INSTALLATION & OPERATION INSTRUCTIONS

GENERAL INFORMATION

1. Clean the lines upstream of the valve particles larger than 1/16" diameter (welding slag, pipe scale & other contaminants). Upstream installation of a 20 mesh strainer is recommended.
2. Air should be eliminated from the system so the Griswold flow control valves remain full of fluid during operation.
3. Flow control valves may be inserted in the pipe line either horizontally or vertically. Straight sections of piping upstream and downstream of the valves are not necessary for proper operation. Reducing bushings or flanges may be attached directly to flow control valves. Standard adapters are adequate for installation of flow control valves.
4. All styles of flow control valves are marked to show the direction of flow. THE FLOW ARROW MUST POINT IN THE DIRECTION OF FLOW FOR PROPER OPERATION.
5. Flow control valves are factory assembled and individually calibrated. The valves are warranted to be accurate within ± 5% of rated flow when properly installed.

COIL PIPING PACKAGES AND HOSEKITS

Griswold Controls uses many quality control checkpoints during its manufacturing process. Handling during transport, unpacking, or installation can alter any component's performance, including joint connections. If torque is applied to the product during installation, dope will crack and a leak may occur. We rely on professional contractors to inspect, install, and perform a thorough test during start up to correct any adverse handling or installation conditions that may affect the performance of the product.

The package contains factory sealed and tightened threaded connections. Please check components to ensure that transportation and unpacking did not crack the pipe dope or loosen connections. All union tailpieces and sweat adapters are hand tightened only to assist your final field connection.

THREADED VALVES

Standard threaded flow control valves are tapped with NPT (BSP threads optional). Seal valves with approved pipe sealant. Torque should not exceed 75 foot/pounds.

FLANGED VALVES

Gray Iron (Class 150) valves (through 20") (ASTM A48(30)) are mechanically compatible with standard ANSI 150lb. flat-faced or raised-face steel flanges, or with 125lb. cast iron flanges. 30" valves are mechanically compatible with 150lb. flanges per MSS SP-44.

Ductile Iron (Class 300) valves (through 20") (ASTM A-45-70, Class 60-40-18) are mechanically compatible with standard ANSI 300lb. flat-faced or raised-faced steel flanges or with 250lb. cast iron flanges. 30" valves are mechanically compatible with 300lb. flanges per MSS SP-44.

Appropriate gasketing material must be used when installing flange-mounted flow control valves (for example, 1/16" thick ring type filled asbestos gaskets). (Not supplied by Griswold).

If the flow control valve is furnished with valve kits or direct mounted meter kits, make sure that clearance is left around the valve for these items.

SWEAT VALVES

Griswold products with sweat connections are designed to be soft soldered. The use of a heat sink is recommended because excessive heat can harm internal polymer materials such as O-rings, P/T seals, and Teflon seals. If the product contains a ball valve it should be soldered in the closed position.

Procedure to Solder Bronze/Brass Valves:

The installation of Solder or Sweat End Valves is comparatively simple. To insure perfect, leak-free joints the following instructions should be followed:

1. Make sure the copper tube ends are cut square, and all burrs and rough edges are removed.
2. Clean tubing ends and the inside of the valve socket with a wire brush and sandpaper suitable for copper tubing and bronze valves. The inside

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of the valve ends should be made bright with a wire brush and the tube ends made bright with sand or emery paper.

3. Carefully coat the inside of the valve sockets and outside of the tubing with non-corrosive solder flux. In extremely cold weather, warm the valves to room temperature before applying flux.
4. After coating the valve sockets and copper tubing with flux, insert the tube ends into the valves socket until it seats against the shoulder. Rotate the tubing a few times to insure proper flux coverage.
5. Use a heat sink (wet towel) around the valve to protect o-rings from heat.
6. Ball valves should be soldered in the closed position and the valves allowed to cool before opening.
7. Using a soldering torch, heat the outside of the valve socket until it is hot enough to melt the solder. The correct temperature can be determined by the touching of the valve socket with the solder.

Once the valve is heated enough to accept the solder, apply the flame to the bottom of the valve socket until all the solder is absorbed, remove the flame and any excess solder. Let the valve cool before operating.

