

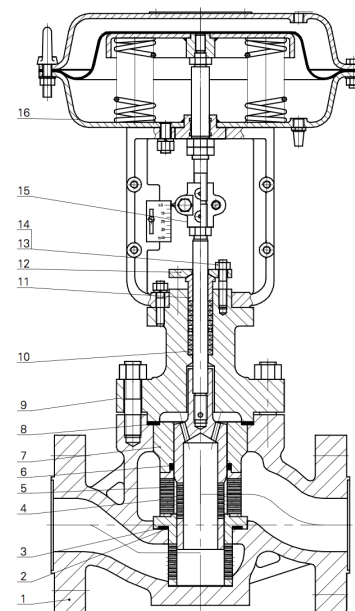
HCN Pneumatic Low-Noise Cage Type Control Valve

OVERVIEW

Model HCN Low-Noise Cage type Control Valves have been designed to remarkably reduce acoustic noise in services of compressible fluids such as steam, air, and natural gas. The cage has a large number of small holes and renders an ideal pressure reduction with a combination in two steps of “restriction” and “diffusion and expansion.” The fluid passage has been designed in S-figure shape for smooth flow of fluid with less pressure loss and a stabilizer is provided as a strainer for flow near the cage, thereby permitting a large Cv value.

The valve plug is of a pressure-balanced type which allows control of a high differential pressure with a small actuating force. The actuator is a compact but high output diaphragm motor of a multiple spring type structured in a simple mechanism.

The model HCN valves, which are compact but of a low noise type and render high dynamic stability, are suitable especially for control of high temperature, high pressure or high differential pressure process lines.



HCN Standard Type

1. Body 2. Seat 3. Gasket 4. Lower Cage 5. Plug 6. Spring sealing 7. Upper Cage 8. Sealing 9. Bonnet 10. Packing 11. Packing Screw 12. Packing Plate 13&14. Nuts&Bolts 15. Stem Connector 16. Actuator

SPECIFICATIONS

Body

Type

Straight-through, cast globe valve

Nominal size

1-1/4", 1-1/2", 2", 2-1/2", 3", 4", 5", 6", 8", 10", 12", 14", 16"

Pressure rating

- ANSI Class 125, 150, 300, 600
- JIS 10K, 16K, 20K, 30K, 40K
- PN1.6, 4.0, 6.4, 10.0 Mpa

End connection

- Flanged End: FF, RF, RJ, LG
According to ANSI B16.5, JIS B2201, JB/T79.1
PN1.6MPa, JB/T79.2
- Welded End: SW, BW
- Threaded End: Rc

Material

A216 WCB, A216WC6, A352 LCB, A351 CF8, A351 CF8M, A351 CF3M, A351 CF3(see table3-1,3-2)

Bonnet

- Plain bonnet (-17 to 230°C)
- Extension bonnet Type1(-45 to -17°C and 230 to 566°C)
- Extension bonnet Type 2 Cryogenic
Integral cast type (-100 to -45°C)
Welded type (-196 to -100°C)
(See Figure 2-1, 2-2)

Gland type

Bolted Gland

Packing

V shaped PTFE, PTFE, Flexible graphite

Gasket material

Stainless steel(SUS304, SUS316, SUS316L), copper, aluminum

Trim

Valve plug

Pressure balanced type

Actuator

Type

Single-acting diaphragm actuator, Spring type piston actuator, Double acting piston actuator

Diaphragm material

Cloth embedded nylon and ethylene propylene rubber

Spring range

- 20 to 100 kPa(0.2 to 1.0 kgf/cm²)
- 40 to 200 kPa(0.4 to 2.0 kgf/cm²)
- 80 to 240 kPa(0.8 to 2.4 kgf/cm²)

Supply pressure

0.14, 0.16, 0.28, 0.4, 0.5 Mpa

Air connection

Rc1/4 or 1/4NPT internal thread

Ambient temperature

-30 to 70°C

Valve action

- FO: Air to close(Direct action actuator is combined.)
- FC: Air to open(Reverse action actuator is combined.)

