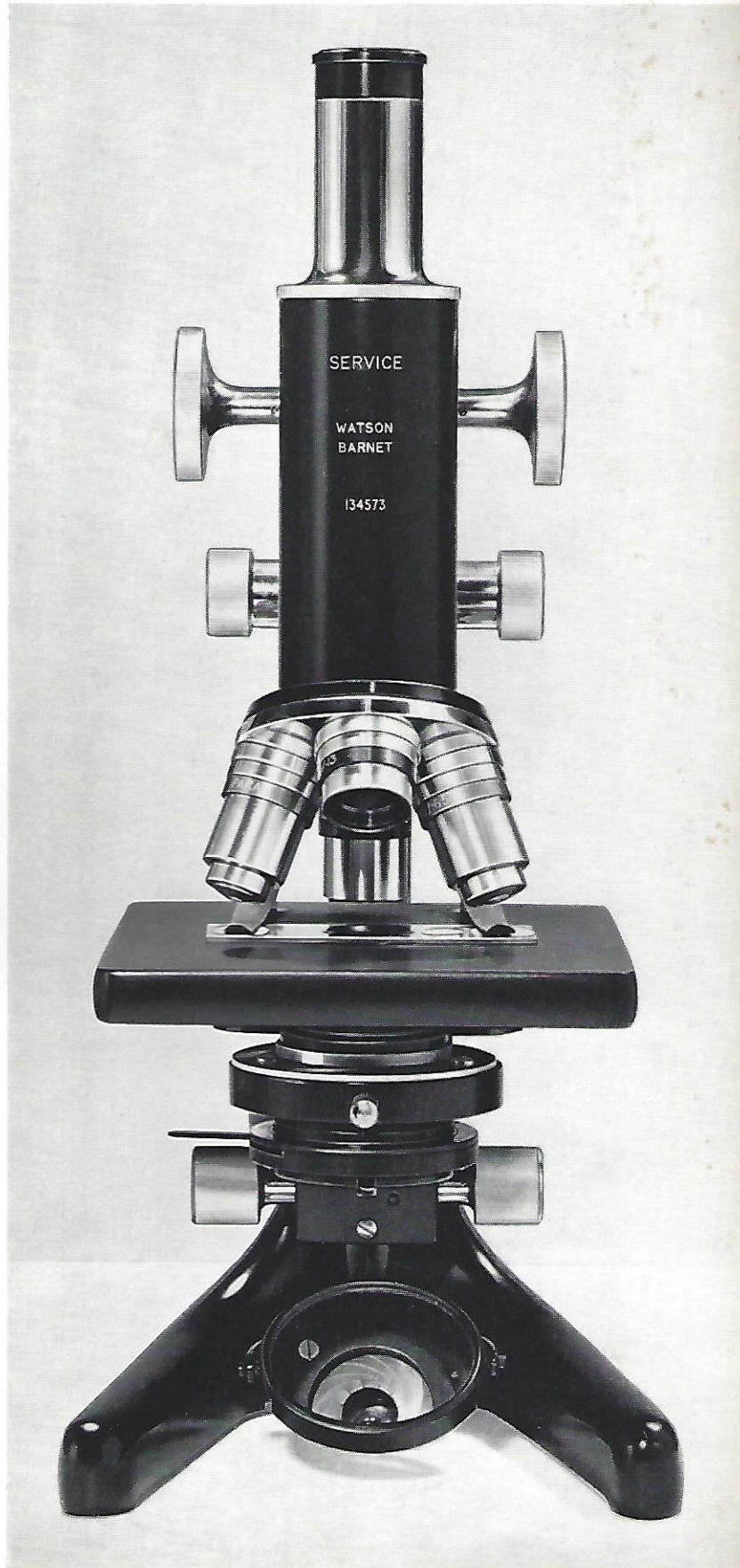


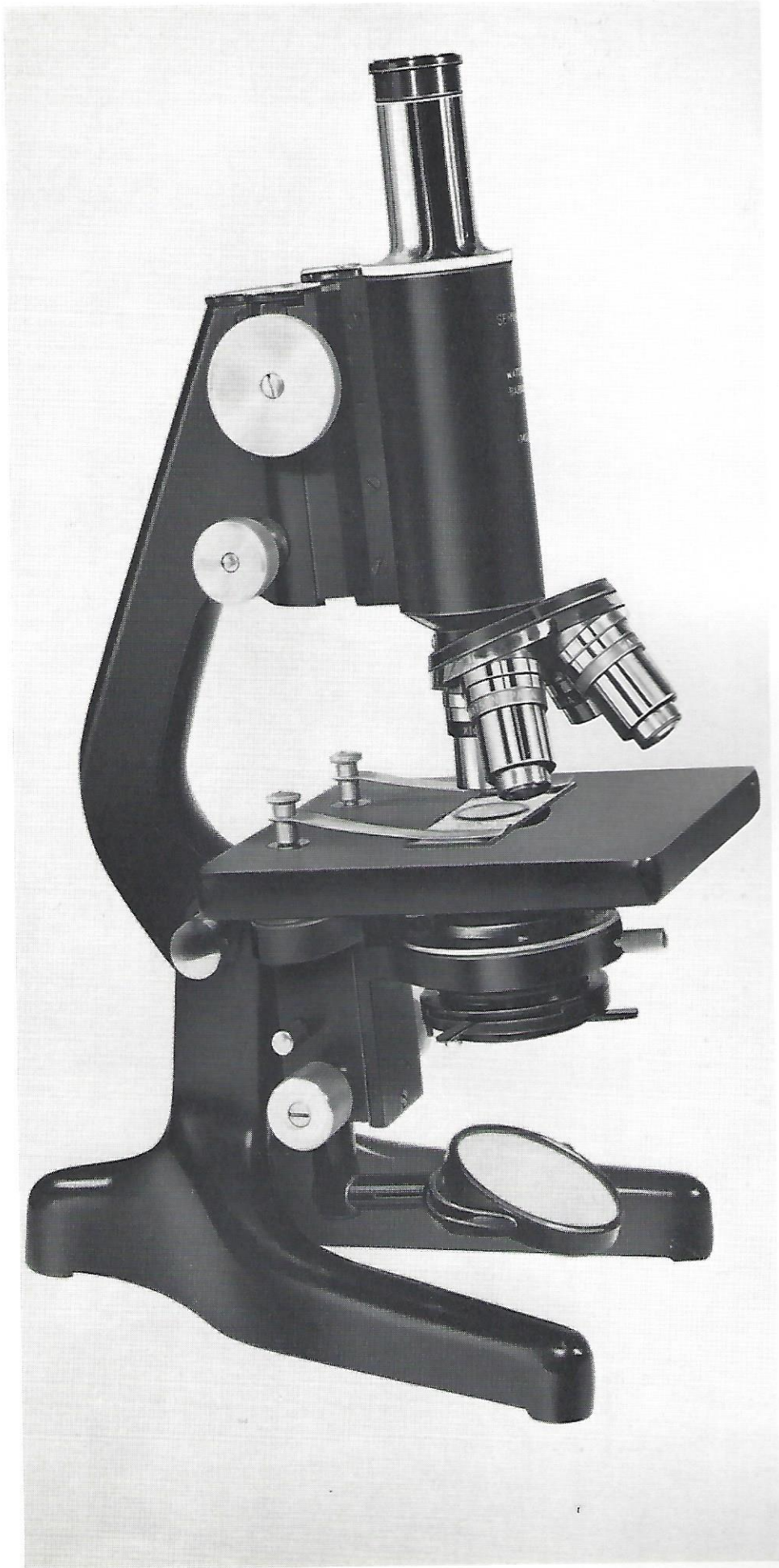
SERVICE MICROSCOPE

WATSON



The Service microscope is basically an instrument for student laboratory use. The comprehensive range of accessories available makes it also an ideal microscope for advanced workers. Simplicity of design allied to very high standards of construction ensure that the Service will give many years of trouble-free operation.

