OMRON

Smart Curing System
ZUV Series

The UV Curing System

Value Model Controllers

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New UV LEDs

Value Model Heads

So, will you keep on using a lamp system ?

realizing

Cost performance that will overwhelm a lamp system

Achieves a low initial cost level believed to be impossible in an LED system up to now.
ZUV value model has made sweeping cost reductions
possible at an initial cost lower than a lamp system.

The cost revolution was made possible by OMRON's extensive track record
in lamp system replacement and LED system introduction.
There's no mistaking it. It's an LED era from now on.

ZUV value model

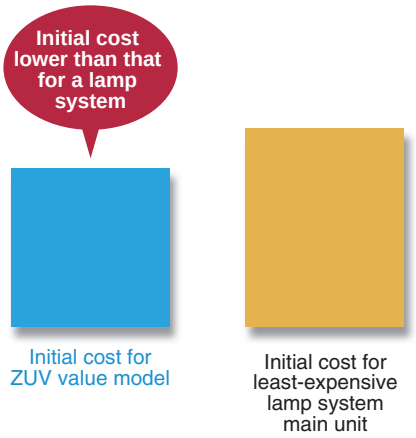
New UV LEDs

Value Model Controller ZUV-C20H × **Value Model Head** ZUV-H20MC

Benefit 1

Initial cost efficiency

Cost comparison when buying new

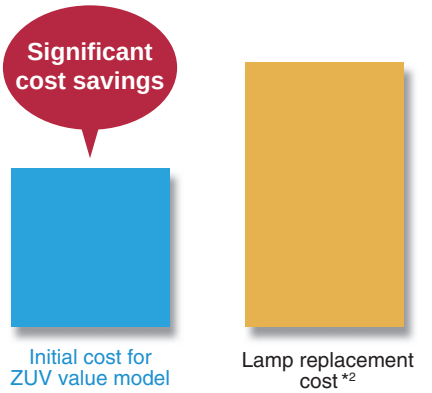


The basic performance of UV bonding is retained while significant cost savings compared to a conventional LED system is achieved with carefully selected features. ZUV value model can be purchased at a price below that of the lamp system.

Benefit 2

Beats lamp replacement costs

Comparison of lamp system aging costs and standard model initial costs*1



*1 Comparing the case in which you keep using a lamp system with the case where you switch to the ZUV value model

*2 Lamp replacement costs after two years have gone by at a replacement frequency of about three times a year

If customers who are currently using a lamp system would compare the costs of lamp replacement, which occurs about three times a year, in cases where they would continuously use a lamp system for two years from now on they would find installing the ZUV value model less expensive.

On top of that, running costs are substantially nil.

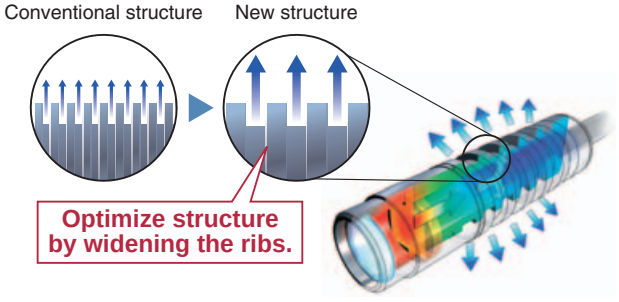
It is characteristic of the LED to have a longer life in comparison with a lamp system. In addition, for a lamp system whose light source is unstable, you have to leave its light source on all the time but an LED system, with its highly stable light source, can be turned off when illumination is not needed. For that reason, extended use over a long period of time is possible and running costs can be said to be substantially nil. Moreover, electricity costs can be reduced by turning the unit off when it is not illuminating.

OMRON's unique head technology

It is a UV-LED, whose characteristic is its long life, but there is a chance that its life will be shorter if the heat is not properly dissipated when emitting light. For that reason, it is considered necessary to avoid rises in temperature during illumination. The advance that has fulfilled this requirement in a compact head is OMRON's unique heat dissipation structure = the Smart Canyon.

■ Optimized "New Smart Canyon Structure"

The Smart Canyon structure has been utilized in all heads in the ZUV Series, but for the sake of achieving low initial cost in the value model heads we have optimized this Smart Canyon structure even further, enabling it to dissipate heat more efficiently.



We deliver the features you need, where you need them

Two models of controller according to your application

Scene 1

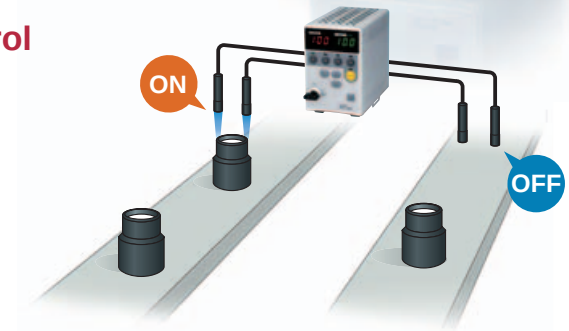
For High cost performance

Value model controller

ZUV-C20H

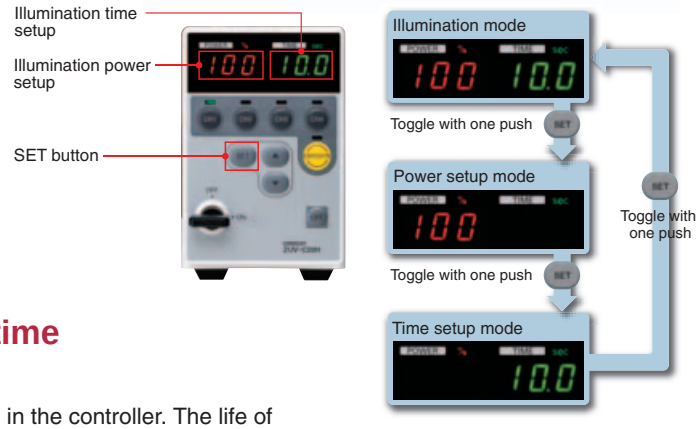
4-head independent On/Off control

Four-head independent On/Off control is available in a single controller. What's more, we've made more efficient illumination possible by achieving "illumination with a different illumination power and timing at each head" which is impossible in a lamp system.



Simple operation in 3 modes

The startup screen at Power On is in illumination mode. Toggle through three modes including Power setup mode, Time setup mode, and Illumination mode with the single push of a button. The setup operation for each mode is simple. With its limited button count, simple operation, and easy-to-read screen, anyone can use it easily.



