SINGER VALVE
Result-Based Solutions. Globally.

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SINGER MODEL 106/206-DW

Deep Well Pump Control Valve Schematic A-7514C
Installation, Operating and Maintenance Instructions

DESCRIPTION:

Singer Model 106/206-DW is a deep well pump control valve designed to eliminate starting and stopping surges of deep well pumps.

The main valve is a single seated, hydraulically operated, diaphragm actuated, globe or angle pattern valve. The main valve is controlled by a solenoid pilot valve, utilizing line pressure for operation. The valve has a Limit Switch, which shuts down the pump when the pumping cycle is completed.

DESCRIPTION OF OPERATION:

Model 106/206-DW is installed in a tee between the pump discharge and the check valve. The pump is started and stopped on an open valve. The discharge may be returned to the well or to an open drain.

The valve is wide open when the pump is off. When the pump is started, the valve discharges initial rush of sand and water from the pump column to waste. Solenoid Valve (7) is energized and the Main Valve starts closing. The closing speed is adjustable. Main Valve (1) closes slowly; flow into system increases gradually, preventing starting surges.

On shutdown Solenoid Valve (7) is de-energized. Main Valve (1) opens slowly. Opening speed is adjustable. While the Main Valve is opening, Limit Switch (9) keeps the pump running. As the Main Valve opens, flow into the system decreases gradually. Pump stopping surges are prevented. When the Main Valve is almost fully open, Limit Switch (9) stops the pump.

INSTALLATION:

1. See 106/206-PT "Installation".
2. Connect the operating pressure connection (5) to the header, downstream of the pump check valve. (See schematic).

   NOTE REGARDING SIZE AND CAPACITY OF THIS CONNECTION:
   Use 3/8" copper tube up to 10 ft of distance, 1/2" copper tube for longer runs. All fittings and drilled holes must be full nominal size for reliable operation.
3. Connect Solenoid Valve (7) and Limit Switch (9) to the electrical system. Check Solenoid Valve name plate for correct pressure. Check side of coil for correct voltage. Connections in the Limit Switch must be to common and normally closed terminals. See 'Suggested Wiring Diagram'.
4. If the outlet pipe has a submerged discharge or any other reason to develop sub-atmospheric pressure, a vacuum breaker is recommended to reduce cavitation damage.

ADJUSTING PROCEDURE:

1. Close Opening Speed Control (8) and Closing Speed Control (2).
2. Start the pump.
3. Open Closing Speed Control (2) slowly until desired closing speed is achieved.
4. Turn the pump switch to off position. The pump should continue to run.
5. Open Opening Speed Control (8) slowly until desired opening speed is achieved.
6. When the valve is almost fully open, Limit Switch (9) should stop the pump. If the pump does not stop, adjust the Limit Switch.
7. Excessively long opening and closing times should be avoided because this may affect the pump motor and may also cause plugging of the speed controls by any solids in the water.

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Adjusting Procedure (Cont.):

FINAL ADJUSTMENT OF LIMIT SWITCH:

Limit Switch (9) should be adjusted to shut the pump off as soon as the main line check valve closes.

The point at which the main line check valve closes can be determined by observing pressure gauges on the inlet and outlet sides of the check valve. The check valve is closed when the inlet pressure is lower than the outlet pressure. If pressure gauges have not been installed, it may be possible to determine when the check valve closes by listening for the check inner valve contacting the seat.

SERVICE SUGGESTIONS:

Fails to close:

1. Lack of pressure in the bonnet due to:

- Lack of pressure in the Connection to Header (5). / Isolate the valve to fill the system. (Original start-up to fill the system)
- Connection to header done improperly. / Assure that header pressure reaches Solenoid Valve (7).

2. Closing Speed Control (2) closed tight. / Open 1/2 turn or as required.

3. Solenoid Valve (7) not energized or not operating properly / Check wiring and refer to solenoid valve instructions.

4. Main Valve diaphragm ruptured or main valve obstructed. / Refer to 106-PT instructions.

Fails to open

1. Opening Speed Control (8) closed tight. / Open 1/2 turn or as required.

2. Solenoid Valve (7) incorrectly wired. / Refer to wiring diagram.

3. Pilot system obstructed between bonnet of Main Valve (1) and atmosphere. / Locate the obstruction and remove.

Pump re-starts after stopping.

Incorrect wiring.

Pump runs too far on it's curve on shut-down.

See FINAL ADJUSTMENT OF LIMIT SWITCH above.

