

# miniMOT V2 Data Sheet

## Product Description

The **miniMOT V2** is a stand-alone, compact, ultra-high vacuum (UHV) trapped atom system equipped with an intuitive user interface designed to allow users to create quantum matter for immediate implementation in any research experiment, teaching laboratory for academic development and workforce training, or as a dedicated UHV system for prototype cold atom product development in computing and sensing applications.

Equipped with our standard thin-walled UHV glass cell, integrated ion pump, electronic drivers for the atom dispenser, and magnet coil assemblies, the miniMOT V2 enables the creation of rubidium (Rb) or cesium (Cs) magnetic optical traps (MOTs) at the touch of a button. The miniMOT V2 can also be configured with AR coated UHV glass cells to meet your specific needs. When paired with **miniMOT Package** and **MOT Coils**, users can align all laser beams entering the **UHV glass cell** and obtain precise control of magnetic fields for easy and controllable MOT generation of up to 108 cold atoms<sup>1</sup>.

The miniMOT V2 removes the need to establish large and expensive vacuum chamber equipment and the system can be installed and set up to create cold atom MOTs in a matter of hours, not weeks.

## Product Features

- Compact UHV system suitable for MOT production from a background vapor
- Active and passive pumps to maintain vacuum quality over several years of operation<sup>2</sup>
- Integrated electronics for vacuum control, alkali atom pressure control and to drive the miniMOT coils
- Touchscreen interface for seamless user control of system operation
- Shipped under vacuum and ready for immediate use

## Specifications and Testing

Vacuum Quality*	<1 x 10 <sup>-8</sup> Torr	<i>*Without alkali load.</i>
Cell Clear Aperture**	54 x 19 mm (side walls) 10 mm dia. min. (end cap)	<i>**When equipped with a standard 2cm Thin-Walled glass cell.</i>
Magnetic Field Gradient***	13-14 G/(A-cm)	<i>***This is the gradient along the coil axis and when using Infleqtion's miniMOT Coils (CAMCMM). For complete system specifications see <a href="#">miniMOT V2 User Manual</a>.</i>
External Dimensions	5.9 x 4.7 x 11.8 in 149 x 119 x 298 mm	
Center Cell Height	3.50 in / 89 mm	
Weight	7.2 lb / 3.3 kg	

<sup>1</sup> Under certain experimental conditions.

<sup>2</sup> Running under normal operating conditions, the vacuum quality will last ~5 years.

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All miniMOT V2 products are subjected to final quality inspection testing, including a fluorescence measurement to confirm vacuum conditions are as specified, and Rb (or Cs) vapor is present in the cell. Each miniMOT V2 comes with a certificate of conformance indicating the minimum current through the alkali metal dispenser to discern fluorescence.

## Product Options

The miniMOT V2 has been designed for the following alkali metal sources:

- Rubidium (Rb)
- Cesium (Cs)

Product part numbers for both rubidium (Rb) and cesium (Cs) for the three types of UHV glass cells and AR coating offered with the miniMOT V2.

UHV Glass Cell	AR Coating Type	Rb Atom Source	Cs Atom Source
2cm Thin-Walled Cell	Uncoated	CMMR0001	CMMC0001
2cm AR Coated Cells	Uncoated	CMMR0005N	CMMC0005N
	H-coating	CMMR0005H	CMMC0005H
	K- coating	CMMR0005K	CMMC0005K
High-NA Imaging Cells	Uncoated	CMMR0003N	CMMC0003N
	H-coating	CMMR0003H	CMMC0003H
	K-coating	CMMR0003K	CMMC0003K

*Note: Custom cell designs and custom AR coatings can be considered. Please contact us at [info@avr-optics.com](mailto:info@avr-optics.com)*

To learn more about the various options for UHV glass cells and AR coatings for use with Rb, Cs, and K, visit our website at <https://www.inflektion.com/atomic-prisms>.

