H100-010 Balance Single Seated Low Temperature Control Valve

H100-010[1] Balance single seated low temperature control valve is mainly used for regulating ultralow temperature media accurately. With temperature up to -196°C, it is applicable for ethylene, liquefied natural gas (LNG), air separation and PSA oxygen generation and other low temperature devices.

The product complies with GB/T4213-2008 standard.

Standard specification

Body

Type	Balance single seated cast globe valve
Nominal size	40、50、65、80、100、125、150、200mm
Nominal pressure	Class 150、300、600 PN 16、20、25、40、50、63、100、110 *
Type of connection	Flanged: FF、RF、RJ、TG、MFM Welded: BW（65～250mm） Flange standard: JIS B2201、JB/T79.1-94(PN1.6MPa)、JB/T79.2-94(PN4.0、6.4MPa)、ANSI B16.5-2009、HG20592-2009、HG20615-2009
Size	See Table 5
Body and upper bonnet material	CF3、CF3M、CF8、CF8M See Table 1 & 2 for application temperature • pressure range of materials
Type of upper bonnet	Extension type III (EIII): -196 ~ +200°C
Type of gland	Bolted gland
Packing	V type PTFE and graphite packing. See Fig. 2
Gasket	Zigzag (316, 316L)
Surface coating	Dark gray (epoxy resin). No coating for the body if it is made of stainless steel.

Trim

Type of plug	Single seated plunger type
Trim material **Trim treatment**	See Table 1 and Figure 1 for standard material combination and application temperature • pressure range
Flow feature	See Fig. 4-1 for high-capacity flow feature ● Equal percentage feature (%F) and linear feature (LF) See Fig. 4-2 for high-accuracy flow feature ● Equal percentage feature (%) and linear feature (L) **Note: See Fig. 1-2 for operating temperature and differential pressure of PTFE seat**

Note [1]: H100-010 corresponding to old model H100;

Actuator

Model / Specification	Pneumatic diaphragm type	Cylinder piston type	Electronic type	Intelligent type
	HA	HV	EIL	M8 series
	Multi-spring type	Single-action and dual-action piston type		
Purpose	Regulation	Regulation	Regulation	
Air supply pressure or power supply voltage	400（80～240）kPa Air supply pressure (spring range) 400（80～240）kPa	400～700kPa Air supply pressure 400～700kPa	Voltage: 220/380V 50HZ Input signal: 4-20mA DC	Voltage: 220 /380V 50HZ Input signal: 4-20mA DC
Connector	NPT 1/4（HA11~HA41）; NPT 1/2（HA51） Air piping: NPT 1/4（HA11~HA41）; NPT 1/2（HA51）	NPT 1/4（HV21~31）; NPT 3/8（HV41~51）; NPT 1/2（HV61~71）; NPT 3/4（HV81） Air piping: NPT 1/4（HV21~31）; NPT 3/8（HV41~51）; NPT 1/2（HV61~71）; NPT 3/4（HV81）	Wiring: 2-PF3/4	Wiring: PG13.5
Direct action	Air to valve close	Air to valve close	Input signal to valve close	Input signal to valve close
Reverse action	Air to valve open	Air to valve open	Input signal to valve open	Input signal to valve open
Hysteresis error	≤1%FS (with positioner) ≤3%FS (without positioner) ≤5%FS (with HA1 type)	） ≤1%FS (with positioner) ≤3%FS (without positioner)	≤1%FS	≤1%FS
Intrinsic error	≤±1%FS（with positioner） ≤±5%FS（without positioner） ≤±2%FS（with HA1 type）	≤±1%FS（with positioner） ≤±5%FS（without positioner）	≤±1%FS	≤±1%FS
Ambient temperature	Standard type: -30 to +70°C High temperature type: -15 to +120°C Low temperature type: -40 to +70°C	Standard type: -20 to +80°C High temperature type: -15 to +120°C Low temperature type: -40 to +80°C	－20～＋70℃	－25～＋70℃
Paint color	RAL5021) Aqua blue (color code RAL5021)	Aqua blue (color code RAL5021)		
附 Accessories	Positioner, air filtration reducer, lock-up valve, valve location transmitter, hand wheel, etc.	Positioner, air filtration reducer, lock-up valve, valve location transmitter, hand wheel, etc.	EIL actuator handwheel	M8 actuator handwheel

性能 Performance

CV value and stroke	See Table 3
Seat leakage	See Table 1
Rangeability	50:1
Allowable differential pressure	See Table 4
Weight	See Table 5

Table 1 Material combination and application temperature of body and trim • Allowable leakage of valve seat

- HT: Heat treatment
- ST: Stellite
- SS: Partial stellite
- SF: Full stellite

Table 1-1 Body material: Stainless steel

Body material		CF8, CF8M,CF3M		
Plug	**Material**	304/316/316L	304/316	304/316/316L
	Treatment	——	PCTFE	SS/SF
Valve seat	**Material**	304/316/316L	304/316/316L	304/316/316L
	Treatment	——	——	SS/SF
Guide	**Material**	304/316/316L	304/316/316L	304/316/316L
	Treatment	——	——	ST
Gasket	**Material**	316L	316L	316L
Allowable leakage of valve seat	**ANSI**	Class Ⅳ	Class Ⅵ	Class Ⅳ
	Rated Cv×	0.01%	Bubble-tight	0.01%
Application temperature °C		-196～+200	-196～+200	-196～+200

Fig. 1 Trim material · Treatment

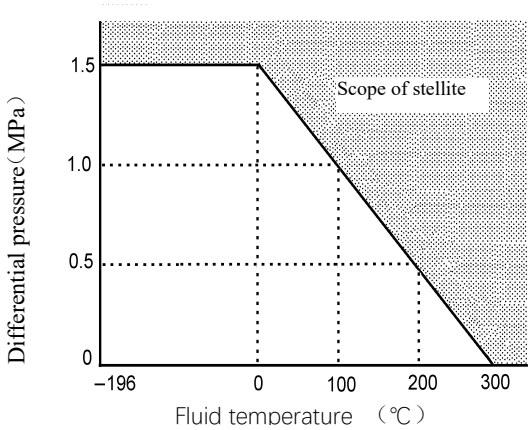


Fig. 1-1 Operating range of stellite

Note: 1. 9Cr18 hardened stainless steel is suggested for cavitation and flashing or water temperature over 100°C.
2. Cavitation, flashing, oil prohibitive service or normally-closed status.
3. If Cv≤0.16, SF or 9Cr18 hardened stainless steel is used for plug.

