

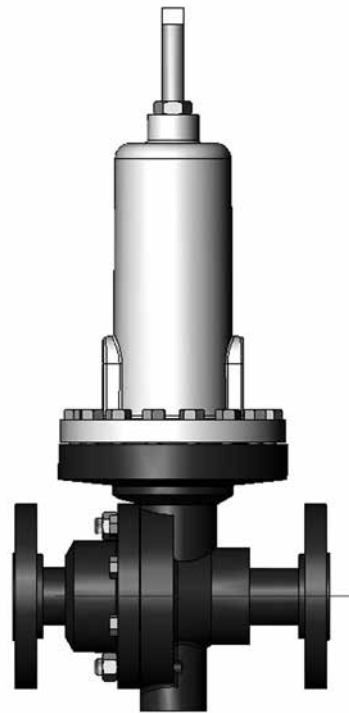
Mark 50HP Series

Self-Operated Back Pressure Regulators

The Mark 50HP Sliding Gate Back Pressure Regulator is used to regulate upstream pressure at a predetermined setpoint. The spring in the Mark 50HP holds the sliding gate seats in their normally closed position.

The upstream pressure is sensed beneath the diaphragm. **(A sensing line is required on sizes: 2-1/2", 3", and 4")**. As the upstream pressure exceeds the setpoint, pressure is exerted on the diaphragm which raises the stem to modulate the disc (the movable component of the sliding gate seat set) toward the open position. As the seats open, upstream pressure will be regulated to the required setpoint. A decrease in pressure relaxes the spring and diaphragm to move the seats toward the closed position.

The MK50HP option is an elongated spring housing that features a large spring for high pressure setpoints up to 450 psi (31,03 bar).



MARK 50HP FEATURES

- **Sliding Gate Trim** — unique seat design for unsurpassed trim life and accuracy.
- **Jorcote Seat Coating** — ceramic composite for liquids, gases and especially steam. Very low friction with outstanding wear resistance and a temperature rating of up to 550°F (288°C). Steam tested to 1,000,000 cycles and still maintained Class IV leakage.
- **Jorlon Diaphragm** — extremely durable, virtually universally applicable up to 450°F. Tested without failure to over 1,000,000 full stroke cycles. Ideal for steam, gases and liquids. 316SST diaphragm applicable up to 550°F.
- **Straight-through Flow** — The flow is straight through the valve seats and body. Direction of the disc travel is perpendicular to the flow, not opposed to the direction of the flow. Thus, the flow does not unbalance the seats. The MK50 can use a wider range of its stroke to give accurate control; less offset and rangeability up to 20:1.
- **Quiet Operation** — typically 5-10 dB less than conventional globe style regulators. The disc and plate are always in contact, which eliminates chattering. Straight-through flow minimizes turbulence. Multiple orifices in the plate and disc divide the flow stream into smaller flow components.
- **Minimum Maintenance** — The MK50 sliding gate seats require no special tools for disassembly. The seats are pre-lapped at the factory and are self-lapping while in operation ensuring a continual tight shutoff.



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SPECIFICATIONS

Sizes: (1/4" & 3/8" sizes use 1/2" body with reducers)

- 1/4" through 4" (DN8 through DN100)

End Connections:

- Threaded – FNPT, BSPT, BSPP (1/4" – 2" only, DN8-DN50)
- ANSI Flanges (150#, 300#, 600#)
- DIN Flanges (PN10/16, PN25/40)
- JIS Flanges (upon request)

Spring Housing:

- Ductile Iron — 1/4" - 2" (DN8 - DN50)
- Ductile Iron — 2-1/2" - 4" (DN65 - DN100)

Body Materials:

- Ductile Iron
- Bronze (1/2" - 2", DN15-DN50)
- Cast Iron (2-1/2" - 4", DN65-DN100)
- Carbon Steel (A216 WCB)
- Stainless Steel (A351/CF8M)

