

MOTOYAMA**MOTOSEAL****General Specifications****Model 16B
ECCENTRIC ROTATING DISC VALVES**

- **MOTOSEAL** is an eccentric rotating disc valve and a tight-shut-off butterfly valve, which is developed by the excellent experience and accumulation of knowhow in years' research as control valve manufacturer, MOTOYAMA.
- **MOTOSEAL** provides extremely low leakage rates, low maintenance cost and long seal life by minimizing amount of moving contact of disc with seal and reducing seal wear and seating torque, and has actualized light weight, large capacity and low cost.
- **MOTOSEAL** has extremely simple construction and realized easy maintenance and inspection.

FEATURES**◆ High Temperature Resistance Seat -20 to $\sim +500^{\circ}\text{C}$**

A resilient seat (material : reinforced PTFE) is available for the temperature from -20 to $+200^{\circ}\text{C}$. Metal seat is recommended for the temperature from -20 to $+500^{\circ}\text{C}$. Model 16B is suitable for high temperature services that is not possible to obtain from normal type of butterfly valves.

◆ Tight-shut off is available using Offset Mechanism ANSI/FCI Class VI

Motoyama originally developed offset design realized moving contact resistance of disc with seat ring to be minimized. This design reduced seal wearing and seating torque at valve opening and closing. This offset design gives greatest tightness at the fully closed position of the disc with the seat ring and minimal leakage is available for high pressure drop services compared to other type of valves.

Zero leakage is available with reinforced PTFE seat and extremely low leakage is provided with metal seat design.

◆ High Range-ability 25 : 1

Smooth opening and closing, with minimum dead band, at lower opening position realized high inherent rangeability of 25 : 1.

Model 16B is available to use for throttling control at higher than 10 degree of disc opening.



16B

1. SPECIFICATIONS

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|--|---|---|-------------------|----------------|------|---|-------------------|--------------------------------------|-------|--|------------------|-----|-----|--|--|--|--|--|--|--|--|--|--|--|
| Valve Type | | Eccentric rotating disc type diaphragm operated control valve (MOTOSEAL) | | | | | | | | | | | | | | | | | | | | | | | |
| Valve Model No. | | PM16B, 2916B | | | | | | | PM16B, 2916B, 2816B | | | | | | | | | | | | | | | | |
| VALVE BODY | Body Type | | 16 B | | | | | | | | | | | | | | | | | | | | | | |
| | Valve Sizes | (mm) (in.) | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 | | | | | | | | | | | |
| | Pressure Rating Note(4) | JIS5K, 10K, 20K, ASME/JPI Class 150, 300 | | | | | | | JIS2K, 5K, 10K ASME/JPI Class 150 | | | | | | | | | | | | | | | | |
| | End Connection | Wafer type | | | | | | | | | | | | | | | | | | | | | | | |
| | Body Materials | See page 3 | | | | | | | | | | | | | | | | | | | | | | | |
| | Gland Type | Bolted gland | | | | | | | | | | | | | | | | | | | | | | | |
| | Packing(Non Asbestos) | Braided packing, Molded packing | | | | | | | | | | | | | | | | | | | | | | | |
| | Gaskets(Non Asbestos) | Serrated gasket | | | | | | | | | | | | | | | | | | | | | | | |
| | Guiding | Inner guide | | | | | | | | | | | | | | | | | | | | | | | |
| | Disc Action | Rotating clockwise to close | | | | | | | | | | | | | | | | | | | | | | | |
| | Seat Type | Metal seat, Resin seat | | | | | | | | | | | | | | | | | | | | | | | |
| | Disc Characteristics | Butterfly valve's inherent characteristics | | | | | | | | | | | | | | | | | | | | | | | |
| | Flow | Flow to Open | | | | | Flow to Close | | | | | | | | | | | | | | | | | | |
| ACTUATOR | Actuator Type | | Model PM00 Spring type single acting cylinder operated | | | | Model 2900 Spring return diaphragm actuator | | | | Model 2800 Pneumatic single acting spring diaphragm actuator | | | | | | | | | | | | | | |
| | Actuator Sizes | | BS-2 | BS-3 | BS-4 | BS-5 | BS-6 | 240HP | 330HP | 400HP | 500H | 650L-D | | | | | | | | | | | | | |
| | Spring Range kPaG (kgf/cm ² G) | | 190~240 (1.9~2.4) ...60° Direct Action 160~210 (1.6~2.1) ...60° Reverse Action 160~240 (1.6~2.4) ...90° | | | | 80~200 (0.8~2.0) | | | | 60~220 (0.6~2.2) | 60~220 (0.6~2.2) | | | | | | | | | | | | | |
| | Supply Air Press. kPaG (kgf/cm ² G) | | 400 (4.0) | | | | 280 (2.8) | | | | 280 (2.8) | | | | | | | | | | | | | | |
| | Rotating Angle | | 60°, 90° | | | | 60°, 90° | | | | 60°, 90° | | | | | | | | | | | | | | |
| | Air Connection | | Rc 1/4 | Rc 1/2 | | | Rc 1/4 | | | | Rc 3/8 | | | | | | | | | | | | | | |
| | Ambient Temp. | | -20°C~+60°C (-40°C~-20°C, +60°C~+100°C*) | | | | -20°C~+70°C (-50°C~-20°C, +70°C~+100°C*) | | | | -30°C~+70°C (-50~-30°C, +70~+100°C*) | | | | | | | | | | | | | | |
| VALVE CHARACTERISTICS AND PERFORMANCE | Painting Color | | Silver | | | | | | | | | | | | | | | | | | | | | | |
| | Control Mode | | Throttling control (opening 0~60°), On-off control (opening 0~90°) | | | | | | | | | | | | | | | | | | | | | | |
| | Valve Action | | Direct action (Air-to-close), Reverse Action (Air-to-open) | | | | | | | | | | | | | | | | | | | | | | |
| | Applicable Press. Range | | Max. 2.94MPaG (30kgf/cm ² G) ~1.33Pa (10 ⁻² Torr) vacuum | | | | | | | | | | | | | | | | | | | | | | |
| | Applicable Temp. Range | | (Metal seat) -20°C~+50 0°C, (Resin seat) -20°C~+20 0°C | | | | | | | | | | | | | | | | | | | | | | |
| | Allowable Differential Press. | | See page 6~7 | | | | | | | | | | | | | | | | | | | | | | |
| | Rated Cv Value | | See page 5 | | | | | | | | | | | | | | | | | | | | | | |
| | Flow Characteristics | | See page 5 | | | | | | | | | | | | | | | | | | | | | | |
| | Inherent Range-ability | | 25 : 1 (60° Opening) | | | | | | | | | | | | | | | | | | | | | | |
| | Allowable Seat Leakage Ratio | Metal Seat | | See page 5 | | | | | | | | | | | | | | | | | | | | | |
| | | Resin Seat | | ANSI/FCI Class VI | | | | | | | | | | | | | | | | | | | | | |
| OPTIONS* | Function Note(1) Accuracy | Hysteresis Error (with Positioner) | | ■ Model PM00 | : Max. 3%F.S. | | | ■ Model 2900/2800 | : Max. 2%F.S. | | | | | | | | | | | | | | | | |
| | | Linearity (with Positioner) | | ■ Model PM00 | : Max. ±3%F.S. | | | ■ Model 2900/2800 | : Max. ±2%F.S. | | | | | | | | | | | | | | | | |
| | Actuator | | External exposure bolt & nut S.S., Handwheel, Travel stop (one side). | | | | | | | | | | | | | | | | | | | | | | |
| | Accessories | | Pneumatic positioner (PA92A), Electro-pneumatic positioner (EA91A-C, EA90A-C, EA10S), Air Filter regulator (MR2000), Limit switch, Solenoid valve, and Others. | | | | | | | | | | | | | | | | | | | | | | |
| | Others | | Steam jacket type, Flanged type, Lug flanged type. The High Pressure The high pressure gas safety law certification, Oil free, Water free, Optional painting color. | | | | | | | | | | | | | | | | | | | | | | |

