Technical Specification: Pressure Reducing Valves

1. Function

a. The Pressure Reducing Valve shall maintain a constant downstream pressure regardless of changing flow rate and/or inlet pressure. The valve shall be of the diaphragm type equipped with pilot spring to provide a range of downstream pressure setting from 25 psi and below. The valve shall have flanged ends.

2. Main valve

a. The valve shall be hydraulically operated, single diaphragm-actuated, globe or angle pattern.

b. The valve shall consist of 3 major components:

1. The Body, with seat installed
2. The Cover, with bearings installed
3. The Diaphragm Assembly
   - The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure.

c. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

3. Main Valve Body

a. No separate chambers shall be allowed between the main valve cover and body.

Valve body and cover shall be of cast material. Ductile iron is standard and other materials shall be available.

The valve shall contain a resilient, synthetic rubber disc with a rectangular cross-section contained on three and one-half sides by a disc retainer and forming a tight seal against a single removable seat insert.

No O-ring type discs (circular, square or quad type) shall be permitted as the seating surface.

The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold disc firmly in place.

The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top

edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface.

b. The center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure.

The main valve seat and the stem bearing in the valve cover shall be removable.

The cover bearing and seat in 6" and smaller size valves shall be threaded into the cover and body.

The valve seat in 8" and larger size valves shall be retained by flat head machine screws for ease of maintenance.

The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits.

The valve and body cover shall be machined with a locating lip to insure proper alignment of the valve stem.

No "pinned" covers to the valve body shall be permitted.

Cover bearing, disc retainer, and seat shall be made of the same material.

c. The diaphragm assembly containing a non-magnetic 303 stainless steel stem with sufficient diameter to with stand high hydraulic pressures shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary.

The flexible, non-wicking diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid.

The Diaphragm must withstand a Mullins Burst Test of a minimum of 600 psi per layer of nylon fabric and shall be cycle tested 100,000 times to ensure longevity.

The diaphragm shall not be used as the seating surface.

The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully open or fully closed positions.

d. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline.

e. The Contractor/Manufacturer shall be able to provide cavitations chart which show flow rate, differential pressure, percentage of the valve opening, Cv factor, system velocity, and if there will be cavitations damage.

4. Material specification

Valve Size: 1¼" – 24"
Main Valve Body and Cover: Ductile Iron
Main Valve Trim: Bronze

Basic Components

1. 100-01 Hytrol (main Valve)
2. X58C Restriction Fitting
3. CRD Pressure Reducing Control

5. Pilot control system

a. The pressure reducing pilot control shall be a direct acting, adjustable, spring-loaded, and normally open, diaphragm valve designed to permit flow when controlled pressure is less than the spring setting.

b. The pilot control is held open by force of the compression on the spring above the diaphragm and it closes when the delivery pressure acting on the underside exceeds the spring setting.

c. The pilot control system shall include a fixed orifice. No variable orifice shall be permitted.

d. A pilot control shall have a second downstream sensing port which can be utilized to install a pressure gauge.

e. Adjustment Ranges: 2-30, 15-75, 30-300 psi

f. Optional Features

1. X46A Flow Clean Strainer
2. CK2 (Isolation Valve)
3. CV Flow Control (Closing)
4. Check Valves with (Isolation Valve)
5. Opening Speed Control
6. X43 "Y" Strainer

g. Additional Requirements:

1. Minimum of one (1) year warranty.
2. Shall provide one (1) technician for start-up service, inspection and necessary adjustments.

3. Supplier shall have the local capability to do repair and maintenance of the units to be supplied.

6. Coatings

Epoxy coating shall conform to AWWA Specifications C550 (PROTECTIVE EPOXY INTERIOR COATINGS FOR VALVES AND HYDRANTS).

7. Warranty

The manufacturer also guarantees that replacements, replacements parts and service shall be made available within thirty (30) calendar days from notice during a period of at least five (5) years from date of acceptance.

8. Certification

The manufacturer shall furnish a sworn statement that the inspection and all of the specified tests have been results thereof comply with the requirements of the applicable Standard(s) herein specified and ISO 9000 and 9001. A copy of the Certification shall be submitted to Calamba Water District.

Technical Specification: Strainer

1. The strainer should be designed for minimum weight and pressure loss.
2. The screen shall be made of perforated stainless steel plate and shaped to give maximum rigidity against the flow stream forces.
3. The effective straining area shall be at least double that of the meter main case inlets.
4. An access cover plate shall be provided.
5. Strainers shall be furnished with dual round-type flanged connections which are faced and drilled. Bolt circle, length and diameters shall be compatible with meter connection dimensions in conformance to ISO 7005 – 2. Sufficient flange bolts; nuts and gaskets shall be furnished.
6. The housing and cover shall be cast iron. Raised letters indicating the flow direction will be clearly visible.
7. Casing bolts, nuts, screws and washers shall be made of a copper alloy containing not less than 57 percent copper or stainless steel.