



CONTROL VALVE STANDARD SPECIFICATION

CRYOGENIC VALVE

2-WAY GLOBE VALVE



YAD-12213, 12233 Series



<http://www.proval.co.kr>



PROVAL Co., Ltd.

[B-6]

PROVAL

CRYOGENIC SERVICE GLOBE VALVE

GENERAL

The **PROVAL** Cryogenic service is a globe style valve which consists of single seat, balanced cage trim with cage guide and quick-change trim.

Cryogenic bodies are constructed of austenitic stainless steel (SUS316).

The cryogenic extended bonnet regulates the temperature of gas moderately and protects the damage of packing from the service fluid.

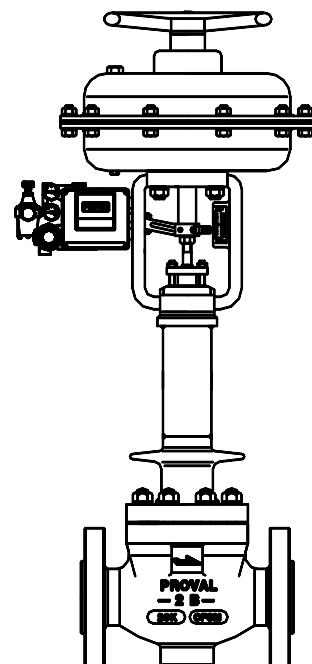
It is usually manufactured from 304 or 316 stainless steel and handles temperature down to -196 °C.

Standard construction consists of stainless steel bonnet nuts and stud bolts. Standard cryogenic valve combine diaphragm actuator with multi-spring.



FEATURES

- Full ANSI 900# and JIS 40K ratings.
- Body has in-line ports with stub and flange for JIS / ANSI standards.
- Butt or socket welding flange available.
- Trim is manufactured of two touches.
Soft (CTFE) + Metal (SUS316 STL.) - (class VI)
- Replacement soft seat element.
- (Class VI)



STANDARD SPECIFICATION

Model No.	Single seated	YADC / YACC-12213 (RA Type), YADC / YACC -22213 (DA Type)															
	Cage balanced	YADC / YACC -12233 (RA Type), YADC / YACC -22233 (DA Type)															
Valve Type		Diaphragm or cylinder actuator operated cryogenic service globe control valve.															
BODY	Valve Size	(mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350
		(inch)	½	¾	1	1¼	1½	2	2½	3	4	5	6	8	10	12	14
	Pressure Rating		ANSI 150# ~ 900# / JIS 10K ~ 40K / JPI 150# ~900#														
	End Connections		Flanged end: FF, RF, RTJ, M/F(female), T/G(female). ※Welding end: SW, BW														
	Body Materials		A351-CF8, CF8M, CF3M, etc.														
	Operating Temperature	Standard	Extension: -21°C to -196°C														
		Special	Long extension bonnet: -196°C or lower														
	Guide		Cage guide (Quick Change Trim)														
	Gland Packing		V-PTFE, Grapoil, High Per,-Seal														
	Gasket		SUS316 + Graphite spiral wound, Metal, High-Per, -Seal														
	Painting Color		Standard is silver. In the case of stainless steel, flange is not painted.														
	Flow Direction		Unbalance Single Type : FTO (Flow action to open), Balance Cage Type FTC (Flow action to close)														
	Trim Materials	Standard	SUS316 (STL.), SUS316L (STL.), Soft (PCTFE)														
		Special	Soft(PCTFE) + Metal(SUS316 STL.) two touch														
Treatment of Trim		See "MATERIAL DATA" page 3, 4															
PERFORMANCE	Valve Action		Direct action, Reverse action.														
	Allowable Differential Pressure		See "ALLOWABLE PRESSURE DROP" page 6														
	Rated Cv Value		See "FLOW CHARACTERISTICS" page 5														
	Flow Characteristics		See "FLOW CHARACTERISTICS" page 5														
	Rangeability		See "FLOW CHARACTERISTICS" page 5														
	Allowable Seat Leakage Ratio	Standard	ANSI B16. 104 Class IV (SUS316 or Soft Seat)														
		Special	Soft seat or Two touch(S+M) – ANSI B16.104 Class VI														
	Action Accuracy	Hysteresis	(Without positioner) max. 4% F.S. (With positioner) max. 1% F.S.														
Linearity		(Without positioner) max. ±5% F.S. (With positioner) max. ±1% F.S.															

ACTUATOR	Valve Size	(mm)	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500
		(inch)	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	4	5	6	8	10	12	14	16	18	20
	Model	A-220M ~ A-520M																		
	Actuator Type	Multi-spring diaphragm type.																		
	Actuator Size (Diaphragm size)	Ø220			Ø270			Ø360			Ø430			Ø520			Cylinder Type			
	Max. Stroke (mm)	20			20, 25			30, 40			55, 60			90			Over 100			
	Supply Air Pressure kPa (kgf/cm ² G)	200 (2.0), 320 (3.2)																		
	Spring Range kPa (kgf/cm ² G)	20~98 (0.2~1.0), 40~200 (0.4~2.0)																		
	Action	Direct action, Reverse action.																		
	Materials	Diaphragm: EPDM, York: FCD450 & A216-WCB, Case: Al-Alloy																		
	Air Connection	Rc 1/4																Rc 3/8		
	Ambient Temperature	-20°C ~ +70°C (※ -50°C ~ -20°C, +70°C ~ +100°C)																		
	Painting Color	Standard is Cobalt Blue(Munsell No : 2.5 PB3/10) [Request other color]																		

[Notes] (1) Bonnet pipe material is SUS304 or SUS316L only.

