Vixen FL55SS fluorite apo refractor

A portable scope designed for astrophotography that also works well visually

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VITAL STATS

- **Price** £1,149 (Reducer HD Kit £799)
- **Optics** Apochromatic fluorite objective lens
- **Aperture** 55mm
- **Focal Length** 300mm, f/5.5 native, or f/4.3 with reducer and flattener
- **Focuser** Dual speed rack and pinion
- **Weight** 1.49kg OTA, 1.95kg with Reducer HD Kit
- **Supplier** Opticron
- **Tel** 01582 726522
- **www.** vixenoptics.co.uk

Vixen has a fine pedigree of telescopes, and new models from the Japanese company always attract their fair share of interest. This is the case with the FL55SS, a compact and lightweight refractor that offers premium features in a portable package.

The FL55SS is a dual-purpose telescope suitable for visual astronomy, or with the addition of a dedicated lens kit, for fast, wide-field astrophotography. The unit is supplied as an OTA, or Optical Tube Assembly only, so to test it visually we used our own 1.25-inch diagonal. An extension tube for the visual back is supplied, which allows the scope to be used in a straight through configuration if desired. Without a diagonal; however, we found this was an uncomfortable way of viewing objects that were high overhead. If you are considering the FL55SS as a visual instrument, then a high-quality, maximum light transmission diagonal would be a worthwhile investment, to ensure optimal results from the front end's petite 55mm objective lens.

Bright ideas

We began our visual session with basic checks for astigmatism, lens misalignment and mechanical issues. As expected with Vixen equipment we found no problems. The telescope has a native focal length of 300mm, so our 25mm Plössl eyepiece, giving just 12x magnification, provided a wide overview – useful for orientation as there is no finderscope included with the FL55SS. The view proved to be too bright as poor sky transparency amplified the effect of background light pollution, but it did highlight the potential for the telescope in dark sky areas. Our 10mm eyepiece with its 72° field of view giving 30x magnification, was more rewarding: the star field contrasted nicely against the background. Bright stars such as Regulus and Arcturus demonstrated their distinctive blue and red hues respectively, and there were no unwanted colour aberrations visible around them. Moving the brighter stars towards the ▸

Fancy flourite

Many telescopes contain objective lenses made of glass. In contrast to this, the FL55SS uses fluorite, which is a crystal. Fluorite is expensive to produce, being fragile and difficult to work on, but fluorite has optical properties that make it very desirable as light can pass through it with minimal dispersion, unlike glass. In practice this means that the overall view is sharper, as all the colours of light entering the telescope are focused to a single point, rather than being dispersed into a fuzzier appearance. Fluorite lenses reduce chromatic aberration, an effect usually seen as unwanted coloured rings around brighter objects. Using parfocal colour filters and a CCD camera on the OTA alone, we checked the focus point of red, blue, and green light in comparison to each other – and as a whole through a luminance filter – to see just how good the fluorite lens is. The results were encouraging; red and green light focused together, with just a tiny deviation towards blue. This result is typical of high-end apochromatic telescopes.

SCALE

Lightweight and compact

The fit and finish of the FL55SS is high quality and the Vixen-style dovetail bar, although removable if required, forms an integral part of the telescope assembly. The tube itself measures just 282mm and weighs 1.5kg. Combined with the Reducer HD Kit the total weight is below 2kg.

Built-in dew shield and tube internals

A generous built-in dew shield helps to prevent problems with dew and restricts stray light from entering the scope and interfering with the view. Internal surfaces of the dew shield and scope are treated with a flat black coating, helping to eliminate reflections that reduce contrast at the eyepiece or camera.

Dual-speed rack and pinion focuser

Smooth and precise focusing is a prerequisite for fast astrographs with a shallow depth of focus. The no-nonsense, dual-speed, rack and pinion focuser offers just that, with a solid, sturdy-feeling adjustment mechanism, no slop in the drawtube and no change in focus when locking it in place.

Reducer HD

Taking the focal length to 237mm when used with the flattener, this 0.76x reducer comprises of three lenses and lowers the focal ratio to f/4.3. It's perfect for astrophotography, especially on portable mounts where less accurate tracking requires shorter exposures. An imaging circle of 44mm is quoted.

