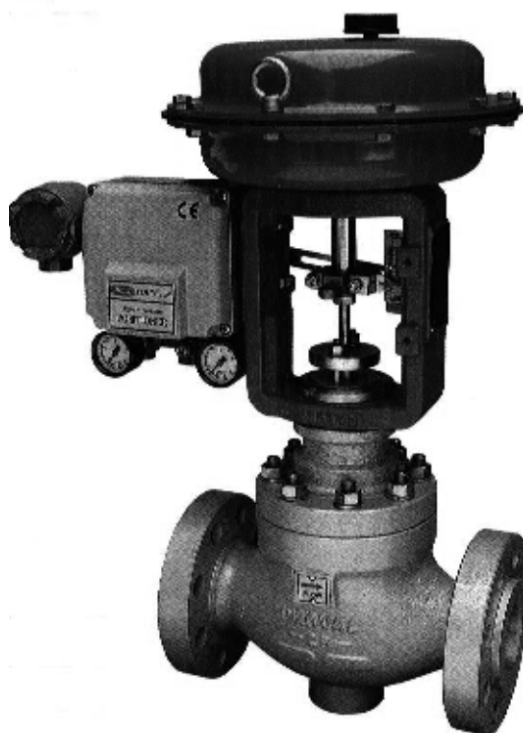




CONTROL VALVE STANDARD SPECIFICATION

CAGE TYPE

2-WAY GLOBE VALVE



YAD-XXX3X Series



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



PROVAL Co., Ltd.

[B-2]

CAGE GUIDED TYPE

GENERAL

The **PROVAL** cage balanced control valves are designed for heavy duty service.

The valves plug is of a pressure-balanced type that permits flow control of a high differential pressure with bellows seal, extension, fin, jacket bonnet.

Standard actuators are multi-spring diaphragm actuator.

FEATURES

- More flow capacity for initial investment. Streamlined flow passages provide greater capacities than most globe bodies of the same line size.

Balanced valve plug construction permits use of smaller, lower-cost actuators.

Also, trim inventory costs are cut because dimensional standardization permits use of most standard **PROVAL** valve cage trim parts.

- High-pressure and temperature capability with class IV shut off.

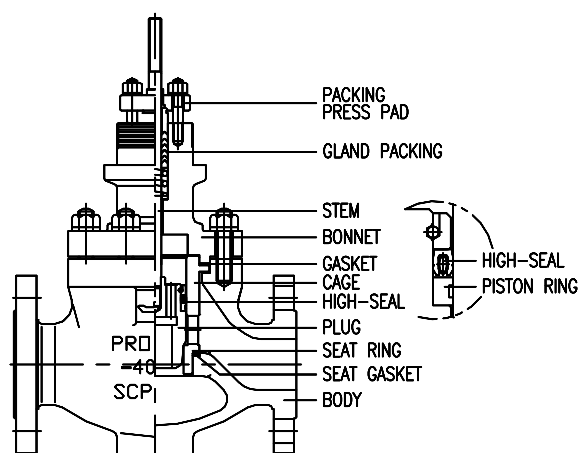
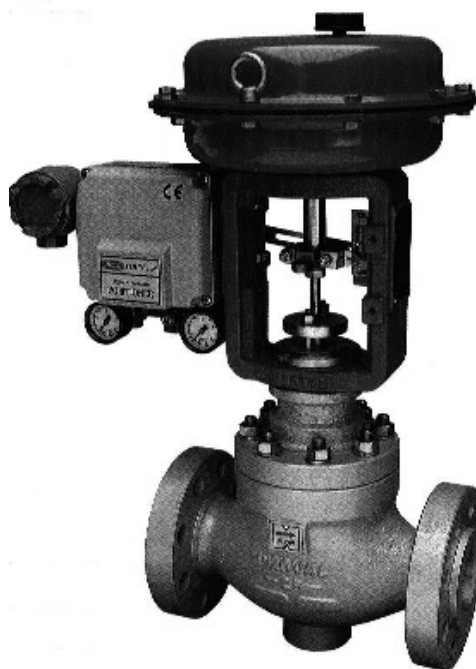
RTFE piston ring and high-seals permits. This shut off up to 230°C.

- **Operational economy**

Increased wear resistance of standard hardened stainless steel trim means long lasting service.

- **Maintenance economy**

The body can stay in the pipeline during removal of trim parts for inspection or maintenance.



