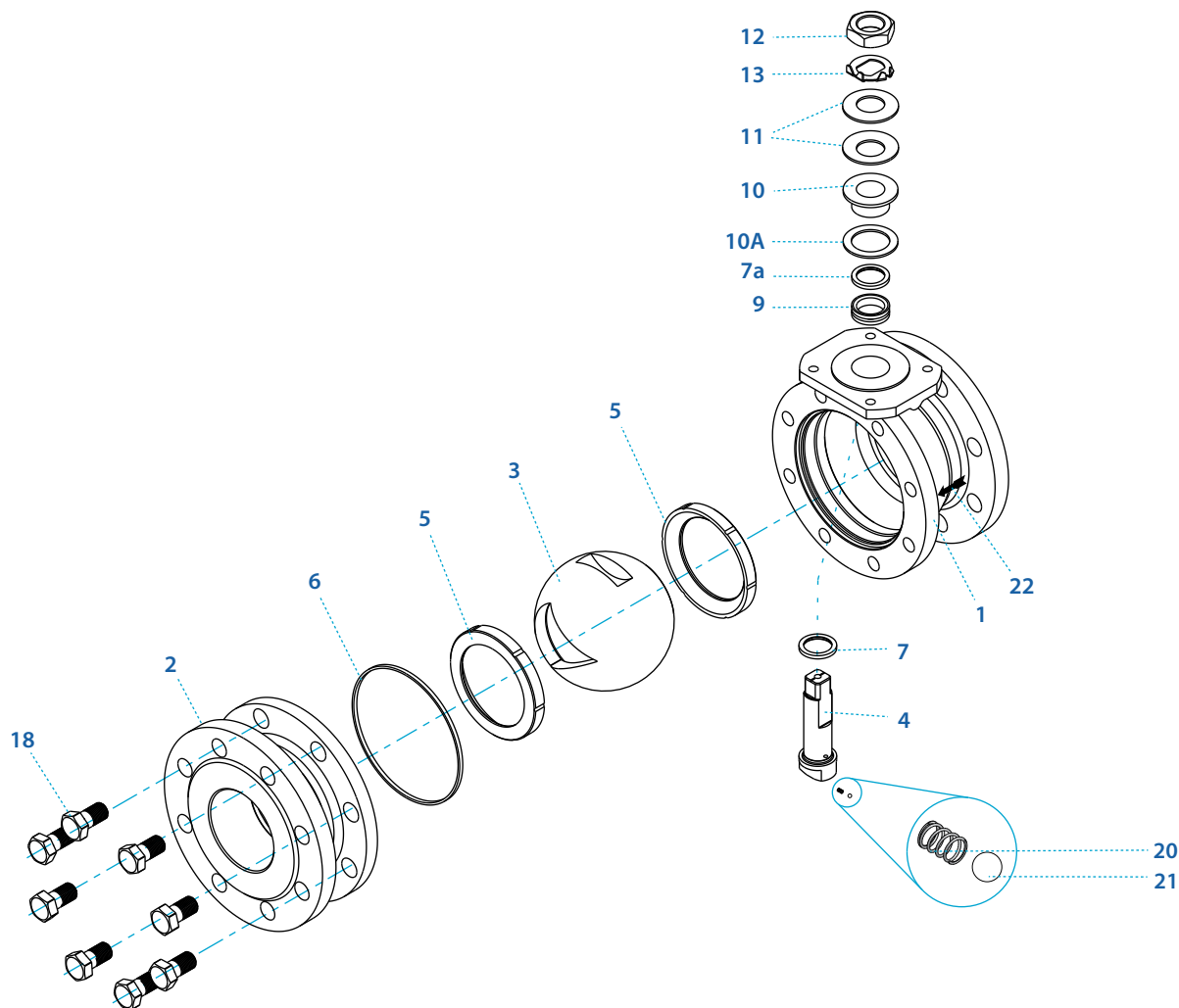


Preparation for actuation



Std. port	Unit	Ball port	A			B	C	D	W	M	N	P	F	TxL	Weight kg/lb			
			F1	F2	F3										F1	F2	F3	
DN80	mm	80.00	310.00	180.00	-	108.00	77.50	162.00	200.00	18.90	M24	16.00	(F10)	102.00	M10x20	26	24	25
3"	inch	3.20	12.20	7.09	-	4.25	3.05	6.40	7.87	0.74		0.63	4.02	57		53	55	
DN100	mm	100.00	350.00	190.00	-	132.00	84.50	186.00	225.00	18.90	M24	16.00	(F10)	102.00	M10x20	34	30	34
4"	inch	3.94	13.78	7.48	-	5.20	3.33	7.32	8.86	0.74		0.63	4.02	75		66	75	
DN150	mm	150.00	-	-	350.00	178.00	163.50	236.00	328.00	28.40	M35	17.50	(F10)	102.00	M12x20	-	-	63
6"	inch	5.91	-	-	13.78	7.01	6.44	9.29	12.91	1.11		0.69	4.02	-		-	139	