SERVICE MICROSCOPE



The Service microscope is finished in extremely durable semi-matt black enamel. Heavily chromium plated milled heads for operating the focusing adjustments are placed on both sides of the limb of the microscope.

The coarse adjustment is actuated by rack and pinion, the entire length of the rack being secured to the rib of the slide giving satin smooth movement without loss; the fine adjustment is actuated by micrometer screw. One revolution of the fine adjustment control head moves the objective 0.12mm (0.005in).

The mirror assembly is held in a gimbal holder which allows free adjustment in order to obtain optimum illumination.

Service microscope with rackwork focusing substage. The College mechanical stage can be fitted when required.

Every complete Service microscope is supplied in a fitted wooden cabinet with a daylight blue filter and a plastic dust-cover. Weight of microscope in case with average equipment 9kg (20lb). A basic outfit must comprise: stand, nosepiece, eyepiece(s), objectives, condenser and mount.

STANDS

- code 68** Stand, with plain stage, fixed body top and rackwork focusing substage
code 6877 Stand, with plain stage, graduated drawtube and rackwork focusing substage

NOSEPIECE

- code 262** Quadruple rotating nosepiece

MONAC AND BINAC

The Watson Service microscope can at any time be fitted with either an inclined monocular head (MONAC) or an inclined binocular attachment (BINAC) which is particularly recommended for prolonged observation with the microscope.

Both attachments are dust-proof, have a magnification of 1.5 and are corrected for 160mm tube length. All prisms and lenses are coated to increase light transmission.

- code 883** BINAC attachment
code 221 MONAC to replace fixed body top
code 299 MONAC to replace draw tube

COLLEGE MECHANICAL STAGE

The Watson College mechanical stage designed for use with the Service microscope allows slides to be moved with the utmost precision.

Horizontal and vertical scales, reading by vernier to 0.1mm are fitted in order that features of special interest on the slide can be swiftly and accurately located at any time. The geared movements of the stage are extremely smooth. The range of movement is 50mm horizontally and 25mm vertically.

- code 98**

SUBSTAGE LAMP

Fitted with a condensing lens, this lamp has a 6volt 18watt bulb with a prefocus cap which ensures accurate positioning of the filament to give a perfectly centred light source.

The lamp fits into the tail of the microscope in place of the mirror stem. An intensity control and on/off switch are incorporated in the transformer housing. The substage lamp control unit is for mains electricity supply, 200-250v AC or 110v AC.

- code 181** Substage Lamp complete with control unit, together with spare bulb with prefocus cap (please state voltage)
code 2087 Spare bulb 6volt 18watt, with prefocus cap

MAINS SUBSTAGE LAMP

This fitting is identical with that described above, but it is fitted with a 15watt bulb for mains electricity supply. No control unit is required.

- code 185** Mains substage lamp (state voltage required)
code 2096 Spare 15watt bulb

PHASE CONTRAST EQUIPMENT

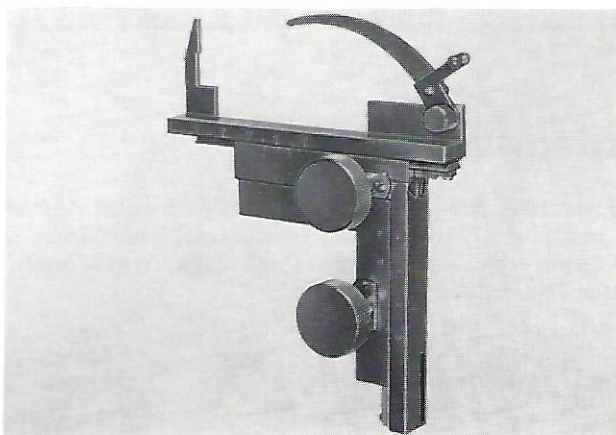
Accessories for phase contrast work including objectives and annuli can be fitted to the Watson Service microscope. Details will be forwarded on request.



