

# **Vickers**

## **M15c microscope**

**VICKERS LTD. VICKERS INSTRUMENTS**

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## **M15c microscope**

The M15c microscope has been developed from the Vickers performance proven M15 microscope range, being both a student microscope in its simpler form, and a laboratory instrument with research capabilities when fitted with more sophisticated accessories.

### **STURDY RESEARCH STAND**

Excellent stand rigidity has been obtained by the use of a large box base fitted with ball-bearing stage focusing slides of unusual width and length, positioned close to the optical axis.

### **UNEXCELLED OPTICAL PERFORMANCE**

A wide range of flat-field microplan objectives are available together with fluorite and achromat systems, which when combined with phase contrast facilities and a magnification changer, provide an optical capability and versatility beyond that normally offered with most other microscope stands.

### **SUPERIOR EASE OF OPERATION**

All the controls, which are kept to an absolute minimum, are placed conveniently to hand. The provision of pendant traverse controls, built in illumination adjustment, and arm-rests allows for even greater comfort.

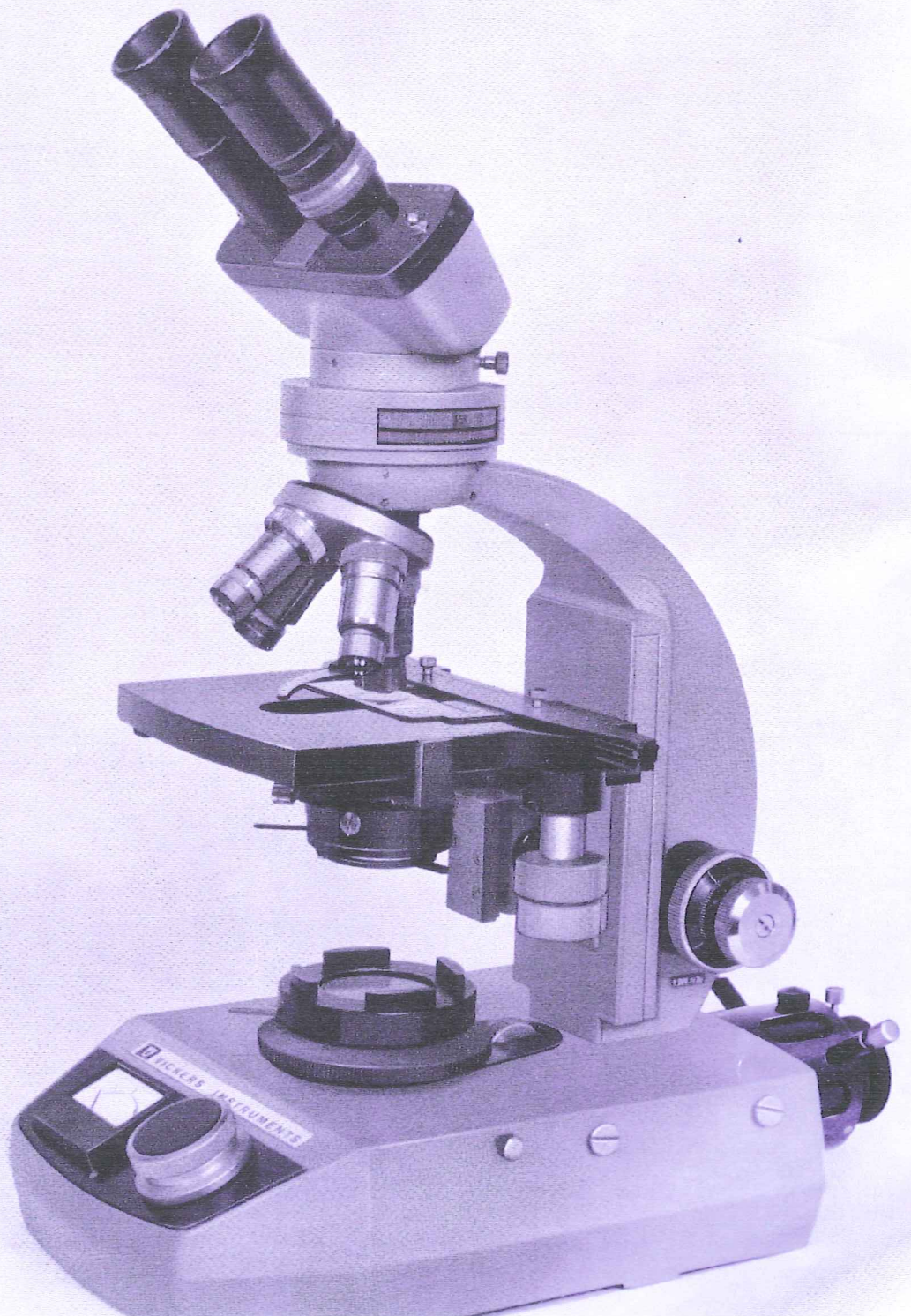
### **THE M15c CAN GROW WITH YOUR NEEDS**