Components & materials



Item	Description	Material specification	Qty.
1	Body	X 2 CrNiMo 17 13 2 (1.4404); GS-C25 (DIN1.0619); NiCr20CuMo (2.4660); NiCu30Fe (2.4360); NiCr16Mo15W(2.4819); NiCr21Mo14W(2.4602); X1CrNiMoCuN20-18-7 (1.4547); X2CrNiMoN 22-5-3 (1.4462); X2CrNiMoN25-7-4 (1.4410)	1
2	End	X 2 CrNiMo 17 13 2 (1.4404); GS-C25 (DIN1.0619); NiCr20CuMo (2.4660); NiCu30Fe (2.4360); NiCr16Mo15W(2.4819); NiCr21Mo14W(2.4602); X1CrNiMoCuN20-18-7 (1.4547); X2CrNiMoN 22-5-3 (1.4462); X2CrNiMoN25-7-4 (1.4410)	1
3	V-Ball	A351 CF8M, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
4	Stem	A564 Gr 630 H1150D 17-4PH, B473 N08020, B164 N04400, B574 N06022, B574 N10276, A479 S31254, A479 S31803, A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, TFM, DELRIN, PCTFE (KEL-F)	2

Item	Description	Material specification	Qty.
6*	Body seal	PTFE, Graphite	2
7*	Stem thrust seal	PEEK, CF PEEK, PCTFE, CF PTFE	1
7a**	Anti-abrasion ring	PEEK, CF PEEK, PCTFE, CF PTFE	1
9*	Stem packing	CF PTFE, TFM	2
10	Follower	Expanded Graphite	1
10A	Slide bearing	TF316	1
11	Disc spring	X5 CrNiMo 17-12-2 (1.4401)	2
12	Stem nut	X7 CrNiAl 17-7 (1.4568)	1
13	Tab lock washer	A240 430 (DIN 1.4016)	1
18	Body bolts	EN3506-1 A2-70	4-8
20	Anti static spring	A313 302	1
21	Anti static plunger	A479 304	1
22	Arrow flow	A167 304	1
23	Tag (not shown)	X5 CrNi 18-10 (1.4301)	1

* Standard items supplied in repair kits

** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

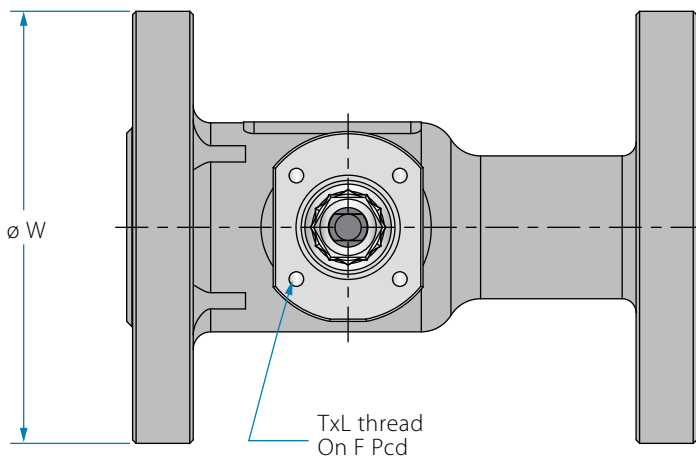
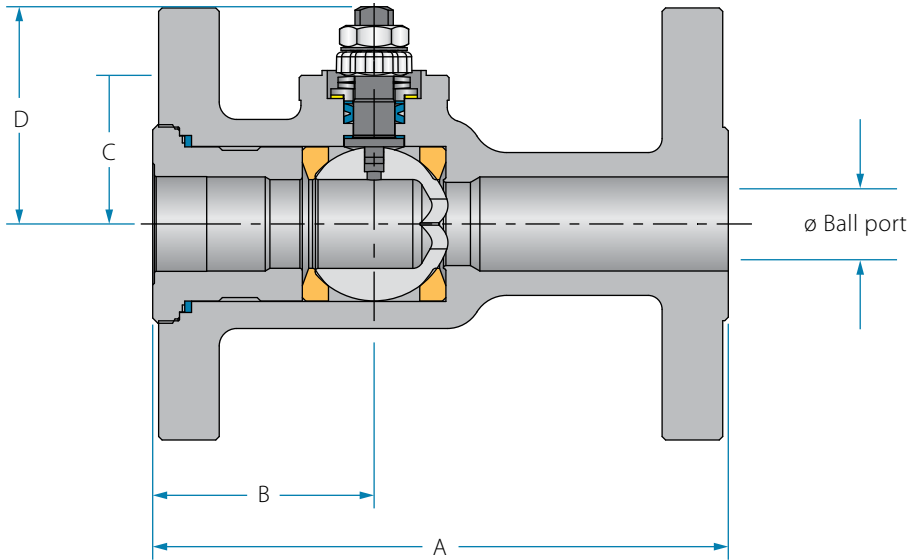
3 Piece

