

# MIRAX

## XMH XMH-CS XMU XMU-CS

<b>Resolution</b>				
In high vacuum mode (SE)	1.0 nm at 30 kV 2.0 nm at 3 kV	1.2 nm at 30 kV 2.5 nm at 3 kV	1.0 nm at 30 kV 2.0 nm at 3 kV	1.2 nm at 30 kV 2.5 nm at 3 kV
In low vacuum mode (SE)	-	-	1.5 nm at 30 kV (LVSTD) 3.0 nm at 3 kV (LVSTD)	1.5 nm at 30 kV (LVSTD) 3.0 nm at 3 kV (LVSTD)
In high/low vacuum mode (BSE)	2.0 nm at 30 kV	2.0 nm at 30 kV	2.0 nm at 30 kV	2.0 nm at 30 kV
<b>Working vacuum</b>				
Chamber – High vacuum mode	< 1 x 10 <sup>-2</sup> Pa	< 1 x 10 <sup>-2</sup> Pa	< 1 x 10 <sup>-2</sup> Pa	< 1 x 10 <sup>-2</sup> Pa
Chamber – Low vacuum mode	-	-	7 – 150 Pa	7 – 150 Pa
Gun vacuum	< 3 x 10 <sup>-6</sup> Pa	< 3 x 10 <sup>-7</sup> Pa	< 3 x 10 <sup>-7</sup> Pa	< 3 x 10 <sup>-7</sup> Pa
<b>Electron optics working modes</b>				
High vacuum mode	Resolution, Depth, Field, Wide Field, Rocking Beam		Resolution, Depth, Field, Wide Field, Rocking Beam	
Low vacuum mode	-		Resolution, Depth	
<b>Magnification</b>	3x to 1,000,000x in Continual Wide Field / Resolution Mode			
<b>Accelerating voltage</b>	200 V to 30 kV			
<b>Electron gun</b>	High brightness Schottky emitter			
<b>Probe current</b>	2 pA to 100 nA			
<b>Scanning speed</b>	From 160 ns to 10 ms per pixel adjustable in steps or continuously			
<b>Focus window</b>	Shape, size and position continuously adjustable			
<b>Scanning features</b>	Dynamic Focus, Point & Line Scan, 3D Beam			
<b>Image size</b>	Up to 8,192 x 8,192 pixels in 16-bit quality, size is adjustable separately for live images (in 3 steps) and for saved images (in 10 steps), for square and rectangular 4:3 or 2:1 image shapes.			
<b>Microscope control</b>	All microscope functions are PC controlled by means of the keyboard, the mouse and the trackball, via the program MiraTC, using the Windows™ platform			
<b>Remote control</b>	Via TCP / IP			
<b>Automatic procedures</b>	The Probe Current and Spot Size continuously adjustable by unique In-Flight Beam Tracing™, Vacuum control, Gun Alignment, Centering of scanning modes, Compensation for kV, Probe Current optimized for Spot Size, Spot Size optimized for Magnification, Scanning Speed, Brightness & Contrast, Focusing & Stigmator, Look up Table.			
<b>UPS</b>	UPS 2kW is standard part of delivery scope			

### Requirements

<b>Installation requirements</b>	Power 230 V/50 Hz or 120 V/60 Hz, 2200 VA No water cooling. Compressed dry nitrogen for venting: 150 – 500 kPa Compressed air: 450 – 600 kPa
<b>Environmental requirements</b>	Temperature of environment: 17 – 24 °C Relative humidity: max. 80 % Vibrations: Passive isolation: < 5 μm/s below 30 Hz; < 10 μm/s above 30 Hz; Active isolation (option): < 10 μm/s below 30 Hz; < 20 μm/s above 30 Hz Acoustic: < 60 dBC Background magnetic field: synchronous max. 3 x 10 <sup>-7</sup> T asynchronous max. 1 x 10 <sup>-7</sup> T System dimensions: 2.15 m x 1.25 m Room for installation: min. 3 m x 3 m

### Software

Measurement	●
Image Operation	●
Image Processing	●
3D Scanning	●
Hardness	●
Multi Image Calibrator	●
Object Area	●
Print Magnification	●
Switch-Off Timer	●
Tolerance	●
Morphology	○
Particle Analysis	○
Image Snapper	○
Sample Observer	○
Draw Beam	○
Mouse Link	○

● standard, ○ option

### XM

Measurement	●
Image Operation	●
Image Processing	●
3D Scanning	●
Hardness	●
Multi Image Calibrator	●
Object Area	●
Print Magnification	●
Switch-Off Timer	●
Tolerance	●
Morphology	○
Particle Analysis	○
Image Snapper	○
Sample Observer	○
Draw Beam	○
Mouse Link	○

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We are constantly improving the performance of our products, so all specifications are subject to change without notice.



