Model TA Series, Tank Angle Control Valves with V Series Actuators

The model TA Series of Valuation is a tank mounted control valve in the form of a 45°(135°), 60°(120°) 90° angle body, mounted to the bottom or right/left side of the tank or vessel.
According to the structure of the Seat & Plug,

- TA-1, Ram Seal type, mainly on-off type for long stroke
- TA-2, Tank Bottom Flush for low pressure ratings
- TA-3, Tank Angle with heay duty for high pressure ratings
- TA-4, Angle Control with jacket type

Since the use fluid of the tank or vessel is mainly a chemical fluid, such as PTA(purified terephthalic acid), the body/trim material consists of high corrosion resistant materials such as CF8M/316L, CF3M/316L, Titanium/Titanium, etc. The shape of the trim is also possible according to the required function, Quick open, Linear, EQ-%, modified-%.
According to the Required seat tightness, the application of metal or soft seat is also possible and supports the fulfillment of the seat leakage class IV, V, and IV.
The body has an Angle shape structure, which has low fluid resistance and sufficient space around the trim.This model can apply spring-diaphragm, cylinder and electric motor type actuators.
SOV & Lim. On-off with S/W, Modulating features with traditional E/P, smart and HART positioners.

1. Numbering System

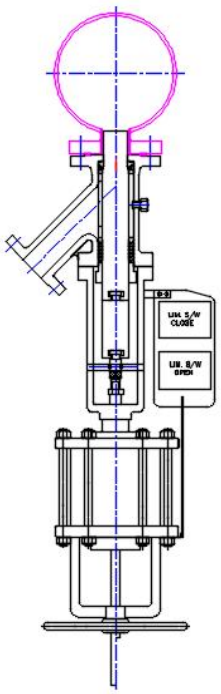
V30	-	TA	1	1	4	1

Actuator Type	Model	Body Type	Flow Direction	Flow Characteristics	Seat Type
V10. Spring Diaphragm V20. Spring Cylinder V30. Cylinder Double Acting V90. Electric Motor V11. Manual H/W V01. Other Type	TA	1. Ram Seal 2. Tank Bottom Flush(Low Pr.) 3. Tank Angle Heavy Duty 4. Angle Control Jacketed	0. Undefined 1. FTO (Flow to Open) 2. FTC (Flow to Close)	0. Undefined 1. Linear 2. Equal % 3. Modified % 4. Quick Open	0. Undefined 1. Seperated Seat 2. Integrated Seat

2. Features

1. Angle style with high F_L factor and flow paths with streamlined structure.
2. An integral plug and stem structure is applied to the body internal flow path optimized for transport and control of 3 phase fluids in the PTA process.
3. Body internal flow path has a continuous open flow structure with minimal dead space.
4. Body angle can be 90°, 45°, or 60°.
5. Flushing connection is possible for the expected area of clogging to the inside of the body and the valve trim
6. Jacket body option available.
7. To prevent leakage of packing, special coating of the stem surface is possible.
8. Customized valve can be manufactured to improve specific weakness of existing same type valve.
9. Applicable to the latest smart positioners as well as traditional P/P and E/P positioners with other instruments.

3. Body Type (1/4)



■ TA-1, Ram Seal Tank Angle Valve

The model TA-1 ram seal valve is a flush bottom outlet valve with a standard 45° outlet angle that reduces all losses of flow(Cv) and discharges to the secondary side as much as possible. Valve stem is swallowed by ram(valve plug or plunger), thus ensuring a smaller physique. Ram cleans the valve body and nozzle every stroke.

The ram seal is provided with a deep stuffing box or gland which ensures protection from leakage into the atmosphere as standard. Many stuffing box designs or packaging layouts can be used to meet specific media or low emission requirements.

The ram seal valve operates by operating the cylinderical plunger(ram). When the valve is closed, the plunger occupies the entire inner bore of the valve body, leaving the minimum space for the particles to collect.

