

ZEISS

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Invertoscopes ID 02
and ID 02 MT

Operating Instructions

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Fig. 1: Invertoscope ID 02

- 1 6 V 10 W lamp housing with lamp carrier
 - 2 Lamp socket with 6 V 10 W halogen lamp connected to in-base power supply
 - 3 Clamping screw to secure the lamp carrier
 - 4 Fixture with clamping screw and pin to align the lamp carrier.
- The illumination system can be rotated about the stand column; the illuminator can be tilted for oblique illumination.
- 5 Fixed stage plate 185 x 270 mm
 - 6 Kpl wide-angle eyepiece 10x/18 Br foc with focusing eyelens (46 40 43-9902)¹⁾
Br = high-eyepoint eyepiece for eyeglass wearers
The eyepieces are equipped with fold-down rubber cups for observation without eyeglasses.
 - 7 Kpl wide-angle eyepiece 10x/18 Br (46 40 42-9903)
 - 8 Rigidly mounted binocular tube
 - 9 Nosepiece with screw-in objectives
 - 10 Focusing control acting on the nosepiece; vertical adjusting range 7 mm
 - 11 Base with integral power supply 220 V or 120 V, 50 ... 60 Hz, power consumption 18 VA (mains connection of transformer via cable with earthing contact or American flat plug)
 - 12 ON-OFF switch with brightness control of 6 V 10 W halogen lamp

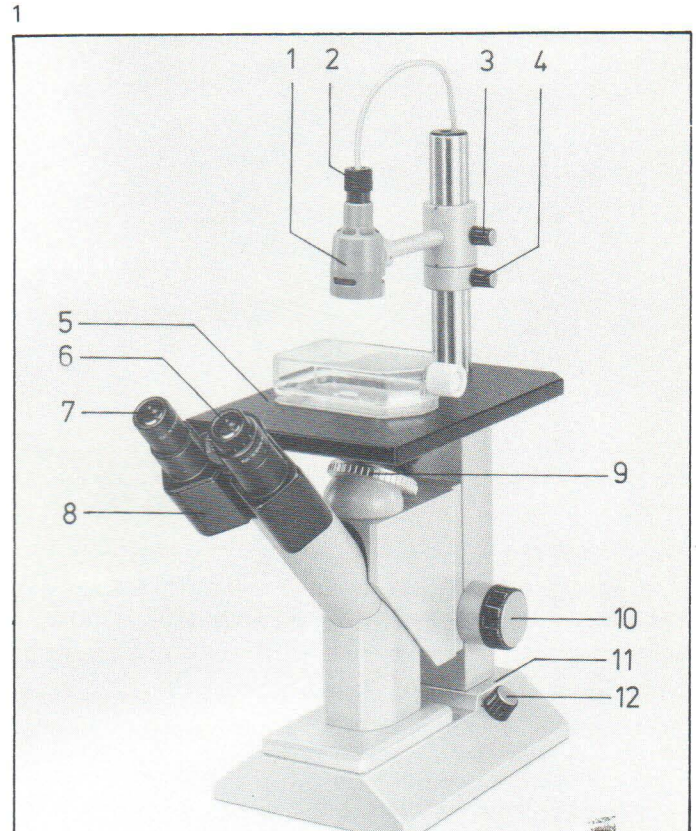
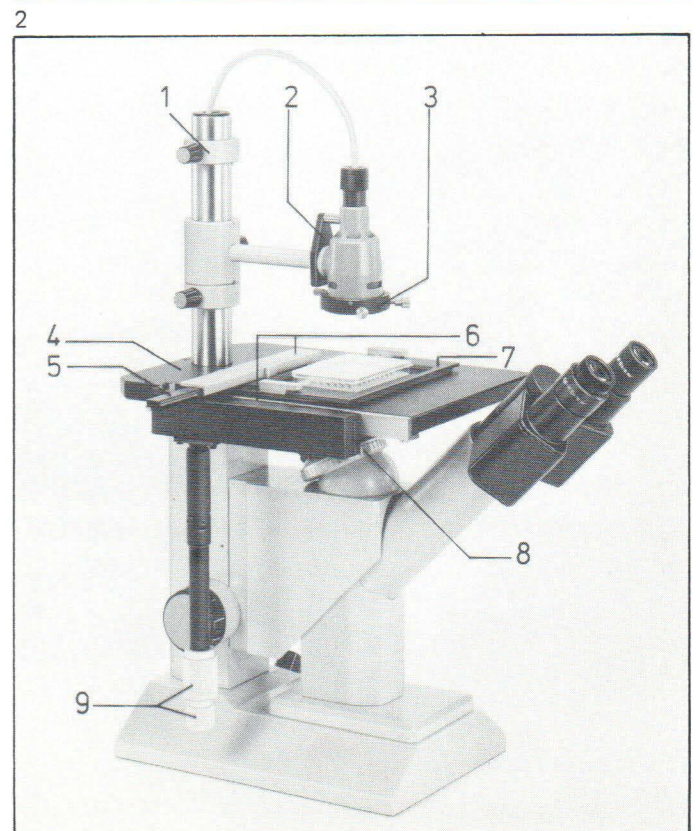