STANDARD SPECIFICATION

Model No.				YAD-12231, 12131, 12331, YAD-22231, 22131, 22331 / YAC-12231, 12331,22231, 22331															
Valve Type				Diaphragm or Cylinder Actuator operated Globe control valve.															
BODY	Valve Size		(mm)	40	50	65	80	100	125	150	200	250	300	350	400	450	500		
			(inch)	1½	2	2½	3	4	5	6	8	10	12	14	16	18	20		
	Pressure Rating			ANSI 150# ~ 4500# / JIS 10K ~ 63K															
	End Connections			Flange end: FF, RF, RTJ, M/F(female),T/G(female) ※ Welding end: SW, BW															
	Body Materials			A216-WCB (SCPH2), A351-CF8 (SCS13), CF8M (SCS14), CF3M (SCS16)															
	Operating Temperature	Single		Standard Type: -20℃ ~ 230℃ Extension: -100℃ ~ -20℃															
		Double		Only fin bonnet type: over 220℃															
	Guide			Cage Guide															
	Gland Packing			V-PTFE, PTFE yarn, Graphite yarn															
	Gasket			SUS316 + Graphite spiral wound, other alloy steels.															
	Painting Color			Standard is silver. In the case of stainless steel, flange is not painted.															
	Plug Characteristics			Linear, Equal %.															
	Cage Type	Single		Single metal Seated and Hi – Seal.															
		Double		Double metal Seated.															
	Flow Direction			FTC (Flow Action to Close)															
	Trim Materials			SUS630 (H.T), SUS304 (STL.), SUS316 (STL.), SUS316L (STL.)															
	Treatment of Trim			See “MATERIAL DATA” page 3 ~ 5															
PERFORMANCE	Control Mode			Throttling control, On-off control.															
	Valve Action			Direct action, Reverse action.															
	Allowable Differential Press.			See “ALLOWABLE PRESSURE DROP” page 7															
	Rated Cv Value			See “FLOW CHARACTERISTICS” page 5															
	Flow Characteristics			See “FLOW CHARACTERISTICS” page 6															
	Rangeability			50A ~ 200A (50 : 1) , 250A over (30 : 1)															
	Allowable Seat Leakage Ratio	Metal Seat	Control	Single	0.01% of rated Cv (ANSI B16. 104 Class IV) ※ Tight shut off – 0.005%										0.01% of rated Cv (ANSI B16. 104 Class IV)				
				Double	0.1% of rated Cv (ANSI B16. 104 Class III) ※ Tight shut off – 0.01%										0.1% of rated Cv (ANSI B16. 104 Class III)				
		Soft Seat	On-Off	Single	0.005% of rated Cv (ANSI B16. 104 Class IV Over.)										0.01% of rated Cv				
				Double	0.01% of rated Cv(ANSI B16. 104 Class IV)										0.05% of rated Cv				
	Action Accuracy	Soft Seat		Control & On-Off	Single & Double	ANSI B16. 104 Class VI													
		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)	40	50	65	80	100	125	150	200	250	300	350	400	450	500	
		(inch)	1½	2	2½	3	4	5	6	8	10	12	14	16	18	20	
	Model		A-270M, A-360M, A-430M, A-520M or Cylinder type														
	Actuator Type		Multi-spring diaphragm type. or Cylinder type														
	Actuator Size (Diaphragm size)		Ø270		Ø360		Ø430		Ø520		CYLINDER TYPE						
	Max. Stroke (mm)		30		45		65		90		OVER 100mm						
	Supply Air Pressure kPa (kgf/cm²G)		140 (1.4), 240 (2.4), 280 (2.8), 320 (3.2)										(300~700) 3.7~7.0				
	Spring Range kPa (kgf/cm²G)		20~98 (0.2~1.0), 40~200 (0.4~2.0) 60~220 (0.6~2.2), 80~240 (0.8~2.4)										200~300 (2.0~3.0) 250~350 (2.5~3.5)				
	Action		Direct action, Reverse action.														
	Materials		Diaphragm: EPDM, York: A216-WCB, FCD Case: Al-Alloy, SS41 and STKM Cylinder														
	Air Connection		Rc 1/4" (※ Rc 3/8" ~ RC1)														
	Ambient Temperature		-20℃ ~ +70℃ (※ -50℃ ~ -20℃, +70℃ ~ +100℃)														
	Painting Color		Standard is Cobalt Blue(Munsell No : 2.5 PB3/10) [Request other color]														

[Notes] (1) Valve performance is represented under the condition of standard packing (V-PTFE).

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

(3) Please contact us as to the high pressure rating ANSI classes 900, 1500 and 2500 valves.

MATERIAL DATA

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

Parts Name		Materials		
Body, Bonnet		ASTM A216-WCB / SCPH2	ASTM A351-CF8 / SCS13	ASTM A351-CF8M / SCS14
Trim	Seat Ring	SUS 630 (H.T), SUS 316 (STL.), SUS304 (STL.), RTFE		SUS 316 (STL.)
	Valve Plug	SUS 630 (H.T), SUS 316 (STL.), SUS304 (STL.)		
	Cage	SUS316 (Hcr Plated)		SUS316 (Hcr Plated)
	Valve Stem	SUS 316 (Hcr plated)		
	Guide Bushing	SUS 420J2 (Hard face)		SUS 316 (Hcr)
Stud Bolt & Nut		SNB7/S45C(H), Class150 S45(H) / S45C(N)	SUS304	

[Notes] (1) This table shows typical combination of materials. The combination may be subject to pressure-temperature and kind of fluid.

(2) Trim materials may be casting in stead of bar materials in some cases.

(3) Bonnet may be forged in some cases.

2. Body material & operating pressure-temperature rating.

2-1 ANSI

[Unit: MPa]

Material Temp. (°C)	150#			300#			600#		
	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M	A216-WCB	A351-CF8	A351-CF8M
-45 ~ 38		1.95	1.95		5.00	5.00		9.96	9.97
-5 ~ 38	2.01	1.95	1.95	5.15	5.00	5.00	10.2 5	9.96	9.97
50	1.97	1.89	1.89	5.15	5.00	5.00	10.0 6	9.61	9.67
100	1.81	1.61	1.66	4.68	4.13	4.26	9.32	8.22	8.48
150	1.62	1.44	1.52	4.56	3.67	3.90	9.09	7.31	7.74
200	1.45	1.30	1.42	4.43	3.32	3.61	8.80	6.59	7.17
250	1.25	1.21	1.25	4.21	3.09	3.39	8.38	6.15	6.72
300	1.06	1.06	1.06	3.92	2.96	3.20	7.79	5.85	6.37
350	0.89	0.89	0.89	3.74	2.86	3.08	7.43	5.65	6.12
375	0.78	0.78	0.78	3.69	2.82	3.01	7.33	5.59	5.98
400	0.69	0.69	0.69	3.49	2.79	2.96	6.94	5.53	5.86
425	0.60	0.60	0.60	2.93	2.76	2.92	5.79	5.47	5.77
450	0.52	0.52	0.52	2.04	2.73	2.86	4.05	5.42	5.66
475	0.42	0.42	0.42	1.40	2.70	2.78	2.75	5.35	5.51
500	0.33	0.33	0.33	0.93	2.65	2.72	1.80	5.25	5.42
525	0.23	0.23	0.23	0.56	2.24	2.62	1.08	4.82	5.20
538	0.18	0.20	0.20	0.36	2.23	2.58	0.77	4.60	5.11