Fig. 2 Application temperature · pressure range of packing

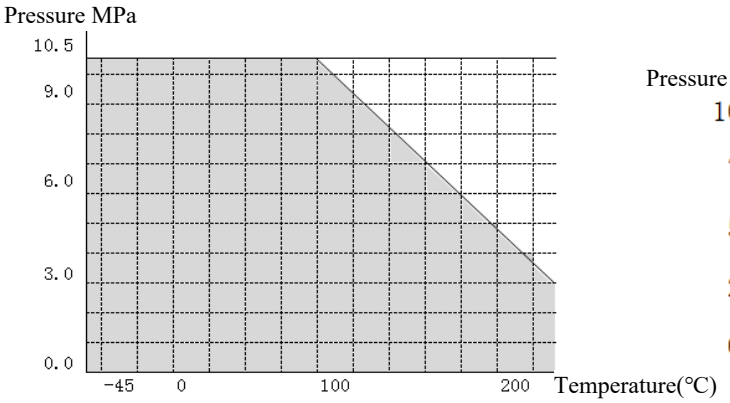


Fig. 2-1 Reinforced PTFE V type packing

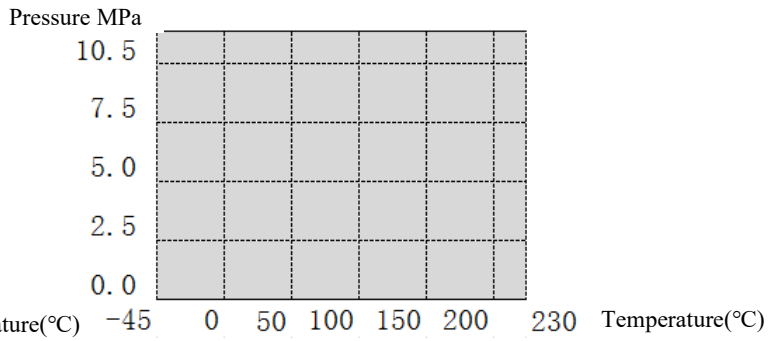


Fig. 2-2 PTFE carbon fiber

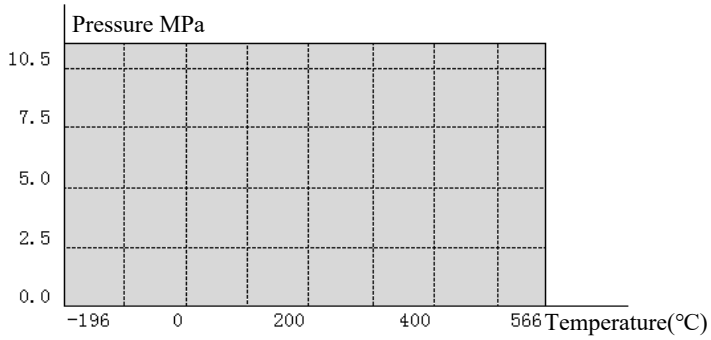


Fig. 2-3 Flexible graphite (non-oxidation environment)

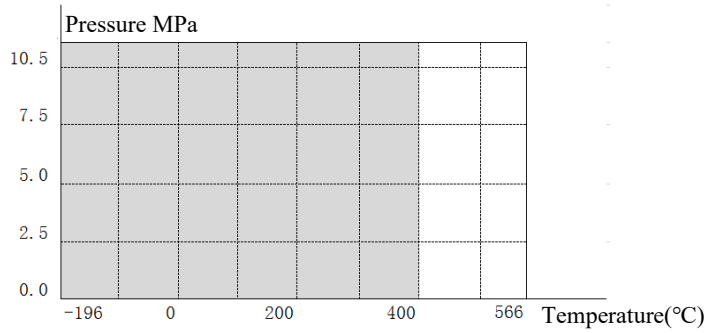


Fig. 2-3 Flexible graphite (oxidation environment)