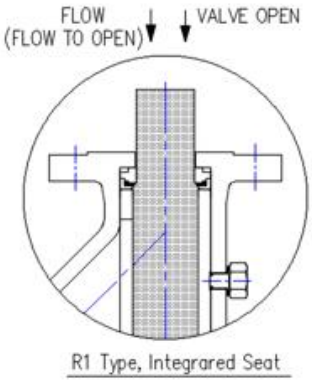
TA-1's seat structure is a quick change structure that enables thorough sealing by inserting soft materials such as PTFE, RTFE, and GTFE into the metal sheet.

Body and trim material consists of highly corrosion resistant materials such as CF8M/316L, CF3M/316L, and Titanium/Titanium, since the used fluid of tank or vessel is mainly chemical fluid such as highly corrosive.

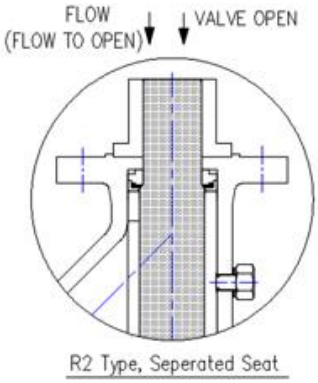
In accordance with the required seat tightness, it is also possible to apply the metal seat/soft seat and supports the fulfillment of the seat leakage class V, IV.

This model can apply actuators of type cylinder and electric motor. SOV & Lim. on-off with S/W, Modulating with traditional E/P, Smart and HART positioners.

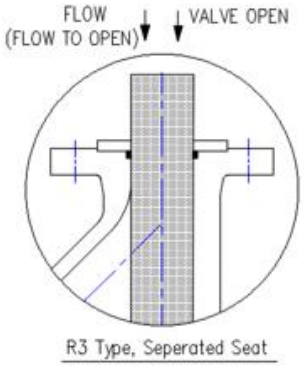
■ TA-1, Ram Seal Valve - Trim Designs



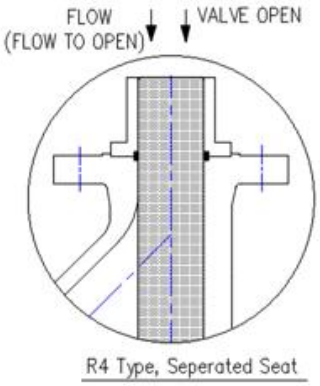
R1 Type, Integrared Seat



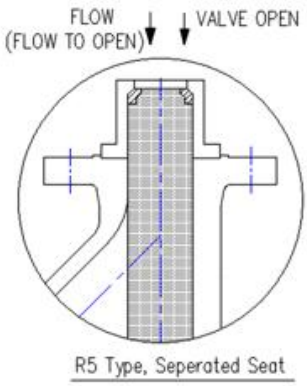
R2 Type, Seperated Seat



R3 Type, Seperated Seat

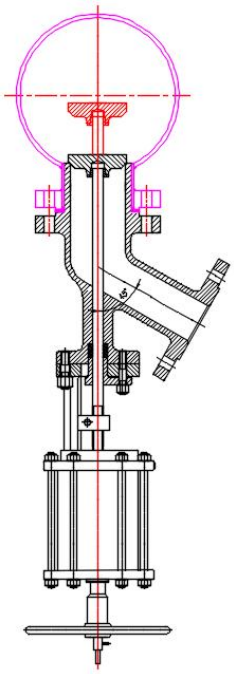


R4 Type, Seperated Seat



R5 Type, Seperated Seat

3. Body Type (2/4)



■ TA-2, Tank Bottom Flush Valve for Low Pressure

The model TA-2 Tank Bottom Angle Valve is a flush bottom outlet valve with a standard 45° outlet angle that reduces all losses of flow(Cv) and discharges to the secondary side as much as possible.

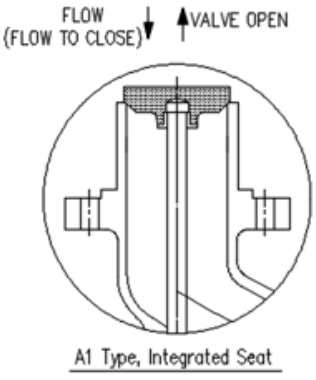
A structure in which the seat and disc of the valve protrude to the top and insert into the nozzle part of the tank or vessel, the disc is opened from the inside of the pipe and passes through the fluid.
In other words, it is a structure that can prevent clogging that can occur in nozzle. This model is generally standard in metal seat structure, but soft seat can be applied as an option.

