

SECTION 46 00 00 00

ASR DOWN HOLE (PRESSURE – FLOW – LEVEL) CONTROL VALVE SYSEYEM

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Flow-control valve
 - 2. Flow-control valve control system

1.02 REFERENCES

- A. ASTM International (ASTM) Standard Specifications:
- B. Hydraulic Institute (HI) Standards
- C. American Water Works Association (AWWA):
- D. UL – Underwriters Laboratory
- E. NSF international
 - 1. Complies with all federal, state, and local laws or codes regarding NSF 61 lead free and NSF 372 drinking water system components.

1.03 SUBMITTALS

- A. Project Data
 - 1. Provide head loss calculations.
 - 2. Provide flow calculations through valve.
 - 3. Provide manufactures warranty statement.
- B. Shop Drawings:
 - 1. Seismic anchorage calculations where required by federal, state or local requirements
 - 2. Dimensional drawings of flow-control valve and any associated control system provided by valve manufacture
- C. Quality Assurance Submittals
 - 1. Performance Testing: Certified non-witnessed factory performance tests in accordance with Hydraulics Institute Standard 14.6 are required for each pump, and shall be not less than acceptance grade Grade 1U including power and efficiency unless noted elsewhere in this Specification. Obtain favorable review from the Engineer prior to shipment of the pumps.
 - 2. Manufacturer's Instructions: recommended procedures for storage and installation operation and maintenance manuals, bulletins, and spare parts lists.
 - 3. Affidavits: Submit affidavit from the manufacturer stating the equipment has been properly installed, adjusted, and tested and is ready for full time operation.
- D. Closeout Submittals
 - 1. Operation and maintenance manuals
 - 2. Spare parts lists

1.04 QUALITY ASSURANCE

- A. All equipment furnished under this Section shall: 1) be of a manufacturer who has been regularly engaged in the design and manufacture of the equipment for at least 5 years; and 2) be demonstrated to the satisfaction of the Engineer that the quality is equal to equipment made by those manufacturers specifically named herein
- B. Valve supplier shall have unit responsibility for furnishing all equipment specified under this section.
- C. Valve supplier shall be certified and recognized by NSF International as:
 - 1. NSF 61 – Drinking Water System Components – Health Effects.
 - 2. NSF 372 – Drinking Water System Components – Lead Content.
- D. Valve manufacture shall provide a 10 year installation and performance warranty. The warranty shall start upon given the notice of substantial completion.

PART 2 - PRODUCTS

2.01 FLOW-CONTROL VALVE SYSTEM

- 1. Manufacturer
 - a. 3R Valve, LLC; Echo, OR; (541) 571-0581
 - b. Or approved equal
- 2. Design Requirements
 - a. Valve shall be a 6" Valve.
 - b. Valve shall be provided with the following thread type:
 - 1) NPT at both ends.
 - c. Valve and control system shall a closed loop system.
 - 1) Valve and control system shall not require the customer – owner to purchase additional disposable products.
 - d. Valve and control system shall be designed to automatically maintain a flow setpoint under the following conditions:
 - 1) Injection flow range: 0 gpm – 1,500 gpm
 - 2) Differential head: 40 ft or greater – XXX ft (pending results from testing program)
 - e. Valve and control system shall be designed to automatically maintain a well head pressure setpoint under the following conditions:
 - 1) Injection pressure range: 0 PSI – 40 PSI.
 - f. Valve and control system shall be designed to automatically maintain the aquifer level.
 - 1) Aquifer level range : 2000 feet – 2,100 feet
 - g. Valve and vendor-designed control system shall automatically:
 - 1) Regulate injection flows to user-specified flow setpoint
 - 2) Regulate minimum pressure at the well head to user-specified setpoint
 - 3) Regulate aquifer level.
 - h. Performance requirements
 - 1) Maximum-allowable deviation from flow setpoint: 500 gpm
 - 2) Average deviation from setpoint: 50 gpm
 - 3) Maximum system power requirement:
 - a) Overcurrent Protection Required from others:

- (1) Control System: 120VAC, single phase – 20 Amp single pole.
 - (2) A/C for Outer Enclosure: 120VAC, single phase – 20 Amp single pole.
- b) UPS power:
 - (1) Provide a UPS sized to run the control system for 20 min during power outage.
 - (2) Provide a UPS sized to
 - (a) Run the downhole control valve from current position to fully closed on loss of normal power.
 - (b) Run the control system for 20 min.
- i. Functional requirements
 - 1) Provide alarm signal for any of the following conditions
 - a) Injection flow above setpoint
 - b) Injection-flow below setpoint
 - c) Well-head pressure above setpoint
 - d) Well-head pressure below setpoint
 - e) Any malfunction of hydraulic power unit
 - f) Malfunction of control system
 - g) Provide valve position indicators/hydraulic pump isolators at the surface with PLC loop to show the valve position on the HMI
 - 2) Provide 7 inch human-machine interface (HMI) as a touch screen for
 - (1) user-specified setpoints (flow, pressure and level)
 - (2) Alarm setpoints for flow and pressure
 - (3) End user remote access.
- j. Provide local control panel with human-machine interface
 - 1) User inputs:
 - a) Flow setpoint [gpm]
 - b) Flow deadband [gpm]
 - c) Well-head pressure [psig]
 - d) Well-head pressure deadband [psig]
 - e) Aquifer level [feet]
 - f) Aquifer level deadband [feet]
- k. Valve Control:
 - 1) Provide programmable logic controller with software to automatically implement all specified requirements.
 - a) Provide tag based PLC.
 - (1) Allen Bradley – L24 Control Logix Controller or equal.
 - 2) Provide Ethernet interface module to exchange data between Flow-control valve PLC and SCADA master
- l. Trending Data:
 - 1) Provide the following data for trending and reporting purposes.
 - a) Well flow.
 - b) Well head pressure.
 - c) Well aquifer level.
 - d) Valve position.
 - 2) Trending data shall be accessible to owner for reporting purposes.
- m. Graphing Data:
 - 1) Provide the following data graph screens at the HMI.
 - a) Well flow.

- b) Well pressure.
 - c) Well aquifer level.
 - d) Valve position.
- 3. Materials
 - a. Valve body: 316 stainless steel
 - b. Hydraulic hose: NSF 61 certified
 - c. Local control panel
 - 1) NEMA 4X

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install the valve per manufacturer's installation instructions.

3.02 FIELD SERVICE

- A. The equipment manufacturer shall supply a competent field service engineer to thoroughly check and inspect the equipment after installation, place the equipment in operation, make necessary adjustments, calibrate instruments, and conduct field tests.

END OF SECTION