Cumulative illumination time control at every head

Cumulative time for every head is stored in the controller. The life of the head can be determined by setting the threshold for this cumulative time. When the cumulative time of the heads exceeds this threshold, an error is issued and the illumination time at every head can be controlled.

Ultra compact body

Because of its ultra compact body that's about 1/8th the size of a conventional lamp system, it lets you build them into small-size devices or install them into the adjusting jig periphery, not to mention integration into cell production lines. Also, we use robot cable instead of quartz glass fiber for connection to the head and controller. It can be reliably used for mounting onto moving elements such as a robot or cylinder.

Scene 2

For R&D and UV curing trial

Multi-function model controller

ZUV-C30H

Easy operation with an LED display

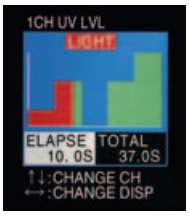
Setup is simple with an LED display. It displays illumination status during operation, allowing for simple, worry-free and reliable UV bonding.

Setup screen

Illumination time and power can be set on the top screen.

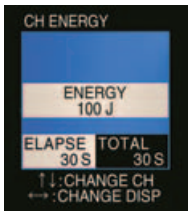
Easy-to-see menu that can be selectable to English or Japanese.

Screen during operation



Not only let's you do constant illumination but patterns as well, such as pulse illumination, to reduce resin shrinkage.

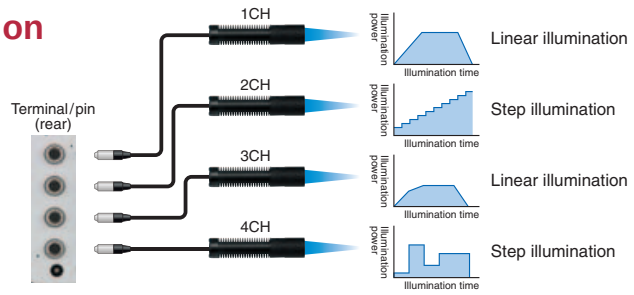
Life management with cumulative energy control. Able to adjust illumination power on the fly.



Illumination power is adjustable while in operation.

Programmed illumination

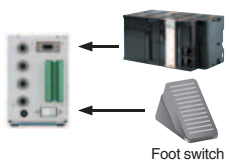
You can program illumination patterns such as step illumination and linear illumination, and high-precision adhesion to reduce resin shrinkage is possible.



Multi-access link

Its usability is top in a class by itself, with multi-connected access link features such as external control using the I/O port or RS-232C connection and data transfers to a PC via USB.

I/O and RS-232C connection ports

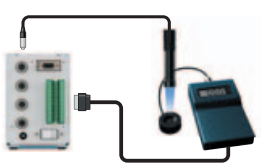


You can turn illumination On or Off, change illumination patterns, or control various types of alarms externally with the I/O port or the RS-232C connection.

Illumination history can be recorded

You can transfer such cumulative illumination energy and frequency data to a PC via USB. This is useful in QA data storage and failure analysis.

Illumination power compensation feature



It comes equipped with a power tuning feature that allows you to correct illumination power based on the output of an illumination meter. Power corrections can be made simply and reliably during startup inspection.

Solve various problems of lamp system

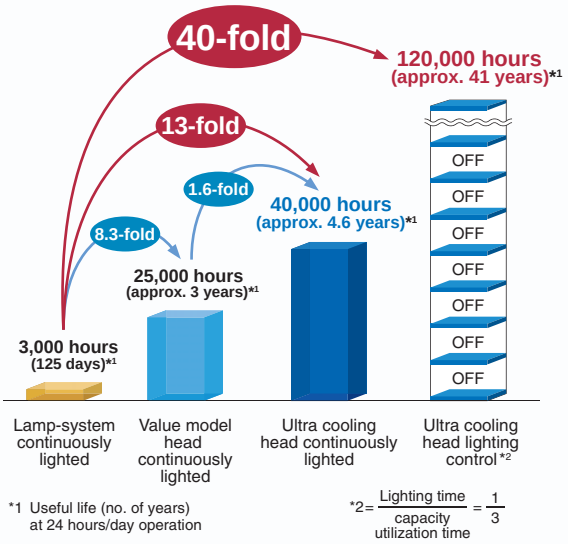
Ultra cooling head
(ZUV-H10MC)

Solution 1

Eliminates the manpower, time, and costs of light source replacement

Industry's top-class lifetime of 40,000 hours achieved with ultra cooling heads

The biggest issue for the lamp system is frequent replacement of the lamp light source.
LED system has longer life compared to the lamp system. Replacement man hours can also be eliminated if you use the ultra cooling head. The continuously-on lifetime of the ultra cooling head is 40,000 hours, or 13 times that of a lamp system. If you assume "lighting-on time divided by capacity utilization time" is one-third, a semipermanent usage of 120,000 hours, or 40 times that of a lamp system, is possible. That means light source replacement becomes essentially unnecessary and both the labor hours and running costs of the replacement work can be reduced substantially.

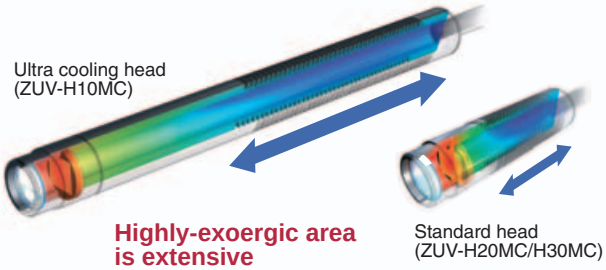


*1 Useful life (no. of years) at 24 hours/day operation

$*2 = \frac{\text{Lighting time}}{\text{capacity utilization time}} = \frac{1}{3}$

As for the ultra cooling head, we have expanded the number of heat dissipating ribs in the Smart Canyon Structure from 21 of standard head (ZUV-H30MC) to 40 by making the housing into a long body. Through effective dissipation of heat, we have achieved industry-leading long life and illuminance stability.