(Notes) (1) Valve performance is represented under the condition of standard packing (P4519+V7010)

(2) *Manufactured and attached as option according to customer's request.

(3) Caution for line piping gasket :

It is available to use flat gasket of non-asbestos, PTFE, graphite or spiral wounded gasket.

When spiral wounded gasket is requested, special gasket is required to be supplied from Motoyama for seat holder side.

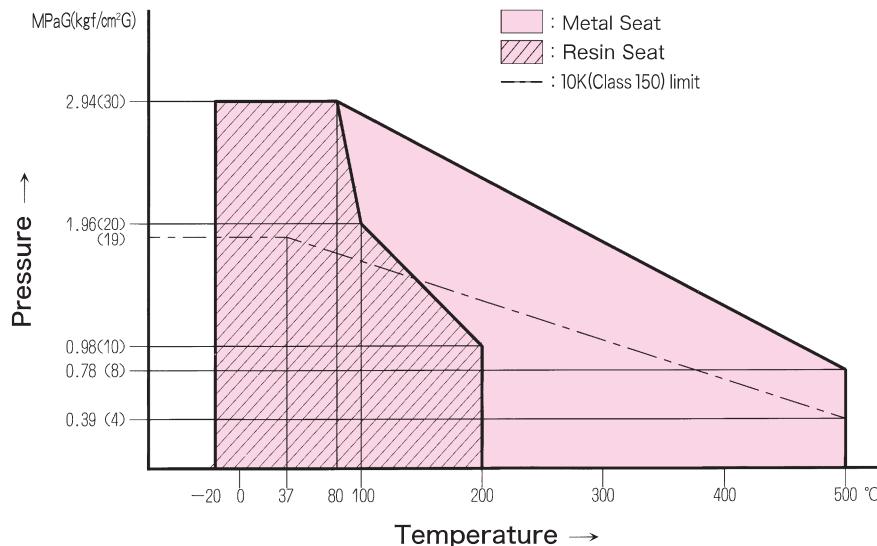
Standard gasket is applicable for the other side.

(4) On valve size 80mm~300mm, pressure rating JIS 2K is available as option.

(5) Double acting cylinder actuator is applicable on request.

2. PRESSURE-TEMPERATURE RANGE AND MAIN MATERIAL CLASSIFICATION.

Applicable Pressure-Temperature Range



MAIN MATERIALS

| Parts Name | | Standard Materials | | | |
|-------------------|-------|---|-----------------------|---|-----------------------|
| | | 80mm~300mm | | 350mm~600mm | |
| Body (Note(1)) | | SCPH2, SCS13A, SCS14A | SCS 16A | SCPH2, SCS13A | SCS14A |
| Disc (Note(2)) | | SCS14A | SCS 16A | SCS13A | SCS14A |
| Seat holder | | SUS 316 | SUS 316L | SUS 304 | SUS 316 |
| Collar | | CoCr Alloy, (Reinforced PTFE) [Note(3)] | | CoCr Alloy, (Reinforced PTFE) [Note(3)] | |
| Shaft | | SUS 316 [Note(4)], (SUS 630) | SUS 316L [Note(4)] | SUS 304, (SUS 630) | SUS 316L [Note(4)] |
| Pin | | SUS 316 | SUS 316L | SUS 316 | |
| Seat Ring | Metal | SUS 316 | SUS 316L | SUS 304 | SUS 316 [Note(5)] |
| | Resin | Reinforced PTFE | | Reinforced PTFE | |

