

Instruction Manual

An ultraviolet sensor mounting high-reliability ultraviolet-to-visible wavelength conversion glass

UV-300K

Thank you for placing your order with us, Sumita Optical Glass.

Please ensure that you first read this instruction manual carefully and understand the correct usage of this product.

1. Main specifications

● Sensor head

Model*	UV-T365/T365W	UV-T254/T254W	UV-L	UV-S
Characteristics	Heat-resistant		Long sleeve	Short sleeve
Measurement in wavelength	300–380 nm	170–380 nm		
Temperature drift	$\leq -0.1\%/^{\circ}\text{C}$			
Operating ambient temperature	–40 to +300°C (No condensation or freezing)		–40 to +150°C (No condensation or freezing)	
Operating ambient humidity	35–85% RH			
Materials	Ultraviolet-to-visible wavelength conversion glass, stainless steel			
Accessories	M6 nuts, washers			

● Light guide

Model	UV-H	UV-F
Characteristics	Heat-resistant	Free cut
Operating ambient temperature	–40 to +300°C* (No condensation or freezing)	–40 to +70°C (No condensation or freezing)
Storage temperature	–40 to +70°C	
Operating ambient humidity	35 to 85% RH	
Total length	2 m (including UV protection tube)	2 m (UV protection tube is mounted onto 1m from its end)
Materials	Multi-component glass, stainless steel	Acrylic, polyethylene, stainless steel

* Heat resistance of the area of the light guide at the amplifier side is +70°C.

● Amplifier unit

Type	UV-300K
Measurement range in power*	UV-T254: 0.1–30 mW/cm ² , UV-T254W: 0.01–3 mW/cm ² at 254nm UV-T365: 3–900 mW/cm ² , UV-T365W: 0.3–90 mW/cm ² at 365nm
Power supply voltage	12–24 VDC ±10% (ripple P-P ≤10%)
Current consumption	≤50 mA
Light intensity value display	3-digit LED, light intensity mode: 0–125%, integral mode: 0–200%
Operation indicator light	Red LED (lit when detection output is ON)
Detection output	NPN open collector (30 V DC, ≤100 mA) Residual voltage ≤1 V (at 100 mA), ≤0.4 V (at 16 mA) Light intensity mode: ON when light intensity is at or below set value Integral mode: ON from integration starts until reaching set value
Answer back Output	NPN open collector (30 V DC, ≤100 mA) Residual voltage ≤1 V (at 100 mA), ≤0.4 V (at 16 mA) Output 1 pulse (1 sec) when remote teaching ends properly
Analog output	1–5 V (≥10 KΩ load resistance), 4–20 mA (≤250 Ω load resistance)
External teaching Input	ON: 0–1.5 V (0 V short circuit current ≤1 mA)
External reset input	OFF: open or 4–30 V
Protection circuit	Power source reverse connection protection, detection output circuit short protection
Sensitivity setting	Teaching (Set 100% value with a switch or external input)
Threshold value setting	Set % value by 1% with a switch Light intensity mode: 10–100% Integral mode: 10–200%
Repeat accuracy	±2.0% F.S.
Temperature drift	±0.1% F.S./°C
Response time	≤300 ms
Operating ambient temperature	–25 to +55°C (No condensation or freezing)
Operating ambient humidity	35 to 85% RH
Insulation resistance	≥20 MΩ with 500 V DC mega, between charging site and case
Withstand voltage	1000 V AC for 1 minute, between charging site and case
Protection structure	IP40
Cable	0.15 mm ² shielded 7 core cabtyre cable, Dia. 5.5 × 2 m
Material	Heat-resistant ABS (case), polycarbonate (cover)
Weight	Approx. 140 g

