

# PA653UL, PA703UL & PA803UL Installation Guide

## Desktop and Ceiling Mount

Rev 1.3

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### Product Description

|                           |                                                                                                       |                                                  |                                                                            |
|---------------------------|-------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------|
| <b>Type:</b>              | 3 panel LCD projector,<br>0.76 p-Si TFT w/MLA                                                         | <b>Dimensions:</b> 22.8"(W) x 8.2"(H) x 19.3"(D) |                                                                            |
|                           |                                                                                                       | <b>Weight:</b> 40.1 lbs                          |                                                                            |
| <b>Resolution:</b>        | 1920 x 1200 (16:10)                                                                                   | <b>Brightness:</b>                               | PA653UL: 6500 Lumens<br>PA703UL: 7000 Lumens<br>PA803UL: 8000 Lumens       |
| <b>Fan Noise:</b>         | PA653UL: 39 dB / 33dB @ 1 meter<br>PA703UL: 42 dB / 34dB @ 1 meter<br>PA803UL: 45 dB / 35dB @ 1 meter |                                                  |                                                                            |
| <b>Power Consumption:</b> | PA653UL: 627W (max)<br>PA703UL: 647W (max)<br>PA803UL: 798W (max)                                     | <b>BTU's:</b>                                    | PA653UL: 2131 BTU/hour<br>PA703UL: 2207 BTU/hour<br>PA803UL: 2713 BTU/hour |

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

### Lens Specifications

|                      |                                                        |                                              |                |                  |
|----------------------|--------------------------------------------------------|----------------------------------------------|----------------|------------------|
| <b>NP44ML-01LK :</b> | Throw Ratio: 0.32:1<br>Screen Sizes: 100"-400"         | Focal Length: 6.27mm<br>F/#:2.0              | <b>Weight:</b> | 7.1lbs. / 3.20kg |
| <b>NP40ZL:</b>       | Throw Ratio: 0.79 – 1.11:1<br>Screen Sizes: 50"-500"   | Focal Length: 13.3 – 18.6mm<br>F/#:2.0 - 2.5 | <b>Weight:</b> | 3.6lbs. / 1.64kg |
| <b>NP41ZL:</b>       | Throw Ratio: 1.30 – 3.02:1<br>Screen Sizes: 50" - 500" | Focal Length: 21.8 – 49.8mm<br>F/#:1.7 – 2.0 | <b>Weight:</b> | 3.9lbs. / 1.75kg |
| <b>NP43ZL:</b>       | Throw Ratio: 2.99 – 5.93:1<br>Screen Sizes: 50"-500"   | Focal Length: 49.7 – 99.8mm<br>F/#:2.2 -2.6  | <b>Weight:</b> | 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  $\pm 5\%$ .

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### 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:

**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

Horizontal Lens Shift Max (Right) = 0.15W

Horizontal Lens Shift Max (Left) = 0.-15W

#### Definitions:

W = Image Width

H = Image Height (size)

C = Throw distance

#### 16:10 Screen Formulas

W = H x 16/10

H = W x 10/16

Screen Diagonal = W x 18.868/16

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

| Screen Size (16:10) |          |            | Zoom Lenses   |                |                                          |                 |                 |                                |
|---------------------|----------|------------|---------------|----------------|------------------------------------------|-----------------|-----------------|--------------------------------|
|                     |          |            | NP40ZL        | NP41ZL         | Horizontal Lens Shift<br>(NP40ZL/NP41ZL) |                 | NP43ZL          | Horizontal Lens Shift (NP43ZL) |
| Diagonal            | Width(W) | Height (H) | 0.79 - 1.11:1 | 1.30 - 3.02:1  | Max<br>(Right)                           | - Max<br>(Left) | 2.99 - 5.93:1   | Max<br>(Right) - Max<br>(Left) |
| inches              | inches   | inches     | inches        | inches         | inches                                   |                 | inches          | inches                         |
| 60                  | 51       | 32         | 39.5 - 55.9   | 65.6 - 152.8   | 10.2                                     | -10.2           | 154.2 - 303.4   | 16.3 - -16.3                   |
| 67                  | 57       | 36         | 44.3 - 62.6   | 73.4 - 170.8   | 11.4                                     | -11.4           | 171.6 - 338.3   | 18.2 - -18.2                   |
| 72                  | 61       | 38         | 47.7 - 67.4   | 79.0 - 183.7   | 12.2                                     | -12.2           | 184.0 - 363.2   | 19.5 - -19.5                   |
| 84                  | 71       | 45         | 55.9 - 78.9   | 92.5 - 214.6   | 14.2                                     | -14.2           | 213.8 - 423.0   | 22.8 - -22.8                   |
| 90                  | 76       | 48         | 60.1 - 84.7   | 99.2 - 230.0   | 15.3                                     | -15.3           | 228.7 - 452.9   | 24.4 - -24.4                   |
| 100                 | 85       | 53         | 66.9 - 94.3   | 110.4 - 255.7  | 17.0                                     | -17.0           | 253.5 - 502.8   | 27.1 - -27.1                   |
| 127                 | 108      | 67         | 85.4 - 120.2  | 140.7 - 325.2  | 21.5                                     | -21.5           | 320.6 - 637.4   | 34.5 - -34.5                   |
| 150                 | 127      | 79         | 101.1 - 142.2 | 166.5 - 384.4  | 25.4                                     | -25.4           | 377.7 - 752.0   | 40.7 - -40.7                   |
| 180                 | 153      | 95         | 121.6 - 171.0 | 200.2 - 461.6  | 30.5                                     | -30.5           | 452.2 - 901.5   | 48.8 - -48.8                   |
| 210                 | 178      | 111        | 142.2 - 199.8 | 233.8 - 538.8  | 35.6                                     | -35.6           | 526.7 - 1051.1  | 57.0 - -57.0                   |
| 241                 | 204      | 128        | 163.4 - 229.5 | 268.6 - 618.5  | 40.9                                     | -40.9           | 603.7 - 1205.6  | 65.4 - -65.4                   |
| 270                 | 229      | 143        | 183.2 - 257.3 | 301.1 - 693.1  | 45.8                                     | -45.8           | 675.8 - 1350.1  | 73.3 - -73.3                   |
| 300                 | 254      | 159        | 203.8 - 286.1 | 334.8 - 770.3  | 50.9                                     | -50.9           | 750.3 - 1499.7  | 81.4 - -81.4                   |
| 400                 | 339      | 212        | 272.2 - 382.0 | 447.0 - 1027.6 | 67.8                                     | -67.8           | 998.7 - 1998.1  | 108.5 - -108.5                 |
| 500                 | 424      | 265        | 340.6 - 477.9 | 559.2 - 1284.9 | 84.8                                     | -84.8           | 1247.0 - 2496.6 | 135.7 - -135.7                 |

