

## B-190 Series



**Advanced Biological Microscopes For Students**

# Fulfill the Next Generation Learning Challenges

## FOR SKILLFUL STUDENTS AND CLASSROOM USE

- » Extremely reliable microscopes for educational purposes
- » Particularly recommended for secondary school
- » Ideal for teaching and learning biology

## YOUR FAVOURITE EDUCATIONAL MICROSCOPES

- » Choose among monocular, binocular and trinocular heads
- » 18mm field number
- » Achromatic lenses for standard brightfield applications



# B-190TB - A Completely New, Revolutionary Experience

## HANDY, YET EXTREMELY STABLE

- » Get accurate, dependable results in one click
- » Equipped with the most reliable OS, Windows 10
- » Holding solution for open discussion, 360° rotating and tilting

## OPTIMUM AND UNPARALLELED COMFORT IN USE

- » Large touch screen with fast, responsive and smooth control
- » Simultaneous camera and power connection for long-term operation
- » Easily detachable, can be used as a laptop (keyboard included)







# 100x With Water – A New Frontier In Education

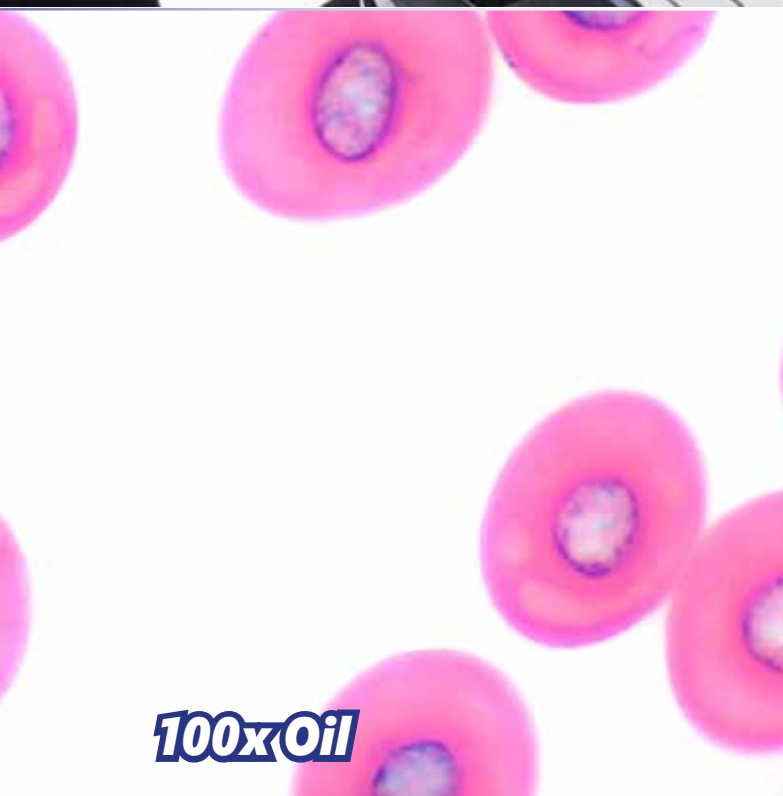
Educational

## SAME OBJECTIVE FOR OIL AND WATER USE

- » Oil represents the best media for high numerical apertures
- » Water combines relevant results with convenience
- » Water is recommended especially for educational purposes

## UNPARALLELED TIME & MONEY SAVINGS

- » Save time by forgetting about tedious cleaning
- » No time-wasting procedures
- » No additional expenses due to inappropriate cleaning & maintenance