(2) ※ : Manufactured and attached as according to customer's order.

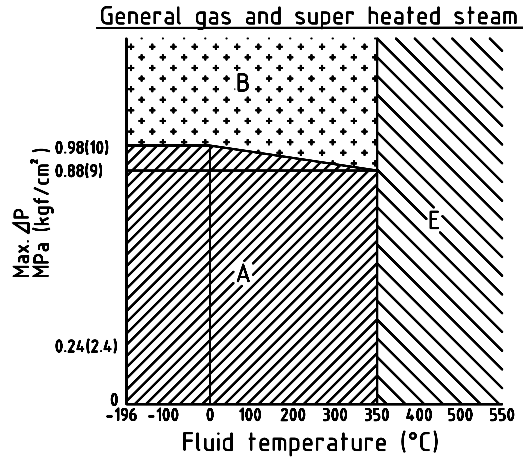
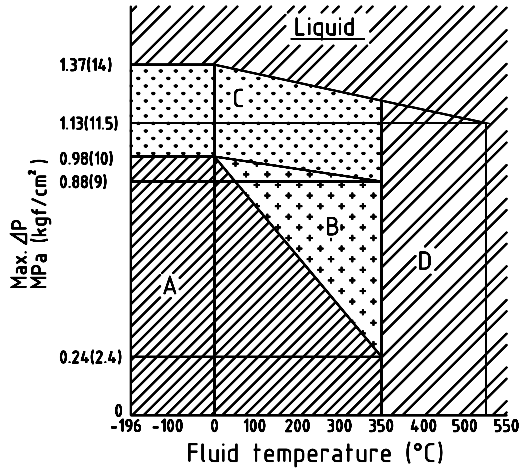
MATERIAL DATA

1. Combining the valve body, bonnet and trim material.

Parts Name		Materials
Body, Bonnet		A351-CF8, CF8M, CF3M
Trim	Valve Plug	SUS316 (STL.), SUS 316L (STL.)
	Cage	SUS316 (Hcr plated), SUS 316L (Hcr plated)
	Seat Ring	SUS316 (Stellite welding), PTFE, CTFE / Two touch (SUS316 STL. + PCTFE)
	Valve Stem	SUS316 (Hcr plated)
Guide Ring		PTFE or Rulon
Bal-Seal		Glass PTFE + SUS316, PTFE(TFM)+LG
Packing		V-PTFE, Grapoil, High Per-Seal.
Packing & Lantern ring		SUS304
Body Stud Bolt & Nut		Stainless steel

2. Trim treatment & material vs operating pressure-temperature ratings.

A: Stellite standard (Plug & Seat) B: Stellite standard and ion treatment C: Stellite face D: Stellite face + Stellite of guide bushing and guide post
E: Stellite seat + Stellite of guide bushing and guide post

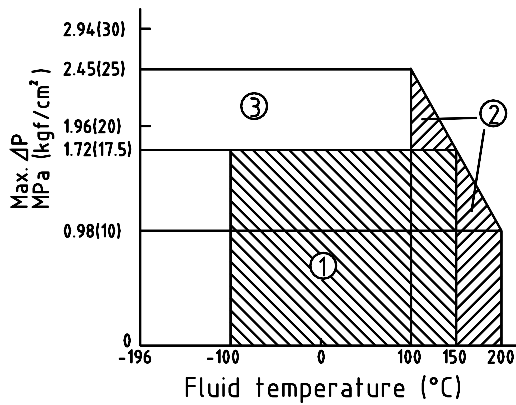


- (1) Seat ring of on-off control valve and of throttling control valve for tight shut off is hard faced at the area of Stellite seat and over.
- (2) In case of flushing fluid, seat ring is hard faces at the area of Stellite area.

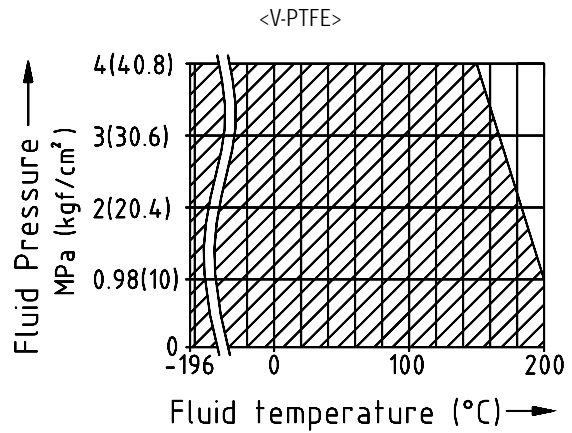
3. Soft seat operating pressure-temperature ratings.

4. Gland packing operating pressure-temperature ratings.

Disc materials : ① PTFE
② Glass reinforced PTFE
③ PCTFE [Note]



