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-PFC

Pressure – Flow Control Valve Schematic A-8270D
Installation, Operating and Installation Instructions

DESCRIPTION:

Without the PFC Actuator (6B) and Orifice Housing and Plate Assembly (7), Model 106/206-PFC is a pilot operated pressure reducing valve designed to automatically reduce a high inlet pressure into a lower outlet pressure. The valve will maintain a relatively steady downstream pressure regardless of fluctuations in the supply pressure or flow rate.

Addition of PFC Actuator (6B) and Orifice Housing and Plate Assembly (7) adds the ability to increase the outlet pressure proportional to pipe friction. This means that the valve can maintain a relatively constant pressure at a **remote location** under varying flows. The amount of pressure increase can be limited to a given maximum value.

The orifice plate must be sized for the particular conditions of the application.

NOTE: With any manufactured product there is a risk of malfunction in service, whether by operating conditions such as a plugged strainer or normal wear and tear. Singer Valve recommends regular maintenance with frequency to suit the importance to customers application. We draw attention to our warranty which limits our responsibility to defects in workmanship and materials only. See Singer Valve Inc. Warranty IOM 613 attached and forming part of this Instruction and Operating Manual.

Unless otherwise specified, the valve will be assembled for service temperatures to 180°F (80°C). Higher temperature ratings are available - consult SINGER VALVE for details.

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. Refer to 106/206-PG 'Description of Operation'. By controlling the pressure in the bonnet, the Main Valve can be made to open fully, close tight or open partially.

Bonnet pressure (and therefore the position of the Main Valve) is controlled by a pilot circuit consisting of Fixed Restriction (5), Flow Stabilizer (4), if so equipped and Pressure Reducing Pilot (6A).

When there is no demand (and the downstream pressure is at the setting of Pilot [6A]), Pilot (6A) is closed. Pressure from the inlet side of the Main Valve is directed to the bonnet through Fixed Restriction (5) and Flow Stabilizer (4), if so equipped. The Main Valve closes. When flow is required, Pilot (6A) senses a drop in pressure and opens. Flow through Pilot (6A) is greater than flow through Fixed Restriction (5). Bonnet pressure is reduced and the Main Valve opens to supply the demand. Speed of opening is determined by the setting of Flow Stabilizer (4), if so equipped. Refer to Model 26 instructions for details and adjustment.

Under flowing conditions, Pilot (6A) reacts to small changes in pressure to modulate the bonnet pressure (and Main Valve position) as required to keep the downstream pressure constant. Note that the Main Valve position follows the position of Pilot (6A). When Pilot (6A) closes, the Main Valve closes. When Pilot (6A) opens, the Main Valve opens.

PFC Actuator (6B) and Orifice Plate and Housing Assembly (7) adjust Pressure Reducing Pilot (6A) to increase the outlet pressure as the flow increases.

ORIFICE SIZING:

1. Determine how much pressure increase is required and corresponding flow.

   Example: Downstream pressure of 50 psi is required at low flow. A pressure increase to 80 psi is desired when the flow reaches 500 USGPM. This means that 30 psi pressure increase is required at 500 USGPM.

2. Refer to **Guide – Pressure Increase vs Flow**. 30 psi pressure increase on the vertical axis corresponds to 3 on the horizontal axis. Dividing 500 USGPM by 3 gives a **required Orifice Cv of 167.**

3. Refer to enclosed **Orifice Cv table** to select orifice diameter.

NOTE: A butterfly valve or ball valve with a gear operator can be used in place of the orifice to give the ability of adjusting the amount of pressure increase at any given flow. Contact your Singer Valve representative for details.

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INSTALLATION:

1. Refer to 106/206-PG 'Installation'.
2. Installation where there is loosely held piping and/or elbows close to the valve may cause the valve to pulsate.

ADJUSTING PROCEDURE:

1. Open Isolating Valves (2A, 2B, 2C and 2D).
2. Crack outlet stop valve and slowly open inlet stop valve wide.
3. Bleed air from Main Valve bonnet. SEE 106/206-PG 'INSTALLATION'.
4. Open outlet stop valve wide.
5. Set **low flow** reduced (downstream) pressure by turning Pilot (6A) adjusting screw: To increase pressure, turn adjusting screw clockwise. - To reduce pressure, turn adjusting screw counterclockwise. **NOTE THAT THERE MUST BE FLOW THROUGH THE VALVE WHEN PRESSURE IS ADJUSTED but this flow must be low enough to not produce any significant pressure drop on the orifice.**
6. **IF THE VALVE DOES NOT OPEN** (pressure remains low), check the adjustment of Flow Stabilizer (4), if so equipped. **SEE MODEL** 26 **INSTRUCTIONS.**
7. **IF THE VALVE BEGINS TO OSCILLATE OR HUNT:**

- Bleed air from Main Valve bonnet. **SEE** 106-PG/206-PG '**INSTALLATION**'.
- Adjust Flow Stabilizer (4), if so equipped. **SEE MODEL** 26 **INSTRUCTIONS.**

Set maximum pressure increase:

- Bleed air from PFC Actuator (6B) by closing Speed Control (9) and opening Test Valve (8). Observe Actuator Position Indicator. It should move down when Test Valve (8) is opened. Cycle the actuator until no air appears in the outlet of Test Valve (8).
- Note that the outlet pressure increases during above procedure. Set the maximum pressure increase to desired limit by adjusting 160-PFC Travel Stop. Loosen the locknut and thread seal to prevent damage to the thread seal.