Flanged

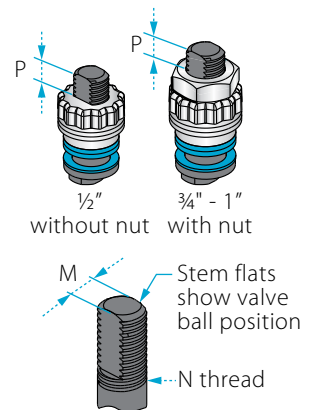
Ordering code system

Size 1/2" - 1" | DN15-DN25 | ANSI Class 150/300 | N73/N74 Series

Valve dimensions

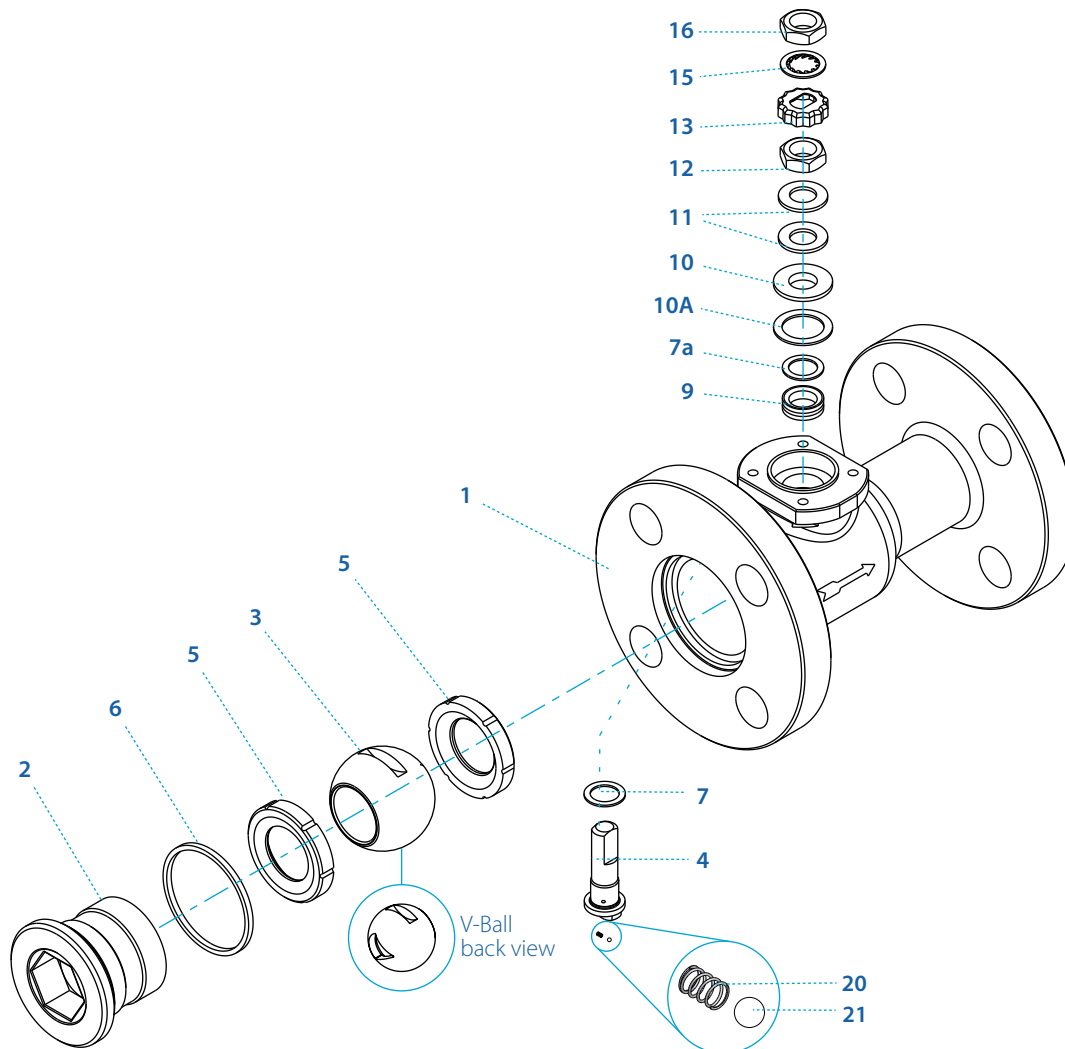


Preparation for actuation



Std. port	Unit	Ball port	A		B	C	D	W		M	N	P	F	TxL	Weight kg/lb		
			150	300				150	300						150	300	
DN15	mm	14.30	108.00	140.00	47.00	31.40	40.50	89.00	95.00	5.54	3/8" - 24 UNF-2A	11.10	(F03)	36.00	M5x10	1.80	2.30
1/2"	inch	0.56	4.25	5.51	1.85	1.24	1.59	3.50	3.74	0.22	24 UNF-2A	0.44		1.42	M5x10	4.00	5.10
DN20	mm	20.60	117.00	152.00	57.00	38.20	55.60	98.00	117.00	7.54	3/8" - 24 UNF-2A	15.40	(F04)	42.00	M5x10	2.20	3.30
3/4"	inch	0.81	4.61	5.98	2.24	1.50	2.19	3.86	4.61	0.30	24 UNF-2A	0.61		1.65	M5x10	4.80	7.30
DN25	mm	25.40	127.00	165.00	62.00	42.70	60.30	108.00	124.00	7.54	7/16" - 20 UNF-2A	15.40	(F04)	42.00	M5x10	3.20	4.60
1"	inch	1.00	5.00	6.50	2.44	1.68	2.37	4.25	4.88	0.30	20 UNF-2A	0.61		1.65	M5x10	7.00	10.10

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M; A216 WCB; A351 CN7M; A494 M35-1; A494 CW-12MW; A494 CX-2MW; A351 CK3MCuN; A995 CD3MN 4A; A995 CE3MN 5A	1
2	Insert	A351 CF8M; A216 WCB; A351 CN7M; A494 M35-1; A494 CW-12MW; A494 CX-2MW; A351 CK3MCuN; A995 CD3MN 4A; A995 CE3MN 5A	1
3	V-Ball	A351 CF8M; B473 N08020; B164 N04400; B574 N06022; B574 N10276; A479 S31254; A479 S31803; A479 S32750	1
4	Stem	B473 N08020; B164 N04400; B574 N06022; B574 N10276; A479 S31254; A479 S31803; A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, CF PEEK, TFM, DELRIN, PCTFE (KEL-F)	2
6*	Body seal	PTFE, Graphite	1
7*	Stem thrust seal	CF PEEK, PCTFE, CF PTFE	1
7a**	Anti-abrasion ring	CF PEEK, PCTFE, CF PTFE	1

