PROFILE PROJECTORS

V-20B

V-12B
Parfocal projection lenses
All projection lenses have the same parfocal distance and feature long working distances. The built-in half mirror eliminates the need to adjust illumination each time the magnification is changed. With improved images with excellent quality, while enabling observation in a comfortable posture by adjusting the eye-point height.

Workpieces up to 20kg measurable
The stage up/down movement unit is rigidly built, and if the PS 10x6B Stage is used, workpieces as heavy as 20kg can be loaded.

Stage Adapter S
For the V-20B
This adapter is used to mount a stage other than the PS 10x6B, PS 8x6B Stage to the V-20B profile projector.

PROFILE PROJECTOR
V-20B
Profile projector with an effective 500mm screen diameter
Large effective screen diameter of 500mm. Permits mounting of a large stage and includes a built-in digital counter and digital protractor.

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PROFILE PROJECTOR
V-12B Series

Desktop-type profile projectors with an effective 305mm screen diameter

Wide measurable range: cross travel 250x150mm
Models with a built-in digital counter and/or protractor are available.

Four types available

<table>
<thead>
<tr>
<th>Type</th>
<th>Built-in digital protractor</th>
<th>Built-in digital counter</th>
</tr>
</thead>
<tbody>
<tr>
<td>V-12BDC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>V-12BD</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>V-12BSC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>V-12BS</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

D: Deluxe type. Comes with a built-in digital protractor
S: Standard type. No digital protractor is included
B: Built-in XY digital counter
The V-12BSC and V-12BS types have a fixed screen.
Therefore, angular measurement by rotating the screen is not possible.

Large stage mountable
The V-12B adapts a focusing mechanism that achieves focus by moving the objective head up and down, allowing stages with longer cross travel to be mounted. When the PS 10x6B Stage is used, the projector can measure areas as wide as 250x150mm.

Adjustable base feet
The projector is less affected by irregularities in the installation surface and external vibrations because the base is 2mm away from the installation surface and the base feet are adjustable.

Increased maximum workpiece height
Because the rigidity of the instrument is increased, thanks to CAE (Computer-Aided Engineering) design, workpieces as tall as 100mm can be loaded.

Built-in digital counter and protractor
The V-12BDC and V-12BSC types come with a digital XY counter, while the V-12BD and V-12BS types have a built-in digital protractor for greater ease of use.

Erect images
Projection images are erect and unreversed for easy measurements, and their quality is as sharp as inverted images.

Switchable vertical/oblique illumination
The built-in surface illuminator can be switched between vertical and oblique illumination, making detection of edges in resin parts and other workpieces much easier.

Four-step zooming condenser lens
When contour illumination is used, this condenser lens delivers the right amount of light to suit the magnification of the projection lens selected. (DIA condenser must be used with this lens when the magnification is 200x)

DIA Condenser Lens
Under contour illumination, the DIA condenser lens is necessary when 200x projection lenses are used.

Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Vertical optical axis bench type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image</td>
<td>Erect and unreversed</td>
</tr>
<tr>
<td>Screen</td>
<td>V-12BDC/V-12BD (305mm): etched center crossline, provided with digital protractor fine rotation knob; 360 rotatable (with digital reading to 1 minute of arc) V-12BSC/V-12BS (305mm) fixed screen</td>
</tr>
<tr>
<td>Lens mount</td>
<td>3-lens turret mount, clamping type</td>
</tr>
<tr>
<td>Projection lens</td>
<td>5x, 10x, 20x, 25x, 50x, 100x, 200x</td>
</tr>
<tr>
<td>Magnification accuracy (vertical)</td>
<td>0.1% for oblique surface/contour illumination, 0.15% for vertical surface illumination</td>
</tr>
<tr>
<td>Light source</td>
<td>24V-150W halogen for both contour and surface illumination</td>
</tr>
<tr>
<td>Max. workpiece height</td>
<td>100mm (70mm: with PS 10x6B, PS 8x6B Stage)</td>
</tr>
<tr>
<td>Stage</td>
<td>PS 10x6B, PS 8x6B, PS 6x4B, PS 4x4B</td>
</tr>
<tr>
<td>Power input</td>
<td>AC 100/120/220/240V, 50/60Hz (PS 2x2 Stage directly mountable)</td>
</tr>
<tr>
<td>Dimensions</td>
<td>410x650x938-1038mm</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 80kg</td>
</tr>
<tr>
<td>XY counter</td>
<td>1, 0.01, 0.05 µm selectable</td>
</tr>
</tbody>
</table>