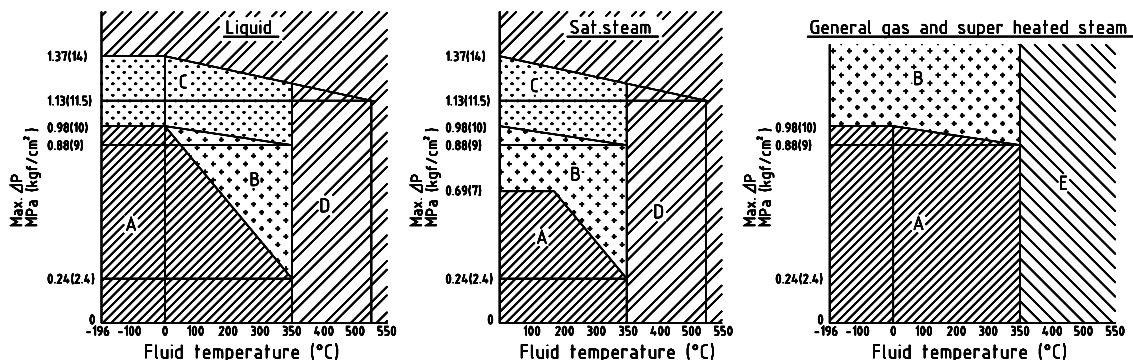
2-2 JIS

[Unit: MPa]

Material Temp. (°C)	SCPH2		
	10K	20K	30K
-5 ~ 120	1.42	3.38	5.04
~ 220	1.32	3.08	4.55
~ 300	1.03	2.89	4.26
~ 350		2.59	3.87
~ 400		2.30	3.38
~ 425		2.01	2.99
~ 450			
~ 475			
~ 490			
~ 500			
~ 510			

3. Trim treatment & material Vs operating pressure-temperature ratings.

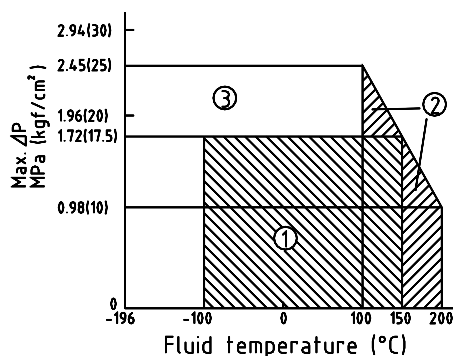
A: Stellite standard (Plug & Seat) B: Stellite standard and ion treatment C: Stellite face D: Stellite face + Stellite of guide bushing and guide post
E: Stellite seat + Stellite of guide bushing and guide post



- (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) In spite of fluid sort, at 350°C and over, guide bushing and guide post is hard faced be Stellite treatment.
- (4) In case of saturated steam, if inlet pressure is 0.69 MPa (7 kgf/cm²G) and over, seat ring is hard faced at area of Stellite seat and over.

4. Soft seat operating pressure-temperature ratings.

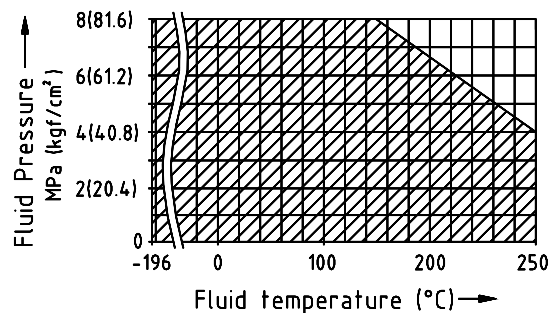
- Disc materials : ① PTFE
② Glass reinforced PTFE
③ PCTFE [Note]



[Note] Poly-chlorotrifluoro ethylene

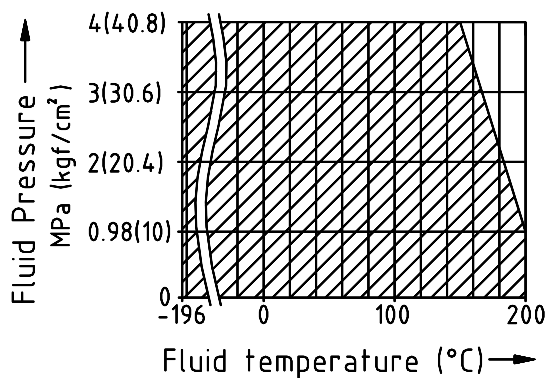
5. Balance seal operating pressure-temperature ratings.

