INSTRUCTION MANUAL

ESPRIT 120EDX



Sky-Watcher®
Be amazed.

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Introduction

The spirit of perfection, by Sky-Watcher

Designed with the discerning astronomer in mind, Sky-Watcher top-of-the-line Esprit refractors deliver the kind of imaging performance one would expect from telescopes costing much more. With their three-element air spaced objective lens design, false color is extremely well corrected, yielding exceptional contrast and sharpness.

The 3" CNC machined 1:11 rotatable dual speed linear power focuser provides a smooth, rock-solid focusing with zero image shifts. D-style dovetail, retractable dew cap and padded case.

Quick overview:



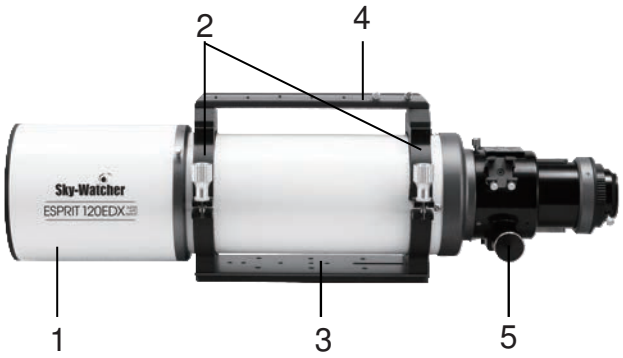
- 120 mm apochromatic, 3-element refractor
- 840 mm (f/7)
- Metallic high-transmission lens coatings
- 3" CNC machined 1:11 dual-speed focuser
- No visual color fringing even on bright objects
- Knife-edge Baffled Optical System
- Tube rings with dovetail D (Losmandy style) bar
- Aluminum foam lined case



- NEVER USE YOUR TELESCOPE TO LOOK DIRECTLY AT THE SUN. PERMANENT EYE DAMAGE WILL RESULT.
- NEVER USE AN EYEPIECE-TYPE SOLAR FILTER.
- NEVER USE YOUR TELESCOPE TO PROJECT SUNLIGHT ONTO ANOTHER SURFACE; THE INTERNAL HEAT BUILDUP WILL DAMAGE THE TELESCOPE OPTICAL ELEMENTS.
- USE A PROPER SOLAR FILTER FIRMLY MOUNTED ON THE FRONT OF THE TELESCOPE FOR VIEWING THE SUN.
- WHEN OBSERVING THE SUN, PLACE A DUST CAP OVER YOUR FINDERSCOPE OR REMOVE IT TO PROTECT YOU FROM ACCIDENTAL EXPOSURE.
- NEVER LET A TELESCOPE POINTING THE SUN UNATTENDED.

Getting started

Parts description



1. Retractable dew cap
2. Tube rings
3. D (Losmandy) dovetail bar
4. Handle
5. 3" 1:11 dual-speed focuser

Cooling the telescope

Telescopes require time to cool down to outside air temperature. This may take longer if there is a big difference between the temperature of the telescope and the outside air. This minimizes heat wave distortion inside telescope tube (tube currents). Your telescope would require at least 25 minutes cooling off to outside conditions. Tip: use this time for planning your session and mount accessories.

Prime focus imaging with the optional field flattener



Before installing the field flattener onto the drawtube of the focuser, the 2" ring adaptor **(2)** needs to be unscrewed and removed.

In order to easily unscrew the ring, hold with one hand the ring **(1)** at the end of the drawtube and then unscrew the 2" ring adaptor **(2)** with the other hand.

It guarantees excellent field flatness and ensures full illumination with extremely minimizedcolor fringing across the entire 44 mm imaging plane.

No "universal" field f.lattener available on the market will deliver the premium results achieved with the Sky-Watcher ESPRIT 120 Field flattener.

The Sky-Watcher ESPRIT 120 Field flattener is not compatible with other telescopes, even refractors with the same aperture and same focal length.

The field flattener needs to be purchased separately by the user.

