

S P E C F I L E



Product Number : **PT-CW230**

Product Name : Ultra Short-Throw DLP™ Projector

Specifications

Main unit

Power supply		100–240 V AC, 50/60 Hz
Power consumption		350 W (0.45 W when STANDBY MODE set to ECO,* ¹ 11.0 W when STANDBY MODE set to NETWORK.)
DLP™ chip	Panel size	16.5 mm (0.65 inches) diagonal (16:10 aspect ratio)
	Display method	DLP™ chip × 1, DLP™ system
	Pixels	1,024,000 (1,280 × 800) pixels
Lens		Fixed (0.19:1 throw ratio), manual focus, F 2.5, f 4.83 mm
Lamp		275 W UHM lamp × 1
Screen size		1.52–2.79 m (60–110 inches) diagonally, 16:10 aspect ratio
Colors		Full color (16,777,216 colors)
Brightness* ²		2,500 lumens (LAMP POWER: NORMAL)
Center-to-corner uniformity* ²		80%
Contrast* ²		2,000:1 (full on/off, LAMP POWER: NORMAL)
Resolution		1,280 × 800 pixels (Input signals that exceed this resolution will be converted to 1,280 × 800 pixels.)
Scanning frequency	HDMI	fH: 15 kHz–93 kHz, fV: 50 Hz–120 Hz, dot clock: 150 MHz or lower
	RGB	fH: 15 kHz–93 kHz, fV: 50 Hz–120 Hz, dot clock: 150 MHz or lower (Signals above 150 MHz are downsampled.)
	YPbPr (YCbCr)	525i (480i): fH 15.75 kHz; fV 60 Hz, 625i (576i): fH 15.63 kHz; fV 50 Hz, 525p (480p): fH 31.50 kHz; fV 60 Hz, 625p (576p): fH 31.25 kHz; fV 50 Hz, 750 (720)/60p: fH 45.00 kHz; fV 60 Hz, 750 (720)/50p: fH 37.50 kHz; fV 50 Hz, 1125 (1080)/60i: fH 33.75 kHz; fV 60 Hz, 1125 (1080)/50i: fH 28.13 kHz; fV 50 Hz
	Video/S-Video	fH: 15.75 kHz, fV: 60 Hz [NTSC/NTSC4.43/PAL-M/PAL60] fH: 15.63 kHz, fV: 50 Hz [PAL/PAL-N/SECAM]
Keystone correction range		Vertical: ±5°
Installation		Ceiling/floor, 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 525p (480p), 625p (576p), 750 (720)/60p, 750 (720)/50p, 1125 (1080)/60i, 1125 (1080)/50i, 1125 (1080)/60p, 1125 (1080)/50p VGA (640 × 480)–WSXGA+ (1,680 × 1,050), Audio signal: linear PCM (sampling frequencies: 48 kHz, 44.1 kHz, 32 kHz)
	COMPUTER (RGB) 1 IN R, G, B	D-sub HD 15-pin (female) × 1 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)
	Y, Pb (Cb), Pr (Cr)	Y: 1.0 Vp-p (including sync signal); Pb (Cb), Pr (Cr): 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)
	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 1 AUDIO IN	M3 (L, R) × 1, 0.5 Vrms
COMPUTER 2 AUDIO 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 (female) × 1, for external control (RS-232C compliant)
LAN	RJ-45 × 1, for network connection, 100Base-TX/10Base-T, compliant with PjLink™
3D SYNC OUT	Mini DIN 3-pin × 1, for 3D transmitter connection
Power cord length	3.0 m (9 ft 10 in)
Cabinet materials	Molded plastic (PC)
Dimensions (W × H × D)	321 mm × 178 mm* ³ × 386 mm (12-5/8 × 7* ³ × 15-3/16 inches)
Weight	Approximately 6.2 kg (13.7 lbs)
Operation noise	36 dB (LAMP POWER: NORMAL), 28 dB (LAMP POWER: ECO)
Operating temperature	0–40 °C (32–104 °F) up to 1,000 m (3,281 ft) above sea level, 0–30 °C (32–86 °F) between 1,000 m and 2,700 m (3,281 ft and 8,858 ft) above sea level.
Operating humidity	20%–80% (no condensation)
Remote control unit	
Power supply	3 V DC (R03/LR03/AAA type battery × 2)
Operation range* ⁴	Approximately 5 m (16.4 ft) when operated from directly in front of the signal receptor
Dimensions (W × H × D)	52 × 110 × 18 mm (2-1/16 × 4-11/32 × 23/32 inches)
Weight	Approx. 67 g (2.4 oz) (including batteries)
Supplied accessories	
	Power cord with security lock (× 1) (× 2 for PT-CW230EA)
	Wireless remote control unit (× 1)
	Batteries for remote control (R03/LR03/AAA type × 2)
	Computer cable (for VGA, 1.8 m / 5 ft 11 in) (× 1)
Optional accessories	
Ceiling mount bracket	ET-PKV100H (for high ceilings) ET-PKV100S (for low ceilings)
Bracket assembly	ET-PKC100B
Wall mount bracket	ET-PKC100W
Replacement lamp unit	ET-LAC100
Replacement filter unit	ET-RFC100