Radiation comparison between ultra cooling head and standard head



Solution 2

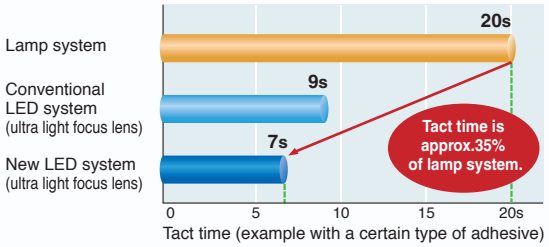
Even shorter tact time with new UV LEDs

High-speed bonding with the highest illumination class in the industry at 13,200 mW/cm² produced by an ultra light focus lens

New UV LEDs with much greater brightness are used on all heads.
If you mount an ultra light focus lens, the illumination greatly exceeds the average illumination of mercury lamps to achieve the industry's top class at 13,200 mW/cm². This represents an approximately 140% increase in illumination over previous heads so that you can reduce bonding tact times even more. *3

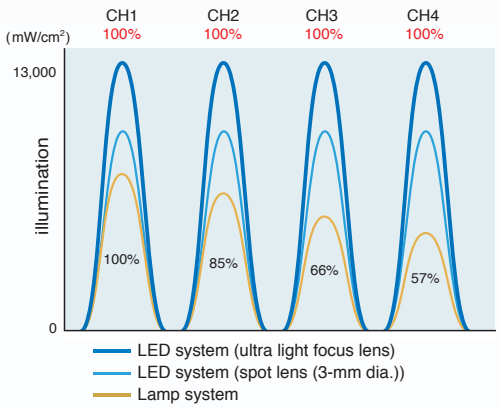
*3 Typical example with ultra light focus lens ZUV-L2H

Tact time comparison



Tact time (example with a certain type of adhesive)

Illumination comparison between LED system head and lamp system fiber when 4 branches are used



Uses UIT-150 UV Light Integrating Actinometer manufactured by Ushio Inc.
When measured at suggested work distance.
Lamp system value is an example with a typical fiber.

As the number of channels is increased by branching fibers, the maximum illumination for a lamp system continues to decrease. With an LED system, the maximum illumination of each head remains the same regardless of how many channels are used, to enable highly productive UV bonding.

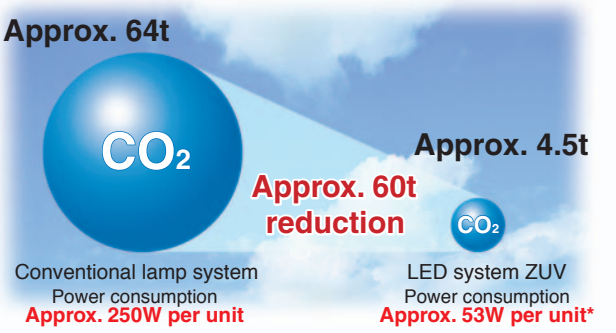
Solution 3

Environmentally safe

Substantially reduces CO_2 emissions in power-saving LED system usage

High power consumption and disposal of the mercury lamps that occurs with each replacement are problems at a lamp system site, but they can be resolved by using an LED system. An LED system has lower power consumption than a mercury lamp system, and can also lead to power saving with efficient use of energy through lighting control. It contributes to reduce CO_2 emissions substantially. In addition, the LED light source doesn't use mercury so it is superior in terms of reduced environmental impact.

Comparison of annual CO_2 discharge amounts when used in 100 units



* Standard model controller ZUV-C20H

Notes
- Assumed to be 24 hours and 260 days operation.
- Assumes "on time divided by equipment operation time" to equal one-third.
- For CO_2 emissions, calculation of 4.1t CO2 reduction with 10,000 kWh reduction in the Nationwide Receiving End Coefficient published by the Federation of Electric Power Companies of Japan
- Power consumption may vary according to device conditions

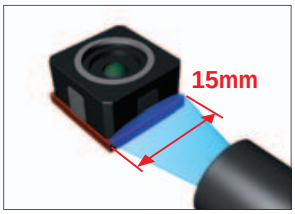
Illumination variation tailored to all UV bonding

Line beam lens
ZUV-L12L (Beam width: 12 mm) and ZUV-L15L (Beam width: 15 mm)

Illumination 1

Bonds at once over a wide range

Line beam lens with a 15mm beam width



UV adhesion with line beam lens

With a line beam lens, UV bonding of work which used to be difficult with a single illumination is also possible. A relatively uniform elongated elliptical illumination area is achieved by illumination with line beam lens (ZUV-L15L) with a 15 mm beam width. You can accomplish UV bonding at once without moving the illumination head, so productivity will increase.

Diffuse illumination head ZUV-H35MC
Diffuse illumination head value model
ZUV-H25MC
Diffusing lens ZUV-L12H

Illumination 2

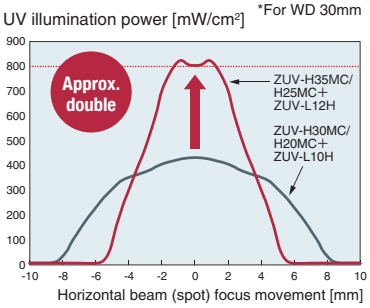
Bonds securely even if separated

800 mW/cm² illumination power even at a working distance of 30 mm

Use the newly developed ZUV-H35MC/H25MC diffuse illumination head and a ZUV-L12H diffusing lens to achieve irradiation power of 800 mW/cm² at a working distance of 30 mm.
Reliable bonding is realized even at a distance by ensuring illumination power that used to be a problem when illumination couldn't be done close to the work.

ZUV-L12H Illumination profile*

*For WD 30mm



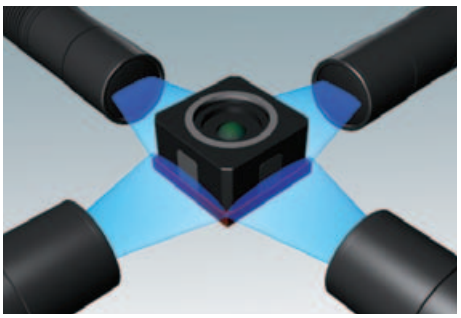
Ultra light focus lens
ZUV-L2H

Illumination 3

Maximum power for high-speed bonding

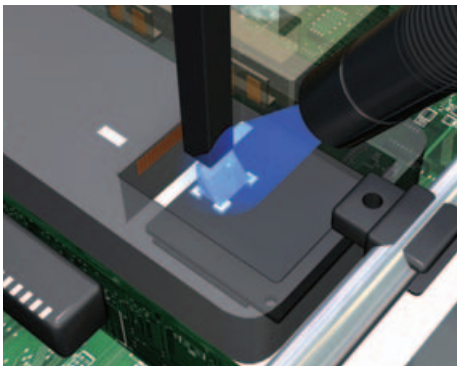
Ultra light focus lens with industry top-class illumination at 13,200 mW/cm²

If you mount an ultra light focus lens with a spot diameter of 2 mm to a value model head with the new, brighter UV LEDs, you will achieve an industry top-class maximum illumination of 13,200 mW/cm².
You can reduce the bonding tact time and increase productivity.



