

# MiniTEM™ data sheet

## Microscope

Specimen size	Standard ø 3.05 mm grids
Specimen exchange time	Approx. 3 min

### Image mode

Nominal accelerating voltage	25kV
Resolving power	1.0 nm
Total magnification	3,400 - 1,300,000x
Field of view	100 × 0.25 µm
Magnification in Low mag regime	1500x
Field of view in Low mag regime	250 µm
Focal length	1.34 mm
Cs (spherical aberration coefficient)	1.03 mm
Cc (Chromatic aberration coefficient)	1.05 mm
$\alpha_{\text{theor}}$ (theoretical aperture angle)	$1.2 \times 10^{-2}$ rad

### Electron optics

Condenser lens	Magnetostatic & electrostatic
The smallest illuminated area	500 nm
Condenser aperture	ø 50, 30 µm
Objective lens	Magnetostatic
Objective aperture	ø 50, 30 µm
Projection lens	Double electrostatic

### Electron gun

Type	SE Cathode ZrO/W[100]
Current density	0.3 mAsr <sup>-1</sup>
Lifetime	>2,000 hours

### Vacuum

Airlock system: turbomolecular pump	10 <sup>-5</sup> mbar
Sample chamber: ion getter pump	10 <sup>-8</sup> mbar
Gun chamber: ion getter pump	10 <sup>-9</sup> mbar

### Light optics

Objective Olympus M20x	NA*0.75
Objective Olympus M4x	NA*0.13

\* Numerical aperture

## Camera (ViroCam)

CCD sensor	Truesense KAI-04070
Pixel size	7.4 × 7.4 µm
Digitalization	16 bits
Image size, full frame	2048 × 2048 pixels
Image size, live mode	1024 × 1024 pixels
Live view frame rate	24 fps
Interface	Gigabit ethernet
Cooling	Passively cooled

## MiniTEM computer

### Hardware

CPU	Intel i7
RAM	16 GB
GPU	Supporting Open CL 1.1
VRAM	16 GB
Data storage	512 GB SSD

### Software

Operating system	Windows 10
Framework	.Net 4.6
Imaging and analysis	MiniTEM

## Mains input

Voltage/frequency	100–240 V/50–60 Hz
-------------------	--------------------

## Power ratings

Standby mode	60 VA
Operation consumption	410 VA
Maximum consumption	600 VA
Camera	60 VA
Computer and monitor	approx. 350 VA

## Weights and dimensions

### Electron and light optics

Weight	140 kg
Dimensions (w x d x h)	630x600x1500 mm

### Airlock pumping system

Weight	17 kg
Dimensions (w x d x h)	300x300x340 mm

### Control electronics

Weight	50 kg
Dimensions (w x d x h)	550x650x670 mm

## Operation conditions

Temperature range	18 to 30 C
Relative humidity	up to 75%
Location	Indoor only
Maximum installation altitude	2000 m (above mean sea level)
Pollution degree	2
Overvoltage category	II

No cooling water for the microscope operation is required