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### Formulas: 16:10 Aspect Ratio (WUXGA)

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#### Projection Formulas:

**NP44ML-01LK:**  
 $A = (0.339 * W) - 25.2$   
 $B = ((0.844 * W) + 6.614) - (0.5 * H)$   
 $C = (0.339 * W) - 1.333$   
 $D = (0.219 * W) - 1.791$   
 $E = (0.219 * W) + 6.562$

#### Definitions:

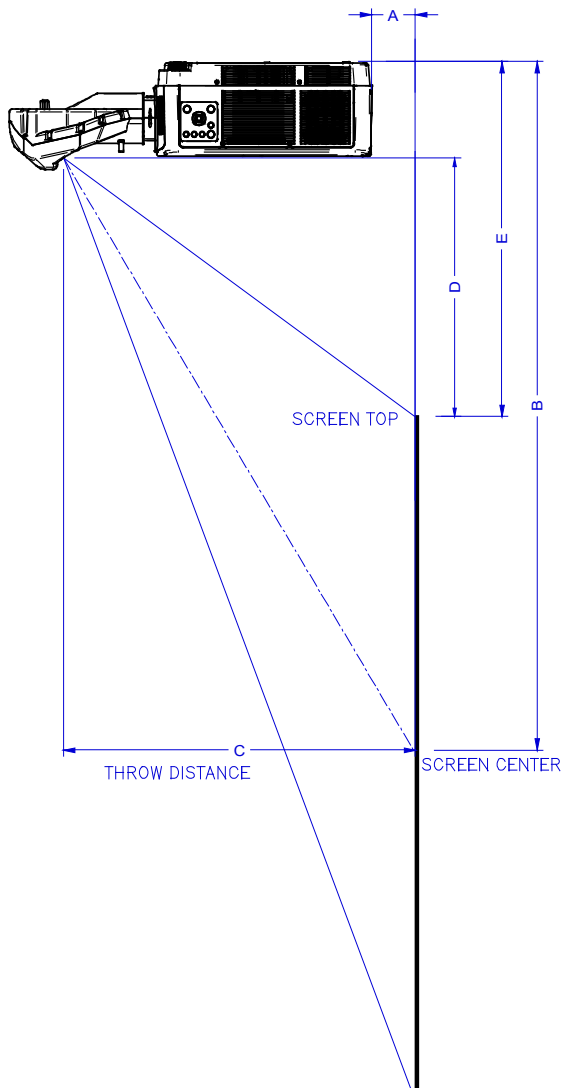
W = Image Width  
H = Image Height (size)  
C = Throw distance

#### 16:10 Screen Formulas

$W = H \times 16/10$   
 $H = W \times 10/16$   
Screen Diagonal =  $W \times 18.868/16$

