

Axio Imager 2

Flexibility Meets Progress

The best tools for biomedical sciences and for material applications. The new Axio Imager product generation will convince you with its outstanding performance, brilliant optics and maximum convenience in all applications.

Axio Imager 2: a leap forward in quality and economy

More flexibility for greater performance: From observation and documentation to complex analysis, the new Axio Imager product generation offers six stand configurations for biology and medicine and four for materials science. They can be adapted to precisely fit your application by means of individual system components. What they all have in common are pioneering features and technical innovations that ensure reliable and successful results.

- Excellent optics and homogeneous illumination in fluorescence, reflected-light and transmitted-light
- Encoding: all important parameters are stored for later use
- Motorization for reproducible settings
- Preconfigured stand configurations for a wide range of applications

Whether you are working in the field of biology, medicine or materials science, with Axio Imager 2 you are ready to meet your growing needs.



The Future-oriented Imaging Platform for Biomedical Research and Materials Science



We make it visible.

Flexibility for Life Sciences: Explore Life in All Dimensions

The diversity and complexity of tasks grow and so do the requirements placed on microscope technology as well. To be able to respond to changes quickly, systems are required that feature powerful components and can be equipped individually. With a range of applications that leaves all your options open, Axio Imager 2 precisely offers you the application that you need.

Axio Imager.A2 LED: high-level basic configuration

The basic version of the new product family is the optimum choice for examining specimens in transmitted-light brightfield. An LED light source for Fixed-Koehler illumination is a standard feature and guarantees a constant color temperature across the entire intensity range. If necessary, fluorescence or DIC can be upgraded at any time. The light manager stores the brightness settings for each magnification separately: an extremely convenient solution for sophisticated routine and research applications.

Axio Imager.A2: Koehler illumination for flexible contrasting techniques

Users who perform more applications using transmitted-light allowing Koehler illumination are best served by the traditional halogen illumination offered by Axio Imager.A2. In addition to transmitted-light brightfield,

this stand also allows Phase Contrast, darkfield, and DIC as well as reflected-light fluorescence at all magnifications. When you are acquiring images with a camera, the color temperature can be kept constant across a wide intensity range using neutral density filters. Light and contrast settings can be stored in the light manager.

Axio Imager.D2: more convenience in fluorescence applications

For more demanding applications, a motorized 6- or 10-position reflector turret is available for this stand. Like all Axio Imager 2 stands, this variant is also encoded. Axio Imager.D2 is particularly suited to applications such as Multi-color FISH involving a number of different fluorescent markers, for which corresponding single, double or multiple filter sets are used in quick succession. For optical sections, Axio Imager.D2 can also be equipped with ApoTome.



Axio Imager.A2 LED



Axio Imager.A2



Axio Imager.D2

Increased Functionality for Materials Science: Stay Focused on Your Application

Axio Imager 2 is the microscope platform for all applications in the fields of materials analysis, materials development and quality control. It is available in four configurations – from encoded to fully motorized stands. Technology that provides the best possible support for your application and delivers quick and reliable results.

Axio Imager.A2m: the flexible basic configuration

This basic stand for simple documentation, measurement, and analysis in materials microscopy can be used for applications that do not require motorization. Typical areas of application include quality control, inspection or measurements. Thanks to the stand's encoding, key microscope parameters can be acquired by the AxioVision software. The objective and total magnification, contrasting technique and brightness settings are stored and can be retrieved at any time.

Axio Imager.D2m: epi-fluorescence and reflected-light brightfield easily combined

Axio Imager.D2m can be partially motorized and has been developed for more sophisticated requirements in material applications. With a motorized 6- or 10-position reflector turret and in combination with a motorized

switching mirror for two lamps, it is also possible for fluorescent samples to be analyzed conveniently in either reflected-light brightfield or fluorescence.

Axio Imager.M2m: operating comfort and reproducibility

This is the high-performance stand for demanding quality control, R&D and failure analysis applications performed in reflected-light. Its motorized focus drive makes Axio Imager.M2m ideal for complex applications such as topographic analyses of silver strip conductors on silicon solar cells. Thanks to the motorized reflected-light beam path, all light and contrast settings are repeatable. This instrument, which is equipped with a touchscreen for displaying the microscope status and controlling the motorized components, guarantees a high degree of operating comfort and reproducibility. And the integrated user administration mode means that work can be managed simply and clearly – even in a multi-user environment.