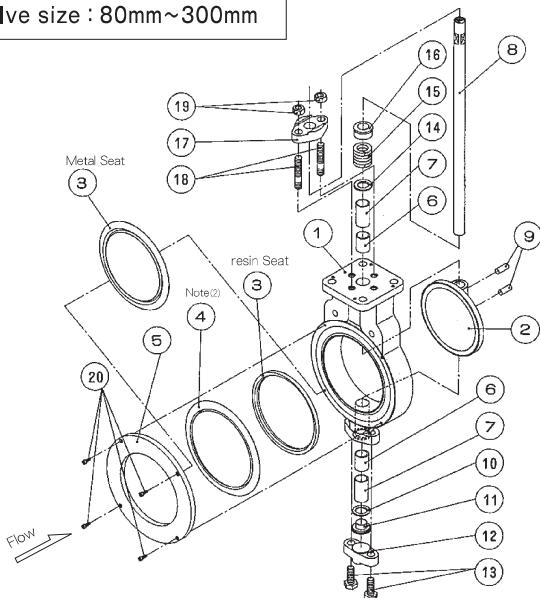
(Notes)

- (1)Stainless body is recommended for the service temperature 351°C and higher.
- (2)On metal seat, disc is either hard chromium plated or CoCr Alloy hardening treated.
- (3)Collar : Reinforced PTFE is applicable as option.
- (4)Shaft is hard chromium plated or CoCr Alloy hard treated on specific service condition.
- (5)Seat ring (metal only) is CoCr Alloy hard treated on specific service conditions.
- (6)Material combination may be changed on specific service conditions.

3. CONSTRUCTIONS

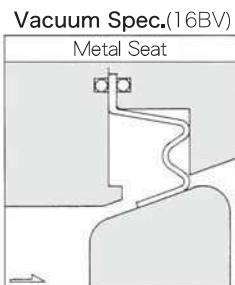
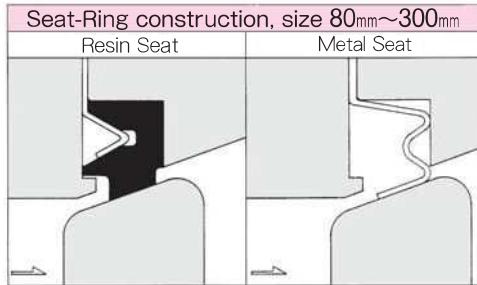
Two kind of seat-ring(metal or resin seat) is available depend on the service condition.
It is easy to replace the seat-ring at site because all other parts are common to use for metal and resin seat.
Valve disc is closed clockwise seeing from actuator side and open at counterclockwise.
Flow direction is Flow to Open on valve size 300mm and smaller, Flow to Close on valve size 350mm and larger.

Valve size : 80mm~300mm

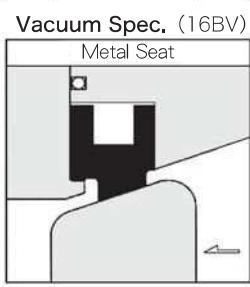
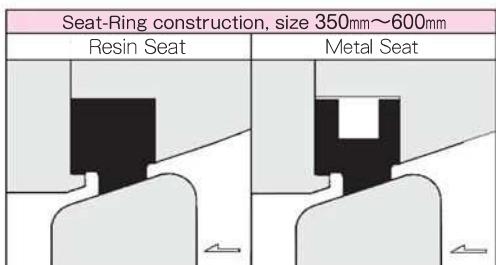
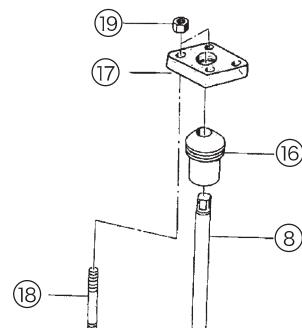


| No. | Part Name | No. | Part Name |
|-----|--------------------|-----|---------------------|
| 1 | Body | 11 | Bottom bush |
| 2 | Disc | 12 | Bottom cover |
| ③ | Seat-Ring | 13 | Bottom bolt |
| 4 | Back Spring Note②) | 14 | Packing ring Note④) |
| 5 | Seat holder | 15 | Gland packing |
| 6 | Collar | 16 | Gland bush |
| 7 | Spacer Note③) | 17 | Gland flange |
| 8 | Shaft | 18 | Gland bolt |
| 9 | Pin | 19 | Gland nut |
| ⑩ | Gasket | 20 | Set screw |
| | | 21 | Bottom nut |

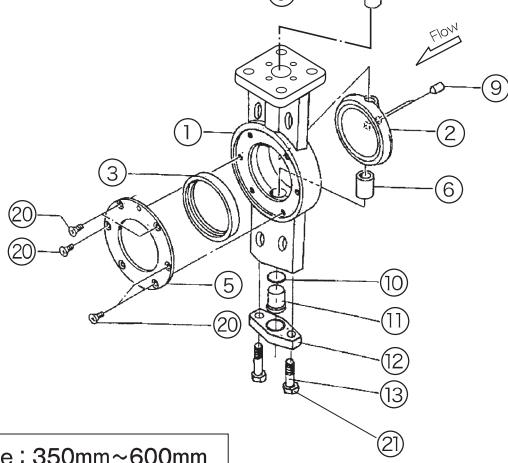
- (Notes) (1) The numbers marked with ○ represent recommended spare parts.
(2) Back spring is applied for resin seat and valve size 300mm or smaller only.
(3) Spacer is applied for valve size 150mm and smaller only.
(4) Packing ring is not applied for valve size 200mm~300mm.