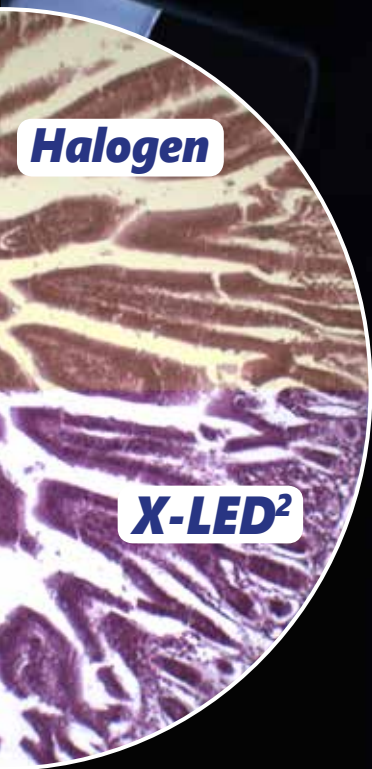
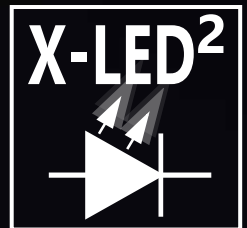
# X-LED<sup>2</sup> – Only Available At OPTIKA

## POWERFUL AND UNIFORM ILLUMINATION

- » Uncomparable light intensity, exclusive lens and collector design
- » Constant pure-white colour temperature at all intensity levels
- » Unmatched colour fidelity and brightness of your specimen

## MONEY & ENERGY SAVING

- » High energy efficiency at a limited cost, only 3 W
- » More efficient brightness than a 30 W halogen lamp
- » LED long lifetime (65.000 hours = 22 years at 8 hours/day usage)



Halogen

X-LED<sup>2</sup>



Multi-plug power supply



## B-190 Series

B-190 is the result of a perfect fusion between years of experience in microscopy and a refined design study. It represents our product philosophy at its best: quality, reliability and innovation, all in one. B-190 Series, the answer of OPTIKA Microscopes to the challenge of the future in the educational field.



### Original, Compact And Robust

The original design of B-190 series is based on robustness, yet keeping the extreme portability of the instrument, with a dedicated handle on the back. The built-in LED illuminator and the patented version with Windows tablet improve the reliability of one of the best-sellers of OPTIKA in the educational field.

### Incorporating The Most Wanted Features In A Student Microscope

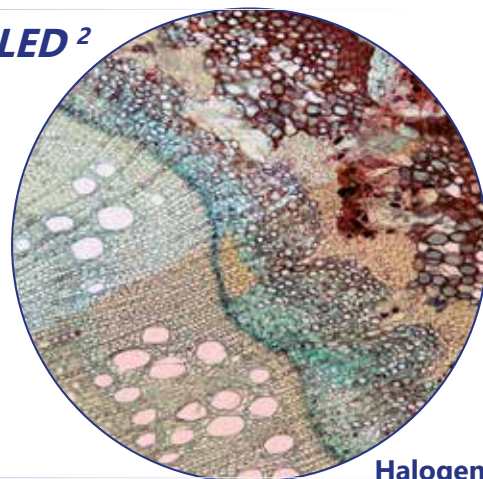
Get all the controls and features common to higher level microscopes: mechanical stage, binocular or trinocular head, coaxial focus knob, adjustable condenser, and 1000x maximum magnification (standard). An extremely simple but well equipped solution, in a modern and ergonomic design.

### X-LED<sup>2</sup> Exclusive Lighting Source

A special design of the lens in front of the LED gives a very high light intensity, while ensuring optimal uniformity of illumination on the whole field number. Relevant money & energy saving thanks to the incredibly low energy consumptions allow you to cut the electricity bills by 90%!

The electric consumption (3 W only) proves the high efficiency of this system: incredibly high light intensity combined with low consumption.

### X-LED<sup>2</sup>



Halogen





# Advanced Biological Microscopes For Students And Teachers

## Optimum And Unparalleled Comfort In Use

The B-190TB offers you a unique, incomparable solution. It includes a built-in camera of 3.1 MP and a Windows tablet with large touch screen, for a responsive and smooth control. Simultaneous camera and power connection ensure long-term operation, with dependable results in one click. It provides a reliable and comfortable solution for open discussion: 360° rotating and tilting tablet, easily detachable, that can be used as a laptop.