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

#### NP44ML-01LK Installation



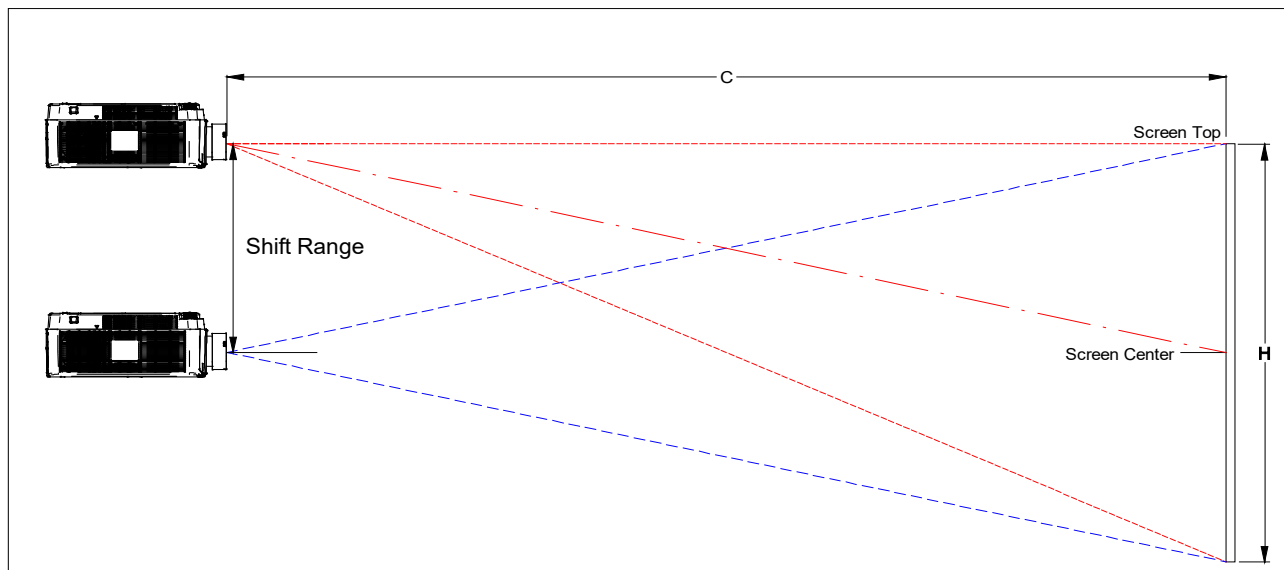
| Screen Size (16:10) |          |           | A      | B      | C      | D      | E      |
|---------------------|----------|-----------|--------|--------|--------|--------|--------|
| Diagonal            | Width(W) | Height(H) |        |        |        |        |        |
| inches              | inches   | inches    | inches | inches | inches | inches | inches |
| 108                 | 92       | 57        | 5.8    | 55.3   | 29.7   | 18.3   | 26.6   |
| 113                 | 96       | 60        | 7.3    | 57.5   | 31.2   | 19.2   | 27.5   |
| 130                 | 110      | 69        | 12.2   | 65.2   | 36.0   | 22.4   | 30.7   |
| 137                 | 116      | 73        | 14.2   | 68.4   | 38.1   | 23.7   | 32.0   |
| 164                 | 139      | 87        | 21.9   | 80.5   | 45.8   | 28.7   | 37.0   |
| 189                 | 160      | 100       | 29.1   | 91.8   | 53.0   | 33.3   | 41.7   |
| 208                 | 176      | 110       | 34.6   | 100.4  | 58.5   | 36.8   | 45.2   |
| 226                 | 192      | 120       | 39.8   | 108.5  | 63.6   | 40.2   | 48.5   |
| 270                 | 229      | 143       | 52.4   | 128.3  | 76.3   | 48.4   | 56.7   |
| 300                 | 254      | 159       | 61.0   | 141.8  | 84.9   | 53.9   | 62.3   |
| 350                 | 297      | 185       | 75.4   | 164.4  | 99.3   | 63.2   | 71.6   |

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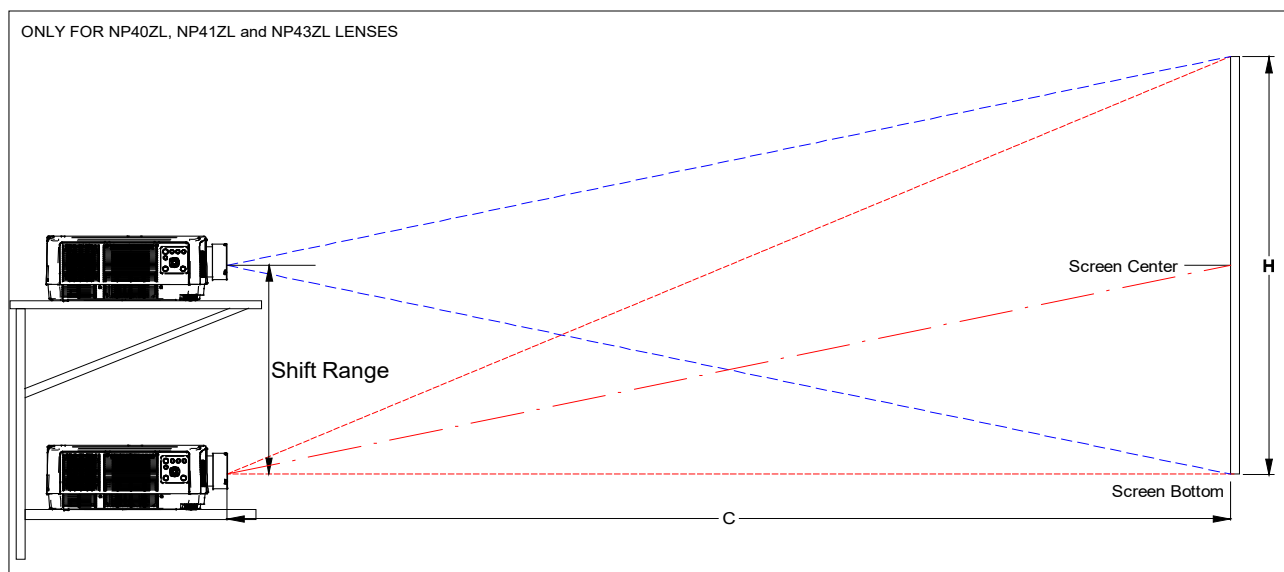
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### Ceiling Mount Installation



