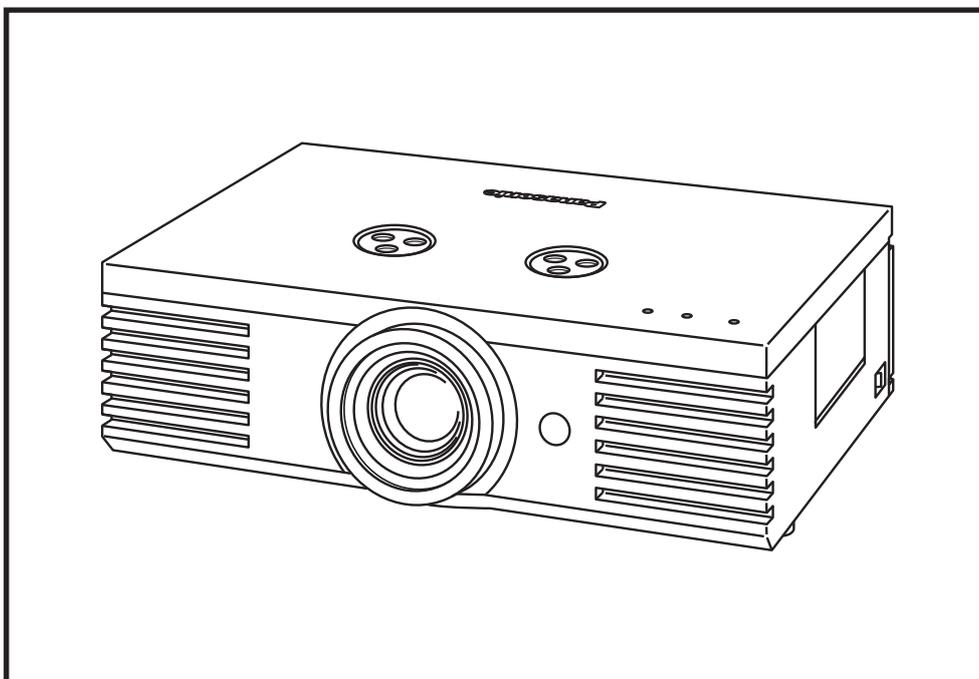


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## S P E C F I L E

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Product Number : **PT-AE2000**

