

CV3000 Alphaplus series

Large sized Pressure Balanced Cage type Control Valves

Model ALVB / ALVM

OVERVIEW

Model ALVB/ALVM, large sized pressure balanced cage type control valves have high performance specifications and are designed for heavy duty service. The valve body has large capacity, wide range ability and high accuracy flow characteristics. The valve plug is structured in a pressure balanced type that permits flow control of high differential pressure with a small actuating force. A piston ring (seal ring) put around the valve plug restrains an excessive flow between the valve plug and the cage and prevents from seat leakage and sticking problems. A powerful diaphragm actuator or high performance piston cylinder actuator is mounted on the valves and realized stable fluid control.

Therefore, the model ALVB/ALVM are widely applicable for control of high differential pressure process lines where dynamic stability, low noise and anti-cavitation/ flashing are required.



SPECIFICATIONS

Body

Type

Straight-through, cast globe valve

Nominal size

14, 16, 18, 20 inches

Pressure rating

- Model ALVB: JIS 10K, ANSI 150, JPI 150
- Model ALVM: JIS 20K, ANSI 300, JPI 300

End connections

Flange end

| Connection type | Pressure rating | Applicable standard |
|-----------------|---------------------|----------------------|
| RF | JIS10K, 20K | JIS B2210-1984 |
| | ANSI Class 150, 300 | ASME/ANSI B16.5-1988 |
| | JPI Class 150, 300 | JPI-7S-15-1993 |

Materials

For body/trim material combinations and operating temperature ranges, refer to Table 1.

Bonnet

Plain bonnet (-5 to 200°C)

Gland type

Bolted gland

Packing/Grease

Grease not provide

When V shaped PTFE packing and PTFE yarn packing is used.

Note) PTFE: Polytetrafluoroethylene.

Gasket

Type

Serrated type

Material

SUS316 PTFE coating

Trim

Valve plug

Single seated pressure balanced type

Cage

Metal seat

(For flow characteristics, refer to Figure 1 and Figure 2.)
Equal percentage (%V)

Linear (LV)

Materials

For body/trim material combinations and operating temperature ranges, refer to Table 1.

Actuator

Type

Single acting diaphragm actuator (Model VA5)
Piston actuator (Model PPA6)

Action

Direct or reverse action

Diaphragm

Type VA5: Cloth-embedded chloroprene rubber

Spring range

Type VA5

40 to 200 kPa {0.4 to 2.0 kgf/cm²}

80 to 240 kPa {0.8 to 2.4 kgf/cm²}

Supply pressure

Diaphragm actuator

Type VA5 : 270 kPa {2.8 kgf/cm²}

Piston actuator

Type PPA : 490 kPa {5 kgf/cm²}

Note) Allowable differential pressure is depended on spring range and air supply pressure.

Air connection

Rc1/4 or 1/4NPT internal thread

Note) Rc1/4 or 1/4NPT adapter is provided on Rc1/2 internal thread.

Ambient temperature

-30 to 70 °C

Valve action

Air-to-close (Direct action actuator is combined.)

Air-to-open (Reverse action actuator is combined.)

Optional accessories

Positioner*, pressure regulator with filter, hand wheel*, limit switch, solenoid valve, motion transmitter, booster relay, lock-up valve, and others

- Note)* 1. For the optional items, refer to specification sheets and installation drawings of respective accessories.
 2. Accessories with an asterisk mark (*) are selected from among the following types depending on the actuators to be combined.

| Actuator | Positioner | | Hand wheel | |
|----------|------------|---------|------------|------|
| | P/P | I/P | Top | Side |
| VA5 | HTP | AVP/HEP | THM | SHM |
| PPA6 | VPP | AVP/HEP | - | SHM |

Additional specifications (by special order)

- Special inspection
 Flow characteristics inspection, material inspection (material certificate), non-destructive inspection, steam inspection, low-temperature inspection
- With drain plug • Double gland
- Oil/water free treatment • Copper free treatment
- Stainless steel (SUS304) atmosphere-exposed nuts and bolts
- Special air piping and joint
- Sand-/ dust-preventive measures
- Saline damage countermeasures
- Cold-area use specifications
- Tropical-area use specifications
- Vacuum service
- Actuator yoke material SCPH2*

Note) *: SCPH2 is standard materials for model PPA6 actuator yoke

Performance

Rated Cv value

Refer to Table 2

Flow characteristics

Refer to Figure 1 and Figure 2.

Inherent rangeability

50 : 1

Allowable differential pressure

Refer to Table 3 and Table 4.

Leakage specification

IEC 60534-4:2006 or JIS B 2005-4:2008

Class IV: Leakage less than 0.01% of maximum valve capacity

Hysteresis error

Without positioner: Within 5% F.S.

With positioner: Within 1% F.S.

Linearity

Without positioner: Within ± 5% F.S.

With positioner: Within ± 2% F.S.

Dimensions

Refer to Figure 3 and Table 5.

Weight

Refer to Table 6.

Actuator orientation

Refer to Figure 4.

Finish

Blue (Munsell 10B5/10) or silver, or other specified colors.

