ASAHI SPECTRA

Instruction Manual

Xenon Light Source 300W

MAX-302

Thank you for your purchase of the Asahi Spectra MAX-302 Xenon Light Source.

The MAX-302 is not a LASER unit.

The MAX-302 generates spectra from UVB to IR wavelengths (200nm to 1200nm), and with our optional accessories, allows you to customize these spectra to match your specific needs.

Read this instruction manual carefully before using your MAX-302, to achieve optimal effectiveness and to help extend the life of the unit.

Asahi Spectra Co.,Ltd.

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Safety precautions

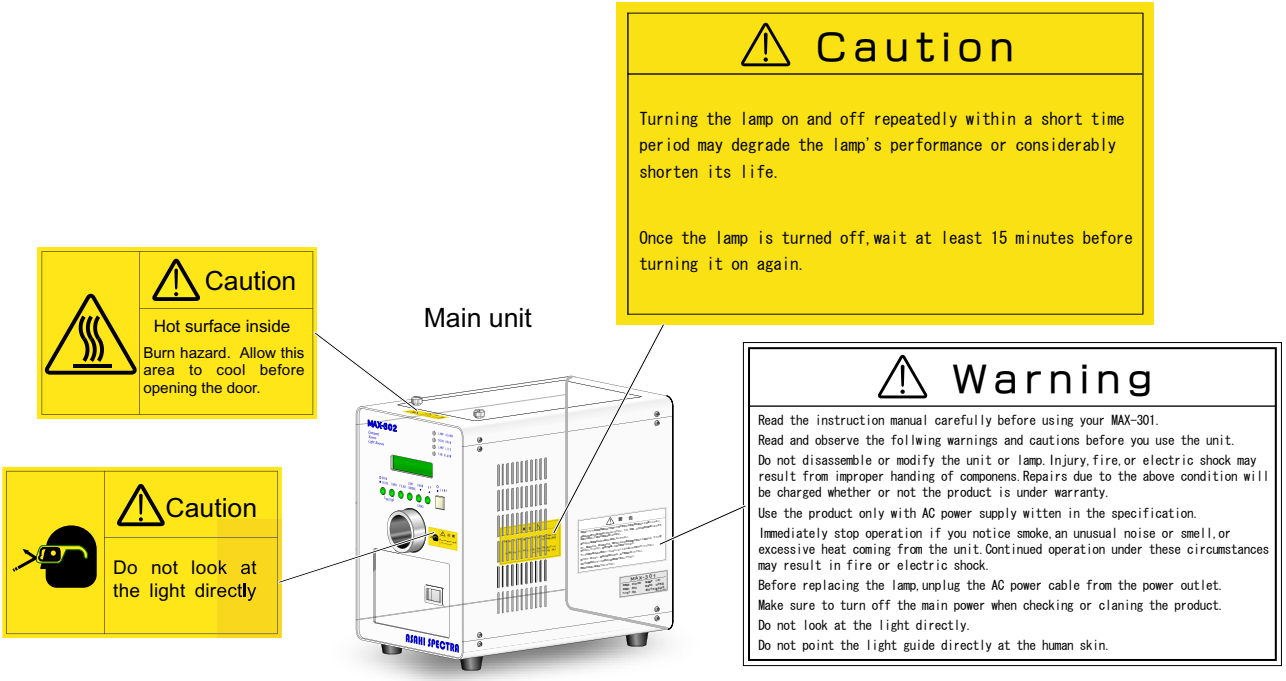
Read and observe the following warnings and cautions before you use the unit.
Operating the MAX-302 unit in an inappropriate manner or failing to maintain it properly may result in degraded performance or damage to the unit. Such damage will not be covered by your warranty.

List of the safety signs

The safety signs in this instruction manual and the safety labels on the products are classified as follows.
Read and observe the following safety signs before you use the unit.

⚠ Warning	This sign indicates the risk of death or heavy injury if you do not follow the instruction or operate the unit in an inappropriate manner.
⚠ Caution	This sign indicates the risk of injury or damage to the unit if you do not follow the instruction or operate the unit in an inappropriate manner.
⚠	Various safety signs are indicated in this sign. Read and observe the instruction before you use the unit.
⊘	This indicates the prohibited matter. Read and observe the instruction before you use the unit.
■	This indicates what you must do. Read and observe the instruction before you use the unit.

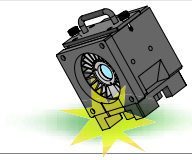
Safety signs are labeled on the following place.



Safety precautions

Warning

Handle the lamp with extreme care. Do not drop, hit, bump, or scratch the lamp. Doing so may cause the lamp to explode due to its high internal pressure.



Do not place combustible materials (paper, fabric, or chemicals) near the unit or place anything over the lamp, as this may result in fire.

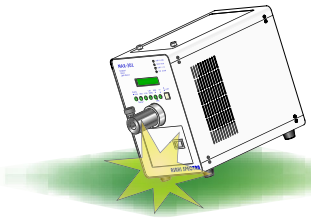
Before turning on the power, confirm the power supply voltage of the MAX-302 conforms to the local voltage.

Do not block the air inlet vents or exhaust ducts. Doing so may cause internal heat build-up which may lead to a fire. The space must be taken at least 30cm.

Caution

Do not subject the unit to any of the following conditions, as these may result in fire or electric shock:

- Direct sunlight
- Open flame of any type
- Flammable or corrosive gas
- High humidity
- Dusty environment
- Temperatures below 10℃ (50℉) or above 35℃ (95℉)



This product must be used with the cables specified in this manual. Using other type of cables may result in degraded performance or damage to the product.
Moreover it may cause a heat build up inside of the product.

The unit must be in a horizontal position during operation.

Immediately stop operation if you notice smoke, an unusual noise or smell, or excessive heat coming from the unit. Continued operation under these circumstances may result in fire or electric shock.

Do not place or store any objects on top of the unit.

Once the lamp is turned off, wait at least 15 minutes before turning it on again.

Do not use sharp objects, such as the tip of a pen, to press the setting buttons.

Before connecting other instruments to the unit, make sure that the unit and the instruments being connected are all powered off, to avoid risk of electric shock.

Grasp the plug firmly and pull the plug, not the cable, when unplugging the AC power cable.

The unit contains components (LCD panel, etc.) that may have special disposal procedures. When you dispose of the unit, consult your local authorities.

This product emits ultraviolet or infrared light which are harmful to your eyes and exposed skin.

Keep your hands or things away from the cooling fans and filter wheel.

Caution

Do not touch the plug with wet hands, as this may result in electric shock or damage to the unit.

Before replacing the lamp, unplug the AC power cable from the power outlet, to avoid risk of electric shock.

Prohibied

Do not disassemble or modify the unit or lamp. Injury, fire, or electric shock may result from improper handling of components.

Do not touch the optical components such as lens, lamp, mirror with bare hands.

Wear Protective glasses

Wear the protective glasses when you check the light beam.

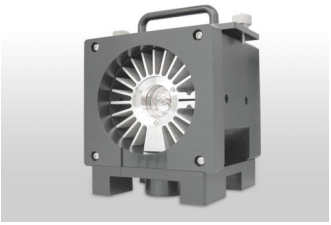
Accessories

Check that you have received all the following items before using the MAX-302.

(1) Main unit

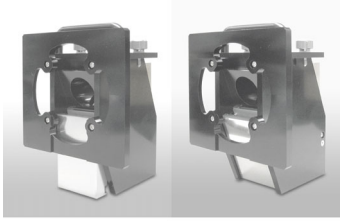
Item no.: MAX-302
Size: 216(W) x 355(D) x 326(H)mm

(2) Lamp cartridge



2 types: UV type
VIS type

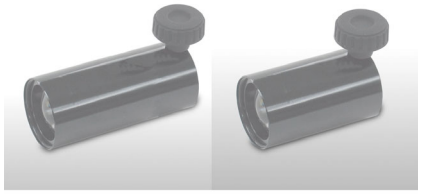
(3) Mirror module



UV VIS

2 types: UV type
VIS type

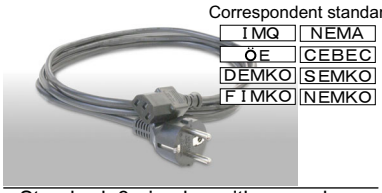
(4) Light guide fitting device



UV VIS

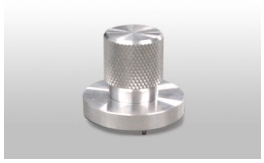
Size: UV type 44mm dia. x 98mm
VIS type 44mm dia. x 75mm

(5) Power supply AC cable



Standard: 3-pin plug with ground
3-pin socket (250V 10A)
Length: 3m

(6) Filter fitting tool

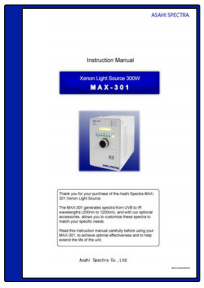


Size: 31(W) x 31(D) x 27(H)mm

(7) Filter ring

Usable filter size: 25mm dia. thickness 1.0 - 6.0mm
Quantity: 8 pcs

(8) Instruction manual



Collimator lens (Option)

RLQ-2 RLQ-05 RLQ-1

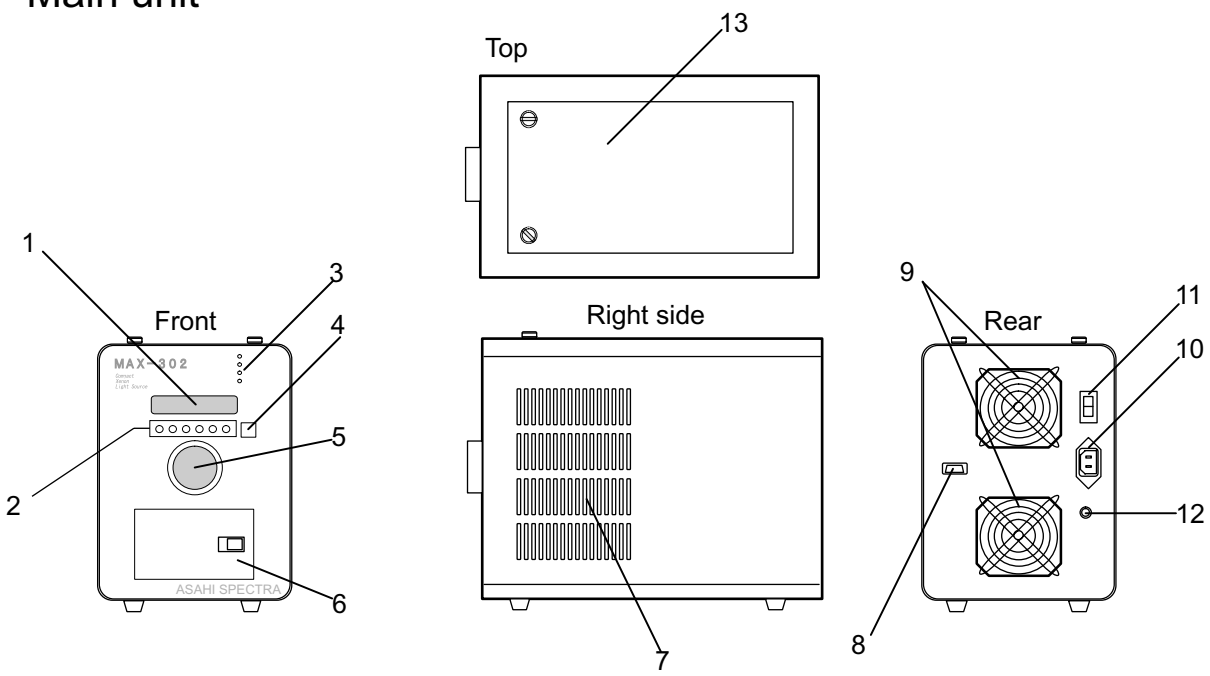
Material: Quartz

Lightguide (Option)

Size: 5mm dia x 1000mm
Material: Quartz, Hybrid, Liquid
* Other lengths are available.

Part names and functions

Main unit

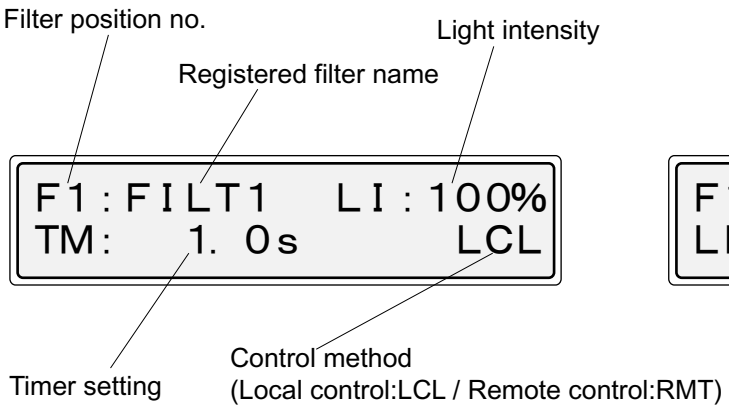


	Names	Functions
1	LCD panel	Displays settings of functions, such as filter wheel, timer, and light intensity.
2	Control buttons	Used to operate or set various functions, such as open/close aperture, timer, and light intensity attenuation. (For detailed information, refer to P. 8.)
3	Warning lamps	Indicate the following alarm conditions when illuminated: lamp trouble, unclosed top cover, short lamp life, and cooling fan trouble.(For detailed information, refer to P. 7.)
4	LAMP Button	Turns the lamp on or off.
5	Light aperture (mount for the light guide fitting device)	Emits light from the unit's internal xenon lamp. Threaded to fit the light guide.
6	Front door	Provides access to the filter wheel, allowing you to install or remove an optional optical filter. The filter wheel holds up to 8 filters.
7	Air inlet vent	Allows fresh air to flow into the unit to cool internal parts such as the lamp and power supply unit.
8	RS-232C port	Allows you to connect an RS-232C serial interface to control the MAX-302 from an external computer (not supplied).
9	Cooling fan	Cools down internal parts such as the lamp and power supply unit by blowing the heated air out of the exhaust ducts.
10	Power connector	Used to connect the supplied AC power cable.
11	Main power switch	Switches the MAX-302 main power on or off.
12	Grounding terminal (GND)	Use to connect a grounding-type plug to prevent electric shock or current leakage.
13	Top cover	Provides access to the lamp mount and mirror module, allowing you to install or remove a lamp and mirror module.

