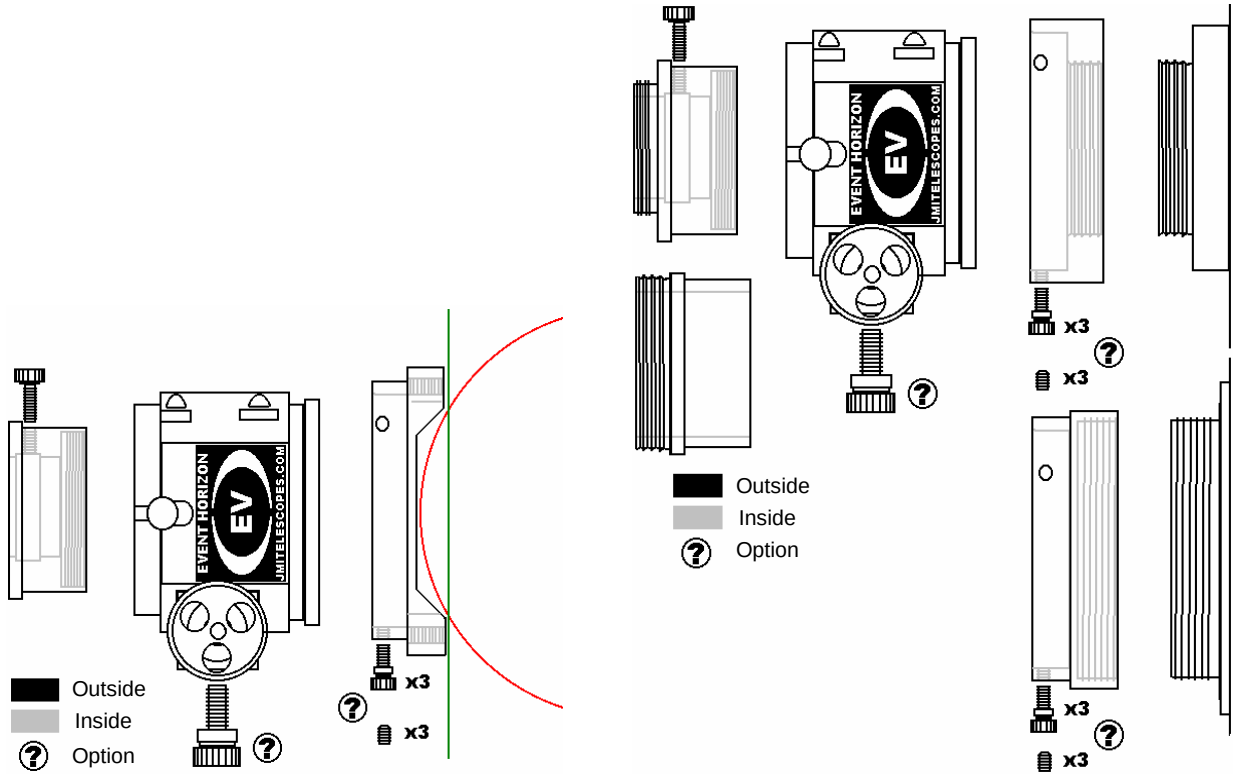
EV Focuser Installation and Operation

Congratulations on your purchase of the Event Horizon Focuser. A great amount of time and money have gone into the research and development of this focuser. We can assure you that the Event Horizon Focuser is a tool you can be proud to have on your telescope.

Installation—Newtonian Version

The first step in installing your new EV Focuser on a Newtonian telescope is to remove the old focuser. If you believe that the old focuser is aligned properly, then it is helpful to collimate your telescope before removing it. This will assist in the alignment of your EV by matching the focuser to the collimation already established. The optical performance of your telescope is greatly affected by the alignment of the focusing drawtube with the optical path. For this reason, leveling setscrews are provided on the base, and we encourage you to make every effort to ensure the focuser is properly aligned and that your telescope is properly collimated.

Next, drill four mounting holes using the focuser base as a template. Using the four mounting screws and nuts, attach the focuser loosely enough to allow adjustment with the leveling setscrews. An optional backup plate (ADPTBUPF for flat surfaces or ADPTBUPC for curved surfaces) is available from JMI for mounting the focuser on a cardboard sonotube or to cover mounting holes left over from previous focusers. This plate can add stability and strength to the mounting surface. (You may want to add an additional backup plate on the inside of a sonotube.) When the focuser has been properly aligned with the optical path and centered directly above the secondary mirror, tighten the mounting screws to secure this position. Installation is now complete.

