

# CV3000 Alphaplus series

## Electric Top-Guided Single-Seated Control Valves

### Model AGVB / AGVM

#### OVERVIEW

The CV3000 Alphaplus range of top-guided single-seat control valves features a compact valve body with excellent flow control and minimal pressure loss. Alphaplus valves have large Cv values, high range ability, and accurate flow control performance.

When securely held in place by a top-guided stem with a long stroke, the valve plug is highly resistant against vibration and provides flow shutoff performance that fully satisfies IEC standards.

The actuator section performs two-position control or proportional control by directly receiving the signal of 4 to 20 mA DC or 1 to 5V DC from the electronic-type controller. The provided electric-type actuator offers high accuracy, compactness, and sturdy structure. Model AGVB/AGVM control valves are especially suitable for process control applications where high reliability and tight flow shutoff are essential.

#### 1. Selection of Alphaplus Specifications

Selection of control valves has traditionally required knowledge and experience. However, CV3000 Alphaplus offers you more accurate product specifications, so that you can easily pinpoint the control valve that satisfies fluid specifications (such as flowrate, pressure, and temperature) at your plant and provides the functions that you need.

If you do not find a valve that completely satisfies your requirements, contact the Azbil Group representative for assistance.

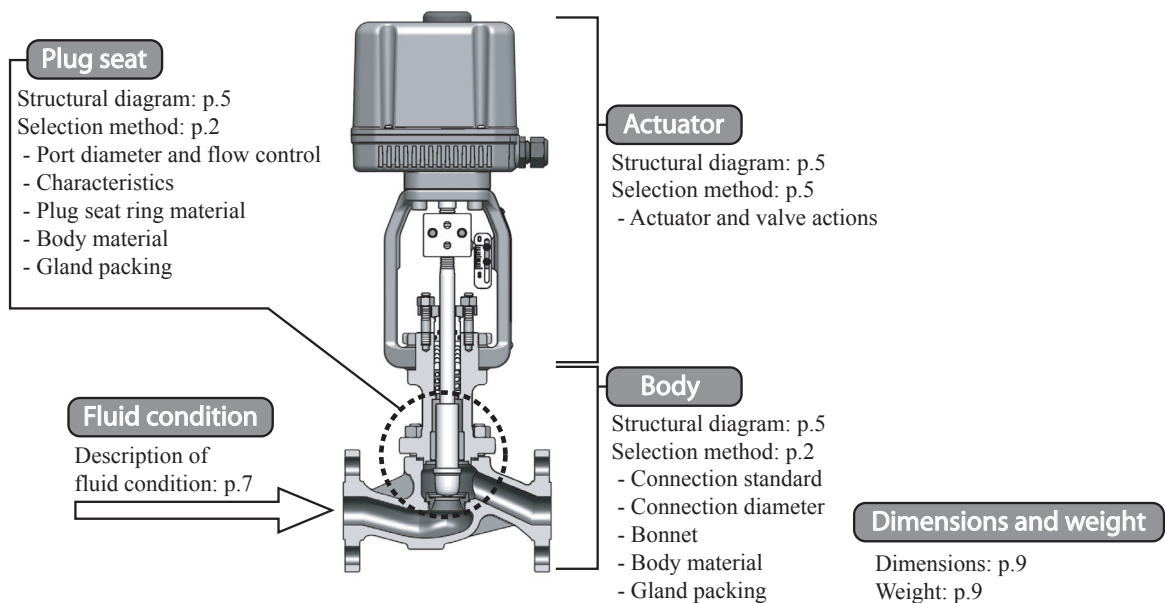


Figure 1 CV3000 Alphaplus selection map

## 2. Basic Model Numbers

### Basic model: 1/2 to 4 inches

Please select basic model no. from the following two kinds according to connected rating.

Model AGVB: JIS 10K, ANSI 150, JPI 150

Model AGVM: JIS 16K, JIS 20K, JIS 30K, ANSI 300, JPI 300

## 3. Optional Specifications

### 3-1 Body

Figure 2 shows optional specifications of the body.

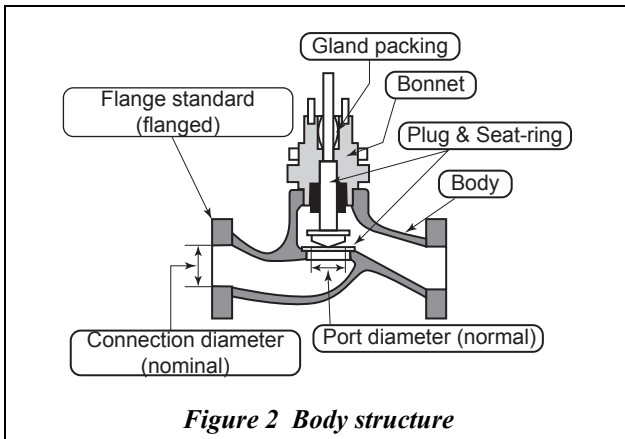


Figure 2 Body structure

#### 3-1-1 Nominal size

Azbil Corporation manufactures diameters from 1/2 inch (15 mm) to 2 inches (50 mm) as shown in Table 1.

**For other diameters, we recommend a selection from the CV3000 series of control valves.**

#### 3-1-2 Port size and flow characteristics

The selection of the port size and the rated Cv value falls within the scope of Table 1 according to the nominal size. For nominal sizes 1 inch (25 mm) or less, port sizes are expressed in terms of Cv values. Flow characteristics depend on the rated Cv value.

