**Příloha č. 3 - Minimální technické požadavky**

Předmětem dodávky je *nový* skenovací elektronový mikroskop včetně veškerého příslušenství (např. ovládací PC, vakuová pumpa) potřebného pro vlastní provoz mikroskopu.

* Požadované detektory: SE (secondary electron), BE (backscattered electron), EDS (energy­ dispersive X-ray spectroscopy)
* Rozlišení EDS detektoru - min. 150 ev
  + detektor SOD bez nutnosti chlazení dusíkem
  + detekce prvků *v* rozsahu od C po U a aktivní plocha detektoru minimálně 60mm2

Požadujeme dodání EDS softwaru jako kompletní balík, včetně: Bodové analýza, kvalitativní analýzy, kvantitativní analýzy, analýzy se standardy, analýzy bez standardů, automatické korekce driftu *v* průběhu mapování, živého EDS mapování, Phi-Rho-Z analýza pro přesnější analýzu vzorků obsahujících lehké a těžké prvky.

* Mód vysokého vakua (HV) a mód nízkého vakua (LV)
  + Požadujeme systém, který umožní softwarové přepínání módu vakua, bez nutnosti otevírání komory a instalování dodatečných komponent
* Zdroj,ele ktronů: wolframové vlákno
* Výměna filamentu bez potřeby servisního technika
* Proud svazku minimálně O.lmA
  + Urychlovací napětí minimálně *v* intervalu 0,5-30ekV
  + Minimá lní rozlišení 3,0 nm pro HV a 4,0 nm pro LV
* Motorizace vnitřního stolku v pěti osách (x,y,z, náklon a rotace)
* Maximální velikost vloženého vzorku: alespoň 150 mm
* Minimální počet volných portů alespoň dva
* Požadujeme vlákna, která budou předcentrována z výrobního závodu.
  + Požadujeme dodat minimálně 6 ks těchto předcentrovaných vláken jako tzv. star ter kit" .

11

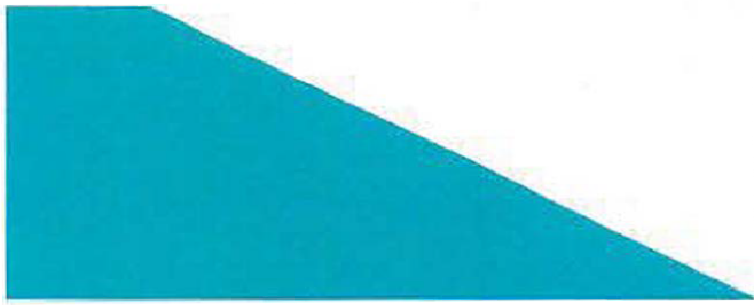
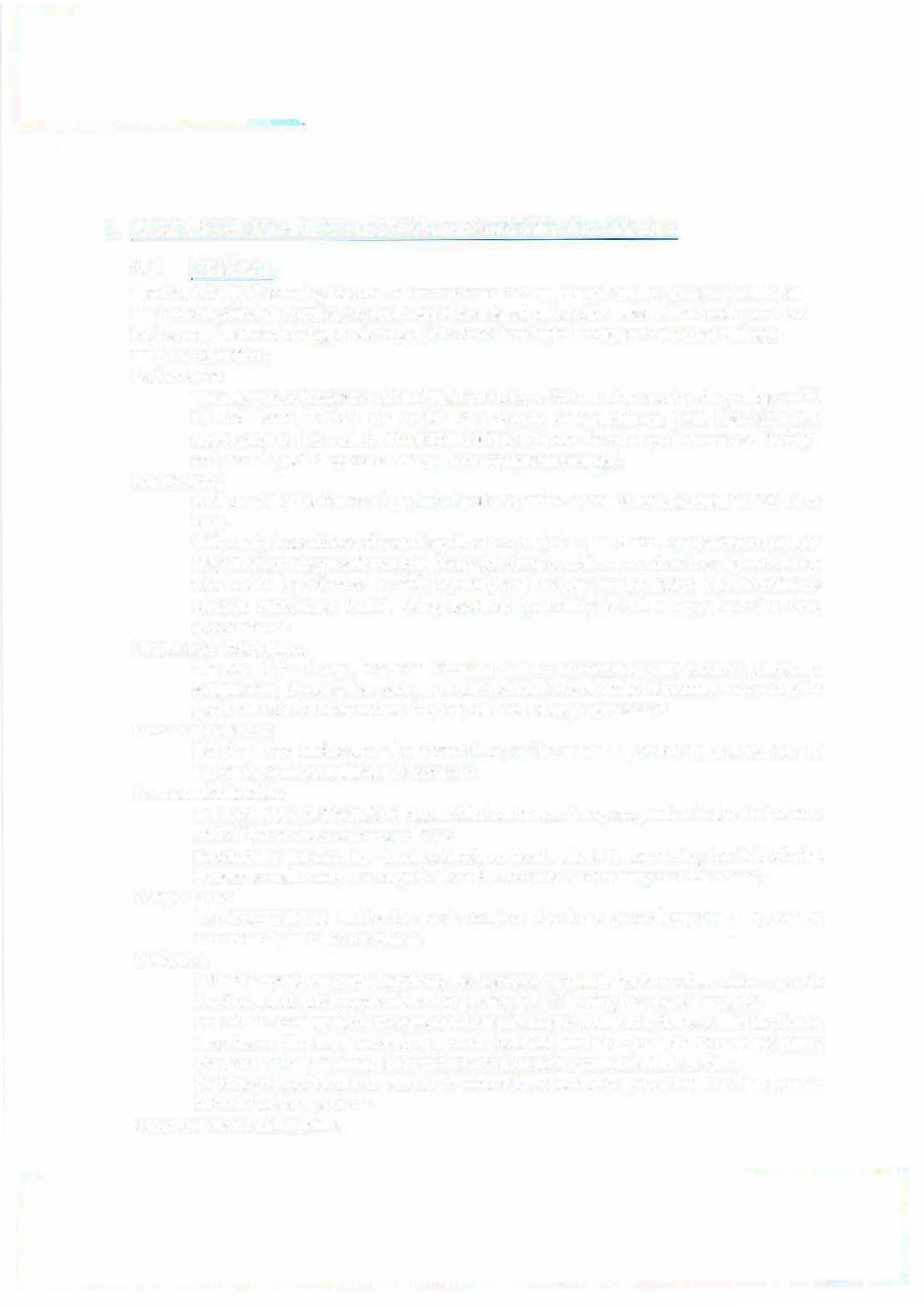
* Barevná CCD kamera pro zobrazení vnitřku komory s rozlišením minimálně 4Mpix
  + kamera musí poskytovat zobrazení držáku vzorků uvnitř komory mikroskopu. Zároveň požadujeme, aby tato kamera byla propojena s motorizovaným stolkem mikroskopu a aby bylo umožněno pomocí navigačního systému automatické ukládání všech pozic na vzorku od nejmenšího zvětšení až po největší zvětšení
  + je možné akceptovat řešení, kde sledování umístění detektorů bude realizováno další kamerou s nižším rozlišením (alespoň 3 Mpix)
* Ovládání mikroskopu pomocí myši, klávesnice a operačního panelu/trackballu zároveň požadujeme monitor s úhlopříčkou min. 32"
* *Dvě* další licence pro analýzu naměřených dat na jiném PC (stačí off-line verze)
  + včetně funkce vytváření EDS map z prvků, které nebyly předem definovány.
* Dodaný systém musí umožňovat zobrazení z velkých ploch pomocí *tzv.* sešívání obrazu -

