J.D.Gould Company, Inc.

SOLENOID VALVES

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GENERAL INSTALLATION & OPERATING INSTRUCTIONS

DESCRIPTION AND OPERATION:

TYPES B, D, K, M & Q are internal PISTON, PILOT OPERATED solenoid valves and require a 5,10 or 20 PSI MINIMUM OPERATING PRESSURE DIFFERENTIAL. When the coil is energized on NORMALLY CLOSED valves, it lifts the pilot valve off the seat screw, opening the pilot orifice through the center of the piston to the outlet side of the valve. This relieves the pressure from the top of the piston ring and pressure under the piston ring forces the piston up to open the main valve orifice. When the coil is de-energized, the pilot valve returns to close the pilot orifice and pressure across the piston ring is equalized through a timing orifice in the side of the piston or in the valve body. The piston spring returns the piston to close the main valve orifice.

TYPES F, G, GX, B3, AD, QD, & KD are DIRECT ACTING solenoid valves and do not require a minimum operating differential pressure. When the coil is energized on NORMALLY CLOSED valves, it lifts the solenoid plunger, which is mechanically connected to the valve seat and lifts it to open the main valve orifice. When the coil is de-energized, gravity and flow return the valve seat to close the main valve orifice.

NORMALLY CLOSED valves OPEN when the coil is energized. NORMALLY OPEN valves (indicated by the letter R after the basic type designation) CLOSE when the coil is energized. The PILOT VALVE ONLY is normally open on piston pilot operated solenoid valves. The PISTON opens only with application of PRESSURE.

ALL Standard valves are supplied with CONTINUOUS DUTY COILS of the proper class of insulation for the service indicated on the nameplate. The COIL TEMPERATURE after being energized for extended periods, although uncomfortably warm to touch, is a safe operating temperature. Smoke or burning odor indicates excessive coil temperature.

INSTALLATION:

Install in HORIZONTAL pipe with the COIL ASSEMBLY on TOP AND VERTICAL with FLOW ARROW or IN AND OUT markings in the proper direction. ALL PIPING should be blown clear before installation and a 40 mesh STRAINER should be installed ahead of the valve, STEAM LINES should be properly TRAPPED at the valve inlet. PIPE DOPE is NOT recommended, but if used should not be applied to the VALVE BODY. Apply sparingly to the pipe threads only. J. D. Gould Company recommends Teflon™ tape for all connections. PIPING should be properly aligned and supported to avoid strain on the valve body. The VALVE BODY should not be held in a VISE except across the pipe ends. Use a PIPE VISE or WRENCH on the pipe and a WRENCH on the HEX PIPE ENDS. DO NOT use the COIL ASSEMBLY for a LEVER to tighten piping.

WIRING:

ALL COIL HOUSINGS have 1/2" THREADED CONDUIT connectors. Check the NAMEPLATE for PROPER VOLTAGE and connect the COIL LEAD WIRES to line voltage in accordance with applicable ELECTRICAL CODES. The LEAD WIRES are not polar, and either may be connected to pos (+) or neg (-). The GREEN wire (when equipped) should be connected to ground. Standard NEMA 1 enclosures, (except Type B3) do not require a separate wiring JUNCTION BOX. Wiring can be run through the conduit connection in the COIL HOUSING and connected to the COIL LEADS inside COIL COVER. DUAL VOLTAGE COILS must be wired in accordance with the DIAGRAM shown on the coil housing. Standard COIL HOUSING may be rotated as required to facilitate wiring. EXPLOSION PROOF HOUSINGS are FIXED and CANNOT be ROTATED except on valves equipped with UNION BONNETS. TORQUE for EXPLOSION PROOF HOUSING BOLTS is 15 ft•lbs.

