

OLYMPUS®

Olympus is about life. About photographic innovations that capture precious moments of life. About advanced medical technology that saves lives. About information- and industry-related products that make possible a better living. About adding to the richness and quality of life for everyone. Olympus. Quality products with a **FOCUS ON LIFE**

METALLURGICAL
MICROSCOPES

BX2M

BX41M-ESD/BX51/BX51M/
BX61/BXFM

System Revolution

UIS
UNIVERSAL
INFINITY SYSTEM





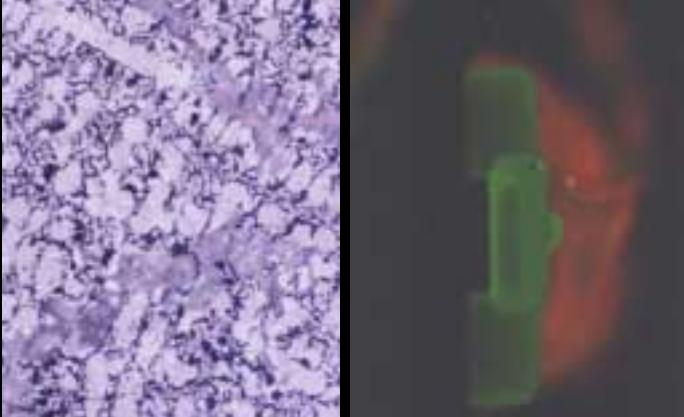
POWER AND FLEXIBILITY TO PERFORM MULTIPLE INSPECTIONS WITH OUTSTANDING EFFICIENCY.

- Ergonomic refinements to the performance-proven Y-shape design.
- Logical layout for superior operability
- Newly employed arm integrated reflected light illuminator
- Greater system flexibility with unprecedented freedom to select and combine components
- Outstanding UIS optical performance
- Excellent image clarity and superb resolution for varied inspection demands

System Revolution



World-leading image quality and further improved UIS optics.



Universal objectives are suitable for all observation methods, from brightfield to fluorescence imaging.

The BX2M system's universal objectives are compatible with all observation methods, including brightfield, darkfield, Nomarski DIC, polarized light and fluorescence microscopy, and provide the highest level of image quality in each mode.



U-DICR

U-DICRHC

Nomarski DIC system maximizes visibility.

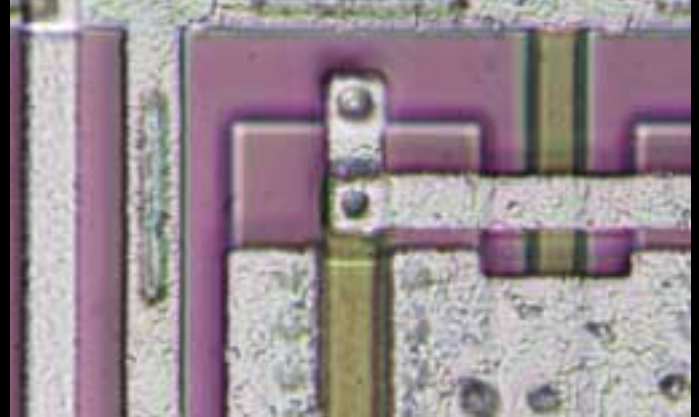
With Nomarski DIC observation now recognized as an indispensable tool for the inspection of materials, metals and semiconductor structures, Olympus provides three different types of prisms, to ensure optimum resolution and contrast for every type of sample: U-DICR for all-purpose inspections; U-DICRH for superior resolution of even the finest structures and U-DICRHC for superior contrast. Each is available as a single slider mounted prism, easily interchangeable and easily accessible for operation.



U-DICR

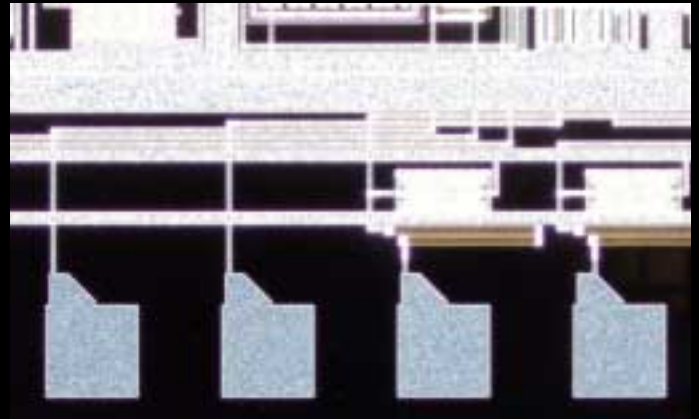
U-DICRH

U-DICRHC



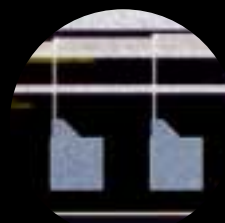
Ultra-high magnification.

The BX-RLA2 brightfield/darkfield reflected light illuminator offers a highly functional aperture stop that can be adjusted down to a pinhole size. This feature allows high contrast observation with extended focus depth and especially complements the super high magnification 150x and 250x Apochromat objectives. The exceptionally long working distance of these objectives helps to avoid contact with the sample during super-high magnification observations.



Darkfield observation at twice the brightness.

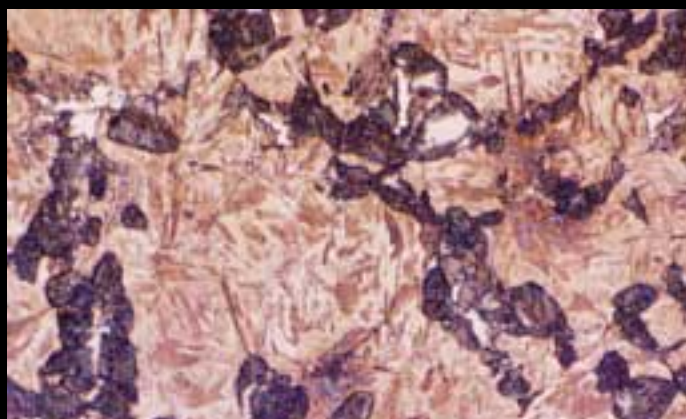
By improving light collection Olympus has made it possible to obtain darkfield images almost twice as bright than those produced by conventional systems. As a result, even the slightest imperfections, the smallest details and most minute contamination can be clearly detected.



Conventional image



Actual image



Plan Apochromat objectives for superior images.

