

High Performance Control Valve



PRODUCT DATA BULLETIN

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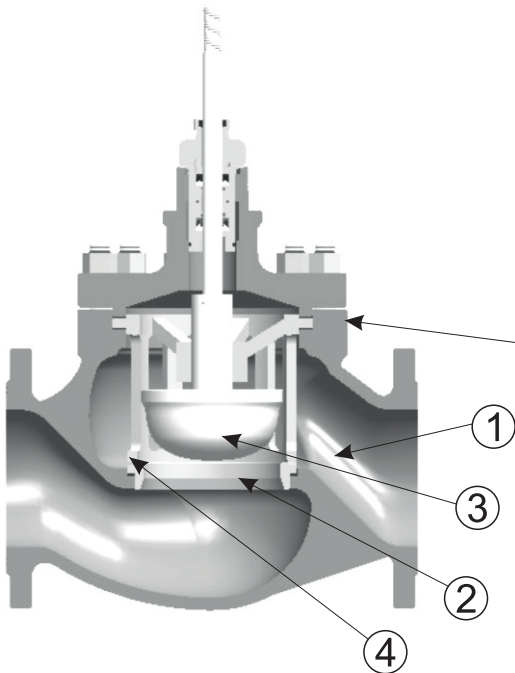
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HIGH PERFORMANCE CONTROL VALVES

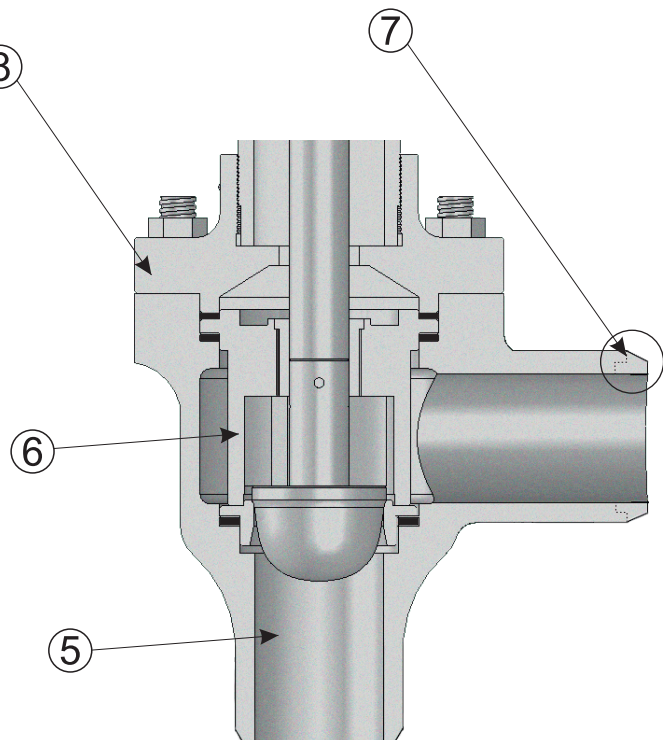
Innovative Technology for the 21st Century

HLV control valve family represent an integrated valve solution for the 1960's...and beyond. Not a compromise or repackaging of old valve technologies. The HLV valve concept integrates proven state-of-the-art design in aerodynamic/hydrodynamic flow, field proven materials, digital positioning, and "smart" valve technology, with a modular design concept. The sum and benefit of flow valve technological advances is simply the most accurate, reliable control valve product line available in the world today.

**Typical Globe Style Body
Unbalanced Trim**



**Typical Angle Style Body
Unbalanced Trim**



HIGH PERFORMANCE CONTROL VALVES

Solution-Engineered Features for Demanding Applications

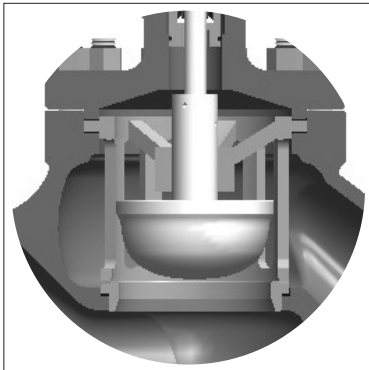
- 1. Aerodynamic Flow Control Valves**
 - integrally cast into the inlet and Outlet
 - ◇ Profiles flow to reduce turbulence
 - ◇ Evenly distributes flow around the cage
 - ◇ Reduces Noise generated in the valve
- 2. Zero Leakage Tight Shut-off**
 - ◇ Exceeds ANSI Class VI Shut-off
 - ◇ Metal to Metal Seat and Pilot Balanced Plug Design
 - ◇ Zero cc/min without over Sized Actuators
- 3. Custom Characterized Trim Options**
 - ◇ Combination Characterized Cage-Combines High Rangeability, Cavitation I Protection and Low Noise in One Valve
 - ◇ High Gain Trim-Ultra High Speed, Extraordinary Accuracy Guaranteed Repeatability
 - ◇ Mini P Multi Stage Trim-Designed For Low-Flow, High ΔP , Cavitating Service with Tight Shut-Off
 - ◇ HLV-Sonic Cage-Provide up to a 25 BA noise reduction
 - ◇ HLV-CAV Multi Stage Cage-Up to five stages control for pressure drops to 4000 PSI(276BAR)
 - ◇ Micro Taper Trim-Specially designed trim for very fine control in Low-Flow/High ΔP Applications
- 4. Tri-Shear Protected Seat Design**
 - ◇ Prevents high velocity erosion at opening and closing
 - ◇ Provides a five-stage pressure drop near the seating position
 - ◇ Prevents particle components on the seating surfaces since they are withdrawn from the direct flow path before flow commences
- 5. “Smart Valve” Capability**
 - ◇ Optional Inlet and Outlet pressure taps provide accurate, stable pressure measurements required by today's “smart” instrument-action
- 6. Quick Change Trim Design(ANSI 900 and above)**
 - ◇ Seat retention and gasket loading are designed of reliability and ease of maintenance
- 7. Oversized Outlet Connection**
 - ◇ HLV flow Valves can be supplied with a larger outlet connection than the valve body size(Socketweld and Buttweld ends only)
- 8. Parts Interchangeability**
 - ◇ All parts interchangeable between globe and angle style bodies
 - ◇ Reduces parts inventory
 - ◇ Reduces maintenance training