Product Name : Full High-Definition Home Cinema Projector

**Specifications****Main Unit**

Power supply:		100–240 V AC, 50/60 Hz
Power consumption:		240 W (0.08 W in standby mode with fan stopped)
LCD* <sup>1</sup> panel:	Panel size:	0.74" diagonal (16:9 aspect ratio)
	Display method:	Transparent LCD panel (x 3, R/G/B)
	Drive method:	Active matrix
	Pixels:	2,073,600 (1,920 x 1,080) x 3, total of 6,220,800 pixels
Lamp* <sup>2</sup> :		165 W UHM™ lamp
Lens:		Powered zoom/focus lens (1:1–1:2), F 1.9–3.2, f 22.4–44.8 mm
Screen size:		40–200 inches
Throw distance:		1.2–12.0 m (3'11"–39'4") (16:9 aspect ratio)
Colours:		Full colour (1,073,741,824 colours)
Brightness* <sup>3</sup> :		1,500 lumens* <sup>4</sup>
Centre-to-corner uniformity ratio* <sup>3</sup> :		85 %
Contrast* <sup>3</sup> :		16,000:1* <sup>4</sup> (full on/full off)
Resolution:		1,920 x 1,080 pixels
Scanning frequency:	RGB:	f <sub>H</sub> 30–70 kHz, f <sub>V</sub> 50–87 Hz, Dot clock: Less than 150 MHz
	YPbPr (YCbCr):	480i (525i): f <sub>H</sub> 15.75 kHz; f <sub>V</sub> 60 Hz, 576i (625i): f <sub>H</sub> 15.63 kHz; f <sub>V</sub> 50 Hz, 480p (525p): f <sub>H</sub> 31.5 kHz; f <sub>V</sub> 60 Hz, 576p (625p): f <sub>H</sub> 31.25 kHz; f <sub>V</sub> 50 Hz, 720/50p (750/50p): f <sub>H</sub> 37.5 kHz; f <sub>V</sub> 50 Hz, 720/60p (750/60p): f <sub>H</sub> 45 kHz; f <sub>V</sub> 60 Hz, 1080/50i (1125/50i): f <sub>H</sub> 28.125 kHz; f <sub>V</sub> 50 Hz, 1080/60i (1125/60i): f <sub>H</sub> 33.75 kHz; f <sub>V</sub> 60 Hz, 1080/24p (1125/24p): f <sub>H</sub> 27 kHz; f <sub>V</sub> 24 Hz, 1080/50p (1125/50p): f <sub>H</sub> 56.3 kHz; f <sub>V</sub> 50 Hz, 1080/60p (1125/60p): f <sub>H</sub> 67.5 kHz; f <sub>V</sub> 60 Hz
	S-Video/Video:	f <sub>H</sub> 15.75 kHz f <sub>V</sub> 60 Hz (NTSC, NTSC4.43, PAL-M, PAL60) f <sub>H</sub> 15.63 kHz f <sub>V</sub> 50 Hz (PAL, PAL-N, SECAM)
Optical axis shift* <sup>5</sup> :		Horizontal: ±40%, vertical: ±100%
Keystone correction range:		Vertical: approx. ±30°
Installation:		Ceiling/floor, front/rear (menu selection)
OSD languages:		English, French, German, Spanish, Italian, Chinese, Korean, Russian, Swedish, Danish, Norwegian, Polish, Czech, Hungarian, Portuguese, Thai
Terminals:	HDMI* <sup>6</sup> IN:	HDMI connector x 3
	COMPUTER IN:	D-sub HD 15-pin (female) x 1
	R, G, B:	0.7 Vp-p (1.0 Vp-p for Sync on G), 75 ohms
	HD/SYNC, VD:	TTL, high impedance (positive/negative polarity)
	COMPONENT IN:	RCA pin (Y, Pb/Cb, Pr/Cr) x 2
	Y:	1.0 p-p, 75 ohms
	Pb/Cb, Pr/Cr:	0.7 Vp-p, 75 ohms
	VIDEO IN:	RCA pin x 1, 1.0 Vp-p, 75 ohms
	S-VIDEO IN:	Mini DIN 4-pin x 1, Y: 1.0 Vp-p, C: 0.286 Vp-p, 75 ohms
	SERIAL IN:	D-sub 9-pin (RS-232C) x 1, for external control

Power cord length:	3 m (9'10")
Cabinet material:	PC + ABS
Dimensions (W x H x D):	460 x 130 x 300 mm (18-1/8" x 5-1/8" x 11-25/32")*7
Weight:	7.2 kg (15.9 lbs.)
Operating temperature:	0°–40°C (32°–104°F)
Operating humidity:	20%–80% (no condensation)

**Remote Control Unit**

Power supply:	3 V DC (AA type battery x 2)
Operation range*8:	Approx. 7 m when operated from directly in front of the signal receptor
Dimensions (W x H x D):	52 x 200 x 28.5 mm (2" x 6-15/16" x 7/8")
Weight:	170 g (6 oz.)

**Supplied Accessories**

Power cord  
Wireless remote control unit  
Batteries for remote control (AA type x 2)