Fig. 2: Invertoscope ID 02 MT for phase contrast (Ph)

- 1 Additional fixture for Ph illumination (see also p. 8)
- 2 Stop for Ph system for vertical alignment of illuminator 10
- 3 Centerable phase stop Ph 1 or Ph 2
- 4 Fixed stage plate 185 x 270 mm
- 5 Specimen guide MT (47 12 26) to screen micro test and microtiter plates; travelling range 78 x 105 mm
- 6 Scale stickers for specimen guide MT
- 7 Mounting frame for microtiter or micro test plates
- 8 Ph objectives screwed into nosepiece
- 9 Controls for specimen movement in the Y-direction (forward-backward) and the X-direction (left-right).



¹⁾ The 6- or 10-digit numbers in brackets are ordering numbers; they are sometimes imprinted on assembly groups or items.

3



Take stand out of transport case and put it on a worktable. With supplied screwdriver loosen two socket head screws 2.5 mm (4.2, meaning Fig. 4, item 2) of stand, pull out stand column (4.1) until it is about 20 cm above the stage plate, and tighten socket head screws again. Hold lamp socket on black knurled ring, turn it out as far as it will go, and pull it out of illuminator 10 (5.4). Loosen lamp carrier (6.1) from column with knurled screw (6.2) and pull it off upwards, thereby threading lamp socket downwards through this fixture.

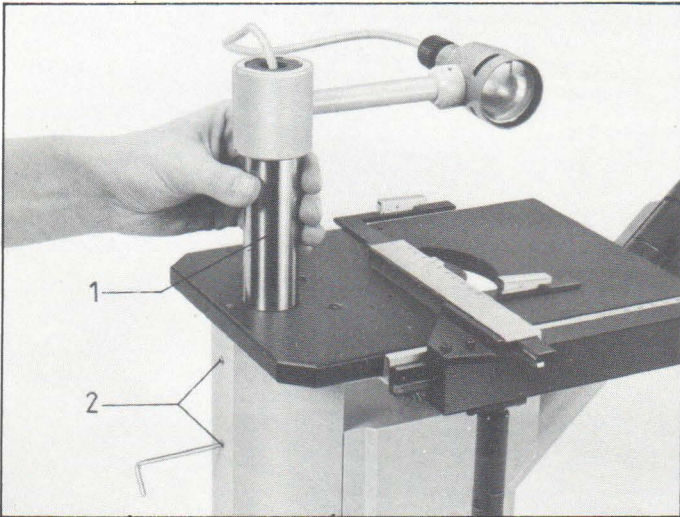
Slip fixture (6.5) with pin (6.4) upwards over the lamp socket and mount it on the column.

Thread lamp carrier again over lamp socket, slide it on the column to fixture (6.5) and secure it. The notch (6.3) of the carrier must be opposite the pin (6.4) of the fixture.

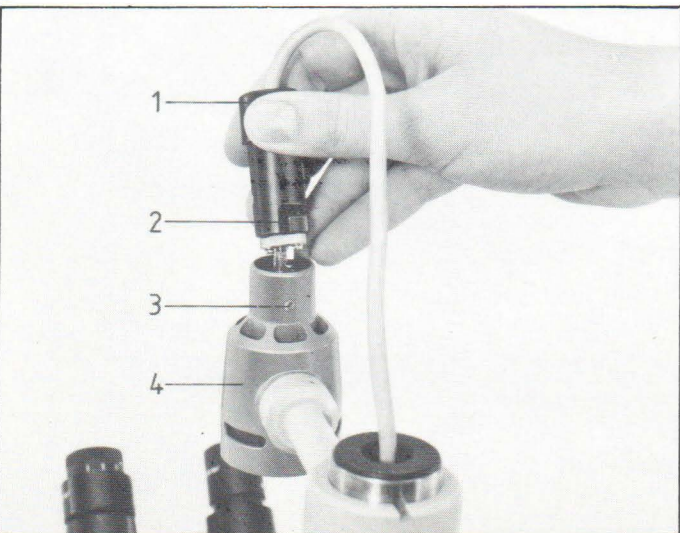
Plug lamp socket with halogen lamp into lamp housing so that pin (5.3) engages notch (5.2). Align illuminator axially ca. 40 mm above the specimen.

Remove dummy plugs of eyepiece tubes and put in eyepieces. Remove dummy plug of nosepiece and screw a series of objectives into nosepiece in uniformly graded sequence, e.g. 3.2 – 10 – 25.