The use of high resolution objectives from which chromatic aberration is entirely eliminated ensures high-contrast, clear images and highly resolved observation of structures, such as semiconductor geometries at the optical resolution limit.

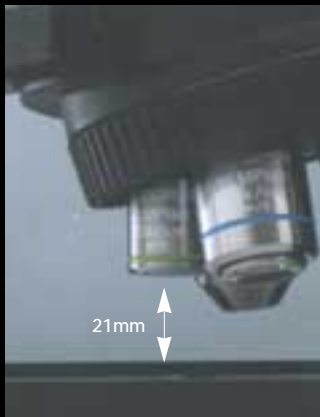
Special objectives corrected for observation through glass substrates.

For observation through substrate glass or filters, a range of different objectives is provided. The LCPlanApo20x and 50x are cap type objectives which compensate for glass of 0.7/1.1mm thickness. The LCPlanFL100x is the correction ring type, and is used for LCD glass of 0.6-1.2mm thickness.



Ultra-long working distance objectives for observation of samples with strong topography.

These ultra-long working distance objectives (21mm for 20x, 15mm for 50x) are especially effective for observing samples such as magnetic heads set in a fixture.



Full line-up of objectives for every application

Objectives	Magnifications	N.A.	W.D. (mm)	Cover Glass Thickness (mm)	Resolution*2 (µm)
UMPlanFL	5x	0.15	20.0	-	2.24
	10x	0.30	10.1	-	1.12
	20x	0.46	3.1	0	0.73
	40x	0.75	0.63	0	0.45
	50x	0.80	0.66	0	0.42
	100x	0.95	0.31	0	0.35
UMPlanFL-BD**	5x	0.15	12.0	-	2.24
	10x	0.30	6.5	-	1.12
	20x	0.46	3.0	0	0.73
	50x	0.80	0.66	0	0.42
	100x	0.90	0.31	0	0.35
	UMPlanFL-BDP**	5x	0.15	12.0	-
10x		0.25	6.5	-	1.34
20x		0.40	3.0	0	0.84
50x		0.75	0.66	0	0.45
100x		0.90	0.31	0	0.37
LMPlanApo		150x	0.9	1.0	0
	250x	0.9	0.80	0	0.37
LMPlanApo-BD**	150x	0.9	1.0	0	0.37
	250x	0.9	0.80	0	0.37
LMPlanFL	5x	0.13	22.5	-	2.58
	10x	0.25	21.0	-	1.34
	20x	0.40	12.0	0	0.84
	50x	0.50	10.6	0	0.67
	100x	0.80	3.4	0	0.42
LMPlanFL-BD**	5x	0.13	15.0	-	2.58
	10x	0.25	10.0	-	1.34
	20x	0.40	12.0	0	0.84
	50x	0.50	10.6	0	0.67
	100x	0.80	3.4	0	0.42
MPlanApo	20x	0.60	0.9	0	0.56
	50x	0.95	0.3	0	0.35
	100x	0.95	0.35	0	0.35
	100xOil	1.40	0.1	0	0.24
MPlanApo-BD**	100x	0.9	0.31		
MPlan**	5x	0.12	19.6	-	3.36
	10x	0.25	10.6	-	1.34
	20x	0.40	1.3	0	0.84
	50x	0.75	0.38	0	0.45
	100x	0.90	0.21	0	0.37
MPlan-BD**1)3)4)	5x	0.10	12.0	-	3.36
	10x	0.25	7.0	-	1.34
	20x	0.40	1.3	0	0.84
	50x	0.75	0.38	0	0.45
	100x	0.90	0.21	0	0.37
SLMPlan	20x	0.35	21.0	0	0.58
	50x	0.45	15.0	0	0.75
LCPlanApo	20x	0.40	8.8	0/0.7/1.1	0.84
	50x	0.60	3.1	0/0.7/1.1	0.56
LCPlanFL-LCD	100x	0.80	0.95	1.2	
			1.1	0.7	
			1.143	0.6	
LMPlan-IR	5x	0.10	20.00	-	-
	10x	0.25	18.5	-	-
	20x	0.40	8.1	-	-
	50x	0.55	6.0	-	-
	100x	0.80	3.4	-	-
MPlan-IR**	100x	0.95	0.3	-	-

** "BD" = "Brightfield/darkfield" objectives

*1 Sight vignetting may occur in the periphery of the field when MPlan-BD series objectives are used with high-intensity light sources such as mercury and xenon for darkfield observation.

*2 Resolutions calculated with aperture iris diaphragm wide open.

*3 Limited up to N.A. 22. No compliance with N.A. 26.5.

*4 BD objectives cannot be combined with BX41M and BX41M-ESD.

Improved design signals
new advance in ergonomics.



More compact Y-shape design for greater ease of use.

The reduced depth of the new microscopes makes Olympus' renowned Y-shape design even more space-efficient. A smaller lamp housing increases compactness, helping both to reduce the space required for installation and to keep desk space free for samples or ancillary equipment without hindering the operator.

Ideal position for reducing operator fatigue in long-duration inspections.

New refinements to the Y-shape frame enhance its well-established reputation for reducing fatigue. All focusing and stage operations are performed with the operator's hands and arms on the desk, and even complex observations require only minimal hand movements.

Easy focusing and convenient "either-side" attachment of the fine focusing knob.

The fine focusing knob can be removed and attached to either side of the microscope to suit right /left-handed operators. The control knob's tactile cover allows light-touch fingertip operation, while the fine focus mechanism is extremely accurate, even at high magnifications.



Integrated ND filter for more comfortable switching between brightfield/darkfield observation methods.

The brightfield/darkfield reflected light illuminator features an integrated ND filter that protects the operator's eye by preventing sudden, drastic changes in brightness. This integrated function can be disengaged manually.



