

# Models 106-DW / 206-DW Deep Well Pump Control Valve – Double Chamber



206-DW Angle

## KEY FEATURES

- Prevents pump starting and stopping surges
- No energy loss while pump is running
- Separate opening and closing speed controls
- Discharges initial air/water silt to waste, on well applications.
- Discharges stagnant water at start-up from dormant wells

## Product Overview

The 106-DW and 206-DW deep well pump control valves are installed in a tee between the pump discharge and the check valve.

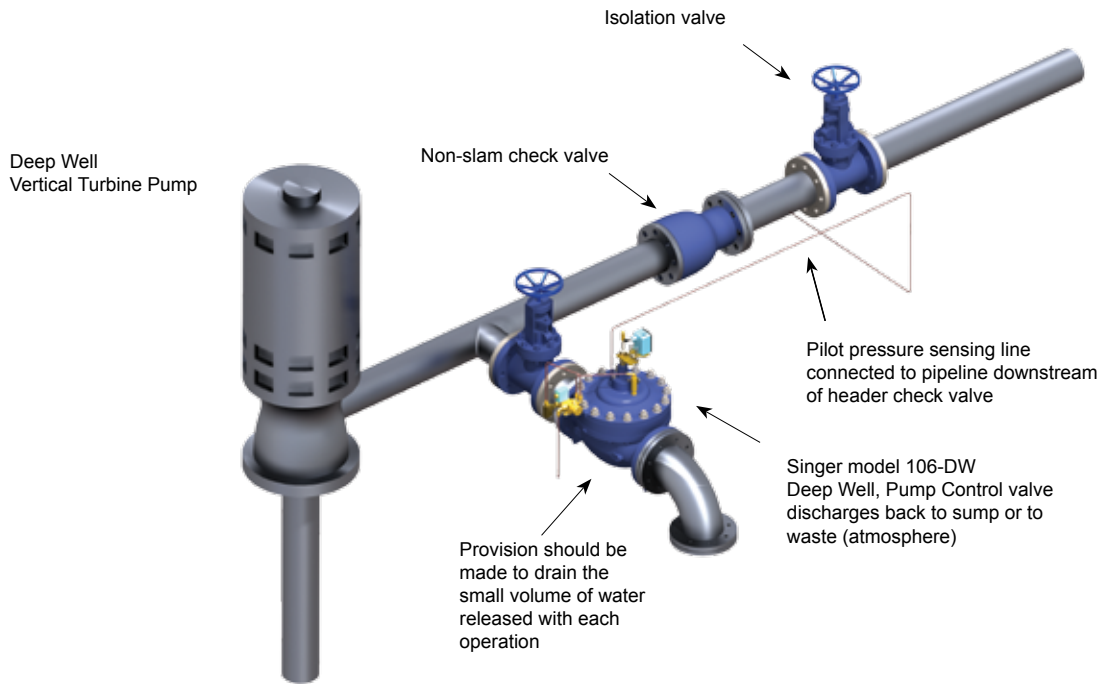
The valve is normally open, and, on pump start-up, a pilot solenoid is energized to start closing the valve at a rate governed by the closing speed control.

Initially, the valve discharges air, water and sand to waste. The open valve discharges all pump flow. As the valve closes slowly, flow is transferred to the main line smoothly, increasing the pipeline flow without surges. When the valve is fully closed, all pump flow is in the pipeline, with no control valve losses.

When shut-down is required, the pilot solenoid on the valve is de-energized to commence opening. The pump is kept running while the valve slowly opens. Increasing proportion of the flow is diverted to waste with less passing through the check valve, until all flow is diverted through the nearly fully open DW valve. The pipeline check valve closes quietly without surges. When the DW valve is almost fully open, a stem mounted cam triggers the limit switch to stop the pump.

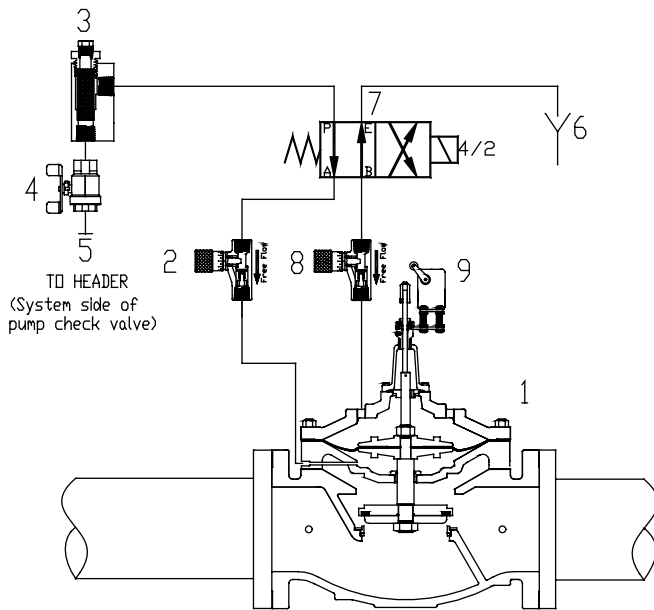
# Models 106-DW / 206-DW Deep Well Pump Control Valve – Double Chamber

