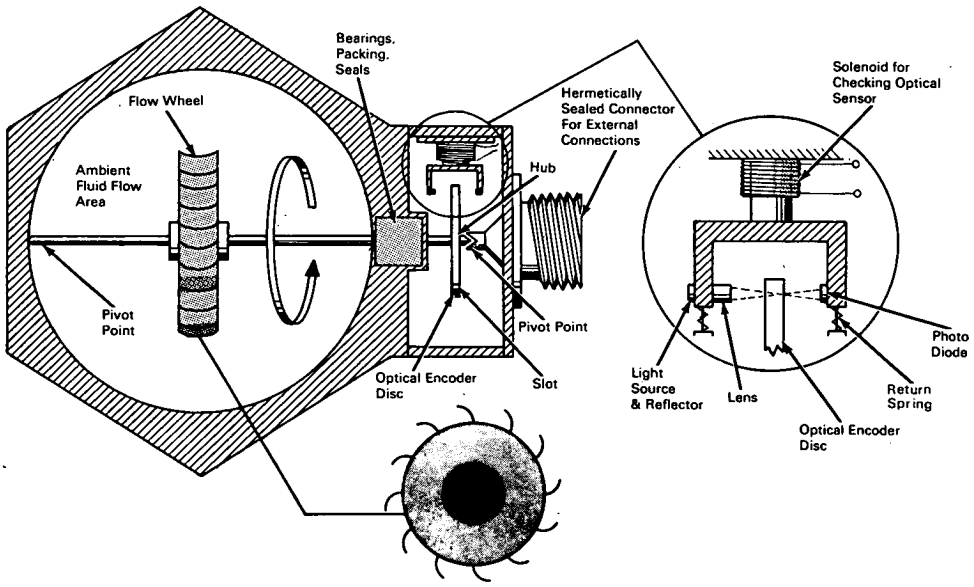
NASA TECH BRIEF

Optical Output Enhances Flowmeter Accuracy



The problem: Accuracy in magnetic flowmeters is degraded by such things as ripple current, power input amplitude variations, and changes in duty cycle. A flowmeter is needed that operates independently of other system inputs.

The solution: A flowmeter with a direct-coupled optical output. The design includes simple external adjustment and signal amplitude control.

How it's done: An optical encoder disk is mounted on the shaft that is driven by the flow wheel in the measured fluid. An optical sensor consisting of a light source, collimating lens, and photodiode is so mounted that the encoder disk interrupts the beam of light from the light source to the photodiode. A slot or other configuration cut out of the disk causes the light source to illuminate the photodiode as it indexes with the beam of light. The design includes a solenoid operated mounting for the optical sensor so it may be moved up out of the encoder disk path for calibration and adjustment. The spring mounted sensor frame returns to operating position when the solenoid is deenergized.

Notes:

1. Signal amplitude is controlled by controlling light source intensity.
2. By means of a servo and feedback, this device could be used to accurately regulate the flow of a liquid.

(continued overleaf)

3. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama, 35812
Reference: B65-10395

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated by NASA.

Source: Edward G. Wolpin of North American Aviation, Inc., under contract to Marshall Space Flight Center (M-FS-482)