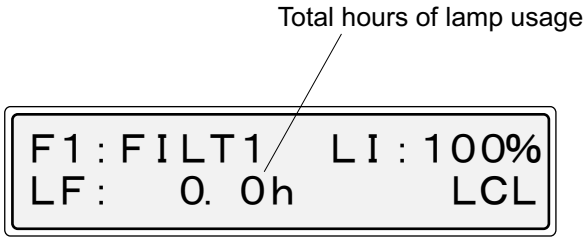
Part names and functions

Description of the LCD panel

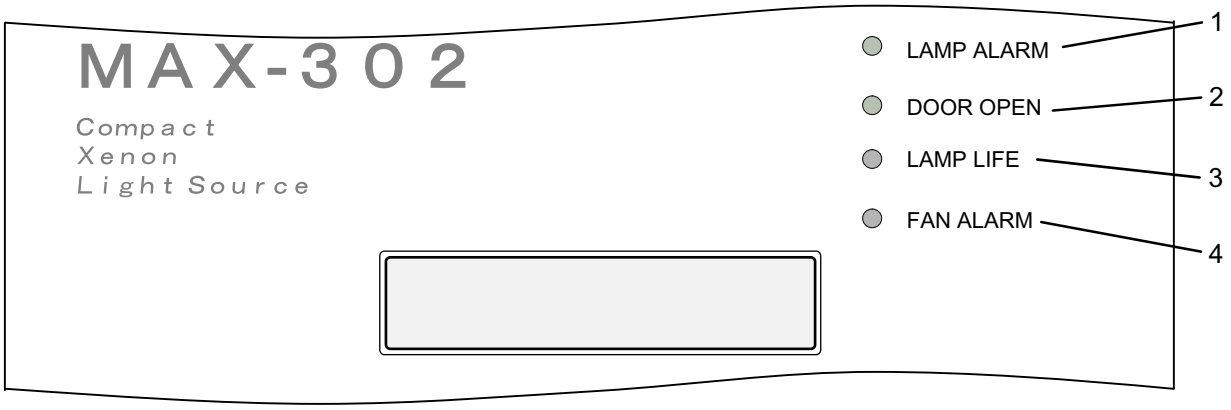
Initial screen



Lamp life screen



Warning lamp

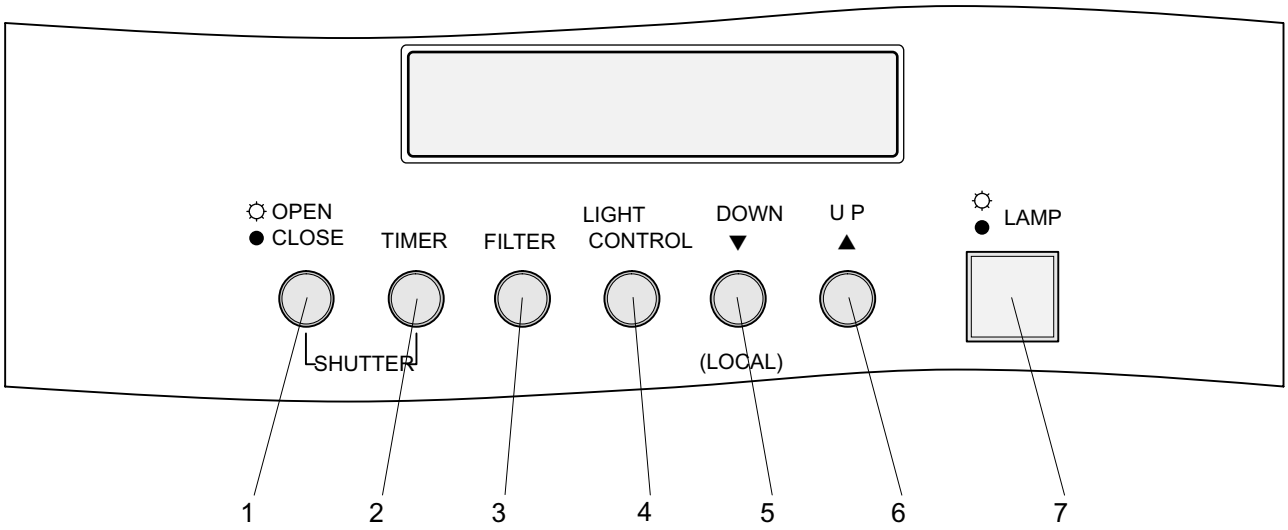


	Names	Functions
1	LAMP ALARM	- Turns on (red) when the lamp fails to light up.
2	DOOR OPEN	- Turns on (red) when the top cover is open.
3	LAMP LIFE	- Turns on (orange) when lamp usage exceeds 500 hours total.
4	FAN ALARM	- Turns on (orange) if the cooling fan stops or if a sharp rise in internal temperature is detected.

Note: For troubleshooting information related to these conditions, refer to P.37.

Part names and functions

Control buttons



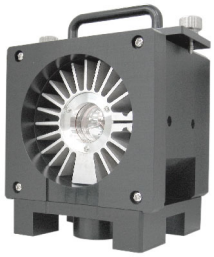
	Names	Functions
1	OPEN / CLOSE button	Use this button to open and close the light aperture. While this button is on (green) ---Shutter is open. While this button is off --- Shutter is closed.
2	TIMER button	- Use this button to set the timer (duration of light emission in seconds)
3	FILTER button	- Use this button to change the position of the filter wheel. - Use this button to register the name(s) of the filter(s) in the filter wheel.
4	LIGHT CONTROL button	- Use this button to attenuate the light intensity. - Use this button to reset the total hours of lamp usage.
5	▼DOWN button	- Use this button to decrease setting values for various operations. - Use this button to reset the lamp usage hours.
6	▲UP button	- Use this button to increase setting values for various operations. - Use this button to reset the lamp usage hours and return to the initial screen.
7	LAMP button	- Use this button to turn the lamp on or off.

Specifications of standard parts

Warning	Handle the lamp with extreme care. Do not drop, hit, bump, or scratch the lamp. Doing so may cause the lamp to explode due to its high internal pressure.

Prohibited	Do not touch the optical components such as lens, lamp, mirror with bare hands.

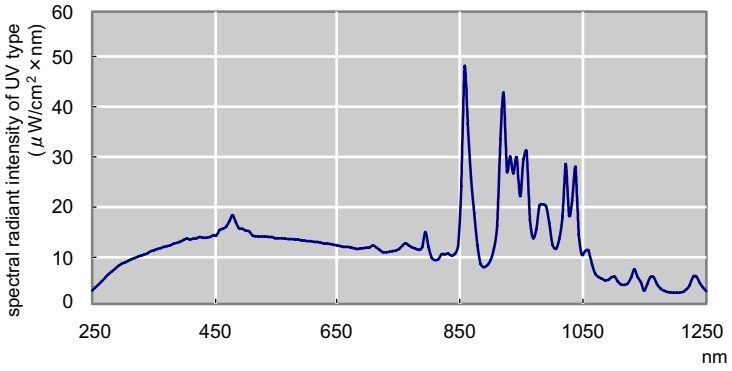
Xenon lamp



Our lamp design achieves optimal brightness by utilizing a 300W short arc xenon lamp and our own specially designed optical filter. The emitted light comprises a continuous spectrum from UV to IR wavelengths. The lamp also uses specially designed mirrors and lenses for maximum performance in the UV portion of the spectrum.

Lamp spectral performance

*Actual data measurement.

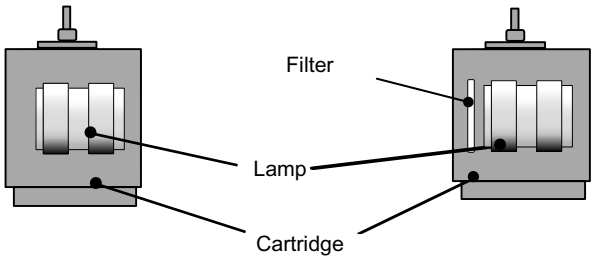


Type of lamp

-There are 2 types of lamp for MAX-302.
-You can select VIS or UV type according to your application.

*You can confirm which type of lamp from the label sealed on top of the main unit.

	VIS Type	UV Type
Radiant range	VIS to IR	250nm to IR
Applicable Mirror Module	VIS Mirror Module	UV or VIS Mirror Module

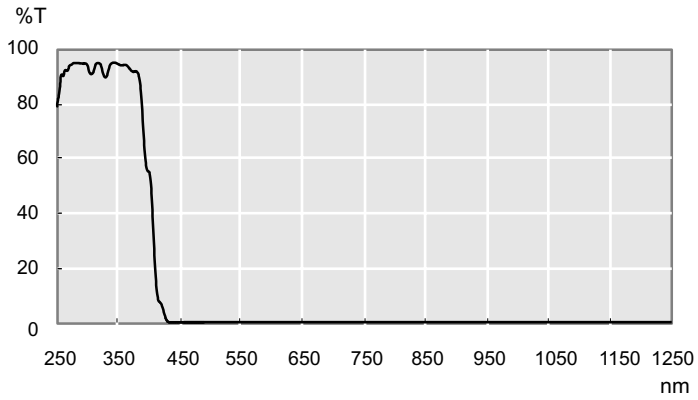


Specifications of standard parts

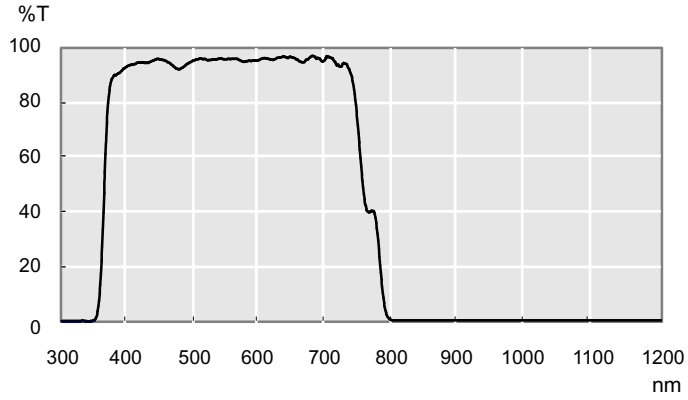
Mirror module

Each mirror module is equipped with a high-performance cold mirror with in-house coatings. This design allows the mirror modules to achieve our highest levels of performance.

UV Mirror Module Spectral Performance



VIS Mirror Module Spectral Performance



Specifications of standard parts

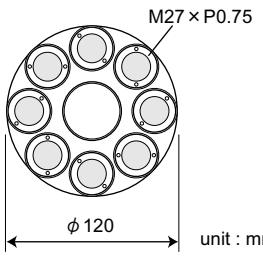
Filter wheel

The filter wheel lets you select a filter using the control buttons.
The selected filter is rotated into position in front of the light beam.

The filter wheel holds up to 8 filters (bandpass filters, long and short wavelength pass filters, etc.)

Filter size requirements
Diameter: 25mm dia. Thickness: 1～6mm
*A spacer may need to be used, depending on the filter thickness.(less than 2mm)

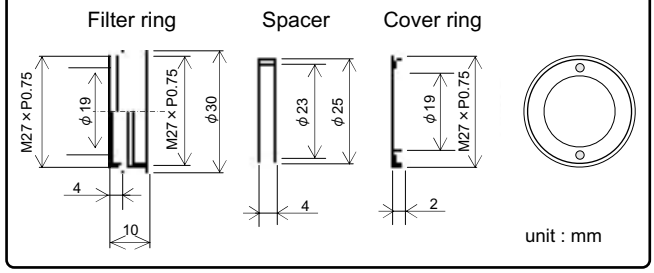
Dimensions



Filter ring

This ring is used to fit an optical filter to the filter wheel.

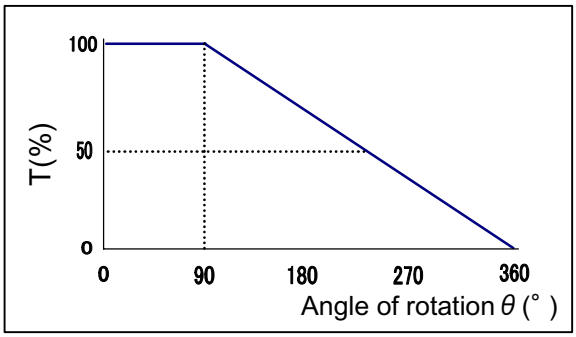
Dimensions



Circular variable ND filter

The circular variable ND filter allows you to attenuate the light intensity by rotating the filter using the control buttons.

Light intensity variable range T%: 100~5%



Before operating

⚠ Warning	Do not place combustible materials (paper, fabric, or chemicals) near the unit or place anything over the lamp, as this may result in fire.
⚠ Warning	Do not block the air inlet vents or exhaust ducts. Doing so may cause internal heat build-up which may lead to a fire. The space must be taken at least 30cm.
⚠ Caution	Do not subject the unit to any of the following conditions, as these may result in fire or electric shock: - Direct sunlight - Open flame of any type - Flammable or corrosive gas - High humidity - Dusty environment
⚠ Caution	The unit must be in a horizontal position during operation.
⚠ Caution	Do not place or store any objects on top of the unit.

Control buttons are functional only when the main power is on.
Only the (LOCAL), LAMP and OPEN/CLOSE buttons are functional during remote controlled operation.

Operational cautions

LAMP button	- Pressing this button toggles the lamp on or off while the main power is on. (Pressing this button while the main power is off will not turn on the lamp.) - The color of this button indicates whether the lamp is on or off. The button is lit green when the lamp is on, and is unlit when the lamp is off. - Pressing this button while it is lit green will turn the lamp off . Caution: Once the lamp is turned off, wait at least 15 minutes before turning it on again. Turning the lamp on and off repeatedly will shorten the lamp life considerably.
OPEN/CLOSE button	- Once the lamp is turned on, you must open and close the shutter (using the OPEN/CLOSE button) in order to emit light. - The color of this button indicates whether the shutter is open/closed. The button is lit green when the shutter is open, and is unlit when the shutter is closed.
▼DOWN button ▲UP button	- Use these buttons to modify the values of various settings. - To decrease a setting's value, press the DOWN button. - To increase a setting's value, press the UP button.
Cooling fan	- The cooling fan runs continuously while the main power is switched on. - After using the MAX-302, leave the main power on so that the fan can continue to cool the unit. - Turn off the main power switch only after the unit has cooled completely. Caution: Do not block the fan or the air intake vents.

Safety Function

As a safety precaution, the lamp turns off automatically under certain conditions.
These conditions and the recovery procedure for each are as follows:

Condition	Recovery procedure
Top cover is opened during operation	Close the top cover and press the LAMP button for more than 1 second. See also DOOR OPEN on P. 37.
Cooling fan stops during operation	Cycle (turn off and on) the main power, then press the LAMP button for more than 1 second. See also FAN ALARM on P. 37.
Lamp reaches abnormally high temperature	Make sure that the air inlet vent or exhaust duct is not blocked. Wait at least 15 minutes before turning on the main power.

If the problem is still observed after you perform the above recovery procedure(s), the product may be experiencing failure. Turn off the main power immediately and contact our sales department. (Refer to P. 39 for contact information.)

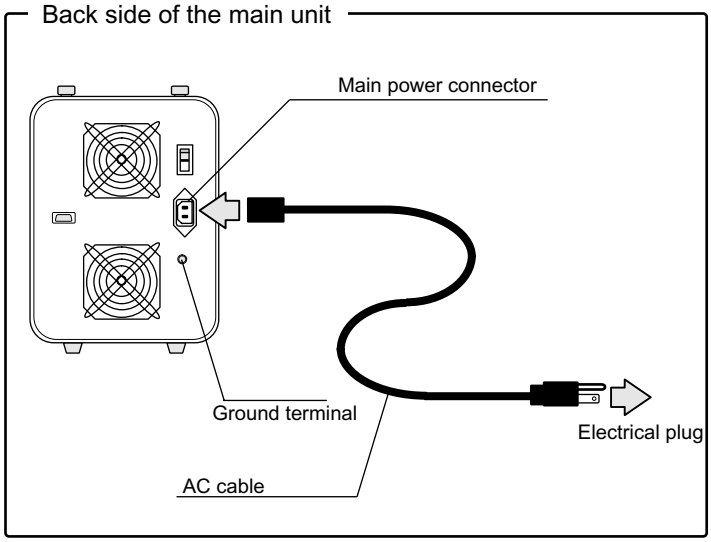
Preparing to operate the MAX-302

Warning	Before turning on the power, confirm the power supply voltage of the MAX-302 conforms to the local voltage.
Warning	This product must be used with the cables specified in this manual. Using other type of cables may result in degraded performance or damage to the product. Moreover it may cause a heat build up inside of the product.
Caution	Do not touch the plug with wet hands, as this may result in electric shock or damage to the unit.

