

High-output Spotlights

HLV2 Series

Wide-range Spotlight System Consisting of our HLV2 Series and Microfiber Heads



The image displays four product categories: 1) HLV2 Series high-output spotlights in various sizes and colors (blue, green, red). 2) HFS/HFR Series microfiber heads with red fiber optic lenses. 3) HLX Series lights designed for microfiber heads. 4) A close-up of a microfiber head with a fiber optic cable.

High-output Spotlights
HLV2 Series

HLV2-14
HLV2-22
HLV2-22-3W
HLV2-22-1220-3W

Patented

Microfiber Heads
HFS/HFR Series

HFS-14-500
HFR-25-10
HFR-25-30
HFR-40-20

Design Registered

Lights Designed for Microfiber Heads
HLV2-3M-RGB-3W
HLV2-22-NR-3W Series

HLV2-3M-RGB-3W
HLV2-22-NR-3W

Replace Your Halogen Light Sources
High-output Spotlights

HVL2 Series

HLV2-14 HLV2-22 HLV2-22-3W HLV2-22-1220-3W



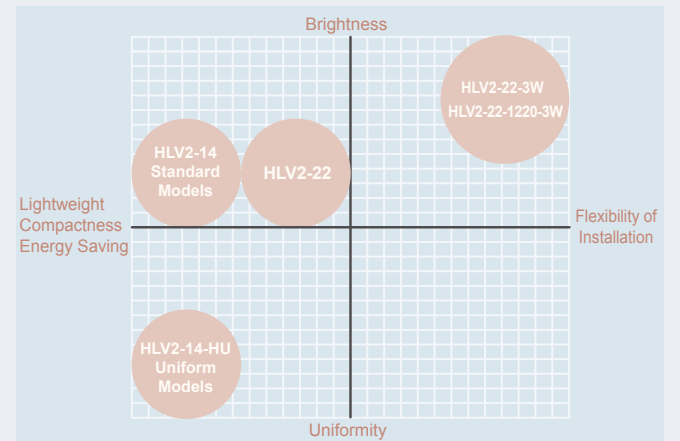
The **HVL2** Series can be customized to meet your specific needs and application environment.

Saving Space	Demands for Small Spotlights	Reducing Running Costs
Demands for Bright Spotlights	Demands for Spotlights with Uniform Illumination	Reducing CO ₂ Emissions

■ HVL2 Series Evaluation Chart

	Brightness	Uniformity	Lightweight	Compactness	Flexibility of Installation	Energy Saving
HLV2-14	○	○	◎	◎	○	◎
HLV2-14-HU Highly Uniform Model	△	◎	◎	◎	○	◎
HLV2-22 (for comparison)	○	○	○	○	○	○
HLV2-22-3W	◎	○	△	△	◎	○
HLV2-22-1220-3W	◎	○	△	△	◎	○

■ HVL2 Series Evaluation Graph



* Comparison of CCS products

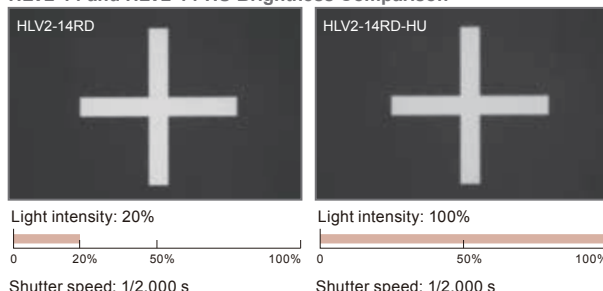
Smallest in the Industry: HVL2-14 Series

■ Lightweight, Compact Design Saves Valuable Space

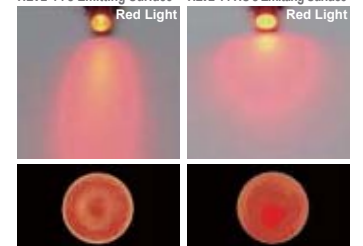
The **HVL2-14** Series is perfect for use in tight spaces due to its compact, lightweight design.



HLV2-14 and HVL2-14-HU Brightness Comparison



HLV2-14's Emitting Surface HVL2-14-HU's Emitting Surface



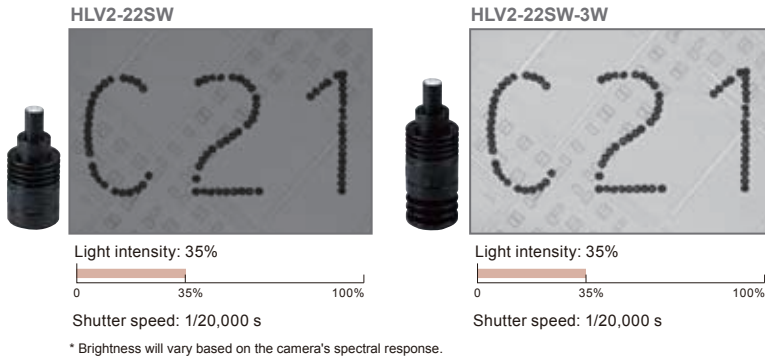
The HVL2-14-HU provides a highly uniform emitting surface unlike any other spotlight seen before.

* Comparison of CCS products

* The data provided here is for reference only. The values are not guaranteed.

Providing the Highest Output in the Series: HLV2-22-3W Series

The HLV2-22-3W has the highest output of any Spotlight in the series. The HLV2-22-3W provides at least 1.5 times more output than the HLV2-22.



Flexible Installation

The flat surface on the back end of the body of the HLV2-22-3W has M3 mounting holes to allow for flexible installation.



Why CCS Products Are Better than Halogen Lights

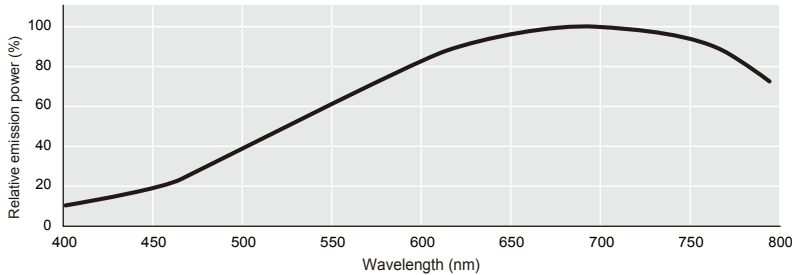


Select an emission wavelength based on the spectral properties of your workpiece for high contrast imaging.