SPEED ADJUSTMENT & MANUAL OPEN OPTION TYPES B & D ONLY:

Adjustments are pre-set at the factory to meet average conditions (or to your specifications); however, individual requirements in the field may necessitate further adjustment. To increase opening speed or decrease closing speed, turn stem at base marked ADJ. clockwise (IN). To decrease opening speed or increase closing speed, turn stem counterclockwise (OUT). On slow opening valves or high-pressure (above 300 PSIG) valves, this adjustment, if opened too far counter-clockwise, will create a situation in which the valve will fail to open. To correct this, close the ADJ. stem (clockwise) with pressure on and solenoid energized until valve opens.
For manual open, turn stem marked "MAN OPN" counter clockwise to open. Turn clockwise until seated to close.

FLOW CONTROL (Type D with NEMA 1 Coil Enclosure ONLY)

Valves are set at factory for full flow unless otherwise specified. To adjust flow rate thru valve, relieve line pressure ahead of valve and loosen nameplate screw. It is not necessary to disconnect wiring or remove coil. Turn bonnet (clockwise) to reduce flow. No wrench is needed if pressure is off system. With bonnet down as far as possible, approximately 25% full flow is obtained. To obtain full flow, back the bonnet off (counter-clockwise) 3 turns for ¾"-1" valves; 4½ turns for 1¼"-1½" valves; or 6 turns for 2" valves. At this position, arrows (or stamped "½" on 1¼"-1½ valve) on body and bonnet are in line and bottom of bonnet is just above full flow line on body. Do not open bonnet above this line. After proper adjustment is made, tighten nameplate screw. (Note: some older valves may have a set-screw to lock the bonnet in place. This must be loosened before adjustment.)

MAINTENANCE:

Close the supply SHUT OFF VALVE and ENERGIZE the SOLENOID VALVE to de-pressurize the inlet supply line. DISCONNECT ELECTRICAL POWER before removing the COIL ASSEMBLY. The COIL will overheat and burn out if left ENERGIZED without the entire SOLENOID ASSEMBLY in place. Since OCCASIONAL INSPECTION AND CLEANING is desirable, be sure to add the valves to your scheduled maintenance program. Flowing media and cycle rate will determine the desired interval between inspections. Removing the BONNET exposes the internal parts of the valve. It is not necessary to remove the VALVE BODY from the line for inspection or repairs. Valve parts may be cleaned in commercial products such as Lime-Away® or CLR™ to remove mineral deposits. Be sure any cleaning solution is compatible with BOTH the metallic and non-metallic (seats & seals) components. Parts should be rinsed thoroughly in clean running water before re-assembly.

BOLT TORQUE for valves with bolt-on bonnets is as follows:

1¼" & 1½"	Type K & KX	60 ft•lb
2"	Type K & KX	70 ft•lb

Refer to INDIVIDUAL BULLETINS for ASSEMBLY DRAWINGS AND PARTS LIST.

INSPECTION CHECK LIST:

VOLTAGE must be within +10% to -15% of the nominal voltage indicated on the nameplate. To check the SOLENOID OPERATION energize and de-energize the solenoid several times. An audible CLICK indicates the solenoid is working properly. If no click is heard, check SUPPLY VOLTAGE. If voltage supply at the coil is proper, check the COIL for open or shorted turns with an OHMMETER.

The pilot valve PLUNGER must be free to move in the BONNET PILOT TUBE. The TUBE must be straight and perpendicular to the BONNET FACE and not kinked, bent or deformed. The PISTON ASSEMBLY should move freely in the cylinder bore with the application very little force. The PISTON RING should be free in the ring groove and the metal EXPANDER under the piston ring should hold the piston ring in contact with the cylinder bore.

The END GAP in the step cut of the piston ring should never be less than .020". The SEAT SCREW pilot orifice should be round and free from nicks, burrs or erosion. The DISC and main orifice SEAT should not be worn or chipped. The cylinder bore in the valve BODY should be round, smooth and free from wear, nicks or gouges.

REPLACEMENT PARTS:

After inspection, replace all worn or damaged parts. REPAIR KITS are available from stock or from local Sales Representatives. Refer to individual SOLENOID VALVE BULLETINS for description and part numbers. Some individual REPAIR PARTS are also available for special repair requirements.