,,stitching"

**Tímto prohlašujeme, že nabízené řešení splňuje minimální požadované technické parametry přístroje.**



TECHNICAL DATA SHEET JSM-IT210{LA)



1. **ANALYTICAL SCANNING ELECTRON MICROSCOPE JSM-IT210LA**
   1. **GENERAL**

#### The JSM-IT210(LA) Scanning Electron Microscope enables high image quality observation with an improved illumination system, vacuum system, and signal processing system. The touch panel and high speed 5-axis motor stage make it possible to achieve high-throughput operation through intuitive operations.

Performance:

The electron optics system achieving a resolution of 3.0 nm at an accelerating voltage of 30 kV and 15nm at lkeV are useful for a variety of applications, from high-resolution observation to EDS analysis. The JSM-IT210(LA) achieves the same performance as the high­ end models, including resolution at a low accelerating voltage.

EDS analysis:

A silicon-drift EDS detector is included in the standard specifications (resolution: 129 eV or less).

With analysis conditions of a working distance (WO) of 10 mm the efficient analysis and low­ magnification mapping is possible under the same conditions as when the high-resolution observation is performed. In addition, analytical functions are integrated into the scanning electron microscope (SEM), giving excellent operability to this energy-dispersive X-ray spectrometer.

Charge-free observation:

The use of the charge-free scan (CF scan) enables observation with reduced charge-up. Additionally, by using low vacuum mode included as a standard function, nonconductive specimens can be observed as they are, without being preprocessed.

Live 30 observation:

The improved backscattered electron detector has made it possible to acquire Live 30 information without tilting the specimen.

Frame series function:

The installation of Simple SEM has enabled continuous image acquisition in the field of view with different observation conditions.

Additionally, the montage function has become standard. By connecting the field of view images, an extremely low magnification electron microscope image can be created.

Compact size:

The JSM-IT210(LA), having the most compact size for a general-purpose SEM, can be conveniently installed anywhere.

Operation:

With the operation guide functions, the operator can easily perform observation, operate functions, and specify operation settings, simply by following the operation guide.

