PA653UL & PA803UL Installation Guide
Desktop and Ceiling Mount

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Product Description
Type: 3 panel LCD projector. Dimensions: 22.8"(W) x 8.2"(H) x 19.3"(D) Weight: 40.1 lbs

Resolution: 1920 x 1200 (16:10) Brightness: PA653UL: 6500 Lumens PA803UL: 8000 Lumens

Fan Noise: 39 dB / 33dB @ 1 meter

Power Consumption: PA653UL: 627W (max) 2131 BTU/hour
PA803UL: 798W (max) 2713 BTU/hour

Network Ready, integrated wired and wireless adapter
Manual: Lens Shift, Horizontal & Vertical /Zoom/ Focus

Lens Specifications
NP44ML-01LK:
- Throw Ratio: 0.32:1
- Screen Sizes: 100"-400"
- Focal Length: 6.27mm
- Weight: 7.1lbs. / 3.20kg

NP40ZL:
- Throw Ratio: 0.79 – 1.11:1
- Screen Sizes: 50"-500"
- Focal Length: 13.3 – 18.6mm
- Weight: 3.6lbs. / 1.64kg

NP41ZL:
- Throw Ratio: 1.30 – 3.02:1
- Screen Sizes: 50" - 500"
- Focal Length: 21.8 – 49.8mm
- Weight: 3.9lbs. / 1.75kg

NP43ZL:
- Throw Ratio: 2.99 – 5.93:1
- Screen Sizes: 50"-500"
- Focal Length: 49.7 – 99.8mm
- Weight: 3.9lbs. / 1.75kg

Screen/Aspect Ratio
4:3, 16:9 and 16:10 screens are fully supported with proper aspect ratio control for both type sources using NEC developed scaling technology. Menu selections have settings for each screen type and aspect ratio control for each source type.

Notes
- For screen sizes not indicated on the projection tables, use the formulas below.
- If the figures on the tables do not match the results of formulas, use the figures in the table.
- Distances are in inches, for millimeters multiply by 25.4.
- Distances may vary ±5%.
Formulas: 16:10 Aspect Ratio (WUXGA)
The Projection Formulas use the image width for calculation. Image width is the same for all aspect ratios, only vertical image size varies. For proper projector placement, determine the image width for a desired screen size. Use the Screen Formulas below to calculate all screen dimensions. Plug in the image width for “W” in the Projection Formulas.
Refer to the diagrams and charts for popular screen sizes on page 2 and 3:

**Projection Formulas:**

**Definitions:**

NP40ZL:

- C(Wide) = 0.807W – 1.535
- C(Tele) = 1.131W – 1.632

NP41ZL:

- C(Wide) = 1.323W – 1.763
- C(Tele) = 3.034W – 1.539

NP43ZL:

- C(Wide) = 2.929W + 5.143
- C(Tele) = 5.878W + 4.320

**16:10 Screen Formulas**

- W = Image Width
- H = Image Height (size)
- C = Throw distance
- Height (H) = W x 10/16
- Screen Diagonal = W x 18.868/16

**Horizontal Lens Shift Max (Right):** 0.15W

**Horizontal Lens Shift Max (Left):** -0.15W

**Distance Chart for popular 16:10 Screens (WUXGA)**

<table>
<thead>
<tr>
<th>Screen Size (16:10)</th>
<th>NP40ZL</th>
<th>NP41ZL</th>
<th>NP43ZL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagonal Width(W)</td>
<td>0.79 - 1.11:1</td>
<td>1.30 - 3.02:1</td>
<td>2.99 - 5.93:1</td>
</tr>
<tr>
<td>Height (H)</td>
<td>Max (Right)</td>
<td>Max (Left)</td>
<td>Max (Right)</td>
</tr>
<tr>
<td>inches</td>
<td>inches</td>
<td>inches</td>
<td>inches</td>
</tr>
<tr>
<td>60</td>
<td>51</td>
<td>32</td>
<td>39.5 - 55.9</td>
</tr>
<tr>
<td>67</td>
<td>57</td>
<td>36</td>
<td>44.3 - 62.6</td>
</tr>
<tr>
<td>72</td>
<td>61</td>
<td>38</td>
<td>47.7 - 67.4</td>
</tr>
<tr>
<td>84</td>
<td>71</td>
<td>45</td>
<td>55.9 - 78.9</td>
</tr>
<tr>
<td>90</td>
<td>76</td>
<td>48</td>
<td>60.1 - 84.7</td>
</tr>
<tr>
<td>100</td>
<td>85</td>
<td>53</td>
<td>66.9 - 94.3</td>
</tr>
<tr>
<td>127</td>
<td>108</td>
<td>67</td>
<td>85.4 - 120.2</td>
</tr>
<tr>
<td>150</td>
<td>127</td>
<td>79</td>
<td>101.1 - 142.2</td>
</tr>
<tr>
<td>180</td>
<td>153</td>
<td>95</td>
<td>121.6 - 171.0</td>
</tr>
<tr>
<td>210</td>
<td>178</td>
<td>111</td>
<td>142.2 - 199.8</td>
</tr>
<tr>
<td>241</td>
<td>204</td>
<td>128</td>
<td>163.4 - 229.5</td>
</tr>
<tr>
<td>270</td>
<td>229</td>
<td>143</td>
<td>183.2 - 257.3</td>
</tr>
<tr>
<td>300</td>
<td>254</td>
<td>159</td>
<td>203.8 - 286.1</td>
</tr>
<tr>
<td>400</td>
<td>339</td>
<td>212</td>
<td>272.2 - 382.0</td>
</tr>
<tr>
<td>500</td>
<td>424</td>
<td>265</td>
<td>340.6 - 477.9</td>
</tr>
</tbody>
</table>

