



CONTROL VALVE STANDARD SPECIFICATION

SEVERE SERVICE CONTROL V/V PROTEK®

PROVAL
VAV
PROVAL



PROTEK® series



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

PROVAL PROVAL Co., Ltd.

SEVERE SERVICE CONTROL TYPE

GENERAL

Many valves are marketed for critical service control but few can provide the complete solution needed for the grueling conditions of severe service. PROTEK® valve was designed solely for this purpose – to meet your specific control valve needs. Whatever your application, for severe service control, there is only one intelligent choice: PROVAL PROTEK® control valve.

PROTEK® is PROVAL of the line high performance specialty trim that offers a proven solution to those severe service applications where a true velocity control trim is the best of possibly the only answer. By limiting the fluid velocities inside the valve, PROTEK® stacked disc design precludes those problems typically associated with high vibration and poor control. Every PROTEK® trim is custom designed to meet the needs of the toughest liquid, steam and gas services in the power and process industries.

FEATURES

- **Reduced Fluid Velocities :**

Design ensures lower fluid velocities for longer trim life.

- **Disc Stack Design :**

1. Particles pass easily through the disc stack.
2. Expanded inlet passages keep large contaminants from damaging the trim.
3. Inspection is easy.
4. Stack disassembles for cleaning or maintenance.

- **Variety of Materials :**

Disc stack can be made from a variety of materials as required by service conditions.

- **Unique Staged Pressure Reduction Design :**

Gaseous and hydrodynamic noise effectively reduced, Cavitation eliminated, Pressure drops reduced in steps.

- **Double-acting, Cylinder Actuator :**

high thrust and stiffness in other directions for high-performance throttling in extreme pressure drops, Compact and lightweight for easier servicing and maintenance, Wide interchangeability, Actuator rated for air pressures up to 150psi



👉 STANDARD SPECIFICATION

Body Sizes.	1" to 20" 15A ~ 500A (12B ~ 20B)
Body Style	Globe.& Angle
Pressure Ratings	ANSI 150# ~ 4500# / JIS 10K ~ 63K
End Connections	Flanged, Socket Welded and Butt Welded
Temperature Range	Metal Seat : -150°C ~ 565° , Soft Seat: Max 250°C
Seat Touch design	Metal Seat or Soft Seat
Trim Design	Unbalanced, Balanced and Auxiliary pilot
Characteristics	Linear, Equal-percentage Quick open and Custom designed
Range ability	Min 30:1, up to 300:1
Disk Stack Guiding	Metal or soft sealed
Materials/Body	A216-WCB , A217-WC6, WC9, A351-CF8,CF8M,CF3M
Seat Leakage	ANSI / FCI 70-2 Class II, III, IV, V (VI Only soft seat).

DISC STACK DISPLAY



8 TURN + 16 TURN + 20 TURN
20EA DISC STACK ACC'Y



16 TURN



8 TURN

APPLICATIONS

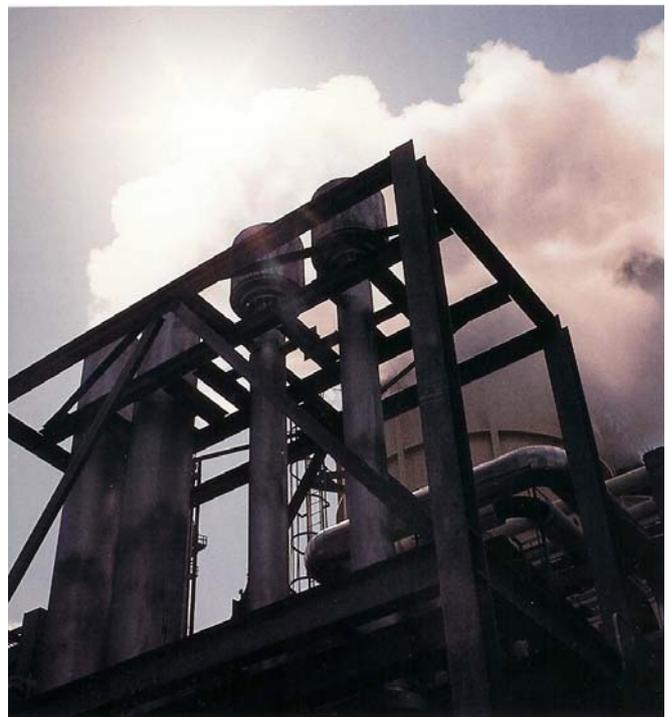
PROVAL's PROTEK® Control valves have been used in the field of severe service applications. PROTEK® design shall be applied into the high pressure fluids such as steam, water, and chemicals. PROTEK® severe service control valves have proven the excellence and stability in critical applications. The applications of PROTEK® control valve at the several industries shall be listed as below.