< Reinforced Teflon/SUS316 >

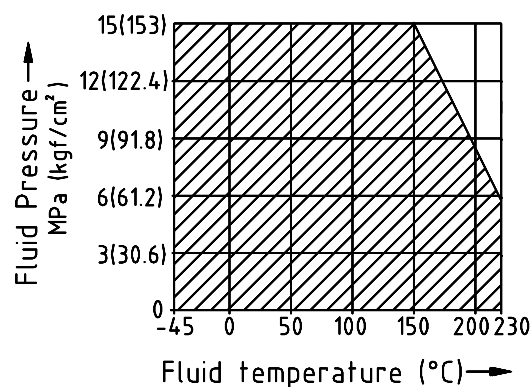


6. Gland packing operating pressure-temperature ratings.

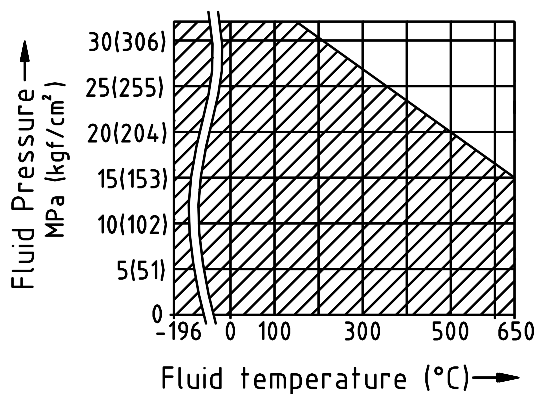
① V-PTFE



② PTFE yarn



③ Graphite yarn



FLOW CHARACTERISTICS

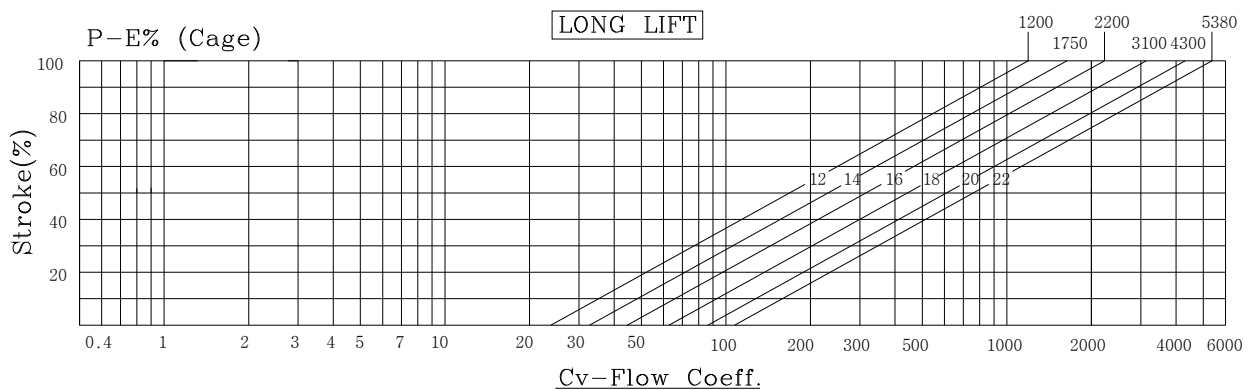
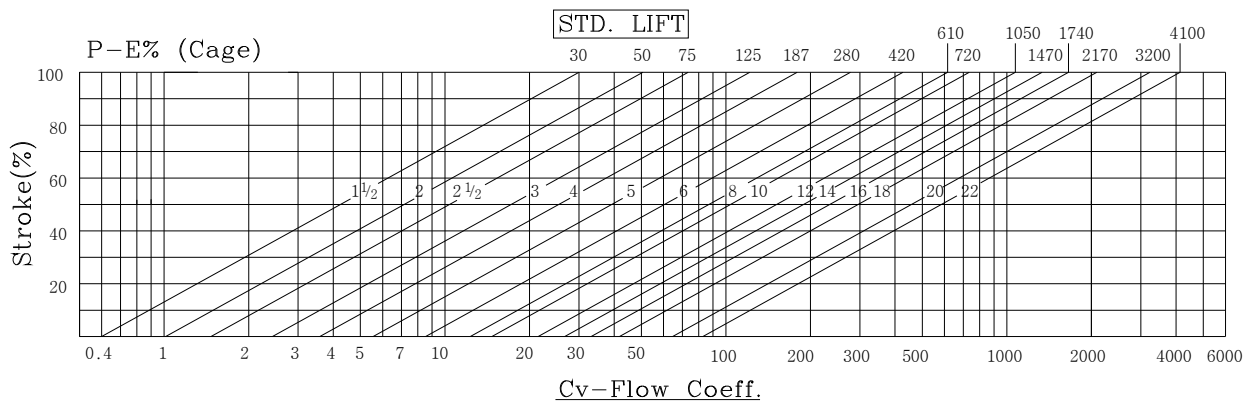
1. Rated Cv Value

[Unit: gal/min]

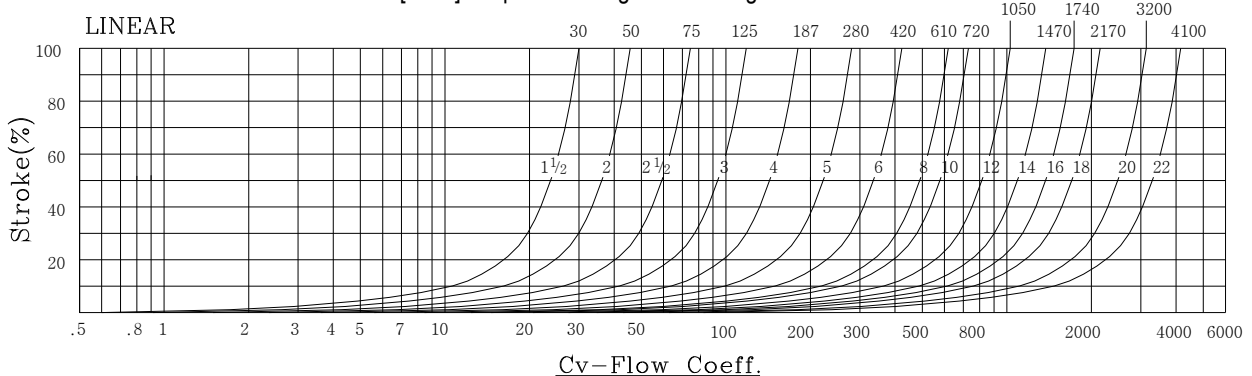
Port Size	40A	50A	65A	80A	100A	125A	150A	200A	250A	300A	350A	400A	450A	500A	550A
	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"	14"	16"	18"	20"	22"
Cv Value	30	50	75	125	187	280	420	610	720	1050 (1200)	1470 (1750)	1740 (2200)	2170 (3100)	3200 (4300)	4100 (5380)