Since the use fluid of the tank or vessel is mainly a chemical fluid, such as PTA(purified terephthalic acid), the body/trim material consists of high corrosion resistant materials such as CF8M/316L, CF3M/316L, Titanium/Titanium, etc. The shape of the trim is also possible according to the required function, Quick open, Linear, EQ-%, modified-%.

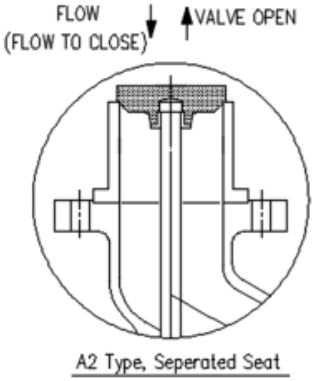
According to the required seat tightness, the application of metal or soft seat is also possible and supports the fulfillment of the seat leakage class V, and IV.

The body has an angle shape structure, which has low fluid resistance and sufficient space around the trim. This model can apply spring-diaphragm, cylinder and electric motor type actuators.
SOV & Lim. On-off with S/W, Modulating features with traditional E/P, smart and HART positioners.

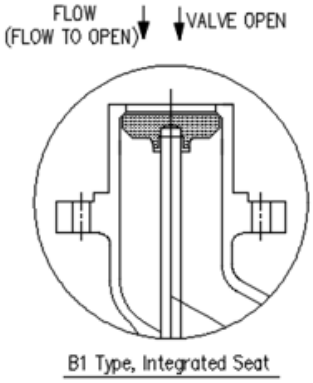
■ TA-2, Tank Bottom Flush Valve - Trim Designs



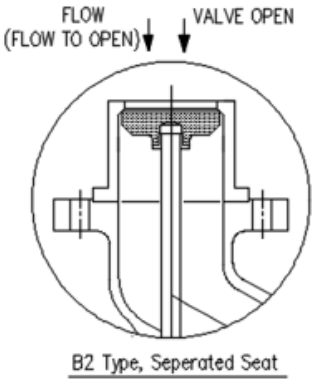
A1 Type, Integrated Seat



A2 Type, Seperated Seat

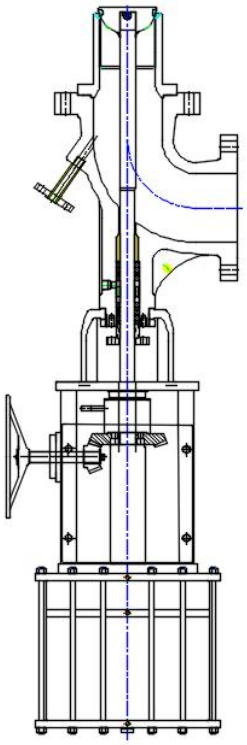


B1 Type, Integrated Seat



B2 Type, Seperated Seat

3. Body Type (3/4)



■ TA-3, Tank Angle, Heavy Duty Control Valve

The model TA-3 Tank angle control valve is generally used in let down pressure, level and flow control, mixing and distribution control for PTA, coal and heavy oil upgrades, gasification and liquefaction, salt and brine, urea, three phase slurry handling or high pressure acid leaching process.
TA-3 control valves are ideal for severe operating conditions in which high flow rate, high pressure or temperature drop, corrosivity and kerosene material, vibration or crystallization may be a problem.

- An integral plug and stem structure is applied to the body internal flow path optimized for transport and control of 3 phase fluids in the PTA process.
- Body internal flow path has a continuous open flow structure with minimal dead space.
- Body angle can be 90°, 45°, or 60°.
- Flushing connection is possible for the expected area of clogging to the inside of the body and the valve trim.
- Jacket body option available
- To prevent leakage of packing, special coating of the stem surface is possible.

Since the use fluid of the tank or vessel is mainly a chemical fluid, such as PTA(purified terephthalic acid), the body/trim material consists of high corrosion resistant materials such as CF8M/316L, CF3M/316L, Titanium/Titanium, etc. The shape of the trim is also possible according to the required function, Quick open, Linear, EQ-%, modified-%.