Optional accessories

- P/P or I/P Positioner
- Air filter regulator
- Top-mounted or Side-mounted Handwheel
- Limit switch
- Solenoid valve
- Motion transmitter
- Booster relay
- Lock-up valve
- Air lock relay
- Others

Performance

Rated Cv value

Refer to table 1.

Flow characteristics

- Approximate Equal percentage
- Approximate Linear

Leakage

According to IEC 60534-4:2006 Class III, leakage less than 0.1% of maximum valve capacity.

Inherent rangeability

- 25:1 (Optional 50:1 for full port size)

Hysteresis error

- Without positioner: Within 3% F.S.
- With positioner: Within 1% F.S.

Linearity

Without positioner: Within $\pm 5\%$ F.S.

With positioner: Within $\pm 1\%$ F.S.

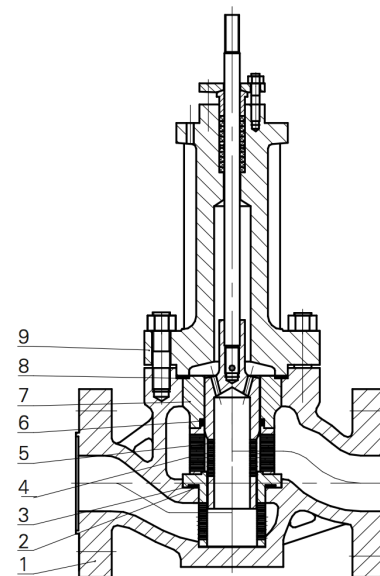
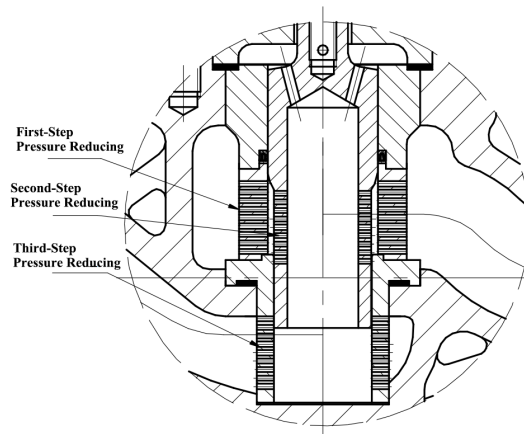


Figure 2-1 Extension Bonnet Type 1
1. Body 2. Seat Gasket 3. Seat 4. Plug 5. Lower Cage
6. Sealing 7. Upper Cage 8. Sealing 9. Extension Bonnet

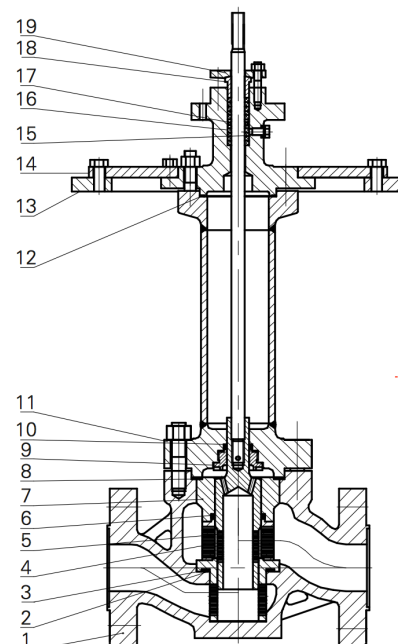


Figure 2-2 Extension Bonnet Type 2
1. Body 2. Seat Gasket 3. Seat 4. Plug 5. Lower Cage 6. Sealing 7. Upper Cage 8. Sealing 9. Extension Bonnet 10. One-way Sealing 11. Extension Bonnet 12. Sealing 13. Welding Plate 14. Connect Flange 15. Inspection Hole 16. Packing 17. Spacer 18. Screw 19. Pressure Plate