[NOTE] () : LONG LIFT TYPE (CYLINDER ACTUATOR)

2. Flow Characteristics



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



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

MAX. ALLOWABLE PRESSURE DROP

1. 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")	100 A (4")	125 A (5")	150 A (6")	200A (8")	250 A (10")	300A (12")	350A (14")	400A (16")	450A (18")	500A (20")
A-270M	2.6	0.4 ~ 2.0	25	21	11											
	3.2	0.8 ~ 2.4	45	38	19	13										
A-360M	2.6	0.4 ~ 2.0		42	22	13	11									
	3.2	0.8 ~ 2.4		35	40	23	20	17								
A-430M	2.6	0.4 ~ 2.0					21	17	14	9						
	3.2	0.8 ~ 2.4					38	30	25	16						
A-520M	2.6	0.4 ~ 2.0								10.5	9	7	6	CYLINDER ACTUATOR STANDARD		
	3.2	0.8 ~ 2.4								19	16	12.5	10			

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

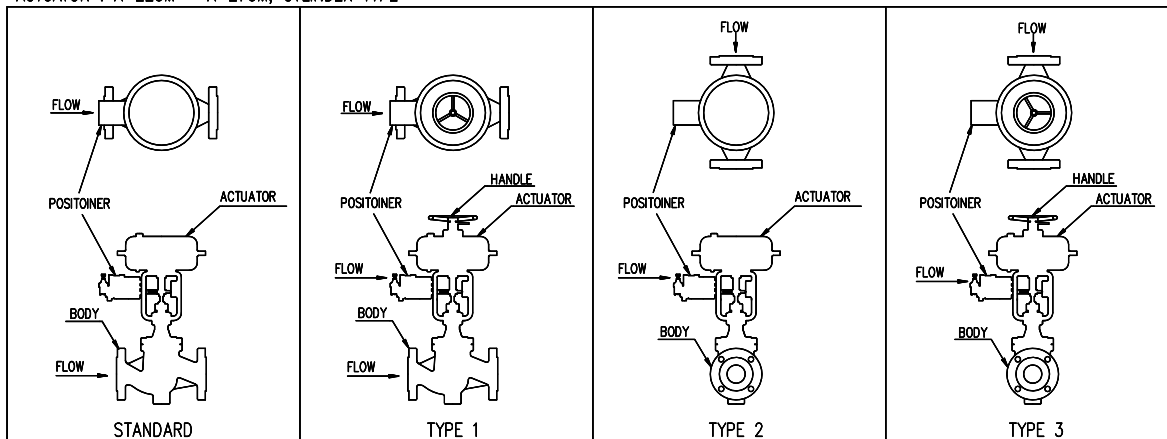
Shaded zone represents standard application.

[Unit: Kg/cm²G]

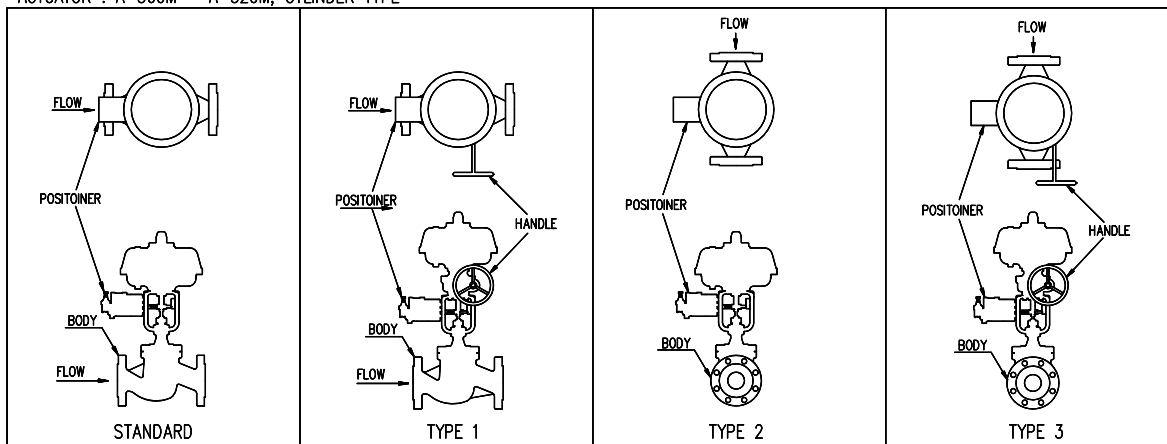
Actuator Model	Air Supply (Kg/cm ² G)	Spring Range (Kg/cm ² G)	Port Size													
			40A (1½")	50A (2")	65A (2½")	80A (3")	100A (4")	125A (5")	150A (6")	200A (8")	250A (10")	300A (12")	350A (14")	400A (16")	450A (18")	500A (20")
A-270M	2.6	0.4 ~ 2.0	25	21	11											
	3.2	0.8 ~ 2.4	63	38	28											
A-360M	2.6	0.4 ~ 2.0		42	22	13	11									
	3.2	0.8 ~ 2.4			56	33	28									
A-430M	2.6	0.4 ~ 2.0					21	17	14	9						
	3.2	0.8 ~ 2.4					53	43	35	23						
A-520M	2.6	0.4 ~ 2.0								10.5	9	7	6	CYLINDER ACTUATOR STANDARD		
	3.2	0.8 ~ 2.4								27	23	18	15			

