# Panasonic ideas for life

S P E C   F I L E



**Product Number :**  PT-**VX400NT**

**Product Name :**  LCD Projector

## Specifications

**Main unit**

| | | |
|---|---|---|
| Power supply | | 100–240 V AC, 50/60 Hz |
| Power consumption | | 322 W |
| | | (0.48 W when standby mode set to eco,*[1] 14.5 W when standby mode set to network.) |
| LCD panel | Panel size | 16.0 mm (0.63 inches) diagonal (16:10 aspect ratio) |
| | Display method | Transparent LCD panel (× 3, R/G/B) |
| | Pixels | 786,432 (1,024 × 768) × 3, total of 2,359,296 pixels |
| | Pixel configuration | Stripe |
| Lens | | Manual zoom (1:1–1.6:1), manual focus F 1.65–2.33, f 15.47–24.53 mm |
| Throw ratio | | 1.2–1.9:1 |
| Lamp | | 245 W UHM lamp |
| Screen size | | 0.76–7.62 m (30–300 inches) diagonally, 4:3 aspect ratio |
| Colors | | Full color (16,777,216 colors) |
| Brightness*[2] | | 4,000 lumens |
| Center-to-corner uniformity*[2] | | 85% |
| Contrast*[2] | | 2,000:1 (full on/full off) |
| Resolution | | 1,024 × 768 pixels (Input signals that exceed this resolution will be converted to 1,024 × 768 pixels.) |
| Scanning frequency | HDMI | $f_H$: 25 kHz–80 kHz, $f_V$: 50 Hz–85 Hz, dot clock: 162 MHz or lower |
| | RGB | $f_H$: 15 kHz–100 kHz, $f_V$: 50 Hz–100 Hz, dot clock: 140 MHz or lower (Signals above 140 MHz are downsampled.) |
| | $YP_BP_R$ ($YC_BC_R$) | 525i (480i): $f_H$ 15.75 kHz; $f_V$ 60 Hz, |
| | | 625i (576i): $f_H$ 15.63 kHz; $f_V$ 50 Hz, |
| | | 525p (480p): $f_H$ 31.50 kHz; $f_V$ 60 Hz, |
| | | 625p (576p): $f_H$ 31.25 kHz; $f_V$ 50 Hz, |
| | | 750 (720)/60p: $f_H$ 45.00 kHz; $f_V$ 60 Hz, |
| | | 750 (720)/50p: $f_H$ 37.50 kHz; $f_V$ 50 Hz, |
| | | 1125 (1080)/60i: $f_H$ 33.75 kHz; $f_V$ 60 Hz, |
| | | 1125 (1080)/50i: $f_H$ 28.13 kHz; $f_V$ 50 Hz |
| | Video/S-Video | $f_H$: 15.75 kHz, $f_V$: 60 Hz [NTSC/NTSC4.43/PAL-M/PAL60] |
| | | $f_H$: 15.63 kHz, $f_V$: 50 Hz [PAL/PAL-N/SECAM] |
| Optical axis shift | | 9:1 (fixed) |
| Keystone correction range | | Horizontal: ±40°, vertical: ±30° (when an XGA signal is input) (horizontal ±30° and vertical ±20° in Auto Keystone Correction mode*[3]) |
| Installation | | Ceiling/desk, front/rear (menu selection) |
| Built-in speaker | Size | 3.7 cm (1-15/32 inches) (round) × 1 |
| | Output power | 10 W (monaural) |
| Terminals | HDMI IN | HDMI 19-pin × 1, HDCP compatible |
| | | 480p (525p), 576p (625p), 720 (750)/60p, 720 (750)/50p, |
| | | 1080 (1125)/60i, 1080 (1125)/50i, 1080 (1125)/60p, 1080 (1125)/50p |
| | | VGA (640 × 480)–WUXGA*[4] (1,920 × 1,200), |
| | | dot clock: 25.2 MHz–146.25 MHz; Audio signal: linear PCM |
| | | (sampling frequencies: 48 kHz, 44.1 kHz, 32 kHz) |
| | COMPUTER (RGB) 1 IN | D-sub HD 15-pin (female) × 1 |
| | R, G, B | G: 0.7 Vp-p (1.0 Vp-p for sync on G), 75 ohms; |
| | | B, R: 0.7 Vp-p, 75 ohms; |
| | | HD/VD, SYNC: high impedance, TTL (positive/negative) |
| | | **NOTE: SYNC/HD and VD terminals do not accept tri-level sync signals.** |
| | Y, $P_B$ ($C_B$), $P_R$ ($C_R$) | Y: 1.0 Vp-p (including sync signal); |
| | | $P_B$ ($C_B$), $P_R$ ($C_R$): 0.7 Vp-p, 75 ohms |
| | COMPUTER (RGB) 2 IN / 1 OUT | |
| | R, G, B | D-sub HD 15-pin (female) × 1 |
| | | (input/output selectable using on-screen menu) |
| | | G: 0.7 Vp-p (1.0 Vp-p for sync on G), 75 ohms; |
| | | B, R: 0.7 Vp-p, 75 ohms; |
| | | HD/VD, SYNC: high impedance, TTL (positive/negative) |
| | | **NOTE: SYNC/HD and VD terminals do not accept tri-level sync signals.** |