(Note)
For vacuum specification, Model number is changed to 16BV. Face to face dimensions is different from standard Model 16B.
(see page. 8, page. 9)



(Model 16BV for vacuum service)



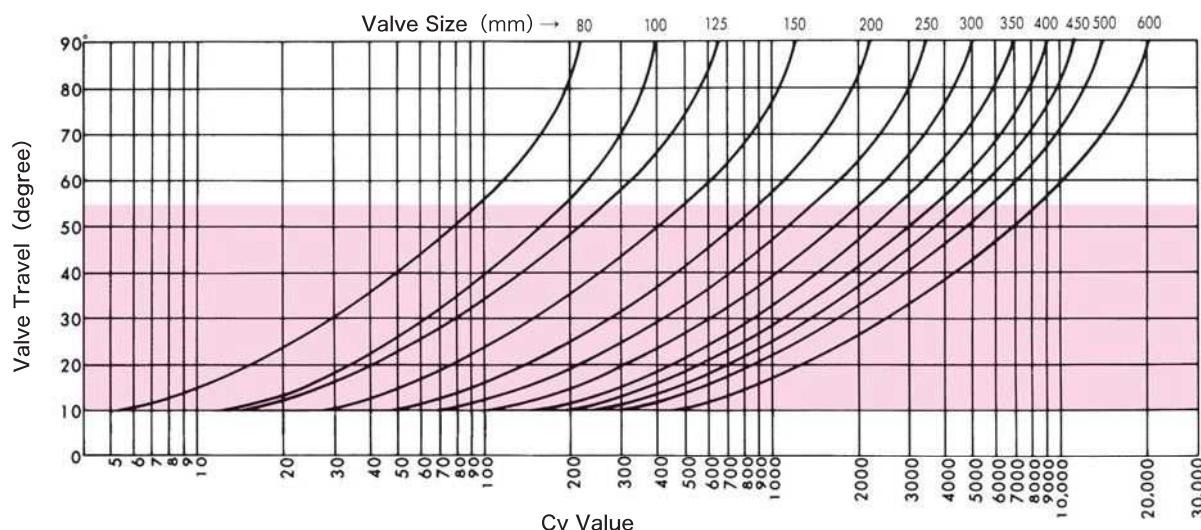
Valve Size : 350mm~600mm

4. CV VALUES AND FLOW CHARACTERISTICS

Rated Cv Values

| Size (mm) | 80 | 100 | 125 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 600 |
|-----------------------------|-----|-----|-----|------|------|------|------|------|------|-------|-------|-------|
| Control Mode (inch) | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 24 |
| ON-OFF Control (90°) | 230 | 390 | 650 | 1230 | 2200 | 3420 | 4920 | 6800 | 9000 | 11200 | 14000 | 20200 |
| Throttling Control (60°) | 120 | 230 | 330 | 620 | 1100 | 1710 | 2460 | 3500 | 4500 | 5600 | 7000 | 10200 |

Flow Characteristics



Colored zone is for throttling control range.

5. LEAKAGE CLASS FOR METAL SEAT

| Leakage Class | | Temperature | |
|------------------|----------------------------------|-------------------------------|------------------------------|
| | | less than 300°C | 300°C and higher |
| Standard Leakage | CLASS A (for Throttling Service) | less than 0.02% of Rated Cv | less than 0.2% of Rated Cv |
| | CLASS B (for On-off Service) | less than 0.001% of Rated Cv | less than 0.01% of Rated Cv |
| Optional Leakage | CLASS C (for On-off Service) | less than 0.0001% of Rated Cv | less than 0.001% of Rated Cv |

(Notes) (1) The values on the above table are those of guarantee when shipped from factory.

(2) Since leakage class C is optional order, please specify "Class C" when placing the order.

Unless other wise specified, standard leakage class is applied.

(3) On valve size 350mm~600mm, leakage class C is not applicable when max. shut-off pressure at valve fully closed position is lower than 0.049MPaG (0.5kgf/cm²G)

6. ALLOWABLE DIFFERENTIAL PRESSURE

1. PM16B Type

■ Valve size : 80mm~300mm

Unit : MPa (kgf/cm²)

| Actuator Size | | BS-2 | BS-3 | BS-4 | BS-5 |
|--------------------|------|---------------------------------|-------------|-------------|-------------|
| Valve Size (mm) | (in) | Valve Opening Shaft Material | 60°, 90° | 60°, 90° | 60°, 90° |
| | | | Shut | Open | Shut |
| 80 | 3 | SUS316 | 2.04 (20.9) | | |
| | | | 0.64 (6.6) | | |
| | | SUS630 | 2.94 (30.0) | | |
| | | | 0.77 (7.9) | | |
| 100 | 4 | SUS316 | 0.55 (5.7) | 2.94 (30.0) | |
| | | | 0.20 (2.1) | 0.55 (5.7) | |
| | | SUS630 | 0.77 (7.9) | 2.94 (30.0) | |
| | | | 0.26 (2.7) | 0.55 (5.7) | |
| 125 | 5 | SUS316 | Shut | 2.03 (20.8) | |
| | | | Open | 0.24 (2.5) | |
| | | SUS630 | Shut | 2.94 (30.0) | |
| | | | Open | 0.32 (3.3) | |
| 150 | 6 | SUS316 | Shut | 1.12 (11.5) | — — |
| | | | Open | 0.15 (1.6) | — — |
| | | SUS630 | Shut | 1.86 (19.0) | 2.94 (30.0) |
| | | | Open | 0.19 (2.0) | 0.34 (3.5) |
| 200 | 8 | SUS316 | Shut | | 2.11 (21.6) |
| | | | Open | | 2.45 (25.1) |
| | | SUS630 | Shut | | 0.13 (1.4) |
| | | | Open | | 0.23 (2.4) |
| 250 | 10 | SUS316 | Shut | | 0.82 (8.4) |
| | | | Open | | 1.00 (10.3) |
| | | SUS630 | Shut | | 0.07 (0.8) |
| | | | Open | | 0.13 (1.4) |
| 300 | 12 | SUS316 | Shut | | 0.82 (8.4) |
| | | | Open | | 2.94 (30.0) |
| | | SUS630 | Shut | | 0.08 (0.9) |
| | | | Open | | 0.23 (2.4) |
| 300 | 12 | SUS316 | Shut | | 0.30 (3.1) |
| | | | Open | | 0.44 (4.5) |
| | | SUS630 | Shut | | 0.02 (0.3) |
| | | | Open | | 0.05 (0.6) |
| 300 | 12 | SUS316 | Shut | | 0.30 (3.1) |
| | | | Open | | 2.29 (23.4) |
| | | SUS630 | Shut | | 0.03 (0.4) |
| | | | Open | | 0.09 (1.0) |