Table 1. Rated Kv Value and Travel

Nominal Diameter DN(mm)	Port Size	Rated Kv Value	Travel(mm)
32	15	4.0	16
	20	6.3	16
	25	10	16
	32	16	25
40	25	10	16
	32	16	25
	40	25	25
50	32	16	25
	40	25	25
	50	40	25
65	40	25	25
	50	40	25
	65	63	40
80	50	40	25
	65	63	40
	80	100	40
100	65	63	40
	80	100	40
	100	160	40

Nominal Diameter DN(mm)	Port Size	Rated Kv Value	Travel(mm)
125	80	100	40
	100	160	40
	125	250	60
150	100	160	40
	125	250	60
	150	400	60
200	125	250	60
	150	400	60
	200	630	60
250	150	400	60
	200	630	60
	250	1000	100
300	200	630	60
	250	1000	100
	300	1600	100
350	250	1000	100
	300	1600	100
	350	2160	100
400	300	1600	100
	350	2160	100
	400	4000	100

Figure 1. Valve Trim Material · Treatment

Figure1-1 Metal Seated

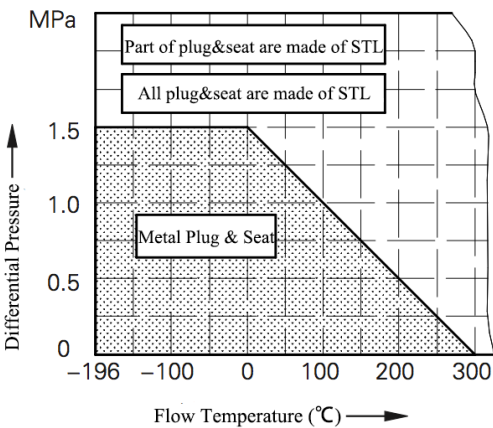


Figure 1-2 Soft Seated(RPTFE)