Connecting the AC Cable

(1) Insert the AC cable into the main power connector located on the back of the main unit.

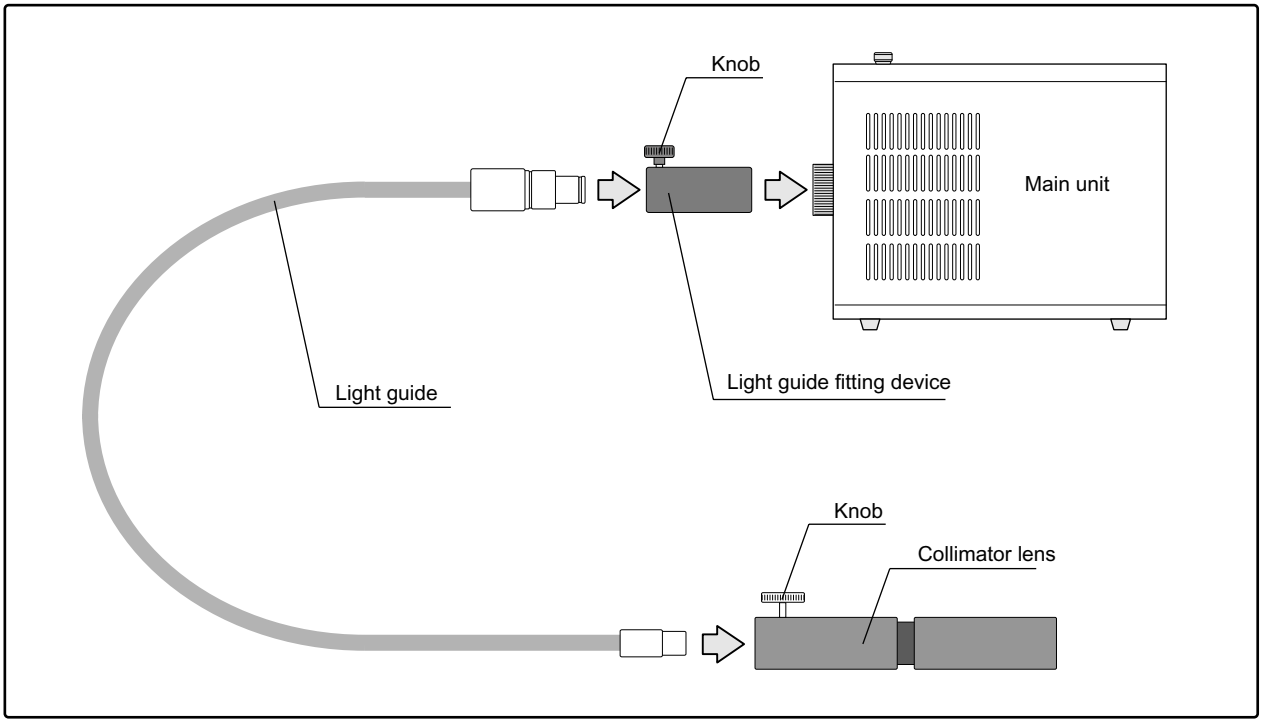
(2) Insert the electric plug of the AC cable into the local outlet.



Caution) Use only the supplied 3-pin AC cable to ensure a proper grounded connection and avoid possible electric shock. Use of a 2-pin (non-grounding) AC cable is not recommended. If you use a 2-pin AC cable, you must also provide a separate connection to ground using the grounding terminal on the back of the unit. Failure to do so may result in electric shock.

Connecting the light guide and the collimator lens

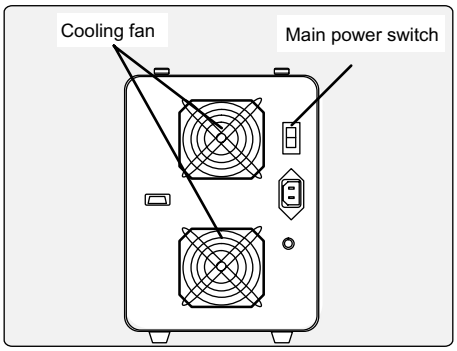
To use the light guide and the collimator lens with the MAX-302,connect them as shown below.
*Rotate the knobs clockwise to fasten.



Preparing to operate the MAX-302

Turning on the main power

Back



(1) Turn on the main power switch at the back side.

- The cooling fan turns on.

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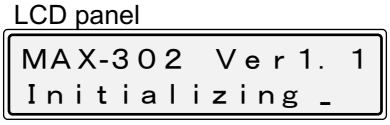
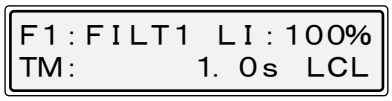
- The LCD panel displays the initialization screen shown at right. Initialization may take up to 60 seconds.

LCD panel



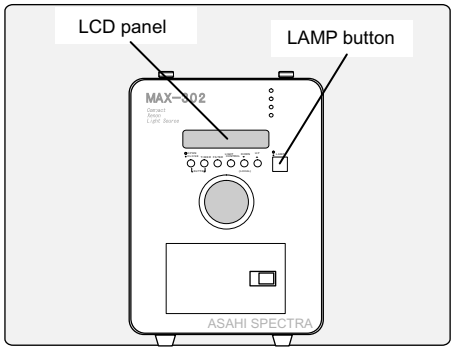
↓

- The LCD panel displays the Initial setting.



Turning on the lamp

Front



(2) Press and hold the LAMP button for one second.

- The LAMP button lights up green, indicating that the lamp is on.

- Once the lamp is on, light is emitted only when the shutter is opened.
  For instructions on opening/closing the shutter, refer to P.15.
- It may take more than one second for the lamp to turn on.

Notes on remote mode operation:

*If the LAMP button is pressed during remote mode, remote mode is stopped and the lamp is turned off.
*If the OPEN/CLOSE button is pressed during remote mode, remote mode is stopped and the shutter is closed.

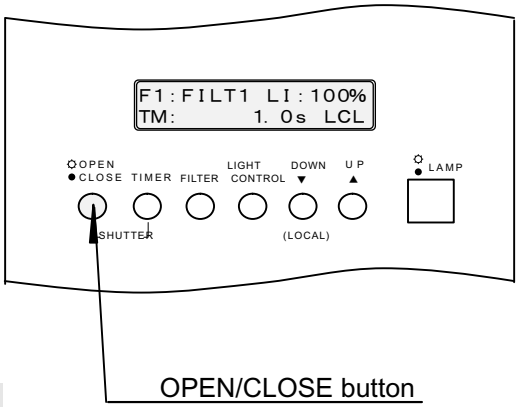
To resume operation in normal mode or remote mode, press the LOCAL button.

Operating the MAX-302

Caution	Do not use sharp objects, such as the tip of a pen, to press the setting buttons.

Wear Protective glasses	Wear the protective glasses when you check the light beam.

Opening the shutter (Starting light emission)



(1) Press the OPEN/CLOSE button.

- OPEN/CLOSE button lights up in green.
- Shutter opens* and the light is emitted.

Closing the shutter (Stopping light emission)

(1) Press the lit OPEN/CLOSE button.

- The OPEN/CLOSE button goes out (is no longer lit).
- The shutter closes* and the light is blocked.

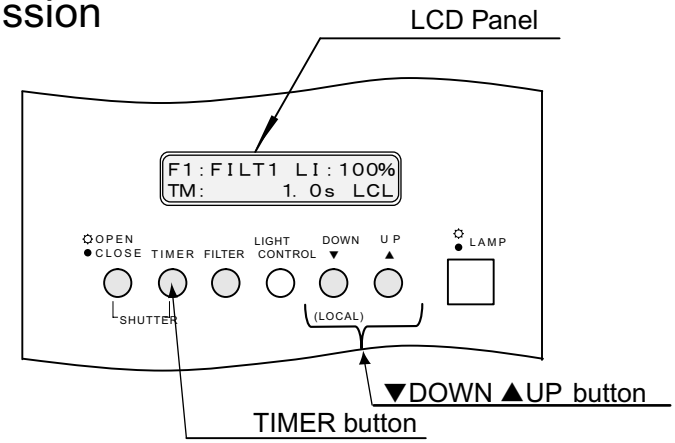
Caution: The xenon lamp is on during this operation.

*The shutter takes approx. 80 msec to open or close.

Operating the MAX-302

Setting the Timer for Timed Light Emission

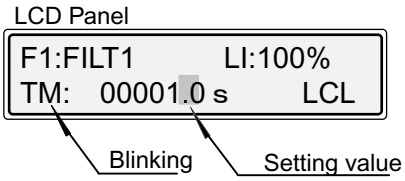
This section explains how to set the timer during timed light emission, in which light is emitted for a specified duration. The timer may be set to any value from 0.1 to 99999.9 seconds.
The default setting is 1 second.



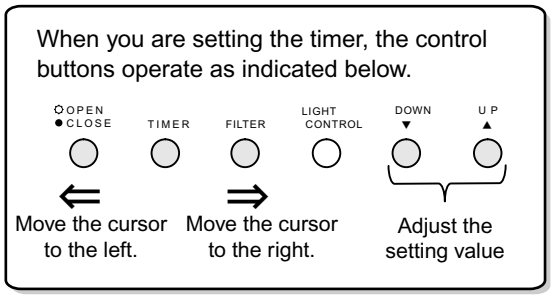
Example: To set the duration to 15 seconds, follow the steps below.

(1) Press and hold the TIMER button for about 2 seconds.

- The LCD will display the screen shown at right. The default timer setting is 1.0 second.

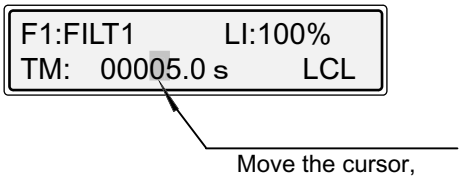


- The TIMER button blinks green.
- The OPEN/CLOSE, FILTER, ▼DOWN and ▲UP buttons light up green.

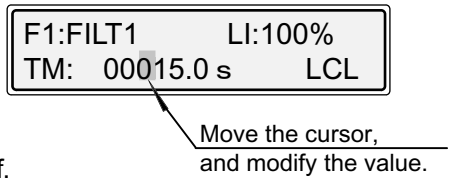


(2) Move the cursor to the left by pressing the OPEN/CLOSE button.
(3) Press ▼DOWN or ▲UP as needed to change the value to 5.

*Pressing the ▼DOWN button decreases the value.
*Pressing the ▲UP button increases the value.

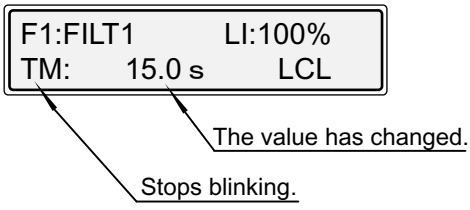


(4) Move the cursor to the left by pressing the OPEN/CLOSE button.
(5) Press ▼DOWN or ▲UP as needed to change the value to 1.



(6) Press the blinking TIMER button.

- The "TM" in the display stops blinking.- The control buttons turn off.

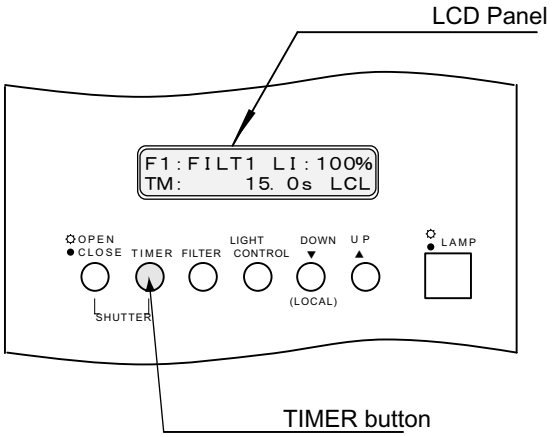


Finish

Caution: The xenon lamp is on during timer setting.

Operating the MAX-302

Opening/Closing the Shutter -- Timed Light Emission

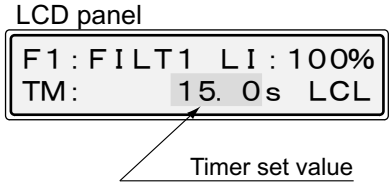


Example: To emit light for 15 seconds (timer set to 15 seconds).

(1) Press the TIMER button.

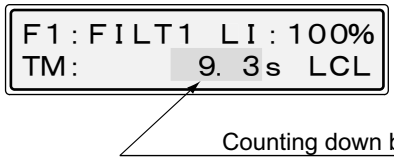
- The OPEN/CLOSE and TIMER buttons light up green.
- The shutter opens to start the light emission.

LCD panel



↓

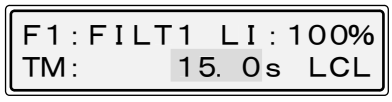
- The timer starts to count down.



If you want to stop the light emission while the timer is counting down, press the TIMER button.

↓

- The shutter closes to end the light emission.
- The OPEN/CLOSE and TIMER buttons turn off.



- The timer value on the LCD panel automatically resets to the original value (15.0 seconds in this example).

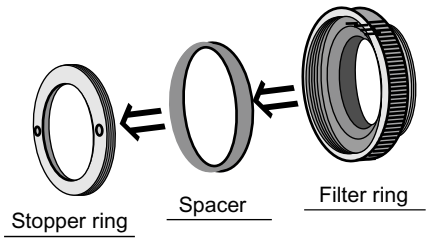
Caution: The xenon lamp is on during timer setting.

Mounting a Filter (optional)

Caution) Turn off the main power when you mount the filter.
If you mount a filter while the main power is on,
your hand may be caught in the filter wheel.

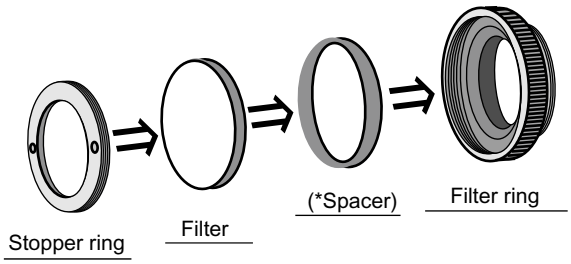
(1) Remove the stopper ring from the filter ring.

*Turn the stopper ring counterclockwise
using the filter fitting tool



(2) Mount the optical filter into the filter ring.

Caution) When you clean a filter surface,wipe it out lightly
with a soft cloth dampened with alcohol.



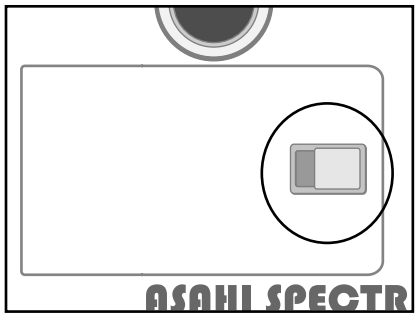
(3) Mount the stopper ring to the filter ring.

*Turn the stopper ring clockwise using the filter fitting tool.

*Use the spacer for thin filters (less than 2mm thick).

Caution) Be careful not to overtighten the stopper ring,
as doing so may crack or damage the filter.

(4) Pull the hook and open the front door.

