

Orion® DSLR Camera Cooler

#52095



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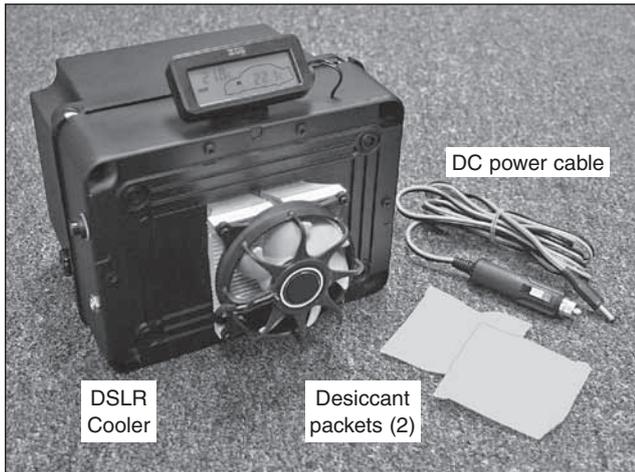


Figure 1. The DSLR Cooler comes with a DC power cable and two desiccant packets.

Congratulations on your purchase of the Orion DSLR Camera Cooler. It's the first affordable commercially produced "cold box" for DSLR cameras, which unlike most astronomical CCD cameras do not have internal cooling systems to reduce thermal noise. Its insulated, thermoelectrically cooled chamber chills the camera's imaging sensor, significantly reducing troublesome noise in your astrophotos. When you're imaging in warm or hot weather, especially, such noise can wreak havoc on deep-sky images. But with the DSLR Cooler, thermal noise is minimized, resulting in smoother, sharper, *better* images that are easier to process.

This instruction manual covers how to set up and operate the DSLR Cooler. Please read it thoroughly before attempting to use it.

First, verify that all the included components shown in **Figure 1** are present and intact. If anything is missing or damaged, please call Orion Customer Service at (800) 676-1343.

