

STANDARD SPECIFICATIONS

SECTION 15300

AUTOMATIC CONTROL VALVES

PART I - GENERAL

A. Description

This section describes the materials and installation of self-contained automatic control valves. The various applications of these control valves are described herein. The various applications shall be achieved through specialized pilot control applications on hydraulically operated, diaphragm-actuated, globe pattern valves.

Items of equipment specified herein shall be the end products of a limited number of manufacturers in order to achieve standardization for operation, maintenance, spare parts, and manufacturer's service.

B. Related Work

- 1. Painting and Coating: 09900
- 2. Hydrostatic Testing of Pressure Pipelines: 15042
- 3. Ductile-Iron Pipe and Fittings: 15056
- 4. Copper, Brass and Bronze Pipe, Fittings and Appurtenances: 15057
- 5. Cement-Mortar Lined and Coated Steel Pipe: 15076
- 6. Domestic and Recycled Water Facilities Identification: 15151

C. Approved Manufacture's

- 1. Cla-Val Company
- 2. Singer Valve Inc.

D. Application Model Number

- 1. Check Valves
 - a. Cla-Val model 81G-02KC with X101 Valve Position Indicator (installed by valve manufacturer)
 - b. Singer model 106-HC

2. Solenoid Control Valves
 - a. Cla-Val model 136G-03YBCSFKC with Limit Switch Assembly Model X105LCW (installed by valve manufacturer).
 - b. Singer model 106-2SC-PCO
3. Pressure Reducing Valves
 - a. Cla-Val model 90G-01YBKC (90G-01YSFC for valves 3 inches and smaller), with X101 Valve Position Indicator (installed by valve manufacturer).
 - b. Singer model 106-PR
4. Pressure Relief Valves
 - a. Cla-Val model 50G-01SBKC with Limit Switch Assembly Model X105LOW (installed by valve manufacturer).
 - b. Singer model 106-BPC
5. Surge Anticipator Valves
 - a. Cla-Val model 52G-01BKC with Limit Switch Assembly Model X105LOW (installed by valve manufacturer).
 - b. Singer model 106-RPS- L&H
6. Pump Controller Valves
 - a. Cla-Val model 60G-11 BKC with Limit Switch Assembly Model X105LCW (installed by valve manufacturer).
 - b. Singer model 106-PG-BPC
7. Two-Way Flow Altitude Valves with Differential Control
 - a. Cla-Val model 201-01 with X-101 position indicator.
 - b. Singer model 106-A-Type 3 with X-107 position indicator.

PART 2 - MATERIALS

A. Complete Assemblies

All valves shall be complete, with all necessary operating appurtenances included in the work under this section.

B. Interior Lining and Exterior Coating

An epoxy coating shall be applied to internal and external ferrous valve surfaces. Coating shall be per AWWA C550. Unless specified otherwise, herein.

C. Globe Valve

All control valve applications shall be based on a hydraulically operated, diaphragm-actuated, globe pattern valve. It shall contain a resilient, synthetic rubber disc, having 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. The diaphragm assembly contacting a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This 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. The diaphragm shall consist of nylon fabric bonded with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the valve.

Valve shall be of indicated size and shall be of manufacturer's standard ductile iron with stainless steel trim (seat, disc guide, cover bearing, stem nut, and stem). Valve shall have a pressure rating of 150 or 300 psi, depending on the service application, with the appropriate class ductile iron flanges. Interior ferrous surfaces shall be lined with factory applied epoxy and exterior ferrous surfaces shall be coated with alkyd enamel per Section 09900.

The design shall preclude cavitation erosion, fouling of working surfaces, and other effects adverse to reliability. Seats and other trim shall be secured by means precluding their loosening by hydraulically induced vibrations; and the fit of stems in guides and guide lengths shall preclude any binding, scraping, or deviation from true alignment affecting the free movement of working parts.

All repairs shall be possible without removing the valve from the line.

D. Check Valve

The check valve shall consist of a globe valve with the appropriate pilot system.