HIGH PERFORMANCE CONTROL VALVES

HLV trim design allows you to choose the ideal cost/performance combination for each application. All trim modules are 100% field interchangeable providing extraordinary flexibility and value. Any of the cage throttling designs shown below can be combined with any of the characterized cages shown in this section to give you the best possible solution to your specific severe service applications where fine control of low flows and high differential pressure is a critical part to your operation.

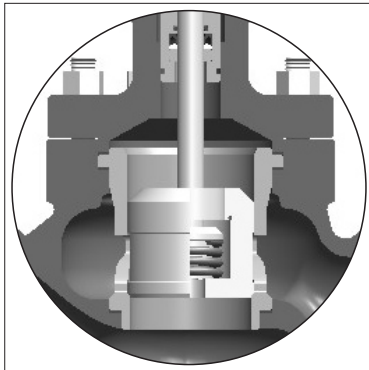
Modular Trim Designs - Top guided design(Unbalanced trim)

UNBALANCED(SS)



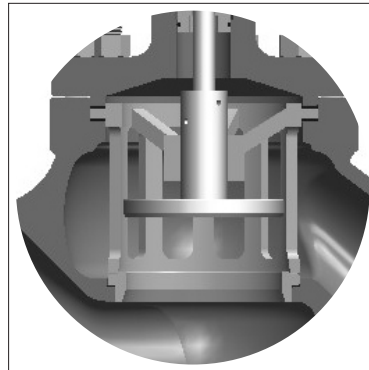
3/4"-12" DN20-DN300
ANSI 150~600#
PN1.6~6.4Mpa
-196°C~565°C
Class V/VI/Zero

UNBALANCED(DPR)



4"-12" DN100-DN300
ANSI 150~600#
PN1.6~6.4Mpa
-196°C~565°C
Class V/VI

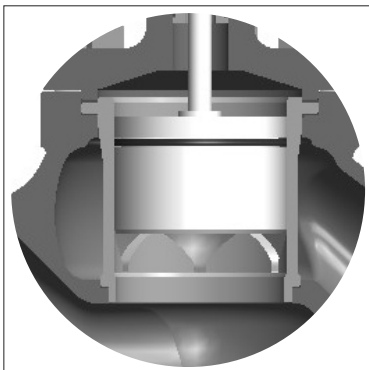
UNBALANCED(SO)



3/4"-12" DN20-DN300
ANSI 150~600#
PN1.6~6.4Mpa
-196°C~565°C
Class VI/Zero

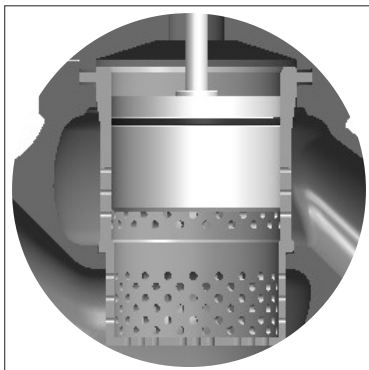
Modular Trim Designs - Cage guided design(Balanced trim)

BALANCED(CS)



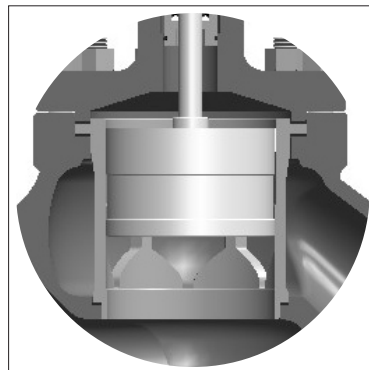
3/4"-12" DN20-DN300
ANSI 150~600#
PN1.6~6.4Mpa
-196°C~565°C
Class VI/Zero

BALANCED(CMH)



3/4"-12" DN20-DN300
ANSI 150~600#
PN1.6~6.4Mpa
-196°C~565°C
Class VI/Zero

BALANCED(CD)



3/4"-12" DN20-DN300
ANSI 150~600#
PN1.6~6.4Mpa
-196°C~565°C
Class VI/Zero

HIGH PERFORMANCE CONTROL VALVES

Cv Table

Flow Characteristic-Linear and Equal %						
Valve size inch/DN	Stoke inch/DN	Stem Dia. inch/DN	Seat Dia. inch/DN	Min Cv STD/DPS	Linear	Equal%
					Max.Cv	Max.Cv
					ANSI 150-600	ANSI 150-600
0.75/20	1/25	0.75/20	1.00/25	0.20/0.06	12	9
1/25	1/25	0.75/20	1.00/25	0.20/0.06	20	16
1.5/40	1/25	0.75/20	1.50/40	0.20/0.10	36	30
2/50	1.5/40	0.75/20	2.25/57	0.30/0.10	65	55
3/80	2/50	0.75/20	3.00/80	0.40/0.20	140	125
4/100	2/50	0.75/20	3.80/97	0.9/0.4	210	190
6/150	3/75	1.00/25	5.31/135	1.4/0.6	470	420
8/200	3/75 4/100	1.25/32	7.06/179	1.8/0.7	725 750	650 720
10/250	3/75 4/100	1.25/32	8.5/216	5.0/2.0	1375 1550	1230 1390
12/300	3/75 4/100	1.25/32	10/254	6.0/2.6	1740 2020	1560 1790