| | | |
|---|---|---|
| VIDEO IN | | RCA pin × 1, 1.0 Vp-p, 75 ohms |
| S-VIDEO IN | | Mini DIN 4-pin × 1, Y: 1.0 Vp-p; C: 0.286 Vp-p, 75 ohms |
| COMPUTER AUDIO IN 1 | | M3 (L, R) × 1, 0.5 Vrms |
| COMPUTER AUDIO IN 2 / MIC IN | | |
| | | M3 (L, R) × 1, 0.5 Vrms |
| VIDEO/S-VIDEO AUDIO IN | | |
| | | RCA × 2 (L/R × 1), 0.5 Vrms |
| AUDIO OUT | | M3 (L, R) × 1 (monitor out: 0–2.0 Vrms, variable) |
| SERIAL IN | | D-sub 9-pin (male) × 1, for external control (RS-232C compliant) |
| LAN | | RJ-45 × 1, for network connection, 100Base-TX/10Base-T, compliant with PJLink™ |
| USB | | USB A (type A) connector × 1, for USB memory viewer |
| | | USB B (type B) connector × 1, for USB display and wireless mouse |
| Power cord length | | 2.0 m (6 ft 7 in) |
| Cabinet materials | | Molded plastic (PC + ABS) |
| Dimensions (W × H × D) | | 350 mm × 97 mm[5] × 277 mm[6] |
| | | (13-25/32 × 3-13/16[5] × 10-29/32[6] inches) |
| Weight | | Approximately 3.6 kg (7.9 lbs) |
| Operation noise | | 35 dB (lamp mode: normal), 29 dB (lamp mode: eco 1/eco 2) |
| Operating temperature | | 5°–35°C (41°–95°F) |
| Operating humidity | | 20%–80% (no condensation) |

**Remote control unit**

| | | |
|---|---|---|
| Power supply | | 3 V DC (R03/AAA type battery × 2) |
| Operation range[7] | | Approximately 7 m (23 ft) when operated from directly in front of the signal receptor |
| Dimensions (W × H × D) | | 48 × 145 × 27 mm (1-7/8″ × 5-23/32″ × 1-3/32″) |
| Weight | | Approx. 102 g (3.6 oz) (including batteries) |

**Wireless LAN**

| | | |
|---|---|---|
| Standard | | IEEE 802.11b/g/n |
| Modulation | IEEE 802.11b | Direct sequence spread spectrum (DS-SS) system |
| | IEEE 802.11g/n | Orthogonal frequency division multiplex (OFDM) system |
| Transmission system | IEEE 802.11b | CCK (11/5.5 Mbps), DQPSK (2 Mbps), DBPSK (1 Mbps) |
| | IEEE 802.11g/n | 64-QAM (54/48 Mbps), 16-QAM (36/24 Mbps), QPSK (18/12 Mbps), BPSK (9/6 Mbps) |
| Transmission speed[8] | IEEE 802.11b | Up to 11 Mbps |
| | IEEE 802.11g | Up to 54 Mbps |
| | IEEE 802.11n | Up to 150 Mbps |
| Operating range[7] | | Approx. 30 m (98´ 5″) |
| Frequency range | | 2,412–2,472 MHz |
| Channels | | 1–13 ch |
| Security | Infrastructure mode | WPA-PSK (TKIP/AES), WPA2-PSK (TKIP/AES), WEP (128 bit/64 bit), WPA-EAP/WPA2-EAP (PEAP [MS-CHAPv2/GTC], EAP-FAST [MS-CHAPv2/GTC], EAP-TTLS [MD5/MS-CHAPv2] |
| | ad-hoc mode[9] | WEP (128 bit/64 bit) |

| **Wireless Manager ME 5.5 system requirements** | | To use network functions, a PC is required that meets the conditions given below. |
|---|---|---|
| | OS | Microsoft® |
| | | Windows® XP: Professional 32-bit, Home Edition 32-bit, Tablet PC Edition 2005 32-bit |
| | | Windows Vista®: Ultimate 32-bit/64-bit, Business 32-bit/64-bit, Home Premium 32-bit/64-bit, Home Basic 32-bit/64-bit |
| | | Windows® 7: Ultimate 32-bit/64-bit, Professional 32-bit/64-bit, Home Premium 32-bit/64-bit |
| | | Apple Mac OS X*10: v10.4, v10.5, v10.6, v10.7 |
| | Web browser | Windows®: Internet Explorer 6.0/7.0/8.0/9.0 |
| | | Mac OS: Safari 2.0/3.0/4.0/5.0 |
| | CPU | Windows®: 1 GHz or higher Intel® Pentium® III or higher, or other compatible processor |
| | | Mac OS X: 1 GHz or higher PowerPC G4, or 1.8 GHz or higher Intel® Core™ processor |
| | Memory | 256 MB or more (512 MB or higher is recommended for Mac OS X) |
| | Free hard disk space | 60 MB or more |
| | CD-ROM drive | CD-ROM drive or DVD drive (required for installation) |
| | Wireless LAN | IEEE 802.11b/g/n compatible (built-in wireless LAN system or external IEEE 802.11b/g/n LAN card must be installed and running normally.) |

**NOTE: Wireless connection may not be possible with some IEEE 802.11b/g/n wireless LAN systems. Macintosh computers must have a built-in wireless LAN adapter. For IEEE 802.11n connection, use a wireless LAN adapter, projector and access point that are IEEE 802.11n compatible, and connect with Infrastructure mode.**

Wired LAN connector    RJ-45

**Supplied accessories**

Power cord with security lock (× 1) (× 2 for PT-VW330EA)

Wireless remote control unit (× 1)