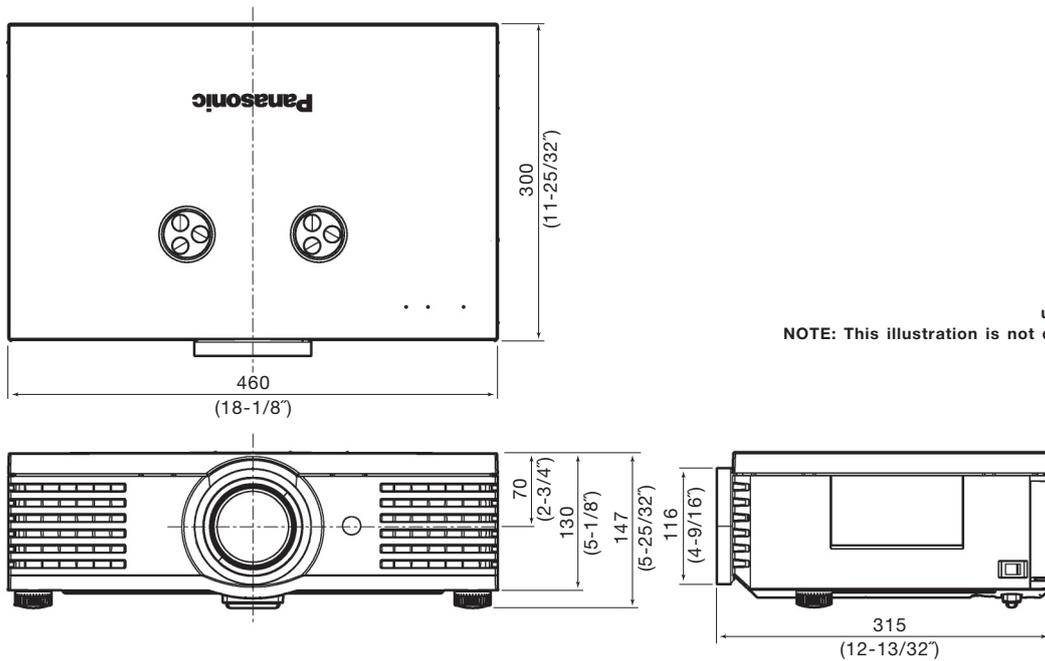
**Optional Accessories**

Replacement lamp: ET-LAE1000  
Ceiling mount bracket for high ceilings: ET-PKE2000  
Ceiling mount bracket for low ceilings: ET-PKE1000S  
Cable cover: ET-PCE2000

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

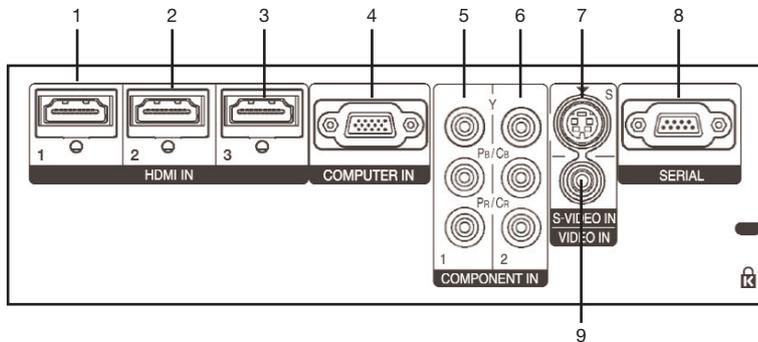
- \*1: The projector uses a type of liquid crystal panel that typically consists of millions of pixels. This panel is built with very high-precision technology to provide the finest possible image. Occasionally, a few pixels may remain turned on (bright) or turned off (dark). Please note that this is an intrinsic characteristic of the manufacturing technology that affects all products using LCD technology.
- \*2: The projector uses a high-voltage mercury lamp that contains high internal pressure. This lamp may break, emitting a large sound, or fail to illuminate, due to impact or extended use. The length of time that it takes for the lamp to break or fail to illuminate varies greatly depending on individual lamp characteristics and usage conditions.
- \*3: Measurement, measuring conditions, and method of notation all comply with ISO 21118 international standards.
- \*4: In AI mode, with dynamic iris on.
- \*5: Shift range is limited during simultaneous horizontal and vertical shifting.
- \*6: Supports Deep Color and xvYCC color space (effective in Color 1 image mode) of HDMI 1.3a standard.
- \*7: Lens and legs not included.
- \*8: Operation range differs depending on environments.

Dimensions



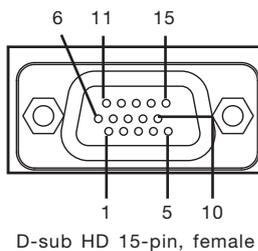
unit : mm (inch)  
NOTE: This illustration is not drawn to scale.

Terminals



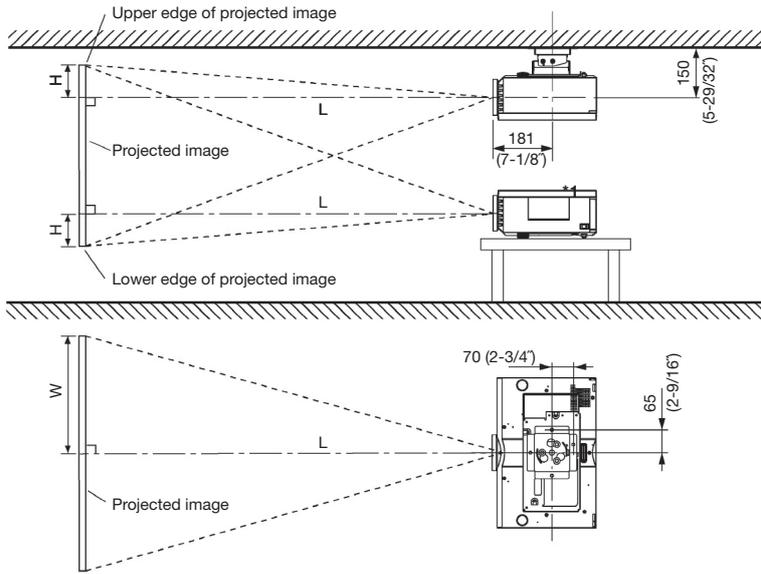
- 1 HDMI 1 input
- 2 HDMI 2 input
- 3 HDMI 3 input
- 4 Computer input
- 5 Component (YPbPr/YCbCr) 1 input
- 6 Component (YPbPr/YCbCr) 2 input
- 7 S-Video input
- 8 Serial input
- 9 Video input