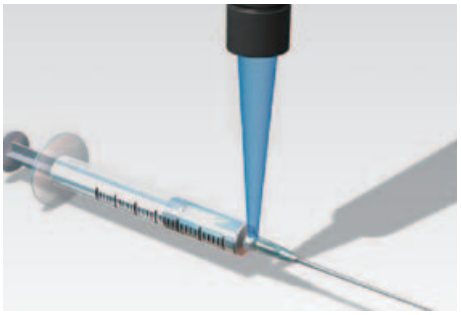
Adhesion of a camera module housing and a board

We shortened tact time by illuminating with a line beam lens. Contributes to improvements in productivity.



UV bonding of a light pickup lens

In addition to being able to bond reliably even at a work distance of 30 mm, it contributes to improvements in productivity with diffuse beam illumination.



Bonding needles to syringes

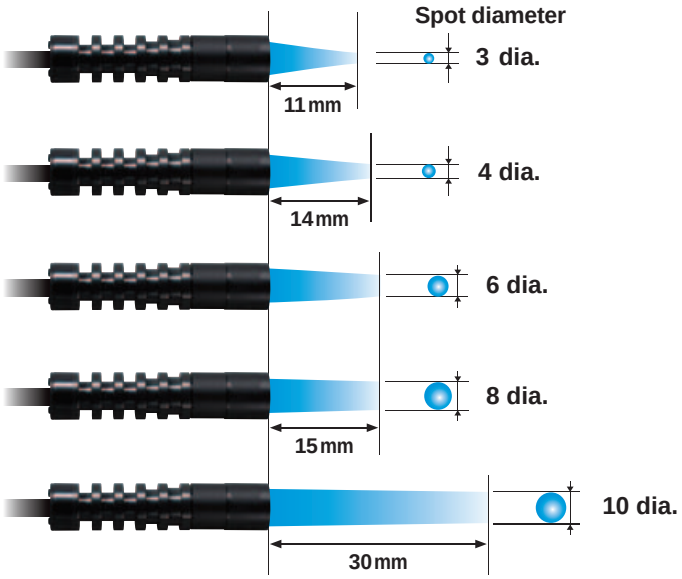
High-speed bonding is enabled by the ultra light focus lens.

Illumination 4

Optimum illumination with five spot sizes to choose from

Spot lenses with 3/4/6/8/10-dia. beam

Easy to change spot size with interchangeable head lenses. Reliable UV bonding can be performed with the selection of a spot in a size appropriate to the work from five lenses.



Spot lens

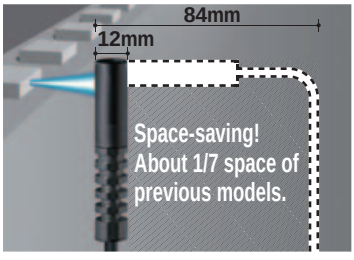
ZUV-L3H/L4H/L6H/L8H/L10H

Illumination 5

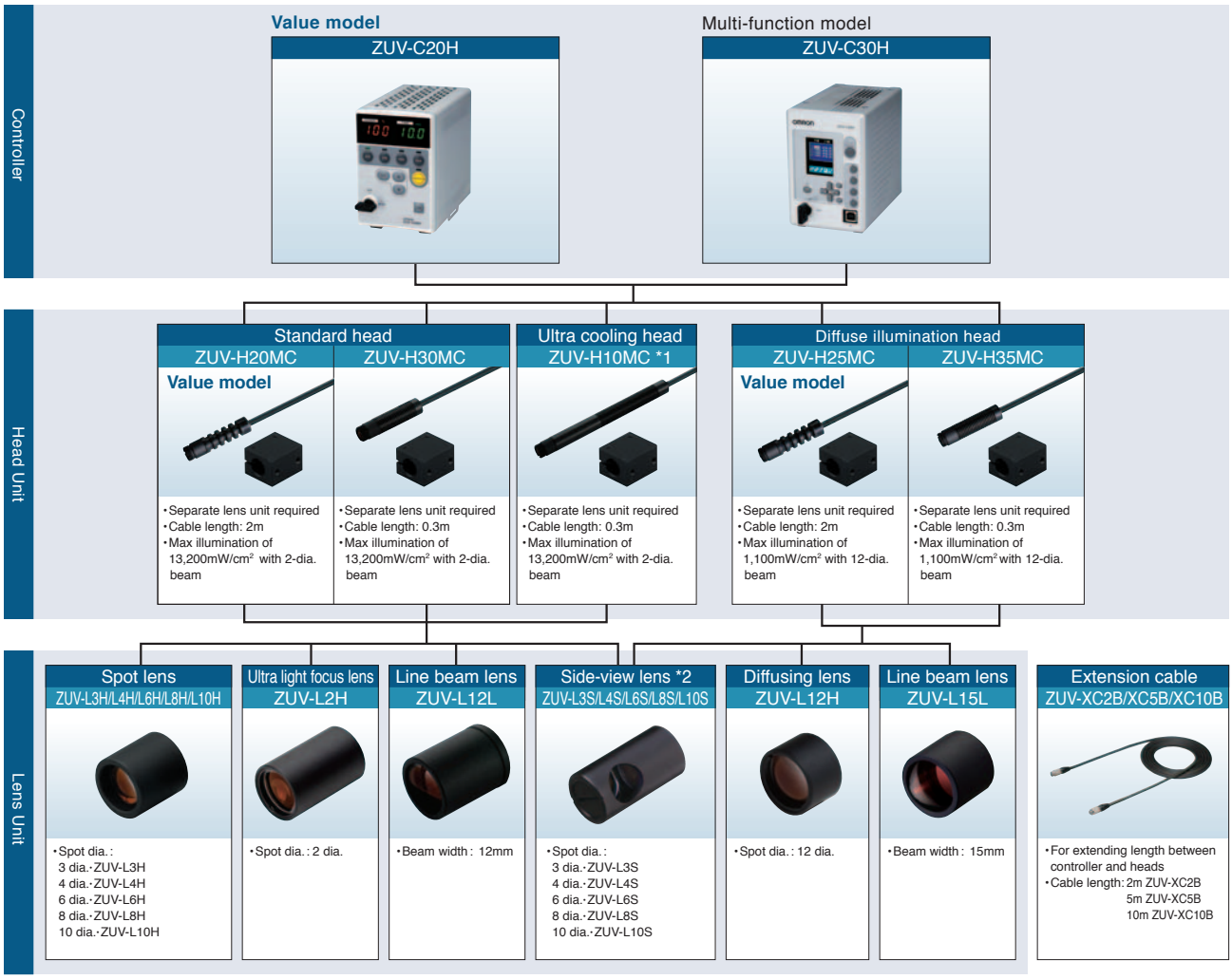
Effectively save equipment space with a light path that is emitted at 90°

