

GEAR PUMP



GEAR PUMP for Spacecraft Thermal Control

Technology and design issued from R&T CNES.

- › 2 manufactured prototypes
- › Cumulated test duration > 1 year
- › Correlated performance model

Main benefits

Pump performances in conformance with known S/C manufacturer expectations:

- ✓ Flow rate (150 l/h)
- ✓ Pressure rise (DPMAX = 1.5 bar)
- ✓ Operating temperature (TQUALIF = +85 °C)
- ✓ Two phases fluid functioning (tolerant to bubbles)
- ✓ Limited sub-cooling

Next steps

- › EM Pump Test (mid-2020)
- › Pump lifetime demonstration with EM Model (begins in 2020)
- › CDR Review and Qualification campaign (begins in 2020)



Keys features

Working Fluid
Ammonia / Water

$T_{\text{START-UP}} = -70\text{ °C}$
 $T_{\text{MAX FLUID}} = +85\text{ °C}$

Nominal Flow rate
150 l/h (0.041 l/s)

Maximum pressure rise
1.5 bar (21.76 psi)

Mass
5 kg (without electronic box)

On demand for other
fluids
Working fluid

Electrical consumption
45 W (without electronic box)

Industrialization
of processes
Decrease production costs
Manufacture small series (e.g.
4-10 pump per year)



6 Chemin de Vignalis, 31130 Flourens, FRANCE
+33(0)5 612 426 16 | info@comat.space

comat.space





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Pumps