### Desktop Installation

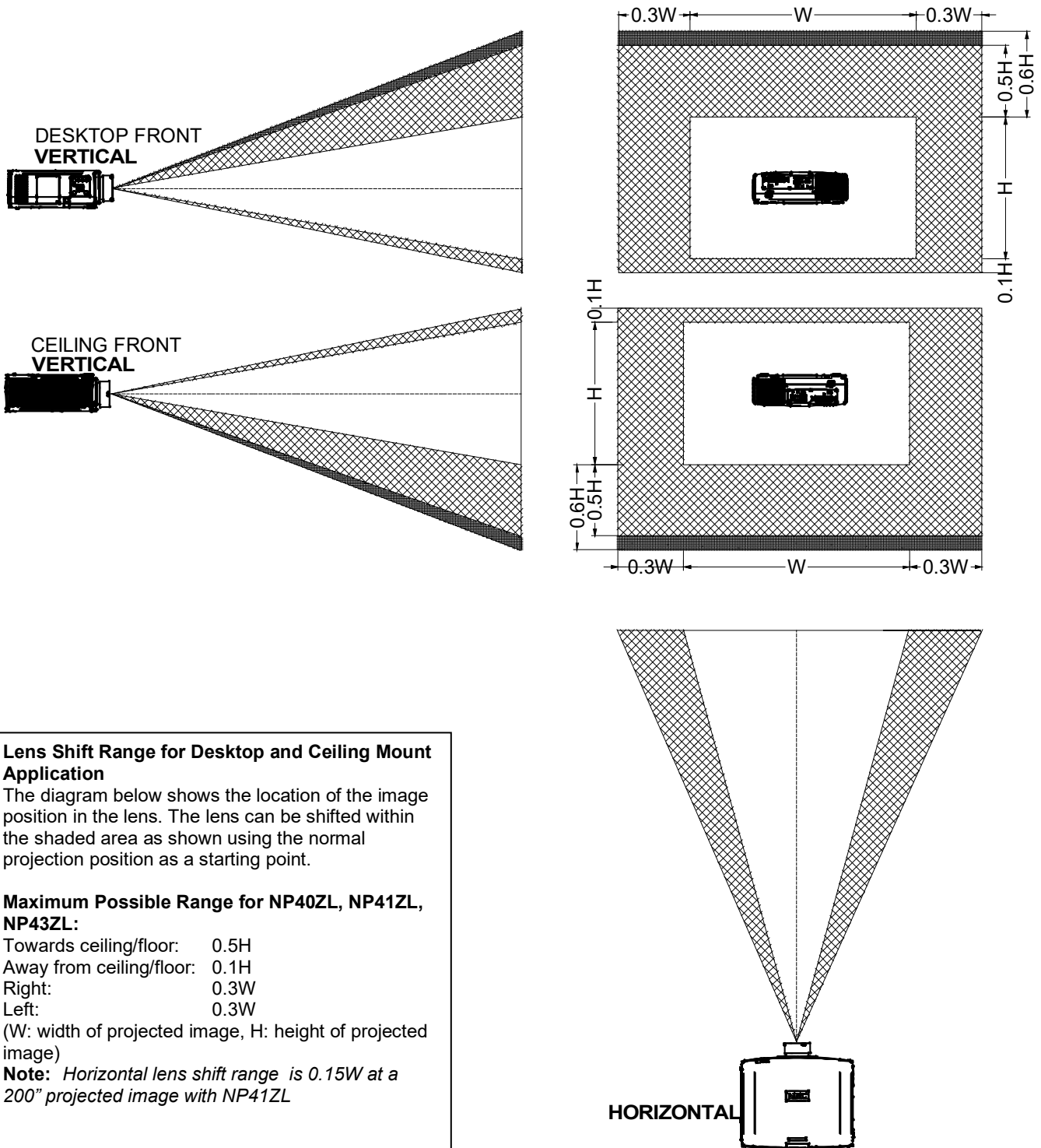


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### Lens Shift Adjustable Range