Item	Description	Material specification	Qty.
9*	Stem packing	CF PTFE, TFM	1
10	Follower	B783 316L	1
10A*	Slide bearing	TF316	1
11	Disc spring	A693 631 17-7PH	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Locking clip	A164 8, 8A	1
15	Serrated washer	A194 6	1
16	Handle nut	A194 8M, EN3506-2 A4-80	1
20	Anti static spring	A313 302	1
21	Anti static plunger	A479 304	1
22	Arrow Flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Standard items supplied in repair kits

** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General | Habonim Valve Sizing (HVS) software

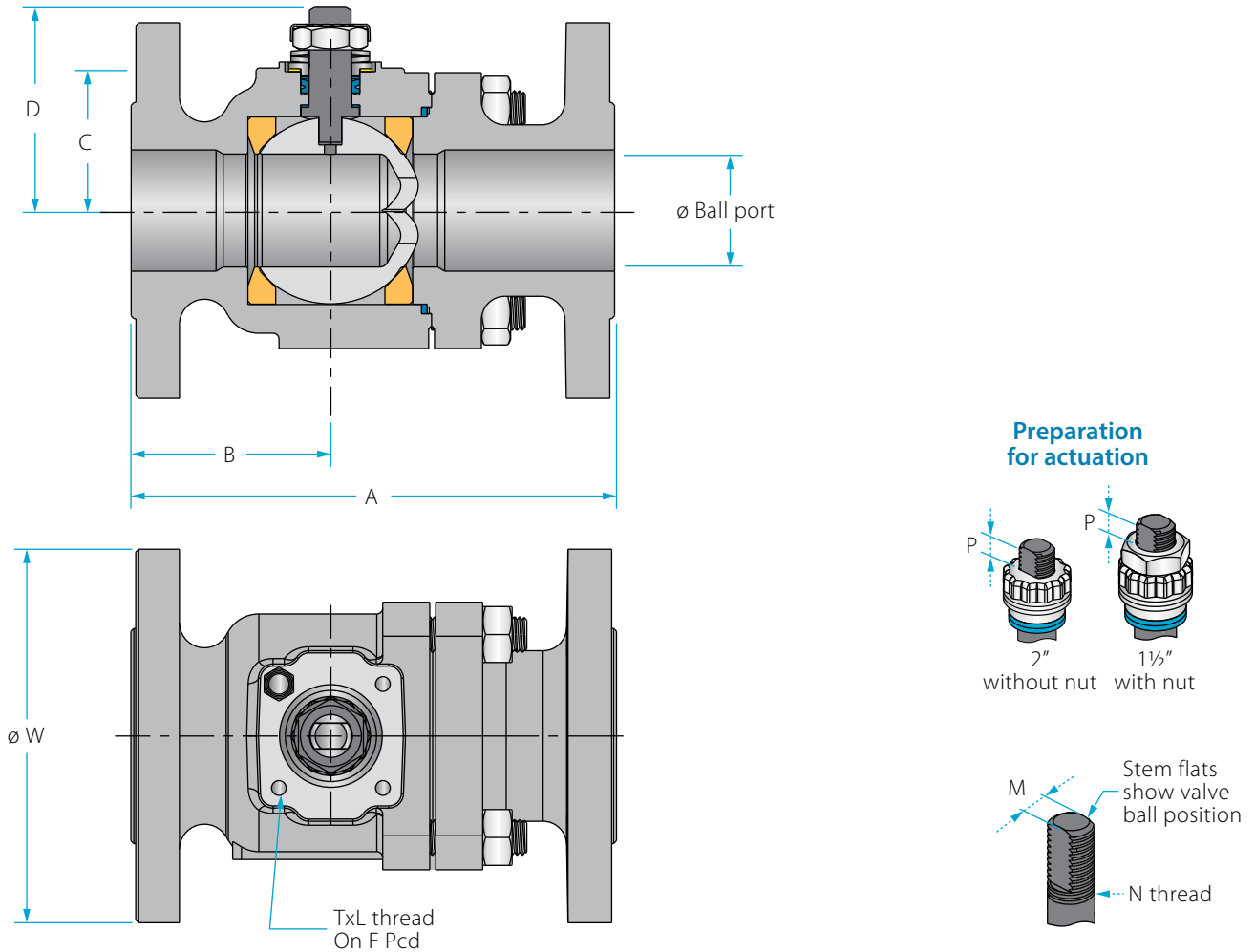
3 Piece

Flanged

Ordering code system

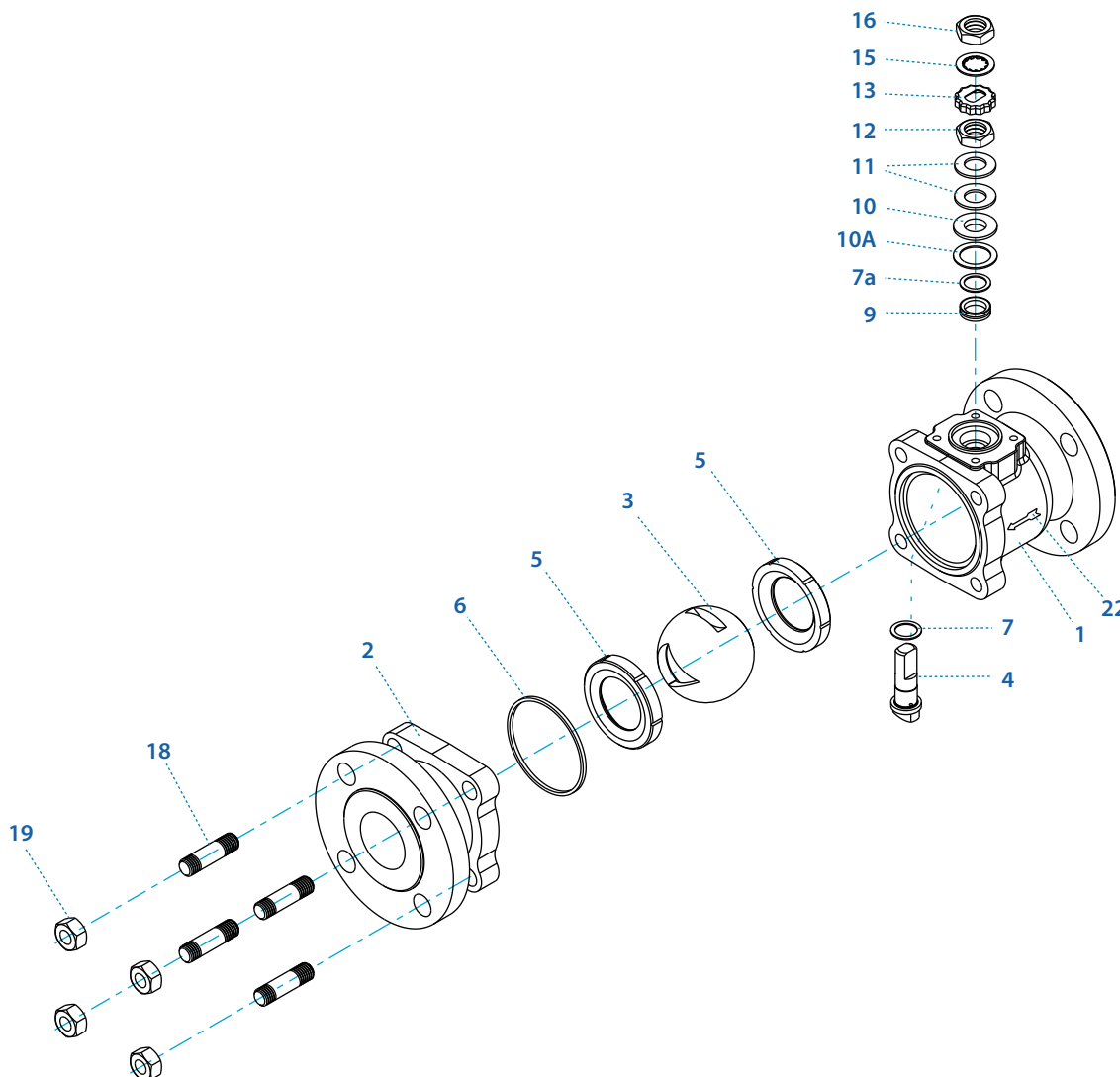
Size 1½"- 2" | DN40-DN50 | ANSI Class 150/300 | N73/ N74 Series

Valve dimensions



Std. port	Unit	Ball port	A		B		C	D	W		M	N	P	F	TxL	Weight kg/lb	
			150	300	150	300			150	300						150	300
DN15	mm	38.10	165.00	190.00	97.00	110.00	48.30	77.80	127.00	156.00	*8.7	9/16 - 18	19.6 (F05)	50.00	M6x12	6.60	10
1½"	inch	1.50	6.50	7.50	3.82	4.33	1.90	3.06	5.00	6.14	*0.34	UNF-2A	0.77	1.97		14.50	22
DN50	mm	50.00	178.00	216.00	109.00	141.00	70.00	88.00	152.00	165.00	*8.7	9/16 - 18	19.6 (F07)	70.00	M8x12	13.00	15
2"	inch	2.00	7.00	8.50	4.29	5.55	2.75	3.46	5.98	6.50	*0.34	UNF-2A	0.77	2.76		28.60	33