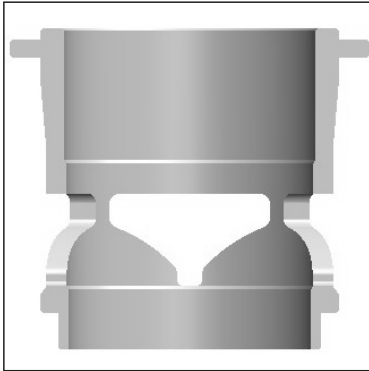
Flow Characteristic-LINEAR									
Valve size inch/DN	Stoke inch/DN	Stem Dia. inch/DN	Seat Dia. inch/DN	Min Cv STD/DPS	ANSI 150-600				
					CAV I	CAV II	CAV III	CAV IV	CAV V
2/50	1.5/38 2/51	0.75/20	2.2/56	0.6	40 52	15 20	9 12	3.6 7	2.4 6
3/80	2/51 3/76	0.75/20	2.96/75	0.8	75 110	28 48	18 28	6 14	4.8 12
4/100	2/51 3/76	0.75/20	3.80/93	0.9	95 140	45 76	27 46	10.8 26	7.8 22
6/150	3/76 4/102	1/25	5.31/135	1.4	200 265	110 175	58 90	22.8 60	16.8 52
8/200	3/76 4/102 5/127	1.25/32	7.06/179	1.8	270 340 430	150 225 300	106 140 180	58 87 116	50 75 100
10/250	3/76 4/102 5/127	1.25/32	8.50/216	5.0	370 490 620	210 280 350	150 195 250	81 122 162	70 106 140
12/300	3/76 4/102 5/127	1.25/32	10/254	5.6	450 600 750	250 330 415	178 235 300	97 146 195	84 126 168

Note: Standard travel maximum and 0.6 factor Cv's are shown in 2-6" valve size for reference. Max Cv'S are shown otherwise. Custom Cv's are standard.

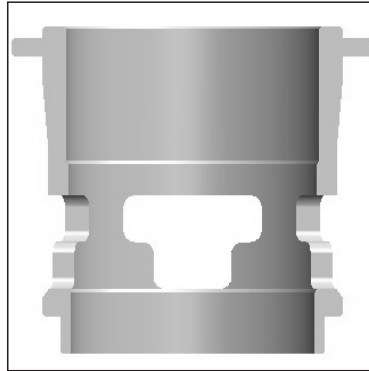
HIGH PERFORMANCE CONTROL VALVES

Custom characterized control

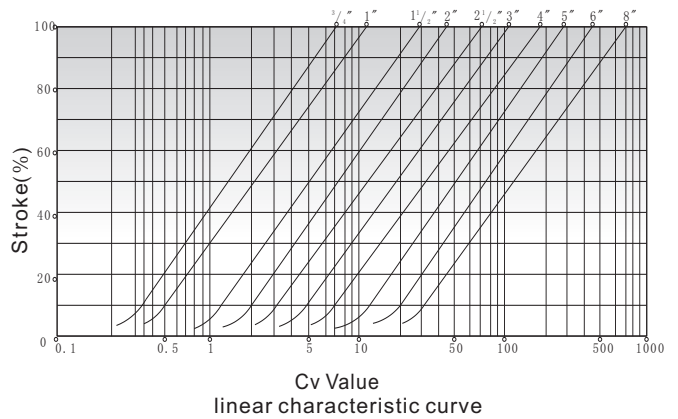
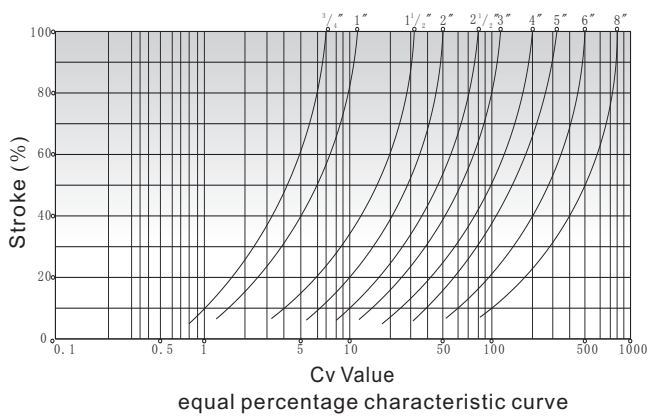
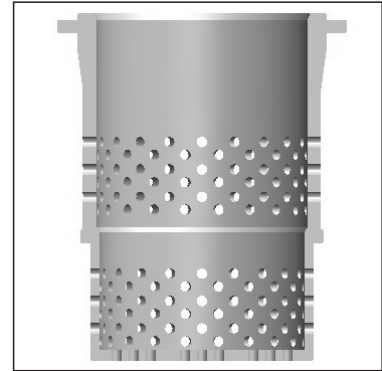
Equal% cage