Fig. 3 Structure of body components

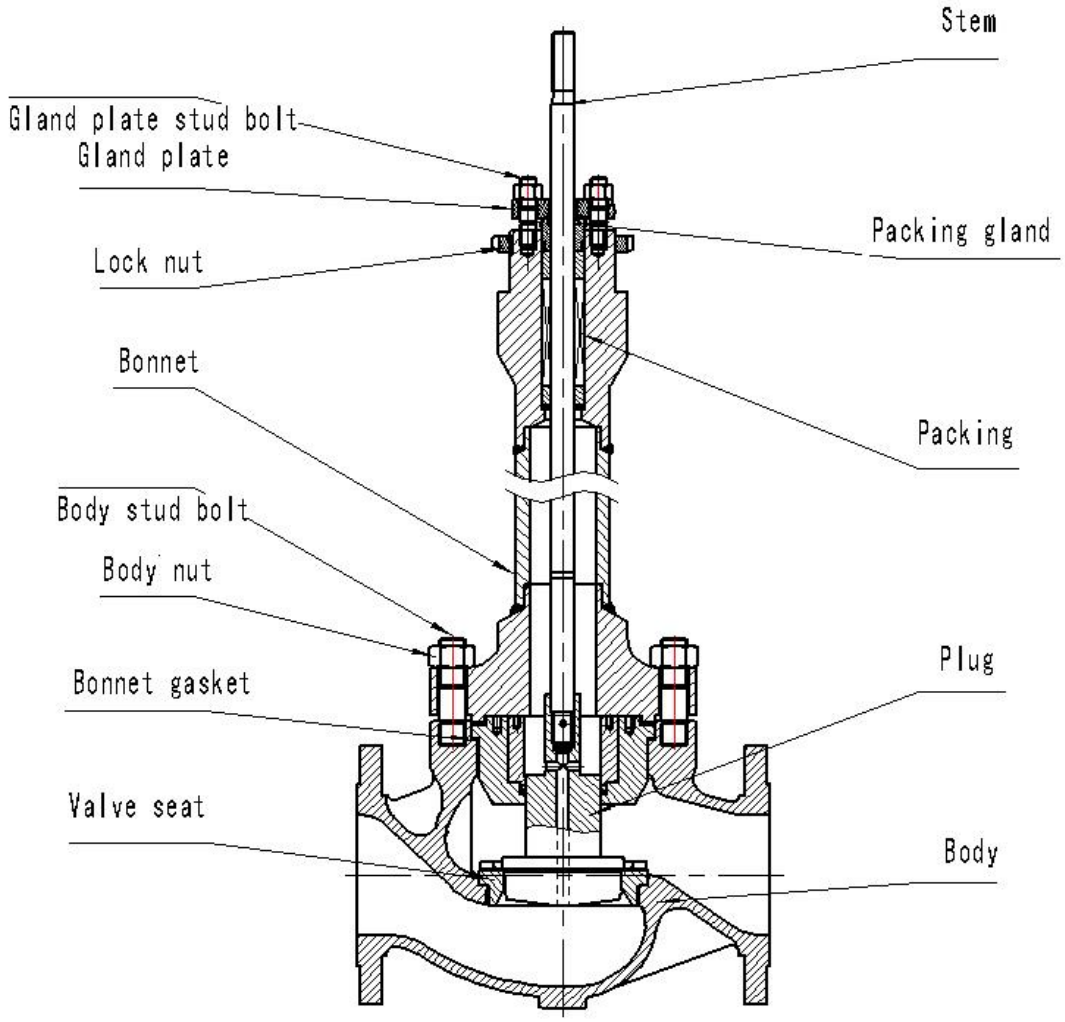


Table 3 CV value and stroke

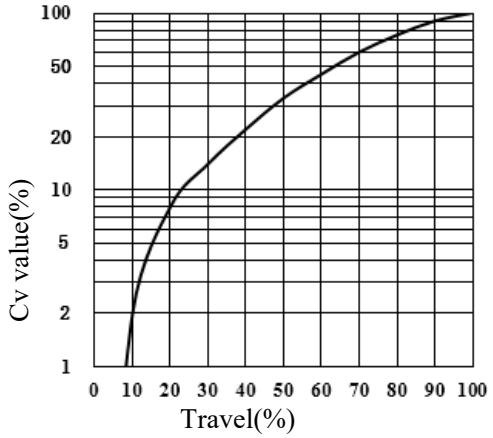
Table 3-1 High-capacity plug (%F, LF)

Nominal size	40	50	65	80	100	125	150	200
Diameter of valve seat	40	50	65	80	100	125	150	200
Rated Cv value	30	50	85	125	200	320	420	700
Rated stroke	25		38			50		75

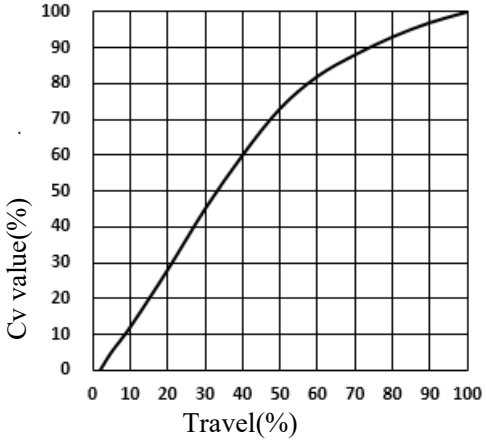
Table 3-2 High-accuracy plug (%, L)

Nominal size	40			50			65			80			100			125			150			200		
Diameter of valve seat	25	32	40	32	40	50	40	50	65	50	65	80	65	80	100	80	100	125	100	125	150	125	150	200
Rated Cv value	10	17	24	17	24	44	24	44	68	44	68	99	68	99	175	99	175	275	175	275	360	275	360	650
Rated stroke	25						38									50						75		

Fig. 4 Typical flow feature curve

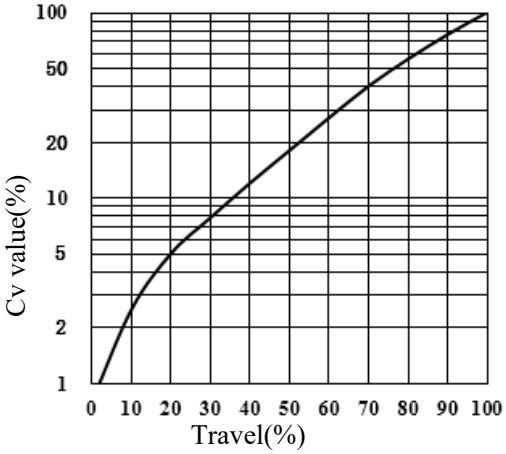


Equal percentage feature (%F)

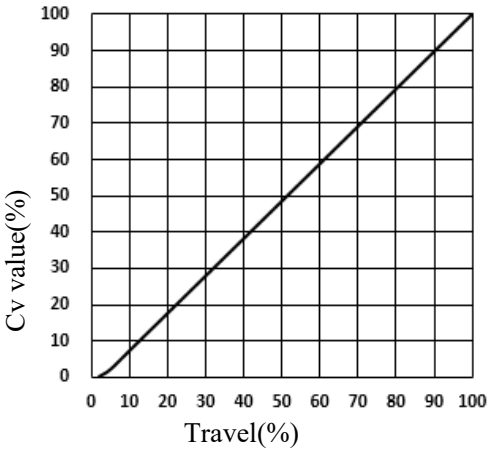


Linear feature (LF)

