Panasonic

S P E C F I L E

Product Number : PT-**EZ770Z/EZ770ZL**

Product Name : LCD Projectors

SFL14M013-1

PT-**EZ770Z/EZ770ZL**

Specifications

Main unit

Power supply		100–240 V AC, 50/60 Hz
Power consumption		590 W (0.3 W with STANDBY MODE set to ECO*1, 10 W with STANDBY MODE set to NORMAL, 37 W with in STANDBY MODE of Audio Setting set to on.)
Optical system		Dichroic mirror separation/prism synthesis system
LCD panel	Panel size	19.0 mm (0.75 inches) diagonal (16:10 aspect ratio)
	Display method	Transparent LCD panel (× 3, R/G/B)
	Pixels	2,304,000 (1,920 × 1,200) × 3, total of 6,912,000 pixels
	Pixel configuration	Stripe
Lens		Powered zoom/focus lens (1.7–2.8:1), F 1.7–2.3, f 26.9–45.4 mm
		Optional powered zoom/focus lenses and fixed-focus lens
Lamp		400 W UHM lamp
Screen size		1.02–10.16 m (40–400 inches), 16:10 aspect ratio
Brightness*2		6,500 lumens (LAMP POWER: AUTO/NORMAL, Dynamic mode, Standard lens)
Center-to-corner uniformity*2		90%
Contrast*2		5,000:1 (full on / full off, LAMP POWER: AUTO, Iris on, Dynamic mode)
Resolution		1,920 × 1,200 pixels
Scanning frequency	DisplayPort/HDMI/DVI-D	fH: 15–100 kHz, fV: 24–120 Hz, dot clock: 25 MHz–162 MHz (VGA: 640 × 480 pixels to WUXGA: 1,920 × 1,200 pixels, VESA CVT-RB compliant, compatible with HDCP)
	RGB	fH: 15–100 kHz, fv: 24–120 Hz, dot clock: up to 162 MHz
	YPBPR (YCBCR)	480i (525i): fH 15.73 kHz; fv 59.94 Hz,
		576i (625i): fH 15.63 kHz; fv 60 Hz,
		480p (525p): fH 31.47 kHz; fv 59.94 Hz,
		576p (625p): fH 31.25 kHz; fv 50 Hz,
		720 (750)/60p: fH 45.00 kHz; fv 60 Hz,
		720 (750)/50p: fH 37.50 kHz; fv 50 Hz,
		1080 (1125)/60i: fH 33.75 kHz; fv 60 Hz,
		1080 (1125)/50i: fH 28.13 kHz; fv 50 Hz,
		1080 (1125)/25p: fH 28.13 kHz; fv 25 Hz,
		1080 (1125)/24p: fH 27.00 kHz; fv 24 Hz,
		1080 (1125)/24sF: fH 27.00 kHz; fv 48 Hz,
		1080 (1125)/30p: fH 33.75 kHz; fv 30 Hz,
		1080 (1125)/60p: fH 67.50 kHz; fv 60 Hz,
		1080 (1125)/50p: fH 56.25 kHz; fv 50 Hz
	Video/YC	fH: 15.73 kHz, fv: 59.94 Hz [NTSC/NTSC4.43/PAL-M/PAL60]
		fH: 15.63 kHz, fv: 50 Hz [PAL/PAL-N/SECAM]
Optical axis shift		Vertical: ±60% (powered), horizontal: ±10% (powered)
		NOTE: Optical axis shift function cannot be operated when used with the ET-ELW21.
Keystone correction range		Vertical: ±40° (with vertical correction only)
		Horizontal: ±30° (with horizontal correction only)
Installation		Ceiling/floor, front/rear
Built-in speaker	Size	3.7 cm (1-15/32 inches) (round) × 1
	Output power	10 W (monaural)

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Terminals	DisplayPort IN	DP-20P × 1, HDCP compatible
		480p(525p), 576p(625p), 720(750)/60p, 720(750)50p, 1080(1125)/60i, 1080(1125)/50i, 1080(1125)/25p, 1080(1125)/24p, 1080(1125)/24sF, 1080(1125)/30p, 1080(1125)/60p, 1080(1125)/50p
		VGA (640 × 400) – WUXGA[*4] (1,920 × 1,200)
		Audio signal: linear PCM (sampling frequencies: 48 kHz, 44.1 kHz, 32 kHz)
	HDMI IN	HDMI 19-pin × 1, Deep Color, HDCP compatible
		480i(525i)[*3], 576i(625i)[*3], 480p(525p), 576p(625p), 720(750)/60p, 720(750)50p, 1080(1125)/60i, 1080(1125)/50i, 1080(1125)/25p, 1080(1125)/24p, 1080(1125)/24sF, 1080(1125)/30p, 1080(1125)/60p, 1080(1125)/50p
		VGA (640 × 400) – WUXGA[*4] (1,920 × 1,200)
		Audio signal: linear PCM (sampling frequencies: 48 kHz, 44.1 kHz, 32 kHz)
	DVI-D IN	DVI-D 24-pin × 1, DVI 1.0 compliant, compatible with HDCP, compatible with single link only
		480i(525i)[*3], 576i(625i)[*3], 480p(525p), 576p(625p), 720(750)/60p, 720(750)50p, 1080(1125)/60i, 1080(1125)/50i, 1080(1125)/25p, 1080(1125)/24p, 1080(1125)/24sF, 1080(1125)/30p, 1080(1125)/60p, 1080(1125)/50p
		VGA (640 × 400) – WUXGA[*4] (1,920 × 1,200)
	RGB1 IN	D-sub HD 15-pin (female) × 1
	R, G, B	R: 0.7 Vp-p, 75 ohms;
		G: 0.7 Vp-p (1.0 Vp-p for sync on G), 75 ohms;
		B: 0.7 Vp-p, 75 ohms;
		HD/VD, SYNC: high impedance, TTL (positive/negative)
	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
		NOTE: SYNC/HD and VD terminals do not accept tri-level sync signals.
	RGB2 IN	BNC × 5 (RGB/YP_BP_R/YC_BC_R × 1)
	R, G, B	R: 0.7 Vp-p, 75 ohms;
		G: 0.7 Vp-p (1.0 Vp-p for sync on G), 75 ohms;
		B: 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
	S-Video IN	Y: 1.0 Vp-p; C: 0.286 Vp-p, 75 ohms
	VIDEO IN	PIN Jack × 1, 1.0 Vp-p, 75 ohms
	MONITOR OUT	D-sub HD 15-pin (female) × 1
		R: 0.7 Vp-p, 75 ohms;
		G: 0.7 Vp-p (1.0 Vp-p for sync on G), 75 ohms;
		B: 0.7 Vp-p, 75 ohms;
		HD/VD, SYNC: high impedance, TTL (positive/negative)
	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
	AUDIO IN	M3 (L, R) × 1, 0.5 Vrms, input impedance: 22 kilohms or more
		M3 (L, R) × 1, 0.5 Vrms, input impedance: 22 kilohms or more
		PIN Jack (L, R) × 2, 0.5 Vrms, input impedance: 22 kilohms or more
	VARIABLE 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)
	REMOTE 1 IN	M3 jack × 1 for wired remote control
	REMOTE 2 IN	D-sub 9-pin (female) × 1, for external control (parallel)
	LAN/DIGITAL LINK	RJ-45 × 1 for network and DIGITAL LINK (video/network/serial control) connection, 100Base-TX, compliant with PJLink™ (class 1), Deep Color, compatible with HDCP,
		480i(525i)[*3], 576i(625i)[*3], 480p(525p), 576p(625p), 720(750)/60p, 720(750)50p, 1080(1125)/60i, 1080(1125)/50i, 1080(1125)/25p, 1080(1125)/24p, 1080(1125)/24sF, 1080(1125)/30p, 1080(1125)/60p, 1080(1125)/50p
		VGA (640 × 400) – WUXGA[*4] (1,920 × 1,200), dot clock: 25 MHz – 162 MHz
		NOTE: Compatible with non-interlaced signals only.

