

The **Smith Meter™ Pressure Sustaining (Model 200-60A) and Pressure Relief (Model 201-60A) Valves** are hydraulically-operated, globe-pattern control valves. These valves are diaphragm actuated. As a pressure sustaining control valve, the Model 200-60A maintains a constant system upstream pressure. The Model 201-60A automatically relieves and maintains constant pressure, typically at pump discharge.

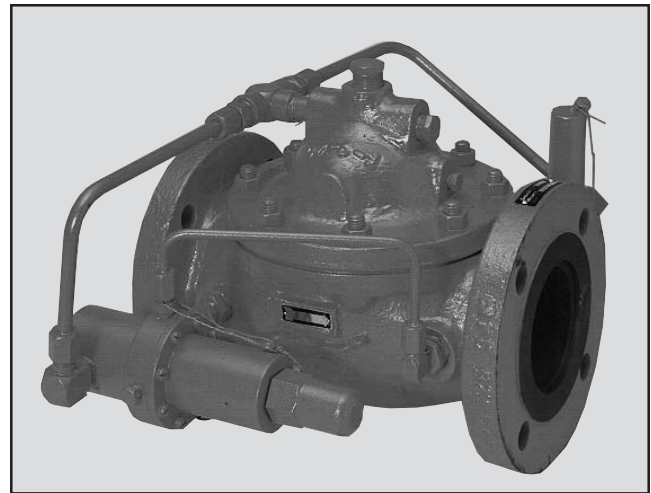
### Features

- **Automatic Operation.**
- **Simple Construction** - Reduces maintenance costs and downtime.
- **Versatile Horizontal or Vertical Applications** - May be combined with other Smith pilots to provide multiple control functions.
- **Fail-Closed Design on 200-60A** - Reduces danger of runaway product in case of failure.

### Principle of Operation

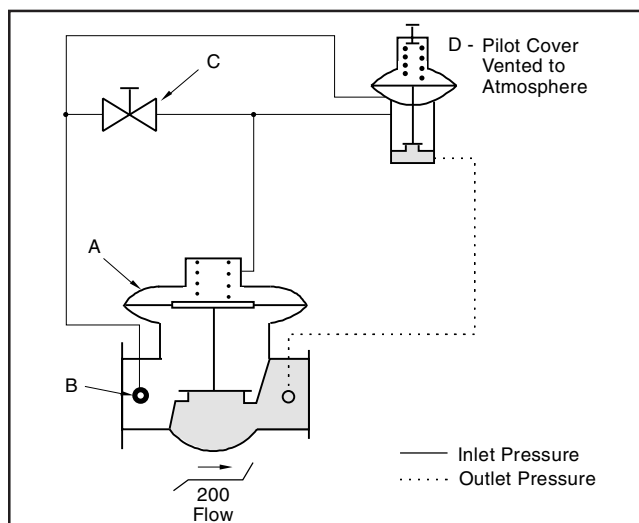
The Smith Meter™ Model 200-60A regulates system pressure by sensing the upstream pressure at the inlet-side of the valve using an integral sense line.

When pressure at the inlet-side (upstream) of the valve is below the pressure setting of the 60A pilot, the pressure in the control cover chamber is insufficient to overcome the pilot spring which is holding the pilot stem assembly closed. With the 60A pilot closed, the pressure above and



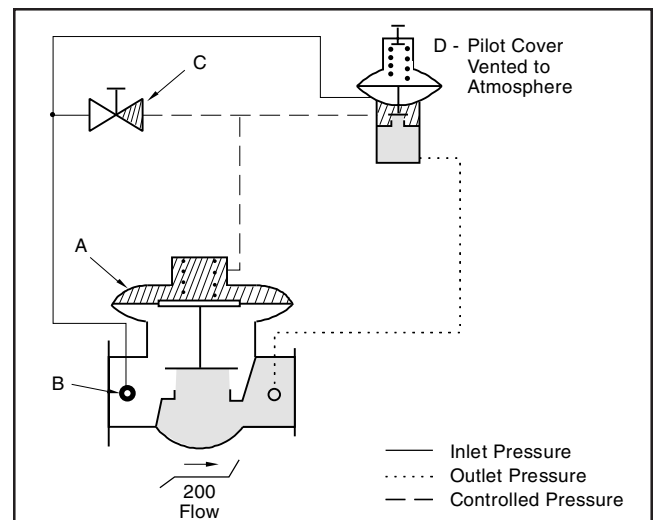
below the main valve (Model 200) diaphragm is balanced and the valve is held closed by the main valve spring in its cover chamber (Figure 1).

As the upstream system pressure increases and eventually exceeds the pilot pressure setting, the pressure in the control cover chamber overcomes the pilot spring and gradually raises the pilot stem assembly and opens the flow path through the pilot seat orifice. The hydraulic pressure in the main valve cover chamber is then vented through the pilot orifice to the downstream side of the 200 valve. The pressure across the 200 valve diaphragm becomes unbalanced, and the higher pressure force beneath the diaphragm overcomes the valve spring and raises the stem assembly. This action causes the 200 valve to open gradually and to permit flow. Any variation in the upstream pressure is immediately sensed by the 60A pilot. The continuous pressure sensing of the 60A provides modulating control for the 200 valve (Figure 2).