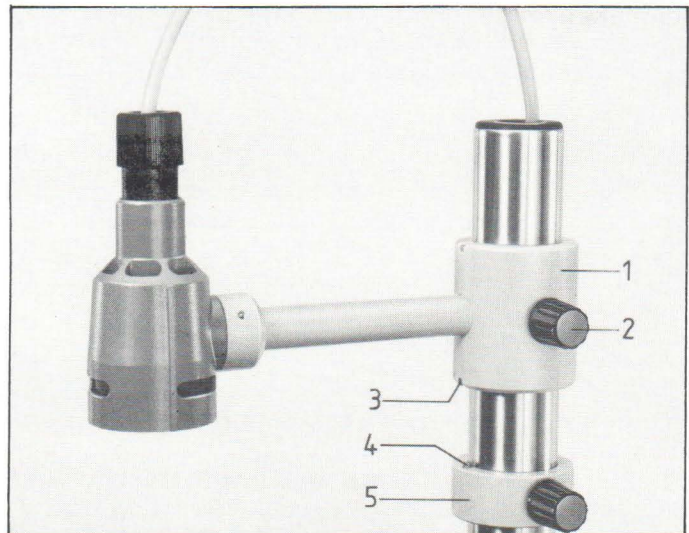
4



5



6



With switch (8.7) off connect microscope to the mains, then switch on halogen lamp with this switch.
Turn in an objective.

Place a specimen on the specimen stage:

With an invertoscope ID 02 with specimen guide MT slide mounting frame (7.4) for microtiter or micro test plates from the front beneath spring clips (7.2) until it snaps in. Unless not yet done, stick scales (7.1) in the recesses of the specimen guide, i.e. the scale with numbers (7.1) in the direction left-right, and the scale with letters (7.3) in the direction to-fro. The mounting frame remains fitted in the specimen guide when exchanging the specimen.

Adjust tubes (8.4) until you see a circular, sharply defined field of view with both eyepieces. Look through eyepiece (8.3) and focus on the specimen with control (8.6). Then focus for the other eye by turning the eyelens (8.2) of the eyepiece.

Illuminate the specimen:

Adjust brightness with control (8.7).

Adjust the size of the illuminated object field by vertical adjustment of the lamp with the lamp carrier, and adjust uniform illumination by turning the lamp socket (8.1) in the lamp housing.

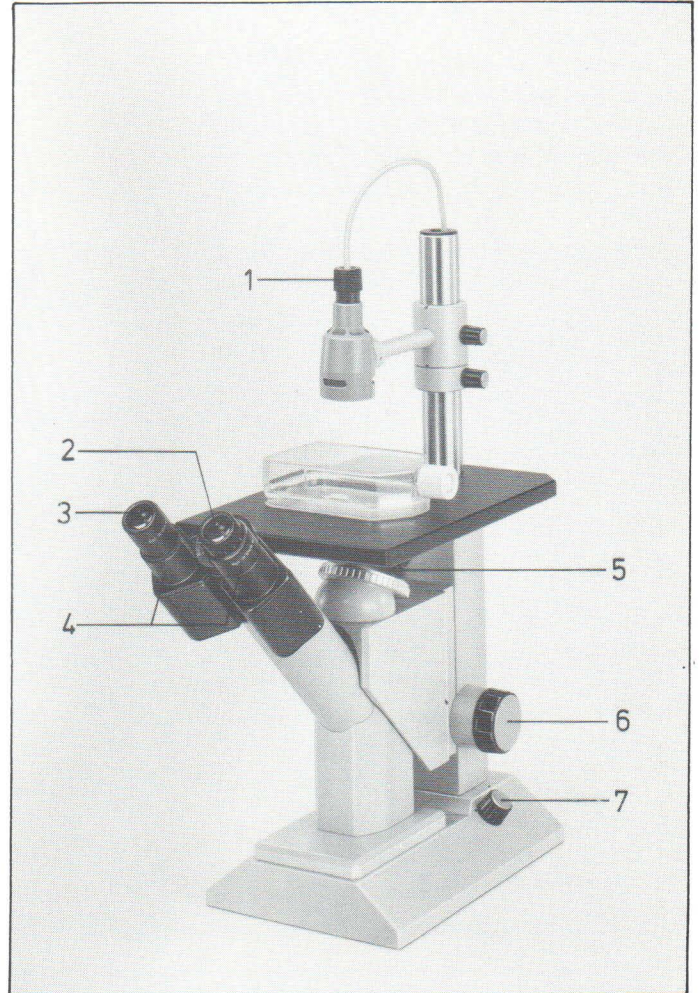
Microscope magnification

$$M_{\text{microscope}} = M_{\text{objective}} \times M_{\text{eyepiece}}, \text{ e.g. } 200 = 20 \times 10$$

