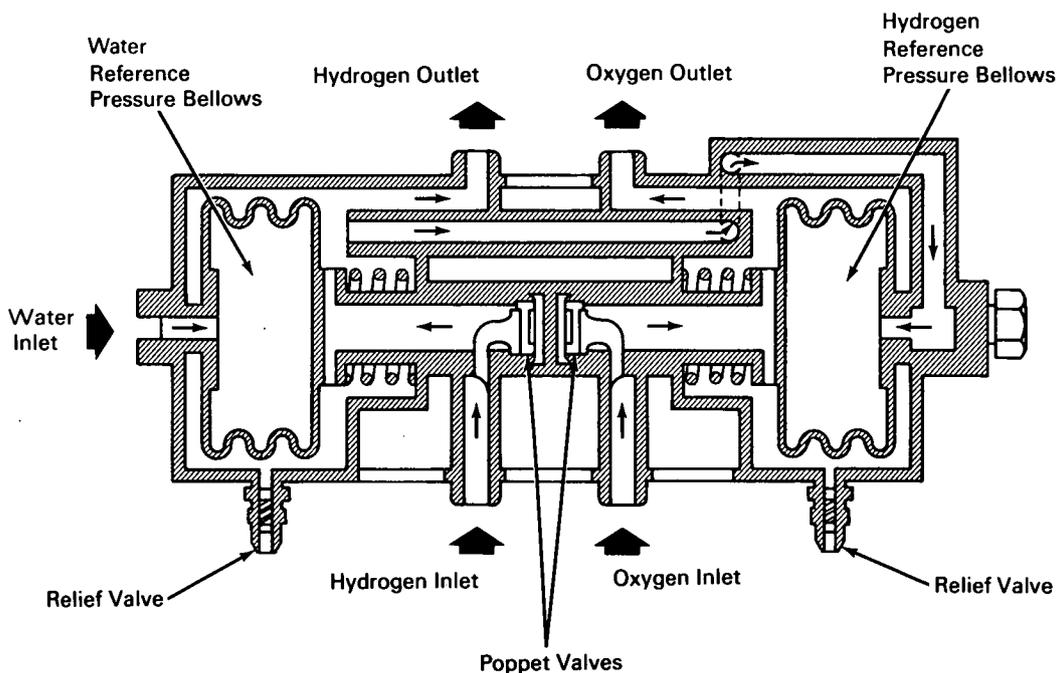


NASA TECH BRIEF



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Dual Regulator Controls Two Gases from a Single Reference



The problem:

To achieve parallel pressure regulation of two gases using a single regulating device and a common reference, while maintaining strict separation of the gases.

The solution:

A simple dual-pressure regulator that uses an external fluid pressure to modulate the flow of one gas, and the regulated flow of the first gas to modulate the flow of the second.

How it's done:

The dual-pressure regulator uses an internal bellows and poppet valve system to achieve the desired regulation. Two normally open plastic seat poppet

valves modulate gas flow through two parallel inlets. Water or other fluid fills the reference pressure bellows. The first gas, hydrogen in the illustration, enters its inlet port, passes through its poppet valve, and surrounds the reference pressure bellows. Increasing hydrogen pressure contracts the bellows to move the hydrogen inlet poppet valve in a direction to decrease hydrogen flow through the valve into the pressure regulator. As hydrogen pressure decreases, the water reference pressure bellows expands to move the hydrogen inlet poppet valve in a direction to increase hydrogen flow through the valve into the pressure regulator.

(continued overleaf)

Hydrogen in the pressure regulator is conducted through interconnecting passageways to the interior of the hydrogen reference pressure bellows and the hydrogen pressure acts as the reference for the second gas pressure, in this case, oxygen. Oxygen enters its inlet port, passes through the poppet valve, and surrounds the hydrogen reference bellows. Modulation of the oxygen inlet poppet valve is accomplished in the same manner for the hydrogen inlet poppet valve except that, in this instance, hydrogen is the reference pressure and the hydrogen reference pressure bellows is contracted and expanded by pressure from the surrounding oxygen.

A constant pressure in the reference bellows results in constant flows from the outlets. Modulation of the reference pressure will cause the outlet flows to be similarly modulated. Relief valves are provided to limit hydrogen and oxygen pressures in the regulator.

Note:

Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
Houston, Texas, 77058
Reference: B66-10167

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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