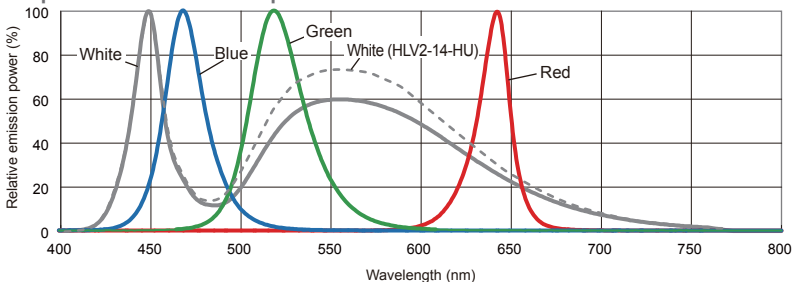
Comparison of Relative Spectral Distribution between a Halogen Lamp and the HLV2 Series

The HLV2-series models are available with red (RD), green (GR), blue (BL), or white (SW) light so that you can use the models that are suitable for the spectral properties of your workpiece. LEDs (RGB) provide light that is nearly monochromatic, allowing you to obtain sharp images without any chromatic aberration.

Spectral Distribution of Halogen Lights



Spectral Distribution Graph of HLV2

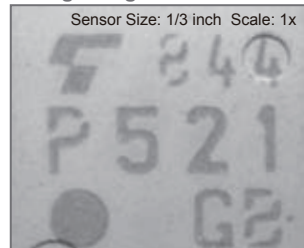


Contrast Comparison between a Halogen Light and the HLV2

By changing the emission color of the LEDs based on the workpiece, you can achieve clear, sharp contrast.

Photocoupler Character Recognition

Halogen Lights

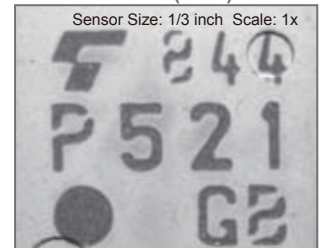


Contrast is low with halogen lights.

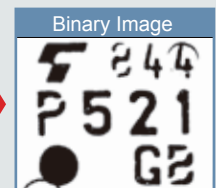


Poor contrast and borders are vague and undefined. May not be recognized properly.

HLV2-22BL-3W (Blue)



You get high contrast with LEDs.



Good contrast. Image can be recognized accurately.

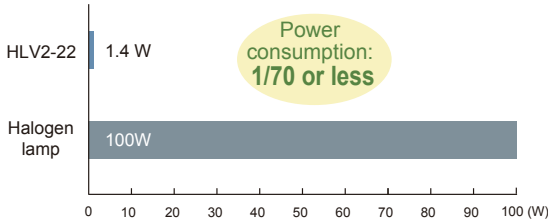
Clear difference shown by binary images

* The data provided here is for reference only. The values are not guaranteed.

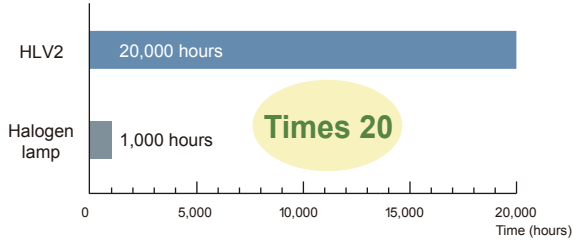
High-output Spotlights HLV2 Series

Long Life and Lower Power Consumption for Less Maintenance and Reduced Costs

■ Comparison of Power Consumption between the HLV2 and a Halogen Lamp

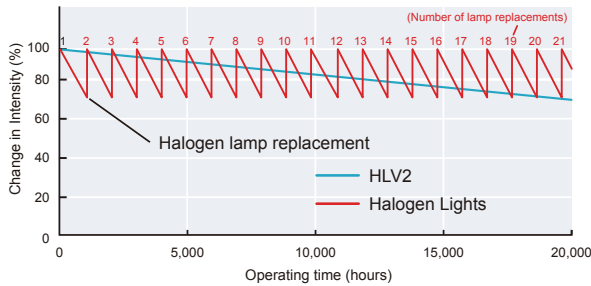


■ Comparison of Life between the HLV2 and a Halogen Lamp



* These are calculated values until the light output decreases to 50% at a light intensity of 100% and an ambient temperature of 40C° (reference values only).

■ Comparison of Change in Brightness between the HLV2 and a Halogen Lamp



Two advantages of using halogen light sources are low initial costs and the ability to select the light guide best suited to your application. However, with a service life of only 1,000 hours on average, halogen lamps require frequent, labor-intensive maintenance in the form of replacement and adjustment resulting in a substantial cost in man-hours as well as losses due to production line downtime. In contrast, CCS's HLV2 High-output Spotlight has a service life of 20,000 hours, 20 times that of halogen lamps. Moreover, you don't have to worry about sudden lamp burnout as you do with halogen lamps and the light intensity can be precisely controlled. With the HLV2, you can expect a return on the total running cost after two years and enjoy stable use for a long period of time.

■ Comparison of Cost between the HLV2 and a Halogen Lamp



* This is a comparison of HLV2-22RD Red High-output Spotlight and a 100-W halogen spotlight operating at maximum intensity for 24 hours.

