

# Honeywell

# VBF5011, VBF5013 Control Ball Valves With Flanged Connections

## SPECIFICATION DATA



4", 5" and 6"



2-1/2" and 3"

## APPLICATION

The VBF5011 Two-Way and the VBF5013 Three-Way Control Ball Valve control hot and chilled water with glycol solutions up to 50% in heating, ventilating and air conditioning (HVAC) systems to provide two-position or modulating functions.

These valve can be used with Honeywell electronic actuators.

## FEATURES

All Models

- **Sizes from 2-1/2" to 6" with ANSI Class 125 flanged connections.**
- **Flow characteristics.**
  - Two-way: equal percentage
  - Three-way: A-AB equal percentage, B-AB linear
- **Can be used with Honeywell electronic actuators.**
- **Field configurable for normally open or normally closed fail-safe position.**
- **For 2-1/2 and 3", removable manual operating handle to control valve during installation or in an event of power failure.**
- **ANSI Class IV leakage specification (0.01% of  $C_V$ ).**
  - 2-way - ANSI Class IV leakage
  - 3-way - A to AB; ANSI Class IV leakage
  - 3-way - B to AB; ANSI Class III leakage
- **Option of four actuator mounting positions on the valve for 4", 5" and 6" valves.**
- **Wide range of  $C_V$  choices from 63 to 360.**
- **Valve ball and stem 316 stainless steel for all valves except 3-way 2-1/2" valve.**

VBF5013 (Three-way)

- **Mixing or diverting control.**
- **Same flow pattern configuration as Globe valve.**



62-3117-02

# SPECIFICATIONS

**Table 1. Model Selection**

| Valve            | Fitting     | Body / Flow  |
|------------------|-------------|--------------|
| VB = valve, ball |             |              |
|                  | F = Flanged |              |
|                  |             | 5011 = 2-way |
|                  |             | 5013 = 3 way |

**Table 2. Control Ball Valve Part Numbers**

| Part#          | Description                             |
|----------------|---|
| VBF5011A1734/U | 2-1/2", 2-WAY CONTROL BALL VALVE, 63 CV |
| VBF5011A1767/U | 3", 2-WAY CONTROL BALL VALVE, 100 CV    |
| VBF5011A1858/U | 4", 2-WAY CONTROL BALL VALVE, 160 CV    |
| VBF5011A1882/U | 5", 2-WAY CONTROL BALL VALVE, 250 CV    |
| VBF5011A1916/U | 6", 2-WAY CONTROL BALL VALVE, 360 CV    |
| VBF5013B1003/U | 2 1/2", 3-WAY CONTROL BALL VALVE, 63 CV |
| VBF5013B1011/U | 3", 3-WAY CONTROL BALL VALVE, 100 CV    |
| VBF5013B1029/U | 4", 3-WAY CONTROL BALL VALVE, 160 CV    |
| VBF5013B1037/U | 5", 3-WAY CONTROL BALL VALVE, 250 CV    |
| VBF5013B1045/U | 6", 3-WAY CONTROL BALL VALVE, 360 CV    |

**Dimensions:** Refer to Figures 1 through 5 and Tables 6 through 9.

**Body Style:** Two-way control ball valve, straight-through flow, full or reduced port using laser-milled stainless steel control ball.

Three-way control ball valve, A-B-AB characterized flow, laser-milled stainless steel control ball.

Combination ANSI 125/PN16 flanged connections.

**Body Size:** 2-1/2" to 6" (DN65, DN80, DN100, DN125, DN150).

**Torque Requirement:** See Table 4.

**Body Pressure Rating (maximum):**

For 2-1/2" & 3":  
360 psi (2482 kPa) at 250° F (121° C).

For 4", 5", & 6":  
240 psi (1655 kPa) at 250° F (121° C).

**Controlled Medium:** Water or Glycol solutions up to 50%. Not suitable for combustible gases.

**Fluid Temperature Range:** -22 to +250° F (-30 to +121° C).

**Flow Characteristics:**

Two-way: Equal Percentage.