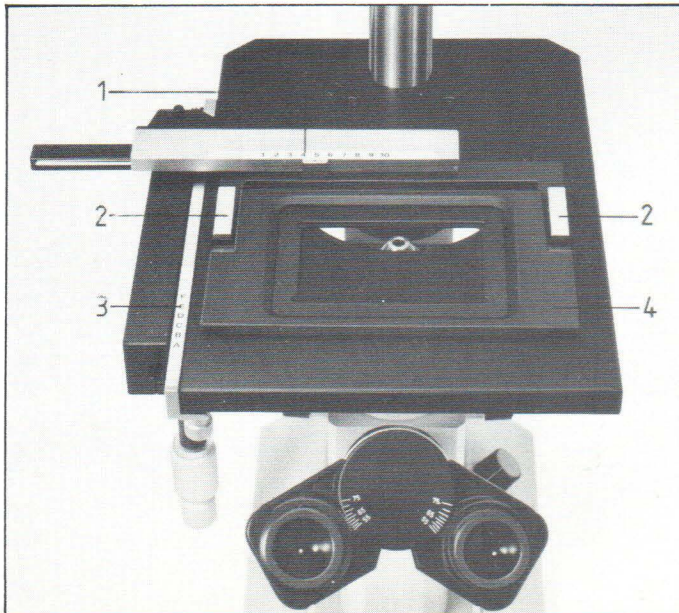
where $M_{\text{objective}}$ = objective magnification, here 20,

and M_{eyepiece} = eyepiece magnification, here 10

8



7



9



Accessories required in addition for phase contrast:

Ph objectives

Centerable phase stop Ph 1 (47 12 37)

Centerable phase stop Ph 2 (47 12 38)

Stop and fixture (47 12 39) for Ph system

Centering telescope (46 48 22)

Screw Ph objectives into nosepiece.

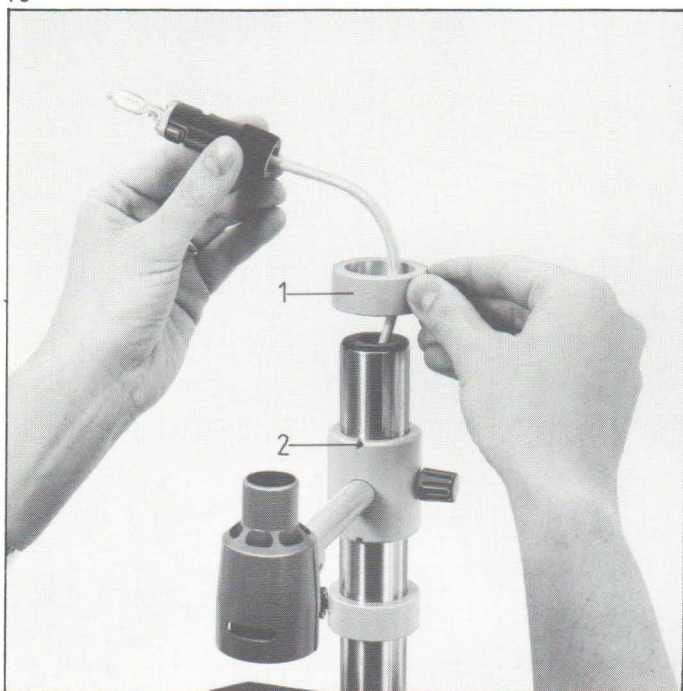
Hold lamp socket on black knurled ring, turn it out as far as it will go and pull it out of the lamp housing 10.

Slide fixture (10.1) with pin down the column as far as the lamp socket. Let pin engage notch (10.2) of lamp carrier. Introduce socket with lamp again into lamp housing.

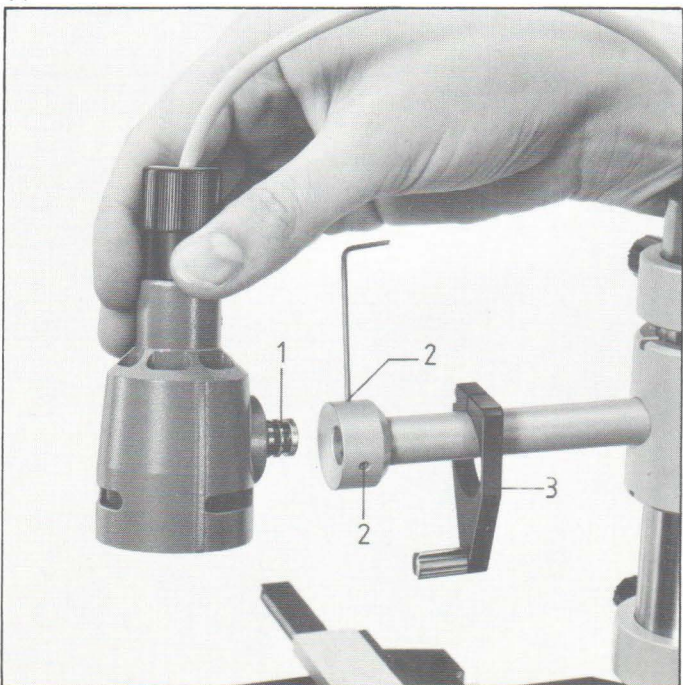
With supplied screwdriver loosen 3 socket head screws 1.5 mm (11.2) of lamp carrier, and pull lamp housing with bolt (11.1) off the lamp carrier. Slide stop (11.3) on lamp carrier as shown in Fig. 11. Secure lamp housing with 3 socket head screws. Align stop (12.2) at head of lamp carrier vertically and secure with socket head screw 2.5 mm (12.3).