According to the required seat tightness, the application of metal or soft seat is also possible and supports the fulfillment of the seat leakage class V, and IV.

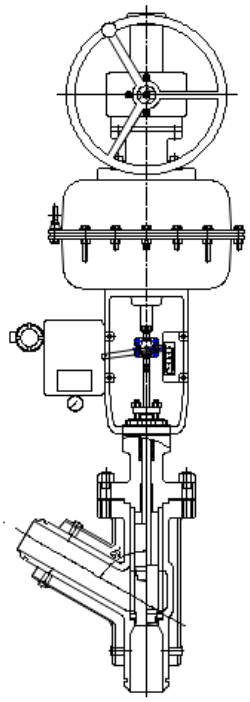
The body has an angle shape structure, which has low fluid resistance and sufficient space around the trim. This model can apply spring-diaphragm, cylinder and electric motor type actuators.
SOV & Lim. On-off with S/W, Modulating features with traditional E/P, smart and HART positioners.

■ TA-3, Tank Angle Control Valve - Trim Designs : Same as A1 and A2 type in the TA-2 model.

- TA-3, Titanium Tank Angle Valve

- TA-3, Tank Angle Control Valve & Trim

3. Body Type (4/4)



■ TA-4, Tank Angle Control Valve – Jacketed Body

TA-3 tank angle control valve models are commonly used for PTA, coal and heavy oil upgrades, gasification and liquefaction, saline, urea, three-phase slurry treatment or high pressure acid leaching processes and other viscous chemical fluid pressure control, level and flow control, mixing and distribution control.
In particular, the TA-3 model is designed to prevent crystallization of high viscosity fluid through separate heating of the jacket by applying the jacket body to the angle-shaped body structure to ensure smooth flow.

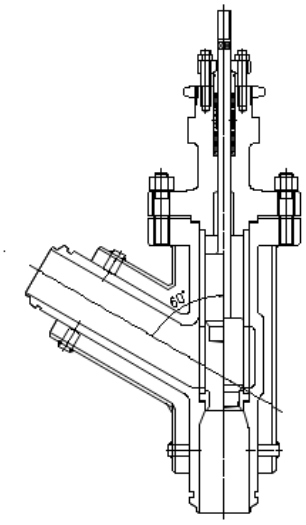
- The integral plug and stem construction is applied to the fluid flow paths within the body that are optimized for the transfer and control of high viscosity fluids.
- Body internal flow path has a continuous open flow structure with minimal dead space.
- Body angle can be 45° or 60°.
- Flushing connection is possible for the expected area of clogging to the inside of the body and the valve trim.
- To prevent leakage of packing, special coating of the stem surface is possible.

Since the use fluid of the tank or vessel is mainly a chemical fluid, such as PTA(purified terephthalic acid), the body/trim material consists of high corrosion resistant materials such as CF8M/316L, CF3M/316L, Titanium/Titanium, etc. The shape of the trim is also possible according to the required function, Quick open, Linear, EQ-%, modified-%.

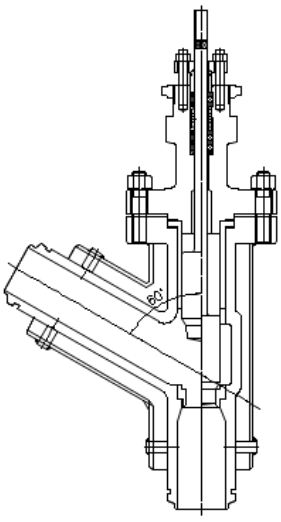
According to the required seat tightness, the application of metal or soft seat is also possible and supports the fulfillment of the seat leakage class VI, V, and IV.

The body has an angle shape structure, which has low fluid resistance and sufficient space around the trim. This model can apply spring-diaphragm, cylinder and electric motor type actuators.
SOV & Lim. On-off with S/W, Modulating features with traditional E/P, smart and HART positioners.