Brightfield observation

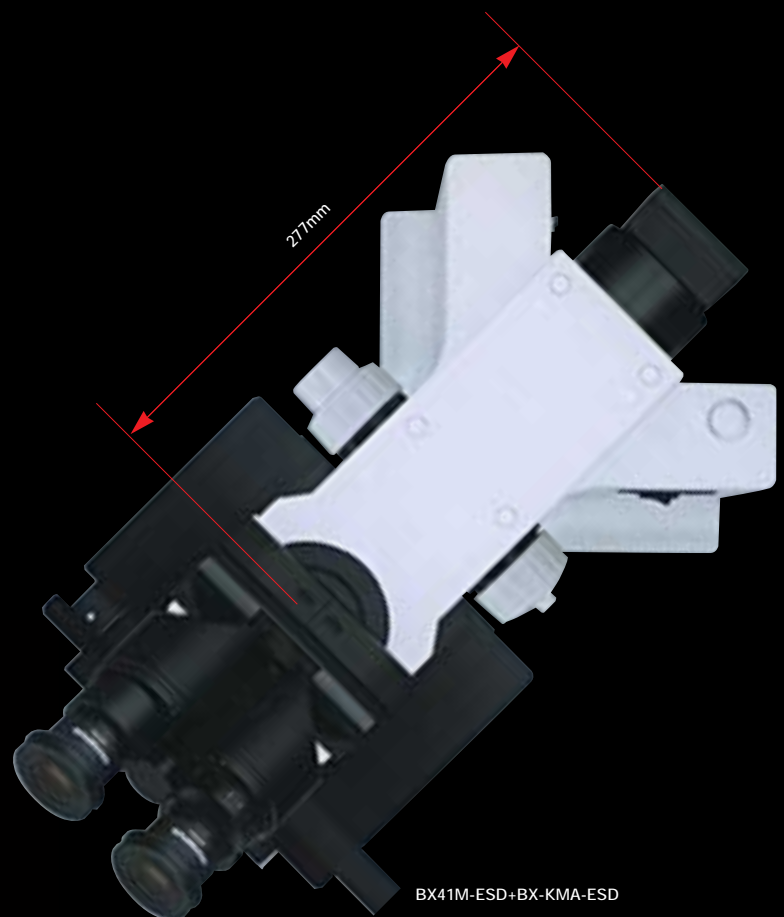


Darkfield observation



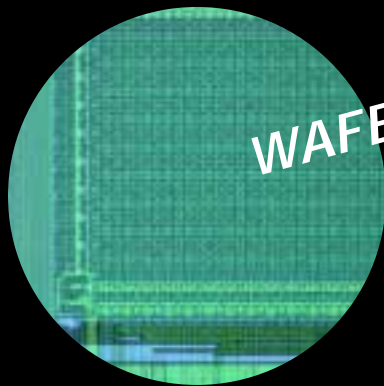
Range of tilting observation tubes to assist operator comfort.

U-TBI and U-ETBI tilting tubes are provided for binocular observation, and the U-ETTR observation tube for documentation / photomicrography. This range of choice lets each operator achieve the most suitable eyepoint and an ergonomic posture, resulting in greatly reduced fatigue for long-duration observations.



Wide choice of highly functional accessories to meet the full range of microscopy inspection needs.

Efficient observation of many kinds of samples



WAFER



ELECTRONIC DEVICE

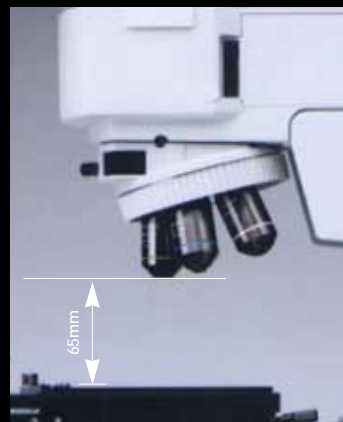


DATA STORAGE



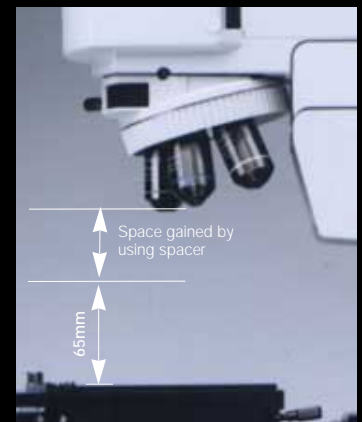
Special stages and adaptation plates.

Various special stages and adaptation plates are provided: a 100x100mm stage plate (U-MMSP4), a wafer holder plate (U-WHP2) for 3- and 4-inch wafers and extra-large stages (U-SIC4R2 and U-SIC4L2), allowing the use of a glass plate (e.g. U-MMSPG) for transmitted light observations. The stage U-SVRM/U-SVLM is designed so that the X-direction guide does not protrude. Using a slide holder, this ergonomic stage is ideal for standard slide size specimen. A 76x50mm stage plate (U-MSSP) accommodates larger specimen.



Observation of samples over 65mm in height.

The reflected light illuminator, integrated into the microscope arm, is a standard feature of the BX41M/BX51M series microscopes, giving them an extra degree of flexibility. Inserting a spacer between the frame and microscope arm increases the distance between the sample and the objective, making it possible to observe samples of over 65mm in height.



Improved efficiency with the motorized revolving nosepiece.

The motorized revolving nosepiece (U-D6RE/U-D5BDREM) allows instant switching to an objective of choice. The handswitch / keypad can be positioned for greatest convenience. The fast, keystroke simple objective change minimizes hand movement and improves efficiency. The motorized revolving nosepiece can be attached to all reflected light illuminators / microscope frames.



NEW MATERIALS



Revolving nosepiece with perfect par-centricity between objectives.

The quintuple BD revolving nosepiece U-P5BDREC and sextuple revolving nosepiece with centering mechanism enables perfect par-centricity between three objectives. There is no image center displacement, even when switching from low to high magnifications, an added boost to efficiency.



U-P5BDREC



U-P6REC

Filter sliders for flexible illumination.

A variety of filter sliders are provided for such filters as yellow UV-cut, color temperature change and color enhancement.



Working with a wide variety of illumination systems

Reflected light illuminators are compatible with a variety of light sources.

For flexibility in high intensity and long lifetime illumination, Olympus lamphouses offer Halogen, Metal Halide, Xenon and Mercury bulb options. The apochromatic collector lens system for halogen, xenon and mercury light sources compensates for chromatic aberrations from the visible to near-infrared light.



Fiber illumination system for all reflected light illuminators.

Cold light illumination, using fiber light guides, is available for all reflected light illuminators. Fiber light illumination systems such as the LG-PS2 utilize a bright 12V100W halogen lamp.

* The type of model varies by country in use.



Fast image measurements

Measurements with the eyepiece micrometer accessory.

For simple, straightforward dimensional measurement an eyepiece micrometer (U-OSM) is available. Light and compact, it can be easily inserted into the binocular observation tube. The measuring scale, moved by a fine micrometer screw, can be positioned with high accuracy. Sample dimensions are easily calculated, dividing the measured length by the objective magnification.



Fail-safe documentation with digital and photographic systems

Digital photomicrography, versatile, fast and easy.