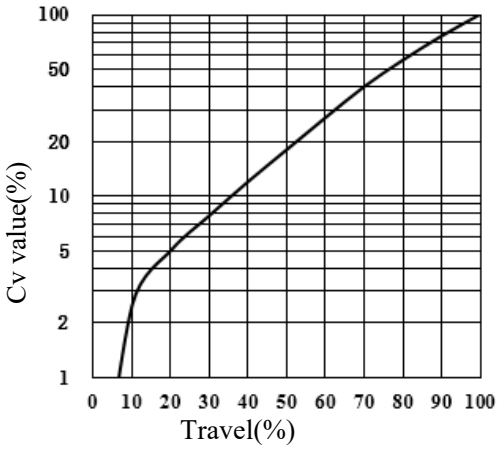
Fig. 4-1 High-capacity flow feature curve



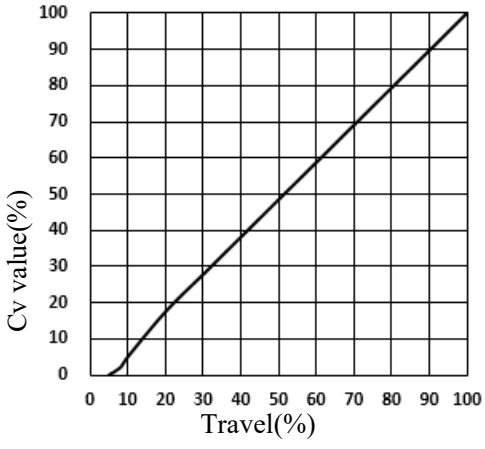
Equal percentage feature (% metal valve seat)



Linear feature (L metal valve seat)



Equal percentage feature (% flexible valve seat)



Linear feature (L flexible valve seat)

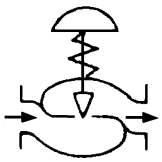
4-2 High-accuracy flow feature curve

Table 4 Allowable differential pressure

Table 4-1 Diaphragm type actuator (HA)

Plunger plug, metal valve seat, flexible valve seat (%, L)

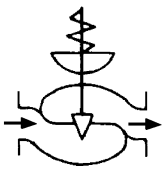
Table 4-1-1 Air-to-close valve **100kPa**



Actuator	Air supply pressure	Spring range	Type of valve seat	Type of upper bonnet	Allowable differential pressure											
					Nominal size											
					40			50			65			80		
					Diameter of valve seat (mm)											
					25	32	40	32	40	50	40	50	65	50	65	80
HA21D8	4.0	0.8～2.4	Metal valve seat	EIII	100	100	100	100	100	100	—	—	—	—	—	—
			Flexible valve seat	EIII	30	30	30	30	30	30	—	—	—	—	—	—
HA31D8	4.0	0.8～2.4	Metal valve seat	EIII	—	—	—	—	—	—	100	100	100	100	100	100
			Flexible valve seat	EIII	—	—	—	—	—	—	30	30	30	30	30	30

Actuator	Air supply pressure	Spring range	Type of valve seat	上 Type of upper bonnet	Allowable differential pressure											
					Nominal size											
					100			125			150			200		
					Diameter of valve seat (mm)											
					65	80	100	80	100	125	100	125	150	125	150	200
HA31D8	4.0	0.8～2.4	Metal valve seat	EIII	100	100	100	100	100	—	100	—	—	—	—	—
			Flexible valve seat	EIII	30	30	—	30	—		—		—		—	—
HA41D8	4.0	0.8～2.4	Metal valve seat	EIII	—	—	—	—	—	100	100	100	100	100	100	80
			Flexible valve seat	EIII	—	—	30	—	30	30	30	30	30	30	30	—
HA42D8	4.0	0.8～2.4	Metal valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	100
			Flexible valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	30
HA51D1	5.0	1.06～2.06	Metal valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	100
			Flexible valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	30

Table 4-1-2 Air-to-open valve **100kPa**



Actuator	Air supply pressure	Spring range	Type of valve seat	Type of upper bonnet	Allowable differential pressure											
					Nominal size											
					40			50			65			80		
					Diameter of valve seat (mm)											
					25	32	40	32	40	50	40	50	65	50	65	80
HA21R8	4.0	0.8～2.4	Metal valve seat	EIII	100	88.2	88.2	88.2	88.2	62.7	88.2	62.7	—	62.7	—	—
			Flexible valve seat	EIII	30	30	30	30	30	30	30	30	—	30	—	—
HA31R8	4.0	0.8～2.4	Metal valve seat	EIII	—	—	—	—	—	—	100	100	100	100	100	90
			Flexible valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	—
HA41R8	4.0	0.8～2.4	Metal valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	100
			Flexible valve seat	EIII	—	—	—	—	—	—	—	—	30	—	30	30

Actuator	Air supply pressure	Spring range	Type of valve seat	Type of upper bonnet	Allowable differential pressure											
					Nominal size											
					100			125			150			200		
					Diameter of valve seat (mm)											
					65	80	100	80	100	125	100	125	150	125	150	200
HA31R8	4.0	0.8～2.4	Metal valve seat	EIII	100	90	60	90	60	—	60	—	—	—	—	—
			Flexible valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	—
HA41R8	4.0	0.8～2.4	Metal valve seat	EIII	—	100	100	100	100	100	100	100	76.4	100	76.4	40
			Flexible valve seat	EIII	30	30	30	30	30	30	30	30	30	30	30	—
HA42R8	4.0	0.8～2.4	Metal t	EIII	—	—	—	—	—	—	—	—	100	—	100	100
			Flexible valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	30
HA51R2	5.0	1.9～3.0	Metal valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	100
				EIII	—	—	—	—	—	—	—	—	—	—	—	83.3
			Metal valve seat	EIII	—	—	—	—	—	—	—	—	—	—	—	30

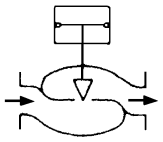
Note: 1. The maximum allowable differential pressure shall not exceed the maximum operating pressure in ASME B16.34 or JIS B2201 standard.

