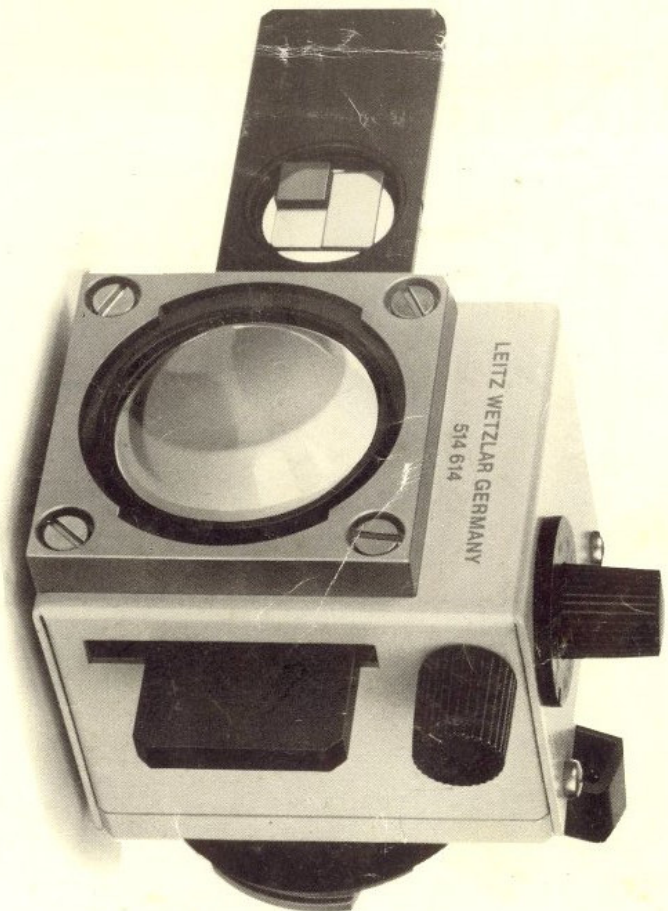


LEITZ VARIOLUM

Instructions



1. Introduction

The illuminating attachment serves for the change of the lighting intensity, the colour characteristics, and the colour temperature. These three parameters are important in microscopy and especially in photomicrography. In addition, the illuminating attachment ensures a particularly even illumination of the image field even when the light source is off-centre.

1.1 Lighting intensity

The lighting intensity can be reduced continuously and reproducibly with purely optical means without effecting the colour temperature. Intensity adjustment through the lamp current, which at the same time changes the colour temperature, is not necessary.

1.2 Colour temperature

The required colour temperature can be set reproducibly on the illuminating attachment independently of the lamp current.

1.3 Colour contrasting

Favourable colour contrast between object and surrounding field can be set through a continuously changeable colour mixture in the entire region of the visible spectrum.

Because of these properties the illuminating attachment is eminently suitable for

photomicrography,
black-and-white and especially colour television microscopy,
quantitative (TV-based) image analysis of microscopic objects.

For photomicrography and television microscopy the main functions are "optical intensity control with unchanged colour temperature" or "optical colour temperature control without readjustment of the power unit (transformer)."

The extremely even illumination of the image field that can be obtained with the illuminating attachment is highly important both in automatic image analysis and in modification of the television picture in the sense of "image enhancement".

The intensity of the light source can be set at a level suitable for visual observation, and, where applicable, for exposure times still within the range of control even when the required colour temperature is high.

2. Description of function



The nucleus of the illuminating attachment is a curved light conductor (1.1)*. The curvature of the radius chosen here has the effect of eliminating irregularities in the spatial light distribution through the utilised emission range of the light source through the multiple total reflection affecting all rays entering the light conductor.

