Gas pressure regulators

Capitalizing on its cryogenic engineering capabilities and extensive experience on space specific requirements, Air Liquide has developed a full range of mechanical gas pressure regulators.

Air Liquide offers both standard and customized turnkey solutions to meet your specific needs and supports you throughout the different phases of your project: from preliminary studies to system qualification.

Key benefits

- ✓ Air Liquide expertise
- ✓ High level of accuracy
- ✓ Robustness
- ✓ Tightness
- ✓ Compact

Small Gas Pressure Regulator (GPR-S)

Single stage regulator (with integrated filter)

Specification

Application	Small launchers
Media (operational)	Gaseous helium
Media (compatibility)	Inert gas
Upstream pressure	328 – 40 bar
Regulated pressure	31.4 ± 0.6 bar
Proof factor	1.5
Burst factor	2.5
Mass flow rate	4 g/s (nominal)
Response time	<100 ms
External leak rate	10-4 scc/s (GHe)
Internal leak rate	10-3 scc/s (GHe)
Lifetime (ground storage)	8 years
Thermal environment	-60°C / +43°C
Inlet gas temperature	-50°C / +33°C
Mass	<1.7kg
Dimension	• Length: 114 mm • Width: 113 mm • Height: 87 mm
Technology Readiness Level (TRL) according to ESA standards	Development in progress: TRL 6
Fluidic interface	Taylormade

Medium Gas Pressure Regulator (GPR-M)

Two stages in serie regulator

Specification

Application	Upper stage heavy launchers
Media (operational)	Gaseous helium
Media (compatibility)	Inert gas
Upstream pressure	400 – 44 bar
Regulated pressure	20.75 ± 0.65 bar
Proof factor	1.5
Burst factor	2.5
Mass flow rate	22.5 g/s nominal (6.5 to 29 g/s)
Response time	<100 ms
External leak rate	<10-2 scc/s (GHe)
Internal leak rate	<1 scc/s (GHe)
Lifetime (ground storage)	6 years
Thermal environment	-20°C / + 70°C
Inlet gas temperature	-70°C / + 40°C
Mass	<5 kg
Dimension	• Length: 216 mm • Width: 235 mm • Height: 75 mm
Flight heritage	Ariane 5 REACH compliance under-qualification

Large Gas Pressure Regulator (GPR-L)

Two stages regulator

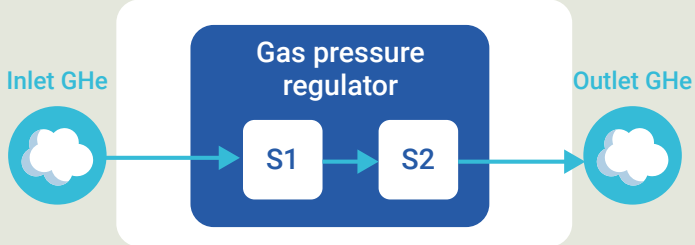
The high-flow rate pressure regulator can be sold separately.

Specification

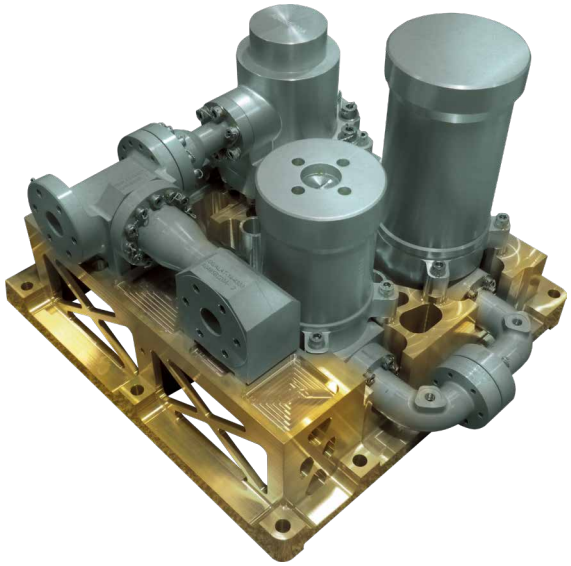
Integrated components	Two stages pressure regulator
Application	Upper stage heavy and super-heavy launchers
Media (operational)	Gaseous helium
Media (compatibility)	Inert gas
Upstream Pressure	400 – 58 bar
Regulated pressure	41 to 49 bara according to mass flow rate
Proof factor	1.5
Burst factor	2.5
Mass flow rate	0.5 g/s to 170 g/s
Response time	< 2 s (oscillations induced by a perturbations last less than)

External leak rate	1 scc/s (GHe)
Internal leak rate	N/A
Lifetime (ground storage)	5 years
Thermal environment	-120°C / 50°C
Inlet gas temperature	-120°C / 60 °C
Mass	9 kg
Dimension	• Length: 220 mm • Width: 190 mm • Height: 250 mm
Technology Readiness Level (TRL) according to ESA standards	TRL 9

Operation



Compatibility witn inert gases (He, N_2)



Optional regulation plate

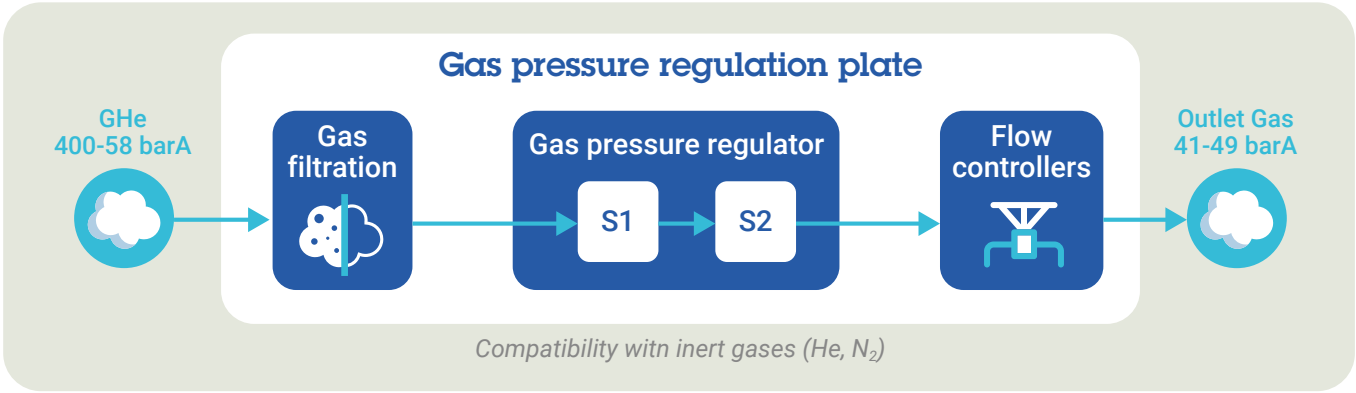
To complete the large gas pressure regulator, we propose an optional regulation plate, which is an integrated high performances and quality solution allowing to:

- Protect downstream circuits from any regulator failure (relief valve)
- Assess regulator behavior (pressure transducer)
- Protect system from a reverse flow (check valves)

Integrated components:

- ✓ Relief valves
- ✓ Pressure transducer
- ✓ Check valves

Operation



Compatibility witn inert gases (He, N_2)

Contacts

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