Use of the Zeromag mode to overlap the cameraimagesacquiredin the past with the Holder Graphics or the stage navigation system (optional) makes it possible to view the entire specimen holder, making it easy to perform analysis for multiple fields of view.

By saving video data, it is possible to record the observation procedure and the dynamic behavior of the specimen.

Accessory device extensibility:

An energy dispersive X-ray spectrometer (EDS), low -vac uum hybrid secondary electron detector (LHSED), WDS, and elect ron backscattered diffraction (EBSD) detector can be attached to the large-sized atta chment ports provided on the specimen chamber.

Popular navigation system and chamber scope can also be used with this instrument.

### PERFORMANCE

|  |  |
| --- | --- |
|  | JSM-IT210 (LA) |
| Vacuum mode | High/low vacuum swit chab le |
| **Pressure range** | 10 to 100 Pa |
| Resolution | High-Vacuum Mode:  3.0 nm: 30 kV (Acc. V), 8 mm **{WO),** secondary electron **image** (SEi)  8.0 nm: 3 kV (Acc.V), 6 mm (WO), SEi  15.0 nm: 1 kV (Acc.V), 6 mm (WO), SEi Low-vacuum mode:  4.0 nm 30 kV (Acc.V), s mm (WO), specimen chamber pressure, backscatt ered electron lmage  Resolution iscalculated by Derivative method (based on ISO/TS 24597 |
| Signal (Detector) | High-Vacuum M ode:  Secondary electron image (E.T. detector ) Reflected electron image (REF) (E.T. detect or)  BEI (composltion, topographic and stereoscopic images/semiconductor **BE** detector) Low-vacuum mode:  BEI(composition, topoaraphíc and stereoscopic images/ semiconductor **BE** detector ) |
| Magnification | Image magnification:  ,c5 to " 300,000   * Magnification defied with display slzed 128 mm >< 96 mm |
| Accelerating voltage | 0.3to 30**kV** |
| Probe current | 1 pA to 1 µA or more |
| Integrated EDS | Standard conflguratlon (bullt-in) Resolution {FWHM):  129.0 ev or less Detectable elements: Be to U |

* 1. SPECIFICATIONS

1 .3.1. Electron Optical System

Applies to both high and low vacuum modes, except for automatic gun control.

###### Electron beam source

Configuration

Electron source: Gun alignment coil:

Functions

Pre-centered tungsten hairpin -type filament Electromagnetic 2-stage deflection

Bias control: Self-bias voltage Filament heating support function:

Line scan profile :

Automatic gun control:

Beam blanking (freeze):

###### Lens system

Configu ration

Condenser lens: Objective lens:

Object ive lens aperture:

Automatic filament heating, Automatic gun alignment adjustment Prevent ion of damage to specimens

High-precisionzoom condenser lens Conical objective lens

4-step selectable





Stigmator coil: Auto focus coil:

Functions

Fine position adjustment along X and Y **axes is** possible Electromagnetic 8-pole X-Y adjustment

For automatic focus

CL mode change (large current mode):

Switching probe current range

Lens clear function: Zoom function:

Wobbler:

Stigmator preset:

WD display: Automatic focusing:

Automatic focus tracer:

Automatic stigmator: Automatic beam alignment: Dynamic focus:

Beam blanking: Beam alignment:

**Scanning system**

Configuration

Scanning coil: Fine shift coil:

Functions

For removing hysteresis

Prevention of changes in focus when the probe current is changed.

Axis alignment function for the objective lens aperture

(linked to magnification)

Linked to loading the stigmator preset value, the acceleration voltage and WD.

Displays th e working distance Automatic focus adjustment

Focus tracing function that is linked to the variation in the

stage Z coordinat es

Automatic astigmatism correction function Automatic beam alignment function

Focus shift correction by specimen tilt Prevent ion of damage to specimens

Electromagneticbeam alígnment function

Electromagnetic 2-stage deflection Electromagnetic 2-stage deflection

Scan rotation: A function for correcting image rotation for WD is provided.

Linearity correction for horizontal/vertical scan:

Specifies the scan rotation angle for the straight line on the observation screen and makes corrections so that the straight line will be horizontal or vertical.

CF Sean:

Preset magnificatio n: Image shift:

Trapezoid correction:

1.3.2. Eucentric Specimen Stage

Specimen movement: Specimen movement range:

X direction: Y di r e ction: Z direction: Tilt:

Rotation:

Specimen holder:

Reduces the specimen charging

Five diffe rent magnificatio ns can be set Electromagnetic field shifts approximately in X and Y directions

On the field of view with a tilt, themagnification is corrected for the front and the rear side with thescreen center as a reference point.

