

# LaserMount™

# 222 SERIES

## USER'S MANUAL



TEC TO-CAN

## Introduction

Thank you for choosing the **222 TEC 3.8mm TO-Can LaserMount** from Arroyo Instruments. The **222 LaserMount** is designed for high performance and long-term use.

The **222 LaserMount** integrates a Peltier cooler for precise control of the package temperature. With an operating range of +15°C to 85°C, the **222 LaserMount** covers a wide range of case temperature control needs.

In addition to the standard cover, which includes support for 30mm CAGE systems, the **222 LaserMount** has an optional cover which adds support for 1" lens tube systems.

The **222 LaserMount** offers all the features you would expect from a modern TO-Can laser diode fixture, including:

- Designed to be quickly integrated with Arroyo's **LaserSource** and **TECSource** instruments.
- Industry-standard D-sub connectors and pin-outs allow for quick integration into existing laser applications.
- Banana plug for case ground, which can be used as a wrist strap connection or to assure proper grounding to an optical table or test bench.

### Accessories – Cover Plates

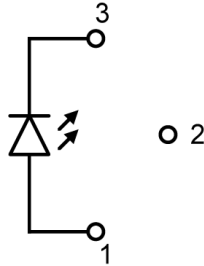
The **222 LaserMount** comes standard with the 224-C-01 cover plate, which has a small opening for free-space devices, and a mounting pattern for 30mm CAGE systems. However, you can purchase additional cover plates separately, making your investment in the **222 LaserMount** even more valuable. These include:

- **Standard Cover Plate (p/n 224-C-01)**  
This plate comes standard with the 222. It has a single 0.27" (6.86mm) opening for laser beam exit, and has mounting holes for 30mm cage systems.
- **Opto-Mech Cover Plate (p/n 224-C-02)**  
The Opto-Mech Cover Plate has mounting holes for 30mm cage systems as well as 1" lens tube systems.

Photos and additional information about the cover plates is available later in this manual, or online at [www.arroyoinstruments.com](http://www.arroyoinstruments.com).

## Installation and Use

The 222 LaserMount is configured for the typical TO-3.8 diodes configuration:



The picture below illustrates the diode socket, including the orientation for the diode.



Face of 222 with cover off

All three pins of the laser diode and the cold plate are isolated from earth ground, allowing the device to float under normal operation. If your application requires you to have any of the pins connected to earth ground, see the section titled “**Ground the Laser**” later in this manual.

**Connect to Laser Diode Driver and TEC Controller:** Next, connect the **222 LaserMount** to your laser diode driver and temperature controller.

### NOTE

Arroyo Instruments offers Laser and TEC cables designed to connect directly between our **LaserSource** and **TECSource** products. If you use your own cables, ensure the connections are properly made between the instrument and the mount, and that proper grounding techniques are used. The pin-out of the connectors can be found later in this document.

### WARNING

Be sure you are properly ESD protected before handling your laser. For additional information, read the section titled “Laser Diode Protection” later in this manual.

**Mounting your device:** Insert the device so that the common pin is the top or bottom pin, the isolated photodiode pin is on the left, and the isolated laser pin is on the right. The illustrations below show the mounting of a free-space TO-can laser, but the fiber-pigtailed device would mount in a similar fashion.



Once the device is loaded use the provided diode clip to clamp the TO-can to the temperature-controlled plate.

When tightening the screws, do not over tighten, which may strip the threads. Also, do not tighten one side further than the other, as poor or uneven temperature control may result.

**Correctly loaded:** gap between clamp and cold plate is even across entire device, screws are fully seated.



**Incorrectly loaded:** gap between clamp and cold plate is uneven and screws are not fully seated.



The photos below illustrate the two cover options.



**224-C-01 Cover Plate  
(included)**



**224-C-02 Cover Plate  
(optional)**

You may choose to install the cover. The cover is not required but will improve the temperature stability of the TO-can. The picture below shows the **222** with device loaded and cover installed on a regular **222**.