Installing the field flattener and a DSLR (Digital Single-Lens Reflex) camera



1. Screw the drawtube adaptor **(1)** at the end of the focus tube.
2. Screw the field flattener **(2)** onto the drawtube adaptor **(1)**.
3. Screw the extender tube **(3)** onto the field flattener **(2)**.
4. Screw the enlarged 48mm TRing **(4)** onto the extender tube**(3)**.

The enlarged 48mm TRing may not be included with your telescope and should match your DSLR camera's manufacturer and model. Please check with your reseller to get the correct 48mm Enlarged T-Ring for your DSLR camera.

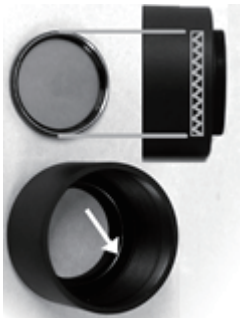
5. Install your DSLR camera on the 48mm enlarged T-Ring **(4)**.



In order to get the premium results the field flattener for ESPRIT 120 can deliver the distance between the last lenses to the sensor should be exactly as designed for. This distance is called the field flattener "back focus".

The rings are designed to provide 75mm of back focus with any DSLR camera. Modifications to this layout, i.e. by adding a radial guider, will lead to blurry stars images in the field edges.

Installing a 48mm filter inside the extender tube



A 48mm (2") filter can be mounted inside the DSLR extender tube if needed. By example using a light pollution reducer filter may allow pictures of the night sky even in suburban areas.

1. Unscrew the closing ring at the rear part of the extender tube.
2. This closing ring has a 48x0.75 mm thread inside, able to receive any 48mm (2") filter.
3. Insert the filter. Do not overtighten the filter. Put the closing ring back in place.

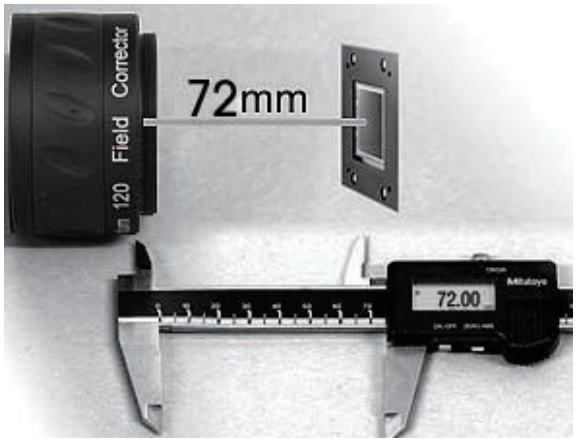
Installing the field flattener and a CCD (Charge-Coupled Device) camera

Installing an astronomical CCD camera and its accessories (filter wheel, radial guider…) behind the field flattener is not as straightforward as installing a DSLR camera. All DSLR cameras have the exact same distance from the front side of the T-Ring adapter to the sensor, thus share the same extension rings to ensure the 75mm back focus distance.

CCD cameras differ from one model to another, even in the same brand name, by the threads used and the body-to-sensor distance. Accessories also have different possible threads and depths, thus the combination of a CCD camera and its accessories can have any total length and any coupling thread.

A custom coupling ring is needed in order to assemble the CCD camera and its accessories (called the "optical train") to the telescope's field flattener. The custom ring should be machined* to have:

1) A female M62x1 thread, to screw and secure the ring to the field flattener exit.
2) A thread compatible with the first component of the optical train.
3) A length to ensure that the distance from the back of the field flattener to the CCD sensor is exactly 75mm.



The 72mm distance is measured from the edge marking the start of the male thread on the field flattener, to the CCD sensor (see picture on the left).

Most CCD cameras have also the distance from their body thread to CCD sensor noted in the manual, thus evaluating the length of the custom ring you need can be precisely evaluated.

* Refer to your local dealer about custom ring supply.

IInstalling the field flattener and a CCD camera - continued



1. Screw the drawtube adaptor **(1)** at the end of the focus tube.
2. Screw the field flattener **(2)** onto the drawtube adaptor **(1)**.
3. Screw the custom ring **(3)** onto the field flattener **(2)**.