ACTUATOR MOUNTING FORMS

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



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



WEIGHT

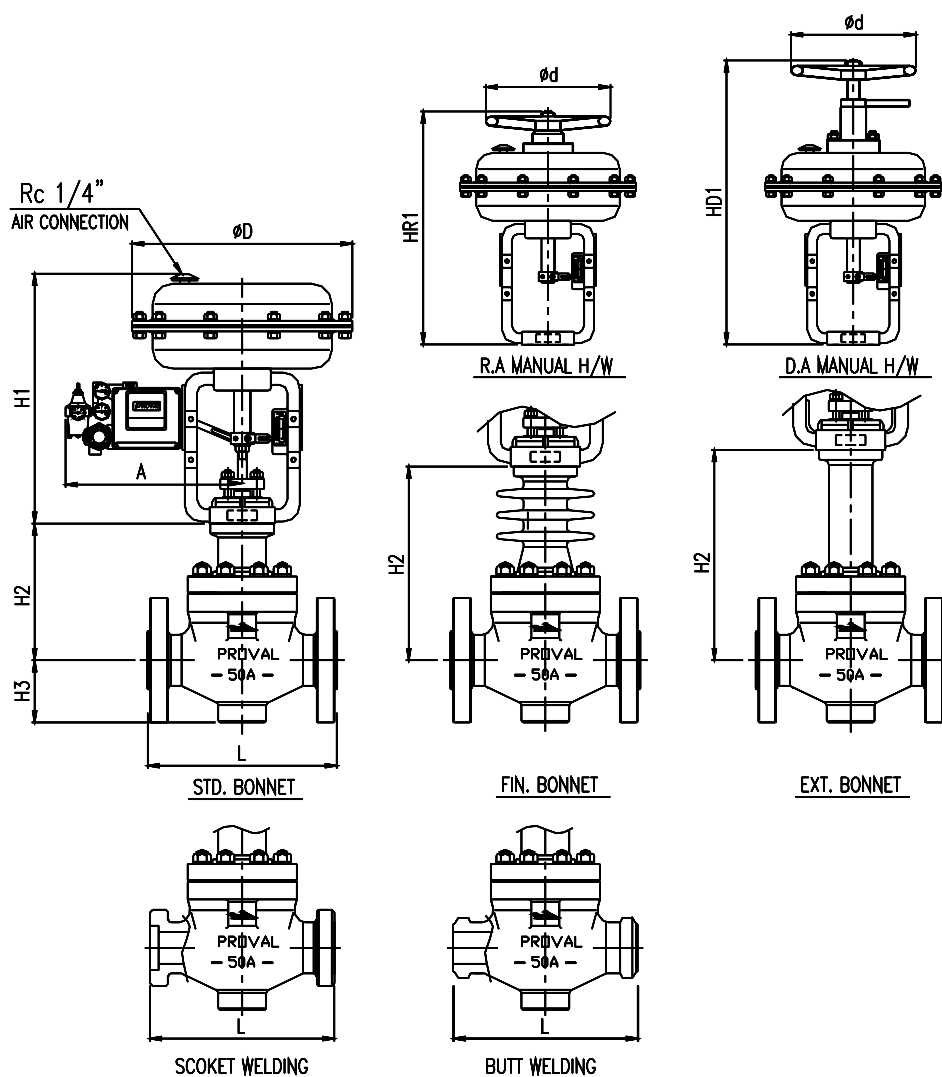
※ Only standard types are represented. Weight of accessories, a hand wheel and the like are not included.

[Unit: kg]

Size	50A		65A		80A		100A		125A		150A		200A		250A		300A		350A		400A		450A		500A	
Actuator Model	Rating		JIS 10K, ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600	JIS 10K ANSI 150	JIS 20K, 30K ANSI 300,600
A-270M	74	77	84	86	92	95																				
A-360M					128	132	152	157	173	239																
A-430M											315	322	322	329												
A-520M															441	459	738	967	1360	1620	1960	2360	2400	2460	2520	2640

DIMENSION DRAWING

ACTUATOR : A-270M



DIMENSIONS

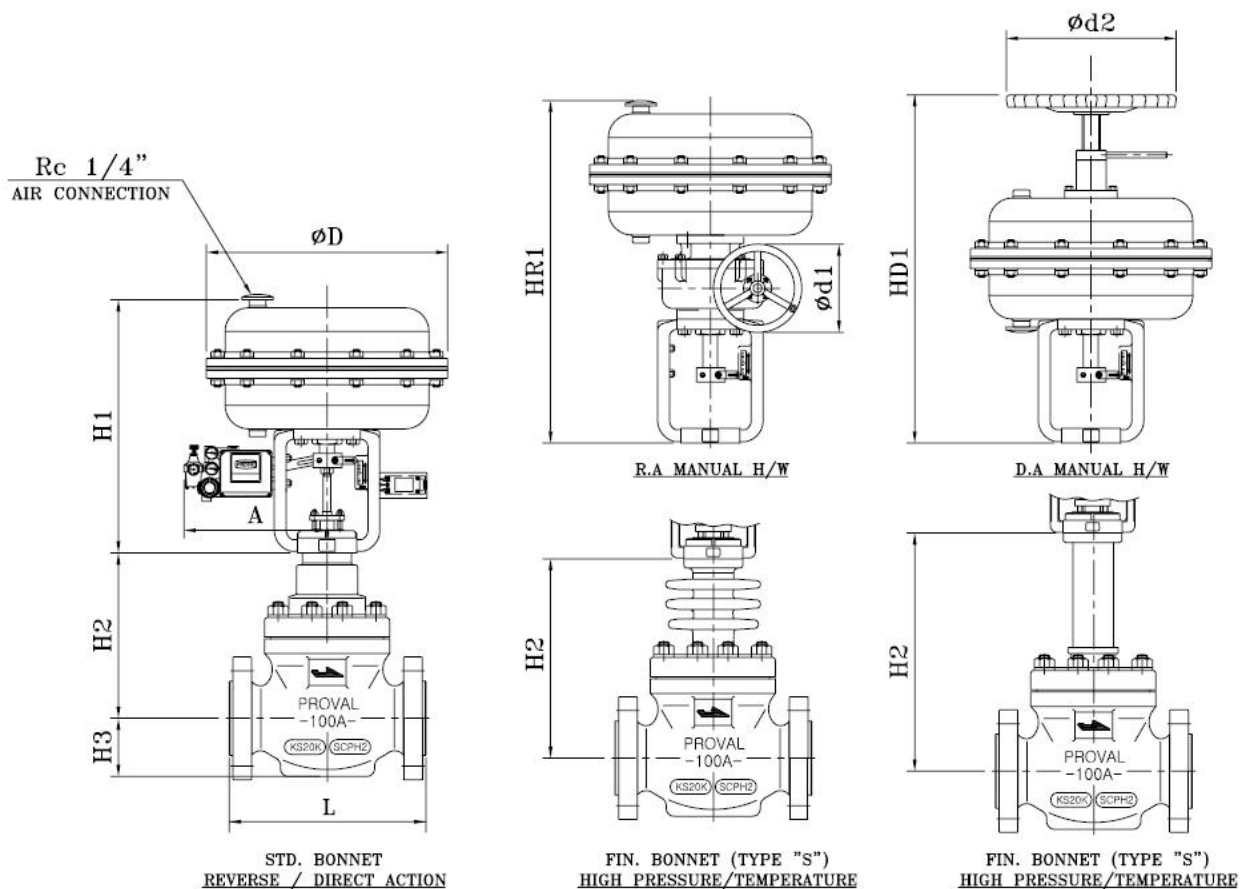
[Unit: mm]