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

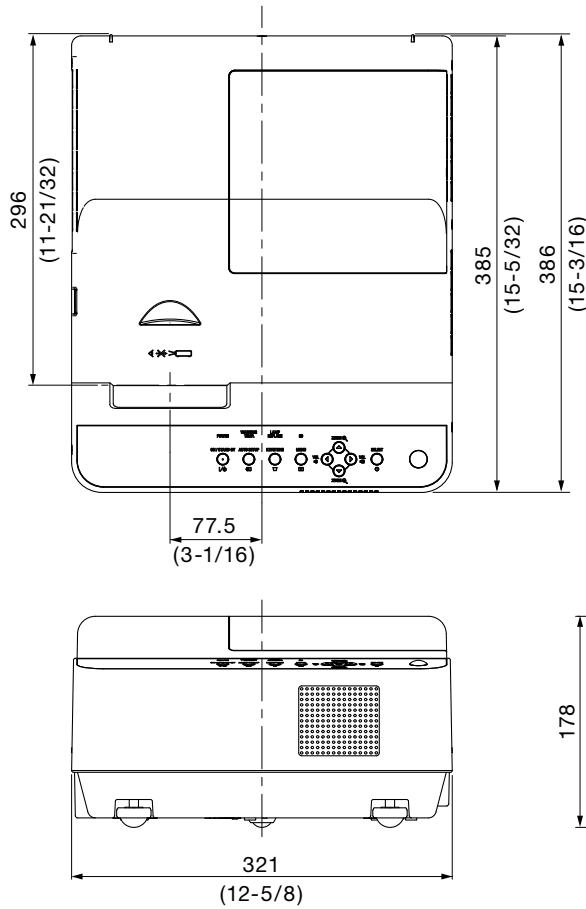
*1 When the standby mode is set to eco, network functions such as power on over the LAN network will not operate. Also, only certain commands can be received for external control using the serial terminal.

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

*3 With legs at shortest position.

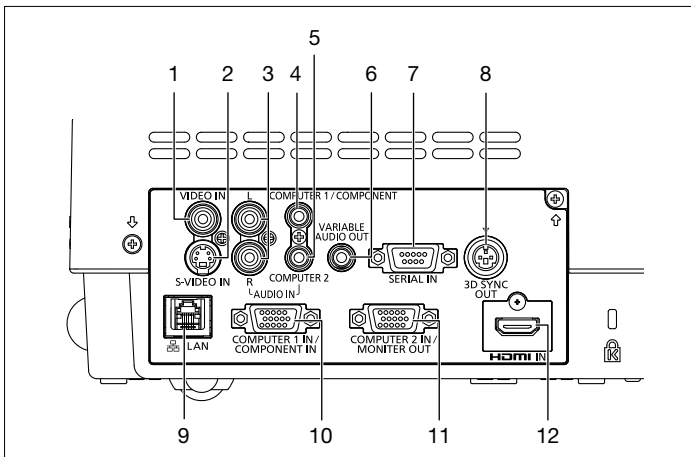
*4 Operation range differs depending on environments.

