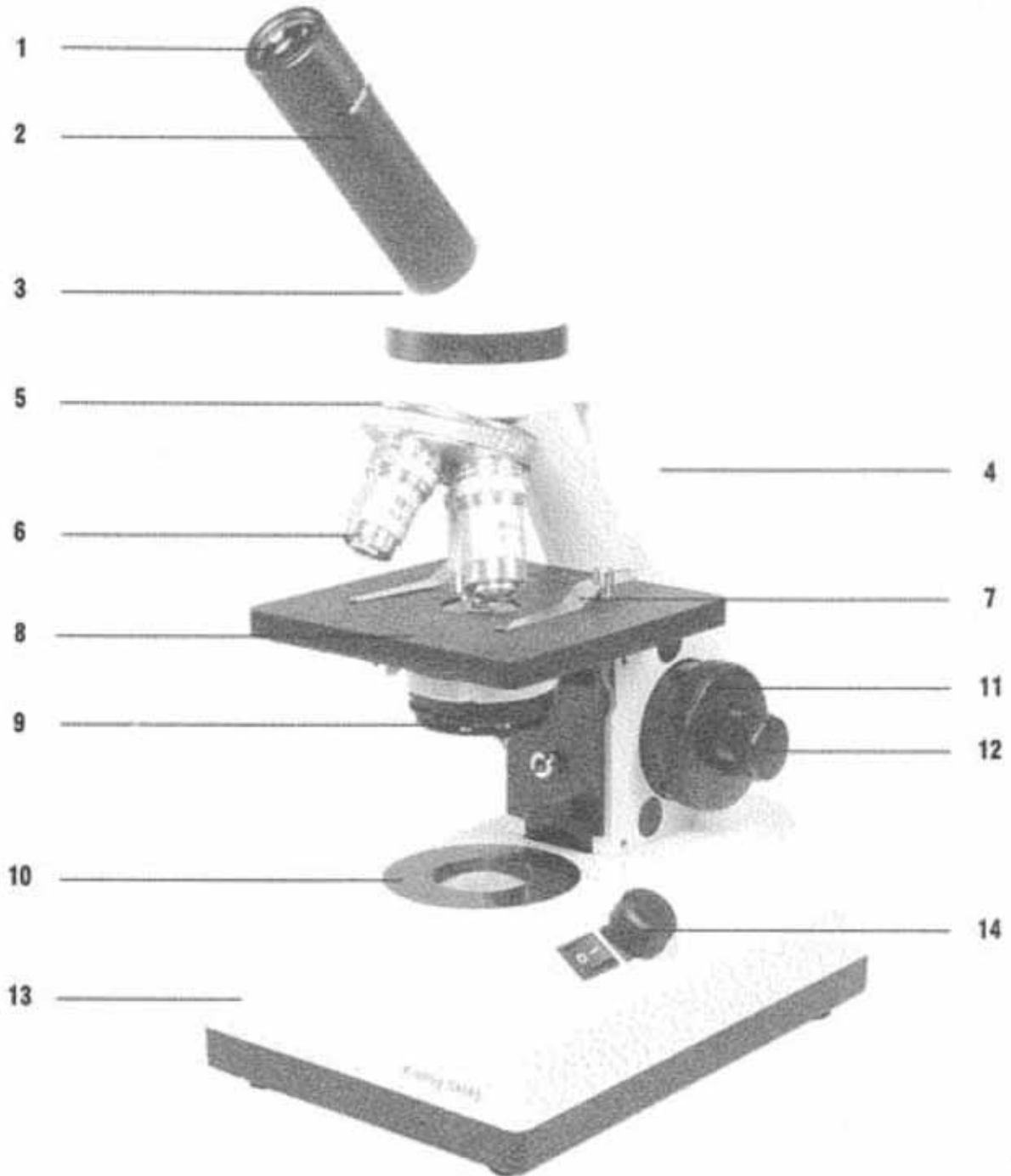


SH45 Kolleg

zu beziehen bei  
sold by  
[www.conatex.com](http://www.conatex.com)



### Kolleg SH 45

- 1 eyepiece WF 10 x
- 2 tube
- 3 360° revolving tube head
- 4 metalstand
- 5 four-position nosepiece with 3 objectives  
4 x / 10 x / 40 x
- 6 objectives
- 7 stage clips
- 8 microscope stage
- 9 Abbe-condenser N.A. 1,25 with iris  
diaphragm and filter holder with blue filter
- 10 illumination optics (halogen 12 V / 10 W)
- 11 coarse adjustment
- 12 fine adjustment
- 13 metal base
- 14 continuous brightness control for illumination

### Kolleg SHB 45

- 1 eyepiece pair WF 10 x
- 2a interpupillary distance adjustment
- 2b dioptic compensation
- 3 360° revolving binocular-head
- 4 metalstand
- 5 four-position nose piece with 3 objectives  
4 x / 10 x / 40 x
- 6 objectives
- 7 stage clips
- 8 microscope stage
- 9 Abbe-condenser N.A. 1.25 with iris  
diaphragm and filter holder with blue filter
- 10 illumination optics (halogen 12 V / 10 W)
- 11 coarse adjustment
- 12 fine adjustment
- 13 metal base
- 14 continuous brightness control for illumination

### Operating instructions and method of working

This microscope is a precision instrument requiring careful and regular maintenance. The focussing mechanism must be highly accurate and fractions of a millimetre can make the difference between a clearly focussed and a blurred image. Microscopy thus also requires a steady hand.