2. 1* is applicable for 65, 80 and 100mm valves, 2* is applicable for 150mm valves.

3. The figure in the black box indicates the valve is applicable for the actuator of standard specification.

Table 4-2 Cylinder type actuator (HV dual-action)
Plunger plug, metal valve seat, flexible valve seat (%, L)

Table 4-2-1 **100kPa**



Actuator	Air supply pressure	Spring range	Type of upper bonnet	Allowable differential pressure											
				Nominal size											
				100			125			150			200		
				Diameter of valve seat (mm)											
				65	80	100	80	100	125	100	125	150	125	150	200
HV41D00	5.0	Metal valve seat	EIII	100	100	100	100	100	100	100	100	100	—	—	—
		Flexible valve seat	EIII	30	30	30	30	30	30	30	30	30	—	—	—
HV51D00	5.0	Metal valve seat	EIII	—	—	—	—	—	—	—	—	—	100	100	100
		Flexible valve seat	EIII	—	—	—	—	—	—	—	—	—	30	30	30

Note: 1. If the actuator has auxiliary air source, the smaller air supply pressure of the two shall be selected as the basis to calculate the allowable differential pressure.

2. The maximum allowable differential pressure shall not exceed the maximum operating pressure in ASME B16.34 or JIS B2201 standard.

Table 4-3 Electronic actuator (EIL) and intelligent actuator (M8) **100kPa**

Actuator	Type of valve seat	Allowable differential pressure																						
		Diameter of valve seat (mm)																						
		40			50			65			80			100			125			150			200	
		Diameter of valve seat (mm)																						
		25	32	40	32	40	50	40	50	65	50	65	80	65	80	100	80	100	125	100	125	150	125	150	200
EIL08 M8610+L8 210	Metal valve seat	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	—	—	—	—	—	—	—	—	—
M8620+L8 220	Metal valve seat	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	100	100	100	100	100	100	100	100	100

Table 5 Size

Table 5-1 Face-to-face size **mm**

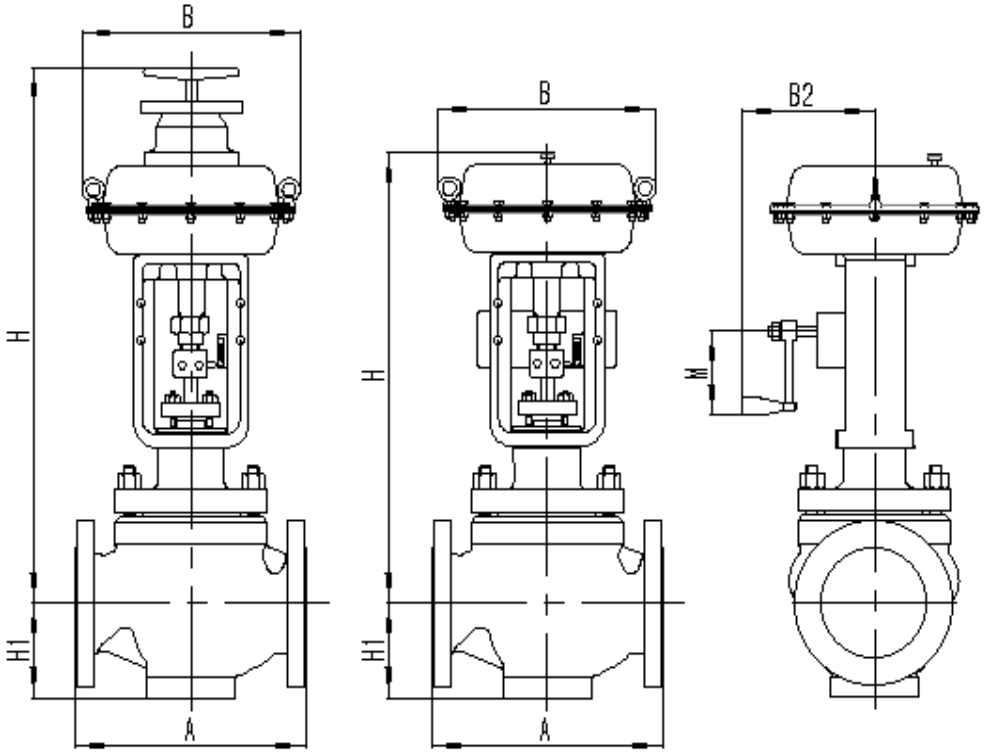
Nominal size	A							
	Class 150 RF JIS 10K FF RF PN16 RF	JIS 16K RF	Class 300 RF JIS 20、30K RF JIS 30K RF PN40 MFM	Class 600 RF JIS 40K RF PN63 MFM	JIS 16K TG	JIS 20K TG	JIS 30K TG	JIS 40K TG
65	276	288	292	311	290	292	303	311
80	298	313	317	337	310	317	326	337
100	352	364	368	394	360	368	379	394
125	403	—	425	457	—	425	—	457
150	451	465	473	508	475	473	486	508
200	543	560	568	610	570	568	580	610

Nominal size	A						
	Class 150 RJ	Class 300 RJ	Class 600 RJ	Class 300 LG	Class 600 LG	Class 150 SW、BW	Class 300、600 SW、BW
65	289	308	314	302	308	311	311
80	311	333	340	327	333	337	337
100	365	384	397	378	391	394	394
150	464	489	511	483	505	473	508
200	556	584	613	578	606	568	610