## Get the most out of our accessories

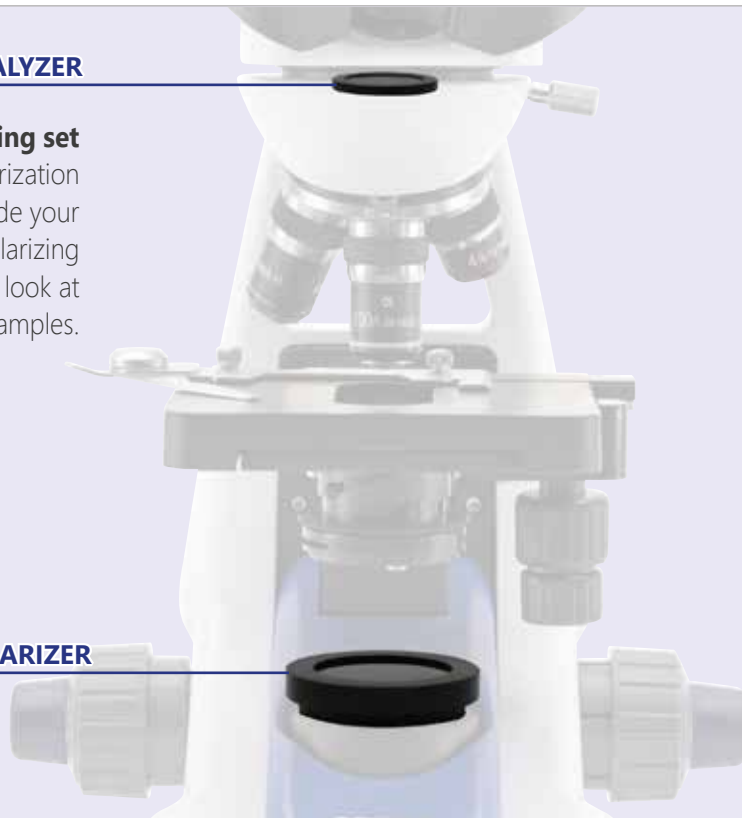
### ANALYZER

#### **M-190 - Polarizing set**

Set for simple polarization analysis. Upgrade your B-190 to a polarizing microscope and look at birefringent samples.



### POLARIZER



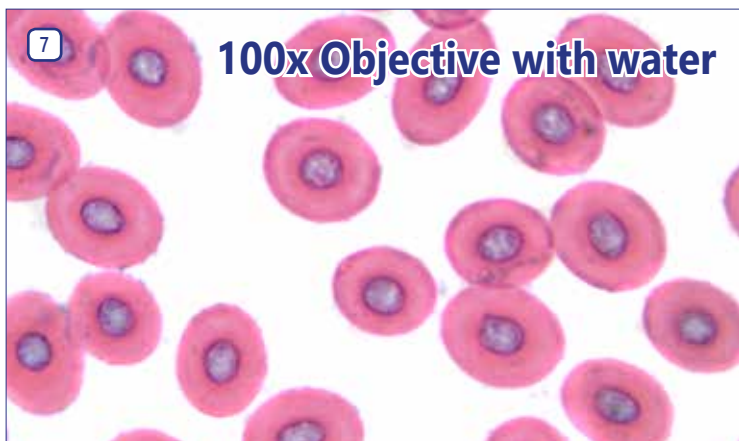
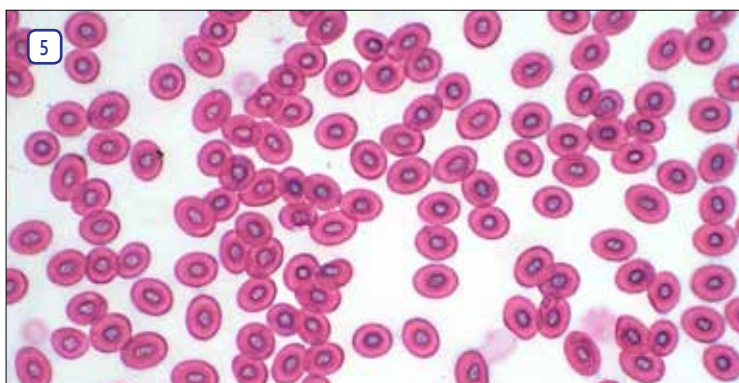
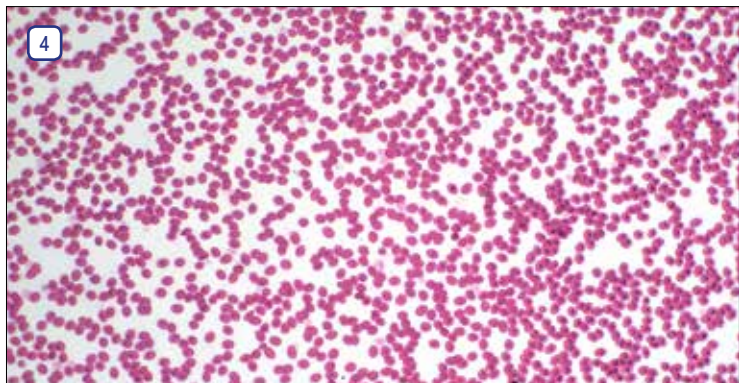
## B-190 Series

