



# Vision Light Tech

creating optical solutions

HLV3 series

## LED Spot Lights

## HLV3 Series



- Achieved both high output and high uniformity
- Optimized for high-resolution telecentric lenses
- Reduced individual differences in brightness

LIGHTING SOLUTION  
CCS Inc.

## ➤ 3rd Gen Lights with Exceedingly High Performance and Quality

- **Achieved both high output and high uniformity**  
A rich lineup for a variety of applications.
- **Optimized for CCS's high-resolution telecentric lenses**  
Optimum Spot Lights for lens magnifications.
- **Reduced individual differences in brightness**  
Reduced maintenance labor times by controlling variations in the brightness of Spot Lights.

## ➤ Full Lineup with a Total of 29 Models

### High Output Models **HLV3-22-4S**

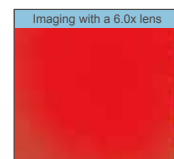
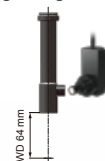
### High Uniformity Models **HLV3-22-4M**



### HLV3-22-4S, a high output models

Optimized for CCS's high-magnification telecentric lenses

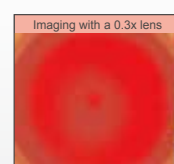
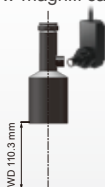
Spot Light (white)  
**HLV3-22SW-4S**  
+  
Telecentric Lens  
6x, WD: 65 mm  
**SE-65VT60-M**



### HLV3-22-4M, a high uniformity models

Optimized for CCS's low-magnification telecentric lenses

Spot Light (white)  
**HLV3-22SW-4M**  
+  
Telecentric Lens  
0.3x, WD: 110 mm  
**SE-110VT03-5M**



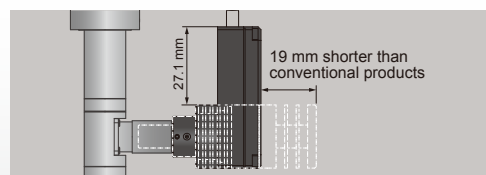
Each color represents the brightness in steps of 10% the maximum value.  
The results for individual products may vary.

### Standard Models **HLV3-22-1** **HLV3-22-2**



Housing has been redesigned and optimized from that of conventional products.

Horizontal space saved by using an L-shaped housing.



Mounting holes on rear of Spot Light enable flexible installation.

### **HLV3-22-2-1220**



### Ø12-mm Light Emitting Tip

The HLV3-22-2-1220 series is derived from the HLV3-22-2 series. The main difference in specifications is the diameter of the light emitting tip.

### IR Model **HLV3-22IR860**

**Infrared (860 nm) models available**  
For transmission applications.



HLV3-22IR860

### Compact and Lightweight Models **HLV3-14** **HLV3-14-HU**



Both standard and high-uniformity types are available

Emitting surface of HLV3-14RD



Emitting surface of HLV3-14RD-HU



Comparison using our measurement conditions.  
The data included is for reference only and the results for individual products may vary.

## ► Revamped Line of Lights to Satisfy Your Specific Needs

### HLV3 Series Comparison Table

Model	Description	Input current (max.)	Brightness (index)			
			RD (red)	SW (white)	BL (blue)	GR (green)
HLV3-22-4S	High output model	1,000 mA	1.6 <sub>x</sub>	1.9 <sub>x</sub>	2.0 <sub>x</sub>	1.6 <sub>x</sub>
HLV3-22-4M	High uniformity model	1,000 mA	1.0 <sub>x</sub>	1.3 <sub>x</sub>	1.2 <sub>x</sub>	1.0 <sub>x</sub>
HLV3-22-2	Standard model	700 mA	1.1 <sub>x</sub>	1.5 <sub>x</sub>	1.5 <sub>x</sub>	1.2 <sub>x</sub>
HLV3-22-1	Standard model	385 mA	0.6 <sub>x</sub>	0.9 <sub>x</sub>	0.9 <sub>x</sub>	0.8 <sub>x</sub>
HLV3-14	Compact model with condensed light	275 mA	1.0 <sub>x</sub>	0.8 <sub>x</sub>	1.3 <sub>x</sub>	1.1 <sub>x</sub>
HLV3-14-HU	Compact model with diffused light	275 mA	<0.1 <sub>x</sub>	0.1 <sub>x</sub>	<0.1 <sub>x</sub>	0.1 <sub>x</sub>
HLV2-22-3W	Brightest model in HLV2 series (Reference data)	700 mA	1.0	1.0	1.0	1.0

Comparison using our measurement conditions. The data included is for reference only and the results may vary.

### Reduced Individual Differences (Excluding HLV3-14, HLV3-14-HU, and HLV3-22IR860)

The newly designed HLV3-series Spot Light allows for brightness adjustment to the standard value.

In the production process, the brightness of each HLV3-series Spot Light is measured and adjusted to the standard value established for each model. This allows us to produce high-quality Spot Lights with minimal variations in brightness between units of the same model. The HLV3 series helps reduce labor time to install, maintain, and adjust brightness of Spot Lights and helps reduce time required on site.

### Optimized for the Optical System of CCS High-Resolution Telecentric Lenses

Optimum Spot Lights for lens magnifications.

High uniformity types are available for low magnification lenses and high output types are available for high magnification lenses.

Spot Lights use an original lens to maintain high quality with minimal deviation in the optical axis.