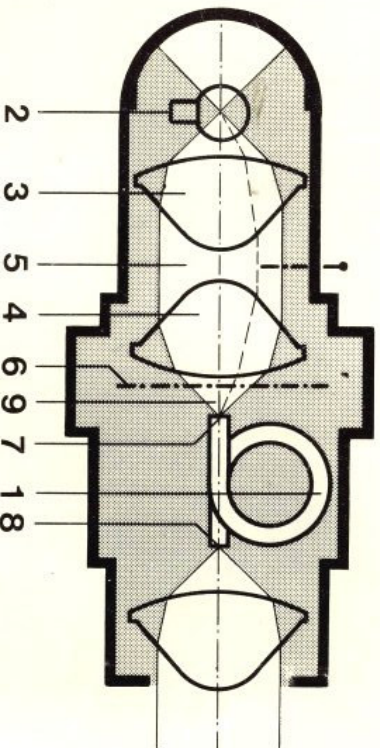
This means that at the exit face (1.8) of the light conductor even illumination will be found, which is completely independent of the spatial intensity distribution at the entry face (1.7). This permits the insertion of diaphragms or filters (1.6) anywhere in the primary optical path in front of the entry face of the light conduc-

tor, which, depending on the proportion of the blocked or affected light bundle, cause a variable attenuation of the light or change of the colour temperature or of the colour mixture across the entire cross section.

An image is formed of the light source (1.2) by the lenses (1.3 and 1.4) on the entry face (1.7) of the light conductor (1.1). The diaphragm or filter slide is in the convergent beam (1.9) and can be moved in the x- and y-axes. It can be set reproducibly with a knurled knob with scale.

* (1.1) = Fig. 1, Part No. 1

Fig. 1: Diagram



3. Operating the illuminating attachment

Careful centration of the lamp is required for even illumination and maximum light utilisation. This must be done before the illuminating attachment is mounted between the lamp housing and the stand. If the lamp is off-centre, this will become apparent only in a loss of intensity when the illuminating attachment is arranged between the lamp housing and the microscope, but no longer by uneven illumination. After centration turn the knob for lamp condenser adjustment on the lamp housing fully to the right (clockwise). Detach the lamp housing from the stand. Fix the illuminating attachment to the stand and the lamp housing to the illuminating attachment, both with bayonet fittings.

3.1 Inserting the filter slide

The grooves (2.2) for engaging the slide must be directed upwards and the side without filters must be on the left. The slide is inserted in the filter slot from the side.

The top edge of the filter slide (2.3) functions as the setting index for the line markings (2.1) on the side of housing.

Adjust the horizontal knurled knob (3.1) so that the outer rim of the star wheel attached to the vertical knob (3.2) is flush with the edge of the housing below.

3.2 Setting the brightness values

Push the scale ring H-D onto the vertical knurled knob (3.2). The lateral recess must engage in the cam of the star wheel.

Move the filter slide into the left-hand engaged position (push it to the right). For setting the brightness values the adjustment range is below the line marking (2.1) on the filter slot.

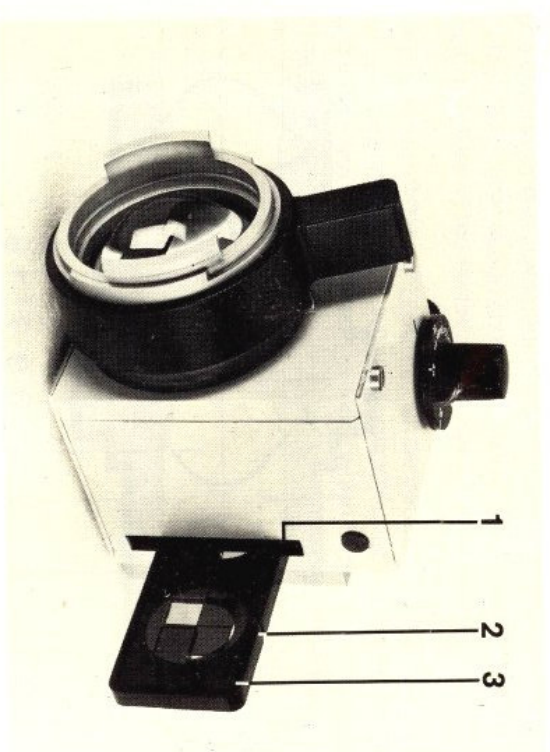


Fig. 2: Illuminating attachment



The highest brightness step is obtained when the filter slide is set at the upper part of the adjustment range in combination with the scale ring setting 1x. The scale values 2x, 4x etc. that can be set by an anticlockwise turn of the vertical knurled knob (3.2) indicate the attenuation factor of the brightness step determined under 1x. Observe the yellow marking, which indicates that the values between 1x and 2x (4, 8, 16, 32, 64x) will be valid during anticlockwise rotation only beyond the "2x" setting mark.