1. Always carry the microscope by the stand arm (4) and never by moveable parts such as the tube or binocular head (3), adjustment knobs (11), (12) or stage (8).

2. When carrying out microscopic examinations ensure that the table at which you are working is high enough for you to sit comfortably and look into the instrument. The microscope itself must be placed on a firm and solid surface. Avoid direct sunlight on the specimen.
3. Start viewing at the lowest magnification using the weakest objective.
4. Place the specimen on the stage (8) and secure it with the two stage clips (7). The object to be viewed should be in the middle of the hole in the stage and the cover glass must always be nearest to the objective, i.e., on top of the specimen.
5. Illumination of the specimen: For the microscopes 3430 and 3434, the low voltage halogen lighting integrated in the base is switched on by turning the brightness control knob (14). The specimen field is fit by means of illumination optics (10) integrated in the base (13) with a special blue filter for increasing the colour temperature.
6. The coarse and fine adjustment knobs (11), (12) are used for focussing. One rotation of the coarse knob raises the stage about 4.6 mm and one rotation of the fine adjustment knob raises the stage by about 0.4 mm.
7. Optical data: With the factory-fitted objectives and eyepieces the following magnifications can be obtained.

**Microscope** Standard four position nosepiece with 3 standardized achromatic objectives 4/0.15, 10/0.25 and 40T/0.65 (T = with specimen protection).

WF 10 x eyepiece:  
Magnification with 40 x, 100 x, 400 x.

**Microscope** Standard four position nosepiece with 3 standardized achromatic objectives 4/0.15, 10/0.25 and 40T/0.65 (T = with specimen protection).

WF 10 x pair of eyepieces: Magnification 40 x, 100 x, 400 x.

With the extensive range of accessories offered by ESCHENBACH additional magnifications can be obtained (see chart):

Objectives		Eyepieces		
Image scale	Numerical aperture	H 6 x	WF/H 10 x	WF/H 15 x
4 : 1	0,10	24	40	60
10 : 1	0,25	60	100	150
40 : 1	0,65	240	400	600
100 : 1 Oil immersion	1,25	600	1000	1500 <sup>*)</sup>

<sup>\*)</sup> = not recommendable magnification for 3430 and 3434 H = Huygens; WF = wide field

The total magnification of a microscope is calculated by multiplying the objective magnification by the eyepiece magnification. The higher the magnification the smaller the field of view and the less the depth of focus. High total magnification is only essential for the recognition of microscopic-structures under certain limited circumstances and is not on its own the decisive factor in determining the quality of a microscope. A far more important consideration is the resolution (numerical aperture = N.A.) of the objective. Microscopic structures which the objective cannot identify or "resolve" cannot be enlarged by the eyepiece. Thus a combination of 60 x objective and 6 x eyepiece is more effective, for example, than 30 x objective and 12 x eyepiece although both combinations produce a total magnification of 360 x.

Whereas wide field or Huygens eyepieces are sufficient for normal magnification ranges, the use of periscope eyepieces is more practical for photomicrography. These eyepieces correct the spherical aberration of high magnification objectives.

The eyepiece lenses can be cleaned (externally) with methylated spirits and additional dusting with an air brush is also recommended.

The lengths of the normal objectives (dry systems) are calculated in such a way that the various different focal lengths of the objectives are compensated, i.e., when changing magnifications the image can be refocused with the fine adjustment alone.

This is not possible, however, when working with oil immersion. In this case the objective is raised a few millimeters and a drop of immersion oil

placed on the specimen. The objective is then brought down on the specimen until the front lens is immersed in the oil. Working with immersion oil demands high precision because the working distance is only 0.12 mm. Minute differences in the thickness of the cover glass can also adversely affect the final result.

After use clean both the cover glass and the front lens of the immersion objective thoroughly with methylated spirits and plust off carefully with an air brush.

4. The following operations will help you to obtain a well contrasted image:
  - Raising and lowering the condensor (9) so as to match the illumination to the objective aperture as well as adjusting the iris diaphragm.
  - Inserting filters into the path of light (filter holder below the condenser (9)).
5. Changing the bulb:
  - **Caution: Unplug the mains adapter from the mains before changing the bulb!**

Slacken the four screws on the base plate to change the lamp.

#### Microscopes

Type of lamp for replacement:  
halogen lamp 12 V / 10 W

6. Conformity sign: 