5 axes (X, Y, Z, R, T) motor drive, CPU control 80mm

40mm

WDS to48 mm

-10° to 90°

360° endless

32 mm (diameter) x 10 mm (height)

Maximum specimen size: Specimen position display: Specimen position memory:

Home position: Specimen exchange:

Specimen damage prevention :

Eucentric R/ T axis: Backlash correction:

Stage horizontal correction:

1.3.3 . Detector

High-vacuum mode

Note: The adapter that can attach the four specimen blocks (10 mm diameter) included.

A specimen of 150 mm diameter can be loaded. Graphic and digital displays

Create any number of registered users and files (within the capacity of HDD).

Selected coordinates can be registered. Movement to selected coordinates is possible.

Draw-out method (specimen holder slides in/out) Movement limiting, automatic stopping and alarm for specimen holder by software. Sample contact prevention function using the specimen height input menu.

Built-in software correctsthe shifting of the field of view when the specimen is rotated or tilted

Automatic

Specifies the stage rotat ion angle for the straight line on the observation screen and makes correctionsso that the straight line will be horizontal.

Secondary electron detector: E.T. detector Backscattered-electron detector:

Semiconductor detector

Low-vacuum mode

Backscattered-electrondetector:

Semiconductor detector

###### Scanning system

Sean speed, 22 different modes CF Sean:

###### Image integration function

Exponential integration:

Frame integration:

Noise removal filter:

###### Imagedisplay function

Full screen display function:

Multiple-screen display: Flexible window display:

Four screen display:

Operation method to reduce the specimen charging. This method can be used when SLOW or PHOTO scan is selected.

A frame integration processing with exponential weighting. For live image observation .

Averaging coefficient.

A frame integration processing with simple weighting. For acquiring saved image data

An arbitra ry number of frames can be integrated. Select from Standard or High.

For live image observation.

Displays the live image and the saved image on the entire screen.

Displays the live imageon two screens concurrently. Displays any rectangular area on the observation screen with different types of signals.

Displays the live image on four screens concurrently. Up to five screen (four screens + main observation

screen) can be displayed concurrentl .

**Image adjustment function** Gamma correction: Digital correction:

Pseudo-color display:

###### Measurement functions

Displays images with multiple mixed signals for the main observation screen.

Corrects the image contrast using gamma curves.

Digit al contrast correction, digital brightness correction, binary coding, color invert, smoothing

The images can be displayed in color. Selection of fixed or custom settings and color image saving can be performed.

Two-point measurement (straight, arbitrary, perpendicular):

Measurement of the distance between the straight line segment connecting any two points and the length of a series of connected straight line segments.

Circle measurement (area, width):

Measures area, and vertical and horizontal width of a circle.

Line width measurement (parallel X-Y, diagonal):

Measurement of the distance between two horizontal or vertical parallel line segments.

lf a rectangle is defined by pairs of horizontal and vertical lines, its diagonal length can be measured.

Angle measurement : Measurement of the angle between two line segments

that extend from a center point.

Area measurement (rectangle, circle, polygon):

Measurement of an area surrounded by a polygon or a circle.

Count (click): Counts and displays the number of times you clicked on the image.

Measurement and calibration function:

High-accuracy measurement is possible by measuring the sample based on the lengthof the calibration standard sample.

Size specification function: Specify the size of the measured item by entering values. Available for rectangle and circle measurements only.

Arrangement function: Align the arrangement ofthe selected multiple

measurement items according to the specified items (left alignment, horizontal centering, right alignment, top

alignment, vertical centering, bottom alignment, right and left alignment, top and bottom alignment)

###### File saving

Image file:

Save/loading: Type:

Video file

Save:

File format:

Save settings:

Saves and loads a field of view for observation Can be saved in BMP, TIFF, JPEG, or PNG format .

Live image can be saved as video

MP4 (storage capacity depends on hard disk capacity on computer)

Specify save destination

**Customization**

Automatic function settings:

Visual field movement: Magnification display setting:

Detector position display setting:

Horne position setting: Ul layout:

Photo data editing:

1.3.4. Operation System

**Basic system**

Operation unit: CPU:

Operating system (OS):

**Operation**

Operation method:

**Automatic functions**

Automatic gun control (AGC): Automatic contrast/brightness (ACB):

Automatic focusing (AF):

Automatic stigmator (AS): Automatic filament saturation (AFS}:

Automatic gun alignment (AGA): Automatic beam alignment (ABA):

**Observation support functions**

Snapshot:

Auto-link setting and auto-contrast/brightness adjustment can be performed.

The stage movement direction can be set

Switch between image magnification and monitor display magnification

Adjustment by changing the display size is possible

You can change the name of the detecto r displayed on the image and select to display or hide the port

The coordinates of the home position can be registered Navigator area position (right or left), icon position and background color can be changed, and icon can be customized.

Background color, font color, text label, photo number, date, and logo image can be edited.

lntel®CoreTMiS or equivalent Windows®lO Pro 64 bit

Note: Windows®lO is a registered trademark of Microsoft. Office Microsoft® Office Horne & Business 2019\*(Word,

Excel, PowerPoint)

Mouse/keyboard operation, graphical user interface (GUI}, operation panel

Filament-heatingtemperature setting and the filament alignment are performed automatically.