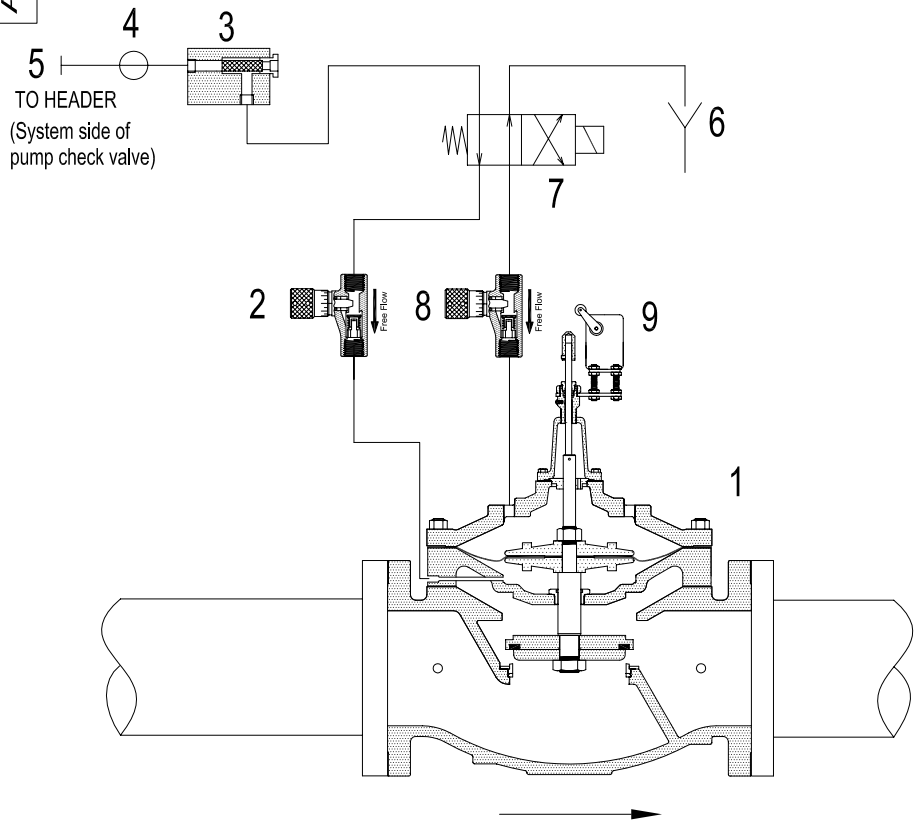
Pump runs too far on it's curve on start-up.

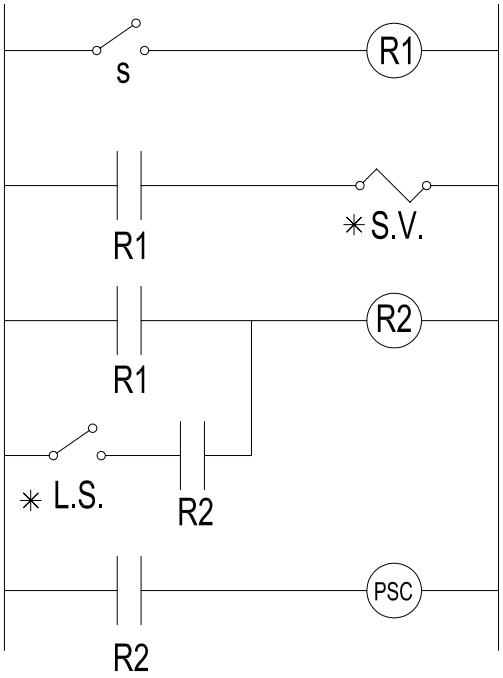
Consider installing a properly sized orifice plate on valve inlet.

Difficulty controlling closing and/or opening speed.

Consider using fixed restrictions in place of speed controls.

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NOTE: This is 'minimum' required diagram. Additional safety and operational functions are frequently added.

1. Main Valve - Model 106/206-PT.
2. Closing Speed Control.
3. Strainer - 40 mesh - J0098A.
4. Isolating Valve - NORMAL POSITION OPEN.
5. CONNECTION TO HEADER (System side of pump check valve).
6. Pilot exhaust to drain.
7. Solenoid Valve.
8. Opening Speed Control.
9. Limit Switch.

S.	On-Off Switch.
✳S.V.	Solenoid Valve.
R1,R2	Auxillary Relays.
✳L.S.	Limit Switch-Connection(typical switch is S.P.D.T.)-N.C. Terminal.
PSC	Pump Motor Starting Contactors.

✳Solenoid Valve and Limit Switch are supplied on the valve.
Other items are supplied by others.

Deep Well Pump control Valve.

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Drawn By:	Approved By:
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Date:	Drawing:
August 20, 2004	A-7514C

Model 106 or 206-DW