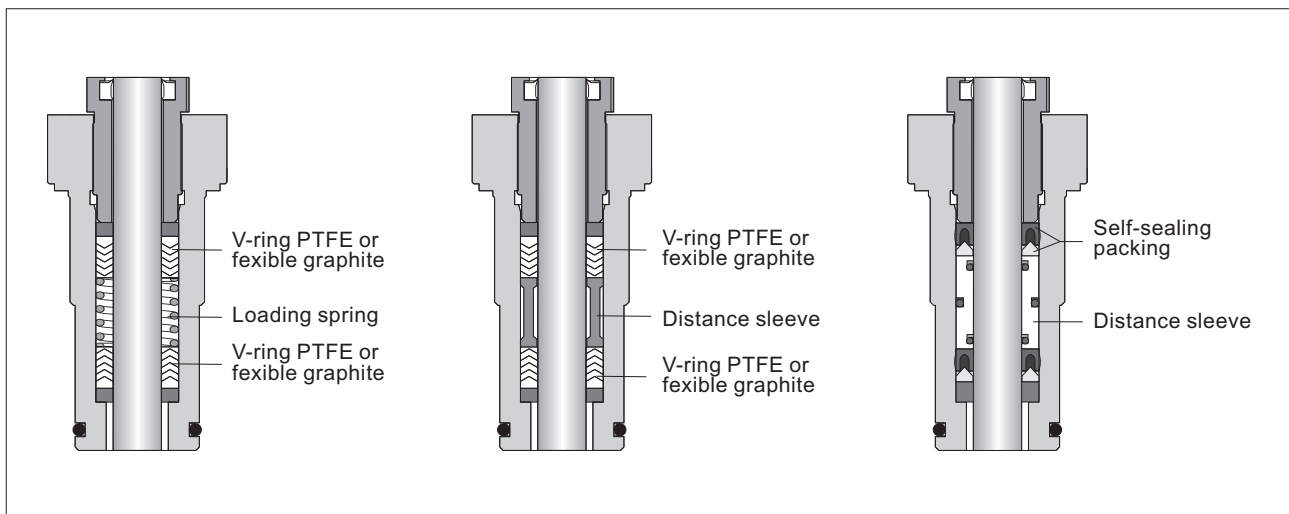
linear cage



Cage for noise control



Custom packing options



HIGH PERFORMANCE CONTROL VALVES

How to Specify HLV Control Valves

Valve Body

- 1.1.1 Body should have integrally cast flow control vanes in the inlet, outlet and body gallery to reduce turbulence and allow maximum Cv/Size ratios.
- 1.1.2 Body should be designed with a pressure tap on the inlet side so that adjacent piping penetration points are not needed.
- 1.1.3 Globe and angle body configurations should be designed so that trim modules are fully interchangeable.

Valve Trim

- 1.2.1 Pilot unbalanced trim to have capability to shutoff to ANSI Class VI or Zero leakage utilizing metal-to-metal seats.
- 1.2.2 Valve plug should be designed with a three stage labyrinth style plug tip for cavitating services.
- 1.2.3 Trim design should allow for reduction down to a 0.2 factor of full Cv, without changing the original plug or seat ring.
- 1.2.4 Cage design should allow for modification of flow window for a desired flow characteristic without changing plug assembly.
- 1.2.5 Unbalanced designs should allow for reduction of Cv without reducing seat ring diameter.

Actuators

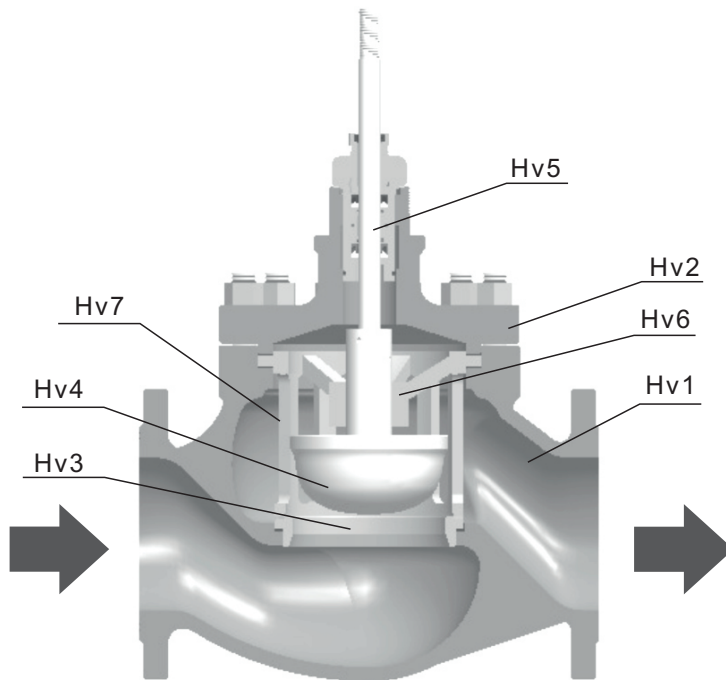
- 2.1.1 Actuator should be designed in a steel or composite construction that is rated for 150 psig working pressure.
- 2.1.2 Air failure spring should be mounted outside air cylinder to minimize residual air volume.
- 2.1.3 Spring cartridge should be mounted so that accessibility for reversing failure modes is easily accomplished.
- 2.1.4 Actuator/spring assembly shall be designed to provide a low center of gravity for vibration and seismic resistance.

Electro-Pneumatic positioners

- 3.1.1 Positioner design should include as a standard, built in limit switch contacts and 4~20mA position transmitter output.
- 3.1.2 Positioner should have a guaranteed accuracy of +0.0012" of calibrated span.
- 3.1.3 Positioner should have a guaranteed repeatability of +0.0012" of span.
- 3.1.4 Hysteresis including dead band should be 0.01%.