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PT-**EZ770Z/EZ770ZL**

Power cord length		3.0 m (9 ft 10 in)
Cabinet materials		Molded plastic
Dimensions (W × H × D)	PT-EZ770Z	530 × 177*5 × 445 mm
		(20-7/8 × 6-31/32*5 × 17-17/32 inches) (with supplied lens)
	PT-EZ770ZL	530 × 177*5 × 385 mm
		(20-7/8 × 6-31/32 *5 × 15-5/32 inches) (without lens)
Weight*6	PT-EZ770Z	Approx. 10.6 kg (23.4 lbs) (with supplied lens)
	PT-EZ770ZL	Approx. 9.8 kg (21.6 lbs) (without lens)
Operation noise*2		37 dB (LAMP POWER: NORMAL), 31 dB (LAMP POWER: ECO 1),
		29 dB (LAMP POWER: ECO 2)
Operating temperature		0–45 °C*7 (32–113 °F)*7
Operating humidity		10%–80% (no condensation)

Remote control unit

Power supply	3 V DC (R03/LR03/AAA type battery × 2)
Operation range*8	Approx. 30 m (98 ft 5 in) when operated from directly in front of the signal receptor
Dimensions (W × H × D)	48 × 145 × 27 mm (1-7/8 × 5-23/32 × 1-1/16 inches)
Weight	Approx. 102 g (3.6 oz) (including batteries)

Supplied accessories

Power cord (including power cord holder) (× 1)
Wireless/wireled remote control unit (× 1)
Batteries for remote control (AAA/R03/LR03 type × 2)
Software CD-ROM (Logo Transfer Software, Multi Projector Monitoring
   & Control Software) (× 1)

Optional accessories

Fixed-focus lens (0.8:1)	ET-ELW21
Short throw zoom lens (0.78-0.98:1 WUXGA / 0.78-0.98:1 WXGA / 0.8-1.0:1 XGA)	ET-ELW22
Zoom lens (1.3–1.7:1)	ET-ELW20
Zoom lens (2.8–4.6:1)	ET-ELT20/ET-ELT22
Zoom lens (4.6–7.2:1)	ET-ELT21/ET-ELT23
Ceiling mount bracket	ET-PKD120H (for high ceilings)
	ET-PKD120S (for low ceilings)
Bracket assembly	ET-PKE300B (for ET-PKD120H/PKD120S)
	ET-PKE200B*9
Replacement lamp unit	ET-LAE300
Replacement filter unit	ET-RFE300

Weights and dimensions shown are approximate. Specifications and appearance are 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, and the serial output termi-nal cannot be used. 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 Only compatible with dot clock frequency of 27 MHz (pixel repetition signal)
*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 Average value. May differ depending on models.
*7 The operating temperature range is 0 °C to 40 °C (32 °F to 104 °F) when used at altitudes between 1,400 m and 2,700 m (4,593 ft to 8,858 ft) above sea level. When operating temperature exceeds 40 °C (35 °C at high altitude), lamp power may automatically switch to ECO 2 in order to protect the projector.
*8 Operation range differs depending on environments.
*9 If the ceiling mount bracket of the ET-PKE200H or ET-PKE200S has already been installed, use the projector attachment for the ET-PKE200B.

PT-**EZ770Z/EZ770ZL**

Dimensions
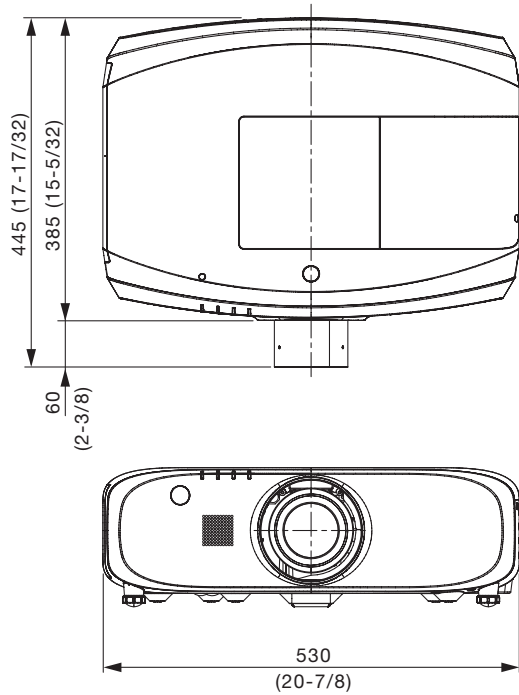
unit : mm (inch)
NOTE: This illustration is not drawn to scale.
The illustration shows the PT-EZ770Z.