The cost effective / high resolution DP11 digital camera system employs a 2/3 inch, 2.5-million pixel progressive CCD to provide accurate color reproduction and images of 1284x1024 pixels. Images are confirmed via the LCD monitor on the front of the camera, making focusing and framing very easy. Image data is directly stored in the built-in SmartMedia or CompactFlash memory cards for convenient handling with a personal computer.



BX51+DP50+U-RLA2



Digital microscope camera with exceptional resolution.

The DP50's unique technology obtains highly faithful images, equivalent to 5.8 million pixels, and provides outstanding image quality in a range of modes from brightfield to fluorescence. Versatile graphic user interface software enables easy image capture and quick, convenient image filing.



Select the photomicrography system to best match your application, from brightfield to fully automatic fluorescence recording .

Match the photomicrography system to your application, choosing from the compact, high-performance PM10SP, the PM20 for brightfield to fluorescence photomicrography, and the PM30 for fully automatic fluorescence photomicrography.

Simultaneous attachment of photomicrography system and video camera.

The intermediate trinocular unit U-TRU, combined with the tilting observation tube U-TBI makes simultaneous attachment of photographic, digital or video documentation equipment possible.



Convenient magnification changer.

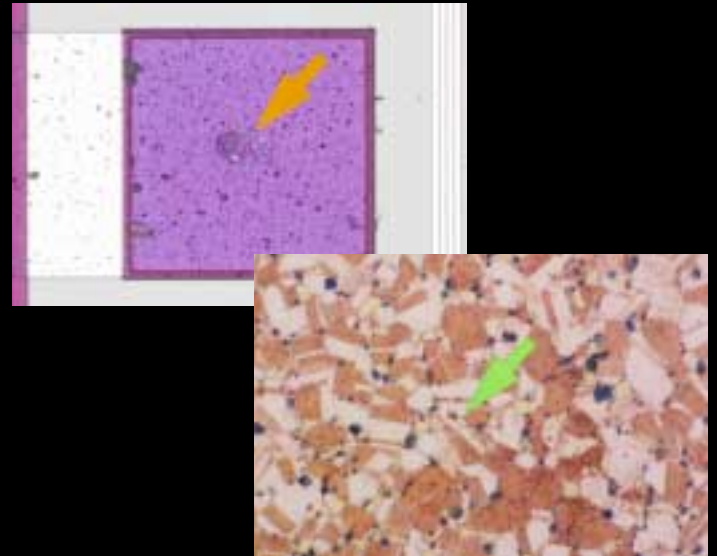
The magnification changer applies an additional 2x magnification to the image, ideal for observation at highest magnifications without changing objectives, for maintaining working distance and for framing of the smallest specimen detail.



Easy, efficient discussion facility

Discussions and teaching tasks made easy.

The arrow pointer (U-APT) is projected into the image path and becomes visible in the observation tube and on the monitor when a video camera is used. The arrow pointer can be moved via joystick and displayed in red or green with adjustable intensity to contrast against the sample. The arrow pointer assists in discussions, facilitates teaching and is captured when recording / documenting for marking of important findings, e.g. for failure analysis / QA reporting.



Multi-purpose intermediate attachment.

A multi-purpose intermediate attachment is provided for such tasks as dividing light into spectral regions, e.g. visible and infrared light, via a beamsplitter cube. It may also serve as an input port for an additional light source, or as a trinocular port for a C-mount device, such as a camera or other image-recording equipment.



Discussion tube and optical path extension.

Two observers examining the same image can communicate by using the arrow pointer and discussion tube U-DO3. The tube can also be used as an optical path extension enabling observation at a (horizontally) distant point from the optical axes.



A full product line-up for every purpose — even for special applications.

New facility for near infrared light observations

BX51/BX51M

The BX51 microscope model offers reflected and transmitted light illumination, the BX51M model offers reflected light illumination only. Both frames can accept the reflected light brightfield/darkfield illuminator BX-RLA2 or the universal illuminator, BX-URA2, which includes fluorescence capability.



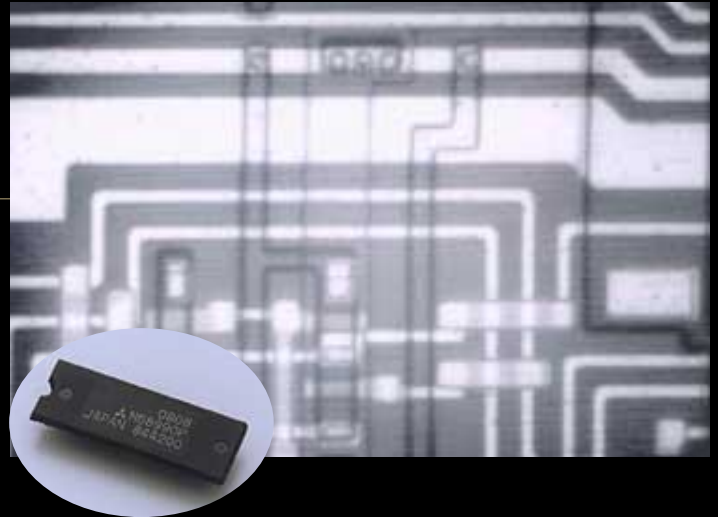
BX51M+BX-RLA2



BX51+BX-URA2

BX51/BX51M-IR

With the same microscope body and reflected light illuminator, it is possible to conduct near infrared light observations of semiconductor interiors and the back surface of a chip package as well as CSP bump inspections.



New facility for near infrared light observations

- Lineup of 5x to 100x IR objectives which compensate for aberrations from visible to near infrared light.
- Straight tube, U-TLUIR, provided to enable near infrared light observations for system-compatible.
- Corresponds to transmitted light/near infrared light observation when combined with the transmitted/reflected frame, BX51TRF.



- 1 100W mercury lamp housing for IR (U-LH100IR)
- 2 Trinocular tube for IR (U-TR30IR)
- 3 Single port tube lens with lens for IR (U-TLUIR)
- 4 Transmitted polarizer for IR (U-POTIR)
- 5 Rotatable analyzer slider for IR (U-AN360IR)
- 6 Reflected polarizer slider for IR (U-POIR)
- 7 Band path filter (1100nm) for IR (U-BP1100IR)
- 8 Band path filter (1200nm) for IR (U-BP1200IR)
- 9 Objectives for IR (LMPlan5X, LMPlan10X, LMPlan20X, LMPlan50X, LMPlan100X and MPlan100X)
- 10 Connector to couple analyser and polarizer (U-POIR accessory)



Overcoming ESD problems

BX41M-ESD

Incorporating all the basic features, the BX41M-ESD also protects electrostatically sensitive samples and other objects under examination by eliminating a possible electrostatic charge from the operator and surrounding air. This is accomplished by making the operating elements of the microscope body (BX41RF-ESD) conductive. Similarly the surface of the reflected light illuminator BX-KMA-ESD (BX41RF-ESD) and the circular ring of the revolving nosepiece (U-D6RE-ESD) are conductive.