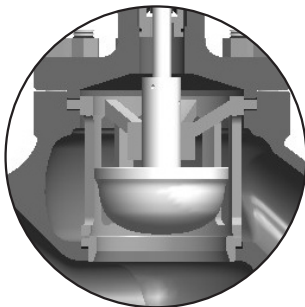
HIGH PERFORMANCE CONTROL VALVES

Unbalanced Design

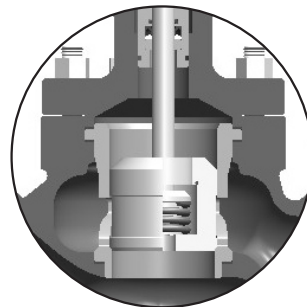


Body/bonnet Module
shown with
Unbalanced Cage
Throttling Trim

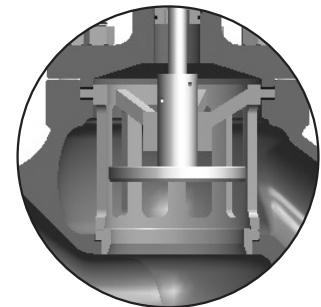
Unbalanced Plug
Throttling Trim-SS



Unbalanced Plug
Throttling Trim-DPR



Unbalanced Plug
Throttling Trim-SO



HIGH PERFORMANCE CONTROL VALVES

Unbalanced Design

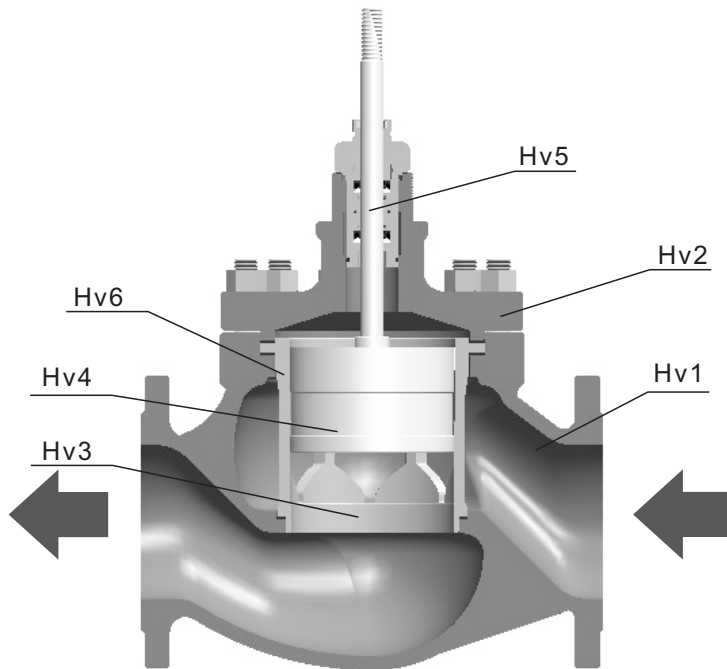
Materials/Temperature Specifications

No.	Parts Name	Trim Materials	Temp. Range (°C)
Hv1	BODY	A216-WCB	-5~+425
		A351-CF8/CF8M	-196~+649
		A217-WC6/WC9	-30~+593
		LF6	-196~+45
Hv2	BONNET	A216-WCB	-5~+425
		A351-CF8/CF8M	-196~+649
		A217-WC6/WC9	-30~+593
Hv3	SEAT	A351-CF8/CF8M/CF3M	-196~+565
		PTFE	-196~+200
Hv4	PLUG	A351-CF8/CF8M/CF3M	-196~+565
Hv5	STEM	17-4PHSS HEAT TREATMENT	-40~+425
		A351-CF8/CF8M/CF3M	-196~+565
Hv6	GUIDED PIECE	17-4PHSS HEAT TREATMENT	-40~+425
		A351-CF8/CF8M/CF3M	-196~+565
Hv7	CAGE	A351-CF8/CF8M/CF3M	-196~+565

Note. The materials in table are all in common use, yet we can supply TA2, Aluminum bronze, Hastelloy, Incone, ect.