445 (17-17/32)
385 (15-5/32)
60
(2-3/8)
530
(20-7/8)
177 (6-31/32)
160 (6-5/16)
80
(3-5/32)
17
(21/32)
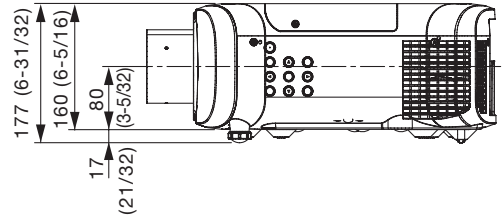
Terminals
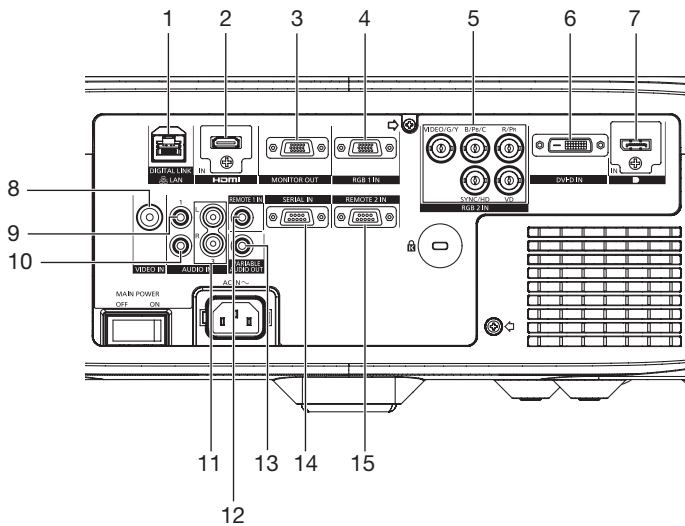
1	LAN/DIGITAL LINK connector
2	HDMI input
3	MONITOR output
4	RGB1 input
5	RGB2 input
6	BVI-D input
7	Display Port input
8	Video input
9	Audio 1 input
10	Audio 2 input
11	Audio 3 input
12	Remote 1 input
13	Audio output
14	Serial input
15	Remote 2 input

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Standard setting-up position

Upper edge of projected image

Projected image

Lower edge of projected image

ø60.5
(2-3/8)

$352–432^{*2}$
$(13-27/32–17)^{*2}$

$443–523^{*2}$
$(17-7/16–20-19/32)^{*2}$

H

L

A^{*1}

190
(7-15/32)

195
(7-11/16)

L

H

Projected image

L

100
(3-15/16)

200
(7-7/8)

100
(3-15/16)

100
(3-15/16)

200
(7-7/8)

100
(3-15/16)
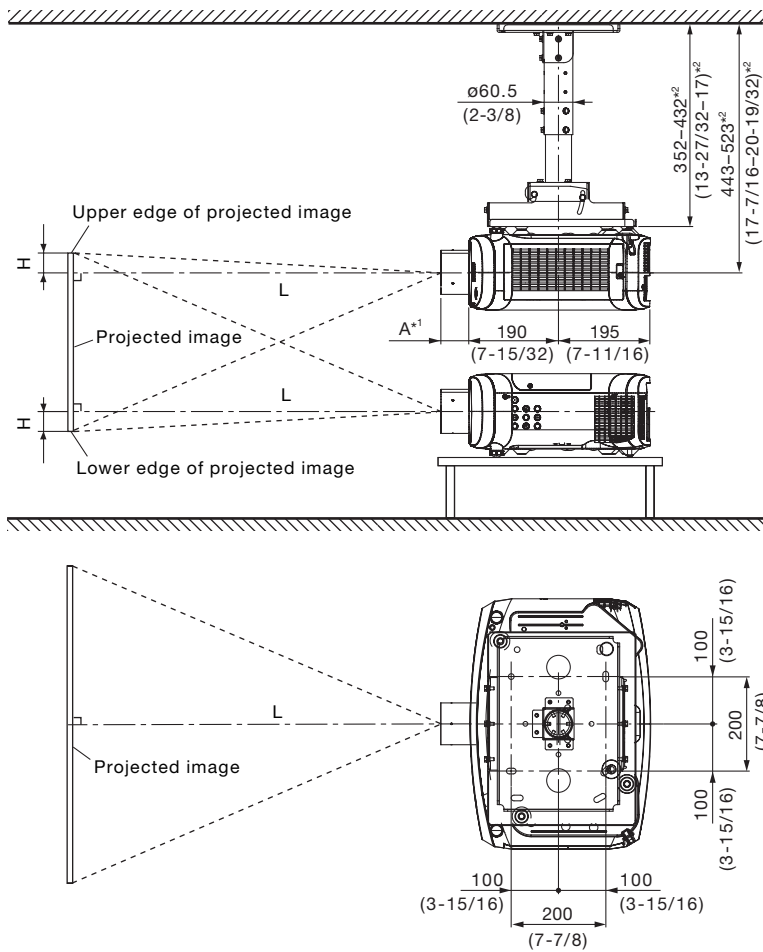
*1 When the lens protrudes to the maximum.
A: 50 mm (1-31/32 in) with the ET-ELW21
95 mm (3-3/4 in) with the ET-ELW22
79.5 mm (3-1/8 in) with the ET-ELW20
60 mm (2-3/8 in) with the supplied lens
84 mm (3-5/16 in) with the ET-ELT20/ELT22
80 mm (3-5/32 in) with the ET-ELT21/ELT23

*2 Adjustable in 40 mm (1-9/16 in) steps.

NOTE:

**Illustrations show the projector
installed using optional ceiling mount
bracket ET-PKD120H and bracket assembly
ET-PKE300B.**

This illustration is not drawn to scale.

unit : mm (inch)

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 drop-
ping, attach the wire between the mounting bracket and the ceiling.

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Projection distance for 16:10 aspect ratio screen