■ Valve size : 350mm~600mm

Unit : MPa (kgf/cm²)

| Actuator Size | | BS-4 | | BS-5 | | BS-6 | | |
|--------------------|------|---------------------------------|------------|------------|-------------|-------------|-------------|-------------|
| Valve Size (mm) | (in) | Valve Opening Shaft Material | 60°, 90° | | 60°, 90° | | 60°, 90° | |
| | | | Resin Seat | Metal Seat | Resin Seat | Metal Seat | Resin Seat | Metal Seat |
| 350 | 14 | SUS316 | Shut | 0.25 (2.6) | 0.98 (10.0) | 0.98 (10.0) | | |
| | | | Open | 0.02 (0.3) | 0.06 (0.7) | 0.06 (0.7) | | |
| | | SUS630 | Shut | 0.25 (2.6) | 1.49 (15.2) | 1.48 (15.1) | | |
| | | | Open | 0.02 (0.3) | 0.06 (0.7) | 0.06 (0.7) | | |
| 400 | 16 | SUS316 | Shut | 0.08 (0.9) | 0.68 (7.0) | 0.68 (7.0) | | |
| | | | Open | 0.01 (0.2) | 0.04 (0.5) | 0.04 (0.5) | | |
| | | SUS630 | Shut | 0.08 (0.9) | 0.98 (10.0) | 1.00 (10.2) | | |
| | | | Open | 0.01 (0.2) | 0.04 (0.5) | 0.04 (0.5) | | |
| 450 | 18 | SUS316 | Shut | | 0.38 (3.9) | 0.60 (6.2) | 0.68 (7.0) | 0.68 (7.0) |
| | | | Open | | 0.01 (0.2) | 0.01 (0.2) | 0.05 (0.6) | 0.05 (0.6) |
| | | SUS630 | Shut | | 0.38 (3.9) | 0.60 (6.2) | 1.47 (15.0) | 1.47 (15.0) |
| | | | Open | | 0.01 (0.2) | 0.01 (0.2) | 0.05 (0.6) | 0.05 (0.6) |
| 500 | 20 | SUS316 | Shut | | — — | 0.36 (3.7) | 0.68 (7.0) | 0.68 (7.0) |
| | | | Open | | — — | 0.01 (0.2) | 0.04 (0.5) | 0.04 (0.5) |
| | | SUS630 | Shut | | — — | 0.36 (3.7) | 1.29 (13.2) | 1.42 (14.5) |
| | | | Open | | — — | 0.01 (0.2) | 0.04 (0.5) | 0.04 (0.5) |
| 600 (JIS10K) | 24 | SUS316 | Shut | | | | 0.09 (1.0) | 0.09 (1.0) |
| | | | Open | | | | 0.02 (0.3) | 0.02 (0.3) |
| | | SUS630 | Shut | | | | 0.76 (7.8) | 0.98 (10.0) |
| | | | Open | | | | 0.02 (0.3) | 0.02 (0.3) |
| 600 (ANSI 150) | 24 | SUS316 | Shut | | | | 0.58 (6.0) | 0.58 (6.0) |
| | | | Open | | | | 0.02 (0.3) | 0.02 (0.3) |
| | | SUS630 | Shut | | | | 0.59 (6.1) | 0.81 (8.3) |
| | | | Open | | | | 0.02 (0.3) | 0.02 (0.3) |

Valve Opening 60° : Throttling

Valve Opening 90° : On-Off Control

[Notes]

(1) "Shut" : Allowable shut-off pressure at valve fully closed position.

"Open" : Allowable differential pressure at valve fully opened (for liquid only).

(2) Standard Shaft material is SUS316 (SUS304) for Body material SCPH2, SCS13A and SCS14A. When higher shut-off pressure is requested, SUS630 is applied for Shaft material as option.

2. 2916B Type

■ Valve size : 80mm~300mm

Unit : MPa (kgf/cm²)