Three-way: Port A to AB: Equal Percentage.

Port B to AB: Linear with 20% reduced flow capacity.

**Rangeability:**

Rangeability is a measure of a valve's controllability (sometimes referred to as its Turndown Ratio). Rangeability is

a measured property and is expressed as the ratio of a valve's

maximum flow rate to its minimum controllable flow rate.

For 2-1/2": 250

For 3": 558

For 4", 5", & 6": 500:1 minimum.

**Mounting:** Bolt holes conform to ANSI B16.1.

**Materials:**

For 2-way 2-1/2", 3" & 3-way 2-1/2":

Body: Forged Brass (ASTM B283)

Flanges: Cast iron ductile ANSI Class 125

Flow Optimizer: Noryl®

Ball and Stem:

Two-way: Stainless Steel

Three-way: Nickel-chrome Plated Brass.

Stem Seals: EPDM O-rings.

Ball Seals: Reinforced TEFLON™ Seals with EPDM O-rings.

For 2-way 4", 5", & 6" & 3-way 3", 4", 5", & 6",

Body: Cast Iron ASTM A395, 60-40-18

Ball and Stem: 316 Stainless Steel.

Stem Seals: EPDM O-Rings.

Ball Seals: Teflon® Seals with EPDM O-rings

**Leakage Rating:**

Valves: ANSI Class IV close-off/leakage (A port only).

2-way - ANSI Class IV leakage

3-way - A to AB; ANSI Class IV leakage

3-way - B to AB; ANSI Class III leakage

**Accessories:**

For 4", 5", and 6", see Table 3 for replacement parts.

**Table 3. Parts list for Flanged Valves**

| Two-way       | 4 in.    | 5 in.    | 6 in.    |
|---------------|----------|----------|----------|
| Seal          | 7981-910 | 7981-915 | 7981-912 |
| Seal O-ring   | 7981-914 | 7981-911 | 7981-916 |
| Flange O-ring | 7978-65  | 7978-66  | 7978-68  |
| Bottom Stem   | 7981-701 | 7981-701 | 7981-701 |

| Three-way     | 4 in.    | 5 in.    | 6 in.    |
|---------------|----------|----------|----------|
| Seal          | 7981-911 | 7981-912 | 7981-913 |
| Seal O-ring   | 7981-915 | 7981-916 | 7981-917 |
| Flange O-ring | 7978-66  | 7978-67  | 7978-69  |
| Bottom Stem   | 7981-701 | 7981-701 | 7981-701 |

## Application Notes

### IMPORTANT

Valve sizing is important for correct system operation. Undersized valves do not have sufficient capacity at maximum load. Oversized valves do not have sufficient authority over the load in modulating applications. Oversized valves can cause excessive cycling and the seat and ball can be damaged because of the restricted opening.

### Proper Use

These valves are only for use in cold, warm and hot water systems. Not suitable for oil, or combustible gases. For water application, they are designed for a medium temperature range from -22 to 250°F, at a maximum pressure of 360 psi for 2-1/2" & 3" valves and 240 psi for 4", 5", & 6" valves. The valves are to be operated with the appropriate Honeywell electronic actuators only. Water should be properly filtered, treated and conditioned according to local conditions and the recommendations of the boiler or chiller manufacturers. The installation of a strainers and filters is recommended.

### IMPORTANT

The presence of excessive iron oxide (red rust) in the system voids the valve warranty.

### Required Torque

Honeywell electronic actuators can be utilized with the VBF5011 and VBF5013 valves. See Table 4, which lists the torque requirement for each valve size. See Table 5, which lists the close-off pressure rating for the valves with the different torque actuators. Larger torque actuators may be used, but there is no increase in close-off pressure rating.

**Table 4. Torque Requirement**

| Type  | Size   | Torque Requirement (in-lbs) |
|-------|--------|-----------------------------|
| 2-way | 2 1/2" | 35                          |
|       | 3"     | 35                          |
|       | 4"     | 85                          |
|       | 5"     | 85                          |
|       | 6" *   | 140                         |
| 3-way | 2 1/2" | 35                          |
|       | 3"     | 85                          |
|       | 4"     | 85                          |
|       | 5"     | 85                          |
|       | 6" *   | 140                         |

\* 6" requires 140 in-lb actuator for flows up to 700 gpm. For flow rates greater than 700 gpm a 200 in-lb actuator is recommended.