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# JPI 150#	ANSI 300#	ANSI 600#		STD.	FIN.	EXT.			HR1	HD1		
40	2	223	228	245	75	160	280	300	270	310	360 ~420	470~ 422	325	200
50	2	256	264	286	80	180	300	320	270	310	360 ~420	470~ 422	325	200
65	2½	283	294	315	70	185	315	335	270	310	360 ~420	470~ 422	325	200
80	3	300	320	345	80	205	375	395	270	310	360 ~420	470~ 422	325	200

MODEL	YAD-12231 / 12131 / 22231 / 22131	SIZE	40A ~ 80A
PROVAL Co., Ltd.			

DIMENSION DRAWING

ACTUATOR : A-360M



DIMENSIONS

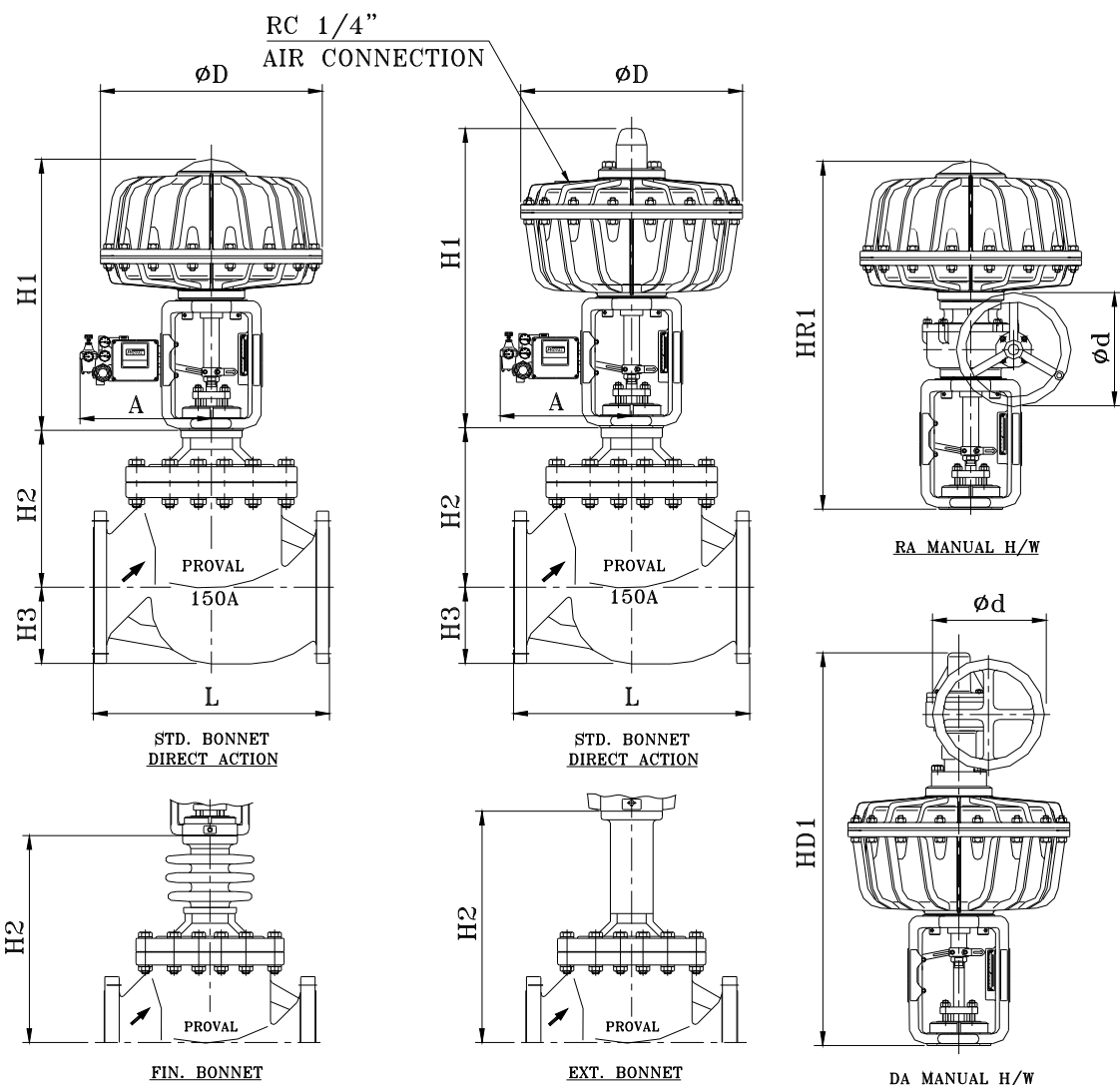
[Unit: mm]