**Note:** For screen sizes not indicated in projection tables, refer to formulas above respective charts.
Formulas: 16:10 Aspect Ratio (WUXGA)
The Projection Formulas use the image width for calculation. Image width is the same for all aspect ratios, only vertical image size varies. For proper projector placement, determine the image width for a desired screen size. Use the Screen Formulas below to calculate all screen dimensions. Plug in the image width for "W" in the Projection Formulas. Refer to the diagrams and charts for popular screen sizes on page 2 and 3:

**Projection Formulas:**
NP44ML-01LK:  
\[ A = (0.339\times W) - 25.2 \]
\[ B = ((0.844\times W) + 6.614) - (0.5\times H) \]
\[ C = (0.339\times W) - 1.333 \]
\[ D = (0.219\times W) - 1.638 \]
\[ E = (0.219\times W) + 6.562 \]

**Definitions:**

**16:10 Screen Formulas**

- \( W \) = Image Width
- \( H \) = Image Height (size)
- \( C \) = Throw distance
- Screen Diagonal = \( W \times 18.868/16 \)

**Distance Chart for popular 16:10 Screens (WUXGA)**

### NP44ML-01LK Installation

<table>
<thead>
<tr>
<th>Screen Size (16:10)</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagonal Width(W)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inches</td>
<td>inches</td>
<td>inches</td>
<td>inches</td>
<td>inches</td>
<td>inches</td>
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<tr>
<td>108</td>
<td>92</td>
<td>57</td>
<td>5.8</td>
<td>55.3</td>
<td>29.7</td>
</tr>
<tr>
<td>113</td>
<td>96</td>
<td>60</td>
<td>7.3</td>
<td>57.5</td>
<td>31.2</td>
</tr>
<tr>
<td>130</td>
<td>116</td>
<td>69</td>
<td>12.2</td>
<td>65.2</td>
<td>36.0</td>
</tr>
<tr>
<td>137</td>
<td>116</td>
<td>73</td>
<td>14.2</td>
<td>68.4</td>
<td>38.1</td>
</tr>
<tr>
<td>164</td>
<td>139</td>
<td>87</td>
<td>21.9</td>
<td>80.5</td>
<td>45.6</td>
</tr>
<tr>
<td>189</td>
<td>160</td>
<td>100</td>
<td>29.1</td>
<td>91.8</td>
<td>53.0</td>
</tr>
<tr>
<td>208</td>
<td>176</td>
<td>110</td>
<td>34.6</td>
<td>100.4</td>
<td>58.5</td>
</tr>
<tr>
<td>226</td>
<td>192</td>
<td>120</td>
<td>39.8</td>
<td>108.5</td>
<td>63.6</td>
</tr>
<tr>
<td>270</td>
<td>229</td>
<td>143</td>
<td>52.4</td>
<td>128.3</td>
<td>76.3</td>
</tr>
<tr>
<td>300</td>
<td>254</td>
<td>159</td>
<td>61.0</td>
<td>141.8</td>
<td>84.9</td>
</tr>
<tr>
<td>350</td>
<td>297</td>
<td>185</td>
<td>75.4</td>
<td>164.4</td>
<td>99.3</td>
</tr>
</tbody>
</table>

**Definitions:**

- \( W \) = Image Width
- \( H \) = Image Height (size)
- \( C \) = Throw distance
- Screen Diagonal = \( W \times 18.868/16 \)
Ceiling Mount Installation

![Diagram of Ceiling Mount Installation]

Desktop Installation

ONLY FOR NP40ZL, NP41ZL and NP43ZL LENSES

![Diagram of Desktop Installation]

Screen Center
Screen Top
Screen Bottom
Shift Range
Lens Shift Adjustable Range

Lens Shift Range for Desktop and Ceiling Mount Application
The diagram below shows the location of the image position in the lens. The lens can be shifted within the shaded area as shown using the normal projection position as a starting point.