The construction of the M15c allows many additional accessories to be added as and when required. Projection facilities, camera equipment, ultra-violet and blue-light fluorescence accessories expand the instrument to cover almost all normal research requirements.



### **M15c MICROSCOPE WITH WIDE FIELD ILLUMINATION BASE**

The M15c microscope (M151287) with the wide field 6 volt 30 watt illumination base is the ideal choice for the routine or research laboratory. The 6 volt 30 watt lamp provides sufficient high intensity illumination for photographic purposes and for use with the projection head under most circumstances. The illumination is suited to high or low power conditions when used with the achromatic condenser M151990 by the operation of a single control. The aperture of an oil immersion objective may be fully filled and the field of a low power objective fully covered without change of condenser or top lens. A substage auxiliary lens further widens the field to cover a  $3\times$  objective.





### STAGES

The stand of the M15c is available either fitted with a pendant control square mechanical stage for routine and research use, or with a plain stage for use as a student microscope.

The square mechanical stage provided with cross verniers has a very large working surface and is supplied fitted for right-handed use. The stage verniers have a cross movement of  $50 \times 75$  mm., the slide carrier itself being removable.

### MAGNIFICATION CHANGER

Both the student and research versions of the M15c can be fitted with a magnification changer. The changer drum contains three lens systems with magnification factors of  $1\times$ ,  $1.5\times$  and  $2.25\times$ , each of which can be rotated into the optical path affording a ready range of magnification without need of eyepiece or objective change. A final position contains a focusable Bertrand lens for examining the back focal plane of the objective when setting up phase contrast and for critical bright field work.

### EYEPIECES

Huygens eyepieces are suitable for use with the low-power achromats and compensating eyepieces are to be used with the high-power objectives. The complan eyepieces which render a flat-field and long eye clearance achieve particularly useful results with the microplan objectives.

### OBJECTIVES

A wide range of objectives are available catering for the needs of simple student microscopes and for the more sophisticated requirements of high grade research work.

Four basic objective types are offered:

The achromats—being simply corrected objectives for student and routine work. The microplans—objectives with achromatic correction but with edge to edge flatness of field without refocusing. The fluorites—these are systems with somewhat better colour correction and enhanced apertures. The apochromats—which are objectives with maximum aperture and colour correction, should be employed when optimum performance is required. Many of the objectives are also available for phase contrast work, a full range of both positive and negative objectives being offered.



Large mechanical stage



M220130 Magnification changer

## CONDENSERS

A number of condensers are offered covering the wide range of available objectives. All condensers listed are suitable for use with the M152330 low voltage illuminator.

The Abbe condenser M150715 is adequate for most students' work.

High-power work calls for the swing-out top lens condenser in either a plain mount M150430 or centring mount M220450. The top lens is swung out for low-power work.

The achromatic condenser is designed for full utilization of the capabilities of the M151287 wide field illumination base. Full low power field coverage and high power aperture filling are achieved without the use of interchangeable or swing-out top lens systems. Further field coverage down to  $3\times$  power objectives is provided for by the use of an auxiliary lens in a swing-in substage mount.

The dark ground oil immersion condenser M151970 is suitable for medium and high power application. Oil immersion objectives should be fitted with iris diaphragms.