Adjust stop so that the pin of the lamp housing engages notch (12.1) of the stop and the illuminator can still be turned.

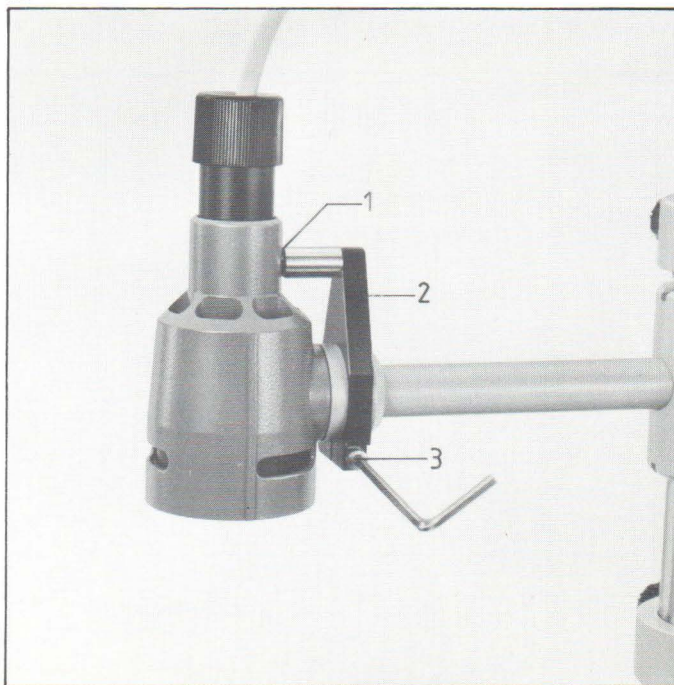
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11

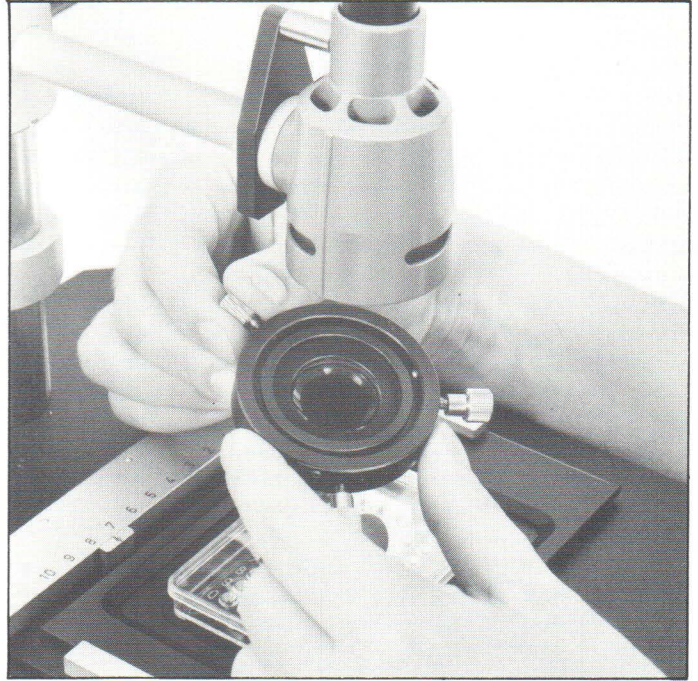


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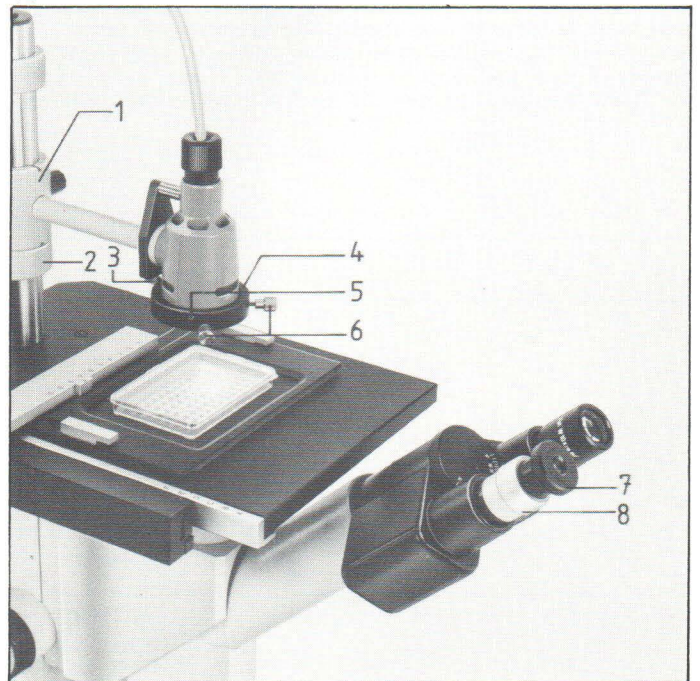


Mount phase stop Ph 1 or Ph 2 on lamp housing 10 from below (Fig. 13) so that the 2 centering screws (14.6) face the user. Secure phase stop with clamping screw (14.3). When working alternatively in brightfield and phase contrast, i.e. with or without phase stop Ph, it is sufficient to secure the stop with screw (14.3). When working only in phase contrast, secure the phase stop in addition with its two socket head screws (14.5) using the supplied screwdriver 1.5 mm.