The custom ring needs to be sturdy enough to secure the optical train to the field flattener.

4. Screw your optical train to the custom ring **(3)**.

Focusing



- Make sure the locking lever below the focuser **(1)** is unlocked (position as shown in picture).
- Slowly turn the focus knobs **(2)** one way or the other, until the image in the eyepiece is nearly sharp.
- To finely focus the image turn the 1:11 knob one way or the other until the image is perfectly sharp **(3)**.
- Lock the screw below the focuser **(1)** if a heavy load is attached (pull the lever at 90°).

The image usually has to be finely refocused over time, due to small variations caused by temperature changes. This often happens when the telescope has not yet reached outside temperature.

Prime focus imaging with the optional 0.77x reducer / flattener



Before installing the reducer flattener onto the drawtube of the focuser, the 2" ring adaptor **(2)** needs to be unscrewed and removed.

In order to easily unscrew the ring, hold with one hand the ring **(1)** at the end of the drawtube and then unscrew the 2" ring adaptor **(2)** with the other hand.

The Sky-Watcher ESPRIT 120 full frame 0.77x reducer / field flattener has been specifically designed for your telescope. It guarantees excellent field flatness and ensures full illumination with extremely minimized color fringing across the entire 34 mm imaging plane.

No "universal" reducer flattener available on the market will deliver the premium results achieved with the Sky-Watcher ESPRIT 120 Reducer flattener.

The Sky - Watcher ESPRIT 120 Reducer flattener is not compatible with other telescopes, even refractors with the same aperture and same focal length.

The reducer flattener needs to be purchased separately by the user.

Installing the reducer flattener and a DSLR camera



1. Screw the reducer flattener onto the focuser drawtube.
2. Screw the extender tube onto the reducer flattener.
3. Screw the enlarged 48mm T-Ring onto the extender tube.
4. Install your DSLR camera on the 48mm enlarged T-Ring.

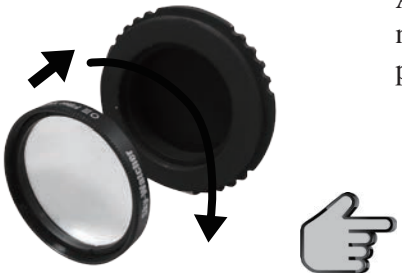
The enlarged 48mm TRing may not be included with your telescope and should match your DSLR camera's manufacturer and model. Please check with your reseller to get the correct 48mm Enlarged T-Ring for your DSLR camera.



In order to get the premium results the reducer flattener for ESPRIT 120 can deliver the distance between the last lenses to the sensor should be exactly 95mm. This distance is called the reducer flattener "back focus".

The rings are designed to provide 95mm of back focus with any DSLR camera. Modifications to this layout, i.e. by adding a radial guider, will lead to blurry stars images in the field edges.

Installing the reducer flattener and a DSLR camera



A 48mm (2") filter can be mounted inside the DSLR extender tube if needed. By example using a light pollution reducer filter may allow pictures of the night sky even in suburban areas.

1. Unscrew the closing ring at the rear part of the extender tube.
2. This closing ring has a 48x0.75 mm thread inside, able to receive any 48mm (2") filter.
3. Insert the filter. Do not overtighten the filter. Put the closing ring back in place.

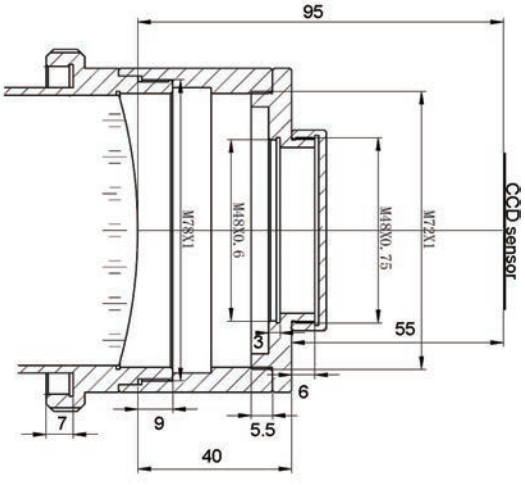
Installing the field flattener and a CCD (Charge-Coupled Device) camera