Dimensions



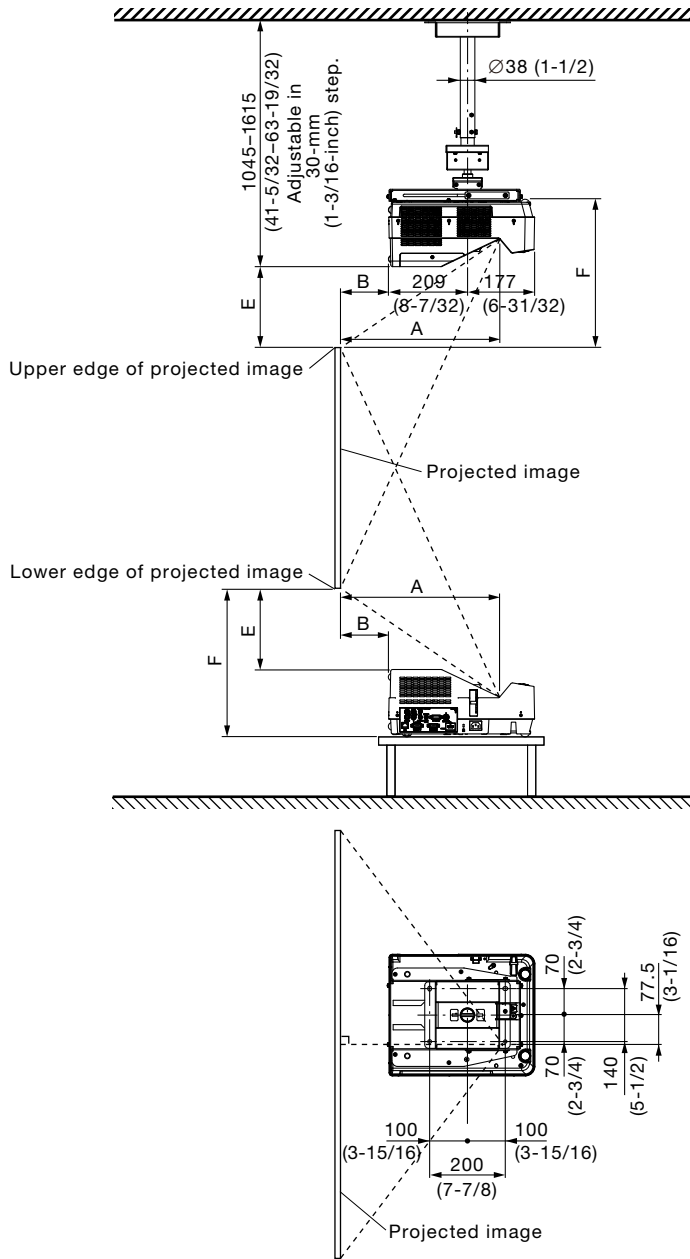
unit : mm (inch)
NOTE: This illustration is not drawn to scale.

Terminals



- 1 Video input
- 2 S-Video input
- 3 Audio input for video/S-Video
- 4 Audio input for computer 1
- 5 Audio input for computer 2
- 6 Audio output
- 7 Serial input
- 8 3D sync output
- 9 LAN connector
- 10 Computer 1 input
- 11 Computer 2 input / computer 1 output
- 12 HDMI input

Standard setting-up position



NOTE:

Illustrations show the projector installed using optional ceiling mount bracket ET-PKV100H and bracket assembly ET-PKC100B.

This illustration is not drawn to scale.

unit : mm (inch)

Projection distance for 16:10 aspect ratio screen

Unit: meters

Screen size (inch, diagonal)	A: Distance from the edge of the projection window to the screen	B: Distance from the projector front to the screen	E: Height from the edge of the screen to the top of the projector	F: Height from the edge of the screen to the bottom of the projector
60	0.23	-0.07	0.05	0.23
70	0.28	-0.02	0.07	0.25
80	0.32	0.02	0.09	0.27
90	0.37	0.07	0.11	0.29
100	0.41	0.11	0.13	0.31
110	0.46	0.16	0.15	0.33

Projection distance for 16:10 aspect ratio screen

Unit: feet

Screen size (inch, diagonal)	A: Distance from the edge of the projection window to the screen	B: Distance from the projector front to the screen	E: Height from the edge of the screen to the top of the projector	F: Height from the edge of the screen to the bottom of the projector
60	0.8	-0.2	0.2	0.8
70	0.9	-0.1	0.2	0.8
80	1.1	0.1	0.3	0.9
90	1.2	0.2	0.4	1.0
100	1.4	0.4	0.4	1.0
110	1.5	0.5	0.5	1.1

