LAOWA Aurogon FF 10-50x
NA0.5 Supermicro APO

使用手册
Instruction Manual

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安徽长庚光学科技有限公司

www.laowalens.com

服务热线：400-066-1316
Email: sales@laowalens.com
电话Tel：(+86) 551-69107990
地址：合肥市庐阳区天水路与太和路交口庐阳中科大校友创新园5号楼
Add：Building 5, USTC Alumni Innovation Park, Crossing of Tianshui and Taihe Road, Luyang District, Hefei City, Anhui Province, China

LAOWA 老蛙

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前言

真诚地感谢您选购 LAOWA Aurogon FF 10-50x NA0.5 Supermicro APO显微镜头。此镜头拥有高亮度，衍射小，光线充足;长工作距离，易补光;高性能，高解析力等镜头特点。



⚠ *为了操作上的安全，使用本产品前请务必详细阅读使用手册与注意事项，并将手册放在需要时容易取得的地方。如遇到不能解决的问题请通过售后电话获取技术支持。*

主要特色

- 1、此显微镜头数值孔径NA：0.5~0.1（可调试），带来的最大优势就是高亮度，衍射小，光线充足，能够保证拍摄时，ISO数值较低，画面更加纯净。
- 2、拥有较长的工作距离，易补光，操作方便，能够在工业和科研方面进行普及。
- 3、采用先进的光学设计，高性能，解析力出众。能够拍摄出惊艳且震撼的作品。
- 4、物镜通用，通过切换管镜，可实现10X、20X、35X、50X的倍率切换。

注意事项

⚠ 安全注意事项

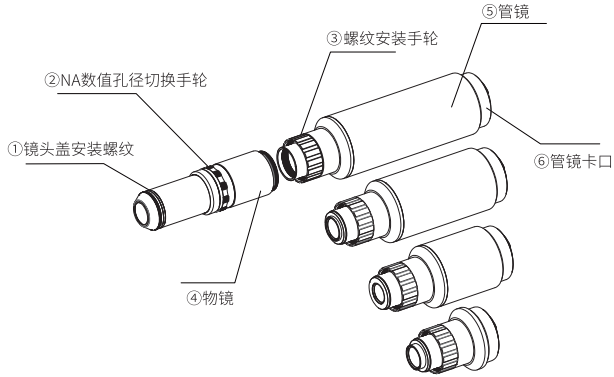
- 切勿自行拆解、修改或改装。当产品由于外力原因破损，切勿触碰外露部分或破损边缘处。
- 切勿放置于直射阳光下、封闭车辆中或其余高温处，否则过高的温度会使镜片和其他部件产生伸缩变形。
- 不使用镜头时，请将镜头前盖盖上或置于没有阳光照射处。凸透镜反射出的光线可能会聚集在附近物体上，导致发生火灾。
- 在逆光拍摄时，切勿将太阳置于画面中心，应该使太阳充分偏离画角，否则阳光会在相机内部聚集并导致火灾或灼伤眼睛。
- 在使用相机内置闪光灯拍摄时，由于镜头本身会遮挡光线而产生渐晕，因此建议您使用外设闪光灯拍摄。

注意事项

长期使用保养注意事项

- 避免触摸镜头表面，应用专用镜头布或气吹去除镜头表面的尘埃，不使用镜头时，应将镜头盖盖上。
- 使用镜头纸或镜头布清洁时，以螺旋的方式从中间向外擦拭镜头上的污垢以及指印。
- 镜头从寒冷的环境突然转移至温暖的环境时，镜头的外部以及内部镜片将会凝结水雾，所以在转移时应采取防潮保护措施。

各部件名称



镜头安装

取下物镜和管镜的前后盖，将物镜的螺纹端拧入管镜，拧紧③安装手轮，完成物镜和管镜的安装。将安装完成的物镜和管镜，管镜卡口⑥安装点对准机身安装点，旋转进行安装，镜头安装完毕。装上镜头后，请尝试旋转镜头确认是否已将其固定在相机上。