Side-view lens for UV illumination from the side of the lens unit

The light path is illuminated at 90° to occupy only about 1/7 the space of previous models. This achieves more flexibility in mounting the head and enables more flexible usage of space in production equipment. Installation is also possible in small spaces in existing equipment.



Ordering Information



*1 Model is also available with 2-m cable. (ZUV-H10MC 2M)

*2 When using ZUV-H25MC/H35MC diffuse illumination head with side-view lens, we recommend using ZUV-L3S/L4S.

Ratings and Characteristics

Controller

Model		ZUV-C20H (Value model)	ZUV-C30H (Multi-function model)
Irradiation method	Constant irradiation	Irradiation power (0% to100%), Irradiation time (max. 99.9 s/unlimited)	Irradiation power (0% to 100%), Irradiation time (999.9 s max./unlimited)
	Pattern irradiation	Unavailable	Can be set to step or ramp (linear) (16 points specified per setting) Applicable Heads: ZUV-H Series
No. of settings		No bank feature	16 banks
Cumulative Irradiation		Time (unit: 100 hour display)	Energy (display unit - J)
Terminalxx block I/O	Inputs	Emergency stop, UV illumination start/stop (all channels/4 channels)	Emergency stop, start/stop UV irradiation (4 channels), select settings (banks)
	Outputs	Ready (all channels/4 channels), error, operating life	Ready (4 channels), UV irradiating, errors
RS-232C and USB I/O		None	Start/stop UV irradiation (4 channels), select settings (banks), get/change settings data, save/read data, power tuning
Cooling method		Natural air cooling (no fan)	Natural air cooling
Power supply voltage		AC power only 100V-240V AC ± 10%, 50/60 Hz (AC adapter attached) *	Select AC or DC power supply • AC power supply: 100 to 240 V AC±10%, 50/60 Hz (AC adapter included)* • DC power supply: 24 V DC±10% (supplied from terminal block on back of unit)
Current consumption		1.4A (53W)	• With AC adapter: 1.5 A (36VA) • With DC power supply: 1.5 A (36VA)
Vibration resistance		10 to 150 Hz (acceleration 50 m/s²) with a 0.35 mm single amplitude for 8 minutes each in X, Y, and Z directions, 10 times	
Shock resistance		150 m/s² in 6 directions (up/down, right/left, front/back), 3 times each	
Ambient temperature range		Operating: 5 to 35°C; Storage: -10 to 60°C (with no condensation or icing)	
Ambient humidity range		Operating/storage: 30% to 85% (with no condensation or icing)	
Degree of protection		IEC 60529 IP20	
Material		Polycarbonate, SECC	SUS, aluminum
Weight (package state)		Approx. 1,800g (Controller: approx. 1,200g)	Approx. 2,600g (Controller: approx. 1,800g)
Accessories		Instruction sheet, key, AC adapter	Instruction sheet, key, AC adapter, CD-ROM (USB driver, user's manual PDF, quick setting guide PDF)

* The power cord that is included as standard is designed for use with 100 VAC (Japanese specifications).

■ Ratings and Characteristics

Head Unit

Model		ZUV-H20MC/H30MC/H10MC/H25MC/H35MC
Light source	Wavelength	365nm *
	Class	Class 3B (JIS C 6802: 2005)　Class 3B (EN60825-1: 1994 +A1: 2002 +A2: 2001)
Vibration resistance		10 to 150 Hz (acceleration 50 m/s²) with a 0.35 mm single amplitude for 8 minutes each in X, Y, and Z directions, 10 times
Shock resistance		150 m/s² in 6 directions (up/down, right/left, front/back), 3 times each
Ambient temperature range		Operating: 5 to 35°C; Storage: -10 to 60°C (with no condensation or icing)
Ambient humidity range		Operating/storage: 30% to 85% (with no condensation or icing)
Degree of Protection		IEC60529 IP40
Material		ZUV-H20MC/25MC:Zinc, aluminum, glass ZUV-H30MC/H10MC/H35MC:Zinc, copper, aluminum, glass
Weight (packed state)		ZUV-H20MC/H25MC : Approx. 185g (Head unit: approx. 100g), ZUV-H30MC/H35MC : Approx. 150g (Head unit: approx. 55g), ZUV-H10MC(0.3m) : Approx. 180g (Head unit: approx. 105g), ZUV-H10MC 2M : Approx. 235g (Head unit: approx. 160g)
Accessories		Instruction sheet, mounting brackets (with M3 screws), warning labels (in English)

* Models are also available with a 385-nm light source wavelength.（Standard head：ZUV-H21MC 2M/H11MC 2M, diffuse illmination head：ZUV-H26MC 2M）

Lens Unit

Model	ZUV-L2H/L3H/L4H/L6H/L8H/L10H/L12L/L15L/L3S/L4S/L6S/L8S/L10S/L12H
Vibration resistance	10 to 150 Hz (acceleration 50 m/s²) with a 0.35 mm single amplitude for 8 minutes each in X, Y, and Z directions, 10 times
Shock resistance	150 m/s², 6 directions (up/down, right/left, front/back), 3 times each
Ambient temperature range	Operating: 5 to 35°C; Storage: -10 to 60°C (with no condensation or icing)
Ambient humidity range	Operating/storage: 30% to 85% (with no condensation or icing)
Degree of Protection	IEC60529 IP40
Material	Aluminum, glass
Weight (package)	ZUV-L2H/L3H/L4H/L6H/L8H/L10H : Approx. 10g (lens unit: approx. 5g), ZUV-L12L/L15L : Approx. 30g (lens unit: approx. 5g), ZUV-L3S/L4S/L6S/L8S/L10S : Approx. 35g (lens unit: approx. 5g), ZUV-L12H : Approx. 30g (lens unit: approx. 5g)
Accessories	Instruction sheet

