

DATA SHEET

HIGH-PRESSURE REGULATOR



Steel/Nickel Plated Models: 7001–7033

Stainless Steel Models: 7001.100–7033.100, 7001.200–7033.200



7011–7014

7021–7033

7001–7003

FEATURES

- Stainless steel conical piston and seat extend valve life by providing a consistently smooth flow that reduces wear and compensates for pressure spikes.
- Lightweight, flow-through design allows for easy installation.
- Unique high velocity design ensures consistent pressure for multiple pump or shut-off gun installations.
- Models 7001–7033 have nickel plated steel lower and upper bodies.
- Models 7001.100–7033.100 have 316SS lower bodies and nickel plated steel upper bodies.
- Models 7001.200–7033.200 have 316SS lower bodies and 304SS upper bodies.
- Stainless steel internal parts for durability and compatibility.
- Standard FPM elastomers for compatibility with many liquids and temperatures up to 240° F.

| SPECIFICATIONS | | U.S. Measure | Metric Measure |
|--|--------|---------------|----------------|
| Models 7001, 7002, 7003, .100 and .200 Series | | | |
| Flow Range | | 0.5–5.0 gpm | 1.9–19 lm |
| Pressure Range | (7001) | 100–1000 psi | 7–70 bar |
| | (7002) | 500–2000 psi | 35–140 bar |
| | (7003) | 1500–3000 psi | 105–210 bar |
| Maximum Temperature | | 240° F | 116° C |
| Inlet/Outlet Port | | 3/8" NPT(F) | 3/8" NPT(F) |
| Bypass Port | | 1/2" NPT(F) | 1/2" NPT(F) |
| Weight | | 2.25 lbs | 1.02 kg |
| Dimensions | | 6.25 x 1.5" | 159 x 38 mm |
| Models 7011, 7012, 7013, 7014, .100 and .200 Series | | | |
| Flow Range | | 1.0–10.0 gpm | 3.8–38 lm |
| Pressure Range | (7011) | 100–1000 psi | 7–70 bar |
| | (7012) | 500–2000 psi | 35–140 bar |
| | (7013) | 1500–3000 psi | 105–210 bar |
| | (7014) | 2000–4000 psi | 140–275 bar |
| Maximum Temperature | | 240° F | 116° C |
| Inlet/Outlet Port | | 1/2" NPT(F) | 1/2" NPT(F) |
| Bypass Port | | 3/4" NPT(F) | 3/4" NPT(F) |
| Weight | | 3.75 lbs | 1.70 kg |
| Dimensions | | 7.5 x 1.88" | 191 x 48 mm |
| Models 7021, 7022, 7023, 7024, .100 and .200 Series | | | |
| Flow Range | | 2.5–25.0 gpm | 9.5–95 lm |
| Pressure Range | (7021) | 100–1000 psi | 7–70 bar |
| | (7022) | 500–2000 psi | 35–140 bar |
| | (7023) | 1500–3000 psi | 105–210 bar |
| | (7024) | 2000–4000 psi | 140–275 bar |
| Maximum Temperature | | 240° F | 116° C |
| Inlet/Outlet Port | | 3/4" NPT(F) | 3/4" NPT(F) |
| Bypass Port | | 1" NPT(F) | 1" NPT(F) |
| Weight | | 5.0 lbs | 2.40 kg |
| Dimensions | | 8.5 x 2.25" | 216 x 57 mm |
| Models 7031, 7032, 7033, .100 and .200 Series | | | |
| Flow Range | | 3.5–35 gpm | 13.2–133 lm |
| Pressure Range | (7031) | 250–1000 psi | 18–70 bar |
| | (7032) | 1000–2000 psi | 70–140 bar |
| | (7033) | 1500–3000 psi | 105–210 bar |
| Maximum Temperature | | 240° F | 116° C |
| Inlet/Outlet Port | | 3/4" NPT(F) | 3/4" NPT(F) |
| Bypass Port | | 1" NPT(F) | 1" NPT(F) |
| Weight | | 5.5 lbs | 2.50 kg |
| Dimensions | | 8.5 x 2.25" | 216 x 57 mm |

SELECTION

These pressure regulators are designed for systems with single or multiple pumps, solenoid (gate) valves, nozzles, and standard or weep guns.

Note: For multiple pump systems, it is best to use a pressure regulator, not a pressure-sensitive regulating unloader.

Regulators should meet both the desired system flow (combined nozzle flow rate requirement) and the desired system pressure.

Note: Operation below the minimum flow of the regulator causes the regulator to cycle or chatter. Operation above the maximum flow of the regulator causes premature regulator wear, regulator cycling and prevents attaining desired system pressure.