	HLV2-22RD (red)	100-W halogen lamps
Power costs ¹	Monthly power consumption: 1.4 W (spotlight power consumption) × 720 hours (24 hours × 30 days) = 1,008 Wh Monthly power cost: (1 kWh = 9 yen) 9 yen/kWh × 1 kWh = 9 yen	Monthly power consumption: 100 W (light source power consumption) × 720 hours (24 hours ntipSymbolMultiply 30 days) = 72,000 Wh Monthly power cost: (1 kWh = 9 yen) 9 yen/kWh × 72 kWh = 648 yen
Yearly power cost	109 yen	7,776 yen
Light source ² replacement cost	Operating life: 20,000 (hours) ÷ 24 (hours) = 833.3 days or approximately 50% brightness reduction over 2 years and 3 months	Operating life: 1,000 (hours) ÷ 24 (hours) = 41.6 days or approximately 1.4 months between each lamp replacement for a total of 8.5 replacements per year Lamp cost (per lamp): 4,800 yen
Yearly replacement cost	0 yen	40,800 yen
Other costs	None	Costs to dispose of used lamps and cost of labor for replacement/adjustment
Running costs after 1 year	109 yen <small>*This does not include initial costs.</small>	48,576 yen <small>*8.5 lamps per year</small>
Running costs after 2 years	218 yen <small>*Only power costs added.</small>	97,152 yen <small>*8.5 more lamps used over the next year (for a total of 17 lamps including the first year).</small>
Running costs after 3 years	327 yen <small>*Only power costs added.</small>	145,728 yen <small>*8.5 more lamps used over the third year (for a total of 25.5 lamps including the second year).</small>

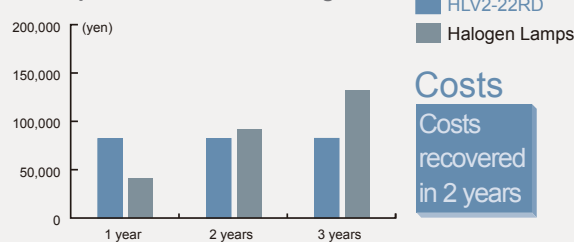
¹: These calculations were made based on the assumption that lamps were used for 24 hours per day each one month (30 days). Calculated using an electricity rate of 9 yen per 1 kWh/month (does not include basic charges).
²: Light lives are calculated values until the light output decreases to 50% at a light intensity of 100% and an ambient temperature of 40C° (reference values only).

■ Comparison of CO₂ Emissions between the HLV2 and a Halogen Lamp

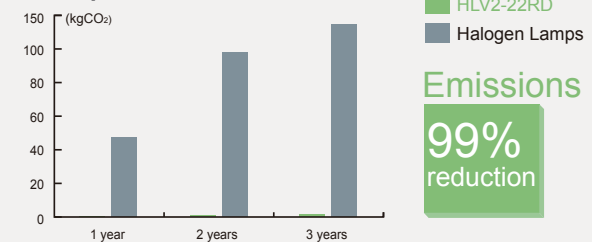
* CO₂ emissions are calculated by multiplying the electricity consumption by an emission coefficient of 0.555 kg CO₂ per kWh.

	HLV2-22RD (red)	100-W halogen lamps
CO ₂ Emissions	 Yearly power consumption 1,008 Wh (monthly power consumption) × 12 (months) = 12,096 Wh CO ₂ Emissions: 0.555 kg of CO ₂ per kWh 12,096 kWh × 0.555 kg CO ₂ /kWh = 6.7 kg CO ₂ (yearly emission)	 Yearly power consumption 72,000 Wh (monthly power consumption) × 12 (months) = 864,000 Wh CO ₂ Emissions: 0.555 kg of CO ₂ per kWh 286.4 kWh × 0.555 kg CO ₂ /kWh = 47.95 kg CO ₂ (yearly emission)
Emissions after One Year	6.7 kgCO ₂	47.95 kgCO ₂
Emissions after Two Years	13.4 kgCO ₂	95.9 kgCO ₂
Emissions after Three Years	20.1 kgCO ₂	143.85 kgCO ₂

■ Comparison of Total Running Costs



■ Comparison of CO₂ Emissions



By replacing the halogen lamps you are using now with the HLV2-series High-output Spotlights, you can greatly reduce CO₂ emissions, a contributing factor to global climate change.

Be Eco Friendly

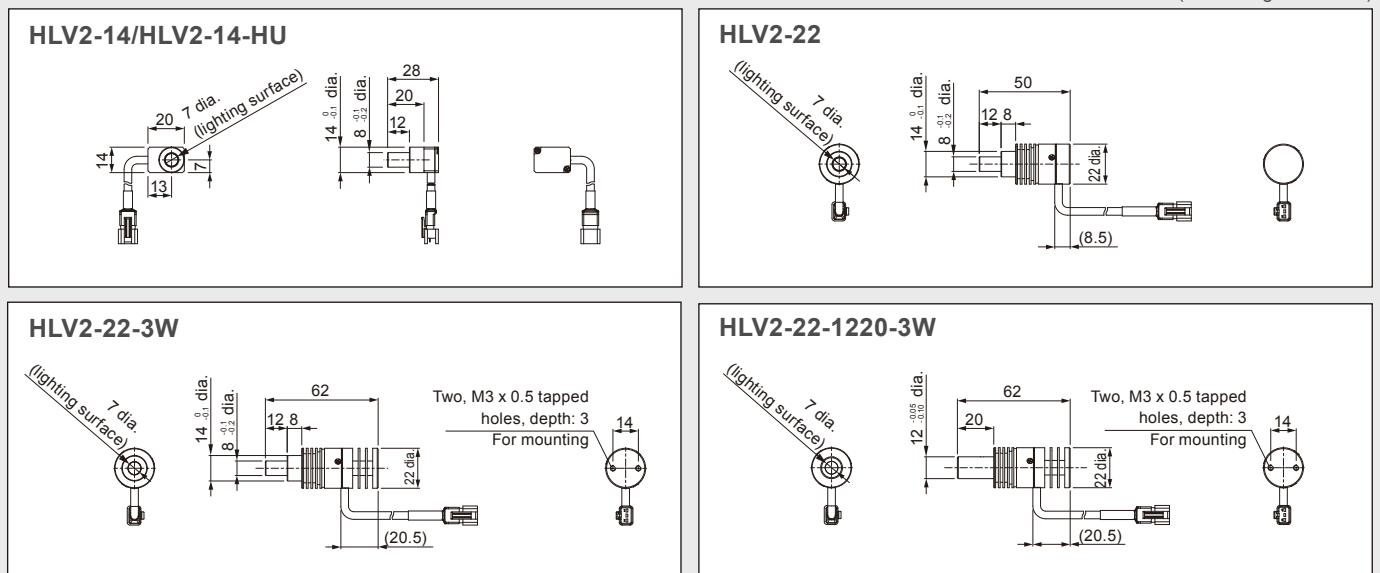
Specifications

* Product Number Guide: You can easily access the information page for any of our products by entering the item's 7-digit product number in the designated box on the CCS website (image processing page).

