



Redefining Perfection and Precision  
**Upright Inspection Microscopes**

**PA53-MET SERIES**  
Motic Scientific Instruments

# MOTIC = Optical + Solution

A combination of high-technology and creativity, the Motic PA53-MET series offers superior optical performance as well as an advanced ergonomic design, futuristic digital capabilities, and innovative modules. Motic PA53-MET: Your ultimate metallurgical Optical Solution.



PA53MET-BD



PA53MET-BD-T

The PA53-MET features superior optical performance and next-generation technology.

### **Superior Optical Performance**

Expertly designed, carefully crafted, high-performance Motic objective lenses provide excellent clarity in any observation environment. Experience this high optical performance for yourself and find out why so many top researchers, inspectors, and technicians praise the quality of Motic Scientific Instruments products.

### **Intelligent, Sleek Design**

Advanced ergonomic design, compact size, carefully sourced high-quality materials, and versatile digital capabilities ensure minimal operator fatigue during extended periods of operation.

### **Innovative Module Design**

The compact size of the PA53-MET minimizes required installation space. Interchangeable individual modules meet the needs of any application. You can select the appropriate optional accessories for your task: reflected light illuminators, transmitted light illuminators, XY stage, Z-axis, etc.



PA53MET-BD-3D

# PA53MET – A Flexible, High-Performance Optical System for a Large Array of Inspection Tasks.

Clear and vivid images are provided through objective lenses and illuminators of the finest quality which have been designed with aspheric lenses.

A variety of observation methods make it easier for the operator to obtain the required images for a range of applications.







## Customizable Optics and Lighting Systems

### Reflected Light Illuminator

The reflected light illuminator provides a variety of observation methods such as BF, BF/DF or DIC to meet all user needs.

### Combined Switch for BF/DF and ND Filter

With the BF/DF converter switch on the front, it is easier to change observation modes. The interlocking ND filter protects the operator's eyes against dramatic changes in brightness,

### Polarizer and Analyzer Filters

A set of polarizer and analyzer filters help you switch from the DIC/POL to other observation modes quickly and easily. These filters are designed as sliders and are accessible from either side of the microscope for maximum convenience.

### Optimal DIC with High Quality Imaging

Using a DIC slider with a single prism, Nomarski DIC observation mode offers easy switching to other observation modes and facilitates observations on any range of magnifications because the position of the DIC prism remains constant.

### Transmitted Light System

ND6, ND25 and LB filters are built in for the observation of samples via transmitted light. This allows for the best possible image clarity for the intended application in conjunction with the condenser.

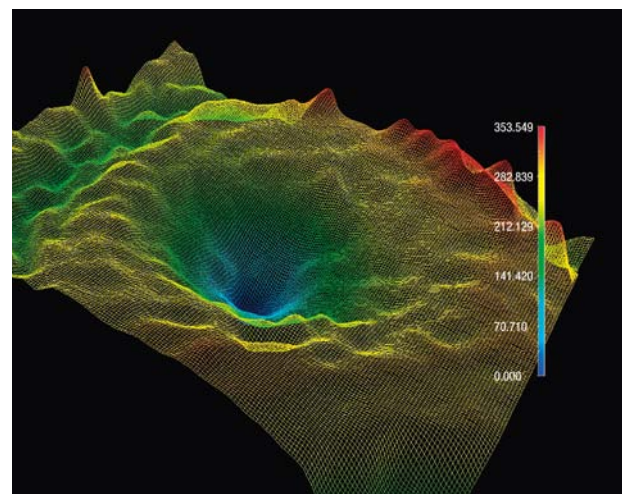
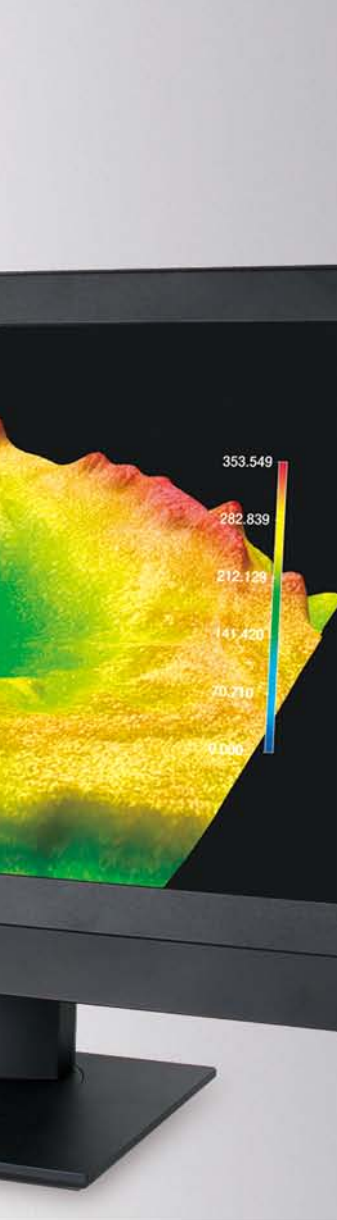
## With Innovative Design, the PA53MET-3D Provides Clear and Accurate Results.