Installing an astronomical CCD camera and its accessories (filter wheel, radial guider…) behind the field flattener is not as straightforward as installing a DSLR camera. All DSLR cameras have the exact same distance from the front side of the T-Ring adapter to the sensor, thus share the same extension rings to ensure the 95mm back focus distance.

CCD cameras differ from one model to another, even in the same brand name, by the threads used and the body-to-sensor distance. Accessories also have different possible threads and depths, thus the combination of a CCD camera and its accessories can have any total length and any coupling thread.

A custom coupling ring is needed in order to assemble the CCD camera and its accessories (called the "optical train") to the telescope's field flattener. The custom ring should be machined* to have:

1) A female M78 x1 thread,to screw and secure the ring to the reducer flattener exit.
2) A thread compatible with the first component of the optical train.
3) A length to ensure that the distance from the last lens of the reducer flattener to the CCD sensor is exactly 95mm.



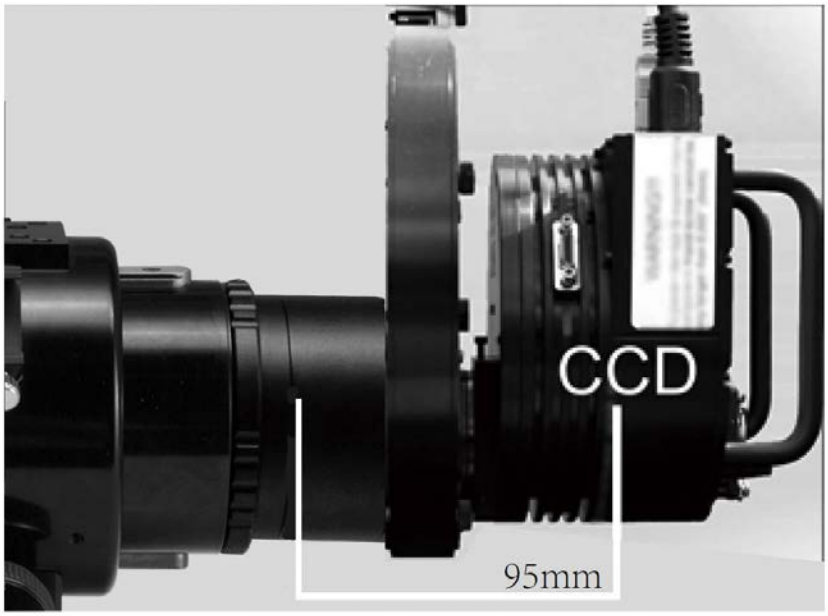
As it can be difficult to evaluate the position of the reducer flattener lenses inside the frame, the distance can be more conveniently measured from the lenses mount edge.

The 95mm distance is measured from the edge marking the start of the M78x1 male thread on the reducer flattener, to the CCD sensor (see picture on the left).

Most CCD cameras have also the distance from their body thread to CCD sensor noted in the manual, thus evaluating the length of the custom ring you need can be precisely evaluated.

* Refer to your local dealer about custom ring supply.

Installing the field flattener and a CCD camera - continued



1. Screw the reducer flattener on the end of the focus tube.
2. Screw the custom ring onto the field flattener.
3. Screw your optical train to the custom ring.

> The custom ring needs to be sturdy enough to secure the optical train to the field flattener.

4. Screw your optical train to the custom ring.

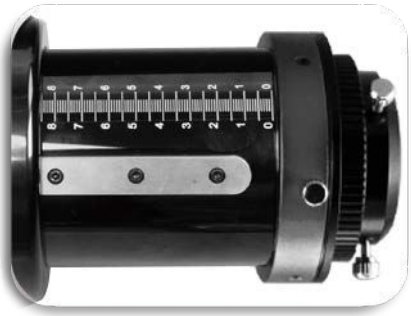
Useful tips for all observations



Removing the finder scope

During an observation, when the desired target is acquired, it is possible to remove the finder scope from its support. When needed the finder scope can be inserted again.