Axio Imager.A2m



Axio Imager.D2m



Axio Imager.M2m

Axio Imager.Z2m: the pinnacle in performance for the toughest challenges during continuous operation

The Axio Imager.Z2m research platform can be fully motorized and perfectly equipped to cope with complex research and routine applications in which requirements change. As a microscope platform within the Particle Analyzer system, Axio Imager.Z2 can perform cleanliness analysis with extremely high precision. This stand is available with a motorized reflected-light beam path and also, as an option, with a motorized transmitted-light beam path. Reproducible illumination and contrast setting is possible thanks to the motorized features of this microscope. A motorized focus, which performs accurate focus movements even with heavy materials samples, guarantees maximum precision. It is also ideal for continuous operation, e. g. for the automatic examination of large numbers of specimens.

Axio Imager 2 for polarization microscopy: modularity means versatility from A to Z

From Axio Imager.A2 to Axio Imager.Z2, each stand within the new product generation is suitable for polarized light microscopy. Axio Imager delivers reliable results with the best image quality in all polarized light microscopic analyses from mineral and structural characterizations to conoscopic analyses. Thanks to the modular system architecture, the instruments can be equipped flexibly and individually and can be easily expanded as your requirements grow. From mineralogy, crystallography, geology, and the glass and building materials industries to the fiber and textile industries, Axio Imager 2 can be used with polarization across all areas of application.



Axio Imager.Z2m



Axio Imager.A2 for polarization



Axio Imager.Z2 for polarization

**Axio Imager.M2p:
geared for perfect pathology**

This variant of Axio Imager.M2 has been specifically tailored to the needs of pathologists. Equipped with an encoded nosepiece and a motorized focus drive, this stand has been designed to allow convenient, efficient, and ergonomic use of the microscope at a high sample throughput rate. When switching between overview and detail magnification, the parfocal adjustment function automatically sets the optimal focus position. The contrast manager, in conjunction with the motorized condenser, always adjusts the right contrast settings from overview and higher magnification. This makes the evaluation process convincingly quick and easy.

**Axio Imager.M2: well-designed operating concept
with touchscreen TFT**

Preconfigured with motorized transmitted-light beam path and focus drive and operated via a touch-sensitive TFT display or directly on the microscope, Axio Imager.M2 offers a substantially higher level of convenience and performance in every detail. The system is ideal for analyzing and documenting specimens using different transmitted-light contrasting techniques with reproducible settings. The automatic switching between reflected-light and transmitted-light contrasting techniques as well as their compatibility enables Axio Imager.M2 to be used in applications at the boundary between the areas of biomedicine and materials science. Typical experiments are

for example the combination of fluorescent markers, such as DAPI, FITC, and Rhodamine, with DIC in transmitted-light. Options for scanning stages allow full mosaic tiling and ApoTome allows for structured illumination based on optical sectioning, thus expanding the flexibility of imaging modalities.

**Axio Imager.Z2:
the imaging platform that meets highest demands**

Axio Imager.Z2, the flagship of the new product family, can rise to any challenge. It has been developed for continuous operation in high-end research. The integrated user administration means that work can be managed simply and clearly – even by large groups. If you want to analyze large numbers of samples automatically overnight or achieve accurate focus movements over long periods using large scanning stages, Axio Imager.Z2 will be the perfect choice. It can be controlled using buttons directly on the microscope or by means of the TFT display. The docking station allows you to control all motorized components remotely. And, when it comes to imaging, the motorization of the microscope guarantees definable and reproducible illumination and contrast settings. A particular highlight of Axio Imager.Z2 is the motorized DIC turret for combining transmitted-light DIC with fluorescence. This swings the DIC prism out of the beam path automatically as soon as you start the acquisition of a fluorescence image to ensure artifact free imaging.



