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# Lx 400 BF/DF/Phase Contrast Kit
# User Manual

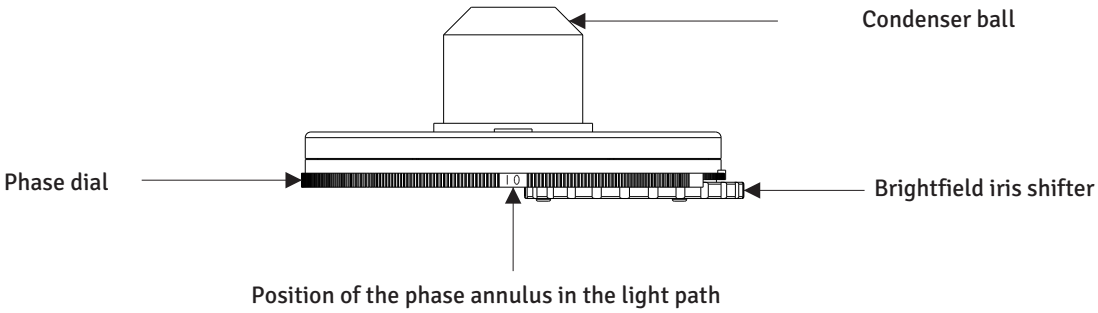
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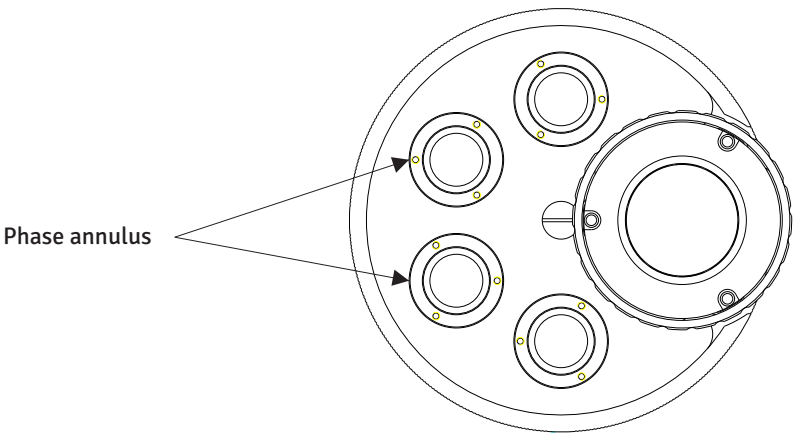
To ensure correct use of this instrument and to avoid injury during operation, read this manual completely before use.

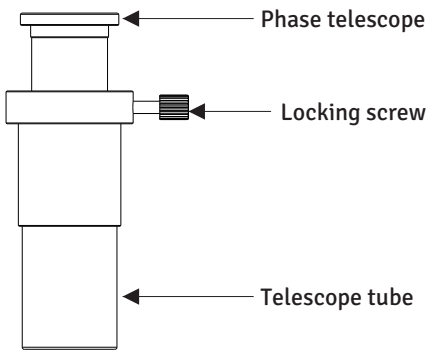
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# INTRODUCTION

Phase contrast is a light microscopy method developed on the principle that speeding up the direct light path causes destructive interference patterns in the viewed image. These patterns make details in the image appear darker against a light background. To create these interference patterns, a system of rings located both in the objective and in the condenser must overlap. When they are aligned correctly, the light waves from the light source reach your eye one-half of a wavelength out of phase, and details of the specimen are greatly enhanced. Phase contrast is useful only for specimens that are colorless and transparent and usually difficult to distinguish from their surroundings. Such specimens are called “phase objects”. Examples of phase objects include cell parts in protozoa, bacteria, sperm tails and other types of unstained cells.