Simple acquisition of 3D images is achievable through Z-axis control.

The control pad helps with quick and accurate adjustment of the focus.

Accurate 3D measurements and analysis are provided by capturing 2D images combined with software analysis.





Amazing results generated through the use of a highly accurate, user-friendly 3D Profiling System.

### Z-Axis Profiler

Z-axis autofocus assists with the simple acquisition of 2D images with samples of varying focal depths. The Z-axis profiler features topographic analysis and 3D profiling through our Motic Analysis software, which generates a composition of all the 2D images into 3D profiles.

### Z-axis Module Specifications

Stroke Distance	30 mm	Dimensions	W:240 mm
Resolution	0.01 $\mu\text{m}$		D:157 mm
Repeatability	0.5 $\mu\text{m}$		H:202.5 mm
Max Speed	1.4 mm/s	Load capacity	15 kg
Weight	5 kg		

### Convenient Control Pad

To help check height at a glance, a display window is positioned in the front. 8 speed settings for controlling z-axis movement allow for precise and quick focusing. A large emergency stop button is also placed on the pad to immediately protect samples in unexpected situations.





## Excellent Optical Performance Provides High-Resolution Images.

With superior color reproduction, high accuracy, minimal optical loss, and zero aberration, you are invited to experience truly excellent optical performance, comparable and in many cases even superior to any leading manufacturer's optical image quality.

Improved images are guaranteed under any required observation mode.







From simple measurements to complicated analyses, our superior optical performance fulfills your needs.

#### **Superior Color Reproduction**

Motic's advanced optical design and lens coating technologies converge to create high quality semi-apochromatic objective lenses. These lenses offer improved resolution and superior color reproduction that are faithful to the original samples.

#### **Complete Removal of Aberration and Flare-Free**

Plan semi-apochromat objective lenses offer the world's best image quality and feature spherical aberration correction. Flare is minimized by anti-reflective processing inside the objective lenses.

#### **Accurate Parcentric Objective Lenses**

Decentration occurs when using different magnification objective lenses. This is minimized by the improved precision-processed objective lenses and nosepiece. The image is kept within the center of view even when observing with a digital camera.

#### **Comfortable Eyepiece**

In order to reduce eyestrain, PA53-MET eyepieces have an extra wide 25mm field number. The 20° angled head provides a comfortable viewing position. In addition, the prism is designed to minimize optical loss.

# Intelligent, Convenient Features. Enhanced Work Performance and Operator Satisfaction.

Adaptable features ensure any potential future requirements can be fulfilled with ease. The optimized system and various digital functions enable routine tasks to be carried out efficiently and effectively.





## High-Speed, High-Efficiency, and Intelligent Functionality from our Latest Digital Technology.

### **Convenient, Multi-Function Illumination Selection Knob**

Enhanced work efficiency and convenience are achieved through the development of a versatile selection knob combining all functionality needed for reflected/transmitted illumination as well as brightness control.

### **Illumination Selection Indicator**

Reflected/Transmitted Illumination, Max/Min Brightness, ECO ON/OFF, and Z-Axis positioning can be easily checked at a glance. Incorrect selections occurring during regular operation are thus minimized—further improving work efficiency and effectiveness.

### **Environment Friendly ECO Function**

An automatic power saving mode is engaged whenever an operator leaves temporarily. This power saving mode is enabled to protect your samples from the heat of the illuminator. This mode also results in energy savings which extend the lifetime of the lamp and reduce overall operational costs. The time delay for power saving mode is adjustable with Motic Analysis software.

### **Constant, Consistent IL Brightness**

Working efficiency is further increased by providing an optimized constant brightness in lighting to images. This consistent brightness level is maintained even if the observation magnification is changed during operation.

