

# Ergonomics

## Comfortable computing

Get products that allow you to keep a comfortable posture when working with a computer. This posture relieves strain on neck muscles.

**Optimal posture, screen height:** For an optimal work posture when viewing a screen, the top of the screen should be level with or slightly below the eye height of the user. To make sure each user can set the screen height to their personal comfort, a monitor arm with sufficient adjustment range is needed. The adjustment range needed depends also on whether you will

be using the computer for sitting or standing use, or for both. Use the screen height chart to determine how much vertical adjustment is necessary for your application.



Many products provide bifocal view, reducing glare and increasing comfort.

### Optimal posture, keyboard height:

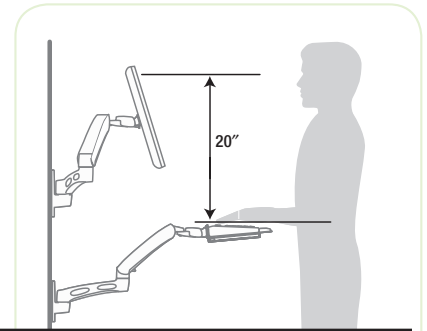
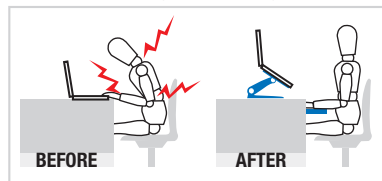
The keyboard needs to be level with elbow height, with forearms and wrists in a level position. As with screen height, each user has to be able to set the keyboard height to their personal comfort. The adjustment range needed depends also on whether you will be using the computer for sitting or standing use, or for both. Use the keyboard height chart to determine how much vertical adjustment is necessary for your application.

**Viewing distance:** Set the distance to your monitor ("x") to at least 20" (50 cm) while considering your personal comfort. An arm's length is usually adequate. Ideally, select a mount with telescoping functionality.

**Viewing angle:** Tilt the monitor back about 10° to 20° so the top and bottom of the monitor screen are the same distance from your eyes. Make minor adjustments to eliminate glare as needed.

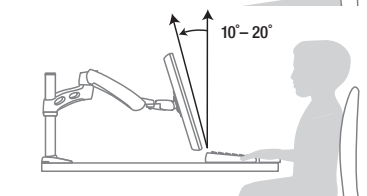
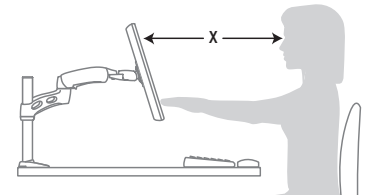
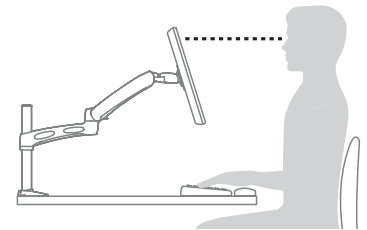
**Laptop ergonomics:** If computing for longer than an hour or two, take the following steps for ergonomic wellness: elevate your laptop so you can see the screen without bending your neck; connect a separate keyboard and place it where wrists are flat while shoulders and elbows are relaxed; pay attention to your posture.

\* Based on US population studies



| Screen height        | Adjustment range to accommodate average-sized male & female users* | Adjustment range to accommodate 95% of users* |
|----------------------|--|---|
| Sitting only         | 4.5" / 11 cm   | 11.3" / 29 cm                                 |
| Standing only        | 5" / 13 cm   | 12.9" / 33 cm                                 |
| Sitting and standing | 20" / 51 cm  | 27.8" / 71 cm                                 |

| Keyboard height      | Adjustment range to accommodate average-sized male & female users* | Adjustment range to accommodate 95% of users* |
|----------------------|--|---|
| Sitting only         | 4" / 10 cm   | 8.7" / 22 cm                                  |
| Standing only        | 3.7" / 9 cm  | 8.9" / 23 cm                                  |
| Sitting and standing | 19.5" / 50 cm  | 24.6" / 62 cm                                 |