Unit: meters

Screen size (diagonal)		Distance to screen (L)											Height from the edge of screen to center of lens (H)		
		Fixed-focus	Zoom												
		ET-ELW21 Fixed-focus lens	ET-ELW22 Zoom lens		ET-ELW20 Zoom lens		Supplied lens		ET-ELT20/ELT22 Zoom lens		ET-ELT21/ELT23 Zoom lens		Fixed-focus lens ET-ELW21	Zoom lenses ET-ELW22	Zoom lenses
[m]	[in]		min.	max.	min.	max.	min.	max.	min.	max	min.	max.			
1.02 / 40		0.63	–	–	1.02	1.41	1.36	2.35	2.29	3.81	3.72	6.03	0.27	–	-0.05 – 0.59
1.27 / 50		0.80	–	–	1.29	1.77	1.71	2.95	2.89	4.79	4.70	7.59	0.34	–	-0.07 – 0.74
1.52 / 60		0.97	1.00	1.26	1.55	2.14	2.06	3.55	3.49	5.77	5.68	9.15	0.40	0 – 0.81	-0.08 – 0.89
1.78 / 70		1.15	1.18	1.48	1.82	2.50	2.42	4.16	4.09	6.75	6.66	10.71	0.47	0 – 0.94	-0.09 – 1.04
2.03 / 80		1.32	1.35	1.69	2.09	2.87	2.77	4.76	4.69	7.73	7.65	12.27	0.54	0 – 1.08	-0.11 – 1.19
2.29 / 90		1.49	1.53	1.91	2.36	3.23	3.12	5.36	5.30	8.71	8.63	13.83	0.61	0 – 1.21	-0.12 – 1.33
2.54 / 100		1.66	1.71	2.13	2.63	3.60	3.48	5.96	5.90	9.69	9.61	15.39	0.67	0 – 1.35	-0.14 – 1.48
3.05 / 120		2.00	2.06	2.56	3.16	4.33	4.18	7.16	7.10	11.65	11.57	18.51	0.81	0 – 1.62	-0.16 – 1.78
3.81 / 150		2.52	2.58	3.22	3.97	5.42	5.24	8.96	8.90	14.59	14.52	23.19	1.01	0 – 2.02	-0.20 – 2.22
5.08 / 200		3.38	3.46	4.30	5.31	7.25	7.01	11.96	11.91	19.49	19.43	30.99	1.35	0 – 2.69	-0.27 – 2.96
6.35 / 250		4.24	4.34	5.39	6.65	9.07	8.77	14.96	14.91	24.39	24.34	38.79	1.68	0 – 3.37	-0.34 – 3.70
7.62 / 300		5.10	5.21	6.48	7.99	10.90	10.54	17.97	17.92	29.29	29.25	46.59	2.02	0 – 4.04	-0.40 – 4.44
8.89 / 350		5.95	6.09	7.56	9.33	12.73	12.30	20.97	20.92	34.19	34.16	54.39	2.36	0 – 4.71	-0.47 – 5.18
10.16 / 400		6.81	6.97	8.65	10.67	14.55	14.07	23.97	23.93	39.09	39.07	62.19	2.69	0 – 5.39	-0.54 – 5.92

Unit: feet

Screen size (diagonal)		Distance to screen (L)											Height from the edge of screen to center of lens (H)		
		Fixed-focus	Zoom												
		ET-ELW21 Fixed-focus lens	ET-ELW22 Zoom lens		ET-ELW20 Zoom lens		Supplied lens		ET-ELT20/ELT22 Zoom lens		ET-ELT21/ELT23 Zoom lens		Fixed-focus lens ET-ELW21	Zoom lenses ET-ELW22	Zoom lenses
[m]	[in]		min.	max.	min.	max.	min.	max.	min.	max	min.	max.			
1.02 / 40		2.1	–	–	3.3	4.6	4.5	7.7	7.5	12.5	12.2	19.8	0.9	–	-0.2 – 1.9
1.27 / 50		2.6	–	–	4.2	5.8	5.6	9.7	9.5	15.7	15.4	24.9	1.1	–	-0.2 – 2.4
1.52 / 60		3.2	3.3	4.1	5.1	7.0	6.8	11.7	11.5	18.9	18.6	30.0	1.3	0 – 2.7	-0.3 – 2.9
1.78 / 70		3.8	3.9	4.8	6.0	8.2	7.9	13.6	13.4	22.1	21.9	35.1	1.6	0 – 3.1	-0.3 – 3.4
2.03 / 80		4.3	4.4	5.6	6.9	9.4	9.1	15.6	15.4	25.4	25.1	40.3	1.8	0 – 3.5	-0.4 – 3.9
2.29 / 90		4.9	5.0	6.3	7.7	10.6	10.2	17.6	17.4	28.6	28.3	45.4	2.0	0 – 4.0	-0.4 – 4.4
2.54 / 100		5.4	5.6	7.0	8.6	11.8	11.4	19.5	19.3	31.8	31.5	50.5	2.2	0 – 4.4	-0.4 – 4.9
3.05 / 120		6.6	6.7	8.4	10.4	14.2	13.7	23.5	23.3	38.2	38.0	60.7	2.7	0 – 5.3	-0.5 – 5.8
3.81 / 150		8.3	8.5	10.5	13.0	17.8	17.2	29.4	29.2	47.9	47.6	76.1	3.3	0 – 6.6	-0.7 – 7.3
5.08 / 200		11.1	11.3	14.1	17.4	23.8	23.0	39.2	39.1	63.9	63.8	101.7	4.4	0 – 8.8	-0.9 – 9.7
6.35 / 250		13.9	14.2	17.7	21.8	29.8	28.8	49.1	48.9	80.0	79.9	127.3	5.5	0 – 11.0	-1.1 – 12.2
7.62 / 300		16.7	17.1	21.2	26.2	35.8	34.6	58.9	58.8	96.1	96.0	152.8	6.6	0 – 13.3	-1.3 – 14.6
8.89 / 350		19.5	20.0	24.8	30.6	41.8	40.4	68.8	68.6	112.2	112.1	178.4	7.7	0 – 15.5	-1.5 – 17.0
10.16 / 400		22.4	22.9	28.4	35.0	47.7	46.2	78.6	78.5	128.2	128.2	204.0	8.8	0 – 17.7	-1.8 – 19.4

- The value for L (distance to screen) varies slightly within ±5% depending on the zoom lens characteristics.
- The zoom lens characteristics may cause slight image distortion.
- When vertical keystone correction is used, the image is corrected in the direction that reduces its projected size.
- The brightness varies depending on the zoom setting.

Note: When the fixed-focus lens ET-ELW21 is mounted, the optical lens shift function cannot be used.

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Projection distance for 16:9 aspect ratio screen