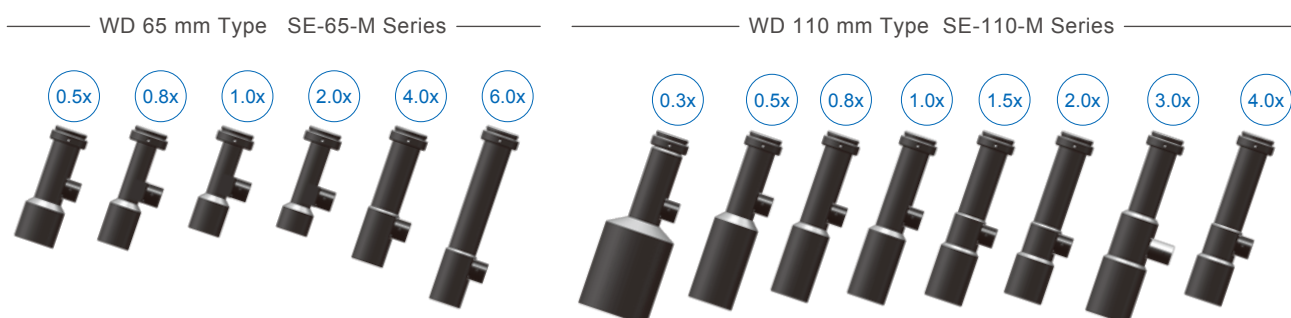
Use Spot Lights with our original telecentric lenses (coaxial type) to create a stable imaging environment.

#### ■ List of the recommended combination of telecentric lens and HLV3 series

	Magnification	0.3	0.5	0.8	1.0	1.5	2.0	3.0	4.0	6.0
	WD									
Telecentric lens	65 mm		SE-65 VT05-M	SE-65 VT08-M	SE-65 VT10-M		SE-65 VT20-M		SE-65 VT40-M	SE-65 VT60-M
	110 mm	SE-110 VT03-5M	SE-110 VT05-M	SE-110 VT08-M	SE-110 VT10-M	SE-110 VT15-M	SE-110 VT20-M	SE-110 VT30-M	SE-110 VT40-M	
HLV3 series		HLV3-22-4M			HLV3-22-1, HLV3-22-2, HLV3-22-4S, HLV3-14, and HLV3-14-HU					

Recommendation based on the test results using our measurement conditions.

### CCS High-Resolution Telecentric Lenses SE-65-M/110-M Series



Refer to the back cover for the detailed specifications.

#	Model name	LED color	Peak wavelength / correlated color temperature (typ.)	Input current (max.)	Power consumption (max.)	Options	Extension cables	Recommended Control Units	Weight (max.)		
①	HLV3-14RD	Red	635 nm	275 mA	0.7 W	-			18 g		
	HLV3-14SW	White	5000 K		0.9 W						
	HLV3-14BL	Blue	465 nm		0.9 W						
	HLV3-14GR	Green	525 nm		1.1 W						
	HLV3-14RD-HU	Red	635 nm		0.7 W						
	HLV3-14SW-HU	White	4900 K		0.9 W						
	HLV3-14BL-HU	Blue	465 nm		0.9 W						
	HLV3-14GR-HU	Green	525 nm		1.1 W						
②	HLV3-22RD-1	Red	630 nm	385 mA	1.1 W	Condenser Lens	FCB *2 Straight Cable  FRCB Robot Cable	PD3 *1 CC-PJ-0707  PJ PJ2	46 g		
	HLV3-22SW-1	White	5600 K		1.4 W						
	HLV3-22BL-1	Blue	465 nm		1.5 W						
	HLV3-22GR-1	Green	520 nm		1.5 W						
	HLV3-22RD-2	Red	630 nm	700 mA	2.1 W						
	HLV3-22SW-2	White	5600 K		2.5 W						
	HLV3-22BL-2	Blue	465 nm		2.7 W						
	HLV3-22GR-2	Green	520 nm		2.8 W						
③	HLV3-22RD-2-1220	Red	630 nm	700 mA	2.1 W	-			47 g		
	HLV3-22SW-2-1220	White	5600 K		2.5 W						
	HLV3-22BL-2-1220	Blue	465 nm		2.7 W						
	HLV3-22GR-2-1220	Green	520 nm		2.8 W						
④	HLV3-22RD-4M	Red	630 nm	1000 mA	3.2 W	Condenser Lens	FCB *2 Straight Cable  FRCB Robot Cable  FCB-HLV3-10 Straight Cable  FRCB-HLV3-10 Robot Cable	PJ2	53 g		
	HLV3-22SW-4M	White	5600 K		3.7 W						
	HLV3-22BL-4M	Blue	465 nm		4.0 W						
	HLV3-22GR-4M	Green	520 nm		4.1 W						
	HLV3-22RD-4S	Red	630 nm		3.2 W						
	HLV3-22SW-4S	White	5600 K		3.7 W						
	HLV3-22BL-4S	Blue	465 nm		4.0 W						
	HLV3-22GR-4S	Green	520 nm		4.1 W						
	HLV3-22IR860	Infrared	860 nm		4.1 W						

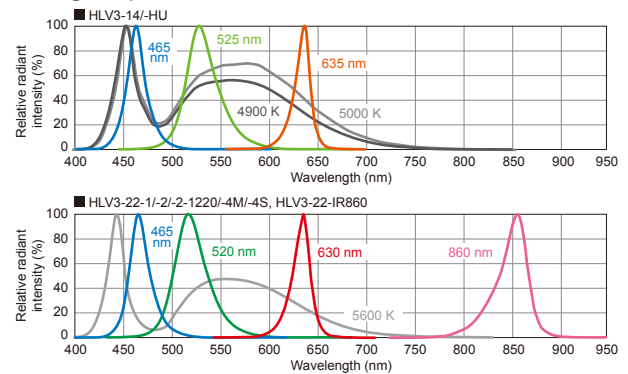
\*1 The PD3-3024-3 and PD3-5024-3 series are not applicable to these products.

\*2 The cables with a model name that ends with "-PF", "-PF-EL9", "-ME7", or "-EL2" are not included.

## Common Specifications

Connector	SMR-03V-B
Polarity	1: Signal, 2: (+), 3: (-)
Cable length	300 mm
Cooling method	Natural air-cooling
Operating env. (indoors only)	Temperature: 0 to 40°C, Humidity: 20 to 85%RH (with no condensation)
Storage environment	Temperature: -20 to 60°C, Humidity: 20 to 85%RH (with no condensation)
CE marking	Safety standard: Conforms to EN62471
Cable material	Aluminum alloy

## Light Spectrum



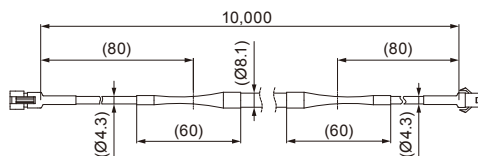
## Optional Cables (Sold Separately)

Extension cables	Straight cables	Robot cables
	FCB-1/-2/-3/-5 (1 m / 2 m / 3 m / 5 m)	FRCB-1/-2/-3/-5 (1 m / 2 m / 3 m / 5 m)
	FCB-HLV3-10 (10 m) *	FRCB-HLV3-10 (10 m) *

\* These 10-m extension cables connect the HLV3-series Spot Light and the PJ2-series Control Unit.