Digital protractor 0.01°/1’ selectable
Stage Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>Surface area (mm)</th>
<th>Stage glass dimensions (mm)</th>
<th>Stroke (mm)</th>
<th>Reading Method</th>
<th>Min. reading (mm)</th>
<th>Rotation range (rotation table)</th>
<th>Tool installation screw hole</th>
<th>Load capacity (kg)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS 10x6B</td>
<td>398x260</td>
<td>955x190</td>
<td>250x150</td>
<td>Linear encoder</td>
<td>0.1</td>
<td>3'-3&quot; (swivel plate)</td>
<td>12-M6 depth 10</td>
<td>20</td>
<td>58.5</td>
</tr>
<tr>
<td>PS 8x6B</td>
<td>348x260</td>
<td>265x190</td>
<td>190x150</td>
<td></td>
<td></td>
<td>10-M6 depth 10</td>
<td>15-M6 depth 15</td>
<td>15</td>
<td>48.5</td>
</tr>
<tr>
<td>PS 6x4B</td>
<td>254x230</td>
<td>210x190</td>
<td>150x150</td>
<td></td>
<td></td>
<td>8-M6 depth 10</td>
<td>8-M6 depth 15</td>
<td>15</td>
<td>23.5</td>
</tr>
<tr>
<td>PS 2x2B</td>
<td>Ø174</td>
<td>Ø107</td>
<td>Ø50x50</td>
<td></td>
<td></td>
<td>Ø107/rotation table</td>
<td>6-M6 depth 7</td>
<td>5</td>
<td>15.5</td>
</tr>
</tbody>
</table>

Rotating Tables

Rotating Table Specifications

<table>
<thead>
<tr>
<th>Table diameter (mm)</th>
<th>Glass insert diameter (mm)</th>
<th>Reading range (mm)</th>
<th>Tool installation screw hole</th>
<th>Weight (Approx. kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotating Table Type 3</td>
<td>262</td>
<td>255</td>
<td>6-M6 (uncalibrated)</td>
<td>6.5</td>
</tr>
<tr>
<td>Rotating Table Type 4</td>
<td>262</td>
<td>255</td>
<td>6-M6 (uncalibrated)</td>
<td>6.5</td>
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</tbody>
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Standard 300mm Scale

Gauges stage travel accuracy up to 300mm. Both 10mm-interval sensor patterns and calibrations are provided. Made of low heat-expansion glass, for minimizing influence of heat.

Tilt angle: 10mm (attached with calibrated value)

<table>
<thead>
<tr>
<th>Maximum sample size (mm)</th>
<th>Center height (mm)</th>
<th>Tilt angle (deg)</th>
<th>Weight (Approx. kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø6x130</td>
<td>45</td>
<td>10</td>
<td>2.2</td>
</tr>
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Tilting Center Fixture A2

Used to tilt samples around the center axis. Type A2 is available for PS 2x2B with Rotating Table Type 3.

Stage Operation

- Tilting roller drive allows smooth changeover of course/fine stage movement.
- Swivel plate comes as standard for PS 10x6B and PS 8x6B stages.
- The course/fine changeover lever and the RESET and SEND buttons are located near the X- and Y- axis knobs.
- This function is not available for PS 2x2B stage.

Large stage adjustment knob

- Enables fine adjustment of swivel plate rotation.
- This is available for PS 10x6B and PS 8x6B stages.