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14



Use centerable phase stop Ph 1 for objectives Ph 1 and phase stop Ph 2 for objectives Ph 2.

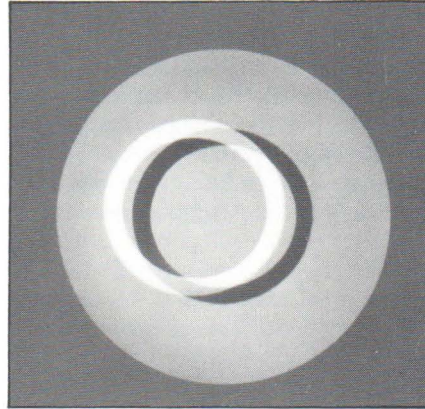
Adjust specimen as described for brightfield.

Adjust lamp carrier (14.1) above fixture (14.2) so that the free space between illumination system and stage surface is ca. 40 mm. Exchange one eyepiece in the binocular tube for the centering telescope (14.8), and adjust the eyepiece eyelens (14.7) until the dark ring is in focus. With the following adjustments bring the black and bright rings to symmetrical coincidence:

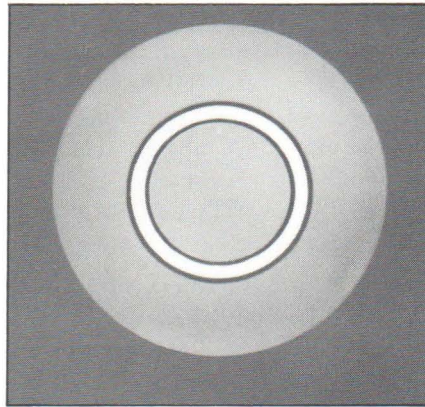
Vertically adjust lamp carrier (17.2) with illuminator so that the bright ring is in focus in the centering telescope (14.8) (Fig. 15). By turning the lamp carrier around the column move the bright Ph ring until it lies inside the black Ph ring (Fig. 16). Clamp in this position and secure with fixture from below. Center precisely with screws (17.3) (Fig. 16). After adjustment of phase rings exchange the centering telescope for the eyepiece and observe the Ph image through the binocular tube.

Phase stop Ph 2 can be used in addition for objectives Ph 1 if the free space between illumination system and stage surface is enlarged to ca. 80 mm by using fixture (17.1) as upper stop of the lamp carrier. The phase stops are centered as described above. In working condition the two fixtures are vertically and laterally aligned so that when fixing the lamp carrier at the upper fixture stop Ph 2 is centered with respect to objectives Ph 1 and at the lower fixture stop Ph 2 is centered with respect to objectives Ph 2. The use of phase stop Ph 2 for objectives Ph 1 is recommended only for bright specimens, because the light is attenuated by the large distance.

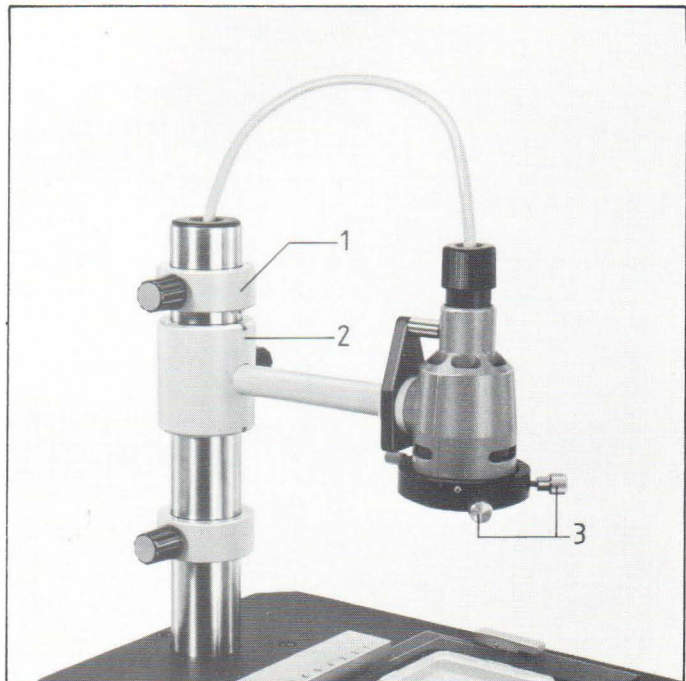
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16



17



We offer a number of special objectives with long working distances, besides Achromat objectives