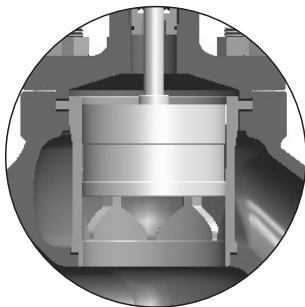
HIGH PERFORMANCE CONTROL VALVES

Balanced Design

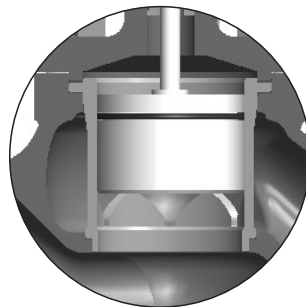


Body/bonnet Module
shown with
Balanced Cage

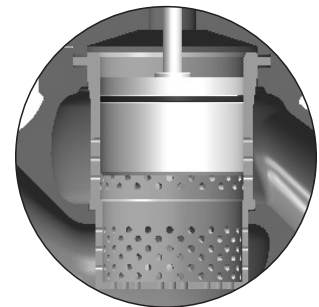
Unbalanced Plug
Throttling Trim-CD



Unbalanced Plug
Throttling Trim-CS



Unbalanced Plug
Throttling Trim-CMH



HIGH PERFORMANCE CONTROL VALVES

Balanced Design

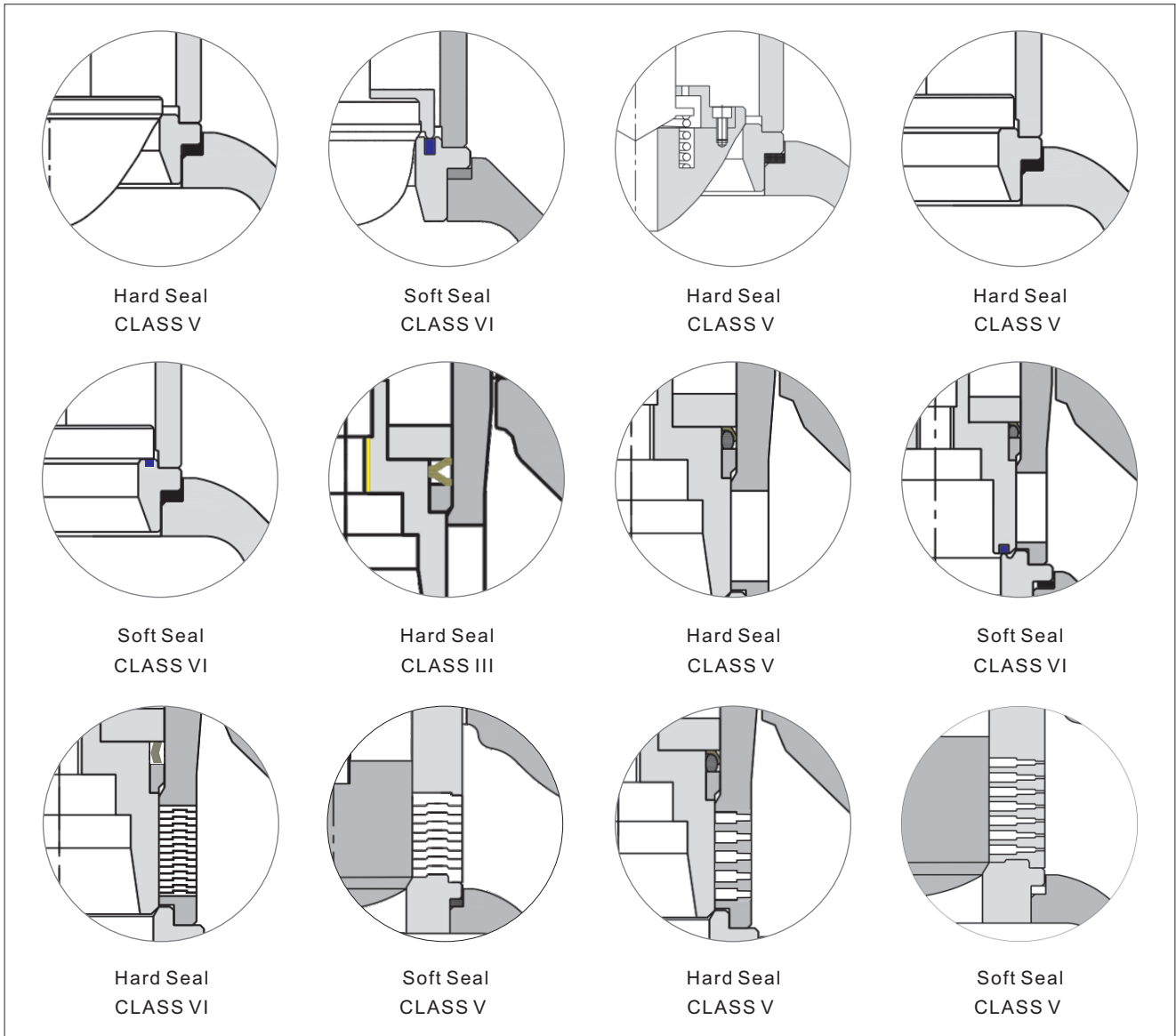
Materials/Temperature Specifications

No.	Parts Name	Trim Materials	Temp. Range (°C)
Hv1	BODY	A216-WCB	-5~+425
		A351-CF8/CF8M	-196~+649
		A217-WC6/WC9	-30~+593
		LF6	-196~+45
Hv2	BONNET	A216-WCB	-5~+425
		A351-CF8/CF8M	-196~+649
		A217-WC6/WC9	-30~+593
Hv3	SEAT	A351-CF8/CF8M/CF3M	-196~+565
		PTFE	-196~+200
Hv4	PLUG	A351-CF8/CF8M/CF3M	-196~+565
Hv5	STEM	17-4PHSS HEAT TREATMENT	-40~+425
		A351-CF8/CF8M/CF3M	-196~+565
Hv6	CAGE	A351-CF8/CF8M/CF3M	-196~+565

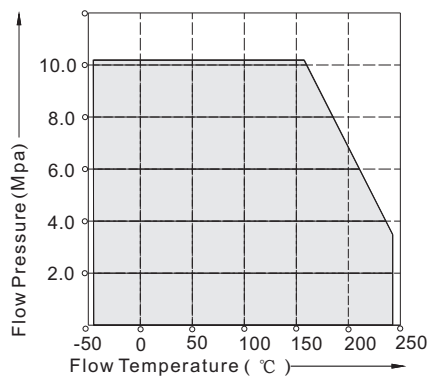
Note. The materials in table are all in common use, yet we can supply TA2, Aluminum bronze, Hastelloy, Incone, ect.