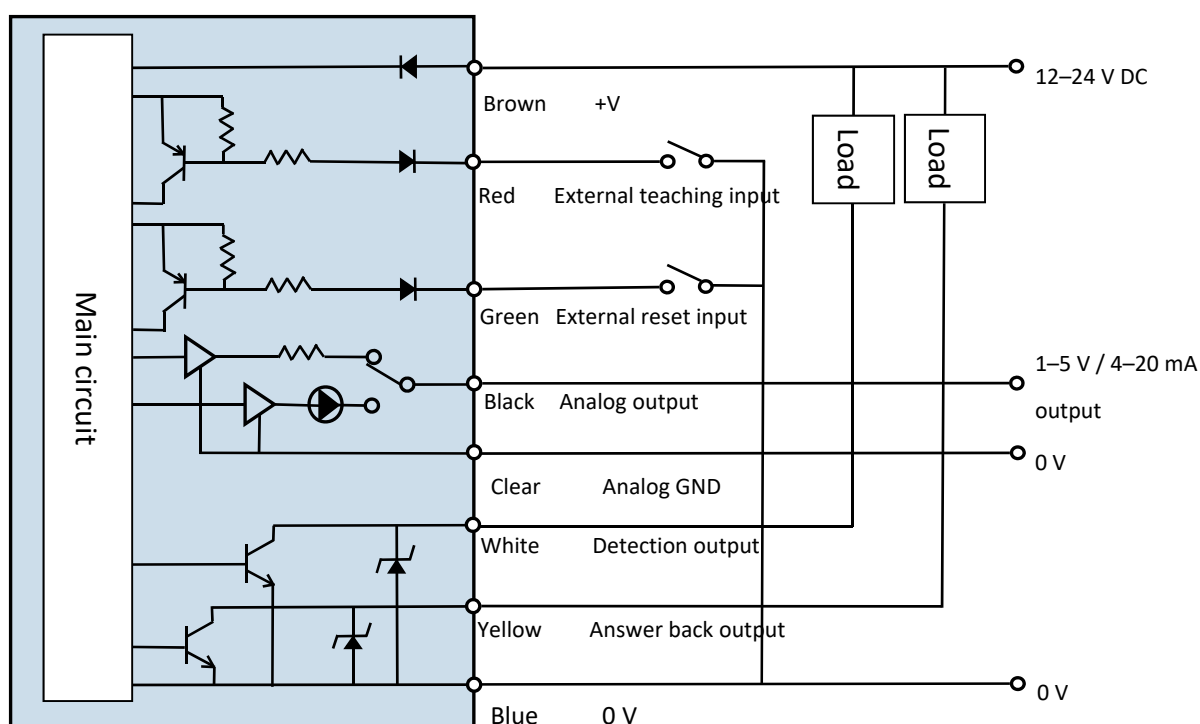
*254 nm: Orc Manufacturing Co., Ltd. UV-M02 (UV-25), 365 nm: Ushio Electric (UVD-365PD)

2. Notes

- Ensure that a power source is turned OFF before starting wiring work.
- Use power supply voltage within the available voltage range.
- Ensure that power supply and load are wired correctly.
- When using a commercially available switching regulator for the power supply, ensure that a frame ground (FG) terminal is installed.
- Do not wire high voltage cabling and power cables side by side. Do not use the same conduit. They can cause induction-related malfunctions.
- Avoid transient states (1 sec) at power ON.
- Do not use in areas with high quantities of steam or dust, etc., or in areas that can be wet.
- Do not use in environments with flammable, explosive, or corrosive gases.
- Install an amplifier unit in a location where an ultraviolet light source cannot be reached.
- Avoid usage in locations where vibrations or shocks can be reached to an amplifier unit directly.
- UV light is harmful to humans. Ensure that a body is not exposed to UV light during installation, etc.
- Ensure that the power is turned OFF before switching between voltage/current for analog output.