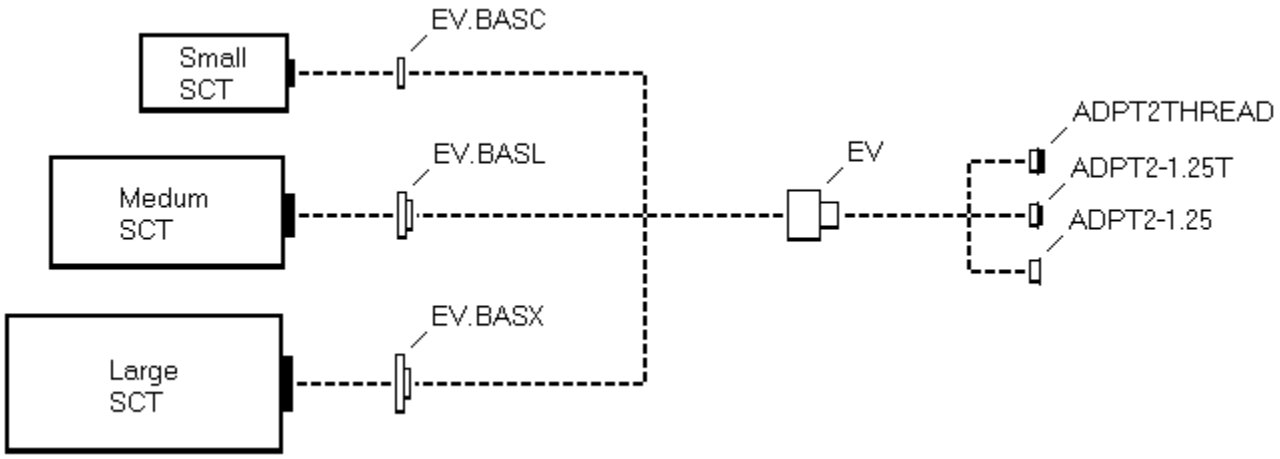


Newtonian Version **Cassegrain Version**

In the diagram above, black lines represent external surfaces, gray lines represent internal surfaces and the question mark shows where you have the option of using metal or nylon thumbscrews or setscrews. Note that the Newtonian version is designed for both flat and curved surfaces. The Cassegrain version shows the output adapters, standard with the EV-1c, EV-2c and EV-3c focusers, and the mounting bases for standard and large-format SCT threads.

Installation—Cassegrain Version

Refer to the diagram below while proceeding with the following installation instructions. Remove all items from the back of the telescope to expose the 2" (EV.BASC), 3.25" (EV.BASL) or 4" (EV.BASX) diameter threads. Thread the base hand tight onto the back of the telescope. If necessary, install three thumbscrews in the side of the base. With the focuser body positioned rotationally to your preference, gently push it into the mounting ring and tighten the thumbscrews. Do not over tighten. If you have the motorized version, plug the coiled cable ends into both the focuser and hand unit jacks. Installation is now complete.



Operation

When operating the optional motor, the drawtube is moved in or out by pressing one of the two red buttons on the hand unit. Holding one of these buttons down for two seconds will cause the motor to automatically switch to fast-speed mode. A two-position switch adjusts the rate of the slow-speed mode from high (left) to low (right). The hand unit operates with one 9-volt battery (included). To replace the battery (every 12 to 24 months), remove the screws holding the back of the hand unit. Some telescope drive systems will support a DC focus motor and should operate an EV focuser. You may find, however, that the included hand unit gives better control over the motor speed and electronic braking.

Drawtube travel on the Cassegrain version is limited to one-half inch and is intended for fine adjustments. It may be necessary to use the telescopes manual focus knob for coarse adjustments.

Installation of the threaded output adapter (part number ADPT2THREAD) in the focuser drawtube will duplicate the standard 2" threads on the back of an SCT allowing you to use the standard threaded accessories on the back of the focuser.

Your EV focuser utilizes a modified "Crayford" design to achieve its outstanding performance and stability. The focuser is driven by the friction that results when a great amount of pressure is applied by the drive shaft against the drawtube, which in turn is pressed against the drawtube post bearings. Because of this enormous pressure, it is normal for a "track" to become apparent on the surface of the drawtube with use. However, it is very important to keep the roller and friction drive surfaces clean. A cotton swab or soft cloth should be used periodically to remove dirt and other foreign particles from these areas. If necessary, moisten sparingly with isopropyl (rubbing) alcohol. It is possible for the drawtube surface to become pitted if not properly maintained, thus reducing performance.

The drawtube should only be moved in or out by use of the manual focus knob or motor. Because it is hard anodized, directly pushing on the drawtube can wear a flat into the stainless steel drive shaft resulting in uneven travel. Also, the manual focus knob should not be forced and use of the motor should not continue when the end of travel has been reached, as excessive wearing of the stainless steel shaft and drawtube may occur. **Damage resulting from the above actions is not covered under warranty.**

Your focuser is supplied with brake screws for locking the focuser in place, in order to prevent any change in focus when using a camera or heavy eyepiece, or for varying the drag resistance on the drive shaft. Both a metal and a nylon version are included for varying friction characteristics.