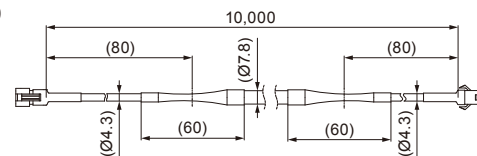
Notes
<ul style="list-style-type: none"> <li>The total length of the FCB-1/-2/-3/-5 and FRCB-1/-2/-3/-5 Extension Cables must be no longer than 5 m.</li> <li>Branch cables are not available for the HLV3 Spot Lights.</li> </ul>

FCB-HLV3-10  
Straight Cable  
(Unit: mm)



Weight: 1,200 g max., Cable permitted bending radius: 65 mm

FRCB-HLV3-10  
Robot Cable  
(Unit: mm)

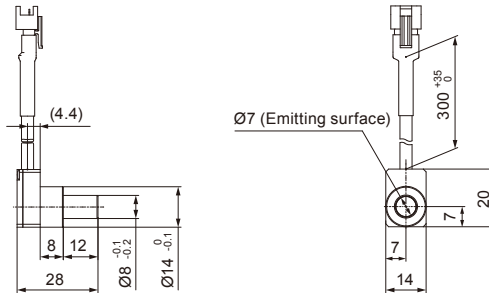


Weight: 1,200 g max., Cable permitted bending radius: 35 mm

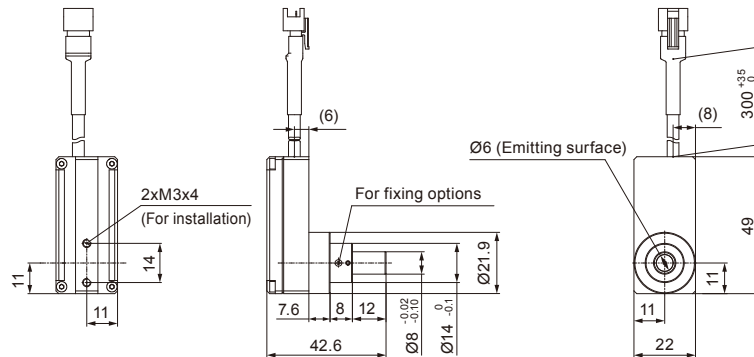
## Dimensions

(Unit: mm)

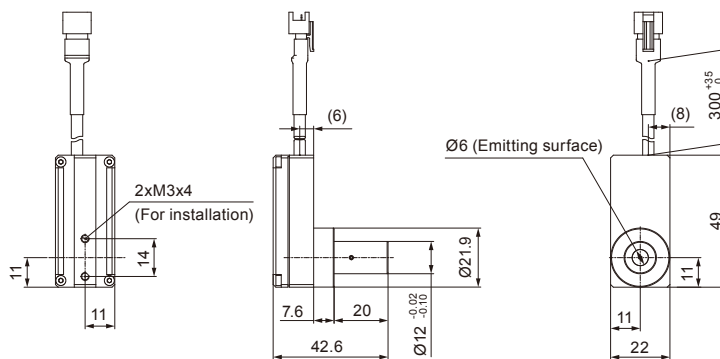
### 1 HLV3-14RD/SW/BL/GR HLV3-14RD-HU/SW-HU/BL-HU/GR-HU



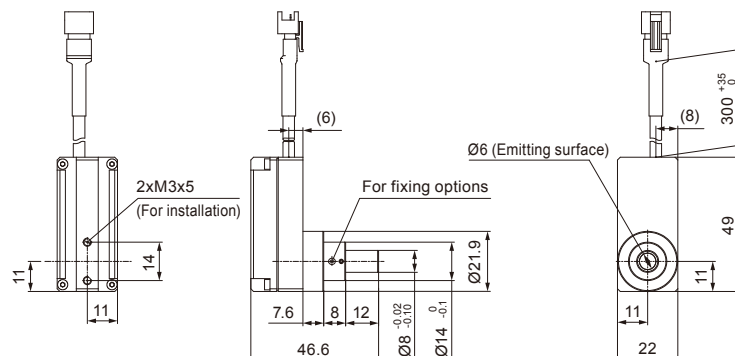
### 2 HLV3-22RD-1/SW-1/BL-1/GR-1 HLV3-22RD-2/SW-2/BL-2/GR-2



### 3 HLV3-22RD-2-1220/SW-2-1220/BL-2-1220/GR-2-1220



### 4 HLV3-22RD-4M/SW-4M/BL-4M/GR-4M HLV3-22RD-4S/SW-4S/BL-4S/GR-4S HLV3-22IR860



# Condenser Lenses

Installable on

• HLV3-22-1, HLV3-22-2  
• HLV3-22-4M, HLV3-22-4S, HLV3-22-IR860

Select lenses according to illuminating distance, illuminating range, and uniform region to achieve optimum illumination, even in imaging environments in which the workpiece is far away.

## High Parallelism

Compact condenser lens for spot illumination with high parallelism.



HL2-25-P



HL2-50-P

Condenser lens for spot illumination with high parallelism.

### ● Illuminance Distribution

HL2-25-P



HL2-50-P



Measured with HLV3-22SW-4S (white) mounted on the lens. Comparison using our measurement conditions. The data included is for reference only and the results for individual products may vary.