Batteries for remote control (R03/AAA type × 2)

Carrying bag (× 1)

VGA cable (× 1)

Filter cover (× 1)

Software CD-ROM (Logo Transfer Software, Multi Projector Monitoring and Control Software, Wireless Manager ME 5.5) (× 1)
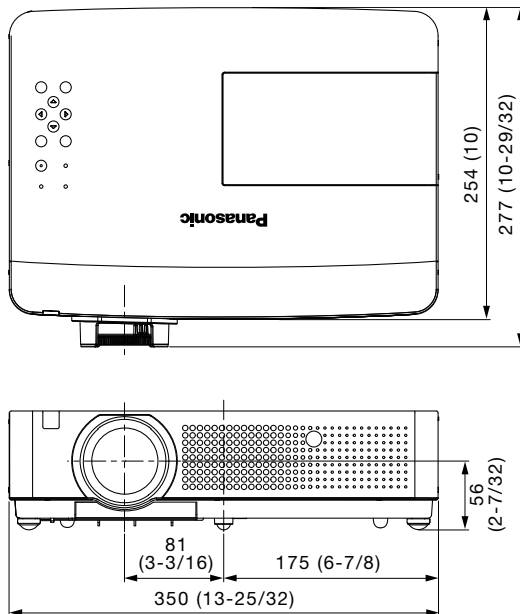
**Optional accessories**

| | |
|---|---|
| Replacement lamp unit | ET-LAV100 |
| Replacement filter unit | ET-RFV100 |
| Ceiling mount bracket | ET-PKV100H (for high ceilings) |
| | ET-PKV100S (for low ceilings) |
| Bracket assembly | ET-PKV100B |

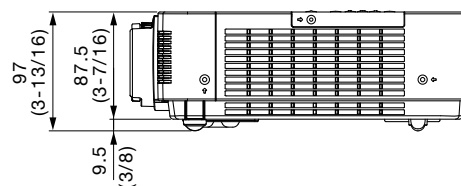**Weights and dimensions shown are approximate. Specifications subject to change without notice.**

∗1   When the standby mode is set to eco, network functions such as power on over the LAN network will not operate. Also, only certain commands can be received for external control using the serial terminal.

∗2   Measurement, measuring conditions, and method of notation all comply with ISO 21118 international standards.

∗3   Auto Keystone Correction is effective when the projection size is from 30 inches to 100 inches diagonally.

∗4   WUXGA resolution is supported only when the signals are compliant with VESA CVT-RB (Coordinated Video Timing-Reduced Blanking).

∗5   With legs at shortest position.

∗6   Protruding parts not included.

∗7   Operation range differs depending on environments.

∗8   This is a theoretical speed. The actual transfer speed varies depending on the usage environment and connected devices.

∗9   Not supported by IEEE 802.11n.

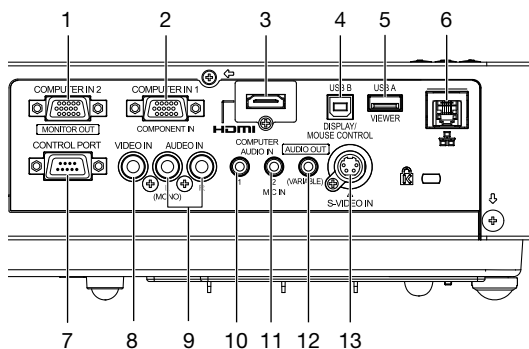∗10  The operation system must be pre-installed at the factory or clean installed.

## Dimensions

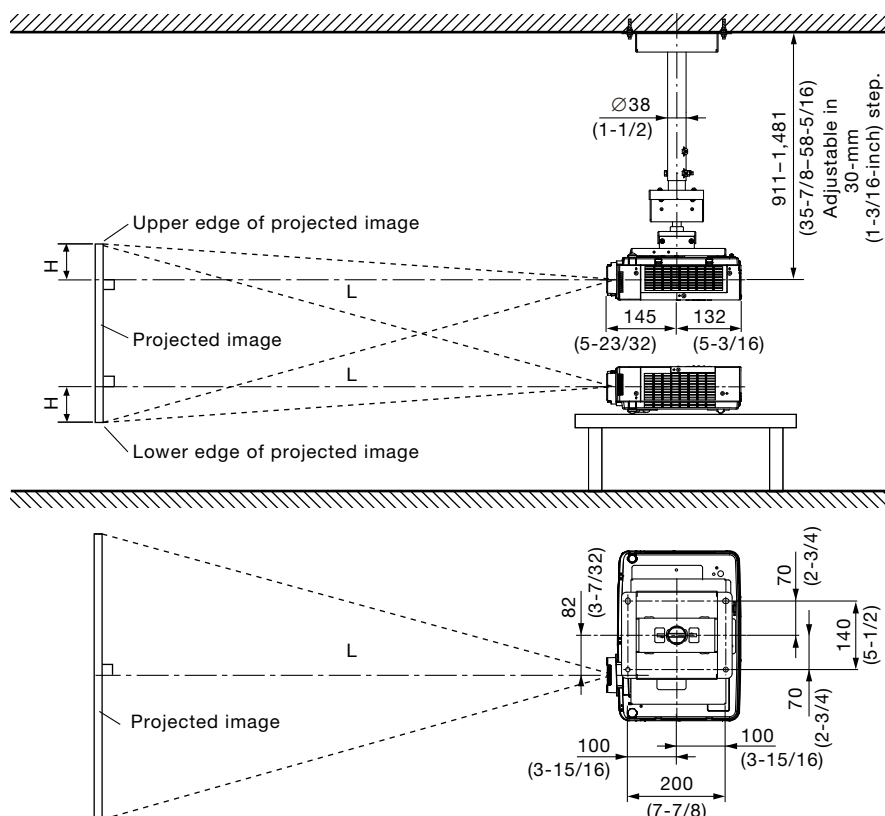unit : mm (inch)
NOTE: This illustration is not drawn to scale.