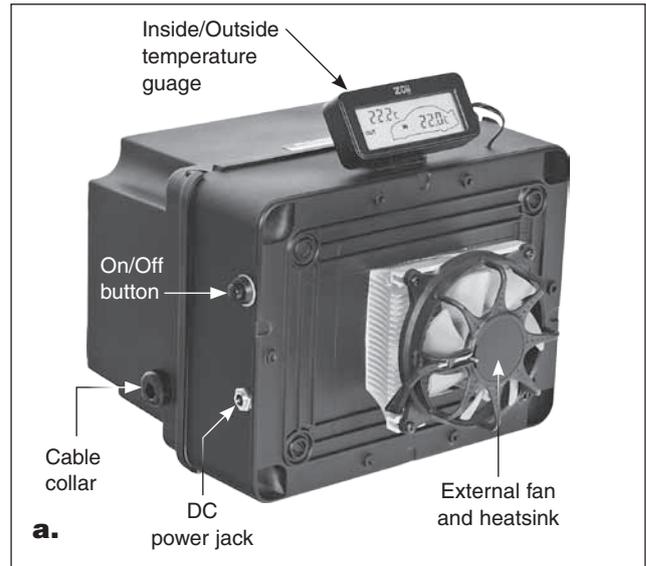
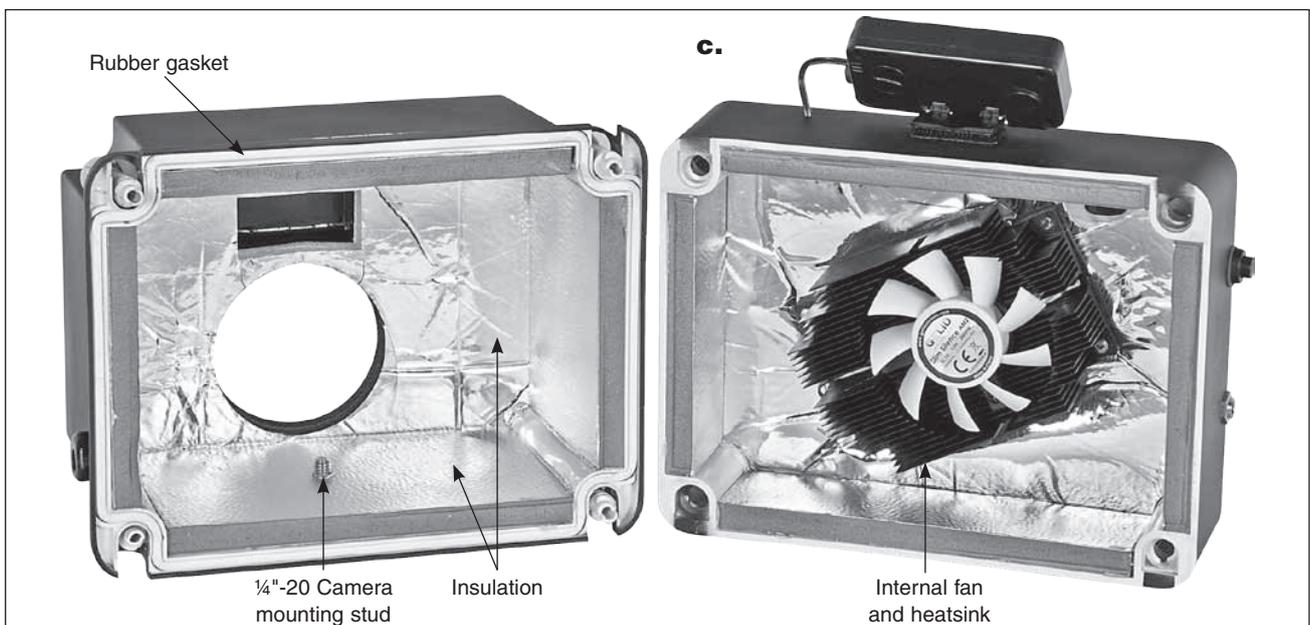
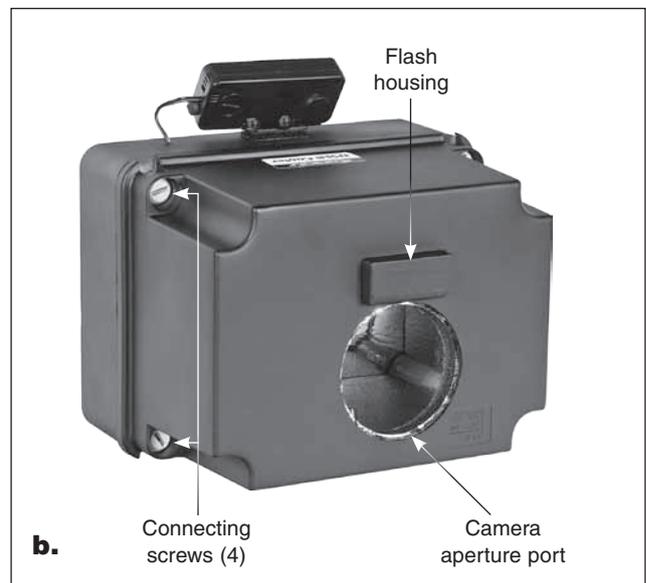


Figure 2. The Orion DSLR Camera Cooler **a)** back side, **b)** front side, and **c)** interior.



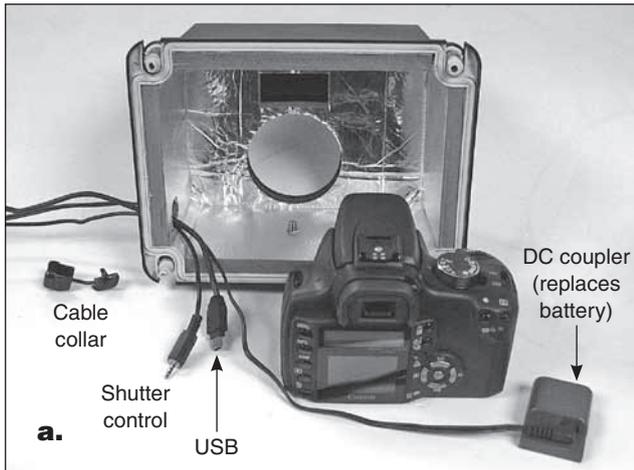


Figure 3. a) With the plastic cable collar removed, run your camera cables through the hole in the side of the housing, **b)** plug DC coupler and other cables into the camera before installing the camera in the cooling chamber

Next, familiarize yourself with the features and components of the DSLR Cooler in **Figure 2**.