### ● Illuminance Distributions (LWD Characteristics)

HL2-25-P + HLV3-22SW-4S (Unit of length used for the diameter of illuminated range: mm)							
LWD	50 mm	100 mm	200 mm	300 mm	500 mm	1,000 mm	1,500 mm
50 to 100% illuminance	Ø18	Ø15	Ø19	Ø28	Ø45	Ø89	Ø128
5 to 100% illuminance	Ø30	Ø30	Ø39	Ø48	Ø69	Ø141	Ø194

HL2-50-P + HLV3-22SW-4S (Unit of length used for the diameter of illuminated range: mm)							
LWD	50 mm	100 mm	200 mm	300 mm	500 mm	1,000 mm	1,500 mm
50 to 100% illuminance	Ø41	Ø40	Ø38	Ø35	Ø28	Ø44	Ø67
5 to 100% illuminance	Ø53	Ø52	Ø52	Ø54	Ø56	Ø79	Ø102

Measured values, where the maximum illuminance within the range is 100%, using our measurement conditions. Results for individual products may vary.

## Adjustable Focus

The length of the lens barrel varies, depending on the distance, to concentrate the light.



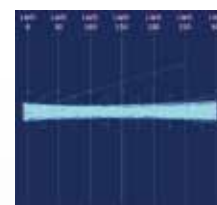
HL2-M50-C

### ● Illuminance Distribution

HL2-M50-C



Measured with HLV3-22SW-4S (white) mounted on the lens. Comparison using our measurement conditions. The data included is for reference only and the results for individual products may vary.

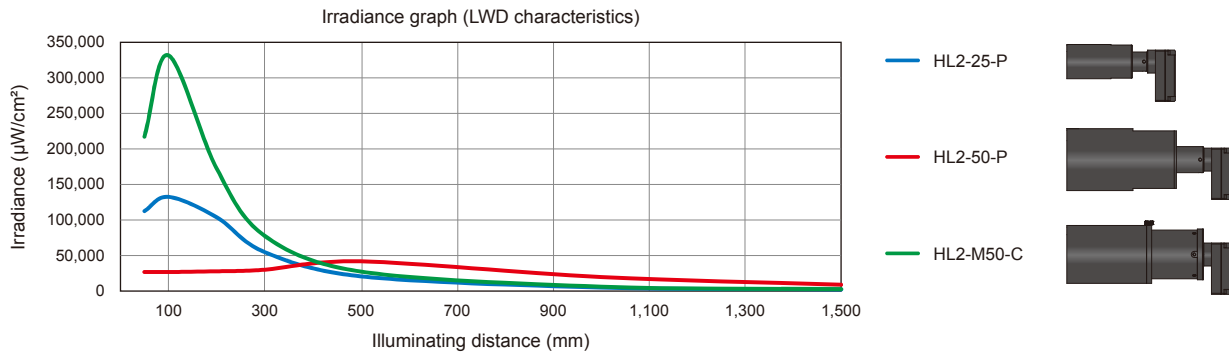


### ● Illuminance Distributions (LWD Characteristics)

HL2-M50-C + HLV3-22SW-4S (Unit of length used for the diameter of illuminated range: mm)							
LWD	50 mm	100 mm	200 mm	300 mm	500 mm	1,000 mm	1,500 mm
50 to 100% illuminance	Ø5	Ø10	Ø19	Ø27	Ø46	—	—
5 to 100% illuminance	Ø18	Ø24	Ø38	Ø49	Ø75	—	—

Measured values, where the maximum illuminance within the range is 100%, using our measurement conditions. Results for individual products may vary.

