

Reliable Alkali Metal Sources (RAMS)

Compact, customizable alkali-metal vapor sources for ultra-high-vacuum quantum and atomic-physics experiments.

Product Overview

QBITFLOW Reliable Alkali Metal Sources (RAMS) provide a stable, high-purity supply of atomic vapor for quantum and atomic-physics applications. Designed for reproducible operation and reliable integration into ultra-high-vacuum systems, the compact oven platform is available in two principal configurations: **BASIC** and **ADVANCED**.

BASIC uses an alkali-metal glass ampoule that is cracked after integration into the experiment. This approach avoids an isolation valve and therefore enables a particularly compact, lightweight source.

ADVANCED is filled directly with pure alkali metal. This avoids glass fragments in the oven chamber, supports direct thermal contact between the alkali metal and the heated chamber walls, and avoids noble-gas contamination originating from ampoule filling. The **ADVANCED** configuration includes a vacuum valve.

All RAMS variants use an externally mounted resistive NiCr80 heater designed to minimize magnetic-field emission. The heater is designed for low power consumption below 4 W, with the required power depending on the atomic species. A 10 kOhm NTC or Type-K thermocouple enables temperature monitoring. Heater and temperature-sensor lines are combined in a circular, lockable industrial-grade LEMO connector.

A high-conductivity filter separates liquid and solid alkali metal from the gaseous phase and protects the connected experiment from liquid or solid material. Standard interfaces are CF16 or CF10; other interfaces are available upon request. Rubidium and potassium are standard species, while other species can be addressed on request.

Prior to delivery, partial pressure and response time are characterized at QBITFLOW's in-house test stand using absorption spectroscopy. A detailed characterization is supplied with the oven. Magnetic-field characterization during operation can also be provided upon request.

Specifications

Parameter	BASIC	ADVANCED
Alkali-metal loading	Glass ampoule, cracked in experiment	Direct filling with pure alkali metal
Approx. size	~ 40 x 40 x 75 mm	~ 102 x 115 x 50 mm (with CF16 angle valve)
Approx. mass	~ 150 g	~ 1 kg
Standard species	Rubidium / Potassium	Rubidium / Potassium
Vacuum interface	CF16 or CF10	CF16 or CF10
Heater	NiCr80, < 4 W	NiCr80, < 4 W
Temperature sensor	10 kOhm NTC or Type K	10 kOhm NTC or Type K

** Dimensions and mass are indicative and depend on the selected material, interface and final configuration. Please contact QBITFLOW for detailed specifications of your individual RAMS.*

Configuration & Feature Table

Comparison of BASIC and ADVANCED RAMS configurations, each available with or without optional driving electronics and harness.

Feature	BASIC without electronics	BASIC with electronics	ADVANCED without electronics	ADVANCED with electronics
Alkali-metal source	Glass ampoule	Glass ampoule	Pure alkali metal	Pure alkali metal
Isolation valve	-	-	Yes	Yes
High-conductivity phase filter	Yes	Yes	Yes	Yes
NiCr80 resistive heater	Yes	Yes	Yes	Yes
Temperature sensor	Yes	Yes	Yes	Yes
Lockable LEMO connection	Yes	Yes	Yes	Yes
Driving electronics	-	Yes	-	Yes
Harness	-	Yes	-	Yes
Pre-delivery partial-pressure characterization	Yes	Yes	Yes	Yes
Response-time characterization	Yes	Yes	Yes	Yes
Magnetic-field measurement	On request	On request	On request	On request
Standard species	Rb / K	Rb / K	Rb / K	Rb / K
Other species / interfaces	On request	On request	On request	On request

BASIC vs. ADVANCED

BASIC: optimized for minimum size and mass. The sealed ampoule simplifies handling prior to activation and eliminates the need for an isolation valve.

ADVANCED: optimized for clean direct alkali-metal loading and controlled isolation from the experiment. Direct filling avoids glass fragments and noble-gas contamination from ampoule filling.

Electronics Option

Both BASIC and ADVANCED can be supplied as the oven assembly alone or together with optional driving electronics and harness. The electronic option is intended to provide the required heater drive and temperature-sensor interface as an integrated delivery package.

Contact

For detailed information, configuration support or quotation requests:

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