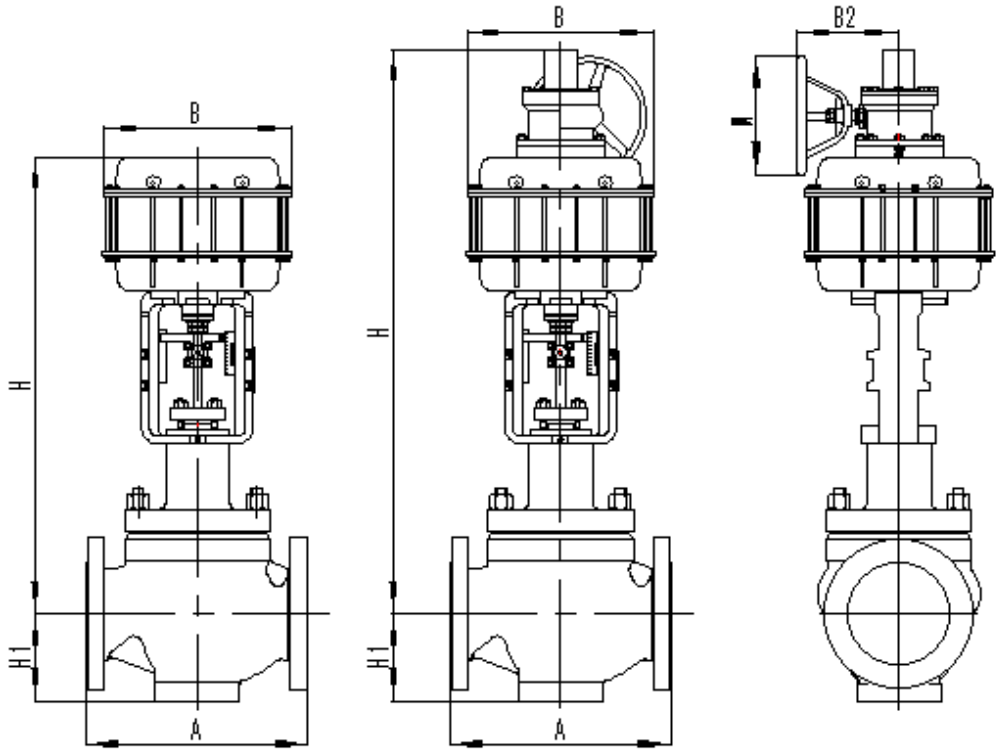
Note: Face-to-face size complies with IEC 60534－3-1 standard.

Table 5-2-1 Overall size **mm**

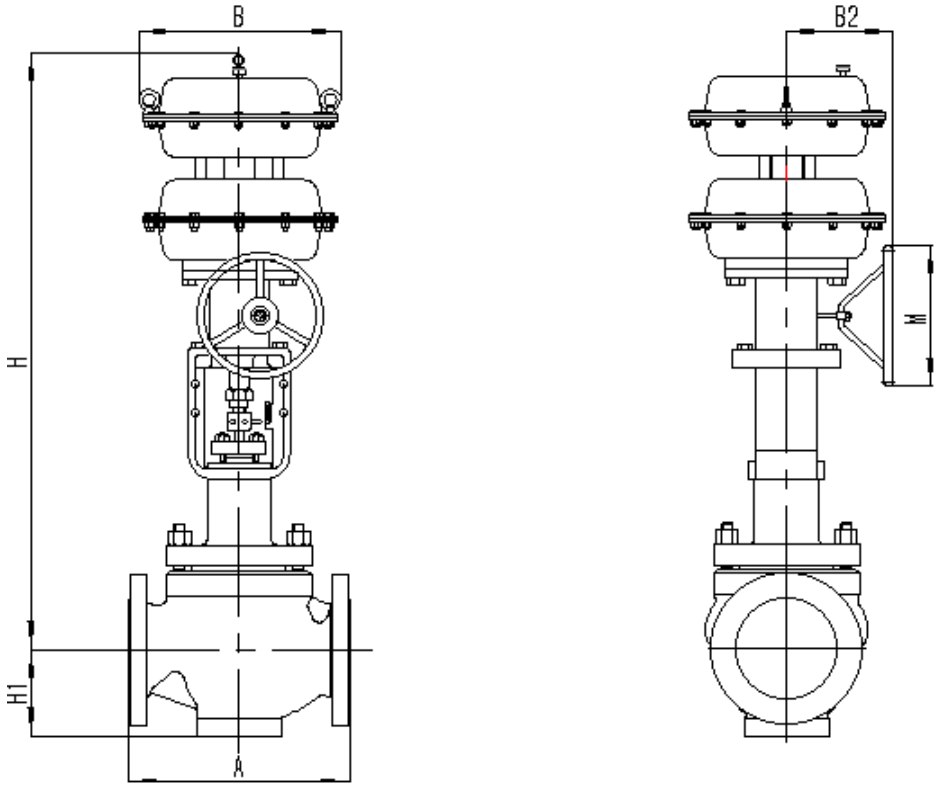
Nominal size	Actuator	H(Extension type III EIII)	B	B1	B2	B3	B4	M	H1
40	HA21D8、R8	1095	281	—	273.5	—	—	¢175	70
	HA31D8、R8	1245	363	—	278.5	—	—	¢175	
	EIL04	1310	172	—	258	—	—	—	
50	HA21D8、R8	1100	281	—	273.5	—	—	¢175	80
	HA31D8、R8	1250	363	—	278.5	—	—	¢175	
	EIL04	1315	172	—	258	—	—	—	
65	HA31D8、R8	1290	363	—	278.5	—	—	¢175	88
	HA41D8、R8	1550	520	—	303	—	—	¢320	
	EIL08	1475	229	—	338	—	—	—	
	M8610+L8210	1530	—	285	346	253	350	—	
80	HA31D8、R8	1295	363	—	278.5	—	—	¢175	98
	HA41D8、R8	1560	520	—	303	—	—	¢320	
	EIL08	1485	229	—	338	—	—	—	
	M8610+L8210	1535	—	285	346	253	350	—	
100	HA31D8、R8	1315	363	—	278.5	—	—	¢175	113
	HA41D8、R8	1575	520	—	303	—	—	¢320	
	HV61SR5	2115	475	—	384	—	—	¢380	
	HV51D00	1825	382	—	324	—	—	¢380	
	EIL08	1515	229	—	338	—	—	—	
	M8610+L8210	1555	—	285	346	253	350	—	
125	HA31D8、R8	1450	363	—	278.5	—	—	¢175	146
	HA41D8、R8	1630	520	—	303	—	—	¢320	
	HV61SR5	2175	480	—	384	—	—	¢380	
	HV51D00	1880	382	—	324	—	—	¢380	
	HV61D00	1995	480	—	384	—	—	¢380	
	HV71D00	1995	580	—	384	—	—	¢380	
	EIL08	1670	229	—	338	—	—	—	
	M8610+L8210	1795	—	313	350	253	350	—	
150	HA31D8、R8	1450	363	—	278.5	—	—	¢175	170
	HA41D8、R8	1630	520	—	303	—	—	¢320	
	HV61SR5	2175	480	—	384	—	—	¢380	
	HV51D00	1880	382	—	324	—	—	¢380	
	HV61D00	1995	480	—	384	—	—	¢380	
	HV71D00	1995	580	—	384	—	—	¢380	
	EIL08	1660	229	—	338	—	—	—	
	M8610+L8210	1795	—	313	350	253	350	—	
200	HA41D8、R8	1780	520	—	303	—	—	¢320	220
	HV51D00	2050	382	—	324	—	—	¢380	
	HV61D00	2165	480	—	384	—	—	¢380	
	HV71D00	2165	580	—	384	—	—	¢380	
	M8620+L8220	2205	—	313	350	253	350	—	
250	HA51	—	605	—	380	—	—	¢325	305
	HV61D00	—	480	—	384	—	—	¢380	
	HV71D00	—	580	—	384	—	—	¢380	
	EIL25	—	258	—	356	—	—	—	
	M8620+L8230	—	—	313	350	253	350	—	