#### 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

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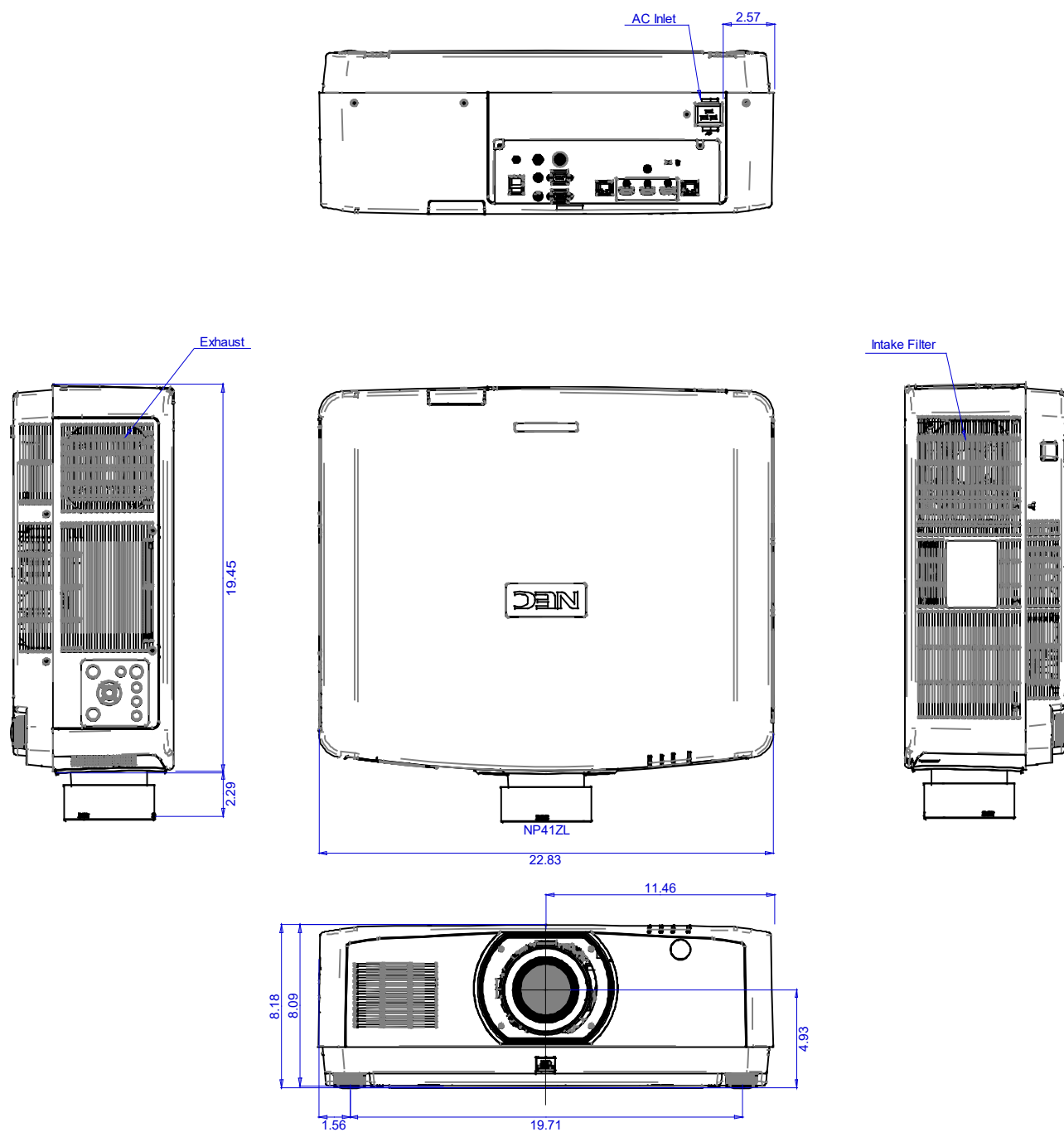
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### Cabinet Dimensions

The following diagrams show the cabinet dimensions for the PA653UL/PA703UL/PA803UL.

Dimensions are in inches. For millimeters multiply by 25.4.