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M; A216 WCB; A351 CN7M; A494 M-35-1; A494 CW-12MW; A494 CX-2MW; A351 CK3MCuN; A995 CD3MN 4A; A995 CE3MN 5A	1
2	Insert	A351 CF8M; A216 WCB; A351 CN7M; A494 M-35-1; A494 CW-12MW; A494 CX-2MW; A351 CK3MCuN; A995 CD3MN 4A; A995 CE3MN 5A	1
3	V-Ball	A351 CF8M; B473 N08020; B164 N04400; B574 N06022; B574 N10276; A479 S31254; A479 S31803; A479 S32750	1
4	Stem	B473 N08020; B164 N04400; B574 N06022; B574 N10276; B574 N06022; A479 S31254; A479 S31600; A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, TFM, DELRIN, PCTFE (KEL-F)	2
6*	Body seal	PTFE, Graphite	1
7*	Stem thrust seal	CF PEEK, PCTFE, CF PTFE	1
7a**	Anti-abrasion ring	CF PEEK, PCTFE, CF PTFE	1
9*	Stem packing	CF PTFE, TFM	2

Item	Description	Material specification	Qty.
10	Follower	B783 316L	1
10a	Slide bearing	TF316	1
11	Disc spring	A693 631 17-7PH	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Locking clip	A164 8, 8A	1
16	Handle nut	A193 B8, B8A	1
18	Studs	A193 B8, DIN 3506 A2-70	4
19	Body nuts	A194 8M, EN3506-2 A4-80	4
20	Anti static spring	A313 302	1
21	Anti static plunger	A479 304	1
22	Arrow flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Standard items supplied in repair kits

** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

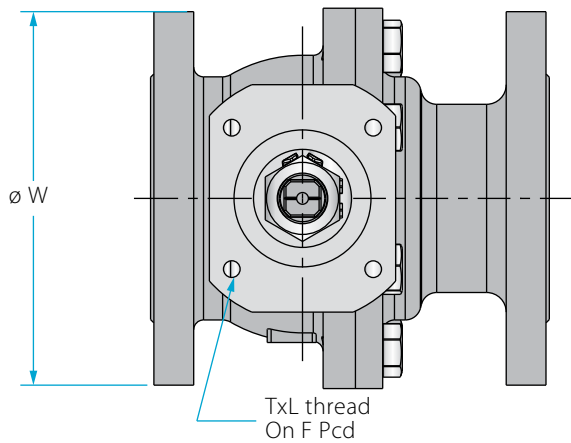
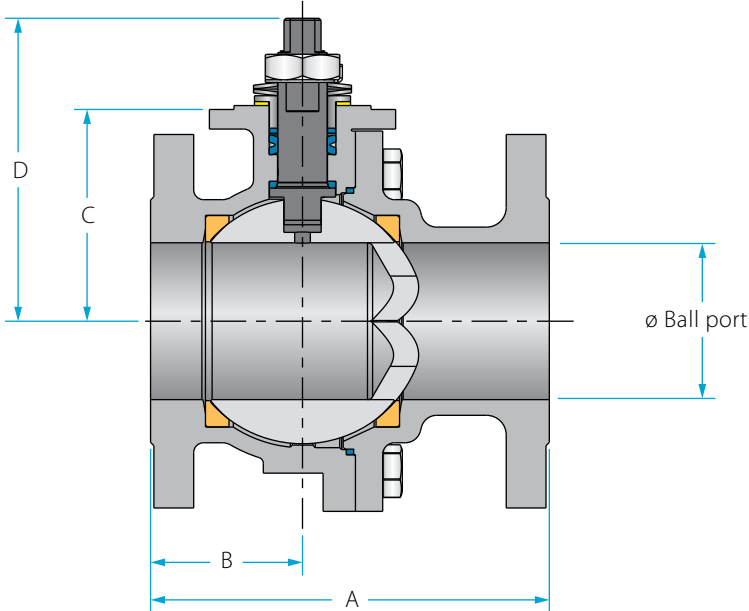
3 Piece