**Table 5. Close-off Pressure Rating**

| Valve Type   | Valve Size | Actuator Type                   |                  |                   |                              |                   |
|--------------|------------|---------------------------------|------------------|-------------------|------------------------------|-------------------|
|              |            | 35 lb-in (4 Nm)                 | 88 lb-in (10 Nm) | 175 lb-in (20 Nm) | 175 lb-in (20 Nm) 2-position | 300 lb-in (34 Nm) |
|              |            | Close-off pressure rating (psi) |                  |                   |                              |                   |
| 2-way        | 2-1/2", 3" | 100                             |                  |                   |                              |                   |
| 3-way        | 2-1/2"     | 40                              |                  |                   |                              |                   |
| 3-way        | 3"         |                                 | 70               | 70                | 70                           | 70                |
| 2-way, 3-way | 4"         |                                 | 70               | 70                | 70                           | 70                |
| 2-way, 3-way | 5"         |                                 | 70               | 70                | 70                           | 70                |
| 2-way, 3-way | 6"         |                                 |                  |                   | 70                           | 70                |

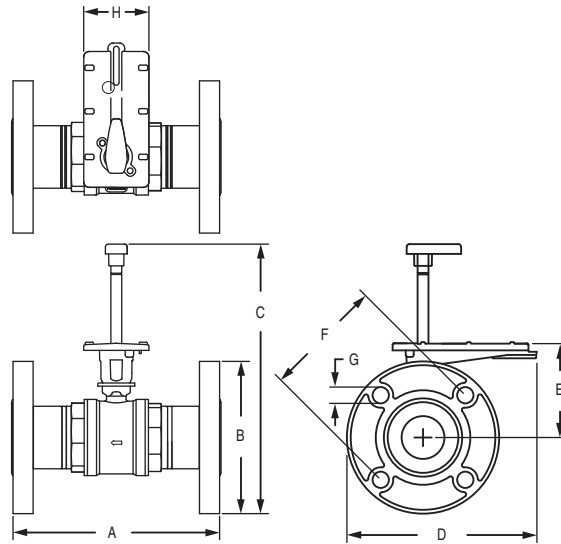
## Flow Characteristics

VBF5011 Two-Way Control Ball Valves have:

- an equal percentage flow characteristic.

VBF5013 Three-Way Control Ball Valves have:

- between ports A and AB: an equal percentage flow characteristic.
- between ports B and AB: a linear flow characteristic with 20% reduced flow capacity.



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**Fig. 1. 2-way 2-1/2" & 3" valve dimensions**

**Table 6. 2-way 2-1/2" & 3" valve dimensions**

| Size in. | Model Number   | A in. (mm)  | B in. (mm)  | C in. (mm)   | D in. (mm)  | E in. (mm)   | F in. (mm)  | G in. (mm) | H in. (mm) |
|----------|----------------|-------------|-------------|--------------|-------------|--------------|-------------|------------|------------|
| 2 1/2    | VBF5011A1734/U | 9 1/2 (241) | 7 (178)     | 12 3/8 (314) | 8 3/4 (222) | 4 5/16 (110) | 5 1/2 (140) | 3/4 (19)   | 3 (76)     |
| 3        | VBF5011A1767/U | 11 (279)    | 7 1/2 (191) | 12 5/8 (321) | 9 (229)     |              | 6 (152)     |            |            |