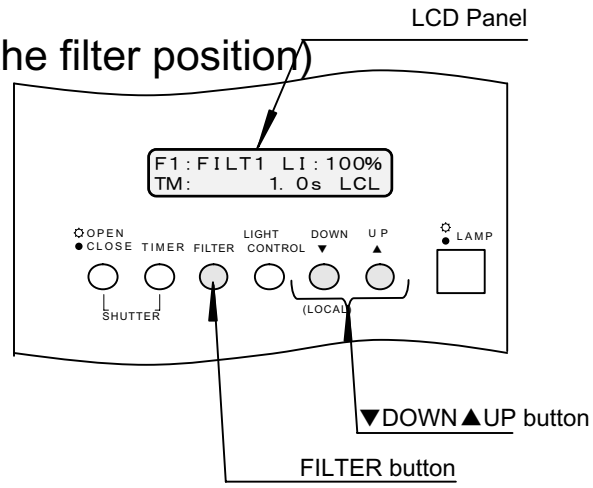


(5) Mount the filter ring on the filter wheel.

*Turn the filter ring clockwise.

(6) Close the front door.

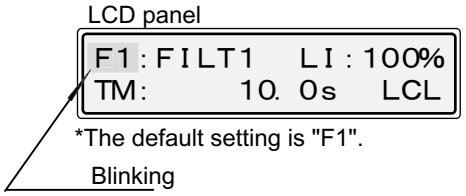
Rotating the Filter Wheel(changing the filter position)



Example: Move the filter at F3 on the filter wheel into position.

(1) Press the FILTER button.

- The FILTER button blinks green.
- The ▼DOWN and ▲UP buttons light up green.

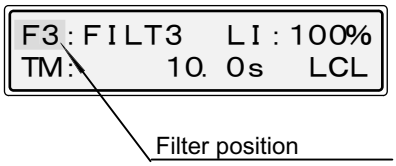


(2) Change the filter position to F3 by pressing the ▼DOWN and ▲UP buttons.

- Pressing ▼DOWN decreases the filter position by one.
- Pressing ▲UP increases the filter position by one.

【Setting range : F1 - F8】

- The filter wheel rotates the filter at F3 to the light emitting point.



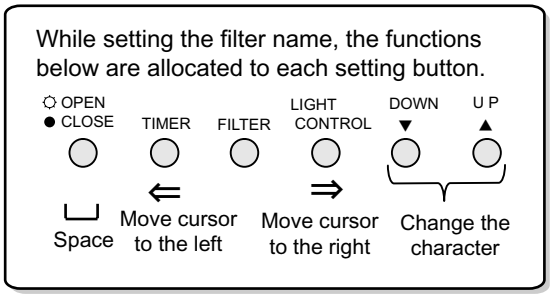
(3) Press the FILTER button.

- The Filter button turns off.

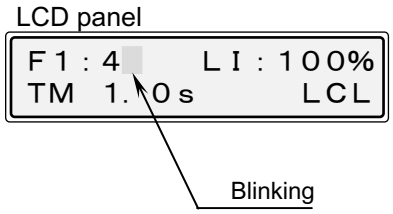
Caution: The xenon lamp is on during this operation.

Assigning names to filters

You can use any of the following characters when assigning a name to a filter.
The numbers indicate the order in which characters are displayed
when the ▼DOWN and ▲UP buttons are pressed.
- Press ▲UP to display the next character (increasing number)
- Press ▼DOWN to display the previous character (decreasing number)



You can change the character at blinking cursor position.



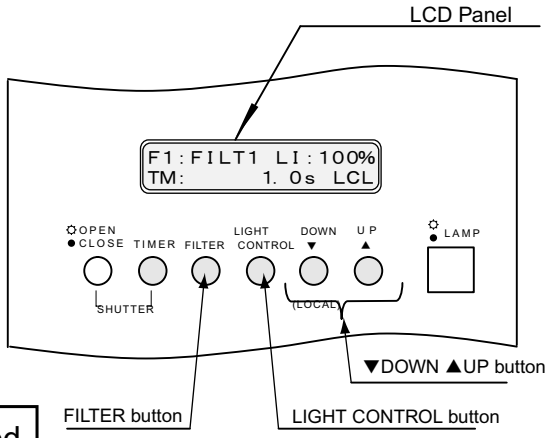
Character list

1		17	0	33	@	49	P	65	`	81	p				
2	!	18	1	34	A	50	Q	66	a	82	q				
3	"	19	2	35	B	51	R	67	b	83	r				
4	#	20	3	36	C	52	S	68	c	84	s				
5	$	21	4	37	D	53	T	69	d	85	t				
6	%	22	5	38	E	54	U	70	e	86	u				
7	&	23	6	39	F	55	V	71	f	87	v				
8	'	24	7	40	G	56	W	72	g	88	w				
9	(	25	8	41	H	57	X	73	h	89	x				
10	)	26	9	42	I	58	Y	74	i	90	y				
11	*	27	:	43	J	59	Z	75	j	91	z				
12	+	28	;	44	K	60	[	76	k	92	{				
13	,	29	<	45	L	61	¥	77	l	93	|				
14	-	30	=	46	M	62	]	78	m	94	}				
15	.	31	>	47	N	63	^	79	n						
16	/	32	?	48	O	64	_	80	o						

Assigning names to filters

After you mount a filter in the filter wheel, you can assign it a name, so that you can later easily identify it by its name rather than its position in the wheel (F1-F8).
The filter name can be up to 8 characters in length, and can contain any of the characters shown in the table on P. 20.

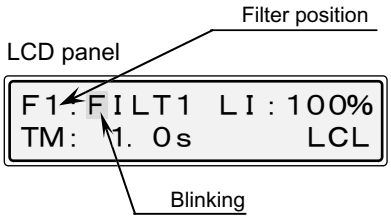
Before you can assign a name to a position in the filter wheel, you must first mount a filter at that position in the wheel. For instructions on how to mount a filter in the filter wheel, refer to P.18.



Example: To assign the name "436" to the filter mounted at filter position F1 of the filter wheel.

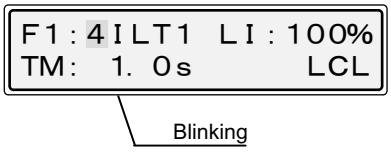
(1) Press and hold the FILTER button for 2 seconds.

- The TIMER, LIGHT CONTROL, ▼DOWN, and ▲UP buttons light up green.
- The Filter button blinks green.



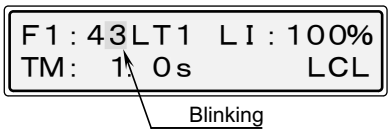
(2) Press and hold ▼DOWN or ▲UP until "4" appears at the cursor.

Refer to P. 20 for a list of available characters.



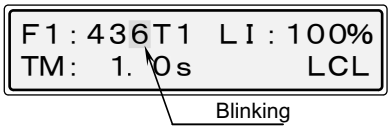
(3) Press LIGHT CONTROL to move the cursor to the right.

(4) Press ▼DOWN or ▲UP until "3" appears at the cursor.



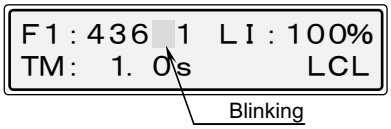
(5) Press LIGHT CONTROL to move the cursor to the right.

(6) Press ▼DOWN or ▲UP until "6" appears at the cursor.



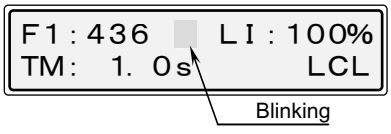
(7) Press LIGHT CONTROL to move the cursor to the right.

(8) Press OPEN/CLOSE to change the current character to a space.



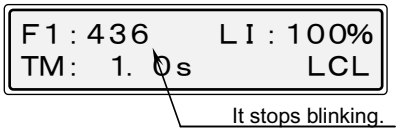
(9) Press LIGHT CONTROL to move the cursor to the right.

(10) Press OPEN/CLOSE to change the currentcharacter to a space.



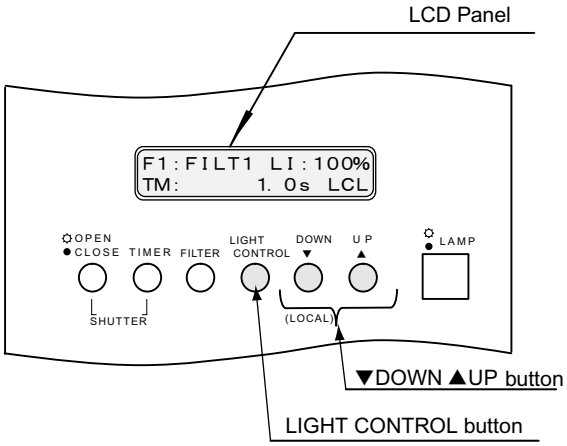
(11) Press the blinking FILTER button.

- The TIMER, LIGHT CONTROL, ▼DOWN, and ▲UP buttons turn off.



Attenuating the light intensity

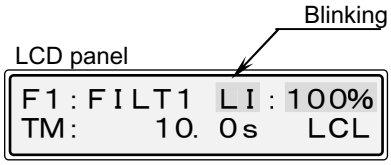
Attenuation of the light intensity is achieved using the circular variable ND (neutral density) filter. The resulting intensity ranges from 100% down to 5%.



Example: To attenuate the light intensity to 25 %.

(1) Press the LIGHT CONTROL button.

The LIGHT CONTROL, ▼DOWN and ▲UP buttons light up green.

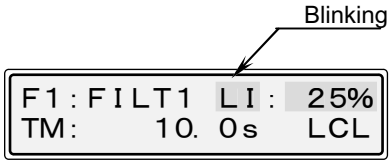


The default setting is "LI: 100%".

(2) Set the light intensity to "LI: 25%" by pressing ▼DOWN or ▲UP until the value displayed equals 25%.

- Press ▲UP to increase the light intensity value.
- Press ▼DOWN to decrease the light intensity value.

【Setting range：5～100%】



(3) Press the lit LIGHT CONTROL button.

- The LIGHT CONTROL, ▼DOWN and ▲UP buttons turn off.

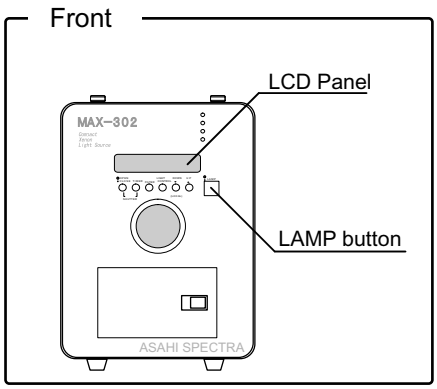
*The settings are stored in the memory.

Caution: The xenon lamp is on while the light intensity is being set.

Ending operation

Caution	Once the lamp is turned off, wait at least 15 minutes before turning it on again.

Turning off the lamp



(1) Press the LAMP button.

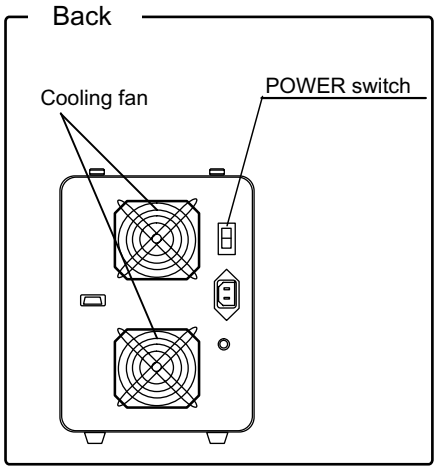
- The LAMP button turns off, indicating that the lamp has turned off properly.

*The cooling fan will continue to run after the lamp has turned off.

Caution: The lamp cartridge will be hot after the lamp is turned off. Allow it to cool completely (about 10 minutes) before proceeding to turn off the main power.

Caution	The lamp is hot after the lamp is turned off. Cool it down completely. Otherwise it may result in damage to the unit and burn injury.

Turning off the main power



(2) Turn off the main power switch.

- The LCD panel turns off.
- The cooling fan stops running.

Caution: Verify the following before you disconnect the AC cable from the unit.

- LCD panel is turned off.
- LAMP button is turned off.
- POWER switch is turned off.

Caution	Grasp the plug firmly and pull the plug, not the cable, when unplugging the AC power cable.

Caution	Do not touch the plug with wet hands, as this may result in electric shock or damage to the unit.

Replacing the lamp cartridge

Caution	The lamp gets high temperature after turned off, Cool it down completely, to avoide the risk of Otherwise it result in damage to the unit and burn injury.

Warning	Handle the lamp with extreme care. Do not drop, hit, bump, or scratch the lamp. Doing so may cause the lamp to explode due to its high internal pressure.

Precautions for handling the lamp cartridge

- Do not touch the xenon lamp, electrodes or heat sink with your bare hands. Touching these surfaces will leave a residue that will turn to soot due to the lamp's high temperature, decreasing the lamp brightness.
  We recommend that you wear fabric gloves when handling the xenon lamp.

- Do not replace the lamp cartridge until the xenon lamp is completely cooled. During operation and immediately after the lamp is turned off, the lamp cartridge is extremely hot.

- Before replacing the lamp cartridge, always turn off the main power and disconnect the AC cable from the outlet to avoid risk of electric shock.

- Do not attempt to remove the xenon lamp from the lamp cartridge. The xenon lamp and lamp cartridge are assembled as a single unit.
  Pack up the used lamp cartridge carefully and send it our refurbishment department. We will install a new lamp in the lamp cartridge and ship the refurbished cartridge back to you.

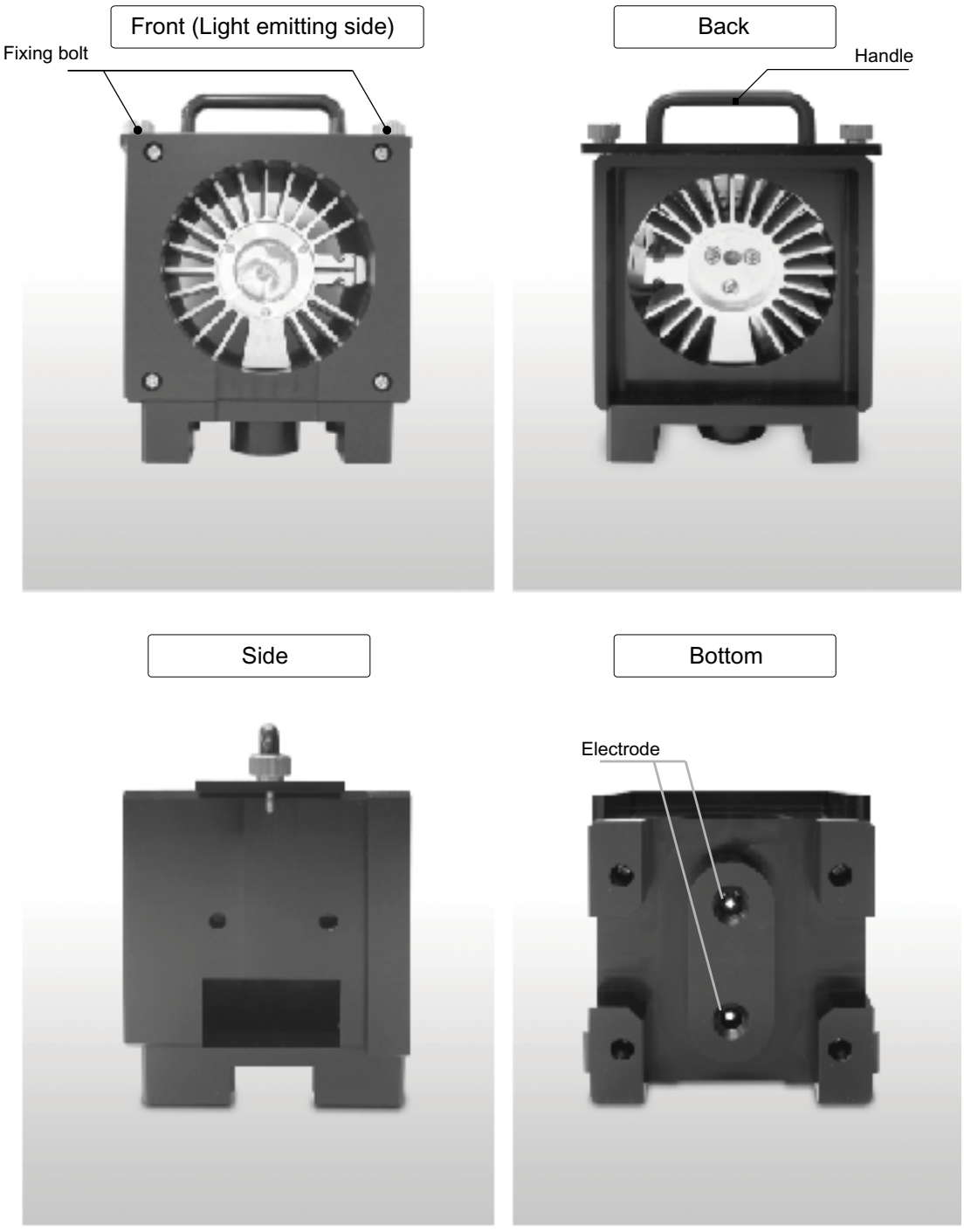
- Lamp refurbishment will take about 2~4 weeks. We recommend that you send us a lamp cartridge for refurbishment before it has reached 500 hours of use.