Monac attachment



Binac attachment



College mechanical stage



Substage lamp

SUGGESTED OPTICAL OUTFITS

The following are selected as being typical of the more popular outfits favoured by a variety of users. These selected outfits should be ordered by the outfit code number shown.

Optical outfit code		Optical outfit code	
2130	Quadruple rotating nosepiece 16mm Parachromatic objective N.A. 0.28 ×10 4mm Parachromatic objective N.A. 0.65 ×45 1 Huygenian eyepiece (×5, ×7 or ×10) please specify	2134	Quadruple rotating nosepiece 16mm Parachromatic objective N.A. 0.28 ×10 4mm Parachromatic objective N.A. 0.65 ×45 2mm Parachromatic objective N.A. 1.30 ×100 2 Huygenian eyepieces (×5, ×7 or ×10) please specify Abbe Condenser, in Plain mount with iris diaphragm
2131	Quadruple rotating nosepiece 16mm Parachromatic objective N.A. 0.28 ×10 4mm Parachromatic objective N.A. 0.65 ×45 1 Huygenian eyepiece (×5, ×7 or ×10) please specify Plain mount with iris diaphragm	897	Quadruple rotating nosepiece 40mm Parachromatic objective N.A. 0.13 ×4 16mm Parachromatic objective N.A. 0.28 ×10 4mm Parachromatic objective N.A. 0.65 ×45 2mm Parachromatic objective N.A. 1.30 ×100 2 Huygenian eyepieces (×5, ×7 or ×10) please specify Abbe Condenser, in Plain mount with iris diaphragm
2132	Quadruple rotating nosepiece 16mm Parachromatic objective N.A. 0.28 ×10 4mm Parachromatic objective N.A. 0.65 ×45 2 Huygenian eyepieces (×5, ×7 or ×10) please specify Abbe Condenser, in Plain mount with iris diaphragm		
2133	Quadruple rotating nosepiece 40mm Parachromatic objective N.A. 0.13 ×4 16mm Parachromatic objective N.A. 0.28 ×10 4mm Parachromatic objective N.A. 0.65 ×45 2 Huygenian eyepieces (×5, ×7 or ×10) please specify Abbe Condenser, in Plain mount with iris diaphragm		

Individual choice may be made from the optical components described on the following pages.

OBJECTIVES

Parachromatic series. These objectives are parfocussed at 34mm and are suitable for Service, Bactil, Bactil-60 and earlier microscopes. (Not suitable for Service 3 or Microsystem 70.) Objectives with magnifications of ×45 and ×100 have spring loaded front cells for protection of specimens.

code	Primary mag. at 160mm t.l.	Focal length	N.A.	Free working distance	Cover glass category	Recommended eyepieces
1200	×3	40mm	0.11	27mm	N	H
203	×4	40mm	0.13	18mm	N	H
205	×10	16mm	0.28	7mm	N	H
208	×45	4mm	0.65	1.0mm	O	H or C
219	×100 (oil)	2mm	1.30	0.12mm	O	H or C

Recommended eyepieces H—Huygenian C—Compensating

Cover Glass Category M—Corrected for use without a cover glass
O—Corrected for 0.18mm cover glass thickness ± .05mm
C—Corrected for 0.18mm cover glass thickness ± .01mm
N—Not critical, may be used with or without cover glass

- code 698 Immersion oil (non-drying), 1oz bottle
- code 691 8oz bottle
- code 634 Lens cleaning tissues, per dozen pads