254 (10)
277 (10-29/32)

97 (3-13/16)
87.5 (3-7/16)
9.5 (3/8)

56 (2-7/32)
81 (3-3/16)
175 (6-7/8)
350 (13-25/32)

## Terminals

1  Computer 2 input / computer 1 output

2  Computer 1 input

3  HDMI input

4  USB B connector

5  USB A connector

6  LAN connector

7  Serial input

8  Video input

9  Audio input for video/S-Video

10  Audio input for computer 1

11  Audio input for computer 2 / mic input

12  Audio output

13  S-Video input

## Standard setting-up position



∅38
(1-1/2)

911–1,481
(35-7/8–58-5/16)
Adjustable in
30-mm
(1-3/16-inch) step.

Upper edge of projected image

L

Projected image

L

Lower edge of projected image

145    132
(5-23/32)  (5-3/16)

**NOTE:**

**Illustrations show the projector installed using optional ceiling mount bracket ET-PKV100H and bracket assembly ET-PKV100B.**

**This illustration is not drawn to scale.**

unit : mm (inch)

L

Projected image

82
(3-7/32)

70
(2-3/4)

140
(5-1/2)

70
(2-3/4)

100
(3-15/16)

100
(3-15/16)

200
(7-7/8)

**Caution:**
- All construction work should be done by a qualified technician.
- When mounting to the ceiling, use the special mounting bracket. To prevent the projector from swaying or dropping, attach the wire that is included with the projector between the mounting bracket and the ceiling.

## Projection distance for 4:3 aspect ratio screen

unit: meters (feet)

| Projection size [diagonal] | Projection distance [L] | | Height from the edge of screen to center of lens [H] | |
|---|---|---|---|---|
| | Min [wide] | Max [telephoto] | | |
| 0.76 m /  30″ | 0.7  (2.3) | 1.1  (3.6) | 0.05  (0.16) | |
| 1.02 m /  40″ | 0.9  (3.0) | 1.5  (4.9) | 0.06  (0.20) | |
| 1.27 m /  50″ | 1.2  (3.9) | 1.9  (6.2) | 0.08  (0.26) | |
| 1.52 m /  60″ | 1.4  (4.6) | 2.3  (7.5) | 0.09  (0.30) | |
| 1.78 m /  70″ | 1.7  (5.6) | 2.7  (8.9) | 0.11  (0.36) | |
| 2.03 m /  80″ | 1.9  (6.2) | 3.1  (10.2) | 0.12  (0.39) | |
| 2.29 m /  90″ | 2.2  (7.2) | 3.5  (11.5) | 0.14  (0.46) | |
| 2.54 m / 100″ | 2.4  (7.9) | 3.9  (12.8) | 0.15  (0.49) | |
| 3.05 m / 120″ | 2.9  (9.5) | 4.7  (15.4) | 0.18  (0.59) | |
| 3.81 m / 150″ | 3.6  (11.8) | 5.8  (19.0) | 0.23  (0.75) | |
| 5.08 m / 200″ | 4.8  (15.7) | 7.8  (25.6) | 0.31  (1.02) | |
| 6.35 m / 250″ | 6.0  (19.7) | 8.0*  (26.2)* | 0.38  (1.25) | |
| 7.62 m / 300″ | 7.2  (23.6) | 8.0*  (26.2)* | 0.46  (1.51) | |

**\* Lens performance cannot be guaranteed for projection sizes larger than 8.0 m (26.2 ft).**

**NOTE:**

• **The value for L (distance to screen) varies slightly depending on the zoom lens characteristics.**

• **At the shortest projection distance, the zoom lens characteristics may cause slight image distortion.**

## Calculation of the projection distance

For a screen size different from the above, use the equation below to calculate the projection distance.

Aspect ratio 4:3
minimum        L (m) = (diagonal screen size in inches) × 0.0242 − 0.0334
maximum       L (m) = (diagonal screen size in inches) × 0.0391 − 0.0326
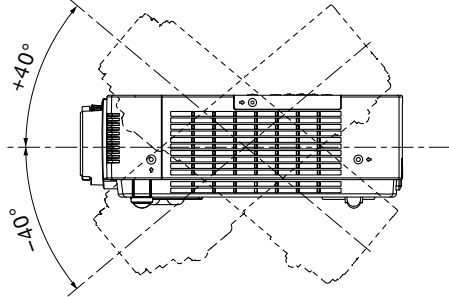
**NOTE:**
**Distances calculated with the above equations will include a slight error.**
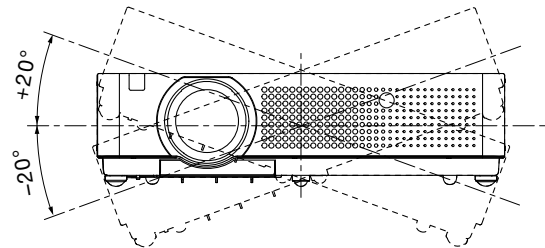
## Installable angle

Install the projector at an angle within the range shown below.