The reduced depth of the Y-shape frame and a smaller lamp housing make the microscope more compact. An optional 30W metal halide light source offers brightness equivalent to that of a 50W halogen lamp and the convenience and savings of a 2000-hour operating life.

- ESD performance:
Surface resistance: Below 10^8 ohm
Discharge time: Less than 0.2 sec.
- Compatible with reflected light brightfield, simple polarized light and Nomarski DIC observations.



Magnetic head



- 1 BX41M-ESD body
- 2 Sextuple Nomarski DIC ESD revolving nosepiece
- 3 Brightfield ESD illuminator



Advanced features with motorized operation

BX61

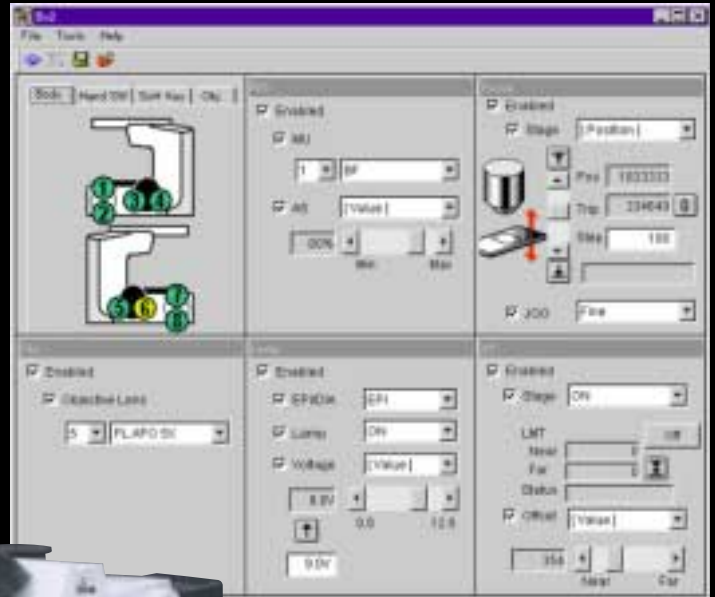
The motorized BX61 microscope is provided with automatic focus and automatic switching between reflected and transmitted light. A package of control software and macro programs enables a range of microscope operations to be performed via keypad, personal computer or palm top terminal.

- Operations such as adjusting the light path for a particular observation method, changing objective magnifications and engaging / disengaging optical components can be programmed precisely.



Complicated operation procedures can be macro-programmed to special function keys, either on the keypad or on the PC keyboard. This makes it possible to recall / reproduce specific observation conditions at the touch of a single button.

- Various motorized modules are provided, including a high-speed revolving nosepiece, a centering revolving nosepiece, a brightfield / darkfield illuminator, universal illuminator, reflected light auto focus unit and filter wheels. These modules are controlled through a key pad or through a personal computer.
- A motorized centering quintuple revolving nosepiece, allowing precise par-centricity between objectives is also provided.



Also included are the motorized brightfield/darkfield illuminator BX-RLAA, which effects automatic changeover between the two observation methods, and the motorized universal illuminator BX-RFAA, which automatically changes observation methods moving the 6 position cube turret. Equipped with a special high-speed motorized revolving nosepiece, auto focus, filter changer and macro programming of the conditions associated with particular observations, special software provides single-action control via a personal computer or other control unit.

- ① Motorized brightfield/darkfield reflected light illuminator (BX-RLAA)
- ② Motorized universal reflected light illuminator (U-RFAA)
- ③ Motorized Nomarski DIC sextuple revolving nosepiece (U-D6REMC)
- ④ Motorized Nomarski DIC quintuple BD revolving nosepiece (U-D5BDREMC)
- ⑤ Motorized centerable (quintuple) revolving nosepiece (U-P5REMC)
- ⑥ Active auto focus unit (U-AFA1M)
- ⑦ Control unit (BX-UCB)
- ⑧ Filter wheel (U-FWR)
- ⑨ Hand switch (U-HSTR2)

Advanced options for system combination

BXFM-S/BXFM

Two focusing units are available for combination with the new Olympus microscope system. The BXFM-S unit incorporates a compact reflected light brightfield illuminator with a depth of only 290mm from the optical axes to the rear of the lamp housing. The BXFM unit accommodates the reflected light brightfield/darkfield and fluorescence illuminators. Fiber illumination, with the option of external control, can be used with both models.

- A compact focus drive, fiber illuminator, motorized revolving nosepiece and tube lens unit are available for installation into the system.
- The illuminator, integrated into the microscope arm helps to facilitate installation.
- An external power source (TH4-100/200) allows remote control of light intensity adjustment and turning ON/OFF of the 100W halogen illumination via an external signal.
- Next to great image quality, flexibility of the optical system is one of the important attributes of UIS optics. Even when the distance between the objective and tube lens is altered, the superior optical design of the tube lens ensures that there is no change of magnification or image deterioration. This optical capability and flexibility is of great advantage when accommodating special needs, or when incorporating the components into inspection systems or other original equipment. In each case the highest standards of optical performance are maintained.