To use manual operation when a motor has been installed, you must disengage the motor by loosening the small screw (on the left) to back off the motor. It is only necessary to back the screw off a few turns to disengage the gears. **Attempting to force a manual adjustment with the motor engaged will damage the focuser.**

Adjustments

The EV Focuser is carefully adjusted and tested at the factory and should remain so for the life of the focuser. If it becomes necessary to adjust the focuser, contact JMI. If the focuser is adjusted improperly, performance will degrade and damage may result. **Damage due to improper adjustments by anyone other than factory-trained technicians, will not be covered under warranty.**

Almost all focuser damage is caused by one or more unnecessary and improper adjustments. If kept clean, your focuser should give you a lifetime of use without the necessity of any adjustments.

Accessories and Options

The combination 1.25" eyepiece and T-thread adapter (part number ADPT2-1.25T) is an optional accessory with the Cassegrain versions. It allows you to mount any camera having standard T-threads, including CCD cameras. Eyepiece and SCT thread output adapters are also available. In addition we have different drawtube lengths as well as extension tubes for a greater "racked out" height.

Other options include Smart Focus, PC Focus Control, DRO and DFC. Smart Focus is a combination of hardware and software for precise remote control of JMI's motorized focusers through a personal computer's serial port. PC Focus Control provides basic PC computer control of any JMI focus motor. Digital Read Out (DRO) gives precise measuring of drawtube movement using a hand unit with electronic digital read out. Digital Focus Counter (DFC) is a more economical mechanical counter. Smart Focus or DRO is a must for CCD use because it allows you to return to a previous position by using the computer screen or digital display.

Hand Unit and Focuser Motor Operation

Your purchase includes a motor and a hand unit for controlling the motor. These instructions will explain the operation of both.

Single-Control Hand Unit
The linear voltage control (LVC) hand unit controls one motor. It includes two red forward and reverse push buttons and a black two-position slow-speed slide switch. The slow-speed switch adjusts from high (left) to low (right). The system automatically changes from slow speed to fast speed when one of the forward or reverse buttons is held down for two seconds or more. This effectively gives the hand unit three speeds:

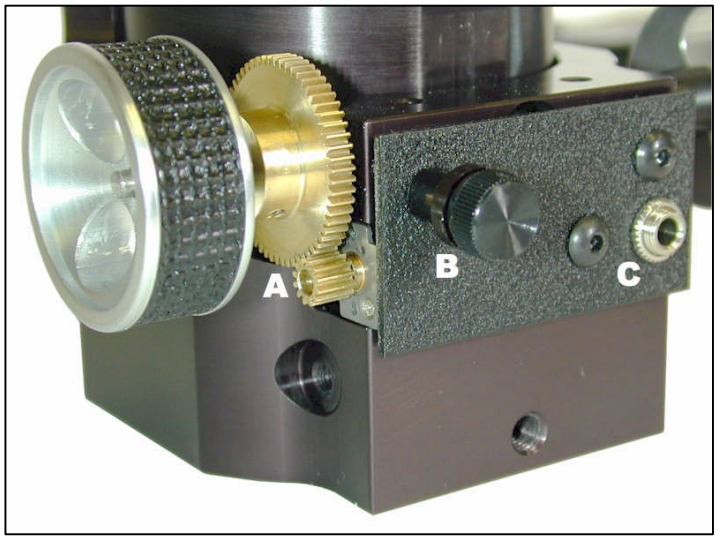
1) **Very Slow** (black switch set to right position with a red button held down for less than two seconds),
2) **Slow** (black switch set to left position with a red button held down for less than two seconds) and
3) **Very Fast** (automatic speed-up when a red button has been pressed for two seconds or more).

Note: You can place the black switch in the center (not a normal position) to get fast speeds at all times.

The system includes a 1/8" jack for the hand-unit-to-motor cable, quick-stop electronic braking to keep the motor from coasting past the point where you release a forward or reverse button and a 9-volt alkaline battery for power. It can control MOTOFOCUS, MOTODEC, EV, NGF and RCF motors.

A dual-control hand unit is available. It includes a toggle switch to switch control between two different motors. The dual-control hand unit does not include LVC electronics and uses a small rotary manual speed control.

Focuser Motor
If you are using the hand control to run a motor on a focuser, the following instructions will explain the operation of the motor.



The focuser is designed to be operated manually or with the motor. To manually focus, by turning the focuser knobs, you must disengage the drive gears (A). This is accomplished by backing off the motor thumbscrew (B) by turning it counterclockwise. When you desire to use motorized operation, simply turn the thumbscrew (B) clockwise until the gears are engaged (meshed together). Only apply enough pressure to completely engage the gears. Your focuser may look slightly different than the picture but the operation will be the same.

To use the motor, plug one end of the motor cable into the jack on the top of the hand unit and the other end into the jack on the focuser (C).

With normal care, your hand unit and motor will give many years of reliable service.

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