**222 with diode loaded and standard cover plate installed**

The Nitrogen connection is intended for use with lid-less TO-can applications, or where condensation might occur. When using the standard **222**, the recommended flow rate is 1-2 SCFH.

Your mount is now ready for use.

## Connector Pin-Outs



222 TEC TO-Can LaserMount Connectors

DB-9 Pin	Description
1 & 2	Shorted together
3	No connection
4 & 5	Laser cathode
6	Photodiode cathode
7	Photodiode anode
8 & 9	Laser anode

Laser DB-9 Connector Pin-Out

For compatibility reasons, the DB-9 Laser connector provides two pins each for laser anode and cathode, but a single pin (recommend pin 5 for cathode and 9 for anode) is sufficient to carry the maximum rated laser current of the 222.

DB-15 Pin	Description
1, 2, 9	TE (+)
2, 3, 10	TE (-)
7	Thermistor
8	Thermistor
5, 6, 9-15	No connection

TEC DB-15 Connector Pin-Out

For compatibility reasons, the DB-15 TEC connector provides three pins each for TE+ and TE-, but a single pin is sufficient to carry the maximum rated TEC current, ensure the wire gauge is large enough (20 AWG for single-pin connection).

## Technical Specifications

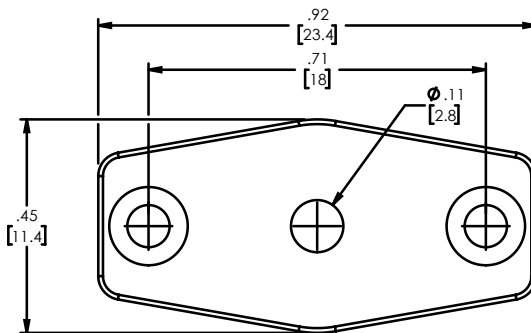
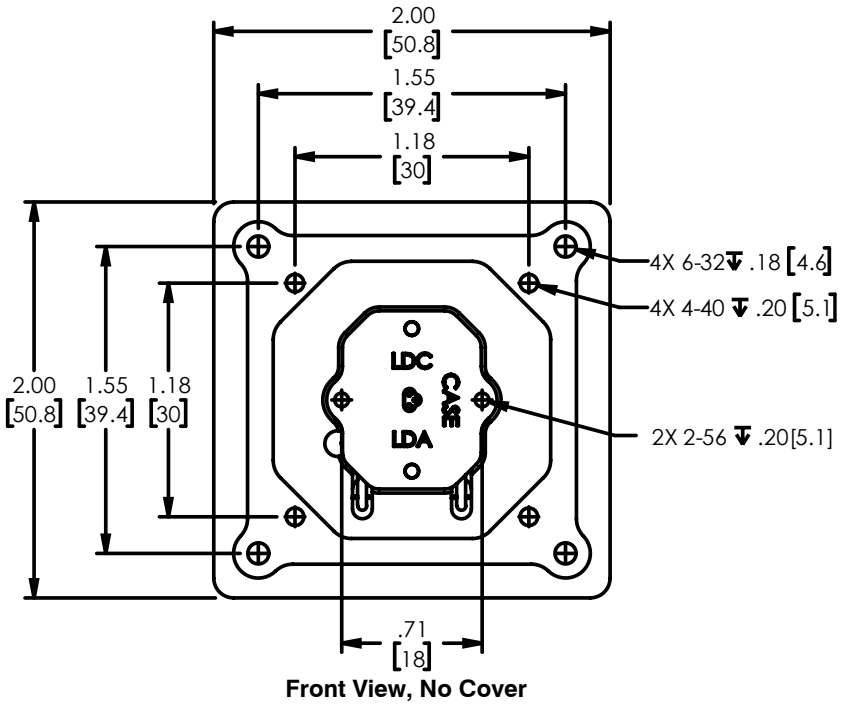
222 TEC TO-Can LaserMount	
<b>LASER PACKAGE SUPPORTED</b>	
Laser Package	3.8mm TO-Can, 3 pin
Pin Length	5.5mm to 14mm
Pin Diameter	0.010" to 0.016" [0.25mm to 0.40mm]
Maximum Current	1 Amp
<b>TEMPERATURE CONTROL</b>	
Temperature Range (°C)	+15 to +85
Thermal Capacity (W)	1.8 @ 25°C
Sensor Type	10kΩ Thermistor
TE Module <sup>1</sup>	I <sub>max</sub> = 3.1A V <sub>max</sub> = 2.6V
<b>STANDARD COVER (224-C-01)</b>	
Size (H x W x D) [in(mm)]	2.0 (50.8) x 2.0 (50.8) x 0.18 (4.57)
Mounting System(s)	30mm CAGE, 4-40 x 4 holes
<b>OPTO-MECH COVER (224-C-02)</b>	
Size (H x W x D) [in(mm)]	2.0 (50.8) x 2.0 (50.8) x 0.30 (7.62)
Mounting System(s)	30mm CAGE, 4-40 x 4 holes and 1" lens tube (1.035"-40)
<b>FIBER PIGTAIL COVER (224-C-03)</b>	
Size (H x W x D) [in(mm)]	2.0 (50.8) x 2.0 (50.8) x 0.18 (4.57)
Mounting System(s)	None
<b>INPUT CONNECTOR</b>	
Laser Diode	DB-9, male
Mount TEC	DB-15, male
Nitrogen	1/16" barb
<b>GENERAL</b>	
Grounding Plug	Banana jack
Size (H x W x D) [in(mm)]	2.0 (50.8) x 2.0 (50.8) x 1.94 (49.3) <sup>2</sup>
Mounting holes	8-32 threaded hole M4 threaded hole