Setting example of fiber illuminator BXFM-A+U-KMAS+U-LGAD+LG-FS



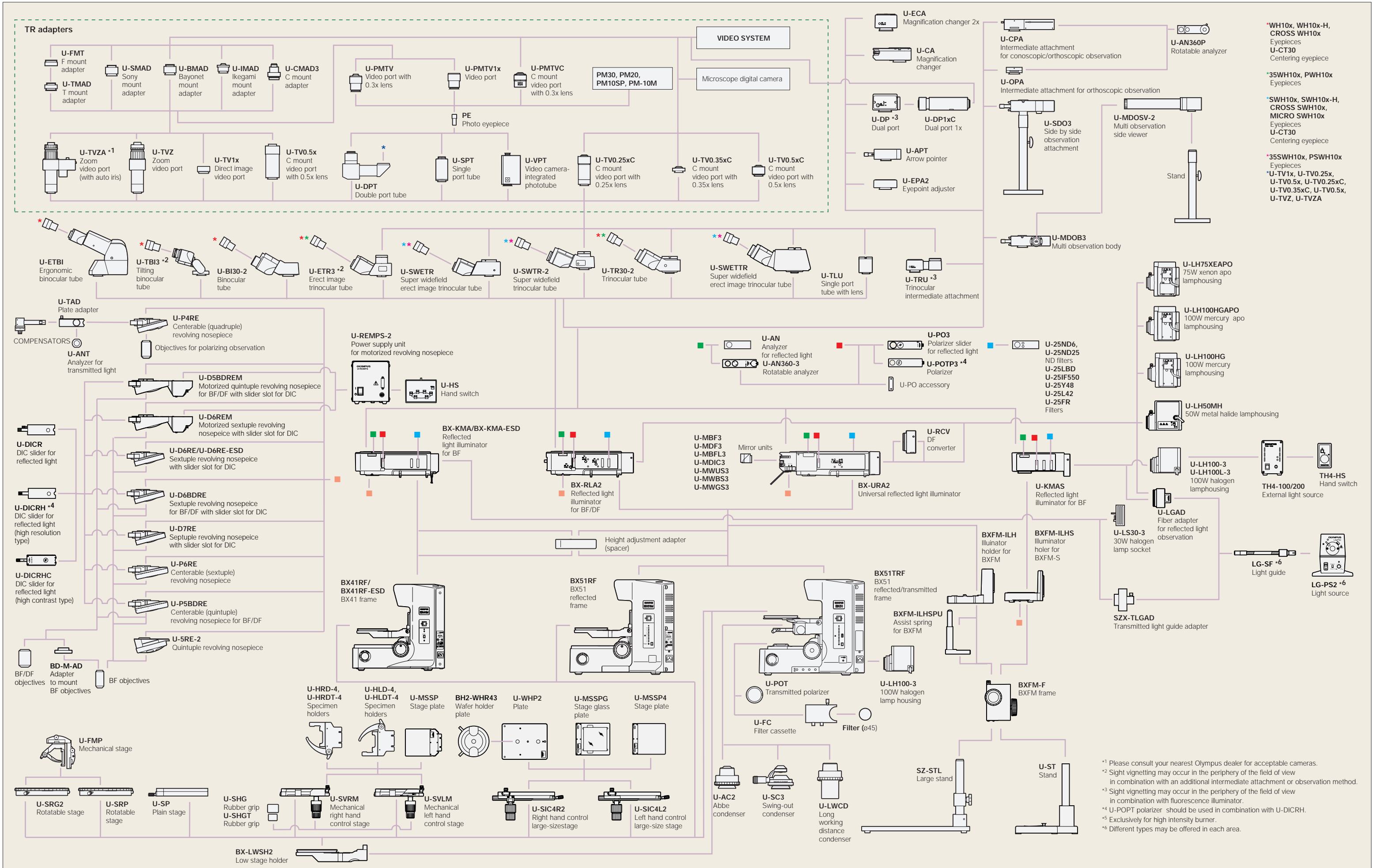
BXFM-S



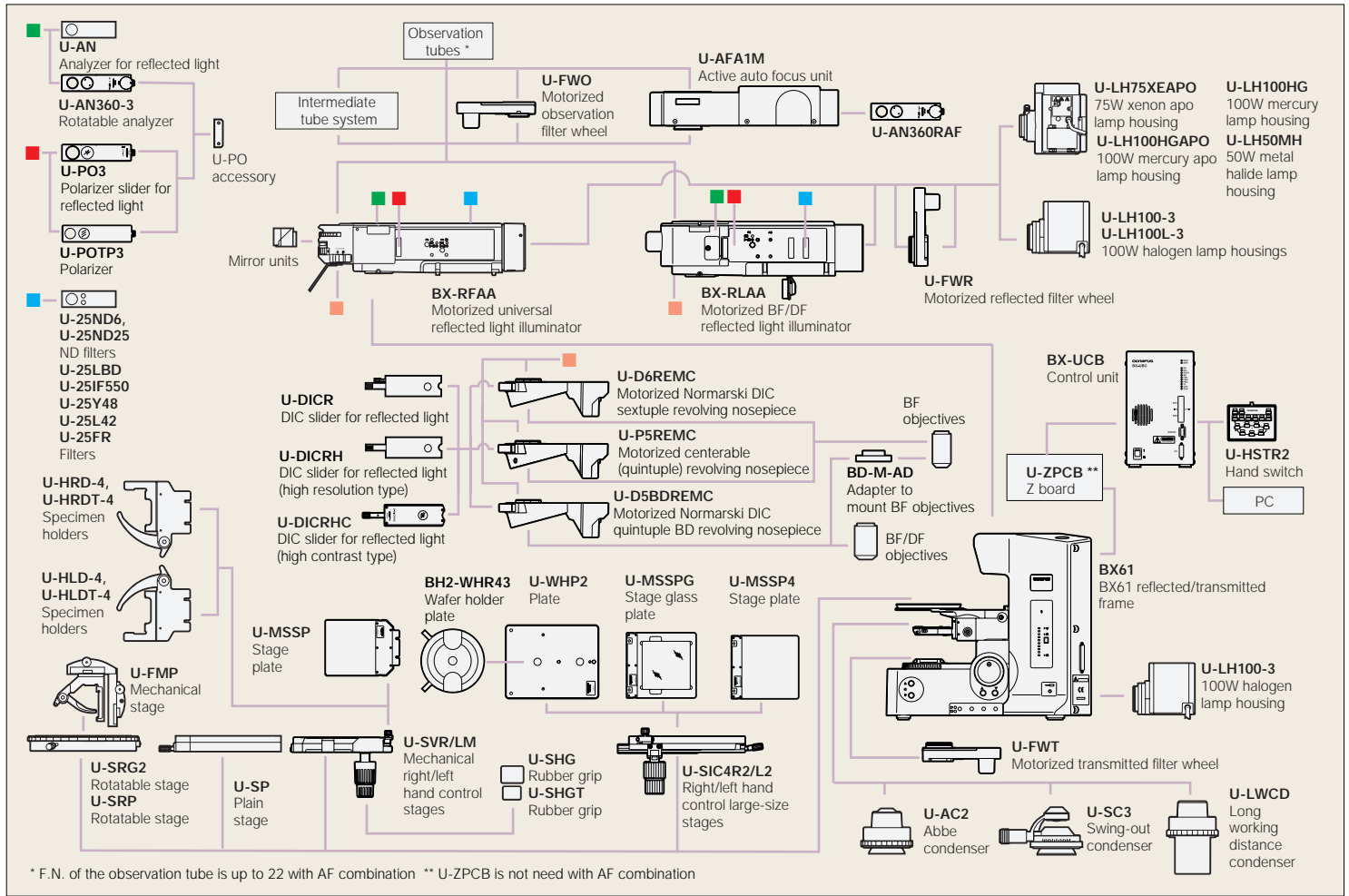
BXFM+BX-RLA2



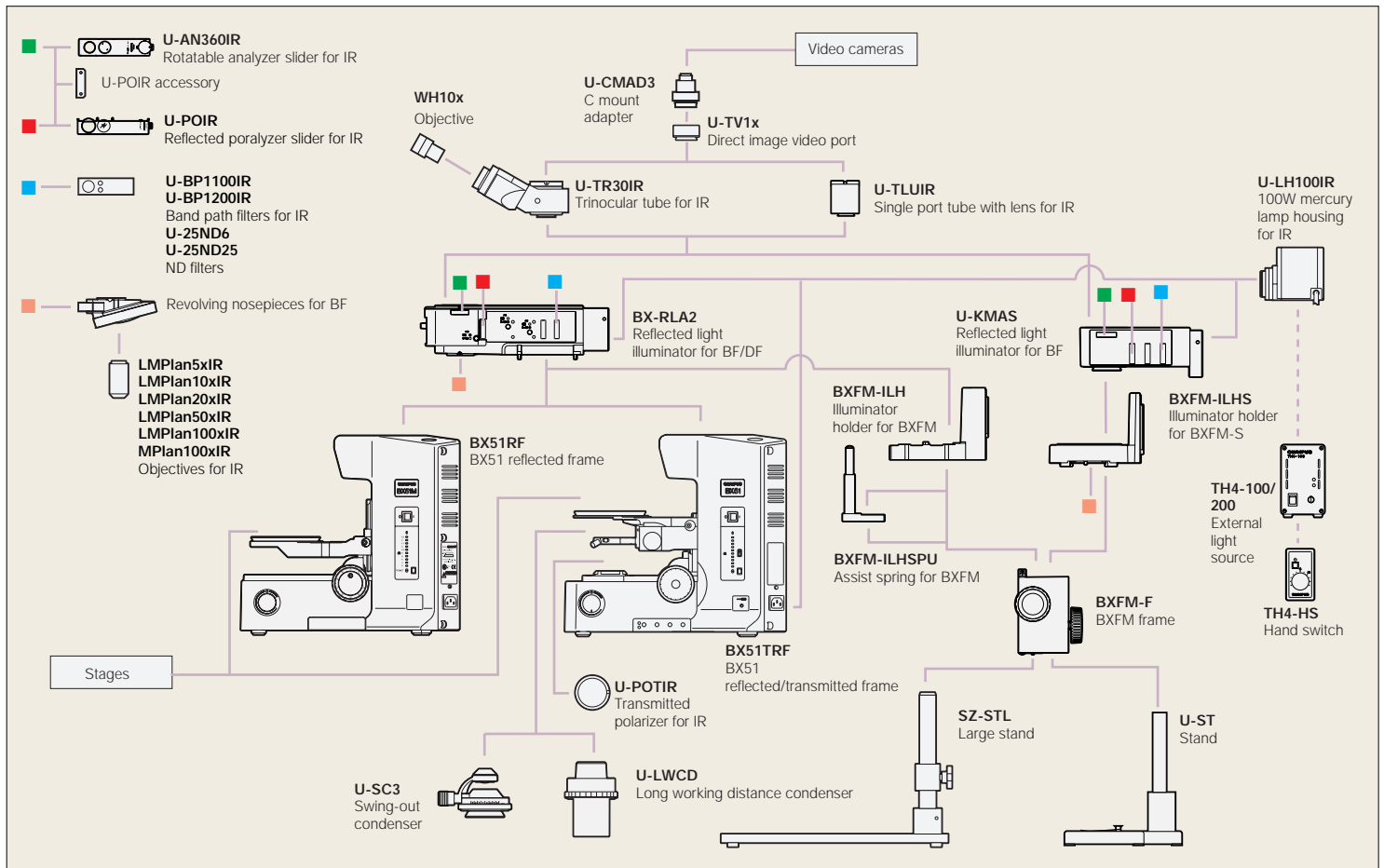
- 1 Large stand (SZ-STL)
- 2 Stand (U-ST)
- 3 BXFM frame (BXFM-F)
- 4 Illuminator holder for BXFM (BXFM-ILH)
- 5 Illuminator holder for BXFM-S (BXFM-ILHS)
- 6 Assist spring for BXFM (BXFM-ILHSPU)
- 7 Reflected light illuminator for BF (BX-KMA)
- 8 Reflected light illuminator for BF (U-KMAS)
- 9 Fiber adapter for reflected light observation (U-LGAD)
- 10 Single port tube with lens (U-TLU)
- 11 External light source (TH4-100/200)
- 12 Hand switch (TH4-HS)