COMPUTER IN connector pin assignment



no.	signal	no.	signal	no.	signal
1	R	6	GND	11	GND
2	G	7	GND	12	NC
3	B	8	GND	13	HD/SYNC
4	GND	9	NC	14	VD
5	GND	10	GND	15	NC

Standard setting-up positions



unit : mm (inch)

**NOTE:**  
 Illustrations show the projector installed using optional ceiling bracket ET-PKE1000S. This illustration is not drawn to scale. Values shown are approximate.

Projection distance (screen aspect ratio 16:9)

Projection size (16:9) Diagonal length	Projection distance (L)		Height from the edge of screen to centre of lens (E)	Width from the right edge of screen to centre of lens (W)
	Min (Wide)	Max (Telephoto)		
1.01 m / 40"	1.2 m / 3'11"	2.3 m / 7'7"	-0.25 m - 0.75 m / 9.8" - 2'6"	0.09 m - 0.80 m / 3.5" - 2'7"
1.52 m / 60"	1.8 m / 5'10"	3.5 m / 11'6"	-0.38 m - 1.13 m / 1'3" - 3'8"	0.14 m - 1.20 m / 5.5" - 3'11"
2.03 m / 80"	2.4 m / 7'10"	4.7 m / 15'5"	-0.50 m - 1.50 m / 1'8" - 4'11"	0.18 m - 1.60 m / 7" - 5'3"
2.54 m / 100"	3.0 m / 10'2"	6.0 m / 19'8"	-0.63 m - 1.87 m / 2'1" - 6'2"	0.23 m - 2.00 m / 9" - 6'7"
3.05 m / 120"	3.6 m / 11'10"	7.2 m / 23'7"	-0.75 m - 2.25 m / 2'6" - 7'5"	0.27 m - 2.40 m / 11" - 7'10"
3.81 m / 150"	4.5 m / 14'9"	9.0 m / 29'6"	-0.94 m - 2.81 m / 3'1" - 9'3"	0.34 m - 2.99 m / 1'1" - 9'10"
5.08 m / 200"	6.0 m / 19'8"	12.0 m / 39'4"	-1.25 m - 3.74 m / 4'1" - 12'3"	0.45 m - 3.99 m / 1'6" - 13'1"

Projection distance (screen aspect ratio 4:3)

Projection size (4:3) Diagonal length	Projection distance (L)		Height from the edge of screen to centre of lens (E)	Width from the right edge of screen to centre of lens (W)
	Min (Wide)	Max (Telephoto)		
1.01 m / 40"	1.5 m / 4'11"	2.9 m / 9'6"	-0.30 m - 0.91 m / 11.8" - 3'	0.08 m - 0.73 m / 3.1" - 2'5"
1.52 m / 60"	2.2 m / 7'3"	4.3 m / 14'1"	-0.45 m - 1.37 m / 1'6" - 4'6"	0.12 m - 1.09 m / 4.7" - 3'7"
2.03 m / 80"	3.0 m / 9'10"	5.8 m / 19'	-0.60 m - 1.82 m / 2' - 6"	0.16 m - 1.46 m / 6.3" - 4'9"
2.54 m / 100"	3.7 m / 12'2"	7.3 m / 23'11"	-0.76 m - 2.28 m / 2'6" - 7'6"	0.20 m - 1.82 m / 7.9" - 6"
3.81 m / 150"	5.6 m / 18'4"	11.0 m / 36'1"	-1.14 m - 3.42 m / 3'9" - 11'3"	0.30 m - 2.74 m / 11.8" - 9"

**NOTE:** The values of L shown above vary due to characteristics of the zoom lens. Images may slightly distort due to characteristics of the zoom lens when the zoom lens is set to the minimum throw distance.