### **Convenient, Automated Magnification Display**

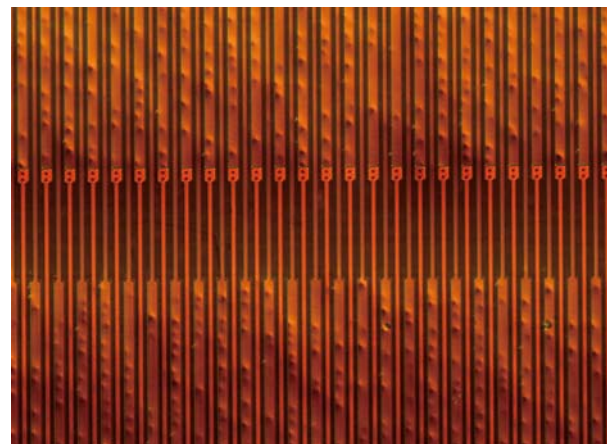
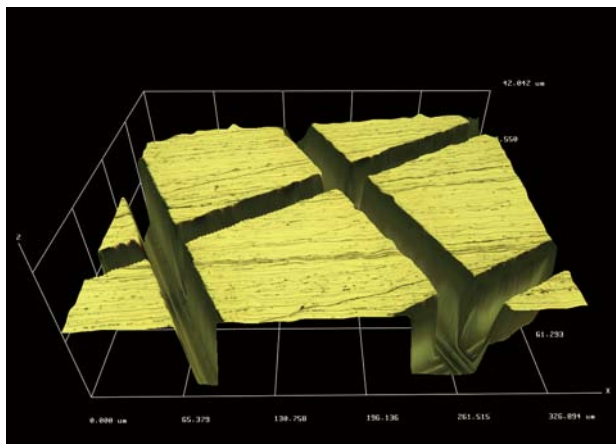
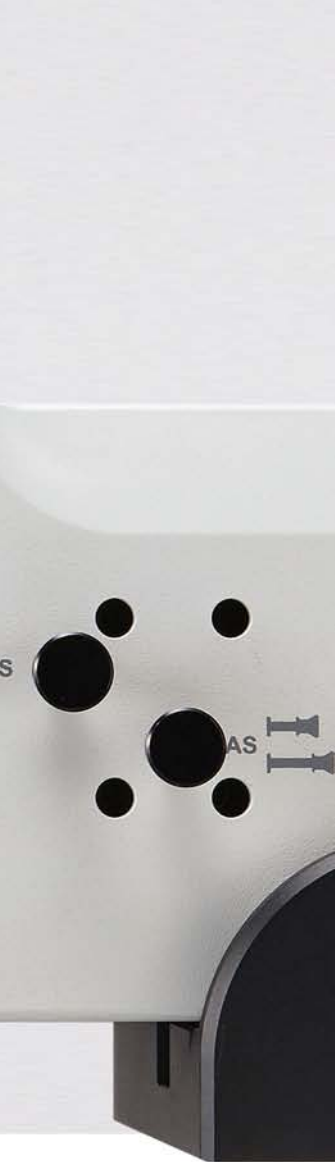
Current working magnification is displayed automatically and the auto-calibrated value is measured through our advanced Motic Analysis software.





## Full Automation, Increased Speed, and Less Effort.

Automatic, precisely controlled nosepieces, X/Y stage, and Z-axis operation reduces operator exertion and makes work quicker and less demanding. Operation can become even more efficient through utilization of accessories and Motic Analysis software by broadening the range of covered applications.



Enjoy a more Satisfying Inspection Microscope Experience through the Convenience of Automated Adjustments and a Wide Range of Observation Methods.

#### **Motorized Revolving Nosepiece**

The motorized nosepiece increases the speed of your workflow marking the PA53-MET more convenient to work with. Choose from software, frame button or controller adjustment methods based on your needs and preference to further increase productivity and efficiency.

#### **Motorized Stage with Image Stitching Capabilities**

- Auto-tiling Function: acquires a set of images in a consecutive order and automatically stitches them in real time;
- Navigation Function: automatic navigation with a simple click on a tiled image;
- Location Information Application: supports large area examination.

#### **Fluorescence Observation**

The PA53-MET supports fluorescence observation with a special illumination module and fluorescence filter cubes while preserving brightfield and darkfield illumination availability. This is a very useful feature when photoresist residue or organic particles are being studied.