MOTORIZED SERIES SYSTEM DIAGRAM



IR SYSTEM DIAGRAM



BX41M-ESD/51M/51/61 specifications

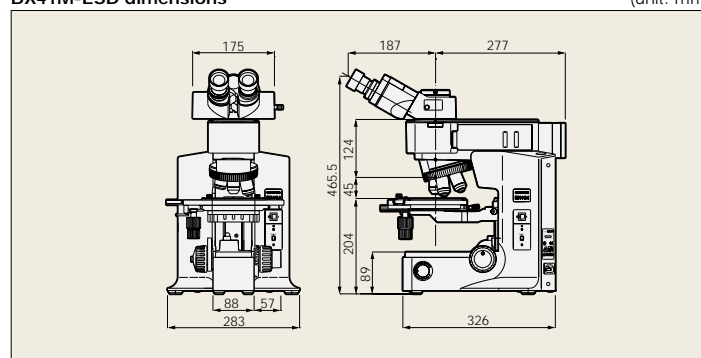
		BX41M-ESD	BX51M	BX51	BX61
Optical system	Objectives	UIS optical system (infinity-corrected)			
	Eyepieces	UIS objectives			
		UIS eyepieces			
Microscope frame	Illumination	Reflected (ESD treatment)	Reflected	Reflected/transmitted	
		Built-in 6V30W light source Light preset switch	Built-in 12V100W light source Light preset switch LED voltage indicator	Built-in 12V100W light source Light preset switch LED voltage indicator Reflected/transmitted changeover switch	External 12V100W light source Light preset switch LED voltage indicator Reflected/transmitted changeover switch
	Focus	Stroke 25mm Fine stroke per rotation 100µm Minimum graduation 1µm With upper limit stopper, torque adjustment for coarse handle			Motorized focusing Stroke 25mm Minimum graduation 0.01µm
	Maximum sample height	65mm (w/o spacer)			25mm (w/o spacer)
Observation tubes	Widefield (F.N. 22)	Inverted: binocular, trinocular, tilting binocular Erect: trinocular, tilting binocular			
	Super widefield (F.N. 26.5)	Inverted: trinocular Erect: trinocular, tilting trinocular			
Reflected light illumination	BF etc.	BX-KMA-ESD 30W halogen BF/DIC/KPO ESD treatment applied	BX-RLA2 100W halogen (high intensity burner, fiber illuminator mountable) BF/DF/DIC/KPO FS, AS (with centering mechanism), BF/DF interlocking ND filter	BX-RLAA Motorized BF/DF changeover Motorized AS	
	Reflected fluorescence	—	BX-URA2 100W mercury lamp, 75W xenon lamp 50W metal halide lamp 6 position mirror unit turret (standard: WB, WG, WU+BF etc) with FS, AS (with centering mechanism), with shutter mechanism	BX-RFAA Motorized 6 position turret Built-in motorized shutter With FS, AS	
Transmitted light		—			100W halogen Abbe/long working distance condensers Built-in transmitted light filters (LBD, ND25, ND6)
Revolving nosepieces	For BF	Sextuple with ESD treatment	Sextuple, centering sextuple, septuple (motorized sextuple: optional)		Motorized sextuple, centering quintuple
	For BF/DF	—	Quintuple, centering quintuple, sextuple (motorized quintuple optional)		Motorized quintuple
Stages		Coaxial left(right) handle stage: 76(X)x52(Y)mm, with torque adjustment Large-size coaxial left (right) handle stage: 110(X)x105(Y)mm, with lock mechanism in Y axis			

BXFM specifications

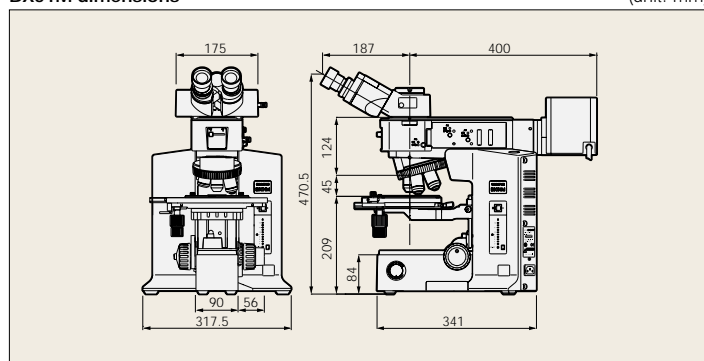
		BXFM	BXFM-S
Optical system	Objectives	UIS optical system	
	Eyepieces	UIS objectives	
		UIS eyepieces	
Observation tubes		UIS observation tubes	
Revolving nosepieces		UIS revolving nosepieces	
Microscope frame		Stroke 30mm, rotation of fine focus knob: 200µm, minimum adjustment gradation: 2µm, with torque adjustment for coarse knob	
Illuminators	BX-RLA2: 100W halogen, etc. BF/DF/DIC/KPO	BX-KMAS: 100W halogen fiber illumination BF/DIC/KPO	
	BX-URA2: 100W mercury lamp, etc. fluorescence illuminator		

BX41M-ESD dimensions

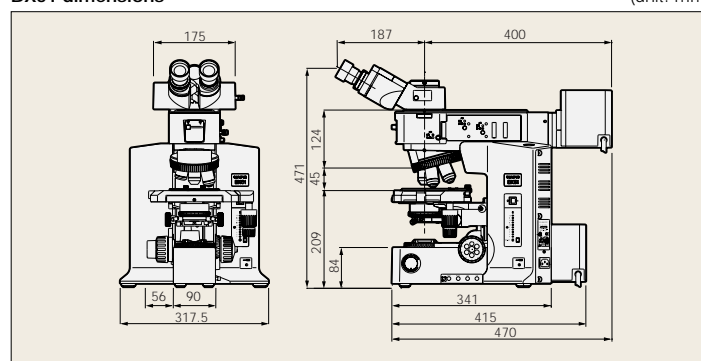
(unit: mm)


BX51M dimensions

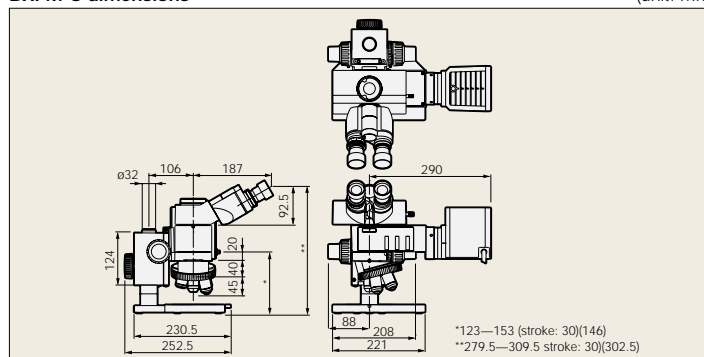
(unit: mm)


BX51 dimensions

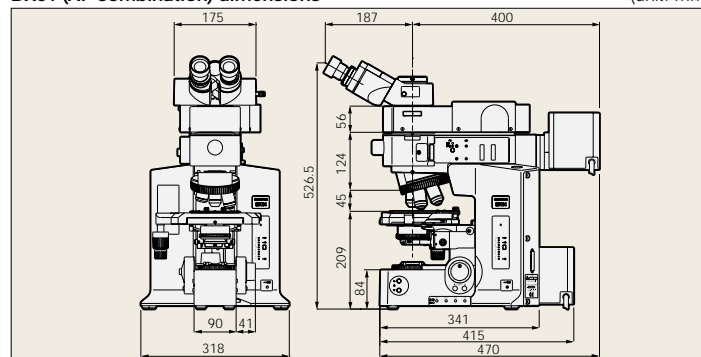
(unit: mm)


BXFM-S dimensions

(unit: mm)


BX61 (AF combination) dimensions

(unit: mm)





Web site address: <http://www.olympus.com>

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Olympus business areas

	Medical and health-care area
	Imaging and information area
	Industrial applications area



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