- If operating the MAX-302 continuously (24 hours/day), we recommend keeping a spare lamp cartridge available to avoid disruption while a lamp cartridge is being refurbished.

- 25kV is generated momentarily at the negative electrode of the lamp; therefore, be sure that the lamp cartridge is completely inserted and that both fixing bolts are securely fastened to the top cover.

Replacing the lamp cartridge

Part names for the lamp cartridge

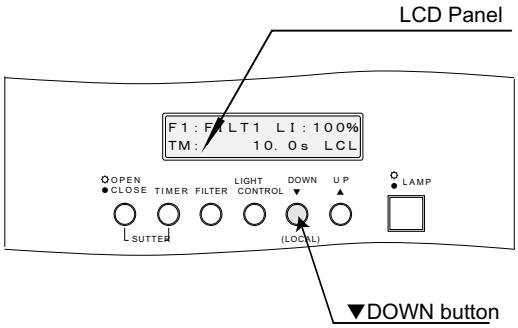


Replacing the lamp cartridge

Checking the lamp usage hours

⚠ Caution	Continuing to use the lamp beyond its rated lifetime (500 hours) may result in damage to the power supply or electrical system. We recommend that you replace the lamp as soon as it reaches 500 hours of use. The lamp is guaranteed to maintain at least 50% of its initial light intensity during its rated lifetime.

⚠ Caution	Do not attempt to reset the lamp usage hours except for the lamp refurbishment.

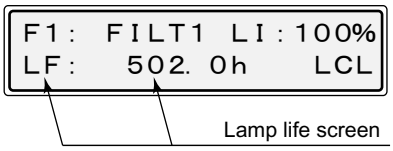


Display the lamp life screen.

Press the ▼DOWN (LOCAL) button.

LCD panel

- The LCD panel displays the lamp life screen.



The default setting is "0.0h".
*We recommend replacing the lamp
when the total hours used exceeds 500 hours.

Return to the initial screen.

Press the ▼DOWN (LOCAL) button while the lamp usage screen is displayed.

- The LCD panel returns to the initial screen.

Replacing the lamp cartridge

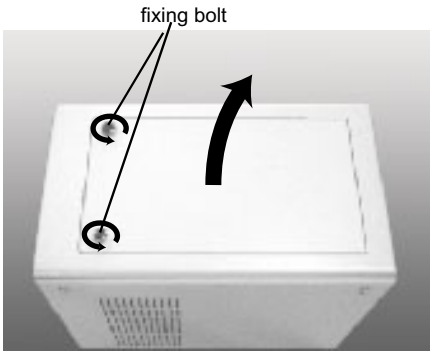
Removing the used lamp cartridge

(1) Make sure of the following before replacing the lamp cartridge.

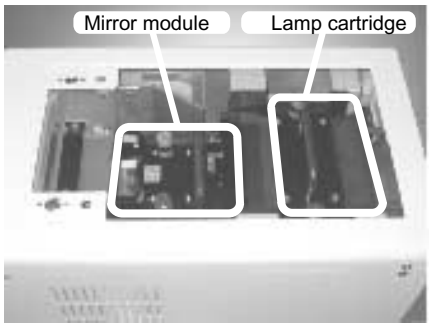
Caution	The lamp gets high temperature after turned off, Cool it down completely, to avoide the risk of Otherwise it result in damage to the unit and burn injury.
Caution	Before replacing the lamp, unplug the AC power cable from the power outlet, to avoid risk of electric shock.

(2) Loosen 2 fixing bolts and remove the top cover.

* These are captive bolts. They will not fall off when loosened.

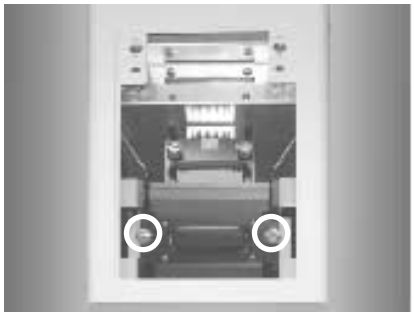


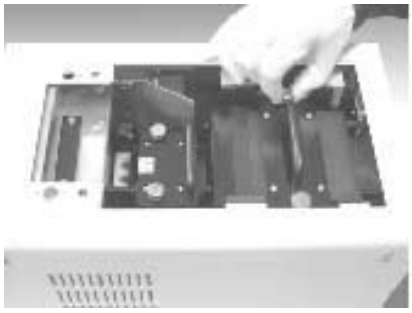
* You can also replace a mirror module when the top cover is removed.



(3) Loosen 2 fixing bolts of the lamp cartridge.

* These are captive bolts. They will not fall off when loosened.





(4) Hold the handles of the lamp cartridge firmly and pull it out.

* If you cannot pull it out, the fixing bolts may not be sufficiently loosened.

Send the used lamp cartridge to our refurbishment dept.
We will replace the lamp and send it back to you.

Caution	Arc lamps that are used beyond their rated lifetime are generally difficult to light up and may explode.

Replacing the lamp cartridge

Mounting the lamp cartridge

(1) Make sure of the following before replacing the lamp cartridge.

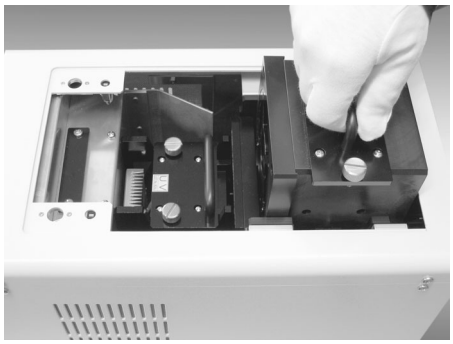
Caution	Before replacing the lamp, unplug the AC power cable from the power outlet, to avoid risk of electric shock.

(2) Insert the lamp cartridge into the main unit.

- Check that the new lamp cartridge is facing in the proper direction.
- The front side of the lamp cartridge shoud face the front side of the main unit.

Slide the lamp cartridge down along the guide rail until the cartridge stops and is firmly seated.

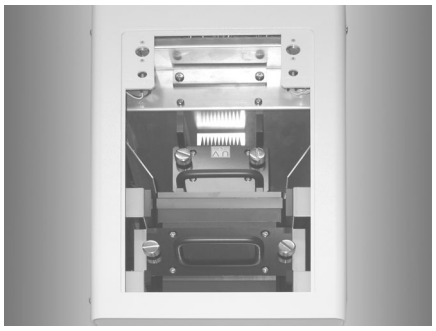
Front

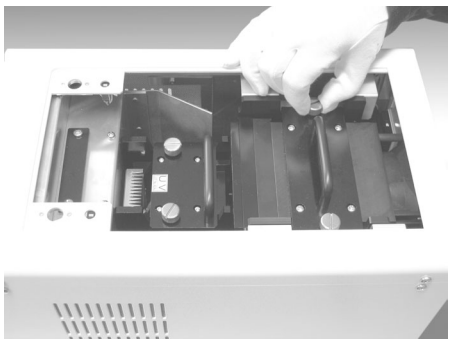


(3) Tighten 2 fixing bolts of the lamp cartridge.

* The fixing bolt cannot be tightened unless the lamp cartridge is properly seated. Make sure that it is completely inserted into the main unit.

* Failure to tighten the fixing bolts securely may result in failure when the main power or lamp is turned on. Make sure the fixing bolts are securely tightened

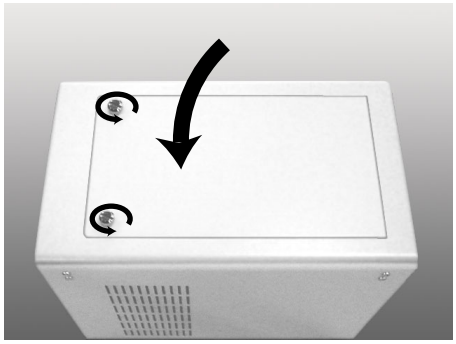




(4) Mount the top cover.

- Mount the top cover and tighten the fixing bolts.

Caution: The top cover may become warped if the lamp cartridge is not inserted completely in the main unit.



(5) Turn on the main power.

- Connect the AC power cable and turn on the main power.

* If a failure occurs during lamp replacement, the safety function will be activated and the LAMP ALARM warning lamp will light up.

(6) Finish.

Replacing the lamp cartridge

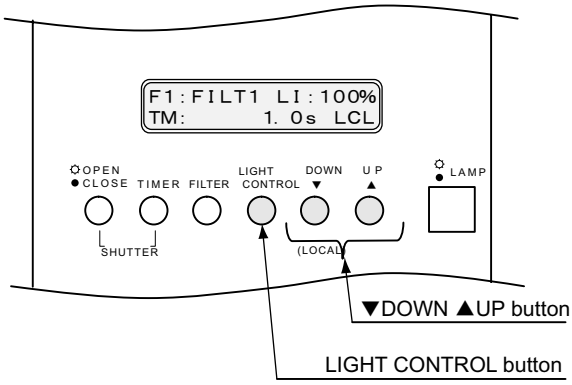
Resetting the lamp usage hours

⚠ Caution	Continuing to use the lamp beyond its rated lifetime (500 hours) may result in damage to the power supply or electrical system. We recommend that you replace the lamp as soon as it reaches 500 hours of use. The lamp is guaranteed to maintain at least 50% of its initial light intensity during its rated lifetime.

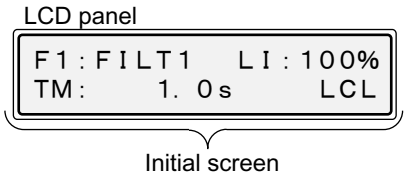
⚠ Caution	Do not attempt to reset the lamp usage hours except for the lamp refurbishment.

The following explains how to reset the lamp usage hours (the total number of hours that the lamp has been used) when you replace the lamp.
The counter does not reset automatically when the lamp is replaced; you must reset it to return the counter to zero.

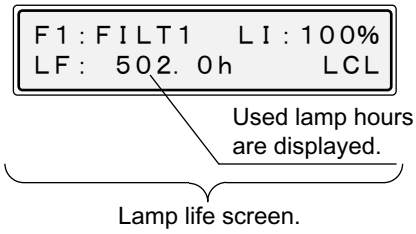
* Turn on the main power and turn off the lamp when you reset the lamp usage hours.



(1) Press the ▼DOWN (LOCAL) button.
（During Initial screen)



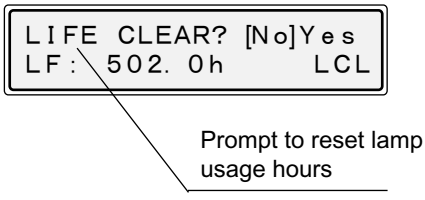
- The LCD panel displays the lamp life screen and displays the total lamp usage hours.
  The default is "0.0h".



(2) Press and hold the LIGHT CONTROL button for at least 2 seconds.

- The LIGHT CONTROL button turns on.
- The ▼DOWN and ▲UP buttons light up green.。

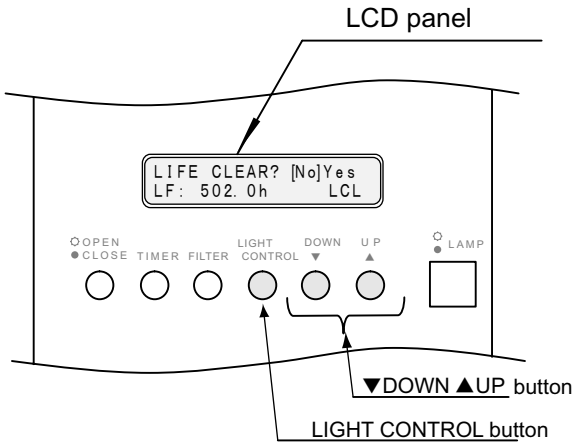
- The LCD panel prompts for confirmation of reset by displaying: LIFE CLEAR? [No] Yes



Continued to the next page

Replacing the lamp cartridge

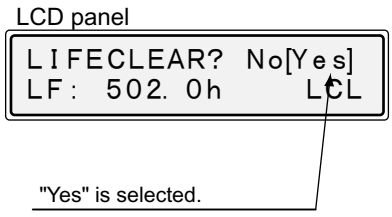
Resetting the lamp usage hours



(3) Press the ▲UP button to move the cursor to "Yes".

- [ ] moves to Yes.

* Press the ▼DOWN button and select "No" if you do not want to reset the lamp usage hours.

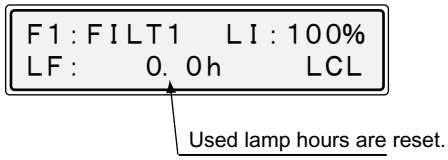


(4) Press the LIGHT CONTROL button to confirm your selection (Yes or No).

* Taking this action finally decides your selection.

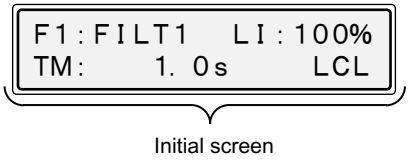
- The LIGHT CONTROL button turns off.
- The ▼DOWN and ▲UP buttons turn off.

- The LCD panel returns to the lamp usage screen.
- The lamp usage display reads "0.0h".



(5) Press the ▼DOWN button.

-The LCD panel returns to the initial screen.



Finish.

