

KOBOLD KSV FLOWMETER

User Instructions

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CAUTION: For safety reasons, please read the cautionary information located at the end of the manual, before attempting installation.

1.0 General

The KOBOLD KSV flowmeter is a low volume measuring and controlling device calibrated for flows of water or air. The unit has a plastic body with metal fittings and is kept leak tight through the use of O-ring seals. The floats are either aluminum, stainless steel, glass, or titanium. Though the float types are determined by measuring range, the customer has a choice of plastics for the body and metals for the fittings. Table 2.4 gives a complete breakdown of the material combinations available.

The KSV is supplied with or without a needle valve, depending upon the order number. We generally recommend that the needle valve version be used to help stabilize the float during introduction of media (particularly gases) into the flowmeter. As is typical for needle valves, complete shutoff cannot be achieved with our valves. Should complete shutoff be desired, we recommend the installation of a shutoff valve upstream of the KSV.

2.0 SpecificationsTable 2.1: Technical Data

Operating Principle:	Ball float with conical flow tube
Display:	Direct reading, calibrated for Air @ STP or water
Flow Direction:	Vertical Upward
Mounting:	Panel mount w/bracket
Connections:	1/8" Female NPT, rear
Accuracy:	± 6% of full scale
Repeatability:	± 1%
Operating Temperature:	
Polycarbonate:	0 Degrees F to 130° F
Polysulfone:	0 Degrees F to 250° F @ 0 PSI (gauge pressure)
Maximum Internal Pressure:	100 PSI @ 70 Degrees F

Table 2.2: Material Composition

Body:	Polycarbonate or Polysulfone
Float Stop:	Polycarbonate or Polysulfone
Connections:	Brass or 303 Stainless Steel
Control Valve:	Brass, polycarbonate, stainless steel, polysulfone
Float:	Glass, Stainless Steel, titanium, or polypropylene
O-rings:	NBR or FKM

3.0 Installation Instructions

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3.1 - Description of Component

The KSV is delivered completely assembled and ready for use. The single detachable item is a U-shaped mounting bracket attached to the back of the device with a single screw. Make sure that this bracket has not become detached.

3.2 - Mounting

As with all float-type, gravity-resisted flowmeters, the KSV must be installed in a vertical position with the inlet at the bottom. The connections to the unit are 1/8" female NPT, horizontally oriented and found at the rear of the housing.

Should panel mounting be desired, the unit flush mounts into a 15/16" x 3 23/32" rectangular opening. To install, remove the U-bracket at the rear of the device, push unit into panel opening, and replace the U-bracket. Take care not to overtighten the U-bracket screw as excess force may damage the plastic housing. Connections may now be made to the 1/8" NPT fittings.

4.0 Operation

We recommend that, if possible, the needle valve be closed (turn knob clockwise to stops) when pressure is introduced to the device, and thereafter opened gradually to achieve the desired flow. This procedure helps avoid oscillation of the float as the flow is turned on and, more importantly, prevents damage due to pressure surges (as described in cautionary section).

5.0 Maintenance

The major enemy of float-type flowmeters is dirt. We recommend that clean or filtered media only be passed through the device.

6.0 __ Arrival of Damaged Equipment

Your instrument was inspected prior to shipment and found to be defect-free. If damage is visible on the unit, we advise that you carefully inspect the packing in which it was delivered. If damage is visible, notify your local carrier at once, since the carrier is liable for a replacement under these circumstances. If your claim is refused, please contact KOBOLD Instruments for further advisement.

7.0 __ Need help with your KSV?

Call one of our friendly engineers at 412-788-2830.

Caution

PLEASE READ THE FOLLOWING GENERAL FLOW METER/ MONITOR WARNINGS BEFORE ATTEMPTING INSTALLATION OF YOUR NEW DEVICE. FAILURE TO HEED THE INFORMATION HEREIN MAY RESULT IN EQUIPMENT FAILURE AND POSSIBLE SUBSEQUENT PERSONAL INJURY.

- Inspect instrument for damage upon arrival. Cracked, fractured, bent or otherwise damaged instruments must not be put into use, since the device is weakened to an unknown extent. (The operations and installation guide will explain how to make a claim on damaged instruments.)
- Under NO circumstances must the maximum tolerances (temperature and pressure) be exceeded.
- The maximum tolerances of the device have been determined using water, air and/or oil. If using other media, especially corrosive ones, it is critically important that the user determine chemical compatibility with our instruments. A list, detailing material composition of our instruments, is available from KOBOLD Instruments Inc. upon request. KOBOLD Instruments Inc. cannot accept responsibility for failure and consequences resulting from use of media other than water, mineral oil, air, and nitrogen.
- Install the device in a fully supported position within your flow system. This avoids excessive stresses which may damage the instrument. In particular:
 - a. Ensure that the plumbing leading to and from the instrument is fully supported and that the instrument does not perform the physical function of a joint.
 - b. When calculating stress on the device caused by plumbing, the weight of the medium in the pipes must be considered as well.
 - c. Misaligned runs of rigid piping can cause large stresses when connected to the instrument. Do not connect in such a fashion.
- During installation, avoid stresses on the instrument by following guidelines given below:
 - a. When connecting fittings, hold the instrument fittings rigid with a correctly sized wrench. Do not install by twisting the instrument into the pipe fittings.
 - b. Do NOT install by holding the device housing to provide counter-torque to the pipe fitting.
 - c. Use an appropriate amount of PTFE tape on male threads of fitting. This reduces the twisting stresses produced by tightening the fittings into each other.
 - d. Do not use pliers or wrenches on the housing, as this may damage it.
 - e. Do not overtighten, as this may fracture the fittings.

- During operation, there are a number of situations to avoid:
 - a. The sudden cessation of fluid flow causes what is typically referred to as "water hammer". Most people are familiar with this phenomenon from their home experience - it is the cause behind the loud clank of water pipes which occurs when faucets are turned off too suddenly. The cause behind this "water hammer" is quite easy to visualize. Water is fairly massive. The amount of water in long runs of pipe is quite substantial. When the faucets are turned off suddenly, especially from a full on condition, the water has considerable momentum and does not want to stop flowing. The situation is similar to stopping a car by running into a wall, rather than by applying brakes. Both are sudden rather than gradual. The damage to the wall can be substantial (not to mention the car).

The "water hammer" causes surges in fluid pressure which could cause the measurement instrument's pressure limit to be exceeded, resulting in failure and possible personal injury.

- b. Fluid surges, as well as the water hammer, can be particularly damaging to empty flowmeters since there is no back pressure in the device. The damage is caused, once again, by momentary excess pressure. To avoid these surges, fluid lines should remain full (if possible) and water flow should be introduced to the device slowly.
 - c. If the instrument is isolated with inlet and outlet valves, the flowmeter must be completely drained when said valves are both closed. Failure to do so could result in damage to the device caused by thermal expansion of fluid.
 - d. Freezing of water in the instrument must be avoided since the resultant expansion will damage the flowmeter and make it unsafe for use.