Zoom Microscope
Ultra Long Working Distance Zoom Microscope

LWZ/LWZ-M

Microscope unit with combination of high resolution objective lenses and 12× zoom range. This single unit covers from the overall image check to the magnified observation.

- The light, compact body is suitable for assembly in a small space.
- A single unit can cover everything from confirmation of the whole image to enlarged observation, with a zoom ratio 12× for optical performance.
- Coaxial epi-illumination, which is regularly mounted on the product, enables the observation of bright fields.
- Dark fields can be observed by using optional products, ring light guides and partial emission cassettes. A017
- The lineup also includes motorized type suitable for embedding in equipment or for automatic measurements.
- Manual type is switching the magnification manually and consisting of the zoom lens tube (SZL) and objective lens (ZOL series).
- Motorized type is switching the magnification by controller and consisting of the zoom lens tube (SZLM), the objective lens (ZOL series), the switching controller (GIP-101) and the zoom control cable (ZCA-2).
- C mount 1/2-inch camera is supported.

Specifications

<table>
<thead>
<tr>
<th>Manual type Part Number</th>
<th>LWZ-15</th>
<th>LWZ-30</th>
<th>LWZ-50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorized type Part Number</td>
<td>LWZ-15M</td>
<td>LWZ-30M</td>
<td>LWZ-50M</td>
</tr>
<tr>
<td>Optical magnification</td>
<td>1.25 – 15×</td>
<td>2.5 – 30×</td>
<td>4.16 – 50×</td>
</tr>
<tr>
<td>N.A.</td>
<td>0.03 – 0.2</td>
<td>0.06 – 0.36</td>
<td>0.1 – 0.45</td>
</tr>
<tr>
<td>WD [mm]</td>
<td>46.2</td>
<td>35.2</td>
<td>14</td>
</tr>
<tr>
<td>Image size [mm]</td>
<td>φ6 (for 1/2 inch sensor size, C mount)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Wavelength range [nm]</td>
<td>400 – 700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual field of view [mm]</td>
<td>6.4 – 0.5</td>
<td>3.2 – 0.3</td>
<td></td>
</tr>
<tr>
<td>Resolution (at Mercury e-line) [μm]</td>
<td>11.18 – 1.68</td>
<td>5.59 – 0.93</td>
<td>3.36 – 0.75</td>
</tr>
<tr>
<td>Depth of field (at Mercury e-line) [μm]</td>
<td>±305.6 – ±6.9</td>
<td>±76.4 – ±2.1</td>
<td>±275 – ±1.4</td>
</tr>
</tbody>
</table>

ULWZ/ULWZ-M

Maximum working distance of 500mm. Suitable for observing the inside of vacuum chambers and ovens in the special environment.

- Light, compact body is suitable for assembly in a small space.
- A single unit can cover everything from confirmation of the whole image to enlarged observation, with an optical performance of zoom ratio 12×.
- The optical magnification and stroke distance can be easily changed by assembling and or replacing the front converter lens (ULWZ-100 is not supported).
- Coaxial epi-illumination, which is regularly mounted on the product, enables the observation of bright field.
- The lineup also includes a motorized type suitable for embedding in equipment or for automatic measurements.
- Manual type is switching the magnification manually and consisting of the zoom lens tube (SZL) and objective lens (UZOL/UFCL series).
- Motorized type is switching the magnification by controller and consisting of the zoom lens tube (SZLM), the objective lens (UZOL/UFCL series), the switching controller (GIP-101) and the zoom control cable (ZCA-2).
- C mount 1/2-inch camera is supported.

Specifications

<table>
<thead>
<tr>
<th>Manual type Part Number</th>
<th>ULWZ-100</th>
<th>ULWZ-200</th>
<th>ULWZ-300</th>
<th>ULWZ-400</th>
<th>ULWZ-500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motorized type Part Number</td>
<td>ULWZ-100M</td>
<td>ULWZ-200M</td>
<td>ULWZ-300M</td>
<td>ULWZ-400M</td>
<td>ULWZ-500M</td>
</tr>
<tr>
<td>Optical magnification</td>
<td>1.25 – 15×</td>
<td>0.58 – 7×</td>
<td>0.37 – 4.48×</td>
<td>0.28 – 3.41×</td>
<td>0.23 – 2.74×</td>
</tr>
<tr>
<td>N.A.</td>
<td>0.03 – 0.2</td>
<td>0.014 – 0.08</td>
<td>0.009 – 0.052</td>
<td>0.007 – 0.039</td>
<td>0.006 – 0.032</td>
</tr>
<tr>
<td>WD [mm]</td>
<td>101</td>
<td>206</td>
<td>305</td>
<td>404</td>
<td>502</td>
</tr>
<tr>
<td>Image size [mm]</td>
<td>φ6 (for 1/2 inch sensor size, C mount)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrected Wavelength range [nm]</td>
<td>400 – 700</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual field of view [mm]</td>
<td>6.4 – 0.5</td>
<td>13.8 – 1.1</td>
<td>21.6 – 1.8</td>
<td>28.6 – 2.3</td>
<td>34.8 – 2.9</td>
</tr>
<tr>
<td>Resolution (at Mercury e-line) [μm]</td>
<td>11.2 – 1.7</td>
<td>24.0 – 4.2</td>
<td>37.3 – 6.5</td>
<td>47.9 – 8.6</td>
<td>55.9 – 10.5</td>
</tr>
<tr>
<td>Depth of field (at Mercury e-line) [μm]</td>
<td>±305.6 – ±6.9</td>
<td>±1403 – ±43</td>
<td>±3395 – ±102</td>
<td>±5612 – ±181</td>
<td>±7639 – ±269</td>
</tr>
</tbody>
</table>
System Diagram