When using the standard head

Ultra light focus lens/Spot lens/Line beam lens

Head unit model	ZUV-H20MC/H30MC/H10MC						
Lens unit model	ZUV-L2H	ZUV-L3H	ZUV-L4H	ZUV-L6H	ZUV-L8H	ZUV-L10H	ZUV-L12L
Spot diameter/Beam shape	2 dia.	3 dia.	4 dia.	6 dia.	8 dia.	10 dia.	12 × 2mm
Recommended working distance	10mm	10mm	15mm	20mm	20mm	30mm	15mm
Peak illumination *1	13,200mW/cm²	8,600mW/cm²	7,200mW/cm²	4,500mW/cm²	2,200mW/cm²	760mW/cm²	1,500mW/cm²

Side-view lens

Head unit model	ZUV-H20MC/H30MC/H10MC				
Lens unit model	ZUV-L3S	ZUV-L4S	ZUV-L6S	ZUV-L8S	ZUV-L10S
Spot diameter	3 dia.	4 dia.	6 dia.	8 dia.	10 dia.
Recommended working distance	4mm	5mm	8mm	13mm	5mm
Peak illumination *1	8,300mW/cm²	6,400mW/cm²	4,200mW/cm²	2,100mW/cm²	660mW/cm²

When using the diffuse Illmination head

Diffusing lens/Side-view lens/Line Beam lens

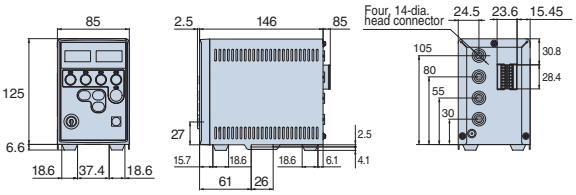
Head unit model	ZUV-H25MC/H35MC			
Lens unit model	ZUV-L12H	ZUV-L3S	ZUV-L4S	ZUV-L15L
Spot diameter/Beam shape	12 dia.	3 dia.	4 dia.	1.5 × 3mm
Recommended working distance	30mm	8mm	13mm	15mm
Peak illumination *1	1,100mW/cm²	5,400mW/cm²	3,000mW/cm²	770mW/cm²

*1 Under the following conditions: 100% irradiation power, 25°C room temperature, and with heat sink. Values for reference only.
The illumination varies depending on factors such as the amiant environment, installation conditions, the service life of part, and differences between parts.
Continually check the curing status to ensure that there is room for error in the illumination.
Refer to Beam Spot Profiles (Typical Examples) on page 13 for design information.

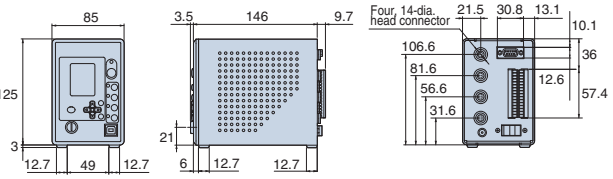
External Dimensions (Unit: mm)

Controller

Value model ZUV-C20H



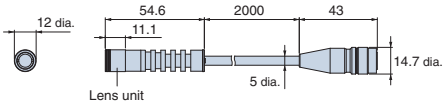
Multi-function model ZUV-C30H



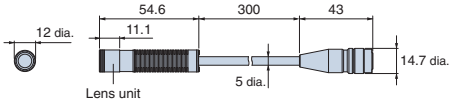
Head Unit

Standard head (When attached to spot lens)

Value model ZUV-H20MC

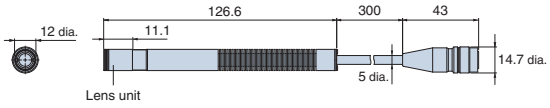


ZUV-H30MC



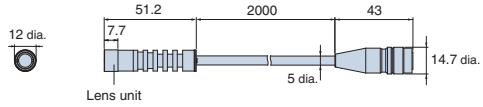
Ultra cooling head

ZUV-H10MC

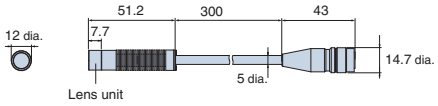


Diffuse illumination head (When attached to ZUV-L12H)

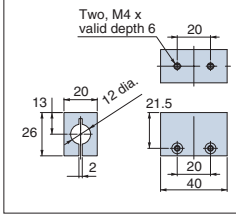
Value model ZUV-H25MC



ZUV-H35MC



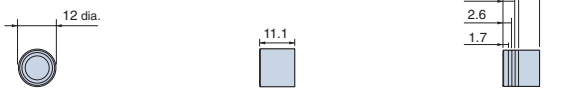
Mounting Bracket



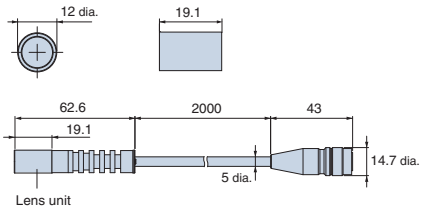
Lens Unit

Spot lens ZUV-L3H/L4H/L6H/L8H/L10H

Note: The model number is printed on the side of the Lens unit.

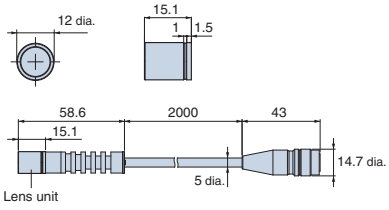


Ultra light focus lens ZUV-L2H



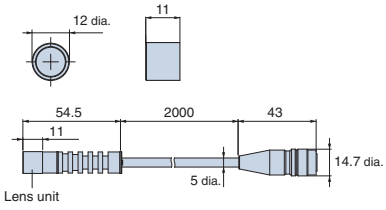
Note: When attached to ZUV-H20MC (Standard head value model)

Line beam lens ZUV-L12L



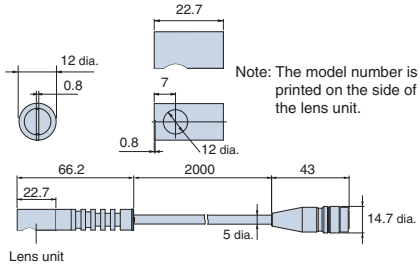
Note: When attached to ZUV-H20MC (Standard head value model)

ZUV-L15L



Note: When attached to ZUV-H25MC (Diffuse illumination head value model)

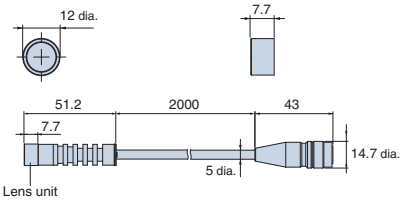
Side-view lens ZUV-L_S



Note: The model number is printed on the side of the lens unit.