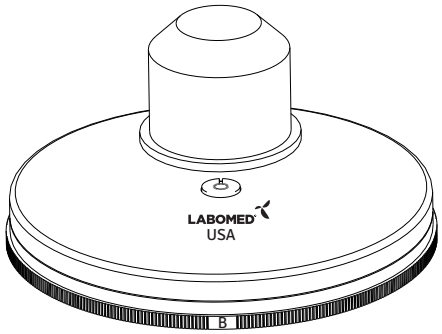


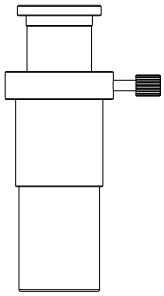



# STANDARD COMPONENTS (PACKING LIST)

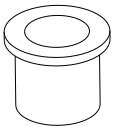
## Lx 400 BF/DF/Phase Contrast Kit (9126000)




1



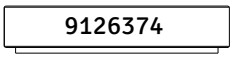
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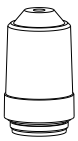
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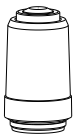
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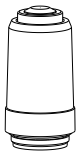

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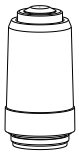
RP PH 10x



RP PH 20x



RP PH 40x (SL)



RP PH 100x (SL, Oil)

6

1) Phase annulus turret (A9120001)
2) Centering telescope eyepiece (3126005)
3) Adapter for the telescope eyepiece (9126005-10)
4) Allen wrench, 1.5mm
5) Green filter (9126374)
6) Phase contrast objectives (10X-9123010); (20X-9123020); (40X-9123040) and (100X-9123100)

Please make sure that all contents of the phase contrast kit are intact. If any physical damage is visible, contact your local distributor.

# INSTALLING THE PHASE KIT

1. Replace the standard microscope objectives with the phase objectives (item 6 of the packing list), in ascending order in the counterclockwise direction.

2. Lower the condenser bracket slightly with the condenser knob. Pull out the standard Abbe condenser (Fig. 1, part 1) after loosening the M3 Allen screw (Fig. 1, part 2) on the condenser bracket (Fig. 1) with the Allen wrench (item 4 of the packing list).

3. Mount the Lx 400 phase turret (Fig. 2, part 1) in place of the standard Abbe condenser and retighten the M3 Allen screw with the 1.5mm Allen wrench.

4. Place the green filter (9126374) on the critical mount (Fig. 2, part 2).

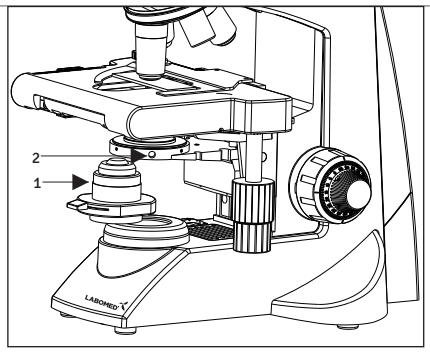



Fig. 1

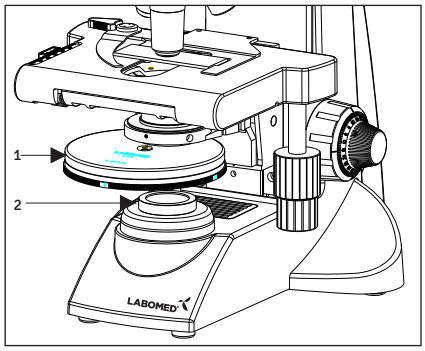



Fig. 2

# SET-UP FOR PHASE CONTRAST MICROSCOPY

1. Turn on the microscope illumination. Bring the 10x phase objective into the light path, set the phase turret dial to the brightfield position 'B' (Fig. 3, part 1) and focus on the specimen slide. Make sure the condenser is in its uppermost position.

2. Pull one eyepiece out of the observation tube and insert the telescope adapter (Fig. 3, part 2) in its place. Then insert the telescope eyepiece (Fig. 3, part 3) in the telescope adapter.

3. Loosen the locking thumb screw of the telescope eyepiece. While looking through the telescope eyepiece, extend the eye lens (Fig. 3, part 4) until the dark ring of the 10x objective in the field of view becomes sharp and crisp. The ring should not appear fuzzy. Tighten the thumb screw to lock the telescope eyepiece in the position where the image is in sharp focus.

