SINGER VALVE
Result-Based Solutions. Globally.

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SINGER MODEL 106/206-DWX

Deep Well Pump Control Valve Schematic A0410G (Sizes 2" to 8" 106 and 3" to 10" 206)
Installation, Operating and Maintenance Instructions

DESCRIPTION:

Singer Model 106/206-DWX controls the starting and stopping of deep well pumps to eliminate surges.

Main Valve (1) is a single seated, hydraulically operated, diaphragm actuated, globe or angle pattern valve. The Main Valve is controlled by Solenoid Valve (6). Limit Switch (8) on the valve shuts the pump on completion of the pumping cycle.

IMPORTANT:

1. Model 106/206-DWX needs header pressure to operate. Size the valve to assure that a minimum of 10 psi header pressure is produced on every start-up. If this is not possible, such as initial filling of the system, a manual valve should be installed on the upstream side of this valve to allow manual filling of the system.
2. Model 106/206-DWX does not prevent surges caused by power failure. A relief valve (or anticipating relief valve) should be considered from header to drain to handle power failure surges.

DESCRIPTION OF OPERATION:

Model 106/206-DWX 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 of the 106/206-DWX may be to the well or to an open drain.

Main Valve (1) is open when the pump is off. When the pump starts, initial rush of air and sand from the pump column is discharged to waste. Solenoid Valve (6) is energized when the pump starts. Main Valve (1) starts closing. The closing speed is adjustable. The valve closes slowly, preventing starting surges.

On shutdown, Solenoid Valve (6) is de-energized to open Main Valve (1). Opening speed is adjustable. While the valve is opening, Limit Switch (8) keeps the pump motor circuit closed to keep the pump running. Main Valve (1) opens slowly to prevent surges. When the valve is open and there is no flow into the system, Limit Switch (8) stops the pump.

INSTALLATION:

1. See 106/206-PGX "Installation".
2. Connect the Header Connection (2) downstream of the pump check valve.
3. If the outlet pipe has a submerged discharge or any other reason to develop sub-atmospheric pressure, **A VACUUM BREAKER MUST BE INSTALLED ON THE OUTLET OF THE VALVE.**
4. Connect Solenoid Valve (6) and Limit Switch (8) to the pump starting circuit. See **SUGGESTED WIRING DIAGRAM.** Check Solenoid Valve name plate for correct pressure. Check side of coil for voltage and service. Connections in the Limit Switch must be to **COMMON AND NORMALLY OPEN TERMINALS**.
5. Wiring must comply with local and national electrical codes.

ADJUSTING PROCEDURE:

1. Close opening and closing speed controls (5) & (7).
2. Start the pump.
3. Open Closing Speed Control (5) slowly until desired closing speed is achieved.
4. Turn pump switch to off position. The pump should continue to run.
5. Open Opening Speed Control (7) slowly until desired opening speed is achieved.
6. When the valve is almost fully open, Limit Switch (8) should stop the pump. If the pump does not stop, adjust the micro-switch.
7. Excessively long opening and closing times should be avoided because this may affect the pump motor.
8. Do not close opening or closing speed controls tight as this renders the valve inoperative.

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FINAL ADJUSTMENT OF LIMIT SWITCH:

Limit Switch (8) should be adjusted to shut the pump 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 (2). / 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 (6).

2. Closing Speed Control (5) closed tight. / Open 1/2 turn or as required.

3. Solenoid Valve (6) 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-PGX instructions.

Fails to open

1. Opening Speed Control (7) closed tight. / Open 1/2 turn or as required.

2. Solenoid Valve (6) incorrectly wired. / Refer to wiring diagram.

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

Valve closes after pump stops.

Vacuum forms in the valve inlet or outlet because of submerged discharge or long vertical pipe. / Break vacuum in the valve outlet.

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.