In 1964, in line with British Standard BS 3836 Part Two, Watson re-designed and began production of microscope objectives to the new parfocal length of 45mm. Since that date objectives made to the earlier standard (34mm) have formed a decreasing proportion of our total output until it has become no longer economic for us to continue production at existing prices. Over the same period our growth in production capacity has been fully absorbed by demand for the new pattern objectives. We have therefore made arrangements for an alternative source of supply that will allow us to maintain a service to customers for the 34mm objectives with only minimal price changes. All 34mm objectives are manufactured and tested to Watson performance specifications and are inspected on site by our senior technical staff. The full Watson guarantee cover is maintained for all objectives. It has to be emphasized that all 45mm objectives, as supplied with Microsystem 70, are wholly Watson produced and will continue so.

CONDENSERS AND MOUNTS

Abbe Condenser

This is a two-lens illuminator, the maximum numerical aperture of which is 1.20. It is particularly suitable for fluorescence microscopy.

code 196

Universal No. 3 Condenser

A new five-component Achromatic condenser which is highly corrected both spherically and chromatically. A special feature is the accessible entrance pupil which makes it suitable for illuminating techniques which require stops or filters to be imaged on to the back lens of the objective. An Aplanatic aperture of 0.9 provides the usual 2/3 core illumination with a $\times 100/1.30$ objective. The condenser is intended to be used dry with slides in the thickness range 1.0 to 1.2mm.

Code 155/24

Plain Condenser Mount

code 158 Plain Condenser Mount with pre-centred iris diaphragm and filter carrier

Centring Condenser Mount

with tubular sleeve, iris diaphragm and filter carrier. By adjustment of the centring screws the entire assembly is aligned with the microscope optical axis.

code 159

Polaroid Analyser and Polariser

Polaroid is a prepared film which is cemented between two optical glass discs. It is an excellent substitute for the special prisms otherwise used. The discs are mounted so that one fits over the eyepiece and the other into the filter carrier beneath the condenser.

code 50 Polaroid Analyser

code 2209 Polaroid Polariser

MEASURING ACCESSORIES

Huymic Eyepiece

is Huygenian in type and fitted with a focusing eye lens. Magnification $\times 10$. The eyepiece is not supplied with a scale or graticule unless ordered.

code 328

Eyepiece Scales

Watson scales and graticules are of unsurpassed quality.

code 332A Scale of 10mm divided into 100 parts

code 336A as Code No. 332A but with cross lines

code 825A Scale of 7.5mm divided into 100 parts

code 337A Scale of 5mm divided into 100 parts

code 338A Scale of 2mm divided into 100 parts

code 339A Step wedge of 10mm with 100 divisions numbered

code 340A Square, each side 1cm divided into 1mm squares

code 390A Total area ruled into 1mm squares

Stage Micrometers

Two types are available: one graduated in inches and the other in millimetres. Both types are on finest quality glass slides 3×1 in with the graduated portion protected by a cover glass.

code 100 Divisions of 0.1 and 0.01mm

code 101 Divisions of 0.01 and 0.001 in

EYEPIECES

Huygenian Eyepieces

have been designed for use with the Watson Parachromatic series of objectives. Paired eyepieces must be specified when ordering an outfit which includes a Binac attachment.

Power	Single Eyepieces code	Paired Eyepieces code
$\times 5$	400	401
$\times 7$	402	403
$\times 10$	404	405
$\times 14$	406	407

Compensating Eyepieces

have been specially computed for use with the Fluorite series. They can also be used with the higher powers of the Parachromatic series, with which they perform extremely well.

Power	Single Eyepieces code	Paired Eyepieces code
$\times 7$	408	409
$\times 10$	410	411
$\times 14$	412	413
$\times 20$	360	—

code 1260 Pointer Huygenian Eyepiece ($\times 10$ only) is used for indicating any feature of interest in the field of view

MICROSCOPE LAMPS

The importance of adequate lighting in microscopy cannot be over-estimated. The lamps available for use with the Service microscope cover the needs of workers at all levels; from student to the most advanced microscopist.