Contrast and brightness are automatically adjusted. (lt can be linked to the switching of the accelerating voltage.)

Automat ically focuses the image

(Combination with ACB is possible. lt can be linked to the acceleratirng voltage).

Automatically corrects astigmatism.

Automatically adjusts filament heating. Automatically performs alignment.

Automatically performs axis alignment of the objective lens.

screens (freeze images) can be pasted on the Snapshot screen.

Additionally, you can apply the Snapshot image capture conditions and paste any image on the Snapsh

Click center:

Click center zoom: Copy:

Drag:

Frame shifting: Video saving:

Sean rotation: Histogram: Stereo:

Montage: Probe tracking:

Depth calculation:

Detector position display: Successive image acquisition:

Eco mode:

Zeromag mode:

lnstant image acquisition:

**Recipe function**

Standard recipe:

Customized recipe:

Double-clickingany point in the image-display area moves the point to the image center.

(A similar operation can be performed in Snap Shot)

When you specify the target range on the Snapshot screen, the stage moves to that range and the image zooms.

Saves the image to the clipboard.

Dragging any point in the image-display area moves the point to any desired position.

Moves the image by a specified factor

A video file can be saved in MP4 format. The recording time depends on the capacity of the hard disk on the computer.

The scan direction can be rotated in the range without moving the stage.

Displays the brightness histogram of the observation image.

ln the same field of view, the instrument acquires the tilted image as well as the image before it was tilted and produces an anaglyph image or a 3D measurement image. Multiple successive images are combined and displayed as one image (multiple areas can be specified).

The program corrects for drift of the observation point over time.

Displays the generation depth of characteristic X-rays according to the incident voltage in a basic manner. Displays the position and name of the installed detector. lt is possible to reserve observation conditions and perform image acquisition collectively. The specified setting can be saved or loaded.

lf you do not use the operation unit for a certain period of time, the system enters Eco (energy saving) mode.

(The time until the energy-saving mode turns on can be specified. The energy-saving mode can be turned on or off from the Ul.)

lf you decrease the magnification by using the mouse wheel, pinching in on the observation window, or using the optional operation panel, the holder graphics at the lowest magnification for each WD, or the image captured using the opt ional stage navigation system is displayed, and the image acquired before the current session is overlapped and displayed as a composite image.

Saves the field of view that is being observed.

When the operator selects the type and condition of the specimen, the image is displayed in the most suitable condition for that specimen. The observation conditions can be *saved* and loaded.

The conditions for each user such as the EOS system, stage

coordinates, vacuum mode, etc., can be saved and loaded.

###### Image management function

Simple data list:

Data management window Report creation function:

**User management** User level setting: User management:

###### Help function

An unlimited number of recipes (within the HD capacity) can be created.

Displays t humbnails of the saved images.

Viewer used to open the saved SEM images and the EDS data.

Viewer used to manage the saved images and the EDS data or the created reports and layouts.

Saving, exporting, thumbnail display, print preview, and layout selection for a report.

Administrator and general user settings, password settings. User registration, deletion, addition, functionality limitation, and changing functions.

Help is classified according to SEM operation process. Processes such as the observation procedure, function operation and maintenance will be displayed. lf operation is performed according to the indicated procedure, the observation process will be easier.

1.3.5 . Evacuation System

Control method: Fully automatic sequential control Ultimate pressure (in the electron gun chamber):

Less than 1 mPa

Venting time: rotary pump:

Turbo molecular pump: 1.3.6. Service Outlet 220V AC, 3 A:

1. 3.7. High Voltage limit Interlock

Approx. 1 min 30 sec

Evacuation speed: 100 L/min or more, 1 set 1 set

3

This interlock has a Pirani gauge and a high voltage application limiting mechanism operated by open/close sensor.

1.3 .8 . lnstallation Requirements

###### Power supply

Single phase 220 V AC, 50/60 Hz, 1.5 kVA, voltage fluctuation: within ±10%, frequency fluctuation: within ±O.S Hz

###### Grounding terminal

100 nor less

###### lnstallation room

Room temperature: Height:

Stray AC magnetic field: Room dimension: Doorwidth:

Dimensions and weight

20 ±5 °C

2000 m or less

0.3 µTor less (50/60 Hz, Sine wave, WD15, 30 kV) 2000 mm (W) x 2500 mm (D) x 1800 mm (H) or more 850 mm or more

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Width (mm} | Depth (mm} | Height (mm} | Weight (kg} |
| Microscope column unit | 630 | 840 | Approx. 1510 | Approx. 260 |
| Rotary pump | 530 | 230 | 320 | Approx. 23 |

## MOVABLE APERTURE

* 1. **GENERAL**

The MP-90170MAP is a 4-step variable objective-lens aperture.