### Display Compatibility Guide

| VESA  | LCD Size                 | LCD Weight            | Hole Mounts                |
|-------|--------------------------|-----------------------|----------------------------|
| MIS-B | 4-7.9"<br>10,2-20,1 cm   | ≤ 4,4 lbs<br>≤ 2 kg   | 50 x 20 mm                 |
| MIS-C | 8-11.9"<br>20,3-30,2 cm  | ≤ 10 lbs<br>≤ 4,5 kg  | 75 x 35 mm                 |
| MIS-D | 12-22.9"<br>30,5-58,3 cm | ≤ 30,8 lbs<br>≤ 14 kg | 75 x 75 mm<br>100 x 100 mm |
| MIS-E | 23-30.9"<br>58,4-78,6 cm | ≤ 50 lbs<br>≤ 22,7 kg | 200 x 100 mm               |
| MIS-F | ≥ 31"<br>≥ 78,7 cm       | N/A                   | 200 mm increments          |



**Industry compliant**  
Interface standards set by the Video Electronics Standards Association (VESA).

LCD Size in all charts is approximation only. Use LCD Weight as guide for choosing mounting solution; exact capacity depends on thickness of display. Hole Mounts are width x height. Compatibility is predicated on the assumption that displays are VESA compliant (hole mount is centered on display's center of gravity).

# Ergonomics Data & Mounting Heights

## Ergonomic Ground Rules – English Units

To obtain optimum performance from a workstation, consider the following topics during installation of your Flat Panel Mounting Solutions:

- The adjustment range of the Mounting Solutions product.
- The use-mode of the Mounting Solutions product...
  - > Monitoring/viewing only?
  - > Data entry?
  - > User will be sitting?
  - > User will be standing?
  - > User will be sitting *and* standing at different times?
- Vertical mounting height of the Mounting Solutions product in respect to user(s)...
  - > Female or male only?
  - > Female and male both?
  - > Average height of users?

Using the Eye-Height / Elbow-Height Tables:

Use these tables to help determine mounting heights of Mounting Solutions products.

Follow these Ergonomic Ground Rules during installation of Mounting Solutions products:

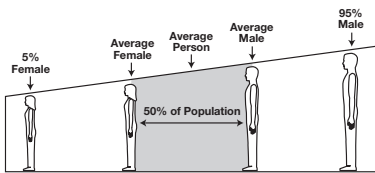
- Screen Height: Top of screen should be level with, or slightly below, Eye Height of user.
- Keyboard Height: Center-line of keyboard should be level with Elbow Height of the operator with forearms and wrists in a level position.
- Screen/Keyboard Height Variance: The distance from top of monitor screen to center-line of keyboard reflects Eye-to-Elbow Measurement of the average female to male users.

Remember that the actual attachment-point height of Mounting Solutions products varies because:

- Dimensions of monitors vary.
- Configurations of Mounting Solution products vary.

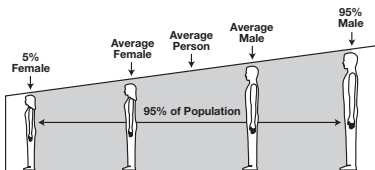
### Eye-Height / Elbow-Height Tables

For average range of users – anthropometric<sup>†</sup> data expressed in inches



| 1            | Eye Height 4 |      |      | Elbow Height 4 |      |      | Eye-to-Elbow Measurement |      |
|--------------|--------------|------|------|----------------|------|------|--------------------------|------|
|              | Stand        | Sit  | Var. | Stand          | Sit  | Var. | Stand                    | Sit  |
| Av. Female   | 59.4         | 44.0 | 15.4 | 38.8           | 23.0 | 15.8 | 20.6                     | 21.0 |
| Av. Person   | 61.7         | 46.1 | 15.6 | 40.4           | 24.9 | 15.5 | 21.3                     | 21.2 |
| Av. Male     | 64.4         | 48.5 | 15.9 | 42.5           | 27.0 | 15.5 | 21.9                     | 21.5 |
| Variance F/M | 5.0          | 4.5  | —    | 3.7            | 4.0  | —    | —                        | —    |

For 5% female to 95% male range of users



|              | Stand | Sit  | Var. | Stand | Sit  | Var. | Stand | Sit  |
|--------------|-------|------|------|-------|------|------|-------|------|
| 5% Female*   | 55.7  | 40.8 | 14.9 | 36.5  | 20.8 | 15.7 | 19.2  | 20.0 |
| 95% Male**   | 68.6  | 52.1 | 16.5 | 45.4  | 29.5 | 15.9 | 23.2  | 22.6 |
| Variance F/M | 12.9  | 11.3 | —    | 8.9   | 8.7  | —    | —     | —    |

<sup>†</sup> Anthropometry: The study of human body measurements. Data based on studies of US population.

\* Denotes the female who is at the 5% mark of a scale ranging 0% to 100%.

