Technical Specifications
Rev. D - 04/2022

# Masoneilan™ 37002 Series MiniTork™ II Control Valve

## Heavy Duty Control Butterfly Valve




Baker Hughes

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# Features

The MiniTork II is a heavy duty, throttling control butterfly valve that provides superior performance by incorporating the following features:

Low Dynamic Torque – the unique cupped shape disc results in a dynamic torque considerably lower than conventional butterfly valves.

Triple Bearing System – provides exceptional support and guiding for the shaft.

Valve Position Indicator – highly visible, which allows quick visual inspection of disc position.

Integrally Cast Extension Bonnet – provides ability to handle wide range of process temperatures.

Spring Diaphragm Actuator – with total enclosure of all moving parts provides increased resistance to environmental corrosion.

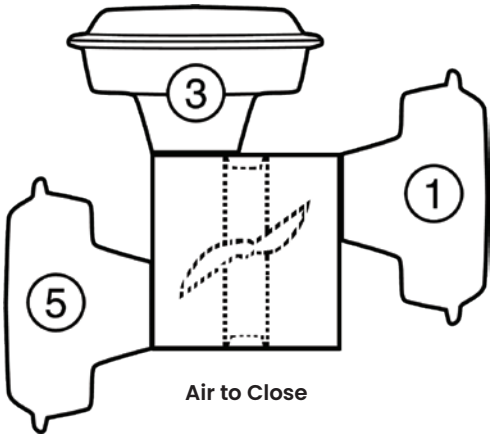

**Handwheel and positioner are optional.**

# Numbering System

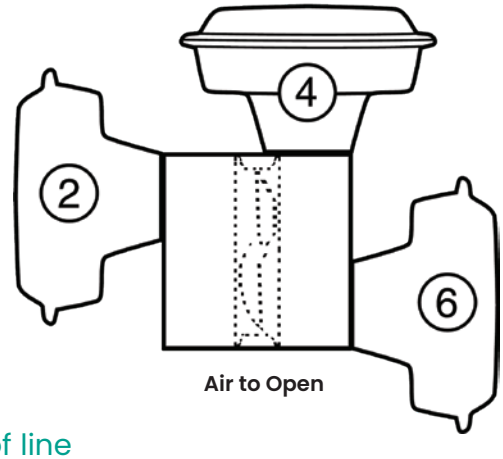
| 1st | 2nd | | 1st | 2nd | 3rd | 4th | 5th |
|---|---|---|---|---|---|---|---|
| 3 | 3 | - | 3 | 7 | | | 2 |

| Actuator | | Body Series | Plug Type | | Bore Type | | Design Series |
|---|---|---|---|---|---|---|---|
| 33 | Spring Diaphragm (Air to extend action only with, or without auxilary handwheel) | 37 | 0 | Undefined | 1 | Undefined | 2 |
| | | | 1 | Horizontal above center valve closes on stem extension (air to close action) | 2 | Elastomer Lined | |
| | | | 2 | Horizontal above center valve opens on stem extension (air to open action) | | | |
| | | | *3 | Vertical above center valve closes on stem extension (air to close action) | | | |
| | | | *4 | Vertical above center valve opens on stem extension (air to open action) | | | |

*Standard actuator mounting arrangement.




**Air to Close**




**Air to Open**

Actuator in front of line

# General Data

| | |
|---|---|
| Flow Characteristic: | Equal percentage |
| Flow Direction: | Universal |
| Temperature Range: | Unlined valves<br>St. St. body<br>-250°F to +500°F (-157°C to +260°C)<br>carbon steel body<br>-20°F to +500°F (-29°C to +260°C)<br>lined valves—see liner material page 7. |
| Seat Leakage: | |
| Metal Seal: | 2" – 4" (DN25-100), 2% of rated $C_V$<br>6" – 12" (DN150-300), 1% of rated $C_V$<br>elastomer seat: per ANSI / FCI 70.2 Class VI |
| $C_V$ Ratio: | 100:1 |