Model	Direct number	LED color	Peak wavelength/Correlated color temperature (typ.)	Power consumption (max.)	Weight (max.)	Polarity and signal	Case material
HLV2-14RD	1004853	Red	645 nm	0.9 W	18 g	SMR-03V-B 1: Signal 2: (+) 3: (-)	Aluminum alloy
HLV2-14SW	1004854	White	5,300 K				
HLV2-14BL	1004855	Blue	465 nm				
HLV2-14GR	1004856	Green	520 nm				
HLV2-14RD-HU	1004857	Red	645 nm				
HLV2-14SW-HU	1004858	White	4,700 K				
HLV2-14BL-HU	1004859	Blue	465 nm				
HLV2-14GR-HU	1004860	Green	520 nm				
HLV2-22RD	1004512	Red	645 nm	1.4 W	37 g	SMR-03V-B 1: Signal 2: (+) 3: (-)	Aluminum alloy
HLV2-22SW	1004513	White	5,300 K				
HLV2-22BL	1004514	Blue	465 nm				
HLV2-22GR	1004515	Green	520 nm				
HLV2-22RD-3W	1004516	Red	645 nm	2.8 W	41 g	SMR-03V-B 1: Signal 2: (+) 3: (-)	Aluminum alloy
HLV2-22SW-3W	1004517	White	5,300 K				
HLV2-22BL-3W	1004518	Blue	465 nm				
HLV2-22GR-3W	1004519	Green	520 nm				
HLV2-22RD-1220-3W	1004524	Red	645 nm		42 g		
HLV2-22SW-1220-3W	1004525	White	5,300 K				
HLV2-22BL-1220-3W	1004526	Blue	465 nm				
HLV2-22GR-1220-3W	1004527	Green	520 nm				

Dimensions (mm)

(Cable length: 300 mm)



Optional Extension Cable

Standard models	Models with robot cables	Using an Extension Cable
FCB-1/-2/-3/-5 (1m/2m/3m/5m)	FRCB-1/-2/-3/-5 (1m/2m/3m/5m)	<ul style="list-style-type: none"> Do not connect an Extension Cable that is longer than 5 m. * If you need to use an Extension Cable longer than 5 m, please contact a CCS sales representative. Branch cables cannot be used.

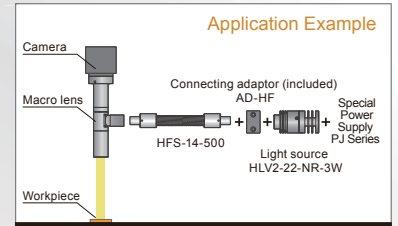
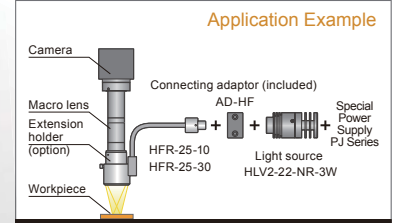
HFR

– Ring Light Units –



HFS

– Straight Light Units –



*Three light sources are required.

Provides 9 Times* or More the Brightness of a 100-W Halogen Ring Light

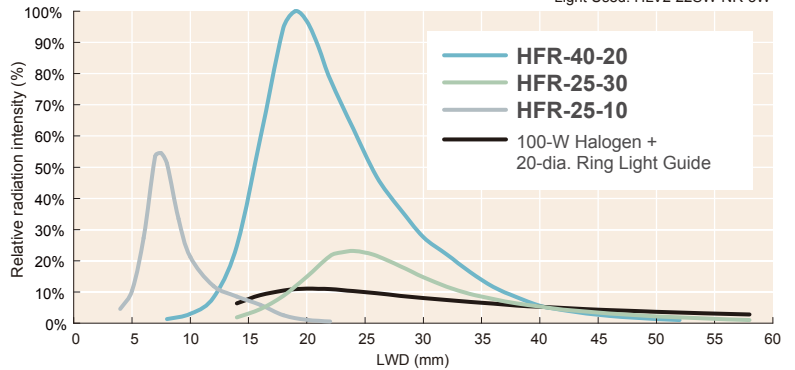
* Comparison of the HFR-40-20 and a 100-W Halogen Light Source + 20-dia. Ring Light Guide at Maximum Intensity

■ Comparison of Brightness between a Halogen Lamp and the HFR Series

While halogen fiber lighting illuminates a wide area, the HFR Series utilizes CCS's original condensing technologies to provide high intensity by illuminating only the required field of view.

■ Change in Radiance at Each LWD of the HFR Series

Light Used: HLV2-22SW-NR-3W



* The data provided here is for reference only. Value is not guaranteed.

Select the Optimal Condensing Illumination for a Variety of Fields of View and LWDs*

* LWD: Light Working Distance (the distance from a light to the workpiece)

HFR-25-10	HFR-25-30	HFR-40-20
Condensed illumination over a 5-mm dia. with a 10-mm LWD (condensed illumination by single array)	Condensed illumination over a 10-mm dia. with a 30-mm LWD (condensed illumination by single array)	Condensed illumination over 10-mm dia. at a 20-mm LWD (condensed illumination by three independent arrays)

Clear Images by Selecting the Illumination Range, Illumination Angle, and Radiance

■ Detecting a singular point that is difficult to capture with an existing halogen light source can be achieved with high contrast.

