SINGER VALVE
Result-Based Solutions. Globally.™

12850-87th Avenue
Surrey, BC. Canada. V3W 3H9
Ph: 604-594-5404
Fx: 604-594-8845
www.singervalve.com

SINGER MODEL 106/206-RF

Rate of Flow Control Valve Schematic A-7427C
Installation, Operating and Maintenance Instructions

DESCRIPTION:

The Singer Model 106/206-RF is a pilot operated valve that limits the flow to a predetermined maximum regardless of upstream and downstream pressure fluctuations. Rate of Flow Pilot (7) senses differential pressure across Orifice Plate (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. Orifice Plate (6) must be changed for flow setting outside of this range.

Differential pressure setting of Pilot (7) is designed to minimize the pressure drop across Orifice Plate for the set point flow. Normally, Orifice Plate differential pressure is 3 at the low end of the range and 12 psi at the high end of the range. Pressure drop across Orifice Plate (6) increases exponentially as the flow setting is increased.

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 bonnet, the Main Valve closes tight because the area of the diaphragm is greater than the area of the seat. Pressure above the diaphragm determines the position of the Main Valve.

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

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

When flow reaches the desired maximum, pressure drop across Orifice Plate (6) closes Pilot (7). Bonnet pressure increases and Main Valve (1) starts closing. The valve then modulates to keep the flow from exceeding the set point.

INSTALLATION:

1. See 106/206-PG "Installation".
2. Install Orifice Plate (6) between two flanges downstream of the Main Valve outlet. The Orifice Plate is designed to fit inside the bolt circle of the Main Valve.
3. **INSTALL BALL VALVE (8) WITH PILOT TUBE FITTINGS IN THE CUSTOMER SUPPLIED HEADER CONNECTION**, as shown on Schematic A-7427C.
4. NOTE: Singer supplied orifice housing, with all necessary pilot connections, are available as an OPTION.
5. Pressurize the valve slowly and vent air from the Main Valve bonnet. Use Wing Nut on top of the Position Indicator to bleed air.

ADJUSTMENT:

1. To adjust the flow setting, turn Pilot (7) adjusting screw counterclockwise for reduced flow, clockwise for increased flow.
2. If the valve starts to oscillate or hunt, adjust Flow Stabilizer (4). Refer to Model 26 instructions.

SERVICE SUGGESTIONS:

In addition to service suggestions listed in the 106-PG/206-PG instruction, we suggest the following:

IF THE VALVE FAILS TO CLOSE:

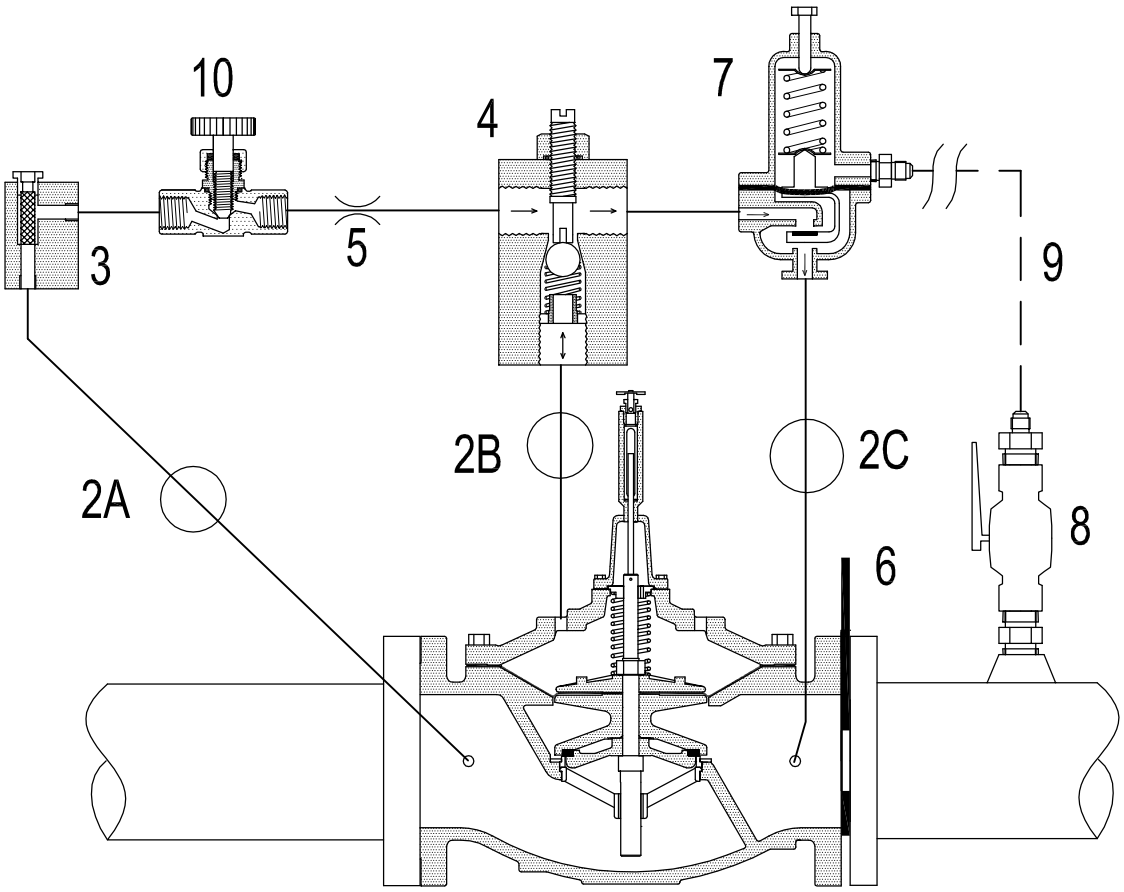
Check that Isolating Valves (2A), (2B) and (8) are open. Close Isolating Valve (2C). If the Main Valve closes, Pilot (7) is defective.

If the valve does not close, close Isolating Valve (2A). Remove the copper tube between Strainer (3) and Flow Stabilizer (4). If there is continuous flow from Flow Stabilizer (4), Main Valve diaphragm is ruptured. If there is no flow from Flow Stabilizer (4), open Isolating Valve (2A) slowly. If there is no flow, Strainer (3) is plugged.

IF THE VALVE FAILS TO OPEN:

- Isolating Valve (2B) or (2C) is closed.
- Flow Stabilizer (4) incorrectly set.
- Insufficient pressure drop available.

A-7427C



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 - standard on all sizes.
4. Flow Stabilizer - Model 26.
5. Fixed Restriction.
6. Orifice Plate, Paddle style (to fit inside flange bolt circle) .
7. Rate of Flow pilot - Model 160-RF.
8. 1/2" Ball Valve and Flare Fittings for 3/8" Tube.
9. Sensing Tubing and Installation - BY OTHERS.
10. Closing Speed Control - model 852-B - OPTIONAL.
11. Orifice Housing (not shown) - OPTIONAL.

Rate of Flow Valve.

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Drawn By:	Approved By:
Kari Oksanen	Kari Oksanen
Date:	Drawing:
September 5, 2004	A-7427C

Model 106 or 206-RF