Axio Imager.M2p



Axio Imager.M2



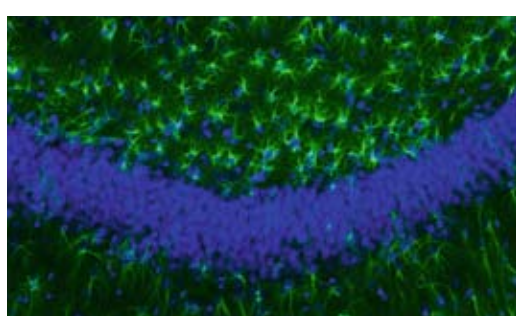
Axio Imager.Z2

Stand	Standard Equipment	Options*	Fields of Application	Materials	Applications
A2 LED	<ul style="list-style-type: none"> LED – Fixed-Koehler illumination transmitted-light Light manager Encoded Reproducible light intensity settings 	<ul style="list-style-type: none"> Transmitted-light beam path with manual filter wheel Reflected-light beam path ApoTome Encoded stage 	<ul style="list-style-type: none"> Pathology Histology Cytology 	<ul style="list-style-type: none"> Histological staining Antibody staining Fluorescence-In-Situ-Hybridization (FISH) Live cell staining on samples of <ul style="list-style-type: none"> - living cells - fixed cells - tissue sections - Whole-mount samples 	<ul style="list-style-type: none"> Evaluation Fast routine work
A2	<ul style="list-style-type: none"> Universal stand transmitted-light Light manager Encoded Reproducible light intensity settings Neutral density filter wheel 	<ul style="list-style-type: none"> Reflected-light beam path ApoTome Encoded and 2-plate scanning stages 	<ul style="list-style-type: none"> Biosciences research Medical sciences research Industrial research Bio-material research 		<ul style="list-style-type: none"> Observation Image acquisition and reporting Interactive measurements
D2	<ul style="list-style-type: none"> Universal stand transmitted-light Encoded Partly motorizable: reflector turret 	<ul style="list-style-type: none"> Reflected-light beam path Reflector turret 6x or 10x ApoTome Encoded and 2-plate scanning stages 	<ul style="list-style-type: none"> Human Genetics Animal Genetics FISH-applications 		<ul style="list-style-type: none"> Evaluation Image acquisition and reporting Semiautomatic measurements
M2p	<ul style="list-style-type: none"> LED – Fixed-Koehler illumination transmitted-light Convenience motorization: parfocality, condenser Encoded nosepiece Motorized z-drive with 25 nm step size 	<ul style="list-style-type: none"> Transmitted-light beam path with motorized luminous field diaphragm Reflected-light beam path TFT ApoTome LSM (entry level) 2- and 3-plate scanning stages 	<ul style="list-style-type: none"> Pathology Histology Cytology 		<ul style="list-style-type: none"> Evaluation Image acquisition and reporting Fast routine work Confocal Imaging (entry level)
M2	<ul style="list-style-type: none"> Universal stand transmitted-light Motorized: luminous field diaphragm Light manager Contrast manager Motorized z-drive with 25 nm step size 	<ul style="list-style-type: none"> Reflected-light beam path ACR for objectives ApoTome 2- und 3-plate scanning stages 2 TV tube motorized 	<ul style="list-style-type: none"> Biosciences research Medical sciences research Industrial research Bio-material research 		<ul style="list-style-type: none"> Automatic image acquisition and analysis 3D Imaging Medium sample throughput Multi-user environment
Z2	<ul style="list-style-type: none"> High-performance stand transmitted-light Motorized: luminous field diaphragm Light manager Contrast manager Motorized high performance focus drive: <ul style="list-style-type: none"> - 10 nm step size - designed for loads up to max. 9 kg - designed for permanent operation 	<ul style="list-style-type: none"> Reflected-light beam path ACR for objectives and filter cubes ApoTome 2- and 3-plate scanning stages LSM 	<ul style="list-style-type: none"> Biosciences research Medical sciences research Industrial research Bio-material research 		<ul style="list-style-type: none"> Automatic image acquisition and analysis Certified image acquisition and archiving (CFR 21 Part 11) 3D Imaging DIC-Fluorescence Imaging Confocal Imaging High sample throughput Multi-user environment

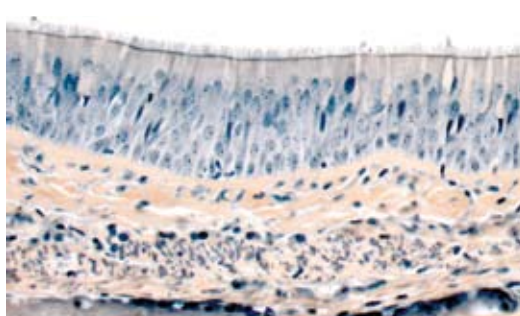
* for imaging, reporting, interactive measurements, image analysis, and automation tasks:

- AxioCam

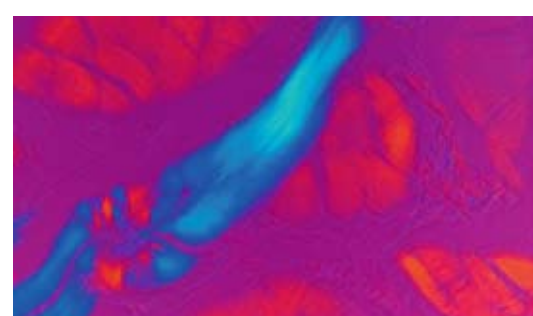
- AxioVision modules: Multidimensional Image Acquisition, Physiology module, Interactive Measurement, Image Analysis modules, Commander module, VBA module



Hippocampus (rat), Multichannel Fluorescence
Objective: C-APOCHROMAT 10x/0,45



Trachea – brush border with microvilli (human)
Objective: Plan-APOCHROMAT 20x/0,8



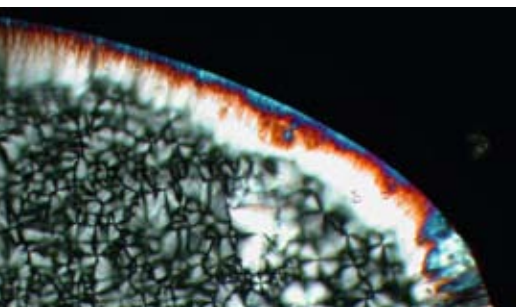
Muscle (mouse)
Objective: EC Plan-NEOFLUAR 40x/0,75

Stand	Standard Equipment	Options*	Fields of Application	Materials	Applications
A2m	<ul style="list-style-type: none"> • Universal stand reflected-light, manual • Light control • Encoded 	<ul style="list-style-type: none"> • Transmitted-light manual • Encoded and motorized stages 	<ul style="list-style-type: none"> • Quality control • Quality assurance • Process control • Damage analysis • Fast routine • Multi-user operation • Research and development 	<ul style="list-style-type: none"> • Steel/iron • Non-iron metals • Ceramics • Compound materials • Polymers • Construction materials • Wood/paper/cellulose • Glass/porcelain • Coal • Petrography materials • Solar cells • Semi conductors • Electronic components 	<ul style="list-style-type: none"> • Texture and structural analysis <ul style="list-style-type: none"> - Pore analysis - Phase analysis - Grain size determination - Cast iron analysis • Purity determination: i. e. non metallic inclusions in steel • Surface analysis: inter alia testing of coatings • Particle analysis: residual dirt analysis of filters
D2m	<ul style="list-style-type: none"> • Universal stand reflected-light, manual • Light control • Encoded • Partly motorizable 	<ul style="list-style-type: none"> • Transmitted-light manual • Reflector turret mot. 6x und 10x • Motorized switching mirror • Encoded and motorized stands 			
M2m	<ul style="list-style-type: none"> • Universal stand motorized: <ul style="list-style-type: none"> - Luminous field diaphragm - Filter wheels • Light control • Contrast manager • Reproducible settings • Motorizable z-focus with 25 nm stepsize 	<ul style="list-style-type: none"> • Transmitted-light manual • ACR objectives • Motorized switching mirror • Motorized stages, heating/cooling stages • 2 TV tube mot. • LSM • Mixed light 			
Z2m	<ul style="list-style-type: none"> • Universal stand, reflected-light path motorized: <ul style="list-style-type: none"> - Luminous field stop - Filter wheels • Light control • Contrast manager • Mot. heavy duty focus: <ul style="list-style-type: none"> - z-focus with 10 nm stepsize - Designed for loads up to 9 kg - Designed for permanent use 	<ul style="list-style-type: none"> • Transmitted-light motorized • ACR objectives and reflector modules • Scanning stages • Motorized switching mirror • 2 TV tube mot. • LSM • Mixed light 			
A2, D2, M2, Z2, A2m, D2m, M2m, Z2m	All stands of the AxioImager 2 can be equipped for polarization microscopy with centerable objective revolver pol, rotatable stage and other polarization accessories.	Depending on the chosen stand: see respective line above			