By using ring lighting and condensing illumination from a low angle, you can detect singular points that are difficult to capture using a halogen light source.

■ Comparison of Chip Part Images

Operating conditions: Shutter speed: 1/20,000 s, Lens: Double-magnification macro lens, Intensity: 100%, Light Unit: HLV2-22BL-NR-3W

100-W Halogen + 20-dia. Ring Light Guide



Illuminated by a 100-W halogen light

HFR-25-30 (Blue)



Condensed illumination from 30 mm LWD (condensed illumination by single array)

HFR-25-10 (Blue)



Condensed illumination over a 5-mm dia. (condensed illumination by single array)

HFR-40-20 (Blue)

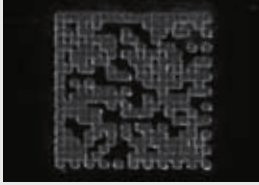


Condensed illumination (condensed by three independent arrays) with wide field of view

Select the Optimal Light Source Color According to the Properties of the Workpiece

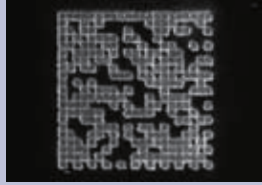
■ Comparison of TFT Barcode Images

100-W Halogen + Ring Light Guide: LWD of 20 mm



Intensity: 100%, Shutter speed: 1/4,000 s

HFR-25-10 (white) : LWD of 10 mm



Intensity: 100%, Shutter speed: 1/4,000 s



HFR-25-10

■ Comparison of Circuit Board Chip Part Images

100-W Halogen + Ring Light Guide: LWD of 20 mm



Intensity: 100%, Shutter speed: 1/2,000 s

HFR-25-30 (blue) : LWD of 30 mm



Intensity: 100%, Shutter speed: 1/2,000 s



HFR-25-30

■ Perfect for a Wide Range of Applications (HFS-14-500)

The **HFS-14-500** Straight Microfiber Head can be attached directly into the coaxial lens because the shape of the tip of halogen straight light guides is the same. Furthermore, less heat conductivity and a compact leading tip allow for applications in a wide variety of situations.

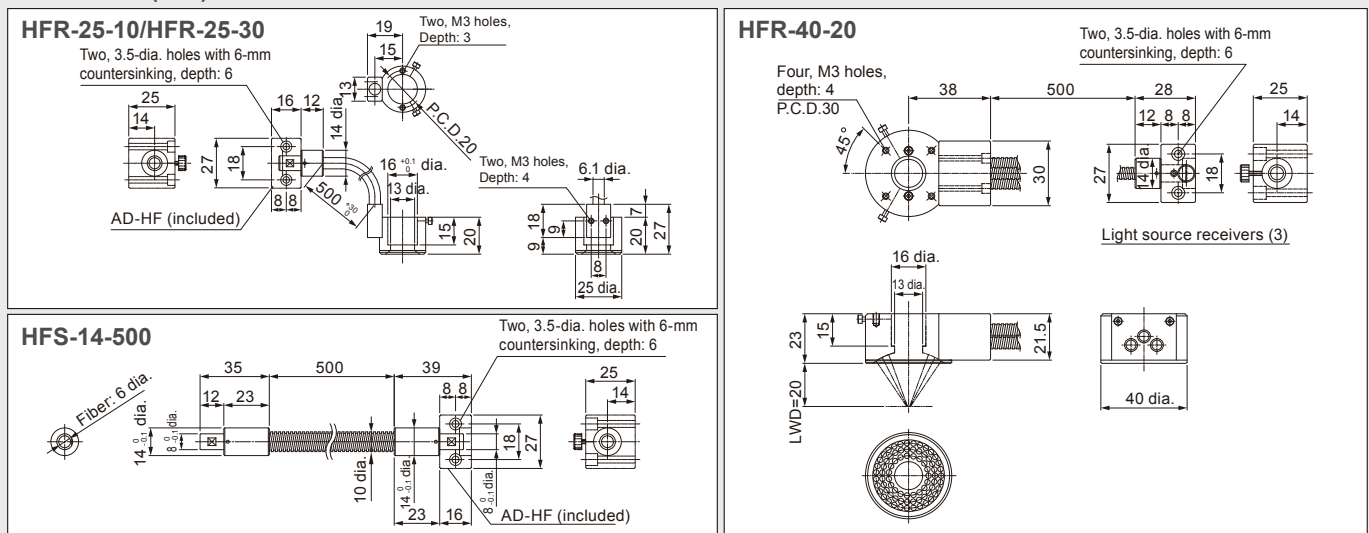


HFS-14-500

Specifications Product Number Guide: You can easily access the information page for any of our products by entering the item's 7-digit product number in the designated box on the CCS website (image processing page).

Model	Direct number	Operating temperature and humidity	Storage temperature and humidity	Weight (max.)
HFR-25-10	1000127	Temp.: 0 to 40°C, Humidity: 20% to 70% (non-condensing)	Temp.: -10 to 60°C, Humidity: 20% to 70% (non-condensing)	60 g
HFR-25-30	1000129			250 g
HFR-40-20	1000134			115 g
HFS-14-500	1000148			

Dimensions (mm)



Original Light Guides

■ Fiber Specifications

Model	HFR-25-10/30 HFR-40-20	HFS-14-500
Fiber material	Plastic	Multi-component glass
Case material	Aluminum	Aluminum
Bundle sheathing	SUS	SUS
Fiber diameter (μm)	500	50
Fiber arrangement	-	Random spec.
Numerical aperture (NA)	0.5	0.56
Acceptance angle (°)	60	68
Spectral transmittance (nm)	400 to 700	300 to 1,300
Minimum bending radius (mm)	30	50

HLV2-3M-RGB-3W

HLV2-22-NR-3W

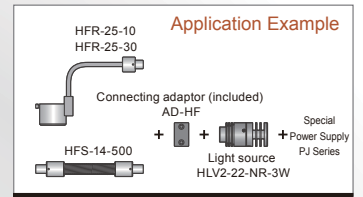
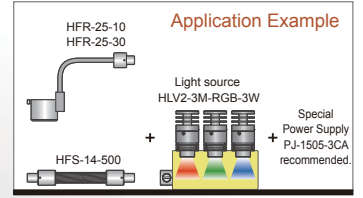


HLV2-3M-RGB-3W HLV2-22BL-NR-3W

HLV2-22RD-NR-3W

HLV2-22SW-NR-3W

HLV2-22GR-NR-3W



Blend Colors in Any Way You Can Imagine!