[Note] Poly-chlorotrifluoro ethylene





CRYOGENIC SERVICE GLOBE VALVES

FLOW CHARACTERISTICS

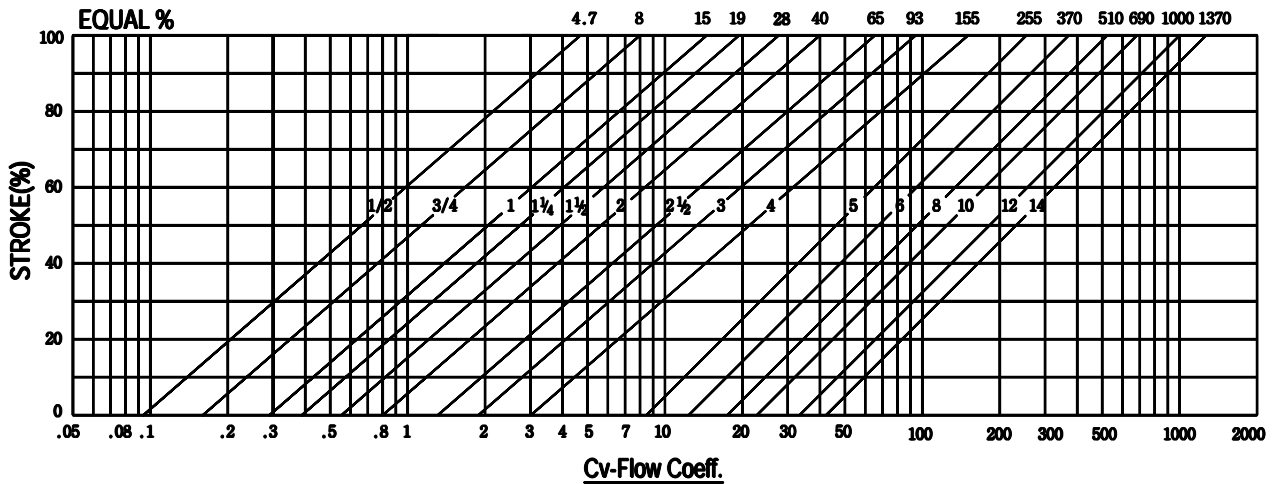
1. Rated Cv Value

Port Size	15A (1/2")	20A (3/4")	25A (1")	32A (1 1/4")	40A (1 1/2")	50A (2")	65A (2 1/2")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")	350A (14")
Cv Value	4.7	8	15	19	28	40	65	93	155	255	370	510	690	1000	1370
Range ability	50:1														

[Unit: gal/min]

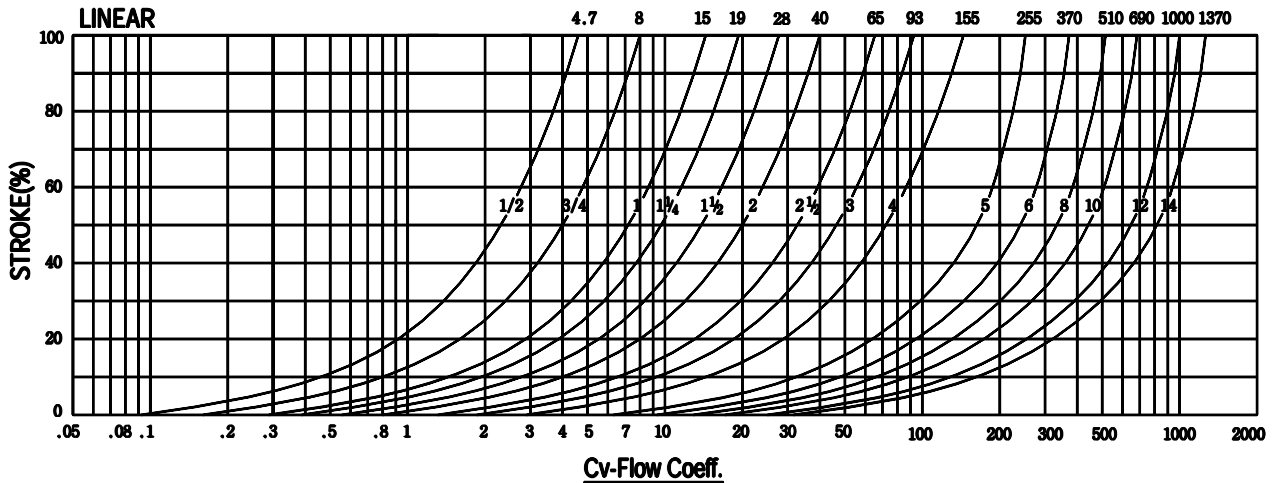
2. Flow Characteristics

2-1 Equal %



[Note] Proper throttling control range: 10-90% stroke

2-2 Linear



[Note] Proper throttling control range: 10-90% stroke

MAX. ALLOWABLE PRESSURE DROP

1. Diaphragm Actuator: Single seat type. Reverse Action (RA, Air to Open)

Shaded zone represents standard application.

[Unit: Kgf/cm²G]

Actuator Model	Air Supply (Kgf/cm ² G)	Spring Range (Kgf/cm ² G)	Port Size														
			10A (3/8")	15A (1/2")	20A (3/4")	25A (1")	32A (1 1/4")	40A (1 1/2")	50A (2")	65A (2 1/2")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")
A-220M	1.4	0.2 ~ 1.0	31	13	8	5	3	2									
	2.4	0.4 ~ 2.0		28	15	10	6	4									
	3.2	0.8 ~ 2.4			26	17	11	7									
A-270M	1.4	0.2 ~ 1.0		20	11	7	5	3	2								
	2.4	0.4 ~ 2.0		40	23	15	8	6	3	3							
	3.2	0.8 ~ 2.4			45	30	17	11	6	5							
A-360M	1.4	0.2 ~ 1.0						6	3	3	1	1					
	2.4	0.4 ~ 2.0						11	7	5	3	2					
	3.2	0.8 ~ 2.4						23	14	10	6	4					
A-430M	2.4	0.4 ~ 2.0											2	1			
	3.2	0.8 ~ 2.4											4	3			
A-520M	2.4	0.4~2.0													2	1.5	1
	3.2	0.8~2.4													4	3	2

2. Diaphragm Actuator: Single seat type. Direct Action (DA, Air to Close)

[Unit: Kgf/cm²G]