### • Vertical direction
The projector may be installed at a vertical angle of 40°.



### • Horizontal direction
The projector may be installed at a horizontal angle of 20°.

## List of compatible signals

The signals that can be input to this projector are shown in the table below. Horizontal scanning frequencies of 25 kHz to 80 kHz (15 kHz to 100 kHz for RGB signals), vertical scanning frequencies of 50 Hz to 120 Hz (50 Hz to 100 Hz for RGB signals), and a dot clock of 162 MHz maximum (140 MHz maximum for RGB signals) can be input.

**NOTE:** The native resolution of this projector is 1,024 × 768 pixels. If the display resolution of the input signal is different from the native resolution, image compression or expansion will be used to convert the input signal to a level within the native resolution.

| Display mode | Display resolution (dots)[1] | Scanning frequency H (kHz) | V (kHz) | Dot clock frequency (MHz) | Format |
|---|---|---|---|---|---|
| NTSC/NTSC4.43/PAL-M/PAL60 | 720 × 480i | 15.7 | 59.9 | – | VIDEO/S-VIDEO |
| PAL/PAL-N/SECAM | 720 × 576i | 15.6 | 50.0 | – | |
| 525i (480i) | 640 × 480i | 15.7 | 59.9 | 12.3 | YPBPR/RGB |
| 625i (576i) | 768 × 576i | 15.6 | 50.0 | 14.8 | |
| 525p (480p) | 640 × 480 | 31.5 | 59.9 | 25.2 | |
| 625p (576p) | 768 × 575 | 31.3 | 50.0 | 29.5 | |
| 720p | 1280 × 720 | 45.0 | 60.0 | 74.3 | |
| | | 37.5 | 50.0 | 74.3 | |
| 1035i | 1920 × 1035i | 33.8 | 60.0 | 74.3 | HDMI/YPBPR/RGB |
| 1080i | 1920 × 1080i | 33.8 | 60.0 | 74.3 | |
| | | 28.1 | 50.0 | 74.3 | |
| VGA | 640 × 400 | 31.5 | 70.1 | 25.2 | RGB |
| | 640 × 480 | 31.5 | 59.9 | 25.2 | HDMI/RGB |
| | | 37.5 | 75.0 | 31.5 | RGB |
| | | 37.9 | 72.8 | 31.5 | |
| | | 37.9 | 74.4 | 31.5 | |
| | | 43.3 | 85.0 | 36.0 | |
| | 720 × 400 | 31.5 | 70.1 | 28.3 | |
| MAC LC13 | 640 × 480 | 35.0 | 66.6 | 31.3 | |
| MAC13 | | 35.0 | 66.7 | 30.2 | |
| SVGA | 800 × 600 | 32.7 | 51.1 | 32.7 | |
| | | 34.5 | 55.4 | 36.4 | |
| | | 35.2 | 56.3 | 36.0 | |
| | | 37.9 | 60.3 | 40.0 | |
| | | 37.9 | 61.0 | 40.0 | |
| | | 38.0 | 60.5 | 40.1 | |
| | | 38.6 | 60.3 | 38.6 | |
| | | 46.9 | 75.0 | 49.5 | |
| | | 48.1 | 72.2 | 50.0 | |
| | | 53.7 | 85.1 | 56.3 | |
| MAC16 | 832 × 624 | 49.7 | 74.6 | 57.3 | |
| XGA | 1024 × 768 | 44.0 | 54.6 | 59.1 | |
| | | 46.9 | 58.2 | 63.0 | |
| | | 47.0 | 58.3 | 61.7 | |
| | | 48.4 | 60.0 | 65.0 | HDMI/RGB |
| | | 48.5 | 60.0 | 65.2 | RGB |
| | | 58.0 | 72.0 | 74.7 | |
| | | 60.0 | 75.0 | 78.8 | HDMI/RGB |
| | | 60.3 | 74.9 | 79.3 | |
| | | 61.0 | 75.7 | 81.0 | RGB |
| | | 62.0 | 77.1 | 84.3 | |
| | | 63.5 | 79.4 | 83.4 | |
| | | 56.5 | 70.1 | 75.0 | HDMI/RGB |
| | | 68.7 | 85.0 | 94.5 | |
| | 1024 × 768i | 36.0 | 87.2 | 47.3 | RGB |
| | | 35.5 | 87.0 | 44.9 | |
| MAC19 | 1024 × 768 | 60.2 | 75.1 | 80.0 | |

*1 The "i" appearing after the resolution indicates an interlaced signal.

