SINGER VALVE
Result-Based Solutions. Globally.™

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SINGER MODEL 106/206-RF-PR

Rate of Flow and Pressure Reducing Valve Schematic A-7634C1
Installation, Operating and Maintenance Instructions

DESCRIPTION:

Singer Model 106/206-RF-PR is a pilot operated valve that keeps the flow constant regardless of upstream and downstream pressure fluctuations. Rate of Flow Pilot (7) senses differential pressure across Orifice (6) and positions Main Valve (1) as required to limit the flow to the predetermined maximum.

The flow setting can be adjusted over a limited range by adjusting Pilot (7); a typical ratio is 2:1 between maximum and minimum flow setting. The orifice plate must be changed for larger flow setting changes.

The differential pressure setting of Pilot (7) is designed to minimize the pressure drop across the orifice plate for the set point flow . Typically Pilot (7) is set for an orifice plate differential of 3 to 10 psi. Pressure drop across the orifice plate increases exponentially as the flow setting is adjusted above this original set point.

This valve also senses the downstream pressure and prevents that pressure from exceeding the setting of Pressure Reducing Pilot (8).

DESCRIPTION OF OPERATION:

Main Valve (1) is normally open when pressure is applied to the valve inlet. When the same pressure is applied to the Main Valve bonnet, Main Valve (1) closes tight because the area of the diaphragm is greater than the area of the seat. The pressure above the diaphragm determines the position of the Main Valve.

The pressure above the diaphragm is controlled by a pilot circuit consisting primarily of Fixed Restriction (5), Pressure Reducing Pilot (8) and Rate of Flow Pilot (7). Rate of Flow Pilot (7) senses the pressure differential produced by Orifice (6).

At flows below set point, Rate of Flow Pilot (7) is open because the differential pressure produced by Orifice (6) is not sufficient to overcome the spring force. The bonnet of Main Valve (1) is vented to downstream and the Main Valve remains open.

When flow reaches the desired maximum, pressure drop across Orifice (6) closes Rate of Flow Pilot (7). Bonnet pressure increases and the Main Valve starts closing. The valve then modulates to keep the flow constant.

Pressure Reducing Pilot (8) senses the downstream pressure of the Main Valve through Rate of Flow Pilot (7). If the downstream pressure reaches the setpoint of Pilot (8), Pilot (8) starts modulating the Main Valve to keep the downstream pressure from exceeding the setpoint of Pilot (8).

