SPACE QUALIFIED PUMPS

LOW COST, VERSATILE CENTRIFUGAL PUMPS

Manned and unmanned space applications

Collins Aerospace's space qualified pumps provide for a broad range of use for environmental control, avionics cooling, fluid pump loops, or for other manned or unmanned applications. The pumps are manufactured from corrosion resistant materials and have a canned motor configuration. They are designed to operate during ascent, orbit, descent, and ground operations. Capable of surviving high vibration and shock loads, our pumps are designed around fluid types such as Ammonia, Water, Freon, Galden, Glycol and HFE. Specific flow, head pressure, speed, and power needs are matched to the customer's need. This will ensure the pump's long life expectancy and efficiency over the wide operating temperature ranges available. Electrically, the pumps can be fixed or variable speed controlled.

We have been designing and manufacturing pumps for manned and unmanned spaceflight for over 50 years on over a dozen platforms. Collins Aerospace brings this unsurpassed experience to these designs, which are mechanically and electrically adaptable to a wide range of customer requirements.

We are developing a common low cost pump for commercial manned or unmanned space applications. The pumps can be easily modified to meet a wide range of applications. Using common parts for multiple programs has reduced our cost and lead time.

OUR DESIGN EXPERIENCE ASSURES

- Fluid specific designs
- Long Operational Life
- High Efficiency
- Proper flow, head, speed, and power for the application
- Wide Operating Temperatures
- Low Acoustic Signature
- Balanced weight, size, and packaging
- Structural robustness to launch environments
- NASA compliant materials for human spaceflight

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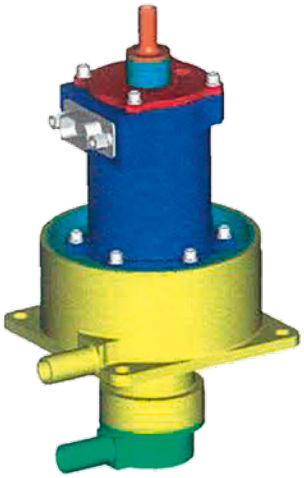
KEY CHARACTERISTICS

- Fluid types
  - Ammonia, Water, Refrigerants, Galden, Glycol,
    HFE, and many others
- General Performance Characteristics
  - Flow (H2O): 0.25 – 2.75 (gpm)
  - Head (H2O): 12 – 126 (feet)
  - Voltage: 28 – 120 (Vdc)
- Pumping Efficiency (NH3)
  - Example: Pump Package
    2500W of cooling with
    25W of input power
- Life Expectancy
  - Space qualified for 15 year service life
  - 1.5 Million Hours collective operation



Compact Efficient Pump

Specifications subject to change without notice.

Collins Aerospace

Collins Aerospace
+1.860.654.3112
darren.samplatsky@collins.com
collinsaerospace.com