**Typical Severe Service Power Plant Application**

- ☞ Main & Start-up feed water recirculation
- ☞ Main & Booster feed water flow control
- ☞ Condensate booster pump recirculation
- ☞ Deaerator level control
- ☞ Turbine by-pass steam pressure control
- ☞ Auxiliary steam shoot blower pressure control
- ☞ Main boiler start-up steam spray
- ☞ High pressure coolant injection
- ☞ Atmospheric venting pressure control

Typical Severe Service Oil & Gas Plant

- ☞ Compressor recycle & anti-surge
- ☞ Pipe line anti-surge
- ☞ Pump minimum flow control
- ☞ Atmospheric venting pressure control
- ☞ Blow-down discharge to vent
- ☞ Gas injection control
- ☞ Gas flow regulation
- ☞ reactor depressurization
- ☞ Turbo-expander by-pass

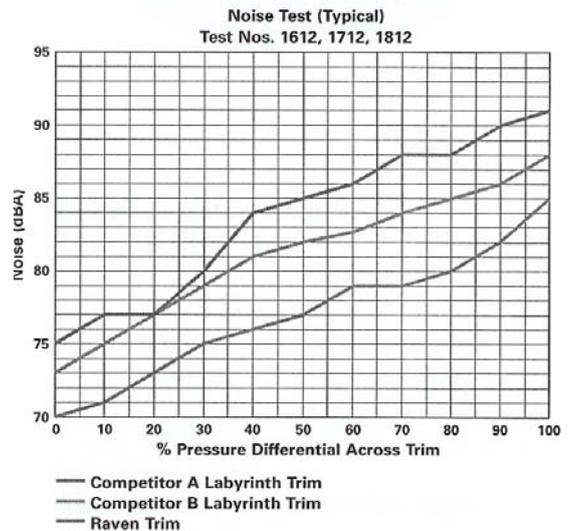


PROTEK® Trim Technology

PROTEK® trim is a proven device to solve the valve damage caused by high pressure drop. When PROTEK® trim is applied in the valve body, process fluid shall be forced to the tortuous path of right angle turns. The flow resistance generated by these turns, fluids high velocities that can result from large pressure drops across the valve which reduces trim exit velocity to a safe level. Erosion, cavitation and vibration are eliminated assuring long, trouble-free control valve life.

1. Reduction in Noise

Labyrinth type trims have been widely accepted over the last 25 years as being the best solution in cases where high noise and vibration are likely. Their wide acceptance is based on the principles of reducing mass flow and strictly controlling the velocity of the medium within the trim. Younan valve engineers have taken this technology one step further. They found that by splitting the outlet flow of each labyrinth path into three or more small mass flows (rather than the one large flow) noise could be reduced by up to 3dBA more than in a similar design labyrinth with the same number of pressure reducing stages. Size for size, PROTEK® has been proven quieter than the leading competitor in extensive laboratory testing.