Note: When attached to ZUV-H20MC (Standard head value model)

Diffusing lens ZUV-L12H



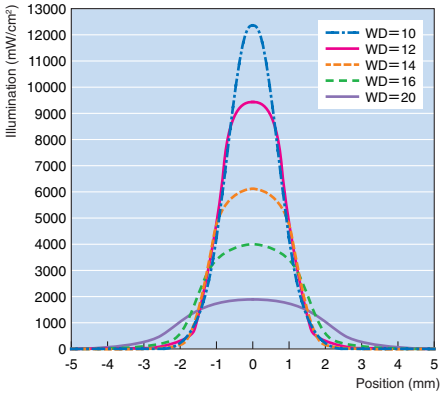
Note: When attached to ZUV-H25MC (Diffuse illumination head value model)

■ Beam Spot Profiles (Typical Examples)

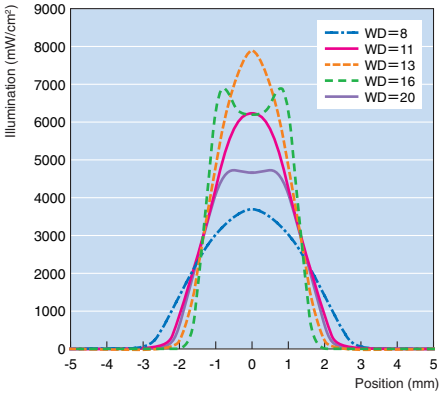
Standard head / ultra cooling head ZUV-H20MC/H30MC/H10MC

(Controller ZUV-C20H/C30H, at 100% irradiation power)

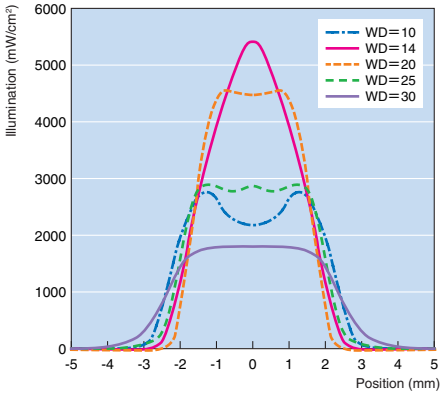
Ultra light focus lens ZUV-L2H Illumination profile



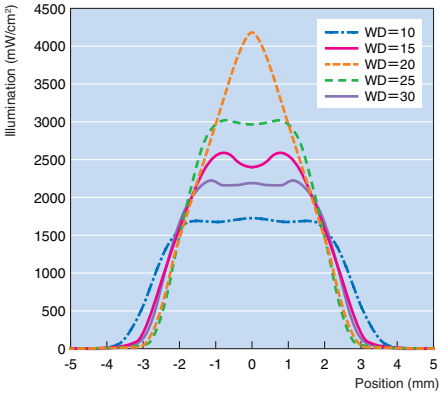
Spot lens ZUV-L3H Illumination profile



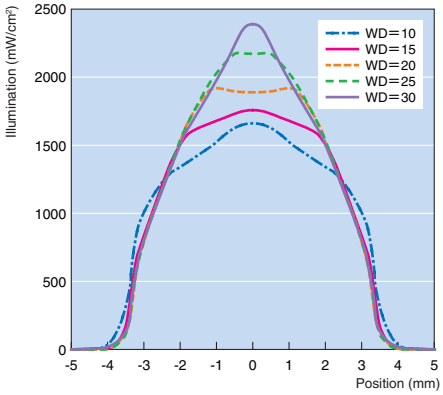
Spot lens ZUV-L4H Illumination profile



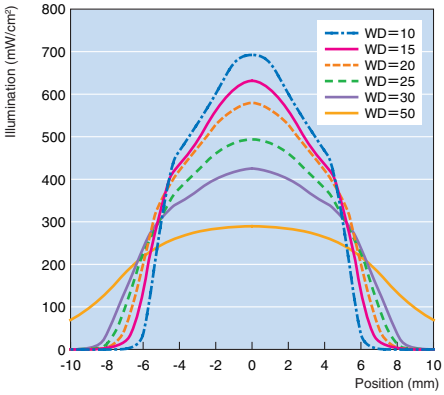
Spot lens ZUV-L6H Illumination profile



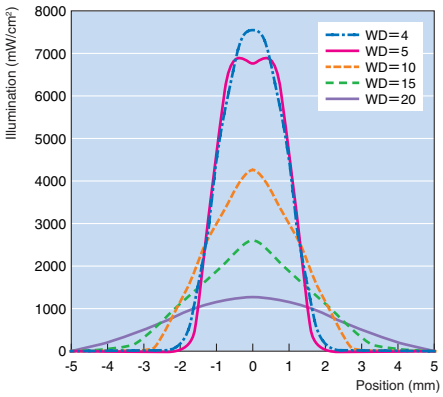
Spot lens ZUV-L8H Illumination profile



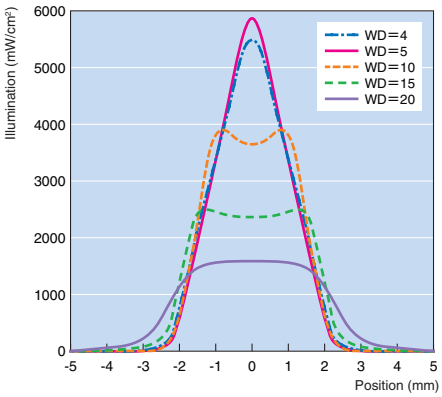
Spot lens ZUV-L10H Illumination profile



Side-view lens ZUV-L3S Illumination profile



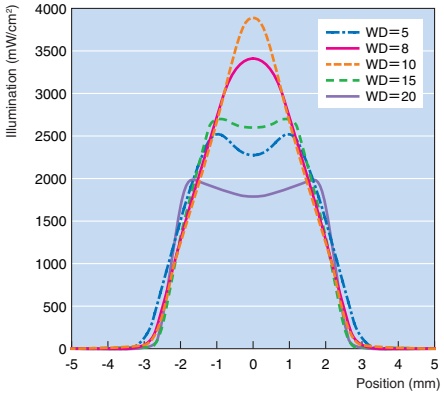
Side-view lensZUV-L4S Illumination profile