Note: Dimensions below shown with the NP41ZL lens

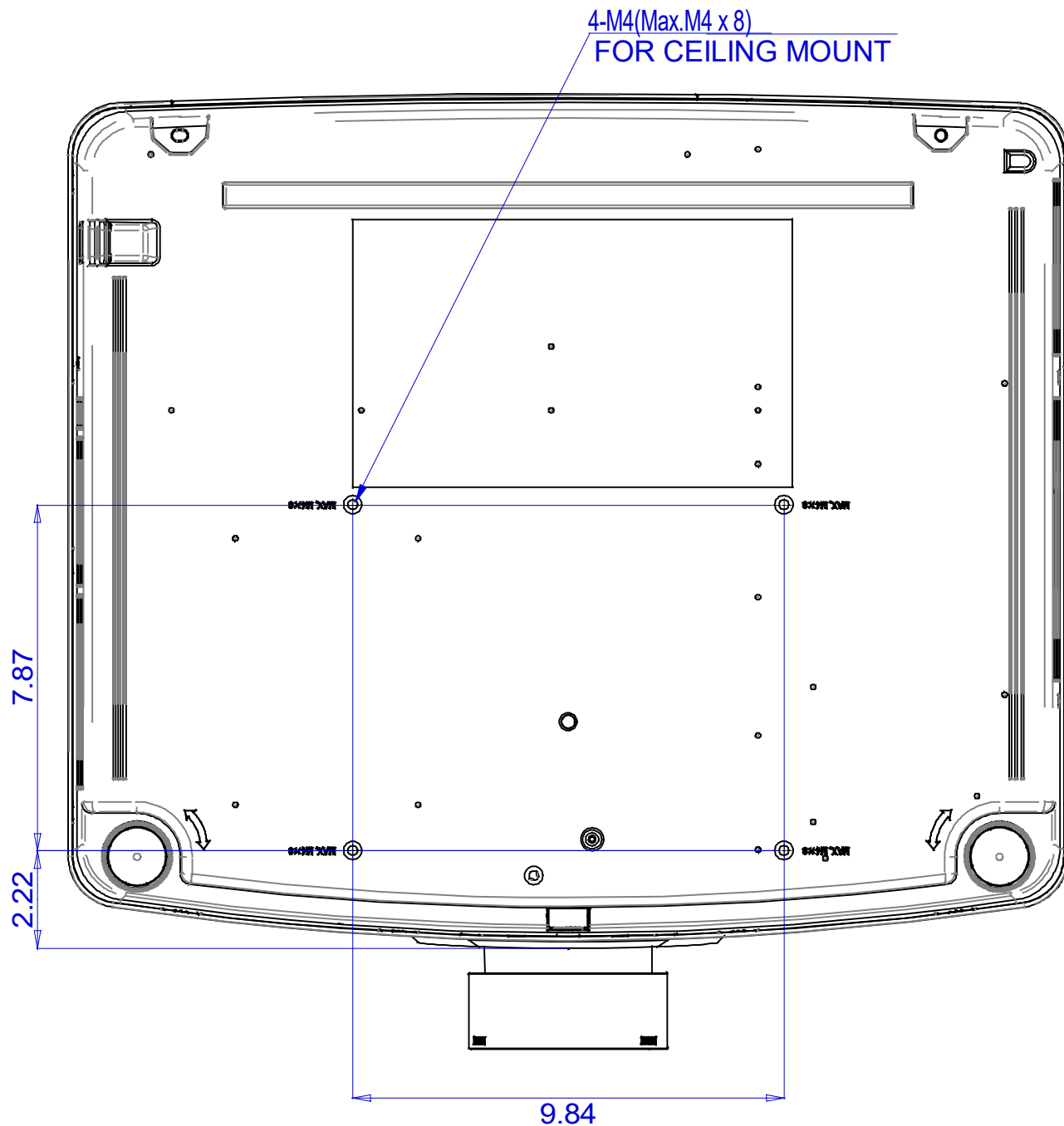


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### Cabinet Dimensions



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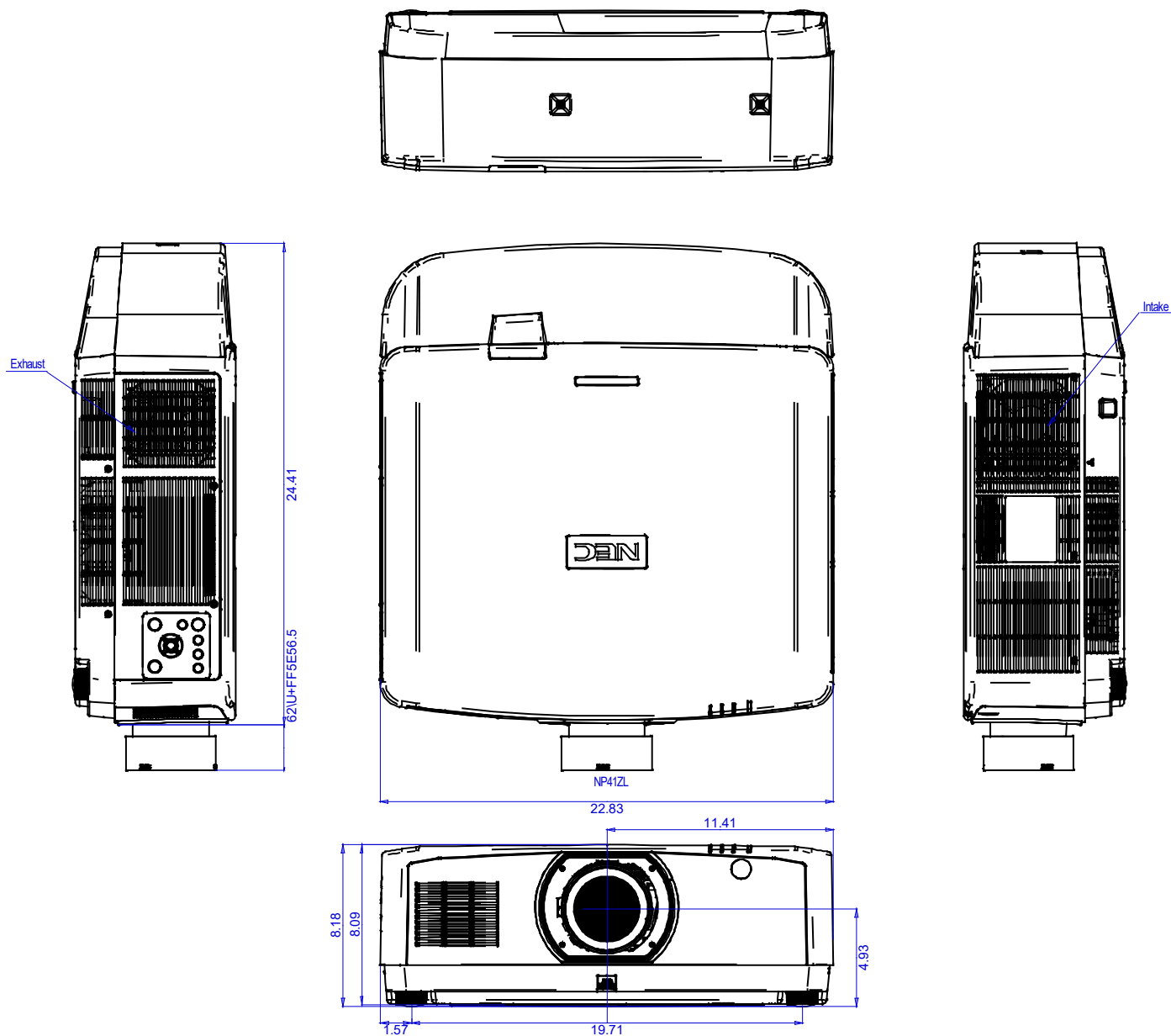
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### Cabinet Dimensions with Cable Cover

The following diagrams show the cabinet dimensions for the PA653UL/PA703UL/PA803UL.

Dimensions are in inches. For millimeters multiply by 25.4.