**Panasonic**

LCD Projector

PT-**VX400NT**

| Display mode | Display resolution (dots)[1] | Scanning frequency H (kHz) | V (kHz) | Dot clock frequency (MHz) | Format |
|---|---|---|---|---|---|
| WXGA | 1280 × 768 | 47.8 | 59.9 | 79.5 | HDMI/RGB |
| | | 60.3 | 74.9 | 102.3 | |
| | | 68.6 | 84.8 | 117.5 | |
| | 1280 × 800 | 41.2 | 50.0 | 68.6 | |
| | | 49.6 | 60.1 | 79.4 | |
| | | 49.7 | 59.8 | 83.5 | |
| | | 56.0 | 70.0 | 95.0 | RGB |
| | | 57.6 | 72.0 | 97.8 | |
| | | 58.2 | 70.0 | 98.9 | |
| | | 60.0 | 72.0 | 102.8 | |
| | | 62.8 | 74.9 | 106.5 | |
| | | 63.9 | 60.0 | 108.0 | HDMI/RGB |
| | | 71.5 | 84.8 | 122.5 | RGB |
| | 1360 × 768 | 47.7 | 60.0 | 86.7 | |
| | | 56.2 | 72.0 | 86.7 | |
| | 1366 × 768 | 48.4 | 60.0 | 100.1 | |
| | 1376 × 768 | 48.4 | 60.0 | 86.7 | |
| MAC21 | 1152 × 870 | 68.7 | 75.1 | 100.0 | |
| SXGA | 1152 × 900 | 61.2 | 65.2 | 92.0 | HDMI/RGB |
| | | 71.4 | 75.6 | 105.1 | |
| | | 61.9 | 66.0 | 94.5 | |
| | 1280 × 960 | 60.0 | 60.0 | 108.0 | |
| | 1280 × 1024 | 62.5 | 58.6 | 108.0 | |
| | | 63.3 | 60.0 | 107.3 | |
| | | 63.7 | 60.0 | 109.5 | |
| | | 63.9 | 60.0 | 108.0 | |
| | | 71.7 | 67.2 | 117.0 | |
| | | 81.1 | 76.1 | 135.0 | |
| | | 64.0 | 60.2 | 108.1 | |
| | | 80.0 | 75.0 | 135.0 | |
| | | 63.4 | 60.0 | 111.5 | |
| | | 77.0 | 72.0 | 130.1 | |
| | | 63.8 | 60.2 | 109.5 | |
| | | 91.1 | 85.0 | 157.5 | |
| | 1280 × 1024i | 50.0 | 86.0 | 80.0 | |
| | | 50.0 | 94.0 | 80.0 | |
| | | 46.4 | 86.7 | 78.4 | |
| MAC | 1280 × 960 | 75.0 | 75.1 | 126.0 | RGB |
| | 1280 × 1024 | 80.0 | 75.1 | 135.2 | |
| SXGA+ | 1400 × 1050 | 64.0 | 60.2 | 108.0 | HDMI/RGB |
| | | 65.4 | 60.1 | 122.9 | |
| | | 65.1 | 59.9 | 122.4 | |
| WXGA+ | 1440 × 900 | 55.9 | 59.9 | 106.5 | |
| | | 74.9 | 60.0 | 161.9 | RGB |
| UXGA | 1600 × 1200 | 75.0 | 60.0 | 162.0 | |
| | | 81.3 | 65.0 | 175.5 | |
| | | 87.5 | 70.0 | 189.0 | |
| | | 93.8 | 75.0 | 202.5 | |
| WSXGA+ | 1680 × 1050 | 65.3 | 60.0 | 146.3 | HDMI/RGB |
| WUXGA | 1920 × 1200 | 74.0 | 59.9 | 154.0 | |
| | | 74.6 | 59.9 | 193.3 | RGB |

**\*1  The "i" appearing after the resolution indicates an interlaced signal.**

SFL11M019                                        **Panasonic**

LCD Projector

## Serial connector

The serial connector complies with RS-232C. To control the projector from a personal computer, commands must be input through communication software, based on the format and satisfying the communication conditions shown below.

## Pin assignments and signal names
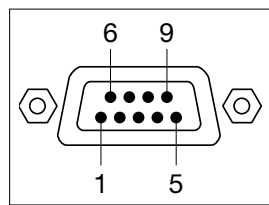
**D-sub 9-pin (male)**
**Serial input**

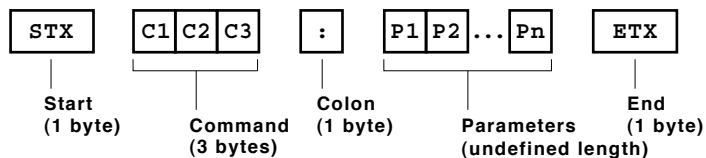| No. | Signal name | Description | No. | Signal name | Description |
|-----|-------------|-------------|-----|-------------|-------------|
| 1 | – | NC | 6 | – | NC |
| 2 | TXD | Send data | 7 | – | NC |
| 3 | RXD | Receive data | 8 | – | NC |
| 4 | – | NC | 9 | – | NC |
| 5 | GND | Ground | | | |

## Communication conditions (factory setting)

| Signal level | RS-232C-compliant |
|---|---|
| Synchronization method | Start-stop synchronization |
| Baud rate | 19,200 bps |
| Parity | None |

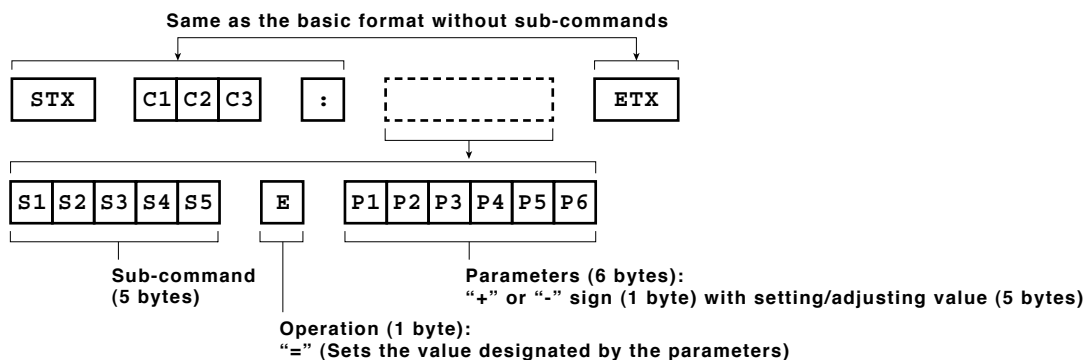| Character length | 8 bits |
|---|---|
| Stop bit | 1 bit |
| X parameter | None |
| S parameter | None |