Table 1 Body/trim material combinations and operating temperature ranges (°C)

| No. | Parts name | Material | |
|---------------------------------|-----------------|------------------|-------------------------|
| 1 | Body | SCPH2 or A216WCB | |
| 2 | Bonnet | SCPH2 or A216WCB | |
| 3 | Stud bolt & nut | SNB7/S45C | |
| 4 | Trim | Cage | SCS24 |
| 5 | | Plug | SCS24 |
| 6 | | Seal ring | Reinforced PTFE +SUS316 |
| 7 | | Valve stem | SUS316 |
| Applicable temperature range °C | | -5 °C to +200 °C | |

Table 2 Cv value and travel

| Nominal size (inches) | 14 | | 16 | | 18 | | 20 | |
|-----------------------|----------|------|------|------|------|------|------|------|
| Port size (inches) | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 |
| Rated CV value | 1440 | 1930 | 1930 | 2560 | 2560 | 3180 | 3180 | 3970 |
| Rated travel | 100 | | 150 | | 200 | | 200 | |
| Actuator | VA5R (D) | | PPA6 | | PPA6 | | PPA6 | |

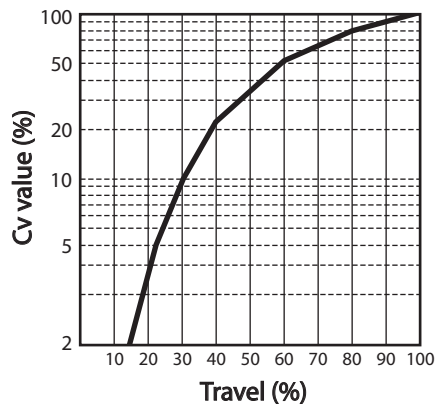


Figure 1 Equal / percentage (%V)

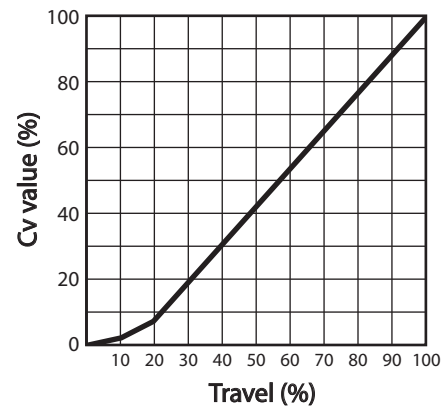
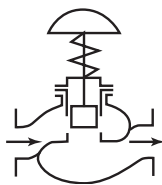


Figure 2 Linear (LV)

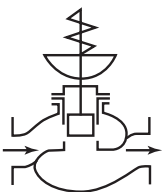
Allowable differential pressure

Table 3 Air-to-close



| Actuator model No. | Supply pressure kPa {kgf/cm ² } | Spring range kPa {kgf/cm ² } | Differential pressure [by nominal size (inches)] kPa {kgf/cm ² } | | | |
|--------------------|---|--|---|-------------|-------------|-------------|
| | | | 14 | 16 | 18 | 20 |
| VA5D | 270 {2.8} | 40 to 200 {0.4 to 2.0} | 1000 {10.2} | — | — | — |
| | | | 1500 {15.3} | | | |
| PPA6 | 500 {5.0} | — | — | 1000 {10.2} | 500 {5.1} | 500 {5.1} |
| | | | | 1500 {15.3} | 1500 {15.3} | 1500 {15.3} |

Table 4 Air-to-open



| Actuator model No. | Supply pressure kPa {kgf/cm ² } | Spring range kPa {kgf/cm ² } | Differential pressure [by nominal size (inches)] kPa {kgf/cm ² } | | | |
|--------------------|---|--|---|-------------|-------------|-------------|
| | | | 14 | 16 | 18 | 20 |
| VA5R | 270 {2.8} | 80 to 240 {0.8 to 2.4} | 1000 {10.2} | — | — | — |
| | | | 1500 {15.3} | | | |
| PPA6 | 500 {5.0} | — | — | 1000 {10.2} | 500 {5.1} | 500 {5.1} |
| | | | | 1500 {15.3} | 1500 {15.3} | 1500 {15.3} |

Note) The upper figures denote the operating allowable differential pressure. The lower denote allowable differential pressure at full closure.

DIMENSIONS

Table 5 Main dimensions

| Nominal size (inches) | Actuator model no. | A | | H | | B | E | | D | F |
|-----------------------|--------------------|--------------------------------------|---------------------------------------|--------------------|-----------------|-----|--------------------------------|--------------------------------|-----|-----|
| | | JIS 10K RF ANSI 150R JPI 150RF | JIS 20K RF ANSI 300RF JPI 300RF | Without hand wheel | With hand wheel | | JIS 10K ANSI 150 JPI 150 | JIS 10K ANSI 150 JPI 150 | | |
| 14 | VA5 | 889 | 927 | 1990 | 1990 | 620 | 380 | 420 | — | — |
| 16 | PPA6 | 1016 | 1057 | 2040 | 2340 | 476 | 410 | 440 | 350 | 400 |
| 18 | PPA6 | 1360 | 1400 | 2320 | 2620 | 476 | 500 | 520 | 350 | 400 |
| 20 | PPA6 | 1703 | 1745 | 2450 | 2750 | 476 | 650 | 650 | 350 | 400 |

When top mounted hand wheel or side Mounted hand wheel VA5 actuators are used, see the hand wheel dimensions designated in respective specification sheets (SS2-8210-0100 for model VA actuators.)