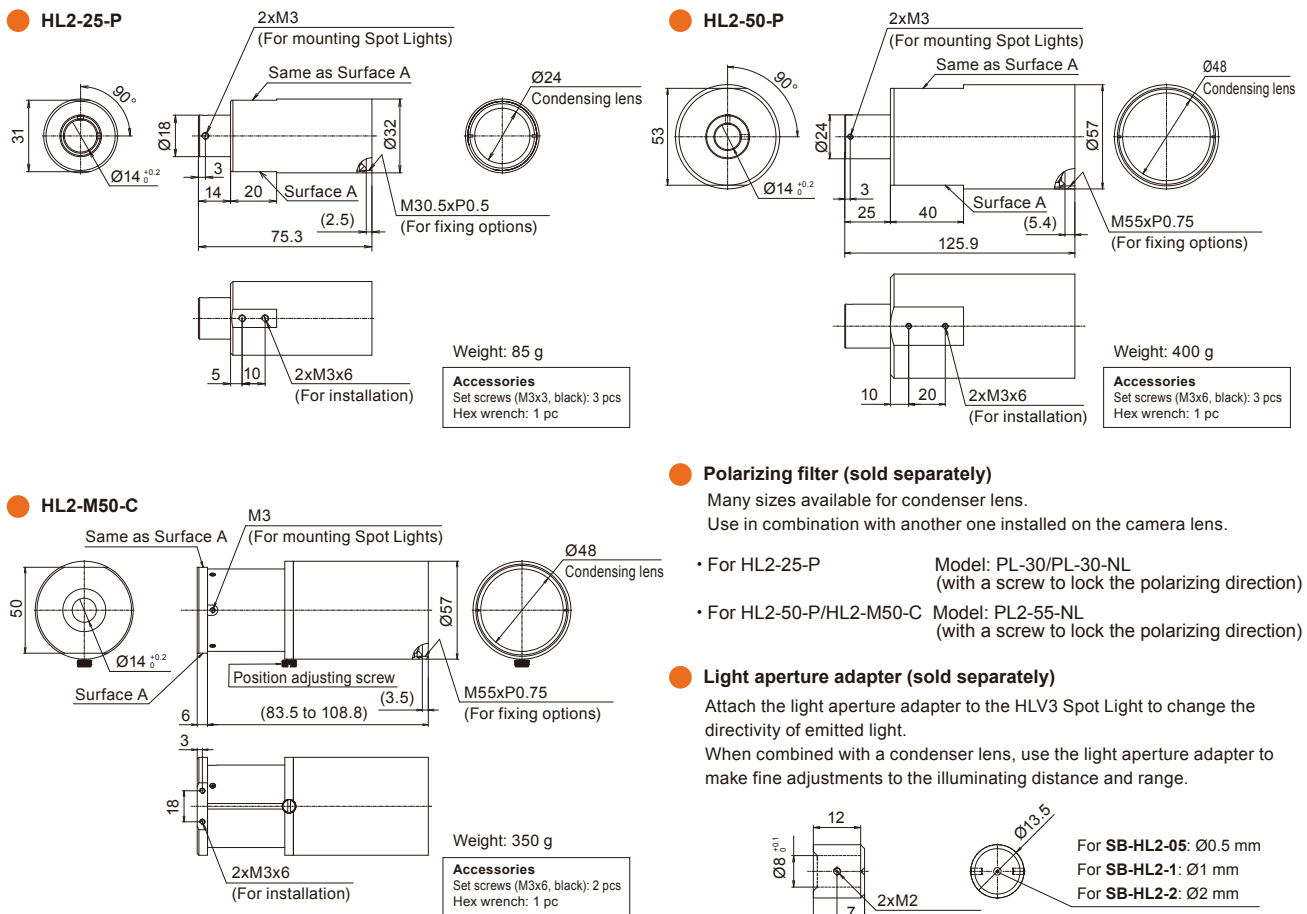
## Irradiance Comparison



Measurement with HL2-22SW-4S (white) mounted on the lens. Measured values using our measurement conditions. Results for individual products may vary.

## Condenser Lens Dimensions

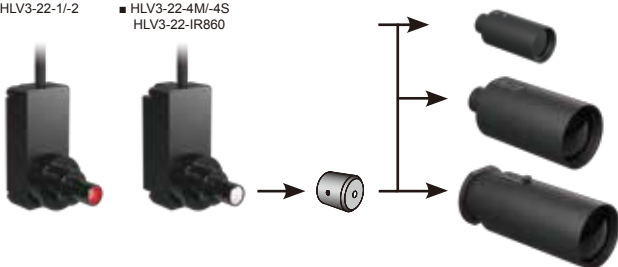
(Unit: mm)



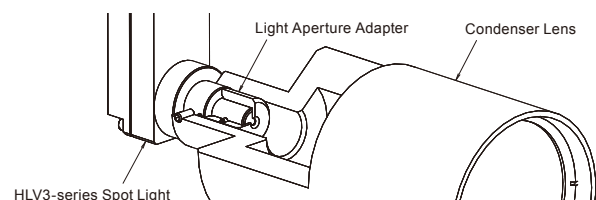
### Installable on

HLV3-22-1/-2

HLV3-22-4M/-4S  
HLV3-22-IR860



Put the Light Aperture Adapter and Condenser Lens all the way onto the tip of the Spot Light.



## HLV3-3M-RGB-4

## HLV3-22-4-NR



HLV3-3M-RGB-4

HLV3-22RD-4-NR

1.5x  
That of Conventional  
Products



HLV3-22SW-4-NR

2.3x  
That of Conventional  
Products



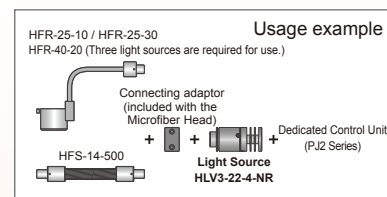
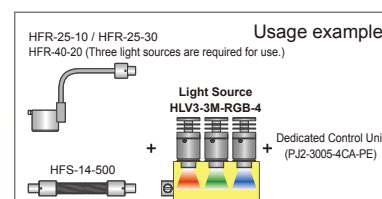
22x  
That of Conventional  
Products

HLV3-22BL-4-NR



HLV3-22GR-4-NR

20x  
That of Conventional  
Products



Comparison with the conventional product HLK2-22-NR-3W of the same color.  
Comparison using our measurement conditions. The data included is for reference only and the results may vary.  
For detailed information on Micro Fiber Heads, refer to our website or the *General Catalog of LED Lighting for Machine Vision Applications*.

## ▶ Step-less Blending of Any Color with High Output and Uniformity

### Illuminate with optimum red, green, and blue emission colors

HLV3-3M-RGB-4 is a dedicated light source composed of light sources and a blending unit. Step-less intensity control of the light sources can be performed for each color. The blending unit achieves uniform illumination due to its special construction. Connect this light source to our unique Micro Fiber Head series to create optimum illumination colors in a variety of illumination configurations.



### ■ Connection example for HLK3-3M-RGB-4 and a Micro Fiber Head



Straight type: HFS-14-500



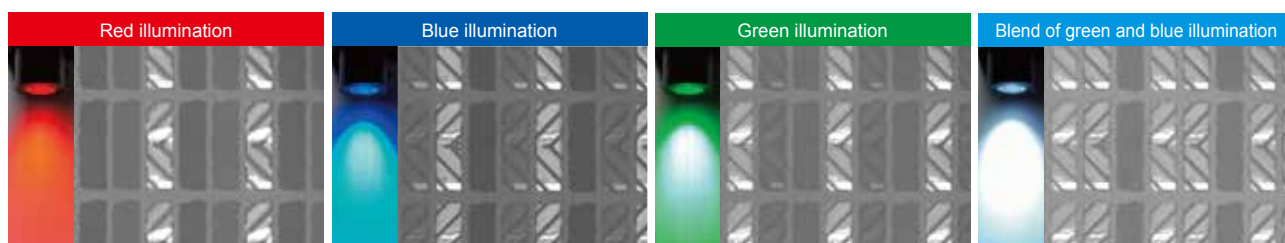
Ring type: HFR-25-10 / HFR-25-30  
HFR-40-20 (Three light sources are required for use.)  
Connect a Micro Fiber Head to easily achieve full color illumination in a variety of illumination configurations.

## ▶ Change Emission Color to Extract Characteristics for Your Purpose

### Example of imaging an LCD color filter

Use the HLK3-22-NR-4 series to achieve high-accuracy blended color illumination.

You can create the desired illumination color with independent intensity control of each light source to help improve inspection accuracy.



# / HLV3-22-4-NR Series

## ▶ Connecting the HLV3-22-4-NR Series and a Micro Fiber Head

### Increase output by using HLV3-22-4-NR

Red (RD), green (GR), blue (BL), and white (SW) emission colors are available so that emitted light close to that of a single-color LED can be used for the spectral characteristics of the workpiece. You can accurately extract characteristics when imaging workpieces by combining the HLV3-22-4-NR with various micro fiber heads and selecting the optimum emission color and illumination configuration.