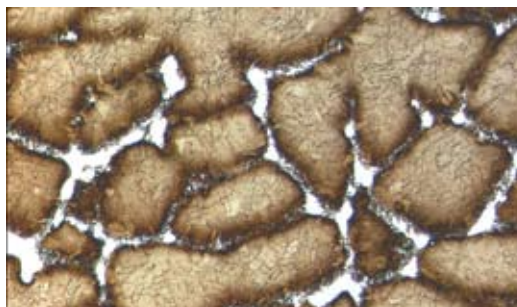
* for documentation, measuring tasks and analysis:

- AxioCam

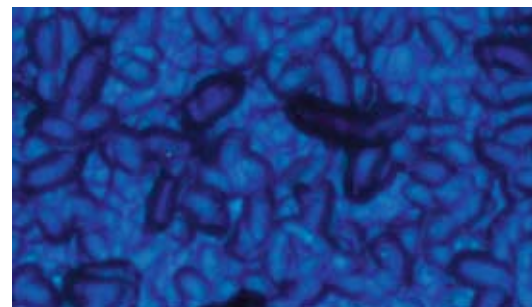
- AxioVision modules: Interactive measurement, AutMess, Particle Analyzer, Graphite, Grains, Phase, Non-metallic inclusions, Linkam heating stage control



Liquid-crystalline phase of $[C_{14}mim]Br$
Polarization contrast
EC EPIPLAN 10x/0.20 at 100 °C in a THMS600
Linkam heating stage
Anna Getsis and Anja-Verena Mudring, Faculty of Chemistry and Biochemistry, Solid-State Chemistry and Materials, Ruhr University Bochum, Germany



Maraging steel recast structure, nital etch with white, unetched areas
Differential Interference Contrast
EC Epiplan-NEOFLUAR, 50x/0.80
Sébastien Reymann, University of Applied Sciences, Materials Engineering Working Group, Aalen, Germany

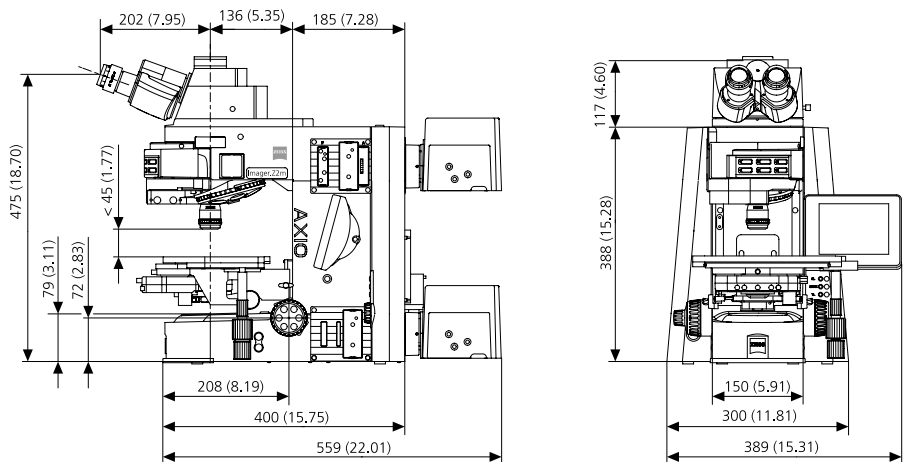


Polycrystalline silicon solar cell
Brightfield
EC EPIPLAN 100x/0.75
Carl Zeiss MicroImaging GmbH, Light Microscopy, Göttingen, Germany