## Typical Application



Pump Control

## Schematic Drawing



1. Main Valve - 106-PT or 206-PT
2. Closing speed control
3. Strainer - 40 mesh stainless steel screen
4. Isolation Valve
5. Connection to the pipeline system side of header check valve - complete in the field
6. Exhaust to drain - complete in the field
7. Solenoid Valve - four way, NEMA 4
8. Opening speed control
9. Model X129 Limit Switch Assembly - NEMA 4, SPDT

Schematic A-7514C

# Models 106-DW / 206-DW

## Deep Well Pump Control Valve – Double Chamber

### Standard Materials

Standard materials for pilot system components are:

- ASTM B-62 bronze or ASTM B-16 brass
- AISI 303 /316 stainless steel trim

Refer to Electronic Control section (SPC product), see page 251, and consult Singer Valve for pump control panel options.

### Selection Summary

1. The Singer model DW deep well pump control valve is sized to ensure that the pump discharge pressure is less than the system static pressure when the pump starts; that the main check valve will remain closed and no surges will be generated.
2. From the pump performance curve, determine the pump flow when the pressure at the pump discharge is 80% of the static pressure against the check valve. When the pump is discharging at full start-up flow, the combined losses of the DW control valve, the piping and the discharge losses must be less than 80% of the static pressure.
3. For pump control other than deep well applications - by-pass control - the discharge from the DW control valve can be returned to the wet well, tank or even the pump suction header. Providing there is sufficient static differential pressure (e.g., 70 to 80% of the pumping differential pressure) the DW control valve should be considered preferable to a BPC, in-line booster pump control valve because of reduced sizing and operating benefits.
4. Refer to the 106 and 206 performance curves, page 284, angle or globe style (straight lines) (see Technical & Sizing Information section, page 282) and select the smallest size with the pressure drop that is acceptable. Bulletins 106-PT(C) and 206-PT(C) (see Main Valves section, page 34) provide / specifications and details of construction of the main valves. Standard configuration provides for NEMA 4 watertight enclosures for the Honeywell model OP-AR, SPDT limit switch and the ASCO solenoid with 120 VAC / 60 Hz (or 220 VAC / 50 Hz or 240 VAC / 60 Hz) coil. For other electrical service or higher pressure ratings consult with Singer Valve. A manual override is available upon request. Other functions may be combined with DW valves, e.g. model 106-DW-RPS, pump control with pressure sustaining feature.

# Models 106-DW / 206-DW

## Deep Well Pump Control Valve – Double Chamber

### Specifications

- The valve shall be a Singer Valve model 106-DW / 206-DW, size “\_\_\_\_\_”, ANSI Class 150 (ANSI 300, ANSI flanges drilled to ISO PN 10 / 16/ 25 or 40) pressure rating / flange standard, globe (angle), style valve. Solenoid Valve shall be four-way de-energized to open valve, with a 120 VAC / 60 Hz (220 VAC / 50 Hz or 240 VAC / 60 Hz) solenoid coil. Assembly shall be according to Schematic A-7514C.
- The valve shall be normally open. On pump start-up, a pilot solenoid is energized to close the valve, at a rate governed by the closing speed control. Separate flow control valves and a double chamber design will allow opening and closing speeds to be adjusted independently. When the solenoid is de-energized the valve slowly opens while the pump continues to run. When the valve is almost fully open and all flow has been diverted as a result of the pipeline check valve closing, a stem-mounted cam triggers the limit switch to stop the pump.
- Refer to Main Valve section, page 34, 106-PT (or 206-PT) for detailed information pertaining to valve sizes and materials, selection criteria and specifications.
- Refer to Pilot and Accessories section, page 277, Micrometer Flow Control Valves for detailed information pertaining to materials and specifications.
- Solenoid specification information is available from Singer Valve only at this time.

### Ordering Instructions

Refer to page 293 for the order form and ordering instructions.

