

















## Vision Accessory Catalog



# Best Solutions for Quality Inspection and Control

With a complete line-up of Lights and Lenses, advanced Vision Sensors, and 30 years of vision solutions knowhow, OMRON provides solutions to maintain your quality, increase the precision of your machines, and reduce your implementation costs.

## LED Lights Constant voltage type FLV Series

|   |              |   |   |       |            |
|---|--------------|---|---|-------|------------|
| Bar Light                                       | FLV-BR       | Uniform illumination over wide areas  |  | ..... | <b>p4</b>  |
| Direct Ring Light                               | FLV-DR       | Used on non-specular surfaces and area lighting   |  | ..... | <b>p7</b>  |
| Low Angle Ring Light                            | FLV-DL       | Perfect for defect and profile detection  |  | ..... | <b>p10</b> |
| Coaxial Light                                   | FLV-CL       | Ideal for defect and character inspection on mirror surfaces                              |  | ..... | <b>p12</b> |
| Shadowless Ring Light                           | FLV-FR       | Eliminate local reflections on glossy surfaces  |  | ..... | <b>p14</b> |
| Shadowless Low Angle Ring Light                 | FLV-FP       | Suitable for edge detection of glossy objects   |  | ..... | <b>p16</b> |
| Shadowless Dome Ring Light                      | FLV-FS       | Uniform diffused illumination ideal for irregular surfaces                                |  | ..... | <b>p17</b> |
| Shadowless Square Light                         | FLV-FQ       | Provides even illumination across squared areas   |  | ..... | <b>p18</b> |
| Spot Light                                      | FLV-EP50     | Uniform, parallel light for long-distance part detection                                  |  | ..... | <b>p19</b> |
| High-power Spot Light                           | FLV-EP08     | Used with coaxial lens to detect alignment mark   |  | ..... | <b>p20</b> |
| Direct Back Light                               | FLV-DB       | High-brightness flat-surface lights for profile measurements                              |  | ..... | <b>p22</b> |
| Edge Type Light                                 | FLV-FB       | Ultrathin flat-surface light fits into narrow spaces                                      |  | ..... | <b>p24</b> |
| Edge Type Coaxial Light                         | FLV-FX       | Uniform diffused illumination with many effects such as backlighting and coaxial lighting |  | ..... | <b>p26</b> |
| Dome Light                                      | FLV-DD       | Uniform illumination from all directions for irregular surfaces                           |  | ..... | <b>p28</b> |
| Line Light                                      | FLV-LN       | High uniformity and brightness ideal for high-speed processing                            |  | ..... | <b>p30</b> |
| Camera-mount Lighting Controller for FLV Series | FLV-TCC      | Camera-mount controller to save space and simplify wiring                                 |  | ..... | <b>p32</b> |
| Analog Lighting Controller for FLV Series       | FLV-ATC      | Stationary type suitable for high power consumption lights                                |  | ..... | <b>p38</b> |
| Digital Lighting Controller for FLV Series      | 3Z4S-LT IDGB | PWM light control power unit for LED lights   |  | ..... | <b>p45</b> |
| FLV Series Options                              |              |   |   | ..... | <b>p48</b> |
| LED Characteristics                             |              |   |   | ..... | <b>p69</b> |













OMRON's unique Camera-mount Lighting Controller helps reduce your implementation costs by reducing wiring work, saving space in the control panel, and easily setting luminance control without programming.

Refer to page 32







## LED Lights Constant current type FL Series

|   |           |  |   |           |
|---|-----------|--|---|-----------|
| MDMC Light  | FL-MD     | Flexibly changes colors and angles   |    | ..... p51 |
| Photometric Stereo Light  | FL-PS     | Shows defects accurately   |   | ..... p53 |
| High-brightness LED Light  |           |  |   |           |
| • Bar Light   | FL-BR     | High-brightness bar light suitable for high-speed lines                      |  | ..... p55 |
| • Direct Ring Light   | FL-DR     | High brightness ring light suitable for high-speed lines                     |  | ..... p58 |
| Camera-mount Lighting Controller for High-brightness LED Lights   | FL-TCC    | Camera-mount controller to save space and simplify wiring                    |  | ..... p61 |
| Digital Lighting Controller for High-brightness LED Lights  | FL-STC    | Small body with digital light control to fit in any location                 |  | ..... p63 |
| Lighting Controller for Photometric Stereo Lights   | FL-TCC1PS | Camera-mount controller eliminates the need to control light emission timing |  | ..... p66 |
| FL Series Option  |           |  |   | ..... p67 |

## Lenses

|                                      |       |     |
|--------------------------------------|-------|-----|
| Lens Selection                       | ..... | p70 |
| Standard Lens                        | ..... | p71 |
| Telecentric Lens                     | ..... | p76 |
| Vibrations and Shocks Resistant Lens | ..... | p80 |

### Options

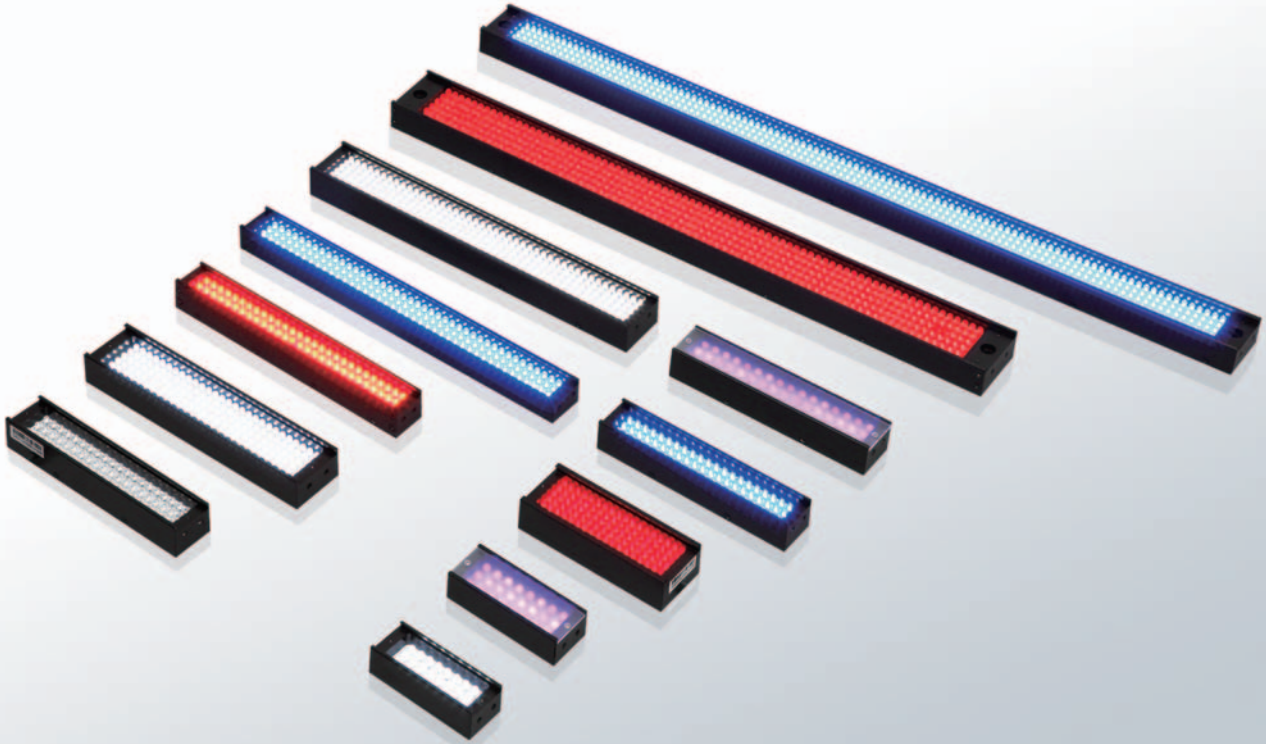
|                                    |               |   |   |           |
|------------------------------------|---------------|---|---|-----------|
| • Polarizing Filter                | SV-PL         | Filters to prevent diffused reflection                        |  | ..... p90 |
| • Protection Cover Filter          | SV-GA         | Covers to protect lens surfaces from dust                     |  | ..... p90 |
| • Extension Tubes                  | SV-EXR        |   |   |           |
| For C-mount Cameras                |               |   |   |           |
| For M42-mount Cameras              | VS-EXR/M42    | Mounted to lenses to change field of view or working distance |  | ..... p91 |
| For Small Digital CCD Cameras      | FZ-LESR       |   |   |           |
| • Rear Converter Lens              | SV-1.5X/2.0X  | Mounted to lenses to change field of view or working distance |  | ..... p91 |
| • M42 - F Mount Conversion Adapter | FH-ADF/M42-10 | Adapter to connect F mount lenses to M42 cameras              |   | ..... p91 |

|               |       |     |
|---------------|-------|-----|
| Optical Chart | ..... | p92 |
|---------------|-------|-----|

|                    |       |      |
|--------------------|-------|------|
| Safety Precautions | ..... | p101 |
|--------------------|-------|------|

# Bar Light FLV-BR Series

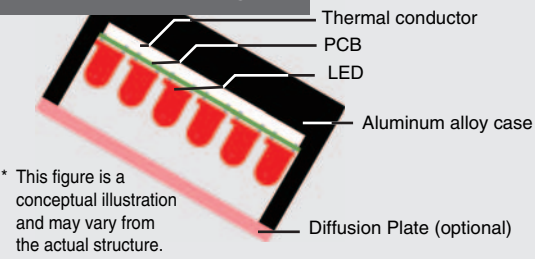
Many color and size variations are available to uniformly illuminate wide surfaces.



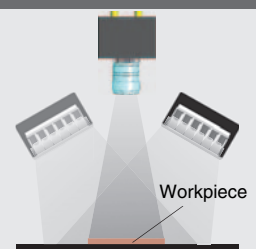
## Product Features

- Ideal for illumination of wide, rectangular surfaces.
- Many color and size variations.

### Cross-sectional Diagram



### Illustration of Illumination



## Applications

Detection of metal surfaces

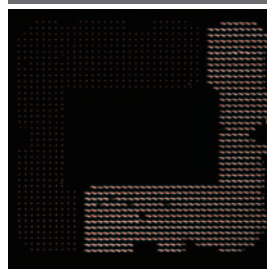
Detection of cracks on surfaces

Detection of LCD panels

### Positioning of LED Packages



### Detection of Faulty LGA Electrodes



### Detection of Printed Logo Marks and Characters on Long Workpieces





Ordering Information

| Model         | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) | Options         |                    |
|---------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|-----------------|--------------------|
|               |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            | Diffusion Plate | Polarization Plate |
| FLV-BR6022W   | WHITE | 1.4                   | 48×18                        | 60×22                  | 17          | A       | ○            | ○        | ○             | 60         | ○               | ○                  |
| FLV-BR6022R   | RED   | 1.3                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR6022B   | BLUE  | 1.4                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR6022IR  | IR    | 0.9                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR6424UV  | UV    | 1.8                   | 53×20                        | 64×24                  | 17          | J       | ○            | ○        | ○             | 70         | ○               | ×                  |
| FLV-BR8532W   | WHITE | 3.5                   | 73×25                        | 85×32                  | 20          | B       | ○            | ○        | ○             | 130        | ○               | ○                  |
| FLV-BR8532R   | RED   | 3.1                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR8532B   | BLUE  | 3.5                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR11222W  | WHITE | 4.2                   | 100×18                       | 112×22                 | 19          | C       | ○            | ○        | ○             | 100        | ○               | ○                  |
| FLV-BR11222R  | RED   | 2.6                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR11222B  | BLUE  | 4.2                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR11222IR | IR    | 1.8                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR11624UV | UV    | 3.6                   | 105×20                       | 116×24                 | 19          | K       | ○            | ○        | ○             | 120        | ○               | -                  |
| FLV-BR14030W  | WHITE | 6.1                   | 126×25                       | 140×30                 | 19          | D       | ○            | ○        | ○             | 140        | ○               | ○                  |
| FLV-BR14030R  | RED   | 4.8                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR14030B  | BLUE  | 6.1                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR15020W  | WHITE | 5.5                   | 138×16                       | 150×20                 | 19          | E       | ○            | ○        | ○             | 120        | ○               | ○                  |
| FLV-BR15020R  | RED   | 3.1                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR15020B  | BLUE  | 5.5                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR21222W  | WHITE | 8.7                   | 199×18                       | 212×22                 | 16          | F       | ○            | ○        | ○             | 140        | ○               | ○                  |
| FLV-BR21222R  | RED   | 5.0                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR21222B  | BLUE  | 8.7                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR21230W  | WHITE | 8.8                   | 200×25                       | 212×30                 | 19          | G       | ○            | ○        | ○             | 220        | ○               | ○                  |
| FLV-BR21230R  | RED   | 7.0                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR21230B  | BLUE  | 8.8                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR21230IR | IR    | 6.1                   |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR21230UV | UV    | 7.8                   | 200×25                       | 212×30                 | 19          | L       | ○            | ○        | ○             | 230        | ○               | ×                  |
| FLV-BR38037W  | WHITE | 15.9                  | 350×33.2                     | 380×37.2               | 19          | H       | ×            | ○        | ○             | 430        | ○               | ○                  |
| FLV-BR38037R  | RED   | 11.3                  |                              |                        |             |         | ○            | ○        | ○             |            |                 |                    |
| FLV-BR38037B  | BLUE  | 15.9                  |                              |                        |             |         | ×            | ○        | ○             |            |                 |                    |
| FLV-BR48031W  | WHITE | 21.9                  | 450×25                       | 480×31                 | 18          | I       | ×            | ○        | ○             | 460        | ○               | ○                  |
| FLV-BR48031R  | RED   | 18.0                  |                              |                        |             |         | ×            | ○        | ○             |            |                 |                    |
| FLV-BR48031B  | BLUE  | 21.9                  |                              |                        |             |         | ×            | ○        | ○             |            |                 |                    |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32

FLV-ATC□: page 38

3Z4S-LT IDGB□: page 45

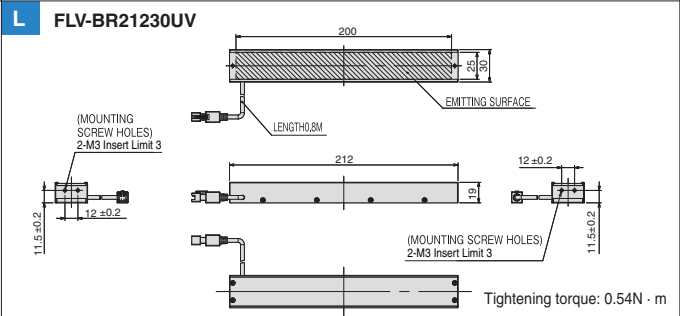
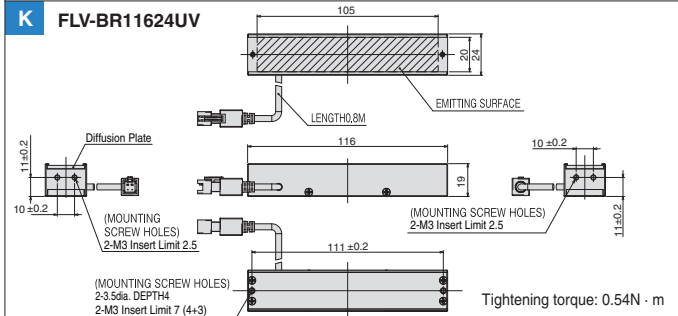
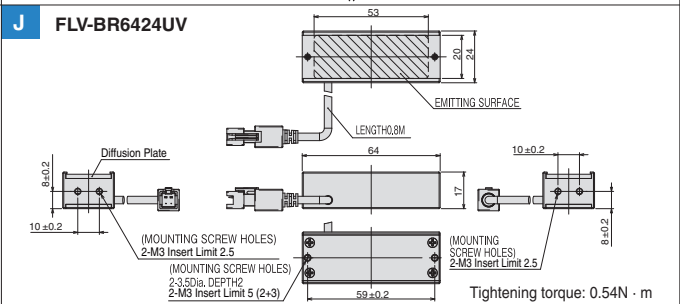
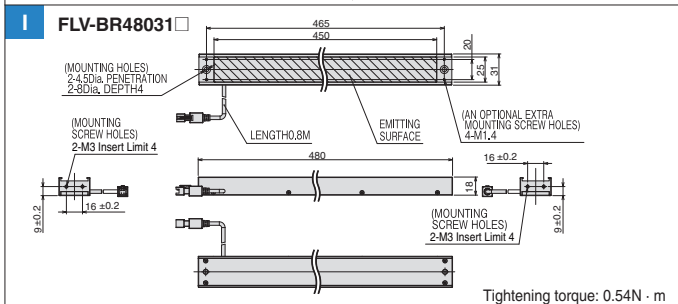
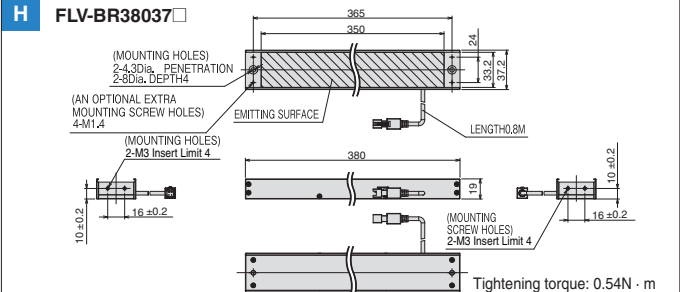
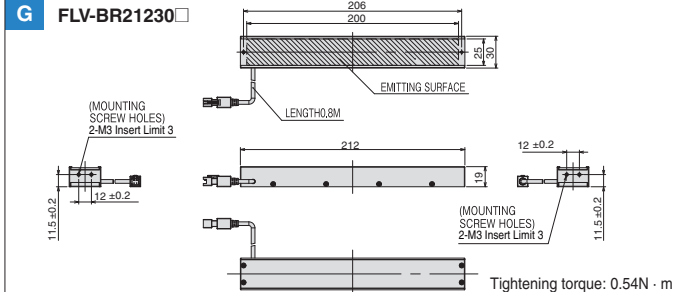
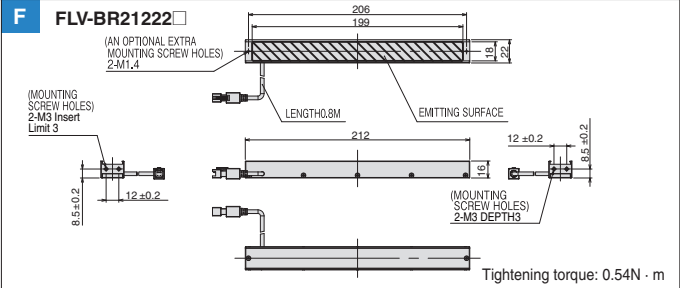
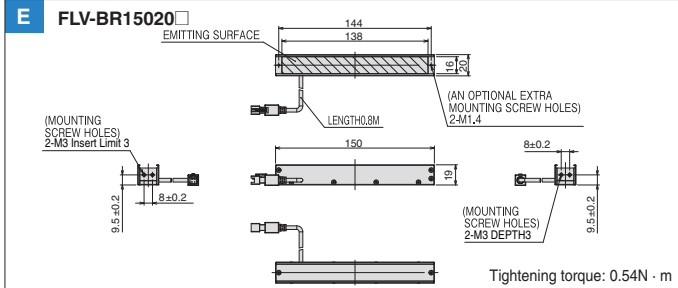
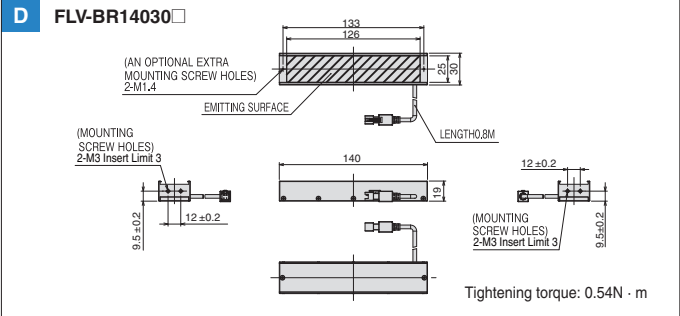
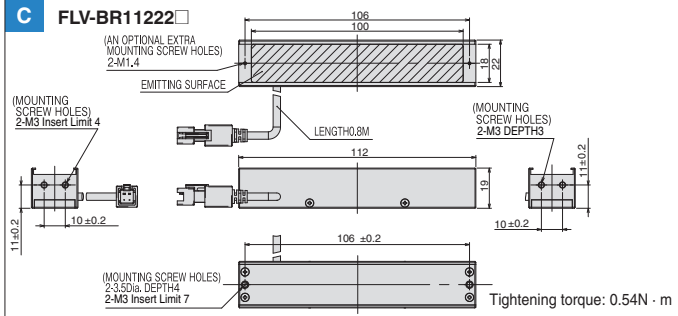
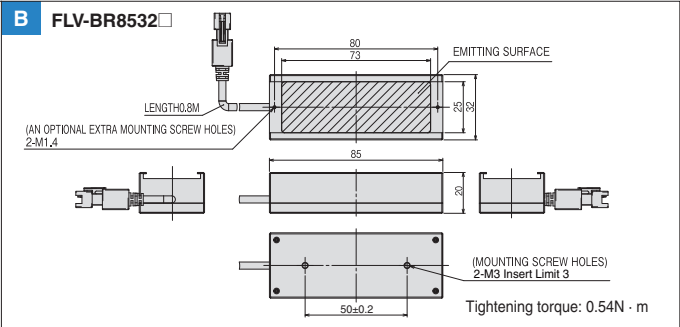
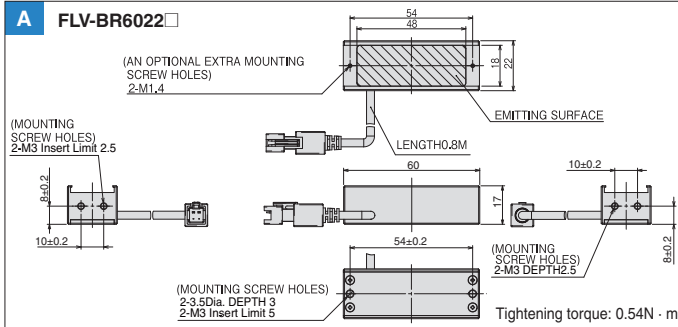
Note: Refer to page 69 for LED Characteristics.

○: Applicable ×: Not applicable

# Bar Light FLV-BR Series

## Dimensions

(Unit: mm)



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses



# Direct Ring Light FLV-DR Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

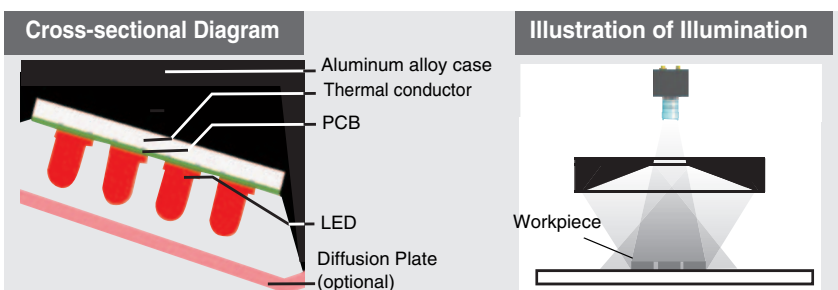
Lenses

Many shape and size variations are available to detect appearance of various workpieces.



## Product Features

- Bright illumination with high-density LED arrays.
- Compact designs that save installation space.
- Optional Diffusion Plates for uniform illumination.



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

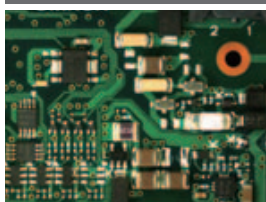
Detection of parts on PCBs

Detection of parts and printing on automotive components

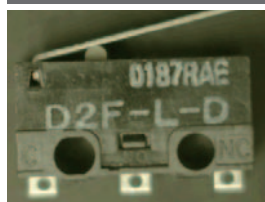
Inspection of defects on mouth tops of PET bottles

Standard character recognition and code reading

Detection of parts on PCBs



Detection of printing



# Direct Ring Light FLV-DR Series

## Ordering Information

| Model        | Color | Power consumption (W) | Dimensions                  |                             |                      |         | Controller * |          |               | Weight (g) | Options         |                    |
|--------------|-------|-----------------------|-----------------------------|-----------------------------|----------------------|---------|--------------|----------|---------------|------------|-----------------|--------------------|
|              |       |                       | External Ring Diameter (mm) | Internal Ring Diameter (mm) | Lighting Angle (Deg) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            | Diffusion Plate | Polarization Plate |
| FLV-DR3220W  | WHITE | 1.4                   | 32 dia.                     | 10 dia.                     | 20 deg.              | A       | ○            | ○        | ○             | 60         | ○               | ○                  |
| FLV-DR3220R  | RED   | 1.3                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR3220B  | BLUE  | 1.4                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR4415W  | WHITE | 2.7                   | 44 dia.                     | 17 dia.                     | 15 deg.              | B       | ○            | ○        | ○             | 70         | ○               | ○                  |
| FLV-DR4415R  | RED   | 1.7                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR4415B  | BLUE  | 2.7                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR5030W  | WHITE | 3.1                   | 50 dia.                     | 26.5 dia.                   | 30 deg.              | C       | ○            | ○        | ○             | 60         | ○               | ○                  |
| FLV-DR5030R  | RED   | 1.8                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR5030B  | BLUE  | 3.1                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR5030IR | IR    | 1.3                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR6030UV | UV    | 3.2                   | 64 dia.                     | 26.5 dia.                   | 30 deg.              | O       | ○            | ○        | ○             | 90         | ○               | ×                  |
| FLV-DR6615W  | WHITE | 5.0                   | 66 dia.                     | 31 dia.                     | 15 deg.              | D       | ○            | ○        | ○             | 120        | ○               | ○                  |
| FLV-DR6615R  | RED   | 3.9                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR6615B  | BLUE  | 5.0                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR7000W  | WHITE | 5.0                   | 70 dia.                     | 33 dia.                     | 0 deg.               | E       | ○            | ○        | ○             | 110        | ○               | ○                  |
| FLV-DR7000R  | RED   | 3.7                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR7000B  | BLUE  | 5.0                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR7030W  | WHITE | 5.0                   | 70 dia.                     | 30 dia.                     | 30 deg.              | F       | ○            | ○        | ○             | 120        | ○               | ○                  |
| FLV-DR7030R  | RED   | 3.7                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR7030B  | BLUE  | 5.0                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR7030IR | IR    | 2.6                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR7530UV | UV    | 5.4                   | 79 dia.                     | 30 dia.                     | 30 deg.              | P       | ○            | ○        | ○             | 150        | ○               | ×                  |
| FLV-DR9000W  | WHITE | 8.8                   | 90 dia.                     | 30 dia.                     | 0 deg.               | G       | ○            | ○        | ○             | 230        | ○               | ○                  |
| FLV-DR9000R  | RED   | 7.0                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR9000B  | BLUE  | 8.8                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR9030W  | WHITE | 8.1                   | 90 dia.                     | 40 dia.                     | 30 deg.              | H       | ○            | ○        | ○             | 200        | ○               | ○                  |
| FLV-DR9030R  | RED   | 6.6                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR9030B  | BLUE  | 8.1                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR9030IR | IR    | 4.3                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR9030UV | UV    | 6.8                   | 94 dia.                     | 40 dia.                     | 30 deg.              | Q       | ○            | ○        | ○             | 220        | ○               | ×                  |
| FLV-DR9215W  | WHITE | 7.4                   | 92 dia.                     | 47 dia.                     | 15 deg.              | I       | ○            | ○        | ○             | 200        | ○               | ○                  |
| FLV-DR9215R  | RED   | 5.4                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR9215B  | BLUE  | 7.4                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR12030W | WHITE | 11.9                  | 120 dia.                    | 60 dia.                     | 30 deg.              | J       | ○            | ○        | ○             | 360        | ○               | ○                  |
| FLV-DR12030R | RED   | 9.8                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DR12030B | BLUE  | 11.9                  |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

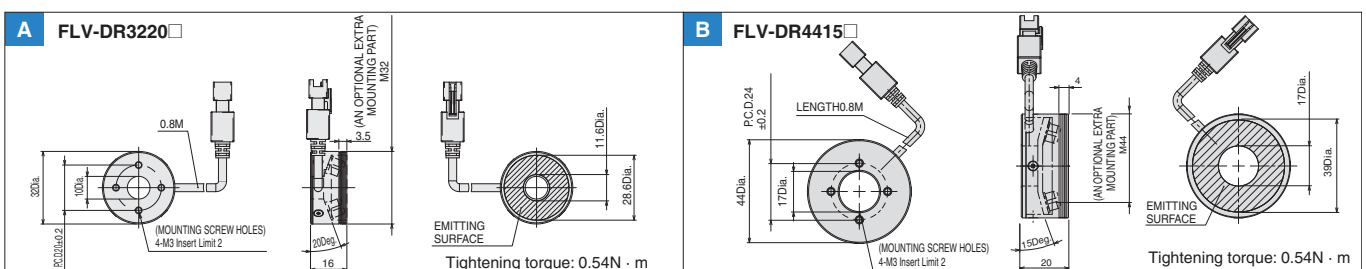
FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Applicable ✕: Not applicable

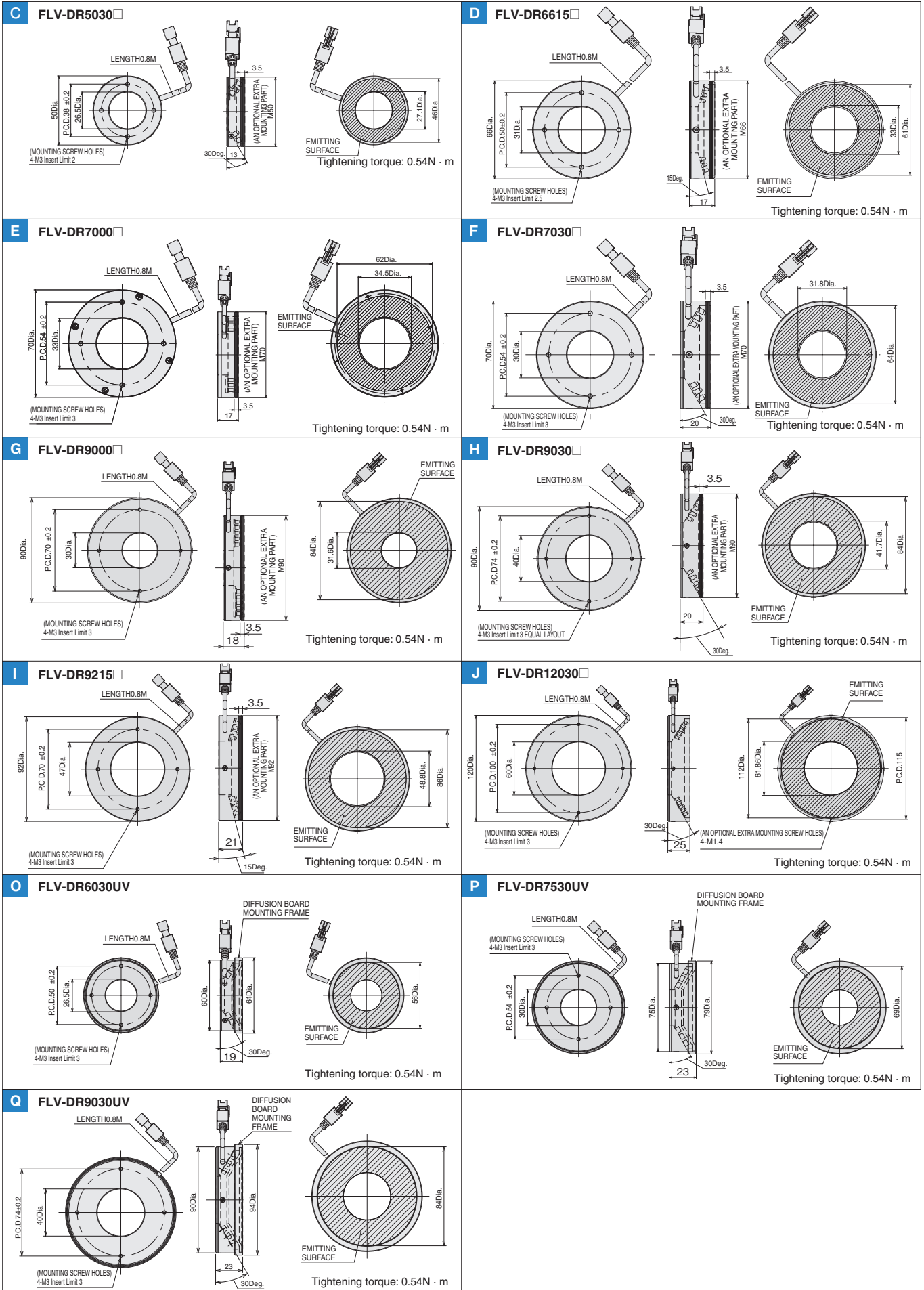
## Dimensions

(Unit: mm)





## Dimensions



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Low Angle Ring Light FLV-DL Series

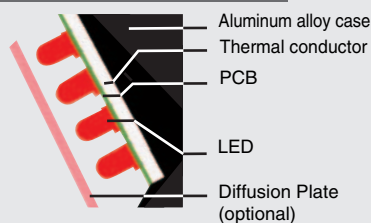
Angled or horizontal illumination emphasizes defects and profiles of workpieces.