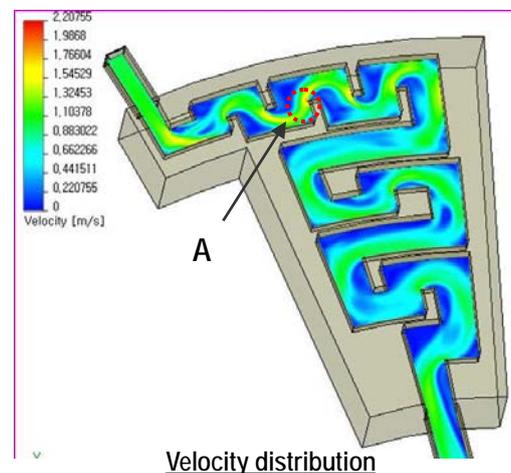
2. PROTEK® provides True Velocity Control

Younan valve PROTEK® Control valves offer a proven solution for severe service applications where a true velocity control trim is the best, or possibly the only, answer. The combined effect of numerous narrow flow channels, each with many sharp turns and a continually expanding flow path, is to remove kinetic energy from the fluid while gradually lowering its pressure. By limiting the fluid velocities inside the valve, PROTEK® trim precludes problems typically associated with high velocity such as erosion, noise, vibration and poor control. The additional benefit for liquid flow is the elimination of cavitation and the damage it can do to a valve, its trim, and the downstream piping.

Trim Exit Velocity

Service Conditions	Kinetic Energy Criteria	Equivalent Water Velocity
	psia/kPa	Ft/M per Second
Continuous Service, Single Phase Fluids	70	100
	450	30
Cavitating and Multi Phase Fluid Outlet (Flashing)	40	75
	275	23
Vibration Sensitive System	11	40
	75	12

PROTEK® low velocities are achieved through the use of a trim cage made by bonding together a series of individual discs. Each disc has a pattern of carefully controlled orifices and channels with a multitude of sharp turns etched into its surface. As the trim's plug travels within the cage, the fluid is throttled and forced to travel an extremely tortuous path with each turn effecting a stage of pressure drop.



4. Long-Life and Reliability

Due to the velocity Control techniques utilized in PROTEK®, vibration can be virtually eliminated. High velocity is a root cause of noise and vibration, which often can cause seal failure, instrumentation problems and cracking of valve components.

5. High Range ability Applications

Due to the characterization achievable within the disc stack, range abilities to 100:1 or as required by the application can be achieved. Wherever a split range, two valves in parallel installation is being considered using conventional valves, it is usually much more attractive, both commercially and technically, to combine both valves into a high range ability PROTEK® Control valve. Typical applications include pipeline packing, boiler feed pumps. Etc.

6. Anti-surge Valve

These valves require tight shutoff, fast-acting pneumatic control, low hysteresis, and since they can operate for extended periods, low noise. Operating speeds of one second can be reliably achieved using pneumatic actuation.

7. Tight Shutoff

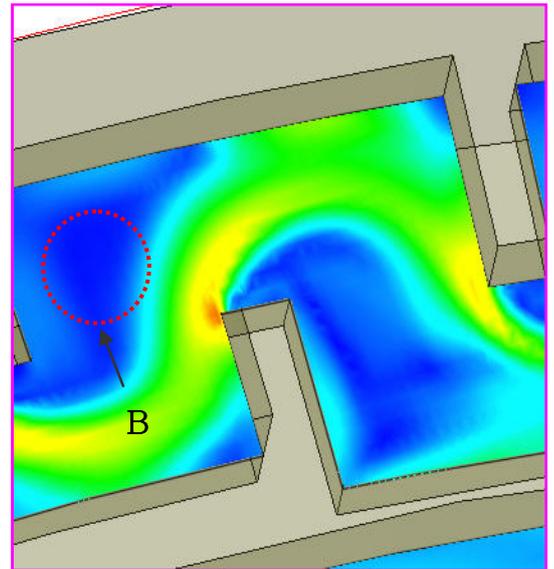
Equipped with various plugs(eg. Unbalanced, balanced, tandem, etc), PROTEK® can provide shutoff classes ranging from ANSI/FCI 70-2 class IV and MSS-SP-61. For particular applications Younan can also supply our patented ZERO leakage design.