HIGH PERFORMANCE CONTROL VALVES

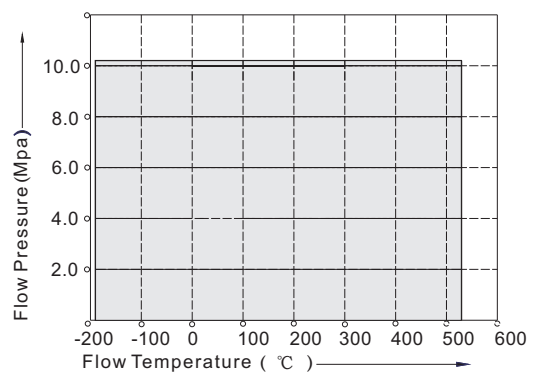
Seal Type



R.PTFE

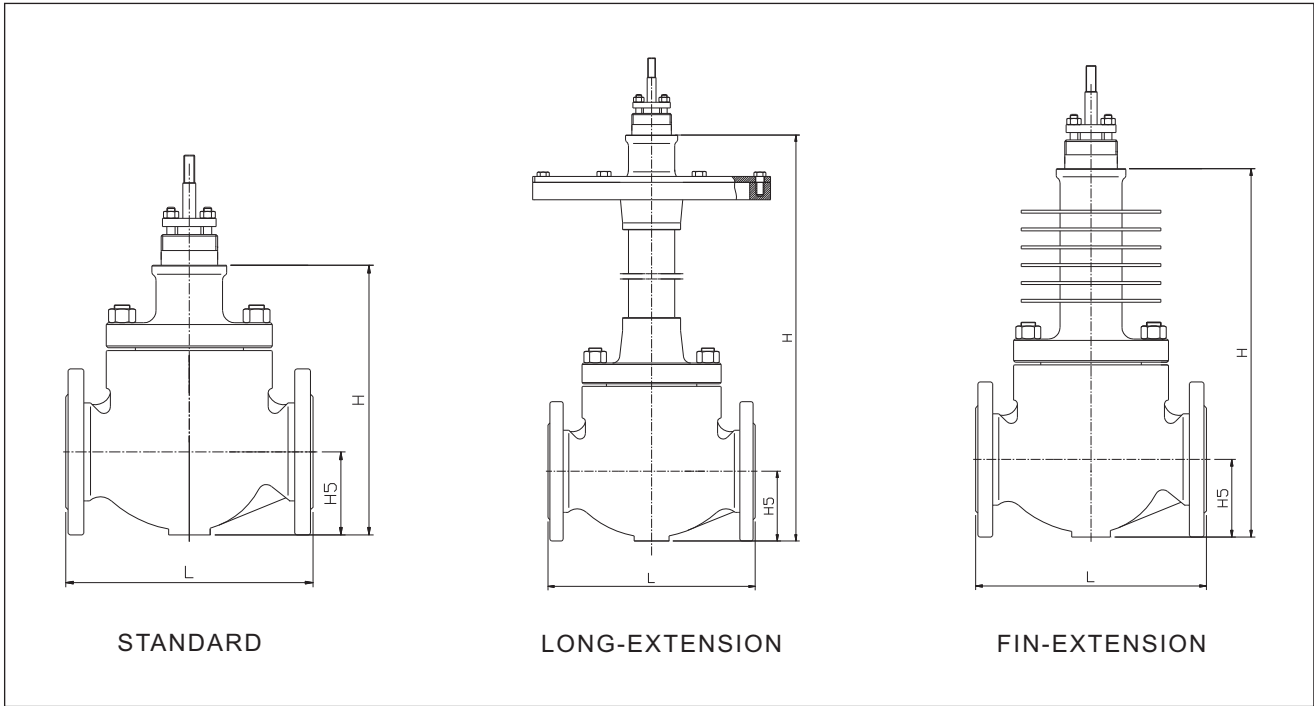


Flexible Graphite



HIGH PERFORMANCE CONTROL VALVES

Dimensions(flange type)



ANSI 150#

DIMENSIONS IN MILLIMETERS							
SIZE	L	H5	H			STANDARD WGT.	STANDARD VOL.
			STANDARD	FIN-EXTENSION	LONG-EXTENSION		
ANSI 150# PN16 Flanged							
20	184	52	184	334	904	24kg	0.1m ³
25	184	52	184	334	904	25kg	0.1m ³
40	222	68	238	407	936	29kg	0.1m ³
50	254	83	262	432	966	43kg	0.1m ³
80	298	98	319	519	996	70kg	0.1m ³
100	352	117	351	551	1034	105kg	0.2m ³
150	451	150	444	704	1100	230kg	0.3m ³
200	543	186	517	777	1172	423kg	0.4m ³
250	673	245	632	882	--	508kg	0.5m ³
300	737	248	713	963	--	785kg	0.7m ³