### Connection example for HLV3-22-4-NR and a Micro Fiber Head



Straight type  
HFS-14-500

Ring type  
HFR-25-10 / HFR-25-30 / HFR-40-20  
(Three light sources are required for use.)

## ▶ Easily Connect and Replace the Light Source

### Instantly handle the selection of optimum emission color

The HLV3-22-4-NR series Micro Fiber Head dedicated light source can be easily installed and removed. Select the optimum emission color when imaging workpieces to achieve accurate extraction of characteristics.

### Specifications

Model name	LED color	Peak wavelength / correlated color temperature (typ.)	Input current (max.)	Power consumption (max.)	Options	Extension cables	Recommended Control Units	Weight (max.)
HLV3-22RD-4-NR	Red	630 nm	1,000 mA	3.0 W	—	FCB *1 Straight Cable  FRCB Robot Cable  FCB-HLV3-10 Straight Cable  FRCB-HLV3-10 Robot Cable	PJ2	37 g
HLV3-22SW-4-NR	White	5,600 K		3.5 W				
HLV3-22BL-4-NR	Blue	465 nm		3.8 W				
HLV3-22GR-4-NR	Green	520 nm		4.0 W				
HLV3-3M-RGB-4	Red	630 nm	1,000 mA	11 W	—	FCB-HLV3-10 Straight Cable  FRCB-HLV3-10 Robot Cable	PJ2-3005 4CA-PE	232 g
	Blue	465 nm						
	Green	520 nm						

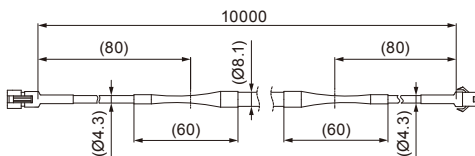
\*1 The cables with a model name that ends with "-PF", "-PF-EL9", "-ME7", or "-EL2" are not included.

## ▶ Optional Cables (Sold Separately)

Extension cables	Straight cables	Robot cables
	FCB-1/-2/-3/-5 (1 m / 2 m / 3 m / 5 m)	FRCB-1/-2/-3/-5 (1 m / 2 m / 3 m / 5 m)
	FCB-HLV3-10 (10 m) *	FRCB-HLV3-10 (10 m) *

\* These 10-m extension cables connect the HLV3-series Spot Light and the PJ2-series Control Unit.

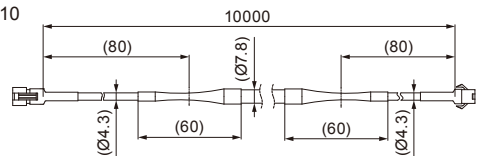
FCB-HLV3-10  
Straight Cable  
(Unit: mm)



Weight: 1,200 g max., Cable permitted bending radius: 65 mm

Notes	
	· The total length of the FCB-1/-2/-3/-5 and FRCB-1/-2/-3/-5 Extension Cables must be no longer than 5 m.
	· Branch cables are not available for the HLV3 Spot Lights.

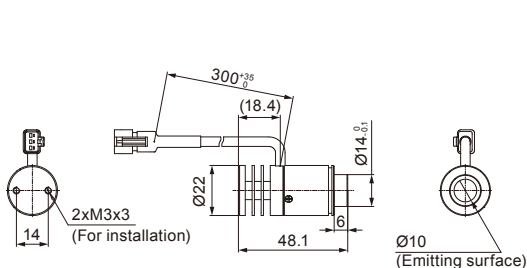
FRCB-HLV3-10  
Robot Cable  
(Unit: mm)



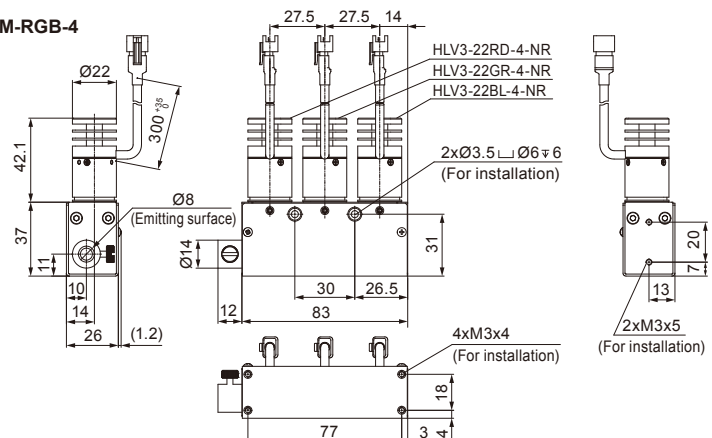
Weight: 1,200 g max., Cable permitted bending radius: 35 mm

### Dimensions (mm)

HLV3-22RD-4-NR/SW-4-NR/BL-4-NR/GR-4-NR



HLV3-3M-RGB-4



# PJ2 Series

Installable on

All models of the HLV3/HLV2 Series

100 to 240 VAC

AC input type

Ethernet

Parallel



**PJ2-1505-2CA-PE**  
2 channels



**PJ2-3005-4CA-PE**  
4 channels

## ► Easily Check and Set Operation of Spot Lights with the Built-in LCD

**Analog Control Unit to which all HLV3/HLV2-series Spot Lights can be connected.**

Light intensity can be set in 1024 steps. The built-in LCD allows for excellent reproducibility and detailed control. Equipped with Ethernet and parallel communications for external control. Available in 2-channel and 4-channel Spot Light output types. Select the type for your application.