## Basic format

Transmission from the computer begins with STX, then command, parameter, and ETX are sent in this order. Add parameters according to the details of control.

| STX | C1 C2 C3 | : | P1 P2 ... Pn | ETX |
|---|---|---|---|---|
| **Start** (1 byte) | **Command** (3 bytes) | **Colon** (1 byte) | **Parameters** (undefined length) | **End** (1 byte) |

**NOTE: When sending commands without parameters, a colon (:) is not necessary.**

## Basic format with sub-commands

**Same as the basic format without sub-commands**

| STX | C1 C2 C3 | : | | ETX |
|---|---|---|---|---|

| S1 S2 S3 S4 S5 | E | P1 P2 P3 P4 P5 P6 |
|---|---|---|
| **Sub-command** (5 bytes) | | **Parameters (6 bytes):** "+" or "-" sign (1 byte) with setting/adjusting value (5 bytes) |

**Operation (1 byte):**
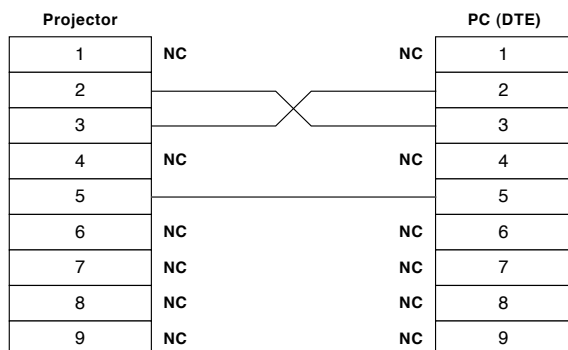**"=" (Sets the value designated by the parameters)**

**NOTE: When sending sub-commands that require no parameters, operation (E) and parameters are not necessary.**

### CAUTION
• It may not be possible to send or receive commands for about 10 to 60 seconds when the lamp is first turned on. If this occurs, wait for 60 seconds, then try sending or receiving again.
• When sending multiple commands, be sure to wait for at least 0.5 second after receiving a response from the projector before sending the next command.
• Additional time is sometimes required for response due to processing inside the projector. Set the time-out period for command response to 10 seconds or more.

## Cable specifications

| Projector | | | PC (DTE) |
|---|---|---|---|
| 1 | NC | NC | 1 |
| 2 | | | 2 |
| 3 | | | 3 |
| 4 | NC | NC | 4 |
| 5 | | | 5 |
| 6 | NC | NC | 6 |
| 7 | NC | NC | 7 |
| 8 | NC | NC | 8 |
| 9 | NC | NC | 9 |

## Control commands

| Command: <Parameter> | Function | Callback: <Parameter> | Parameter value Min | Max |
|---|---|---|---|---|
| `PON`*1/*2 | Power on (standby mode on) | `PON` | – | – |
| `POF`*1 | Power off (standby mode off) | `POF` | – | – |
| `AVL:<pl>` | Volume control | `AVL:<pl>` | 0 | 63 |
| `IIS:<input signal>` | Input signal selection | `IIS:<input signal>` | – | – |
| `OFZ:<off on>` | Freeze | `OFZ:<off on>` | 0 | 1 |
| `VPM:STD` | Picture mode: Standard | `VPM:STD` | – | – |
| `VPM:DYN` | Picture mode: Dynamic | `VPM:DYN` | – | – |
| `VPM:CIN` | Picture mode: Cinema | `VPM:CIN` | – | – |
| `VPM:REA` | Picture mode: Real | `VPM:REA` | – | – |
| `VPM:BBD` | Picture mode: Blackboard | `VPM:BBD` | – | – |
| `VPM:CBD` | Picture mode: Colorboard | `VPM:CBD` | – | – |
| `VPM:IM1` | Picture mode: Image 1 | `VPM:IM1` | – | – |
| `VPM:IM2` | Picture mode: Image 2 | `VPM:IM2` | – | – |
| `VPM:IM3` | Picture mode: Image 3 | `VPM:IM3` | – | – |
| `VPM:IM4` | Picture mode: Image 4 | `VPM:IM4` | – | – |
| `AUU` | Volume up | `AUU` | – | – |
| `AUD` | Volume down | `AUD` | – | – |
| `OSH`*1 | AV mute | `OSH` | – | – |
| `DZU` | Digital zoom: Enlargement | `DZU` | – | – |
| `DZD` | Digital zoom: Reduction | `DZD` | – | – |

*1  Do not send PON, POF, or OSH commands continuously in a short period of time. Doing so may burst the lamp or shorten the lamp replacement cycle.
*2  These commands are effective when the standby mode is set to eco. (Other commands are not effective.)

