

# CELESTRON FOCUS MOTOR

## #94155-A - Setup Guide

The focus motor is compatible with all Celestron SCTs from 6" to 14" in aperture that have been produced since the year 2006; it is not compatible with 5" SCTs or older models. It is compatible with all EdgeHD telescopes. It is compatible with the 8" and 36cm Rowe-Ackermann Schmidt Astrograph (RASA) models, and the Celestron 7" Maksutov-Cassegrain. The focus motor can also be used with the 11" RASA, but if it has the FeatherTouch MicroFocuser installed, then it will require the Focuser Retrofit Kit for the RASA 11 (#94255).

For 6" Schmidt-Cassegrain telescopes only, the Off-Axis Guider (#93648) cannot be used when the focus motor is installed due to mechanical interferences.

This setup guide will guide you through installation and basic operation of the focus motor. The full instruction manual can be downloaded from the focus motor webpage at [celestron.com](http://celestron.com). For the 36cm RASA, refer to the "Focus Motor Installation for the RASA 36cm" instructions found on the focus motor webpage at [celestron.com](http://celestron.com).

### PARTS LIST

1. Focus Motor Assembly
2. Cover Plate, 6" through 9.25" **Fig.1**
3. Cover Plate, 11" & 14" **Fig.2**
4. Adapter Sleeve
5. Adapter Sleeve Screw
6. Set Screw
7. AUX Cable
8. Hex Key
9. Wrench
10. Screwdriver

Fig.1

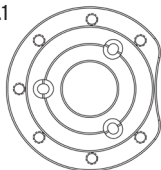
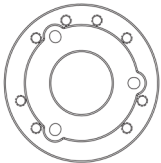
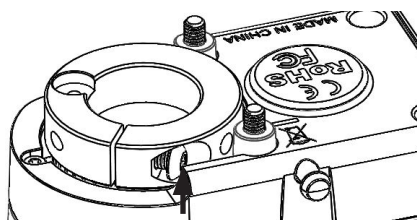


Fig.2



### WARNINGS

- Do not run the focus motor when the clamping screw is not tightened, as the unthreaded screw can interfere with the motor housing, which will prevent the motor from turning. If the screw is unthreaded and interferes with the motor housing, do not use the supplied wrench to force the motor to turn. Doing so can damage the motor. Instead, tighten the clamping screw, and the motor should operate properly.



Unthreaded clamping screw can interfere with motor housing

- Never use the wrench to turn the motor when the motor is powered. If you should ever need to use the wrench, first disconnect power to the motor and confirm the clamping screw is not interfering with the motor housing.

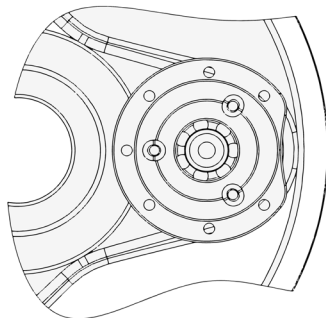
- Do not attempt to tighten the motor's clamping screw onto the focuser knob until the motor is firmly connected to the cover plate. Otherwise, the focus motor may become tilted relative to the cover plate, which can cause the focus motor to bind.

- If the motor does not turn the focuser after initial installation, **DO NOT USE THE WRENCH TO FORCE THE MOTOR TO TURN!** Likely an improper installation is causing the focuser to bind and using the wrench to turn the motor can damage the gears in the motor's gearbox and break the motor. If the focus motor will still not properly turn the focuser after reinstalling carefully following the steps below, please contact Celestron Technical Support at:

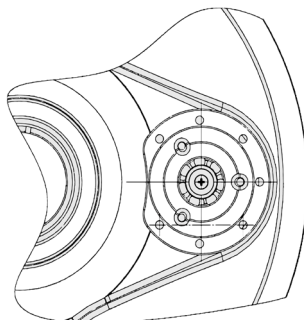
[celestron.com/pages/technical-support](http://celestron.com/pages/technical-support)

### INSTALLATION

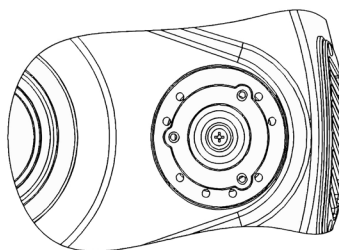
1. Remove the rubber cover from the telescope's focuser knob. If you cannot simply pull it off, use a flat head screwdriver or other tool to pry off the rubber cover.
2. Loosen and remove the 3x screws on the cover plate of the focuser.
3. Carefully remove the cover plate.
4. Identify which one of the two supplied cover plates is for your size optical tube as indicated in the parts list.
5. Orient the new orange cover plate for your size optical tube as shown below.