Rotating Table Specifications

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Data Processing Software E-MAX Series

E-MAX is a series of general-purpose measurement support systems with a common user interface for PCs. The software processes two-dimensional data by a wide range of manual measuring instruments, including projectors. Data result can be saved as a csv file.

Data Processing Software E-MAX Series: Measurement Processing

- Actual measurement + recall measurement
- Reference settings

Data Processing Software E-MAX Series: Measurement Processing

- Recall settings
- Recall measurement (reference settings)

A built-in navigation function improves measurement efficiency by displaying the current position and the next measurement position during replays. Number ① is the current position and number ② is the next measurement position.

User-friendly Windows® interface allows a host of measurement and processing functions to be easily controlled using easy-to-understand multi windows and a mouse.

- Graphical window
- Counter window
- List window
- Toolbar (measurement codes)
- Results display window

* An output window, image window, and editing listing window can be displayed as necessary.

Data Processor DP-E1A

Data processing system combining both enhanced accuracy and ease of use

The DP-E1A was developed in response to the demands for enhanced accuracy and improved work efficiency across the entire measurement system. Despite its compact form with a built-in counter, the unit dramatically improves usability thanks to its 330×240 pixel LCD. It enables integrated operation with measuring microscopes and profile projectors, speedy measurement calculations, and reliable data processing.

- User-friendly, small-footprint system
- Easy-to-master control keys
- Saves measurement results on USB memory

Teaching files and measurement results files can be saved to a USB memory device for easy access.

* Retrofit Counter/DP unit is also required

Measurement Support Application (option)

Custom Create

Direct link to Excel sheet programs

- Measurement data from counters and/or data processors can be transferred directly to Excel sheets.
- Allows data transfer to customized inspection-result sheet form
- Three standard inspection-result sheet forms are available
- Transfer from multiple worksheets allows for more efficient measurements

Custom Fit QC

The software can make measurement reports easily. 10 standard formats are supplied and can be customized. It can handle angle in degree, minute and seconds and can create graphics automatically. Custom Fit QC can create histograms, X-R chart, scatter diagrams, etc., used in QC.
Digital Thermal Printer DPU-414
Thermal Printer TSP651-24

<table>
<thead>
<tr>
<th></th>
<th>DPU-414</th>
<th>TSP651-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper width</td>
<td>68mm or 80mm</td>
<td>58mm or 80mm</td>
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</table>

Foot Switch 4

This switch can be used for such purposes as issuing load instructions for the DP-E1A from a Retrofit Counter/DP Unit or for EXRST/EDGE connector (V-20B, V-12BSC, or V-12BDC). It helps improve measurement efficiency by freeing the user’s hands to perform other tasks.

2-Axis Counter Display

These displays show X and Y-axis coordinates with Retrofit Counter/DP Unit. (Can be switched between 1μm, 0.1μm, and 0.01μm)

Retrofit Counter/DP Unit

This is for adding the DP-E1A Data Processor or connecting the 2-Axis Counter display to V-12BD and V-12BS.

Green Filter, ND Filter, DIA Adapter A

For V-12B only

Glass Scale Set

Used to check the magnifying accuracy of the projector being used. Equipped with:
- 50mm standard scale in 1mm increments (accuracy ±[3+7L/100]μm)
- 300mm standard scale in 0.1mm increments (accuracy ±[6+L/50]μm)
- 6x magnifier

* L = measurement length

Accessory Cabinet

Used to store accessories. Measures (W×D×H): 450×600×740mm (This is not for placing profile projector)

Glass Reading Scale

Used to measure projection images on the screen. 200mm and 300mm scales—both in 0.5mm increments—are available. Accuracy: ±15μm

Chart Clip Type LL

Used to measure charts on the screen. Comes standard with V-12B.

DIA Adapter A

ND Filter

Green Filter

The green filter is used for black- and-white photography or for viewing edges of a workpiece with greater sharpness. The ND filter is used to adjust brightness. Both filters must be used with the DIA Adapter A.