## Connections

| Valve Size | | ANSI Class 150 & 300 |
|---|---|---|
| Inches | DN | Carbon & St. St. |
| 2 | 50 | • |
| 3 | 80 | • |
| 4 | 100 | • |
| 6 | 150 | • |
| 8 | 200 | • |
| 10 | 250 | • |
| 12 | 300 | • |

# Body Assembly Data

| | |
|---|---|
| Body Type: | Cast wafer with integral bonnet |
| Sizes: | 2"-12" (DN 25-300) |
| Materials: | Carbon steel[1] ASTM A216 Gr WCB<br>Stainless steel ASTM A351 Gr CF8M |
| Connections: | Flangeless – clamped between ANSI Class 125, 150, 250 and 300 line flanges |
| Rating: | ANSI Class 300 – carbon steel and stainless steel |
| Elastomer Liner Type: | Replaceable metal reinforced flangeless ring with controlled compression |
| Materials: | |
| Buna-N® | +10°F to +180°F (-12°C to +82°C) |
| Nordel® | -30°F to +250°F (-34°C to +121°C) |
| Viton® | -10°F to +400°F (-23°C to +204°C) |
| (+180 °F/+82 °C maximum for liquids and steam) | |

| | |
|---|---|
| Disc Type: | Low dynamic torque reverse cupped disc |
| Materials: | 316 stainless steel |
| Shaft Type: | One piece shaft, splined on outboard end |
| Material: | 17-4 PH stainless steel<br>316 stainless steel (optional) |
| Bushings: | Stellite® Alloy 6 |
| Bracket Bearing: | A dirt sealed, permanently lubricated ball bearing |
| Packet Box: | Bolted |
| Packing: | Carbon Core Braided PTFE fiber ring (optional)<br>*EF*™ Seal for fugitive emission protection (optional) |

1. Carbon steel is the standard body material in elastomer lined valves.

# Actuator Data (Model 33)

| | |
|---|---|
| Type: | Spring diaphragm, floating stem pneumatic actuator |
| Action: | Increasing air extends stem |
| Bench Range: | B size 7-14 psig<br>C size 9-15 psig |
| Connection: | 1/4" NPT |
| Fail Safe Action: | Field reversible |
| Bracket: | Cast iron |
| Handwheel: (optional) | Push type tilting, rising stem, Permanently lubricated |

| Valve Size | | Shaft Diameter | | Actuator | | | | | Handwheel Diameter | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Size | Effective Area | | Stroke | | | |
| Inches | DN | Inches | DN | | sq. in. | sq. cm | Inches | mm | Inches | mm |
| 2 | 50 | 0.500 | 12.7 | B | 70 | 450 | 2.25 | 57 | 10 | 254 |
| 3 | 80 | 0.500 | 12.7 | B | 70 | 450 | 2.25 | 57 | 10 | 254 |
| 4 | 100 | 0.625 | 15.9 | B | 70 | 450 | 2.25 | 57 | 10 | 254 |
| 6 | 150 | 0.625 | 15.9 | B | 70 | 450 | 2.25 | 57 | 10 | 254 |
| 8 | 200 | 1.000 | 25.4 | C | 140 | 900 | 2.25 | 57 | 10 | 254 |
| 10 | 250 | 1.000 | 25.4 | C | 140 | 900 | 2.25 | 57 | 10 | 254 |
| 12 | 300 | 1.000 | 25.4 | C | 140 | 900 | 2.25 | 57 | 10 | 254 |

## Maximum Rated Flow Coefficients ($C_V$) and Pressure Recovery Coefficients ($F_L$) at Maximum Opening (75°)

| Valve Size | | $C_V$ (1) | $F_L$ |
|---|---|---|---|
| Inches | DN | | |
| 2 | 50 | 90 | 0.65 at Max. Opening |
| 3 | 80 | 280 | |
| 4 | 100 | 480 | |
| 6 | 150 | 1330 | |
| 8 | 200 | 2370 | |
| 10 | 250 | 3700 | |
| 12 | 300 | 5300 | |