## STANDARD RESEARCH PHASE CONTRAST UNIT

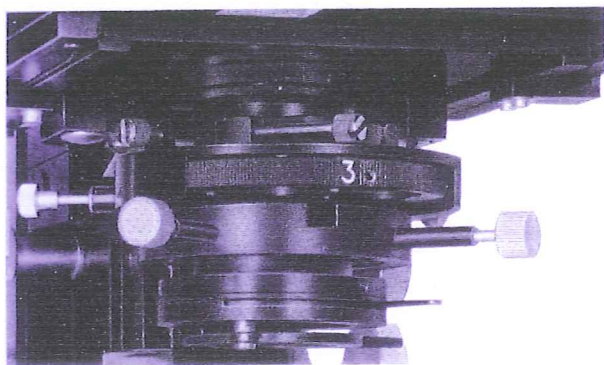
The unit, M410975, may be used with both negative and positive phase objectives. Three revolver mounted phase annuli cover the full range of phase contrast objectives. A fourth position is intended for bright field work with the condenser aperture iris. A final free aperture is reserved for further accessories. The annuli are centred to the objective rings by operating a pair of captive sprung pins which retract from the annuli mounts after centration. All the rings may thus be accurately centred and cannot then be disturbed by inadvertent operation of the pins.

The unit, M152345 has an extremely long working distance of 15 mm making it very suitable for use with haemocytometer cells counting chambers, etc. The unit operates with  $10\times$  and  $20\times$  phase contrast objectives. Construction is identical to M410975.

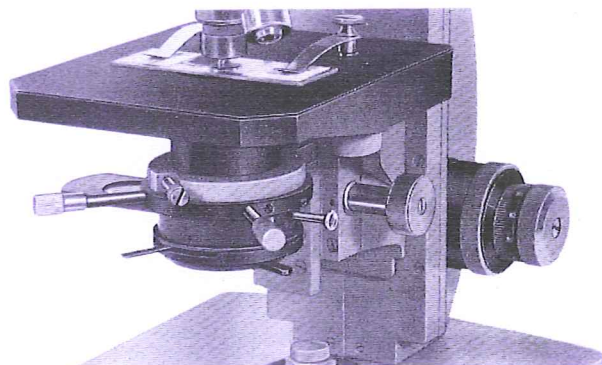
## STUDENT PHASE CONTRAST UNITS

Two condenser units are available. M151650 is provided with a three annulus slider matched for  $10\times$ ,  $40\times$  and  $100\times$  objectives. The slider can be removed for bright field work.

M151660 has a two annulus slider fitted with annuli for  $10\times$  and  $40\times$  objectives. A further clear aperture is provided for bright field work.



Research phase contrast unit



Student phase contrast unit



## INTERCHANGEABLE VIEWING HEADS

A wide range of interchangeable heads are available to suit almost all possible applications.

**M150325** is an inclined monocular head—intended for student work or where increased image intensity is required.

**M150215** is an inclined binocular head—for use on advanced student or research outfits.

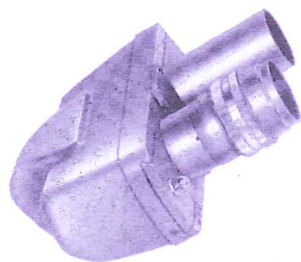
**M220570** is an inclined binocular head fitted with high efficiency prisms and twin focusing eyetubes—to be recommended for fluorescence applications.

**M150870** is a straight monocular head—to be used with photographic attachments or the 6" viewing screen.

**M150855** is a photo-visual trip mirror unit—to be used in conjunction with the straight monocular head and either the inclined monocular head or inclined binocular head. A trip mirror sends all the light either to the straight tube or the inclined tube. The unit has a magnification factor of  $1.6\times$ .

**M150815** is a reflector unit with a beam splitter allowing half the light to the viewing head and half to the camera. The unit has a magnification factor of  $1.6\times$ . The unit is used in conjunction with the straight monocular head and either the monocular or binocular head.

**M152370** is a binocular photo-visual head fitted with a trip mirror enabling all the light to be sent either to the straight tube for photography or all to the binocular tube for visual use. The unit has a magnification factor of  $1.3\times$ .



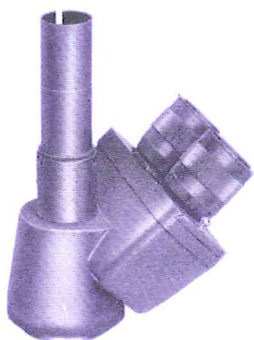
M150215



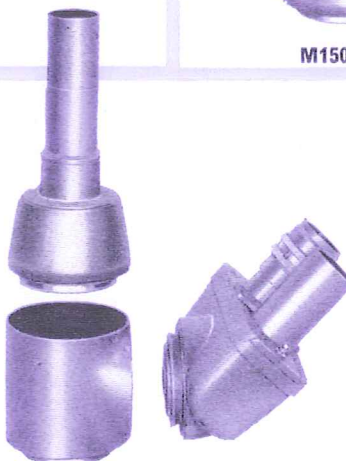
M150870



M150325



M152370



M150855 set up as photo-visual unit with M150870 and M150215



M150855 set up as projection unit with M150870 and M150215

## ILLUMINATION

The range of built-in illuminators covers the needs of student, routine and research applications.