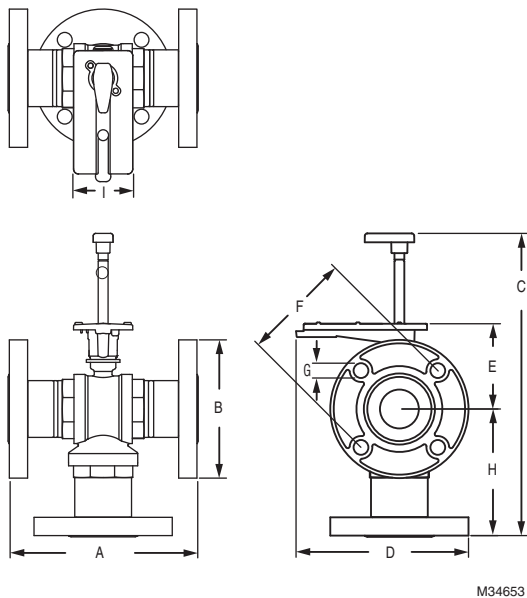


Fig. 2. 3-way 2-1/2" valve dimensions

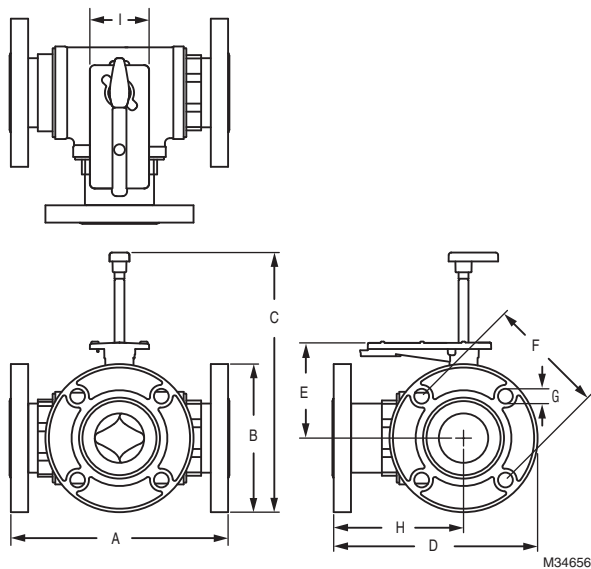
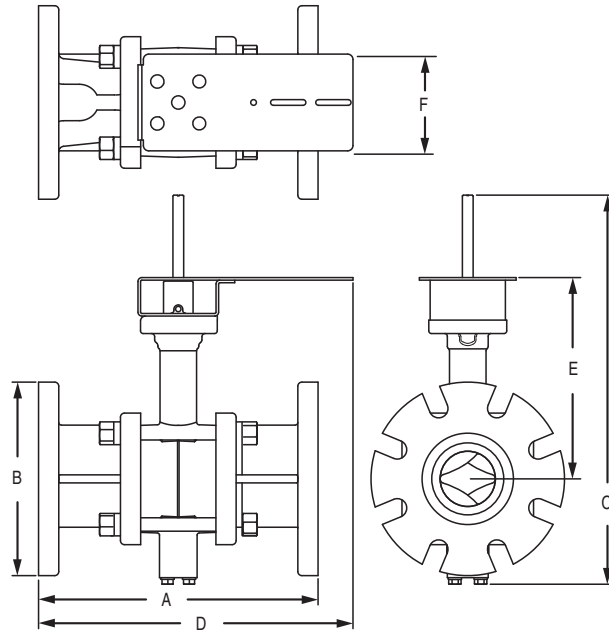


Fig. 3. 3-way 3" valve dimensions

Table 7. 3-way 2-1/2" & 3" valve dimensions

| Size in. | Model Number   | A in. (mm)  | B in. (mm)  | C in. (mm)    | D in. (mm)    | E in. (mm)    | F in. (mm)  | G in. (mm) | H in. (mm)   | I in. (mm) |
|----------|----------------|-------------|-------------|---------------|---------------|---------------|-------------|------------|--------------|------------|
| 2 1/2    | VBF5013B1003/U | 9 1/2 (241) | 7 (178)     | 15 5/16 (389) | 8 3/4 (222)   | 4 5/16 (110)  | 5 1/2 (140) | 3/4 (19)   | 6 7/16 (164) | 3 (76)     |
| 3        | VBF5013B1011/U | 11 (279)    | 7 1/2 (191) | 13 1/8 (333)  | 10 5/16 (262) | 4 13/16 (122) | 6 (152)     |            | 6 5/8 (168)  |            |