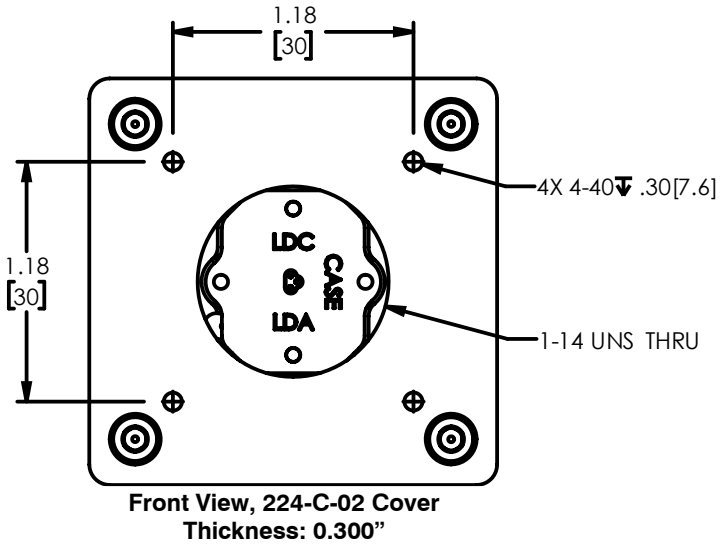
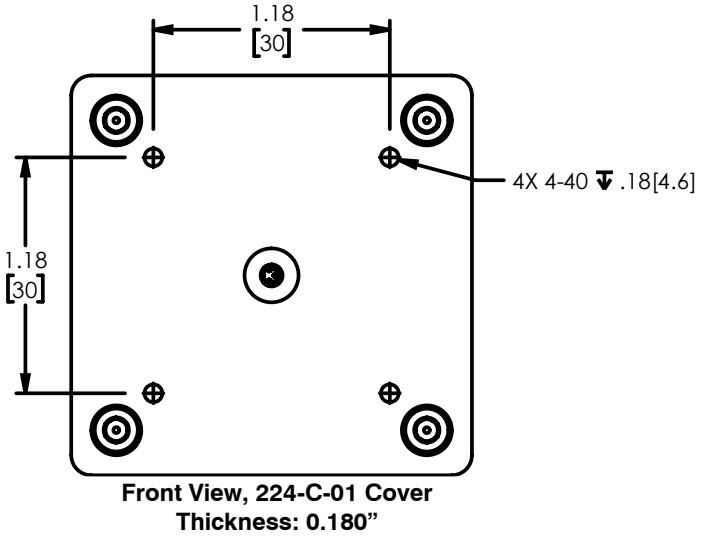
<sup>1</sup> At 25°C