- **Controller**

- **Cable**

- **SZLM (Motorized type)**

- **SZL (Manual type)**

- **ZOL-15/WD46.2mm**

- **ZOL-30/WD35.2mm**

- **ZOL-50/WD14.0mm**

- **UZOL-15/WD101mm**

- **UZOL-7/WD206mm**

- **UFCL-300/WD305mm**

- **UFCL-400/WD404mm**

- **UFCL-500/WD502mm**

Outline Drawing (in mm)

- **Zoom Lens Tube**

  - **SZL (Manual)**

  - **SZLM (Motorized)**

- **Long working distance objective lenses**

  - **ZOL-15**

  - **ZOL-30**

  - **ZOL-50**

- **Ultra Long working distance objective lenses**

  - **UZOL-15**

  - **UZOL-7**

- **Front converter lenses**

  - **UFCL-300**

  - **UFCL-400**

  - **UFCL-500**

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**Microscope Unit**

- **Alignment**

- **Interferometers**

- **Inspection/Observation**

- **Bio-photonics**

- **Laser Processing**

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**Optics & Optical Coatings**

- **Opto-Mechanics**

- **Bases**

- **Manual Stages**

- **Actuators & Adjusters**

- **Motorized Stages**

- **Light Sources & Laser Safety**

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**Application Systems**

- **Systems**

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**Zoom Microscope Option**

**Rear Converter Lens | ZRCL**

By mounting this rear converter lens between the camera and lens barrel, magnification can be increased without changing the working distance or the objective.

- **Part Number**: ZRCL-1.5, ZRCL-2.0
- **Magnification**: 1.5x, 2.0x
- **Camera mount**: C mount

**Attention**
- It is only for C mount, so it can not be used to the CS mount products such as microscopes, observation systems or cameras.
- Optical performance and resolution will not be improved even if mounting the rear converter lens. It will be depending on the performance of the microscope.

**Guide**
- A variety of microscope for C-mount compatible and camera are provided. (Microscope, Zoom Microscope, OUCI-2, Camera)

**Reference image**
- Zoom Microscope LWZ-15 (Optical Magnification 15x)

**Ring Light Guide | ZRL-ZOL15**

Best used for viewing objects with sloping features, providing a shadow free image.

- **Part Number**: ZRL-ZOL15
- **Covering**: SUS flexible
- **Length [mm]**: 1,000
- **Bending radius [mm]**: 60
- **Inward angle of the light emitted [°]**: 15
- **Bundle Diameter [mm]**: 7
- **Inner diameter [mm]**: 31

**Attention**
- This product is only for Zoom microscope (LWZ-15/LWZ-15M). If it is used with other products, there is a possibility that optimal illumination can not be done.

**Guide**
- A variety of light source is available. (LED light source, Tungsten Halogen light source and Metal Halide light source)

**Specifications**

**Focusing Unit / Pole Stand | ZAS-FAC-PST / PS-S/L**

These products proved a base and fine focusing capability for the Zoom microscope units and the OUCI microscope bodies.

- **Part Number**: ZAS-FAC-PST
- **Travel [mm]**: 30

- **Part Number**: PS-S, PS-L

**Attention**
- Screws are not supplied with focusing unit for fixing to observation unit with coaxial illumination and zoom microscope.
- When using a focusing unit and pole stand, please check that required working distance is ensured. ULWZ series is not available for long working distance.

**Outline Drawing**

**Guide**
- Standard 60mm sized manual stages can be mounted to the base plate using the M4 hole pattern.

**Specifications**
Partial Light Blocking Cassette | ZPSC-T1

By blocking the co-axial illumination partially, surface is illuminated with grazing-incidence enhancing visibility of rough edges

Specifications

| Part Number | ZPSC-T1 |

Image Measurement Software | SGMMSE

This is an integrated software system that easily can be used by a PC mouse, and it enables to carry out image measurement and analysis, image storage, focus synthesis and so on to support the zoom microscope.

- This software is for image processing and measurement with 2.0 Mega pixels USB2.0 Color Camera (SK-TC202USB-AT). Windows® XP / 7 (32bit) is supported.

[Measurement functions]

- **Image and video capture**
  Image by BMP, JPG, GIF, and PNG format and Video by AVI format can be saved.

- **Measurement function**
  It easily measures the size of an object by clicking the mouse on the screen. It can measure the distance between two points, the radius and diameter from the point of three or more points, angle, etc.

- **Calibration function**
  11 types of calibration settings can be registered depending on the magnification of the zoom microscope.

- **Camera control**
  Camera's gain, shutter speed, white balance and reversal can be displayed.

- **Line display** (cross line, scale display)

### HDR (High Dynamic Range Imaging) Function

When observed objects with different reflection, an image can be obtained by reducing the overexposure and underexposure. It can be taken completely the state of the sample.

By using the motorized Z-axis stage, it can take an “in-focus” picture over the entire screen. 3D images can be displayed from the image of the composed focus.

Example of Synthetic Image

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