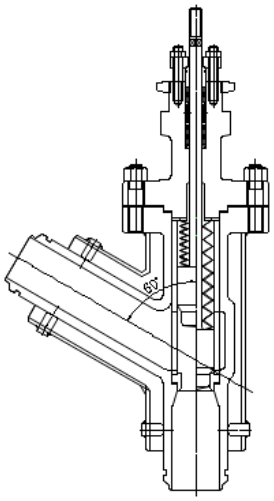
■ TA-4, Tank Angle Control Valve - Jacketed Body, Trim Designs



- TA-4, Quick Change Trim



- TA-4, Threaded Trim



- TA-4, Quick Change & Bellows Trim

4. Specifications (1/2)

■ General Specifications

Size Range	1" ~ 20" (other sizes are available)
Pressure Range	ASME 150#~2500#
Temperature Range	-29 ~ 260 ℃ (other ranges are available)
Body Materials	A351 CF8, CF8M, CF3M, Duplex, Inconel, Titanium & others
Trim Materials	316, 316L, 321, 347, Duplex, Inconel, W-Co. overay, Titanium & others
Trim Design	Ram Seal, Un-balanced, Cage-balanced, others
Trim Characteristics	E-Q%, Modified%, Linear, Quick-open, others
Cv Ratio	50 : 1(standard)
Seak Leakage Class	ANSI/FCI 70-2, Class IV, V, VI according to the spec.
Applicable Actuators	Pneumatic Diaphragm, Cylinder, Electric Motor, others
Applicable Instruments	P/P & E/P & Smart Positioners, SOV & other Relays
Options	Handwheel, Limit Stopper, Jacket Body, Flushing Connection, Special NDT

■ Applicable Material Combinations

Code No.	Services & Fluids	Material Combinations	
		Body	Trim
MTR1	Corrosive Fluids	CF8M(F316)	316(L) SS
MTR2		CF3M(F316L)	316L SS
MTR3		CF8C	321 or 347 SS
MTR4	Fairly High Corrosive Fluids	Duplex SS	Duplex SS
MTR5	Very High Corrosive Fluids	Titanium Gr.-2	Titanium Gr.-2 or 5
MTR6		Hastelloy	Hastelloy or Titanium Gr.-2 or 5
MTR7		Inconel 718	Inconel 718
MTR8	Others		
*. Special coatings are available on the body & trim surface.			

■ Seat Leakage Classifications (per ANSI FCI 70-2)

Code No.	Trim Style	Leakage Class
SL1	Metal to metal seat with V10 Actuator	Class IV
SL5	Metal to metal seat with V30 Actuator	Class V
SL6	Metal plug & soft seat with V30 Actuator	Class VI

***. Note**

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2. All data shown above are subject to change without notice.

4. Specifications (2/2)

■ Seat Seal Applications (Temp. ranges are general spec.)

Code No.	Material & Style	Temp. Range(℃)
SR1	PTFE+Graphite, Pressure enegized seal	-40~ +260
SR2	HPTFE+Graphite, Pressure enegized seal	-40 ~ +300
SR3	PTFE, Pressure enegized seal	-196 ~ +235
SR4	Metal seal	-196 ~ +592
SR5	Graphite seal	-196 ~ +592

■ Packing Applications (Temp. ranges are general spec.)

Code No.	Material & Style	Gasket Materials	Temp. Range(℃)
PK1	PTFE + Carbon fiber, Braided	#150 ~ #900	-196 ~ +260
PK2	PTFE V-Ring	#150 ~ #600	-196 ~ +235
PK3	Graphite(Braided + Mold)	#150 ~ #2500	-196 ~ +410
PK4	Hi-Graphite(Braided + Mold)	#150 ~ #2500	-196 ~ +592
PK5	GTFE V-Ring + SPC	#150 ~ #2500	-196 ~ +260

■ Bolt(Stud) & Nut Applications (Temp. ranges are general spec.)

Code No.	Body, Bonnet 5Materials	Bolt(Stud) / Nut Materials	Temp. Range(℃)
BN1	WCB, A105 Carbon steel	Stud : ASTM A193, B7 Nut : ASTM A194, 2H	-29 ~ +425
BN2	CF8,CF8M,CF3,CF3M Stainless steel	Stud : ASTM A193(320), B8(M) Nut : ASTM A194(320), 8(M)	-196 ~ +592
BN3	WC6,WC9,C12A,F91 Cr-Mo. steel	Stud : ASTM A193, B16 Nut : ASTM A194, 4	-29 ~ +592

■ Gaskets Applications (Temp. ranges are general spec.)

