SINGER VALVE
Result-Based Solutions. Globally.™

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SINGER MODEL 106/206-RPS-RR

Anticipating Relief Valve (on Rate of Rise)
Installation, Operating and Maintenance Instructions
up to 6" 106/8" 206 Schematic A-7340F
8" 106/10" 206 & larger Schematic A-7340F1

DESCRIPTION:

Model 106/206-RPS-RR is an anticipating relief valve designed to dissipate surges caused by power failure or other sudden stoppage of a pump.

The valve opens when the header pressure rises faster than a rate determined by the pilot system. The valve also opens if the header pressure reaches the setpoint of Relief Pilot (13).

MODEL 106/206-RPS-RR:

- Anticipates the surge by opening as soon as the pressure starts to rise.
- Closes after the surge has been dissipated and the header pressure is stable.
- Handles initial filling of the system automatically.
- Is not affected by over sizing the way standard anticipating surge valves are.

DESCRIPTION OF OPERATION:

Main Valve (1) closes when **BOTH** Pilot (12) and Pilot (13) are closed. The Main Valve opens when **EITHER** Pilot (12) or Pilot (13) opens. On larger valves (Schematic A-7340F1), Pilot (12) acts through a Booster Valve (18) to increase opening speed.

When the header pressure increases slowly, the two pressures sensed by Pilot (12) remain equal and Pilot (12) remains closed. When the header pressure increases rapidly, the pressure in the spring casing (above the diaphragm) of Pilot (12) lags behind the pressure below the diaphragm. Pilot (12) opens. The rate of pressure rise required to open Pilot (12) depends on Accumulator (11) and the size of Fixed Restriction (15).

For Schematic A-7340F, Pilot (12) opens the Main Valve (1) as soon as the header pressure starts increasing after a power failure (pump stoppage). This gives the Main Valve sufficient time to be fully open before the pressure rises to destructive levels.

For schematic A-7340F1, Pilot (12) operates the Main Valve by opening Booster Valve (18). When Booster Valve (18) opens, the Main Valve opens. When Booster Valve (18) closes, the Main Valve closes.

Pilot (13) opens the Main Valve if the header pressure reaches the set point of Pilot (13).

INSTALLATION:

Model 106/206-RPS-RR is installed on a "Tee" from the main line (header) into atmosphere.

1. Refer to 106/206-PG "installation". Bypass and strainer are normally not used.
2. Model 106/206-RPS-RR operates under conditions which cause very high velocities and severe cavitation. These conditions may cause considerable vibration. The supports for the valve must be designed accordingly.
3. **CONNECT PILOT SENSING (6) TO THE HEADER.**
4. Open isolating valves (7), (14 A) and (14 B).

ADJUSTMENT AND TEST PROCEDURE:

1. Setting of Pilot (12) and pre-charge of Accumulator (11) should not be changed without a clear understanding of the consequences. These are factory set and should not require adjustment.
2. Relief Pilot (13) can be set approximately by removing the tubing from the outlet of Pilot (13) and observing Pilot (13) under maximum pumping pressure. Pilot (13) should be set about one turn of the adjusting screw higher than the point where it starts leaking.
3. If a more exact pressure setting is required, a hydrostat pump or other source of pressure should be connected to the sensing line of Pilot (13).
4. To test Accumulator (11), Check Valve (16) and Fixed Restriction (15):

a) Close Isolating Valve (14 B).
b) Close Isolating Valve (7).
c) Open Strainer Flush Valve (4). Water should flow for one or two seconds and should then stop suddenly. There should not be any appearance of air in the flow.
d) Close Strainer Flush Valve (4).
e) Observe Pressure Gauges (9) and (10) and open Isolating Valve (7). Gauge (9) should jump to line pressure immediately but Gauge (10) should rise slowly and steadily over several seconds. The rate at which Gauge (10) rises is the rate of pressure rise that triggers Pilot (12).

If it is desired to test Differential Pilot (12) and Main Valve (1), repeat above procedure with Isolating Valve (14 B) open. Main Valve (1) should open fast and close slowly after the pressure readings in Gauges (9) and (10) have equalized.

NOTE: DO NOT ADJUST PILOT (12) TO ADJUST THE RATE OF RISE SETTING. If a different rate is required, Fixed Restriction (15) must be changed.