3. Connections

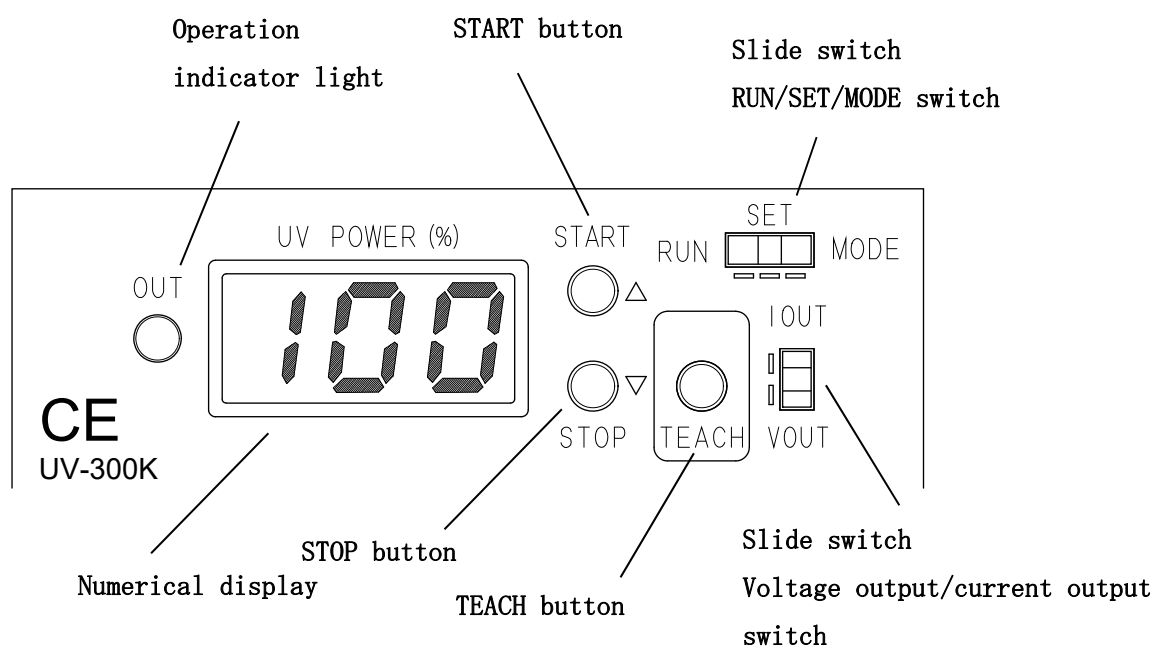
- Wire as shown in a figure below.



- When connecting a sensor head to a light guide, ensure that they are fastened securely with no looseness.
- When mounting a light guide to an amplifier unit, loosen locking screws of the light guide, slowly insert into a full slot, and tighten the locking screws.

4. Basic operation

(1) Names of parts



(2) Zero settings

Carry out zero setting when the UV light source is off.

In case zero setting is carried out before the first use, then it's not necessary to set up each time.

- ① Set a slide switch to the "MODE" side.
- ② Press either the "START" or "STOP" buttons, and **0St** will be displayed.
- ③ Press the "TEACH" button. **0tc** will be displayed.
- ④ In case the setting is carried out correctly, it will be switched to the operation mode display.
Operation mode display: Present operation mode (**Por**, **PoL**, **PoH**, **Int**)

(3) Operation mode selection

The UV-300K has Light intensity mode and Integral mode as operation modes.

In Light intensity mode, it is possible to set up the maximum and the minimum light sensitivity.

- ① Set a slide switch to the "MODE" side.
- ② Press the "START" or "STOP" buttons to display the operation mode.
The following information is displayed on the operation mode display.

Light intensity mode (set up sensitivity using teaching):

Por

Light intensity mode the minimum sensitivity (teaching is not required):

PoL

Light intensity mode the maximum sensitivity (teaching is not required):

PoH

Integral mode:

Int

- ③ Press the "TEACH" button.

The display flashes once and the selection will be completed.

(4) Teaching

(4-1) Light intensity mode

In Light intensity mode teaching, set up light intensity to 100%.