Axio Imager 2 – Flexibility for all application areas

Component	Option	A2 LED	A2	M2p	M2	D2	Z2	A2m	M2m	D2m	Z2m
Stand	manual	+	+	-	-	+	-	+	-	+	-
	motorized	-	-	+	+	O*	+	-	+	O*	+
Encoding	readout by computer	+	+	+	+	+	+	+	+	+	+
Tube lens turret	encoded	O	O	O	O	O	O	O	O	O	O
	motorized	-	-	O	O	-	O	-	O	-	O
Reflector turret	6x encoded	O	O	O	O	O	O	O	O	O	O
	6x motorized	-	-	O	O	O	O	-	+	O	O
	6x motorized ACR	-	-	-	-	-	O	-	-	-	O
	10x motorized ACR**	-	-	-	-	O	O	-	-	O	O
Nosepiece	6x encoded POL	O	O	-	O	O	O	O	O	O	O
	6x encoded HD DIC	O	O	-	O	O	O	O	O	O	O
	6x motorized HD DIC	-	-	-	O	-	O	-	O	-	O
	6x motorized HD DIC ACR	-	-	-	O	-	O	-	O	-	O
	7x encoded HD	O	O	+	O	O	O	O	O	O	O
Modulator turret for C-DIC/TIC	7x motorized HD	-	-	-	O	-	O	-	O	-	O
	manual	O	O	O	O	O	O	O	O	O	O
Modulator turret for DL- DIC	motorized*****	-	-	-	O	-	O	-	O	-	O
	motorized*****	-	-	-	-	-	O	-	-	-	O
Stage carrier with condenser carrier, detachable	0 mm - 25 mm sample height	+	+	+	+	+	O	O	O	O	O
Stage carrier detachable, for attachable condenser carrier	0 mm - 45 mm sample height	O	O	O	O	O	O	O	O	O	O
Stage carrier reflected-light, detachable	0 mm - 63 mm sample height	O	O	O	O	O	O	O	O	O	O
Transmitted-light beam path	manual	-	+	-	-	+	-	O	O	O	O
	motorized	-	-	-	+	-	+	-	-	-	O
LED transmitted-light	-	+	O	+	O	O	O	O	O	O	O
Double filter wheel transmitted-light	manual	-	+	-	O	O	O	O	O	O	O
	motorized	-	-	-	O	-	O	-	-	-	O
Reflected-light beam path	manual***	O	O	O	O	O	O	+	-	+	-
	motorized***	-	-	-	-	-	O	-	+	-	+
Luminous field stop slider reflected-light	manual	O	O	O	O	O	O	+	O	+	O
	motorized	-	-	-	-	-	O	-	O	-	O
Aperture stop slider reflected-light	manual	O	O	O	O	O	O	O	O	O	O
	motorized	-	-	-	-	-	O	-	O	-	O
Double filter wheel reflected-light	manual	O	O	O	O	O	O	O	O	O	O
	motorized	-	-	-	O	-	O	-	O	-	O
Fluorescence attenuator	manual	O	O	O	O	O	O	O	O	O	O
	motorized	-	-	-	-	-	O	-	O	-	O
Lamp switch reflected-light/transmitted-light	manual	+	+	-	-	+	-	+	-	+	-
	software	-	-	+	+	-	+	-	+	-	+
Mixed light with additional external power supply	manual	+	+	-	-	+	-	+	-	+	-
	software	-	-	+	+	-	+	-	+	-	+
Focus (z-axis)	manual	+	+	-	-	+	-	+	-	+	-
	motorized 25 nm step size	-	-	+	+	-	-	-	+	-	-
	High Performance Focus motorized 10 nm step size	-	-	-	-	-	+	-	-	-	+
TFT display	-	-	-	O	+	-	+	-	+	-	+
ApoTome	-	O	O	O	O	O	O	O	O	O	O
Power supply	external	-	-	+	+	-	+	-	+	-	+
	internal	+	+	-	-	+	-	+	-	+	-
Mechanical stage CAN	motorized****	O	O	O	O	O	O	O	O	O	O
Scanning stages	Piezo	O	O	O	O	O	O	O	O	O	O
	DC / stepper motors	O	O	O	O	O	O	O	O	O	O
Fast z-piezo insert	with manual stage	O	O	O	O	O	O	O	O	O	O
	with scanning stage	O	O	O	O	O	O	O	O	O	O
2 TV tube head motorized	-	-	-	O	O	-	O	-	O	-	O
Condenser	manual	O	O	O	O	O	O	O	O	O	O
	motorized	-	-	O	O	-	O	-	O	-	O

- + = Included in stand
- O = Optionally available
- = Not available
- * = Motorized (6x und 10x) reflector revolver can be used
- ** = ACR function not possible with Axio Imager.D1 and D1m
- *** = A motorized shutter is included in every reflected-light illumination. For fluorescence applications this can optionally be replaced by a high speed shutter
- **** = For the use at the Axio Imager.A2 LED, A2, A2m, D2, and D2m an USB-CAN converter 432909 is required
- ***** = Only in combination with motorized objective nosepiece
- m = Optimized for materials applications



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