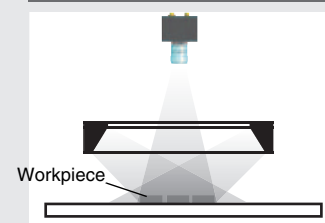
## Product Features

- Bright illumination with high-density LED arrays.
- Compact designs that save installation space.
- Optional Diffusion Plates for uniform illumination.

### Cross-sectional Diagram



### Illustration of Illumination



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

Detection of marking and defects on surfaces of metal workpieces

Detection of foreign matter in medicines

Detection of chips on circumference of O rings

### Surface and profile inspection of metal workpieces



Ring Light



Low Angle Ring Light

## Ordering Information

| Model        | Color | Power consumption (W) | Dimensions                  |                             |                      |         | Controller * |          |               | Weight (g) | Options         |                    |
|--------------|-------|-----------------------|-----------------------------|-----------------------------|----------------------|---------|--------------|----------|---------------|------------|-----------------|--------------------|
|              |       |                       | External Ring Diameter (mm) | Internal Ring Diameter (mm) | Lighting Angle (Deg) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            | Diffusion Plate | Polarization Plate |
| FLV-DL5890W  | WHITE | 1.9                   | 58 dia.                     | 27 dia.                     | 90 deg.              | J       | ○            | ○        | ○             | 90         | ○               | ×                  |
| FLV-DL5890R  | RED   | 1.3                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL5890B  | BLUE  | 1.9                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL7260W  | WHITE | 5.7                   | 72 dia.                     | 44 dia.                     | 60 deg.              | K       | ○            | ○        | ○             | 120        | ○               | ○                  |
| FLV-DL7260R  | RED   | 3.9                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL7260B  | BLUE  | 5.7                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL9090W  | WHITE | 2.8                   | 90 dia.                     | 50 dia.                     | 90 deg.              | L       | ○            | ○        | ○             | 100        | ×               | ×                  |
| FLV-DL9090R  | RED   | 1.8                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL9090B  | BLUE  | 2.8                   |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL12060W | WHITE | 12.7                  | 120 dia.                    | 67 dia.                     | 60 deg.              | M       | ○            | ○        | ○             | 310        | ○               | ○                  |
| FLV-DL12060R | RED   | 10.5                  |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL12060B | BLUE  | 12.7                  |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL15060W | WHITE | 13.6                  | 150 dia.                    | 108 dia.                    | 60 deg.              | N       | ○            | ○        | ○             | 260        | ○               | ○                  |
| FLV-DL15060R | RED   | 11.2                  |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |
| FLV-DL15060B | BLUE  | 13.6                  |                             |                             |                      |         | ○            | ○        | ○             |            |                 |                    |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

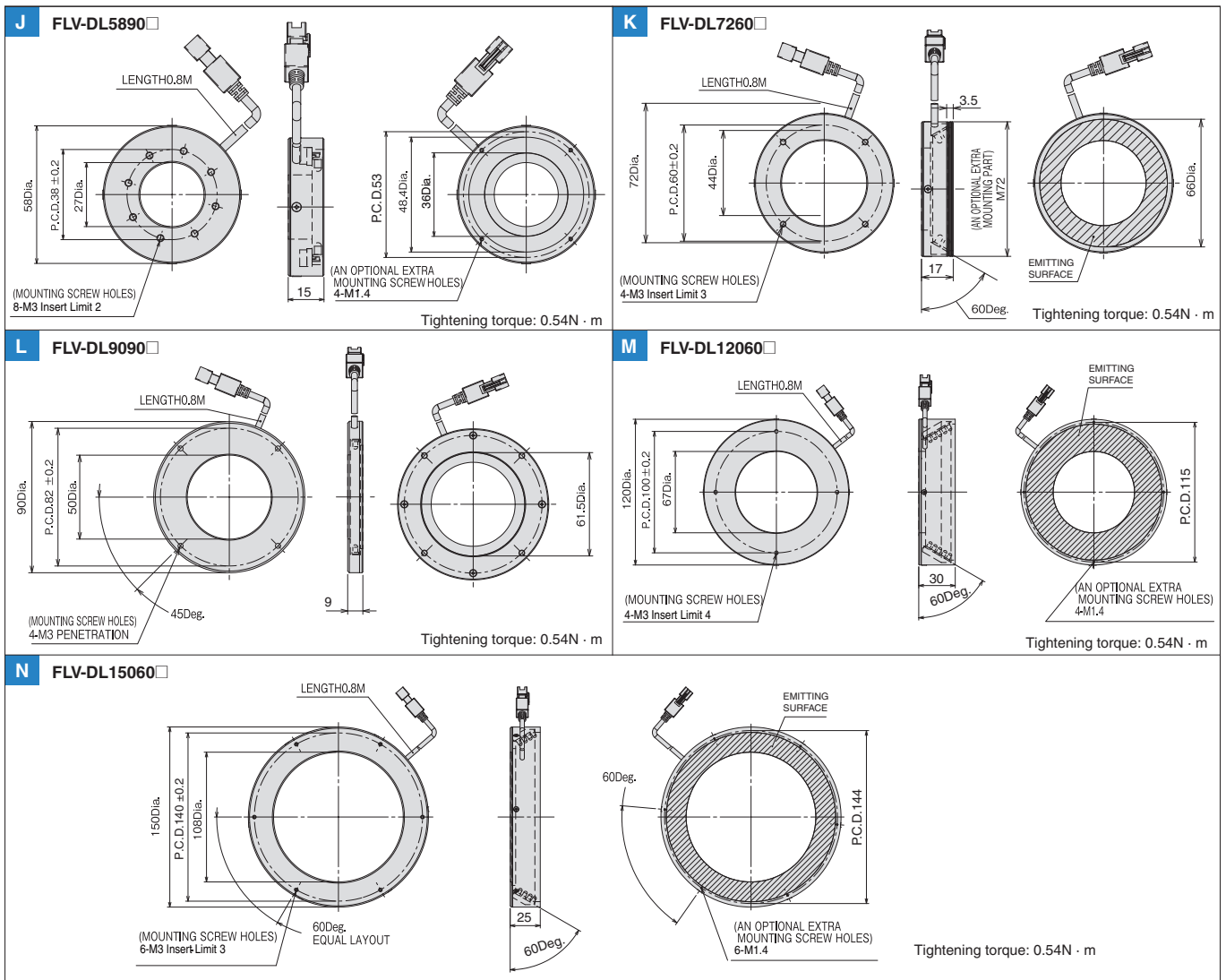
FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Applicable ×: Not applicable

## Dimensions

(Unit: mm)





# Coaxial Light FLV-CL Series

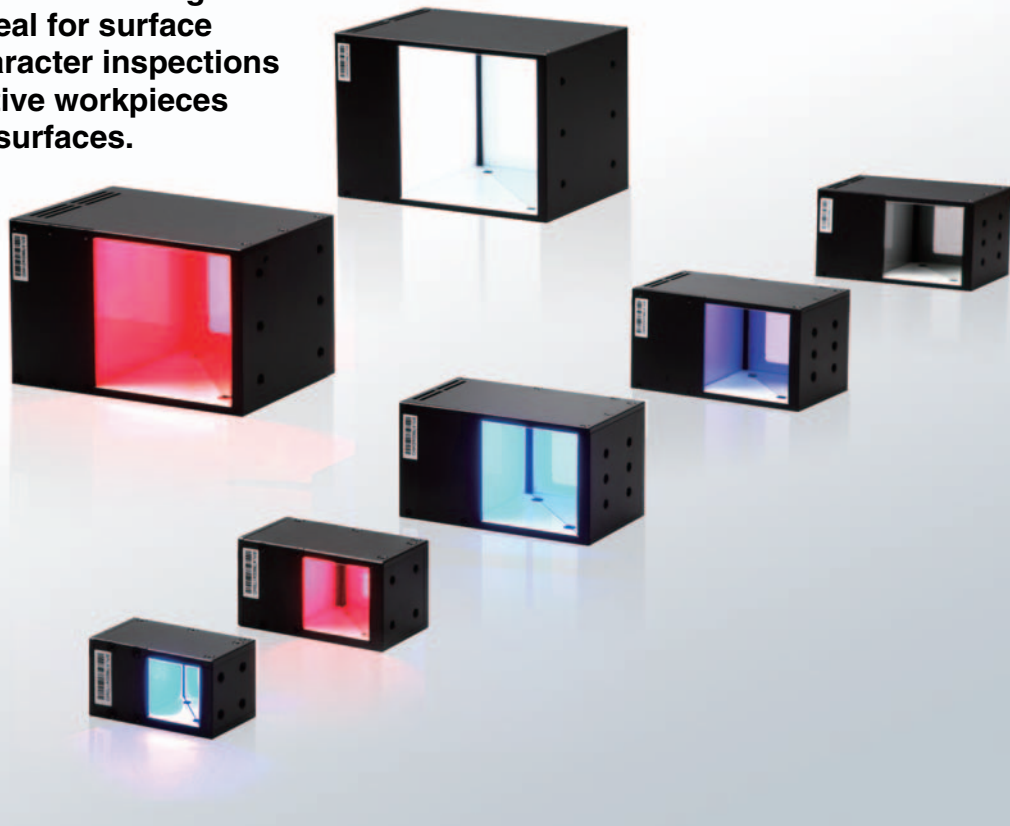
Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

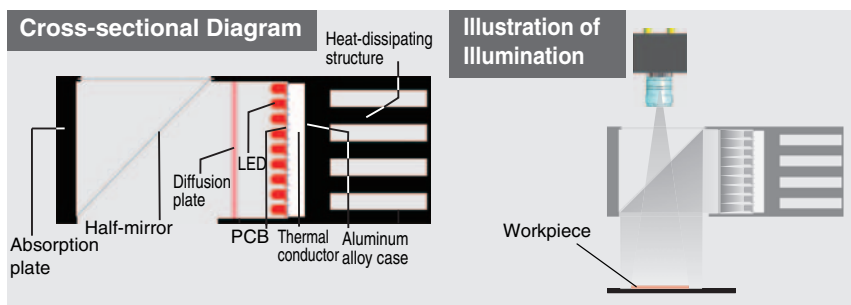
Lenses

Coaxial illumination with the Lens helps prevent interference from reflected light. This series is ideal for surface damage and character inspections on highly reflective workpieces with mirror-like surfaces.



## Product Features

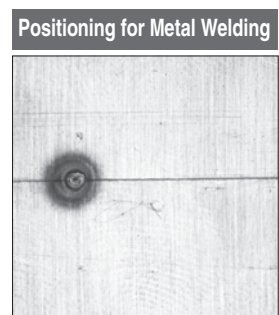
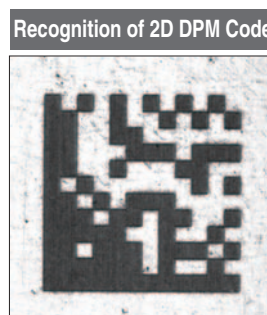
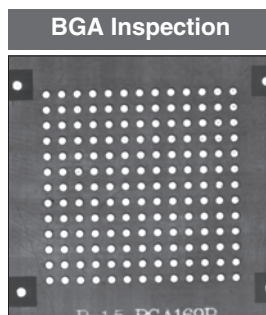
- Long life and stability result from a structure with optimum heat dissipation.
- Uniform illumination for clear images.



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

- Inspection for scratches on highly reflective surfaces
- Inspection for damages on chips and silicon wafers
- Detection of positioning marks
- Recognition of bar codes on packages
- Recognition of laser-marked characters and 2D DMP codes
- General exterior detection



## Ordering Information

| Model      | Color | Power consumption (W) | Dimension                    |                        |             |         | Controller * |          |               | Weight (g) |
|------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|            |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-CL30W  | WHITE | 2.4                   | 24×25                        | 32×59.5                | 31          | A       | ○            | ○        | ○             | 110        |
| FLV-CL30R  | RED   | 1.4                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL30B  | BLUE  | 2.4                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL40W  | WHITE | 3.9                   | 34×34                        | 40×74                  | 40          | B       | ○            | ○        | ○             | 170        |
| FLV-CL40R  | RED   | 2.3                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL40B  | BLUE  | 3.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL60W  | WHITE | 10.4                  | 51×52                        | 58×104                 | 60.5        | C       | ○            | ○        | ○             | 380        |
| FLV-CL60R  | RED   | 5.7                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL60B  | BLUE  | 10.4                  |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL60IR | IR    | 3.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL60UV | UV    | 3.0                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL80W  | WHITE | 10.8                  | 72×72                        | 78×124                 | 77.5        | D       | ○            | ○        | ○             | 580        |
| FLV-CL80R  | RED   | 7.2                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL80B  | BLUE  | 10.8                  |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-CL100W | WHITE | 22.7                  | 92×92                        | 98×141                 | 99.5        | E       | ×            | ○        | ○             | 820        |
| FLV-CL100R | RED   | 15.2                  |                              |                        |             |         | ×            | ○        | ○             |            |
| FLV-CL100B | BLUE  | 22.7                  |                              |                        |             |         | ×            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

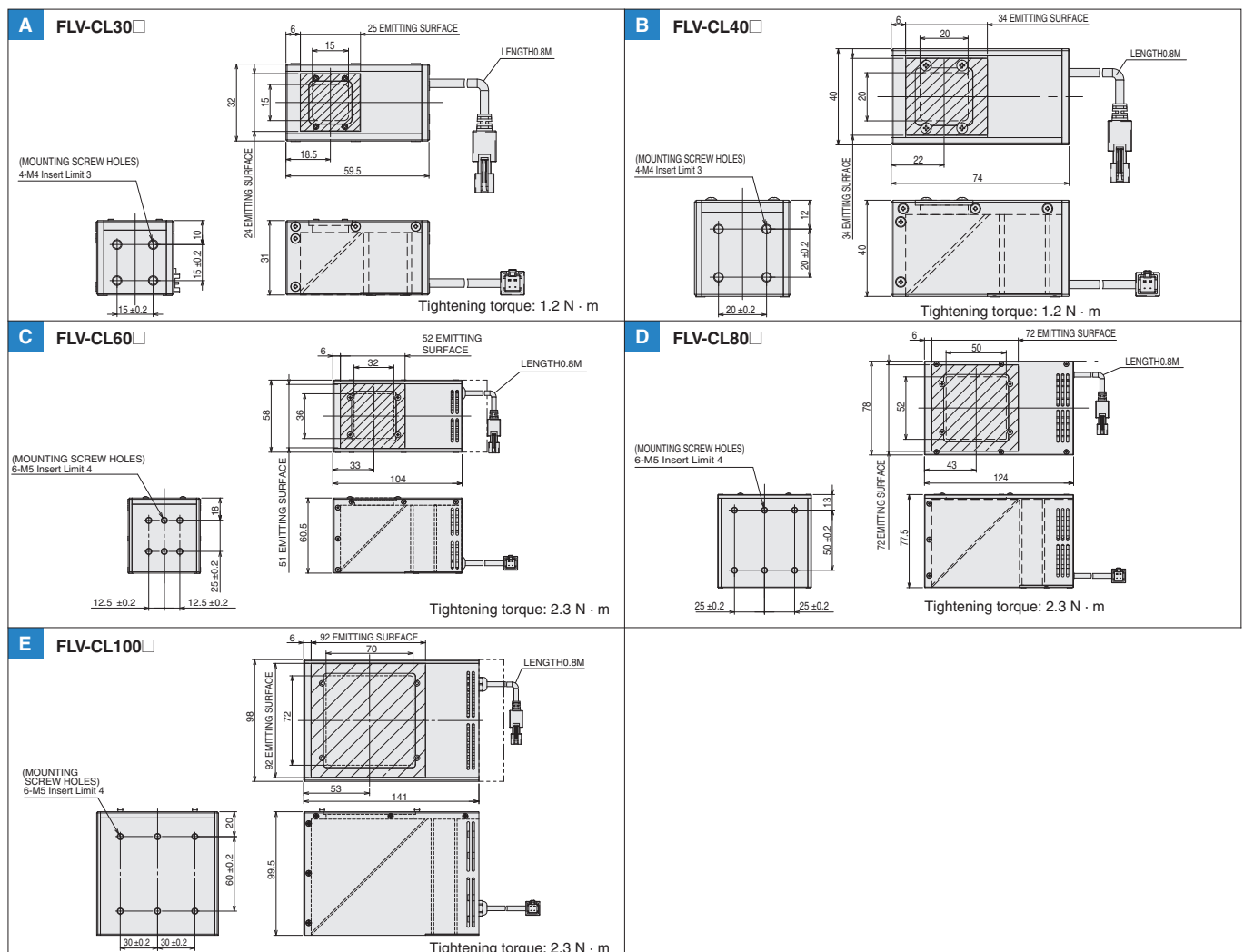
FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable ×: Not connectable

## Dimensions

(Unit: mm)



# Shadowless Ring Light FLV-FR Series

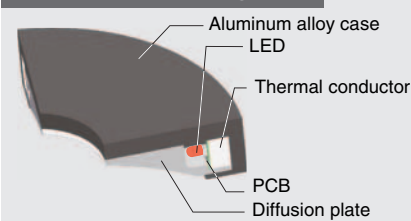
This series effectively eliminates the influences of localized reflections for the surfaces of small workpieces.



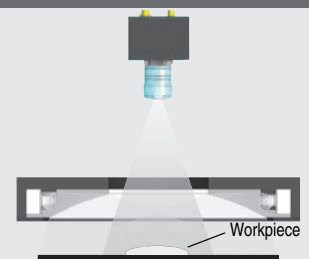
## Product Features

- Special diffusion plates create greater uniformity in lighting than normal ring lighting.

### Cross-sectional Diagram



### Illustration of Illumination



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

Character inspections on electronic components or formed plastic parts

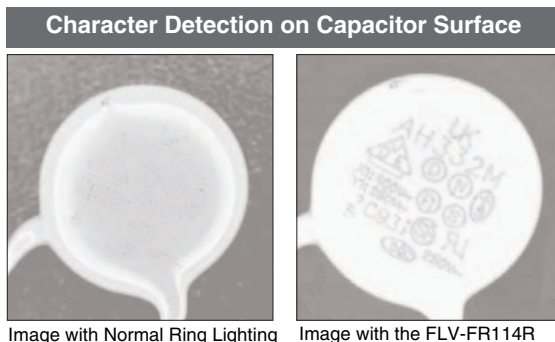


Image with Normal Ring Lighting

Image with the FLV-FR114R

## Ordering Information

| Model      | Color | Power consumption (W) | Dimensions                  |                             |                             |         | Controller * |          |               | Weight (g) |
|------------|-------|-----------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------|----------|---------------|------------|
|            |       |                       | External Ring Diameter (mm) | Internal Ring Diameter (mm) | Lighting Area Diameter (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-FR114W | WHITE | 3.9                   | 114 dia.                    | 40 dia.                     | 92 dia.                     | A       | ○            | ○        | ○             | 270        |
| FLV-FR114R | RED   | 3.1                   |                             |                             |                             |         | ○            | ○        | ○             |            |
| FLV-FR114B | BLUE  | 3.9                   |                             |                             |                             |         | ○            | ○        | ○             |            |
| FLV-FR150W | WHITE | 6.1                   | 150 dia.                    | 40 dia.                     | 123 dia.                    | B       | ○            | ○        | ○             | 500        |
| FLV-FR150R | RED   | 3.5                   |                             |                             |                             |         | ○            | ○        | ○             |            |
| FLV-FR150B | BLUE  | 6.1                   |                             |                             |                             |         | ○            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32

FLV-ATC□: page 38

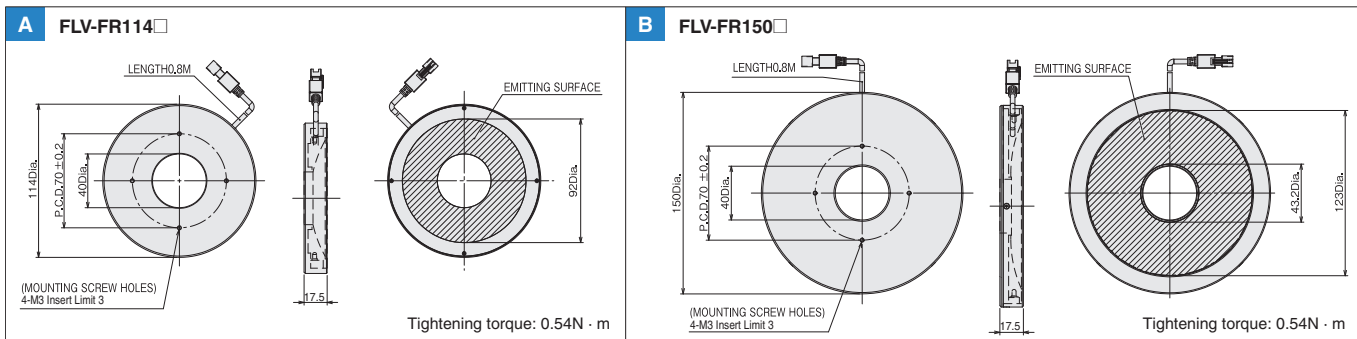
3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable

## Dimensions

(Unit: mm)





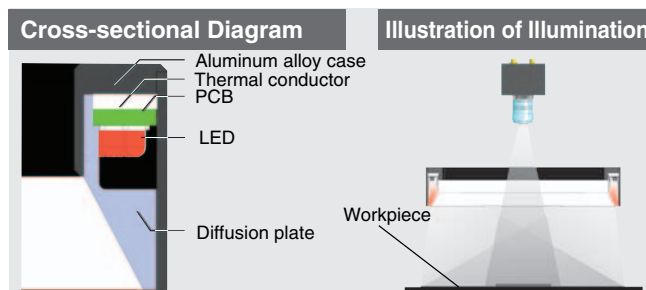
# Shadowless Low Angle Ring Light FLV-FP Series

This series achieves highly uniform illumination across a wide field of view.  
Excellent symmetry eliminates diagonal shadows.



## Product Features

- Shadowless Ring Lighting
- Achieve highly uniform illumination and obtain different images at different installation distances for a much wider range of application compared to normal ring lighting.



\* This figure is a conceptual illustration and may vary from the actual structure.

## Ordering Information

| Model      | Light Color | Power consumption (W) | Dimensions                  |                             |                             |         | Controller * |          |               | Weight (g) |
|------------|-------------|-----------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------|----------|---------------|------------|
|            |             |                       | External Ring Diameter (mm) | Internal Ring Diameter (mm) | Lighting Area Diameter (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-FP130W | WHITE       | 8.1                   | 130 dia.                    | 100 dia.                    | 120 dia.                    | A       | ○            | ○        | ○             | 320        |
| FLV-FP130R | RED         | 5.8                   |                             |                             |                             |         | ○            | ○        | ○             |            |
| FLV-FP130B | BLUE        | 8.1                   |                             |                             |                             |         | ○            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable

## Applications

Detection of bumps, scratches, and other defects on surfaces

Recognition of marks

Recognition of printed characters

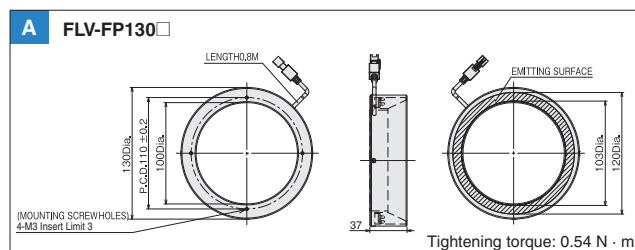
Recognition of barcodes

### Recognition of Marked Characters



## Dimensions

(Unit: mm)



# Shadowless Dome Ring Light FLV-FS Series

Standard Models  
FLV Series

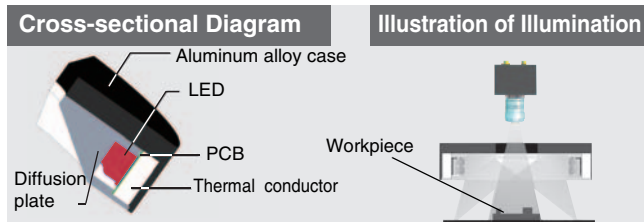
High-brightness Models  
FL Series

Highly uniform illumination eliminates the influences of small surface irregularities to highlight features through changes in inclination.



## Product Features

- Uniquely designed diffusion plate achieve highly uniform illumination through reflection and diffusion.
- Eliminates the influences of small surface irregularities to highlight features through large differences in inclination.
- Saves space for small workpieces while achieving the benefits of dome lighting.



\* This figure is a conceptual illustration and may vary from the actual structure.

## Ordering Information

| Model     | Color | Power consumption (W) | Dimensions                  |                             |                             |         | Controller *             |                          |                          | Weight (g) |
|-----------|-------|-----------------------|-----------------------------|-----------------------------|-----------------------------|---------|--------------------------|--------------------------|--------------------------|------------|
|           |       |                       | External Ring Diameter (mm) | Internal Ring Diameter (mm) | Lighting Area Diameter (mm) | Drawing | FLV-TCC□                 | FLV-ATC□                 | 3Z4S-LT IDGB□            |            |
| FLV-FS74W | WHITE | 5.2                   | 74 dia.                     | 20 dia.                     | 64 dia.                     | A       | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | 140        |
| FLV-FS74R | RED   | 3.5                   |                             |                             |                             |         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |            |
| FLV-FS74B | BLUE  | 5.2                   |                             |                             |                             |         | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

: Connectable

## Applications

Edge positioning and size measurement for metal parts

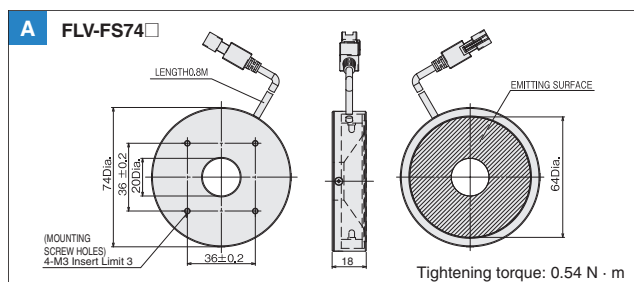
Gap Position Detection on Multilayered Shafts

Detection of bumps in metal parts



## Dimensions

(Unit: mm)



LED Characteristics

Lenses

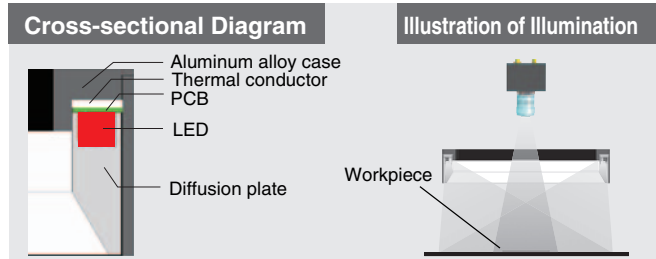
# Shadowless Square Light FLV-FQ Series

This series achieves wide highly uniform illumination across a square field of view.



## Product Features

- Shadowless Square Lighting
- Achieves highly uniform illumination and obtains different images at different installation distances for a much wider range of applications compared to normal ring lighting.



\* This figure is a conceptual illustration and may vary from the actual structure.

## Ordering Information

| Model     | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|-----------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|           |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-FQ48W | WHITE | 2.0                   | 41×41                        | 48 × 48                | 30          | A       | ○            | ○        | ○             | 100        |
| FLV-FQ48R | RED   | 1.2                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FQ48B | BLUE  | 2.0                   |                              |                        |             |         | ○            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable

## Applications

Detection of defects on workpiece surfaces

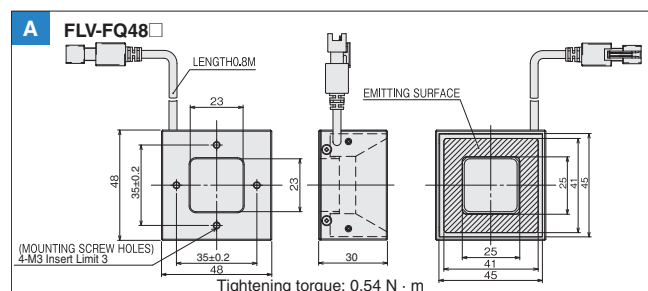
Recognition of printed characters and bar codes

Appearance Inspections of Chip Components



## Dimensions

(Unit: mm)



# Spot Light FLV-EP50 Series

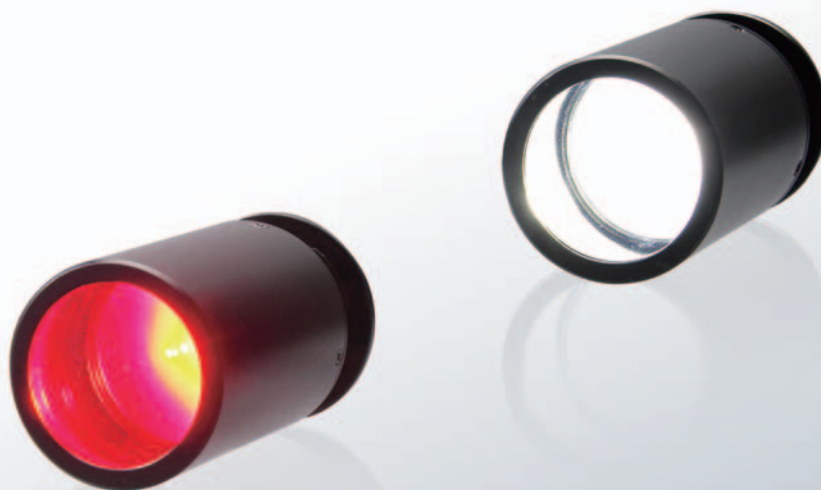
Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

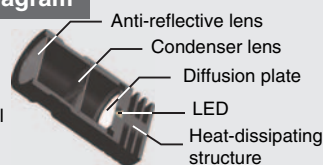
**Long-distance Spot Lighting**  
This series achieves uniform, parallel light.



## Product Features

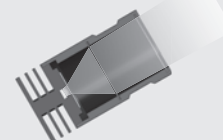
- Superior directional characteristic, essentially parallel light, and long-distance illumination.

### Cross-sectional Diagram



\*This figure is a conceptual illustration and may vary from the actual structure.

### Illustration of Illumination



## Ordering Information

| Model     | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|-----------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|           |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-EP50W | WHITE | 1.6                   | 40 dia.                      | 50 dia.                | 94.5        | A       | ○            | ○        | ×             | 200        |
| FLV-EP50R | RED   | 1.1                   |                              |                        |             |         | ○            | ○        | ×             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable

## Applications

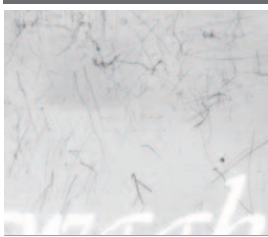
Size measurements of small workpieces

Detection of defects on surfaces

Detection of Gaps in Small Parts

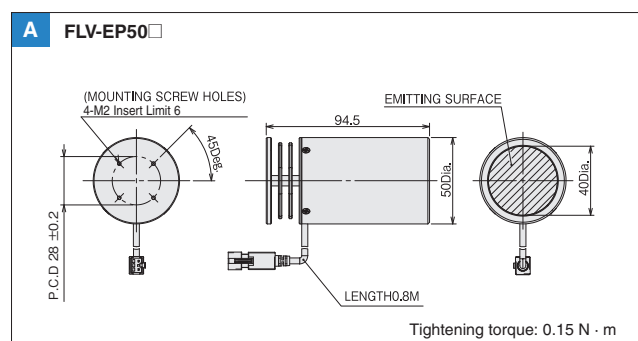


Detection of Scratches on Card Surfaces



## Dimensions

(Unit: mm)





# High-power Spot Light FLV-EP08 Series

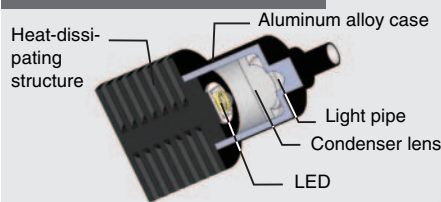
High-power, Compact Spot Light Sources.



