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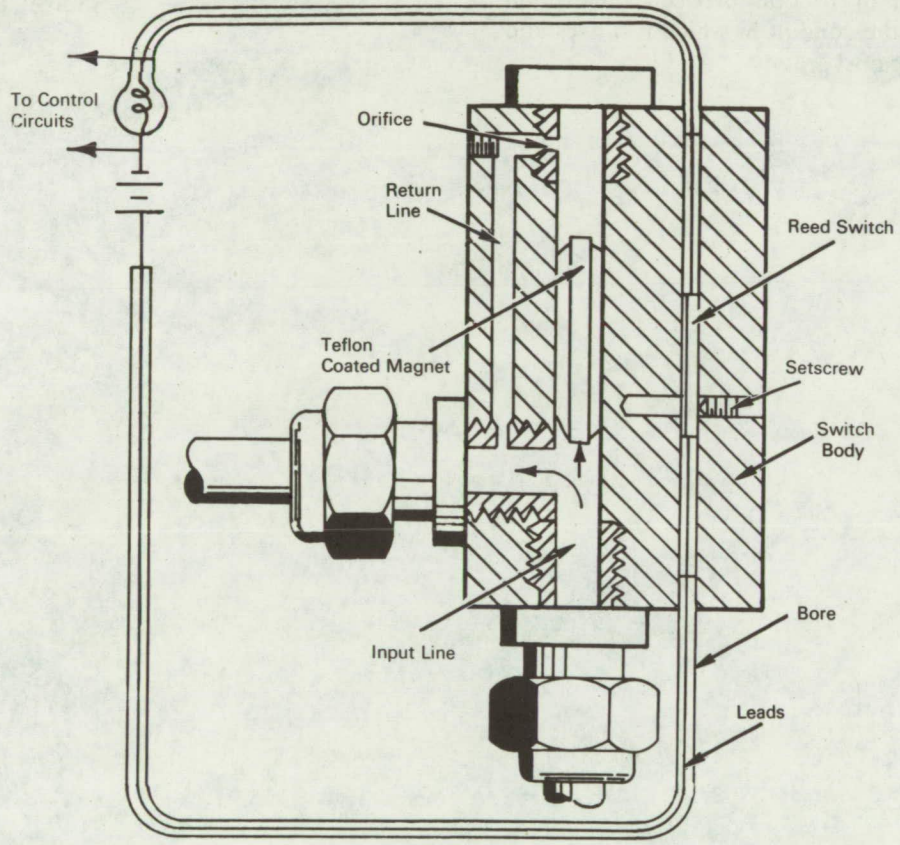
Brief 66-10696

NASA TECH BRIEF

Low Rate Flow Switch Can Be Used for Gas or Liquid



The problem:

To construct a reliable flow switch which is operable at low flow rates. This is used for detecting the flow of a water coolant in a vacuum deposition apparatus. Coolant monitoring is imperative in many semi-automatic machines used in processing production items. The switch should be convenient and simple to use, trouble free, and capable of use with either gas or liquid.

The solution:

A flow switch utilizing one more reed switches that are actuated by a sliding magnet.

How it's done:

The switch elements are incorporated in a conduit in such a manner that a slight movement of fluid in the conduit causes the sliding magnet to move into a position relative to the reed switch assembly. When

(continued overleaf)

this occurs, the magnetic flux path reacts with the switch assembly and closes the switching circuit. The magnet is coated with a low-friction material such as Teflon. The reed switches are set into place by set-screws.

A return line connects the low pressure side of the input to the output line in such a way that any input forces the magnet upward. The orifice is designed so that any liquid remaining in the chamber above the magnet is bypassed out the return line. Return of the magnet downward is accomplished by gravity. An external indicator circuit consisting of a battery and lamp is closed when the magnet is moved under a critical point.

This system does not require pressure sufficient to close a spring bias. The only forces involved are the very low coefficient of friction between the Teflon coated magnet and the conduit in which it moves and lifting the magnet against gravity.

Notes:

1. Although in practice the switch body was made of lucite, any other nonmagnetic material can be used.
2. Models have been constructed which were able to sense flow ranges as low as 4.0 cc per second.
3. Inquiries concerning this invention may be directed to:

   Technology Utilization Officer
   Jet Propulsion Laboratory
   4800 Oak Grove Drive
   Pasadena, California 91103
   Reference; B66-10696

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

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(JPL-867)