Table 6 Weights

| Nominal size (inches) | Actuator model no. | JIS 10K RF, JIS 20K RF, JPI 150 | | JIS 20K RT, ANSI 300RF, JPI 300 | |
|-----------------------|--------------------|---------------------------------|-----------------|---------------------------------|-----------------|
| | | Without hand-wheel | With hand-wheel | Without hand-wheel | With hand-wheel |
| 14 | VA5 | 1350 | 1440 | 1740 | 1820 |
| 16 | PPA6 | 2100 | 2190 | 2690 | 2780 |
| 18 | PPA6 | 2750 | 2660 | 3570 | 365 |
| 20 | PPA6 | 3720 | 3810 | 5870 | 5960 |

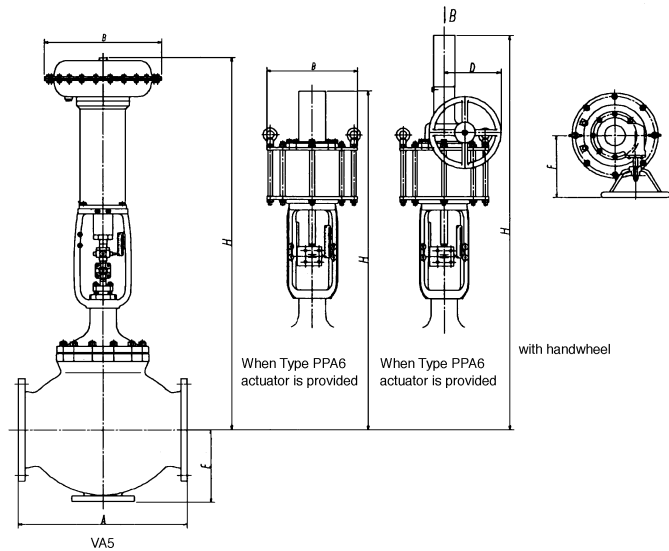


Figure 3 Dimensional drawings

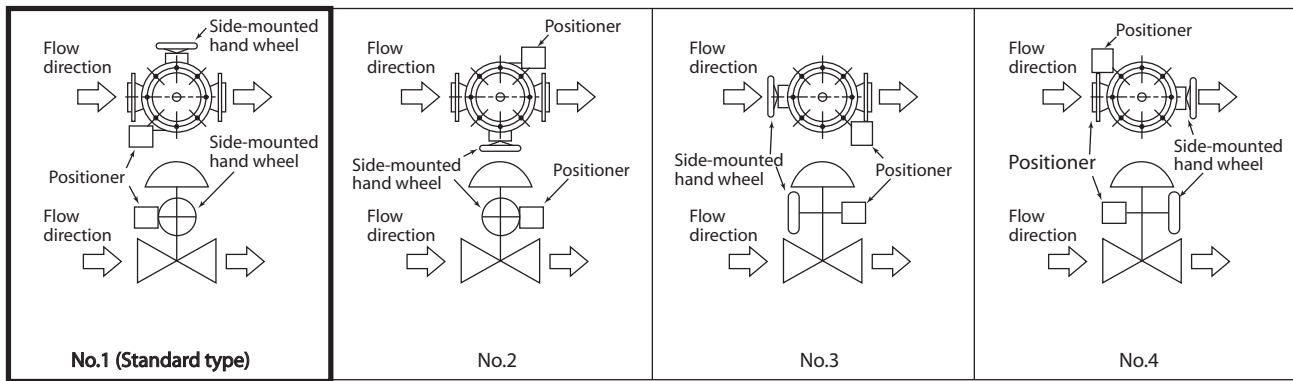


Figure 4 Actuator orientation

Note) 1. Indicate position number when installation other than the standard type is required.
 2. With type PPA6 actuator, the side mounted hand wheel are mounted on the same side as the positioners.

Ordering Information

When ordering, please specify;

- | | |
|--|---|
| 1) Model number: ALVB / ALVM | 9) Special requirement of oil free treatment, copper free treatment or other treatments |
| 2) Nominal size X port size | 10) Fluid name and fluid state |
| 3) Type and rating of end connections | 11) Normal flow rate and maximum required flow rate |
| 4) Body and trim material | 12) Pressure of flow medium, upstream and downstream pressure at maximum required flow |
| 5) Type of bonnet | 13) Temperature and specific gravity of flow medium |
| 6) Valve and plug characteristics | 14) Viscosity of flow medium, inclusive or exclusive of slurry |
| 7) Type of actuator, type of hand wheel, air supply pressure | |
| 8) Valve action (direct or reverse) | |
| 9) Accessories (positioner, hand wheel, pressure regulator etc.) | |

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