

Cold Gas Mechanical Pressure Regulator

- Single Stage Nitrogen Regulator



The Cold Gas Mechanical Pressure Regulator is a single stage passive flow control device, primarily intended for gaseous regulation in propulsion systems. The regulator will step down the high pressure inlet gas to a predefined outlet pressure for the customer.

The design approach permits the implementation of soft

seat technology which reduces the sealing forces required and consequently limits the performance degradation which could otherwise occur with harder seat materials/ higher sealing forces. The sealing forces are derived from the lock-up pressure acting on the diaphragm.

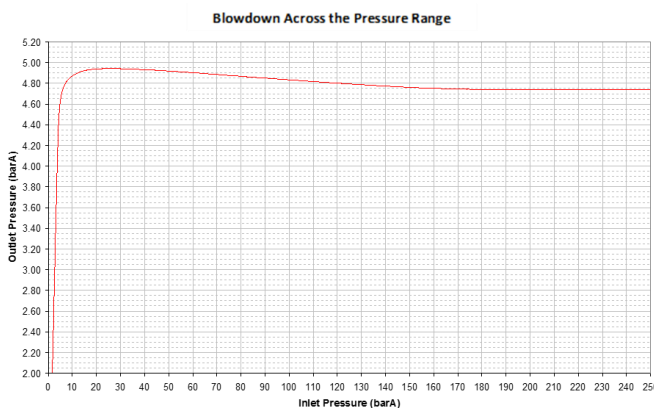
The regulator can also be delivered in a dual stage series redundant configurations. The dual stage regulator can be either forward or reverse cascade configuration.

There are no sliding fits involved, reducing the risk of particulate contamination. Filters can be included at the inlet and the outlet of the unit. Compensation for decreasing inlet pressure

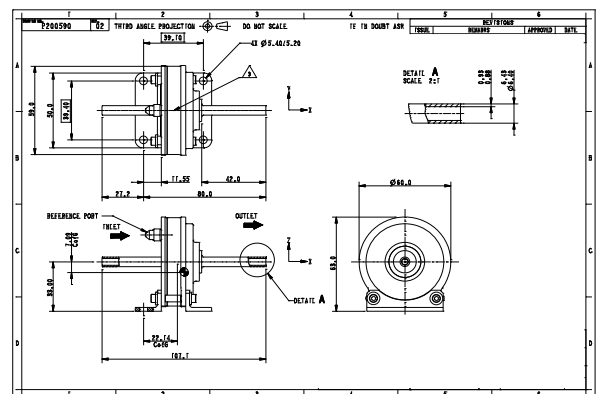
is included within the design.

The regulator is manufactured from lightweight Titanium, and the seal material is PCTFE. The regulator is all electron-beam welded construction, with tubing and mounting interfaces to customer requirements.

This single stage design regulator was used successfully on the PRISMA satellite mission.



Outlet pressure trace based on blow down from 250 bar at inlet. Outlet pressure set at 4 bar



Interfaces can be customised based on customer needs

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Operating Media	GN2
Inlet Pressure	250 bar
Outlet Pressure	4 bar nominal
Set Point Accuracy	3.9 bar to 4.1 bar, set at max operating inlet pressure
Outlet Pressure Tolerance	+/- 0.4 bar over life
Lockup	<1.5 bar above set point
Outlet MEOP	6 bar maximum
External Leakage	< 1×10^{-6} GN2 over pressure and temperature range
Internal Leakage at Lockup	< 1×10^{-4} scc/s GN2
Operating Temperature	+17°C to +60°C
Non-Operating Temperature	-20°C to +60°C
Mass Flow	10 mg/s GN2
Mission Life	1 year
Hardware Mass	0.25 kgs
Structural Interface	4 bolts, M5
Fluidic Interface	1/4" tube stub or screwed AS4395 fitting
Envelope	107mm x 60mm x 63mm
Technology Readiness Level	TRL9, ESA Prisma mission 2010



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