**M151392** The mains illuminator is suitable for monocular student use.

The wide field 6 volt 30 watt illumination base with a rheostat, transformer and voltmeter housed within the base provides high intensity full field and full aperture illumination from the lowest to the highest power objectives.

**M152330** The centrabale 6 volt 18 watt illuminator allows accurate adjustment of the illuminating ray-path. This Köhler type illuminator incorporates a field iris and precise centration control. A rheostat and transformer are housed within the base. Non-centring condensers should be employed with this unit.

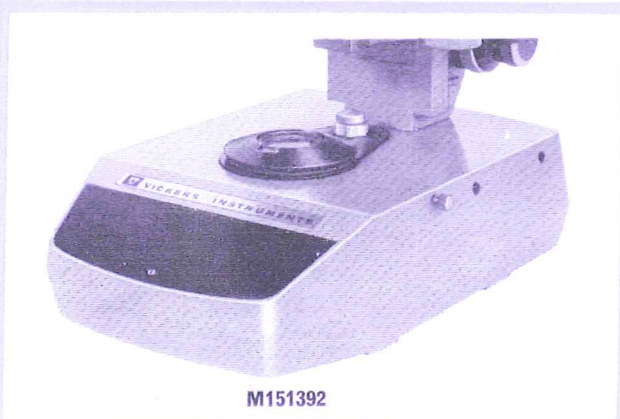
**M151391** The mirror in a gimbal is for use with any free-standing external illuminators.



M152330



M151391



M151392



Wide field illumination base



## HIGH INTENSITY ILLUMINATORS

If high intensity illumination is required for use with fluorescence techniques or with a projection screen there is a choice of two basic systems

### THE CAMERA BASE FOR HIGH INTENSITY ILLUMINATORS

The special camera base, designed to carry the standard range of Vickers attachment camera accessories, on a support arm, is fitted with a side mounted lamp bracket. To this lamp bracket may be attached lamp units containing either a 12 volt 100 watt tungsten halogen lamp or a 50 watt mercury vapour lamp.

The tungsten halogen lamp unit is fitted with lamp centring controls, a flip-in diffuser and a focusing lamp condenser.

The mercury vapour lamp unit is fitted with lamp centring controls, focusing lamp condenser and a concave back reflector.

Each unit is provided with a filter box containing a field iris and two quadruple filter revolvers. A set of filters for standard photographic procedures or a set of filters for fluorescence excitation should be ordered along with the unit.

If fluorescence is to be undertaken a capsule with three slider-mounted barrier filters is available. Alternatively, a pair of screw-in eyepiece barrier filters may be supplied.

#### Fluorescence filters for the tungsten halogen lamp, and mercury vapour lamp 50 watt

##### EXCITER FILTER SET

Disc 1	0. Clear 1. UG 12 2. BG 12 3. BG 12	2 mm thick* 1 mm thick 3 mm thick
Nearest Lamp		
Disc 2.	0. Clear 1. UG 2 2. BG 12 3. BG 12	2 mm thick 2 mm thick 3 mm thick