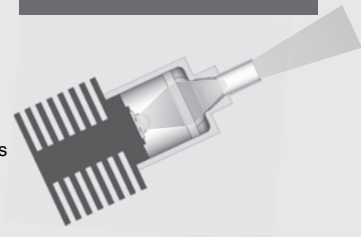
## Product Features

- High-power LEDs generate strong light with a compact design.
- Ideal for applications in combination with a Coaxial Lens.
- Highly efficient heat-dissipating structure ensures a long life.

### Cross-sectional Diagram



### Illustration of Illumination



\* This figure is a conceptual illustration and may vary from the actual structure.

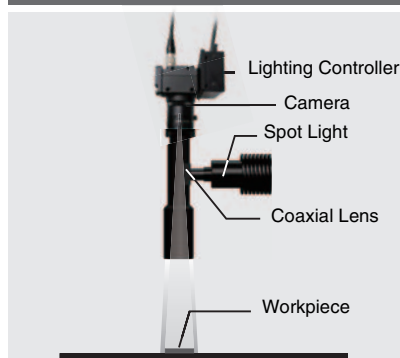
## Applications

Detection of alignment marks

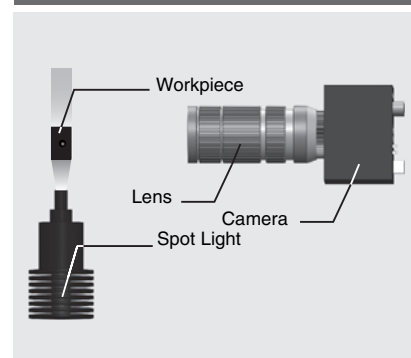
Detection of chips

Detection of defects on workpiece surfaces

### Illustration of Illumination in Combination with a Coaxial Lens



### Simplified Illustration of Detection of Bubbles in Transparent Material

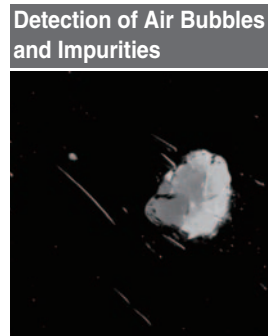
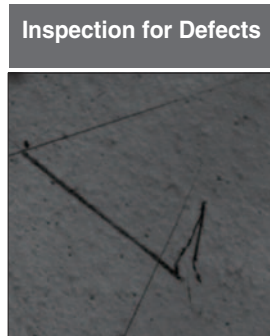


Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses



## Ordering Information

| Model       | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|-------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|             |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-EP0803W | WHITE | 1.6                   | 6.8 dia.                     | 28 dia.                | 60          | A       | ○            | ○        | ×             | 80         |
| FLV-EP0803R | RED   | 1.1                   |                              |                        |             |         | ○            | ○        | ×             |            |
| FLV-EP0803B | BLUE  | 1.6                   |                              |                        |             |         | ○            | ○        | ×             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32

FLV-ATC□: page 38

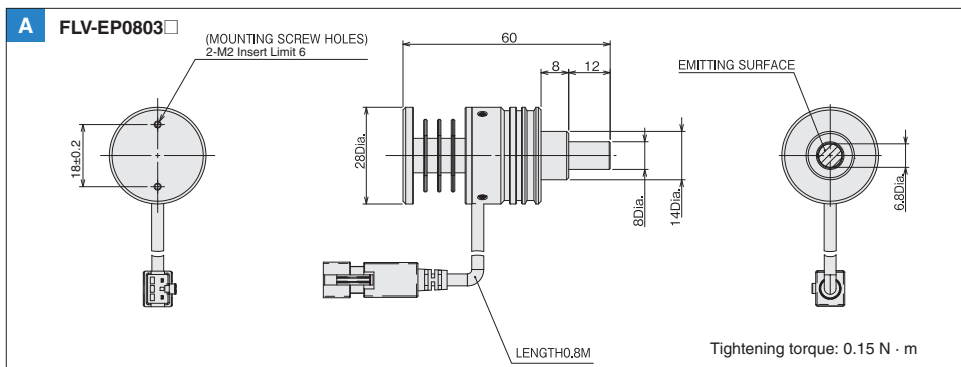
3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable

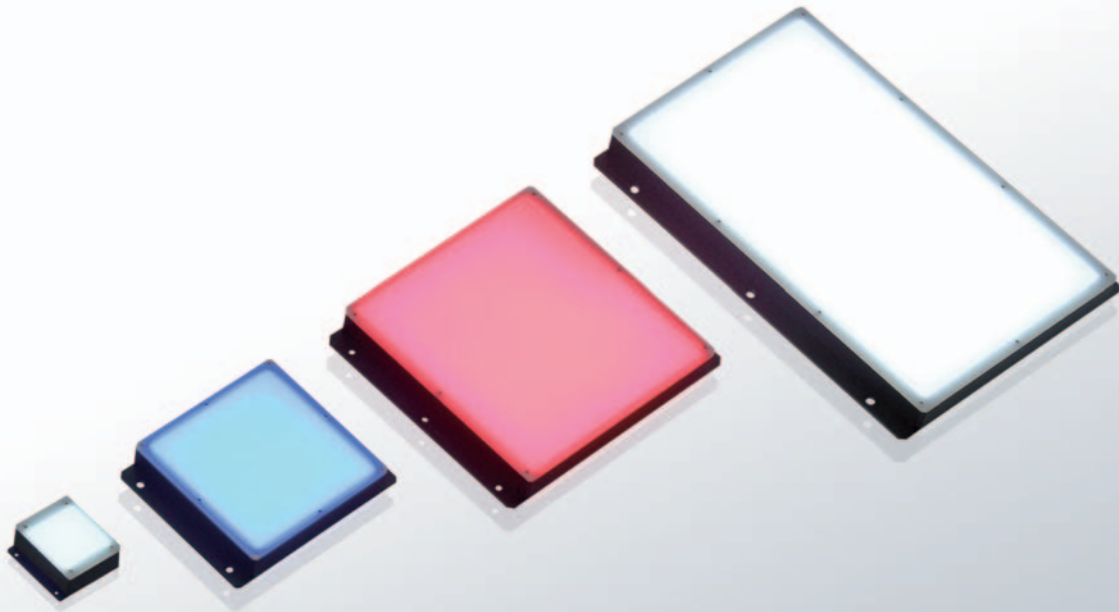
## Dimensions

(Unit: mm)



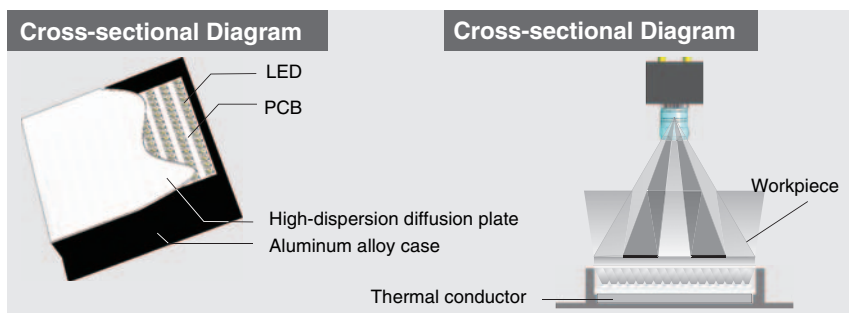
# Direct Back Light FLV-DB Series

**Uniform Illumination from a Flat Emitting Surface**  
Illumination from the back of the workpiece produces a high-contrast silhouette.



## Product Features

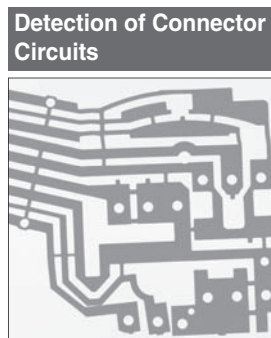
- Highly uniform backlighting with high-density LED arrays. Emphasizes the outline features of workpieces.



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

- Size measurements of machine parts
- Shape detections for electronic components and ICs
- Dirt detection on films



## Ordering Information

| Model         | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|---------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|               |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-DB3729W   | WHITE | 0.9                   | 27×27                        | 37×37                  | 15          | A       | ○            | ○        | ○             | 50         |
| FLV-DB3729R   | RED   | 0.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DB3729B   | BLUE  | 0.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DB10181W  | WHITE | 8.1                   | 73×73                        | 101×81                 | 17          | B       | ○            | ○        | ○             | 160        |
| FLV-DB10181R  | RED   | 4.7                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DB10181B  | BLUE  | 8.1                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DB130130W | WHITE | 13.0                  | 114×120                      | 144×126                | 17          | C       | ○            | ○        | ○             | 270        |
| FLV-DB130130R | RED   | 11.5                  |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DB130130B | BLUE  | 13.0                  |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DB212152W | WHITE | 29.4                  | 200×120                      | 212×152                | 17          | D       | ×            | ○        | ○             | 510        |
| FLV-DB212152R | RED   | 20.2                  |                              |                        |             |         | ×            | ○        | ○             |            |
| FLV-DB212152B | BLUE  | 29.4                  |                              |                        |             |         | ×            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller

FLV-TCC□: page 32

FLV-ATC□: page 38

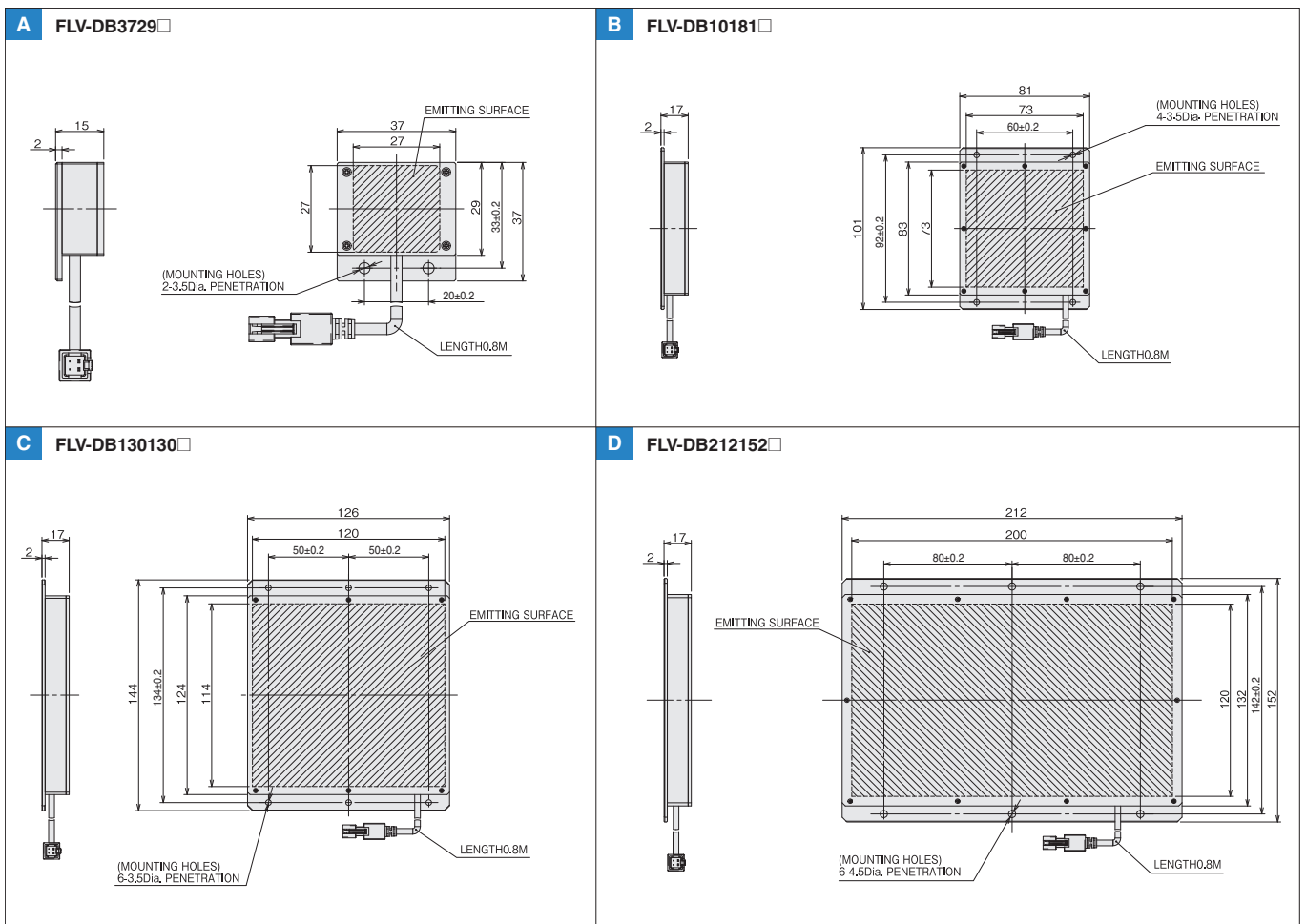
3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable ×: Not connectable

## Dimensions

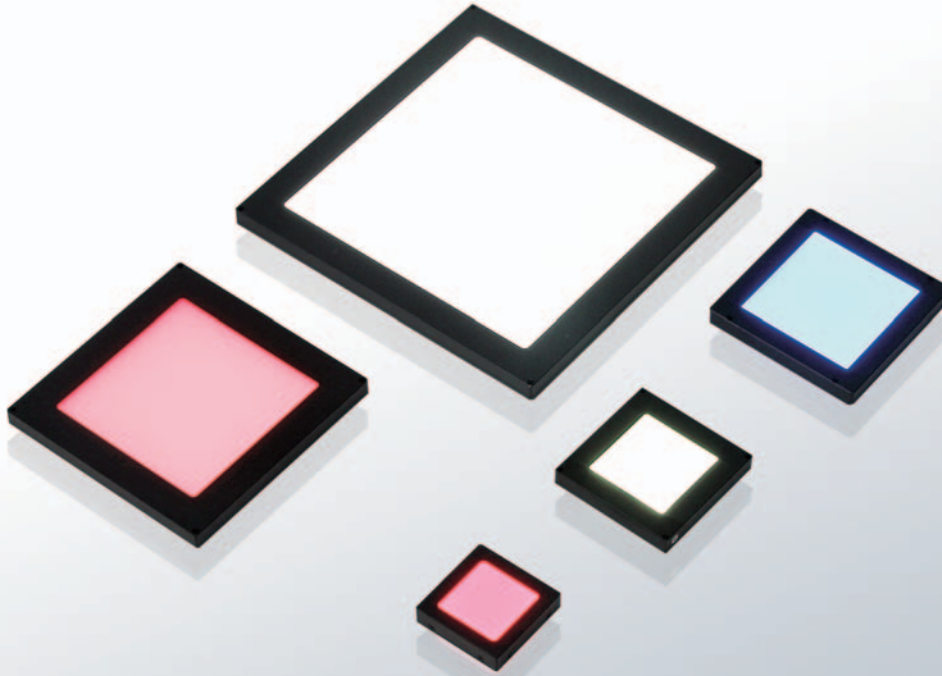
(Unit: mm)





# Edge Type Light FLV-FB Series

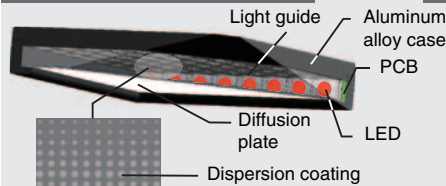
**Ultrathin, Highly Uniform Backlights**  
Thin enough to conveniently fit into narrow spaces.



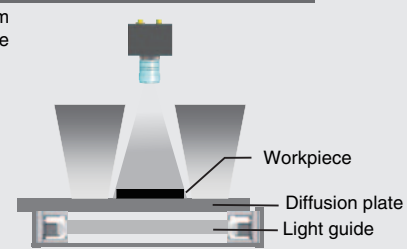
## Product Features

- Five size variations with emitting surfaces from 35 mm square to 164 mm square.
- As thin as 8 mm (FLV-FB7070).

### Cross-sectional Diagram



### Illustration of Illumination



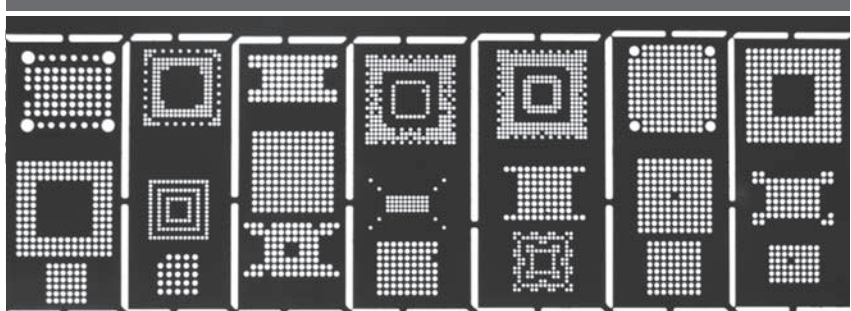
\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

Detection and size measurements of electronic devices

Detection of LCD dead pixels

### Detection of Silkscreen Patterns on Cell Phone PCBs



Ordering Information

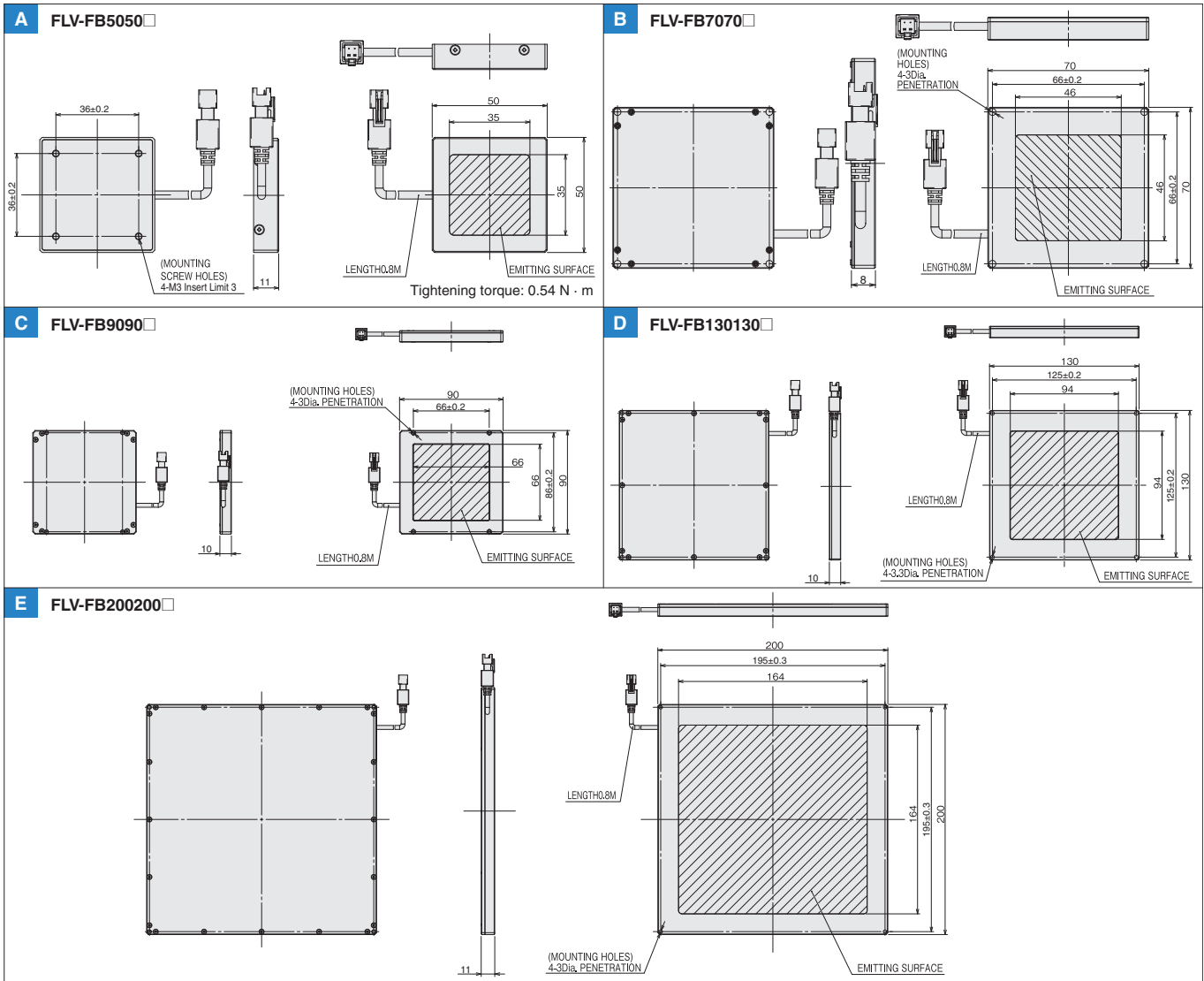
| Model         | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|---------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|               |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-FB5050W   | WHITE | 1.9                   | 35×35                        | 50×50                  | 11          | A       | ○            | ○        | ○             | 75         |
| FLV-FB5050R   | RED   | 0.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB5050B   | BLUE  | 1.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB7070W   | WHITE | 1.9                   | 46×46                        | 70×70                  | 8           | B       | ○            | ○        | ○             | 85         |
| FLV-FB7070R   | RED   | 1.4                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB7070B   | BLUE  | 1.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB9090W   | WHITE | 3.7                   | 66×66                        | 90×90                  | 10          | C       | ○            | ○        | ○             | 155        |
| FLV-FB9090R   | RED   | 1.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB9090B   | BLUE  | 3.7                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB130130W | WHITE | 5.5                   | 94×94                        | 130×130                | 10          | D       | ○            | ○        | ○             | 230        |
| FLV-FB130130R | RED   | 3.7                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB130130B | BLUE  | 5.5                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB200200W | WHITE | 7.3                   | 164×164                      | 200×200                | 11          | E       | ○            | ○        | ○             | 710        |
| FLV-FB200200R | RED   | 5.5                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FB200200B | BLUE  | 7.3                   |                              |                        |             |         | ○            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.  
 FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45  
 Note: Refer to page 69 for LED Characteristics.

○: Connectable

Dimensions

(Unit: mm)



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Edge Type Coaxial Light FLV-FX Series

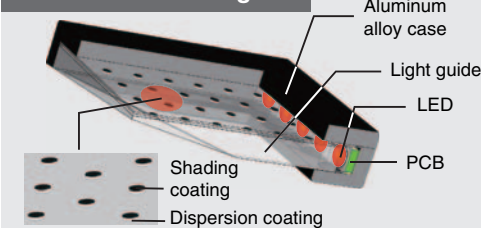
This series features a wide range of applications with many effects, such as backlighting and coaxial lighting.



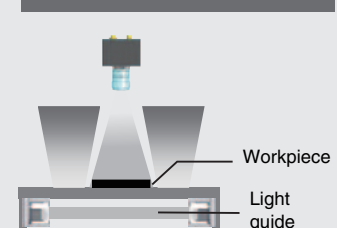
## Product Features

- High uniformity with diffused illumination.
- Achieves both shadowless and coaxial illumination.
- Lightweight and compact to conveniently fit into narrow spaces

### Cross-sectional Diagram



### Illustration of Illumination



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

Package inspections for foodstuffs, cigarettes, and household chemicals

Appearance inspections of home appliance cases and components

Detection, measurement, and recognition of characters and figures on highly reflective, uneven surfaces

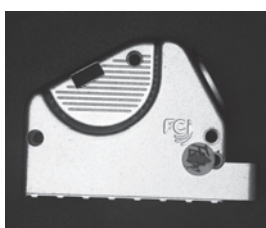
Detection of Mounting Hole Positions



Inspections for Defects on Metal Parts



Inspections for Defects on Plated Parts



Recognition of Metal Characters and Patterns on Plastic Surfaces



## Ordering Information

| Model      | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|            |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-FX100W | WHITE | 3.7                   | 60×60                        | 100×100                | 11          | A       | ○            | ○        | ○             | 180        |
| FLV-FX100R | RED   | 1.9                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FX100B | BLUE  | 3.7                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FX143W | WHITE | 5.5                   | 100×100                      | 143×143                | 11          | B       | ○            | ○        | ○             | 240        |
| FLV-FX143R | RED   | 3.7                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-FX143B | BLUE  | 5.5                   |                              |                        |             |         | ○            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32

FLV-ATC□: page 38

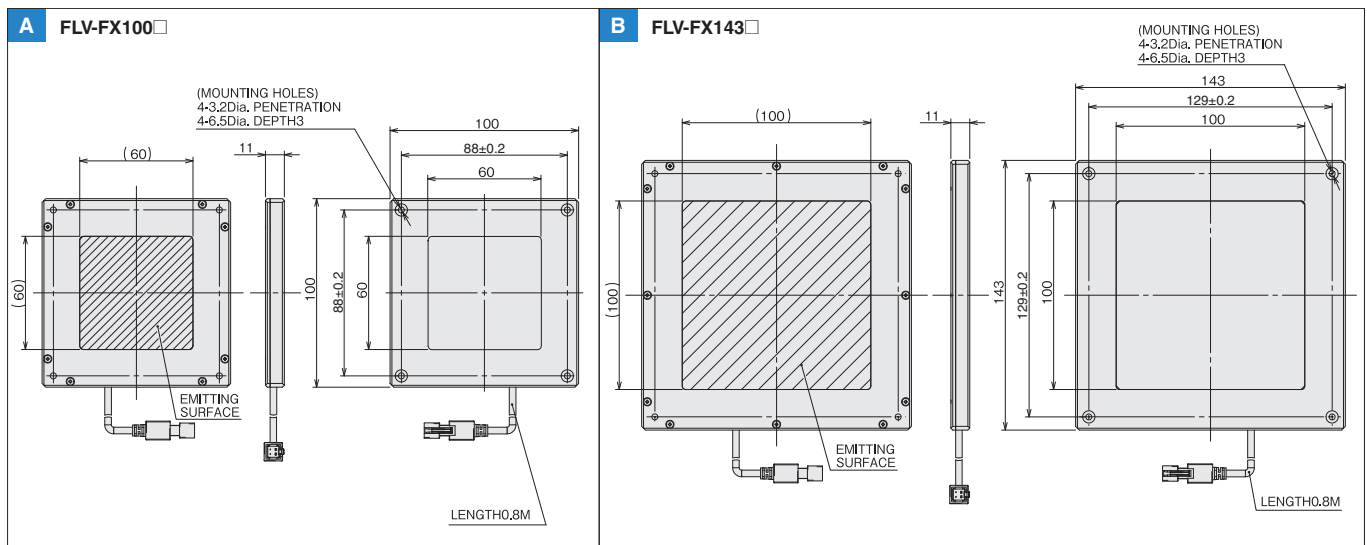
3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable

## Dimensions

(Unit: mm)



# Dome Light FLV-DD Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

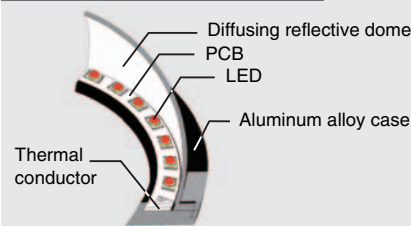
**Uniform Illumination from All Directions**  
This series produces shadowless images of the entire workpiece.



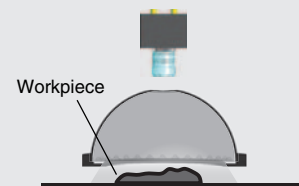
## Product Features

- Achieves uniform illumination by reflecting light from a ring-shaped light source through a highly reflective, diffusion dome.

### Cross-sectional Diagram



### Illustration of Illumination



\* This figure is a conceptual illustration and may vary from the actual structure.

## Applications

Detection of characters and marks on curved or uneven surfaces

Detection of highly reflective surfaces, such as metal or glass

Shape measurements of curved or uneven workpieces

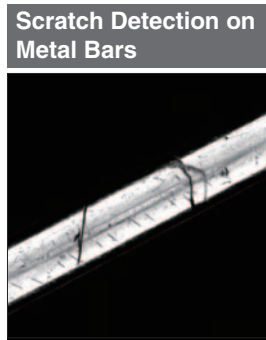
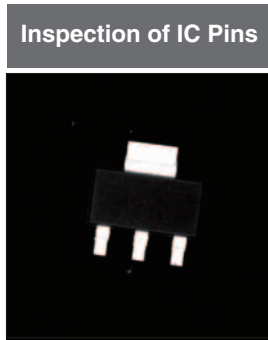
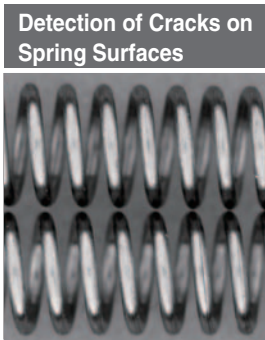
### Inspection of Date Characters on Drink Cans



### Detection of Characters on Cell Phones







## Ordering Information

| Model      | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|            |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-DD70W  | WHITE | 2.3                   | 45 dia.                      | 70 dia.                | 31.74       | A       | ○            | ○        | ○             | 130        |
| FLV-DD70R  | RED   | 1.4                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DD70B  | BLUE  | 2.3                   |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DD100W | WHITE | 17.9                  | 65.6 dia.                    | 114 dia.               | 56.28       | B       | ×            | ○        | ○             | 210        |
| FLV-DD100R | RED   | 11.9                  |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DD100B | BLUE  | 17.9                  |                              |                        |             |         | ×            | ○        | ○             |            |
| FLV-DD150W | WHITE | 17.9                  | 116 dia.                     | 175 dia.               | 83.21       | C       | ×            | ○        | ○             | 490        |
| FLV-DD150R | RED   | 11.9                  |                              |                        |             |         | ○            | ○        | ○             |            |
| FLV-DD150B | BLUE  | 17.9                  |                              |                        |             |         | ×            | ○        | ○             |            |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

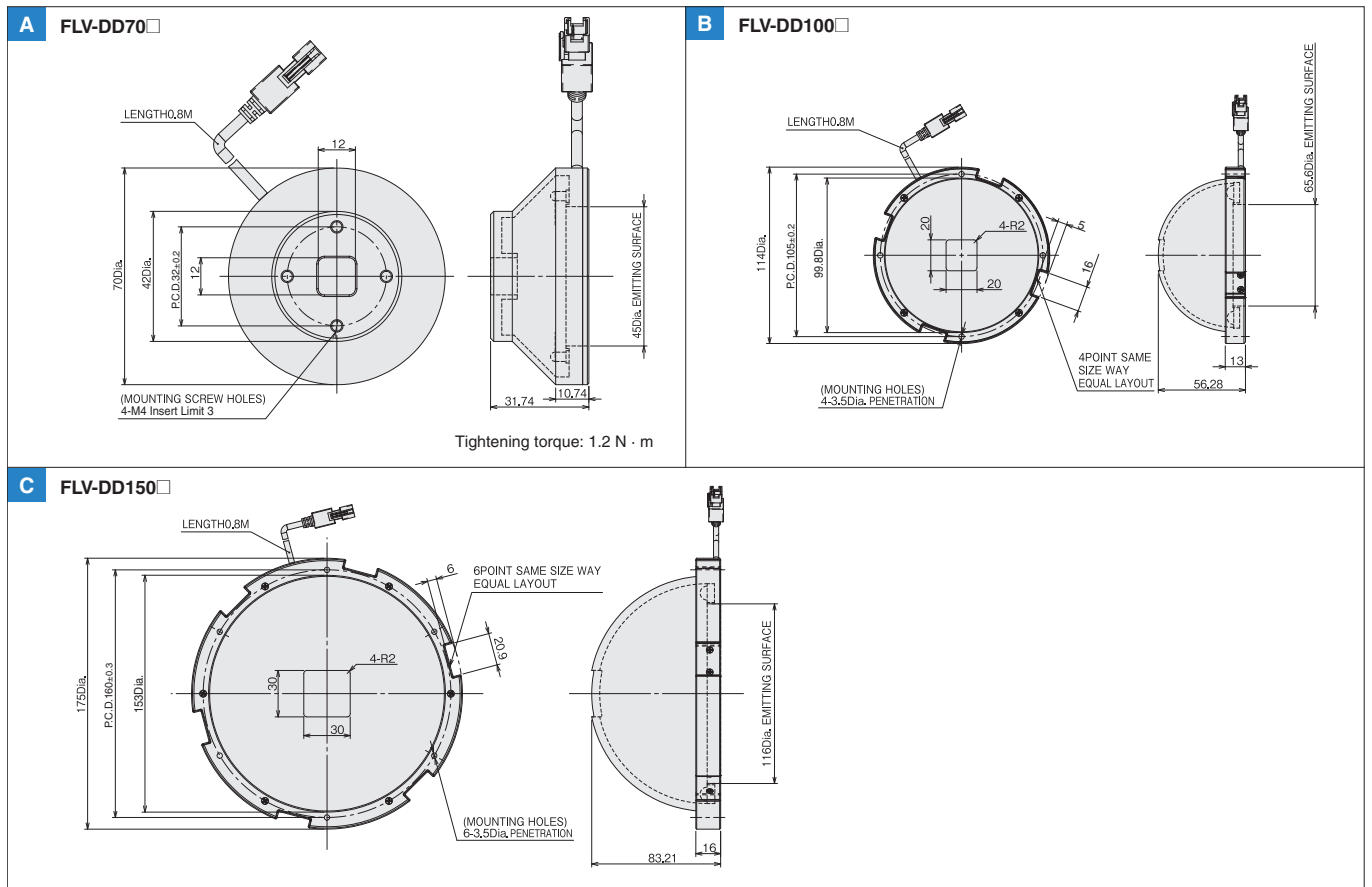
FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable ×: Not connectable

## Dimensions

(Unit: mm)



# Line Light FLV-LN Series

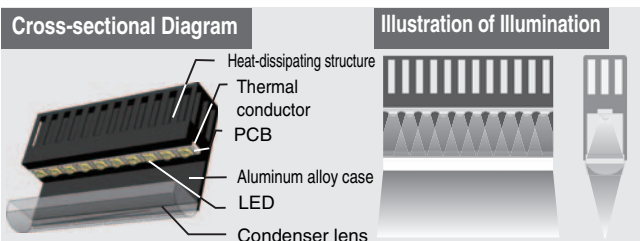
## Exceptionally Bright, Highly Uniform Line Lighting

This series is ideal for high-speed processing with line cameras.