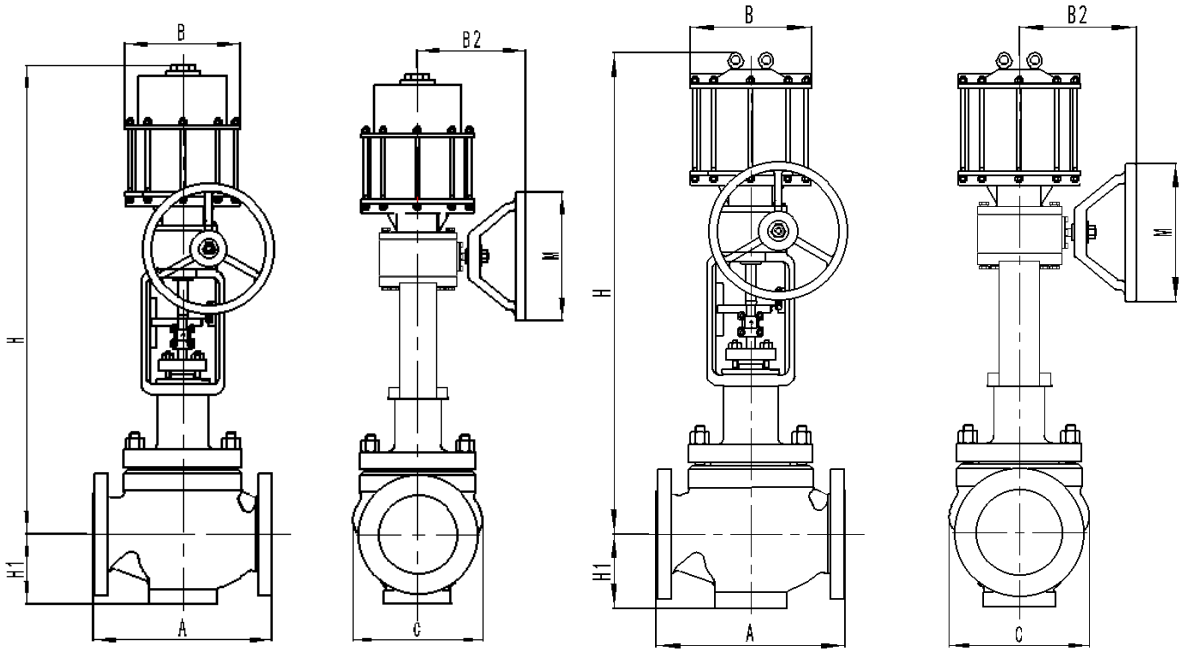
With HA actuator



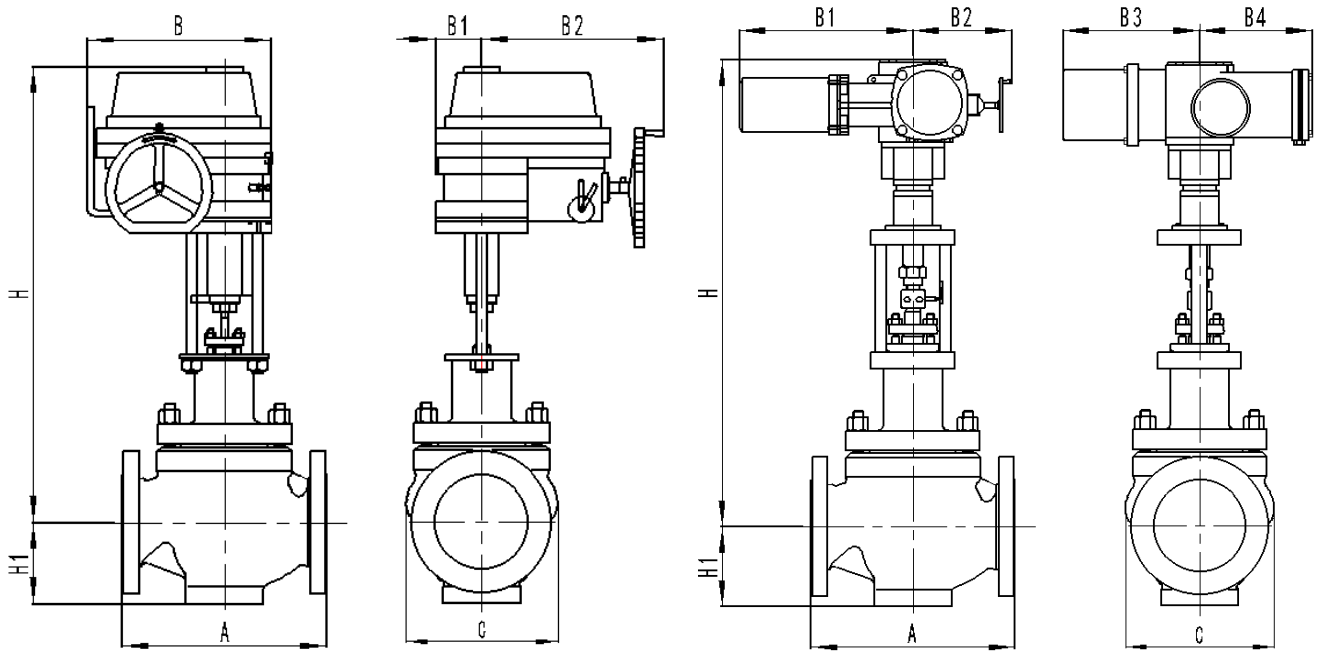
With HA51D、R actuator



With HA42 actuator



With HV single/dual-action actuator



With EIL\ M8 actuator

Fig. 5 Face-to-face size and overall size

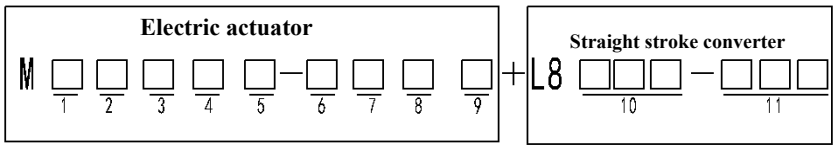
Table 6 Weight **kg**

Nominal size	Actuator	Flanged			Welded
		ANSI 125、150	ANSI 300	ANSI 600	ANSI 150、300、600
		EIII			
40	HA21D8、R8	39	44	52	44
	HA31D8、R8	51	56	64	56
	EIL04	31	36	44	36
50	HA21D8、R8	45	50	55	50
	HA31D8、R8	57	62	67	62
	EIL04	37	42	50	56
65	HA31D8、R8	65	70	87	70
	HA41D8、R8	96	101	118	101
	EIL08	49	54	71	54
	M8610+L8210	71	76	93	76
80	HA31D8、R8	80	90	112	90
	HA41D8、R8	111	121	143	121
	EIL08	64	74	96	74
	M8610+L8210	86	96	118	96
100	HA31D8、R8	93	108	143	105
	HA41D8、R8	124	139	174	136
	HV61SR5	266	281	316	278
	HV51D00	141	156	191	153
	EIL08	77	92	127	89
	M8610+L8210	99	114	149	111

Nominal size	Actuator	Flanged			Welded
		ANSI 125、150	ANSI 300	ANSI 600	ANSI 150、300、600
		EIII			
125	HA31D8、R8	168	193	243	180
	HA41D8、R8	199	224	274	211
	HV61SR5	341	366	416	353
	HV51D00	231	256	306	243
	HV61D00	291	316	366	303
	HV71D00	401	426	476	413
	EIL08	152	177	227	164
	M8610+L8210	174	199	249	186
150	HA31D8、R8	182	212	262	202
	HA41D8、R8	213	243	293	233
	HV61SR5	355	385	435	375
	HV51D00	245	275	325	265
	HV61D00	305	335	385	325
	HV71D00	415	445	495	435
	EIL08	166	196	247	186
	M8610+L8210	188	218	268	208
200	HA41D8、R8	303	353	473	343
	HV51D00	335	365	505	375