镜头拆卸

关机后按住相机上的镜头释放按钮，依照所购买卡口的安装方向反向旋转镜头，随后将镜头从座圈中拔出。拧松物镜安装手轮，旋出物镜。

NA孔径手轮使用

使用时，可以根据需要，通过调节NA的大小，来适配需要的景深。（注：NA的大小不同，衍射程度也会不同，通常NA越小，衍射越大，如果NA过小，会因为衍射而导致解析力下降。）

管镜卡口端到coms面的距离

10X：74.77mm　20X：145.38mm　35X：195.6mm　50X：240.52mm

对焦

- 此款镜头在搭配不同倍率管镜下，对焦距离会有所不同，对焦需要通过移动机身，来确定焦点。

对焦方法一

■ 峰值对焦(视所使用相机功能而定)

- 1、开启机身峰值对焦选项，峰值颜色选择为红色或常用颜色，峰值选项为低。
- 2、通过取景器或开启Live View（实时取景）功能观察画面，通过峰值来观察对焦点。
- 3、移动机身对物体进行精确对焦。

对焦方法二

■ 放大对焦

- 先构定拍摄画面，在通过取景器或开启Live View（实时取景）功能观察画面的同时，通过按键或者双击屏幕将对焦点放大，移动机身直至合焦。

Aurogon FF 10-50x NA0.5 Supermicro APO				
放大倍率	10x	20x	35x	50x
可调数值孔径（NA）	0.5/0.45/0.4/0.35/0.30/0.25/0.2/0.15			
盖玻片厚度	N/A			
工作距离(mm)	20			
物镜最大直径(mm)	50			
物镜长度(mm)	167			
物镜重量(g)	447			
波长范围(nm)	435-656			
物镜+管镜焦距（mm）	18.8	10.3	6.85	5.56
老蛙专用管镜型号	10x倍率管	20x倍率管	35x倍率管	50x倍率管
管镜最大直径(mm)	70	70	70	70
管镜长度(mm)	112	163	210	253
管镜重量(g)	377	444	530	609
最大畸变	0.60%	0.80%	0.40%	0.40%
像场直径	全画幅(24mm×36mm)			
共轭距离（mm）	299.4	370	420.2	465.1
卡口	EF，F，E，R，Z，L			

Preface

Thank you very much for purchasing LAOWA Aurogon FF 10-50x NA0.5 Supermicro APO microscopic lens. This lens has high NA with low diffraction and a long working distance for better illumination. It also has a high resolution, enabling excellent image performance.



⚠ *Read this operation manual carefully to familiarize yourself with its contents and ensure that you can operate the product properly. Keep the Instruction Manual in a safe place where it can easily be referenced whenever required. If you are still unable to solve the problem by reading the manual, please contact our after-sales service for further technical support.*

Features

- 1. The numerical aperture of this microscopic lens is 0.5~0.1 (adjustable). The most significant advantage of this lens is high NA with low diffraction, a long working distance, high resolution, and great performance. This ensures that the ISO value is lower when shooting to achieve clearer images.
- 2. This lens has a long working distance, easy to fill light, easy to operate, can be popularized in industry and scientific research.
- 3.This lens adopts advanced optical design with good performance and high resolution, allowing photographers to shoot outstanding images.
- 4. The lens can be used by photographers universally. It can achieve 10X, 20X, 35X, and 50X rate switches by switching tube lenses.