Trim Materials:

- 303SST — Standard on Ductile Iron, Bronze, Carbon Steel valves
- 316SST — Standard on Stainless Steel valves
- Monel, Hastelloy and other Alloys available

Pressure Control Ranges: Select a range to match your setpoint. For optimal performance, your setpoint should fall in the upper portion of the selected range.

| Model | Size (DN) | Spring Ranges | |
|-------|-------------------------------|---------------|---------------|
| | | PSI | BAR |
| 50HP | 1/2" - 2" (DN15 - DN40) | 75 - 190 | 5,17 - 13,10 |
| | | 100 - 320 | 6,89 - 22,06 |
| | | 150 - 450 | 10,34 - 31,02 |
| | 2-1/2" - 4" (DN65 - DN100) | 25 - 50 | 1,72 - 3,45 |
| | | 40 - 130 | 2,76 - 8,96 |

MAXIMUM WORKING PRESSURE, PSI

| Temp °F | 50 HP Series (1/2" - 2") | |
|---------|--------------------------|--------------------|
| | CS Body | SS Body |
| | 600# Flange or NPT | 600# Flange or NPT |
| 100 | 1480 | 1440 |
| 200 | 1355 | 1240 |
| 300 | 1315 | 1120 |
| 400 | 1270 | 1030 |
| 500 | 1208 | 955 |
| 600 | 1095 | 905 |
| 650 | 1075 | 890 |

Notes:

1. Consult factory for maximum working pressure on 2-1/2" - 4" (DN65 - DN100) Mark 50HP Series

Seat Materials:

- Jorcote on SST — Standard
- Other materials available — Consult factory

Diaphragm Materials:

- Jorlon - Standard
- Stainless Steel - Standard
- Buna-N - Standard
- Viton - Optional

Service: Steam, water, oil, gas, air and chemicals

Shutoff: ANSI Class IV

Cv Values & Maximum Differential Pressures

| Cv (Kv) | Size (DN) | Seat Material | Max. ΔP PSI (bar) |
|-------------|------------------------------|---------------|-------------------|
| 0.84 (0,74) | 1/4" (DN8) | Jorcote | 500 (34) |
| 1.6 (1,4) | 3/8" (DN12) | Jorcote | 500 (34) |
| 2.5 (2,2) | 1/2" & 3/4" (DN15 & DN20) | Jorcote | 450 (31) |
| 4.4 (3,8) | | | |
| 6.4 (5,5) | 1" & 1-1/4" (DN25 & DN32) | Jorcote | 450 (31) |
| 9.5 (8,2) | | | |
| 15 (12,9) | 1-1/2" (DN40) | Jorcote | 450 (31) |
| 25 (21,5) | 2" (DN50) | Jorcote | 450 (31) |
| 30 (25,8) | | | |
| 55 (47,3) | 2-1/2" (DN65) | Jorcote | 150 (10) |
| 115 (99) | 3" (DN75) | Jorcote | 150 (10) |
| 200 (172) | 4" (DN100) | Jorcote | 150 (10) |

Low Flow Cv's: reduced Cv's (Kv's) are available. Cv (Kv) ratings of smaller valves can be supplied in larger-sized valves.

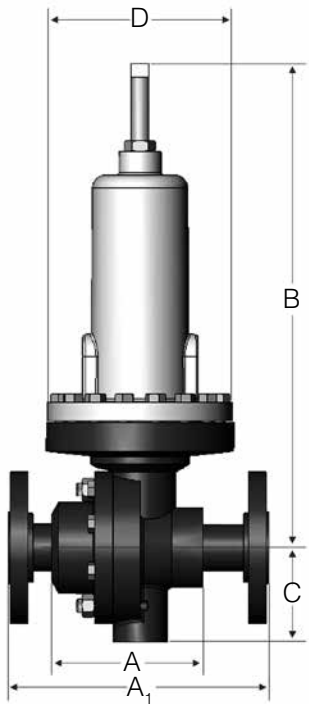
| | | | | |
|---------------|---------------|---------------|-----------------|-------------|
| 0.42 (0,36) | 0.21 (0,18) | 0.08 (0,07) | 0.04 (0,03) | 0.02 (0,02) |
| 0.008 (0,007) | 0.004 (0,003) | 0.002 (0,002) | 0.0008 (0,0007) | |