Flattener HD

This two-element lens removes the inherent coma of the main objective lens and acts as a slight 1.04x Barlow. The resulting imaging circle has a 44mm diameter. The flattener attaches to the reducing lens, or to an included extension tube, and fits inside the focuser drawtube.

▸ edge of the eyepiece started to reveal the effects of coma, which was quite pronounced at the perimeter. In the 10mm eyepiece the Great Hercules Cluster, M13, was a bright, but fairly indistinct object, but swapping to a 4.5mm eyepiece revealed more individual stars. At 66x the view was darkened, the brighter stars were tight and round with text-book airy discs, and we felt that we had probably reached the maximum useful magnification.

Kitted out

The primary purpose of the FL55SS, though, is a portable high-quality astrograph, when it is married to the Vixen SD Reducer HD Kit and a suitable camera. The kit is specially designed to complement the telescope; it includes a flattening lens to remove coma and a reducing lens to widen the field and lower the focal ratio from f/5.5 to f/4.3. There is also an extension tube that allows the flattener to be used separately from the reducer if desired.

Connecting a camera to the FL55SS requires a Vixen 60mm-adaptor. We borrowed one for our full-frame Canon 6D DSLR and then pointed the telescope towards Orion. The field of view on offer was tantalising, easily framing the three stars of Orion's Belt, and down beyond the Sword. Our imaging opportunities were limited, but the fast optics allowed even a handful of 30-second exposures at ISO 1600 to begin revealing objects like the Flame Nebula and glimpses of the Horsehead Nebula. Markarian's Chain of galaxies seemed another natural target for this equipment, and even a cropped photo easily contained the triangle formed by M58, M91 and M84, with dozens of faint galaxies alongside. More compact targets, like the Moon, or the Great Hercules Cluster are captured in the context of the sky around them, but the rich star field around the Great Hercules Cluster, M13, demonstrated that the flattening lens does its job well. Stars in the corners of the full-frame image started showing slight curvature, but the majority of the image had good, round stars.

Lightweight, compact, easy to use and effective both visually and photographically, the Vixen FL55SS proves its worth as a telescope and an astrograph.

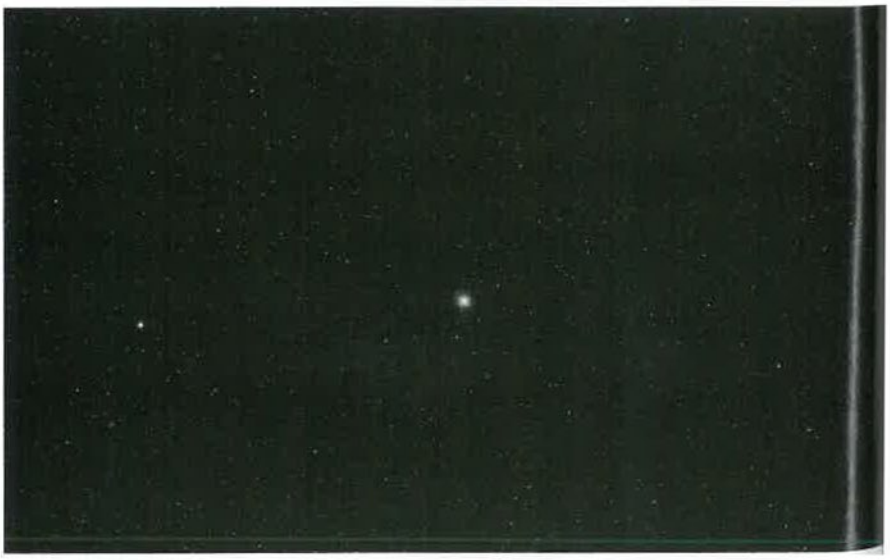
KIT TO ADD

1. 7x50 finderscope

2. Holder for 7x50 finderscope

3. Finderscope holder shoe

◂ A slightly cropped image of Orion's Belt and Nebula, as viewed through the Vixen FL55SS scope and captured with a Canon 6D DSLR, using exposures of 9x30 seconds at ISO 1600



▲ The Vixen's view of M13, captured on a Canon 6D using 50x45 second exposures at ISO 1600. The flattening lens works well on the star field

VERDICT

Build and design	★★★★★
Ease of use	★★★★☆
Features	★★★½☆
Imaging quality	★★★★☆
Optics	★★★★☆
OVERALL	★★★★☆

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