8. Easily Serviced

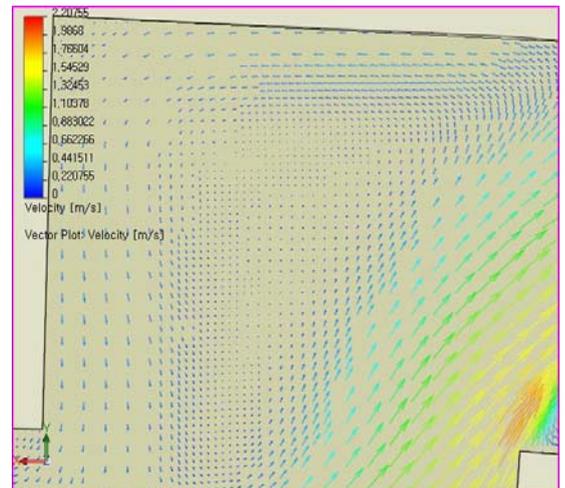
Quick-changed design With no threaded or Welded-in parts. Seat ring is a separate replaceable item.

9. Resists Plugging and Galling

A pressure-balancing groove inboard of the I.D. of each disc allows the plug to be completely balanced around its circumference, and provides a landing area for entrained debris, thus precluding plug galling. Additionally, bypasses in the flow path allow for entrained debris to clear the main fluid flow path.



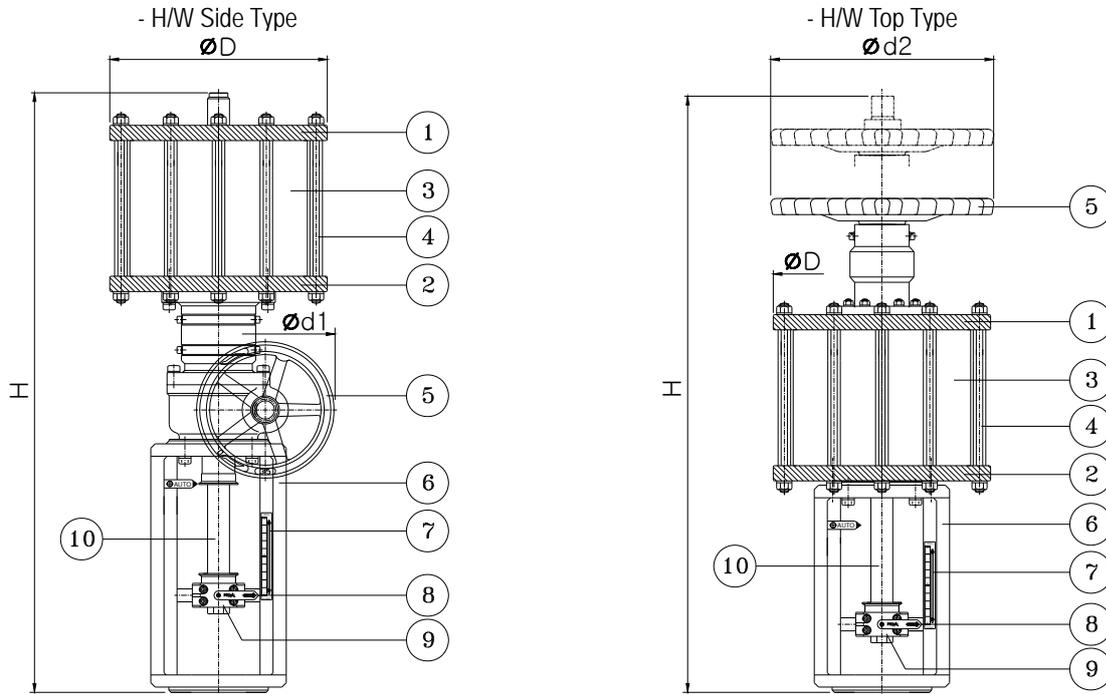
Maximum Velocity Stress View "A"