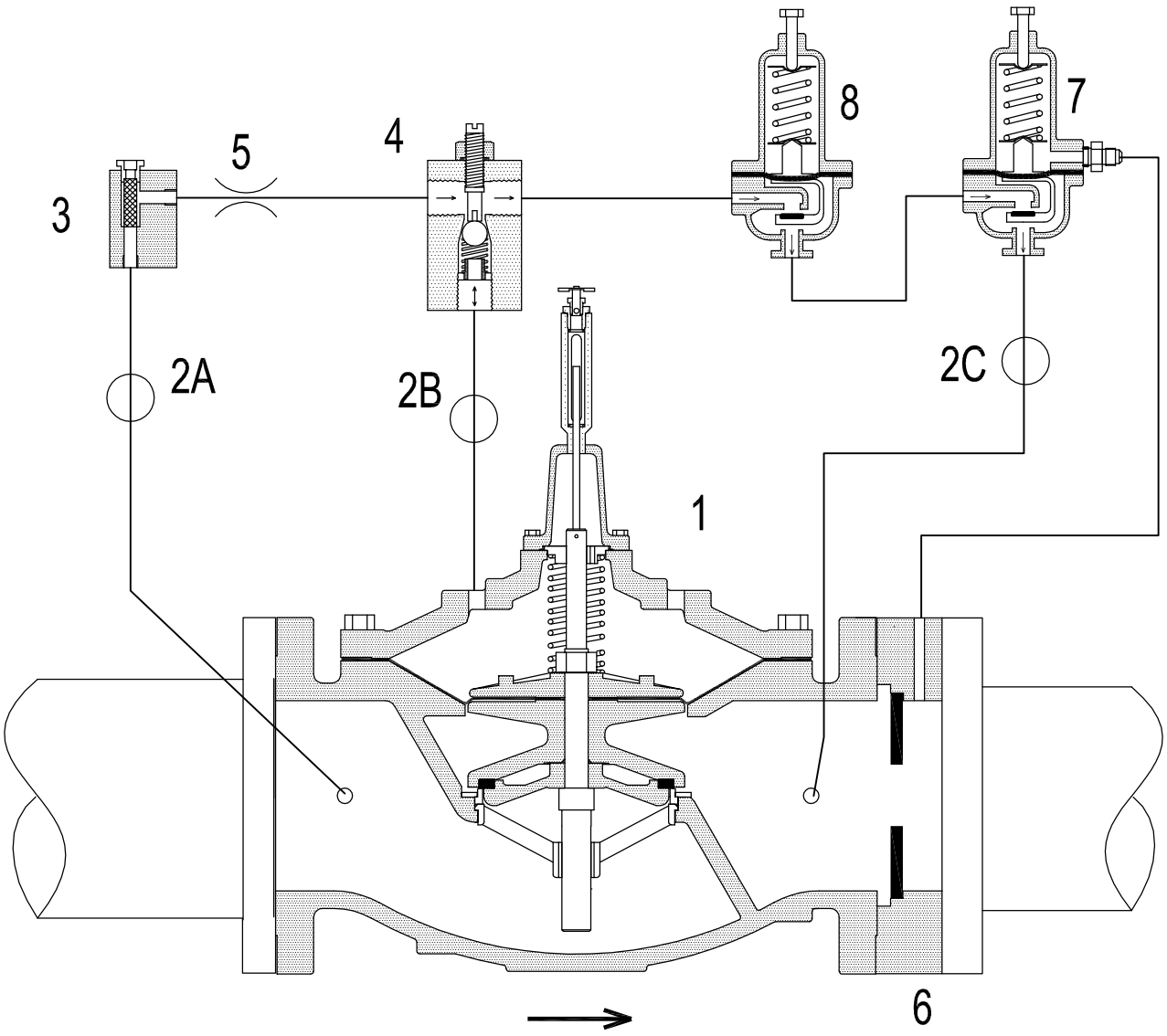
INSTALLATION:

1. See 106/206-PG "Installation".
2. Install Orifice Housing and Plate on the outlet flange of Main Valve (1) or further downstream. Orifice Plate and Orifice Screws are on the upstream (Main Valve) side of the Housing. Sensing connection is on the downstream side of the Orifice Plate. Make sure that the Housing is installed correctly.

ADJUSTMENT:

1. To adjust the flow setting, turn Rate of Flow Pilot (7) adjusting screw counterclockwise for reduced flow, clockwise for increased flow. When adjusting flow setting, downstream pressure must be below the setting of Pressure Reducing Pilot (8).
2. To adjust Pressure Reducing Pilot (8), turn adjusting screw clockwise for increased pressure, counterclockwise for reduced flow. When adjusting Pressure Reducing Pilot (8), the flow must be less than the setting of Rate of Flow Pilot (7).
3. If the valve starts to oscillate or hunt, adjust Flow Stabilizer (4). Refer to Model 26 instructions.

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1. Main Valve - Model 106/206-PG c/w Position Indicator.
2. Isolating Valves - A,B,C - standard on all sizes.
3. Strainer - 40 mesh - J0098A.
4. Flow Stabilizer - Model 26.
5. Fixed Restriction.
6. Orifice Housing and Plate.
7. Rate of Flow Pilot - Model 160-RF.
8. Pressure Reducing Pilot - Model 160.

Rate of Flow and Pressure Reducing Valve c/w Orifice Housing and Plate.

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Date:	Drawing:
September 5, 2004	A-7634C1

Model 106 or 206-RF-PR (with orifice housing)