### Product Features

- Extremely high brightness
- Achieves highly effective line illumination with a condenser lens.



\* This figure is a conceptual illustration and may vary from the actual structure.

### Applications

Printing inspections

Sheet inspections

Detection of film and glass surface damage and internal impurities

### Ordering Information

| Model      | Color | Power consumption (W) | Dimensions                   |                        |             |         | Controller * |          |               | Weight (g) |
|------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|--------------|----------|---------------|------------|
|            |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FLV-TCC□     | FLV-ATC□ | 3Z4S-LT IDGB□ |            |
| FLV-LN82W  | WHITE | 9.2                   | 62×16                        | 82×83.5                | 50          | A       | ×            | ○        | ×             | 640        |
| FLV-LN82B  | BLUE  | 9.2                   |                              |                        |             |         | ×            | ○        | ×             |            |
| FLV-LN122R | RED   | 10.4                  | 102×16                       | 122×83.5               | 50          | E       | ×            | ○        | ×             | 800        |
| FLV-LN142W | WHITE | 18.4                  | 122×16                       | 142×83.5               | 50          | B       | ×            | ○        | ×             | 890        |
| FLV-LN142B | BLUE  | 18.4                  |                              |                        |             |         | ×            | ○        | ×             |            |
| FLV-LN222R | RED   | 20.7                  | 202×16                       | 222×83.5               | 50          | F       | ×            | ○        | ×             | 1320       |
| FLV-LN322W | WHITE | 45.9                  | 302×16                       | 322×83.5               | 50          | C       | ×            | ○        | ×             | 1950       |
| FLV-LN322  | BLUE  | 45.9                  |                              |                        |             |         | ×            | ○        | ×             |            |
| FLV-LN322R | RED   | 31.1                  |                              |                        |             |         | ×            | ○        | ×             |            |
| FLV-LN442W | WHITE | 64.3                  | 442×16                       | 442×83.5               | 50          | D       | ×            | ○        | ×             | 2450       |
| FLV-LN442B | BLUE  | 64.3                  |                              |                        |             |         | ×            | ○        | ×             |            |
| FLV-LN442R | RED   | 41.4                  | 402×16                       | 422×83.5               | 50          | H       | ×            | ○        | ×             | 2400       |

\* For the connectable Lighting Controller models and conditions, refer to the Specifications pages of each Lighting Controller.

FLV-TCC□: page 32 FLV-ATC□: page 38 3Z4S-LT IDGB□: page 45

Note: Refer to page 69 for LED Characteristics.

○: Connectable ×: Not connectable



# Camera-mount Lighting Controller for FLV Series

## FLV-TCC Series

**Compact Lighting Controller**  
**Mounts directly onto the FH/FZ**  
**OMRON Cameras**  
**Multistage Control of Lighting on**  
**Up to Four Lights can be connected.**



### Product Features

- Saves space with its compact design.
- No need for space in control panels for expansion.
- Maintains Lighting intensity even when located at long distances.
- Light intensity and luminance control are set through the Vision System.

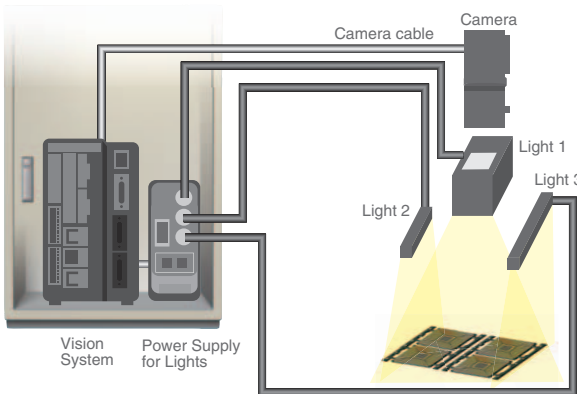
● **Simple wiring and space saving**

Wiring from the control panel to remote Cameras and Lights is simplified.

The more Cameras and Lights are connected to the Vision System Controller, the more effective in simplifying wiring and saving space.

#### Standard Lighting System

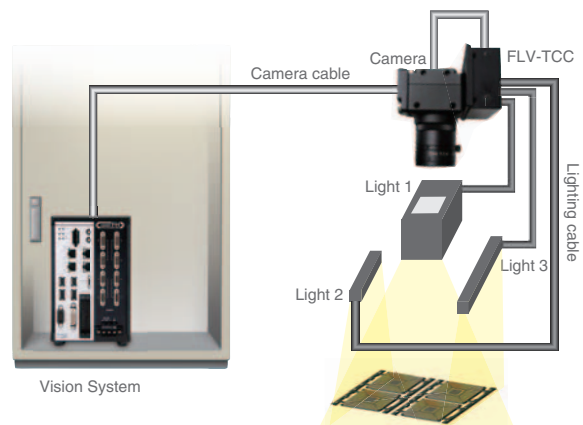
- Complicated wiring from the control panel to the Lights and Camera is required.
- Space to install the Power Supply for Lights in the control panel is required.



**Camera cable + lighting cables are wired from control panel**

#### FLV-TCC Series

- Power supplied from the Camera eliminates the need for complicated wiring from the control panel to the Lights.
- The compact design that enables mounting onto the Camera saves space in the control panel.



**Only the camera cable is connected from control panel**

Standard Models  
FLV Series

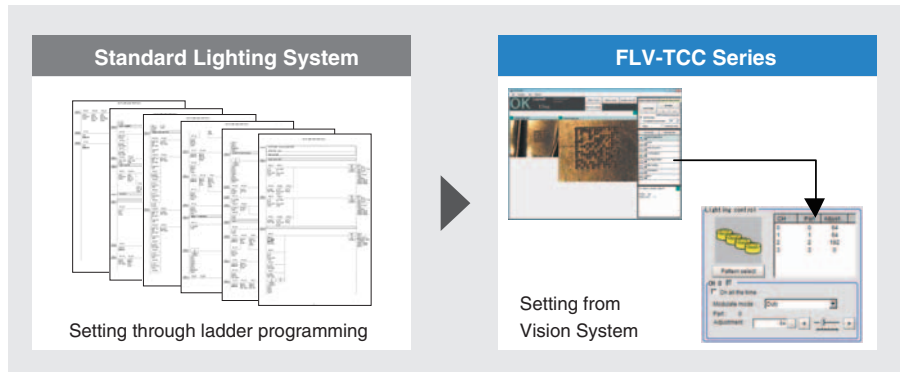
High-brightness Models  
FL Series

LED Characteristics

Lenses

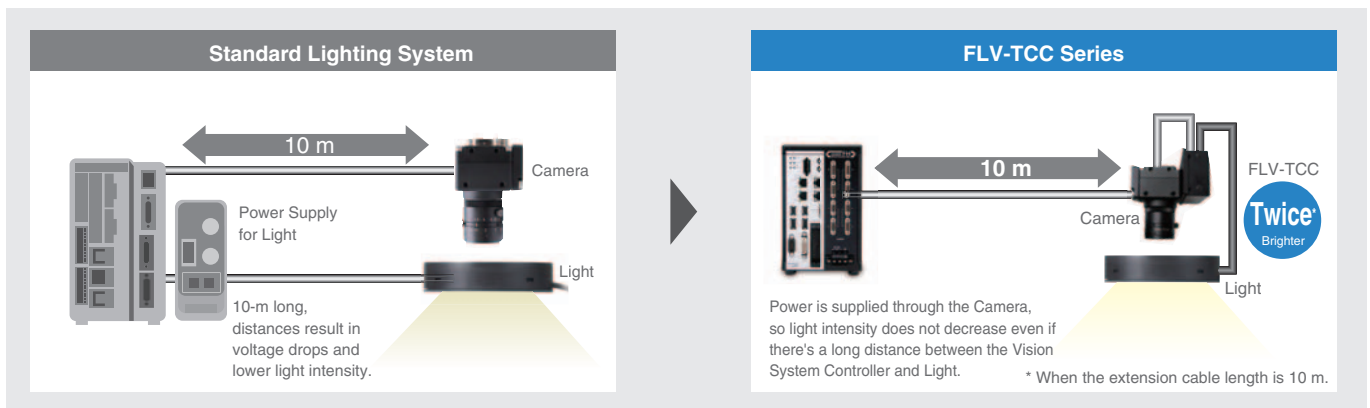
## ●Easy control setting

Light intensity and luminance control can be set from the flow menu of the Vision System Controller. No need of ladder programming to create light sequence or communications settings.



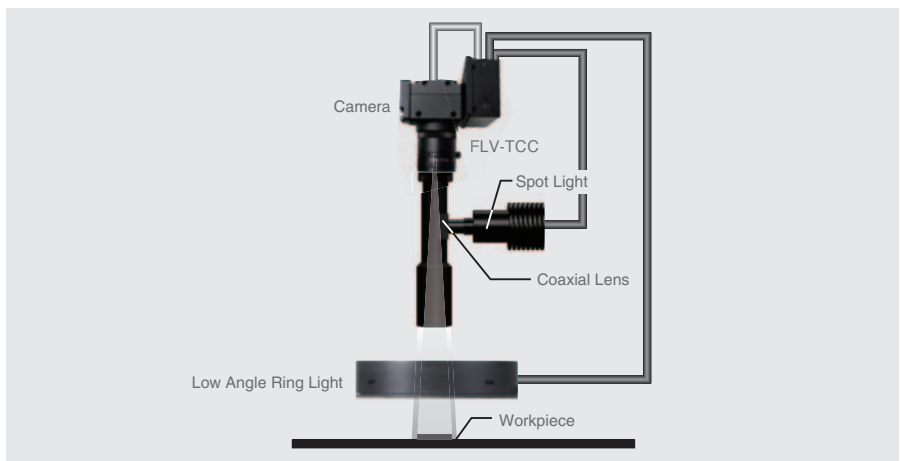
## ●Maintaining light intensity even with long wiring distances

Even if the Vision System Controller and Light are separated by a long distance, the light intensity is maintained due to power being supplied through the Camera. This means that it is not required to increase light intensity and power consumption for high-speed production lines.



## ●Connecting Spot Light

The new FLV-TCC□EP can be connected with a Spot Light, and the hybrid type FLV-TCC□HB can be connected with up to two Standard Lights and a Spot Light. Applications such as alignment and cosmetic inspection of small electronic parts, e.g. connectors and IC's, require these kind of Lighting Controllers using Spot Lights.



## Ordering Information

| Model      | Number of Channels                 | Applicable Light *5         |                          |                          | Power Supply Voltage | Power of Connected Light                      | Luminance Control Method |
|------------|------------------------------------|-----------------------------|--------------------------|--------------------------|----------------------|---|--------------------------|
|            |                                    | Standard Light FLV Series*1 | Spot Light FLV-EP Series | Line Light FLV-LN Series |                      |   |                          |
| FLV-TCC4   | 4 standard lights                  | ○                           | ×                        | ×                        | 24 VDC *2            | 15 W max.*3                                   | Digital *4               |
| FLV-TCC1   | 1 standard light                   | ○                           | ×                        | ×                        |                      |   |                          |
| FLV-TCC3HB | 1 Spot Light and 2 standard lights | ○                           | ○                        | ×                        |                      |   |                          |
| FLV-TCC1EP | 1 Spot Light                       | ×                           | ○                        | ×                        | —                    | Any FLV-EP-series Spot Light can be connected |                          |

\*1. Standard light means all FLV-series Lights excluding the FLV-EP-series Spot Lights and the FLV-LN-series Line Lights.  
 \*2. If the total power consumption of Lights is 7.5 W or less, an external power supply is not required because the power is supplied from the Camera.  
 \*3. Refer to the Specifications on page 34 for the details of "power for connectable lighting".  
 \*4. Intensity is controlled through the settings of the Vision System Controller.  
 \*5. ○: Connectable ×: Not connectable



# Camera-mount Lighting Controller for FLV Series FLV-TCC Series

## Specifications

| Item                                | Model                      | FLV-TCC4   | FLV-TCC1  | FLV-TCC3HB                                      | FLV-TCC1EP  |   |                                     |  |
|-------------------------------------|----------------------------|--|---|---|---|---|-------------------------------------|--|
| Number of channels                  |                            | 4 standard lights  | 1 standard light                                | 1 Spot Light,<br>2 standard lights              | 1 Spot Light  |   |                                     |  |
| Applicable light *1                 |                            | FLV series (excluding FLV-EP series and FLV-LN series)   |   | FLV series (excluding FLV-LN series)            | FLV-EP series   |   |                                     |  |
| Applicable camera *2                |                            | FH-S series, FZ-S series   |   |   |   |   |                                     |  |
| Applicable vision system controller |                            | FH series, FZ5 series  |   |   |   |   |                                     |  |
| Input voltage                       |                            | Supplied from applicable camera (12 V) or external power supply (24 V) *3  |   |   | Supplied from applicable camera (12 V)  |   |                                     |  |
| External power supply voltage       |                            | 24 VDC 10% (including ripple)  |   |   | —   |   |                                     |  |
| Current consumption                 |                            | 1.5A max.  |   |   | 1.0A max.   |   |                                     |  |
|                                     | Recommended power supply   | S8VS-06024 (manufactured by OMRON, 24 VDC, 2.5 A, 60 W)  |   |   | —   |   |                                     |  |
| Power of connected light            | 12 VDC for camera supply   | Continuous lighting  |   | 4ch total 7.5 W max.                            | 7.5 W max.  | 0ch connection: 1,2ch total 5.5 W max.<br>0ch non-connection: 1,2ch total 7.5 W max.  | All FLV-EP series can be connected. |  |
|                                     |                            | Trigger lighting   | Simultaneous lighting                           | 4ch total 7.5 W max.                            | 7.5 W max.  |   |                                     | 0ch connection: 1,2ch total 5.5 W max.<br>0ch non-connection: 1,2ch total 7.5 W max. |
|                                     |                            |  | Individual lighting                             | 7.5 W max. for 1ch                              |   |   |                                     | 7.5 W max. for 1ch   |
|                                     | 24 VDC for external supply | Continuous lighting  |   | 4ch total 7.5 W max.                            | 7.5 W max.  | 0ch connection: 1,2ch total 5.5 W max.<br>0ch non-connection: 1,2ch total 7.5 W max.  |                                     | —  |
|                                     |                            | Trigger lighting   | Simultaneous lighting                           | 4ch total 15 W max.                             | 15 W max.   | 0ch connection: 1,2ch total 14 W max.<br>0ch non-connection: 1,2ch total 15 W max.  |                                     |  |
|                                     |                            |  | Individual lighting                             | 15 W max. for 1ch                               |   | 15 W max. for 1ch   |                                     |  |
| Drive method                        |                            | Constant voltage method  |   |   | 0ch Constant current method<br>1ch/2ch: Constant voltage method   | Constant current method   |                                     |  |
| Lighting method                     |                            | Trigger lighting, Continuous lighting  |   |   |   |   |                                     |  |
| Luminance control method            |                            | Duty light adjustment or voltage light adjustment<br>Duty light adjustment: PWM frequency of 100 kHz, light adjustment of 255 levels<br>Voltage light adjustment: Light adjustment of 255 levels<br>(all are configured with vision system controller) |   |   | 0ch Duty light adjustment or current light adjustment<br>1ch/2ch Duty light adjustment or voltage light adjustment<br>Duty light adjustment: PWM frequency of 100 kHz, light adjustment of 255 levels<br>current light adjustment/<br>Voltage light adjustment: Light adjustment of 255 levels (all are configured with vision system controller) | Duty light adjustment or current light adjustment<br>Duty light adjustment: PWM frequency of 100 kHz, light adjustment of 255 levels<br>current light adjustment: Light adjustment of 255 levels (all are configured with vision system controller) |                                     |  |
| Trigger lighting                    |                            | Lighting in synchronization with trigger input timing from the controller.   |   |   |   |   |                                     |  |
| Trigger lighting delay time         |                            | Ton: 30μs max.   |   |   |   |   |                                     |  |
| Lighting duration setting           |                            | Auto setting in accordance with shutter speed.   |   |   |   |   |                                     |  |
| External interface                  |                            | Camera connection cable (directly connected with the main unit)  |   |   |   |   |                                     |  |
| Insulation resistance               |                            | 0.5 MΩ (100VDC)  |   |   |   |   |                                     |  |
| Ambient temperature                 |                            | Operating: 0 to +50°C, Storage: -15 to +60°C (with no icing or condensation)   |   |   |   |   |                                     |  |
| Ambient humidity                    |                            | Operating and storage: 35% to 85% (with no condensation)   |   |   |   |   |                                     |  |
| Degree of protection                |                            | IP20 (IEC60529)  |   |   |   |   |                                     |  |
| Vibration resistance (destructive)  |                            | 10 to 150 Hz, (0.7mm double amplitude) 80 min each in X, Y, and Z directions   |   |   |   |   |                                     |  |
| Shock resistance (destructive)      |                            | 150 m/s <sup>2</sup> 3 times each in 6 directions(up/down, left/right, forward/backward)   |   |   |   |   |                                     |  |
| Materials                           |                            | Case, Camera mount plate: Aluminum, Cable: FPVC  |   |   |   |   |                                     |  |
| Weight                              |                            | Approx. 130g (including the camera mount plate)  | Approx. 120g (including the camera mount plate) | Approx. 130g (including the camera mount plate) | Approx. 120g (including the camera mount plate)   |   |                                     |  |
| Accessories                         |                            | Instruction sheet, Lighting connection table, Camera Mount plate, Mounting screws (M2 set screw x 4, M2 flat head screw x 4, M4 flat head screw x 4)   |   |   |   |   |                                     |  |
| Applicable standards                |                            | EN61326-1 *4, KC   |   |   |   |   |                                     |  |

\*1. Check the lighting connection table of accessory.

\*2. When mounting on the FH-S□12, use the FH-SM12-XLC (sold separately).

\*3. When supplying the power to this product from an external input power supply (24V), make sure to turn ON the power to this product first or at the same time with the vision system controller. If you reverse this order, this product will not recognize the 24V external input, so lighting greater than 7.5W will not be possible.

\*4. Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

Also, the following condition is applied to the immunity test of this product.

There are case that Lighting brightness fluctuate Max 10%.

# Camera-mount Lighting Controller for FLV Series FLV-TCC Series

## FLV Light Connection Table

Lighting controllers that can be connected to each light are shown below.

○: Connectable, continuous lighting possible ○: Connectable, only trigger lighting possible ×: Not connectable

The following table shows if you can connect one light to each lighting controller.

When connecting lights to multiple channels, make sure that the total power consumption of the connected lights is within the specification of the lighting controller.

### Direct Ring Light

| Model        | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□ *1     |                |
|--------------|-------------------|------------------------|--------------------|----------------|
|              |                   |                        | 0ch non-connection | 0ch connection |
| FLV-DR3220W  | 1.4W              | ○                      | ○                  | ○              |
| FLV-DR3220R  | 1.3W              | ○                      | ○                  | ○              |
| FLV-DR3220B  | 1.4W              | ○                      | ○                  | ○              |
| FLV-DR4415W  | 2.7W              | ○                      | ○                  | ○              |
| FLV-DR4415R  | 1.7W              | ○                      | ○                  | ○              |
| FLV-DR4415B  | 2.7W              | ○                      | ○                  | ○              |
| FLV-DR5030W  | 3.1W              | ○                      | ○                  | ○              |
| FLV-DR5030R  | 1.8W              | ○                      | ○                  | ○              |
| FLV-DR5030B  | 3.1W              | ○                      | ○                  | ○              |
| FLV-DR5030IR | 1.3W              | ○                      | ○                  | ○              |
| FLV-DR6030UV | 3.2W              | ○                      | ○                  | ○              |
| FLV-DR6615W  | 5.0W              | ○                      | ○                  | ○              |
| FLV-DR6615R  | 3.9W              | ○                      | ○                  | ○              |
| FLV-DR6615B  | 5.0W              | ○                      | ○                  | ○              |
| FLV-DR7000W  | 5.0W              | ○                      | ○                  | ○              |
| FLV-DR7000R  | 3.7W              | ○                      | ○                  | ○              |
| FLV-DR7000B  | 5.0W              | ○                      | ○                  | ○              |
| FLV-DR7030W  | 5.0W              | ○                      | ○                  | ○              |
| FLV-DR7030R  | 3.7W              | ○                      | ○                  | ○              |
| FLV-DR7030B  | 5.0W              | ○                      | ○                  | ○              |
| FLV-DR7030IR | 2.6W              | ○                      | ○                  | ○              |
| FLV-DR7530UV | 5.4W              | ○                      | ○                  | ○              |
| FLV-DR9000W  | 8.8W              | ○                      | ○                  | ○              |
| FLV-DR9000R  | 7.0W              | ○                      | ○                  | ○              |
| FLV-DR9000B  | 8.8W              | ○                      | ○                  | ○              |
| FLV-DR9030W  | 8.1W              | ○                      | ○                  | ○              |
| FLV-DR9030R  | 6.6W              | ○                      | ○                  | ○              |
| FLV-DR9030B  | 8.1W              | ○                      | ○                  | ○              |
| FLV-DR9030IR | 4.3W              | ○                      | ○                  | ○              |
| FLV-DR9030UV | 6.8W              | ○                      | ○                  | ○              |
| FLV-DR9215W  | 7.4W              | ○                      | ○                  | ○              |
| FLV-DR9215R  | 5.4W              | ○                      | ○                  | ○              |
| FLV-DR9215B  | 7.4W              | ○                      | ○                  | ○              |
| FLV-DR12030W | 11.9W             | ○                      | ○                  | ○              |
| FLV-DR12030R | 9.8W              | ○                      | ○                  | ○              |
| FLV-DR12030B | 11.9W             | ○                      | ○                  | ○              |

\*1.0ch is only for Spot Light.

### Low Angle Ring Light

| Model        | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|--------------|-------------------|------------------------|--------------------|----------------|
|              |                   |                        | 0ch non-connection | 0ch connection |
| FLV-DL5890W  | 1.9W              | ○                      | ○                  | ○              |
| FLV-DL5890R  | 1.3W              | ○                      | ○                  | ○              |
| FLV-DL5890B  | 1.9W              | ○                      | ○                  | ○              |
| FLV-DL7260W  | 5.7W              | ○                      | ○                  | ○              |
| FLV-DL7260R  | 3.9W              | ○                      | ○                  | ○              |
| FLV-DL7260B  | 5.7W              | ○                      | ○                  | ○              |
| FLV-DL9090W  | 2.8W              | ○                      | ○                  | ○              |
| FLV-DL9090R  | 1.8W              | ○                      | ○                  | ○              |
| FLV-DL9090B  | 2.8W              | ○                      | ○                  | ○              |
| FLV-DL12060W | 12.7W             | ○                      | ○                  | ○              |
| FLV-DL12060R | 10.5W             | ○                      | ○                  | ○              |
| FLV-DL12060B | 12.7W             | ○                      | ○                  | ○              |
| FLV-DL15060W | 13.6W             | ○                      | ○                  | ○              |
| FLV-DL15060R | 11.2W             | ○                      | ○                  | ○              |
| FLV-DL15060B | 13.6W             | ○                      | ○                  | ○              |

### Bar Light

| Model         | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|---------------|-------------------|------------------------|--------------------|----------------|
|               |                   |                        | 0ch non-connection | 0ch connection |
| FLV-BR6022W   | 1.4W              | ○                      | ○                  | ○              |
| FLV-BR6022R   | 1.3W              | ○                      | ○                  | ○              |
| FLV-BR6022B   | 1.4W              | ○                      | ○                  | ○              |
| FLV-BR6022IR  | 0.9W              | ○                      | ○                  | ○              |
| FLV-BR6424UV  | 1.8W              | ○                      | ○                  | ○              |
| FLV-BR8532W   | 3.5W              | ○                      | ○                  | ○              |
| FLV-BR8532R   | 3.1W              | ○                      | ○                  | ○              |
| FLV-BR8532B   | 3.5W              | ○                      | ○                  | ○              |
| FLV-BR11222W  | 4.2W              | ○                      | ○                  | ○              |
| FLV-BR11222R  | 2.6W              | ○                      | ○                  | ○              |
| FLV-BR11222B  | 4.2W              | ○                      | ○                  | ○              |
| FLV-BR11222IR | 1.8W              | ○                      | ○                  | ○              |
| FLV-BR11624UV | 3.6W              | ○                      | ○                  | ○              |
| FLV-BR14030W  | 6.1W              | ○                      | ○                  | ○              |
| FLV-BR14030R  | 4.8W              | ○                      | ○                  | ○              |
| FLV-BR14030B  | 6.1W              | ○                      | ○                  | ○              |
| FLV-BR15020W  | 5.5W              | ○                      | ○                  | ○              |
| FLV-BR15020R  | 3.1W              | ○                      | ○                  | ○              |
| FLV-BR15020B  | 5.5W              | ○                      | ○                  | ○              |
| FLV-BR21222W  | 8.7W              | ○                      | ○                  | ○              |
| FLV-BR21222R  | 5.0W              | ○                      | ○                  | ○              |
| FLV-BR21222B  | 8.7W              | ○                      | ○                  | ○              |
| FLV-BR21230W  | 8.8W              | ○                      | ○                  | ○              |
| FLV-BR21230R  | 7.0W              | ○                      | ○                  | ○              |
| FLV-BR21230B  | 8.8W              | ○                      | ○                  | ○              |
| FLV-BR21230IR | 6.1W              | ○                      | ○                  | ○              |
| FLV-BR21230UV | 7.8W              | ○                      | ○                  | ○              |
| FLV-BR38037W  | 15.9W             | ×                      | ×                  | ×              |
| FLV-BR38037R  | 11.3W             | ○                      | ○                  | ○              |
| FLV-BR38037B  | 15.9W             | ×                      | ×                  | ×              |
| FLV-BR48031W  | 21.9W             | ×                      | ×                  | ×              |
| FLV-BR48031R  | 18.0W             | ×                      | ×                  | ×              |
| FLV-BR48031B  | 21.9W             | ×                      | ×                  | ×              |

### Coaxial Light

| Model      | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|------------|-------------------|------------------------|--------------------|----------------|
|            |                   |                        | 0ch non-connection | 0ch connection |
| FLV-CL30W  | 2.4W              | ○                      | ○                  | ○              |
| FLV-CL30R  | 1.4W              | ○                      | ○                  | ○              |
| FLV-CL30B  | 2.4W              | ○                      | ○                  | ○              |
| FLV-CL40W  | 3.9W              | ○                      | ○                  | ○              |
| FLV-CL40R  | 2.3W              | ○                      | ○                  | ○              |
| FLV-CL40B  | 3.9W              | ○                      | ○                  | ○              |
| FLV-CL60W  | 10.4W             | ○                      | ○                  | ○              |
| FLV-CL60R  | 5.7W              | ○                      | ○                  | ○              |
| FLV-CL60B  | 10.4W             | ○                      | ○                  | ○              |
| FLV-CL60IR | 3.9W              | ○                      | ○                  | ○              |
| FLV-CL60UV | 3.0W              | ○                      | ○                  | ○              |
| FLV-CL80W  | 10.8W             | ○                      | ○                  | ○              |
| FLV-CL80R  | 7.2W              | ○                      | ○                  | ○              |
| FLV-CL80B  | 10.8W             | ○                      | ○                  | ○              |
| FLV-CL100W | 22.7W             | ×                      | ×                  | ×              |
| FLV-CL100R | 15.2W             | ×                      | ×                  | ×              |
| FLV-CL100B | 22.7W             | ×                      | ×                  | ×              |

# Camera-mount Lighting Controller for FLV Series FLV-TCC Series

## Shadowless Light

| Model      | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|------------|-------------------|------------------------|--------------------|----------------|
|            |                   |                        | 0ch non-connection | 0ch connection |
| FLV-FR114W | 3.9W              | ○                      | ○                  | ○              |
| FLV-FR114R | 3.1W              | ○                      | ○                  | ○              |
| FLV-FR114B | 3.9W              | ○                      | ○                  | ○              |
| FLV-FR150W | 6.1W              | ○                      | ○                  | ○              |
| FLV-FR150R | 3.5W              | ○                      | ○                  | ○              |
| FLV-FR150B | 6.1W              | ○                      | ○                  | ○              |
| FLV-FP130W | 8.1W              | ○                      | ○                  | ○              |
| FLV-FP130R | 5.8W              | ○                      | ○                  | ○              |
| FLV-FP130B | 8.1W              | ○                      | ○                  | ○              |
| FLV-FS74W  | 5.2W              | ○                      | ○                  | ○              |
| FLV-FS74R  | 3.5W              | ○                      | ○                  | ○              |
| FLV-FS74B  | 5.2W              | ○                      | ○                  | ○              |
| FLV-FQ48W  | 2.0W              | ○                      | ○                  | ○              |
| FLV-FQ48R  | 1.2W              | ○                      | ○                  | ○              |
| FLV-FQ48B  | 2.0W              | ○                      | ○                  | ○              |

## Direct Back Light

| Model         | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|---------------|-------------------|------------------------|--------------------|----------------|
|               |                   |                        | 0ch non-connection | 0ch connection |
| FLV-DB3729W   | 0.9W              | ○                      | ○                  | ○              |
| FLV-DB3729R   | 0.9W              | ○                      | ○                  | ○              |
| FLV-DB3729B   | 0.9W              | ○                      | ○                  | ○              |
| FLV-DB10181W  | 8.1W              | ○                      | ○                  | ○              |
| FLV-DB10181R  | 4.7W              | ○                      | ○                  | ○              |
| FLV-DB10181B  | 8.1W              | ○                      | ○                  | ○              |
| FLV-DB130130W | 13.0W             | ○                      | ○                  | ○              |
| FLV-DB130130R | 11.5W             | ○                      | ○                  | ○              |
| FLV-DB130130B | 13.0W             | ○                      | ○                  | ○              |
| FLV-DB212152W | 29.4W             | ×                      | ×                  | ×              |
| FLV-DB212152R | 20.2W             | ×                      | ×                  | ×              |
| FLV-DB212152B | 29.4W             | ×                      | ×                  | ×              |

## Edge Type Light

| Model         | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|---------------|-------------------|------------------------|--------------------|----------------|
|               |                   |                        | 0ch non-connection | 0ch connection |
| FLV-FB5050W   | 1.9W              | ○                      | ○                  | ○              |
| FLV-FB5050R   | 1.0W              | ○                      | ○                  | ○              |
| FLV-FB5050B   | 1.9W              | ○                      | ○                  | ○              |
| FLV-FB7070W   | 1.9W              | ○                      | ○                  | ○              |
| FLV-FB7070R   | 1.4W              | ○                      | ○                  | ○              |
| FLV-FB7070B   | 1.9W              | ○                      | ○                  | ○              |
| FLV-FB9090W   | 3.7W              | ○                      | ○                  | ○              |
| FLV-FB9090R   | 1.9W              | ○                      | ○                  | ○              |
| FLV-FB9090B   | 3.7W              | ○                      | ○                  | ○              |
| FLV-FB130130W | 5.5W              | ○                      | ○                  | ○              |
| FLV-FB130130R | 3.7W              | ○                      | ○                  | ○              |
| FLV-FB130130B | 5.5W              | ○                      | ○                  | ○              |
| FLV-FB200200W | 7.3W              | ○                      | ○                  | ○              |
| FLV-FB200200R | 5.5W              | ○                      | ○                  | ○              |
| FLV-FB200200B | 7.3W              | ○                      | ○                  | ○              |

## Edge Type Coaxial Light

| Model      | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|------------|-------------------|------------------------|--------------------|----------------|
|            |                   |                        | 0ch non-connection | 0ch connection |
| FLV-FX100W | 3.7W              | ○                      | ○                  | ○              |
| FLV-FX100R | 1.9W              | ○                      | ○                  | ○              |
| FLV-FX100B | 3.7W              | ○                      | ○                  | ○              |
| FLV-FX143W | 5.5W              | ○                      | ○                  | ○              |
| FLV-FX143R | 3.7W              | ○                      | ○                  | ○              |
| FLV-FX143B | 5.5W              | ○                      | ○                  | ○              |

## Dome Light

| Model      | Power consumption | FLV-TCC4□<br>FLV-TCC1□ | FLV-TCC3HB□        |                |
|------------|-------------------|------------------------|--------------------|----------------|
|            |                   |                        | 0ch non-connection | 0ch connection |
| FLV-DD70W  | 2.3W              | ○                      | ○                  | ○              |
| FLV-DD70R  | 1.4W              | ○                      | ○                  | ○              |
| FLV-DD70B  | 2.3W              | ○                      | ○                  | ○              |
| FLV-DD100W | 17.9W             | ×                      | ×                  | ×              |
| FLV-DD100R | 11.9W             | ○                      | ○                  | ○              |
| FLV-DD100B | 17.9W             | ×                      | ×                  | ×              |
| FLV-DD150W | 17.9W             | ×                      | ×                  | ×              |
| FLV-DD150R | 11.9W             | ○                      | ○                  | ○              |
| FLV-DD150B | 17.9W             | ×                      | ×                  | ×              |

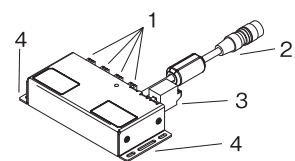
## Spot Light

| Model       | Power consumption | FLV-TCC3HB□<br>FLV-TCC1EP□ |
|-------------|-------------------|----------------------------|
| FLV-EP0803W | 1.6W              | ○                          |
| FLV-EP0803R | 1.1W              | ○                          |
| FLV-EP0803B | 1.6W              | ○                          |
| FLV-EP50W   | 1.6W              | ○                          |
| FLV-EP50R   | 1.1W              | ○                          |

## Line Light

| Model      | Power consumption |
|------------|-------------------|
| FLV-LN82W  | 9.2W              |
| FLV-LN142W | 18.4W             |
| FLV-LN322W | 45.9W             |
| FLV-LN442W | 64.3W             |
| FLV-LN122R | 10.4W             |
| FLV-LN222R | 20.7W             |
| FLV-LN322R | 31.1W             |
| FLV-LN422R | 41.4W             |
| FLV-LN82B  | 9.2W              |
| FLV-LN142B | 18.4W             |
| FLV-LN322B | 45.9W             |
| FLV-LN442B | 64.3W             |

## Part Names and Functions



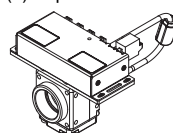
| No. | Name  | Description  |
|-----|---|--|
| 1   | Lighting connecting connector                     | Connects to the LED lighting.  |
| 2   | Camera connecting cable                           | Connects to the extension connector of the camera.   |
| 3   | 24 V external power supply input terminal block * | Connect a 24-VDC power supply if the total power consumption of the Lightings exceeds 7.5 W. |
| 4   | Mounting hole for fixing screw                    | Holes to mount the screws to secure the Lighting Controller to a mounting plate or device.   |

\* To wire the terminal block, connect a applicable cord (AWG12-26 with a 10 mm margin for work).