■ Increased Output with the HLV2-22-NR-3W

The **HLV2-3M-RGB-3W** is a special light source that consists of a Light Source Unit and a Blending Unit. This enables stepless, independent dimming of each individual color. The special construction of the Blending Unit eliminates irregularities to provide uniform light emission. Connection to a model from our Microfiber Head Series allows you to create the perfect illumination color for a wide range of configurations.



■ Connecting the HLV2-3M-RGB-3W and Microfiber Head

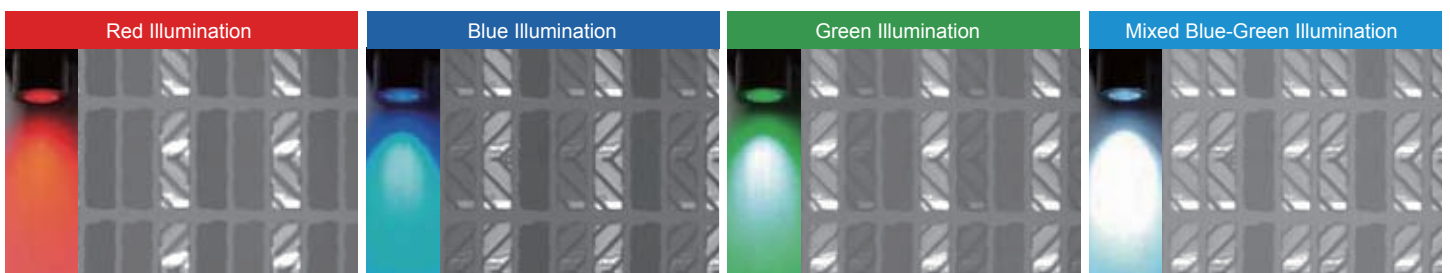


By connecting to CCS Microfiber Heads you can achieve full color illumination with a wide range of illumination.

By changing the light source color, high-quality images can be obtained based on your particular application.

■ Image Examples of Liquid Crystal Color Filters

By utilizing the **HLV2-22-NR-3W** Series, we achieve highly accurate mixed color illumination. Independent control of intensity provides optimal illumination and images, and helps to improve inspection precision.



-3W/HLV2-22-NR-3W Series

Connecting the HLV2-22-NR-3W and Microfiber Head

In order to utilize the unique properties of different wavelengths, four colors are available: red (**RD**), green (**GR**), blue (**BL**), and white (**SW**). By connecting to different types of microfiber heads, you can select the optimal color and illumination configuration when imaging to achieve the most precise feature extraction possible.

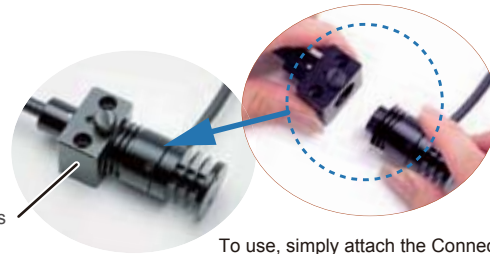


Straight Model
HFS-14-500

Ring Models
HFR-25-10/HFR-25-30

Easily Connect and Replace Light Sources

The special **HLV2-22-NR-3W**-series Light Sources for microfiber heads can easily be installed and removed. Highly precise feature extraction is achieved by choosing the optimal light source color when imaging.



Connecting Adapter (**AD-HF**) is included with the HFS/HFR Series

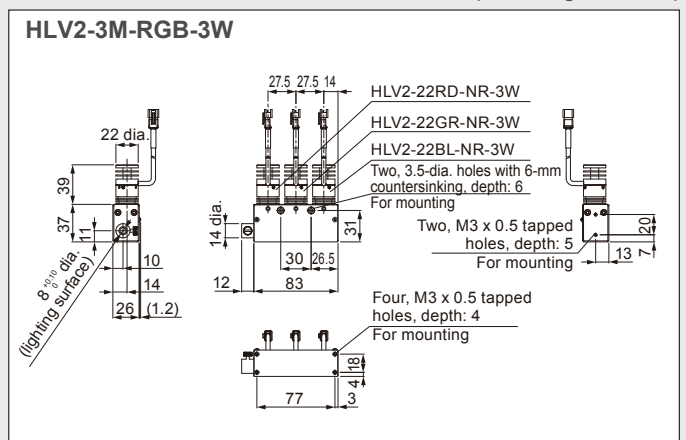
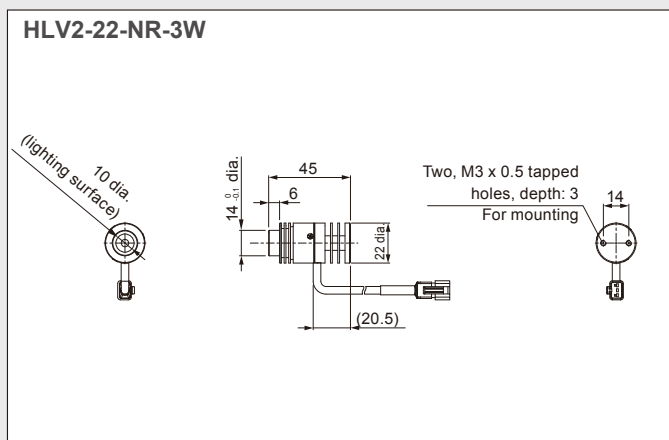
To use, simply attach the Connecting Adapter that is provided with the HFS/HFR Series.