Maximum Possible Range for NP40ZL, NP41ZL, NP43ZL:
- Towards ceiling/floor: 0.5H
- Away from ceiling/floor: 0.1H
- Right: 0.3W
- Left: 0.3W
(W: width of projected image, H: height of projected image)

Note: Horizontal lens shift range is 0.15W at a 200” projected image with NP41ZL.
Cabinet Dimensions

The following diagrams show the cabinet dimensions for the PA653UL/PA803UL. Dimensions are in inches. For millimeters multiply by 25.4. Note: Dimensions below shown with the NP41ZL lens.
Cabinet Dimensions

FOR CEILING MOUNT

4-M4(Max.M4 x 8)

Dimensions:
- 7.87
- 2.22
- 9.84
Cabinet Dimensions with Cable Cover

The following diagrams show the cabinet dimensions for the PA653UL/PA803UL. Dimensions are in inches. For millimeters multiply by 25.4.

Note: Dimensions below shown with the NP41ZL lens.
Cabinet Dimensions with Cable Cover

4-M4 (Max. M4 x 8)
For Ceiling Mount

Dimensions:
- Length: 9.84 in
- Width: 7.87 in
- Height: 2.22 in
Optional Lens Dimensions (NP40ZL and NP43ZL)
Optional Ceiling Mount Dimensions (Part #: NP600CM)
The following diagrams show ceiling mount dimensions for the NP600CM. Dimensions are in inches. For millimeters multiply by 25.4.

Input Panel
**PC Control Codes**

<table>
<thead>
<tr>
<th>Function</th>
<th>Code Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER ON</td>
<td>02H 00H 00H 00H 00H 02H</td>
</tr>
<tr>
<td>POWER OFF</td>
<td>02H 01H 00H 00H 00H 03H</td>
</tr>
<tr>
<td>INPUT SELECT HDMI1</td>
<td>02H 03H 00H 00H 02H 01H A1H A9H</td>
</tr>
<tr>
<td>INPUT SELECT HDMI2</td>
<td>02H 03H 00H 00H 02H 01H A2H AAH</td>
</tr>
<tr>
<td>INPUT SELECT DisplayPort</td>
<td>02H 03H 00H 00H 02H 01H A6H AEH</td>
</tr>
<tr>
<td>INPUT SELECT Computer</td>
<td>02H 03H 00H 00H 02H 01H 01H 09H</td>
</tr>
<tr>
<td>INPUT SELECT HDBaseT</td>
<td>02H 03H 00H 00H 02H 01H BFH C7H</td>
</tr>
<tr>
<td>PICTURE MUTE ON</td>
<td>02H 10H 00H 00H 00H 12H</td>
</tr>
<tr>
<td>PICTURE MUTE OFF</td>
<td>02H 11H 00H 00H 00H 13H</td>
</tr>
<tr>
<td>SOUND MUTE ON</td>
<td>02H 12H 00H 00H 00H 14H</td>
</tr>
<tr>
<td>SOUND MUTE OFF</td>
<td>02H 13H 00H 00H 00H 15H</td>
</tr>
<tr>
<td>ON SCREEN MUTE ON</td>
<td>02H 14H 00H 00H 00H 16H</td>
</tr>
<tr>
<td>ON SCREEN MUTE OFF</td>
<td>02H 15H 00H 00H 00H 17H</td>
</tr>
</tbody>
</table>

**ASPECT RATIO (4:3 Screen)**

4:3          03H 10H 00H 00H 05H 18H 00H 00H 00H 00H 30H
LETTERBOX     03H 10H 00H 00H 05H 18H 00H 00H 01H 00H 31H
WIDESCREEN    03H 10H 00H 00H 05H 18H 00H 00H 02H 00H 32H
ZOOM          03H 10H 00H 00H 05H 18H 00H 00H 03H 00H 33H

**ASPECT RATIO (RGB)**

4:3 WINDOW     03H 10H 00H 00H 05H 18H 00H 00H 00H 00H 30H
16:9          03H 10H 00H 00H 05H 18H 00H 00H 02H 00H 32H
5:4           03H 10H 00H 00H 05H 18H 00H 00H 08H 00H 38H
16:10         03H 10H 00H 00H 05H 18H 00H 00H 0CH 00H 3CH
15:9          03H 10H 00H 00H 05H 18H 00H 00H 0DH 00H 3DH
AUTO ADJUST   02H 0FH 00H 00H 02H 05H 00H 18H

**Cable Connection**

**Communication Protocol:**
- **Baud Rate:** 38400 bps (for cable lengths longer than 20', it is recommended changing to 9600 bps in setup menu)
- **Data Length:** 8 bits
- **Parity:** No Parity
- **Stop Bit:** One bit
- **X on/off:** None
- **Communications:** Full duplex

**PC Control Connector (D-Sub 9P)**

**NOTE 1:** Pins 1, 4, 6, and 9 are used inside the projector.
**NOTE 2:** For long cable runs it is recommended to set communication speed within the projector to 9600 bps.
**NOTE 3:** Jumper "Request to Send" and "Clear to Send" together on both ends of the cable to simplify cable connection.