Unit: meters

Screen size (diagonal)		Distance to screen (L)											Height from the edge of screen to center of lens (H)		
		Fixed-focus	Zoom										Fixed-focus lens ET-ELW21	Zoom lenses ET-ELW22	Zoom lenses
		ET-ELW21 Fixed-focus lens	ET-ELW22 Zoom lens		ET-ELW20 Zoom lens		Supplied lens		ET-ELT20/ELT22 Zoom lens		ET-ELT21/ELT23 Zoom lens				
[m]	[in]		min.	max.	min.	max.	min.	max.	min.	max	min.	max.			
1.02 / 40		0.65	–	–	1.05	1.45	1.40	2.42	2.36	3.92	3.83	6.20	0.25	–	-0.05 – 0.55
1.27 / 50		0.83	–	–	1.32	1.82	1.76	3.04	2.98	4.92	4.84	7.81	0.31	–	-0.06 – 0.69
1.52 / 60		1.00	1.03	1.30	1.60	2.20	2.12	3.66	3.59	5.93	5.84	9.41	0.37	-0.04 – 0.79	-0.08 – 0.82
1.78 / 70		1.18	1.21	1.52	1.87	2.57	2.49	4.27	4.21	6.94	6.85	11.01	0.44	-0.05 – 0.92	-0.09 – 0.96
2.03 / 80		1.36	1.39	1.74	2.15	2.95	2.85	4.89	4.83	7.95	7.86	12.62	0.50	-0.06 – 1.05	-0.10 – 1.10
2.29 / 90		1.53	1.57	1.97	2.43	3.32	3.21	5.51	5.45	8.95	8.87	14.22	0.56	-0.06 – 1.18	-0.11 – 1.23
2.54 / 100		1.71	1.75	2.19	2.70	3.70	3.57	6.12	6.06	9.96	9.88	15.82	0.62	-0.07 – 0.13	-0.13 – 1.37
3.05 / 120		2.06	2.11	2.64	3.25	4.45	4.30	7.36	7.30	11.97	11.90	19.03	0.75	-0.08 – 1.58	-0.15 – 1.64
3.81 / 150		2.59	2.66	3.31	4.08	5.58	5.39	9.21	9.15	15.00	14.93	23.84	0.93	-0.10 – 1.97	-0.19 – 2.06
5.08 / 200		3.47	3.56	4.42	5.46	7.45	7.20	12.30	12.24	20.03	19.98	31.86	1.25	-0.14 – 2.63	-0.25 – 2.74
6.35 / 250		4.36	4.46	5.54	6.84	9.33	9.02	15.38	15.33	25.07	25.02	39.87	1.56	-0.17 – 3.29	-0.31 – 3.42
7.62 / 300		5.24	5.36	6.66	8.21	11.20	10.83	18.47	18.42	30.11	30.07	47.89	1.87	-0.21 – 3.94	-0.37 – 4.11
8.89 / 350		6.12	6.26	7.77	9.59	13.08	12.65	21.55	21.51	35.14	35.12	55.91	2.18	-0.24 – 4.60	-0.44 – 4.79
10.16 / 400		7.00	7.16	8.89	10.97	14.96	14.46	24.64	24.60	40.18	40.17	63.92	2.49	-0.28 – 5.26	-0.50 – 5.48

Unit: feet

Screen size (diagonal)		Distance to screen (L)											Height from the edge of screen to center of lens (H)		
		Fixed-focus	Zoom										Fixed-focus lens ET-ELW21	Zoom lenses ET-ELW22	Zoom lenses
		ET-ELW21 Fixed-focus lens	ET-ELW22 Zoom lens		ET-ELW20 Zoom lens		Supplied lens		ET-ELT20/ELT22 Zoom lens		ET-ELT21/ELT23 Zoom lens				
[m]	[in]		min.	max.	min.	max.	min.	max.	min.	max	min.	max.			
1.02 / 40		2.1	–	–	3.4	4.8	4.6	7.9	7.7	12.8	12.6	20.4	0.8	–	-0.2 – 1.8
1.27 / 50		2.7	–	–	4.3	6.0	5.8	10.0	9.8	16.2	15.9	25.6	1.0	–	-0.2 – 2.3
1.52 / 60		3.3	3.4	4.2	5.2	7.2	7.0	12.0	11.8	19.5	19.2	30.9	1.2	-0.1 – 2.6	-0.3 – 2.7
1.78 / 70		3.9	4.0	5.0	6.1	8.4	8.2	14.0	13.8	22.8	22.5	36.1	1.4	-0.2 – 3.0	-0.3 – 3.2
2.03 / 80		4.4	4.6	5.7	7.1	9.7	9.3	16.0	15.8	26.1	25.8	41.4	1.6	-0.2 – 3.4	-0.3 – 3.6
2.29 / 90		5.0	5.2	6.4	8.0	10.9	10.5	18.1	17.9	29.4	29.1	46.7	1.8	-0.2 – 3.9	-0.4 – 4.1
2.54 / 100		5.6	5.8	7.2	8.9	12.1	11.7	20.1	19.9	32.7	32.4	51.9	2.0	-0.2 – 0.4	-0.4 – 4.5
3.05 / 120		6.8	6.9	8.6	10.7	14.6	14.1	24.1	23.9	39.3	39.0	62.4	2.5	-0.3 – 5.2	-0.5 – 5.4
3.81 / 150		8.5	8.7	10.8	13.4	18.3	17.7	30.2	30.0	49.2	49.0	78.2	3.1	-0.3 – 6.5	-0.6 – 6.7
5.08 / 200		11.4	11.7	14.5	17.9	24.4	23.6	40.3	40.2	65.7	65.5	104.5	4.1	-0.5 – 8.6	-0.8 – 9.0
6.35 / 250		14.3	14.6	18.2	22.4	30.6	29.6	50.5	50.3	82.2	82.1	130.8	5.1	-0.6 – 10.8	-1.0 – 11.2
7.62 / 300		17.2	17.6	21.8	26.9	36.8	35.5	60.6	60.4	98.8	98.7	157.1	6.1	-0.7 – 12.9	-1.2 – 13.5
8.89 / 350		20.1	20.5	25.5	31.5	42.9	41.5	70.7	70.6	115.3	115.2	183.4	7.1	-0.8 – 15.1	-1.4 – 15.7
10.16 / 400		23.0	23.5	29.2	36.0	49.1	47.4	80.8	80.7	131.8	131.8	209.7	8.2	-0.9 – 17.2	-1.6 – 18.0

- The value for L (distance to screen) varies slightly within ±5% depending on the zoom lens characteristics.
- The zoom lens characteristics may cause slight image distortion.
- When vertical keystone correction is used, the image is corrected in the direction that reduces its projected size.
- The brightness varies depending on the zoom setting.

Note: When the fixed-focus lens ET-ELW21 is mounted, the optical lens shift function cannot be used.

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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

| ET-ELW21	(fixed focus)	L (m) = (diagonal screen size in inches) × 0.017178 - 0.057678
ET-ELW22	minimum	L (m) = (diagonal screen size in inches) × 0.017536 - 0.048460
	maximum	L (m) = (diagonal screen size in inches) × 0.021737 - 0.045477
ET-ELW20	minimum	L (m) = (diagonal screen size in inches) × 0.026816 - 0.055497
	maximum	L (m) = (diagonal screen size in inches) × 0.036511 - 0.053400
Supplied lens	*minimum*	*L (m) = (diagonal screen size in inches) × 0.035305 - 0.054882*
	maximum	*L (m) = (diagonal screen size in inches) × 0.060045 - 0.048228*
ET-ELT20/ELT22	minimum	L (m) = (diagonal screen size in inches) × 0.060102 - 0.114022
	maximum	L (m) = (diagonal screen size in inches) × 0.098001 - 0.112874
ET-ELT21/ELT23	minimum	L (m) = (diagonal screen size in inches) × 0.098214 - 0.212284
	maximum	L (m) = (diagonal screen size in inches) × 0.155996 - 0.210772