6" and 7"



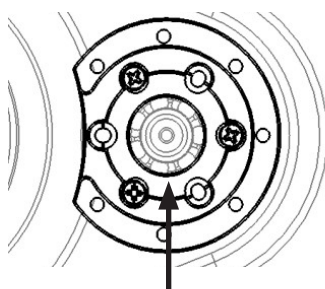
8" and 9.25"



11" and 14"

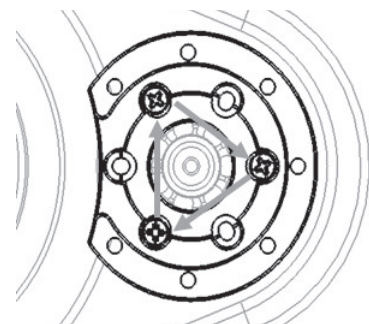
6. Reuse the 3 screws previously removed to install the new orange cover plate in place of the old one. We recommend first placing the telescope tube in a vertical position (i.e. with the front aperture facing the ground), as this will prevent any sagging due to gravity before the screws are tightened. Install the three cover plate mounting screws loosely; do not fully tighten them.

7. While the cover plate can still move around slightly, make sure the central hole in the cover plate is concentric with the brass cylinder of the focuser knob.



Keep the brass cylinder of the focuser knob centered relative to the inner diameter of the cover plate.

8. Hold the brass cylinder concentric with the cover plate while tightening the three screws by a small amount each. Follow the arrows in the illustration below for the tightening sequence. This will require two or three passes. **DO NOT OVERTIGHTEN THE SCREWS!** This can cause the focuser bearing to bind. The screws should be tight enough to prevent any lateral movement of the focuser knob, but not so tight that it binds. The cover plate must install flatly onto the machined surface in the recess without tilting.

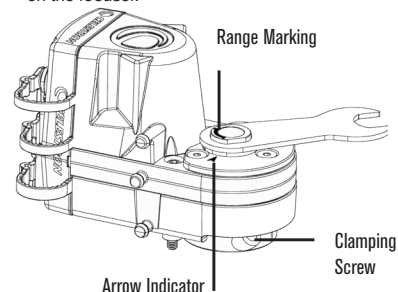


Tighten a screw by a small amount, then move on to the next screw

9. Check to make sure the focuser knob cannot move when applying side pressure to it. If the focuser knob can move, then the brass cylinder will need to be re-centered (as in step 7), and the screws will need to be tightened a little more. This is an important step, as it will ensure the focus motor will install straight and won't bind and become inoperable. However, do not overtighten the screws!

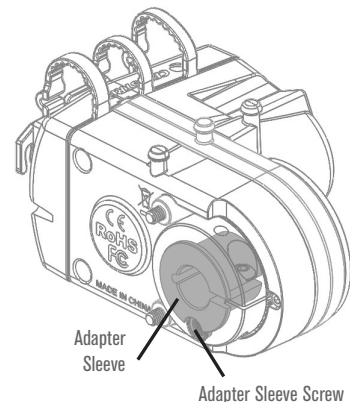
10. Rotate the focuser knob a couple rotations in each direction to make sure it moves smoothly and does not bind. If it does bind, then repeat all previous steps.

11. Check to see if the arrow indicator on the motor housing is pointing within the "range" marking on the rear of the motor coupling. If it isn't, rotate the motor coupling using the supplied wrench as shown until the arrow points within the range. This allows access to the motor coupling's clamping screw after the motor is installed on the focuser.



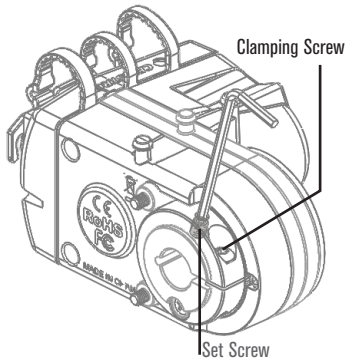
12. Loosen the focus motor's clamping screw a few turns using the supplied 2.5mm hex key.

13. **FOR 6" THROUGH 9.25" TELESCOPES ONLY:** Install the adapter sleeve into the focus motor. Use the supplied adapter sleeve screw to secure the sleeve.

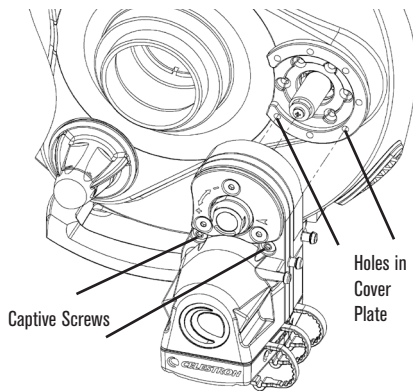


#### 14. FOR 6" THROUGH 9.25" TELESCOPES ONLY:

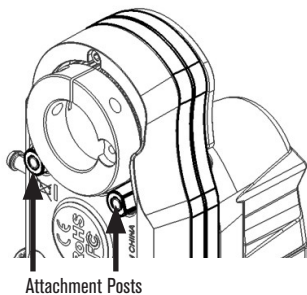
Install the set screw into the threaded hole in the focus motor's clamping collar using the supplied hex key. Do not tighten the set screw yet, only thread it in a few turns.