Bench Lamp

A solid inexpensive microscope lamp of robust construction. The light source is a 40 or 60watt bulb run directly from the mains. Three feet of 3-core cable is supplied with the lamp. The lamp can be inclined to any convenient angle by means of a control knob which is heat insulated from the lamp housing. Cooling vents are provided in the housing, and these are so arranged that stray light cannot cause inconvenience to the microscopist.

The base of the lamp is a heavy casting, so designed that it is virtually impossible for the lamp to be accidentally knocked over. The lamp and stand have a light grey, hard and durable finish.

- code 2160 Bench Lamp with 60watt pearl bulb
- code 2098 Spare 60watt pearl bulb

Universal Lamp

The metal lamp housing is fitted with a small bar on which are mounted a condenser, iris diaphragm and double filter holder for 2in square filters, all of which are independently adjustable.

The stand consists of a heavy circular base, a vertical pillar and a horizontal arm to which the lamp housing is clamped. The lamp housing can be inclined to any angle and clamped at any height on the vertical pillar.

- code 75 Universal Lamp, as described above, with 16v 108w ribbon filament lamp
- code 76 Variac Control Unit for use with code 75 above; mains input 200/250v AC
- code 2091 Spare Ribbon Filament Lamp, 6v 108w

Fluorescence Lamp Outfit

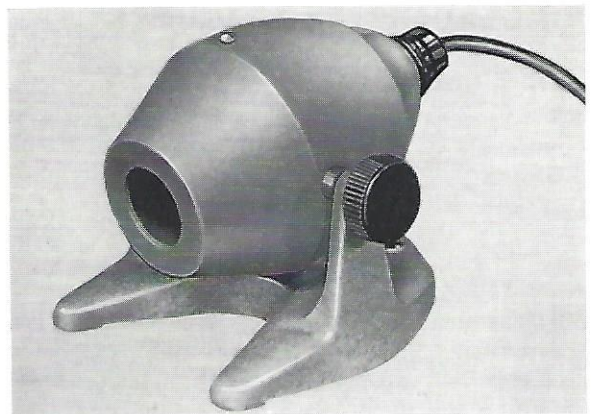
- code 2040 Universal Lamp as described above, with 250w ME/D mercury discharge lamp and extraneous light shield
- code 2041 Choke and Capacitor Lamp Control Unit mounted on base board with on/off switch and mains supply cable
- code 2043 Ultra Violet Interference Filter 2 x 2in (3650A)
- code 756 Chance-Watson 2 x 2in Heat Absorbing Filter, ON22
- code 49(13) Chance-Watson 1 3/8in diameter Ultra Violet Filter, OX1 to fit microscope substage
- code 2044 Chance-Watson 21mm diameter Ultra Violet 'Stopping' Filter, OY12 to fit microscope eyepiece
- code 2102 Spare 250w Box Type ME/D Lamp

Regulite Lamp

This lamp has a 6volt 30watt projector type bulb mounted in a metal hood. Centring screws are provided to allow accurate adjustment of the lamp holder. The aplanatic condenser has a multiple thread focusing adjustment and is complete with iris diaphragm and a double filter holder (1 3/8in diameter). A ground glass disc is supplied.

The lamp is mounted in a trunnion fitting on top of the housing containing the transformer, intensity control and on/off switch. The Regulite is for mains electricity supply, 200-250v AC or 110v AC.