\*\* Denotes the male who is at the 95% mark of a scale ranging 0% to 100%.

1 Fixed-height applications: Mount at height for average person.

Height-adjustable applications...

2 Sitting *or* standing for average range of users: ≥ 5" vertical adjustment range required.

3 Sitting *or* standing for 95% range of users: ≥ 12.9" vertical adjustment range required.

4 Sitting *&* standing for average range of users: ≥ 19.5" vertical adjustment range required.

Keyboard placement...

5 Keyboard to monitor relationship: The optimal distance is 21" in all applications.

# Ergonomics Data & Mounting Heights

## Ergonomic Ground Rules – Metric Units

To obtain optimum performance from a workstation, consider the following topics during installation of your Flat Panel Mounting Solutions:

- The adjustment range of the Mounting Solutions product.
- The use-mode of the Mounting Solutions product...
  - > Monitoring/viewing only?
  - > Data entry?
  - > User will be sitting?
  - > User will be standing?
  - > User will be sitting *and* standing at different times?
- Vertical mounting height of the Mounting Solutions product in respect to user(s)...
  - > Female or male only?
  - > Female and male both?
  - > Average height of users?

Using the Eye-Height / Elbow-Height Tables:

Use these tables to help determine mounting heights of Mounting Solutions products.

Follow these Ergonomic Ground Rules during installation of Mounting Solutions products:

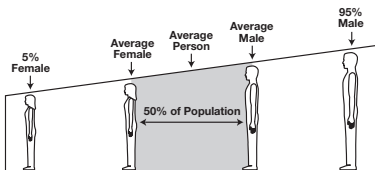
- Screen Height: Top of screen should be level with, or slightly below, *Eye Height* of user.
- Keyboard Height: Center-line of keyboard should be level with *Elbow Height* of the operator with forearms and wrists in a level position.
- Screen/Keyboard Height Variance: The distance from top of monitor screen to center-line of keyboard reflects *Eye-to-Elbow Measurement* of the average female to male users.

Remember that the actual attachment-point height of Mounting Solutions products varies because:

- Dimensions of monitors vary.
- Configurations of Mounting Solution products vary.

### Eye-Height / Elbow-Height Tables

For average range of users – anthropometric<sup>†</sup> data expressed in millimeters

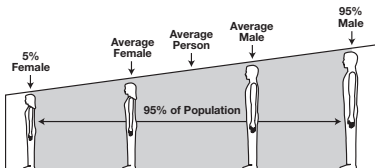


| 1            | Eye Height 4 |      |      | Elbow Height 4 |     |      | Eye-to-Elbow Measurement |     |
|--------------|--------------|------|------|----------------|-----|------|--------------------------|-----|
|              | Stand        | Sit  | Var. | Stand          | Sit | Var. | Stand                    | Sit |
| Av. Female   | 1509         | 1118 | 391  | 986            | 584 | 401  | 523                      | 533 |
| Av. Person   | 1567         | 1171 | 396  | 1026           | 632 | 394  | 541                      | 538 |
| Av. Male     | 1636         | 1232 | 404  | 1080           | 686 | 394  | 556                      | 546 |
| Variance F/M | 127          | 114  | —    | 94             | 102 | —    | —                        | —   |

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For 5% female to 95% male range of users



|              | Stand | Sit  | Var. | Stand | Sit | Var. | Stand | Sit |
|--------------|-------|------|------|-------|-----|------|-------|-----|
| 5% Female*   | 1415  | 1036 | 378  | 927   | 528 | 399  | 488   | 508 |
| 95% Male**   | 1742  | 1323 | 419  | 1153  | 749 | 404  | 589   | 574 |
| Variance F/M | 328   | 287  | —    | 226   | 221 | —    | —     | —   |

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<sup>†</sup> Anthropometry: The study of human body measurements. Data based on studies of US population.

\* Denotes the female who is at the 5% mark of a scale ranging 0% to 100%.

\*\* Denotes the male who is at the 95% mark of a scale ranging 0% to 100%.

1 Fixed-height applications: Mount at height for average person.

Height-adjustable applications...

2 Sitting *or* standing for average range of users: ≥ 127 mm vertical adjustment range.

3 Sitting *or* standing for 95% range of users: ≥ 328 mm vertical adjustment range.

4 Sitting & standing for average range of users: ≥ 495 mm vertical adjustment range.

Keyboard placement...

5 Keyboard to monitor relationship: The optimal distance is 533 mm in all applications.