| Actuator Size | | | 240HP | | 330HP | | 400HP | | 500H | |
|--------------------|-----------------------|----------------|-------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Valve Size (mm) | Valve Opening (in) | Shaft Material | 60° | 90° | 60° | 90° | 60° | 90° | 60° | 90° |
| 80 | 3 | SUS316 | Shut | 2.04 (20.9) | 1.01 (10.4) | | | | | |
| | | SUS316 | Open | 0.68 (7.0) | 0.63 (6.5) | | | | | |
| | 3 | SUS630 | Shut | 2.94 (30.0) | 1.01 (10.4) | | | | | |
| | | SUS630 | Open | 0.68 (7.0) | 0.63 (6.5) | | | | | |
| 100 | 4 | SUS316 | Shut | 0.67 (6.9) | — — | 2.94 (30.0) | 2.94 (30.0) | | | |
| | | SUS316 | Open | 0.35 (3.6) | — — | 0.68 (7.0) | 0.55 (5.7) | | | |
| 125 | 5 | SUS316 | Shut | | | 2.03 (20.8) | 1.69 (17.3) | — — | 2.03 (20.8) | |
| | | SUS316 | Open | | | 0.41 (4.2) | 0.29 (3.0) | — — | 0.31 (3.2) | |
| | 5 | SUS630 | Shut | | | 2.94 (30.0) | 1.69 (17.3) | — — | 2.94 (30.0) | |
| | | SUS630 | Open | | | 0.50 (5.1) | 0.29 (3.0) | — — | 0.37 (3.8) | |
| 150 | 6 | SUS316 | Shut | | | 1.12 (11.5) | 0.93 (9.5) | 1.12 (11.5) | 1.12 (11.5) | |
| | | SUS316 | Open | | | 0.25 (2.6) | 0.18 (1.9) | 0.25 (2.6) | 0.20 (2.1) | |
| | 6 | SUS630 | Shut | | | 2.79 (28.5) | 0.93 (9.5) | 2.94 (30.0) | 2.56 (26.2) | |
| | | SUS630 | Open | | | 0.40 (4.1) | 0.18 (1.9) | 0.42 (4.3) | 0.31 (3.2) | |
| 200 | 8 | SUS316 | Shut | | | 0.35 (3.5) | — — | 1.61 (16.5) | 0.34 (3.5) | 2.46 (25.1) |
| | | SUS316 | Open | | | 0.10 (1.1) | — — | 0.22 (2.3) | 0.09 (1.0) | 0.29 (3.0) |
| | 8 | SUS630 | Shut | | | 0.35 (3.5) | — — | 1.61 (16.5) | 0.34 (3.5) | 2.94 (30.0) |
| | | SUS630 | Open | | | 0.10 (1.1) | — — | 0.22 (2.3) | 0.09 (1.0) | 0.33 (3.4) |
| 250 | 10 | SUS316 | Shut | | | | | 0.55 (5.7) | — — | 1.01 (10.3) |
| | | SUS316 | Open | | | | | 0.11 (1.2) | — — | 0.15 (1.6) |
| | 10 | SUS630 | Shut | | | | | 0.55 (5.7) | — — | 2.43 (24.8) |
| | | SUS630 | Open | | | | | 0.11 (1.2) | — — | 0.26 (2.7) |
| 300 | 12 | SUS316 | Shut | | | | | | | 0.44 (4.5) |
| | | SUS316 | Open | | | | | | | 0.06 (0.7) |
| | 12 | SUS630 | Shut | | | | | | | 1.48 (15.1) |
| | | SUS630 | Open | | | | | | | 0.11 (1.2) |

■ Valve size : 350mm~450mm

Unit : MPa (kgf/cm²)

| Actuator Size | | | 500H | | | | |
|--------------------|-----------------------|----------------|------------|------------|------------|------------|------------|
| Valve Size (mm) | Valve Opening (in) | Shaft Material | 60° | | 90° | | |
| | | | Resin Seat | Metal Seat | Resin Seat | Metal Seat | |
| 350 | 14 | SUS316 | Shut | 0.71 (7.3) | 0.80 (8.2) | 0.06 (0.7) | 0.25 (2.6) |
| | | SUS316 | Open | 0.06 (0.7) | 0.06 (0.7) | 0.02 (0.3) | 0.02 (0.3) |
| | 14 | SUS630 | Shut | 0.71 (7.3) | 0.80 (8.2) | 0.06 (0.7) | 0.25 (2.6) |
| | | SUS630 | Open | 0.06 (0.7) | 0.06 (0.7) | 0.02 (0.3) | 0.02 (0.3) |
| 400 | 16 | SUS316 | Shut | 0.40 (4.1) | 0.50 (5.2) | — — | 0.09 (1.0) |
| | | SUS316 | Open | 0.04 (0.5) | 0.04 (0.5) | — — | 0.01 (0.2) |
| | 16 | SUS630 | Shut | 0.40 (4.1) | 0.50 (5.2) | — — | 0.09 (1.0) |
| | | SUS630 | Open | 0.04 (0.5) | 0.04 (0.5) | — — | 0.01 (0.2) |
| 450 | 18 | SUS316 | Shut | — — | 0.27 (2.8) | | |
| | | SUS316 | Open | — — | 0.01 (0.2) | | |
| | 18 | SUS630 | Shut | — — | 0.27 (2.8) | | |
| | | SUS630 | Open | — — | 0.01 (0.2) | | |

3. 2816B Type

■ Valve size : 350mm~600mm

Unit : MPaG (kgf/cm²G)

| Actuator Size | | | 650LD | | | |
|--------------------|-----------------------|----------------|-------------|-------------|------------|------------|
| Valve Size (mm) | Valve Opening (in) | Shaft Material | 60° | | 90° | |
| | | | Resin Seat | Metal Seat | Resin Seat | Metal Seat |
| 350 | 14 | Shut | 1.66 (17.0) | 1.62 (16.6) | 0.56 (5.8) | 0.70 (7.2) |
| | | Open | 0.12 (1.3) | 0.12 (1.3) | 0.05 (0.6) | 0.05 (0.6) |
| 400 | 16 | Shut | 1.10 (11.3) | 1.10 (11.3) | 0.27 (2.8) | 0.42 (4.3) |
| | | Open | 0.08 (0.9) | 0.08 (0.9) | 0.03 (0.4) | 0.03 (0.4) |
| 450 | 18 | Shut | 0.47 (4.8) | 0.68 (7.0) | — — | 0.20 (2.1) |
| | | Open | 0.03 (0.4) | 0.03 (0.4) | — — | 0.01 (0.2) |
| 500 | 20 | Shut | — — | 0.42 (4.3) | | |
| | | Open | — — | 0.02 (0.3) | | |
| 600 (JIS 10K) | 24 | Shut | — — | 0.22 (2.3) | | |
| | | Open | — — | 0.01 (0.2) | | |
| 600 (ASME 150) | 24 | Shut | — — | 0.17 (1.8) | | |
| | | Open | — — | 0.01 (0.2) | | |

Valve Opening 60° : Throttling

Valve Opening 90° : On-Off Control

(Notes)

(1) "Shut" : Allowable shut-off pressure at valve fully closed position.