MAXIMUM WORKING PRESSURE, BAR

| Temp °C | 50 HP Series (DN15 - DN50) | |
|---------|----------------------------|--------------------|
| | CS Body | SS Body |
| | 600# Flange or NPT | 600# Flange or NPT |
| 38 | 102 | 99 |
| 93 | 93 | 85 |
| 149 | 91 | 77 |
| 204 | 88 | 71 |
| 260 | 83 | 66 |
| 316 | 75 | 62 |
| 343 | 74 | 61 |

MARK 50HP HIGH PRESSURE SELF-OPERATING BACK PRESSURE REGULATORS

DIMENSIONS



• Mark 50HP: Flanged Ends

| Size | Flange | Dimensions (inches) | | | | | Weight (lbs.) |
|--------|--------|---------------------|-------|-------|------|------|---------------|
| | | A1 | | B† | C | D | |
| | | DI/BRZ | CS/SS | All | All | All | |
| 1/2" | 150# | 7.25 | 7.25 | 12.75 | 1.69 | 5.20 | 21 |
| | 300# | 7.50 | 7.50 | 12.75 | 1.69 | 5.20 | |
| | 600#‡ | 8.00 | 8.00 | 12.25 | 1.69 | 5.20 | |
| 3/4" | 150# | 7.25 | 7.25 | 12.75 | 1.69 | 5.20 | 22 |
| | 300# | 7.62 | 7.62 | 12.75 | 1.69 | 5.20 | |
| | 600#‡ | 8.12 | 8.12 | 12.25 | 1.69 | 5.20 | |
| 1" | 150# | 7.25 | 7.25 | 13.25 | 2.62 | 5.20 | 37 |
| | 300# | 7.75 | 7.75 | 13.25 | 2.62 | 5.20 | |
| | 600#‡ | 8.25 | 8.25 | 12.75 | 2.62 | 5.20 | |
| 1-1/4" | 150# | 7.87 | — | 12.75 | 2.62 | 5.20 | 37 |
| | 300# | 8.37 | | 12.75 | 2.62 | 5.20 | |
| 1-1/2" | 150# | 8.75 | 8.75 | 13.75 | 2.31 | 5.20 | 45 |
| | 300# | 9.25 | 9.25 | 13.75 | 2.31 | 5.20 | |
| | 600#‡ | 9.87 | 9.87 | 13.25 | 2.31 | 5.20 | |
| 2" | 150# | 10.00 | 10.00 | 14.00 | 2.75 | 5.20 | 49 |
| | 300# | 10.50 | 10.50 | 14.00 | 2.75 | 5.20 | |
| | 600#‡ | 11.25 | 11.25 | 13.50 | 2.75 | 5.20 | |

† For IFE, add 1" (25,4mm) to all "B" dimensions.

‡ 600# are not IFE

• Mark 50HP: Threaded & FSW Ends

| Size | Mat'l | Dimensions (inches) | | | | Weight (lbs.) |
|-------------|--------|---------------------|-------|------|------|---------------|
| | | A | B | C | D | |
| 1/2" & 3/4" | DI/BRZ | 3.62 | 12.75 | 1.75 | 5.12 | 15 |
| | CS/SS | 3.62 | 12.75 | 1.75 | 5.12 | 17 |
| 1" | DI/BRZ | 4.12 | 13.00 | 2.12 | 5.20 | 21 |
| | CS/SS | 4.18 | 13.25 | 2.12 | 5.20 | 25 |
| 1-1/4" | DI/BRZ | 4.12 | 13.00 | 2.12 | 5.20 | 21 |
| 1-1/2" | DI/BRZ | 4.50 | 13.25 | 2.31 | 5.20 | 23 |
| | CS/SS | 4.81 | 13.75 | 2.50 | 5.20 | 31 |
| 2" | DI/BRZ | 4.50 | 13.25 | 2.50 | 5.20 | 26 |
| | CS/SS | 5.50 | 14.00 | 2.50 | 5.20 | 35 |