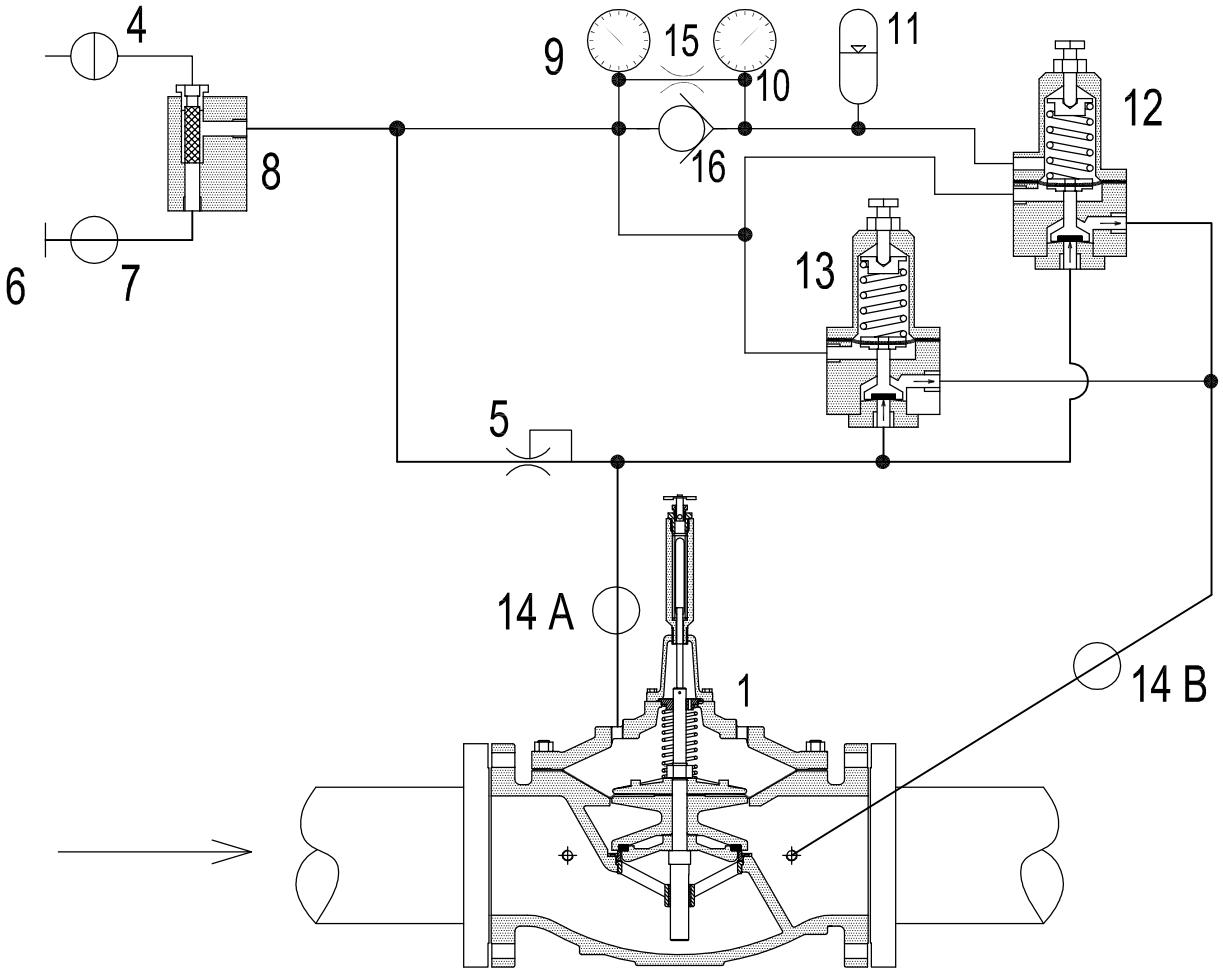
If the closing speed of Main Valve (1) needs adjustment, insert of Flow Control (5) must be changed.

Accumulator loading should be approximately 20% of the maximum pumping pressure. This loading can be tested **IF REQUIRED** at the fitting on top of Accumulator (11). The loading should not be checked too frequently, as some nitrogen will be lost on each test. Only nitrogen should be used for charging the accumulator.

After testing, check to make sure that Isolating Valves are in the proper position:

- Valves 7, 14 A and 14 B - **OPEN**
- Valve 4 - **CLOSED**

A-7340F



1. Main Valve - Model 106/206-PG c/w Position Indicator.
4. Strainer Flush Valve - NORMAL POSITION CLOSED.
5. Flow Control - J0077A.
6. CONNECTION TO HEADER.
7. Isolating Valve - NORMAL POSITION OPEN.
8. Strainer - 40 mesh - J0098A.
9. Pressure Gauge.
10. Pressure Gauge.
11. Bladder Accumulator - M1408A.
12. Differential Pilot - Model 81-RPD - Normally Closed.
13. Relief Pilot - Model 81-RP.
14. Isolating Valve - NORMAL POSITION OPEN.
15. Fixed Restriction - 1/16".
16. Check Valve - J0040A.

REV "F" : ISOLATING VALVE 14 A ADDED. May 13, 2002.

Anticipating Relief Valve.
Sizes: 2" to 6"-106 & 4" to 8"-206

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Drawn By:	Approved By:
Kari Oksanen	Kari Oksanen
Date:	Drawing:
May 13, 2002	A-7340F

Model 106 or 206-RPS-RR