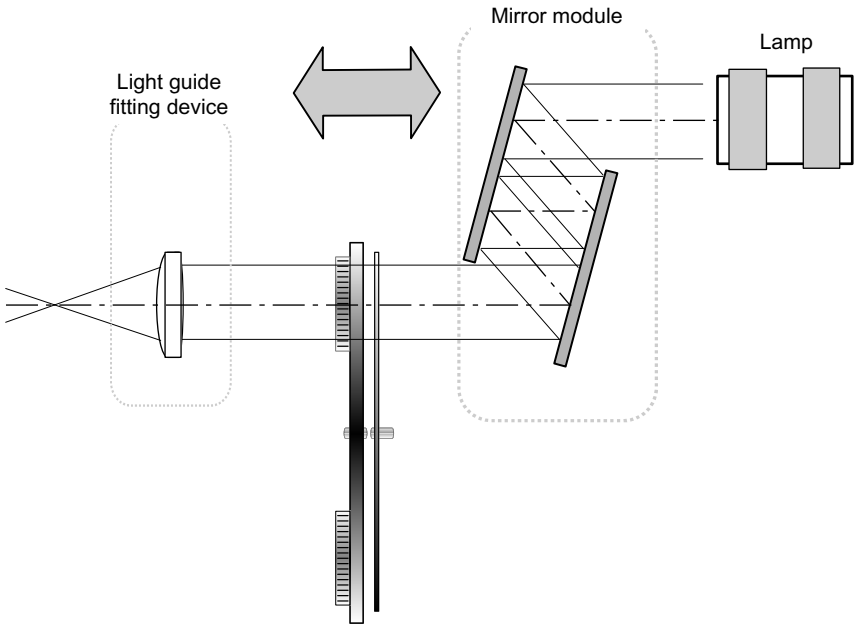
Replacing the mirror module

Combination of the mirror module and the light guide fitting device (condenser lens)

Prohibited	Do not touch the optical components such as lens, lamp, mirror with bare hands.

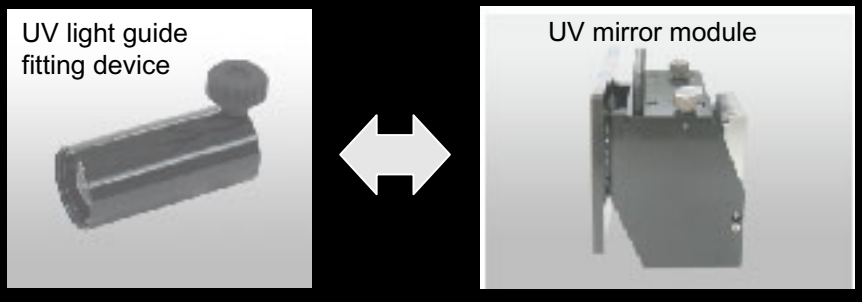
The mirror module and light guide fitting device (condenser lens) are designed for maximum performance in both UV and VIS combinations.

Confirm that the light guide fitting device is of the same type (UV or VIS) as the mirror module. Failure to match types will result in decreased performance of the MAX-302.

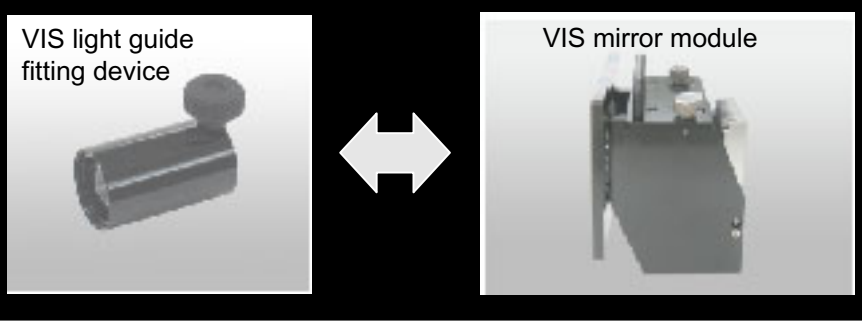


- The light guide fitting device is available in two types: UV and VIS.
- The UV type is assembled with quartz, and the VIS type is assembled with BK7 as a lens material.
- Both the mirror module and the light guide fitting device have labels that indicate their type (UV or VIS). Before using them in combination, be sure that these labels match.

UV combination



VIS combination



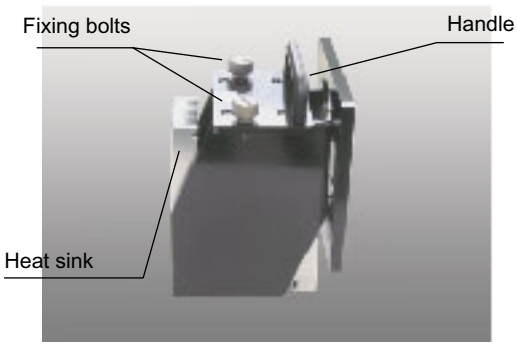
Changing the mirror module

Removing the mirror module

(1) Make sure of the following before changing the mirror module.

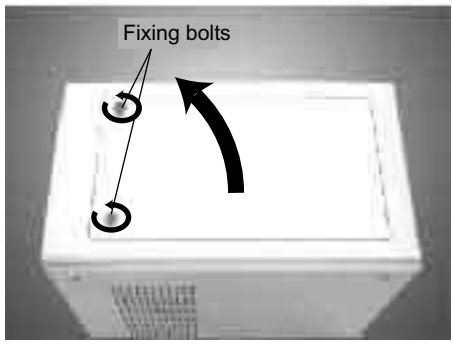
- The unit has completely cooled down.
- The Main power switch is turned off.
- The AC cable is not connected to an outlet.

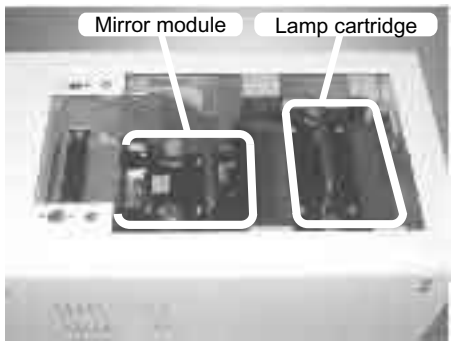
Part names of the mirror module



(2) Loosen 2 fixing bolts and remove the top cover.

* These are captive bolts. They will not fall off when loosened.
* You can also replace a lamp cartridge when the top cover is removed.





(3) Loosen 2 fixing bolts of the mirror module.

* These are captive bolts. They will not fall off when loosened.

(4) Hold the handles of the mirror module firmly and pull it out.

*If you cannot pull it out, the fixing bolts may not be sufficiently loosened.

Changing the mirror module

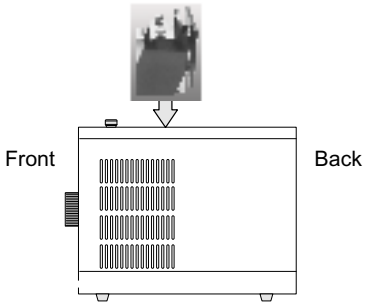
Mounting the mirror module

(1) Make sure of the following before replacing the mirror module.

- The unit has completely cooled down.
- The main power switch is turned on.
- The AC cable is not connected to an outlet.

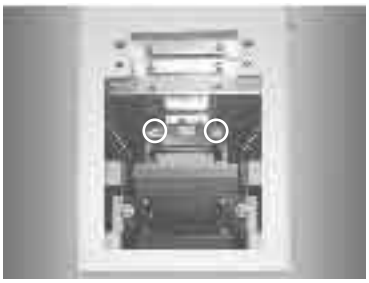
(2) Insert the mirror module into the main unit.

- Make sure that the mirror module is oriented properly.
- Carefully insert the module into the main unit, sliding the lamp cartridge downward along the guide rail.
- Verify that the mirror module is inserted completely and seated securely in position.



(3) Tighten the mirror module's two fixing bolts to secure it in place.

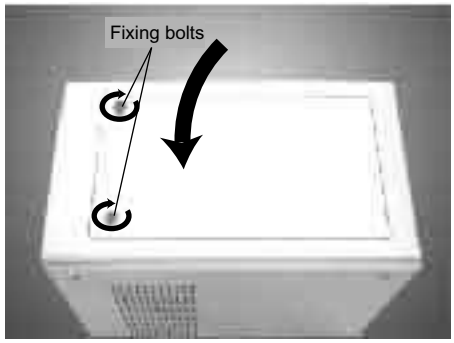
* The fixing bolts cannot be tightened unless the mirror module is properly seated. Be sure that the module is inserted completely.



(4) Replace the top cover and tighten the fixing bolts.

Caution: The fixing bolts cannot be tightened if the mirror module is not inserted completely.

* If the top cover is not mounted properly, safety function will be activated and the DOOR OPEN warning lamp will light up.



(5) Finish.

Care and storage

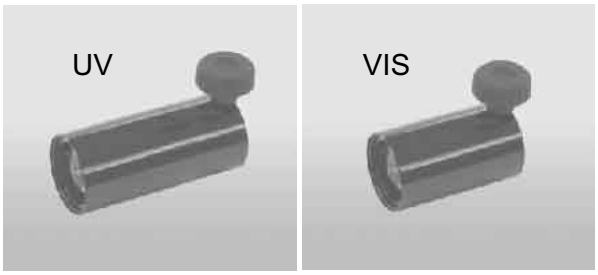
Care and cleaning

Prohibited	Do not touch the optical components such as lens, lamp, mirror with bare hands.

Main Unit
- Use a dry, soft cloth to wipe away grime and dust
- Use a cloth lightly dampened with water to clean the case

Options
For maximum performance, keep glass surfaces (optical filters, lenses, the end of the light guide, etc.) clean. Wipe with a clean cloth lightly dampened with alcohol.

Light guide fitting device



Comes fully assembled with our original-design lenses

Light guide

The end surfaces of the light guide are polished flat.

Optical filter

Collimator lens

Caution: Be especially careful when handling an optical filter, as its surface is easily damaged. Contact us if you have questions on maintenance of accessories.

Storage

Do not store the main unit in a location subject to any of the following conditions, as these may lead to a loss of performance:
- Vibration and shock
- Direct sunlight
- High humidity or dust levels
- Temperatures below 10℃(50℉) or above 35℃ (95℉)
- Day/night temperature fluctuations

- Store accessories in a hard container to protect them from damage.
- Do not bend the Light guide sharply when storing it after use. Once the light guide is broken it cannot be repaired.

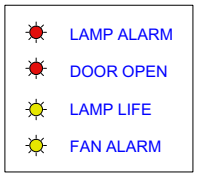
Troubleshooting

If you experience a problem while operating the MAX-302, consult the following information to help determine the cause of the problem and its solution. If the problem is not listed below, or if the problem is not user-solvable, contact us for repair information.

Prohibited	Do not disassemble or modify the unit or lamp. Injury, fire, or electric shock may result from improper handling of components.

IMPORTANT
Be sure to contact Asahi Spectra for all repair work. Your unit's performance will no longer be guaranteed if repairs are done by any company or individual other than Asahi Spectra.

Troubleshooting

Problem	Troubleshooting
Lamp cartridge cannot be removed.	Loosen 2 fixing bolts completely.
No light is being emitted from the aperture.	Is the POWER switch turned on? → Turn on the main power switch.  Is the LAMP button lit up green? → Press the LAMP button for more than 1 second until it lights up green.  Is the OPEN/CLOSE button lit up green? → Press the OPEN/CLOSE button so that it lights up green. The shutter will be opened. Is the top cover properly closed? → Interlock function is activated. Mount the top cover properly. Do the lamp used hours exceed the lamp life? → The lamp life is 500 hours. If it is already over 500 hours, replace the lamp with a new one and reset the hour meter. Are any of the warning lamps turned on? → Refer to P.37. 
The light emission timer cannot be set.	Is the previous operation finished? → Complete or cancel the previous operation. Is "TM" blinking? → Press the TIMER button for more than 2 seconds. "TM" will then blink, allowing you to set the timer.

Troubleshooting 2

Troubleshooting

Problem	Troubleshooting
Filter wheel is not working.	Is "F x" blinking? → Press the FILTER button for more than 2 seconds. "F x" will then blink, allowing you to operate the filter wheel. Is the previous operation finished? → Complete or cancel the previous operation.
Light intensity cannot be set.	Is "LI" blinking? → Press the LIGHT CONTROL button. "LI" will then blink, allowing you to set the light intensity. Is the previous operation finished? → Complete or cancel the previous operation.

Troubleshooting for error messages

Error message	Error	Troubleshooting
SHUTTER UNIT ERROR	The shutter has stopped at an improper position.	Switch off the power and turn on the power switch again.
ND UNIT ERROR	The circular variable ND filter has stopped at an improper position.	Switch off the power and turn on the power switch again.
FILTER UNIT ERROR	The filter wheel has stopped at an improper position.	Switch off the power and turn on the power switch again.
EEPROM Data Init・・・・ ――― Hit Any Key―――	An error was detected with data in internal memory.	Press any key to continue. The system will restore but all data will be deleted. Settings will return to the default settings.
MAX-302 Ver : 1.00 EEPROM Data Restore	An error has been detected in the main data; however, the data will be automatically restored.	No operator action required.
MAX-302 Ver : 1.00 EEPROM Data Stock	Main data is different from backup data. Data will be copied automatically from main data to backup data.	No operator action required.
――― Emergency Stop ―――	The system has received an "EMG" command from the remote computer or the remote computer has stopped operating.	Switch off the power and turn on the power switch again.

If the information listed above does not resolve the problem, contact us for assistance.

If the warning lamps are turned on

The MAX-302 has warning lamps that light up when certain conditions are detected.
The lamps and their indications are listed below.

Warning lamp	Indication when lit	Troubleshooting
☼ LAMP ALARM	The internal xenon light has failed to light up.	Make sure that the AC cable is properly connected to the outlet and the lamp cartridge is properly mounted. Make sure that the lamp cartridge is correctly mounted.
☼ DOOR OPEN	The unit's top cover is open. (Note: The xenon lamp is turned off when this condition is detected.)	Make sure that the top cover is properly closed.
☼ LAMP LIFE	The xenon lamp has been used for 500 or more hours.	Check the lamp usage hours. We recommend replacing the lamp cartridge once it has been used for over 500 hours.
☼ FAN ALARM	FAN ALARM is turned on when the cooling fan stops working or the temperature increases. *At the same time, the xenon lamp will be turned off.	Make sure that the cooling fan is working. If the cooling fan is stopped: Switch off the power and turn on the power switch again. If the cooling fan is working: The unit's internal temperature is too high. Check the cooling fan and air inlet and remove any obstructions. Let the fan keep running to cool the unit's interior.

* If the information listed above does not resolve the problem, contact us for assistance.

1) Regular service

We offer regular service to maintain the performance level of your MAX-302.
A fee is assessed for this service.
- The life of the circular variable ND filter and interference filter (optional) may be shortened by high humidity or temperature extremes. We recommend regular maintenance to ensure proper performance.
- If parts become dirty or scratched, system performance will be adversely affected.

2) Repair service and product warranty

- Contact us for repairs that may be covered under your warranty.
- If your unit is under warranty, we will repair the unit at no charge according to the terms of the warranty.
- If the warranty has expired, upon your request we will repair the unit for a fee, provided the unit is repairable.
- When shipping the unit to us for repair:
  - Pack the unit securely to allow it to withstand shock during handling.
  - Include a note that lists any accessories used and complete details on errors observed during operation.
  - We will repair a unit for 10 years past the date of manufacture. In certain cases, we will repair a unit beyond 10 years after manufacture.
- Specifications or software are subject to change without notice.

Note: All user-selected settings are reset during repair or maintenance service.
Be sure to note down your settings before sending back the unit for service.

3) Main unit and optional parts

Each unit undergoes a strict inspection before shipping. Inform us immediately if your unit has a manufacturing defect or was damaged during shipping.