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Model	Direct number	LED color	Peak wavelength/Correlated color temperature (typ.)	Power consumption (max.)	Weight (max.)	Polarity and signal	Case material
HLV2-22RD-NR-3W	1004520	Red	645 nm	2.8 W	37 g	1: Signal 2: (+) 3: (-)	Aluminum alloy
HLV2-22SW-NR-3W	1004521	White	5,300 K				
HLV2-22BL-NR-3W	1004522	Blue	465 nm				
HLV2-22GR-NR-3W	1004523	Green	520 nm				
HLV2-3M-RGB-3W	1004528	Red	645 nm	8.4 W	232 g		
		Blue	465 nm				
		Green	520 nm				

Dimensions (mm)

(Cable length: 300 mm)



Optional Extension Cable

Standard models	Models with robot cables
FCB-1/-2/-3-/5 (1m/2m/3m/5m)	FRCB-1/-2/-3-/5 (1m/2m/3m/5m)

Using an Extension Cable

- Do not connect an Extension Cable that is longer than 5 m.
- * If you need to use an Extension Cable longer than 5 m, please contact a CCS sales representative.
- Branch cables cannot be used.

HLV2 Series Light Sources **PJ Series**

100 to 240-VAC Models



24-V DC Models



Power Supplies for the HLV2 Series: PJ Series

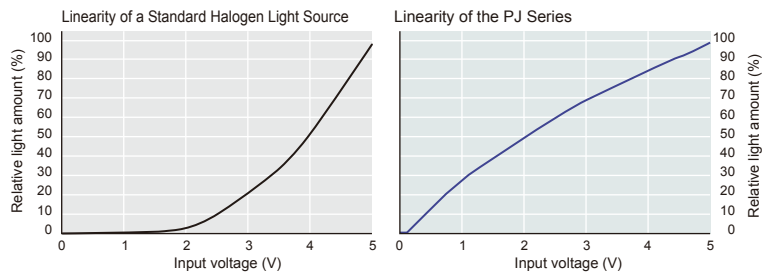
You can perform external control of the system you are currently using with the same 0-5V external control as a standard halogen light source. Continuous current control enables more precise adjustment of the light intensity than is possible with halogen light sources. You can choose from four different models of Controllers based on your operating environment.

100 to 240-V AC Models

Two channels: PJ-1505-2CA, Three channels: PJ-1505-3CA

24-V DC Models

Two channels: PJ-1505-2CA, Three channels: PJ-1505-3CA



CE Models with CE Marking
PJ-1505-2CA/PJ-1505-3CA
PJ-1505-2CD24/PJ-1505-3CD24

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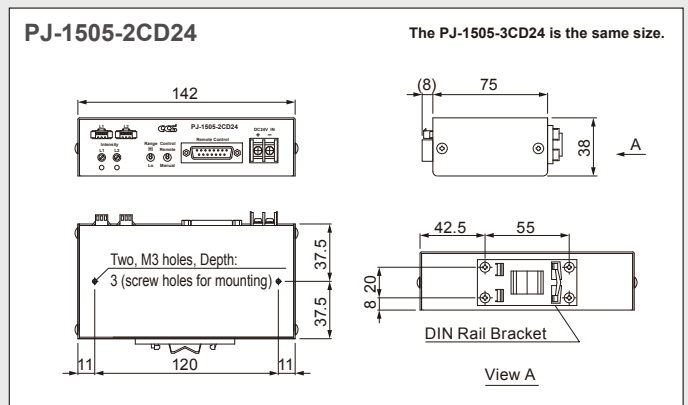
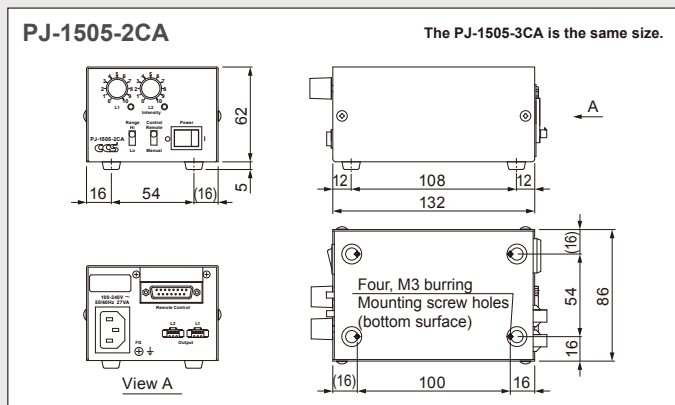
Model	Direct number	Input voltage (rated)	Input voltage (range)	Power consumption (typ.)	Number of channels	Output voltage (maximum rated)	Light intensity control	Weight (max.)
PJ-1505-2CA	2000131	100 to 240 VAC	85 to 264 VAC	27 VA	2	DC 5.5 V	Manual: Front light intensity dial Remote (external): Analog input voltage of 0 to 5 V (5.25 V maximum)	640 g
PJ-1505-3CA	2000136			37 VA	3			660 g
PJ-1505-2CD24	2000134	24 VDC	10 to 24 VDC	10 W	2			380 g
PJ-1505-3CD24	2000139			14.5 W	3			

* The operable input voltage range is: 85 to 265 VAC for the PJ-1505-2CA and PJ-1505-3CA, and 10 to 26 VDC for the PJ-1505-2CD24 and PJ-1505-3CD24.

ON/OFF control	OFF: 2.5 to 5.0 V (24 V maximum) ON: 0.8 to 0 V (pulled down with 4.7 KΩ)
External control connector	D-Sub, 15-pin (plug)

External control cables are also available as an options.