Actuator Model	Air Supply (Kgf/cm ² G)	Spring Range (Kgf/cm ² G)	Port Size														
			10A (3/8")	15A (1/2")	20A (3/4")	25A (1")	32A (1 1/4")	40A (1 1/2")	50A (2")	65A (2 1/2")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")
A-220M	1.4	0.2 ~ 1.0	61	27	15	10	6	4	2.5								
	3.2	0.4 ~ 2.0			47	30	18	11	7								
A-270M	1.4	0.2 ~ 1.0				15	9	5	3	2.5							
	3.2	0.4 ~ 2.0				43	26	17	11	7							
A-360M	1.4	0.2 ~ 1.0						11	7	5	2.5	2					
	3.2	0.4 ~ 2.0						34	22	15	9	5					
A-430M	1.4	0.2 ~ 1.0										3	2	1.5	1		
	3.2	0.4 ~ 2.0									10	7	4	3			
A-520M	1.4	0.2~1.0													2.5	1.5	1
	3.2	0.4~2.0													6	4	3

MAX. ALLOWABLE PRESSURE DROP

3. Diaphragm Actuator: Cage balanced type. Reverse Action (RA, Air to Open)

Shaded zone represents standard application.

[Unit: Kg/cm²G]

Actuator Model	Air Supply (Kg/cm ² G)	Spring Range (Kg/cm ² G)	Port Size													
			40A (1½")	50A (2")	65A (2½")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")	450A (14")	400A (16")	450A (18")	500A (20")
A-270M	2.6	0.4 ~ 2.0	13	11	6											
	3.2	0.8 ~ 2.4	13	19	9	7										
A-360M	2.6	0.4 ~ 2.0		21	11	7	6									
	3.2	0.8 ~ 2.4		18	20	12	10	9								
A-430M	2.6	0.4 ~ 2.0					10	8	7	5						
	3.2	0.8 ~ 2.4					19	15	13	8						
A-520M	2.6	0.4 ~ 2.0									6	5	4	3	CYLINDER ACTUATOR STANDARD	
	3.2	0.8 ~ 2.4									9	8	6	5		

4. Diaphragm Actuator: Cage balanced type. Direct Action (DA, Air to Close)

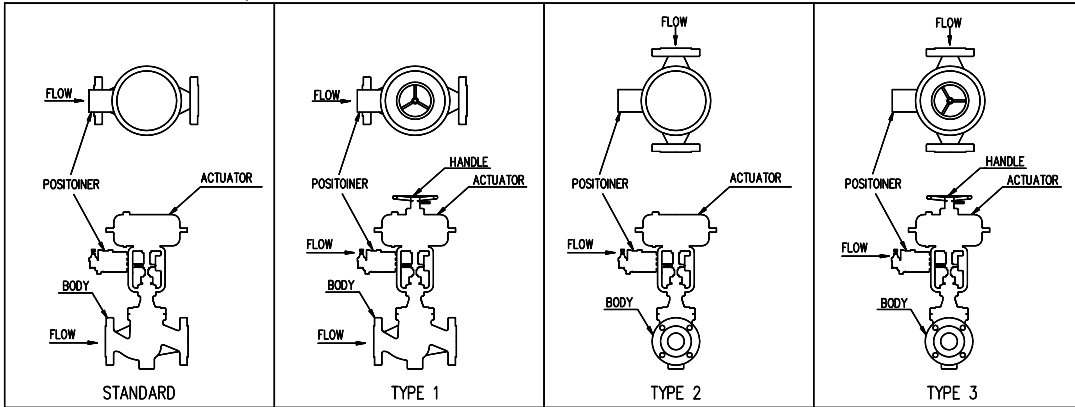
Shaded zone represents standard application.

[Unit: Kg/cm²G]

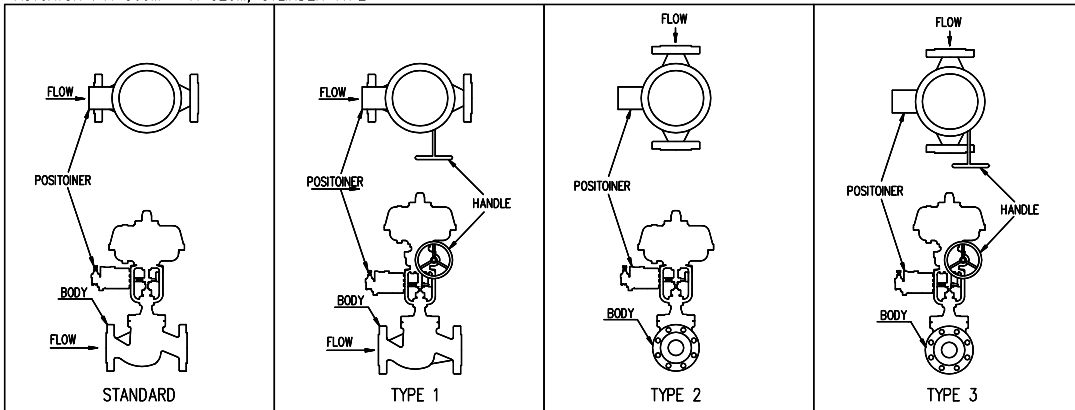
[Unit: Kg/cm ² G] Actuator Model	Air Supply (Kg/cm ² G)	Spring Range (Kg/cm ² G)	Port Size													
			40A (1½")	50A (2")	65A (2½")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")	450A (14")	400A (16")	450A (18")	500A (20")
A-270M	2.6	0.4 ~ 2.0	13	10	6											
	3.2	0.8 ~ 2.4	32	19	14											
A-360M	2.6	0.4 ~ 2.0		21	11	6	5									
	3.2	0.8 ~ 2.4			28	16	14									
A-430M	2.6	0.4 ~ 2.0					10	8	7	5						
	3.2	0.8 ~ 2.4					27	22	18	11						
A-520M	2.6	0.4 ~ 2.0									6	5	4	3	CYLINDER ACTUATOR STANDARD	
	3.2	0.8 ~ 2.4									14	12	9	7		