4) Warranty policy

1. We will repair your unit without charge only if it has been operated as instructed in this manual.
2. The warranty period is one (1) year starting the day you take delivery of the product.
   However, for consumables such as a lamp, the expiration date of the lifetime or 1 year after the delivery, whichever comes first is applicable.
3. We do not cover damages resulting directly or indirectly from use of this product.
4. Repairs due to the following conditions will be charged whether or not the product is under warranty:
   (1) The product has been used or stored in an improper manner.
   (2) The product has been disassembled or repaired without our permission.
   (3) The product has been damaged by rough handling, natural disaster, electrical interference or an unforeseeable accident.
   (4) The product has been used in a manner other than its intended purpose.
   (5) The serial number cannot be identified.
5. The customer is responsible for all shipping charges, including those incurred by Asahi Spectra when returning the product to the customer. Shipping charges are not covered under the terms of the 1-year warranty.

* If you have a question about after-sales service, contact us.

Contact us

Tokyo Head Office (Japan)

Asahi Spectra Co.,Ltd.
Overseas Sales Department

Gardenia Bldg. 4F, 2-13-1, Kami-jujo, Kita-ku, Tokyo 114-0034 Japan
TEL:81-3-3909-1151FAX:81-3-3909-1152
Hours open : Mon - Fri 8:45 - 17:15 (Japan Time)
e-mail : info@asahi-spectra.com
website : http://www.asahi-spectra.com

US Office

Asahi Spectra USA Inc.

23505 Crenshaw Boulevard, Suite 229 Torrance, CA 90505 U.S.A.
TEL:310-530-5855
FAX:310-325-8974
Hours open : Mon - Fri 10:00 - 17:00 (Pacific Time)
e-mail : info@asahi-spectra.com
website : http://www.asahi-spectra.com

Tochigi Factory (Japan)

Asahi Spectra Co.,Ltd.
Manufacturing Department

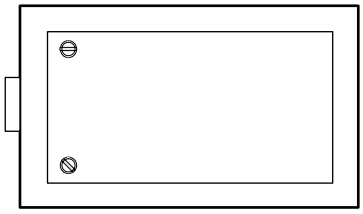
Kita-akada 1576, Nasushiobara-shi, Tochigi 329-2741
TEL:81-287-37-4079
FAX:81-287-37-4029
(Representative)TEL:81-287-37-4000 / FAX:81-287-37-4001
Hours open : Mon - Fri 8:30 - 17:00 (Japan Time)

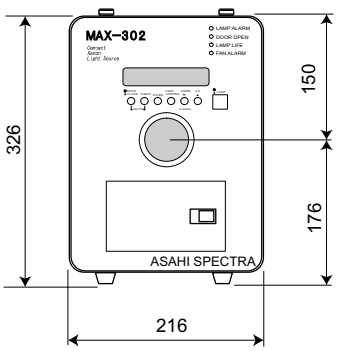
Specifications

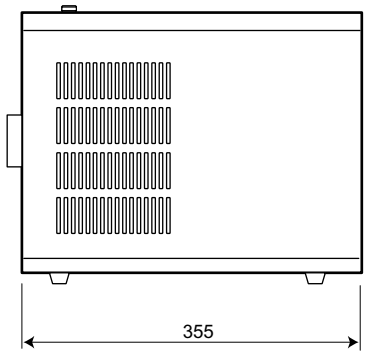
Main unit

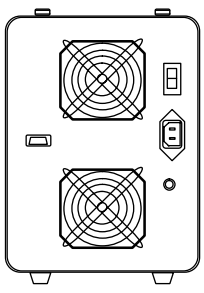
Model	MAX - 302
Circuit method	Forward converter switching
Input voltage	Rating : AC100 ~ 240V 50/60Hz
Power supply AC cable	3-pin plug with ground(withstand voltage AC100/200V)
Power consumption	1030VA (240V / 50Hz)
Lamp type	Xenon lamp 300W
Lamp voltage	14V(DC)
Lamp current	21A(DC)
Lamp life	500 hours
Cooling method	Forced cooling
Cooling fan	Back & upper side - Maximum airflow 2.50 m^3 /min. Back & lower side - Maximum airflow 1.56 m^3/min.
Shutter	Pulsed motor drive
Settable timer	0.1 - 99999.9 sec
Lamp maintenance	Free alignment (cartridge type)
Mirror module	2 types of UV and VIS
Attenuation of light	100 - 5%(T) : Continuously variable
Filter Wheel	8 holes : 25mm dia./t=6mm filter is usable
Remote control	RS232C
Warning lamp	A warning lamp lights up if any of the following is detected - Xenon lamp problem - Top door is open - Lamp usage exceeds 500 hours - Cooling fan problem
Interlock	The interlocking function is activated when the top cover is open.
Recommended environment	Temperature 10 - 35℃/ Humidity 20 - 80% (Avoid condensation)
Size	216(W) x 355(D) x 326(H)mm
Weight	14kg

Dimensions (mm)





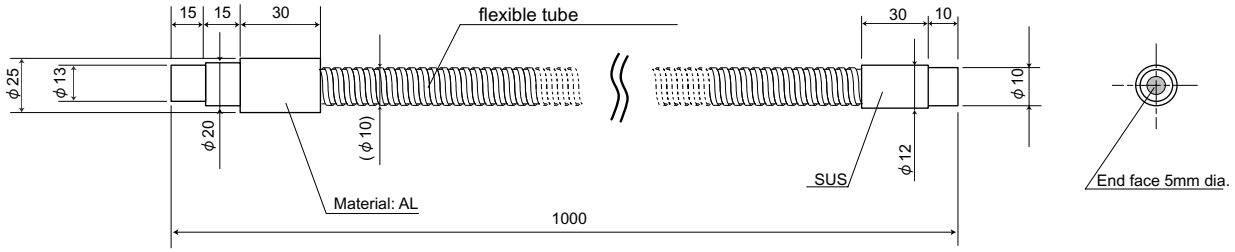




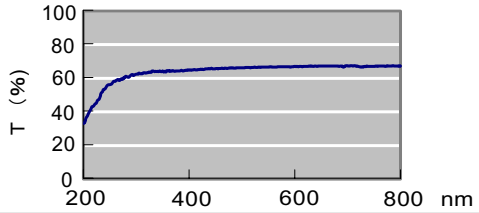
Specifications

Accessories

Optical light guide



Material	Quartz
Core / Clad diameter	190 μm / 200 μm diameter
N.A	0.2
Flexibility	R=50mm
Heat stability	Light receiving side 500℃ Light emitting side 150℃ Other parts 80℃

Spectral transmission	

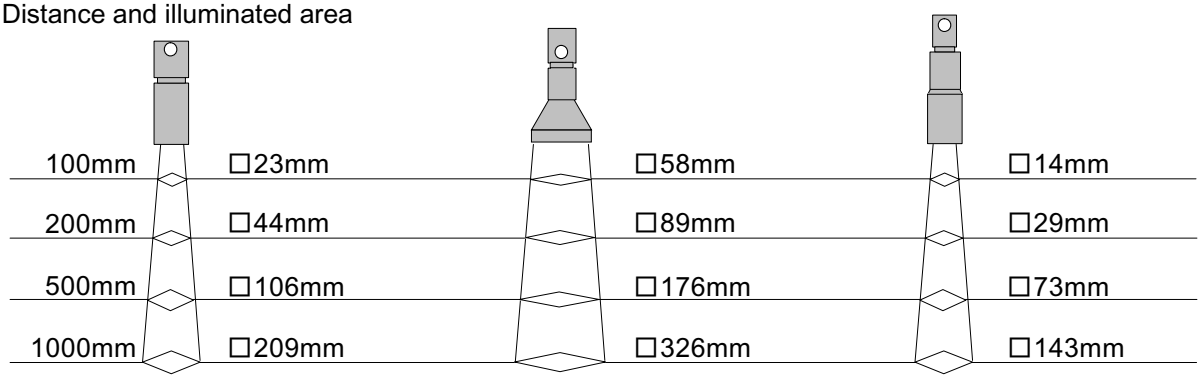
Collimator lens

Standard

Double illuminated area

Half illuminated area

Distance and illuminated area



Caution for accessory usage

Optical filter	- Wipe with a clean cloth lightly dampened with alcohol when cleaning the surface. - Turn off the main power when mounting the filter. - Use light pressure when wiping to avoid damaging glass surfaces.
Light guide	- Do not bend the Light guide sharply when storing it after use. Once the light guide is broken it cannot be repaired. - Do not touch the end surfaces of the light guide. If this should happen, wipe the surface with a clean cloth lightly dampened with alcohol.
Collimator lens	- Do not pull out forcefully when removing the collimator lens from the light guide. - Do not touch the end surfaces of lens. If this should happen, wipe the surface with a clean cloth lightly dampened with alcohol.

Contents of this instruction manual are subject to change without notice.

ASAHI SPECTRA

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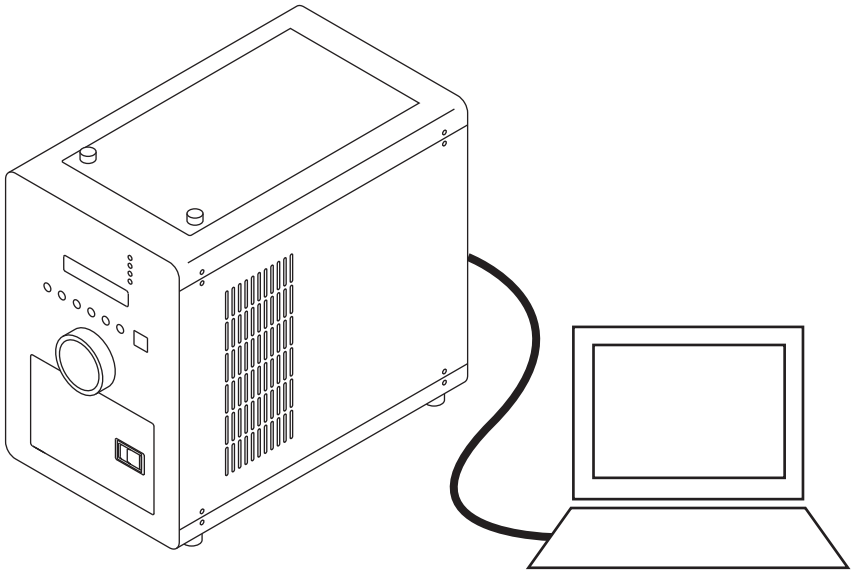
ASAHI SPECTRA USA

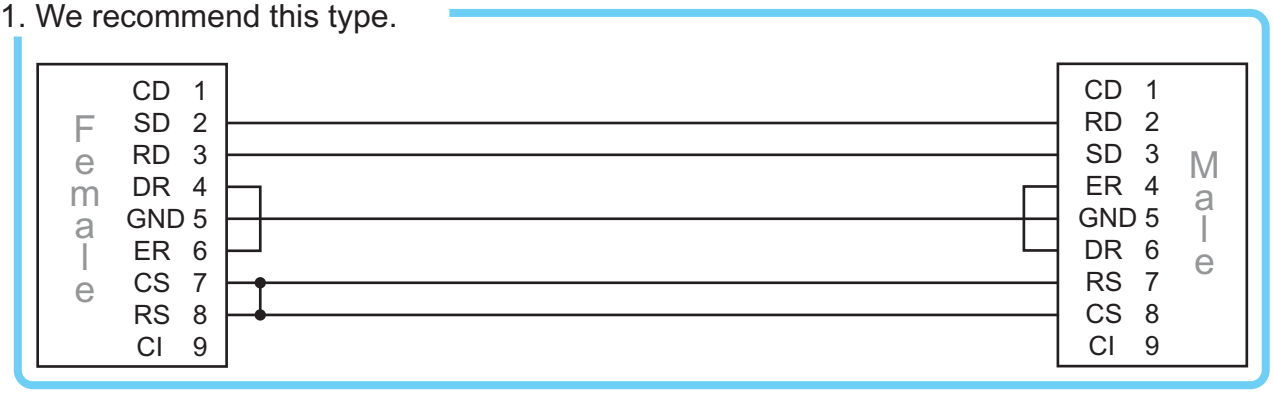
MAX-302 Xenon Light Source 300W
Control by remote computer



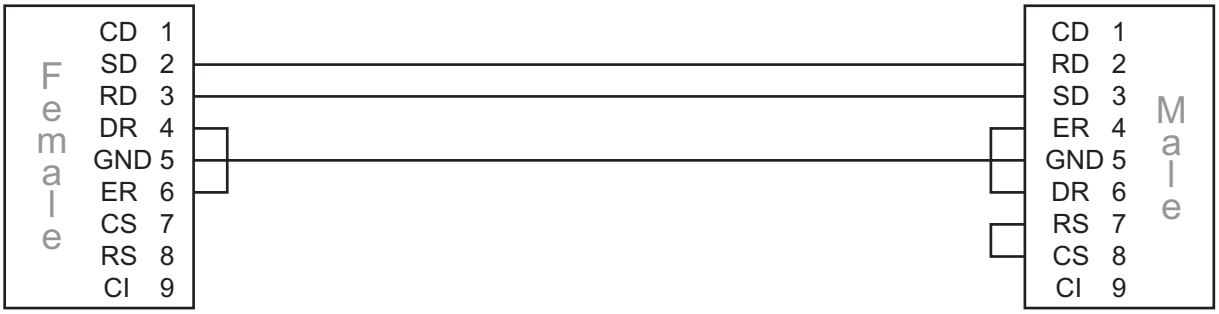
Type of communication cable (RS232C)

Light Source Side (DSUB9PIN) male PC Side (DUSB9PIN) female

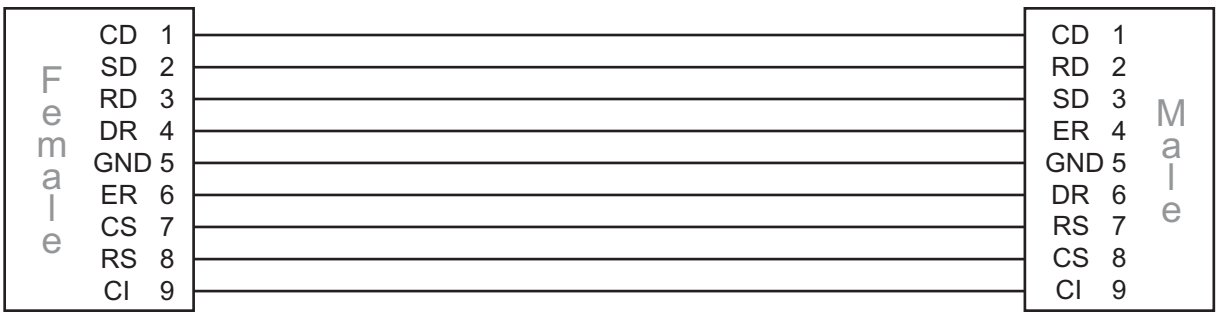
1. We recommend this type.



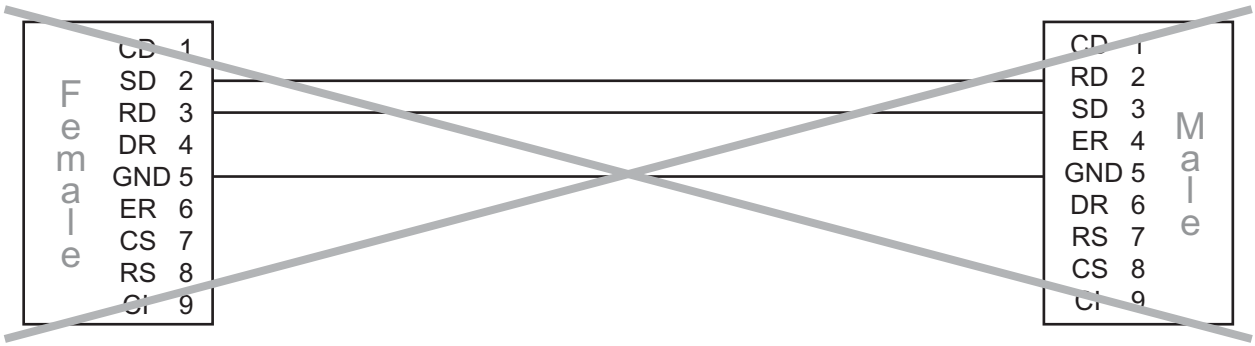
2. It is OK.