**Based on the rated Cv value and the calculated necessary Cv value, check the controllability (valve position) using the flow control characteristics tables in Figure 4, 5, and 6.**

#### 3-1-3 Pressure (flange type)

RF ;  
JIS 10K, 16K, 20K, 30K, (JIS B2210-1984)  
ANSI 150, 300 (ASME/ANSI B16.5-1988)  
JPI 150, 300 (JPI-75-15-1993)

**For other rated pressures and connection types, you are recommended to consider the CV3000 series of control valves.**

### 3-1-4 Bonnet

We manufacture bonnets that can be used at fluid temperatures ranging from -196°C to 400°C.

[Unit: °C]

| Body material<br>Bonnet type       | SCPH2       | SCS13A/<br>SCS14A        |
|------------------------------------|-------------|--------------------------|
| General use                        | -5 ~ +30    | -17 ~ +230               |
| Extension type<br>(high&low temp.) | +230 ~ +400 | -45 ~ -17<br>+230 ~ +400 |

**For fluid temperatures outside the above temperature range, we recommend a selection from the CV3000 series of control valves.**

### 3-1-5 Body and plug seat ring materials

For combinations of body and plug seat ring materials and their applicable temperature ranges, see Table 2. In some ranges the plug seat ring material needs hardening treatment. See Figure 10. When you select a soft seat, refer to Figure 11.

**For materials other than those shown in Table 2, we recommend a selection from the CV3000 series of control valves.**

### 3-1-6 Valve seat leakage

For the seat leak performance when the valve is fully closed, select from among the following four classifications, which conform to IEC60534-4:2006 or JIS B2005-4:2008

Class IV:  $10^{-4} \times$  rated Cv value  
(0.01% of rated Cv value)

Class VI:  $3 \times$  valve differential pressure (MPa)  
 $\times$  leakage coefficient ml/min. shown below

| Nominal size<br>inches (mm) | 1<br>(25) | 1½<br>(40) | 2<br>(50) | 2½<br>(65) | 3<br>(80) | 4<br>(100) |
|-----------------------------|-----------|------------|-----------|------------|-----------|------------|
| Leakage<br>coefficient      | 0.15      | 0.23       | 0.36      | 0.51       | 0.62      | 1.20       |

**For shutoff valves, choose either Class VI. (soft seat)**

### 3-1-7 Inherent range ability:

| Rated Cv             | Inherent Range ability |
|----------------------|------------------------|
| 0.1, 0.16, 0.25, 0.4 | 20:1                   |
| 0.63                 | 30:1                   |
| 1.0 or more than 1.0 | 50:1 (75:1*)           |

Note)\*: Optional, metal seat and equal percentage only.

### 3-1-8 Gland packing

According to your application, select appropriate type of gland packing from among the following:

| Usage  | Type   | Material                                  |
|--|--|---|
| General use<br>(oils, solvent acids, alkalis, etc.)        | PTFE yarn packing<br>(P4519)                         | Woven PTFE yarn with carbon fiber core    |
| General use and oil-free treatment                         | V shaped PTFE packing                                | PTFE molding                              |
| Vacuum service   | V shaped PTFE packing<br>(direct+reverse mounted)    | PTFE molding                              |
| Low temperature service                                    | V shaped PTFE packing                                | PTFE molding                              |
| High temperature service                                   | Graphite yarn packing*1<br>(P6610CL+P6722)           | Graphite                                  |
| Low leakage spec. for VOC*2<br>regulation (SECURE-SEAL™)*3 | PTFE yarn packing(P4519) with live<br>load structure | Woven PTFE yarn with carbon fiber<br>core |

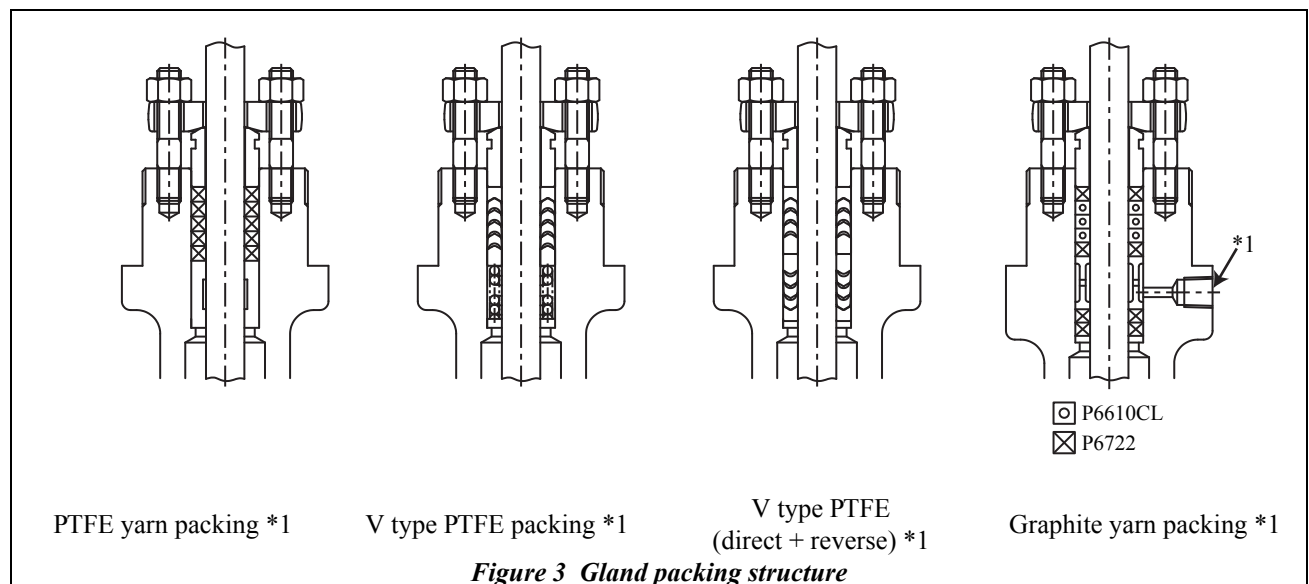
Note) PTFE: polytetrafluoroethylene resin

\*1 Grease provided

\*2 Volatile Organic Compound

\*3 Refer to No.SS2-SSL100-0100 about detail of SECURE-SEAL™.