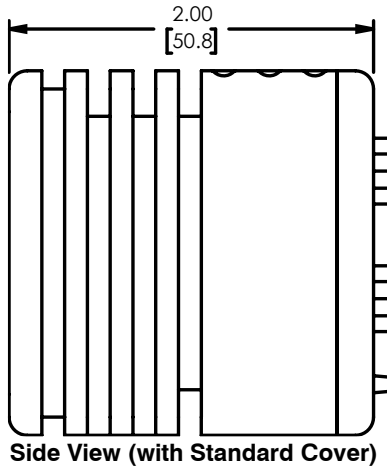
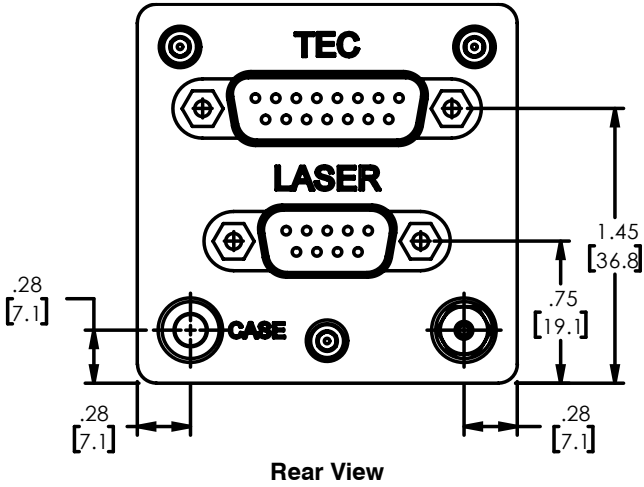
<sup>2</sup> Depth is with no cover installed and excluding rear connectors.