	HV61D00	395	445	565	435
	HV71D00	505	555	675	545
	M8620+L8220	283	333	453	323
250	HA5YD、R	—	—	—	—
	HV61D00	—	—	—	—
	HV71D00	—	—	—	—
	EIL20	—	—	—	—
	M8620+L8230	—	—	—	—

Chongqing Chuanyi Control Valve Co., Ltd.

M series model code rules



Model rules: (1) Output type

8-8000 multi-revolution type

0-Small torque 90° type

1-Small thrust linear stroke

(2) Control module:

1-Simple ON-OFF type (MCC)

2-ON-OFF control

3-Intelligent ON-OFF type

4-Intelligent control type

5-Variable frequency ON-OFF type

6-Variable frequency control type

(3) Output torque:

1—50N.m or 100N.m/90°

2—100N.m or 200N.m/90°

3—200N.m or 300N.m/90°

4—400N.m

5—600N.m

6—1000N.m. or 600N.m/90°

3—200N.m or 300N.m/90°

7—1600N.m～2500N.m

8—3000N.m

Note: Small thrust is output thrust

（4）输出速度：

(4) Output speed:

0—36r/min 或 34s/90°

0—36r/min or 34s/90°

1—24r/min 或 28s/90°

1—24r/min or 28s/90°

2—12r/min；

3—72r/min

4—84r/min；

6—144r/min

Small thrust default

(5) Explosion-proof rating:

None-No requirement

d—Ex dIIBT4

D—Ex dibIICT4

(6) Ambient temperature

0-Normal temperature

E-Low temperature

G-High temperature

(7) Power:

0—380V/3PH

S—220V/1PH

B—24 V d.c.

U—12 Vd.c.

X—440V～460V/3PH

(8) Communication protocol:

0-None

r-Infrared

w-Wireless

p-Profibus (2p is two-channel)

m-Modbus

f-FF fieldbus

h-HART fieldbus

(9) Feedback:

0-None

c-ON-OFF type with 4mA-20mA

(10) Specification code

(11) Stroke: not indicated in general model

e.g.: M8510-0S0C+L8210