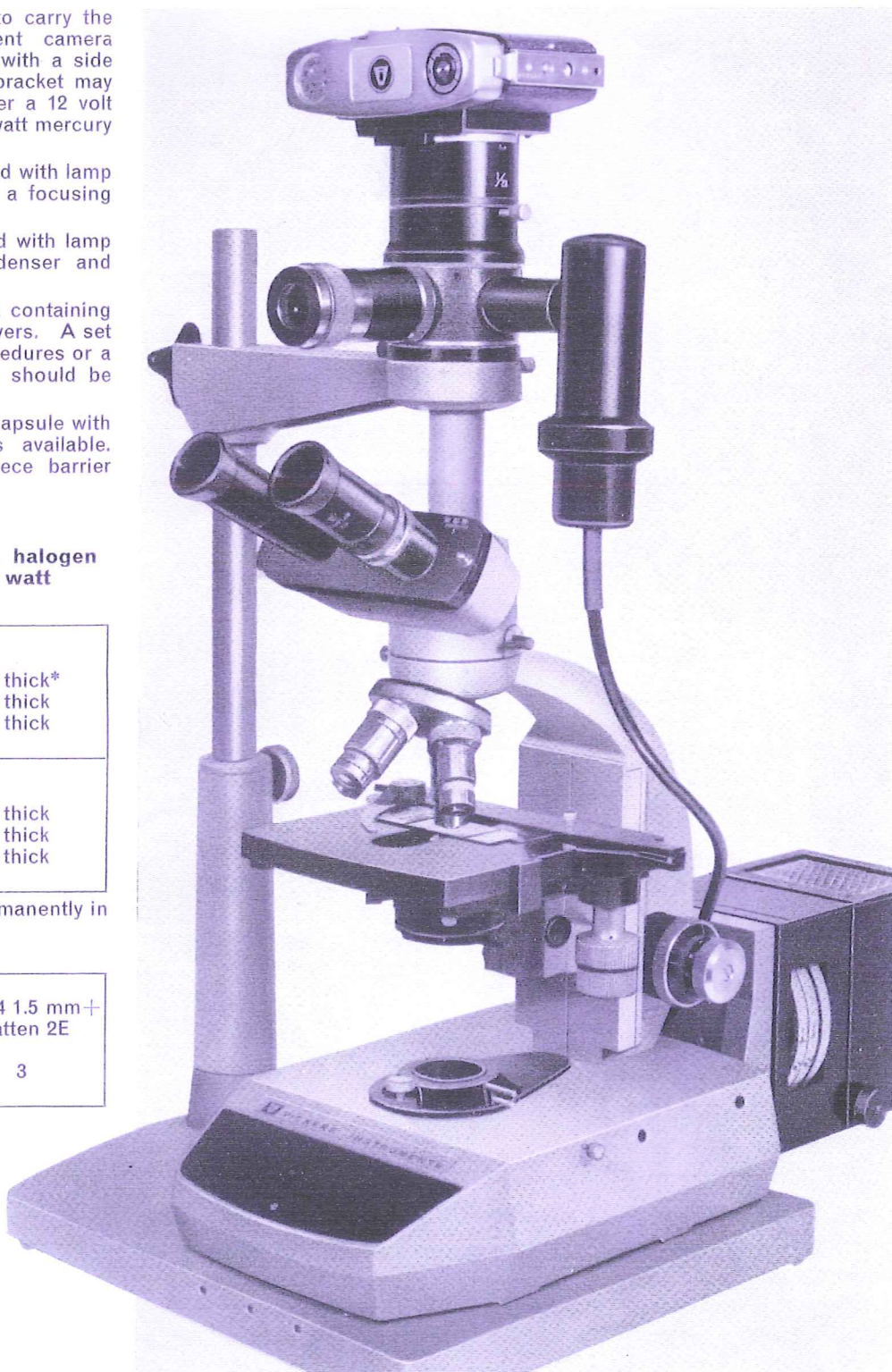
A red minus BG 38 filter is mounted permanently in place.

##### BARRIER FILTER SLIDE

OG515 1.5 mm + GG9 1.5 mm	OG530 1.5 mm + GG9 1.5 mm	GG4 1.5 mm + Wratten 2E
1	2	3

The 50 watt mercury vapour lamp employed with the Abbe condenser fully illuminates the field for fluorescence at objective powers from 10× to 100×.

\* Equivalent to 1mm UG 2.