For other gland packing materials, please provide closest model number and Azbil Corporation will take your request under advice.



Note) \*1: Grease is used.

### 3-1-9 Gasket

|                                   | General / Low temp.                           | High temperature                  | General or low temp. / Oil-free treatment            |
|-----------------------------------|---|-----------------------------------|--|
| <b>Between bonnet and body</b>    | Metal gasket<br>(PTFE coating)<br>V543 (PTFE) | Metal gasket<br>V543              | Metal gasket<br>(PTFE coating)<br>V543 (PTFE)        |
| <b>Between seat ring and body</b> | Not necessary                                 | Flat metal gasket<br>V564 (Monel) | Flat metal gasket<br>with PTFE coating<br>V563(PTFE) |

Table 1 Models of AGVB and AGVM

|                              |                     |             |            |            |            |          |         |             |          |          |          |         |          |         |          |         |          |          |          |          |          |  |        |  |  |       |  |  |        |  |  |
|------------------------------|---------------------|-------------|------------|------------|------------|----------|---------|-------------|----------|----------|----------|---------|----------|---------|----------|---------|----------|----------|----------|----------|----------|--|--------|--|--|-------|--|--|--------|--|--|
| Nominal size inches (mm)     | 1 (25)              |             |            |            |            |          |         |             |          |          |          |         |          |         |          |         | 1½ (40)  |          |          | 2(50)    |          |  | 2½(65) |  |  | 3(80) |  |  | 4(100) |  |  |
|                              | ¾ (20)              |             |            |            |            |          |         |             |          |          |          |         |          |         |          |         |          |          |          |          |          |  |        |  |  |       |  |  |        |  |  |
|                              | ½ (15)              |             |            |            |            |          |         |             |          |          |          |         |          |         |          |         |          |          |          |          |          |  |        |  |  |       |  |  |        |  |  |
| Port diameter (inches)       | 0.1<br>0.16<br>0.25 | 0.4<br>0.63 | 1.0<br>1.6 | 2.5<br>4.0 | 8.0<br>6.3 | 10<br>14 | 1<br>14 | 1¼<br>21    | 1½<br>30 | 1¾<br>21 | 1½<br>30 | 2<br>50 | 1½<br>30 | 2<br>50 | 2½<br>85 | 2<br>50 | 2½<br>85 | 3<br>115 | 2½<br>85 | 3<br>115 | 4<br>200 |  |        |  |  |       |  |  |        |  |  |
| Rated Cv value               | 20                  |             |            |            |            |          |         |             |          |          |          |         |          |         |          |         |          |          |          |          |          |  |        |  |  |       |  |  |        |  |  |
| Rated travel (mm)            | 20                  |             |            |            |            |          |         |             |          |          |          |         |          |         |          |         |          |          |          |          |          |  |        |  |  |       |  |  |        |  |  |
| Flow control characteristics | Fig.4               | Figure 5, 7 |            |            |            |          |         | Figure 6, 7 |          |          |          |         |          |         |          |         |          |          |          |          |          |  |        |  |  |       |  |  |        |  |  |

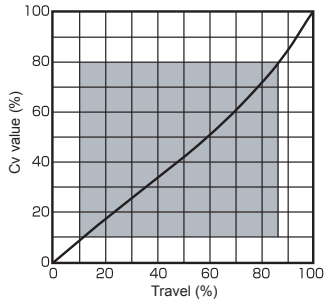


Figure 4 Cv values 0.1, 0.16, and 0.25 (linear model)

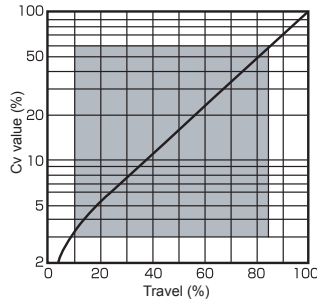


Figure 5 Cv values 0.4 to 14 (equal percentage model)

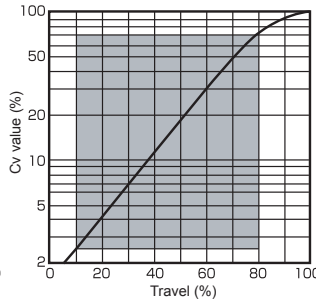


Figure 6 Port diameter 1 to 2 inch (equal percentage model)

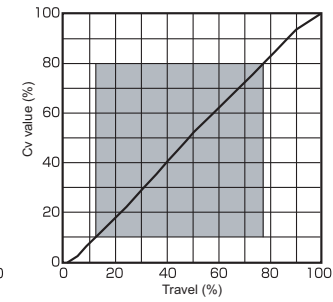


Figure 7 Cv values 0.4 to 14 (linear model)