ACTUATOR MOUNTING FORMS

ACTUATOR : A-220M ~ A-270M, CYLINDER TYPE



ACTUATOR : A-360M ~ A-520M, CYLINDER TYPE



WEIGHT

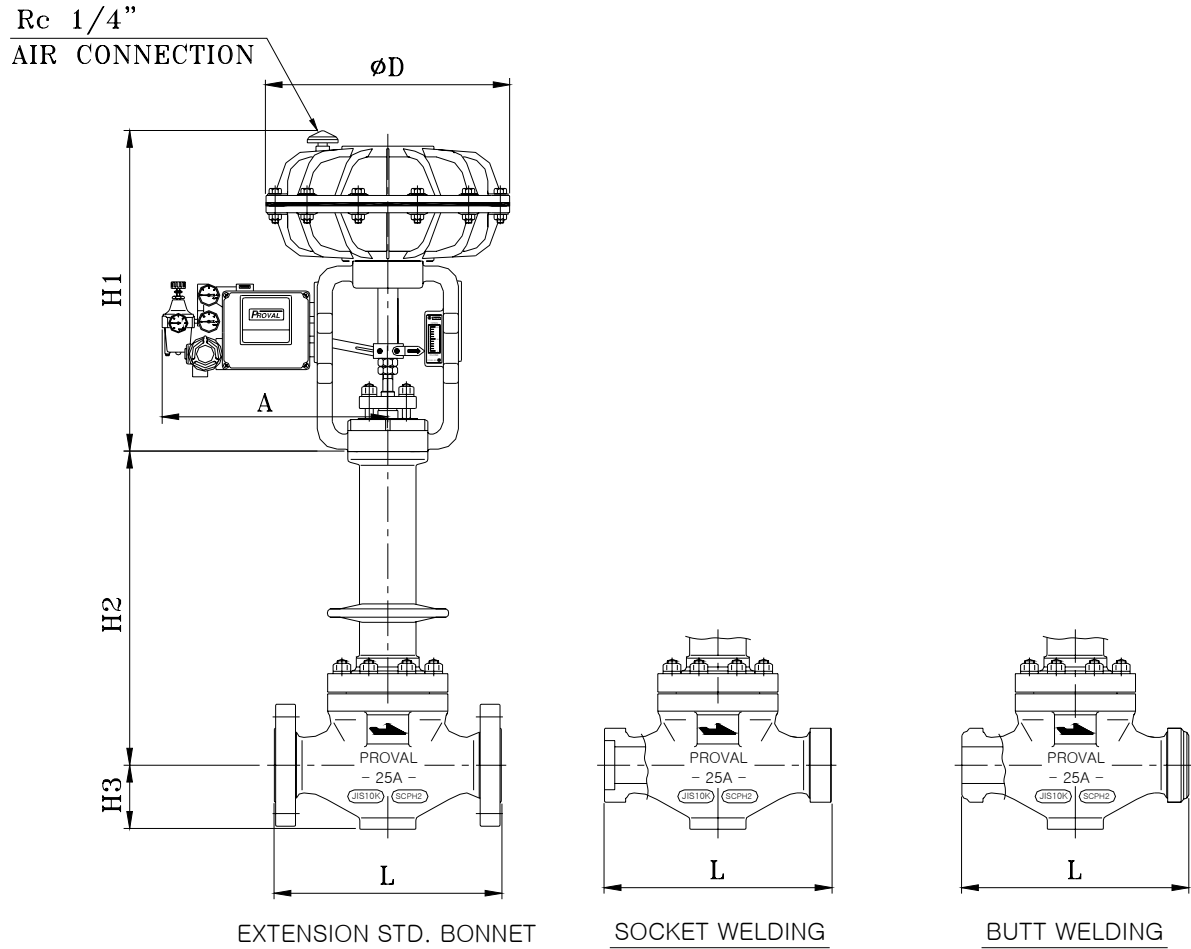
※ Only standard types are represented. Weight of accessories, a hand wheel and the like are not included.

[Unit: kg]

Size	15A (1/2")	20A (3/4")	25A (1")	32A (1 1/4")	40A (1 1/2")	50A (2")	65A (2 1/2")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")	350A (14")
Actuator Model	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#	10,20K ANSI 150#, 300# 30,40K ANSI 600#, 900#
A-220M	82	83	83	85	86	87	87	89	89	90	91	92			
A-270M				121	122	122	124	124	124	126	126	130	140	143	150
A-360M									187	192	204	210	220	230	260
A-430M											476	500	510	530	545
A-520M															
												555	555	555	560
												750	780	750	780
												1255	1644	1700	1750