Code No.	Body, Bonnet Materials	Gasket Materials	Temp. Range(℃)
GS1	WCB, A105 Carbon steel	316 SS + Graphite S/W	-29 ~ +425
GS2	CF8,CF8M,CF3,CF3M Stainless steel	316 SS + Graphite S/W	-196 ~ +592
GS3		316 SS + PTFE S/W	-196 ~ +235
GS4	WC6,WC9,C12A,F91 Cr-Mo. steel	316 SS + Graphite S/W	-29 ~ +592

***. Note**

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5. Flow Coefficients - Rated Cv

■ Flow Coefficients - Rated Cv for Full Bore Trim

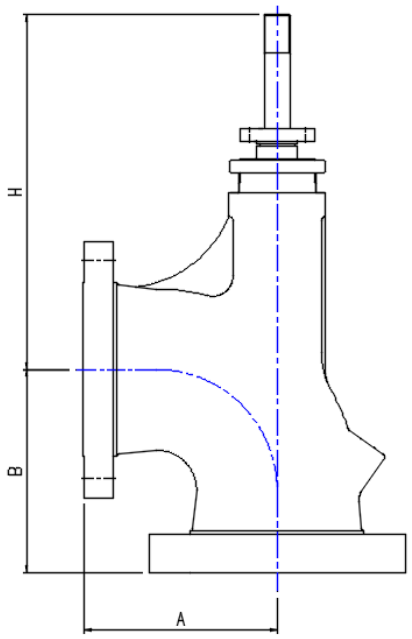
Valve Size (inch/mm)	Max. Rated Cv (Full Bore)										
	1"	1-1/2"	2"	3"	4"	6"	8"	10"	12"	14"	16"
1 (25)	16										
1-1/2(40)		44									
2 (50)			80								
3 (80)				162							
4 (100)					305						
6 (150)						595					
8 (200)							985				
10 (250)								1380			
12 (300)									2050		
14 (350)										2500	
16 (400)											3450

6. Dimensions for TA Series

■ Dimensions for TA Series Control Valves

(unit : mm)

Valve Size (inch/mm)	A & B						H
	Class 150	Class 300	Class 600	Class 900	Class 1500	Class 2500	
1 (25)	70	102	108	127	127	154	175
1-1/2(40)	83	114	121	152	152	192	225
2 (50)	102	133	146	184	184	226	254
3 (80)	121	159	178	190	235	289	322
4 (100)	146	178	216	225	273	337	385
6 (150)	203	222	279	305	353	457	535
8 (200)	248	279	330	368	416	511	610
10 (250)	311	311	394	419	495	635	695
12 (300)	349	356	419	483	565	711	785
14 (350)	394	412	488	514	629	882	880
16 (400)	457	478	598	660	722	978	985



*. The above data is only our standard, and the dimension table for each size shall be follow the detailed dwg. and/or customer`s spec.

***. Note**

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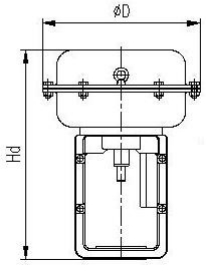
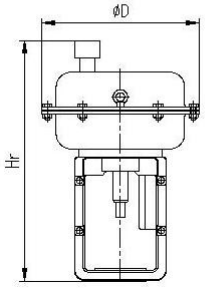
7. Actuators for TA Series

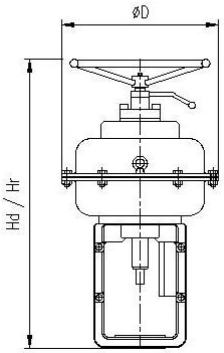
■ Model V10 Diaphragm Actuators



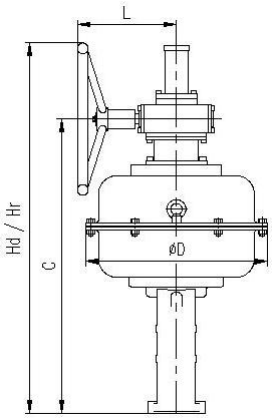
Direct Action



Reverse Action



Top Handwheel



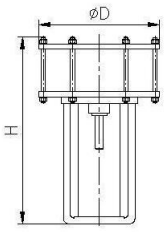
Side Handwheel

Model V10

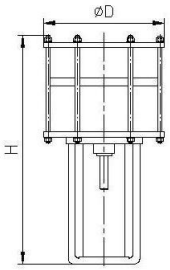
(unit : mm)