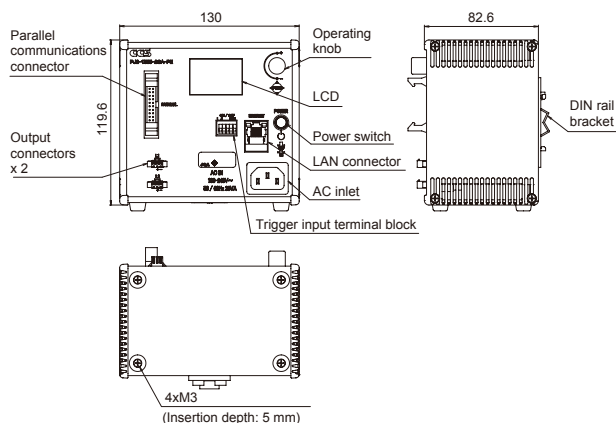
Compliant models  
PJ2-1505-2CA-PE  
PJ2-3005-4CA-PE

## ► Specifications

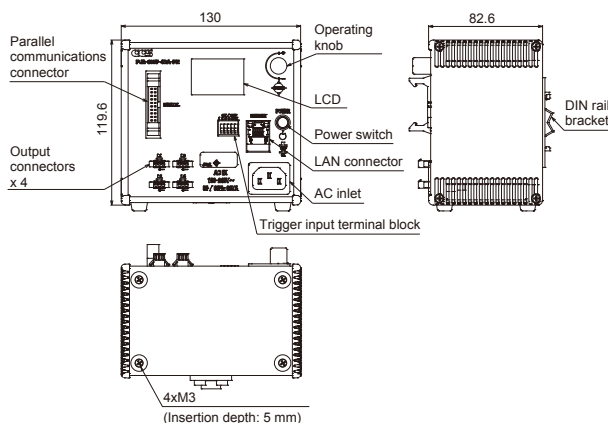
Model name	PJ2-1505-2CA-PE	PJ2-3005-4CA-PE
Lighting method	Continuous lighting	
Drive method	Constant-current system	
Intensity control method	Variable-current control	
Number of channels	2 channels	4 channels
Applicable Light Units	HLV3- and HLV2- series Spot Lights (The type of Spot Light is automatically detected.)	
Output voltage (ratings)	5.5 VDC	
Output current	1,000 mA max./channel (Depends on the maximum input current of the Spot Light.)	
Input power	100 to 240 VAC (+10%, -15%), 50/60 Hz	
Power consumption	38 VA max.	68 VA max.
Inrush current (typ.)	15 A (at 100 VAC), 36 A (at 240 VAC) from a cold start	
Ground leakage current	3.5 mA max. (264 VAC, 60 Hz, with no load)	
Insulation withstand voltage (input-output, input-FG)	1500 VAC for one minute, Cutoff current: 10 mA, 500 VDC, 20 MΩ min.	
Overvoltage category	Category II	
Operating environment	Temperature: 0 to 40°C, Humidity: 20% to 85% (with no condensation), Altitude: 2,000 m max., Protective ground class: Class I, Pollution degree: 2, Indoor use only	
Storage environment	Temperature: -20 to 60°C, Humidity: 20% to 85% (with no condensation)	
Cooling method	Natural air cooling	Forced air cooling
CE marking	Safety standard: Conforms to EN 61010-1 EMC standard: Conforms to EN61000-3-2, EN61000-3-3, EN61000-6-2, and EN61000-6-4	
Material, coating, and surface processing	Material: Aluminum and resin, Surface processing: Blue alumite	
Weight	700 g max.	
Accessories	Instruction guide, 2-m-long 3-prong AC power cord with ground terminal	

## ► Dimensions (mm)

**PJ2-1505-2CA-PE**



**PJ2-3005-4CA-PE**



## Dedicated Control Units for the HLV3/HLV2-Spot Lights Series

# PJ Series

Installable on

- HLV3-14, HLV3-14-HU
- HLV3-22-1, HLV3-22-2, HLV3-22-2-1220
- All models of the HLV2 Series

100 to 240 VAC

AC input type



**PJ-1505-2CA**  
2 channels



**PJ-1505-3CA**  
3 channels

24 VDC

DC input type



**PJ-1505-2CD24**  
2 channels



**PJ-1505-3CD24**  
3 channels

## ► Four Types to Match Your Use Environment

### Dedicated Analog Control Units for HLV3/HLV2 Series

Step-less intensity control is performed by varying the current. There are 2 and 3-channel Spot Light output types. You can select AC or DC power supply types.



Compliant models  
PJ-1505-2CA, PJ-1505-3CA,  
PJ-1505-2CD24, PJ-1505-3CD24

## Digital Control Units

# PD3 Series

100 to 240 VAC

AC input type



**PD3-5024-4 Series**  
4 channels



**PD3-10024-8 Series**  
8 channels

Ethernet

EIA-485

Parallel



**PD3-5024-4 Series**  
4 channels



Ethernet

Parallel

24 VDC

DC input type

## ► Select from Three Types of External Control for Your Network Environment

### Digital Control Units selectable by control function

Compatible with two lighting modes: continuous lighting and ON/OFF lighting. Three types of external control: Ethernet, EIA-485, and parallel. Available in 4-channel and 8-channel Light Unit output types. Select the power supply from AC type and DC type.

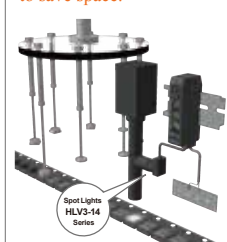


Compliant models  
PD3-5024-4 Series (AC input type)  
PD3-10024-8 Series

## Dedicated Compact Controller for the HLV3/HLV2-Spot Lights Series

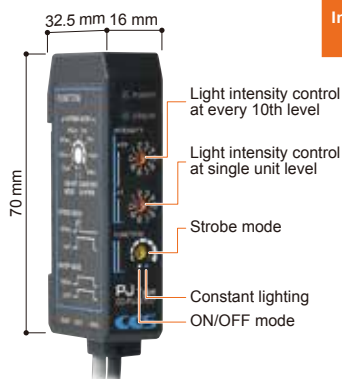
# CC-PJ-0707

Perfect for narrow spaces,  
used together with a Spot Light  
to save space.



24 VDC

DC input type



Installable on

- HLV3-14, HLV3-14-HU
- HLV3-22-1, HLV3-22-2, HLV3-22-2-1220
- All models of the HLV2 Series

### ■ Setting the light intensity

x10	0	0	...	1	...	9
x1	0	1	...	1	...	9
Intensity level	1	2	...	12	...	100

### ■ Selecting the strobe time

50  $\mu$ s, 100  $\mu$ s, 250  $\mu$ s, 500  $\mu$ s,  
1 ms, 4 ms, 10 ms, 40 ms  
Response time: 50  $\mu$ s max.  
Overdrive is not supported.