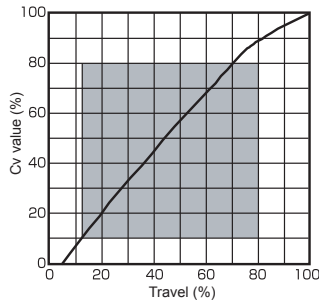


Figure 8 Cv values 0.4 to 14, Port diameter 1 to 2 inch (linear model)

□ : Scope of control generally considered feasible (Cv value in percentage and travel in percentage)

Table 2 Body, plug and seat ring materials

| Trim material         |      | Temperature range (°C) |             |             |
|-----------------------|------|------------------------|-------------|-------------|
| SUS 316               |      | -5 to +300             | -45 to +300 | -45 to +300 |
| SUS 316 Stellite      |      | -5 to +400             | -45 to +400 | -45 to +400 |
| SUS440C               |      | -5 to +400             | -45 to +400 | -45 to +400 |
| SUS 316 soft seat     |      | -5 to +230             | -45 to +230 | -45 to +230 |
| SUS 316 Stellite face |      | -5 to +400             | -45 to +400 | -45 to +400 |
| SUS 316L              |      | ---                    | -45 to +300 | -45 to +300 |
| SUS 316L Stellite     |      | -5 to +230             | -45 to +400 | -45 to +400 |
| SUS 316L soft seat    |      | -5 to +230             | -45 to +230 | -45 to +230 |
| Body material         | JIS  | SCPH2                  | SCS13A      | SCS14A      |
|                       | ASTM | A216WCB                | A351CF8     | A351CF8M    |

Note) \*1: Parts that adjust flow (such as a plug and a seat ring) are referred to as the valve trim.

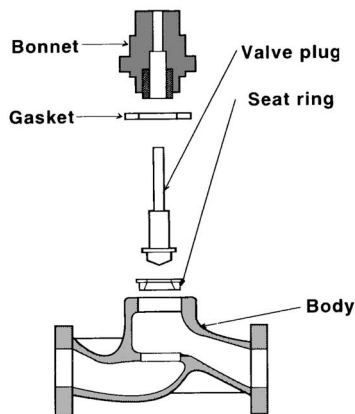
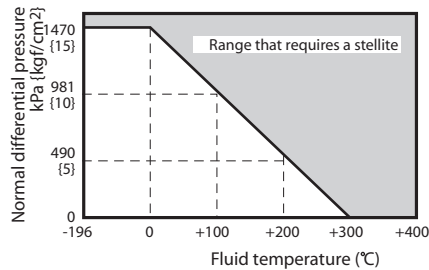


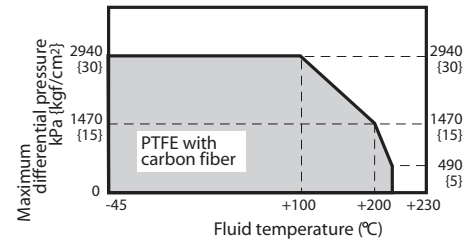
Figure 9 Development view of AGVB/AGVM



**Figure 10 Temperature and normal differential pressure ranges that require a Stellite**

Note) 1) For valves for cavitation/flashing service, oil-proof service, or tight shutoff service, a stellite is recommended regardless of process fluid temperatures or differential pressures.

2) For valves for cavitation/flashing service for water or for valves for superheated water above 100 °C, SUS 440C is recommended.



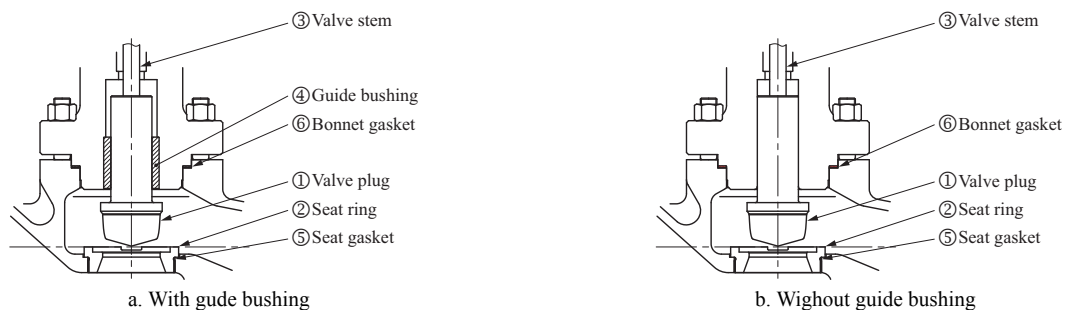
**Figure 11 Temperature and maximum differential pressure ranges for soft seats**

Note) 1) When there is a possibility of erosion by such fluids as saturated steam and heated water please use metal seats.

2) The material of washing treatment for oil-free of the wetted parts (inside the body) is PTFE with galss.

**3-1-10 Structural drawing of trim and body/trim material combinations**

Following table shows typical body/trim material combinations. Please contact us about materials that are not listed in this table.