## SPECIFICATIONS

Type:

Aperture diameters:

Click-stop mechanism (4-step selectable) 20 µm, 30 µm, 30 µm, 60 µm

### EDS SOFTWARE

* 1. GENERAL

This software provides standard EDS functions such as qualitative analysis, quantitative analysis and mapping to the EM software.

### SPECIFICATIONS

This software enables the EDS functions shown below.

##### EDS monito ri ng

Displays and switches each status related to the EDS system.

**Counting rate monitoring**

lndicates the counting rate (input and output) and the dead time measured using the EDS hardware .

**Instrument adjustment**

The user can adjust the instrument as necessary.

##### live EDS analysis

The spectrum is continuously display in the SEM software.

##### Spectrum monitoring

Displays spectra and qualitative elements during observation using the electron microscope so that the elements contained in the specimen can be checked.

##### Spectrum analysis

Measures an X-ray spectrum on a specified position or region and analyzes the spectrum.

**Spectrum measurement**

Region:

Termination condition: Probe current measurement: Energy range:

**Spectrum display** Scale (horizontal axis): Scale (vertical axis): Element label:

Whole, point, area, selected range Real time, live time, ROI accumulation Automatic

20 keV, 40 keV (10 eV/CH)

Linear

Linear, log, root

Element symbol+ main line (K, L, M) + secondary line (a,

##### ,,,)

Marker: Main lines (K, L, M) and sub lines (a, , ...) of characteristic X-rays, escape, sum peak (A+ A)



**Comparison display:**

Multiple, thumbnail

Two spectra or more can be compared.

###### Spectrum processing

**Escape peak removal**

Escape peaks can be removed from spectra.

###### Sum peak removal

Sum peaks can be removed from spectra.

**Qualitative analysis** Up to 32 elements

###### Automatic identification

Automatically identifies unknown spectra.

###### Manual identification (peak identification)

The peak position on the spectrum and the KLM marker can be compared by selecting elements from the candidate element list.

lt is also possible to specify an element from the periodic table.

###### Visual peak identification (VID)

Spectra of identified elements can be created for comparison with the measured spectra. Qualitative analysis can be checked visually and numerically.

###### Periodic table

Use to check the elements detected through qualitative analysis and specify elements for manual identification.

###### Quantitative Analysis

**Curve fitting**

Removes the background of the spectrum and performs curve fitting using the standard spectrum. The difference in resolution of each time constant is also corrected.

###### Standard-less quantitative analysis

Calculates the concentration of an unknown specimen according to the spectrum provided beforehand.

The result is displayed so that the total concentration is always normalized to 100%.

###### Quantitative correction

The concentration can be calculated (ZAF or PRZ correction method) according to the intensity of each element measured by curve fitting.

###### Quantitative analysis result types

Mass percent (ms%), atomic percent (atom%), oxide conversion concentration (ms%, mol%), cation quantity

* + 1. Line Analysis

Performs probe scanning and consecutive measurement of a specified position in a straight line and displays the graph of changes in the intensity and quantitative values.

###### Line measurement

Measurement position Line width

Horizontal, selected direction

Specifying a certain width for the measurement target line provides an average result.

###### Line display

**Image**

By displaying an EM image in parallel to a graph, the situation of the image and the line analysis result becomes easy to understand.

lt is also possible to display the graph on an EM image.

###### Profile display

Displays th.e line measurement result as a profile.

* + 1. Map analysis

**Map measurement**

Measured region: Whole, selected rectangle area Number of EM images that can be acquired at one time: 1

**Map display**

IndividuaI element display: Color synthesis map:

Line profile:

**Photomontage EDS map**

Up to 32 elements

EM image (1) + element map image (up to 32 elements) Displays line profiles of EM images and element map images.

automat ically performs analysis of multiple areas for creating montage images of the electron microscope image and elemental map. Fully-automatic observation and elemental-map creation can be made over a large area..

**Curve fitting map net count map**

Displays the map after removing the background and performing curve fitting (deconvolution). This function can be applied even during measurement.

**Quantitativ map**

Displays the map after removing the background and performing curve fitting (deconvolution) then the quantification correction is applied (ZAF ). Popup spectrum

**Popup spectrum**

lt is possible to select a region and extract and display the spectra included in the region. Extraction can be performed even during measurement.

Extraction region: Point, area

Number of spectra that can be extracted at one time:

**Filter**

Up to 32

Filtering provides sharper element maps and EM images. This function can be applied to element maps even during measurement.

Type: Averaging, weighted averaging, Laplacian, Sobel, median, gradient, bilateral

* + 1. Other analysisfunctions

**Probe tracking**

Periodically corrects shifting of the measurement position. Correction interval: 1 second (minimum) **Display the depth of signal**

This function displays the analysis depth in the specimen according to the HT and to the elements inside the sample.