Projection distance for 16:9 aspect ratio screen

Unit: meters

Screen size (inch, diagonal)	A: Distance from the edge of the projection window to the screen	B: Distance from the projector front to the screen	E: Height from the edge of the screen to the top of the projector	F: Height from the edge of the screen to the bottom of the projector
60	0.24	-0.06	0.09	0.27
70	0.28	-0.01	0.12	0.30
80	0.33	0.03	0.15	0.33
90	0.38	0.08	0.18	0.35
100	0.42	0.13	0.20	0.38
105	0.45	0.15	0.22	0.39

Unit: feet

Screen size (inch, diagonal)	A: Distance from the edge of the projection window to the screen	B: Distance from the projector front to the screen	E: Height from the edge of the screen to the top of the projector	F: Height from the edge of the screen to the bottom of the projector
60	0.8	-0.2	0.3	0.9
70	0.9	0.0	0.4	1.0
80	1.1	0.1	0.5	1.1
90	1.2	0.3	0.6	1.1
100	1.4	0.4	0.7	1.2
105	1.5	0.5	0.7	1.3

Calculation of the projection distance

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

Aspect ratio 16:10

$$A (m) = (\text{diagonal screen size in inches}) \times 0.0044968 - 0.039967$$

Aspect ratio 16:9

$$A (m) = (\text{diagonal screen size in inches}) \times 0.0046218 - 0.039967$$

NOTE:

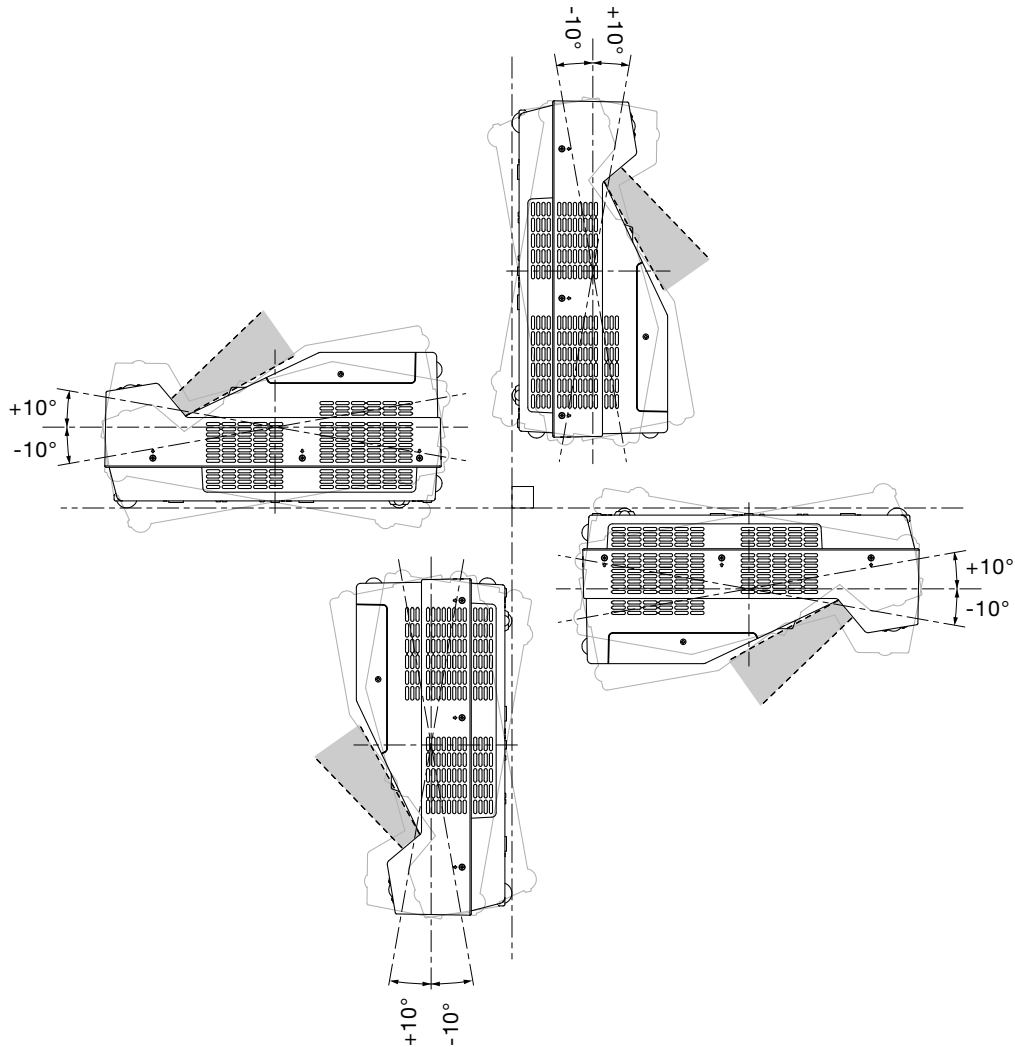
Distances calculated with the above equations will include a slight error.