**Figure 12 Structural drawing of trim**

**Table 3 The valve body material is carbon steel (SCPH2/A216WCB).**

| ① Valve plug<br>② Seat ring | SUS316   |                      | SUS440C  | SUS316 Stellite<br>SUS316 Stellite face                  |                       | SUS316 soft seat      |                       |
|-----------------------------|--|----------------------|--|--|-----------------------|-----------------------|-----------------------|
|                             | General  | Oil-free             | General  | General  | Oil-free              | General               | Oil-free              |
| ③ Valve stem                | SUS316   |                      |  |  |                       |                       |                       |
| ④ Guide bushing             | SUS440C  | SUS316 Stellite face | SUS440C  | SUS316 Stellite  | SUS316 Stellite       | SUS440C               | SUS316 Stellite face  |
| ⑤ Seat gasket               | Without (Design temperature: -17 to +230°C)              | SUS316(PTFE coating) | Without (Design temperature: -17 to +230°C)              | Without (Design temperature: -17 to +230°C)              | SUS316 (PTFE coating) | Without               | SUS316 (PTFE coating) |
|                             | Monel (Design temperature: above +230°C)                 |                      | Monel (Design temperature: above +230°C)                 | Monel (Design temperature: above +230°C)                 |                       |                       |                       |
| ⑥ Bonnet gasket             | SUS316(PTFE coating) (Design temperature: -17 to +230°C) | SUS316(PTFE coating) | SUS316(PTFE coating) (Design temperature: -17 to +230°C) | SUS316(PTFE coating) (Design temperature: -17 to +230°C) | SUS316(PTFE coating)  | SUS316 (PTFE coating) | SUS316 (PTFE coating) |
|                             | SUS316 (Design temperature: above +230°C)                |                      | SUS316 (Design temperature: above +230°C)                | SUS316 (Design temperature: above +230°C)                |                       |                       |                       |

| ① Valve plug<br>② Seat ring | SUS316   |                       | SUS316L Stellite   |                      | SUS316L soft seat    |                       |
|-----------------------------|--|-----------------------|--|----------------------|----------------------|-----------------------|
|                             | General  | Oil-free              | General  | Oil-free             | General              | Oil-free              |
| ③ Valve stem                | SUS316L  |                       |  |                      |                      |                       |
| ④ Guide bushing             | SUS316L  | SUS316L Stellite face | SUS316L Stellite   | SUS316L Stellite     | SUS316L              | SUS316L Stellite face |
| ⑤ Seat gasket               | Without (Design temperature: -17 to +230°C)              | SUS316(PTFE coating)  | Without (Design temperature: -17 to +230°C)              | SUS316(PTFE coating) | Without              | SUS316(PTFE coating)  |
|                             | Monel (Design temperature: above +230°C)                 |                       | Monel (Design temperature: above +230°C)                 |                      |                      |                       |
| ⑥ Bonnet gasket             | SUS316(PTFE coating) (Design temperature: -17 to +230°C) | SUS316(PTFE coating)  | SUS316(PTFE coating) (Design temperature: -17 to +230°C) | SUS316(PTFE coating) | SUS316(PTFE coating) | SUS316(PTFE coating)  |
|                             | SUS316 (Design temperature: above +230°C)                |                       | SUS316 (Design temperature: above +230°C)                |                      |                      |                       |

**Table 4 The valve body material is stainless steel (SCS13A/A351CF8 or SCS14A/A351CF8M)**

| ① Valve plug<br>② Seat ring | SUS316  |                         | SUS440C *1  | SUS316 Stellite<br>SUS316 Stellite face   |                         | SUS316 soft seat  |                         |
|-----------------------------|---|-------------------------|---|---|-------------------------|---|-------------------------|
|                             | General   | Oil-free                | General   | General   | Oil-free                | General   | Oil-free                |
| ③ Valve stem                | SUS316  |                         |   |   |                         |   |                         |
| ④ Guide bushing             | Without: bonnet guide<br>(Design temperature:<br>-17 to +230°C)                   | SUS316 Stellite<br>face | SUS440C   | SUS316 Stellite   | SUS316 Stellite         | Without<br>(bonnet guide)<br>(Design temperature:<br>-17 to +230°C) | SUS316 Stellite<br>face |
|                             | SUS316<br>(Design temperature:<br>above +230°C and<br>below -17°C)                |                         |   |   |                         | SUS316<br>(Design temperature:<br>above +230°C and<br>below -17°C)  |                         |
| ⑤ Seat gasket               | Without<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C)              | SUS316(PTFE<br>coating) | Without<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C)              | Without<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C)              | SUS316(PTFE<br>coating) | Without   | SUS316(PTFE<br>coating) |
|                             | Monel<br>(Design temperature:<br>above +230°C)                                    |                         | Monel<br>(Design temperature:<br>above +230°C)                                    | Monel<br>(Design temperature:<br>above +230°C)                                    |                         |   |                         |
| ⑥ Bonnet gasket             | SUS316(PTFE coating)<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C) | SUS316(PTFE<br>coating) | SUS316(PTFE coating)<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C) | SUS316(PTFE coating)<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C) | SUS316(PTFE<br>coating) | SUS316(PTFE<br>coating)   | SUS316(PTFE<br>coating) |
|                             | SUS316<br>(Design temperature:<br>above +230°C)                                   |                         | SUS316<br>(Design temperature:<br>above +230°C)                                   | SUS316<br>(Design temperature:<br>above +230°C)                                   |                         |   |                         |