**Panasonic**

## Status request commands

| Command | Description | | Callback <Parameter> |
|---------|-------------|--|----------------------|
| `QPW` | Standby power status | | `<power condition>` |
| `Q$S` | Lamp status | | `<lamp condition>` |
| `QIN` | Input signal status | | `<input signal>` |
| `QAV` | Volume adjustment value | | `<pl>` |
| `QPM` | Picture mode status | Standard | `STD` |
| | | Dynamic | `DYN` |
| | | Cinema | `CIN` |
| | | Real | `REA` |
| | | Blackboard | `BBD` |
| | | Colorboard | `CBD` |
| | | Image 1 | `IM1` |
| | | Image 2 | `IM2` |
| | | Image 3 | `IM3` |
| | | Image 4 | `IM4` |
| `QFZ` | Freeze status | | `<off_on>` |
| `Q$L` | Lamp run time | | `<acctch>` |
| `QSH` | AV mute function status | | `<off_on>` |

**NOTE: If a wrong command is received, the projector will send an ER401 command to the computer.**

## Parameter format

| Parameter format | Size (Byte) | Definition |
|------------------|-------------|------------|
| `<pl>` | 3 (1 or 2 bytes also possible when under control) | Decimal without signs: 0 to 999 (000, 001, 002...999) Decimal with signs: -99 to +99 (-99...-01, +00, +01, +02...+99)       Callback from the projector is 3 Byte. |
| `<off on>` | 1 | 0 = off, 1 = on |
| `<input signal>` | 3 | HD1 = HDMI, RG1 = computer 1, RG2 = computer 2, VID = video, SVD = S-Video |
| `<power condition>` | 3 | 000 = power off (standby mode off), 001 = power on (standby mode on) |
| `<lamp condition>` | 1 | 0 = standby, 1 = lamp on under control, 2 = lamp on, 3 = lamp off under control |
| `<acctch>` | 4 | Decimal without signs: 0000−9999 hours |

**NOTE: If a wrong command is received, the projector will send an ER401 command to the computer.**

## Command example

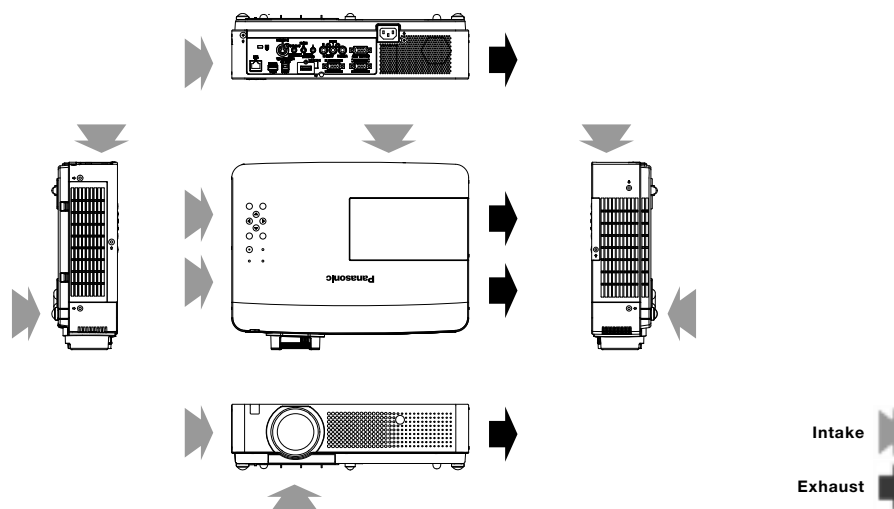To set the volume to +30, send the command as shown below.

| STX | AVL | : | 30 | ETX |
|-----|-----|---|----|-----|
| **Start** | **Command** | | **Parameter** | **End** |

**NOTE: When sending commands without parameters, a colon (:) is not necessary.**

## Notes on projector placement and operation

The projector uses a high-wattage lamp that becomes very hot during operation. Please observe the following precautions.

1.  Never place objects on top of the projector while it is operating.
2.  Make sure there is the unobstructed space as shown below or more around the projector's exhaust openings. In addition to this space, also ensure that there is a sufficient work space for removing and installing the lamp, filter and other parts.
3.  Make sure that nothing blocks the projector's air intake and exhaust openings. Also, install the projector so that cool or hot air from other air conditioning equipment does not flow directly toward the projector's air intake or exhaust openings.
4.  Do not install the projector in an enclosed space. If it is necessary to install it in an enclosed space, add a separate ventilation system. If ventilation is insufficient, hot air will accumulate at the intake opening. This may cause the projector's protective circuit to interrupt projector operation.

200 mm (7-7/8″)      500 mm (19-11/16″)                    1,000 mm (39-3/8″) or more
or more              or more
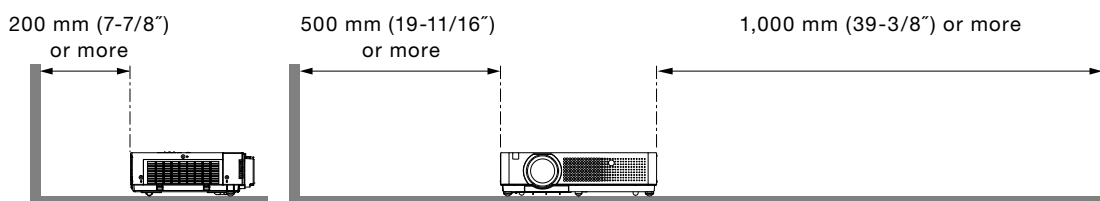
## Direction of air intake and exhaust

Intake

Exhaust

## Operating the projector continuously

1.  If the projector is to be operated continuously 12 hours or more, lamp replacement cycle duration becomes shorter.
2.  The lamp replacement cycle duration becomes shorter if the projector is operated repeatedly for short periods (one hour or less).