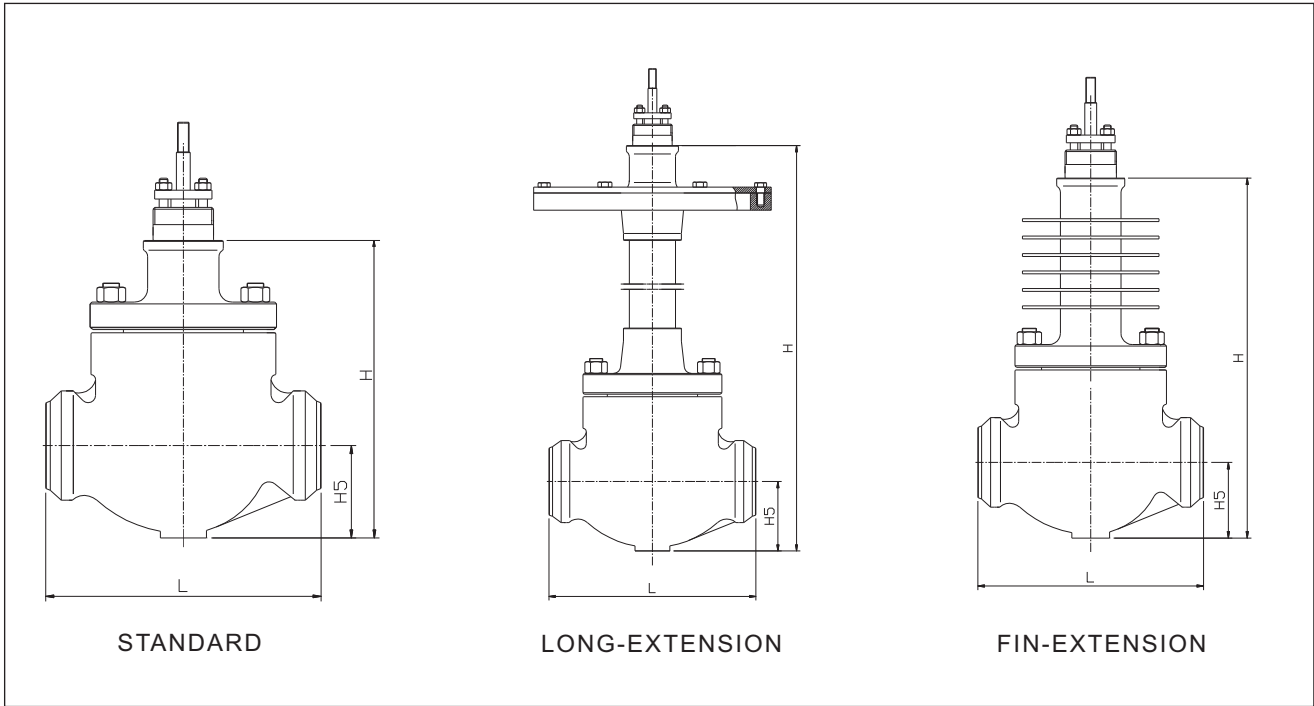
HIGH PERFORMANCE CONTROL VALVES

Dimensions(flange type)

DIMENSIONS IN MILLIMETERS							
SIZE	L	H5	H			STANDAR D WGT.	STANDAR D VOL.
			STANDARD	FIN-EXTENSION	LONG-EXTENSION		
ANSI 300# PN40 Flanged							
20	194	52	184	334	904	25kg	0.1m ³
25	197	52	184	334	904	26kg	0.1m ³
40	235	68	238	407	936	30kg	0.1m ³
50	267	83	262	432	966	44kg	0.1m ³
80	317	98	319	519	996	73kg	0.1m ³
100	368	117	351	551	1034	109kg	0.2m ³
150	473	150	444	704	1100	239kg	0.3m ³
200	568	186	517	777	1172	432kg	0.5m ³
250	700	245	632	882	--	517kg	0.6m ³
300	775	248	713	963	--	798kg	0.7m ³
ANSI 600# PN64-100 Flanged							
20	206	52	184	334	904	25kg	0.1m ³
25	210	52	184	334	904	26kg	0.1m ³
40	251	68	238	407	936	30kg	0.1m ³
50	286	83	262	432	966	44kg	0.1m ³
80	337	98	319	519	996	73kg	0.1m ³
100	394	117	351	551	1034	109kg	0.2m ³
150	508	150	444	704	1100	239kg	0.3m ³
200	610	186	517	777	1172	432kg	0.5m ³
250	770	245	632	882	--	517kg	0.6m ³
300	819	248	713	963	--	798kg	0.7m ³

HIGH PERFORMANCE CONTROL VALVES

Dimensions(weld type)



ANSI 150#

DIMENSIONS IN MILLIMETERS							
SIZE	L	H5	H			STANDARD WGT.	STANDARD VOL.
			STANDARD	FIN-EXTENSION	LONG-EXTENSION		
ANSI 150# PN16 Weld							
20	184	52	184	334	904	22kg	0.1m ³
25	184	52	184	334	904	23kg	0.1m ³
40	222	68	238	407	936	27kg	0.1m ³
50	254	83	262	432	966	42kg	0.1m ³
80	298	98	319	519	996	68kg	0.1m ³
100	352	117	351	551	1034	103kg	0.2m ³
150	451	150	444	704	1100	226kg	0.3m ³
200	543	186	517	777	1172	415kg	0.4m ³
250	673	245	632	882	--	496kg	0.5m ³
300	737	248	713	963	--	772kg	0.7m ³

HIGH PERFORMANCE CONTROL VALVES

Dimensions(weld type)

DIMENSIONS IN MILLIMETERS							
SIZE	L	H5	H			STANDAR D WGT.	STANDAR D VOL.
			STANDARD	FIN-EXTENSION	LONG-EXTENSION		
ANSI 300# PN40 Weld							
20	194	52	184	334	904	23kg	0.1m ³
25	197	52	184	334	904	24kg	0.1m ³
40	235	68	238	407	936	28kg	0.1m ³
50	267	83	262	432	966	43kg	0.1m ³
80	317	98	319	519	996	70kg	0.1m ³
100	368	117	351	551	1034	105kg	0.2m ³
150	473	150	444	704	1100	228kg	0.3m ³
200	568	186	517	777	1172	417kg	0.5m ³
250	700	245	632	882	--	500kg	0.6m ³
300	775	248	713	963	--	774kg	0.7m ³
ANSI 600# PN64-100 Weld							
20	206	52	184	334	904	24kg	0.1m ³
25	210	52	184	334	904	25kg	0.1m ³
40	251	68	238	407	936	29kg	0.1m ³
50	286	83	262	432	966	44kg	0.1m ³
80	337	98	319	519	996	72kg	0.1m ³
100	394	117	351	551	1034	109kg	0.2m ³
150	508	150	444	704	1100	235kg	0.3m ³
200	610	186	517	777	1172	425kg	0.5m ³
250	770	245	632	882	--	510kg	0.6m ³
300	819	248	713	963	--	786kg	0.7m ³

HIGH PERFORMANCE CONTROL VALVES

NOTES.

HLV[®]

**HLV FLOW
MACHINERY**

Canada HLV Flow Machinery Corporation
[Http://www.hlvflow.com](http://www.hlvflow.com)

ADD: 54-4936 Dalton Drive NW
Calgary, Alberta Canada T3A2E4
TEL: (403)390-3406
FAX: (403)286-8868