| ① Valve plug<br>② Seat ring | SUS316L   |                         | SUS316L Stellite  |                      | SUS316L soft seat   |                         |
|-----------------------------|---|-------------------------|---|----------------------|---|-------------------------|
|                             | General   | Oil-free                | General   | Oil-free             | General   | Oil-free                |
| ③ Valve stem                | SUS316L   |                         |   |                      |   |                         |
| ④ Guide bushing             | Without: bonnet guide<br>(Design temperature:<br>-17 to +230°C)                   | SUS316L Stellite face   | SUS316L Stellite  | SUS316L Stellite     | Without: bonnet guide<br>(Design temperature:<br>-17 to +230°C) | SUS316L Stellite face   |
|                             | SUS316L<br>(Design temperature:<br>above +230°C and<br>below -17°C)               |                         |   |                      | SUS316L<br>(Design temperature:<br>below -17°C)                 |                         |
| ⑤ Seat gasket               | Without<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C)              | SUS316(PTFE<br>coating) | Without<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C)              | SUS316(PTFE coating) | Without   | SUS316(PTFE<br>coating) |
|                             | Monel<br>(Design temperature:<br>above +230°C)                                    |                         | Monel<br>(Design temperature:<br>above +230°C)                                    |                      |   |                         |
| ⑥ Bonnet gasket             | SUS316(PTFE coating)<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C) | SUS316(PTFE<br>coating) | SUS316(PTFE coating)<br>(Design temperature:<br>-17 to +230°C and<br>below -17°C) | SUS316(PTFE coating) | SUS316(PTFE coating)  | SUS316(PTFE<br>coating) |
|                             | SUS316<br>(Design temperature:<br>above +230°C)                                   |                         | SUS316<br>(Design temperature:<br>above +230°C)                                   |                      |   |                         |

Note) \*1 SUS440C is applicable to body material SCS14A/A351CF8M.

## 3-2 Actuator

### 3-2-1 Actuator and valve actions

Table 5 Specification of actuator

| Type   | Electronic motor  |
|--|---|
| Control action                                 | Proportional control or two-position control  |
| Power supply                                   | Single phase 100V, 110V, 115V, 120V, 200V, 210V, 220V, 230V, 240V AC $\pm 10\%$ , 50/60 Hz) |
| Input signal                                   | 4 to 20 mA DC, 1 to 5 VDC<br>Open or close contact input                                    |
| Action   | Direct or reverse   |
| Power failure action                           | Close, open or hold   |
| Input resistance                               | 250 $\Omega$  |
| Power supply capacity (general)                | 0.32A (power supply 100V AC)<br>0.18A (power supply 200V AC)                                |
| Insulation resistance                          | Between input terminal and case<br>100 M $\Omega$ / 500V DC                                 |
| With stand voltage                             | Between power supply terminal and case 500V / 1 min   |
| Main material                                  | Case: Aluminium die-casting (ADC 12)<br>Stem: SUS303<br>Yoke: Carbon steel (SCPH2)          |
| Type of protection                             | IP65 equivalent   |
| Explosion-proof                                | None  |
| Motor  | Reversible motor  |
| Coil insulation class                          | E   |
| Rated temperature                              | Continuity (built-in thermal switch: 120°C trip automatic operation type)                   |
| Position sensor                                | Potentiometer   |
| Protective device                              | Built-in open/close limit switch (standard)<br>Built-in lower torque limiter (standard)     |
| Electrical connection                          | G1/2 (two position)   |
| Ambient temperature limits                     | -25 to 55°C   |
| Ambient humidity limits                        | 10 to 90%RH   |
| Vibration tolerance                            | 2 G 5 to 100 Hz   |
| Travel transmission*                           | 1 to 5V DC  |
| Manual operation                               | Top handle (standard)   |
| Dead band                                      | Within $\pm 1\%$ F.S.   |
| Operation speed (open $\leftrightarrow$ close) | 16 sec.   |

Note) \*: The travel transmission is a standard specification for the proportional control, but that is a optional specification for the two position control.

#### Valve action

The valve action is decided by selecting the operation of the actuator action.

Signal to open: actuator action where the valve opens as the input signal increases

Signal to close: actuator action where the valve closes as the input signal increases

- **With the Alphaplus, the valve closes as the plug lowers. The valve action depends, in turn, on whether an signal to close or signal to open actuator is chosen.**
- **When the power supply is “Stop”, the actuator keeps the travel transmission of that time.**

### 3-2-2 Tables of allowable differential pressures

Ensure the required shut-off differential pressure specified in the equipment design is satisfied by selecting an actuator with an allowable differential pressure equal to or higher than the shut-off pressure, according to the seat leakage class.

#### Seat leakage, Class IV (0.01% of rated Cv value)

- Model AGVB: Table 6-1 and 6-2 on page 8
- Model AGVM: Table 6-3 and 6-4 on page 8

#### Seat leakage, Class VI (high shutoff model: soft seat)

- Model AGVB: Table 7-1 and 7-2 on page 8
- Model AGVM: Table 7-3 and 7-4 on page 8

### 3-2-3 Finish

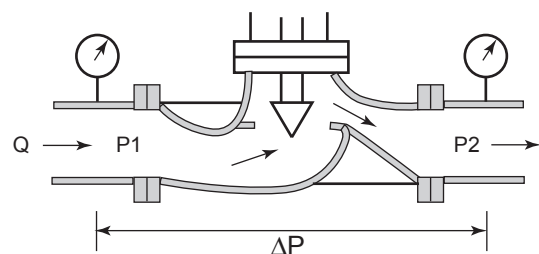
The normal standard coating color for Azbil Corporation's control valves is blue (Munsell 10B 5/10). Silver is also available as standard.

**You can specify any other color using the number code of the Japan Paint Industry Assignment or the Munsell color system.**

Standard colors are also used for such optional accessories as positioners, pressure regulator with filter, and solenoid valves.