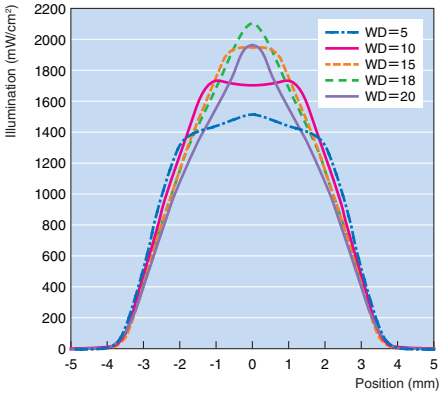
Note: 1. WD is setting distance to a workpiece from a lens unit end face.
Note: 2. The illumination profile varies depending on factors such as the ambient environment, the installation conditions, the service life of part, and differences between parts. Continually check the curing status of the resin to ensure that there is room for error in the illumination profile.

(Continued on page 14.)

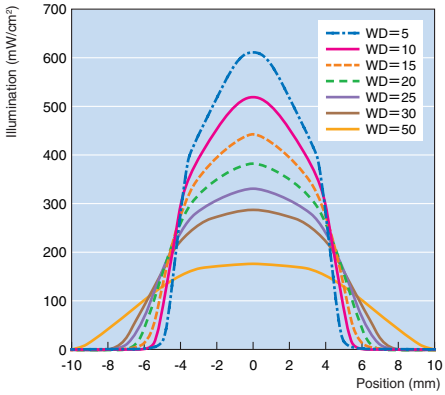
Side-view lens ZUV-L6S Illumination profile



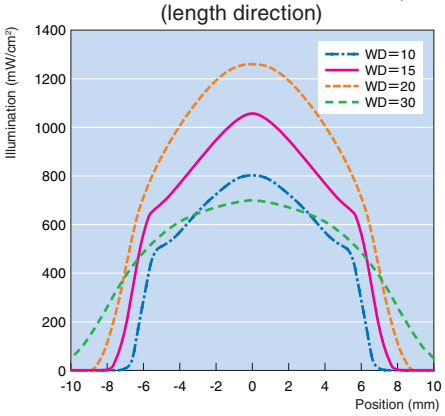
Side-view lens ZUV-L8S Illumination profile



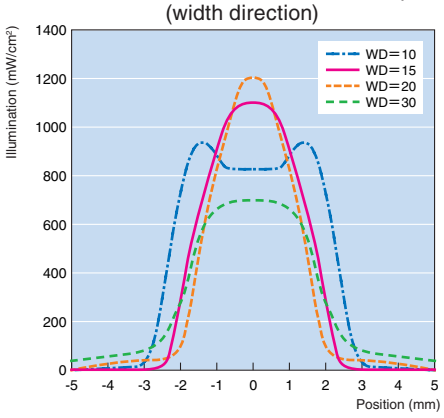
Side-view lens ZUV-L10S Illumination profile



Line beam lens ZUV-L12L Illumination profile (length direction)



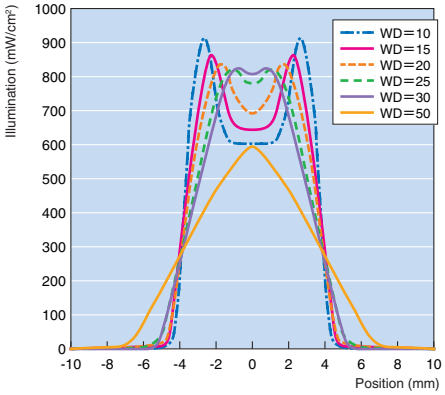
Line beam lens ZUV-L12L Illumination profile (width direction)



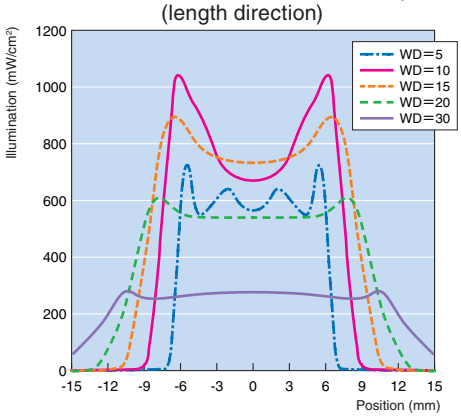
Diffuse illumination head ZUV-H25MC/H35MC

(Controller ZUV-C20H/C30H, at 100% irradiation power)

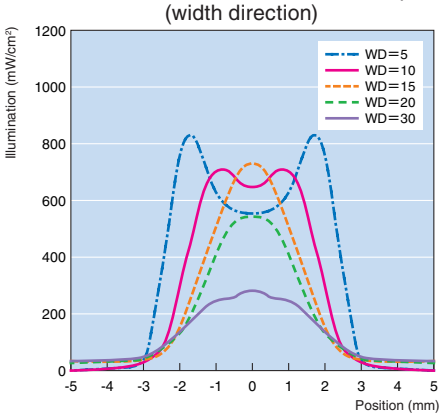
Diffusing lens ZUV-L12H Illumination profile



Line beam lens ZUV-L15L Illumination profile (length direction)



Line beam lens ZUV-L15L Illumination profile (width direction)



Note: 1. WD is setting distance to a workpiece from a lens unit end face.
Note: 2. The illumination profile varies depending on factors such as the ambient environment, the installation conditions, the service life of part, and differences between parts. Continually check the curing status of the resin to ensure that there is room for error in the illumination profile.

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⚠ WARNING

Never look directly at or allow your skin to be exposed to the ultraviolet light.
Ultraviolet light will damage vision and skin if it is viewed directly or the skin is exposed.
Workers shall wear protective goggles and equipment to protect from being exposed to light reflection.

Never disassemble the Unit.
Disassembling the Unit may lead to electric shock or damage from light leakage.

⚠ CAUTION

Moderate burn is likely to occur.
Lamp is hot immediately after power is turned OFF.

This document provides information mainly for selecting suitable models. Please read the document User's Manual (Z281) carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

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