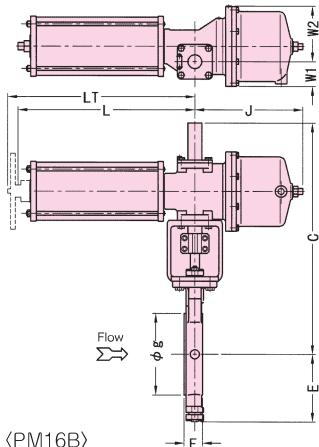
"Open" : Allowable differential pressure at valve fully opened (for liquid only).

(2) Standard shaft material is SUS316 (SUS304) for Body material SCPH2, SCS13A and SCS14A. When higher shut-off pressure is requested, SUS630 is applied for shaft material as option.

(2) Standard shaft material is SUS630.

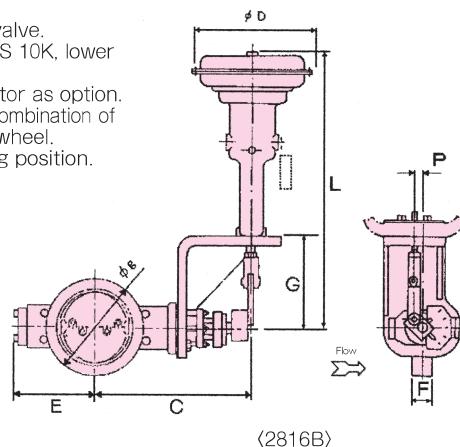
7. DIMENSIONS & WEIGHT

1. Model PM16B and 2816B



[Notes]

- (1) The sketch shows reverse action valve.
- (2) *1, upper dimension specify for JIS 10K, lower specify ASME/JPI class 150.
- (3) Hand wheel is applicable on actuator as option.
- (4) Specified weight are with standard combination of body and actuator without hand wheel.
- (5) [---] shows positioner mounting position.



■ PM16B Type (Valve size : 80mm~600mm)

| Valve Size | | g | | | Face-to-Face Dimension F | | E | | Actuator Size | L | LT | J | C | | W1 | W2 | Weight (kg) |
|------------|------|----------------|--------------------|--------------------|--------------------------|------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-----|-----|-------------|
| (mm) | (in) | JIS2K JIS5K | JIS10K ASME 150 | JIS20K ASME 300 | 16B | 16BV | Positive Press. | Negative Press. | JIS10K ASME 150 | JIS20K ASME 300 | JIS10K ASME 150 | JIS20K ASME 300 | JIS10K ASME 150 | JIS20K ASME 300 | | | |
| 80 | 3 | 125 | 128 | 134 | 46 | 49 | 135 | 135 | BS-2 | 335 | 362 | 210 | 445 | 455 | 38 | 106 | 24 |
| 100 | 4 | 145 | 153 | 159 | 52 | 55 | 155 | 160 | BS-2 | 335 | 362 | 210 | 495 | 415 | 38 | 106 | 28 |
| 125 | 5 | 180 | 183 | 195 | 56 | 59 | 165 | 185 | BS-3 | 451 | 482 | 276 | 595 | 615 | 52 | 140 | 56 |
| 150 | 6 | 210 | 213 | 230 | 56 | 61 | 180 | 195 | BS-3 | 451 | 482 | 276 | 605 | 625 | 52 | 140 | 58 |
| 200 | 8 | 255 | 263 270 | 275 | 60 | 65 | 220 | 240 | BS-4 | 575 | 609 | 351 | 645 | 665 | 81 | 188 | 106 |
| 250 | 10 | 320 | 322 | 345 | 68 | 73 | 245 | 265 | BS-4 | 575 | 609 | 351 | 710 | 730 | 81 | 188 | 120 |
| 300 | 12 | 365 | 368 381 | 381 | 78 | 90 | 280 300 | 300 | BS-4 | 575 | 609 | 351 | 740 | 760 | 81 | 188 | 140 |
| 350 | 14 | 403 | 413 | | 85 | 85 | 341 | | BS-5 | 745 | 795 | 446 | 850 | 880 | 117 | 256 | 260 |
| 400 | 16 | 463 | 475 470 | | 90 | 90 | 376 | | BS-4 | 745 | 795 | 446 | 965 | 995 | 117 | 256 | 312 |
| 450 | 18 | 523 | 530 533 | | 100 | 100 | 406 | | BS-5 | 745 | 795 | 446 | 880 | 910 | 81 | 188 | 215 |
| 500 | 20 | 573 | 585 584 | | 110 | 110 | 437 | | BS-5 | 745 | 795 | 446 | 995 | 1025 | 117 | 256 | 336 |
| 600 | 24 | 680 | 690 692 | | 120 | 120 | 494 | | BS-6 | 931 | 1006 | 638 | 1005 | 1035 | 117 | 256 | 386 |
| | | | | | | | | | BS-5 | 745 | 795 | 446 | 1040 | 1070 | 130 | 326 | 574 |
| | | | | | | | | | BS-6 | 931 | 1006 | 638 | 1005 | 1035 | 117 | 256 | 425 |
| | | | | | | | | | BS-5 | 745 | 795 | 446 | 1075 | 1105 | 130 | 326 | 613 |
| | | | | | | | | | BS-6 | 931 | 1006 | 638 | 1005 | 1035 | 117 | 256 | 523 |
| | | | | | | | | | BS-5 | 745 | 795 | 446 | 1150 | 1180 | 130 | 326 | 711 |
| | | | | | | | | | BS-6 | 931 | 1006 | 638 | 1110 | 1140 | | | |