The pilot shall contain auxiliary controls which permit the adjustment of the opening and closing speeds, and shall be set for fast opening and slow closing.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

E. Solenoid Control Valve

The solenoid control valve shall consist of a globe valve with the appropriate pilot system.

The pilot control shall be a solenoid valve controlling a diaphragm-operated three-way auxiliary valve. The control system shall include opening and closing speed controls, a wye strainer and limit switch Model X105LCW.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

F. Pressure Reducing Valve

The pressure reducing valve shall consist of a globe valve with the appropriate pilot system.

The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting. The control system shall include a fixed orifice.

The pilot valve system shall have a direct-acting, adjustable, spring-loaded pilot, diaphragm actuated valve, designed to permit flow in the pilot valve system whenever the controlling pressure exceeds the spring setting. The pilot valve system shall also contain a strainer needle valve assembly that shall control the opening or the main valve.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

G. Pressure Relief Valve

The pressure relief valve shall consist of a globe valve with the appropriate pilot system.

The pilot valve system shall have a direct acting, adjustable, spring-loaded pilot, diaphragm actuated valve, designed to permit flow in the pilot valve system whenever the controlling pressure exceeds the spring setting. The pilot valve system shall also contain a strainer needle valve assembly that shall control that closing of the main valve.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

H. Surge Anticipator Valve

The surge anticipator valve shall consist of a globe valve with the appropriate pilot system.

The pilot control shall be a direct-acting, adjustable, spring-loaded, diaphragm valve. The pilot valve system shall contain a strainer needle valve assembly that shall control the closing of the main valve. The pilot valve system shall also contain a check valve that is installed on one of the main valve cover connections. This check valve shall be so installed that if low pressure occurs at the inlet of the valve, it will open and relieve the cover pressure to the inlet side of the valve.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

I. Pump Control Valve - Booster Type

This valve shall be a hydraulically operated, single seated, diaphragm actuated, composition disc, dual-port globe style valve with solenoid valve control. The valve shall have a built-in check feature; designed to operate with pump controls to start and stop pump against a closed valve.

Valves shall have emergency shutdown power check features for surge protection as described below: upon power failure, solenoids de-energize and a check valve in the diaphragm unit shall release to effect closure under spring action when flow stops before flow reversal can occur.

Pilot valves shall be all bronze conforming to ASTM B62 with stainless steel trim. Hydraulic control and sensing lines shall be copper, conforming to Section 15057, herein.

A manual control override shall be provided on the valve assembly. The design shall preclude cavitation erosion, fouling of working surfaces, and other effects adverse to reliability. Seats and other trim shall be secured by means precluding their loosening by hydraulically induced vibrations; and the fit of stems in guides and guide lengths shall preclude any binding, scraping, or deviation from true alignment affecting the free movement of working parts.

The valve shall be provided with a SPDT limit switch actuated by the control rod. The switch shall indicate: 1) When the valve is fully closed; 2) When the valve is not fully closed.

J. Altitude Valve

The altitude valve shall consist of globe valve with the appropriate control system.

The control system shall consist of auxiliary valves working in conjunction with the pilot valve to control the main valve. The pilot valve is to be controlled by the difference between the reservoir pressure and an adjustable spring pressure with a spring range of 5-40 feet of water. The entire valve and control assembly shall be designed so that no surface water can be drawn into the pilot system or the main valve at any time.

PART 3- EXECUTION

A. Manufacturer's Services

A manufacturer's representative for the equipment specified herein shall be present at the job site and/or classroom designated by the District for that minimum personnel days listed for the services hereunder, travel time excluded:

One (1) personnel day for equipment start up, and

One (1) personnel-day for post start-up training.

Start up services and training of District's personnel shall be at such times as requested by the Owner.

B. Installation

1. Automatic control valves shall be installed above ground or within a vault to provide for adjustment, maintenance and repair. Direct burial of a control valve will not be permitted under any circumstance.
2. Automatic control valves are to be installed with ductile iron piping per Section 15056 or cement-mortar lined and coated steel pipes per Section 15076.

END OF SECTION