Calculation of the projection distance

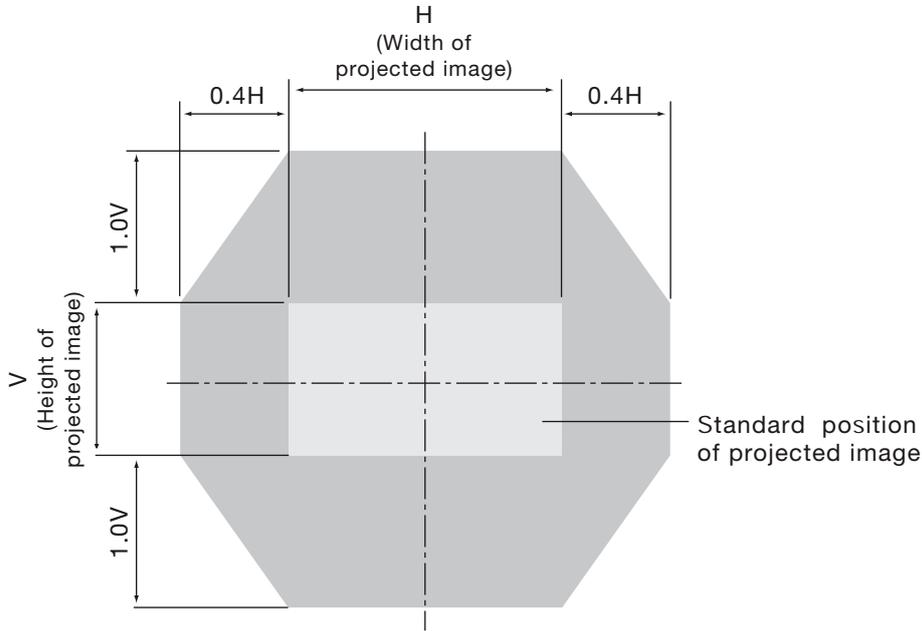
For a screen size different from the above, use the equation below to calculate the projection distance.

16 : 9	minimum	$L (m) = (\text{diagonal screen size in inches}) \times 0.0302 - 0.04$
	maximum	$L (m) = (\text{diagonal screen size in inches}) \times 0.0604 - 0.05$
4 : 3	minimum	$L (m) = (\text{diagonal screen size in inches}) \times 0.0371 - 0.04$
	maximum	$L (m) = (\text{diagonal screen size in inches}) \times 0.0739 - 0.05$

**NOTE:** The accuracy of calculated value by the formula shown above is  $\pm 5\%$ .

**Shift range**

Optical axis shift function allows to shift the position of a projected image as shown below.

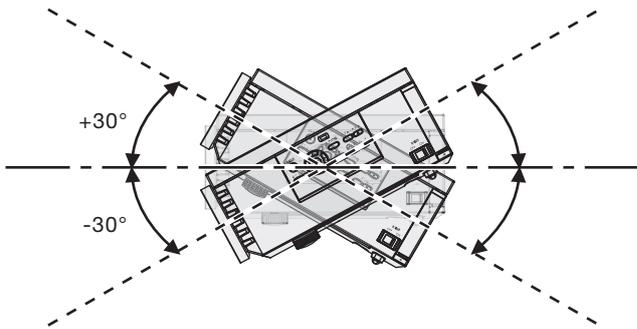


**Installable angle**

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

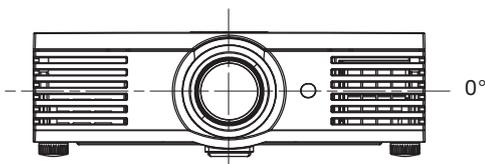
**• Vertical direction**

The projector may be installed at a vertical angle of  $\pm 30^\circ$ .



**• Horizontal direction**

The projector may not be angled horizontally.



**Computer data compatibility**

This projector accepts up to 70 kHz horizontal scanning frequency and 150 MHz dot clock.

**NOTE:** The display resolution of this projector is 1920 x 1080 pixels. If the display resolution indicated in the above data does not match this resolution, the input signal will be converted to 1920 x 1080 pixels.