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, 2C and 2D) are open. Close Isolating Valve (2C). If the Main Valve closes, Pilot (6A) is defective.

If the valve does not close, close Isolating Valves (2A, 2B and 2C). Remove the copper tube between Strainer (3) and Flow Stabilizer (4), if so equipped. Open Isolating Valve (2B). 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.

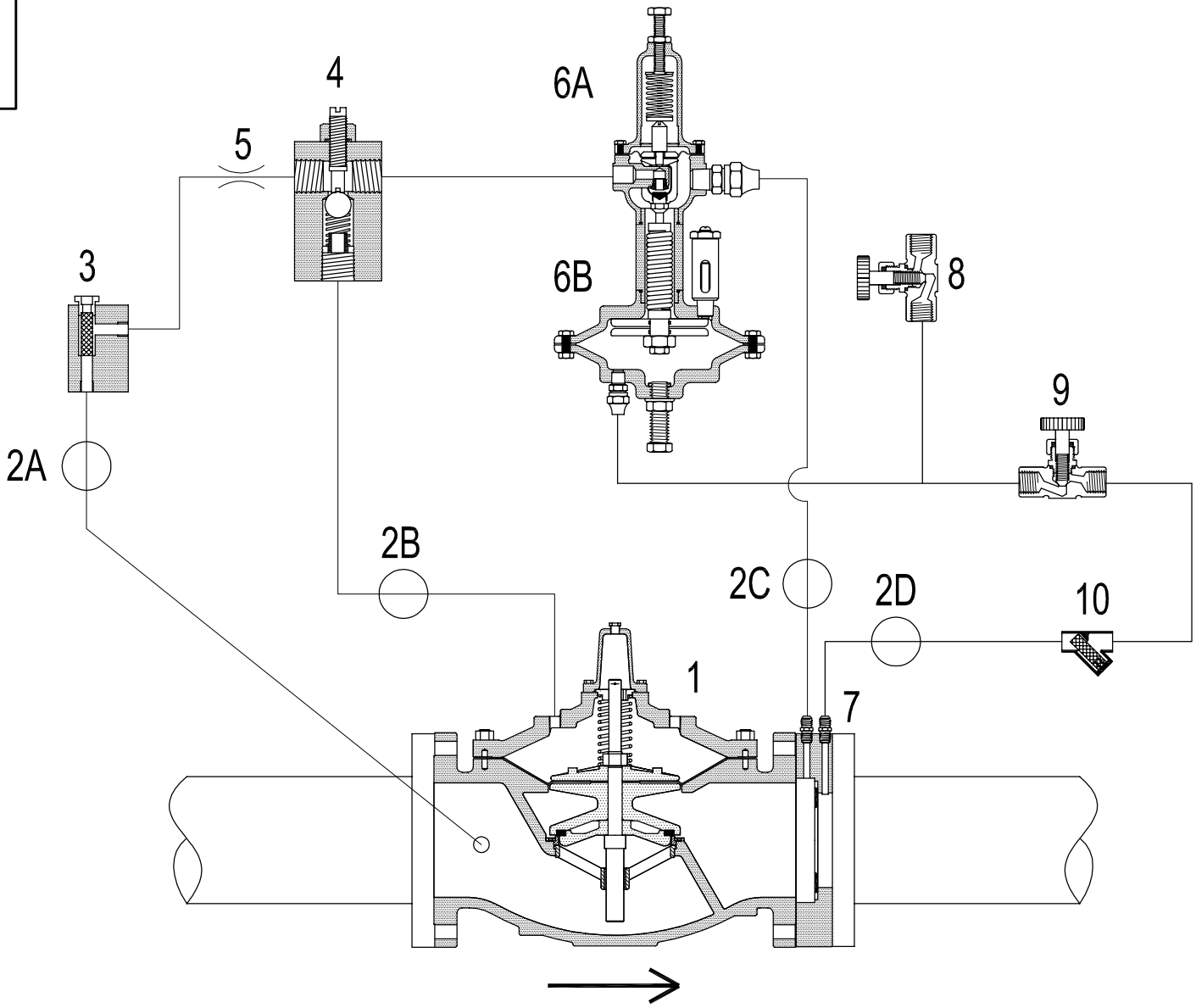
IF THE VALVE FAILS TO OPEN:

1. Check that Isolating Valves (2B) and (2C) are open.
2. Check Flow Stabilizer (4), if so equipped. See Model 26 Instructions.

IF THE PFC ACTUATOR PULSATES:

1. Bleed air from the actuator as explained above.
2. Close Speed Control (9) and open it just enough to not cause pulsing.

A-8270D



1. Main Valve - Model 106/206-PG.
2. Isolating Valve - A,B,C,D.
3. Strainer - J0098A.
4. Flow Stabilizer - Model 26 - 8" 106/10" 206 and smaller only.
5. Fixed Restriction.
6. Pressure-Flow Control Pilot - Model 160-PFC.
7. Orifice Housing and Plate.
8. Test Valve - Model 852-B.
9. Speed Control - Model 852-B.
10. Strainer - "Y" type- OPTIONAL.

Pressure - Flow Control Valve.

*PATENTED

Model 26 removed from 10" 106/12" 206 and larger April 25, 2008

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Drawn By:	Approved By:
Eugene Bahia	Kari Oksanen
Date:	Drawing:
October 31, 2000	A-8270D

Model 106 or 206-PFC