Aspect ratio 16:9

ET-ELW21	(fixed focus)	L (m) = (diagonal screen size in inches) × 0.017656 - 0.057678
ET-ELW22	minimum	L (m) = (diagonal screen size in inches) × 0.018024 - 0.048460
	maximum	L (m) = (diagonal screen size in inches) × 0.022341 - 0.045477
ET-ELW20	minimum	L (m) = (diagonal screen size in inches) × 0.027561 - 0.055497
	maximum	L (m) = (diagonal screen size in inches) × 0.037526 - 0.053400
Supplied lens	*minimum*	*L (m) = (diagonal screen size in inches) × 0.036286 - 0.054882*
	maximum	*L (m) = (diagonal screen size in inches) × 0.061714 - 0.048228*
ET-ELT20/ELT22	minimum	L (m) = (diagonal screen size in inches) × 0.061773 - 0.114022
	maximum	L (m) = (diagonal screen size in inches) × 0.100725 - 0.112874
ET-ELT21/ELT23	minimum	L (m) = (diagonal screen size in inches) × 0.100944 - 0.212284
	maximum	L (m) = (diagonal screen size in inches) × 0.160333 - 0.210772

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

Shift range

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

H
(Width of projected image)

0.1H   0.1H

0.6V

V
(Height of projected image)

0.6V

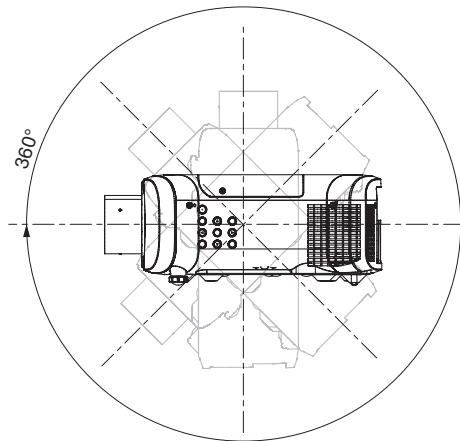Standard postition of projected image
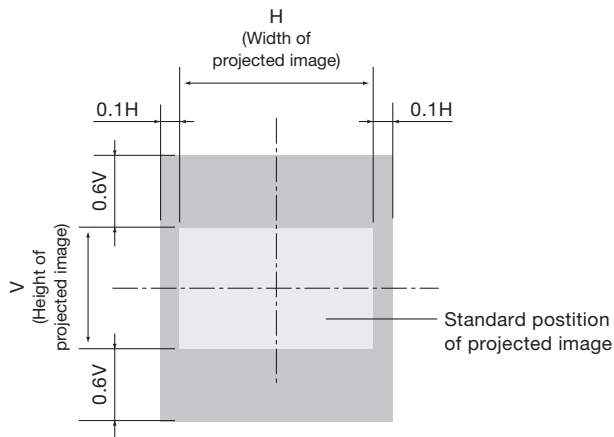
- **The ET-ELW21 is a fixed short-focus lens. Therefore, the lens shift function provided in the main unit cannot be used.**

Installable angle

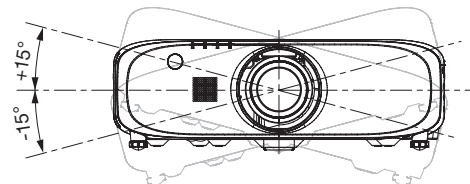Install the projector at an angle within the range shown below.

• Vertical direction	**• Horizontal direction**
The projector may be installed at a vertical angle of 360°.	The projector may be installed at a horizontal angle of ±15°.

360°

+15°
–15°

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 100 kHz, vertical scanning frequencies of 24 Hz to 120 Hz, and a dot clock of 162 MHz maximum can be input.

NOTE: The native resolution of this projector is 1,920 × 1,200 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	13.5	YCBCR/RGB
625i (576i)	768 × 576i	15.6	50.0	13.5	
525i (480i)	720(1440) × 480i*2	15.7	59.9	27.0	HDMI/DVI-D
625i (576i)	720(1440) × 576i*2	15.6	50.0	27.0	
525p (480p)	720 × 480i	31.5	60.0	27.0	DisplayPort/HDMI/
625p (576p)	720 × 576i	31.3	50.0	27.0	DVI-D/YPBPR/RGB
750 (720)/60p	1280 × 720	45.0	60.0	74.3	
750 (720)/50p		37.5	50.0	74.3	
1125 (1080)/60i*3	1920 × 1080i	33.8	60.0	74.3	
1125 (1080)/50i		28.1	50.0	74.3	
1125 (1080)/25p	1920 × 1080	28.1	25.0	74.3	
1125 (1080)/24p		27.0	24.0	74.3	
1125 (1080)/24sF		27.0	48.0	74.3	
1125 (1080)/30p		33.8	30.0	74.3	
1125 (1080)/60p		67.5	60.0	148.5	
1125 (1080)/50p		56.3	50.0	148.5	
VESA400	640 × 400	37.9	85.1	31.5	DisplayPort/HDMI/
VGA	640 × 400	31.5	70.1	25.2	DVI-D/RGB
	640 × 480	31.5	59.9	25.2	
		35.0	66.7	30.2	
		37.5	75.0	31.5	
		37.9	72.8	31.5	
		43.3	85.0	36.0	
SVGA	800 × 600	35.2	56.3	36.0	
		37.9	60.3	40.0	
		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	39.6	50.0	51.9	
		48.4	60.0	65.0	
		56.5	70.1	75.0	
		60.0	75.0	78.8	
		65.5	81.6	86.0	
		68.7	85.0	94.5	
		81.4	100.0	113.3	
		98.8	120.0	139.1	
MXGA	1152 × 864	53.7	60.0	81.6	
		64.0	70.0	94.2	
		67.5	74.9	108.0	
		77.1	85.0	119.7	
MAC21	1152 × 870	68.7	75.1	100.0	

*1 The "i" appearing after the resolution indicates an interlaced signal.
*2 Only compatible with dot clock frequency of 27 MHz (pixel repetition signal)
*3 Compliant with VESA CVT-RB (Coordinated Video Timing-Reduced Blanking).