### Legend

1. B-190 Series lens containing X-LED<sup>2</sup> illumination system.
2. B-190 Series WF10x/18mm eyepieces for large specimen view and interpupillary adjustment.
3. B-191 pre-centered condenser with achromatic objectives.
4. Frog Blood Smear, with B-192 and 10x objective.
5. Frog Blood Smear, with B-192 and 40x objective.
6. Frog Blood Smear, with B-192 and 100x objective.
7. Frog Blood Smear, with B-192 and 100x objective with water.
8. B-190 Series handle for easy transportation.
9. B-190TB digital microscope with Widows tablet PC.
10. B-190 Series adjustable condenser in height.







# B-190 Series - Range

Educational

## B-191s



Advanced monocular microscope up to 600x total magnification. The exclusive **X-LED<sup>2</sup>** provides unmatched performance for powerful and uniform illumination.

**Observation mode:** Brightfield.

**Head:** Monocular, 360° rotating and 30° inclined.

**Eyepiece:** WF 10x/18 mm, secured by screw.

**Nosepiece:** Quadruple revolving nosepiece, rotation on ball bearings.

**Objectives:**

- HC - High Contrast Achromatic 4x/0.10 with anti-fungus treatment.
- HC - High Contrast Achromatic 10x/0.25 with anti-fungus treatment.
- HC - High Contrast Achromatic 40x/0.65 with anti-fungus treatment.
- HC - High Contrast Achromatic 60x/0.85 with anti-fungus treatment.

**Specimen stage:** Double layer mechanical sliding stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, adjustable height with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and light intensity control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

## B-191



Advanced monocular microscope up to 1000x total magnification, with oil/water. The exclusive **X-LED<sup>2</sup>** provides unmatched performance for powerful and uniform illumination.

**Observation mode:** Brightfield.

**Head:** Monocular, 360° rotating and 30° inclined.

**Eyepiece:** WF 10x/18 mm, secured by screw.

**Nosepiece:** Quadruple revolving nosepiece, rotation on ball bearings.

**Objectives:**

- HC - High Contrast Achromatic 4x/0.10 with anti-fungus treatment.
- HC - High Contrast Achromatic 10x/0.25 with anti-fungus treatment.
- HC - High Contrast Achromatic 40x/0.65 with anti-fungus treatment.
- HC - High Contrast Achromatic 100x/1.25 (Oil/Water) with anti-fungus treatment.

**Specimen stage:** Double layer mechanical sliding stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, adjustable height with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and light intensity control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.



# B-190 Series - Range

1

Educational

## B-192s



Advanced binocular microscope up to 600x total magnification. The exclusive **X-LED<sup>2</sup>** provides unmatched performance for powerful and uniform illumination.