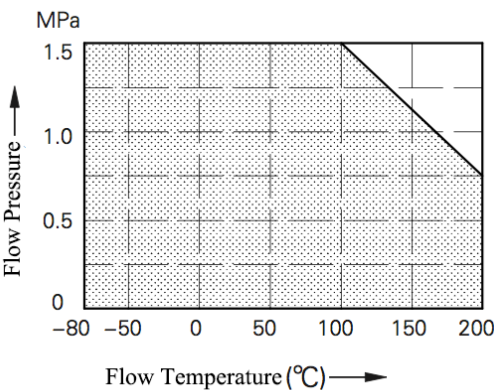


Figure 2. Working Temperature of Packing Material · Pressure Ranges

Figure 2-1 V-Type RPTFE

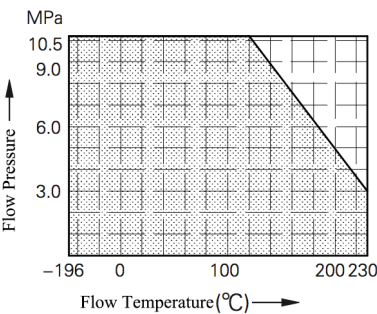


Figure 2-2 PTFE+Carbon Fiber/PTFE+Asbestos

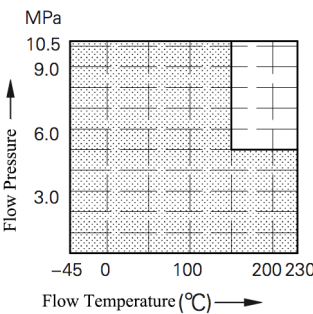
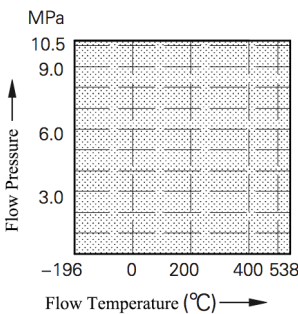
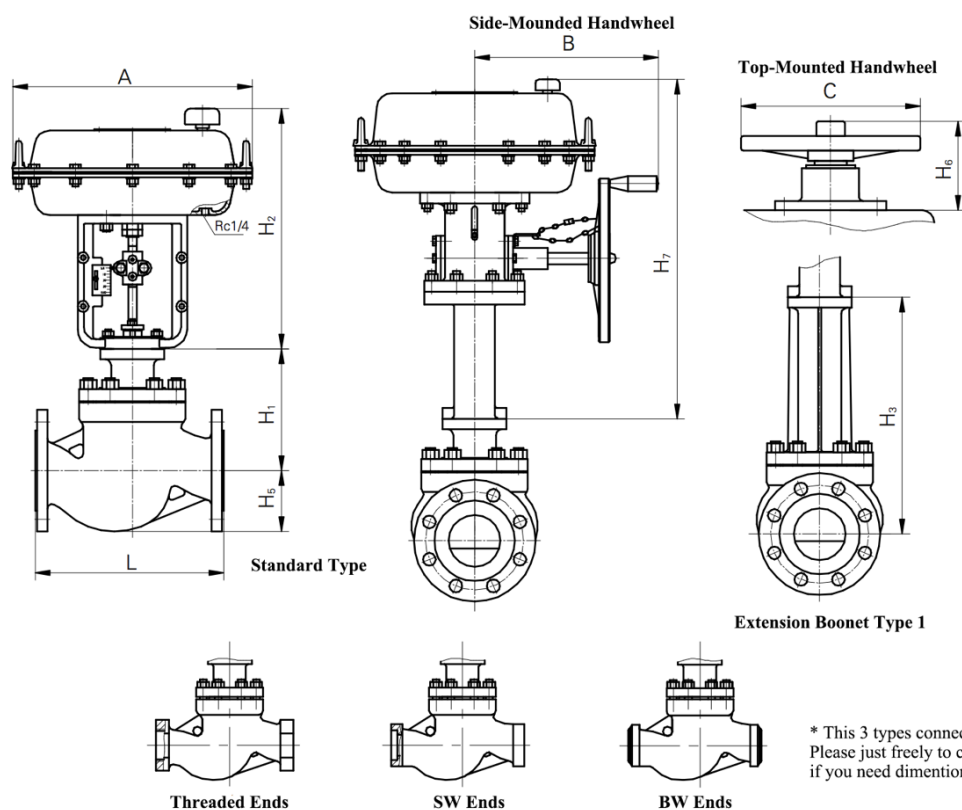


Figure 2-3 Flexible Graphite



External Dimensions for Standard and Extension Type 1(Diaphragm Actuator)