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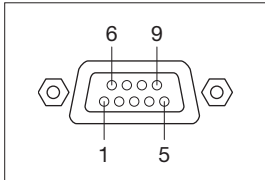| Display mode	Display resolution (dots)*1	Scanning frequency H (kHz)	V (kHz)	Dot clock frequency (MHz)	Format
1280 × 720	1280 × 720	37.1	49.8	60.5	DisplayPort/HDMI/ DVI-D/RGB
		44.8	59.9	74.5	
		76.3	100.0	131.8	
		92.6	120.0	161.6	
1280 × 768	1280 × 768	39.6	49.9	65.3	
	1280 × 768*2	47.4	60.0	68.3	
	1280 × 768	47.8	59.9	79.5	
		60.3	74.9	102.3	
		68.6	84.8	117.5	
1280 × 800	1280 × 800	41.3	50.0	68.6	
	1280 × 800*2	49.3	59.9	71.0	
	1280 × 800	49.7	59.8	83.5	
		62.8	74.9	106.5	
		71.6	84.9	122.5	
MSXGA	1280 × 960	60.0	60.0	108.0	
SXGA	1280 × 1024	52.4	50.0	88.0	
		64.0	60.0	108.0	
		72.3	66.3	125.0	
		78.2	72.0	135.1	
		80.0	75.0	135.0	
		91.1	85.0	157.5	
1366×768	1366 × 768	39.6	49.9	69.0	
		47.7	59.8	85.5	
SXGA+	1400 × 1050	54.1	50.0	99.9	
		64.0	60.0	108.2	
		65.2	60.0	122.6	
		65.3	60.0	121.8	
		78.8	72.0	149.3	
		82.2	75.0	155.9	
WXGA+	1440 × 900	55.9	59.9	106.5	
1600×900		46.3	50.0	97.0	
		55.9	60.0	119.0	
UXGA60	1600 × 1200	75.0	60.0	162.0	
WSXGA+	1680 × 1050	54.1	50.0	119.5	
		65.3	60.0	146.3	
1920×1080	1920 × 1080	55.6	49.9	141.5	
	1920 × 1080*2	66.6	59.9	138.5	
	1920 × 1080*3	67.2	60.0	173.0	RGB
WUXGA	1920 × 1200	61.8	49.9	158.3	DisplayPort/HDMI/ DVI-D/RGB
	1920 × 1200*2	74.0	60.0	154.0	
	1920 × 1080*3	74.6	59.9	193.3	RGB

*1 The "i" appearing after the resolution indicates an interlaced signal.
*2 Compliant with VESA CVT-RB (Coordinated Video Timing-Reduced Blanking).
*3 The image processing circuit reduces the number of pixels to display images.

NOTE: DIGITAL LINK and HDMI inputs share the same compatible signal.

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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.
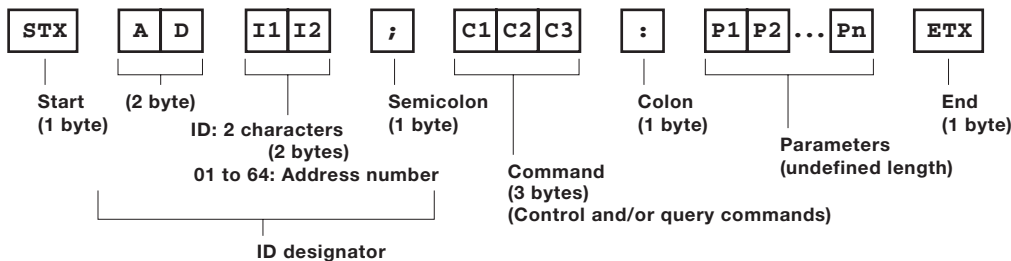
Pin assignments and signal names

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

D-sub 9-pin (female) Serial input

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.

STX	A D	I1 I2	;	C1 C2 C3	:	P1 P2 ... Pn	ETX

Start
(1 byte)

(2 byte)

ID: 2 characters
(2 bytes)
01 to 64: Address number

Semicolon
(1 byte)

Command
(3 bytes)
(Control and/or query commands)

Colon
(1 byte)

Parameters
(undefined length)

End
(1 byte)

ID designator

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.
- When using two or more units, set different IDs for each unit.

LCD Projectors

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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		Callback
PON	Standby power	On	**PON**
POF		Off	**POF**
OSH:0	Shutter	Off	**OSH:0**
OSH:1		On	**OSH:1**
IIS:DL1	Input selection	DigitalLink	**IIS:DL1**
IIS:DP1		DisplayPort	**IIS:DP1**
IIS:HD1		HDMI	**IIS:HD1**
IIS:DVI		DVI-D	**IIS:DVI**
IIS:RG1		RGB1	**IIS:RG1**
IIS:RG2		RGB2	**IIS:RG2**
IIS:VID		Video	**IIS:VID**
VXX:RYC2=+00000	RGB2 INPUT SETTING	RGB/YP$_B$P$_R$	**VXX:RYC2=+00000**
VXX:RYC2=+00001		S-Video	**VXX:RYC2=+00001**
VXX:RYC2=+00002		Video	**VXX:RYC2=+00002**
VXX:LPWI1=+00030	Lamp power	Auto	**VXX:LPWI1=+00030**
VXX:LPWI1=+00001		Normal	**VXX:LPWI1=+00001**
VXX:LPWI1=+00020		Eco 1	**VXX:LPWI1=+00020**
VXX:LPWI1=+00021		Eco 2	**VXX:LPWI1=+00021**
OAS	Auto setup		**OAS**
VSE:0	Aspect	Normal/Auto/VID Auto	**VSE:0**
VSE:1		4:3	**VSE:1**
VSE:2		Wide	**VSE:2**
VSE:5		Real	**VSE:5**
VSE:6		Full	**VSE:6**
VSE:9		H-fits	**VSE:9**
VSE:10		V-fits	**VSE:10**
VPM:NAT	Picture	Natural	**VPM:NAT**
VPM:STD		Standard	**VPM:STD**
VPM:DYN		Dynamic	**VPM:DYN**
VPM:CIN		Cinema	**VPM:CIN**
VPM:DIC		DICOM Simulation	**VPM:DIC**

*   **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.**

*   **When a command that cannot be executed during standby mode is sent, the projector will send an ER401 command in reply.**

Status request commands

Command:Parameter	Function	Callback	Description
QPW	Main power status	**000**	Off
		001	On
QSH	Shutter function status	**0**	Off
		1	On
QIN	Input signal status	**DL1**	DigitalLink
		DP1	DisplayPort
		HD1	HDMI
		DVI	DVI-D
		RG1	RGB1
		RG2	RGB2
		VID	Video
QVX:LPWI1	Lamp power mode status	**VXX:LPWI1=+00030**	Auto
		VXX:LPWI1=+00001	Normal
		VXX:LPWI1=+00020	Eco 1
		VXX:LPWI1=+00021	Eco 2
QSE	Aspect mode status	**0**	Normal/Auto/VID Auto
		1	4:3
		2	Wide
		5	Real
		6	Full
		9	H fit
		10	V fit
QPM	Picture mode status	**NAT**	Natural mode
		STD	Standard mode
		DYN	Dynamic mode
		CIN	Cinema mode
		DIC	DICOM Simulation.mode
QST	Projector run time	**p1p2p3p4p5**	00000 – 99999 hours
Q$L:1	Lamp run time	**p1p2p3p4**	0000 – 9999 hours
QTM:0	Temperature status	**p1p2p3p4/p5p6p7p8**[*1]	Air intake
QTM:1		**p1p2p3p4/p5p6p7p8**[*1]	Exhaust

*1 p1p2p3p4 = Celsius (°C), p5p6p7p8 = Fahrenheit (°F)
NOTE: If a wrong command is received, the projector will send an ER401 or ER402 command to the computer.