Installable angle

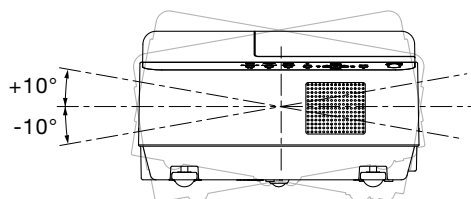
Install the projector at an angle within the range shown below.

• Vertical direction

The projector may be installed at a vertical angle shown here.

**• Horizontal direction**

The projector may be installed at a horizontal angle of $\pm 10^\circ$.



List of compatible signals

The signals that can be input to this projector are shown in the table below. Horizontal scanning frequencies of 15 kHz to 93 kHz, vertical scanning frequencies of 50 Hz to 120 Hz, and a dot clock of 150 MHz maximum can be input. (RGB signals exceeding the dot clock rate of 150MHz are downsampled.)

NOTE: The native resolution of this projector is 1,280 × 800 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		Dot clock frequency (MHz)	Format	3D-ready	
		H (kHz)	V (kHz)				
NTSC/NTSC4.43/PAL-M/PAL60	720 × 480i	15.7	59.9	–	VIDEO/S-VIDEO	Yes	
PAL/PAL-N/SECAM	720 × 576i	15.6	50.0	–			
525i (480i)	640 × 480i	15.7	59.9	12.3	YPbPr/RGB	No	
		15.7	59.9	–	HDMI	Yes	
		31.5	119.9	–			
625i (576i)	768 × 576i	15.6	50.0	14.8	YPbPr/RGB	No	
		15.6	50.0	–	HDMI	Yes	
		31.3	100.0	–			
525p (480p)	640 × 480	31.5	59.9	25.2	YPbPr/RGB	YPbPr only	
		31.5	59.9	27.0	HDMI	Yes	
		62.9	119.9	54.0			
625p (576p)	768 × 575	31.3	50.0	29.5	HDMI/YPbPr/RGB	HDMI/YPbPr only	
		62.5	100.0	54.0	HDMI	Yes	
720/60p	1280 × 720	45.0	60.0	74.3	HDMI/YPbPr/RGB	HDMI/YPbPr only	
		90.0	120.0	148.5	HDMI	Yes	
720/50p		37.5	50.0	74.3	HDMI/YPbPr/RGB	HDMI/YPbPr only	
		75.0	100.0	148.5	HDMI	Yes	
1080/60i	1920 × 1080i	33.8	60.0	74.3	HDMI/YPbPr/RGB	HDMI/YPbPr only	
		67.5	120.0	148.5	HDMI	Yes	
1080/50i		28.1	50.0	74.3	HDMI/YPbPr/RGB	HDMI/YPbPr only	
		56.3	100.0	74.3	HDMI	Yes	
		27.0	24.0	74.3	HDMI/YPbPr/RGB	No	
1080/24p	1920 × 1080	28.1	25.0	148.5			
1080/25p		33.8	30.0	148.5			
1080/30p		67.5	60.0	74.3			
1080/60p		56.3	50.0	148.5			
VGA	640 × 400	31.5	70.1	25.2	RGB		
		31.5	59.9	25.2	HDMI	Yes	
	640 × 480	31.5	59.9	25.2	RGB		
		37.5	75.0	31.5		No	
		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		Yes	
		34.5	55.4	36.4			
		35.2	56.3	36.0			
		37.9	60.3	40.0	HDMI/RGB		
		37.9	61.0	40.0	RGB		
		38.0	60.5	40.1			
		38.6	60.3	38.6			
		46.9	75.0	49.5		No	
		48.1	72.2	50.0			
		53.7	85.1	56.3			
		76.3	120.0	73.3	HDMI/RGB	Yes	
MAC16	832 × 624	49.7	74.6	57.3	RGB	No	

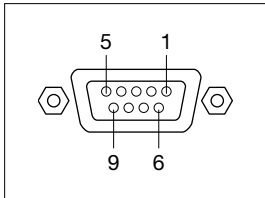
*1 The "i" appearing after the resolution indicates an interlaced signal.

