* 1. SOLENOID CONTROL VALVE

1. Supply a *insert size* Singer Model *specify model as 106/S106/206/S206* – SC Solenoid Control Valve.
   1. The valve shall be equipped with the following available options:
      1. Maintained manual operator
      2. *specify*
      3. *specify*.
   2. Singer Valve schematic *specify*.
2. Function: The valve shall be an On/Off – Open/Closed, non-modulating, solenoid pilot operated control valve, which will open or close the main valve when the solenoid pilot valve is electrically energized or de-energized. The main valve shall be specified and supplied as SC-NO (Normally Open) or SC-NC (Normally Closed), based on the de-energized state of the solenoid pilot valve.
3. Operation: The 3-way solenoid pilot valve, when electrically energized, shall either apply or relieve the main valve bonnet pressure to hydraulically close or open the main valve. The 3-way solenoid pilot valve shall be supplied as a 3-way NO-Normally Open; energize solenoid to open the main valve, or a 3-way NC-Normally Closed; energize solenoid to close the main valve.
   1. Quality Assurance
4. The control valve shall be tested prior to shipment. The standard test shall include a functional stroke, pressure and leak test of valve body, seat, fitted pilots and accessories.
5. The control valve shall be covered by a minimum three (3) year warranty against defects in materials and workmanship. The AISI 316 stainless steel seat ring shall be covered by a lifetime guarantee.
6. All control valve maintenance and repairs shall be possible without removing the main valve body from the line, when installed in accordance with manufacturer’s recommendations.
   1. Main Valve
7. The main valve shall be a Singer *specify main valve model number (106/S106/206/S206)* -PG single chamber, diaphragm actuated *specify (full/reduced)* port model.
8. Main valves, 6” (150mm) and larger, shall provide smooth frictionless motion to ensure a low flow stability to *specify minimum USGPM or L/s*, achieved using SRD-Single Rolling Diaphragm technology.
9. The main valve, bonnet and removable stem cap shall be constructed of ASTM A536 (Grade 65/45/12) ductile iron.
10. Main valves of 2.5” (65mm) and larger shall have a removable stem cap for access to the main valve stem for alignment check, spring installation and ease of service and assembly.
11. The main valve trim, consisting of seat ring and stem shall be constructed of AISI 316 stainless steel. The valve stem shall have wrench flats for ease of maintenance.
12. The main valve bonnet shall be located using two or more locating guide pins to maintain the inner valve assembly alignment and for ease of maintenance.
13. The main valve shall provide a drip-tight seal using a mechanically retained resilient disc, having a rectangular cross section, against the stationary AISI 316 stainless steel seat ring.
14. The stationary AISI 316 stainless steel seat ring of main valves 2.5” (65mm) and larger shall be held in place using Spiralock® self-locking screws and seat ring retainers.
15. All internal and external ferrous components, including all mating surfaces, shall be coated with an NSF-61 approved fusion bonded epoxy to a minimum of 10 mils DFT-Dry Film Thickness.
16. The main valve elastomers: diaphragm, resilient disc and seals, shall be of EPDM or Buna-N.
17. All main valve fasteners (bolts, nuts, studs, cap screws) shall be supplied as AISI 18-8 or 304 stainless steel. All bonnet bolts shall be fitted with stainless steel washers to prevent damage to the bonnet coating.
18. Valve shall have flanged, threaded or grooved end connections. Flanged connections shall be *specify ANSI/ASME B16.42 Class 150#/300# or ISO 7005-2 PN10/16/25/40* flange drilled, faced and rated. Threaded connections shall be *specify NPT or BSPT*.
19. Due to the potential for noise, vibration and erosion damage from cavitation, the valve manufacturer shall provide, upon request, a computerized sizing and cavitation analysis, using independent third party software. Cavitation analysis shall provide the status of cavitation based on customer supplied parameters as to valve size, flow rate requirements and pressure conditions. The cavitation analysis shall also provide information as to Cv factor, percent of valve lift, cavitation index and noise level.
20. The valve manufacturer shall be able to supply cavitation control trim which shall be engineered to be optimized to the actual operating parameters of the control valve application and warranted to perform correctly and prevent main valve cavitation damage under the stated conditions. Orifice plates or other non-engineered cavitation control devices shall not be used to prevent or minimize valve cavitation.
    1. Pilot Controls
21. The solenoid pilot valve shall be an ASCO 3-way solenoid valve with satisfactory pressure rating and flow capacity (Cv/Kv) for the service conditions and operation requirements. Solenoid model to be specified by the manufacturer. Solenoid valve coil voltage shall be *specify voltage (12VDC, 24VDC, 110-120VAC 50/60Hz, 220-240VAC 50Hz/60Hz or other)*. Solenoid valve shall be supplied with a NEMA *specify rating (4X, 6, 6P or 9 or other)* enclosure. Solenoid valve body material shall be *specify (brass or 303/304 stainless steel)* with NPT connections.
22. The pilot fittings shall be supplied as *specify material (ASTM B16 brass or AISI 316 stainless steel)*.
23. The pilot tubing shall be supplied as *specify material (ASTM B280 seamless copper or AISI 316 stainless steel or PTFE lined flexible braided stainless steel)*.
24. For valves 4” (100mm) and larger, opening and closing needle valve speed controls shall be supplied. Needle valves shall be constructed of *specify material (B16 brass or 316 stainless steel)* with manual operator.
25. For valves 4” (100mm) and larger, (3) pilot isolation ball valves shall be supplied. Pilot isolation ball valve(s) shall be constructed of *specify material (B16 brass or 316 stainless steel)* with stainless steel handle operator.
26. A pilot strainer shall be supplied as standard. Strainer material to be ASTM A351 CF8M stainless steel with a 40-mesh or 80-mesh 316 stainless steel screen. The external pilot strainer shall have a removable plug for easy maintenance access to the pilot screen and have provision for installation of a ball valve for pilot screen flushing.
    1. Control Valve Components – Available Options
27. The solenoid pilot valve shall be equipped with a maintained manual operator. The manual operator will operate the solenoid valve when electrical supply power is off.
28. specify.