**Observation mode:** Brightfield.

**Head:** Binocular, 360° rotating and 30° inclined. Interpupillary distance from 48 to 75 mm; dioptic adjustment on left eyepiece.

**Eyepieces:** WF 10x/18 mm, secured by screw.

**Nosepiece:** Quadruple revolving nosepiece, rotation on ball bearings.

**Objectives:**

- HC - High Contrast Achromatic 4x/0.10 with anti-fungus treatment.
- HC - High Contrast Achromatic 10x/0.25 with anti-fungus treatment.
- HC - High Contrast Achromatic 40x/0.65 with anti-fungus treatment.
- HC - High Contrast Achromatic 60x/0.85 with anti-fungus treatment.

**Specimen stage:** Double layer mechanical sliding stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, adjustable height with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and light intensity control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

## B-192



Advanced binocular microscope up to 1000x total magnification, with oil/water. The exclusive **X-LED<sup>2</sup>** provides unmatched performance for powerful and uniform illumination.

**Observation mode:** Brightfield.

**Head:** Binocular, 360° rotating and 30° inclined. Interpupillary distance from 48 to 75 mm; dioptic adjustment on left eyepiece.

**Eyepieces:** WF 10x/18 mm, secured by screw.

**Nosepiece:** Quadruple revolving nosepiece, rotation on ball bearings.

**Objectives:**

- HC - High Contrast Achromatic 4x/0.10 with anti-fungus treatment.
- HC - High Contrast Achromatic 10x/0.25 with anti-fungus treatment.
- HC - High Contrast Achromatic 40x/0.65 with anti-fungus treatment.
- HC - High Contrast Achromatic 100x/1.25 (Oil/Water) with anti-fungus treatment.

**Specimen stage:** Double layer mechanical sliding stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, adjustable height with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and light intensity control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.



# B-190 Series - Range

## B-193

-  18
-  X-LED<sup>2</sup>
-  HC
-  100x
-  WATER



Advanced trinocular microscope up to 1000x total magnification, with oil/water, mechanical stage and exclusive **X-LED<sup>2</sup>** for unmatched performance for powerful and uniform illumination. All the OPTIKA cameras can be easily mounted and used straight away.

**Observation mode:** Brightfield.

**Head:** Trinocular, 360° rotating and 30° inclined. Interpupillary distance from 48 to 75 mm; dioptic adjustment on left eyepiece.

**Eyepieces:** WF 10x/18 mm, secured by screw.

**Nosepiece:** Quadruple revolving nosepiece, rotation on ball bearings.

**Objectives:**

- HC - High Contrast Achromatic 4x/0.10 with anti-fungus treatment.
- HC - High Contrast Achromatic 10x/0.25 with anti-fungus treatment.
- HC - High Contrast Achromatic 40x/0.65 with anti-fungus treatment.
- HC - High Contrast Achromatic 100x/1.25 (Oil/Water) with anti-fungus treatment.













**Specimen stage:** Double layer mechanical sliding stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm.

**Focusing:** Coaxial coarse and fine focusing mechanism with limit stop to prevent the contact between objective and specimen. Adjustable tension of coarse focusing knob.

**Condenser:** Abbe N.A. 1.25, pre-centered, adjustable height with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and light intensity control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply.

## B-190TB

-  18
-  X-LED<sup>2</sup>
-  HC
-  100x
-  WATER
-  10.8"
-  3.1 MP
-  HDMI
-  Wi-Fi
-  SD
- 
- 



3.1 MP Built-in camera and 10.8" Windows tablet PC up to 1000x total magnification, mechanical stage and exclusive **X-LED<sup>2</sup>** for unmatched performance for powerful and uniform illumination.

**Observation mode:** Brightfield.

**Head:** Binocular, 360° rotating and 30° inclined. Interpupillary distance from 48 to 75 mm; dioptic adjustment on left eyepiece. Built-in 3.1 MP camera.