#### **Simultaneous Reflected and Transmitted Light**

The PA53-MET features simultaneous reflected and transmitted light illumination options.

#### **Vibration Isolation**

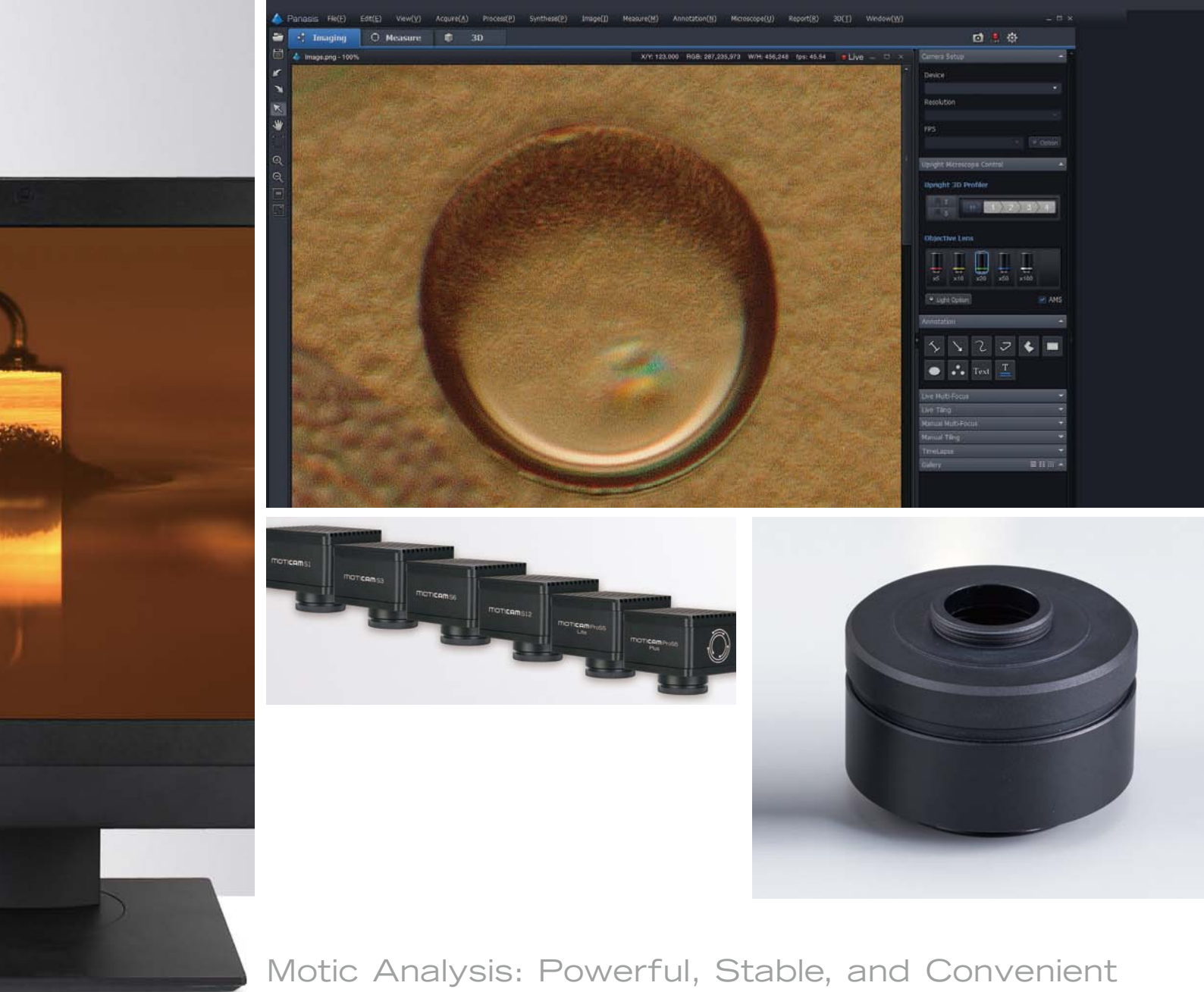
The PA53-MET can be installed stably in any environment or working condition. A high-quality vibration isolation frame prevents distorted images during high-resolution imaging.