1) $C_V$ rating per ISA Test Procedure SP 39.2

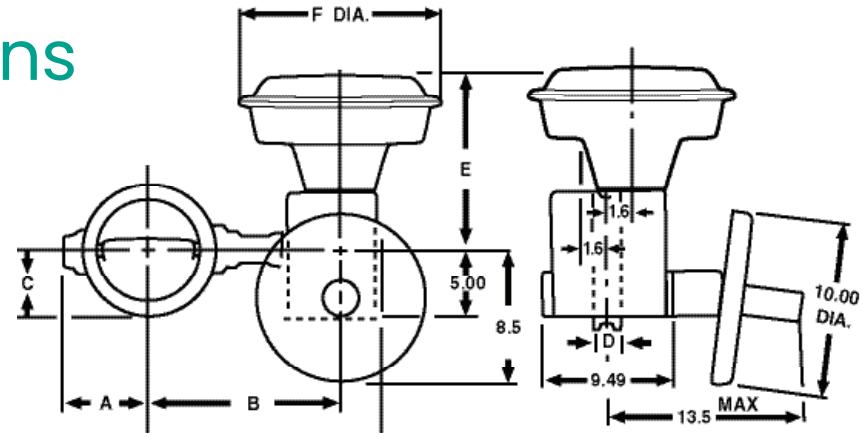
## Flow Coefficients ($C_V$) Versus Valve Travel

| % Max. Opening | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| % Max. $C_V$ | 1.2 | 2.5 | 5 | 9 | 14 | 23 | 34 | 51 | 72 | 100 |

## Pressure Recovery Coefficient ($F_L$) Versus % Maximum $C_V$

| % Max. $C_V$ | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
|---|---|---|---|---|---|---|---|---|---|---|
| Pressure Recovery Coefficient $F_L$ | .80 | .78 | .76 | .75 | .73 | .71 | .69 | .67 | .66 | .65 |

# Dimensions



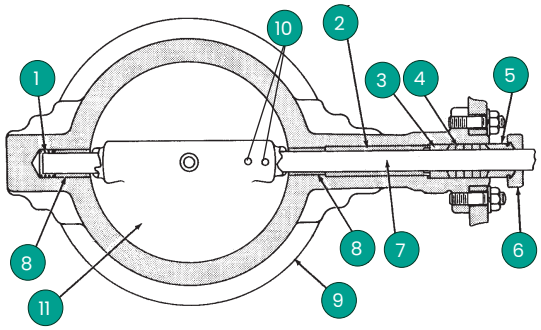

### Dimensions (inches)

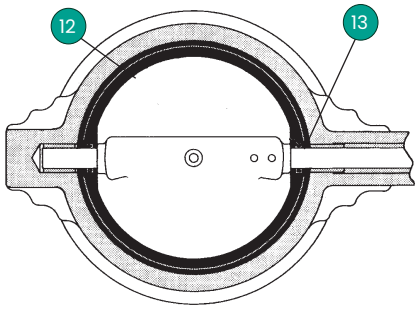
| Valve Size | | Actuator Size | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| Inches | DN | | | | | | | |
| 2 | 50 | B | 2.8 | 10.3 | 1.8 | 1.8 | 11.5 | 13.0 |
| 3 | 80 | B | 3.3 | 10.8 | 2.5 | 1.9 | 11.5 | 13.0 |
| 4 | 100 | B | 3.8 | 11.3 | 3.1 | 2.0 | 11.5 | 13.0 |
| 6 | 150 | B | 5.4 | 12.5 | 4.3 | 2.3 | 11.5 | 13.0 |
| 8 | 200 | C | 7.0 | 15.4 | 5.5 | 2.5 | 15.2 | 17.5 |
| 10 | 250 | C | 8.0 | 16.4 | 6.4 | 2.5 | 15.2 | 17.5 |
| 12 | 300 | C | 9.0 | 17.4 | 7.4 | 3.0 | 15.2 | 17.5 |