INSTALLATION

These regulators can operate when mounted in any direction. However, it is preferred to keep the plumbing to a minimum and the pressure adjusting nut easily accessible. The best mounting location is directly on the pump discharge manifold head or in the discharge line. A flexible, high-pressure hose (minimum single wire braid) should be at least the size of the regulator ports when plumbing to and from the regulator.

Since this is a flow-through design regulator, the inlet and discharge connections are interchangeable and are located on either side. An arrow on the label indicates liquid flow in either direction. Port size varies with each size of regulator (see specifications). Plumb into one side for inlet flow from pump and plumb opposite side to the discharge line with spray guns, solenoid (gate) valves or nozzles.

The bypass connection of this regulator is located on the bottom. An arrow on the label indicates the direction of flow. Port size varies with each size of regulator (see specifications). Bypass liquid is directed out this port and can be routed to a reservoir (preferred method), or to a drain or back to the pump inlet.

OPERATION

This pressure regulator maintains established system pressure in the discharge line and at the pump head when the trigger gun or the solenoid (gate) valve is closed, or the nozzle is clogged, thus bypassing all excess flow. Squeezing the trigger gun or opening the solenoid (gate) valve allows for a quick return to established system pressure.

PRESSURE ADJUSTMENT

1. Setting and adjusting the regulator pressure must be done with the system on.
2. Start the system with the regulator backed off to the lowest pressure setting (counterclockwise).
3. Squeeze the trigger and read the pressure on the gauge at the pump.

Note: Do not read the pressure at the gun or nozzle.

4. If more pressure is desired, release the trigger, turn brass adjusting nut one-quarter turn in a clockwise direction.
5. Squeeze the trigger and read the pressure.
6. Repeat this process until desired system pressure is attained.
7. Once the desired system pressure is reached, stop turning the brass adjusting nut.

NOTICE A minimum bypass flow of 5% of the regulator rated flow capacity is required for proper regulator performance. If the entire output is directed through the regulator, zero-bypass of the cushioning feature of the bypass liquid is eliminated, and the regulator can malfunction or wear prematurely.

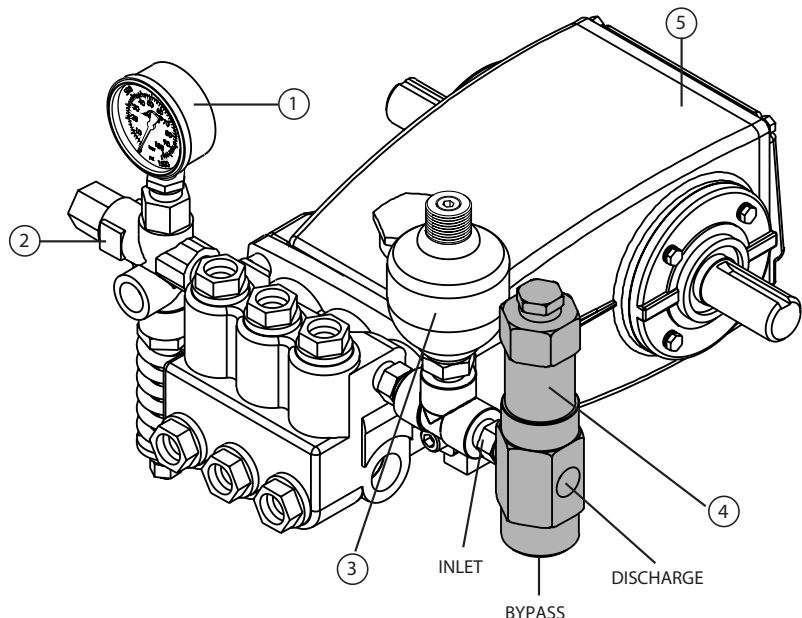
8. If desired system pressure cannot be reached, review TROUBLESHOOTING chart.
9. When servicing existing systems, back off adjusting nut.
10. Follow adjustment procedures as stated above.

Note: Do not adjust regulator pressure setting to compensate for a worn nozzle. Check the nozzle as part of the regular maintenance and replace it if worn.

Note: A secondary pressure safety relief device (i.e. pop-off valve, safety valve) should be used along with this pressure regulator. The final adjustment for the relief valve should relieve at 200 psi above the system operating pressure.

TYPICAL REGULATOR INSTALLATION

1. Pressure Gauge
2. Relief Valve
Shown as a secondary safety relief valve
3. Pulsation Dampener
4. **Pressure Regulator**
5. Triplex Plunger Pump



SERVICING

CAUTION Before commencing with service, shut off drive (electric motor, gas or diesel engine) and turn off water supply to pump. Relieve all discharge line pressure by triggering gun or opening valve in discharge line.