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# JPI 150#	ANSI 300#	ANSI 600#		STD.	FIN.	EXT.		R.A	D.A	HR1	HD1		
65	2½	283	294	315	70	202	315	335	360	365	365	528	518 ~ 480	518 ~ 445	200 / 315
80	3	300	320	345	80	225	375	395	360	365	365	528	518 ~ 480	518 ~ 445	200 / 315
100	4	358	373	397	100	263	395	415	360	365	365	528	518 ~ 480	518 ~ 445	200 / 315
125	5	400	417	457	110	291	495	515	360	365	365	528	518 ~ 480	518 ~ 445	200 / 315

MODEL	YAD-12231 / 12131 / 12331 / 22231 / 22131	SIZE	65A ~ 125A
PROVAL Co., Ltd.			

DIMENSION DRAWING

ACTUATOR : A-430M



DIMENSIONS

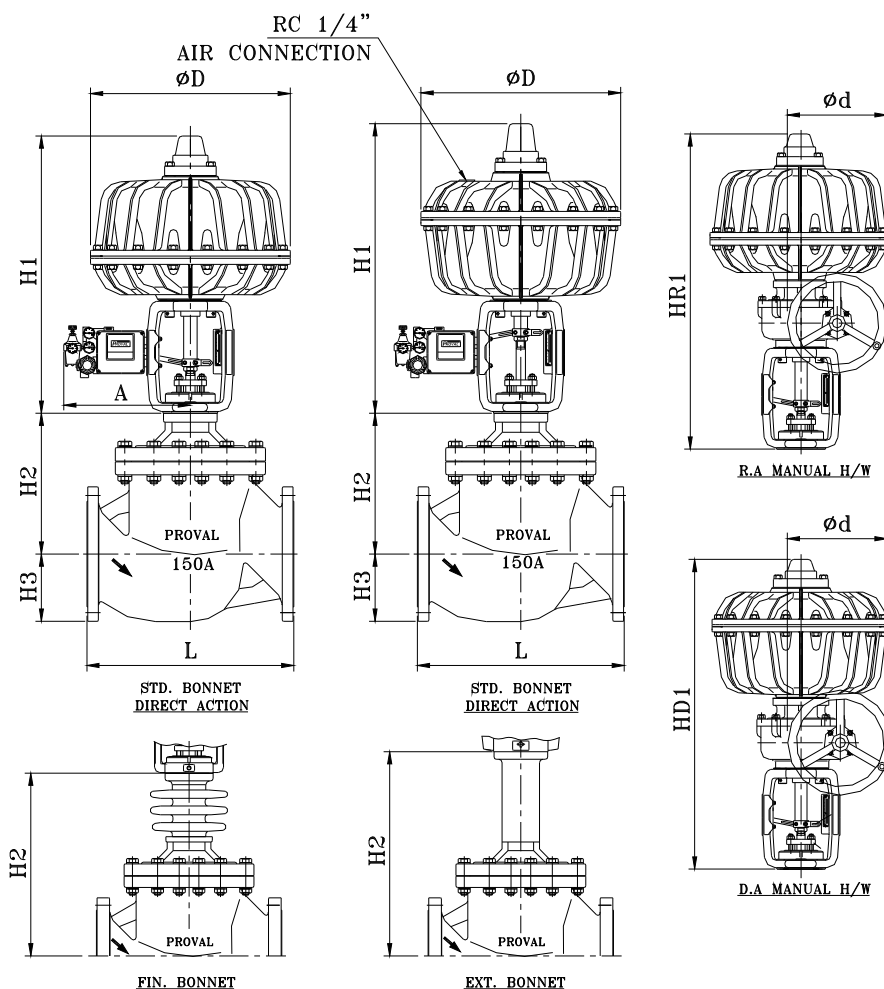
[Unit: mm]

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# JPI 150#	ANSI 300#	ANSI 600#		STD.	FIN .	EX T.		R.A.	D.A.	HR1	HD1		
125	5	400	417	457	110	273	495	515	430	554	643	880	870 ~780	350	315
150	6	462	479	508	136	299	515	535	430	554	643	880	870 ~780	350	315
200	8	554	567	610	176	343	643	663	430	554	643	880	870 ~780	350	315

MODEL	YAD-12231 / 12331, YAD-22231 / 22131 / 22331	SIZE	125A ~ 200A
PROVAL Co., Ltd.			

DIMENSION DRAWING

ACTUATOR : A-520M



DIMENSIONS

[Unit: mm]

Valve Size		Face to Face : L			H3	H2			Actuator or size (ØD)	H1		With Manual H/W		A	Ød
mm	inch	JIS 10K, 20K ANSI 150# JPI 150#	ANSI 300#	ANSI 600#		STD.	FIN.	EXT.		R.A.	D.A.	HR1	HD1		
200	8	554	567	610	176	343	643	743	520	735	795	990	1060	370	315
250	10	676	703	752	210	406	706	806	520	735	795	990	1060	370	315
300	12	799	866	819	389	561	861	961	520	735	795	990	1060	370	315
350	14	890	940	972	421	611	911	1011	520	735	795	990	1060	370	315
400	16	943	1057	1108	421	1057	1375	2115	Application of Cylinder Actuator						
450	18	1074	1194	1251	473	1321	1720	2642							
500	20	1340	1372	1524	473	1321	1720	2642							

MODEL	YAD-12231 / 12331, YAD-22231 / 22331	SIZE	200A ~500A
PROVAL Co., Ltd.			