Turbulence State View "B"



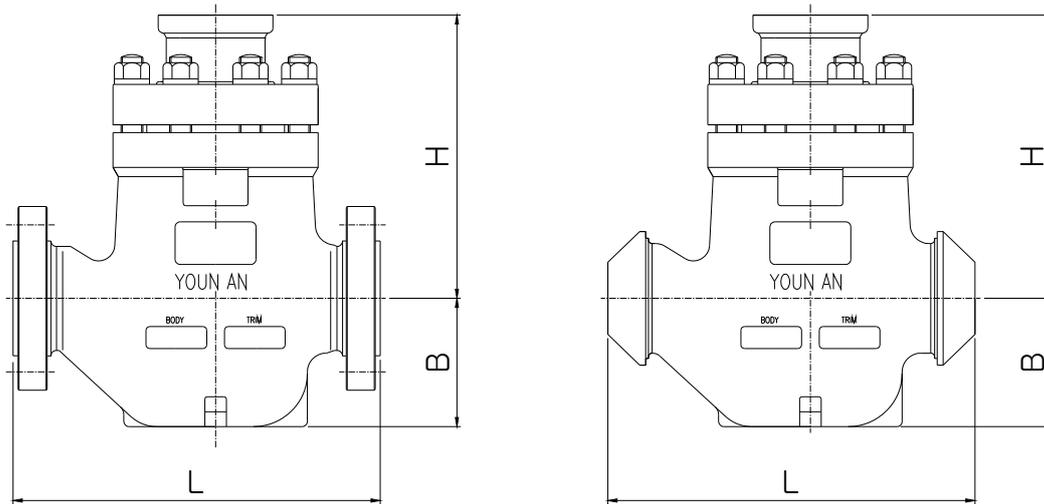
Disk Stack Assembly

ACTUATOR ASSEMBLY


No.	Part Name	Standard material	REMARKS
1	CYLINDER TOP COVER	SS41	
2	CYLINDER B.T.M COVER	SS41	
3	CYLINDER PIPE	STKM	H.CR PLATED
4	STUD BOLT	SUS304	
5	HAND WHEEL	FCD450, A216-WCB	
6	YOKE	FCD40, SCPH2	
7	GAUGE	SUS304	
8	INDICATOR	SUS304	
9	CLAMP	SUS304	
10	SHAFT	SUS304	H.CR PLATED