Disassembly

1. Disconnect bypass, discharge and inlet plumbing from the regulator.
2. Remove regulator from the pump.
3. Secure lower body of regulator in a vise with brass adjusting nut facing up.
4. Turn the brass adjusting nut counter-clockwise to relieve the spring tension.
5. Remove the upper body by unthreading from lower body.
6. Grasp top of piston stem and separate from the conical piston.
7. Remove piston stem with stack of spring washers, flat washers and anti-rotating washer and place on a flat surface.
8. Remove conical piston with reverse pliers by making contact on the inside diameter of conical piston.

NOTICE Exercise extreme caution to avoid contact and damage to outside diameter and sharp tip of the conical piston.

9. Remove piston retainer from the lower body of regulator.

NOTICE Exercise extreme caution to avoid contact and damage to the inside diameter of the piston retainer.

10. Remove conical seat from the lower body of regulator.

NOTICE Exercise extreme caution to avoid contact and damage to outside diameter and the tapered surface of the seat.

Note: With the regulator completely disassembled, inspect lower body sealing areas where the conical seat and piston retainer make contact. Look for grooves, pitting and wear. If damage is found, replace with a new lower body or complete new regulator. If not, proceed with reassembly.

Reassembly:

Note: The conical piston and seat should be changed as a matched set when upgrading from the old tapered piston and seat. See Tech Bulletin 097.

Note: Spring washers and flat washers should be changed as a spring set. See Tech Bulletin 102.

1. Place the lower regulator body with bypass port facing down into a vise.
2. Lubricate and install O-ring onto outside diameter of conical seat. Press conical seat down into the lower regulator body with small hole facing up.
3. Lubricate and install the O-ring onto piston retainer. Press piston retainer into the lower regulator body with raised surface facing up.
4. Lubricate and install backup ring, then O-ring onto outside diameter of conical piston. Press conical piston with sharp point facing down into the piston retainer.
5. Replace piston stem with stack of spring washers and flat washers into the hole of the conical piston.
6. Place anti-rotating washer on top of the spring set. Align tabs on washer with slots on the upper body.

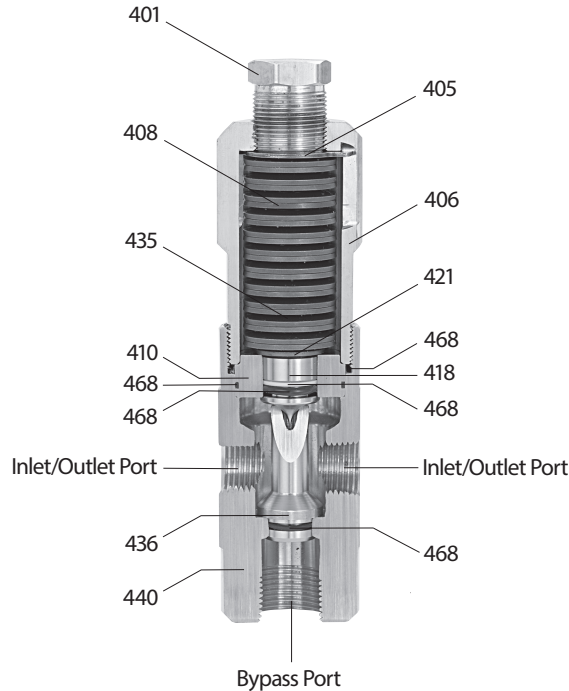
Note: The number of flat washers varies with each spring set. Place the first flat washer between the anti-rotating washer and spring stack. Place the second washer (if required) between spring stack and retaining ring. Place all remaining washers with the first washer.

7. Thread upper body into lower body.
8. Re-install regulator onto pump.
9. Reconnect bypass, discharge and inlet plumbing to regulator.
10. Proceed to PRESSURE ADJUSTMENT.

TROUBLESHOOTING

| | |
|--------------------------------------|--|
| Cycling/Chattering | <ul style="list-style-type: none"> • Air in system, poor connections. • Worn low-pressure seals in the pump. • Worn O-ring in gun. |
| System will not build up to pressure | <ul style="list-style-type: none"> • Worn Nozzle. • Improper nozzle size for system specifications. • Foreign material trapped in seat. |
| Pressure drop | <ul style="list-style-type: none"> • Worn Nozzle. • Worn piston and seat in regulator. • Air in system, poor connections. • Insufficient flow to pump. • Filter clogged. Check and clean regularly. • Fatigued or broken spring washers. |
| Pressure spikes while in bypass | <ul style="list-style-type: none"> • Minimum bypass of 5% not present. • Excessive pressure adjustment made for worn nozzle. Replace nozzle and reset system pressure. |
| Leakage from regulator vent hole | <ul style="list-style-type: none"> • Worn O-ring around piston service with O-ring kit. • Piston Retainer scored. Service with O-ring kit and or top slots, replace retainer. • Fatigued or broken spring washers. |