**Figure 1 — Pressure Sustaining Valve with Insufficient Back Pressure**

- A 200 Series flow to close control valve.
- B 09SC Self Cleaning Strainer.
- C Model 13 Needle Valve to adjust control valve opening and closing speed.
- D Model 60A Pressure Sustaining Pilot.



**Figure 2 — Pressure Sustaining Valve with Sufficient Back Pressure**

## Applications

The Smith Model 200-60A Pressure Sustaining Control Valve is a “flow-to-close” (flow over the seat) valve installed to allow the valve to close automatically in the event of diaphragm failure. It is ideally suited for applications where it is desirable to maintain a constant upstream system pressure. A typical example is a multiple position loading rack fed by an undersized pumping system. If all of the loading positions are in operation, it is possible that product cavitation could result across a meter or meters due to insufficient back pressure against the meter(s). A 200-60A valve properly installed and adjusted will sustain the required back pressure to prevent the cavitation from occurring.

The Smith Model 201-60A Bypass Relief Valve is a “flow-to-open” (flow under the seat) valve installed so that product will flow even if the diaphragm fails. The most common application for this valve is in service as pump bypass relief. The valve is installed in a product recirculating loop originating on the discharge side of a pump (Figure 3). In a multiple loading arm installation where all positions use a single pump discharge, pressure relief for system component protection is required when several positions are in use. The Model 201-60A will automatically relieve the pump discharge pressure by continually monitoring that pressure and opening when the pressure exceeds the predetermined 60A pilot setting.

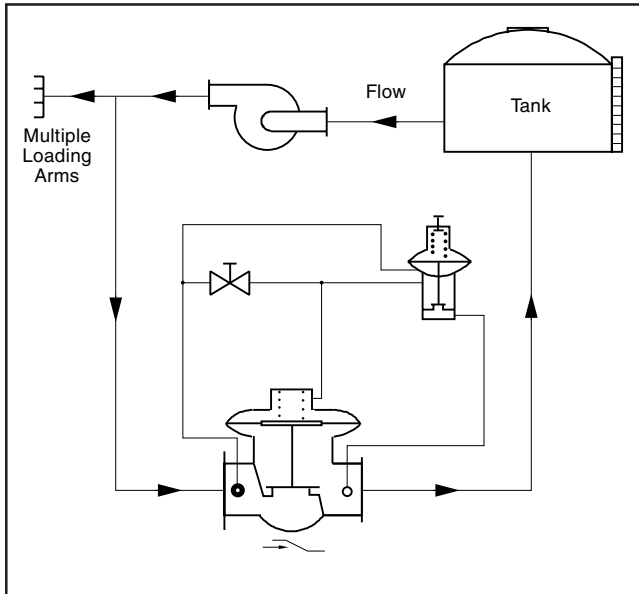


Figure 3 — Model 201-60A Pressure Relief Valve

Additional control functions can be added to either the 200-60A or 201-60A pressure control valves. Other options are solenoid block (Model 30A), maximum rate of flow control (Model 40A), pressure reducing (Model 60B), and check and thermal relief (Model 80B/07).

## Specifications

### Nominal Flow Ratings

Size	Flow		Cv
	USGPM	L/min	
2"	130	492	50
3"	420	1,600	133
4"	600	2,250	204
6"	1,000	3,750	436

### Maximum Product Viscosity

200 SSU (40 mPa·s<sup>1</sup>). Above 200 SSU, consult factory.

### Pressure Rating/Connections<sup>2,3</sup>

Class 150 ASME, 285 psi (19.6 bar).

Class 300 ASME, 300 psi (20.7 bar).

### Temperature Range

Valve Elastomer	Temperature Range <sup>2,4</sup>
LS (Low Swell) Buna	-20°F to 200°F (-28°C to 93°C)
Buna-N	-20°F to 200°F (-28°C to 93°C)
Viton	-20°F to 350°F (-28°C to 177°C)

### Materials of Construction

Component	Body	Internals	Elastomers
Model 202/203	Cast Steel	Bronze, Stainless Steel, Carbon Steel, Ductile Iron Options: No Bronze Epoxy Coating	Low Swell Buna <sup>5</sup> , Viton or Buna-N
09SC Strainer	Carbon Steel	304 Stainless Steel	—
13 Needle Valve	Carbon Steel	Stainless Steel, Carbon Steel	Teflon
60A	Carbon Steel	300 Stainless Steel, Carbon Steel	Viton, Buna

1 1 mPa·s = 1 cP.

2 Pressure ratings are based on temperatures of -20°F to 100°F (-28°C to 38°C). For operation at higher temperatures, the maximum working pressure may be derated.