# Creative Imaging Solutions with Superior Image Processing Capabilities.

Working efficiency is improved through a user-friendly interface, superior image processing, and rapid image processing in conjunction with a variety of measuring tools.







## Motic Analysis: Powerful, Stable, and Convenient Measurement / Analysis Software for All User Environments.

### Motic Analysis

Motic Analysis software is optimized to work intuitively and smoothly with the PA53-MET. It is a professional software suite which can be used in both inspection and research environments, and features impressive 3D rendering capabilities that can be applied to many different applications.

### Fast and Convenient Live Multi-Focus

All images have an intrinsic depth of focus for each image and these can be combined into a fully-focused image in real time by simply adjusting the focus through the height of the sample using the handy Z-axis controller thus allowing all fields to be seen crisply and clearly.

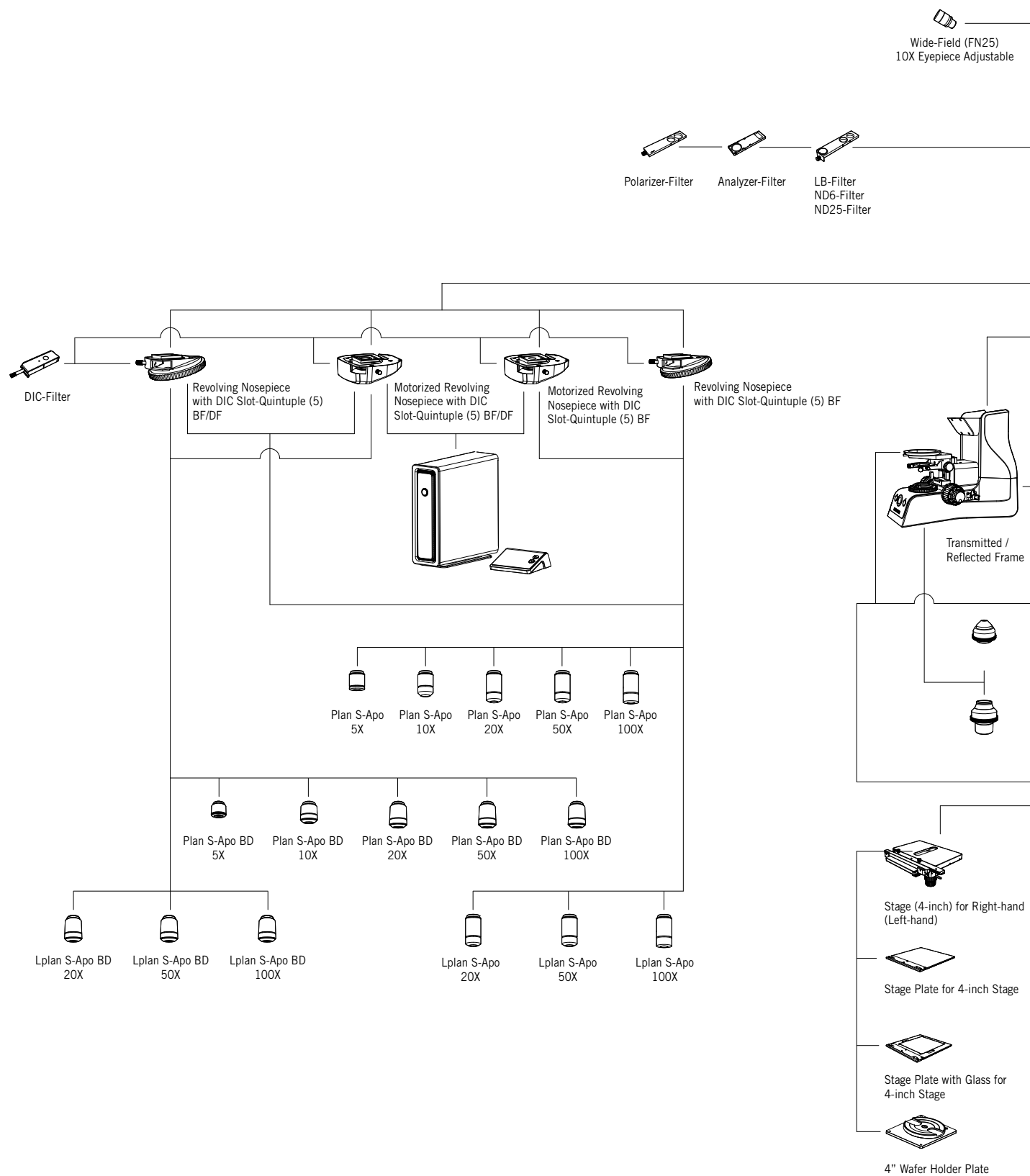
### Realistic Live Tiling

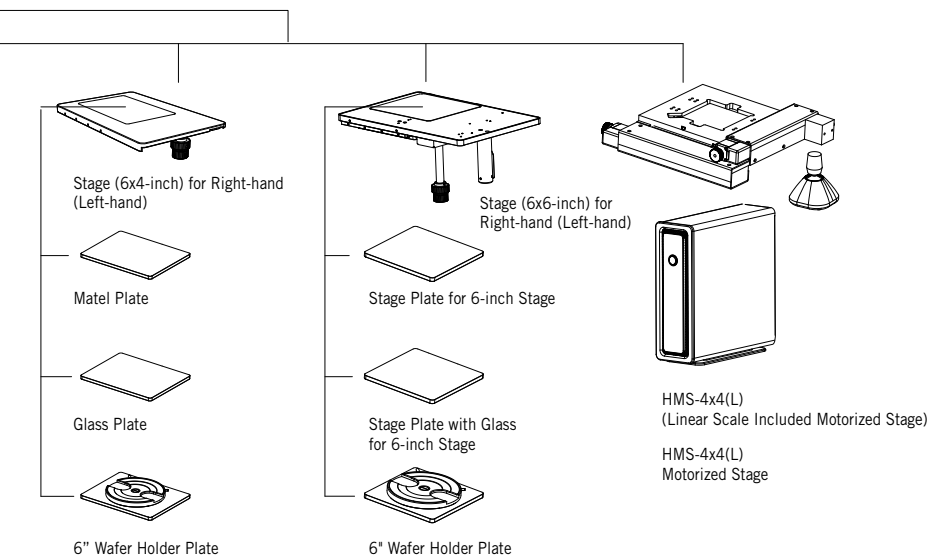
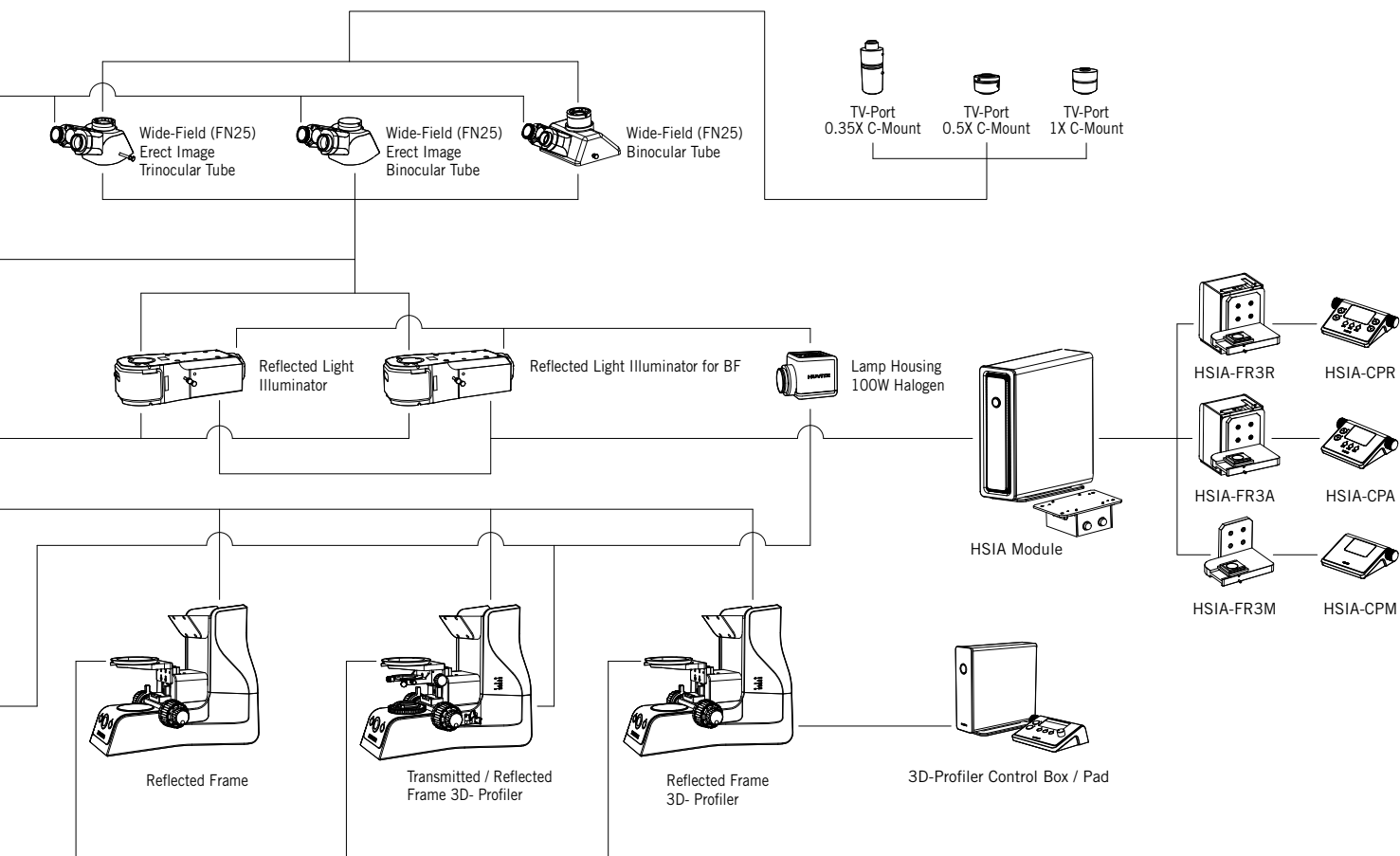
Live tiling is a useful function to obtain a wide panorama image composed of several images captured while moving the X/Y stage. You can tile adjoining fields in real time further extending the PA53-MET's field of view.