**Eyepieces:** WF 10x/18 mm, secured by screw.

**Nosepiece:** Quadruple revolving nosepiece, rotation on ball bearings.

**Objectives:**

- HC - High Contrast Achromatic 4x/0.10 with anti-fungus treatment.
- HC - High Contrast Achromatic 10x/0.25 with anti-fungus treatment.
- HC - High Contrast Achromatic 40x/0.65 with anti-fungus treatment.
- HC - High Contrast Achromatic 100x/1.25 (Oil/Water) with anti-fungus treatment.

**Specimen stage:** Double layer mechanical sliding stage, 125x115 mm, 70x30 mm X-Y movement range. Vernier scale on the two axes, accuracy: 0.1mm.

**Focusing:** Coaxial coarse (adjustable tension) and fine focusing mechanism with limit stop to prevent the contact between objective and specimen.

**Condenser:** Abbe N.A. 1.25, pre-centered, adjustable height with iris diaphragm.

**Illumination:** X-LED<sup>2</sup> with white 3 W LED and light intensity control. Color temperature: 6,300 K. Multi-plug 100-240Vac/6Vdc external power supply. Color temperature: 6,300 K.

# B-190TB - Digital Microscope with Camera & Tablet

The latest OPTIKA digital microscopes with Windows tablet PC open new microscopy horizons, combining high-end optics with innovative digital technology for microscopic imaging. B-190TB includes a 3.1 MP camera with a 10.8" Windows tablet. View, capture, analyze and share your images with simplicity and reliability.

## *Intuitive, Yet Powerful Software*

Simple and user-friendly, ideal for students and experienced users.

**PATENTED**



### Unique Features

- > Simultaneous camera & power connection
- > Equipped with the latest **Windows OS & Intel** processor
- > Easily detachable, can be used as a laptop (keyboard included)

## *360° Rotating & Tilting*



## *Detachable*



# B-190TB - Digital microscope with camera & tablet

Tilting

## TABLET TECHNICAL SPECIFICATIONS

Model	Tablet 10.8"
Operating System	Windows 10 32-bit
Language	Multilanguages already installed
Image capturing software	OPTIKA Vision lite
CPU	Intel® Atom™ Z3735F, Quad core
CPU speed	1.44 GHz
Graphics Card	Intel® HD Graphics 3D Accelerator
Memory	Ram 2,048 GB DDR3L
LCD display	<b>LED 10.1" IPS Multi Touch Screen</b>
LCD resolution	1920 x 1280, 16/10 (WXGA)
Storage	HDD 64GB
Network	Wireless, Bluetooth 4.0
Input/output ports	Micro USB-B - USB - Microphone - MicroSD card reader - Mini HDMI - Head-phone
Control Buttons	Auto rotate off, volume control
Battery Technology	Lithium-ion battery, 2x cell
Battery capacity	8400 mAh
Max load	15 W
Dimensions	Thickness 10,5 mm, Height 17,4 cm, Width 25,7 cm
Weight	720 g
Cables included	USB-B to USB-A / OTG cable (Micro USB-B to USB-A)
Also included	Instruction manual, Keyboard with touchpad, touch pen.

## CAMERA TECHNICAL SPECIFICATIONS

Digital camera resolution	3.14 MPixel
Signal output	USB 2.0
Sensor Size	1/2.5"
Sensor technology	CMOS
Image format	4\3
Full Image size	2048 x 1536
Pixel size	2.2 x 2.2 micron
Frame rate full resolution	5 frames\sec
Frame rate other resolutions	8 FPS (1280x1024) - 30FPS (640x480)
Automatic White Balance	Auto - Man
Automatic Gain Control	Auto - Man
Automatic Back light control	Auto - Man
Exposure control	Auto - Man