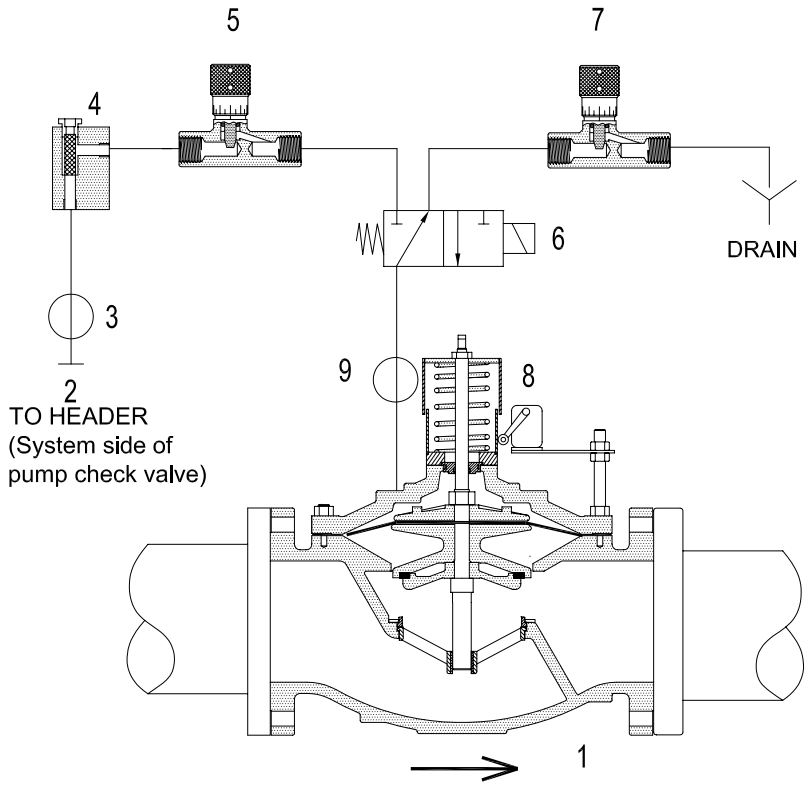
Pump runs too far on it's curve on start-up.

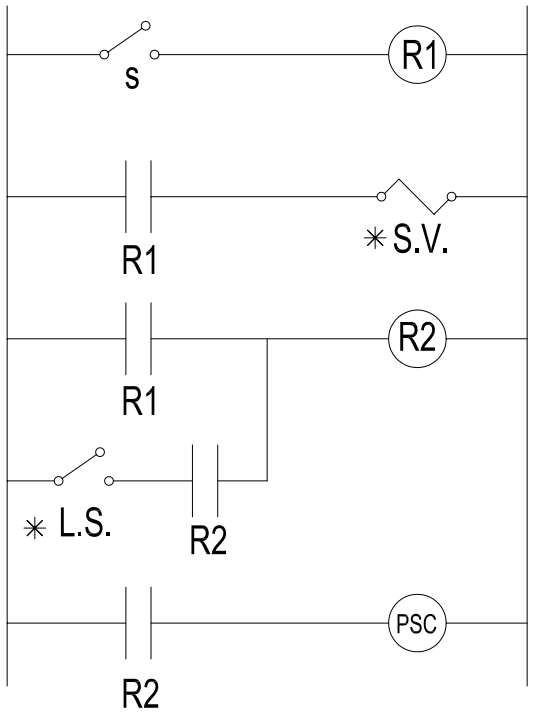
Consider installing a properly sized orifice plate on valve inlet.

Difficulty controlling closing and/or opening speed.

Consider using fixed restrictions in place of speed controls.

A-0410G





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

1. Main Valve - Model 106/206-PGX.
2. CONNECTION TO HEADER (System side of pump check valve).
3. Isolating Valve - J0044A.
4. Strainer - 40 mesh - J0098A.
5. Closing Speed Control.
6. Solenoid Valve - Normally Closed.
7. Opening Speed Control.
8. Limit Switch Assembly - SPDT - Normally Open.
9. Isolating Valve

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.O. Terminal.
PSC	Pump Motor Starting Contactors

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

By-Pass Pump Control Valve

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Drawn By:	Approved By:
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Date:	Drawing:
May 8, 1997	A-0410G

Model 106 or 206-DWX