Display mode	Display resolution (dots) ¹	Scanning frequency		Dot clock frequency (MHz)	Format	3D-ready
		H (kHz)	V (kHz)			
XGA	1024 × 768	43.4	60.0	65.0	HDMI	Yes
		44.0	54.6	59.1	RGB	
		46.9	58.2	63.0		
		47.0	58.3	61.7		
		48.4	60.0	65.0		
		48.5	60.0	65.2		
		No	56.5	70.1	75.0	
			58.0	72.0	74.7	
			60.0	75.0	78.8	
			60.3	74.9	79.3	
			61.0	75.7	81.0	
			62.0	77.1	84.4	
			63.5	79.4	83.4	
			68.7	85.0	94.5	
				97.6	120.0	115.5
MAC19		60.2	75.1	80.0	RGB	No
WXGA	1280 × 768	47.8	59.9	79.5	HDMI/RGB	Yes
		60.3	74.9	102.3		No
		68.6	84.8	117.5		
		97.4	119.8	140.3		Yes
	1280 × 800	41.2	50.0	68.6		
		49.6	60.1	79.4		
		49.7	59.8	83.5		
		101.6	119.9	140.3		
	1360 × 768	97.5	120.0	148.3		
	1376 × 768	48.4	60.0	86.7		
MAC21	1152 × 870	68.7	75.1	100.0	RGB	No
SXGA	1152 × 864	64.2	70.4	94.6		
		61.2	65.2	92.0		
		71.4	75.6	105.1		
	61.9	66.0	94.5			
		60.0	60.0	108.0		
	1280 × 960	60.0	60.0	108.0		
	1280 × 1024	60.3	58.1	93.1	HDMI	No
		62.5	58.6	108.0	RGB	Yes
		63.3	60.0	108.2		
		63.4	60.0	111.5		
		63.7	60.0	109.5		
		63.8	60.2	108.2		
		63.9	60.0	107.4		
64.0		60.0	108.0	HDMI/RGB		
71.7		67.2	117.0	RGB	No	
77.0		72.0	130.1			
80.0	75.0	135.0				
81.1	76.1	135.0				
91.1	85.0	157.5				
80.0	75.1	135.2				
MAC						
SXGA+	1400 × 1050	62.5	58.6	108.0	HDMI/RGB	Yes
		64.0	60.0	108.2	RGB	
		64.0	60.2	108.0		
		64.7	59.9	101.0	HDMI/RGB	RGB only
		65.1	59.9	122.4		Yes
		65.3	60.0	121.8		Yes
		65.4	60.1	122.9		RGB only
		WXGA+	1440 × 900	55.9	59.9	106.5
UXGA	1600 × 1200	75.0	60.0	162.0	RGB	No
		81.3	65.0	175.5		
		87.5	70.0	189.0		
		93.8	75.0	202.5		
		106.3	85.0	229.5		
WSXGA+	1680 × 1050	65.3	60.0	146.3	HDMI/RGB	
WUXGA	1920 × 1200	74.0	60.0	154.0	RGB	Yes
		74.6	59.9	193.3		No

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 (female)
Serial input

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

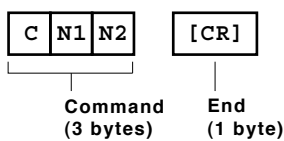
Communication conditions (factory setting)

Signal level	RS-232C-compliant
Synchronization method	Start-stop synchronization
Baud rate	19,200 bps
Parity	None
Character length	8 bits
Stop bit	1 bit
X parameter	None
S parameter	None

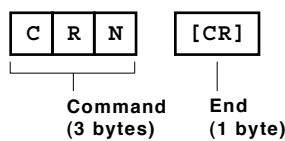
Basic format

Send transmissions from the computer in the following order: command, carriage return (CR).