Note: Dimensions below shown with the NP41ZL lens



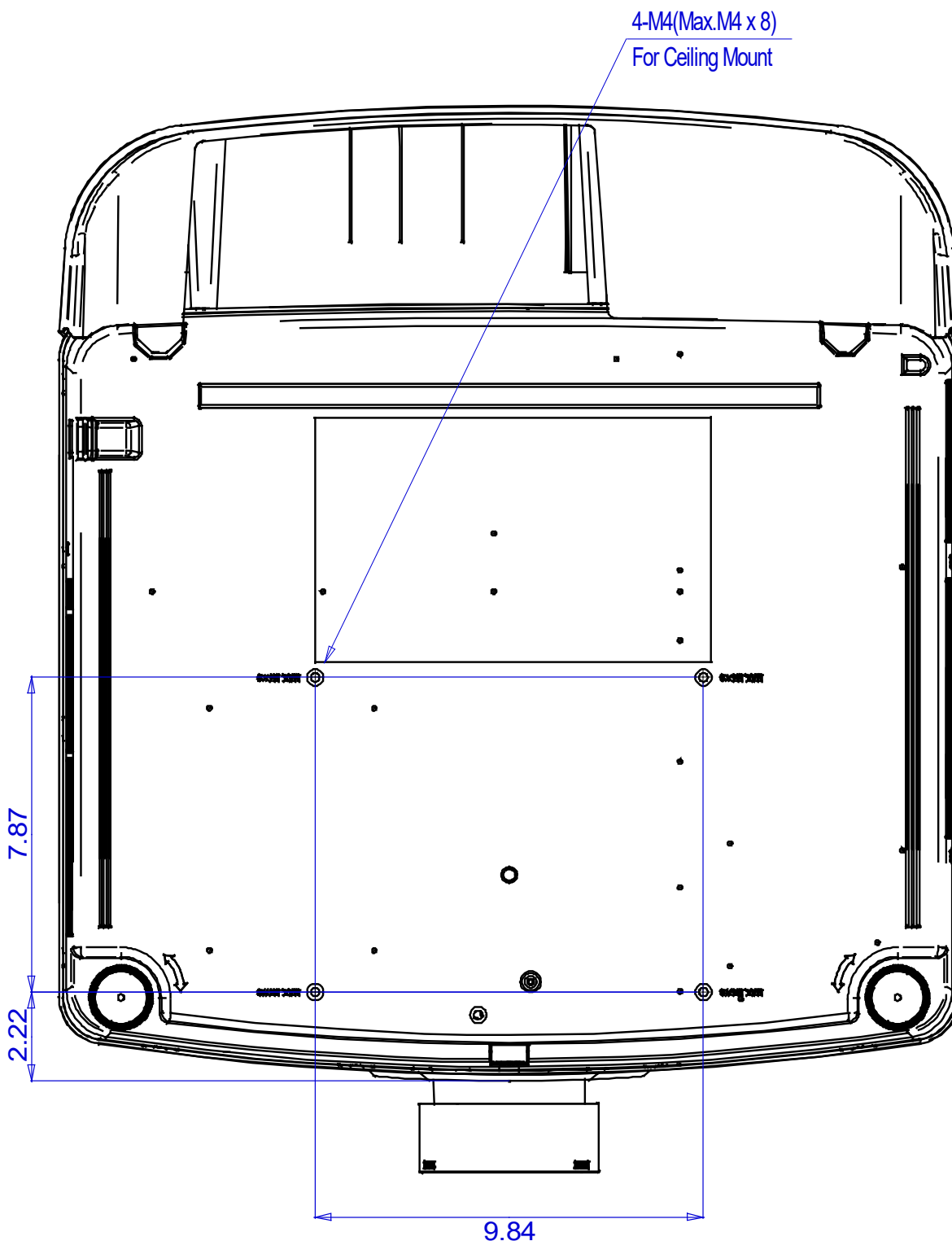


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### Cabinet Dimensions with Cable Cover

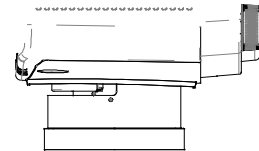
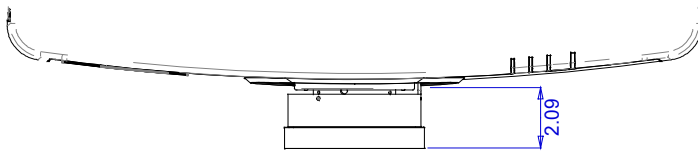


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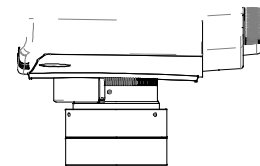
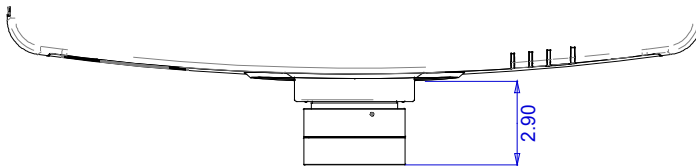
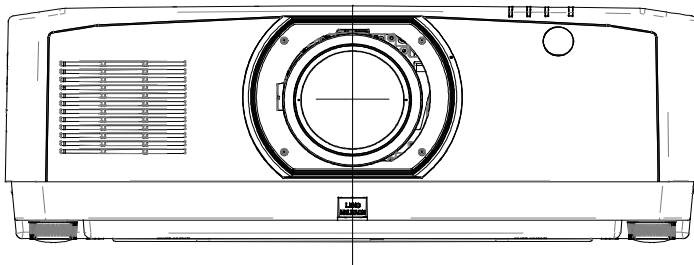
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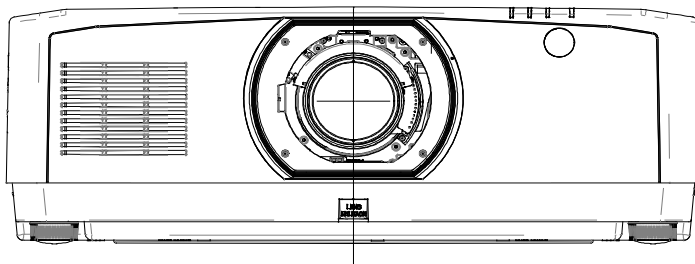
### Optional Lens Dimensions (NP40ZL and NP43ZL)