Compatible Cameras

At the time of this manual's writing, the following Canon EOS cameras are known to be compatible with the DSLR Cooler:

350D (XT)	550D (T2i)
400D (XTi)	1000D (XS)
450D (XSi)	1100D (T3)
500D (T1i)	

Other Canon models and other brands of DSLR may not fit physically in the Cooler due to their overall size or proportions, or to the position of their lens opening relative to the ¼"-20 mounting hole on the bottom of the camera.

Installing the Camera in the DSLR Cooler

This section describes installing your compatible Canon DSLR camera in the DSLR Cooler with a DC coupler, USB cable, and shutter control cable, all of which are sold separately.

1. Disassemble the two parts of the cooler housing by unscrewing the four plastic connecting screws using a flat screwdriver.
2. Attach a T-ring (sold separately) to your camera.

Before installing the camera in the cooling chamber, you will need to insert the DC power coupler into the battery compartment and attach all necessary cables to the camera. We recommend powering the camera with an external power source via a "DC coupler" (fake camera battery) designed for your particular camera model rather than the standard internal battery, for several reasons:

- a. Batteries lose charge faster in cold conditions, so the internal battery may not last for an entire imaging session before needing replacement or recharging. An external marine cell battery or AC power source has plenty of extra capacity to keep your camera



Figure 4. With the camera installed, the T-ring on the camera should be seated snugly in the aperture port of the housing.

- a. powered on continuously for extended periods of time.
 - b. It is not possible to swap a discharged internal battery with a fresh one without opening up the cooler housing.
 - c. You won't be able to see the battery charge indicator on the camera's LCD screen to know when the battery is about to die!
3. Remove the plastic cable collar from the housing by pushing it with a finger from the inside while pulling it from the outside. You may have to twist it or rock it a bit to dislodge it.
 4. Insert the USB, shutter control, and DC coupler cables through the hole in the housing (**Figure 3a**). Then, insert the USB and shutter control plugs into your camera and install the DC coupler in the battery compartment (**Figure 3b**).
 5. Now attach the camera to the floor of the cooling chamber. Line up the threaded socket in the bottom of the camera with the ¼"-20 stud in the bottom of the housing. When they are lined up, the T-ring on the camera should be positioned snugly within the circular opening of the housing (**Figure 4**). Now thread the stud



Figure 5. The protruding flash housing could crack if it contacts a hard surface!

into the camera by turning the knob clockwise until secure.

CAUTION: Do not set the DSLR Cooler down on the protruding flash housing (Figure 5)! Doing so could damage the flash housing.

6. Pry open the collar's tab with your fingers or the back end of a pen and lay the cables in (Figure 6). Then close the tab and insert the collar back into the open port. The camera should now appear as in Figure 7.
7. Plug the small end of the included DC power cable into the power jack on the side of the DSLR Cooler and connect the other end to your 12V marine battery (see below). Alternatively, you can use an optional 12V AC-to-DC adapter rated at 5A (available from Orion), to power the DSLR Cooler.
8. Set the camera to ON, then reattach the rear housing to the front section.

NOTE: The interior temperature sensor is affixed to the roof of the cooling chamber, as shown in Figure 8. It is NOT intended to be removed from there and adhered to the camera body.

Desiccant Packets

We recommend placing one or both of the included silica gel desiccant packets inside the DSLR cooler for each imaging session. Although it is unlikely that moisture will condense inside the chamber during operation (and even less likely that it would condense on the camera itself), the moisture-absorbing desiccant will keep the air surrounding the camera dry, even in humid weather conditions.

The reusable desiccant packets can be dried, or "recharged," by heating them in an oven at 250°F (120°C) for two hours.

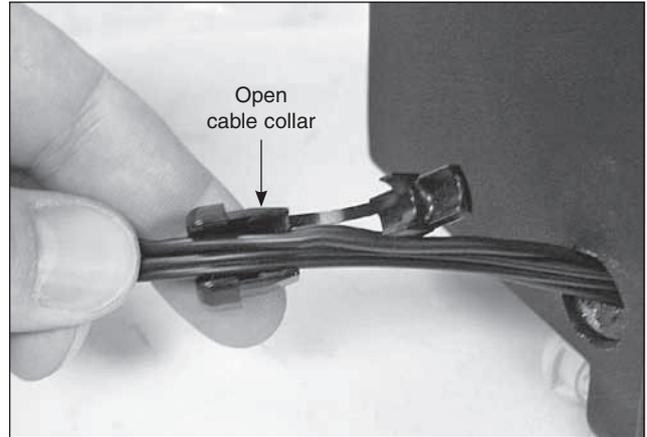


Figure 6. Lay the camera cables in the open cable collar, then close it and re-insert it in the housing.