Flanged

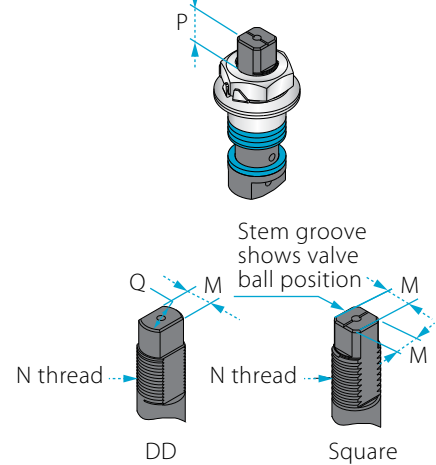
Ordering code system

Size 3"- 8" | DN80-DN200 | ANSI Class 150/300 | N73/N74 Series

Valve dimensions

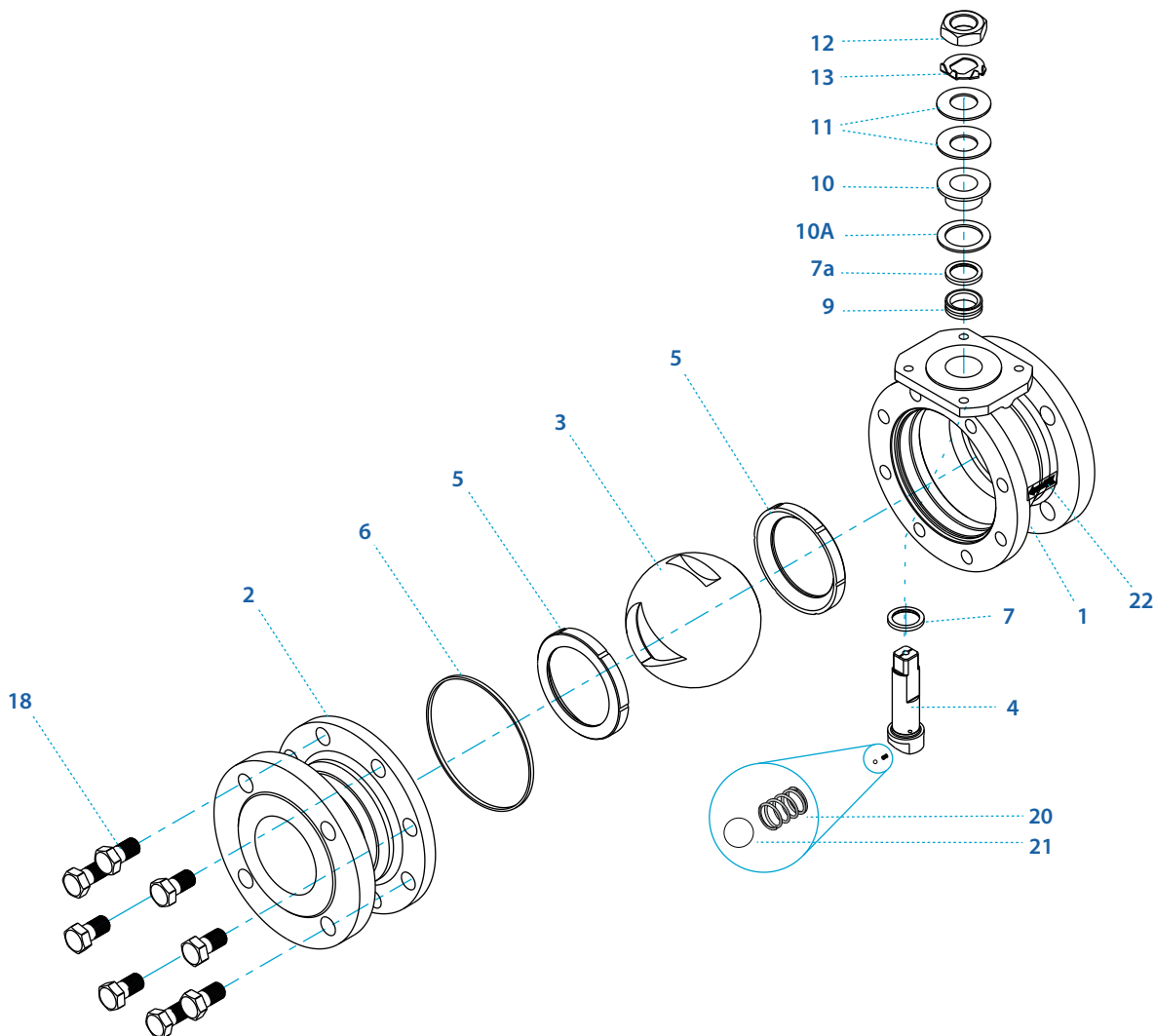


Preparation for actuation



Std. port	Unit	Ball port	A		B		C	D	H	S	W		M	M-DO	N	P	Q	F	TxL	Weight kg/lb		
			150	300	150	300					150	300								M	M-DO	150
DN80	mm	80.00	203.00	283.00	126.00	185.00	108.00	154.60	194.80	400.00	191.00	210.00	18.90	15.90	1"-14	16.70	23.00	(F10)	102.00	M10x20	26	29
3"	inch	3.25	8.00	11.14	4.96	7.28	4.25	6.08	7.67	15.75	7.52	8.27	0.24	0.60	UNF-2A	0.66	0.90		4.02	M10x20	57	64
DN100	mm	100.00	229.00	305.00	144.00	200.00	124.00	170.60	211.00	610.00	230.00	254.00	18.90	15.90	1"-14	16.70	23.00	(F10)	102.00	M10x20	34	39
4"	inch	3.94	9.00	12.01	5.67	7.87	4.88	6.71	8.31	24.00	9.06	10.00	0.24	0.60	UNF-2A	0.66	0.90		4.02	M10x20	75	86
DN150	mm	150.00	394.00	403.00	230.00	229.00	179.00	248.50	308.00	916.00	328.00	328.00	28.40	23.80	1½"-12	26.20	23.00	(F12)	125.00	M12x20	71	78
6"	inch	5.91	15.51	15.87	9.06	9.02	7.05	9.78	12.12	36.00	12.91	12.91	1.11	0.94	UNF-1A	1.03	0.90		4.92	M12x20	156	172
DN200	mm	200.00	457.20	403.50	215.00	261.00	241.00	353.70	-	-	450.00	450.00	35.90	30.15	2"-UN-2A	56.00	32.00	(F12)	125.00	M16x30	190	225
8"	inch	7.87	18.00	15.89	8.46	10.28	9.49	13.93	-	-	17.72	17.72	1.41	1.19	2"-UN-2A	2.20	1.40		5.51	M16x30	419	496

Components & materials



Item	Description	Material specification	Qty.
1	Body	A351 CF8M; A216 WCB; A351 CN7M; A494 M-35-1; A494 CW-12MW; A494 CX-2MW; A351 CK3MCuN; A995 CD3MN 4A; A995 CE3MN 5A	1
2	End	A351 CF8M; A216 WCB; A351 CN7M; A494 M-35-1; A494 CW-12MW; A494 CX-2MW; A351 CK3MCuN; A995 CD3MN 4A; A995 CE3MN 5A	1
3	V-Ball	A351 CF8M; B473 N08020; B164 N04400; B574 N06022; B574 N10276; B574 N06022; A479 S31254; A479 S31600; A479 S32750	1
4	Stem	B473 N08020; B164 N04400; B574 N06022; B574 N10276; B574 N06022; A479 S31254; A479 S31600; A479 S32750	1
5*	Seat	RPTFE, CF PTFE, PEEK, TFM, DELRIN, PCTFE (KEL-F)	2
6*	Body seal	PTFE, Graphite	1
7*	Stem thrust seal	CF PEEK, PCTFE, CF PTFE	1
7a**	Anti-abrasion ring	CF PEEK, PCTFE, CF PTFE	1

Item	Description	Material specification	Qty.
9*	Stem packing	CF PTFE, TFM	2
10	Follower	B783 316L	1
10A	Slide bearing	TF316	1
11	Disc spring	A693 631 17-7PH	2
12	Stem nut	A194 8M, EN3506-2 A4-80	1
13	Tab lock washer	A240 304	1
18	Bolt	A193 B8, DIN 912 A2-70	8-12
20	Anti static spring	A313 302	1
21	Anti static plunger	A479 304	1
22	Arrow flow	A167 304	1
23	Tag (not shown)	A167 304	1