**List of Compatible Signals**

Display mode	Display resolution (dots) <sup>1</sup>	Scanning frequency		Dot clock frequency (MHz)	Picture quality <sup>2</sup>	Format
		H (kHz)	V (kHz)			
NTSC/NTSC4.43/PAL-M/PAL60	720 x 480i	15.7	59.9	-	A	VIDEO/S-VIDEO
PAL/PAL-N/SECAM	720 x 576i	15.6	50.0	-	A	VIDEO/S-VIDEO
480i (525i)	720 x 480i	15.7	59.9	13.5	A	COMPONENT
576i (625i)	720 x 576i	15.6	50.0	13.5	A	COMPONENT
480p (525p)	720 x 480	31.5	59.9	27.0	A	COMPONENT/HDMI
576p (625p)	720 x 576	31.3	50.0	27.0	A	COMPONENT/HDMI
720 (750)/60p	1,280 x 720	45.0	60.0	74.3	AA	COMPONENT/HDMI
720 (750)/50p	1,280 x 720	37.5	50.0	74.3	AA	COMPONENT/HDMI
1080 (1125)/60i	1,920 x 1,080i	33.8	60.0	74.3	AA	COMPONENT/PC/HDMI
1080 (1125)/50i	1,920 x 1,080i	28.1	50.0	74.3	AA	COMPONENT/PC/HDMI
1080 (1125)/24p	1,920 x 1,080	27.0	24.0	74.3	AA	COMPONENT/HDMI
1080 (1125)/60p	1,920 x 1,080	67.5	60.0	148.5	AA	COMPONENT/PC/HDMI
1080 (1125)/50p	1,920 x 1,080	56.3	50.0	148.5	AA	COMPONENT/PC/HDMI
VGA480	640 x 480	31.5	59.9	25.2	A	PC/HDMI
	640 x 480	37.5	75.0	31.5	A	PC
	640 x 480	43.3	85.0	36.0	A	PC
	640 x 480	72.1	138.0	62.3	A	PC
WIDE480	856 x 480	30.1	60.1	31.5	A	PC
SVGA	800 x 600	35.2	56.3	36.0	A	PC
	800 x 600	37.9	60.3	40.0	A	PC
	800 x 600	48.1	72.2	50.0	A	PC
	800 x 600	46.9	75.0	50.0	A	PC
	800 x 600	53.7	85.1	56.3	A	PC
WIDE600	1,072 x 600	37.2	59.9	51.4	A	PC
WIDE720	1,280 x 720	45.1	60.1	76.5	AA	PC
XGA	1,024 x 768	48.4	60.0	65.0	A	PC
	1,024 x 768	56.5	70.1	75.0	A	PC
	1,024 x 768	60.0	75.0	78.8	A	PC
	1,024 x 768	68.7	85.0	94.5	A	PC
	1,024 x 768	72.1	89.0	99.2	A	PC
WIDE768	1,280 x 768	45.3	56.5	76.2	A	PC
MXGA	1,125 x 864	64.0	71.2	94.2	A	PC
	1,125 x 864	67.5	74.9	108.0	A	PC
SXGA	1,280 x 1,024	64.0	60.0	108.0	A	PC
WIDE768-2	1,360 x 768	48.8	59.8	74.3	A	PC
SXGA60+	1,400 x 1,050	65.1	59.9	122.4	A	PC
WIDE800	1,280 x 800	49.7	59.8	83.5	A	PC
WIDE900	1,440 x 900	55.9	59.9	106.5	A	PC

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

2. The following symbols are used to indicate picture quality.

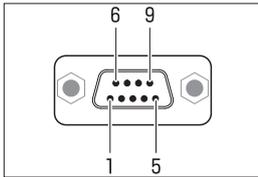
AA Maximum picture quality can be obtained.

A Signals are converted by the image processing circuit before picture is projected.

**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

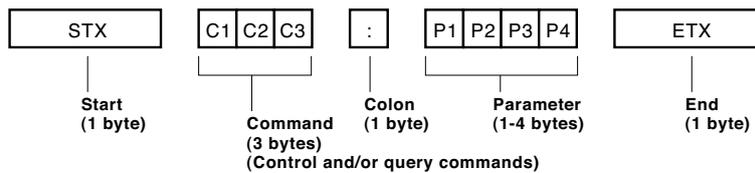
No.	Signal name	Description	No.	Signal name	Description
1	-	NC	6	-	NC
2	TXD	Send data	7	RTS	Connected internally
3	RXD	Receive data	8	CTS	Connected internally
4	-	NC	9	-	NC
5	GND	Ground			