WARNING! DO NOT, under any circumstances, solder the downstream end of the valve while there is upstream pressure, or with fluid trapped in the cavity around the ball. Thermal expansion of this fluid could produce excessive internal pressure that could damage seat or body materials. Always drain down the system and cycle the valve two to three times after drain down is complete before applying heat. Steam created from trapped fluid in cavity around ball could cause the valve to BURST if it is heated excessively.

COMBO VALVES

When soldering sweat-end combo valves, remove the union nut and slide over the pipe. Then sweat the tail piece to the pipe. If there are sweat ends on both sides, repeat the same steps for each end. Next, install the combo body assembly between the tail pieces and tighten the union nuts. This will prevent damage to the O-rings.

GROOVED END VALVES

1. Grease the pipe ends, valve ends and rubber gasket lips with cup grease, graphite paste or similar grease.
2. Slip the rubber gasket over the pipe end of each joint. Note: in 10" and larger valve connections, turn the gasket out and slip it over the pipe ends. Roll the gasket back after bringing the valve into position.
3. Position the grooved end valve between the pipe ends and slide the gasket back into central spanning position. Smear grease on the outside of the gasket.
4. Put housing clamps over gasket – insert bolts and nuts.
5. Tighten nuts evenly, using socket or other wrench. (Note: best speed of assembly is obtained with brace or T-Handle wrenches.) Tighten so that housing clamps come together evenly. This avoids gasket pinching. When housing clamps meet metal to metal, further tightening of bolts is not necessary or desirable.
6. Pre-assemble large diameter multi-segment housing clamps loosely, and install them as half-housings. Take up evenly from top to bottom on alternate bolts.

ISOLATOR äR, ISOLATOR äY

Cartridge removal in these valves can be accomplished without removing the valve from the line. Carefully remove the cap and pull the cartridge out with your fingers. When refitting a cartridge, make sure the O-ring or gasket on the cartridge and O-ring on the cap are in place.

When soldering sweat-end fittings on these valves, remove the union nut and slide over the pipe. Then sweat the tailpiece to the pipe. Next, install the valve body and tighten the union nut. This procedure will prevent damage to the O-ring.

Regular blow-down or other cleaning of the filter screen will be required.

FLOWCON K VALVE

Cartridge removal in the FlowCon K valve can be accomplished without removing the valve from the line. Carefully remove the cap (including the P/T Tap) and pull the cartridge out with your fingers. It is a slip fit so

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no pliers are necessary (pliers would damage the cartridge). When refitting a cartridge, make sure the O-ring on the cartridge and on the cap are both in place.

THREADED MINI, COMBO VALVE

Cartridge removal in these valves can be accomplished after the valve housing is removed from the line.

Tools Required
No tools are required for 1/2" & 3/4" FCV's. Use 1/2" SCH 40 PVC x 5" long with bolt head to remove the cartridge from 1", 1-1/4", and 1-1/2" FCV models.
Use 1" SCH 40 PVC x 5-1/2" long with aluminum head to insert the 1-1/4" cartridge in the 1", 1-1/4" & 1-1/2" FCV's.

Removing Cartridge
1. Remove the FCV housing from the system.
2. Remove all nuts, O-rings, and packing plugs from the housing end.
3. With a screwdriver, remove the clip ring from inside the housing (around cartridge at the base of cup, up-stream side).
4. For 1/2" & 3/4" FCV only - Cartridge is slip fit with an O-ring seal. Do not use pliers on cup (damage may result). For 1" to 1-1/2" housing, insert the tool completely inside the cartridge and tap it out with a hammer. The tool should rest on the inside of the cup with the orifice openings to prevent damage to the spring.

Inserting the Cartridge
1. On 1/2" & 3/4", reverse procedure used in removal.
2. For 1" to 1-1/2" housing, place the cartridge in the FCV housing and then place the housing on a solid surface. Use hammer to tap down the cartridge into the housing seat (approximately 3/4" travel).

Reinstall, or replace the clip ring in the housing grooves and reassemble the end pieces and O-rings.

WAFER, GROOVED END, FLANGE END

Cartridge removal in these valves can be accomplished after the valve housing is removed from the line.

Removing Cartridge
1. Remove the FCV housing from the system.
2. With a screwdriver, remove the screws that hold the cartridge(s) in place.
3. Remove the cartridge(s) from the housing.