This can be useful when the observer's head is in a position where the finder scope becomes an obstacle to observation.



Using the indexed scale

The indexed scale on the focuser drawtube gives an accurate indication on the focus position for various accessories.

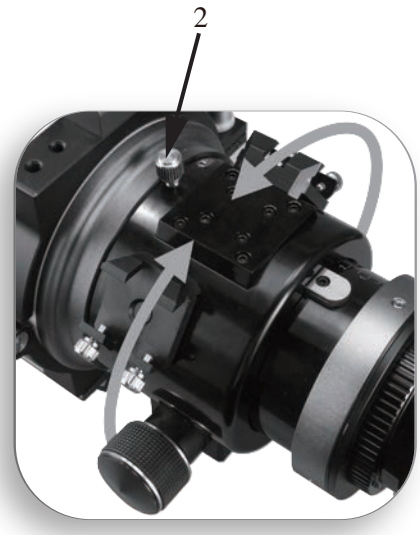
Once the position for one accessory is known it is very easy to approximate the focus position.

Due to the precision needed to reach perfect focus a fine tuning is advised.



Rotating diagonal ring

Loosen the screw **(1)** to rotate the diagonal ring



Rotating the focuser

The whole focuser body can be rotated. It is useful when the focuser knobs aren't in a convenient position.

1. Remove all accessories from the focuser.
2. Fully retract the drawtube inside the focuser body.
3. Loosen the screw **(2)** .
4. Rotate the focuser body.
5. Lock the screw **(2)** .



Retractabling dew cap

To extend the dew cap unscrew the two screws on the aluminum ring **(3)**, then gently pull the dew cap forward **(4)**. When in position, tighten the two screws to ensure the dew cap stays in position .



When the dew shield is fully retracted, you can see an M128x2 screw at the front of the objective lens cell, which can be used to attach some accessories, such as the front-facing filter.

Specifications

Telescope specifications

Optical Design	*Refractor (air-spaced triplet APO)*
Aperture (mm)	120 mm (4.7 in)
Focal Length	840 mm (33 in)
Focal Ratio	7
Highest Useful Magnification	283 x
Lowest Useful Magnification	17 x
Limiting Stellar Magnitude	12.9
Resolution (Rayleigh)	1.16 arc seconds
Resolution (Dawes)	0.97 arc seconds
Light Gathering Power	294 x(Compared to Human Eye)
Optical Coatings	Fully multi-coated
Optical Tube Length	70 cm (28 in)（Retracted Dew Cap）
Optical Tube Weight	10.7kg (25 lbs)
*Telescope Visual Backfocus**	>225mm (8.7 in)
Focuser type	Rack and pinion, double speed, diameter 74mm (3 in)

Threads specifications



Rings/ Threads	Focuser Tube	Enlarged T-Ring	Enlarged T-Ring
In Ø	n/a	M62X1 F.	M48x0.75 F.
In screw depth	n/a	8.5mm	variable
Out Ø	M74 x1 M	M48X0.75M	Camera
Out screw depth	6 mm	6mm	n/a

* The visual back focus of the telescope is the distance from the end of the focuser tube (with 2'' adapter installed) to the focal plane. This means, all accessories needing 170mm back focus or less can be installed.

** The back focus of the field flattener is the distance from the back of the field flattener (flat surface at the. exit) to the focal plane. To obtain flat wide field images, the sensor should be positioned at exactly (+-1mm) this distance. See also detailed explanations on bottom of page 8.



We want to ensure that your experience with a Sky-Watcher product is the best it can be. To make that happen we have a comprehensive technical and customer support available, alongside with the list of distributors and dealers worldwide, on our worldwide internet site:

http://www.skywatcher.com

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