DIMENSION DRAWING

ACTUATOR : A-220M



DIMENSIONS

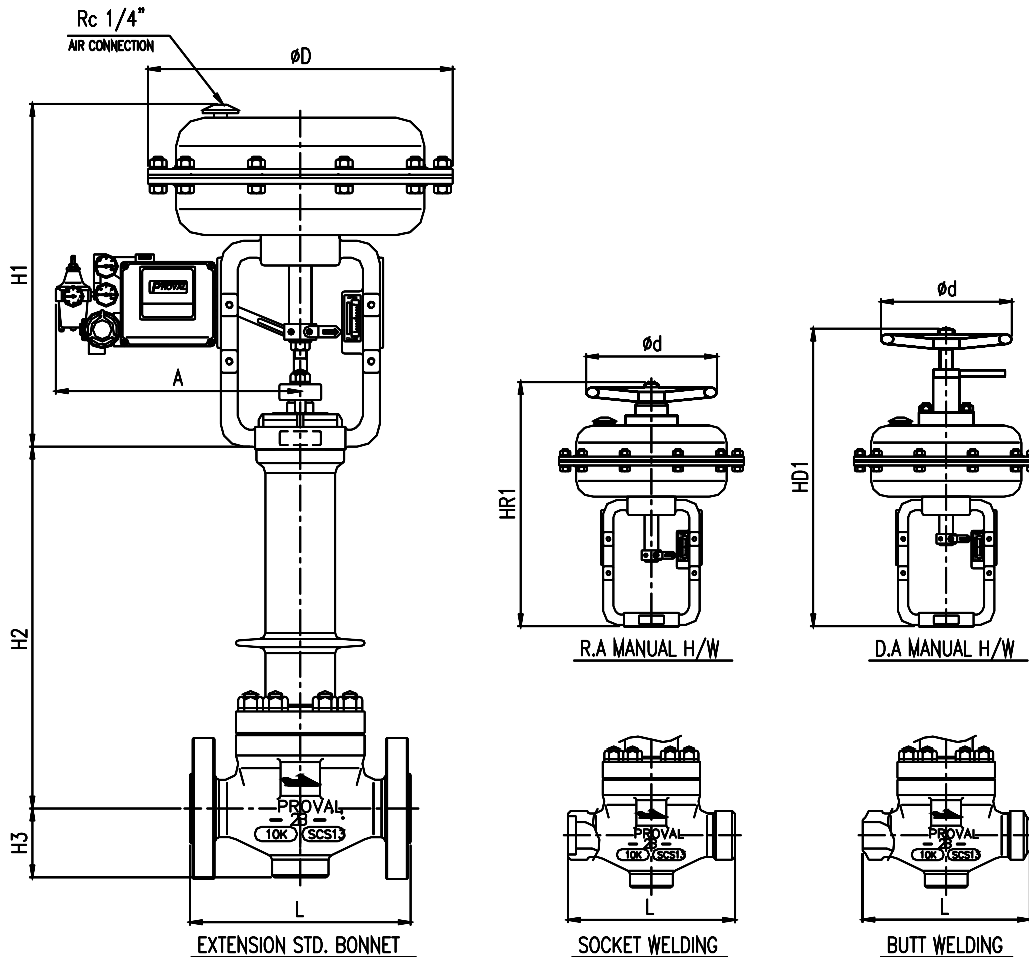
[Unit: mm]

Valve Size		Face to Face : L			H3	H2	Actuator size (ØD)	H1	With Manual H/W		A
mm	inch	JIS 10K, 20K ANSI 150#	ANSI 300#	JIS 30K ANSI 600#					HR1	HD1	
15	½	185	185	201	68	703	225	280	335 ~ 355	400 ~ 420	310
20	¾	185	185	201	68	703	225	280	335 ~ 355	400 ~ 420	310
25	1	185	185	201	68	703	225	280	335 ~ 355	400 ~ 420	310

MODEL	Single seated type- YADC-12213, YADC-22213 Cage balanced -type YADC-12233, YADC-22233	SIZE	15A - 25A
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DIMENSION DRAWING

ACTUATOR : A-270M



DIMENSIONS

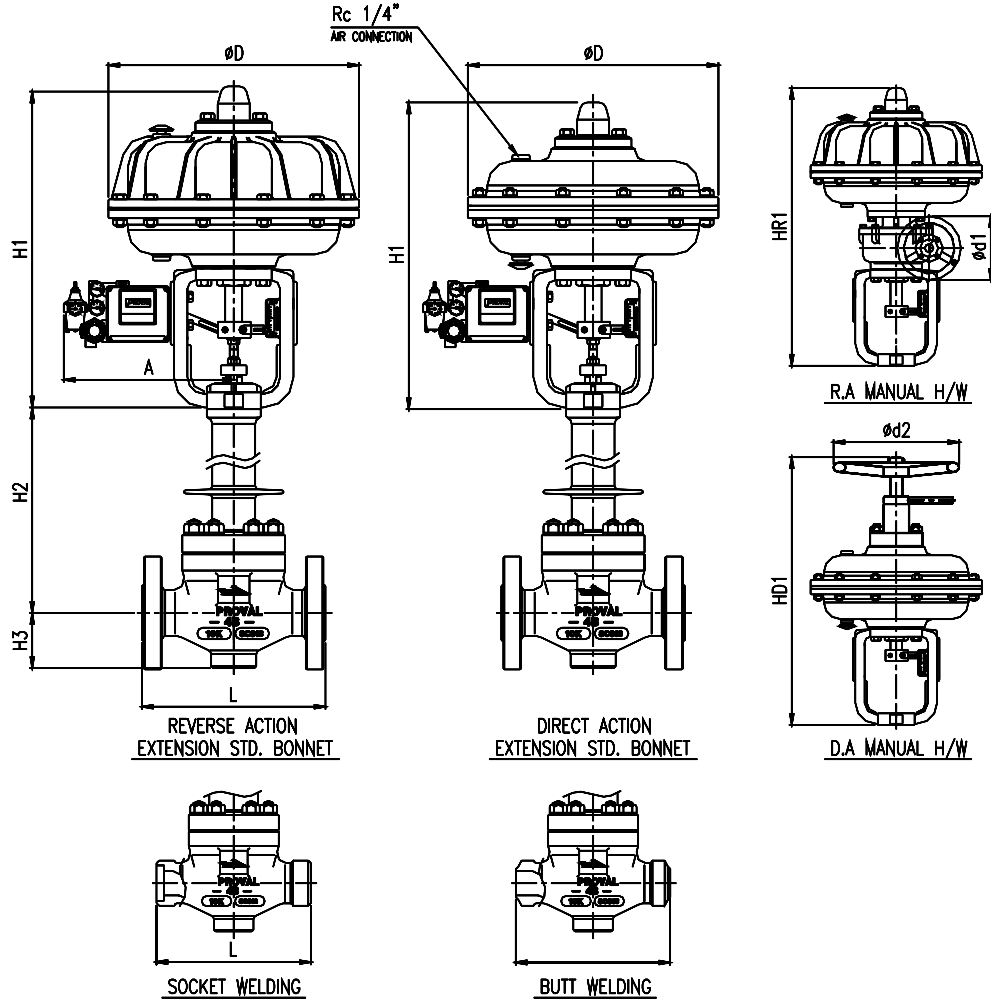
[Unit: mm]

