

Preparation Chamber System

UHV preparation chamber systems for efficient pre-cooling and transport of atomic beams in cold-atom and quantum-sensing experiments.

Product Overview

QBITFLOW Preparation Chamber Systems provide a ready-to-use atomic source stage for advanced quantum sensing and cold-atom experiments. The systems are designed for reliable operation under ultra-high-vacuum conditions and support efficient pre-cooling and transfer of atomic beams. They are delivered evacuated and pre-characterized, reducing integration and commissioning effort for research groups and system developers.

The Preparation Chamber is equipped with a Differential Pumping Stage (DPS) for assuring a pressure gradient of two orders of magnitude. A high-reflective mirror on the DPS enables pusher/retarder configurations.

The established standard configuration is designed for rubidium and potassium and combines the preparation chamber with a getter pump, valve, magnetic-field coils, standard viewport coatings and alkali-metal ovens. Depending on the application, the system can be extended with trapping / beam-delivery telescopes, spectroscopy optics and electronics, and magnetic-coil driver electronics.

The modular configuration approach allows customers to select the functionality required for their experiment while retaining a common mechanical and vacuum-system platform. Non-standard species, larger trapping volumes, longer chamber geometries, or comparable redesigns can be addressed as custom engineering work.

Specifications

Size	~ 200 x 165 x 160 mm (incl. valve)
Chamber Material	Titanium
Viewports	BK7 AR780nm/767nm/0deg
Valve	Stainless Steel Gate Valve
Mass	~ 2.5 kg (incl. valve, excl. coils and optics)

** Specifications are indicative and may vary depending on the selected configuration. Please contact QBITFLOW for detailed specifications of your individual system.*

Configuration & Feature Table

Comparison of the standard Preparation Chamber and current functional options.

Feature	Base Chamber	Trapping Optics Package	Spectroscopy Package	Full Optics Package	Coil Driver	Full Configuration
Standard Rb/K chamber	Yes	Yes	Yes	Yes	Yes	Yes
Getter pump + valve	Yes	Yes	Yes	Yes	Yes	Yes
Magnetic-field coils	Yes	Yes	Yes	Yes	Yes	Yes
Evacuated & pre-characterized	Yes	Yes	Yes	Yes	Yes	Yes
Standard viewport coatings / ovens	Yes	Yes	Yes	Yes	Yes	Yes
Trapping / beam-delivery telescopes	-	Yes	-	Yes	-	Yes
Spectroscopy optics	-	-	Yes	Yes	-	Yes
Spectroscopy electronics	-	-	Yes	Yes	-	Yes
Partial-pressure measurement capability	External / Pre-Characterisation	External / Pre-Characterisation	Integrated optics + electronics	Integrated optics + electronics	External / Pre-Characterisation	Integrated optics + electronics
Magnetic-coil driver electronics	-	-	-	-	Yes	Yes
Non-standard redesign / NRE	Separate	Separate	Separate	Separate	Separate	Separate

Standard/custom boundary: The standard product covers the established chamber geometry for rubidium and potassium. Other alkali species, a larger trapping volume / longer chamber, or comparable redesigns are quoted separately as NRE.

Optics split: Trapping and spectroscopy are offered as distinct functional packages and can be combined depending on the required system configuration.

Contact

For detailed information, integration support, or quotation requests, please contact:

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