Command example

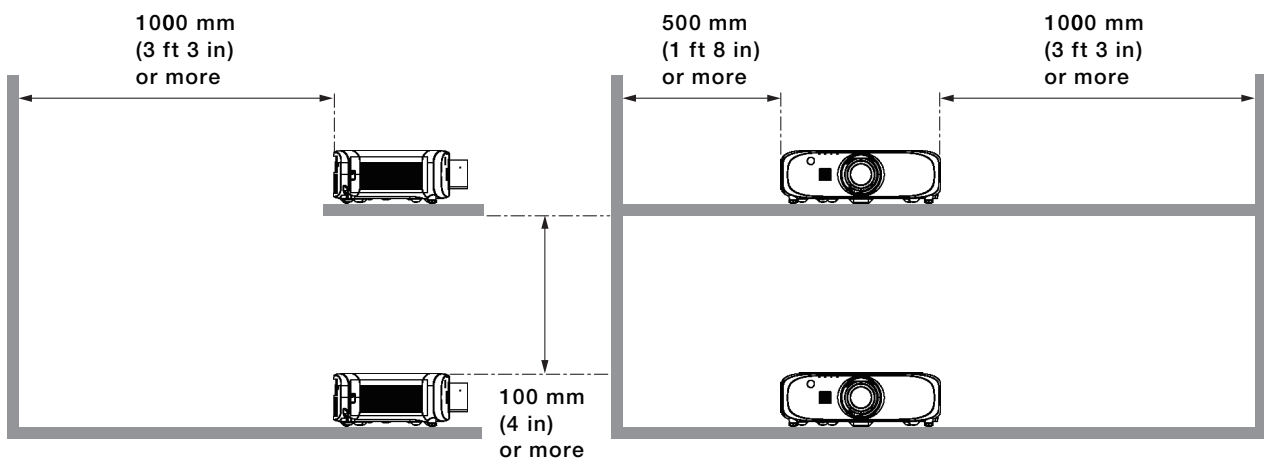To set the shutter function on, send the command as shown below.

STX   ADZZ ; OSH : 1   ETX

Start   **ID Address**   **Command**   **Parameter**   **End**
Character code 02   ZZ: ID ALL   Character code 03

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.
2. Make sure there is an unobstructed space of 1,000 mm (3 feet 3 inches) or more around the projector's exhaust openings.
3. Do not stack projector units directly on top of one another for the purpose of multiple (stacked) projection. When stacking projector units, be sure to provide the amount of space indicated below between them. These space requirements also apply to installations where only one projector unit is operating at one time and the other unit is used as a backup.
4. 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.
5. 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.
6. If the projector is installed in an enclosed space, ensure that 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.
7. When installing the projector in any manner other than floor mounting with the adjuster legs, use the four threaded ceiling mount holes (screw diameter: M6, projector interior thread length: 12 mm) to secure the projector.

1000 mm (3 ft 3 in) or more   **500 mm (1 ft 8 in) or more**   **1000 mm (3 ft 3 in) or more**

100 mm (4 in) or more
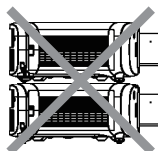
Do not stack projector units directly on top of one another.

Direction of air intake and exhaust

```
Intake
Exhaust
```
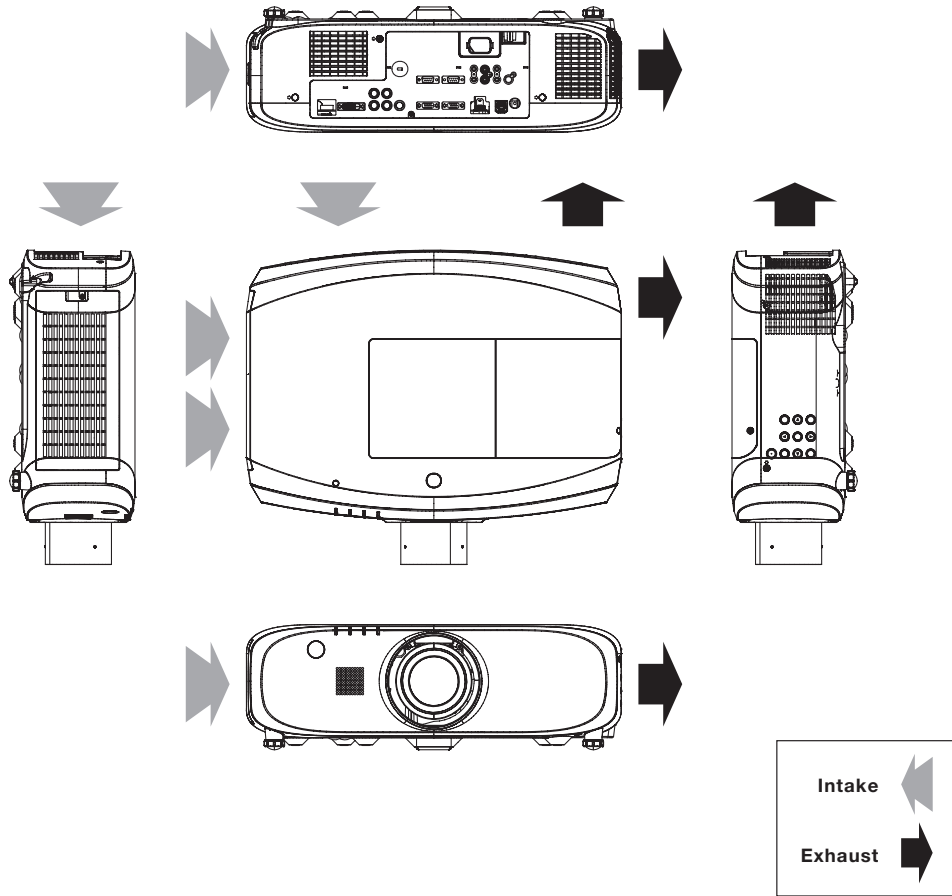
Operating the projector continuously

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.