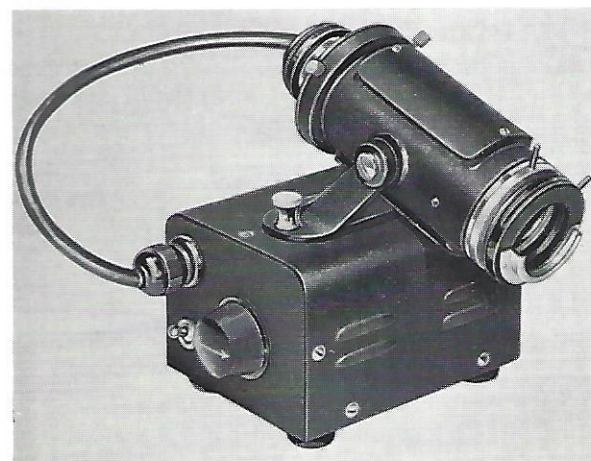
- code 153 Regulite Lamp (please state voltage)
- code 2090 Spare Bulb 6v 30w



Bench lamp



Universal lamp



Regulite lamp

EYEPIECE CAMERA

The Watson eyepiece camera is a complete and inexpensive outfit designed to enable black and white or colour photomicrography to be undertaken simply and efficiently with any make of microscope. The microscope must have a vertical monocular eyepiece tube onto which the camera is mounted.

The eyepiece camera is an indispensable auxiliary for microscopists who in the course of their work require quickly to record photographically what they see, and only the simplest of manipulations are required. All microscope focusing adjustments made to the image in the viewing eyepiece simultaneously adjust the image at the film plane. Accurate exposure determination may be undertaken with the Watson CdS exposure meter (*see below*).

- code 420/23** 35mm camera back with lever film wind-on, frame counter, speeded shutter (speeds of 1 sec to 1/125 sec, T and B) and cable release
- code 420/24** Basic prism unit with viewing eyepiece and photocell tube
- code 420/21** Standard microscope eyepiece tube adaptor



CdS EXPOSURE METER

The Watson CdS Exposure Meter is a highly sensitive and robust photometer for use with any microscope possessing standard eyepiece tube diameter. The cadmium sulphide cell is designed to replace the microscope eyepiece, to be inserted in the photometer tube of a photographic microscope, or to be held over the focusing eyepiece of an eyepiece camera. It may also be held in contact with the ground glass screen of a plate camera. Four decade scales cover an intensity range of 100,000 to 1 and a slide-rule calculator built into the Meter quickly and easily converts meter readings to precise exposure times. The exceptional sensitivity of the cadmium sulphide cell permits useful readings at very low light levels. Heart of the Watson Exposure Meter is the outstanding Pye taut-suspension microammeter from which conventional pivots and bearings have been eliminated—along with errors due to friction, wear or sticking. The meter scale is large, clear and easy to read.

The Watson CdS Exposure Meter is elegantly styled in grey, black and anodised silver and is designed for either bench or wall mounting.

code 783



WATSON IMAGE-SHEARING EYEPIECE

For simple and rapid particle sizing; diameter measurements; measurement of transistor components and photographic masks; measurement of many biological specimens and bacteria; dust control; measurement of diamond pyramid indents in hardness testing. By comparing the image with itself instead of with a fixed scale, the difficulties of measuring moving or drifting objects are largely eliminated. The wise incorporates a dichroic beam splitter giving colour differentiation of the beams with less than 3% light loss due to absorption. The shear is proportional both to the movement of the two mirrors in the system and to the rotation of the setting head from which readings are taken. The setting head is designed to give a quick, easy and accurate read-out. Use of filters is normally unnecessary. The wise will fit most microscopes having Royal Microscopical Society standard tube diameter, and will accept interchangeable eyepieces. Direction of shear can be altered simply by turning the device in the microscope tube. A graticule indicates direction of shear and defines a standard area for particle counting. Overall magnification of WISE as supplied is $\times 20$.

code 329



Watson policy is one of continuous development. Current production models of the Service microscope and accessories may, therefore, differ in minor details from the specifications given.

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WATSON**PRICE LIST**SERVICE MICROSCOPE CATALOGUE

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	897	- - -	52.	5.	0.		101	- - -	2.	14.	0.
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NOTE:

Prices quoted are for goods delivered to destination (UK only)

Orders not exceeding £50 value ... 2/6 extra.

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Page 8	329	- - -	72.	10.	0.