• **Control command**



• **Status request command**



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			7
8			8
9	NC	NC	9

Control commands

Command: <Parameter>	Function
C00	Power on (standby mode on)
C01	Power off (standby mode off)
C04	Input signal selection: HDMI
C50	Computer 1 (RGB)
C50	Computer 1 (YPbPr/YCbCr)
C06	Computer 2
C07	Video
C34	S-Video
C09	Volume up
C0A	Volume down
C0D	AV mute on
C0E	AV mute off

Status request commands

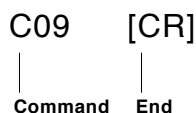
Command	Description	Callback <Parameter>
CR0	Standby power status	<power condition>
CR1	Input signal status	<input signal>
CR3	Lamp run time	<acctch>

Parameter format

Parameter format	Size (Byte)	Definition
<power condition>	2	80 = power off (standby mode off), 00 = power on (standby mode on)
<input signal>	1	3 = HDMI, 1 = computer 1, 2 = computer 2, 4 = video, 5 = S-Video
<acctch>	5	Decimal without signs: 00000–99999 hours

Command example

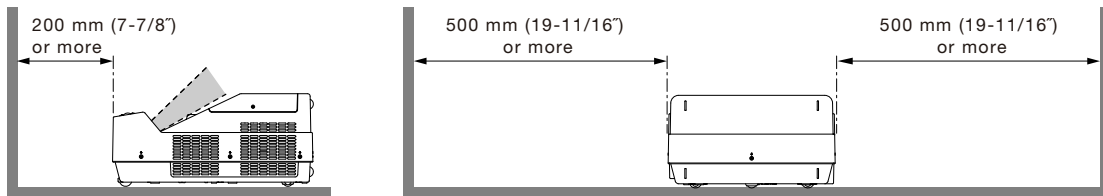
To set the volume to "up", send the command as shown below.



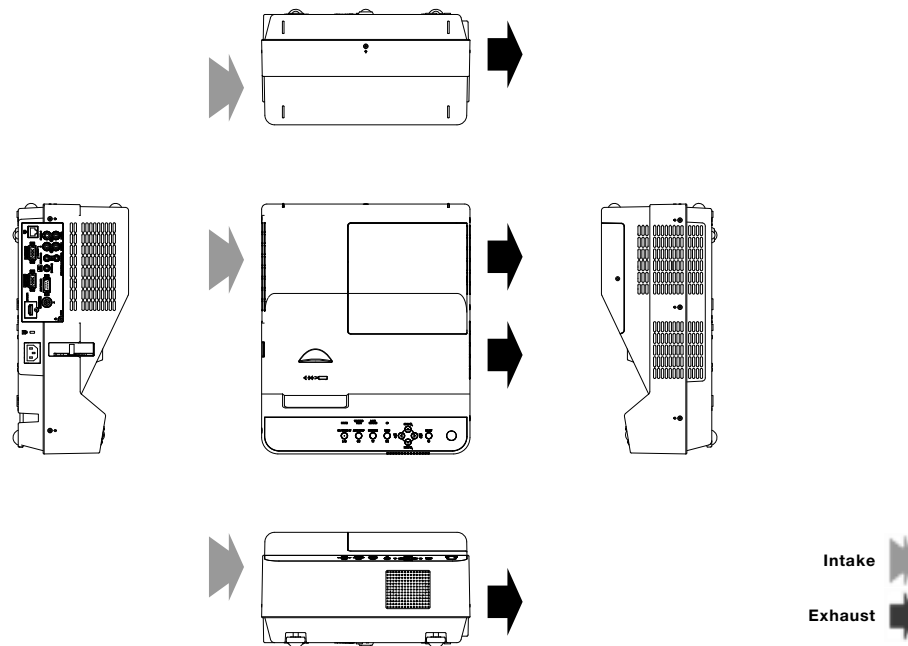
Notes on projector placement and operation

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, air 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.
5. When installing the projector by any method other than using the adjuster feet on a flat surface, use the five ceiling-mount holes (thread diameter: M4, projector inner thread length: 16 mm) to secure the projector.



Direction of air intake and exhaust



Operating the projector continuously

1. If the projector is to be operated continuously 22 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).

Weights and dimensions shown are approximate. Specifications and appearance are subject to change without notice.
Product availability differs depending on region and country. This product may be subject to export control regulations.

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