**Communication conditions (factory setting)**

Signal level	RS-232C-compliant
Synchronization method	Start-stop synchronization
Baud rate	9,600 bps
Parity	None
Character length	8 bits
Stop bit	1 bit
X parameter	None
S parameter	None

**Basic format**

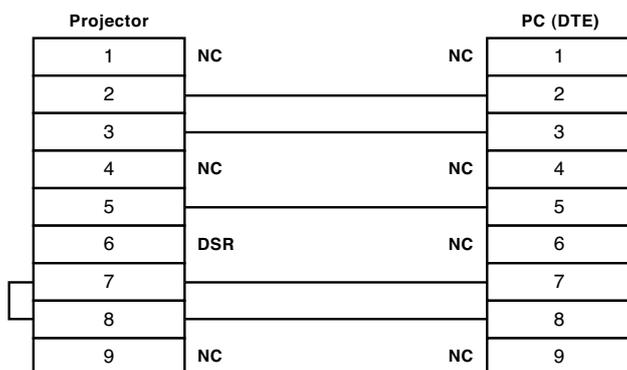
Transmission from the computer begins with STX, then the ID, command, parameter, and ETX are sent in this order. Add parameters according to the details of control.



**CAUTION**

When sending multiple commands, be sure to send the next command after receiving a response from the projector.

**Cable specifications**



**Control commands**

Command: <Parameter>	Function	Callback: <Parameter>	Parameter value	
			Min	Max
<b>PON*</b>	Power on (standby mode on)	<b>PON</b>		
<b>POF*</b>	Power off (standby mode off)	<b>POF</b>		
<b>IIS:&lt;input signal&gt;</b>	Input signal selection	<b>IIS:&lt;input signal&gt;</b>	-	-
<b>OFZ:&lt;off_on&gt;</b>	Freeze	<b>OFZ:&lt;off_on&gt;</b>	0	1
<b>OEN</b>	Enter	<b>OEN</b>		
<b>VPM:&lt;picture mode&gt;</b>	Picture mode	<b>VPM:&lt;picture mode&gt;</b>	-	-
<NOR>	Normal	<NOR>	-	-
<DYN>	Dynamic	<DYN>	-	-
<CN1>	Cinema 1	<CN1>	-	-
<CN2>	Cinema 2	<CN2>	-	-
<CN3>	Cinema 3	<CN3>	-	-
<CL1>	Colour 1	<CL1>	-	-
<CL2>	Colour 2	<CL2>	-	-
<b>OMN</b>	Menu	<b>OMN</b>	-	-
<b>OCU</b>	Cursor up	<b>OCU</b>		
<b> OCD</b>	Cursor down	<b> OCD</b>		
<b> OCL</b>	Cursor left	<b> OCL</b>		
<b> OCR</b>	Cursor right	<b> OCR</b>		
<b>OSH*</b>	Shutter	<b>OSH</b>		
<b>OST</b>	The same function as "DEFAULT" button	<b>OST</b>		
<b>OVM</b>	The same function as "PICTURE MODE" button	<b>OVM</b>		
<b>VS1</b>	The same function as "ASPECT" button	<b>VS1</b>		
<b>OBK</b>	The same function as "RETURN" button	<b>OBK</b>		
<b>OLE</b>	The same function as "LENS" button	<b>OLE</b>		
<b>OOT:&lt;off_timer&gt;</b>	Off timer	<b>OOT:&lt;off_timer&gt;</b>	0	7
<b>OWM:&lt;x&gt;</b>	Waveform monitor activate/off	<b>OWM:&lt;x&gt;</b>	0	8

\* 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.

**Status asking commands**

Command	Description	Callback <Parameter>
<b>QPW</b>	Standby power status	<b>&lt;power condition&gt;</b>
<b>QIN</b>	Input signal status	<b>&lt;input signal&gt;</b>
<b>QPM</b>	Picture mode status	Normal
		Dynamic
		Cinema 1
		Cinema 2
		Cinema 3
		Colour 1
	Colour 2	<b>&lt;CL2&gt;</b>
<b>QFZ</b>	Freeze status	<b>&lt;off_on&gt;</b>
<b>QOT</b>	Off timer status	<b>&lt;off_timer&gt;</b>
<b>QSH</b>	Shutter function status	<b>&lt;off_on&gt;</b>
<b>QWM</b>	Waveform monitor status	<b>&lt;x&gt;</b>