## Mounting the Controller to the Camera

The Lighting Controller can be mounted to the Camera using the provided camera mount plate. Mounting directions are: (1) Top/Bottom mount, (2) Right side mount, (3) Left side mount.

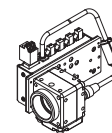
(1) Top/Bottom mount



(2) Right side mount



(3) Left side mount



# Camera-mount Lighting Controller for FLV Series FLV-TCC Series

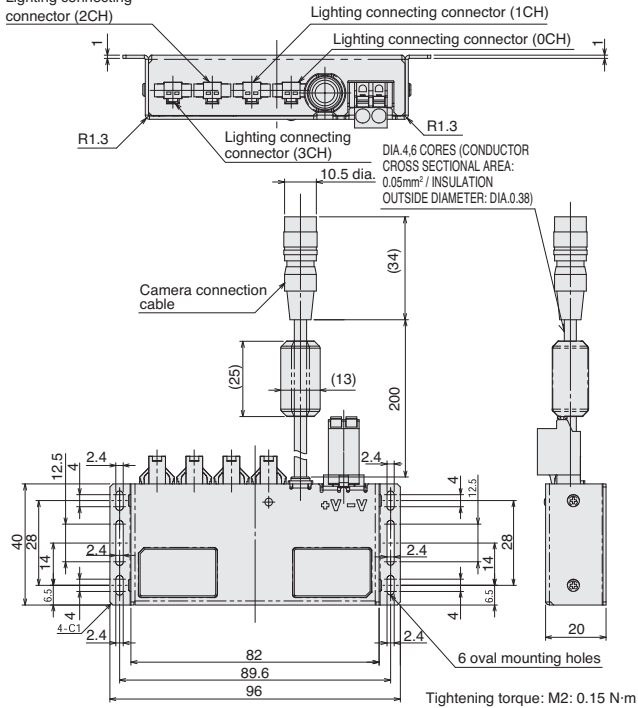
## Dimensions

(Unit: mm)

### ● Lighting Controller

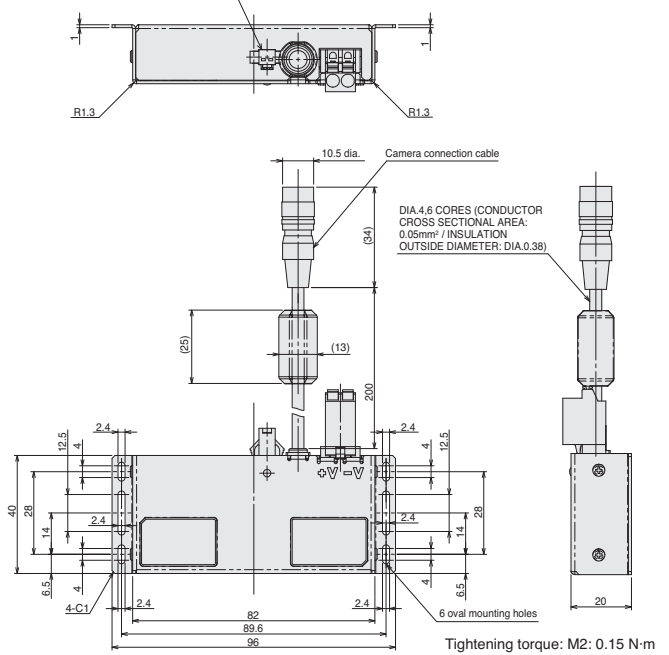
#### FLV-TCC4

Lighting connecting connector (2CH)

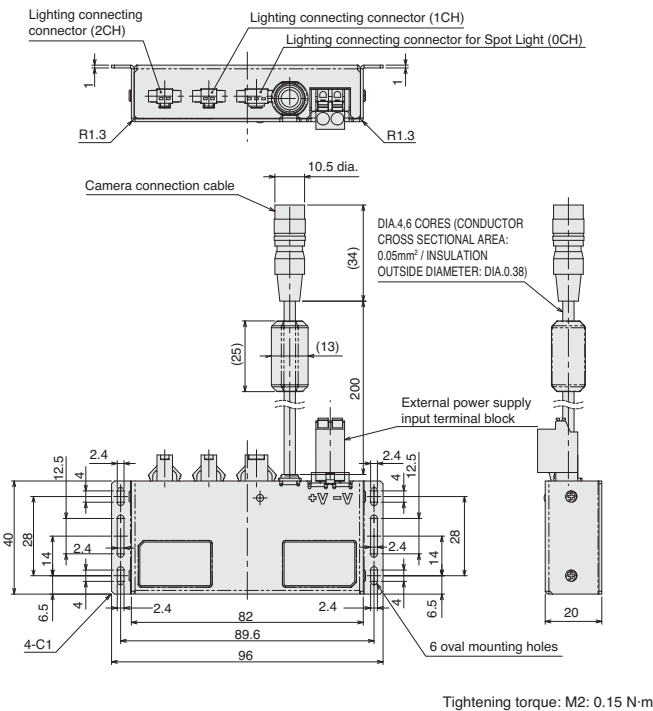


#### FLV-TCC1

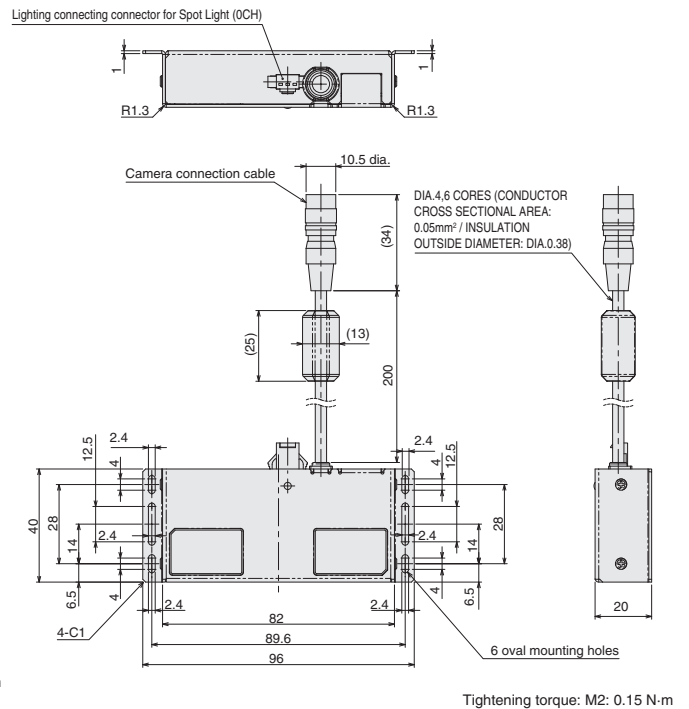
Lighting connecting connector (0CH)



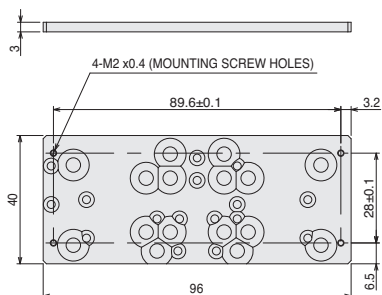
#### FLV-TCC3HB



#### FLV-TCC1EP



### ● Camera mount plate (provided)



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Analog Lighting Controller for FLV Series

## FLV-ATC Series

Stationary Lighting Controller.



### Product Features

- Stationary type suitable for separate installation when no space near the Camera.
- Light emission trigger can be input directly even without Vision Sensor.

### Ordering Information

| Applicable light      | Model                | Number of channels | Power supply voltage     | Power of connected light | Luminance control method |
|-----------------------|----------------------|--------------------|--------------------------|--------------------------|--------------------------|
| For standard light *1 | FLV-ATC21024 *2      | 2                  | 100 to 240 VAC, 50/60 Hz | 40 W max.                | Analog                   |
|                       | FLV-ATC41024 *2      | 4                  |                          | 3 W max.                 |                          |
| For spot light        | FLV-ATC10405 *2      | 1                  |                          | 12 W max.                |                          |
|                       | FLV-ATC40405 *2      | 4                  |                          | 240 W max.               |                          |
| For line light        | FLV-ATC26024-100V *2 | 2                  | 100 to 120 VAC, 50/60 Hz | 240 W max.               |                          |
|                       | FLV-ATC26024-200V    | 2                  | 200 to 240 VAC, 50/60 Hz |                          |                          |

\*1. Standard Light means all FLV-series Lights excluding the FLV-EP-series Spot Lights and the FLV-LN-series Line Lights.

\*2. For AC power cords: An A-type plug is standard. C-type and O-type plugs are also available. (Add "-C" or "-O" to the end of the model number.)

| Plug type     | A     | C     | O     |
|---------------|-------|-------|-------|
| Rated voltage | 125 V | 240 V | 240 V |
| Standard      | PSE   | CEE   | CCC   |

### AC Power Cords with A-type Plugs

#### WARNING

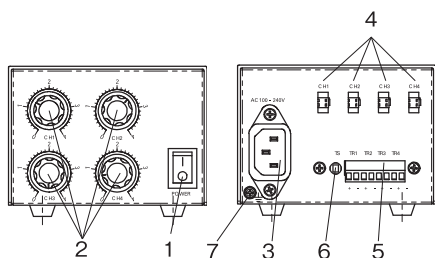
The cable included in this package can be applied only to 100 VAC commercial power in Japan. You can not use it in the country outside Japan. Please never use it on the voltage beyond 100 VAC. It becomes a cause of ignition, generation of heat, and failure.





## Lighting Controller for Standard Light FLV-ATC21024/-ATC41024

### Part Names and Functions



| No. | Name                            | Description  |
|-----|---------------------------------|--|
| 1   | Main power supply               | Starts up the Controller when it is turned ON.   |
| 2   | Lighting adjustment volume      | Rotating the volume clockwise increases the emission intensity or counterclockwise decreases it.   |
| 3   | AC power supply input connector | A terminal to supply AC power. Connect the provided AC input cable.  |
| 4   | Lighting connector              | Connects an LED light.   |
| 5   | Trigger input terminal block    | A terminal block for lighting illumination trigger input from outside to each lighting.  |
| 6   | Lighting mode switching button  | Lighting mode switch button is ON (The button is pushed.):<br>Short-circuiting (+) and (-) of TR1 to TR4 respectively makes the trigger input status ON, turning the light ON.<br>Releasing (+) and (-) makes the status OFF, turning the light OFF.<br><br>Lighting mode switch button is OFF (The button is not pushed.):<br>Short-circuit (+) and (-) of TR1 to TR4 respectively makes the trigger input status OFF, turning the light OFF.<br>Releasing (+) and (-) makes the status ON, turning the light ON. |
| 7   | Frame ground terminal           | A terminal for frame ground. Connect the ground line.  |

### Specifications

| Item                               | Model | FLV-ATC21024-□ *1   | FLV-ATC41024-□ *1                        |
|------------------------------------|-------|---|--|
| Number of channels                 |       | 2   | 4  |
| Applicable light                   |       | FLV series (FLV-EP series and FLV-LN series are excluded.)                                |  |
| Power supply voltage *2            |       | 100 to 240 VAC, 50/60 Hz  |  |
| Current consumption                |       | 1 A max.  |  |
| Power of connected light           |       | 2ch total 40 W max.<br>30 W max. for 1ch  | 4ch total 40 W max.<br>30 W max. for 1ch |
| Drive method                       |       | Constant voltage method   |  |
| Lighting method                    |       | Trigger lighting, Continuous lighting   |  |
| Luminance control method           |       | Voltage light adjustment: 14.0 to 24.0 V  |  |
| Trigger lighting                   |       | Lighting in synchronization with input from the trigger input terminal                    |  |
| Trigger lighting delay time        |       | T <sub>on</sub> : 100 μs max.   |  |
| External interface                 |       | Trigger input terminal block  |  |
| Dielectric strength                |       | 1500 VAC 50/60 Hz 1 min   |  |
| Insulation resistance              |       | 20 MΩ (500 VDC)   |  |
| Ambient temperature                |       | Operating: 0 to 50°C, Storage: -15 to 60°C (with no icing or condensation)                |  |
| Ambient humidity                   |       | Operating/storage: 35% to 85% (with no condensation)                                      |  |
| Degree of protection               |       | IP20 (IEC60529)   |  |
| Vibration resistance (destructive) |       | 10 to 150 Hz, (0.2 mm double amplitude) 80 min each in X, Y, and Z directions             |  |
| Shock resistance (destructive)     |       | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward) |  |
| Materials                          |       | Case: Aluminum  |  |
| Weight                             |       | Approx. 800 g   |  |
| Accessories                        |       | Instruction sheet, AC input cable *1  |  |
| Applicable standards               |       | EN61326-1 *3  |  |

\*1. The suffixed symbol of the model name means the plug type of the accessory cable. A model name with no suffix means type A.

\*2. This product is the exclusive use for apparatus inclusion in the industrial machine field.

This product cannot be used for the connection to electric power equipment, such as a common residence, store, and small establishment, because of nonconformity with to Electrical Appliance and Material Safety Law (PSE).

\*3. Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

Also, the following condition is applied to the immunity test of this product.

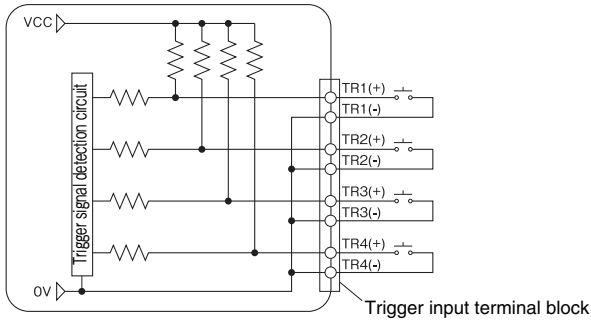
There are case that Lighting brightness fluctuate Max 10%.

# Analog Lighting Controller for FLV Series FLV-ATC Series

## Connecting to External Trigger Input Terminal Block

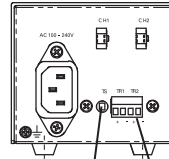
- Connection of this terminal block is not required if lighting illumination trigger input from outside is not used.

### <Connection of trigger input terminal block>



\* Current flowing through the short circuit is less than 2 mA.

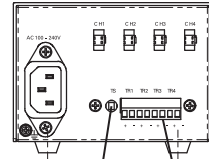
### ●FLV-ATC21024-□



Lighting mode switch button

Trigger input terminal block CH1 to CH2

### ●FLV-ATC41024-□



Lighting mode switch button

Trigger input terminal block CH1 to CH4

Lighting mode switch button is ON (The button is pushed.)

Short-circuiting (+) and (-) of TR1 to TR4 respectively makes the trigger input status ON, turning the light ON.

Releasing (+) and (-) makes the status OFF, turning the light OFF.

Lighting mode switch button is OFF (The button is not pushed.)

Short-circuit (+) and (-) of TR1 to TR4 respectively makes the trigger input status OFF, turning the light OFF.

Releasing (+) and (-) makes the status ON, turning the light ON.

### [Important]

Make sure that excessive force is not imposed on the wire and terminal block.

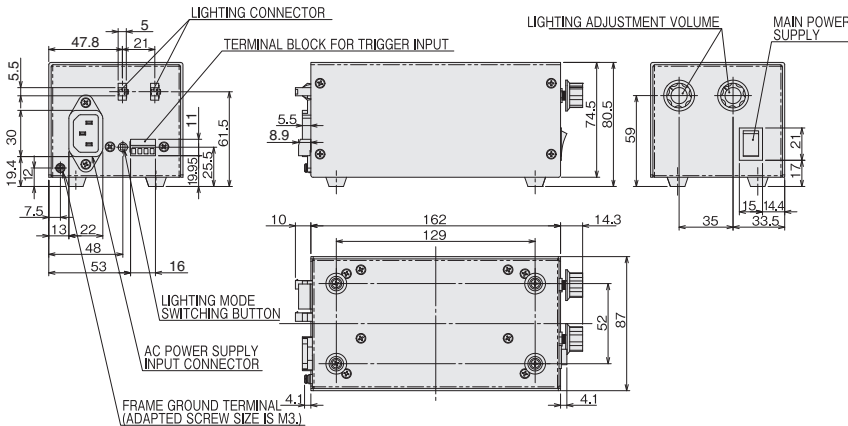
Do not install the product in which loads are constantly applied to the terminal block such as the wire being under tension.

When wiring the terminal block, use an applicable cable (AWG 14 to 24, tip processing length: 7 mm).

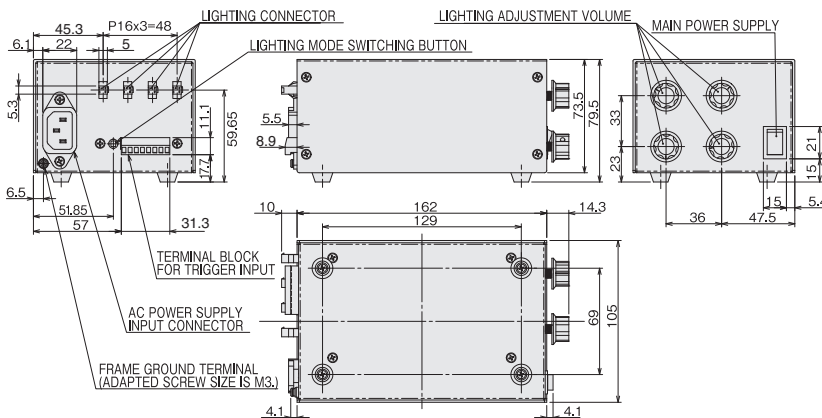
## Dimensions

(Unit: mm)

### ●FLV-ATC21024-□

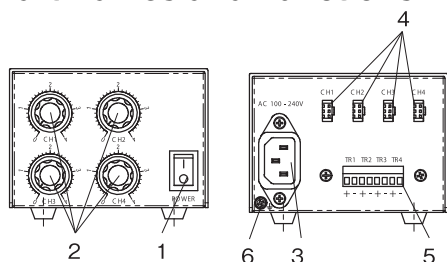


### ●FLV-ATC41024-□



## Lighting Controller for Spot Light FLV-ATC10405/-ATC40405

### Part Names and Functions



| No. | Name                             | Description  |
|-----|----------------------------------|--|
| 1   | Main power supply                | Starts up the Controller when it is turned ON.   |
| 2   | Lighting adjustment volume       | Rotating the volume clockwise increases the emission intensity or counterclockwise decreases it. |
| 3   | AC power supply input connector  | A terminal to supply AC power. Connect the provided AC input cable.                              |
| 4   | Lighting connector               | Connects an LED lights.  |
| 5   | Terminal block for trigger input | A terminal block for lighting illumination trigger input from outside to each lighting.          |
| 6   | Frame ground terminal            | A terminal for frame ground. Connect the ground line.  |

### Specifications

| Item                               | Model | FLV-ATC10405-□ *1   | FLV-ATC40405-□ *1                       |
|------------------------------------|-------|---|---|
| Number of channels                 |       | 1   | 4                                       |
| Applicable light                   |       | FLV-EP series   |   |
| Power supply voltage *2            |       | 100 to 240 VAC, 50/60 Hz  |   |
| Current consumption                |       | 0.6 A max.  |   |
| Power of connected light           |       | 3 W max.  | 4ch total 12 W max.<br>3 W max. for 1ch |
| Drive method                       |       | Constant current method   |   |
| Lighting method                    |       | Trigger lighting, Continuous lighting   |   |
| Luminance control method           |       | Current light adjustment : 0.4 A max.   |   |
| Trigger lighting                   |       | Turning the light off in synchronization with input from the trigger input terminal       |   |
| Trigger lighting delay time        |       | T_on: 1000 μs max.  |   |
| External interface                 |       | Trigger input terminal block  |   |
| Dielectric strength                |       | 1500 VAC 50/60 Hz 1 min   |   |
| Insulation resistance              |       | 20 MΩ (500 VDC)   |   |
| Ambient temperature                |       | Operating: 0 to 50°C, Storage: -15 to 60°C (with no icing or condensation)                |   |
| Ambient humidity                   |       | Operating/storage: 35% to 85% (with no condensation)                                      |   |
| Degree of protection               |       | IP20 (IEC60529)   |   |
| Vibration resistance (destructive) |       | 10 to 150 Hz, (0.2 mm double amplitude) 80 min each in X, Y, and Z directions             |   |
| Shock resistance (destructive)     |       | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward) |   |
| Materials                          |       | Case: Aluminum  |   |
| Weight                             |       | Approx. 800 g   |   |
| Accessories                        |       | Instruction sheet, AC input cable *1  |   |
| Applicable standards               |       | EN61326-1 *3  |   |

\*1. The suffixed symbol of the model name means the plug type of the accessory cable. A model name with no suffix means type A.

\*2. This product is the exclusive use for apparatus inclusion in the industrial machine field.  
This product cannot be used for the connection to electric power equipment, such as a common residence, store, and small establishment, because of nonconformity with to Electrical Appliance and Material Safety Law (PSE).

\*3. Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)  
Also, the following condition is applied to the immunity test of this product.  
There are case that Lighting brightness fluctuate Max 10%.

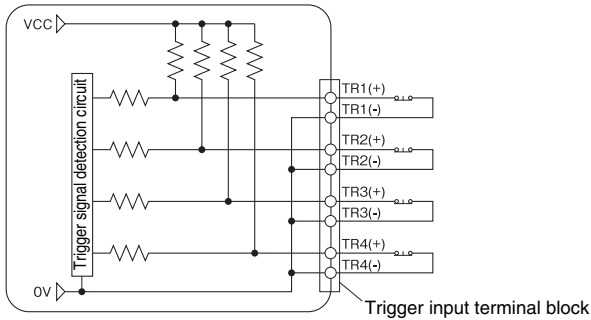
# Standard Models

## Analogue Lighting Controller for FLV Series FLV-ATC Series

### Connecting to External Trigger Input Terminal Block

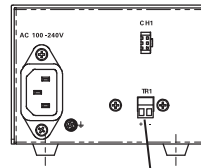
- Connection of this terminal block is not required if lighting illumination trigger input from outside is not used.

#### <Connection of trigger input terminal block>



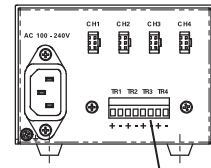
\* Current flowing through the short circuit is less than 1 mA.

#### ● FLV-ATC10405-□



Trigger input terminal block CH1

#### FLV-ATC40405-□



Trigger input terminal block CH1 to CH4

Short-circuiting (+) and (-) of TR1 to TR4 respectively makes the trigger input status OFF, turning the light OFF.  
Releasing (+) and (-) makes the status ON, turning the light ON.

#### [Important]

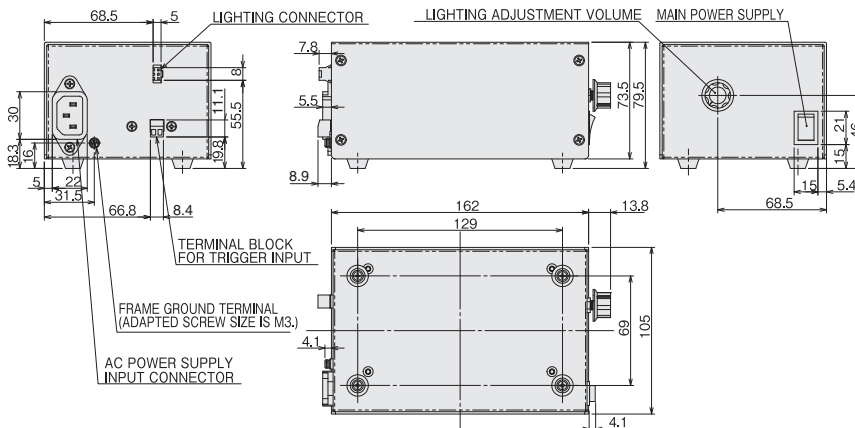
- Make sure that excessive force is not imposed on the wire and terminal block.
- Do not install the product in which loads are constantly applied to the terminal block such as the wire being under tension.

When wiring the terminal block, use an applicable cable (AWG 14 to 24, tip processing length: 7 mm).

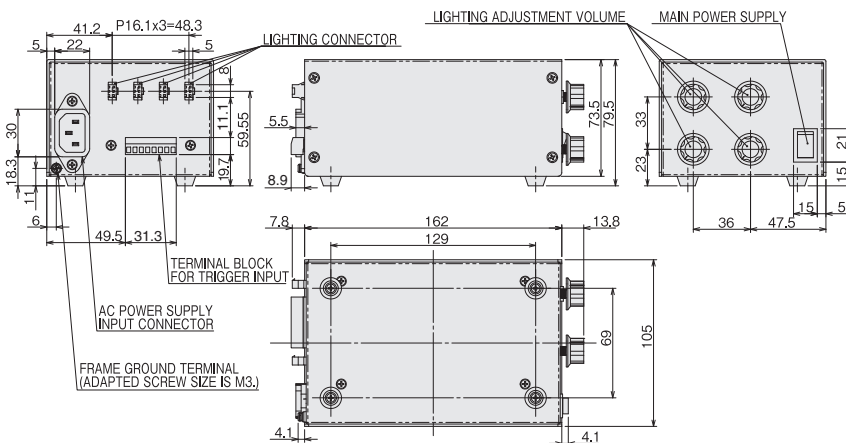
### Dimensions

(Unit: mm)

#### ● FLV-ATC10405-□

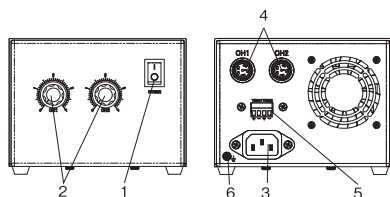


#### ● FLV-ATC40405-□



## Lighting Controller for Line Light: FLV-ATC26024-100V/-200V

### Part Names and Functions



| No. | Name                            | Description  |
|-----|---------------------------------|--|
| 1   | Main power supply               | Starts up the Controller when it is turned ON.   |
| 2   | Lighting adjustment volume      | Rotating the volume clockwise increases the emission intensity or counterclockwise decreases it. |
| 3   | AC power supply input connector | A terminal to supply AC power. Connect the provided AC input cable.                              |
| 4   | Lighting connector              | Connects an LED lights.  |
| 5   | Trigger input terminal block    | A terminal block for lighting illumination trigger input from outside to each lighting.          |
| 6   | Frame ground terminal           | A terminal for frame ground. Connect the ground line.  |

### Specifications

| Item                               | Model | FLV-ATC26024-100V□ *1   | FLV-ATC26024-200V□ *1    |
|------------------------------------|-------|---|--------------------------|
| Number of channels                 |       | 2   |                          |
| Applicable light                   |       | FLV-LN series   |                          |
| Power supply voltage *2            |       | 100 to 120 VAC, 50/60 Hz  | 200 to 240 VAC, 50/60 Hz |
| Current consumption                |       | 7 A max.  | 4 A max.                 |
| Power of connected light           |       | 2ch total 240 W max.<br>120 W max. for 1ch  |                          |
| Drive method                       |       | Constant voltage method   |                          |
| Lighting method                    |       | Trigger lighting, Continuous lighting   |                          |
| Intensity control method           |       | Current light adjustment : 5 A max.   |                          |
| Luminance control method           |       | Turning the light off in synchronization with input from the trigger input terminal       |                          |
| Trigger lighting delay time        |       | T_on: 500 μs max.   |                          |
| External interface                 |       | Trigger input terminal block  |                          |
| Dielectric strength                |       | 1500 VAC 50/60 Hz 1 min   |                          |
| Insulation resistance              |       | 20 MΩ (500 VDC)   |                          |
| Ambient temperature                |       | Operating: 0 to 40°C, Storage: -15 to 60°C (with no icing or condensation)                |                          |
| Ambient humidity                   |       | Operating/storage: 35% to 85% (with no condensation)                                      |                          |
| Degree of protection               |       | IP20 (IEC60529)   |                          |
| Vibration resistance (destructive) |       | 10 to 150 Hz, (0.2 mm double amplitude) 80 min each in X, Y, and Z directions             |                          |
| Shock resistance (destructive)     |       | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward) |                          |
| Materials                          |       | Case: Aluminum  |                          |
| Weight                             |       | Approx. 2.1 kg  |                          |
| Accessories                        |       | Instruction sheet, AC input cable *1  |                          |
| Applicable standards               |       | EN61326-1 *3  |                          |

\*1. The suffixed symbol of the model name means the plug type of the accessory cable. A model name with no suffix means type A.

\*2. This product is the exclusive use for apparatus inclusion in the industrial machine field.

This product cannot be used for the connection to electric power equipment, such as a common residence, store, and small establishment, because of nonconformity with to Electrical Appliance and Material Safety Law (PSE).

\*3. Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)

Also, the following condition is applied to the immunity test of this product.