- ① In case the operation mode is set to integral mode, then back to “(3) Operation mode selection” and select Light intensity mode.
- ② Set a slide switch to the “SET” side.
The operation mode and threshold value (%) will be sequentially displayed.
- ③ Press the “TEACH” button.
Ptc will be displayed.
- ④ When teaching is completed, it will return to the original display.
During Ptc display, ensure that light intensity does not change significantly.

(4-2) Integral mode

In Integral mode teaching, set up the integral value to 100%.

- ① In case the operation mode is set to Integral mode, then back to “(3) Operation mode selection” and select Integral mode.
- ② Set a slide switch to the “SET” side.
The operation mode and threshold value (%) will be sequentially displayed.
- ③ Press the “TEACH” button to start the integration.
Itc will be displayed.
- ④ Press the “TEACH” button one more time to stop the integration.
- ⑤ When teaching is completed, it will return to the original display.

The integral values in ③ and ④ are 100%.

(5) Threshold value

Set the percentage out of the 100% value set in teaching for detection output.

- ① Set a slide switch to the “SET” side.
The operation mode and threshold value (%) will be sequentially displayed.
- ② Press the “START” button to increase the percentage.
Press the “STOP” button to decrease the percentage.

In Light intensity mode, it is possible to set increments by 1% between 10% and 100%.

In case light intensity decreases below the set percentage, then detection output will be turned ON.

In Integral mode, it is possible to set increments by 1% between 10% and 200%.

Detection output will be turned ON by starting integration and turned OFF by setting the percentage.

(6) Monitoring operation

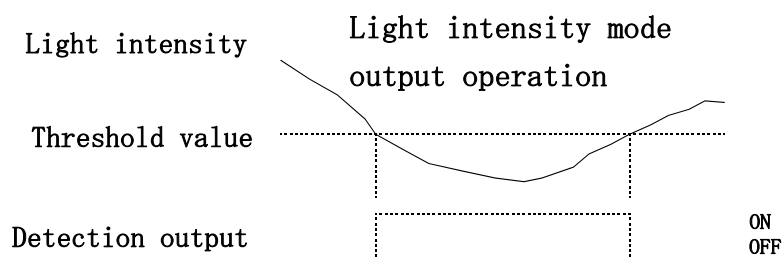
(6-1) Light intensity mode

- ① Set a slide switch to the "RUN" side.

The present light intensity will be displayed as a percentage of the light intensity in teaching.

In case it exceeds 125%, then **HI** will be displayed.

If the light intensity decreases below the threshold value (%), then detection output will be turned ON.



(6-2) Integral mode

- ① Set a slide switch to the "RUN" side.

0 will flash, and the status becomes start wait status.

At this time, detection output is OFF.

- ② Press the "START" button to start the integration.

Detection output will be turned ON.

The present integral value will be displayed as a percentage of the integral values in teaching.

- ③ In case the value reaches the set threshold value (%), then detection output will be turned OFF, and integration stops.

The numerical value flashes.

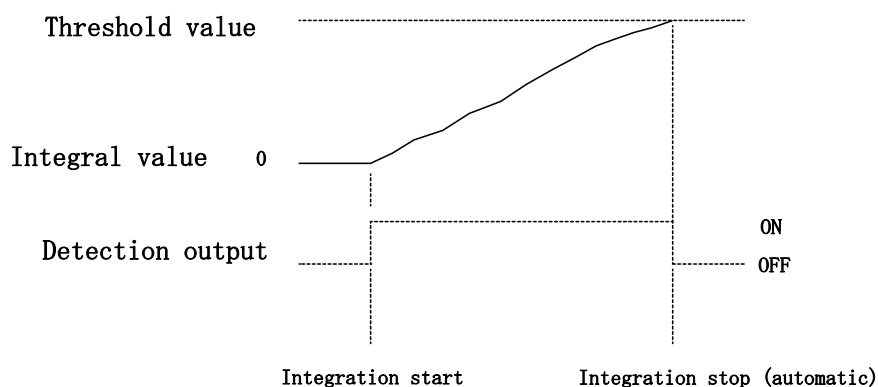
- ④ In case you need to repeat this, return to the operation in ②.