NP40ZL



NP43ZL



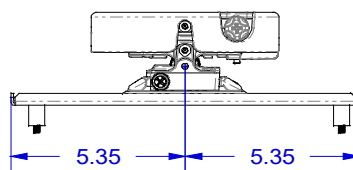
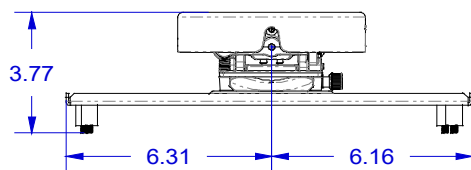
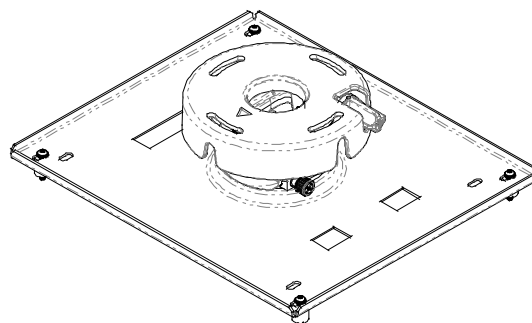
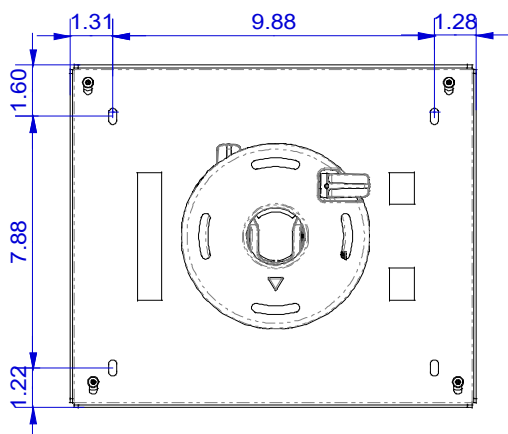
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#### Optional Ceiling Mount Dimensions (Part #: NP600CM)

The following diagrams show ceiling mount dimensions for the NP600CM. Dimensions are in inches. For millimeters multiply by 25.4.



#### Input Panel



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## PC Control Codes

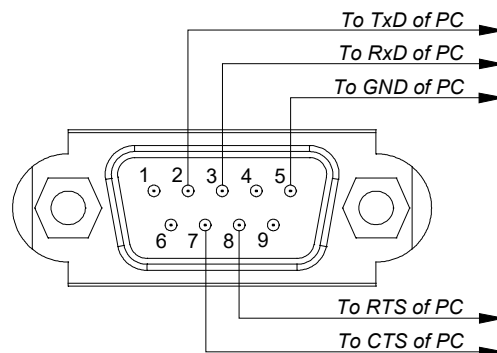
| Function                  | Code Data |     |     |     |     |     |     |     |     |     |     |
|---------------------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| POWER ON                  | 02H       | 00H | 00H | 00H | 00H | 02H |     |     |     |     |     |
| POWER OFF                 | 02H       | 01H | 00H | 00H | 00H | 03H |     |     |     |     |     |
| INPUT SELECT HDMI1        | 02H       | 03H | 00H | 00H | 02H | 01H | A1H | A9H |     |     |     |
| INPUT SELECT HDMI2        | 02H       | 03H | 00H | 00H | 02H | 01H | A2H | AAH |     |     |     |
| INPUT SELECT DisplayPort  | 02H       | 03H | 00H | 00H | 02H | 01H | A6H | AEH |     |     |     |
| INPUT SELECT Computer     | 02H       | 03H | 00H | 00H | 02H | 01H | 01H | 09H |     |     |     |
| INPUT SELECT HDBaseT      | 02H       | 03H | 00H | 00H | 02H | 01H | BFH | C7H |     |     |     |
| PICTURE MUTE ON           | 02H       | 10H | 00H | 00H | 00H | 12H |     |     |     |     |     |
| PICTURE MUTE OFF          | 02H       | 11H | 00H | 00H | 00H | 13H |     |     |     |     |     |
| SOUND MUTE ON             | 02H       | 12H | 00H | 00H | 00H | 14H |     |     |     |     |     |
| SOUND MUTE OFF            | 02H       | 13H | 00H | 00H | 00H | 15H |     |     |     |     |     |
| ON SCREEN MUTE ON         | 02H       | 14H | 00H | 00H | 00H | 16H |     |     |     |     |     |
| ON SCREEN MUTE OFF        | 02H       | 15H | 00H | 00H | 00H | 17H |     |     |     |     |     |
| 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 | 0BH | 00H | 3BH |
| 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.