CUTAWAY



PARTS LIST

| Item | Description | MATL | 7001 | 7002 | 7003 | 7011 | 7012 | 7013 | 7014 | 7021 | 7022 | 7023 | 7024 | 7031 | 7032 | 7033 |
|------|---|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 401 | Nut, Adjusting | BB | 30758 | 30758 | 30758 | 30759 | 30759 | 30759 | 30759 | 30760 | 30760 | 30760 | 30760 | 30760 | 30760 | 30760 |
| 405 | Washer, Anti-Rot | STL | 34491 | 34491 | 34491 | 34492 | 34492 | 34492 | 34492 | 34493 | 34493 | 34493 | 34493 | 34493 | 34493 | 34493 |
| 406 | Body, Upper | STNP | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | <i>Body, Upper (.200 Option)</i> | S | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 408 | Spring Set | STL | 76201 | 76202 | 76202 | 76211 | 76212 | 76213 | 76214 | 76221 | 76222 | 76223 | 76224 | 76221 | 76222 | 76223 |
| 410 | Retainer, Piston | SSS | 30873 | 30873 | 30874 | 30875 | 30875 | 30876 | 30876 | 30877 | 30877 | 30878 | 30878 | 30877 | 30877 | 30878 |
| | <i>Retainer, Piston (.100 Option)</i> | SS | 33885 | 33885 | 33886 | 31635 | 31635 | 31666 | 31666 | 33877 | 33877 | 31878 | 31878 | 33877 | 33877 | 31878 |
| 418 | Piston, Conical | SSB | 31733 | 31733 | 31734 | 31738 | 31738 | 31739 | 31739 | 31743 | 31743 | 31744 | 31744 | — | — | — |
| | Piston, Conical | SSSS R | — | — | — | — | — | — | — | — | — | — | — | 31749 | 31749 | 31750 |
| 421 | Ring, Retainer | STL R | 30585 | 30585 | 30585 | 30886 | 30886 | 30886 | 30886 | 30887 | 30887 | 30887 | 30887 | 30887 | 30887 | 30887 |
| 435 | Stem, Piston | STL | 30588 | 30588 | 30588 | 30889 | 30889 | 30889 | 30889 | 30892 | 30892 | 30892 | 30892 | 30892 | 30892 | 30892 |
| 436 | Seat, Conical | SSB | 31732 | 31732 | 31732 | 31736 | 31736 | 31736 | 31736 | 31742 | 31742 | 31742 | 31742 | — | — | — |
| | Seat, Conical | SSSS R | — | — | — | — | — | — | — | — | — | — | — | 31748 | 31748 | 31748 |
| 440 | Body, Lower | STNP R | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | <i>Body, Lower (.100, .200 Options)</i> | SS | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| 468 | Kit, O-Ring, Hex Body Style | FPM | 30771 | 30771 | 30775 | 30777 | 30777 | 30781 | 30781 | 30783 | 30783 | 30787 | 30787 | 30783 | 30783 | 30787 |

For EPDM O-Ring Kits add .0220 to the FPM kit part numbers (i.e., 30771.0220)

It is recommended to replace spring washers and flat washers as a set.

Italics are optional items. See Tech Bulletins 022, 044, 097 and 102 for additional information. R components comply with RoHS Directive.
 Material Codes (Not Part of Part Number): BB=Brass FPM=Fluorocarbon S=304SS SS=316SS SSB=316SS Condition B SSS=416SS SSSS=440SS
 STNP=Steel/Nickel Plated STL=Steel. Contact Cat Pumps for optional NBR or EPDM O-Ring Kits.

⚠ CAUTIONS AND WARNINGS

All high-pressure systems require a primary pressure regulating device (i.e. regulator, unloader) and a secondary pressure relief device (i.e. pop-off valve, relief valve). Failure to install such relief devices could result in personal injury or damage to pump or property. Cat Pumps does not assume any liability or responsibility for the operation of a customer's high-pressure system. Read all CAUTIONS and WARNINGS before commencing service or operation of any high-pressure system. The CAUTIONS and WARNINGS are included in each Service Manual and with each Accessory Data sheet. CAUTIONS and WARNINGS can also be viewed online at www.catpumps.com/dynamic-literature/cautions-and-warnings or can be requested directly from Cat Pumps.

WARRANTY

View the Limited Warranty online at www.catpumps.com/literature/cat-pumps-limited-warranty