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Distributor

# MIRAX XM



High Resolution Schottky FE SEM with an Extra Large Chamber and an Extended Motorized Stage



# MIRA\\ XM

The MIRA\\ XM is an extra large chamber variant of the Mira series of high performance scanning electron microscopes equipped with a Schottky field emission electron gun.



## Features of the Mira FE SEM series

- A high brightness Schottky emitter for high-resolution/high-current/low-noise imaging
- A powerful **In-Beam Detector** for High Resolution imaging especially at low accelerating voltages
- A unique three-lens **Wide Field Optics™** design offering a variety of working and displaying modes embodying the Tescan proprietary Intermediate Lens for the beam aperture optimization
- Real time **In-Flight Beam Tracing™** for the performance and spot optimization integrating the well established Electron Optical Design software
- Fast imaging rate
- A fully automated microscope set-up including electron optics set-up and alignment
- Sophisticated software for SEM control, image acquisition, archiving, processing and analysis
- All network operations and built-in remote access/diagnostics come as Tescan standard

## Features of the XM chamber model

- An extra large chamber with robust stage is able to accommodate large samples
- 5 axes fully motorized compucentric manipulator with extra wide range of movements
- 9+ chamber interface ports with optimized geometry for EDX and EBSD
- High-throughput large-area automation, e.g. automated particle location and analyses
- A fully integrated active vibration isolation as an option

### Chamber XM

<b>Internal dimensions</b>	300 mm (width) x 330 mm (depth)
<b>Door</b>	280 mm (width) x 310 mm (height)
<b>Number of ports</b>	9+
<b>Chamber suspension</b>	pneumatic or optionally active vibration isolation

### Specimen stage

<b>Type</b>	compucentric
<b>Movements*</b>	Fully motorized: X = 130 mm , Y = 130 mm , Z = 100 mm Rotation: 360° continuous Tilt: -20° to +80°
<b>Specimen height</b>	maximum 143 mm

+ Standard number and configuration of ports can be modified to customers needs.  
\* Range of the manipulator movements can be different for particular detector configuration.

## MIRA\\ XMH

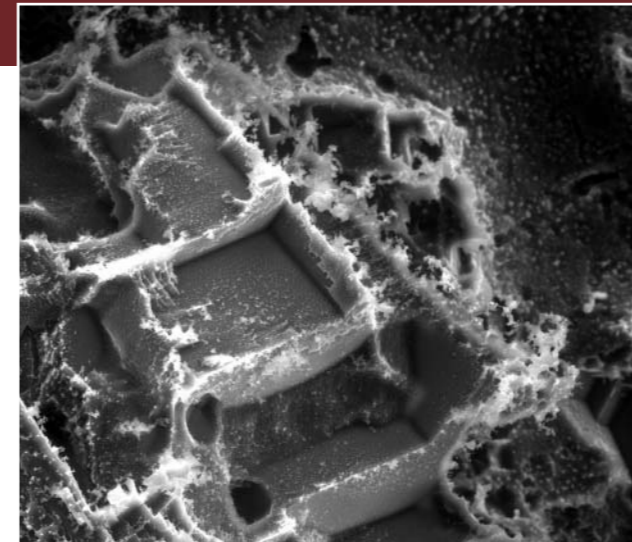
An extra large chamber model with compucentric motorized manipulator operates at high vacuum for investigation of conductive samples with extraordinary imaging quality.