There are case that Lighting brightness fluctuate Max 10%.





# Digital Lighting Controller for FLV Series

## 3Z4S-LT IDGB Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

### PWM light control power unit for LED lights



### Product Features

- Fully synchronized external ON/OFF signals and lighting outputs.
- 3 types of operation using external ON/OFF signals: Normal, Repeat, and Single.
- Delay time from inputting an external ON signal to turning ON the light can be set.
- Brightness can be adjusted between 256 levels within a duty cycle range of 0 to 100% at a frequency of 125 kHz.
- Clear digital display for easy to read set values
- DIN track mounting

### Ordering Information

#### Digital Lighting Controllers

| Model                  | Number of channels | Applicable light *1             |                                |                                | Input voltage | Output voltage | Capacity (W) |
|------------------------|--------------------|---------------------------------|--------------------------------|--------------------------------|---------------|----------------|--------------|
|                        |                    | Standard Light<br>FLV Series *2 | Spot Light<br>FLV-EP Series *2 | Line Light<br>FLV-LN Series *2 |               |                |              |
| 3Z4S-LT IDGB-50M2-L01  | 2                  | ○                               | ×                              | ×                              | 24 VDC        | 24 VDC         | 46           |
| 3Z4S-LT IDGB-150M4-L01 | 4                  | ○                               | ×                              | ×                              |               |                | 144          |

\*1. ○:Connectable ×:Not connectable

\*2. Standard light means all FLV-series Lights excluding the FLV-EP-series Spot Lights and the FLV-LN-series Line Lights.

#### External ON/OFF Cables

| Model                | Cable length | Weight        |
|----------------------|--------------|---------------|
| 3Z4S-LT IC-MIL-20-1  | 1 m          | Approx. 100 g |
| 3Z4S-LT IC-MIL-20-2  | 2 m          | Approx. 190 g |
| 3Z4S-LT IC-MIL-20-3  | 3 m          | Approx. 280 g |
| 3Z4S-LT IC-MIL-20-5  | 5 m          | Approx. 450 g |
| 3Z4S-LT IC-MIL-20-10 | 10 m         | Approx. 900 g |

#### External Light Control Cables

| Model                | Cable length | Weight          |
|----------------------|--------------|-----------------|
| 3Z4S-LT IC-MIL-26-1  | 1 m          | Approx. 110 g   |
| 3Z4S-LT IC-MIL-26-2  | 2 m          | Approx. 220 g   |
| 3Z4S-LT IC-MIL-26-3  | 3 m          | Approx. 330 g   |
| 3Z4S-LT IC-MIL-26-5  | 5 m          | Approx. 540 g   |
| 3Z4S-LT IC-MIL-26-10 | 10 m         | Approx. 1,070 g |

# Digital Lighting Controller for FLV Series 3Z4S-LT IDGB Series

## Specifications

| Item                        | Model | 3Z4S-LT IDGB-50M2-L01   | 3Z4S-LT IDGB-150M4-L01                      |
|-----------------------------|-------|---|---|
| Rated capacity              |       | 46 W  | 144 W                                       |
| Number of channels          |       | 2   | 4   |
| Applicable light            |       | FLV Series (excluding FLV-EP Series and FLV-LN Series)  |   |
| Power supply voltage        |       | 24 VDC±5%   |   |
| Current consumption         |       | 2.08 A max.   | 6.25 A max.                                 |
| Power of connected light *1 |       | 2 ch total 46 W max.<br>46 W max. for 1 ch  | 4 ch total 144 W max.<br>70 W max. for 1 ch |
|                             |       | <div style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;"><b>⚠ CAUTION</b></p> <p style="text-align: center;"><b>The output voltage of this product is 24 V. Do not connect any light with rated voltage of 12 V.</b></p> </div> |   |
| Drive method                |       | Constant voltage method   |   |
| Lighting method             |       | Continuous lighting   |   |
| Luminance control method    |       | PWM light adjustment  |   |
| Light adjustment            |       | 256 levels (Duty ratio of 0 to 100% at a lighting frequency of 125 kHz) *3  |   |
| Delay time                  |       | 0 to 9,000 μs in 1 μs increments<br>(Actual output will be delayed by the sum of the external ON/OFF response time described below and the set delay time.)   |   |
| External ON/OFF response *2 |       | High mode --- OFF → ON: 40 μs or less, ON → OFF: 10 μs or less<br>Low mode --- OFF → ON: 10 μs or less, ON → OFF: 40 μs or less   |   |
| Ambient temperature         |       | Operating: 0 to 50 °C, Storage: -20 to 65 °C, (with no icing or condensation)   |   |
| Ambient humidity            |       | Operating and storage: 35% to 85% (with no condensation)  |   |
| Cooling method              |       | Natural air cooling   | Forced air cooling                          |
| Weight                      |       | Approx. 700 g   | Approx. 1,000 g                             |
| Overvoltage category        |       | Category I  |   |
| Applicable standards        |       | EMC Directives: EN 55011 Group 1 Class A, EN 61000-6-2  |   |
| Environmental regulation    |       | Conforms to RoHS Directive  |   |
| Pollution degree            |       | 2   |   |

\*1. When connecting lights to multiple channels, make sure that the total power consumption of the connected lights is within the specification of the lighting controller.

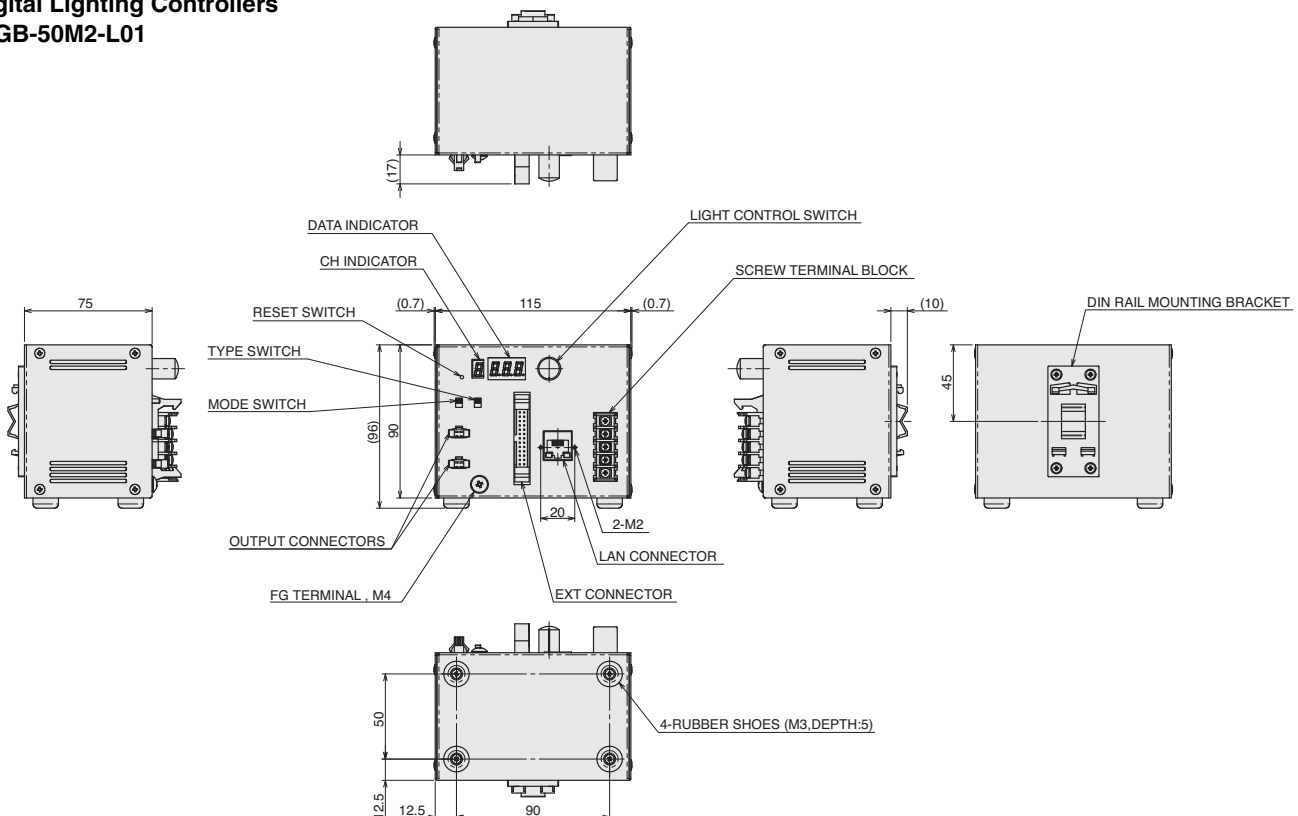
\*2. Measured with a rated light connected.

\*3. There will be some variation in light adjustment between units when the level is set between 0 and 10 or between 250 and 255.

## Dimensions

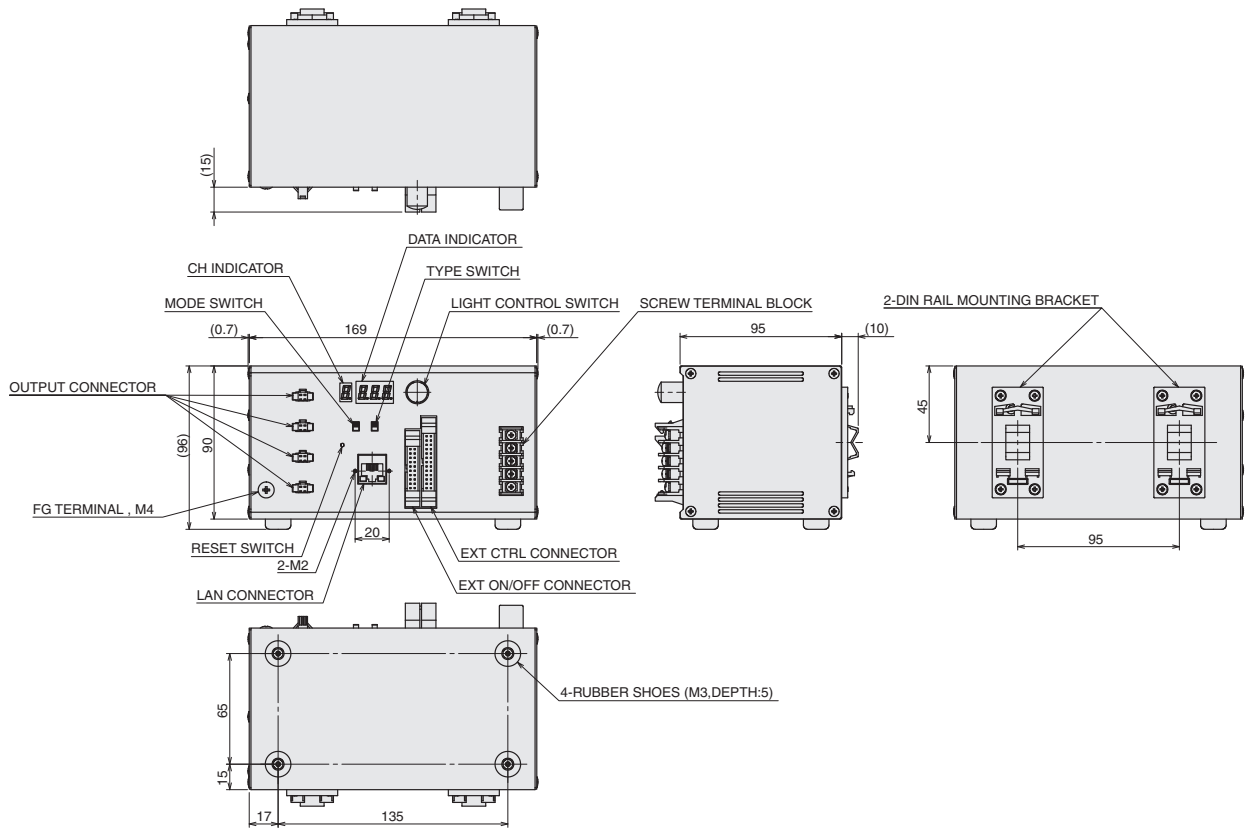
(Unit: mm)

### Digital Lighting Controllers IDGB-50M2-L01

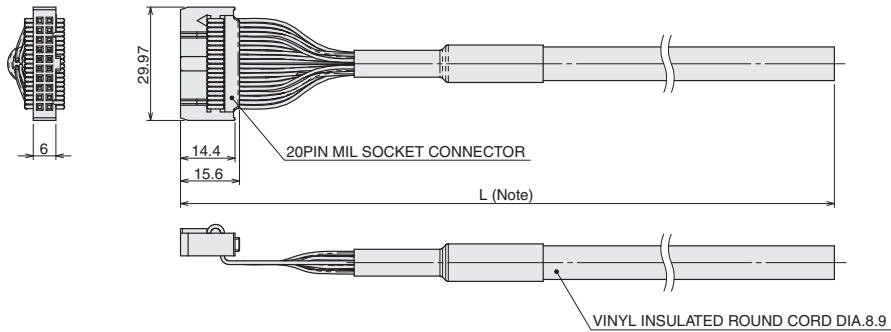


# Digital Lighting Controller for FLV Series 3Z4S-LT IDGB Series

## IDGB-150M4-L01



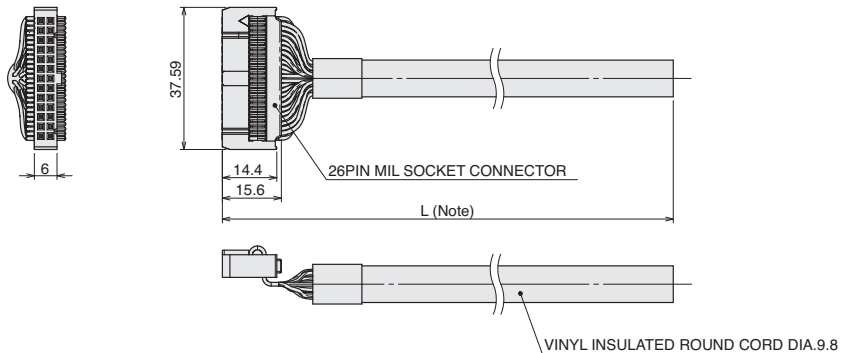
## External ON/OFF Cables IC-MIL-20-□



Note: Cable length L is as follows by the type.

| Type                 | Cable length L |
|----------------------|----------------|
| 3Z4S-LT IC-MIL-20-1  | 1,000          |
| 3Z4S-LT IC-MIL-20-2  | 2,000          |
| 3Z4S-LT IC-MIL-20-3  | 3,000          |
| 3Z4S-LT IC-MIL-20-5  | 5,000          |
| 3Z4S-LT IC-MIL-20-10 | 10,000         |

## External Light Control Cables IC-MIL-26-□



Note: Cable length L is as follows by the type.

| Type                 | Cable length L |
|----------------------|----------------|
| 3Z4S-LT IC-MIL-26-1  | 1,000          |
| 3Z4S-LT IC-MIL-26-2  | 2,000          |
| 3Z4S-LT IC-MIL-26-3  | 3,000          |
| 3Z4S-LT IC-MIL-26-5  | 5,000          |
| 3Z4S-LT IC-MIL-26-10 | 10,000         |

# Cable/Diffusion Plate

## Cable

### Ordering Information

| Series                                | Type                           | Model          | Cable Length | Weight       | Dimensions   |   |
|---------------------------------------|--------------------------------|----------------|--------------|--------------|--------------|---|
| Extension Cable for Standard Light *1 | Standard Cable                 | FLV-XC1        | 1 m          | Approx. 30g  | A            |   |
|                                       |                                | FLV-XC2        | 2 m          | Approx. 50g  |              |   |
|                                       |                                | FLV-XC3        | 3 m          | Approx. 70g  |              |   |
|                                       |                                | FLV-XC5        | 5 m          | Approx. 110g |              |   |
|                                       |                                | FLV-XC10       | 10 m         | Approx. 210g |              |   |
|                                       | Bend resistant Cable           | FLV-XC1R       | 1 m          | Approx. 40g  | B            |   |
|                                       |                                | FLV-XC2R       | 2 m          | Approx. 60g  |              |   |
|                                       |                                | FLV-XC3R       | 3 m          | Approx. 80g  |              |   |
|                                       |                                | FLV-XC5R       | 5 m          | Approx. 130g |              |   |
|                                       |                                | FLV-XC10R      | 10 m         | Approx. 250g |              |   |
| Extension Cable for Spot Light        | Standard Cable                 | FLV-XC1EP      | 1 m          | Approx. 30g  | C            |   |
|                                       |                                | FLV-XC2EP      | 2 m          | Approx. 50g  |              |   |
|                                       |                                | FLV-XC3EP      | 3 m          | Approx. 70g  |              |   |
|                                       |                                | FLV-XC5EP      | 5 m          | Approx. 110g |              |   |
|                                       | Bend resistant Cable           | FLV-XC1EPR     | 1 m          | Approx. 40g  | D            |   |
|                                       |                                | FLV-XC2EPR     | 2 m          | Approx. 60g  |              |   |
|                                       |                                | FLV-XC3EPR     | 3 m          | Approx. 80g  |              |   |
|                                       |                                | FLV-XC5EPR     | 5 m          | Approx. 130g |              |   |
|                                       | Extension Cable for Line Light | Standard Cable | FLV-XC1LN    | 1 m          | Approx. 200g | E |
|                                       |                                |                | FLV-XC2LN    | 2 m          | Approx. 270g |   |
| FLV-XC3LN                             |                                |                | 3 m          | Approx. 320g |              |   |
| FLV-XC5LN                             |                                |                | 5 m          | Approx. 440g |              |   |
| Branch Cable for Standard Light *1    | Standard Cable                 | FLV-XC1S2      | 1 m          | Approx. 30g  | F            |   |
|                                       |                                | FLV-XC2S2      | 2 m          | Approx. 50g  |              |   |
|                                       |                                | FLV-XC3S2      | 3 m          | Approx. 80g  |              |   |
|                                       |                                | FLV-XC5S2      | 5 m          | Approx. 120g |              |   |

\*1. Standard light means all FLV-series Lights excluding the FLV-EP-series Spot Lights and the FLV-LN-series Line Lights.

### Dimensions

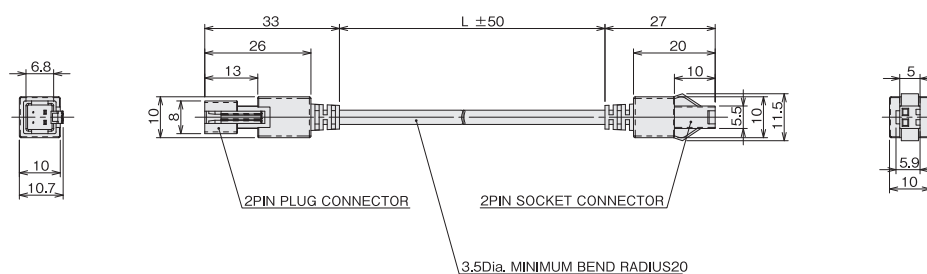
(Unit: mm)

| Model    | L      |
|----------|--------|
| FLV-XC1  | 1,000  |
| FLV-XC2  | 2,000  |
| FLV-XC3  | 3,000  |
| FLV-XC5  | 5,000  |
| FLV-XC10 | 10,000 |

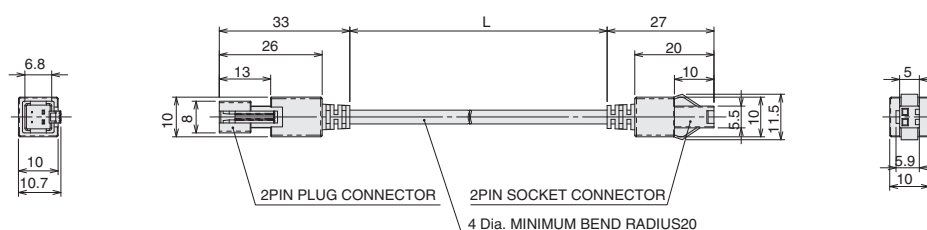
  

| Model     | L      |
|-----------|--------|
| FLV-XC1R  | 1,000  |
| FLV-XC2R  | 2,000  |
| FLV-XC3R  | 3,000  |
| FLV-XC5R  | 5,000  |
| FLV-XC10R | 10,000 |

#### A FLV-XC□



#### B FLV-XC□R







# Options for FLV Series Cable/Diffusion Plate

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

## Diffusion Plate/Polarization Plate

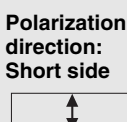
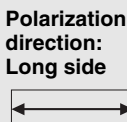
### Ordering Information

#### ● Diffusion Plate

| Type                                      | Model             |                 |                 | Applicable light |
|---|-------------------|-----------------|-----------------|------------------|
|   | Transparency rate | High            | Middle          |                  |
| Diffusivity                               | Low               | Middle          | High            |                  |
| For FLV-DR-series<br>Direct ring light    | FLV-DR3220DF      | FLV-DR3220DF50  | FLV-DR3220DF30  | FLV-DR3220□      |
|   | FLV-DR4415DF      | FLV-DR4415DF50  | FLV-DR4415DF30  | FLV-DR4415□      |
|   | FLV-DR5030DF      | FLV-DR5030DF50  | FLV-DR5030DF30  | FLV-DR5030□      |
|   | FLV-DR6030DF      | ---             | ---             | FLV-DR6030UV     |
|   | FLV-DR6615DF      | FLV-DR6615DF50  | FLV-DR6615DF30  | FLV-DR6615□      |
|   | FLV-DR7000DF      | FLV-DR7000DF50  | FLV-DR7000DF30  | FLV-DR7000□      |
|   | FLV-DR7030DF      | FLV-DR7030DF50  | FLV-DR7030DF30  | FLV-DR7030□      |
|   | FLV-DR7530DF      | ---             | ---             | FLV-DR7530UV     |
|   | FLV-DR9000DF      | FLV-DR9000DF50  | FLV-DR9000DF30  | FLV-DR9000□      |
|   | FLV-DR9030DF      | FLV-DR9030DF50  | FLV-DR9030DF30  | FLV-DR9030□      |
| For FLV-DL-series<br>Low angle ring light | FLV-DR9215DF      | FLV-DR9215DF50  | FLV-DR9215DF30  | FLV-DR9215□      |
|   | FLV-DR12030DF     | FLV-DR12030DF50 | FLV-DR12030DF30 | FLV-DR12030□     |
|   | FLV-DL5890DF      | FLV-DL5890DF50  | FLV-DL5890DF30  | FLV-DL5890□      |
|   | FLV-DL7260DF      | FLV-DL7260DF50  | FLV-DL7260DF30  | FLV-DL7260□      |
| For FLV-BR-series<br>Bar light            | FLV-DL12060DF     | FLV-DL12060DF50 | FLV-DL12060DF30 | FLV-DL12060□     |
|   | FLV-DL15060DF     | FLV-DL15060DF50 | FLV-DL15060DF30 | FLV-DL15060□     |
|   | FLV-BR6022DF      | FLV-BR6022DF50  | FLV-BR6022DF30  | FLV-BR6022□      |
|   | FLV-BR6424DF      | ---             | ---             | FLV-BR6424UV     |
|   | FLV-BR8532DF      | FLV-BR8532DF50  | FLV-BR8532DF30  | FLV-BR8532□      |
|   | FLV-BR11222DF     | FLV-BR11222DF50 | FLV-BR11222DF30 | FLV-BR11222□     |
|   | FLV-BR11624DF     | ---             | ---             | FLV-BR11624UV    |
|   | FLV-BR14030DF     | FLV-BR14030DF50 | FLV-BR14030DF30 | FLV-BR14030□     |
|   | FLV-BR15020DF     | FLV-BR15020DF50 | FLV-BR15020DF30 | FLV-BR15020□     |
|   | FLV-BR21222DF     | FLV-BR21222DF50 | FLV-BR21222DF30 | FLV-BR21222□     |
| FLV-BR21230DF                             | FLV-BR21230DF50   | FLV-BR21230DF30 | FLV-BR21230□    |                  |
| FLV-BR38037DF                             | FLV-BR38037DF50   | FLV-BR38037DF30 | FLV-BR38037□    |                  |
| FLV-BR48031DF                             | FLV-BR48031DF50   | FLV-BR48031DF30 | FLV-BR48031□    |                  |

#### ● Polarization Plate

| Type                                      | Model           | Applicable light |
|---|-----------------|------------------|
| For FLV-DR-series<br>Direct ring light    | FLV-DR3220PL    | FLV-DR3220□      |
|   | FLV-DR4415PL    | FLV-DR4415□      |
|   | FLV-DR5030PL    | FLV-DR5030□      |
|   | FLV-DR6615PL    | FLV-DR6615□      |
|   | FLV-DR7000PL    | FLV-DR7000□      |
|   | FLV-DR7030PL    | FLV-DR7030□      |
|   | FLV-DR9000PL    | FLV-DR9000□      |
|   | FLV-DR9030PL    | FLV-DR9030□      |
|   | FLV-DR9215PL    | FLV-DR9215□      |
|   | FLV-DR12030PL   | FLV-DR12030□     |
| For FLV-DL-series<br>Low angle ring light | FLV-DL7260PL    | FLV-DL7260□      |
|   | FLV-DL12060PL   | FLV-DL12060□     |
|   | FLV-DL15060PL   | FLV-DL15060□     |
| For FLV-BR-series<br>Bar light            | FLV-BR6022PL    | FLV-BR6022□      |
|   | FLV-BR8532PL    | FLV-BR8532□      |
|   | FLV-BR11222PL   | FLV-BR11222□     |
|   | FLV-BR14030PL   | FLV-BR14030□     |
|   | FLV-BR15020PL   | FLV-BR15020□     |
|   | FLV-BR21222PL   | FLV-BR21222□     |
|   | FLV-BR21230PL   | FLV-BR21230□     |
|   | FLV-BR38037PL   | FLV-BR38037□     |
|   | FLV-BR48031PL   | FLV-BR48031□     |
|   | FLV-BR6022PL-V  | FLV-BR6022□      |
|   | FLV-BR8532PL-V  | FLV-BR8532□      |
|   | FLV-BR11222PL-V | FLV-BR1122□      |
|   | FLV-BR14030PL-V | FLV-BR14030□     |
|   | FLV-BR15020PL-V | FLV-BR15020□     |
|   | FLV-BR21222PL-V | FLV-BR21222□     |
|   | FLV-BR21230PL-V | FLV-BR21230□     |
| FLV-BR38037PL-V                           | FLV-BR38037□    |                  |
| FLV-BR48031PL-V                           | FLV-BR48031□    |                  |

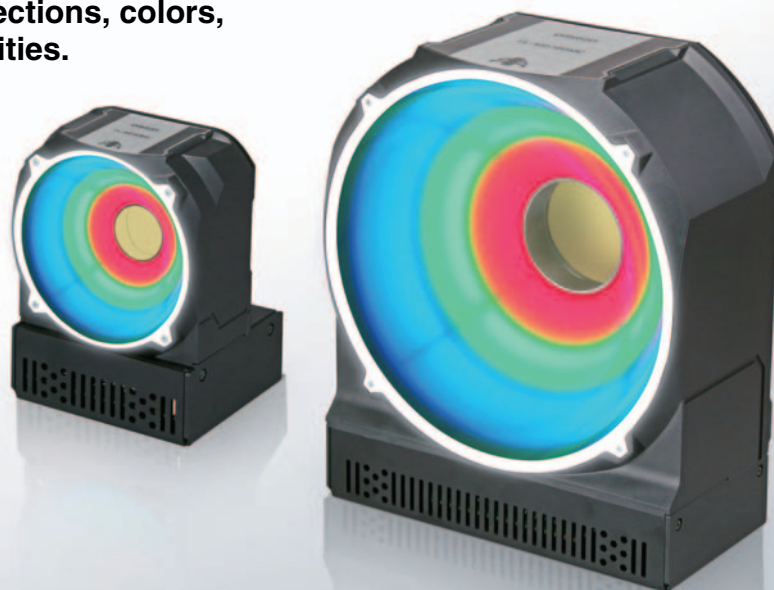


# MDMC Light FL-MD Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

RGB full color light flexibly changes illumination directions, colors, and light intensities.



## Product Features

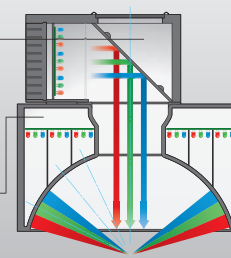
- Combination of illumination directions, colors, and light intensities.
- Flexible illumination patterns for additional objects or inspection items.

## Illumination Structure

Choose the best pattern by combining illumination directions x full color RGB x 128 brightness levels of 13 blocks

Full color coaxial light

Full color 3-tier x 4-block dome light



LED Characteristics

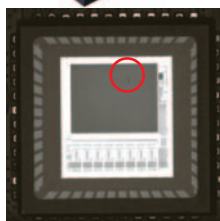
## Applications

### Standard Lighting System

Different lights are required for different defects

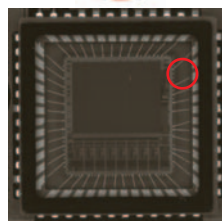
Glass surface inspection

Coaxial light



Wire inspection

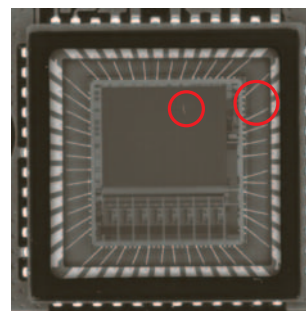
Low angle light



### FL-MD Series

One light clearly shows both broken wires and dirt on elements

Inspection for broken wires and dirt on elements



Lenses

# MDMC Light FL-MD Series

## Ordering Information

| Model      | Color          | Dimensions              |             |         | Weight (g) |
|------------|----------------|-------------------------|-------------|---------|------------|
|            |                | Outside dimensions (mm) | Height (mm) | Drawing |            |
| FL-MD90MC  | RGB full color | 125 × 90                | 82          | A       | 800        |
| FL-MD180MC | RGB full color | 215 × 180               | 154         | B       | 3000       |

Note: Refer to page 69 for LED Characteristics.