Press the "STOP" button to stop integration during integration.

The integral value at this time will be displayed and detection output will remain ON.

In either status, press the "TEACH" button to enter start wait status (① status).

Integral mode output operation



5. Applicable operations

(1) Light intensity mode levelization setting

In Light intensity mode, it is possible to levelize monitored values of UV light sources with ripple.

- ① Set a slide switch to the “MODE” side.
- ② Press the “START” or “STOP” buttons to display PoA.
- ③ Press the “TEACH” button to display the present levelization status as on (levelization enabled) or oFF (levelization disabled).
- ④ Press the “START” button to turn this on.
Press the “STOP” button to turn this oFF.

Enabling levelization reduces response speed.

(2) Using external input

(2-1) Integral mode monitoring operation

By using external teaching input, it is possible to start/stop integration.

By using external reset input, it is possible to reset integration.

A slide switch at the “RUN” side

- ① In start wait status, set external teaching input to 0 V.
Integration starts.
Detection output will be turned ON.
The present integral value will be displayed as a percentage of the integral values in teaching.
- ② If the value reaches the set threshold value (%), then detection output turns OFF, and the integration stops.
The numerical value flashes.
- ③ In case you need to repeat this, return to the operation in ①.

During integration, set external teaching input to 0 V to stop integration.

When external reset input is set to 0 V, the status becomes start wait.

When setting external teaching input to 0 V to start or stop the integration, set external reset input to either 4 V to 30 V, or to be released.

(2-2) Light intensity mode teaching

By using external teaching input, teaching is also possible during monitoring operation (slide switch: RUN).

A slide switch at the "RUN" side.

- ① Set external teaching input to 0 V.
Ptc will be displayed.
- ② When teaching is completed, it returns to monitoring operation.

In case of a teaching error, the teaching value is not updated and the operation returns to monitoring operation.

With a slide switch at SET, teaching is also possible by using external teaching input.

(2-3) Integral mode teaching

By using external teaching input and external reset input, teaching is also possible during monitoring operation (slide switch: RUN).

A slide switch at the "RUN" side.

- ① Set external reset input to 0 V. (This remains until teaching will be completed)
- ② Set external teaching input to 0 V. Integration starts.
Itc will be displayed.
- ③ Set external teaching input to 0 V again. Integration stops.
- ④ Set external reset input to 4 V–30 V, or to be opened.
- ⑤ The operation enters Integral mode start wait status.

During teaching, set external reset input to 4 V to 30 V, or to be opened to stop teaching.

With a slide switch at SET, teaching is possible only with external teaching input when external reset input is set to 4 V to 30 V or to be opened.

(3) Analog output

In case of using analog output, select either voltage output (1–5 V) or current output (4–20 mA).

It is possible to switch between voltage/current outputs with the output toggle switch.

With both Light intensity mode and Integral mode at 0%, voltage output will be 1 V and current output will be 4 mA. At 100%, voltage output will be 5 V and current output will be 20 mA.

Analog output of 1–5 V or 4–20 mA will be output in accordance with the light intensity.

At the maximum value of 125%, voltage output will be approx. 6 V and current output will be approx. 24 mA.

(4) Answer back

At the normal end of teaching, 1 pulse (1 sec) will be output by using external teaching input.