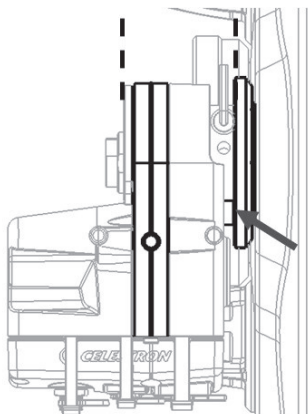
15. Place the focus motor onto the brass focuser knob. Orient the motor as shown below. Make sure the two captive screws in the focus motor line up with the two holes in the orange cover plate as shown.



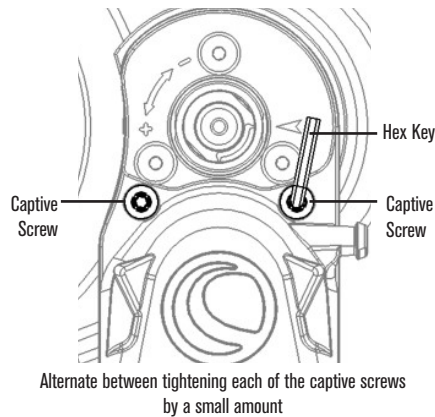
16. Slide the focus motor onto the focuser knob until the two attachment posts on the face of the motor are flat against the cover plate.



17. Check to make sure there are no air gaps between the cover plate and the two attachment posts on the focus motor as indicated by the arrow in the illustration below.



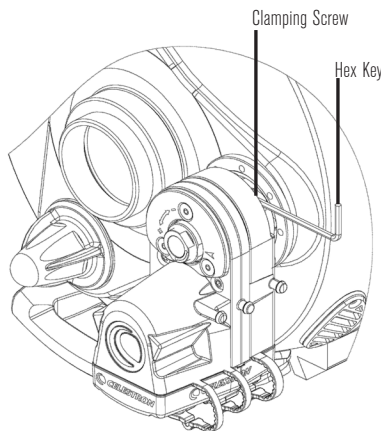
18. Tighten the two captive screws on the motor to the corresponding threaded holes on the cover plate using the supplied hex key. Again, first loosely connect the screws to the cover plate, then alternate tightening each screw by a small amount until the focus motor cannot move or wiggle and is solid. Do not overtighten the screws.



#### 19. FOR 6" THROUGH 9.25" TELESCOPES ONLY:

Fully tighten the set screw that was installed in step 14. Tighten until snug, but do not overtighten. If you need to rotate the motor coupling to gain better access to the set screw, use the wrench as indicated in step 11.

20. Tighten the focus motor's clamping screw using the hex key until fully tightened. If you need to rotate the motor coupling to gain better access to the clamping screw, use the wrench as indicated in step 11. Tighten the screw snugly, but be careful: attempting to use full force on the wrench may strip the hex socket in the screw head.



**NOTE:** If the focus motor interferes with camera installation, the motor mounting orientation can be rotated. This can be done by using the other mounting holes in the cover plate's perimeter (step 15), or by rotating the entire cover plate (step 5).

#### POWERING THE FOCUS MOTOR

There are three ways to power the focus motor:

1. Use a Celestron computerized mount. Connect the AUX port on the focus motor to an AUX port on the mount using the supplied cable.
2. Use a USB3 port or a USB2 port that provides at least 900 mA. Connect the focus motor with a USB A-to-B cable (not included). Use a high quality cable, or the motor may not receive enough power.
3. Use a DC power source able to supply at least 1A. Connect the power source to the 12V DC jack on the focus motor using a 5.5mm/2.1mm plug that is tip positive.

#### CONTROLLING THE FOCUS MOTOR WITH A CELESTRON HAND CONTROL

If using a Celestron mount and plugged into an AUX port, the focus motor can be controlled from the mount's hand control. Either the NexStar+ hand control (requires firmware version 5.30+) or the StarSense hand controller (requires firmware version 1.19+) can be used. If your firmware is not up to date, use the Celestron Firmware Manager (CFM) program available at [celestron.com/CFM](http://celestron.com/CFM) to update it. The focus motor controls can be found in the hand control by pressing the MENU button and selecting "Focuser."

#### CONTROLLING THE FOCUS MOTOR WITH A COMPUTER

If using a Celestron mount and plugged into an AUX port, connect the hand control to the computer using a USB A-to-mini B cable (not included). One end of the cable is connected to the USB mini B port on the bottom of the hand control, the other end is connected to the computer. Once connected, you can use most any third-party astronomy software that has focuser control by using the Celestron Unified ASCOM mount driver (download from [ascom-standards.org](http://ascom-standards.org)).

If connected directly to a computer through the focus motor's USB port, use the focus motor with third-party astronomy software by using the Celestron Focuser USB ASCOM driver (download from the focus motor page at [celestron.com](http://celestron.com)).

Celestron also offers free Windows PC software that controls the focus motor without the need for an ASCOM driver. The simple Celestron Focuser Utility Program can be downloaded from the focus motor page at [celestron.com](http://celestron.com). The focus motor can also be controlled with the Celestron PWI program.

For more information, download the full instruction manual from the focus motor page at [celestron.com](http://celestron.com)



**FCC NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product is designed and intended for use by those 14 years of age and older.



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