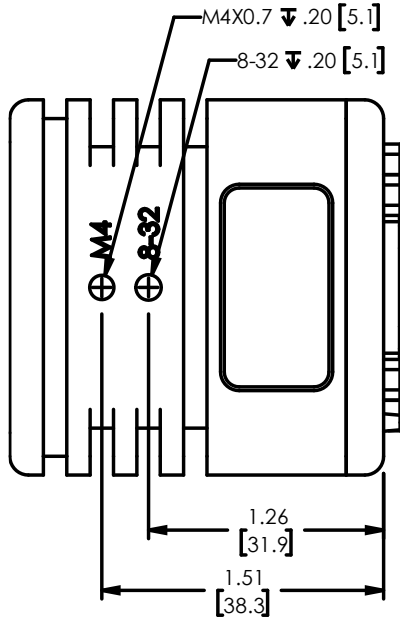


## Mechanical Specifications









**Bottom View (with Standard Cover)**

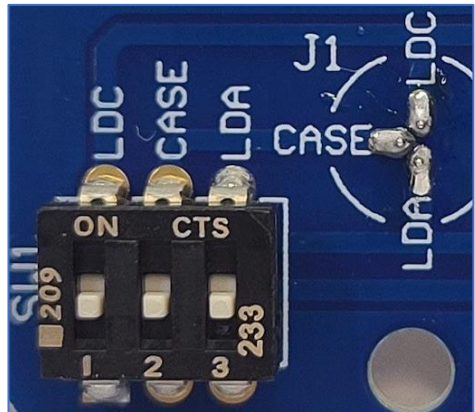
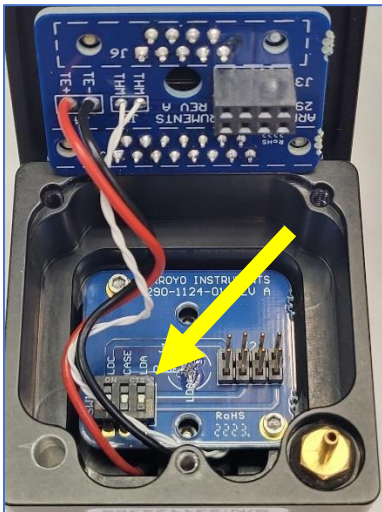
## Grounding the Laser

By default, the pins and plate of the **222** are isolated from earth ground. If your application requires grounding of the diode pins, a 3-position switch inside the **222** allows for any of the three pins to be connected to earth ground.

To access the switch, remove the three screws on the back of the **222**, shown with yellow circles in the photo to the right.

Once removed, gently pull the rear plate of the **222** from the front portion of the body. The TEC wires will still be connected to the rear plate, so be careful not to pull out too far.

Inside you will see a 3-position switch, with positions 1, 2, and 3 labeled LDC, CASE, and LDA, respectively. To connect a pin to earth ground, simply slide the switch for the respective pin into the ON position.



To reassemble the fixture, bring the two halves together, making sure the 8-pin pin and socket header on the two PCBs properly mate and the TEC and sensor wires are not pinched between the rear plate and main body. Reinstall the three screws.

## Laser Diode Protection

Electrostatic discharge and current spikes can be a significant cause of damage to laser diodes, but when proper precautions are taken, these risks can be greatly reduced or eliminated. Arroyo Instruments' controllers offer state-of-art laser diode protection, but no instrument can fully shield the laser from damage. Please take these considerations into account when operating your laser:

1. Always set the current limit at or below the maximum current your laser can handle. This prevents the device from accidentally driving the current too high, either via the set point or from the modulation port. This also provides additional current limiting protection from ESD.
2. Always work in an ESD safe operating environment, including the use of wrist straps, ESD grounded work surfaces and floors, and ESD-safe tools.
3. Where the AC power to the laser driver to temperature controller may be noisy, use isolation transformers or uninterruptible power supplies that provide isolation.
4. Make sure all cables are securely connected and fastening screws are screwed in tight.
5. Do not route power cords or other cables in parallel with the laser or temperature controller cables, as coupling may occur between the cables and inject noise into the laser diode.
6. While it is not possible to create a ground loop through the LaserSource because of its isolation of all inputs, it is possible when using other equipment. Ensure that any other equipment is properly isolated to avoid any ground loop problems.

## Warranty

Arroyo Instruments warrants this product to be free from defects in material and workmanship under normal use and service for a period of one (1) year from date of shipment. It does not apply when the product has been misused, altered or damaged by accident or abnormal conditions of operation. If found to be defective during the warranty period, the product will either be repaired or replaced at Arroyo Instruments's option.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. ARROYO INSTRUMENTS SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE PURCHASE OR USE OF ITS PRODUCTS.

## Service and Support

For service and support, contact your local distributor or Arroyo Instruments.

By mail:                   Arroyo Instruments  
                                  1201 Prospect Street  
                                  San Luis Obispo, CA 93401  
                                  USA

By phone:                 +1 (805) 543-1302

By fax:                    +1 (805) 543-1303

Email:                    support@arroyoinstruments.com

Web:                      http://www.arroyoinstruments.com



1201 Prospect Street, San Luis Obispo, CA 93401

Tel: (805) 543-1302 Fax: (805) 543-1303

**[sales@arroyoinstruments.com](mailto:sales@arroyoinstruments.com)**

**[www.arroyoinstruments.com](http://www.arroyoinstruments.com)**