# B-190 Series - Optical performance

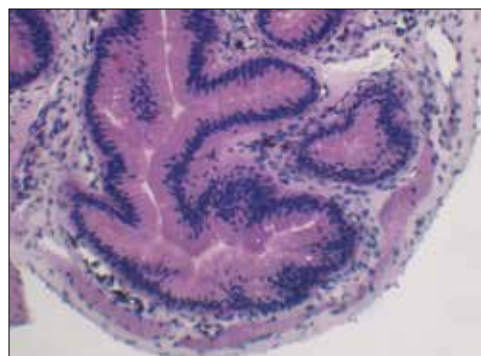
Eyepiece		10x (M-002.1)			16x (M-003)	
Field number (mm)		18			12	
Objective	N.A.	W.D (mm)	Total magnification	Field of View (mm)	Total magnification	Field of View (mm)
4x	0.1	18	40x	4.5	64x	3
10x	0.25	7	100x	1.8	160x	1.2
20x	0.4	2	200x	0.9	320x	0.6
40x	0.65	0.53	400x	0.45	640x	0.3
60x	0.85	0.45	600x	0.3	960x	0.2
100x	1.25 (oil/water)	0.13	1000x	0.18	1600x	0.12



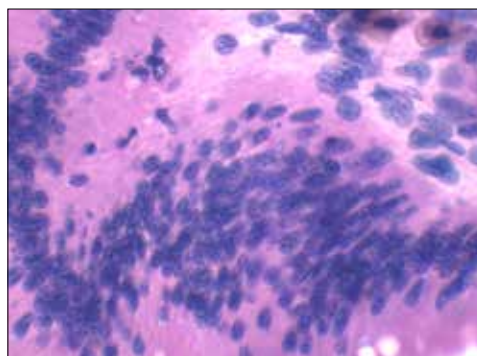
**HC**

**OPTIKA HC** objectives ensure a versatile and reasonably priced entry-level lenses for brightfield, darkfield and simple polarization applications. They are specifically designed to achieve optimal contrast and thus maximize yield on an instrument intended for education on F.N. 18.

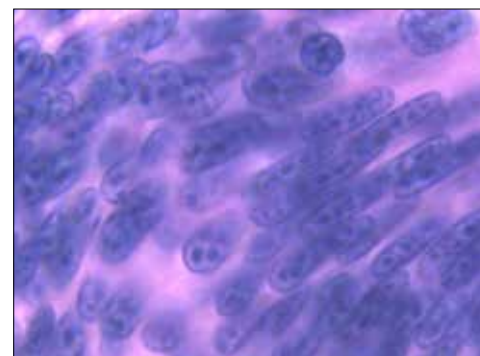
## B-190 Series - Zoom comparison



Frog small intestine - B-193 - 10x HC objective



Frog small intestine - B-193 - 40x HC objective



Frog small intestine - B-193 - 100x Oil HC objective

## B-190 Series - Comparison chart

Model	Head	Eyepiece(s)	Nosepiece	Objectives	Stage	Focusing	Condenser	Illuminator
<b>B-191s</b>	Monocular, 360° rotating, 30° inclined	Wide Field 10x/18mm	Quadruple, reversed	HC Achromatic 4x, 10x, 40x, 60x	Double layer, 125x115 mm with 70x30mm X-Y moving range	Coaxial coarse and fine focusing	N.A. 1.25 Abbe type with adjustable height and iris diaphragm	3 W X-LED <sup>2</sup> , brightness control
<b>B-191</b>	Monocular, 360° rotating, 30° inclined	Wide Field 10x/18mm	Quadruple, reversed	HC Achromatic 4x, 10x, 40x, 100x	Double layer, 125x115 mm with 70x30mm X-Y moving range	Coaxial coarse and fine focusing	N.A. 1.25 Abbe type with adjustable height and iris diaphragm	3 W X-LED <sup>2</sup> , brightness control
<b>B-192s</b>	Binocular, 360° rotating, 30° inclined	Wide Field 10x/18mm	Quadruple, reversed	HC Achromatic 4x, 10x, 40x, 60x	Double layer, 125x115 mm with 70x30mm X-Y moving range	Coaxial coarse and fine focusing	N.A. 1.25 Abbe type with adjustable height and iris diaphragm	3 W X-LED <sup>2</sup> , brightness control
<b>B-192</b>	Binocular, 360° rotating, 30° inclined	Wide Field 10x/18mm	Quadruple, reversed	HC Achromatic 4x, 10x, 40x, 100x	Double layer, 125x115 mm with 70x30mm X-Y moving range	Coaxial coarse and fine focusing	N.A. 1.25 Abbe type with adjustable height and iris diaphragm	3 W X-LED <sup>2</sup> , brightness control
<b>B-193</b>	Trinocular, 360° rotating, 30° inclined	Wide Field 10x/18mm	Quadruple, reversed	HC Achromatic 4x, 10x, 40x, 100x	Double layer, 125x115 mm with 70x30mm X-Y moving range	Coaxial coarse and fine focusing	N.A. 1.25 Abbe type with adjustable height and iris diaphragm	3 W X-LED <sup>2</sup> , brightness control
<b>B-190TB</b>	Binocular, digital 360° rotating, 30° inclined	Wide Field 10x/18mm	Quadruple, reversed	HC Achromatic 4x, 10x, 40x, 100x	Double layer, 125x115 mm with 70x30mm X-Y moving range	Coaxial coarse and fine focusing	N.A. 1.25 Abbe type with adjustable height and iris diaphragm	3 W X-LED <sup>2</sup> , brightness control