## Upgrade Options

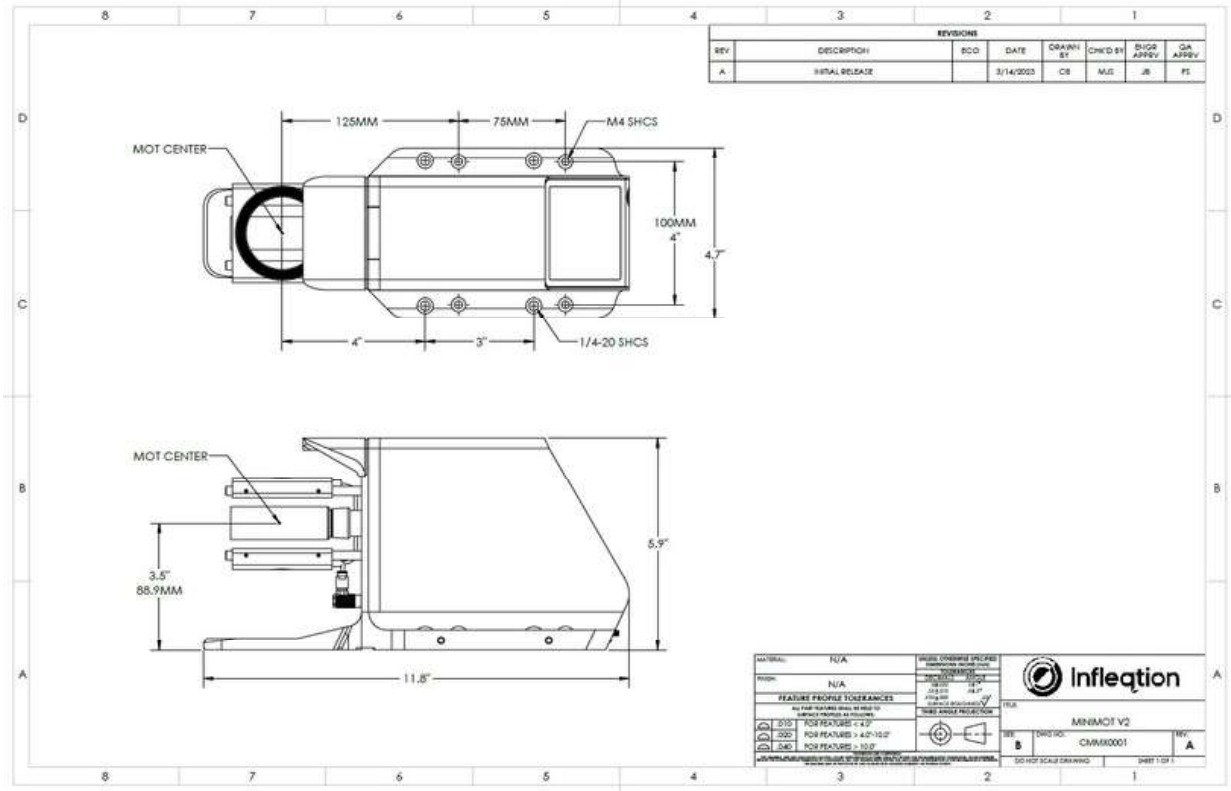
The miniMOT V2 can be upgraded to a [miniMOT Package](#), our pre-assembled optics kit that allows users to quickly align the laser beams into the glass cell and enables MOTs to be created in hours, saving significant time and cost when establishing a complete quantum matter experiment.

- miniMOT Package (CMPX0001)

Note: "X" specifies the atomic species (R - Rb, C - Cs)

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## Mechanical Drawing



All Infleqtion hardware, software, products, services as well as all included materials and data are governed by the Terms and Conditions of Sale and Service found at <https://www.infleqtion.com/standard-purchase-order-terms-and-conditions-1>



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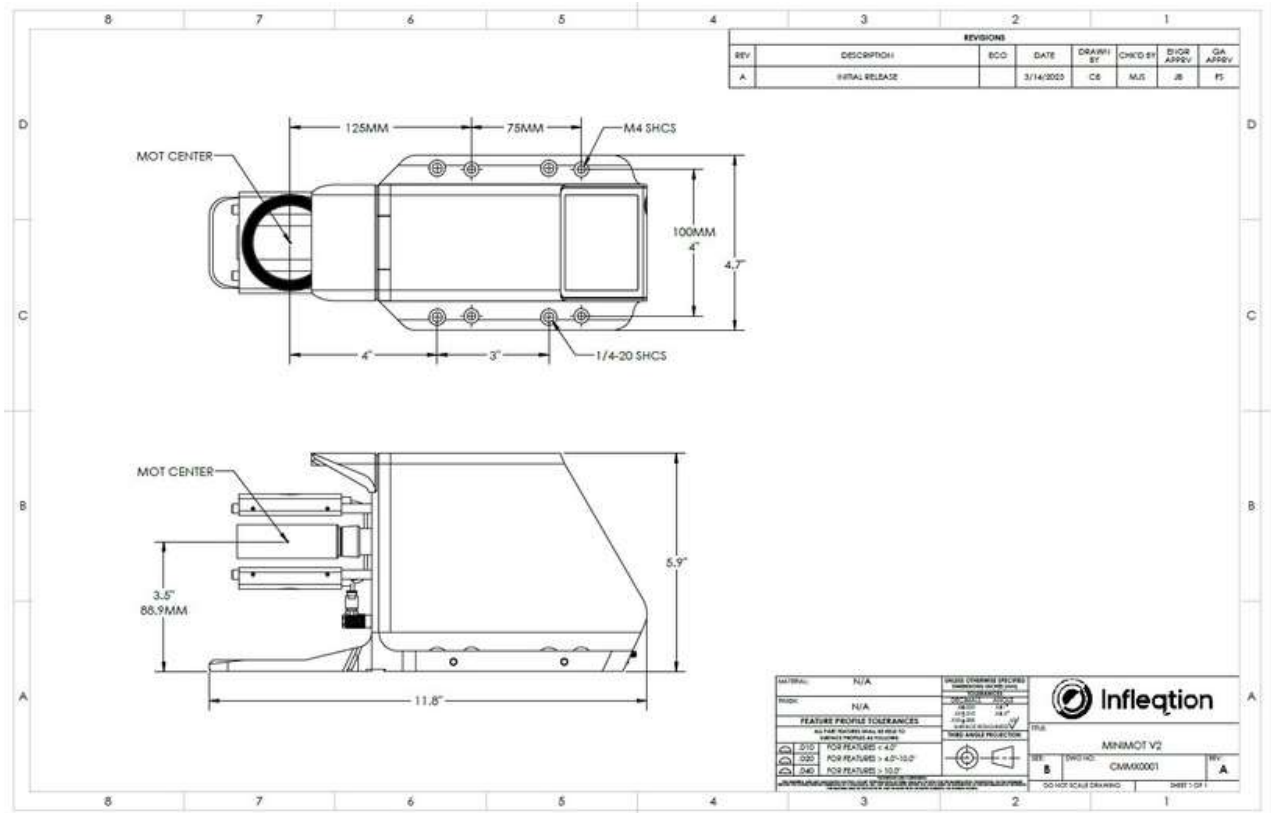
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