Inserting the Cartridge
1. Reverse procedure used in removal.

OPERATION

For optimum operation, air entrapment in the fluid MUST be eliminated. The flow control valve must remain full of fluid during system operation.

The system should contain 20-mesh (minimum) screen strainer protection.

The operation of the Griswold flow control valve is dependent on the characteristics of the flowing medium. It is therefore important that when ordering a valve, complete fluid specifications are included (if the fluid is anything other than 100% water, example: If the fluid is 50/50 ethylene glycol and water).

1. Specific Gravity

   Specific gravity is the most important attribute of a liquid used in a Flow Control Valve. The specific gravities of fluids at temperatures other than 60° F are referenced to water at 60° F. Correction will need to be made for any fluid with a specific gravity other than 1.

   The flow control valves are available in specific flow rate increments. When the flow rate is corrected for specific gravity, it may fall in-between two available flow rates. We will supply a valve that is closest to the theoretically determined flow unless otherwise requested.

2. Viscosity & Temperature

   The viscosity of a fluid is mainly dependent on the fluid temperature. For some fluids such as water, the viscosity change with temperature is immaterial. In other fluids, such as petroleum oils, the viscosity change with temperature is quite noticeable. Both fluid viscosity and operating temperature must be specified.

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MAINTENANCE

If the system experiences large amounts of pipe scale due to poor water conditions, as sometimes found in older or retrofit systems, provisions should be made to keep the system clean. Proper water treatment is also recommended by the use of a Griswold Separator.
If a Griswold Separator is not used for system cleaning, the flow control valves should be inspected annually.

Spare cartridge assemblies, factory calibrated and pre-assembled, may be ordered. In most cases, both the control range and the flow rate can be changed by ordering new cartridges.

O-RING REPLACEMENT

Assembly must be made with care to protect the O-ring from damage during installation. Some of the more important features to ensure this are:

- Cleanliness is important for proper seal action and long O-ring life. Foreign particles like dirt, metal chips, etc. in the O-ring groove may cause leakage and can damage the O-ring thus reducing its life.
- Using silicon oil or grease lubricant at assembly helps protect the O-ring from damage by abrasion, pinching, or cutting. Do not use aerosol products or petroleum based lubricants. The lubricant should not excessively soften or harden.
- Depending on the application, the O-ring should be placed in the groove or stretched over the threads.
- O-rings should not be twisted, forced or rolled over sharp corners, threads, or other sharp edges.

TROUBLE SHOOTING

Selection of the correct valve control range is probably the most common field problem. This can be corrected by reading our "Design Guide" brochure (F-4367).

Refer to the following table to identify the type of problem and the solution.

CONDITION	PROBABLE CAUSE	SOLUTION
Low Flow	Pump not sized correctly.	Change pump impeller or go to larger pump.
	System valve partially closed.	Open all system valves.
	Strainer clogged.	Clean strainer.
	Cartridges clogged (no strainer).	Remove and clean cartridges. Install a Griswold Separator.
	Installed in wrong location.	Check prints for correct location.
	System pressure too low.	Check delta P across valve. Change cartridge to appropriate spring range if delta P reads above or below specified range.
	Installed equipment different from original design.	Check original submittals with "as builts".
High Flow	Pump not sized correctly.	Change pump impeller or go to smaller pump.
	System pressure too high.	Check delta P across valve. Change to appropriate spring range if delta P reads above or below specified range.
	Installed in wrong location.	Check prints for correct location.
	Installed backwards.	Check direction of arrow on housing indicating direction of flow.
	Installed equipment different from original design.	Check original submittals with "as built".
Pipe Vibration/ Surge Noise	Cartridge has wrong spring range for system pressure.	Check delta P across valve. Change to appropriate spring range if delta P reads above or below specified range.
	Two flow controls installed in series.	Remove one flow control from line.
	System valve (2-way or 3-way) opening and closing incorrectly.	Check valve operation.
	Air in lines.	Bleed off air.
	Pump cavitation.	Check pump operation.
No pressure drop across flow controls	Installed backwards.	Check direction of arrow on housing indicating direction of flow.
	Pump cavitation.	Check pump operation.
	System not running.	Start pump.
	Control valve is closed.	Open valve.

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