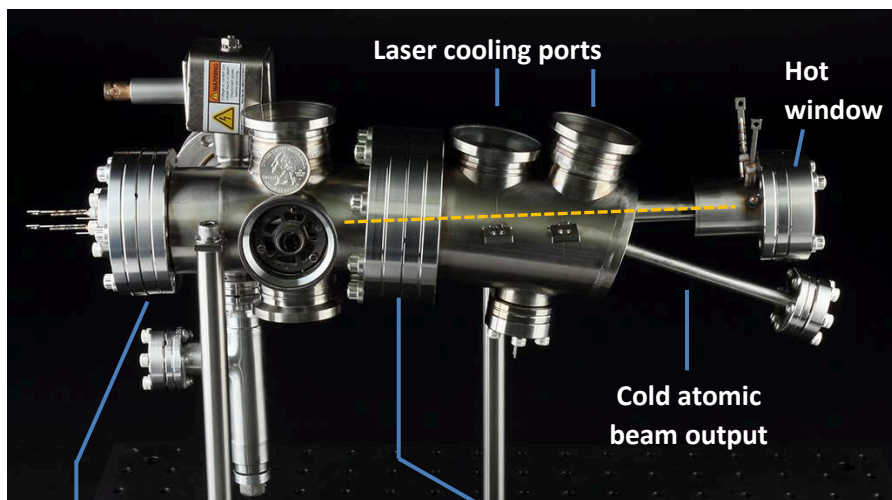


Beam-RevC-XX

Cold atomic beam system

- Cold atom flux $> 10^{11}$ atoms/s at $T_{\perp} < 3$ mK, axial speed ~ 40 m/s.
- Miniature chambers (1-2 L) and in-vacuum optics achieve baseline pressures $< 10^{-10}$ Torr.
- Proprietary oven and Zeeman slower, hot window, and integrated transverse cooling/trapping.
- Hot beam flux is entirely blocked from entering the cold beam output port.
- Species available: strontium, calcium, or ytterbium.



High flux atomic beam oven

- Low power consumption and no water cooling.
- Exceptionally low outgassing at elevated temperatures (6×10^{-8} Torr-L/s at 400 °C).
- Flux $> 10^{13}$ atoms/s using only 4 W.
- Holds many grams of material.

Zeeman slower

- Permanent magnet design (US Patent 8,710,428 B1)
- Requires no electrical power or cooling water.

| | |
|---|---|
| Cold Atomic beam system | Performance |
| Cold atom flux | 10^{11} atoms/s |
| Temperature transverse | $T_{\perp} < 3$ mK |
| Axial speed | ~ 40 m/s |
| Atomic beam oven | Performance |
| Strontium flux, 17 mrad half-angle | $> 3 \times 10^{13}$ atoms/s |
| Calcium flux, 11 mrad half-angle | $> 1 \times 10^{14}$ atoms/s |
| Power consumption | 5 W at 520 °C |
| Outgassing | 6×10^{-8} Torr-L/s at 400 °C |
| Water cooling | none |
| Maximum temperature (tested) | 650 °C |
| Zeeman slower | Performance |
| Type | Sigma-minus standard |
| B-field generation | Permanent magnets |
| Magnetic shield | Integrated |
| Thermal shield | Integrated |
| Mounting | In-vacuum |
| Hot window for slower | Performance |
| Maximum temperature (tested) | 480 °C |
| Outgassing | 3×10^{-9} Torr-L/s at 480 °C |
| Mounting | In-vacuum |
| Window material | Z-cut sapphire, AR coating |
| Clear aperture | 8.5 mm diameter |
| Atomic beam chambers | Performance |
| Windows | Welded, AR coated |
| Seals | ConFlat |
| Volume | 2 L, complete system |
| Ion pump | 3 L/s, integrated |
| Getter pumps | 50 L/s and 5 L/s |
| Beam chamber baseline vacuum level (before pressure drop across the differentially-pumped output tube): | |
| <ul style="list-style-type: none"> Oven and hot window off 480 °C oven, 350 °C window – typical operation | $< 1 \times 10^{-10}$ Torr $< 2 \times 10^{-8}$ Torr |
| Connection to customer systems | UHV gate valve standard (not shown) |

Sub-assemblies can be provided in off-the-shelf vacuum enclosures by request.

For more information, contact us at sales@aosense.com