Valve Size		Face to Face : L			H3	H2	Actuator size (ØD)	H1	With Manual H/W		A	Ød
mm	inch	JIS 10K, 20K ANSI 150#	ANSI 300#	JIS 30K ANSI 600#					HR1	HD1		
25	1	185	185	201	68	703	270	310	360 ~ 390	442 ~ 422	322	200
32	1¼	223	228	245	85	727	270	310	360 ~ 390	442 ~ 422	322	200
40	1½	223	228	245	85	727	270	310	360 ~ 390	442 ~ 422	322	200
50	2	256	264	286	90	739	270	310	360 ~ 390	442 ~ 422	322	200
65	2½	283	294	315	80	749	270	310	360 ~ 390	442 ~ 422	322	200

MODEL	Single seated type- YADC-12213, YADC-22213 Cage balanced -type YADC-12233, YADC-22233	SIZE	25A - 65A
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DIMENSION DRAWING

ACTUATOR : A-360M



DIMENSIONS

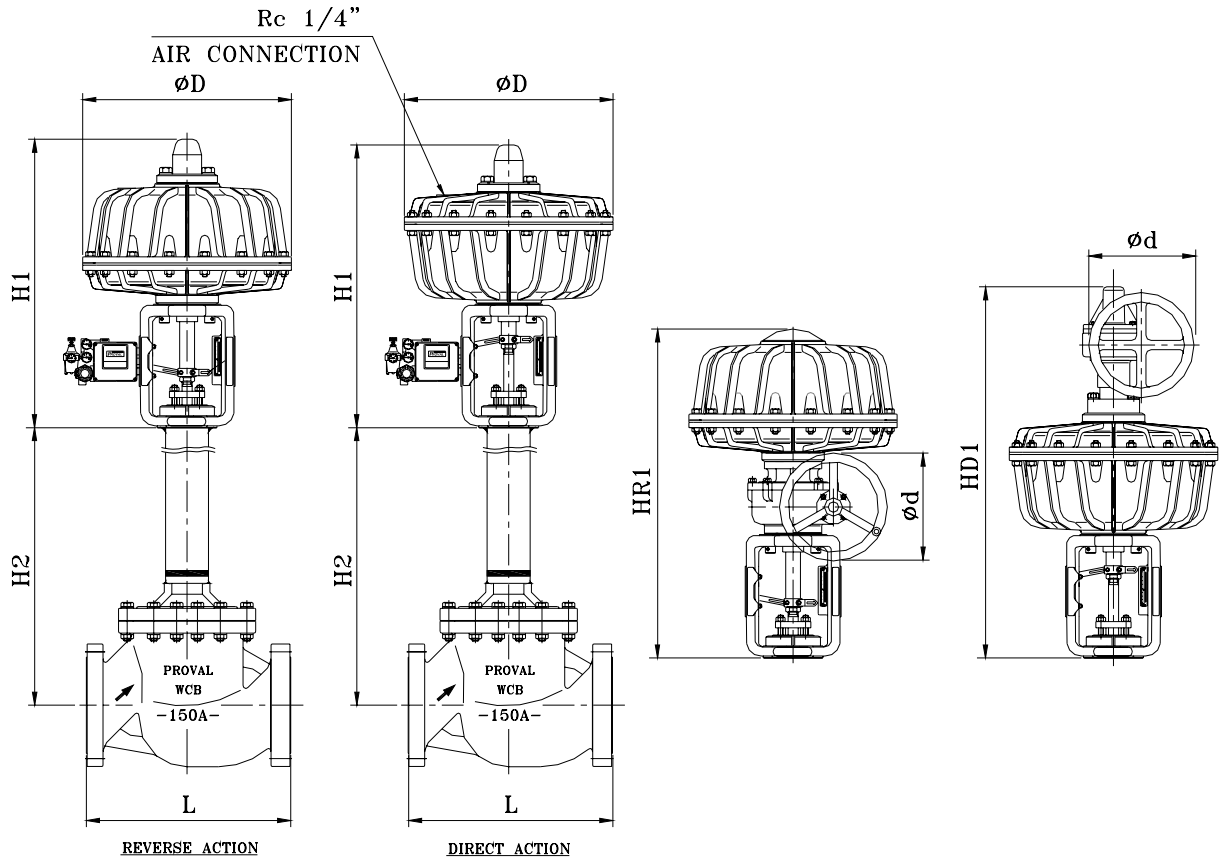
[Unit: mm]