## 4. Fluid Conditions

It is important to make the fluid conditions clear in selecting the control valve. Please fill in each data on “Fluid specifications” column in the lower of the model selection table.



| Mark             | Name                                    | Description   |
|------------------|---|---|
| -                | Fluid name                              | Name or symbol of fluid to flow through control valve   |
| Q                | Flow rate                               | Maximum (MAX), normal (NOR), and minimum (MIN) flow rates to be controlled                              |
| P1               | Upstream pressure                       | Pressure on upstream side of control valve  |
| P2               | Downstream pressure                     | Pressure on downstream side of control valve  |
| $\Delta P$       | Differential pressure                   | Pressure loss at control valve  |
| $\Delta P$ close | Differential pressure when fully closed | Differential pressure when the valve is fully closed (actuator selection condition)                     |
| Temp             | Temperature                             | Temperature of fluid on upstream side   |
| G                | Specific gravity                        | Specific gravity of the fluid   |
| V                | Viscosity                               | Viscosity at the temperature of the fluid on upstream side  |
| -                | Flashing %                              | Weight percentage of flashing to occur on downstream side when pressure is reduced by the control valve |

#### Calculation of the Cv values and expected noise

For calculation of the Cv values and expected noise, refer to following document.

Selecting the control valves: No. IB2-8000-0100

Azbil Corporation has developed personal computer software to calculate Cv values and expected noise. Please specify if you require such a PC-based tool.



**Valve seat leakage, Class IV: 0.01% of the rated Cv value**

**Table 6-1 Model AGVB nominal size 1/2, 3/4, and 1 inch**  
Note that the allowable differential pressure varies with the rated Cv value you have selected.

| Nominal size [inches] | Actuator | Differential pressure (by Cv value) kPa {kgf/cm <sup>2</sup> } |          |         |         |         |       |
|-----------------------|----------|--|----------|---------|---------|---------|-------|
|                       |          | 0.25 or less   | 0.4 0.63 | 1.0 1.6 | 2.5 4.0 | 6.3 8.0 | 10 14 |
| 1 inch or less        | EA1      | 1960 {20.0}  |          |         |         |         |       |

Note) Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB2201-1984, ANSIB16.34-1981, and JPI-7S-65-83.

**Table 6-2 Model AGVB nominal size 1½, 2 inches**

Note that the allowable differential pressure varies with the port diameter (inches) you have selected.

| Nominal size inches | Actuator | Differential pressure (by Port size) kPa {kgf/cm <sup>2</sup> } |             |             |           |
|---------------------|----------|---|-------------|-------------|-----------|
|                     |          | 1   | 1¼          | 1½          | 2         |
| 1½                  | EA1      | 1960 {20.0}   | 1870 {19.0} | 1270 {12.9} | -         |
| 2                   |          | -   |             |             | 760 {7.7} |

Note) Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB220-1-1984, ANSIB16.34-1981, and JPI-7S-65-83

**Table 6-3 Model AGVM nominal size 1/2, 3/4, and 1 inch**

Note that the allowable differential pressure varies with the rated Cv value you have selected.

| Nominal size inches | Actuator | Differential pressure (by Cv value) kPa {kgf/cm <sup>2</sup> } |             |         |             |         |       |
|---------------------|----------|--|-------------|---------|-------------|---------|-------|
|                     |          | 0.25 or less   | 0.4 0.63    | 1.0 1.6 | 2.5 4.0     | 6.3 8.0 | 10 14 |
| 1/2<br>3/4<br>1     | EA1      | 1960 {20.0}  |             |         |             |         |       |
|                     |          | 5100 {52.0}  | 4120 {42.0} |         | 3040 {31.0} |         |       |

Note) 1. Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB2201-1984, ANSIB16.34-1981, and JPI-7S-65-83.

Note) 2. In the differential pressure column, upper figures show normal differential pressures and lower figures differential pressures when the valve is fully closed. At your request, we can manufacture control valves with normal pressures exceeding 1960 kPa.

**Table 6-4 Model AGVM nominal size 1½, 2 inches**

Note that the allowable differential pressure varies with the port diameter (inches) you have selected.

| Nominal size inches | Actuator | Differential pressure (by Port size) kPa {kgf/cm <sup>2</sup> } |             |             |           |
|---------------------|----------|---|-------------|-------------|-----------|
|                     |          | 1   | 1¼          | 1½          | 2         |
| 1½                  | EA1      | 1960 {20.0}   | 1870 {19.0} | 1270 {12.9} | -         |
|                     |          | 3040 {31.0}   |             |             |           |
| 2                   |          | -   |             |             | 760 {7.7} |

Note) 1. Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB2201-1984, ANSIB16.34-1981, and JPI-7S-65-83.

Note) 2. In the differential pressure column, upper figures show normal differential pressures and lower figures differential pressures when the valve is fully closed. At your request, we can manufacture control valves with normal pressures exceeding 1960 kPa.

**Valve seat leakage, Class VI: high shutoff model: soft seat**

**Table 7-1 Model AGVB nominal size 1/2, 3/4, and 1 inch**  
Note that the allowable differential pressure varies with the rated Cv value you have selected.

| Nominal size inches | Actuator | Differential pressure (by Cv value) kPa {kgf/cm <sup>2</sup> } |          |         |         |         |       |
|---------------------|----------|--|----------|---------|---------|---------|-------|
|                     |          | 0.25 or less   | 0.4 0.63 | 1.0 1.6 | 2.5 4.0 | 6.3 8.0 | 10 14 |
| 1 inch or less      | EA1      | 1960 {20.0}  |          |         |         |         |       |

Note) Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB220-1-1984, ANSIB16.34-1981, and JPI-7S-65-83.