* Standard items supplied in repair kits
 ** Only With HermetiX™ stem seal

Floating Ball Valves

Control valves

General

Habonim Valve Sizing (HVS) software

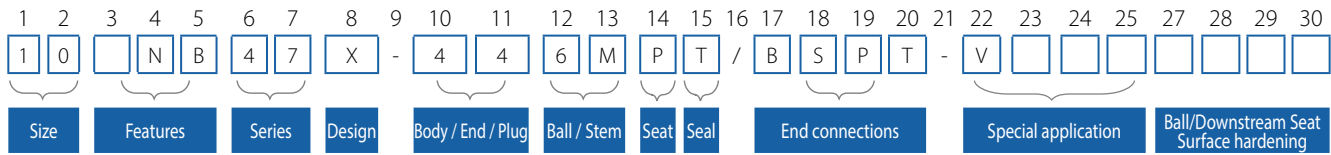
3 Piece

Flanged

Ordering code system

Ordering code system

The Habonim Control Valves identification code



Size			Features		Body / End / Plug			Seal		V-Port	
Code	inch	mm	N	Control	4	C. Steel A216 WCB	G	Expended Graphite	S08	0.8mm Slot on downstream seat	
05	1/2"	15	B	Full Bore	R	C. Steel A352 LC1	I	Impregnated Graphite	S16	1.6mm Slot on downstream seat	
07	3/4"	20	C	Cryogenic	9	C. Steel A352 LCB	R	15% Glass filled RPTFE	S32	3.2mm Slot on downstream seat	
10	1"	25	D	Diverter	6	S. Steel A351 CF8M	T	PTFE	V30	V30° Shape on downstream seat	
12	1 1/4"	32	F	Firesafe	8	S. Steel A351 CF8	U	UHMWPE	V60	V60° Shape on downstream seat	
15	1 1/2"	40	O	Clean assembly for O ₂ service	A	Alloy-20 A351 CN7M	V	VITON	V90	V90° Shape on downstream seat	
20	2"	50	V	Vacuum	W	Alloy-C22 A494 CX-2MW	B	NBR	V-Ball		
25	2 1/2"	65	Series		D	Duplex A995 CD3MN 4A	End Connection		SB08	0.8mm Slot on ball	
30	3"	80	47 ⁽¹⁾	3 Piece Design	K	Super Duplex A995 CE3MN 5A	BSPT	BS 21	SB16	1.6mm Slot on ball	
40	4"	100	31 ⁽²⁾	ANSI #150 std. port	S	254SMO A351 CK3MCuN	DIN	DIN2999 (BSPP)	SB32	3.2mm Slot on ball	
60	6"	150	32 ⁽²⁾	ANSI #300 std. port	Ball / Stem		NPT	B1.20.1	VB30	V30° Shape on ball	
80	8"	200	73 ⁽³⁾	ANSI #150 Full port	M	17-4PH A564 Gr 630 H1150D	BW	Buttweld (Sch 5,10,40)	VB60	V60° Shape on ball	
			74 ⁽³⁾	ANSI #300 Full port	Z	Inconel 718 B637 N07718	XBW	Extended Buttweld	VB90	V90° Shape on ball	
			77 ⁽³⁾	DIN PN16 Full port	7	Monel B164 N04400	SW	Socketweld	Ball/Downstream Seat Surface hardening		
			78	DIN PN40 Full port	A	Alloy-20 B473 N08020	XSW	Extended Socketweld	PN	Low Temperature Plasma carboNitridding (Standard)	
			Design		W	Alloy-C22 B574 N06022	BWO	OD tube	Hardening		
			P	ISO pad basic design	D	Duplex A479 S31803	ETO	Extended OD Tube	I	Cr3C2 - Chromium Carbide with Nickel Chrome binder - HVOF technique	
			X	HermetiX™ stem seal	K	Super Duplex A479 S32750	SWO	Socketweld OD Tube	O	WC-Co - Tungsten Carbide with Cobalt binder - HVOF technique	
			W	HermetiX™ graphite free fire safe stem seal	S	254SMO A479 S31254	TC	Tri-Clamp	E	Stellite - PTA technique	
			G	HermetiX™ graphite free fire safe stem seal FDA compliant	Seat		Flange				
					A	TFM	150	ANSI #150 RF			
					C	PCTFE	300	ANSI #300 RF			
					K	CF PEEK	PN16	EN1092 PN16 RF			
					L	Virgin PEEK	PN16	EN1092 PN40 RF			
					P	CF PTFE					
					R	15% Glass filled RPTFE					
					U	UHMWPE					
					Y	Derlin					
					W	PVDF					

⁽¹⁾ Available sizes 1/4" - 4" DN8-DN100 full port

⁽²⁾ Available sizes 1/2" - 8" DN15-DN200, with the exception of 1 1/4" and 2 1/2" DN32-DN65

⁽³⁾ Available sizes 1/2" - 6" DN15-DN150, with the exception of 1 1/4" and 2 1/2" DN32-DN65

⁽⁴⁾ Ball/Characterized Seat Assembly base material available only with stainless steel AISI 316

⁽⁵⁾ Various standard slot options available for up to 1" valve size.

⁽⁶⁾ Exotic material trims available only with Characterized Ball.

⁽⁷⁾ Various additional designs and materials are available.

⁽⁸⁾ Also used as a downstream seat with a characterized ball.

In some applications the available options above are limited to specific sizes. Consult with Habonim for details.



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