## Specifications

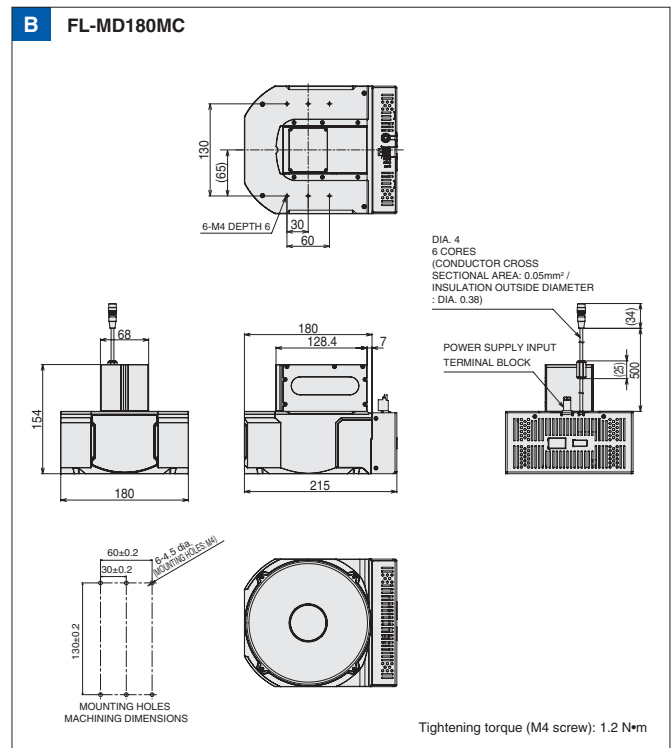
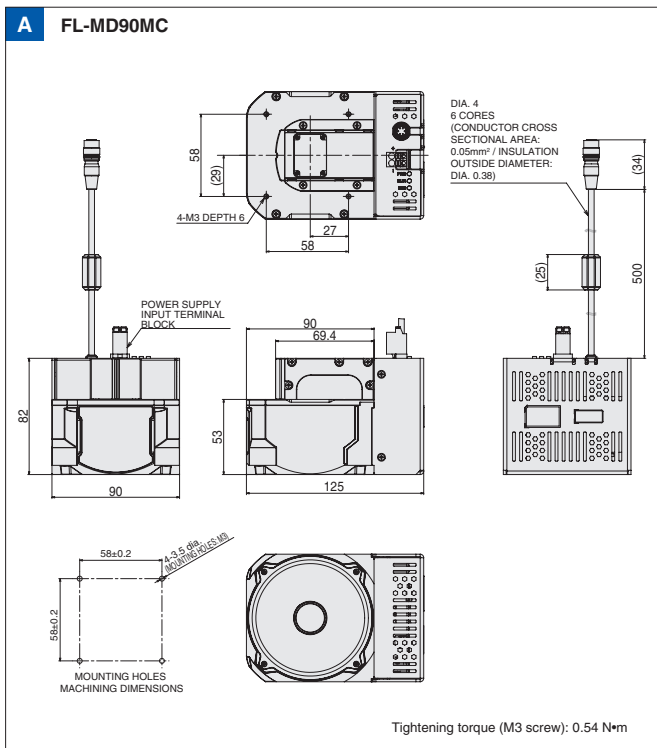
| Item                             | Model | FL-MD90MC  | FL-MD180MC                           |
|----------------------------------|-------|--|--------------------------------------|
| Applicable controller            |       | FH series  |                                      |
| Applicable camera                |       | FH-S series, FZ-S series   |                                      |
| Lighting color (peak wavelength) |       | R: Red (Typ.635nm), G: Green (Typ.525nm), B: Blue (Typ.465nm)  |                                      |
| Light source                     |       | LED  |                                      |
| LED safety                       |       | W,B: Risk Group 2, R,G: Risk Group 1   | W,G,B: Risk Group 2, R: Risk Group 1 |
| Power supply voltage             |       | 24 VDC±10% (including ripple)  |                                      |
| Recommended power supply         |       | S8VK-G12024 (manufactured by OMRON, 24 VDC, 5 A, 120 W)  |                                      |
| Current consumption              |       | 1.5 A max.   | 3.0 A max.                           |
| Drive method                     |       | Constant voltage method  |                                      |
| Lighting method                  |       | Trigger lighting   |                                      |
| Luminance control method         |       | Duty light adjustment: PWM frequency of 200 kHz, light adjustment of 128 levels (configured with vision system controller) |                                      |
| Trigger lighting                 |       | Lighting in synchronization with trigger input timing from the controller (configured with vision system controller).      |                                      |
| Lighting duration setting        |       | Auto setting in accordance with shutter speed.   |                                      |
| Lighting time control            |       | Set with vision system controller or set in accordance with shutter speed.   |                                      |
| External interface               |       | Camera connection cable (directly connected with the main unit) Cable length: 500 mm                                       |                                      |
| Ambient temperature              |       | Operating: 0 to 40°C, Storage: -15 to 60°C (with no icing or condensation)   |                                      |
| Ambient humidity                 |       | Operating and storage: 35% to 85% (with no condensation)   |                                      |
| Degree of protection             |       | IP20 (IEC60529)  |                                      |
| Vibration resistance             |       | 10 to 150 Hz, (0.35mm half-amplitude) 80 min each in X, Y, and Z directions  |                                      |
| Shock resistance                 |       | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward)                                  |                                      |
| Material                         |       | Case: Aluminum, PC, PMMA Cable: PVC  |                                      |
| Weight                           |       | Approx. 0.8 kg   | Approx. 3.0 kg                       |
| Accessories                      |       | Instruction Sheet, Compliance Sheet, 24 V power supply terminal block (male)   |                                      |

Note: 1. Turn ON the power of this product and vision system controller at the same time or this product first.

- This light complies with the EN standard (EN61326-1) (Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)) Also, the following condition is applied to the immunity test of this product. There may be cases that light brightness fluctuates within 10%.
- This light complies with the KC standard.

## Dimensions

(Unit:mm)



# Photometric Stereo Light FL-PS Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

Shows defects accurately.

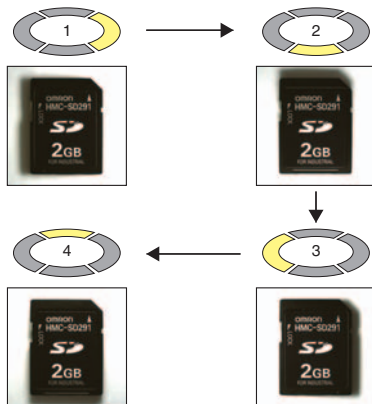


## Product Features

- Captures images under different illumination directions to extract “characters” and “scratches and dents”.

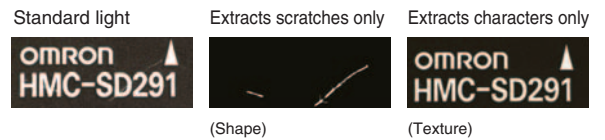
### Illumination Structure

Four lights are lit in turn, and variations in brightness are analyzed. Printed characters with little variation in brightness even under different illumination directions are extracted as texture, and a dent with huge variation in brightness is extracted as a shape.



## Applications

### Inspection of dents on characters



LED Characteristics

Lenses



# Photometric Stereo Light FL-PS Series

## Ordering Information

| Model     | Color | Dimensions                  |                             |             |         | Lighting controller |         |           | Weight (g) |
|-----------|-------|-----------------------------|-----------------------------|-------------|---------|---------------------|---------|-----------|------------|
|           |       | External ring diameter (mm) | Internal ring diameter (mm) | Height (mm) | Drawing | FL-STC□             | FL-TCC□ | FL-TCC1PS |            |
| FL-PS90W  | White | 90 dia.                     | 50 dia.                     | 35          | A       | ×                   | ×       | ○         | 200        |
| FL-PS140W | White | 140 dia.                    | 100 dia.                    | 35          | B       | ×                   | ×       | ○         | 350        |
| FL-PS260W | White | 260 dia.                    | 200 dia.                    | 35          | C       | ×                   | ×       | ○         | 800        |

Note: Refer to page 69 for LED Characteristics.

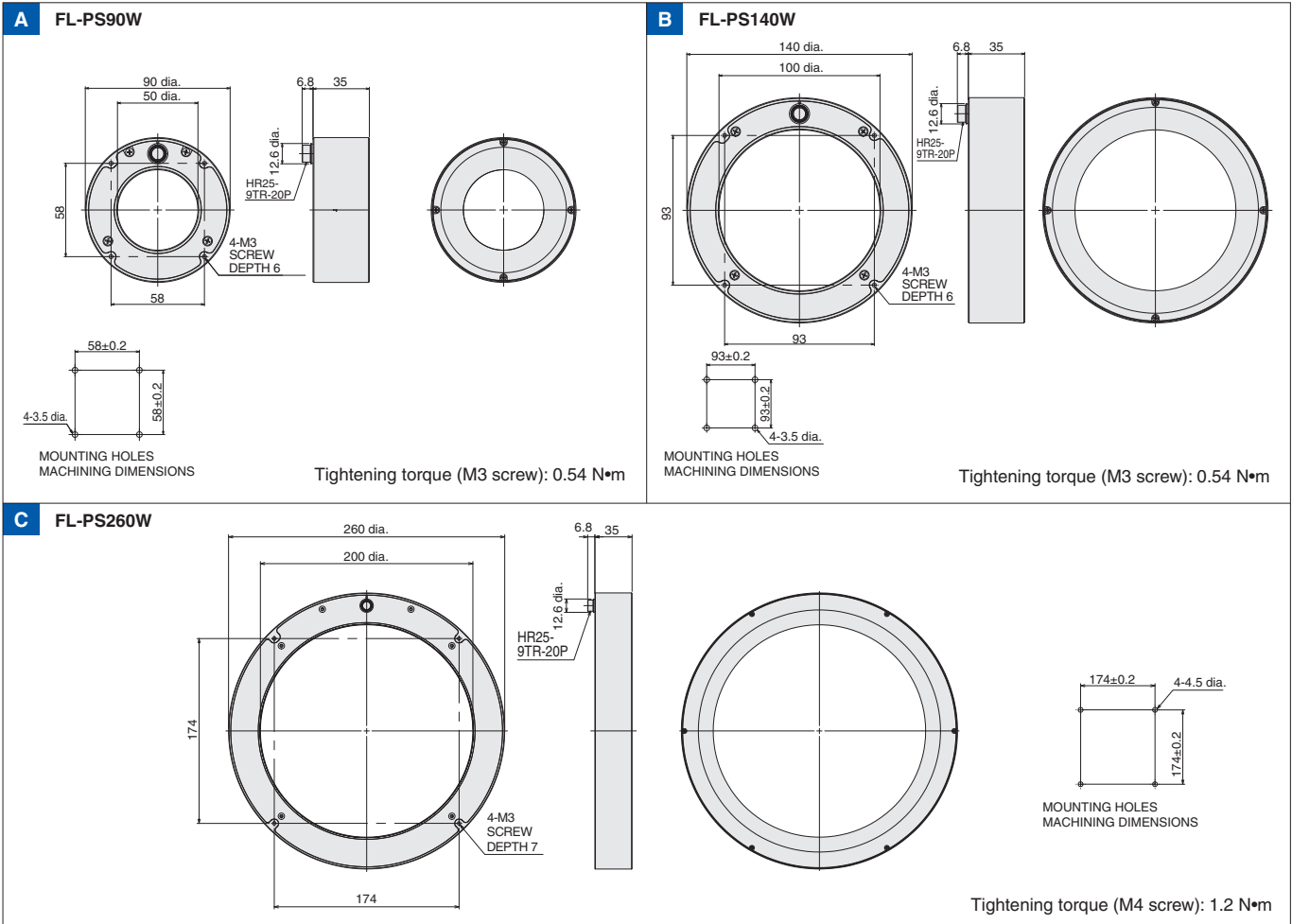
○: Connectable ×: Not connectable

## Specifications

| Item                               | Model | FL-PS90W  | FL-PS140W    | FL-PS260W    |
|------------------------------------|-------|---|--------------|--------------|
| Applicable controller              |       | FL-TCC1PS   |              |              |
| Lighting color                     |       | W: White  |              |              |
| Light source                       |       | LED   |              |              |
| LED safety                         |       | Risk group 2  |              |              |
| Power consumption                  |       | 32W   | 47W          | 61W          |
| Ambient temperature                |       | Operating: 0 to 40°C Storage: -15 to 60°C (with no icing nor no condensation)             |              |              |
| Ambient humidity                   |       | Operating and storage: 35% to 85% (no condensation)                                       |              |              |
| Degree of protection               |       | IP20(IEC60529)  |              |              |
| Vibration resistance (destructive) |       | 10 to 150 Hz, (0.35mm half-amplitude) 80 min. each in X, Y, and Z directions              |              |              |
| Shock resistance (destructive)     |       | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward) |              |              |
| Materials                          |       | Case: Aluminum, PMMA  |              |              |
| Weight                             |       | Approx. 200g  | Approx. 350g | Approx. 800g |
| Accessories                        |       | INSTRUCTION SHEET (THIS SHEET), Compliance Sheet  |              |              |

## Dimensions

(Unit:mm)



# Bar Light FL-BR Series

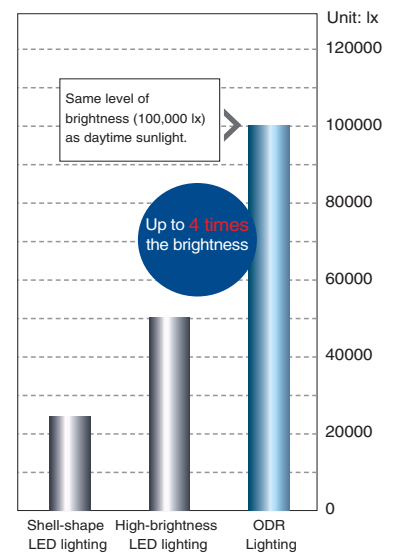
The highest level\* of brightness in the industry.  
This series is structured for adaptable wiring and mounting.



\* Based on OMRON testing in November 2010.

## Product Features

- High-brightness ODR lighting beyond the limitations of LEDs.
- Stable inspection even for high-speed applications.
- Bright even through a polarizing filter.
- Easy wiring, mounting, and adjustment.



## Wiring



The cable can extend from either direction, allowing for horizontal or vertical wiring layouts on the mounting surface.

## Mounting and Adjustment

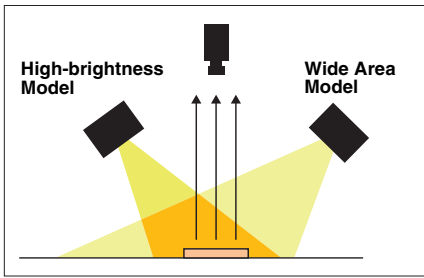


The light is structured for mounting with nuts to an arm on the back or side surfaces. Minute changes in the position can be achieved by sliding the light.



Specialized mounting brackets enable mounting at a flexible angle.

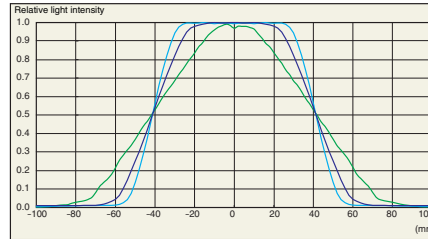
Illumination Structure



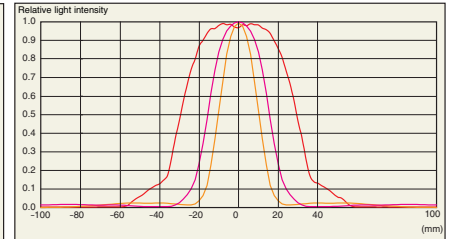
Lighting Intensity Distribution Characteristics

High-brightness Model (FL-BR9120W-H)

X axis (long axis)

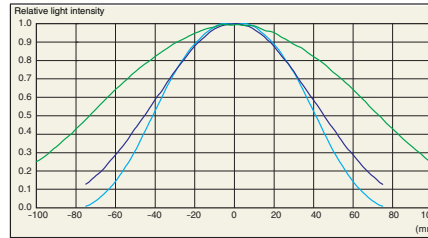


Y axis (short axis)

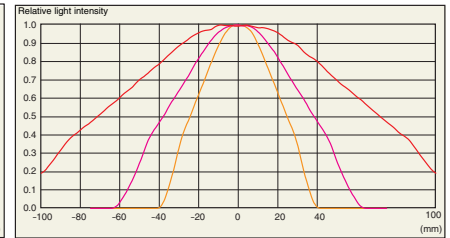


Wide Area Model (FL-BR9120W)

X axis (long axis)



Y axis (short axis)



Applications

Standard light



It is difficult to read characters with low contrast.

FL Series



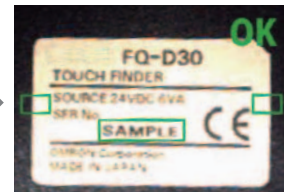
Sharp images are created of both two-dimensional codes and characters.

Standard light



Inspection is not possible because of workpiece blurring or a lack of brightness.

FL Series



Complete extraction of edges and characters.

Ordering Information

| Model         | Color | Type                  | Dimensions                   |                        |             |         | Controller                      |                                 |                                     | Weight (g) | Options               |                                     |
|---------------|-------|-----------------------|------------------------------|------------------------|-------------|---------|---------------------------------|---------------------------------|-------------------------------------|------------|-----------------------|-------------------------------------|
|               |       |                       | Lighting Area Dimension (mm) | Outside Dimension (mm) | Height (mm) | Drawing | FL-STC <input type="checkbox"/> | FL-TCC <input type="checkbox"/> | FL-TCC1PS <input type="checkbox"/>  |            | Diffusion Plate       | Polarization Plate                  |
| FL-BR5020W    | WHITE | Wide Area Model       | 40.8x9                       | 49.8x20                | 20          | A       | <input type="radio"/>           | <input type="radio"/>           | <input checked="" type="checkbox"/> | 40         | <input type="radio"/> | <input checked="" type="checkbox"/> |
| FL-BR5020W-H  | WHITE | High-brightness Model |                              |                        |             |         |                                 |                                 |                                     |            |                       |                                     |
| FL-BR9120W    | WHITE | Wide Area Model       | 81.6x9                       | 90.6x20                | 20          | B       | <input type="radio"/>           | <input type="radio"/>           | <input checked="" type="checkbox"/> | 70         | <input type="radio"/> | <input checked="" type="checkbox"/> |
| FL-BR9120W-H  | WHITE | High-brightness Model |                              |                        |             |         |                                 |                                 |                                     |            |                       |                                     |
| FL-BR13120W   | WHITE | Wide Area Model       | 122.4x9                      | 131.4x20               | 20          | C       | <input type="radio"/>           | <input type="radio"/>           | <input checked="" type="checkbox"/> | 100        | <input type="radio"/> | <input checked="" type="checkbox"/> |
| FL-BR13120W-H | WHITE | High-brightness Model |                              |                        |             |         |                                 |                                 |                                     |            |                       |                                     |

Note: Refer to page 69 for LED Characteristics.

The color of white LEDs can vary due to intrinsic characteristics. Confirm suitability for the application in advance.

○: Applicable ✕: Not applicable

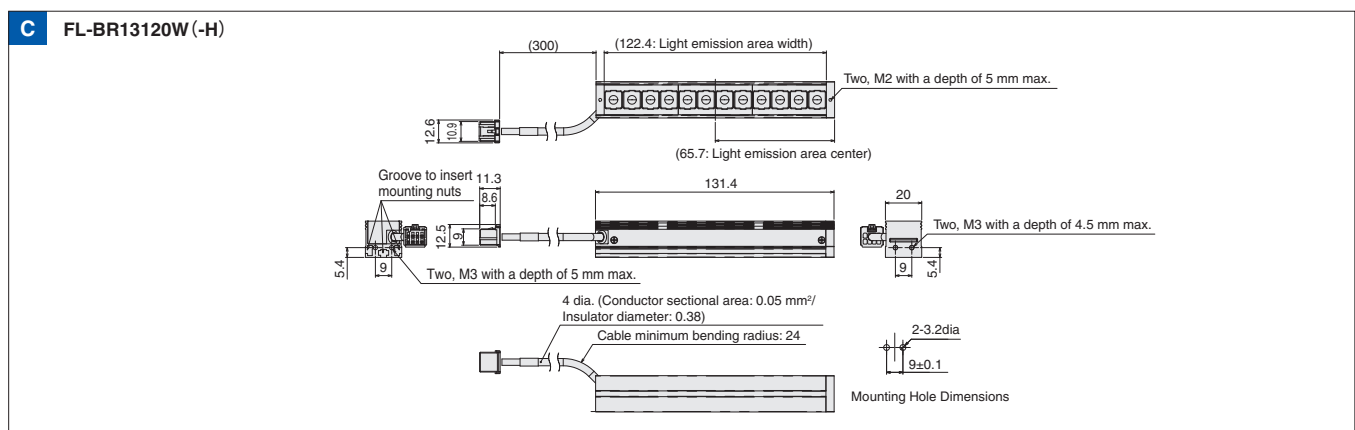
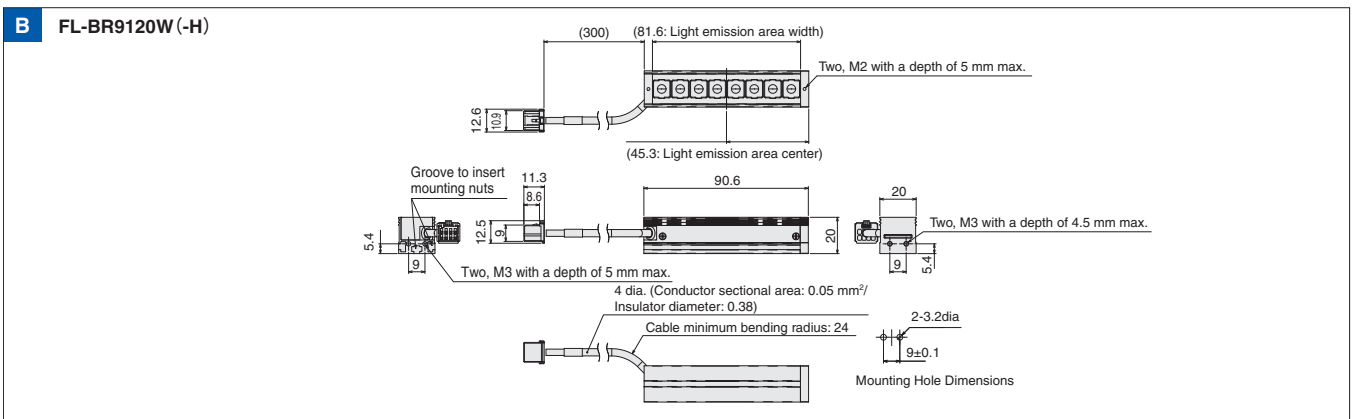
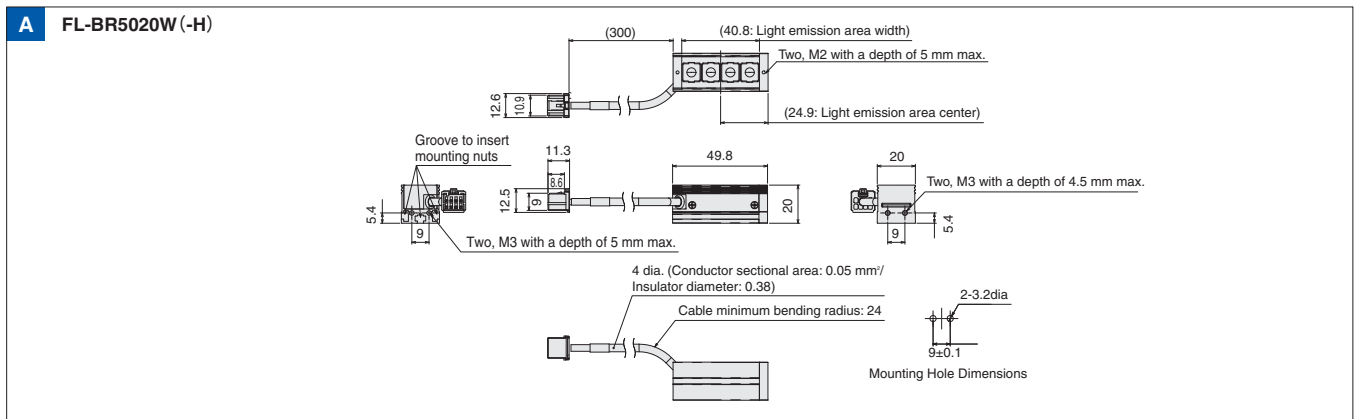
Specifications

| Model                | Wide Area Model  | High-brightness Model | Wide Area Model | High-brightness Model | Wide Area Model | High-brightness Model |
|----------------------|--|-----------------------|-----------------|-----------------------|-----------------|-----------------------|
|                      | FL-BR5020W   | FL-BR5020W-H          | FL-BR9120W      | FL-BR9120W-H          | FL-BR13120W     | FL-BR13120W-H         |
| Light source         | White LEDs   |                       |                 |                       |                 |                       |
| Vibration resistance | 10 to 150 Hz (Double amplitude: 0.7 mm), 80 min each in X, Y, and Z directions   |                       |                 |                       |                 |                       |
| Shock resistance     | 150 m/s <sup>2</sup> 3 times each in 6 directions  |                       |                 |                       |                 |                       |
| Ambient temperature  | Operating: 0 to 40°C, Storage: -15 to 60°C (with no icing or condensation)   |                       |                 |                       |                 |                       |
| Ambient humidity     | Operating/storage: 35% to 85% (with no condensation)   |                       |                 |                       |                 |                       |
| Ambient atmosphere   | No corrosive gases.  |                       |                 |                       |                 |                       |
| Degree of protection | IEC60259 IP20  |                       |                 |                       |                 |                       |
| Weight               | Approx. 40 g   |                       | Approx. 70 g    |                       | Approx. 100 g   |                       |
| Materials            | Case: Aluminum; Cover, side parts, and lens: PC; Cable: Heat resistant polyvinyl chloride; Connector: Thermoplastic resin with glass |                       |                 |                       |                 |                       |
| LED safety           | Risk Group 2 (IEC 62471)   |                       |                 |                       |                 |                       |
| Accessories          | Instruction sheet  |                       |                 |                       |                 |                       |

The color of white LEDs can vary due to intrinsic characteristics. Confirm suitability for the application in advance.

Dimensions

(Unit:mm)



# Direct Ring Light FL-DR Series

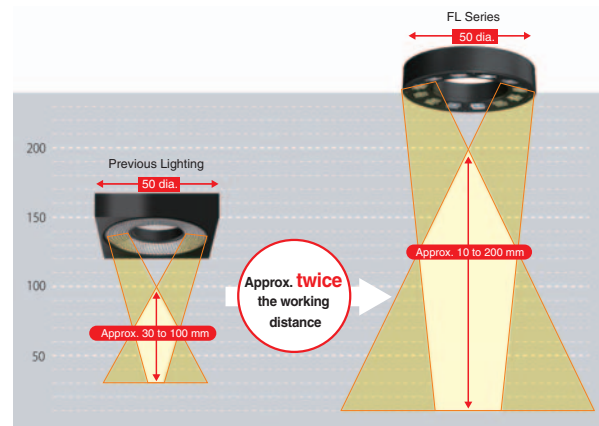
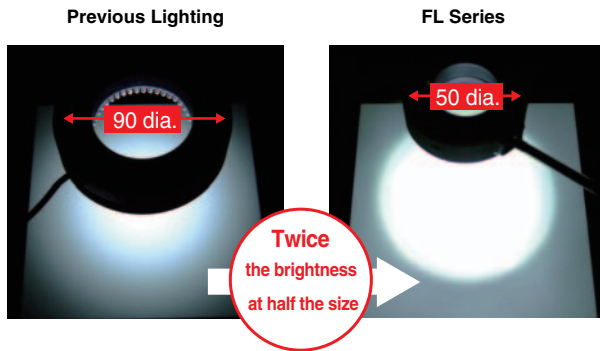
Clear Images with Industry's Best Level\* of Brightness and Illumination over a Wide Field of View



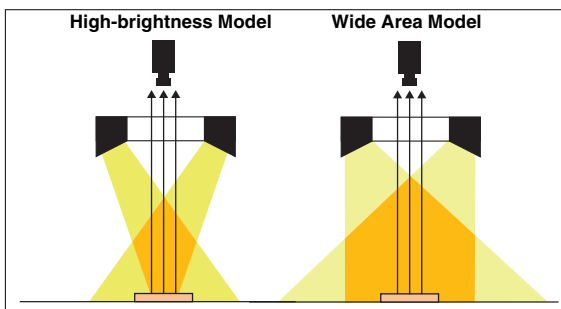
\* Based on OMRON testing in November 2010.

## Product Features

- High brightness in a small package.
- Wide range of working distance.

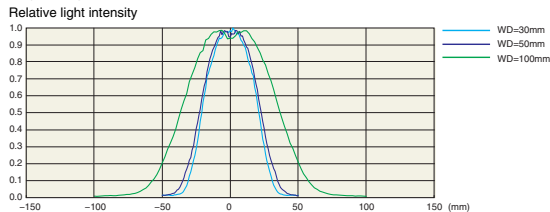


## Illumination Structure

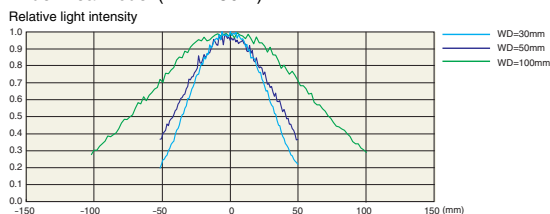


## Lighting Intensity Distribution Characteristics

### High-brightness Model (FL-DR50W-H)



### Wide Area Model (FL-DR50W)



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses



Applications



Faster lines make it necessary to increase shutter speeds, but then the clarity of workpiece images decreases.



More than sufficient brightness is provided for high-speed lines.



It was necessary to create different inspection standards for each section.



With uniform lighting from corner to corner, it is possible to inspect.

Ordering Information

| Model      | Color | Type                  | Dimensions                  |                             |                      |         | Controller |         |           | Weight (g) | Options         |                    |
|------------|-------|-----------------------|-----------------------------|-----------------------------|----------------------|---------|------------|---------|-----------|------------|-----------------|--------------------|
|            |       |                       | External Ring Diameter (mm) | Internal Ring Diameter (mm) | Lighting Angle (Deg) | Drawing | FL-STC□    | FL-TCC□ | FL-TCC1PS |            | Diffusion Plate | Polarization Plate |
| FL-DR32W   | WHITE | Wide Area Model       | 32 dia.                     | 10 dia.                     | 20 deg.              | A       | ○          | ○       | ×         | 25         | ○               | ○                  |
| FL-DR32W-H | WHITE | High-brightness Model |                             |                             |                      |         |            |         |           |            |                 |                    |
| FL-DR50W   | WHITE | Wide Area Model       | 50 dia.                     | 28 dia.                     | 10 deg.              | B       | ○          | ○       | ×         | 30         | ○               | ○                  |
| FL-DR50W-H | WHITE | High-brightness Model |                             |                             |                      |         |            |         |           |            |                 |                    |
| FL-DR90W   | WHITE | Wide Area Model       | 90 dia.                     | 50 dia.                     | 20 deg.              | C       | ○          | ○       | ×         | 70         | ○               | ○                  |
| FL-DR90W-H | WHITE | High-brightness Model |                             |                             |                      |         |            |         |           | 80         |                 |                    |

Note: Refer to page 69 for LED Characteristics.

The color of white LEDs can vary due to intrinsic characteristics. Confirm suitability for the application in advance.

○: Applicable ×: Not applicable

Specifications

| Model                | Wide Area Model  | High-brightness Model | Wide Area Model | High-brightness Model | Wide Area Model | High-brightness Model |
|----------------------|--|-----------------------|-----------------|-----------------------|-----------------|-----------------------|
|                      | FL-DR32W   | FL-DR32W-H            | FL-DR50W        | FL-DR50W-H            | FL-DR90W        | FL-DR90W-H            |
| Light source         | White LEDs   |                       |                 |                       |                 |                       |
| Vibration resistance | 10 to 150 Hz (Double amplitude: 0.7 mm), 80 min each in X, Y, and Z directions                         |                       |                 |                       |                 |                       |
| Shock resistance     | 150 m/s <sup>2</sup> 3 times each in 6 directions  |                       |                 |                       |                 |                       |
| Ambient temperature  | Operating: 0 to 40°C, Storage: -15 to 60°C (with no icing or condensation)                             |                       |                 |                       |                 |                       |
| Ambient humidity     | Operating/storage: 35% to 85% (with no condensation)   |                       |                 |                       |                 |                       |
| Ambient atmosphere   | No corrosive gases.  |                       |                 |                       |                 |                       |
| Degree of protection | IEC60259 IP20  |                       |                 |                       |                 |                       |
| Weight               | Approx. 25 g   |                       | Approx. 30 g    |                       | Approx. 70 g    | Approx. 80 g          |
| Materials            | Case and Lens: PC, Cable: Heat resistant polyvinyl chloride, Connector: Thermoplastic resin with glass |                       |                 |                       |                 |                       |
| LED safety           | Risk Group 2 (IEC 62471)   |                       |                 |                       |                 |                       |
| Accessories          | Instruction sheet  |                       |                 |                       |                 |                       |

The color of white LEDs can vary due to intrinsic characteristics. Confirm suitability for the application in advance.