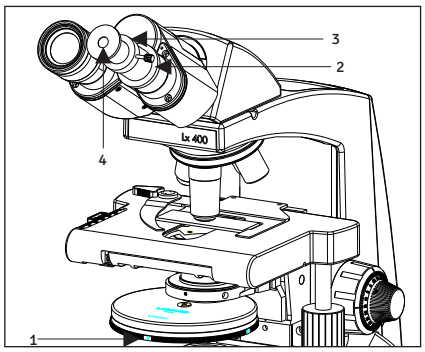



Fig. 3

4. Index the phase turret to the 10x annulus position by rotating the turret dial clockwise, i.e. from right to left (the phase dial is marked B, 10, 20/40, 100 and DF). Index the 10x objective into the light path. Looking through the telescope, two rings are visible: the dark ring is from the phase objective (Fig. 4, part 1) and the yellow illuminated ring is from the phase turret (Fig. 4, part 2). Adjust the telescope eyepiece to sharpen the yellow ring image if required.

5. You may find that the phase rings of the objective and of the turret do not overlap. To align the two phase rings, move the 10x annulus with your fingertips, holding it by the ring shifter (Fig. 5, part 1), which is located in the light path below the phase turret. Leave the annulus shifter ring where the two rings overlap (Fig. 6).

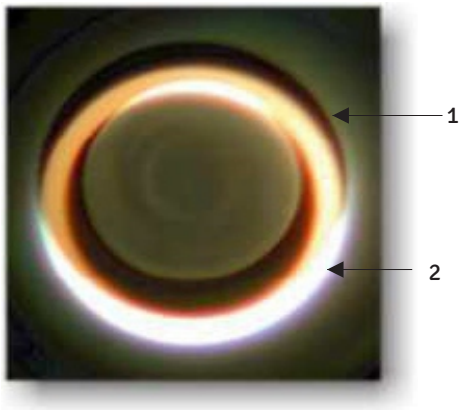



Fig. 4

6. Repeat steps 3 to 5 for the remaining 20x/40x, 100x and DF positions, and make sure that the phase annulus selected on the phase turret matches the magnification of the objective in use.

7. Remove the telescope eyepiece and the telescope adapter and put the eyepiece back in the eye tube. Place a phase slide or specimen on the stage. Your microscope is now ready for phase contrast microscopy.

8. Additional feature: the DF annulus marking on the phase turret dial is intended for darkfield use with objective magnifications up to 40x only. For best results, you may have to adjust the condenser height accordingly.

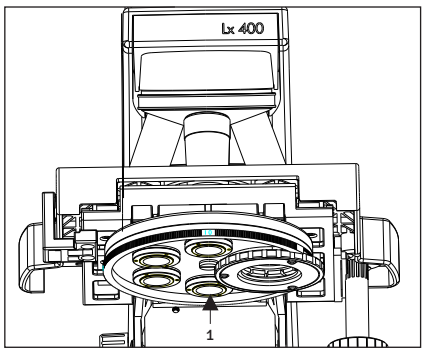



Fig. 5

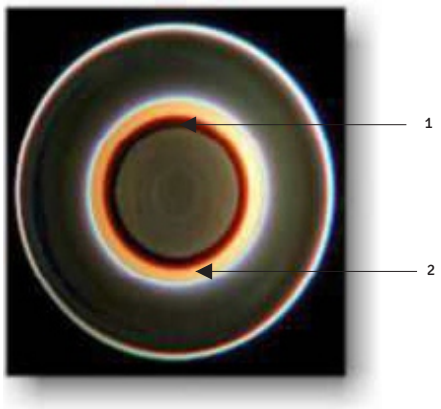



Fig. 6

## CARE AND MAINTENANCE

- Loose particles can be removed from the surface of the condenser, diaphragm or phase annulus by wiping gently with lens tissue moistened with acetone or methanol.
- Avoid leaving fingerprints on the surfaces of the condenser and phase annulus.
- When the phase contrast kit will not be used for a long time, store it in its original packaging.

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**Manufacturer: Labotech Microscopes India Pvt. Ltd.**
**Sales and Distribution:**
**Labo America Inc.**
920 Auburn Court
Fremont
CA 94538
U.S.A.
Telephone: 510 445 1257
sales@laboamerica.com

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