- F-Achromat flatfield objectives
- Planachromat perfect flatfield objectives, also for phase contrast
- Neofluar top-of-the-line fluorite objectives for high-contrast images

Make sure that with all objectives on the nosepiece the parfocal length is 2.5 mm above the stage plane in air. When objectives are exchanged this plane will always be in focus, i.e. if you focus on this plane with an objective, the focus is maintained when you exchange the objective.

| Objective | Magnification/ Aperture | Working distance mm | Cat. No. |
|--------------|----------------------------|------------------------|---------------|
| Planachromat | 2.5/0.08 | 8.9 | 46 01 10-9906 |
| F-Achromat | 2.5/0.08 | 8.9 | 46 01 05 |
| Achromat | 3.2/0.07 | 23.2 | 46 01 00-9903 |
| Planachromat | 6.3/0.16 | 4.9 | 46 03 10 |
| Achromat | 10/0.22 | 5.0 | 46 04 00-9903 |
| Achromat | 10/0.22 Ph 1 | 5.0 | 46 04 01-9904 |
| F-Achromat | 10/0.25 | 6.8 | 46 04 05 |
| F-Achromat | 10/0.25 Ph 1 | 6.8 | 46 04 06 |
| Planachromat | 10/0.22 | 4.8 | 46 04 10 |
| Neofluar | 10/0.30 | 4.8 | 46 04 20 |
| Planachromat | 16/0.35 | 2.8 | 46 05 10 |
| Planachromat | 16/0.35 Ph 2 | 2.8 | 46 05 11 |
| LD-Epiplan | 16/0.30 Pol | 4.1 | 46 21 23 |
| LD-Achromat | 20/0.25 | 2.0 | 46 06 05 |
| LD-Achromat | 20/0.25 Ph 1 | 2.0 | 46 06 06 |
| Planachromat | 25/0.45 | 1.4 | 46 06 10 |

Eyepieces

CPL compensating flatfield eyepieces, highly corrected, for sophisticated work.

| Magnification/ Field-of-view number | Angular field | Cat. No. |
|---|---------------|----------|
| CPL 10x/18 Br ¹⁾ | 42° | 46 40 22 |
| CPL 10x/18 Br ¹⁾ foc ²⁾ | 42° | 46 40 23 |
| CPL 12.5x/12.5 Br ¹⁾ | 36° | 46 41 20 |

¹⁾ High-eyepoint eyepiece for eyeglass wearers. Users who do not wear eyeglasses use the fold-down rubber cups.

²⁾ Focusing eyepiece

Kpl compensating flatfield eyepieces, optimally corrected, for most exacting demands.

| Magnification/ Field-of-view number | Angular field | Cat. No. |
|---|---------------|----------|
| Kpl 10x/18 Br ¹⁾ | 41° | 46 40 42 |
| Kpl 10x/18 Br ¹⁾ foc ²⁾ | 41° | 46 40 43 |
| Kpl 12.5x/18 Br ¹⁾ | 48° | 46 41 42 |
| Kpl 12.5x/18 Br ¹⁾ foc ²⁾ | 48° | 46 41 43 |
| Kpl 16x/16 | 55° | 46 42 44 |

Fixed stage plate 185 x 270 mm (1.5)

included in basic equipment of ID 02.

2 clamps for bottles (47 12 35).

They are slid onto the stage plate from the front edge of the stage and secured with clamping screws (19.3) at both sides.

The stage plate can be subsequently equipped with specimen guide MT (47 12 26) (2.5):

Attach specimen guide (18.1) to left edge of stage and fix it with 3 knurled screws (18.2). (Invertoscope ID 02 MT is series-produced with his stage and attached specimen guide).

To screen micro test or microtiter plates the following items are required in addition:

Mounting frame (47 12 27) including scale stickers for 96-position microtiter plates or mounting frame (47 12 28) with scale stickers (Fig. 7) for 60- or 72-position micro test plates.

Large stage plate 300 x 270 mm (19.1)

must be subsequently mounted.

Take lamp socket out of illuminator.