## ► A Single Unit Compatible with Continuous, ON/OFF, and Strobe Lighting

### A compact, dedicated Controller for the HLV3/HLV2 series

Compact size of only 16 mm  $\times$  70 mm  $\times$  32.5 mm (wx>d) is optimal for installation in narrow spaces and for saving space. Available in 1-channel Spot Light output type. Intensity value can be adjusted in 100 steps. Power supply is 24 VDC, optimal for on-site usage.



Compliant

# CCS High-Resolution Telecentric Lenses

## SE-65-M Series / SE-110-M Series

### Specifications (SE-65-M Series)

**SE-65VT60-M**  
6x, WD: 65 mm



Total of  
**28**  
Models

Model name(Coaxial type)	SE-65VT05-M	SE-65VT08-M	SE-65VT10-M	SE-65VT20-M	SE-65VT40-M	SE-65VT60-M
Model name(Straight type)	SE-65ST05-M	SE-65ST08-M	SE-65ST10-M	SE-65ST20-M	SE-65ST40-M	SE-65ST60-M
Optical magnification	0.5x±5%	0.8x±5%	1.0x±5%	2.0x±5%	4.0x±5%	6.0x±5%
WD	65.1±2 mm	65.4±2 mm	65.1±2 mm	65.2±2 mm	65.3±2 mm	64±2 mm
Depth of field <sup>*1,2</sup>	2.87 mm	1.18 mm	0.79 mm	0.26 mm	0.08 mm	0.06 mm
Resolution <sup>*2,3</sup>	12.0 μm	8.0 μm	6.7 μm	4.4 μm	2.9 μm	2.9 μm
NA <sup>*2</sup>	0.028	0.042	0.05	0.076	0.118	0.118
Actual F-number (Fe) <sup>*2</sup>	9.0	9.4	9.8	12.9	16.9	25.5
TV distortion <sup>*2</sup>	-0.001%	+0.006%	-0.023%	+0.021%	-0.003%	-0.026%
Weight (Coaxial)	80 g	62 g	54 g	55 g	85 g	100 g
Weight (Straight)	77 g	57 g	49 g	49 g	83 g	98 g
Mount	C mount					
Maximum applicable image size	2/3 inch (Ø11.00 mm)			2/3 inch L (Ø12.75 mm) <sup>*4</sup>		
Physical distance (O/I) <sup>*2</sup>	171.1 mm	171.5 mm	161 mm	160.9 mm	184.5 mm	216.7 mm

\*1 The depth of field is a value calculated using 40 μm as the permissible circle of confusion.

\*2 These are calculated values.

\*3 The resolution is a value calculated using a 550 nm wavelength.

\*4 2/3 inch L (Length: 5.98 mm, Width: 11.26 mm)

The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

### Specifications (SE-110-M Series)

**SE-110VT03-5M**  
0.3x, WD: 110 mm



5 M								
Model name(Coaxial type)	SE-110VT03-5M	SE-110VT05-M	SE-110VT08-M	SE-110VT10-M	SE-110VT15-M	SE-110VT20-M	SE-110VT30-M	SE-110VT40-M
Model name(Straight type)	SE-110ST03-5M	SE-110ST05-M	SE-110ST08-M	SE-110ST10-M	SE-110ST15-M	SE-110ST20-M	SE-110ST30-M	SE-110ST40-M
Optical magnification	0.3x±5%	0.5x±5%	0.8x±5%	1.0x±5%	1.5x±5%	2.0x±5%	3.0x±5%	4.0x±5%
WD	110.3±3.3 mm	110.8±3.3 mm	110.1±3.3 mm	110.5±3.3 mm	110.1±3.3 mm	110.6±3.3 mm	111.4±3.3 mm	110.5±3.3 mm
Depth of field <sup>*1,2</sup>	5.75 mm	3.03 mm	1.31 mm	0.82 mm	0.42 mm	0.27 mm	0.14 mm	0.11 mm
Resolution <sup>*2,3</sup>	14.5 μm	12.7 μm	8.8 μm	6.9 μm	5.2 μm	4.5 μm	3.6 μm	3.7 μm
NA <sup>*2</sup>	0.023	0.026	0.038	0.049	0.064	0.075	0.094	0.091
Actual F-number (Fe) <sup>*2</sup>	6.5	9.4	10.3	10.2	11.7	13.0	16.0	21.9
TV distortion <sup>*2</sup>	+0.026%	-0.009%	-0.026%	-0.0007%	+0.024%	-0.018%	+0.008%	-0.004%
Weight (Coaxial)	212 g	131 g	106 g	108 g	110 g	115 g	166 g	121 g
Weight (Straight)	211 g	128 g	103 g	105 g	108 g	113 g	160 g	120 g
Mount	C mount							
Maximum applicable image size	2/3 inch L <sup>*4</sup> (Ø12.75 mm)	2/3 inch (Ø11.00 mm)	2/3 inch L <sup>*4</sup> (Ø12.75 mm)				2/3 inch (Ø11.00 mm)	
Physical distance (O/I) <sup>*2</sup>	268.2 mm	259.7 mm	254.2 mm	255.8 mm	256.9 mm	255.8 mm	272.9 mm	256.7 mm

\*1 The depth of field is a value calculated using 40 μm as the permissible circle of confusion.

\*2 These are calculated values.

\*3 The resolution is a value calculated using a 550 nm wavelength.

\*4 2/3 inch L (Length: 5.98 mm, Width: 11.26 mm)

The specifications above are values based on the optical design. Differences between individual devices may occur due to assembly accuracy, etc.

### CAUTION

- To ensure proper and safe use of the product, please read the Instruction Guide completely before using the product.
- The design and specifications of this product are subject to change without notification for product improvement.
- The workpiece imaging examples included in this brochure are intended to serve only as references to help you select a suitable Light Unit. Please verify the functionality and conditions required for your particular application before you make a final selection. The sample workpieces used in this brochure have been processed specifically for sample imaging. They are not intended to represent product quality and performance.

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