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**Fig. 4. 2-way 4", 5" & 6" valve dimensions**

**Table 8. 2-way 4", 5" & 6" valve dimensions**

| Size in. | Model Number   | A in. (mm)   | B in. (mm) | C in. (mm)     | D in. (mm)   | E in. (mm)    | F in. (mm)  |
|----------|----------------|--------------|------------|----------------|--------------|---------------|-------------|
| 4        | VBF5011A1858/U | 13 (330)     | 9 (229)    | 18 1/8 (460)   | 14 5/8 (371) | 9 3/8 (238)   | 4 1/2 (114) |
| 5        | VBF5011A1882/U | 15 (381)     | 10 (254)   | 18 13/16 (478) | 15 5/8 (397) | 9 11/16 (246) |             |
| 6        | VBF5011A1916/U | 16 1/2 (419) | 11 (279)   | 19 11/16 (500) | 16 3/8 (416) | 10 1/8 (257)  |             |

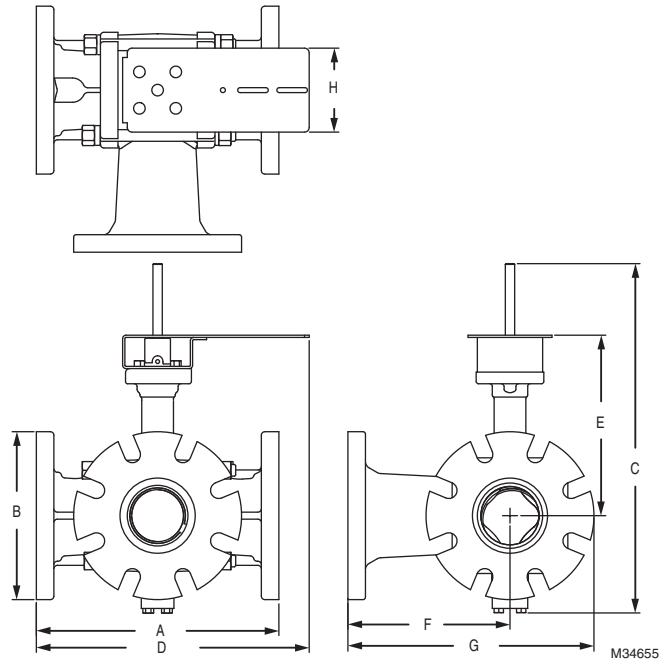


Fig. 5. 3-way 4", 5" & 6" valve dimensions

Table 9. 3-way 4", 5" & 6" valve dimensions

| Size in. | Model Number   | A in. (mm)   | B in. (mm) | C in. (mm)     | D in. (mm)   | E in. (mm)     | F in. (mm)     | G in. (mm)    | H in. (mm)  |
|----------|----------------|--------------|------------|----------------|--------------|----------------|----------------|---------------|-------------|
| 4        | VBF5013B1029/U | 13 (330)     | 9 (229)    | 18 13/16 (478) | 14 5/8 (371) | 9 11/16 (246)  | 8 11/16 (221)  | 13 3/16 (335) | 4 1/2 (114) |
| 5        | VBF5013B1037/U | 15 (381)     | 10 (254)   | 19 11/16 (500) | 15 5/8 (397) | 10 1/16 (256)  | 9 5/8 (244)    | 14-5/8 (371)  |             |
| 6        | VBF5013B1045/U | 16 1/2 (419) | 11 (279)   | 20 3/4 (527)   | 16 3/8 (416) | 10 11/16 (271) | 10 11/16 (271) | 16 3/16 (411) |             |

## TYPICAL SPECIFICATIONS

### ACCESSORIES

Identification tags shall be available for all valves; tags shall be indelibly marked with C<sub>v</sub>, model number and location.

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### **Honeywell Building Technologies**

In the U.S.:

Honeywell

715 Peachtree Street NE

Atlanta, GA 30308

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