Valve Size		Face to Face : L			H3	H2	Actuator size (ØD)	H1		With Manual H/W		A	Ød1	Ød2
mm	inch	JIS 10K, 20K ANSI 150#	ANSI 300#	JIS 30K ANSI 600#				R.A.	D.A.	HR1	HD1			
50	2	256	264	286	90	739	360	458	427	590	588 ~ 548	327	200	315
65	2½	283	294	315	70	749	360	458	427	590	588 ~ 548	327	200	315
80	3	300	313	397	80	813	360	458	427	590	588 ~ 548	327	200	315
100	4	358	373	394	101	840	360	458	427	590	588 ~ 548	327	200	315
125	5	400	417	457	110	955	360	458	427	590	588 ~ 548	327	200	315

MODEL	Single seated type- YADC-12213, YADC-22213 Cage balanced -type YADC-12233, YADC-22233	SIZE	50A ~ 125A
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DIMENSION DRAWING

ACTUATOR : A-430M



DIMENSIONS

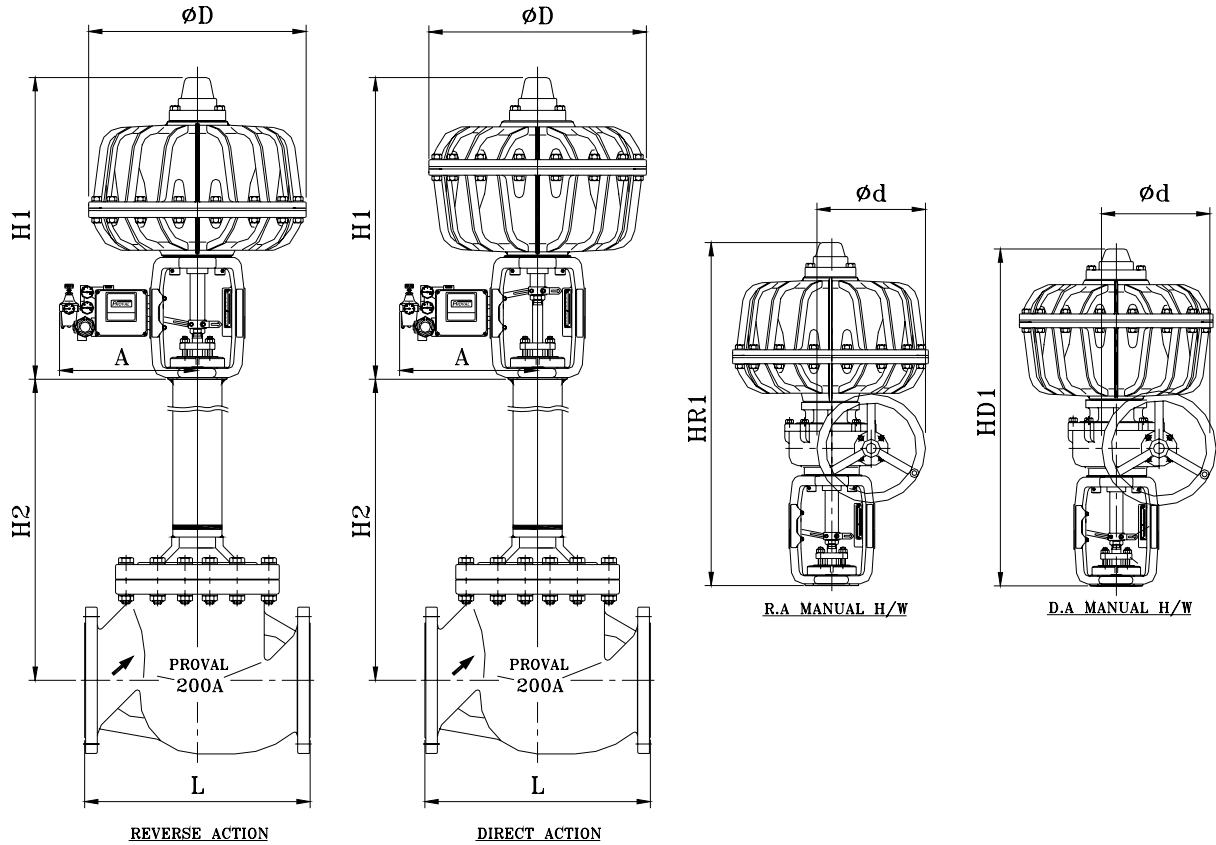
[Unit: mm]

Valve Size		Face to Face : L			H3	H2	Actuator size (ØD)	H1		With Manual H/W		A	Ød
mm	inch	JIS 10K, 20K ANSI 150#	ANSI 300#	JIS 30K ANSI 600#				R.A.	D.A.	HR1	HD1		
100	4	358	373	394	101	840	430	554	643	880	870 ~ 780	345	315
125	5	400	417	457	110	955	430	554	643	880	870 ~ 780	345	315
150	6	462	479	508	136	975	430	554	643	880	870 ~ 780	345	315
200	8	554	592	610	176	1122	430	554	643	880	870 ~ 780	345	315

MODEL	Single seated type- YADC-12213, YADC-22213 Cage balanced -type YADC-12233, YADC-22233	SIZE	100A ~ 200A
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DIMENSION DRAWING

ACTUATOR : A-520M



DIMENSIONS

[Unit: mm]

Valve Size		Face to Face : L			H2	Actuator size (ØD)	H1		With Manual H/W		A	Ød
mm	inch	JIS 10K, 20K ANSI 150#	ANSI 300#	JIS 30K ANSI 600#			R.A.	D.A.	HR1	HD1		
200	8	554	592	610	1122	520	735	795	990	1060	350	315
250	10	676	703	752	1152	520	735	795	990	1060	350	315
300	12	799	866	819	1205	520	735	795	990	1060	350	315
350	14	890	940	940	1285	520	735	795	990	1060	350	315

MODEL	Single seated type- YADC-12213, YADC-22213 Cage balanced -type YADC-12233, YADC-22233	SIZE	200A ~ 350A
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