3.3 Setting the colour temperature

Several scale rings are available for the reproducible setting of the colour temperature as a function of the lamp voltage (12V 100W tungsten-halogen lamp). The figures printed transversely on these rings indicate the colour temperature values in ° Kelvin that can be set.

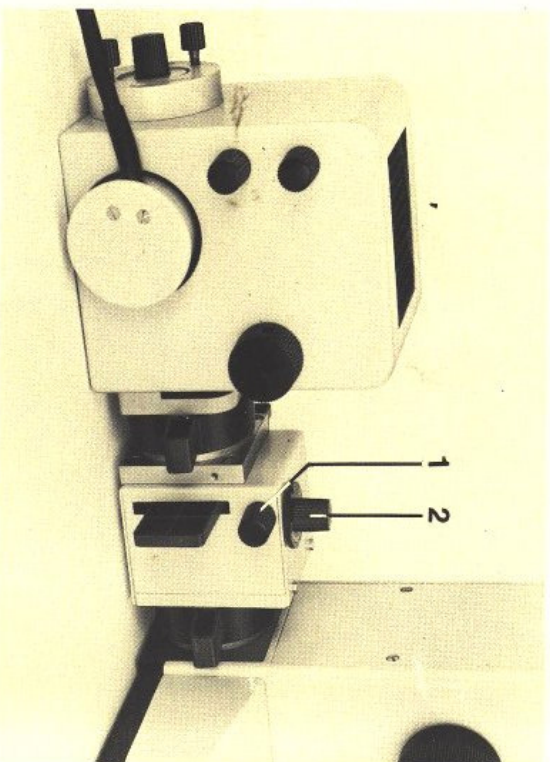
Push the required scale ring onto the vertical knurled knob (3.2). The lateral recess must engage in the cam of the star wheel.

Move the filter slide into the central engaged position. Set the highest voltage value indicated on the scale disc so that the upper edge of the filter slide is below the lateral adjustment mark. Now turn the setting scale anticlockwise, to set the value read on the voltmeter of the lamp supply unit.

It should be ensured that the upper edge of the filter slide is always below the line marking when setting the highest voltage.

Because the colour temperature is influenced by the entire optical equipment (condenser, objective, beam splitter etc.) the device must be calibrated for exposures at the correct colour temperature by means of a trial film or with the aid of a colour temperature meter.

Fig. 3: DIALUX 22 with illuminating attachment



4. Suitable microscopes

3.4 Colour mixture

Move the filter slide into the right-hand engaged position (pull the slide to the left).

Set the required hue by rotating the two knurled knobs (3.1, 3.2). The setting corresponds to the subjective colour impression.

The illuminating attachment is designed for all microscopes with separate lamp housing and bayonet changer. It is available in two versions, one with bayonet changer for the DIALUX[®] 22, ORTHOLUX[®] 2, DIAVERT[®], and the second version for the ORTHOPLAN[®] and its corresponding POL and metallo variants and for the special versions LABORLUX[®] 12 ME and HL, METALUX[®], METALLOPLAN[®], EPVERT[®], MM6, ERGOLUX[®], SM-LUX HL, METALLOPLAN-HL 6 x 6, LABORLUX 11-POL incident light, LABORLUX 12-POL, ORTHOLUX 2-POL BK, ORTHOPLAN POL, microscopes in conjunction with the comparison bridge, and comparison macroscopes (bench and floor stands). The illuminating attachment can also be used with discharge lamps, where it offers the unique possibility of intensity control.

5. Outfit



The filter slide of the illuminating attachment is available in two versions,

- a) for the intensity regulation and as a conversion filter for colour control.
- b) with additional colour filter for contrasting.



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