Attaching the Camera with DSLR Cooler to Your Telescope

1. Attach a 2" T-adapter, coma corrector, reducer or flattener to the T-ring on your camera.

NOTE: Cooling performance will be compromised somewhat if you use just a T-adapter with an open-tube telescope such as a Newtonian reflector, as this allows a constant flow of uncooled, ambient-temperature air to enter the camera and warm the imaging sensor. It's best to "seal" the front opening of the camera by using an optical adapter such as a coma corrector or focal reducer – or even a clear filter threaded on the T-adapter – or use a telescope with a "closed" tube, such as a refractor, Maksutov-Newtonian, or Schmidt-Cassegrain.

2. Insert the 2" barrel of the T-adapter or other adapter into the telescope's focuser and tighten the screws on the focuser to secure the camera/DSLR Cooler. Figure 9 shows the DSLR Cooler attached to an Orion 80mm triplet refractor.

Given the weight of the DSLR Cooler and camera combination, you may need to increase the tension adjustment on your focuser drawtube to prevent any slipping while focusing. Once focus is achieved, it's a good idea to lightly tighten the drawtube locking thumbscrew, if your focuser has one.

Operating the DSLR Cooler

1. Press the ON/OFF button once to turn on the Cooler.

It is recommended that you turn on the DSLR Cooler at least 1 hour before starting your imaging session, to allow sufficient time to cool the camera. Keep the DSLR Cooler powered on for the duration of your imaging session. Once it is turned off, the temperature inside the chamber will remain about the same for 5 minutes or so, then will start to rise rapidly.

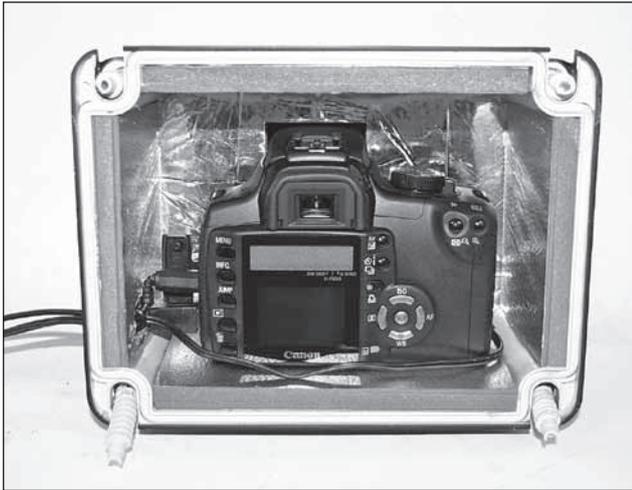


Figure 7. Here, a Canon 350D is installed in the DSLR Cooler, with cables passing through the cable collar. The cable plugs are a tight fit!

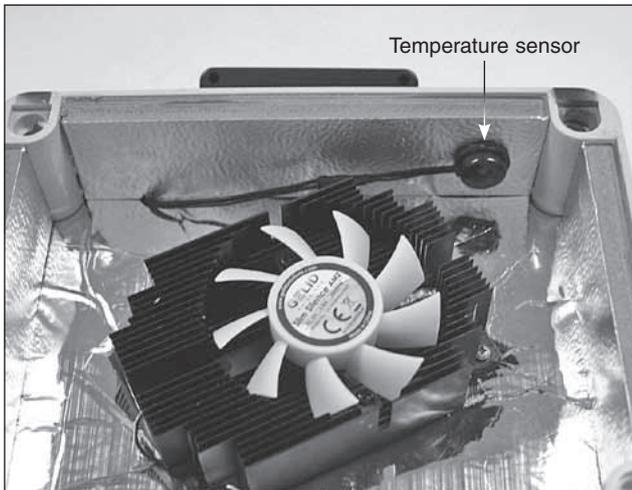


Figure 8. The interior temperature sensor should not be removed from the ceiling of the housing.