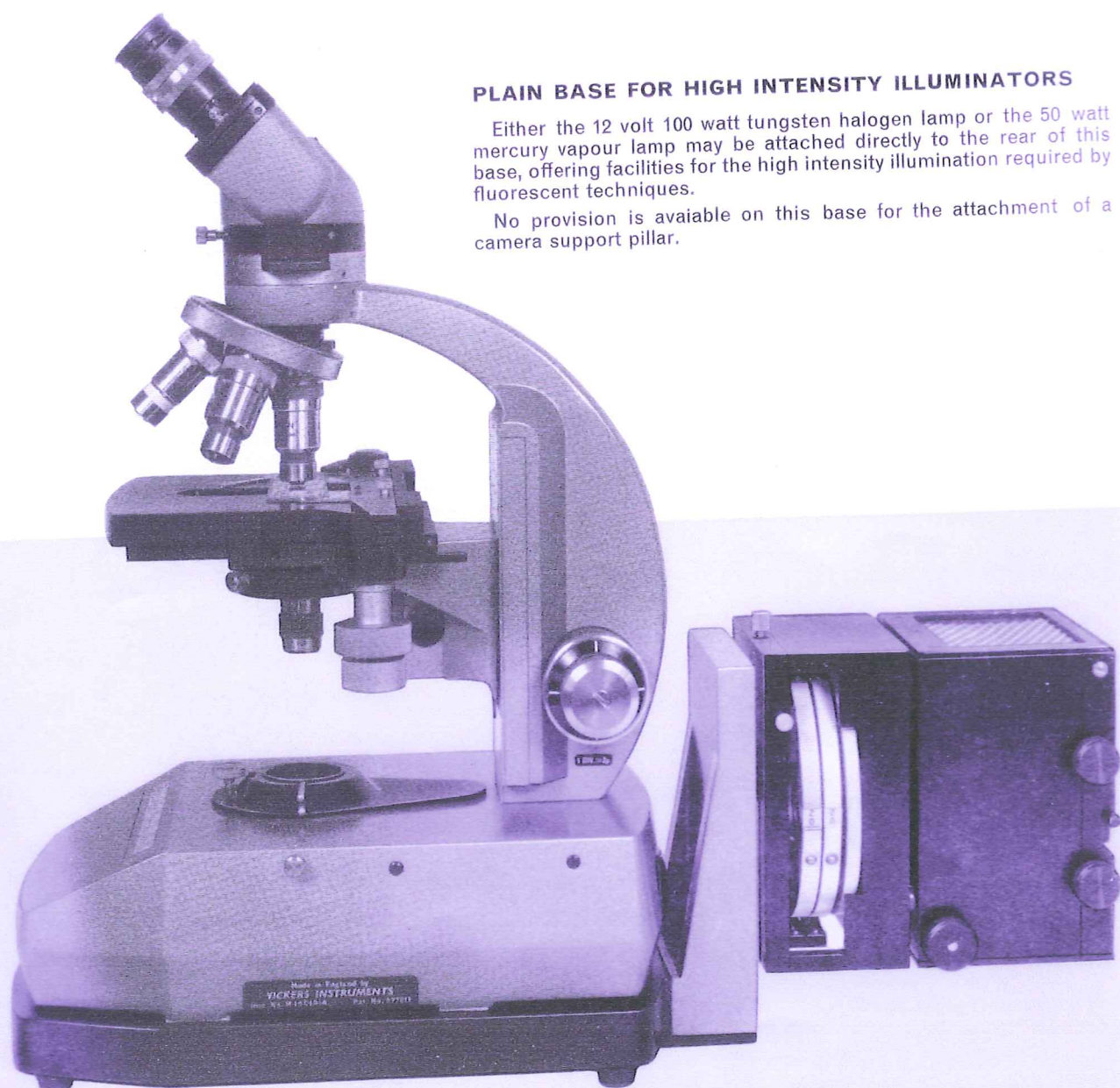




### PROJECTION HEAD

The 6" diameter micro-crystalline wax viewing screen may be fitted to the head of the instrument providing a swivelling, well-illuminated projection surface. For normal bright field applications sufficient illumination is available from the 6 volt 30 watt wide field illuminator when used in slightly subdued lighting conditions.

The tungsten halogen illuminator in either base is highly suitable for use with the projection head giving bright even illumination.



### PLAIN BASE FOR HIGH INTENSITY ILLUMINATORS

Either the 12 volt 100 watt tungsten halogen lamp or the 50 watt mercury vapour lamp may be attached directly to the rear of this base, offering facilities for the high intensity illumination required by fluorescent techniques.