**Parameter format**

Parameter format	Size (Byte)	Difinition
<off_on>	1	0 = off, 1 = on
<input signal>	3	VID = video, SVD = S-video, RG1 = computer, CP1 = component 1, CP2 = component 2, HD1 = HDMI 1, HD2 = HDMI 2, HD3 = HDMI 3
<power condition>	3	000 = power on (standby mode on), 001 = power off (standby mode off)
<off_timer>	1	0 = off, 1 = 60 min, 2 = 90 min, 3 = 120 min, 4 = 150 min, 5 = 180 min, 6 = 210 min, 7 = 240 min
<x>	1	0 = off, 1 = full scan (Y), 2 = full scan (R), 3 = full scan (G), 4 = full scan (B), 5 = single line (Y), 6 = single line (R), 7 = single line (G), 8 = single line (B)

**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.

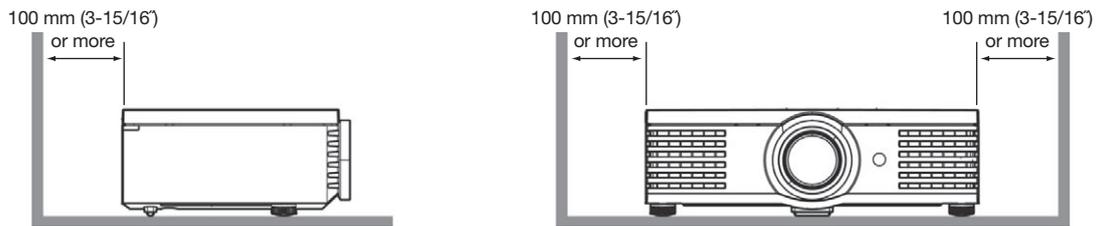
STX	AVL	:	30	ETX
Start	Command		Parameter	End

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

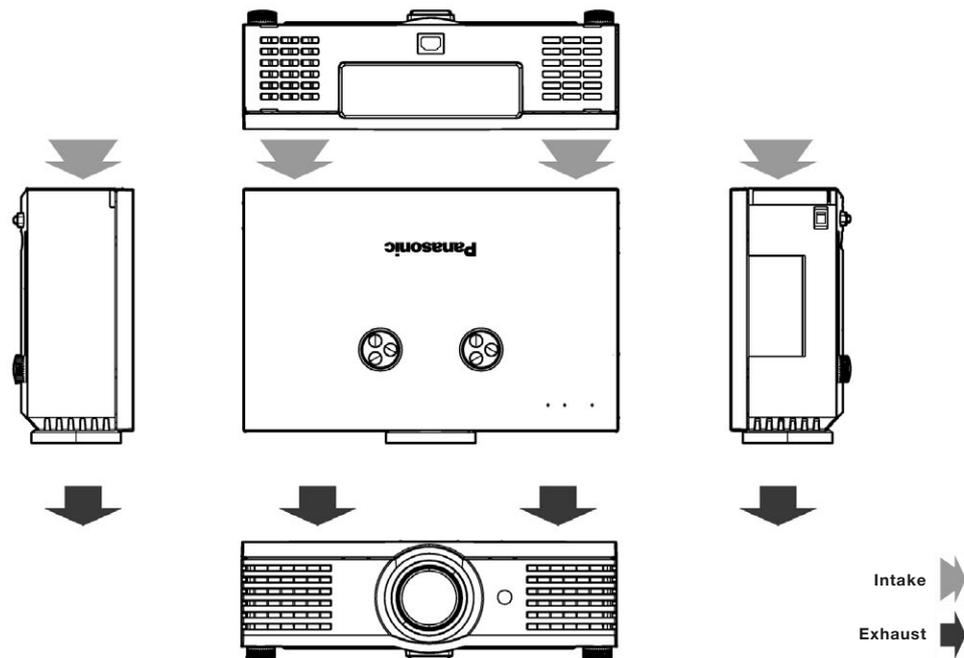
**Notes on Projector Placement and Operation**

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 an unobstructed space of 100 mm (3-15/16") or more around the projector's air intake openings.
3. If the projector is placed in a box or enclosure, ensure the temperature of the air surrounding the projector is between 0°C/32°F and 35°C/95°F. Also make sure the projector's intake and exhaust openings are not blocked. Take particular care to ensure that hot air from the exhaust openings is not sucked into the intake openings.



**Direction of Air Intake and Exhaust**



**Operating the Projector Continuously**

1. If the projector is to be operated continuously 10 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.