# B-190 Series - Accessories

## ACCESSORIES FOR B-190 SERIES

- M-001 Huygens 5x eyepiece.  
 M-002.1 WF10x/18 eyepiece, high eyepoint.  
 M-003 WF16x/12 eyepiece.  
 M-004 WF10x/18 eyepiece, with micrometric scale (10mm/100um).  
 M-008 WF10x/18 eyepiece, with pointer.
- M-137 HC (high contrast) objective 4x/0.10.  
 M-138 HC (high contrast) objective 10x/0.25.  
 M-139 HC (high contrast) objective 20x/0.40.  
 M-141 HC (high contrast) objective 40x/0.65.  
 M-142 HC (high contrast) objective 60x/0.85.  
 M-143 HC (high contrast) objective 100x/1.25 (oil/water).
- M-174 Polarising set (filters only) for B-190 & B-290 series.  
 M-974 Blue filter, 32 mm diameter.  
 M-976 Green filter, 32 mm diameter.  
 M-978 Yellow filter, 32 mm diameter.  
 M-988 Frosted glass filter, 32 mm diameter.  
 M-971 Plane-concave mirror, with base for B-190 & B-290 Series.  
 M-114 0.5x C-Mount projection lens.  
 M-115 0.35x C-Mount projection lens.  
 M-118 0.75x C-Mount projection lens.  
 M-173 Photo adapter for APS-C and Full Frame Reflex cameras.  
 DC-002 Plastic dust cover, medium 490(l)x490(h) mm.  
 DC-003 TNT dust cover, medium 600(l)x550(h) mm (for B-290TB).  
 M-069 Solar charger.  
 15008 OPTIKA immersion oil 10ml.  
 M-005 Micrometric slide, 26x76mm, with 2 X scales (1mm/100div. for biological / 10mm/100div. for stereo).  
 15104 Cleaning kit.  
 VP-190 IQ/OQ/PQ Validation Protocols.

## M-069 - Solar charger

Included battery: rechargeable – Lithium-Poly. Capacity: 2600 mAh. Output voltage: 5,5Vdc. - Dimensions: 120x73x10 mm. Autonomy: over 6 hours at medium intensity (X-LED<sup>3</sup>). Charging modes: with solar panel (12h), with external USB power supply (not included) or from PC USB port (5h).



B-192 Powered by solar battery pack (M-069)

## 15104 - Cleaning kit

It cleans glass quickly and effectively, without leaving residue or odor. Ideal for precision lens or prism cleaning.



### How to connect the cameras to our microscopes.

Please refer to the Adapter reference list on Digital section.

v 1.4.0 - OPTIKA reserves the right to make corrections, modifications, enhancements, improvements and other changes to its products at any time without notice.

## Headquarters and Manufacturing Facilities

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