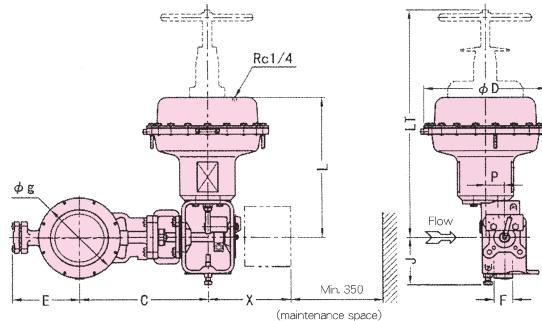
16B

■ 2816B Type (Valve size : 350mm~600mm)

| Valve Size | | g | | | Face-to-Face Dimension F | | E | Actuator Size | D | L | G | C | P | | Weight (kg) |
|------------|------|----------------|--------|---------|--------------------------|------|-----|---------------|-----|------|-----|-----|---------------|---------------|-------------|
| (mm) | (in) | JIS2K JIS5K | JIS10K | ASME150 | 16B | 16BV | | | | | | | 60° Travel | 90° Travel | |
| 350 | 14 | 403 | 413 | 413 | 85 | 85 | 341 | 650L-D | 650 | 1458 | 325 | 543 | 112.6 | 65 | 382 |
| 400 | 16 | 463 | 475 | 470 | 90 | 90 | 376 | | | | | | | | 406 |
| 450 | 18 | 523 | 530 | 533 | 100 | 100 | 406 | | | | | | | | 456 |
| 500 | 20 | 573 | 585 | 584 | 110 | 110 | 437 | | | | | | | | 495 |
| 600 | 24 | 680 | 690 | 692 | 120 | 120 | 494 | | | | | | | | 593 |

2. Model 2916B

- (Notes) (1) The sketch shows reverse action valve.
 (2) \dagger 1, upper dimension specify for JIS 10K, lower specify ASME/JPI class 150.
 (3) Hand wheel is applicable on actuator as option.
 (4) Specified weight are with standard combination of body and actuator without hand wheel.
 (5)  shows positioner mounting position.



■ Valve size : 80mm~450mm

Unit : mm

| Valve Size | g | Face to Face | | E | Actuator Size | D | L | LT | J | C | | X | P | | weight (kg) | | | | |
|------------|----|--------------|------------|-----|---------------|-----|------------|-----|-------|----------------|----------------|------|------------|------------|-------------|-----|-----|----|-----|
| | | 16B | 16BV | | | | | | | JIS10K ASME150 | JIS20K ASME300 | | 60° Travel | 90° Travel | | | | | |
| 80 | 3 | 125 | 128 | 134 | 46 | 49 | 135 | 135 | 240HP | 240 | 275 | 480 | 115 | 245 | 255 | 230 | 30 | 18 | 21 |
| 100 | 4 | 145 | 153 | 159 | 52 | 55 | 155 | 160 | 240HP | 240 | 275 | 480 | 115 | 280 | 300 | 230 | 30 | 18 | 25 |
| | | | | | | | | | 330HP | 330 | 435 | 690 | 130 | 330 | 350 | 240 | 52 | 30 | 44 |
| | | | | | | | | | 400HP | 400 | 470 | 765 | 160 | 395 | 415 | 270 | 60 | 35 | 81 |
| 125 | 5 | 180 | 183 | 195 | 56 | 59 | 165 | 185 | 330HP | 330 | 435 | 690 | 130 | 340 | 360 | 240 | 52 | 30 | 46 |
| | | | | | | | | | 400HP | 400 | 470 | 765 | 160 | 410 | 430 | 270 | 60 | 35 | 85 |
| | | | | | | | | | 330HP | 330 | 435 | 690 | 130 | 395 | 415 | 240 | 52 | 30 | 65 |
| 150 | 6 | 210 | 213 | 230 | 56 | 61 | 180 | 195 | 400HP | 400 | 470 | 765 | 160 | 420 | 440 | 270 | 60 | 35 | 100 |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | 470 | 490 | 270 | 104 | 60 | 176 |
| | | | | | | | | | 330HP | 330 | 435 | 690 | 130 | 395 | 415 | 270 | 104 | 60 | 195 |
| 200 | 8 | 255 | 263 270 | 275 | 60 | 65 | 220 | 240 | 400HP | 400 | 470 | 765 | 160 | 455 | 475 | 270 | 60 | 35 | 119 |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | 505 | 525 | 270 | 104 | 60 | 195 |
| | | | | | | | | | 330HP | 330 | 435 | 690 | 130 | 395 | 415 | 240 | 52 | 30 | 65 |
| 250 | 10 | 320 | 322 | 345 | 68 | 73 | 245 | 265 | 400HP | 400 | 470 | 765 | 160 | 455 | 475 | 270 | 60 | 35 | 119 |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | 505 | 525 | 270 | 104 | 60 | 195 |
| | | | | | | | | | 330HP | 330 | 435 | 690 | 130 | 395 | 415 | 240 | 52 | 30 | 65 |
| 300 | 12 | 365 | 368 381 | 381 | 78 | 90 | 280 300 | 300 | 500H | 500 | 635 | 1090 | 205 | 540 560 | 560 | 270 | 104 | 60 | 211 |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | 598 | | | | | 243 |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | 628 | | 270 | 104 | 60 | 267 |
| 350 | 14 | 403 | 413 | 85 | 85 | 341 | | | 500H | 500 | 635 | 1090 | 205 | 652 | | | | | 317 |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| 400 | 16 | 463 | 475 470 | 90 | 90 | 376 | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| 450 | 18 | 523 | 530 533 | 100 | 100 | 406 | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |
| | | | | | | | | | 500H | 500 | 635 | 1090 | 205 | | | | | | |

Actuator Mounting Orientation

■ Several combinations of Valve Body and Actuator are available as shown below to fit the valve in a limited piping spaces.

It is also available to mount the Actuator in vertical position.

Sketch D-1L or R-1L is Motoyama standard shipping orientation unless otherwise specified.

Note : Valve disc is closed clockwise seeing from actuator side.

| Direct Action | D-1L(Standard) | D-2L | D-3L | D-4L |
|----------------|---|---|---|---|
| |  |  |  |  |
| Reverse Action | R-1L(Standard) | R-2L | R-3L | R-4L |
| |  |  |  |  |

【Code】  Flow Direction



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