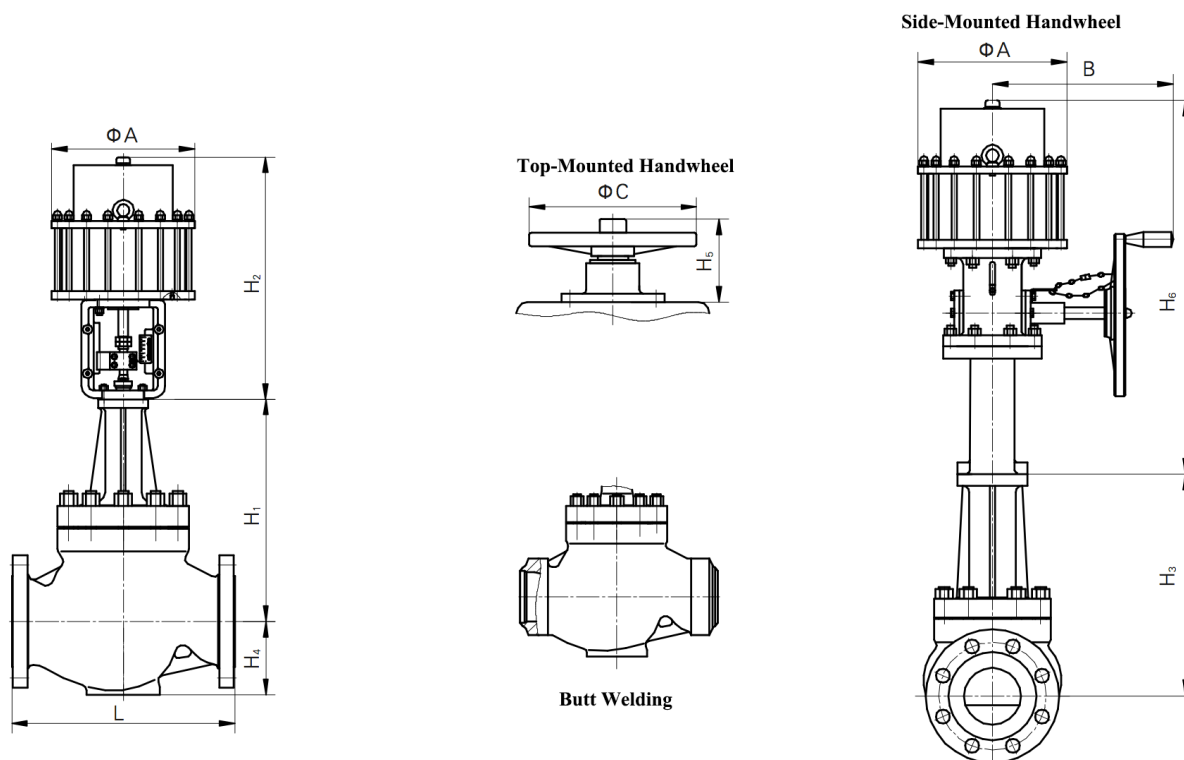
* This 3 types connection is optional for customer.
Please just freely to contact THINKTANK service
if you need dimintions.

Unit: mm

Nominal Diameter DN(mm)	L			H1	H2	H3	H4	H5	H6	A	B	C
	PN16/ 25/40, 150LB	PN64, 300LB	PN100, 600LB									
32(1-1/4")	222	235	251	152	280	386	56	180	400	308	260	220
40(1-1/2")	222	235	251	152	280	402	65	180	400	308	260	220
50(2")	254	267	286	159	280	320	76	180	400	308	260	220
65(2-1/2")	276	292	311	205	360	365	100	236	580	394	580	270
80(3")	298	317	337	205	360	365	100	236	580	394	580	270
100(4")	352	368	394	208	360	373	110	236	580	394	580	270
125(5")	400	500	500	274	435	484	126	310	675	498	675	320
150(6")	451	473	508	333	435	529	149	310	675	498	675	320
200(8")	543	568	610	370	435	730	198	310	675	498	675	320
250(10")	-①	-	-	493	621	771	220	394	959	618	959	500
300(12")	-	-	-	545	621	771	326	394	959	618	959	500
350(14")	-	-	-	610	621	812	350	394	959	618	959	500
400(16")	-	-	-	681	621	830	372	394	959	618	959	500

Note: ① The distance of two flange or Valve Length could be custom by customer's requirements.

External Dimensions for Standard and Extension Type 1(Single Acting Piston Actuator)