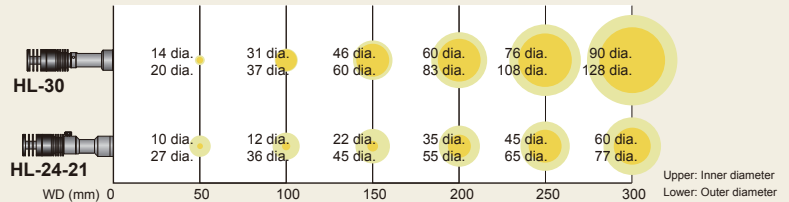
Dimensions (mm)



Options

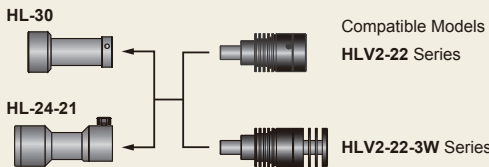
Condensing Lens for the HLV2-22 Series: HL-30/HL-24-21

■ Illumination Range of the HL-30/HL-24-21



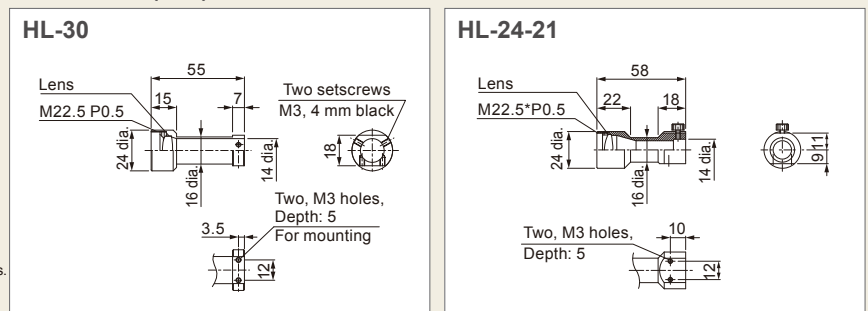
* The data shown here represents actual measurements. Value is not guaranteed.

■ Mounting to the HLV2-22 Series



* Cannot be used with the HLV2-14, HLV2-22-1220-3W, or HLV2-22-NR-3W Series.

Dimensions (mm)



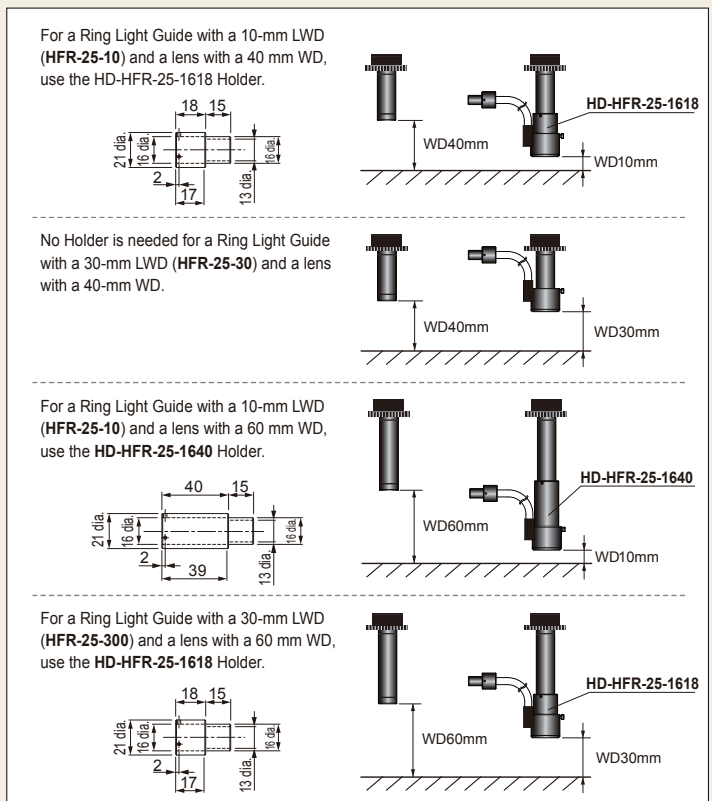
Extension Holders for the HFR-25-10/HFR25-30

These Extension Holders are available to adjust the condensing location of the HFR Series when using a high-power lens with a fixed working distance. The light can be mounted with ease, allowing you to mount it at the most efficient condensing position.



■ Usage Examples of Extension Holders (HD-HFR-25-1618/HD-HFR-25-1640)

- Used for mounting a macro lens or telecentric lens and microfiber head.
- Use an appropriate Holder model for the working distance of the lens and the working distance of the Ring Light Guide that you are using.



* For usage configurations other than those listed above, please inquire separately.

Highly Functional, Cost-effective
Original Macro Lens

SE-16/SE-18 Series

SE-16 series



SE-16VM05

SE-16VM1

SE-16VM2

Covers 0.5x, 1x, and
2x fields of view.

Coaxial Lens Models

SE-18 series



SE-18VM2

SE-18VM4

SE-18VM6

Covers 2x, 4x, and
6x fields of view.

Coaxial Lens Models

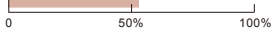
A lens that provides the optimal
brightness for image processing



Two-dimensional Codes



Macro Lens: SE-16VM2
LED Light: HLV2-22RD-3W
Sensor Size: 1/3 inch
Scale: 2x
Shutter speed: 1/20,000 s
Light intensity: 55%



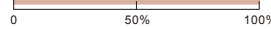
A lens with a long work distance of 110 mm



LED Display Alignment Marks



Macro Lens: SE-18VM4
LED Light: HLV2-22SW-3W
Sensor Size: 1/3 inch
Scale: 4x
Shutter speed: 1/7,000 s
Light intensity: 100%



For more details about our macro lenses, see our catalogs and pamphlets, or look us up on the web.

Notes

- Carefully read the product's instruction manual before use to ensure correct operation.
- Product specifications and design are subject to change without notice.
- Examples of workpiece imaging in this catalog are a guide that may be informative for choosing illuminations. Please check the functions of the equipment and requirements when choosing.



CCS Inc.

Headquarters

Shimodachiuri-agaru, Karasuma-dori, Kamigyo-ku, Kyoto 602-8011 Japan
Phone: +81-75-415-8284 / Fax: +81-75-415-8278
URL: <http://www.ccs-grp.com> E-mail: intlsales@ccs-inc.co.jp

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