ACTUATOR DIMENSION

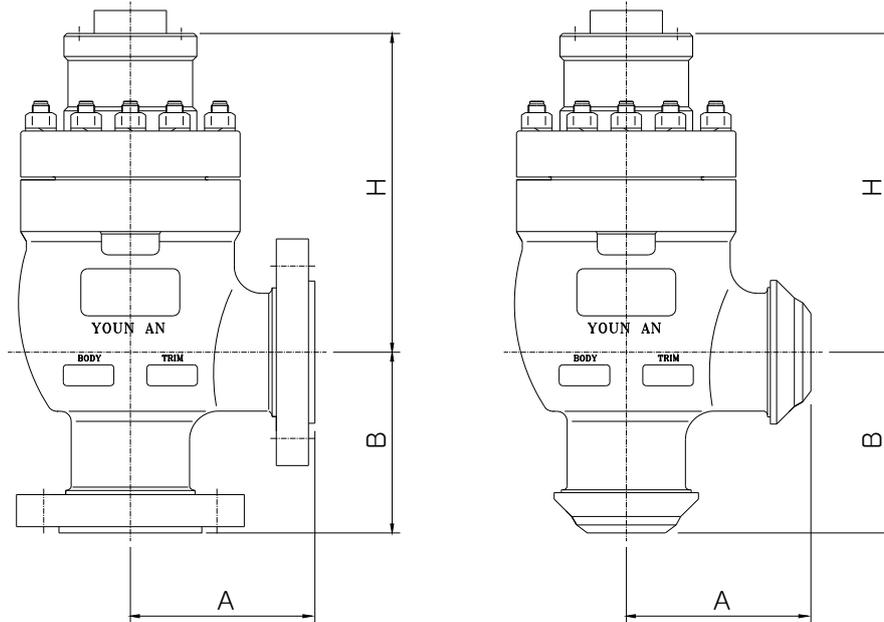
Actuator model	Actuator Size (ØD)	H		Ød1	Ød2	Rc.A	Note
		Side	Top				
C-300SR(D)	390	1200	1350	315	430	3/8	
C-400SR(D)	480	1400	1350	430	430	3/8	
C-430SR(D)	520	1610	1570	430	600	1/2	
C-480SR(D)	590	1800	1570	430	600	1/2	
C-530SR(D)	650	1800	1800	600	750	1/2	
C-580SR(D)	720	1800	1800	600	750	3/4	
C-630SR(D)	800	1800	1800	600	750	3/4	

DIMENSION DRAWING
GLOBE VALVE TYPE


Unit : mm

Valve Size (inch)	L								B		H			
	RF Flange					Welding			ANSI Class		Standard		Extension	
	ANSI Class					ANSI Class					ANSI Class		ANSI Class	
	150	300	600	900	1500	150~600	900, 1500	2500	-600	900, 1500	-600	900, 1500	-600	900, 1500
2	254	267	286	375	375	286	375	400	94	70	250	-	367	
3	298	317	337	441	460	337	460	498	114	119	300	345	460	502
4	352	368	394	511	530	394	530	575	127	159	330	345	460	550
6	451	473	508	714	768	508	768	762	198	194	393	393	536	622
8	543	568	610	914	972	610	972	1028	222	235	497	523	645	709-
10	673	708	752	1092	1168	752	1168	-	271	278	565	-	746	-
12	737	775	819	1130	1219	819	1219	-	362	375	618	-	799	-
14	889	927	972	-	-	972	-	-	415	-	663	-	869	-
16	1016	1057	1108	-	-	1109	-	-	480	-	704	-	910	-
18	1140	1190	-	-	-	1235	-	-	515	-	799	-	1007	-

MODEL	YACK-12211, YACK-22211	SIZE	50A ~ 450A (2"~18")
PROVAL Co., Ltd.			

DIMENSION DRAWING
ANGLE VALVE TYPE


Unit : mm

Valve Size (inch)	A & B												H		
	RF Flange						Welding						Standard		
	ANSI Class						ANSI Class						ANSI Class		
	150	300	600	900	1500	2500	150	300	600	900	1500	2500	900	1500	2500
2	-	-	-	188	188	230	-	-	-	188	188	230	328	328	342
3	-	-	-	230	230	330	-	-	-	230	230	330	459	459	424
4	-	-	-	265	265	460	-	-	-	265	265	460	479	479	454
6	-	-	-	-	419	790	-	-	-	-	419	790	CUSTOM DESIGN		
8 X10	-	394	450	485	-	-	-	277	290	295	-	-			
10X12	-	-	-	-	-	942	-	-	-	-	-	472			
10X14	462	485	546	-	719	-	335	343	376	-	414	-			
12X16	513	546	561	612	-	-	386	399	376	391	-	-			
12X18	544	572	-	660	-	-	404	414	-	427	-	-			
16X20	582	622	696	-	-	-	437	460	498	-	-	-			
18X24	-	-	-	-	-	-	503	432	-	-	-	-			

MODEL	YACKA-12211, YACKA-22211	SIZE	50A - 450A X 600A (2"-18")
PROVAL Co., Ltd.			