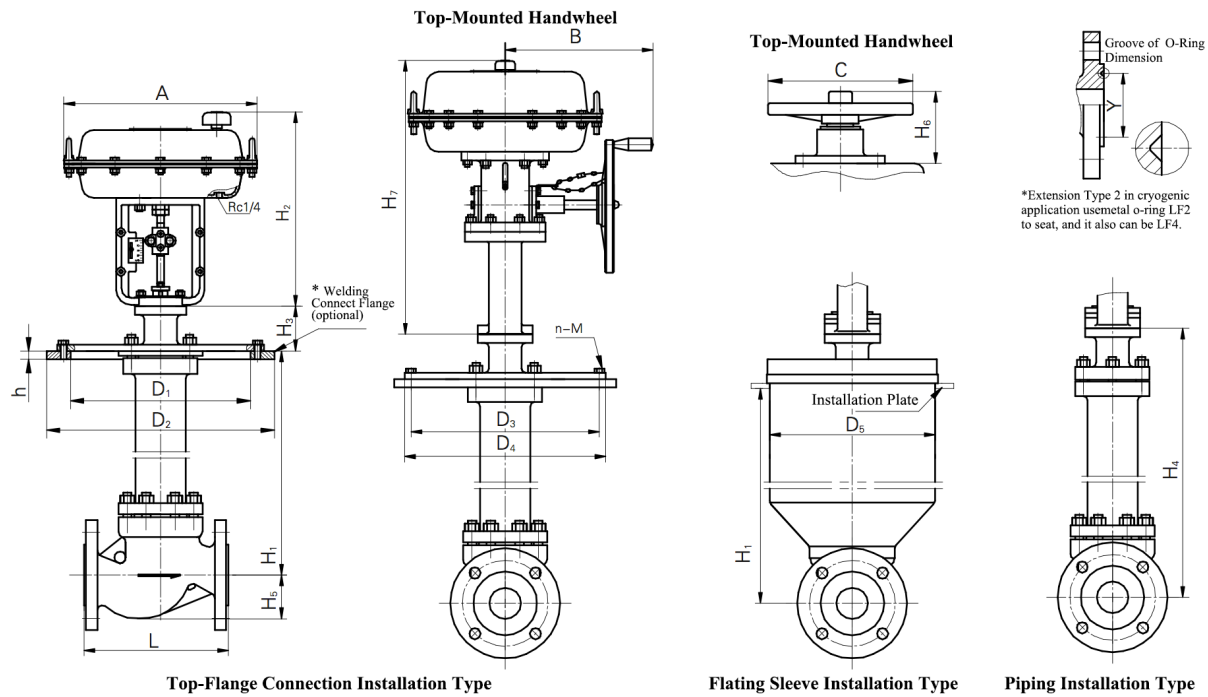


Unit: mm

Nominal Diameter DN(mm)	L			H1	H2	H3	H4	H5	H6	A	B	C
	PN16/ 25/40, 150LB	PN64, 300LB	PN100, 600LB									
65(2-1/2")	276	292	311	205	495	365	100	236	660	215	305	270
80(3")	298	317	337	200	495	365	100	236	660	215	305	270
100(4")	352	368	394	208	495	373	110	236	660	275	305	270
125(5")	400	500	500	274	727	484	126	310	922	325	330	320
150(6")	451	473	508	333	727	529	149	310	795	325	330	320
200(8")	543	568	610	370	727	561	198	310	795	325	330	320
250(10")	-①	-	-	493	727	750	220	394	1035	340	374	500
300(12")	-	-	-	545	775	771	326	394	1035	385	374	500
350(14")	-	-	-	610	775	812	350	394	1083	412	374	500
400(16")	-	-	-	680	775	830	372	394	1083	485	374	500

Note: ① The distance of two flange or Valve Length could be custom by customer's requirements.