Additionally, include the following information for this product:

1. Full port (106) or reduced port (206)
2. Solenoid voltage
3. Maximum inlet pressure

# Models 106-DW / 206-DW

## Deep Well Pump Control Valve – Double Chamber

| 106-DW                              | Flow Coefficient C <sub>v</sub><br>(See 106-PT in Main Valve section for other valve data) |          |       |        |
|-------------------------------------|--|----------|-------|--------|
|                                     | 2 in   | 2-1/2 in | 3 in  | 4 in   |
| Size (inches)                       | 2 in   | 2-1/2 in | 3 in  | 4 in   |
| Size (mm)                           | 50 mm  | 65 mm    | 80 mm | 100 mm |
| C <sub>v</sub> <sup>1</sup> - Globe | 55   | 80       | 110   | 200    |
| K <sub>v</sub> <sup>2</sup> - Globe | 13   | 19       | 26    | 47     |
| C <sub>v</sub> <sup>1</sup> - Angle | 61   | 90       | 135   | 230    |
| K <sub>v</sub> <sup>2</sup> - Angle | 15   | 21       | 32    | 55     |

| 106-DW                              | Flow Coefficient C <sub>v</sub><br>(See 106-PT in Main Valve section for other valve data) |        |        |        |        |        |       |        |
|-------------------------------------|--|--------|--------|--------|--------|--------|-------|--------|
|                                     | 6 in   | 8 in   | 10 in  | 12 in  | 14 in  | 16 in  | 20 in | 24 in  |
| Size (inches)                       | 6 in   | 8 in   | 10 in  | 12 in  | 14 in  | 16 in  | 20 in | 24 in  |
| Size (mm)                           | 150 mm   | 200 mm | 250 mm | 300 mm | 350 mm | 400 mm | 50 mm | 600 mm |
| C <sub>v</sub> <sup>1</sup> - Globe | 460  | 800    | 1300   | 2100   | 2575   | 3300   | 5100  | 7600   |
| K <sub>v</sub> <sup>2</sup> - Globe | 110  | 190    | 310    | 500    | 610    | 780    | 1210  | 1800   |
| C <sub>v</sub> <sup>1</sup> - Angle | 520  | 950    | 1400   | 2400   | -      | 3000   | -     | -      |
| K <sub>v</sub> <sup>2</sup> - Angle | 123  | 225    | 332    | 570    | -      | 710    | -     | -      |

| 206-DW                              | Flow Coefficient C <sub>v</sub><br>(See 206-PT in Main Valve section for other valve data) |        |        |        |
|-------------------------------------|--|--------|--------|--------|
|                                     | 4 in   | 6 in   | 8 in   | 10 in  |
| Size (inches)                       | 4 in   | 6 in   | 8 in   | 10 in  |
| Size (mm)                           | 100 mm   | 150 mm | 200 mm | 250 mm |
| C <sub>v</sub> <sup>1</sup> - Globe | 150  | 250    | 505    | 985    |
| K <sub>v</sub> <sup>2</sup> - Globe | 36   | 60     | 120    | 230    |
| C <sub>v</sub> <sup>1</sup> - Angle | 150  | 250    | 580    | -      |
| K <sub>v</sub> <sup>2</sup> - Angle | 36   | 60     | 138    | -      |

| 206-DW                              | Flow Coefficient C <sub>v</sub><br>(See 206-PT in Main Valve section for other valve data) |        |        |        |              |              |        |        |        |        |
|-------------------------------------|--|--------|--------|--------|--------------|--------------|--------|--------|--------|--------|
|                                     | 12 in  | 16 in  | 18 in  | 20 in  | 24 x 16 in   | 24 x 20 in   | 28 in  | 30 in  | 32 in  | 36 in  |
| Size (inches)                       | 12 in  | 16 in  | 18 in  | 20 in  | 24 x 16 in   | 24 x 20 in   | 28 in  | 30 in  | 32 in  | 36 in  |
| Size (mm)                           | 300 mm   | 400 mm | 450 mm | 500 mm | 600 x 400 mm | 600 x 500 mm | 700 mm | 750 mm | 800 mm | 900 mm |
| C <sub>v</sub> <sup>1</sup> - Globe | 1550   | 2200   | 3300   | 3400   | 3500         | 5100         | 7800   | 7800   | 7900   | 8000   |
| K <sub>v</sub> <sup>2</sup> - Globe | 370  | 520    | 780    | 810    | 830          | 1210         | 1850   | 1850   | 1870   | 1900   |
| C <sub>v</sub> <sup>1</sup> - Angle | -  | -      | -      | -      | -            | -            | -      | -      | -      | -      |
| K <sub>v</sub> <sup>2</sup> - Angle | -  | -      | -      | -      | -            | -            | -      | -      | -      | -      |

C<sub>v</sub> = USGPM at 1 psi pressure drop

K<sub>v</sub><sup>2</sup> = L / s at 1 bar pressure drop

$$Q = C_v \sqrt{\Delta P}$$