(Only possible when using external teaching input)

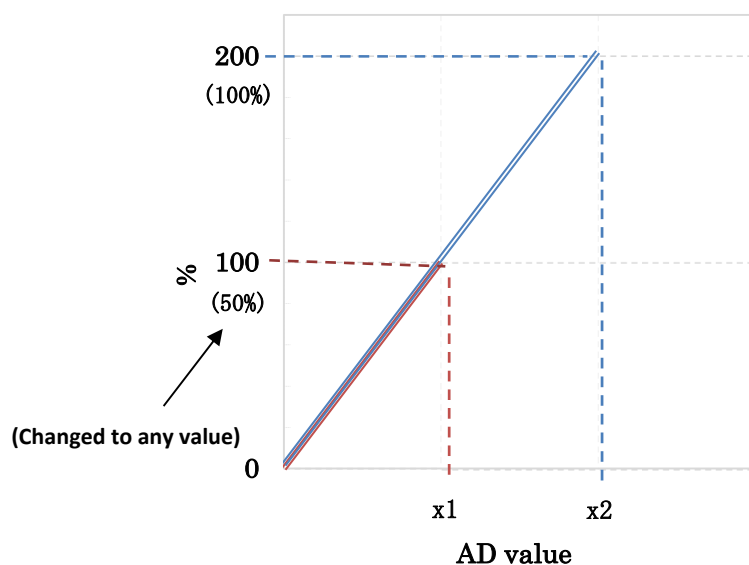
(5) Display inversion

The numerical LED display can be inverted vertically.

- ① Set a slide switch to the "MODE" side.
- ② Press the "START" or "STOP" button to display dis.
- ③ Press the "TEACH" button to invert the display.

(6) The sensitivity value change function at light intensity of 100%

In case this function is used in the light intensity mode "Por", the 100% value set in teaching can be changed to any percent value. Also, in case the light intensity mode is set at "PoH" or "PoL", the 100% value can be changed to any percent value.



For example, in case the light intensity mode is set at "Por", after a certain amount of incoming light is taught, set the light intensity as 100% value when the AD value is x_1 , and change the 100% value to 50% with this function, 50% will be displayed when the AD value is at x_1 and 100% will be displayed when the AD value is at x_2 in the monitor operation.

How to set this function

1. Set the light intensity mode at "(3) Operation mode selection" as per the UV-300K instruction manual. In case the light intensity mode is set at "PoH" or "PoL", after setting the light intensity mode, carry out the following steps 2 to 4. In case the light intensity mode is set at "Por", conduct teaching after setting the light intensity mode, and carry out the following steps 2 to 4.
2. In the "RUN" or "MODE" state, switch to "SET" while pressing both "START" and "STOP" to display 100% sensitivity value.
3. Press the "START" button to increase the percent value. Press the "STOP" button to decrease the percent value.

4. When a slide switch is set to the "RUN" side, the monitor operation will be performed.
When using this function, external teaching input and external reset input are not available.

Available setting range of this function

At PoH, it can be set by 1% increments between 1% and 100%.

At PoL, it can be set by 1% increments between 100 and 200%.

At Por, the setting range will be changed according to the amount of incoming light during teaching.

How to reset this function

Switch to "MODE" and press "TEACH" when any of Por, PoH, PoL is displayed.

Alternatively, switch to "SET" and press "TEACH" during Por is displayed.

(7) Error

An error display during monitoring operation is as described below.

Please refer to details and responses of the display noted below.

Shr: Detection output is short-circuited.

Check load connections.

Monitoring operation is not possible during short circuit. Any button or switch inputs are not available.

Error displays in zero setting and in teaching are as described below.

Please refer to details and responses of each display noted below.

ErL: UV strength and integral value are too low to conduct teaching.

(**ErL** is not displayed when using external teaching input.)

Adjust the sensor head position and angle to increase the UV strength irradiating the sensor head.

Make sure the sensor head is not irradiated by UV light.

ErH: UV strength and integral value are too high to conduct teaching.

(**ErH** is not displayed when using external teaching input.)

Adjust the sensor head position and angle to decrease the UV strength irradiating the sensor head.

The signal level is high in zero setting.

Err: Other errors.

Contact the point of purchase.

Press any of the "START", "STOP", or "TEACH" buttons to clear the error display.

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Instruction Manual



<https://www.sumita-opt.co.jp/en/products/uv300k.html#mdld>

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Video



For any questions or comments regarding the product, please contact either the retailer or the Sales Division at Sumita Optical Glass.



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