Detach lamp carrier and fixture from column

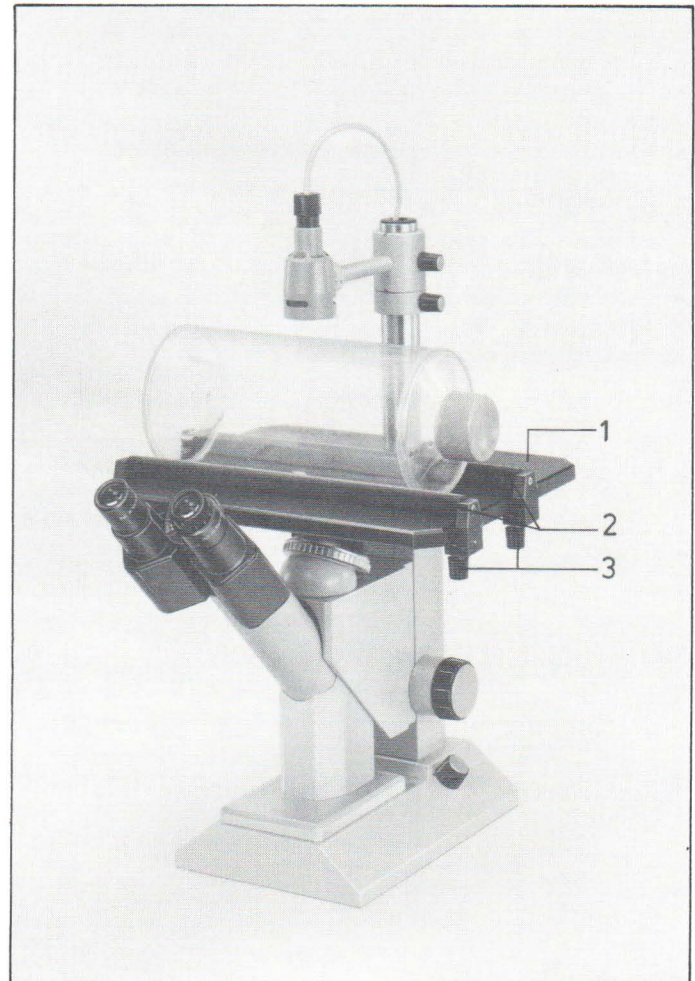
Loosen 3 socket head screws 3 mm (20.1) and pull stage off upwards. Mount large stage plate by proceeding in the reverse sequence.

Accessories:

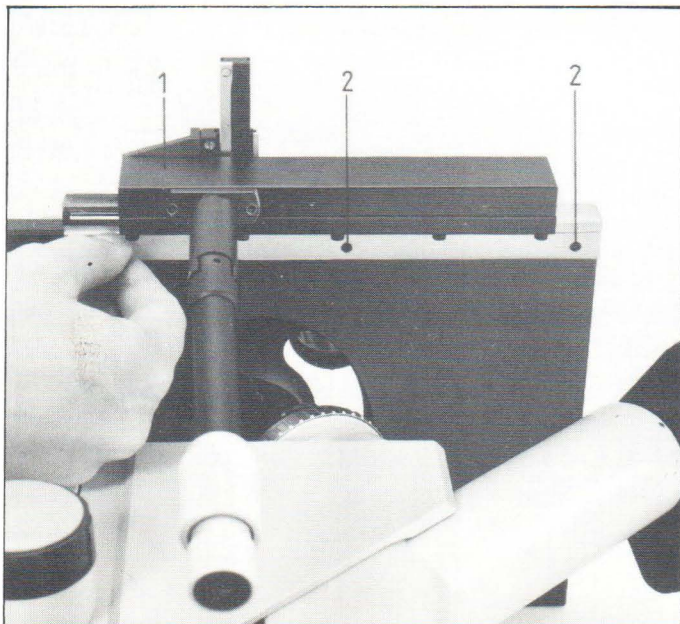
2 clamps (47 12 36) (19.2) for bottles.

They are slid onto the stage plate from the front edge of the stage and secured with clamping screws (19.3) at both sides.

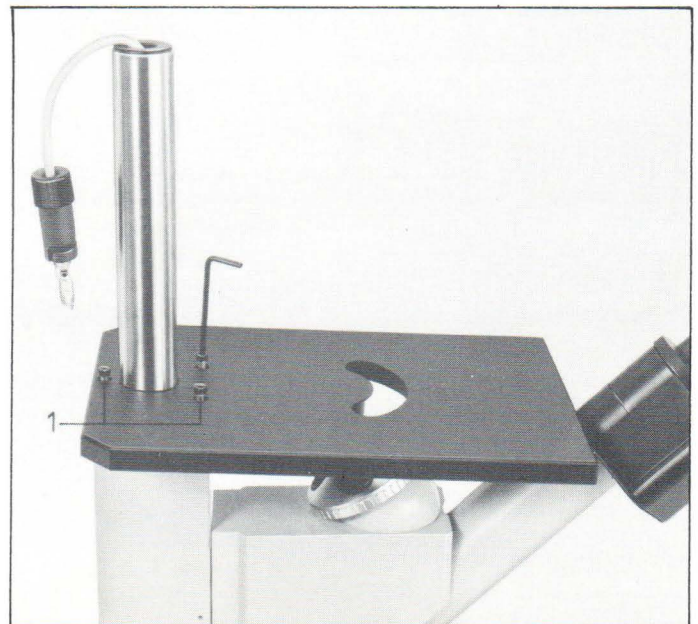
19



18



20



Hold lamp socket on black knurled ring, turn it out as far as it will go and pull it out of illuminator 10.
Pull out halogen lamp 6 V 10 W (21.2).
Hold new lamp on protective cap with which it is supplied and plug it into lamp socket (21.1). Wipe off fingerprints on the bulb.
Introduce socket with lamp into lamp housing so that the pin engages the notch.

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