After turning the Cooler on, you should see a temperature drop of 17°C to 20°C (30.6°F to 36°F) within 30 minutes, with a possible further decrease that levels off after about an hour.

NOTE: The digital thermometer on the DSLR Cooler displays the internal temperature as “OUT” and the outside (ambient) temperature as “IN” (Figure 10). We know, it’s wacky!

2. After your imaging session, press the ON/OFF button again to turn the Cooler off. You’ll know it is off when the fan on the back of the housing stops rotating.

To prevent condensation from forming on the cold camera, it is best to either:

- a. Leave it in the closed Cooler for a half hour or so before removing it, to allow the camera to warm up slowly, or
- b. Remove it from the Cooler while still outside and immediately place the camera into a plastic bag and



Figure 9. The DSLR Cooler in place and ready to chill!

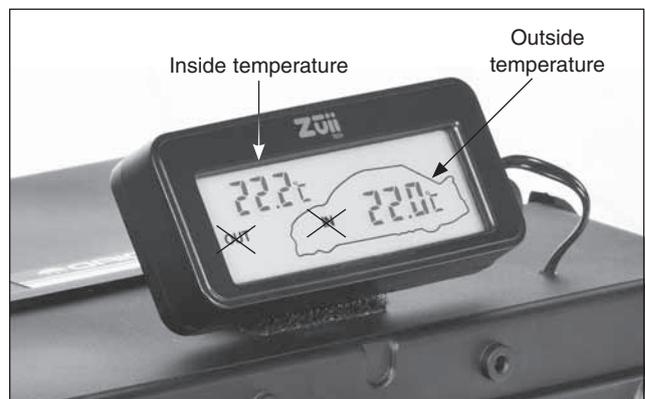


Figure 10. On the LCD temperature gauge, the IN reading is really the outside temperature and the OUT reading is the temperature inside the Cooler! That’s what happens when you repurpose an indoor/outdoor car thermometer.

seal it. (A large zip-lock freezer type food storage bag is ideal.) This way the condensation will form on the plastic bag, not on the camera itself.

Power Consumption

Drawing 3.7 to 4 amps of current, the DSLR Cooler requires lots of power. We recommend running it on at least a 30 amp-hour (AH) deep-cycle marine battery or, if possible, on household 110V power via an AC-to-12V DC adapter rated for at least 4 amps (both sold separately). A 30AH battery will provide power for up to 7.5 hours of continuous operation, theoretically ($30\text{AH} \div 4\text{A} = 7.5\text{H}$); a 55AH battery will allow nearly 14 hours of continuous operation.

We do not recommend use of the Orion Dynamo Pro 12AH or 17AH batteries, since they would power the DSLR Cooler for only about 3 or 4 hours, respectively, on a full charge.

Specifications

Compatibility	Canon EOS 350D (XT), 400D (XTi), 450D (XSi), 500D (T1i), 550D (T2i), 1000D (XS), 1100D (T3)
Peltier cooler	51 watts
Voltage	12-volts DC, 5.5mm/2.5mm jack
Current draw	4 amp max
External heat sink	yes, fan diameter 80mm
Internal heat sink	yes, fan diameter 65mm
Cooling delta	17 - 20°C (30 - 36°F) in 30 minutes
Thermometer	LCD, interior/exterior reading (in °C)
Body	Plastic, insulated
Cable	12V DC auto-lighter cable included
Dimensions	8-3/8"L x 7-5/8"W x 6-1/2"H
Desiccant	Two silica gel packets included
Weight	2 lbs., 7 oz. (1.1 kg)

One-Year Limited Warranty

The Orion DSLR Cooler is warranted against defects in materials or workmanship for a period of one year from the date of purchase. This warranty is for the benefit of the original retail purchaser only. During this warranty period Orion Telescopes & Binoculars will repair or replace, at Orion's option, any warranted product that proves to be defective, provided it is returned postage paid to: Orion Warranty Repair, 89 Hangar Way, Watsonville, CA 95076. Proof of purchase (such as a copy of the original receipt) is required.

This warranty does not apply if, in Orion's judgment, the product has been abused, mishandled, or modified, nor does it apply to normal wear and tear. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. For further warranty service information, contact: Orion Customer Service (800) 676-1343; support@telescope.com.

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