3. It is OK.



4. It dose not work.

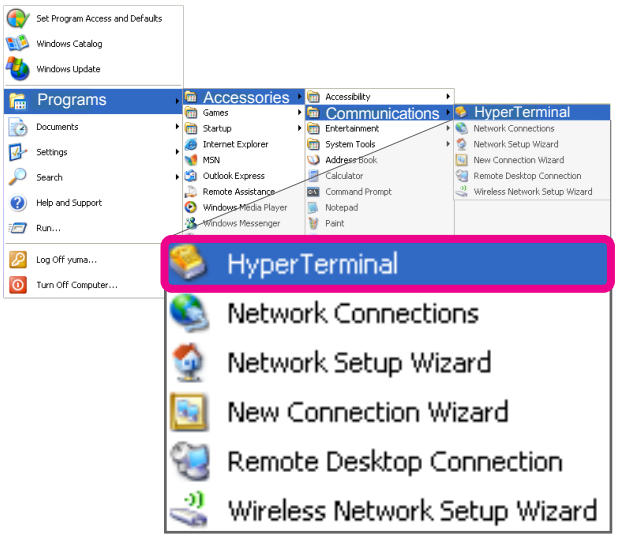


Setting up the communication

Ex) HyperTerminal

1.Select the “HyperTerminal”.

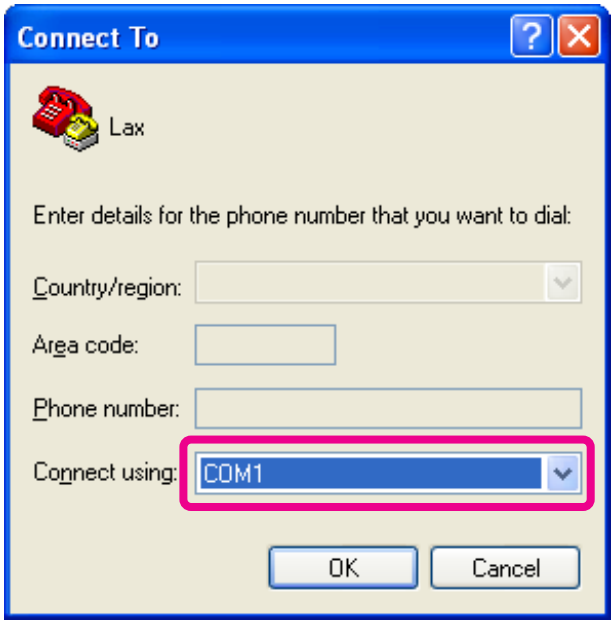
“Programs” ➡ ”Accessories”
➡ ”Communications” ➡ “HyperTerminal”



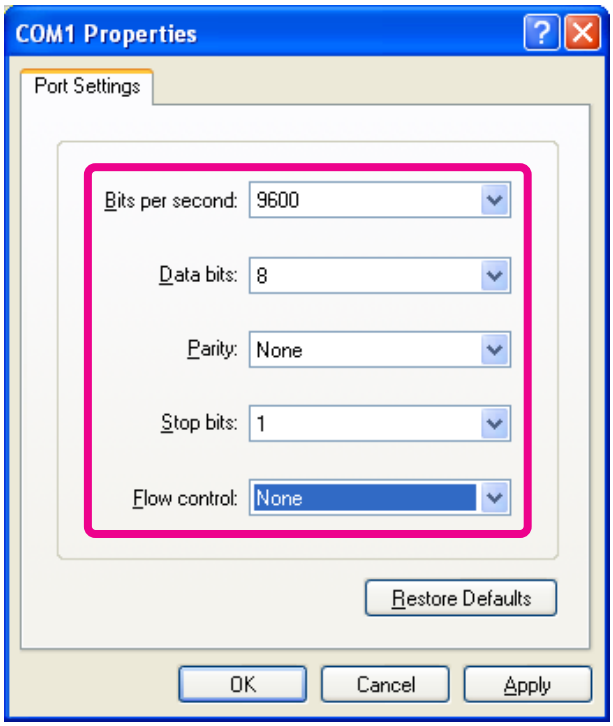
2.Set the file name and press ”OK”.

Setting up the communication

3.Select the communication port and press “OK”.

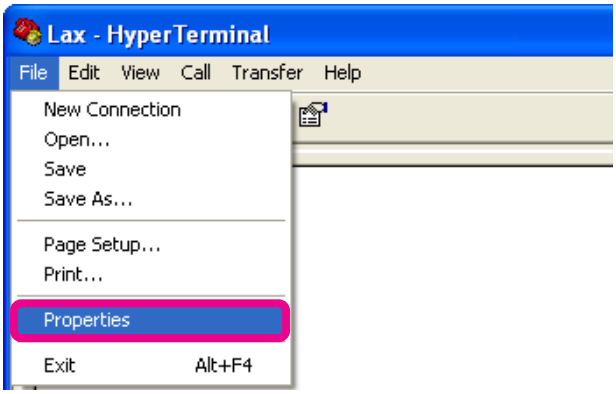


4.Set the detail of communication port as a right picture, and press “OK”.



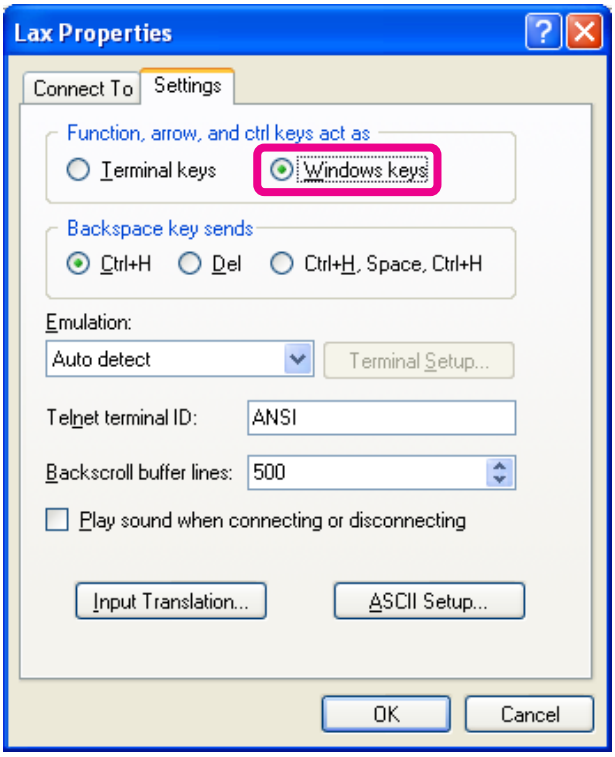
5.Select the “Properties”

“File” ➡ “Properties”

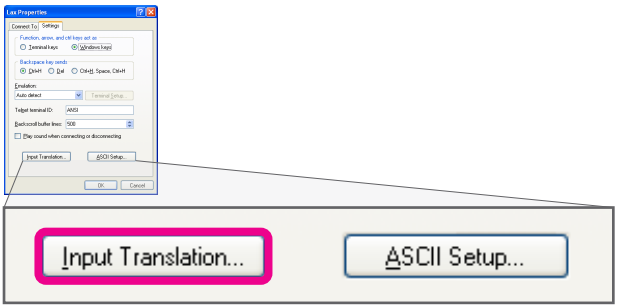


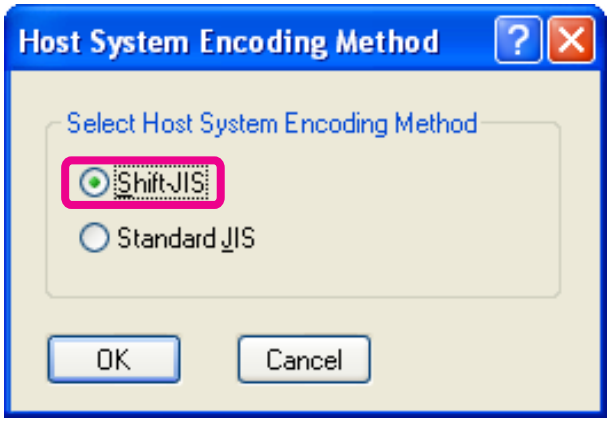
Setting up the communication

6.Select the “Windows keys”.



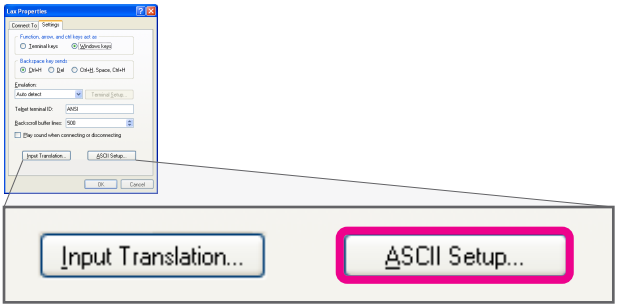
7.Press the “Input Translation...” and select the “Shift-JIS”.

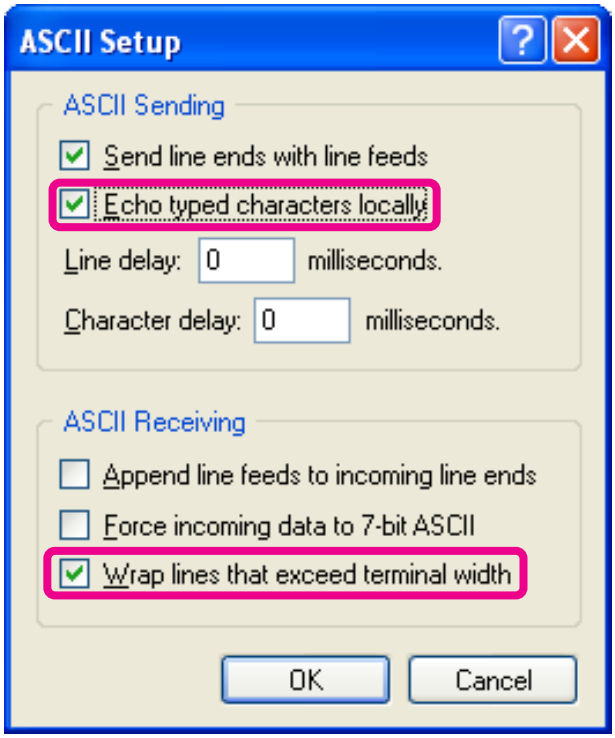




Setting up the communication

8.Press the “ASCII Setup...” and set the detail as a right picture.





Command list

Caution	Before connecting other instruments to the unit, make sure that the unit and the instruments being connected are all powered off, to avoid risk of electric shock.

Rules and hints on remote control commands:
- Commands and queries must be submitted using half-width alphanumeric characters.
  The characters must be all uppercase or all lowercase. Do not mix uppercase and lowercase characters.
- Replies are displayed only in uppercase characters.
- the system enters remote mode When the first remote command is received.
- the system remains in remote mode until the cancel command is submitted or
  the vDOWN(LOCAL) button is pressed.

Note: The OPEN/CLOSE and LAMP buttons remain functional during remote mode.

(1) Communication parameter

Transmission speed	9600 bps
Data format	8 bit
Parity	Not used
Terminator	[CR][LF]

(2) Code and its meaning

nnn	Positive number
nnn.n	Positive number with 1 decimal place
[x | y]	x or y

- the characters must be all uppercase or all lowercase.
  Do not mix uppercase and lowercase characters. Example: [Life?]
- the Reply is always in uppercase characters only.
- A space between the command and argument is optional.

(3) Command list

Open and close the shutter.	Command form	S[1 | 0]	Open and close the shutter. [1:Open | 0:Close]
	Reply	OK	The command is properly executed.
	Query form	S?	Request the shutter state (open/closed).
	Reply for query	SHUTTER xxx	The shutter state is displayed with "xxx" set to: "OPEN" (shutter open) / "CLOSE" (shutter closed)

Set the shutter timer	Command form	Tnnn.n	Set the shutter timer. nnn.n = 0.1-99999.9 (seconds)
	Reply	OK	The command is properly executed.
	Query form	T?	Request the value of the timer setting.
	Reply for query	Tnnn.n[s]	The timer setting is displayed.

Start the shutter timer.	Command form	TS	Start the shutter timer.
	Reply	OK	The command is properly executed.
	Query form	No command	(Use T? for timer setting and S? for shutter state)
	Reply for query	No command	

Stop the shutter timer	Command form	TP	Stop the shutter timer
	Reply	OK	The command is properly executed.
	Query form	No command	
	Reply for query	No command	

Change the position of filter wheel	Command form	Fnnn	Change the position of filter wheel. nnn = 1-8
	Reply	OK	The command is properly executed.
	Query form	F?	Request the position of the filter wheel.
	Reply for query	Fnnn xx	The filter wheel position is displayed: Nnn:filter no. Xx:name

Command list

Register the name of filter.	Command form	FL xx	Register the name of selected filter. Xx: alphabet up to 8 digit. Refer to "List of registerable characters" on P.25
	Reply	OK	The command is properly executed.
	Query form	No command	(Use F? to request the position of the filter wheel)
	Reply for query	No command	

Attenuate the light	Command form	LInnn	Attenuate the light. nnn = 5-100 (%)
	Reply	OK	The command is properly executed.
	Query form	LI?	Requests the light intensity setting.
	Reply for query	LInnn	The light attenuation level is displayed.

Turn on/off the lamp.	Command form	PW[1 | 0]	Turn on/off a lamp. [1:ON | 2:OFF]
	Reply	OK	The command is properly executed.
	Query form	PW?	Inquire the state of lamp.
	Reply for query	LAMP xxx	The lamp state is displayed with "xxx" set to: "ON" / "OFF"

End remote mode operation	Command form	L	End remote mode operation.
	Reply	OK	The command is properly executed.
	Query form	No command	
	Reply for query	No command	

Inquire the lamp used hours	Query form	LIFE?	Request the lamp usage hours
	Reply for query	LIFE nnn[h]	The lamp usage hours is displayed with "nnn" set to the total number of hours

(4) Error message

ERROR COMMAND	Command error. Occurs when: - Invalid command (command not found in the above list) - Command contains mixed-case characters (both uppercase and lowercase)
ERROR RANGE	Argument (number) error. Occurs when: - Argument is out of range (beyond settable value)
ERROR EXECUTE	Execution error. Occurs when the PW command is issued under the following conditions: - Lamp cartridge is not mounted - Top door is open - Cooling fan is stopped - Lamp usage hours has exceeded 500 hours
ERROR ARGUMENT	Occurs when: - No argument is set - Incomplete argument is set

(5) Emergency stop

EMG	Remote mode is canceled and all operations are stopped. Lamp is immediately turned off.

*Turn off the main power switch after the emergency stop.

(6) Emergency stop using control buttons on unit

If the LAMP or OPEN/CLOSE button is pressed during remote mode,
the internal lamp turns off and the unit enters emergency stop mode.
To restart operation, press the LOCAL button.

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