### DRY SD60 DETECTOR UNIT

* 1. GENERAL

The EX-94470T4L41 Dry SD60 Detector Unit is an energy dispersive spectrometer (EDS) that utilizes a silicon drift detector (SDD). This unit detects characteristic X-rays generated by the electron probe of the electron microscope. By using the dedicated software, it is possible to analyze elements contained in the sample. These features enable data acquisition of the spectral analysis, line analysis, as well as the acquisitio n of element maps of any analysis area.

### PERFORMANCE

129.0 eV or less (ICR 3,000 cps or less)

### SPECIFICATIONS

##### 3.1. X-ray detector

This unit detects characteristic X-rays generated from the sample. Detection element type: Silicon-drift detector

Detection element area: 60 mm2

Detectable elements: Window:

Cooling method:

Usable accelerating voltage:

Retraction mechanism: lnstallation port:

Take-off angle:

Optimum working distance (WD):

Beto U

Polymer thin film

Thermoelectric cooling (Peltier cooling)

30 kV or less

Not available (Non-retractable)

EDS port 270° (left side of the SEM unit when viewed from the front)

35°

10mm

### OFFLINE DATA PROCESSING SOFTWARE

* 1. GENERAL

This offline software is intended for using the data acquired using an electron microscope and an energy dispersive X-ray spectrometer on a PC other than the instrument PC (hereinafter the user PC). This software makes it possible to perform data analysis and create reports from the user PC.

After the installation is completed, this software

operates under the name of SMILE VIEW Lab on the PC.

Other: Microsoft® Office 2016 / 2019 / 2021

### DATA MANAGEMENT FUNCTION

This viewer function can be used to manage the saved images, EDS data, reports, layouts etc.

Project data management Data Filter

Data Search

Import/Export

### REPORT FUNCTION

Reports can be created, exported and edited.

Creating reports Report Functions Layout edit

### MONTAGE FUNCTION

Multiple successive images are combined and disp!ayed as one image. lt is also possible to modify the positioning of each field of view.

### S.S. ELECTRON MICROSCOPE FUNCTIONS

##### Image adjustment function

Adjustment of the microscope image is possible.

Gamma correction Digital correction

Pseudo-color display:

* + 1. Metrology functions

Measurements such as the distance measurement are possible using the microscope images: Two-point measurement (straight, perpendicular or arbitrary)

Line width measurement (parallel, X, Y, diagonal) Angle measurement

Area measurement (Rectangle, circle. polygon) Count (click)

### OPERATION PANEL

* 1. GENERAL

The MP-950800P2 Operation Panel is connected to the main instrument and used to facilitate various adjustments of observation images such as focusing, magnification, and shifting the field of view.

### PERFORMANCE

6 . 2 . 1 . Manual functions

Focus adjustment (you can select from coarse and fine) Stigmator adjustment (adjustment of the X and Y directions)

Contrast and brightness adjustment (you can select from coarse and fine) Magnification adjustment

Preset magnification settings

6.2.2. Scanning functions

Sean mode switching (ROC, FAST, SLOW, PHOTO, CF, FREEZE)

6.2 .3 . Automatic functions Automatic focusing

Automatic stigmator

Automatic contrast/brightness adjustment

6.2.4. Stage functions

Observation view movement (X, V, Z, T, and R axes) by operating the stage Observation view movement (X, V directions) by image shift

Image shift reset

### 6.3. SPECIFICATIONS

Sean mode switching: Stage control:

Beam shift:

Contrast adjustment: Contrast, coarse/fine: Brightness adjustment:

Brightness, coarse/fine adjustment:

Astigmatism correction (X, Y): Focus adjustment:

Focusing, coarse/fine adjustment: Magnification adjustment:

Preset magnification:

ROC, FAST, SLOW, PHOTO, FREEZE, CF buttons

Joystick Joystick Rotary knob

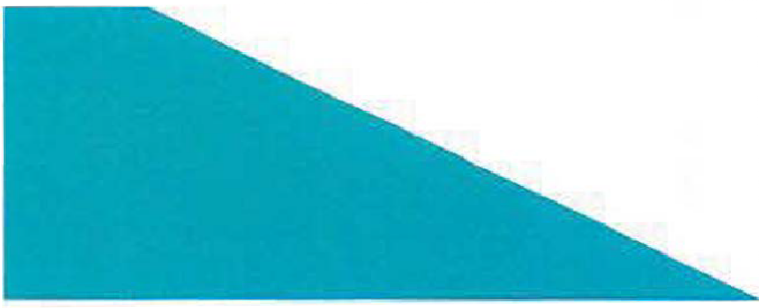
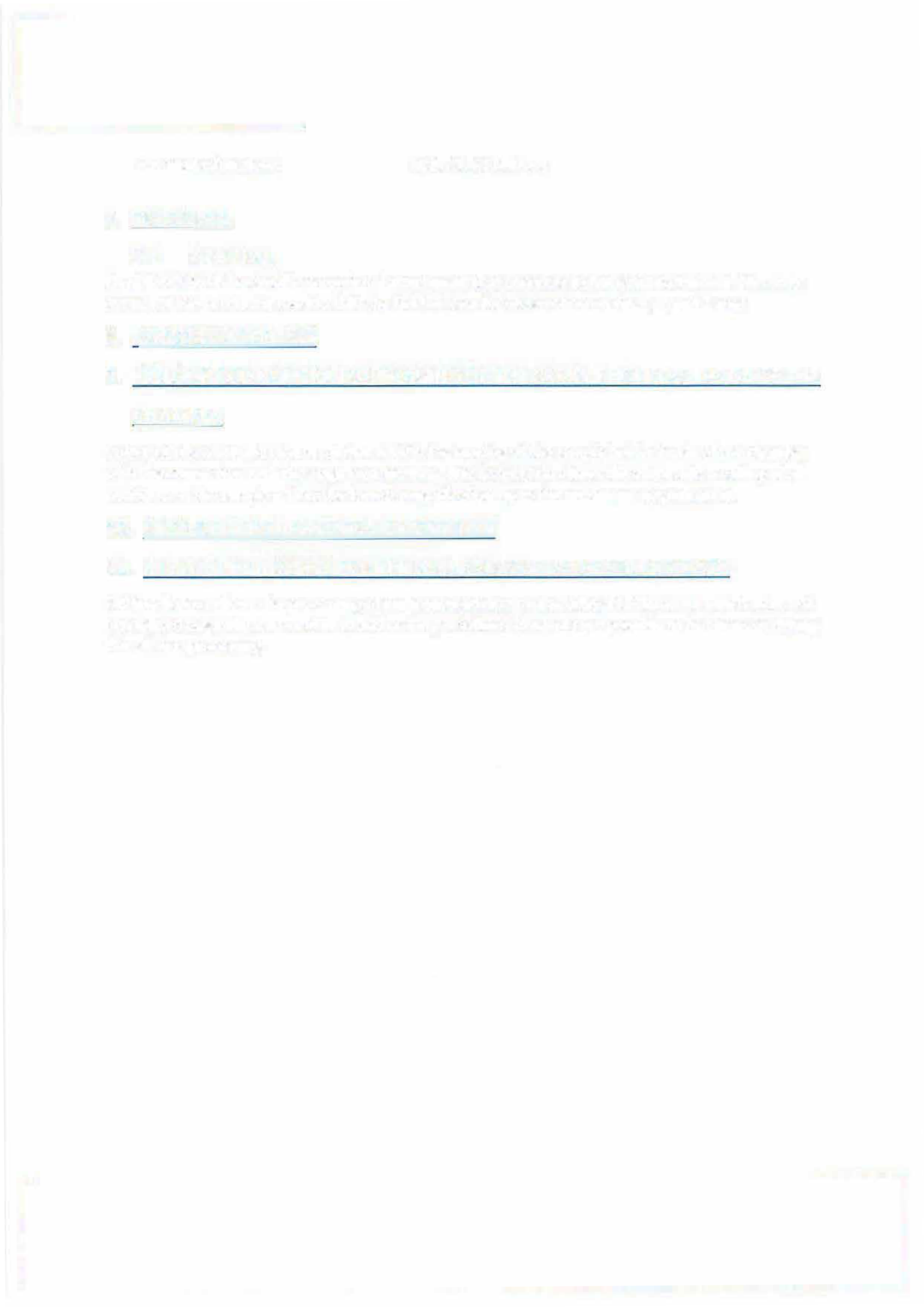
Switch by knob-clicking Rotary knob

Switch by knob-clicking Rotary knob

Rotary knob

Switch by knob-clicking Rotary knob

Knob-clicking



Automatic functions: ACB, AF, AS buttons

1. **TRACKBALL**
   1. **GENERAL**

The MP-95030TB Trackball is an optional attachment that connects to the main instrument. The stage control of this product is used to shift the field of view for observation on the X, Y, and Z axes

1. **PC SCREEN MIN. 32"**
2. **COLOUR CCD CAMERA FOR IMAGING OF THE SAMPLE HOLDERS INSIDE OF THE CHAMBER**

Colour CCD camera with the resolution 4 MPix for imaging of the sample holder inside of the chamber with the connection with the stage motorization. This connection allows the automatic recalling of all positions on the sample -from the lowest magnification up to the maximum magnification.

1. **6 PCS OF THE FILAMENTS+ STARTER KIT**
2. 2 X **OFF-LINE LICENCE FOR THE ANALYSIS OF THE MEASURED DATA**

Off-line licence allows the processing of the measured data on the other PC. Elements, which were not predefined originally are possible to add or the predefined elements are possible to be removed during this off-line processing.