3 PED requirements limit applications to liquids with maximum vapor pressures of .5 bar above atmospheric pressure, at maximum allowable temperature.

4 For temperature outside these ranges, consult factory.

5 Standard; for other elastomer material, consult factory.

## Weight

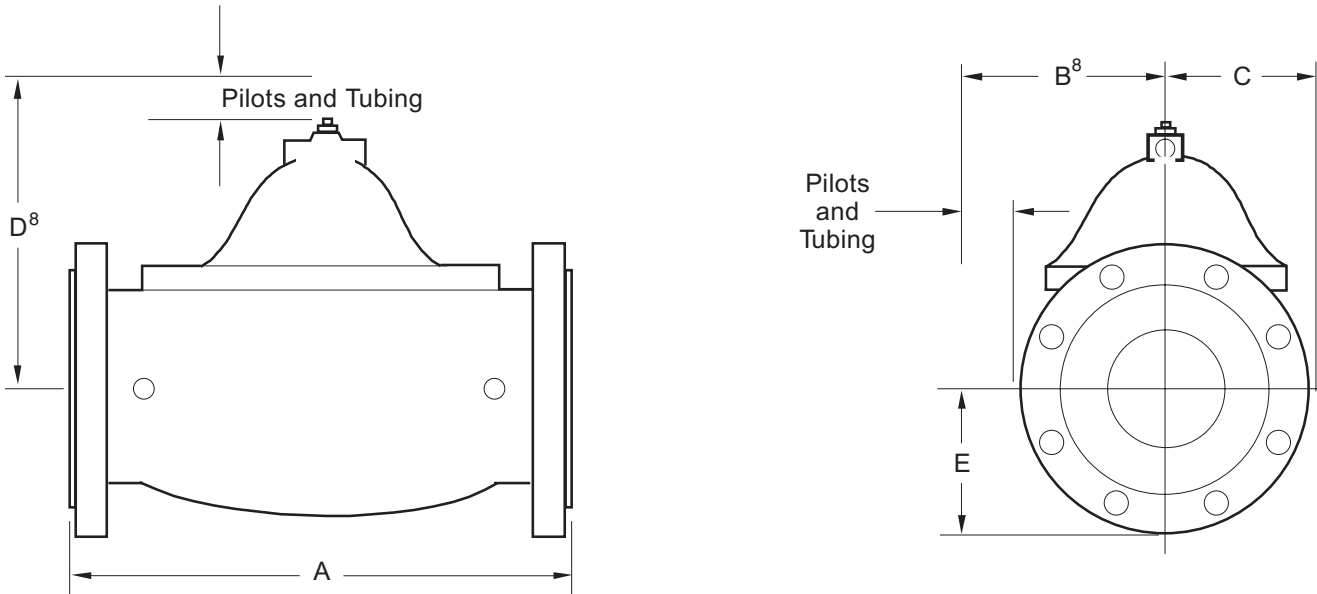
Model	Size	Weight - lb (kg)
200-60A & 201-60A	2"	48 (22)
	3"	85 (39)
	4"	138 (63)
	6"	260 (118)

## Ordering Information

Operating Conditions	Liquid - name and specific gravity, or API gravity, temperature range <sup>7</sup> viscosity range <sup>7</sup> , maximum working pressure and pressure settings.
Seals	Low Swell Buna, Viton, Buna-N.

## Dimensions

Inches (mm)



Model	Size	A		B <sup>8</sup>	C	D <sup>8</sup>	E
		Class 150 ASME Flange	Class 300 ASME Flange				
200-60A and 201-60A	2"	8.0 (203)	8.5 (216)	8.0 (203)	4.0 (102)	7.5 (140)	3.0 (76)
	3"	11.0 (279)	11.8 (299)	9.5 (241)	4.0 (102)	9.5 (241)	4.1 (105)
	4"	13.5 (343)	14.2 (362)	9.5 (241)	4.9 (124)	9.5 (241)	4.5 (114)
	6"	17.0 (432)	17.9 (454)	11.0 (279)	6.6 (168)	12.5 (318)	5.5 (140)

**Note:** Dimensions — Inches to the nearest tenth (millimeters to the nearest whole mm), each independently dimensioned from respective engineering drawings.

<sup>7</sup> Minimum, normal, and maximum.

<sup>8</sup> Pilots and tubing will be within these dimensions.

Page 2: Removed reference to 200P42A-29/13 and 8", 10" and 12" valves. Revised Temperature Range and Materials of Construction.  
Added footnote for PED.  
Page 3: Removed reference to 8", 10" and 12" valves.  
Page 4: Removed figure 3 reference to 200P-42A-29/13 valves.

The specifications contained herein are subject to change without notice and any user of said specifications should verify from the manufacturer that the specifications are currently in effect. Otherwise, the manufacturer assumes no responsibility for the use of specifications which may have been changed and are no longer in effect.

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