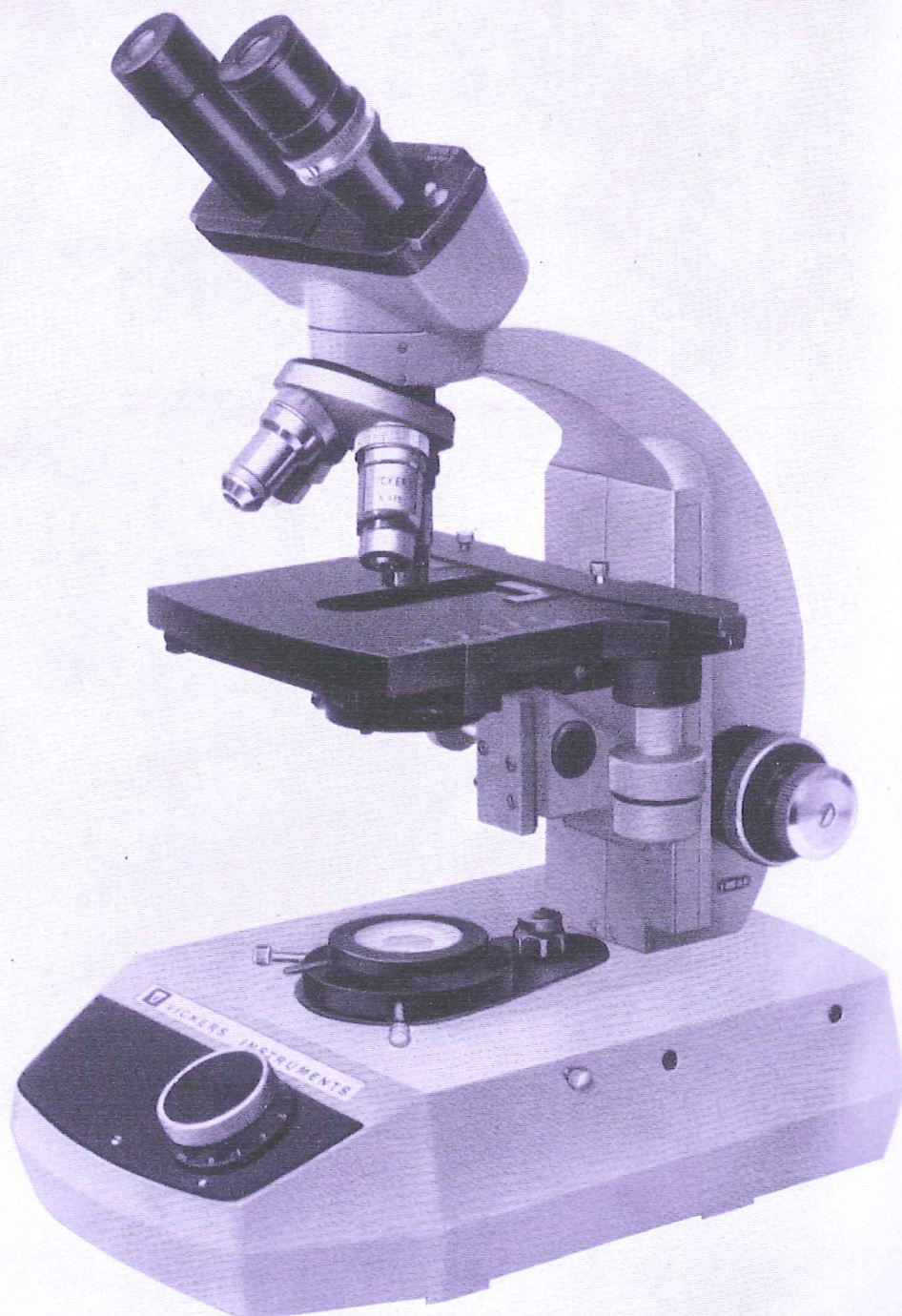
No provision is available on this base for the attachment of a camera support pillar.



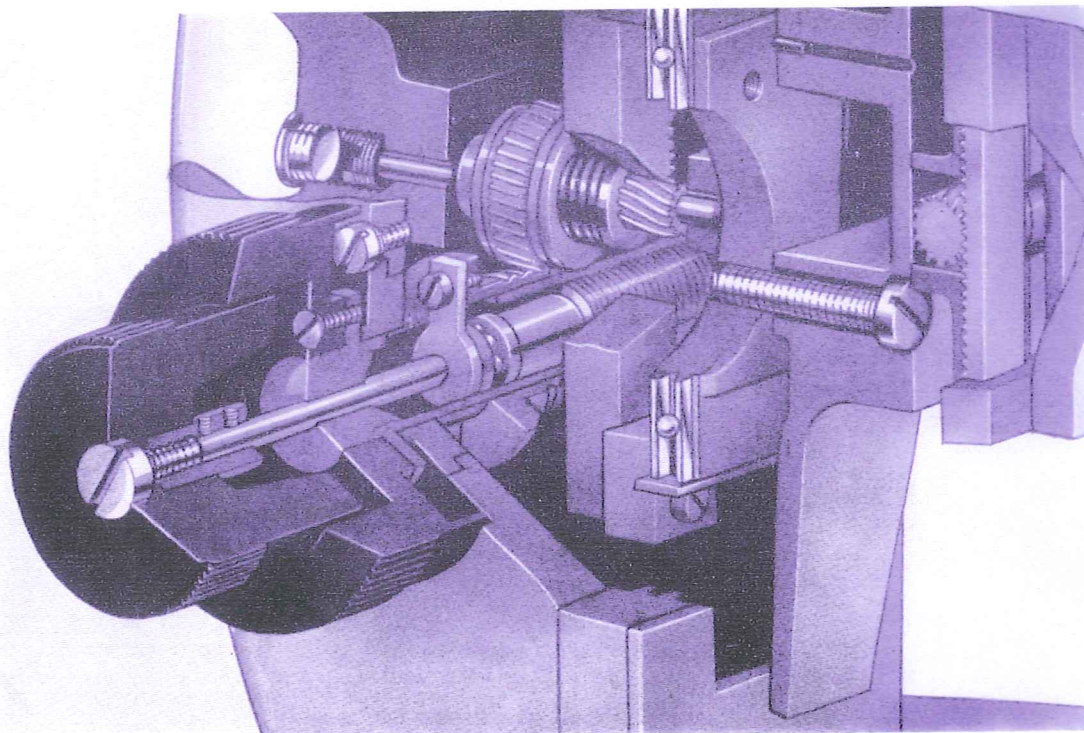
### **LOW VOLTAGE ILLUMINATOR WITH FIELD IRIS**