Precautions

⚠ Safety Precautions

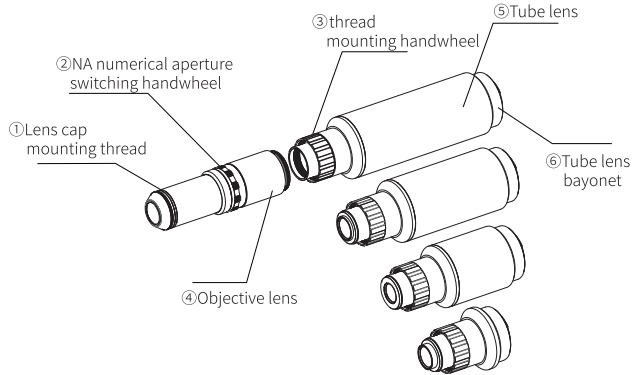
- Do not disassemble, modify the lens by yourself. Do not touch the internal parts that become exposed as the result of external force.
- Do not leave the lens where it will be exposed to high temperatures, such as in direct sunlight and an enclosed vehicle. Excessive heat may deform the glass elements and other parts of the lens.
- Whether it is attached to the camera or not, do not leave the lens under the sun without the lens cap attached. This is to prevent the lens from concentrating the sun' s rays, which could cause a fire.
- Do not place the sun in the frame center when shooting with backlight. Doing so might cause a fire or harm your eyes.
- The camera' s built-in flash will cause barrel shadow if used with this lens. For best results, please use an external flash unit.

Precautions

Maintenance Precautions

- Avoid touching the surface of the lens, use a special lens cloth or air blower to remove dust on the surface of the lens, and cover the lens cap when the lens is not in use.
- When cleaning with lens tissue or lens cloth, wipe dirt and fingerprints on the lens from the center outward in a circular motion.
- When the lens is suddenly transferred from a cold environment to a warm one, water will condense on the outer and inner lenses of the lens. Please take moisture protection measures when moving the lens in different environments.

Nomenclature



To attach the Lens

1.Remove the front and rear caps of the objective lens and tube lens.

2.Screw the objective lens into the tube lens and tighten the handwheel to complete the installation.

3.Align the installed objective lens and tube lens to the installation point of the microscope and screw to install.

4. After attaching the lens, try rotating the lens to confirm that it is secured to the camera.

To remove the lens

1.After turning off the camera, press and hold the lens release button on the camera, rotate the lens in the opposite direction of the mount, and then pull the lens out.

2.Loosen the handwheel and unscrew the objective lens.

NA aperture handwheel

You can adjust the size of NA to adapt to the required depth of field. (Note: The diffraction degree varies with the size of NA. Generally, the smaller the NA, the greater the diffraction. If the NA is too small, the resolution will decrease due to diffraction.

Distance between the tube lens bayonet and COMS

10 x: 74.77 mm　　20 x: 145.38 mm

35 x: 195.6 mm　　50 x: 240.52 mm

Focusing

This lens has different focusing distances when matched with different magnification tube lenses. The focus can be adjusted by changing the camera body.

Focusing Methods

Method 1 Focus Peaking (depending on the camera function)

- 1. Turn on the focus peaking option on the camera, select the peaking color as red or other common colors, and choose the peaking option as low.
- 2. Observe the image through the viewfinder or turn on the Live View function and observe the focus point through the peak value.
- 3. Move the camera to focus precisely on the object.

Method 2 Focus Magnification

- First, set the shooting picture, while observing the image through the viewfinder or by turning on the Live View function. Then, press the button or double-tap the screen to zoom in on the focus point and move the camera until the focus is achieved.

Aurogon FF 10-50x NA0.5 Supermicro APO				
Magnification	10x	20x	35x	50x
Adjustable numerical aperture (NA)	0.5/0.45/0.4/0.35/0.30/0.25/0.2/0.15			
Cover glass thickness	N/A			
Working distance(mm)	20			
Maximum objective diameter(mm)	50			
Length of objective lens(mm)	167			
Weight of objective lens(g)	447			
Wavelength range(nm)	435-656			
Objective lens + tube lens focal length (mm)	18.8	10.3	6.85	5.56
Special tube lens for Laowa model	10x Magnification tube	20x Magnification tube	35x Magnification tube	50x Magnification tube
Maximum diameter of tube lens (mm)	70	70	70	70
Length of tube lens (mm)	112	163	210	253
Weight of tube lens(g)	377	444	530	609
Maximum distortion	0.60%	0.80%	0.40%	0.40%
Image field diameter	Full-frame (24mm×36mm)			
Conjugate distance (mm)	299.4	370	420.2	465.1
Mounts	EF, F, E, R, Z, L			