## MIRA\\ XMU

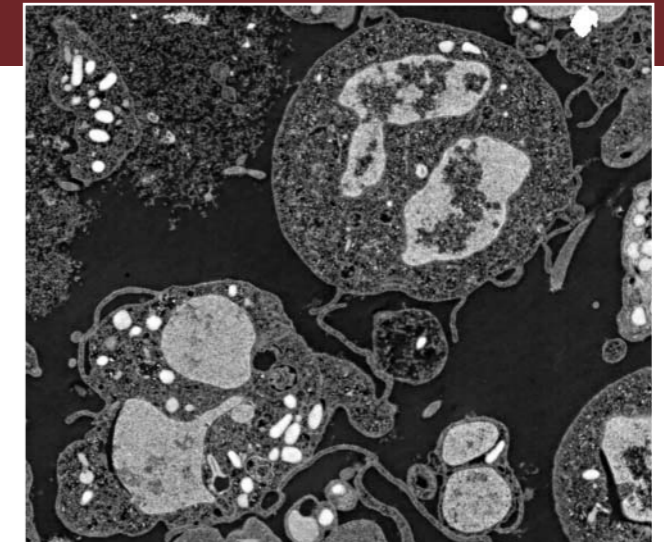
A variable pressure FE SEM that supplements all the advantages of the high vacuum model with extended facilities for low vacuum operations, allowing investigation of nonconductive specimens in their natural uncoated state.



Application in research: In-situ observation of dynamic processes. Investigation of melting ice placed on a Peltier cooling stage.

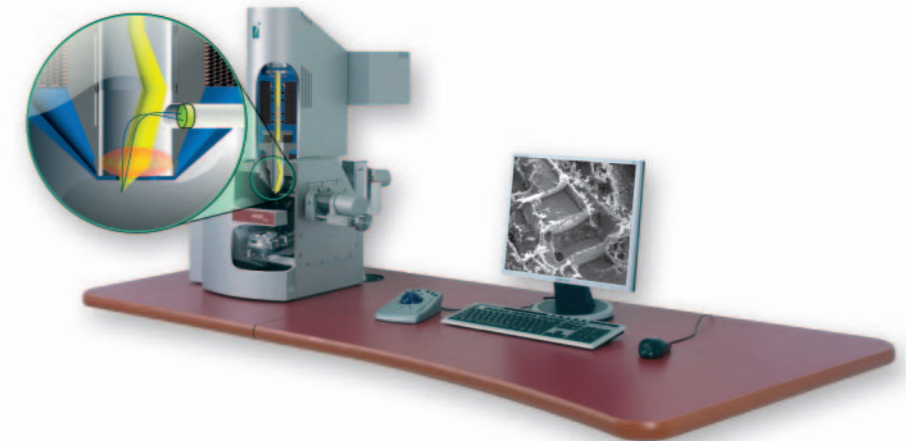


Medical application: High resolution histology using TE detector. Investigation of neutrophils and macrophages ultra thin section (Dark Field mode).



Ingenious port geometry with modifiable flanges allows the attaching of a variety of detectors and accessories and makes MIRA\\ XM microscope an extraordinary analytical tool.

## In-Beam Detector



## MIRA\\

MIRA\\ is equipped with a selected combination of premium detectors as a standard. It is a suitable tool for demanding applications where the highest resolution at big magnifications and low accelerating voltages is required.

## MIRA\\ CS

MIRA\\ CS with a standard set of detectors and a great analytical potential offers a **compact solution** for a wide range of technical applications.

### Detectors

	XMH	XMH-CS	XMU	XMU-CS
In-Beam SE detector	●	-	●	-
SE detector	●	●	●	●
Retractable BSE detector	●	○	●	●
LVSTD	-	-	○	○
TE detector	○	○	○	○
CL detector	○	○	○	○
EBIC	○	○	○	○
EDX*	○	○	○	○
WDX*	-	○	-	○
EBSD*	○	○	○	○

### Accessories

Probe current measurement	●	●	●	●
Touch alarm	●	●	●	●
Chamber view camera	●	●	●	●
Peltier cooling stage	○	○	○	○
Active vibration isolation	○	○	○	○
Magnetic field cancelling system*	○	○	○	○
Beam blanker	○	○	○	○
Nanomanipulators*	○	○	○	○

\* fully integrated third party products  
● standard, ○ option, - not available