A new low cost 6 volt 18 watt illuminator (M152330) fitted with a field iris is now available for the M15c. The illuminator includes a rheostat and transformer housed within the instrument base. Full even field illumination is obtained for objectives from 5 $\times$  to 100 $\times$ .

The illuminator is available with a centring field iris, offering the user an inexpensive system of illumination which is both simple and precise in adjustment. Use of the non-centring swing-out top lens or the achromatic 1.25 N.A. condensers is advised.







# M15c MICROSCOPE TECHNICAL SPECIFICATIONS

<b>Optics</b>	Range of achromats, microplans with fluorites and apochromats. Full series of negative and positive phase contrast objectives. High eyepoint and standard eyepieces. T. Length 160 mm. Coverslip (where applicable) 0.18 mm.	<b>Focusing</b>	Direct coupled and sliding worm operated rack and pinion fitted with overrun clutch. Coarse movement 35 mm. Fine movement 1.9 mm graduated to 0.002 mm.
<b>Objective Changer</b>	Quadruple fixed.	<b>Substage</b>	Sleeve fitting 38 mmø rack and pinion 25 mm. range. Abbe, achromatic, aplanatic, phase and dark ground condensers. Condenser offered with screw centring.
<b>Viewing Heads</b>	Interchangeable on cone fitting. Monocular straight (photo), monocular inclined (45°), binocular inclined (45°). Monocular phototube, binocular phototube, binocular phototube with trip mirror.	<b>Illumination</b>	All centrabale. Mains 230 volt 25 watt. 6 volt 18 watt with built-in transformer and centrabale field iris. 6 volt 30 watt Köhler illuminator with built-in transformer and voltmeter. Mirror in gimbal. Base for tungsten halogen or 50 watt mercury vapour.
<b>Head Accessories</b>	Magnification changer 1×, 1.5×, 2.25× with Bertrand lens. Photo-visual trip mirror unit. Barrier filter unit.	<b>Accessories</b>	Full range of camera equipment including high sensitivity partial field photometer and automatic exposure unit. Microcrystalline wax viewing screen 6"ø. Fluorescence equipment. Simple polarizer and analyser.
<b>Stages</b>	Square mechanical right-handed drop coaxial 50×75 mm verniers read to 0.1 mm. Plain stage.		



#### PARTIAL FIELD PHOTOGRAPHIC EQUIPMENT

A high sensitivity partial field photographic photometry system incorporating an automatic wind-on 35 mm. camera is available for use with the M15c microscope.

The J37 high sensitivity photometer timer with its associated partial field device enables precisely controlled photography to be undertaken on even the faintest and least homogeneous dark ground fluorescence images. A stop device enables photometric measurements to be undertaken on sections of the field 1/10, 1/100 or 1/500 by area of the whole field or the whole field. The system is extremely sensitive such that it is possible to measure the amount of light present with the 1/500 stop in place when the image can only just be seen by the well dark adapted eye.

A full range of automatic, semi-automatic and manual camera equipment is available for the M15c. All normal camera formats from 35 mm. to 4" x 5" and Polaroid can be accommodated.



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