Actuator Size	ØD	Without Handwheel		With Handwheel				
		DA	RA	Handwheel Type	DA	RA	C	L
		Hd	Hr		Hd	Hr		
#2	250	332	352	Top	450	473	-	-
#3	290	369	419	Top	534	569	-	-
#4	370	410	460	Top	575	620	-	-
#5	480	629	679	Top side	979	979	779	260
#6	550	678	728	Top side	1,098	1,098	848	300
#6H	550	728	778	Top side	1,148	1,148	848	300

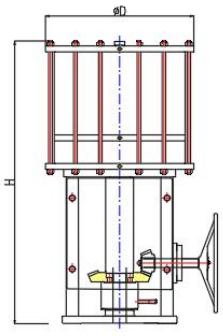
■ Model V30 Cylinder Actuators



without Volume Chamber



with Volume Chamber



with Optional Handwheel

***. Note**

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2. All data shown above are subject to change without notice.

Model V30 Actuator

(unit : mm)

Actuator Size	ØD	H								
		Travel(mm)								
		40	50	70	80	100	130	150	200	300
Without Volume Chamber										
#30	375	510	520	540	550	570	600	-	-	-
#40	465	585	595	615	625	645	675	695	745	845
#50	575	605	615	635	645	665	695	715	765	865
With Volume Chamber (Chamber Capacity)										
#30(10)	375	635	645	665	675	695	725	-	-	-
(20)		735	745	765	775	795	825	-	-	-
(30)		785	795	815	825	845	875	-	-	-
#40(10)	465	715	725	745	755	775	805	825	875	975
(20)		815	825	845	855	875	905	925	975	1075
(30)		860	870	890	900	920	950	970	1,020	1,120
#50(10)	575	730	740	760	770	790	820	840	890	990
(20)		825	835	855	865	885	915	935	985	1,085
(30)		860	870	890	900	920	950	970	1,020	1,120
With Handwheel - Without Volume Chamber										
#30	375	770	780	800	810	830	860	-	-	-
#40	465	965	975	995	1,005	1,025	1,055	1,075	1,125	1,225
#50	575	985	995	1,015	1,025	1,045	1,075	1,095	1,145	1,245
With Handwheel and Volume Chamber (Chamber Capacity)										
#30(10)	375	895	905	925	935	955	985	-	-	-
(20)		995	1,005	1,025	1,035	1,055	1,085	-	-	-
(30)		1,045	1,055	1,075	1,085	1,105	1,135	-	-	-
#40(10)	465	1,095	1,105	1,125	1,135	1,155	1,185	1,205	1,255	1,355
(20)		1,195	1,205	1,225	1,235	1,255	1,285	1,305	1,355	1,455
(30)		1,240	1,250	1,270	1,280	1,300	1,330	1,350	1,400	1,500
#50(10)	575	1,110	1,120	1,140	1,150	1,170	1,200	1,220	1,270	1,370
(20)		1,205	1,215	1,235	1,245	1,265	1,295	1,315	1,365	1,465
(30)		1,240	1,250	1,270	1,280	1,300	1,330	1,350	1,400	1,500

8. Instruments for TA Series

■ Applicable Instruments

- Positioners
: Smart, E/P, P/P Positioners for Single/Double Acting

- Instruments
: Transfer(Trip) Valves, Volume Booster Relay, Lock-up Valves, Check Valves
Air Regulators(Air Set), Speed Control Valves, Volume Tanks

- limit Switches & Stoppers

- Solenoid Valves

***. Note**

1. All data shown in this product specification are currently standard specifications of Valution and can be customized by order specification.
2. All data shown above are subject to change without notice.

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