• Mark 50HP: Threaded & FSW Ends, Metric

| Size (DN) | Mat'l | Dimensions | | | | Weight (kg) |
|-----------|--------|------------|-----|------|-------|-------------|
| | | A | B | C | D | |
| 15 & 20 | DI/BRZ | 92,0 | 324 | 44,5 | 130,0 | 6,8 |
| | CS/SS | 92,0 | 324 | 44,5 | 130,0 | 7,7 |
| 25 | DI/BRZ | 104,7 | 330 | 53,9 | 132,1 | 9,5 |
| | CS/SS | 106,2 | 337 | 53,9 | 132,1 | 11,3 |
| 32 | DI/BRZ | 104,7 | 330 | 53,9 | 132,1 | 9,5 |
| 40 | DI/BRZ | 114,3 | 337 | 58,7 | 132,1 | 10,4 |
| | CS/SS | 122,2 | 349 | 63,5 | 132,1 | 14,1 |
| 50 | DI/BRZ | 114,3 | 337 | 63,5 | 132,1 | 11,8 |
| | CS/SS | 139,7 | 356 | 63,5 | 132,1 | 15,9 |

• Mark 50HP: Flanged Ends, Metric³

| Size (DN) | Flange PN | Dimensions (mm) | | | | | Weight (kg) |
|-----------|-----------|---------------------|-------|----------------|------|-------|-------------|
| | | A1 | | B ² | C | D | |
| | | DI/BRZ ¹ | CS/SS | All | All | All | |
| 15 | 10/16 | 184,2 | 130,0 | 324 | 42,9 | 132,1 | 9,5 |
| | 25/40 | 184,2 | 130,0 | 324 | 42,9 | 132,1 | |
| 20 | 10/16 | 184,2 | 150,0 | 324 | 42,9 | 132,1 | 10,0 |
| | 25/40 | 184,2 | 150,0 | 324 | 42,9 | 132,1 | |
| 25 | 10/16 | 184,2 | 160,0 | 337 | 66,6 | 132,1 | 16,8 |
| | 25/40 | 184,2 | 160,0 | 337 | 66,6 | 132,1 | |
| 32 | 10/16 | 199,9 | — | 324 | 66,6 | 132,1 | 16,8 |
| | 25/40 | 199,9 | | 324 | 66,6 | 132,1 | |
| 40 | 10/16 | 222,3 | 200,0 | 349 | 58,7 | 132,1 | 20,4 |
| | 25/40 | 222,3 | 200,0 | 349 | 58,7 | 132,1 | |
| 50 | 10/16 | 254,0 | 230,0 | 356 | 69,9 | 132,1 | 22,2 |
| | 25/40 | 254,0 | 230,0 | 356 | 69,9 | 132,1 | |

1. Not IFE & not per DIN3202

2. For IFE, add 25,4mm.

3. For DIN flanges above PN40, please consult factory.

4. Consult factory for dimensions on 2-1/2" - 4" (DN65 - DN100 Mark 50HP Series

ORDERING SCHEMATIC

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|----|
| | | | | | | | | | |

| 2 | Size | | | |
|-----|-------------|-----|---------------|--|
| | Inches (DN) | | Inches (DN) | |
| 025 | 1/4" (DN8) | 150 | 1-1/2" (DN40) | |
| 038 | 3/8" (DN10) | 200 | 2" (DN50) | |
| 050 | 1/2" (DN15) | 250 | 2-1/2" (DN65) | |
| 075 | 3/4" (DN20) | 300 | 3" (DN80) | |
| 100 | 1" (DN25) | 400 | 4" (DN100) | |