### Professional Quality Moticam S Series Cameras

All of our high-quality Moticam S Series cameras are compatible with the PA53-MET and are designed with faithful, high resolution image reproduction in mind.

# SYSTEM OVERVIEW





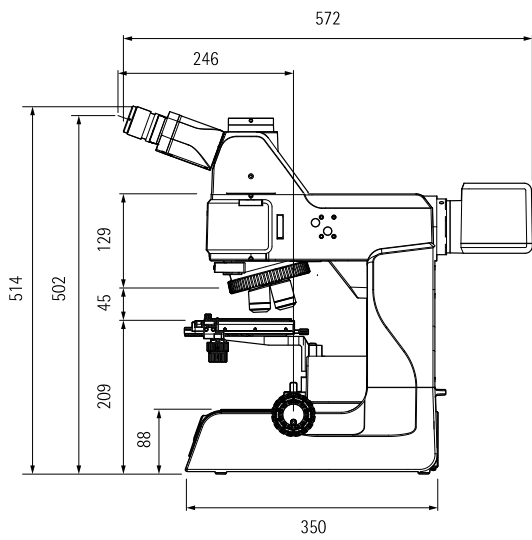
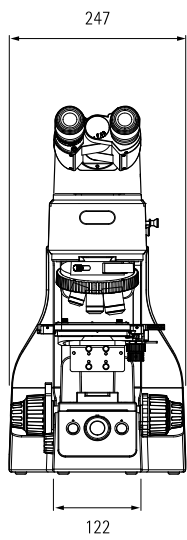