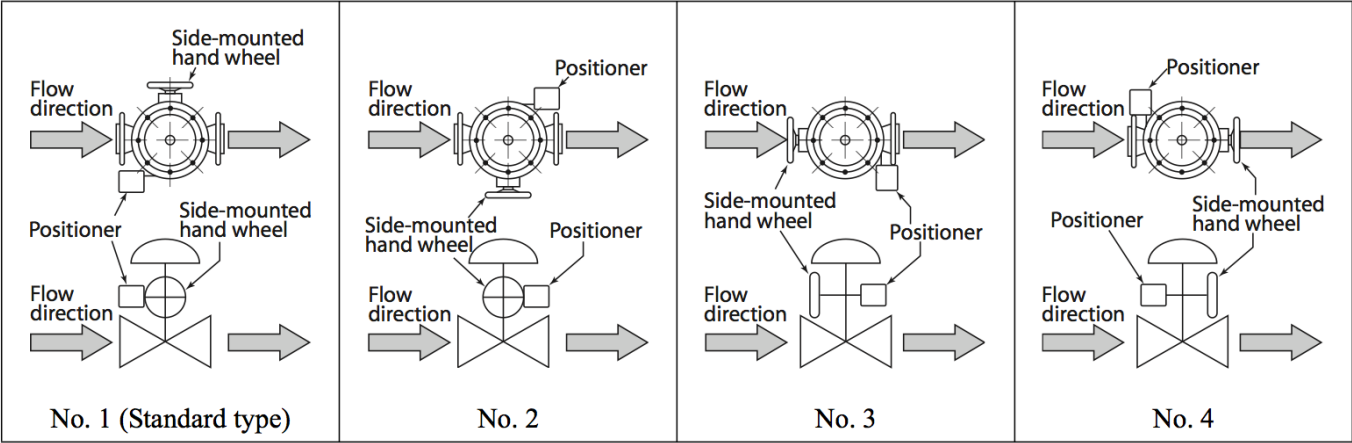
External Dimensions for Extension Type 2



Unit: mm

Nominal Diameter DN(mm)	L			D1	D2	D3	D4	D5	Y	H1	H3	H4	H5	Actuator					
	PN16/25/40, 150LB	PN64,300LB B	PN100, 600LB											A	C	H2	H6	H7	B
32(1-1/4")	222	235	251	250	335	285	315	285	60	700	88	587	56	308	220	280	180	400	260
40(1-1/2")	222	235	251	270	355	305	335	285	65	700	88	587	65	308	220	280	180	400	260
50(2")	254	267	286	305	390	340	370	285	75	700	88	587	76	308	220	280	180	400	260
65(2-1/2")	276	292	311	342	430	370	400	470	90	700	95	695	100	394	270	360	236	580	305
80(3")	298	317	337	375	465	405	435	470	104	700	95	695	100	394	270	360	236	580	305
100(4")	352	368	394	430	520	460	490	470	135	700	95	695	110	394	270	360	236	580	305
125(5")	400	500	500	490	585	528	555	—	165	800	170	870	126	498	320	435	310	675	330
150(6")	451	473	508	556	600	590	630	—	195	800	170	872	149	498	320	435	310	675	330
200(8")	543	568	610	665	770	700	740	—	245	800	170	970	198	498	320	435	310	675	330
250(10")	①	-	-	845	970	900	940	—	305	900	110	909	220	618	500	621	394	959	374
300(12")	-	-	-	980	1120	1030	1080	—	350	900	110	892	326	618	500	621	394	959	374
350(14")	-	-	-	1080	1220	1130	1180	—	400	900	110	945	350	618	500	621	394	959	374
400(16")	-	-	-	1180	1320	1230	1280	—	455	900	110	978	372	618	500	621	394	959	374

Note: ① The distance of two flange or Valve Length could be custom by customer's requirements.



Actuator orientation

Note) Indicate by position number when installation other than the standard type is required.

Ordering Information

When ordering, please specify;

- | | |
|--|---|
| 1) Model Number: HCN | 9) Accessories (pressure regulator and etc.) |
| 2) Nominal size × Cv required | 10) Special requirement of degreasing, copper free and etc. |
| 3) Type and rating of end connections | 11) Name of flow medium |
| 4) Body and trim material, necessity of hardening | 12) Normal flow and maximum required flow |
| 5) Type of bonnet | 13) Pressure of flow medium, upstream and downstream pressure at maximum and minimum, required flow |
| 6) Valve and plug characteristics | 14) Temperature and specific gravity of flow medium |
| 7) Type of actuator, necessity of hand wheel, and air to diaphragm | 15) Viscosity of flow medium, inclusive or exclusive of slurry |
| 8) Valve action (direct or reverse) | |

**Specifications are subject to change without notice.*

THINKTANK®

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