| 3 | Body Material | |
|---|---------------|-------------------------|
| | DI | Ductile Iron |
| | BR | Bronze (1/4" - 2") |
| | CS | Carbon Steel |
| | S6 | Stainless Steel |
| | CI | Cast Iron (2-1/2" - 4") |

| 4 | End Connections | |
|---|-----------------|-----------------------|
| | 1/4" - 2" | |
| | PT | NPT |
| | BT | BSPT |
| | BP | BSPP |
| | SW | FSW |
| | F1 | 125#FE (Except IFE) |
| | I5 | 150# IFE |
| | F5 | 150# FE (except IFE) |
| | F2 | 250# FE (except IFE) |
| | I3 | 300# IFE |
| | F3 | 300# FE (except IFE) |
| | I7 | PN 10 DIN IFE (CS/S6) |
| | I6 | PN 16 DIN IFE (CS/S6) |
| | I8 | PN 25 DIN IFE (CS/S6) |
| | I4 | PN 40 DIN IFE (CS/S6) |
| | 2-1/2" - 4" | |
| | I1 | 125# IFE |
| | I5 | 150# IFE |
| | I2 | 250# IFE |
| | I3 | 300# IFE |
| | I7 | PN 10 DIN IFE (CS/S6) |
| | I6 | PN 16 DIN IFE (CS/S6) |
| | I8 | PN 25 DIN IFE (CS/S6) |
| | I4 | PN 40 DIN IFE (CS/S6) |

| 5 | Trim | | | |
|---|------|-------|----|------------------------|
| | S3 | 303SS | I3 | 303SSF/IFE (1/2" - 2") |
| | S6 | 316SS | I6 | 316SSF/IFE (1/2" - 2") |

| 6 | Seat Material | | | |
|---|---------------|----------------------|---|----------------------|
| | A | 303SST (1/4" - 2") | V | 303SS/Jorcote |
| | B | 316SST (1/4" - 2") | W | 316SS/Jorcote |
| | Q | 303SST/Teflon Coated | R | 316SST/Teflon Coated |

| 7 | Cv (Kv) | | | |
|---|---------|-------------|--------------------|--------------|
| | 1 | 0.21 (0,28) | 9 | 15 (12,93) |
| | 2 | 0.42 (0,36) | A | 25 (21,55) |
| | 3 | 0.84 (0,72) | B | 30 (25,86) |
| | 4 | 1.6 (1,38) | D* | 55 (47,41) |
| | 5 | 2.5 (2,16) | F* | 85 (73,28) |
| | 6 | 4.4 (3,79) | G* | 115 (99,14) |
| | 7 | 6.4 (5,52) | I* | 200 (172,41) |
| | 8 | 9.5 (8,19) | * 2-1/2" - 4" only | |

| 8 | MK50HP Spring Range PSI (BAR) | | | |
|---|-------------------------------|-----------------------|-------------|--------------------|
| | 1/2" - 2" | | 2-1/2" - 4" | |
| | A1 | 75-190 (5,17-13,10) | 64 | 25-50 (1,72-3,45) |
| | A7 | 100-320 (6,89-22,06) | 82 | 40-130 (2,76-8,96) |
| | A9 | 150-450 (10,34-31,02) | | |

| 9 | Diaphragm | |
|---|-----------|---------------------------------|
| | S6 | 316 SST (1/4" - 2" only) |
| | VI | Viton |
| | BN | Buna-N (standard above 2"/DN50) |
| | JL | Jorlon |

| 10 | Actuator | |
|----|----------|--------------------------------------|
| | MD | for Metal Diaphragm (1/4" - 2" only) |
| | ED | for Elastomer Diaphragm |