### Dimensions (millimeters)

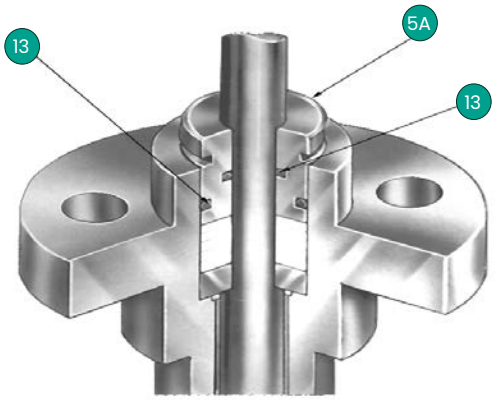
| Valve Size | | Actuator Size | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|
| DN | Inches | | | | | | | |
| 50 | 2 | B | 71 | 262 | 46 | 46 | 292 | 330 |
| 80 | 3 | B | 84 | 274 | 64 | 48 | 292 | 330 |
| 100 | 4 | B | 97 | 287 | 79 | 51 | 292 | 330 |
| 150 | 6 | B | 137 | 318 | 109 | 58 | 292 | 330 |
| 200 | 8 | C | 178 | 391 | 140 | 64 | 386 | 445 |
| 250 | 10 | C | 203 | 417 | 163 | 64 | 386 | 445 |
| 300 | 12 | C | 229 | 442 | 188 | 76 | 386 | 445 |

# Materials




| Temperature | | -250°F | -30°F | -20°F | -10°F | 10°F | 180°F | 250°F | 400°F | 450°F | 500°F |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ref. No** | **Description** | **Standard Materials** | | | | | | | | | |
| 1 | Spring | 302 Stainless Steel ASTM A313 Type 302 | | | | | | | | | |
| 2 | Spacer Tube | 316 Stainless Steel ASTM A269 Gr Type 316 | | | | | | | | | |
| 3 | Packing Adapter | 316 Stainless Steel ASTM A479 Type 316 | | | | | | | | | |
| 4 | Packing | Carbon Core Braided PTFE | | | | | | | | | |
| | | PTFE Fiber Ring Chesterton 324 (optional) | | | | | | | | | |
| 5 | Packing Follower | 316 Stainless Steel ASTM A276 Type 316 | | | | | | | | | |
| 5A | EF Seal | | | | A582 Type 303 St. St. with 2 Vition Rings | | | | | | |
| 6 | Packing Flange | Cadmium Plated Steel ASTM A105 Gr 11 | | | | | | | | | |
| 7 | Vane Shaft | 17-4 Stainless Steel ASTM A564 Gr 630 H1075 | | | | | | | | | |
| | | 316 Stainless Steel ASTM A276 Type 316 (optional) | | | | | | | | | |
| 8 | Guide Bushing | Stellite Alloy 6 | | | | | | | | | |
| 9 | Valve Body | 316 Stainless Steel ASTM A351 Gr CF8M | | | | | | | | | |
| | | | | | Carbon Steel ASTM A216 WCB | | | | | | |
| 10 | Shaft Pin | 316 Stainless Steel ASTM A479 Type 316 | | | | | | | | | |
| 11 | Vane | 316 Stainless Steel ASTM A351 Gr CF8M | | | | | | | | | |
| 12 | Liner and O-ring | | | | | Buna-N | | | | | |
| 13 | | | | | Nordel | | | | | | |
| | | | | | | Viton | | | | | |
| Temperature | | Δ -157°C | Δ -34°C | Δ -29°C | Δ -23°C | Δ -12°C | Δ 82°C | Δ 121°C | Δ 204°C | Δ 232°C | Δ 260°C |




**EF Seal Option**
**Double O-Ring Seal Packing Follower**
Fugitive Emission Containment Package

Provides long term reliable extremely low emission shaft seal performance. This economical solution to fugitive emissions won't compromise control performance and is suitable for use in environmentally sensitive applications.

# Weights

## Assembly Weights (1)

| Valve Size | | Valve Weight | |
|---|---|---|---|
| **in.** | **DN** | **lbs** | **Kg** |
| 2 | 50 | 59 | 27 |
| 3 | 80 | 61 | 28 |
| 4 | 100 | 66 | 30 |
| 6 | 150 | 72 | 33 |
| 8 | 200 | 142 | 64 |
| 10 | 250 | 157 | 71 |
| 12 | 300 | 186 | 84 |

1. Add 22 lbs. (10 Kgs) for assemblies with handwheels.

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