**Table 7-2 Model AGVB nominal size 1½, 2 inches**

Note that the allowable differential pressure varies with the port diameter (inches) you have selected.

| Nominal size inches | Actuator | Differential pressure (by port size) kPa {kgf/cm <sup>2</sup> } |             |           |           |
|---------------------|----------|---|-------------|-----------|-----------|
|                     |          | 1   | 1¼          | 1½        | 2         |
| 1½                  | PSA1R    | 1700 {17.3}   | 1100 {11.2} | 630 {6.4} | -         |
| 2                   |          | -   |             |           | 250 {2.5} |

Note) Note that the maximum allowable differential pressures must not exceed the maximum working pressure specified by JISB220-1-1984, ANSIB16.34-1981, and JPI-7S-65-83.

**Table 7-3 Model AGVM nominal size 1/2, 3/4, and 1 inch**

Note that the allowable differential pressure varies with the rated Cv value you have selected.

| Nominal size inches | Actuator | Differential pressure (by Cv value) kPa {kgf/cm <sup>2</sup> } |          |             |         |         |             |
|---------------------|----------|--|----------|-------------|---------|---------|-------------|
|                     |          | 0.25 or less   | 0.4 0.63 | 1.0 1.6     | 2.5 4.0 | 6.3 8.0 | 10 14       |
| 1/2<br>3/4<br>1     | EA1      | 1960 {20.0}  |          |             |         |         | 1700 {17.3} |
|                     |          | 2940 {30.0}  |          | 2070 {21.1} |         |         |             |

Note) 1. Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB220-1-1984, ANSIB16.34-1981, and JPI-7S-65-83.

Note) 2. In the differential pressure column, upper figures show normal differential pressures and lower figures differential pressures when the valve is fully closed. At your request, we can manufacture control valves with normal pressures exceeding 1960 kPa.

**Table 7-4 Model AGVM nominal size 1½, 2 inches**

Note that the allowable differential pressure varies with the port diameter (inches) you have selected.

| Nominal size inches | Actuator | Differential pressure (by port size) kPa {kgf/cm <sup>2</sup> } |             |           |           |
|---------------------|----------|---|-------------|-----------|-----------|
|                     |          | 1   | 1¼          | 1½        | 2         |
| 1½                  | PSA1R    | 1700 {17.3}   | 1100 {11.2} | 630 {6.4} | -         |
| 2                   |          | -   |             |           | 250 {2.5} |

Note) 1. Note that the maximum allowable differential pressures must not exceed the maximum working pressures specified by JISB220-1-1984, ANSIB16.34-1981, and JPI-7S-65-83.

Note) 2. In the differential pressure column, upper figures show normal differential pressures and lower figures differential pressures when the valve is fully closed. At your request, we can manufacture control valves with normal pressures exceeding 1960 kPa.



## DIMENSIONS

Table 8 and 9 show the dimensions and weight of the control valves. Note that the addition of any optional specifications will change their installed dimensions and weights.

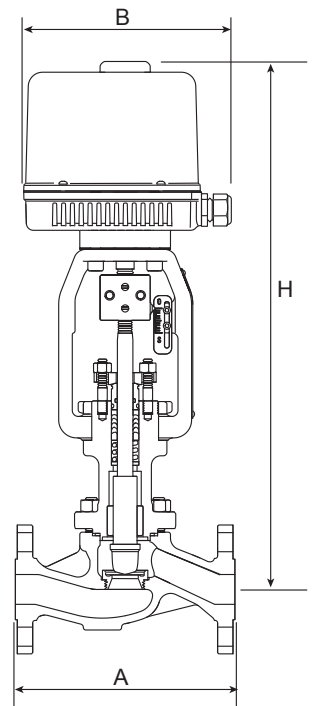
**Table 8 Face-to-face dimension and External dimensions**

| Connection diameter (inches) | Actuator | Dimensions (mm)             |        |                                     |                       |                     |     |
|------------------------------|----------|-----------------------------|--------|-------------------------------------|-----------------------|---------------------|-----|
|                              |          | A                           |        |                                     | H                     |                     | B   |
|                              |          | JIS10K<br>ANSI150<br>JPI150 | JIS16K | JIS20K,<br>30K<br>ANSI300<br>JPI300 | General<br>use bonnet | Extension<br>bonnet |     |
| 1/2, 3/4                     | EA1      | 184                         | 190    | 194                                 | 445                   | 570                 | 180 |
| 1                            |          | 184                         | 193    | 197                                 | 445                   | 570                 | 180 |
| 1½                           |          | 222                         | 231    | 235                                 | 445                   | 630                 | 180 |
| 2                            |          | 254                         | 263    | 267                                 | 445                   | 630                 | 180 |

**Table 9 Weight**

(unit: kg)

| Nominal size (inches) | JIS10K, ANSI150, JPI150 |                  | JIS16K       |                  | JIS20K, JIS30K, ANSI300, JPI300 |                  |
|-----------------------|-------------------------|------------------|--------------|------------------|---------------------------------|------------------|
|                       | Plain bonnet            | Extension bonnet | Plain bonnet | Extension bonnet | Plain bonnet                    | Extension bonnet |
| 1/2                   | 12                      | 13               | 12           | 13               | 13                              | 14               |
| 3/4                   | 13                      | 14               | 13           | 14               | 15                              | 16               |
| 1                     | 14                      | 15               | 14           | 15               | 16                              | 17               |
| 1½                    | 21                      | 25               | 21           | 25               | 26                              | 30               |
| 2                     | 24                      | 28               | 24           | 28               | 27                              | 31               |



**Figure 13 Face-to-face dimension and External dimensions**





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<http://www.azbil.com/products/bi/order.html>

*Specifications are subject to change without notice.*

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