# SPECIFICATIONS

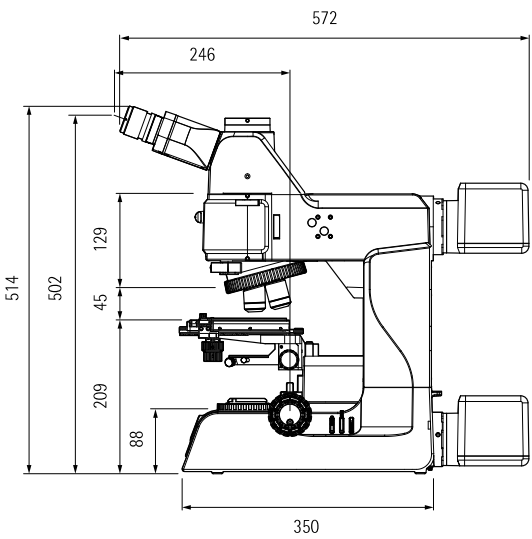
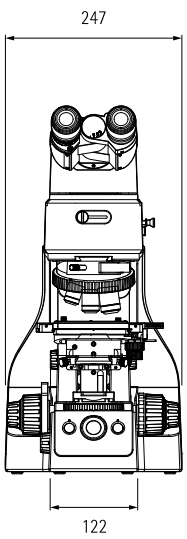
	PA53MET	PA53MET-3D	PA53MET-T	PA53MET-BD	PA53MET-BD-3D	PA53MET-BD-T
Optical System	Colour Corrected Infinity Optical System (CCIS®)					
Illumination	Reflected	Reflected	Reflected / Transmitted	Reflected	Reflected	Reflected / Transmitted
Observation Tube						
Binocular (Optional)	Erect type (F.N 25), 20° inclined					
Trinocular	Erect type (F.N 25), 20° inclined, Trino Light path selection: 2-step (100:0 / 0:100)					
Eyepieces	10X (F.N 25), Diopter adjustable, Reticle optional					
Revolving Nosepiece						
Brightfield	5-position Nosepiece for Brightfield objective lens with DIC slot			/		
Brightfield/ Darkfield	/			5-position Nosepiece for Brightfield, Darkfield objective lens with DIC slot		
Objectives						
Plan S-APO	5X/0.15 W.D 20mm, 10X/0.3 W.D 12mm, 20X/0.45 W.D 3mm, 50X/0.8 W.D 1mm, 100X/0.9 W.D 0.5mm (Optional)			/		
Plan S-APO BD	/			5X/0.15 W.D 20mm , 10X/0.3 W.D 12mm, 20X/0.45 W.D 3mm, 50X/0.8 W.D 1mm, 100X/0.9 W.D 0.5mm (Optional)		
LPlan S-APO (Optional)	20X/0.4 W.D 12mm, 50X/0.55 WD 8mm, 100X/0.8 W.D 3.3mm			/		
LPlan S-APO BD (Optional)	/			20X/0.4 W.D 12mm, 50X/0.55 WD 8mm, 100X/0.8 W.D 3.3mm		
Base unit - Focus	Stroke range: 29.5 mm / Coarse and Fine focusing knob.					
	Coarse: 17.7 mm/revolution / Fine: 0.1 mm/revolution (1 μm scale)					
	Upper limit stopper, Torque adjustment ring					
Base unit - Electronics	Integrated power supply for light adjustment / LED voltage indicator / IL switch and ECO switch					
3D Profile Module	No	Yes	No	No	Yes	No
Mechanism	-	High-resolution 5-phase stepping motor, Long cross-roller guide system	-	-	High-resolution 5-phase stepping motor, Long cross-roller guide system	-
Stroke Distance	-	30 mm	-	-	30 mm	-
Resolution	-	0.01μm	-	-	0.01μm	-
Repeatability	-	0.5μm	-	-	0.5μm	-
Max Speed	-	1.4 mm/sec	-	-	1.4 mm/sec	-
Dimensions	-	240(W) X 157(D) X 202.5 (H) mm	-	-	240(W) X 157(D) X 202.5 (H) mm	-
Weight	-	5 kg	-	-	5 kg	-
Load capacity	-	15 kg	-	-	15 kg	-
Reflected Illumination						
BF	Kohler illumination system / Brightfield, Normaski DIC, simple Polarized			/		
BF/DF	/			Kohler illumination system / Brightfield / Darkfield, Normaski DIC, simple Polarized		
Light source	12V 100W halogen					
Transmitted Illumination	No		Yes	No		Yes
Illumination	-		Kohler illumination system Brightfield / Built-in filters	-		Kohler illumination system Brightfield / Built-in filters
Light Source	-		12V100W halogen	-		12V100W halogen
Lamp	-		12V 100W long-life halogen bulb (Philips 7724)	-		12V 100W long-life halogen bulb (Philips 7724)
Condenser	No		Yes	No		Yes
Abbe	-		N.A 1.20	-		N.A 1.20
Long-working	-		LWCD, N.A 0.65	-		LWCD, N.A 0.65
Stage						
4x4 inch	Size 210(W) X 170(D) mm, Stroke 104(X) X 102(Y) mm, metal plate, glass plate					
Optional	6x6” stage, 6x6” stage, 8” wafer stage, 12” wafer stage					
Dimension	Approx. 246(W) x 572(D) x 514(H)					
Weight	Approx. 19kg					

# DIMENSIONS

PA53MET  
PA53MET-BD



PA53MET-T  
PA53MET-BD-T





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