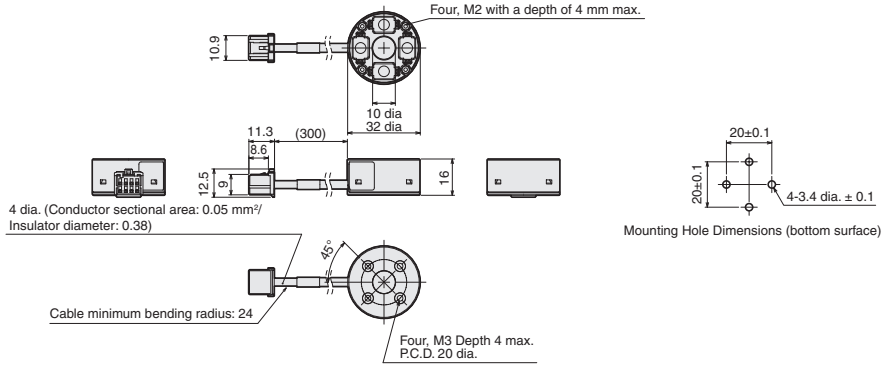
# Direct Ring Light FL-DR Series

## Dimensions

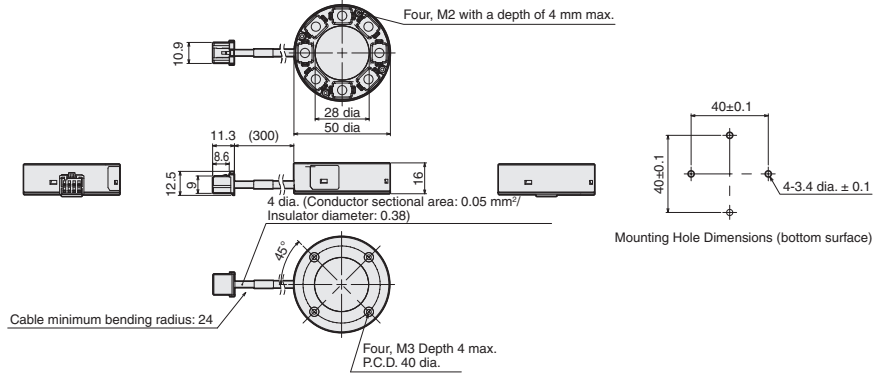
(Unit:mm)

Standard Models  
FLV Series

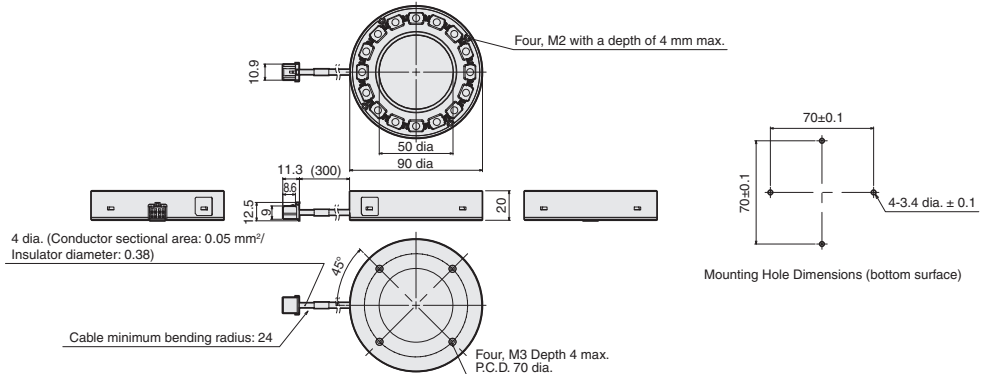
### A FL-DR32W (-H)



### B FL-DR50W (-H)



### C FL-DR90W (-H)



High-brightness Models  
FL Series

LED Characteristics

Lenses

# Camera-mount Lighting Controller for FL Series

## FL-TCC Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

**Camera-mount Compact  
Lighting Controller Which Requires  
No Power Supply Nor Lighting Control**



### Product Features

- No separate power supply is required because the power is supplied from the Camera.
- Light is emitted when a trigger signal is received from the Camera.
- Simple connection between the Camera and the Lighting with a single cable.



LED Characteristics

### Ordering Information

| Item                       | Model       | Weight        |
|----------------------------|-------------|---------------|
| Lighting Controller        | FL-TCC1     | Approx. 110 g |
| Camera Mounting Spacer     | FL-TCC1-XSP | Approx. 10 g  |
| Camera Mounting Attachment | FL-TCC1-XAT | Approx. 20 g  |

Lenses

# Camera-mount Lighting Controller for FL Series FL-TCC Series

## Specifications

### ● Lighting Controller

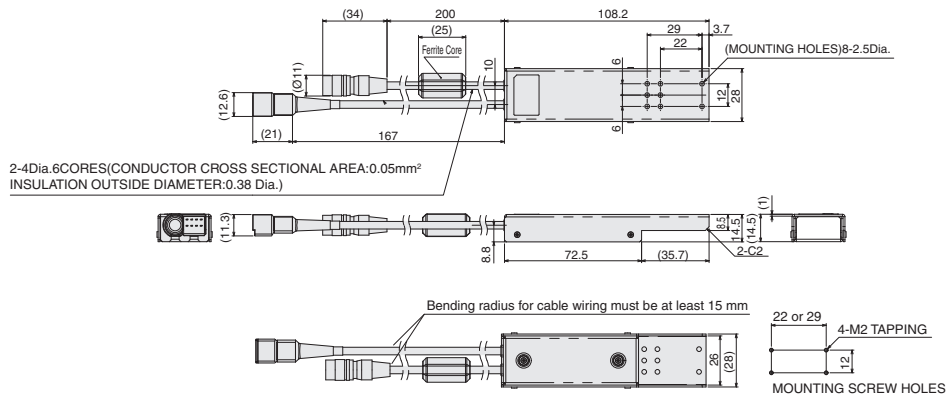
| Product type              |                             | Lighting Controller  |
|---------------------------|-----------------------------|--|
| Model                     |                             | FL-TCC1  |
| Input voltage             |                             | Supplied from applicable camera.   |
| Applicable camera         |                             | FH-S/SC/S02/SC02/S04/SC04, FZ-S/SC/S2M/SC2M/S5M2/SC5M2/SH/SHC/SF/SFC/SP/SPC, FQ-MS series and others.                        |
| Applicable controller     |                             | FH series, FZ5 series, FZ4 series and others.  |
| Power consumption         |                             | 10 W, 0.9 A max. (including the lighting section)  |
| Number of output channels |                             | 1  |
| Applicable light          |                             | FL-□ series  |
| Luminance control method  | Functions                   | PWM frequency: 100 kHz, Light adjustment: 255 levels (set with the Controller)   |
|                           | Trigger lighting            | Lighting ON synchronized with trigger input timing from the Controller. (Auto setting in accordance with the shutter speed.) |
|                           | Trigger lighting delay time | Ton: 30 μs max. (Trigger ready μs)<br>Toff: 10 μs max.   |
| External interface        |                             | Dedicated communication connector  |
| Ambient temperature       |                             | Operating: 0 to 50°C, Storage: -15 to 60°C (with no icing or condensation)   |
| Ambient humidity          |                             | Operating/storage: 35% to 85% (with no condensation)   |
| Vibration resistance      |                             | 10 to 55 Hz, (0.7 mm double amplitude) 80 min each in X, Y, and Z directions   |
| Shock resistance          |                             | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward)                                    |
| Materials                 |                             | Case: SECC, Cable: PVC   |
| Degree of protection      |                             | IP20 (IEC60529)  |
| Weight                    |                             | Approx. 110 g  |
| Accessories               |                             | Instruction sheet, Insulation sheet, Mounting screw (M2 × 6 mm) × 4  |
| Applicable standards      |                             | EN61326-1 *, KC  |

\* Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)  
Also, the following condition is applied to the immunity test of this product.  
There are case that Lighting brightness fluctuate Max 10%.

## Dimensions

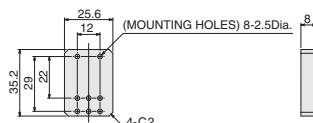
(Unit:mm)

### ● Lighting Controller FL-TCC1

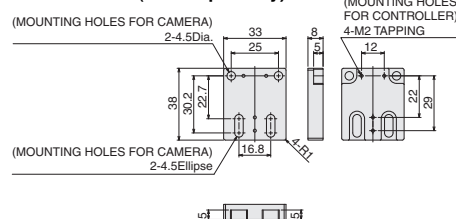


### ● Options

#### Camera Mounting Spacer FL-TCC1-XSP (sold separately)



#### Camera Mounting Attachment FL-TCC1-XAT (sold separately)



# Digital Lighting Controller for FL Series

## FL-STC Series

Standard Models  
FLV Series

High-brightness Models  
FL Series

Small body is combined  
with the long cable at 25 m.  
Install in essentially any location.



Two-channel models

One-channel models

### Product Features

#### ● Easy Control and Adjustment of the Lighting

With a compact design small enough to fit in the palm of your hand, the Controller can be built into the control panel or in the gap between production lines.

By using the longest lighting cable in the industry (25 m), the Controller can be installed along with the image processing monitor in a variety of locations. It is possible to adjust the lighting while looking at the screen.

#### Connect to a Remote Control Panel



#### Mount to a DIN Rail underneath the Line or in the Gap between Tables



#### Lighting Control without Programming

This enables light emission synchronized with the camera using essentially any trigger, such as a photoelectric sensor.

The Controller can be connected to an image processing device to control lighting without any programming on a PLC.

#### [ Control Output ]

- PNP/NPN models
- Power source: 24 V

#### [ Lighting Emission Controls ]

- Lighting triggers can be used individually for each channel.
- Lighting delay and lighting time can be controlled.

#### Intuitive Digital Light Controls

Digital adjustment of light emission makes it easy to reproduce the lighting environment after line switchovers.



The quantity of light is displayed digitally in 400 levels. Adjust the light in fine detail.

▲ Increases brightness

▼ Decreases brightness

LED Characteristics

Lenses

## Ordering Information

| Type               | Model    | I/O specification | Input voltage |
|--------------------|----------|-------------------|---------------|
| One-channel models | FL-STC10 | NPN               | 24 VDC        |
|                    | FL-STC15 | PNP               |               |
| Two-channel models | FL-STC20 | NPN               |               |
|                    | FL-STC25 | PNP               |               |

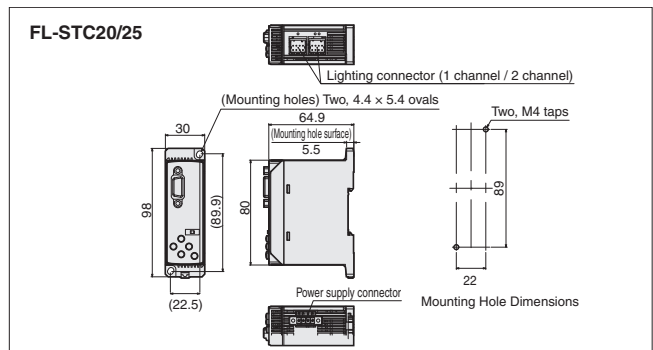
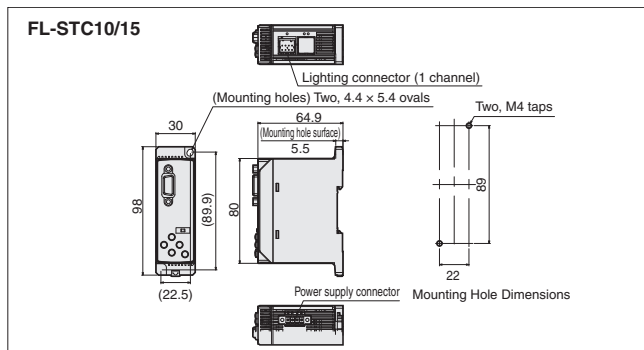
## Specifications

| Product type              |                       | One-channel models  |          | Two-channel models                              |          |
|---------------------------|-----------------------|---|----------|---|----------|
| I/O type                  |                       | NPN   | PNP      | NPN   | PNP      |
| Model                     |                       | FL-STC10  | FL-STC15 | FL-STC20  | FL-STC25 |
| Power supply voltage      |                       | 24 VDC±10% (including ripple)   |          |   |          |
| Power consumption         |                       | 36 W, 1.5 A max. (including the lighting section)   |          | 72 W, 3 A max. (including the lighting section) |          |
| Number of output channels |                       | 1   |          | 2   |          |
| Applicable light          |                       | FL-□ Series   |          |   |          |
| Luminance control method  | CONTINUOUS mode       | While the Strobe Controller power source is ON, light is continuously emitted.<br>PWM frequency: 100 kHz, Light adjustment: 400 levels  |          |   |          |
|                           | EXTERNAL TRIGGER mode | Lighting in synchronization with an external trigger input.<br>Lighting duration: Continuous while the trigger is input, or 0.1 to 99.9 ms (set in 0.1-ms increments)<br>PWM frequency: 100 kHz, Light adjustment: 400 levels |          |   |          |
|                           | STORBE mode           | Lighting in synchronization with the external trigger input, but twice brighter than EXTERNAL TRIGGER mode.<br>Lighting pulse width: 0.01 to 5 ms (light adjustment: 500 levels equivalent)                                   |          |   |          |
| Luminance adjustment      | Key                   | Luminance control method and adjustment value: Slide switch and cross key setting   |          |   |          |
|                           | I/O                   | Luminance adjustment value: 9-bit binary input control  |          |   |          |
| External interface        |                       | Parallel I/O connector (D-sub 15-pin), Terminal block (external trigger input with 2 terminals, power source voltage input with 2 terminals)  |          |   |          |
| Ambient temperature       |                       | Operating: 0 to 40°C, Storage: -15 to 60°C (with no icing or condensation)  |          |   |          |
| Ambient humidity          |                       | Operating/storage: 35% to 85% (with no condensation)  |          |   |          |
| Vibration resistance      |                       | 10 to 150 Hz (0.7 mm double amplitude), 80 min each in X, Y, and Z directions   |          |   |          |
| Shock resistance          |                       | 150 m/s <sup>2</sup> 3 times each in 6 direction (up/down, left/right, forward/backward)  |          |   |          |
| Materials                 |                       | Case: PC  |          |   |          |
| Degree of protection      |                       | IEC60529 IP20   |          |   |          |
| Weight                    |                       | Approx. 100 g   |          |   |          |
| Accessories               |                       | Instruction sheet, Terminal block connector   |          |   |          |
| Applicable standards      |                       | EN61326-1 *, KC   |          |   |          |

\* Electromagnetic environment: Industrial electromagnetic environment (EN/IEC 61326-1 Table 2)  
Also, the following condition is applied to the immunity test of this product.  
There are case that Lighting brightness fluctuate Max 10%.

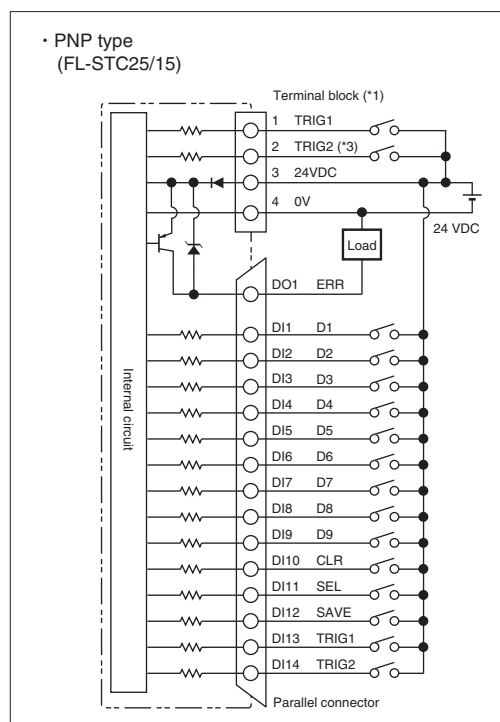
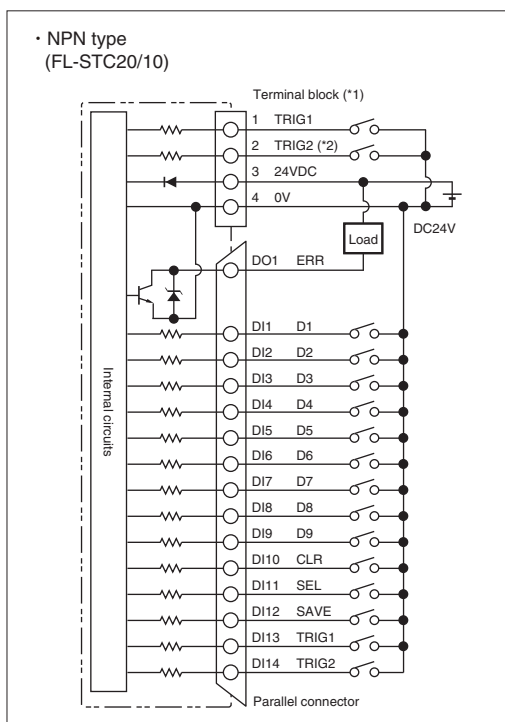
## Dimensions

(Unit:mm)





## I/O Circuit Diagrams



\*1. To wire the terminal block, connect a applicable cord (AWG16-22 with a 5 mm margin for work).

\*2. No use for FL-STC10

\*3. No use for FL-STC15

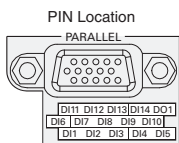
### ●Electrical Specifications

| Output circuit   | Input circuit  |
|--|--|
| NPN Open-collector<br>30 VDC 50 mA max.<br>ON: Residual voltage 1.2 V max.<br>OFF: Leakage current 0.1 mA max. | ON: Short-circuited with 0 V or 1.5 V or less<br>OFF: Open<br>(Leakage current: 0.1 mA max.) |

### ●Electrical Specifications

| Output circuit  | Input circuit  |
|---|--|
| PNP Open-collector<br>50 mA max.<br>ON: Residual voltage 1.2 V max.<br>OFF: Leakage current 0.1 mA max. | ON: Supply voltage short-circuited or supply voltage within 1.5 v<br>OFF: Open<br>(Leakage current: 0.1 mA max.) |

## Wiring Diagram



| PIN No. | Signal | I/O    | Function   |
|---------|--------|--------|--|
| DI1     | D1     | Input  | Data 1bit (low)  |
| DI2     | D2     | Input  | Data 2bit  |
| DI3     | D3     | Input  | Data 3bit  |
| DI4     | D4     | Input  | Data 4bit  |
| DI5     | D5     | Input  | Data 5bit  |
| DI6     | D6     | Input  | Data 6bit  |
| DI7     | D7     | Input  | Data 7bit  |
| DI8     | D8     | Input  | Data 8bit  |
| DI9     | D9     | Input  | Data 9bit (High)   |
| DI10    | CLR    | Input  | Error clear. (OFF→ON timing)                                   |
| DI11    | SEL    | Input  | Select setting CH. OFF=1CH, ON=2CH                             |
| DI12    | SAVE   | Input  | Save data D9 - D1 to memory at the timing of "save" OFF→ON *3) |
| DI13    | TRIG1  | Input  | CH1 Trigger Input (*1)(*2)                                     |
| DI14    | TRIG2  | Input  | CH2 Trigger Input (*1)(*2)                                     |
| DO1     | ERR    | Output | ON at the Error happens  |

\*1. Pin 1 and 2 of terminal block have lighting trigger. Make sure isolate another trigger terminal when you use one trigger terminal.

\*2. Prevent from chattering, otherwise the lighting timing would be missed.

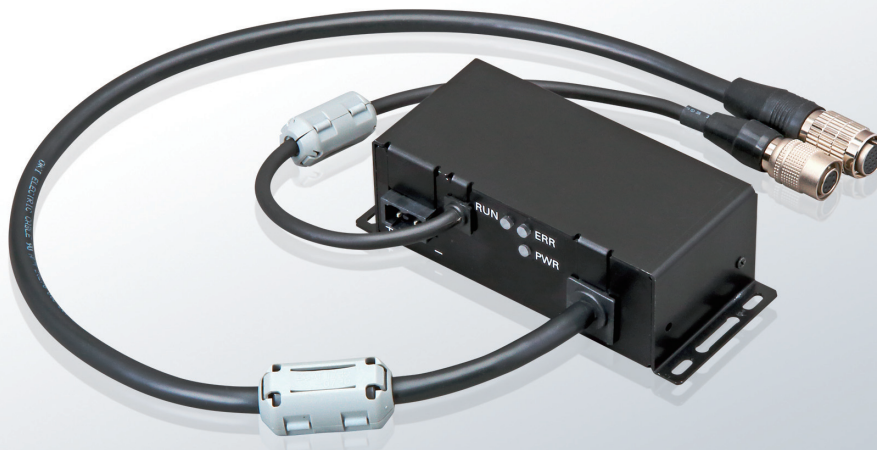
\*3. Memory function "ON": The data stored in FLASH memory.

Memory function "OFF": The data stored in RAM memory.

# Lighting Controller for Photometric Stereo Lights

## FL-TCC1PS Series

Lighting controller for photometric stereo lights.



### Product Features

- No need to control light emission timing.
- Simple wiring from a vision system controller.
- Light intensity and luminance control are set through the vision system controller.

### Specifications

| Model                               | FL-TCC1PS   |
|-------------------------------------|---|
| Applicable vision system controller | FH series (Ver.6.00 or higher)  |
| Applicable camera                   | FH-S series, FZ-S series  |
| Applicable light                    | FL-PS series  |
| Number of channels                  | 1   |
| Power supply voltage *              | 24 VDC±10% (including ripple)   |
| Recommended power supply            | S8VK-G12024 (manufactured by OMRON, 24 VDC, 5 A 120 W)  |
| Current consumption                 | 3.0 A max.  |
| Drive method                        | Constant voltage method   |
| Luminance control method            | Duty light adjustment: light adjustment of 255 levels (configured with vision system controller)  |
| Trigger lighting                    | Lighting in synchronization with trigger input timing from the controller (configured with vision system controller).   |
| Lighting duration setting           | Auto setting in accordance with shutter speed.  |
| Lighting time control               | Set with vision system controller or set in accordance with shutter speed.  |
| External interface                  | Camera connection cable (directly connected with the main unit) 400 mm<br>Lighting connection cable (directly connected with the main unit) 400 mm  |
| Ambient temperature                 | Operating: 0 to 40°C Storage: -15 to +60°C (with no icing nor no condensation)  |
| Ambient humidity                    | Operating and storage: 35% to 85% (with no condensation)  |
| Degree of protection                | IP20 (IEC60529)   |
| Vibration resistance                | 10 to 150 Hz, (0.35mm half-amplitude)<br>80 min. each in X, Y, and Z directions   |
| Shock resistance                    | 150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward)   |
| Material                            | Case: Aluminum, Cable: PVC, Camera Mount Plate: POM   |
| Weight                              | Approx. 200 g   |
| Accessories                         | Instruction Sheet (this Sheet), 24 V power supply terminal block (male), camera mount plate, Compliance Sheet, mounting screws (M2 set screw x 4, M2 flat head screw x 4, M4 flat head screw x 4) |

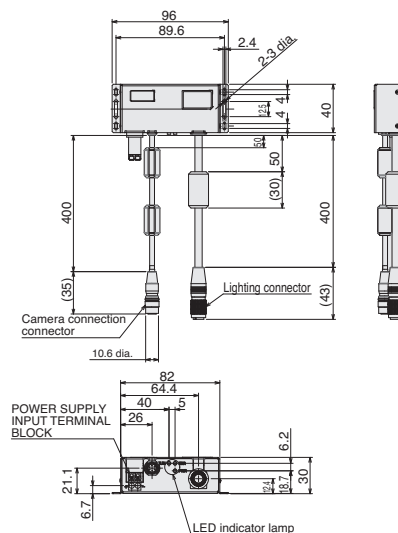
- Note: 1. When supplying the power to this lighting controller, make sure to turn ON the power to this lighting controller first or at the same time with the vision system controller.  
 2. When FL-PS260W is used in the length of the power supply line at least 15m, adjust the power voltage to become 24-26.4 V.  
 3. This lighting complies with the EN standard (EN61326-1) (Electromagnetic environment : Industrial electromagnetic environment (EN/IEC 61326-1 Table 2))  
 Also, the following condition is applied to the immunity test of this product.  
 There are case that Lighting brightness fluctuate Max 10%.  
 4. This light complies with the KC standard.

### Ordering Information

| Model     |
|-----------|
| FL-TCC1PS |

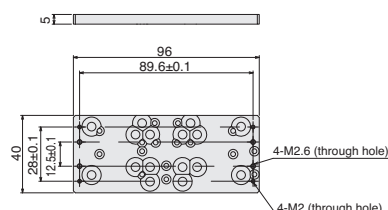
### Dimensions

(Unit:mm)



Tightening torque (M2 screw): 0.15 N·m




### Camera mount plate (provided)



# Cable/Diffusion Plate/Mounting Bracket

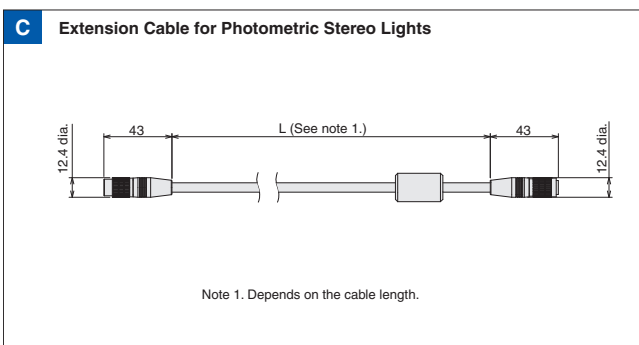
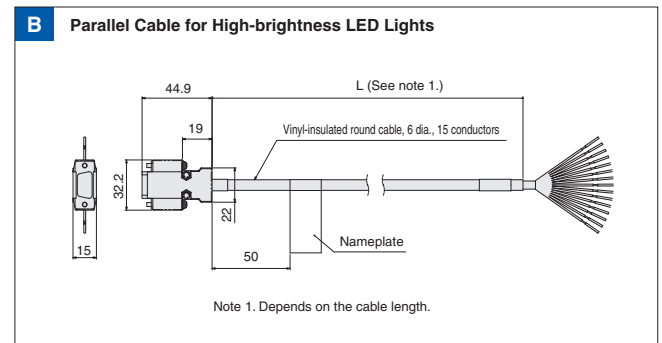
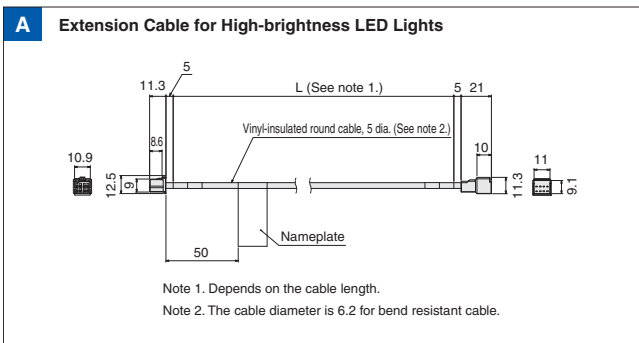
## Cable

### Ordering Information

| Type                           | Cable Type  | Model     | Cable Length | Weight (g)   | Drawing |
|--------------------------------|---|-----------|--------------|--------------|---------|
| For high-brightness LED lights | Extension Cable, Standard Cable<br>                        | FL-XC1    | 1            | Approx. 50   | A       |
|                                |   | FL-XC2    | 2            | Approx. 80   |         |
|                                |   | FL-XC3    | 3            | Approx. 120  |         |
|                                |   | FL-XC5    | 5            | Approx. 190  |         |
|                                |   | FL-XC10   | 10           | Approx. 400  |         |
|                                |   | FL-XC25   | 25           | Approx. 1000 |         |
|                                | Extension Cable, Bend resistant Cable<br>                  | FL-XC1R   | 1            | Approx. 60   | A       |
|                                |   | FL-XC2R   | 2            | Approx. 100  |         |
|                                |   | FL-XC3R   | 3            | Approx. 150  |         |
|                                |   | FL-XC5R   | 5            | Approx. 240  |         |
|                                |   | FL-XC10R  | 10           | Approx. 500  |         |
|                                |   | FL-XC25R  | 25           | Approx. 1200 |         |
|                                | Parallel Cable  | FL-XCP2   | 2            | Approx. 180  | B       |
| For photometric stereo lights  | Extension Cable between Light and Lighting Controller<br> | FL-XC05PS | 0.5          | Approx. 100  | C       |
|                                |   | FL-XC1PS  | 1            | Approx. 150  |         |

### Dimensions

(Unit:mm)



## Diffusion Plate

## Ordering Information



## ●Diffusion Plate

| Type         | Model        | Dimensions (mm) |
|--------------|--------------|-----------------|
| Bar Lighting | FL-BR5020DF  | 49.8×18×4       |
|              | FL-BR9120DF  | 90.6×18×4       |
|              | FL-BR13120DF | 131.4×18×4      |

| Type                 | Model     | Outer diameter/Inner diameter/Thickness (mm) |
|----------------------|-----------|--|
| Direct Ring Lighting | FL-DR32DF | 32 dia./10 dia./4                            |
|                      | FL-DR50DF | 50 dia./28 dia./4                            |
|                      | FL-DR90DF | 90 dia./50 dia./4                            |

## ●Polarization Plate

| Type                 | Model     | Outer diameter/Inner diameter/Thickness (mm) |
|----------------------|-----------|--|
| Direct Ring Lighting | FL-DR32PL | 32 dia./10 dia./2                            |
|                      | FL-DR50PL | 50 dia./28 dia./2                            |
|                      | FL-DR90PL | 90 dia./50 dia./2                            |

## Mounting Bracket

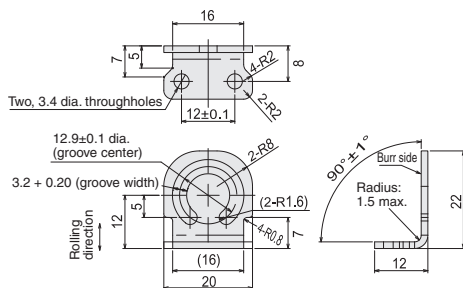
## Ordering Information

| Type           | Model   |
|----------------|---------|
| Bar Lighting * | FL-XBK1 |

\* One set includes two pieces.  
Four mounting screws (M3 × 6 mm) are also included.

## Dimensions

(Unit:mm)



Bracket material: SUS

Burr's must extend less than 0.1 mm.

# LED Characteristics

## LED Safety

The LEDs that are used in the Light are classified as follows according to IEC 62471.

| Series     | Shape                    | Model      | Color                         | LED Safety   | Indication |
|------------|--------------------------|------------|-------------------------------|--------------|------------|
| FLV Series | Direct Ring Light        | FLV-DR□    | White, Blue                   | Risk Group 2 | B          |
|            | Direct Ring Light        | FLV-DR□    | Red, Ultraviolet              | Risk Group 1 | D          |
|            | Direct Ring Light        | FLV-DR□IR  | Infrared                      | Risk Group 1 | C          |
|            | Low Angle Ring Light     | FLV-DL□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Bar Light                | FLV-BR□    | White, Blue                   | Risk Group 2 | B          |
|            | Bar Light                | FLV-BR□    | Red, Ultraviolet              | Risk Group 1 | D          |
|            | Bar Light                | FLV-BR□IR  | Infrared                      | Risk Group 1 | C          |
|            | Coaxial Light            | FLV-CL□    | White, Red, Blue, Ultraviolet | Risk Group 1 | D          |
|            | Coaxial Light            | FLV-CL□IR  | Infrared                      | Risk Group 1 | C          |
|            | Shadowless Light         | FLV-FS□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Shadowless Light         | FLV-FR□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Shadowless Light         | FLV-FP□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Shadowless Light         | FLV-FQ□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Direct Back Light        | FLV-DB□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Edge Type Light          | FLV-FB□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Edge Type Coaxial Light  | FLV-FX□    | White, Red, Blue              | Risk Group 1 | D          |
|            | Dome Light               | FLV-DD□    | White, Red, Blue              | Risk Group 1 | D          |
|            | High-power Spot Light    | FLV-EP50□  | White, Red                    | Risk Group 1 | D          |
|            | Spot Light               | FLV-EP08□  | White, Red, Blue              | Risk Group 1 | D          |
|            | Line Light               | FLV-LN□W   | White                         | Risk Group 3 | A          |
| Line Light | FLV-LN□R                 | Red        | Risk Group 1                  | D            |            |
| Line Light | FLV-LN□B                 | Blue       | Risk Group 2                  | B            |            |
| FL Series  | MDMC Light               | FL-MD180MC | White, Blue, Green            | Risk Group 2 | B          |
|            | MDMC Light               | FL-MD180MC | Red                           | Risk Group 1 | D          |
|            | MDMC Light               | FL-MD90MC  | White, Blue                   | Risk Group 2 | B          |
|            | MDMC Light               | FL-MD90MC  | Red, Green                    | Risk Group 1 | D          |
|            | Photometric Stereo Light | FL-PS□W    | White                         | Risk Group 2 | B          |
|            | Direct Ring Light        | FL-DR□     | White                         | Risk Group 2 | B          |
|            | Bar Light                | FL-BR□     | White                         | Risk Group 2 | B          |

A

|  |
|--|
| <b>WARNING</b>   |
| Possibly hazardous optical radiation emitted from this product |
| Risk Group 3<br>IEC 62471                                      |

B

|  |
|--|
| <b>CAUTION</b>   |
| Possibly hazardous optical radiation emitted from this product |
| Risk Group 2<br>IEC 62471                                      |

C

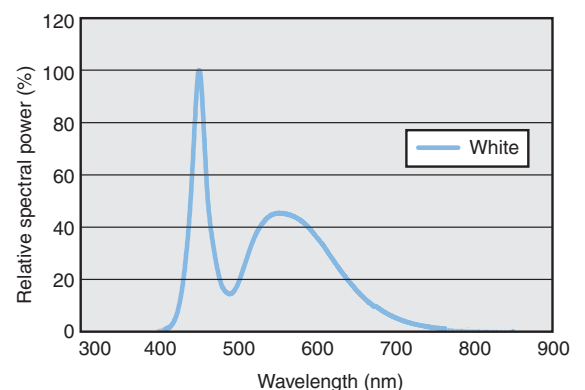
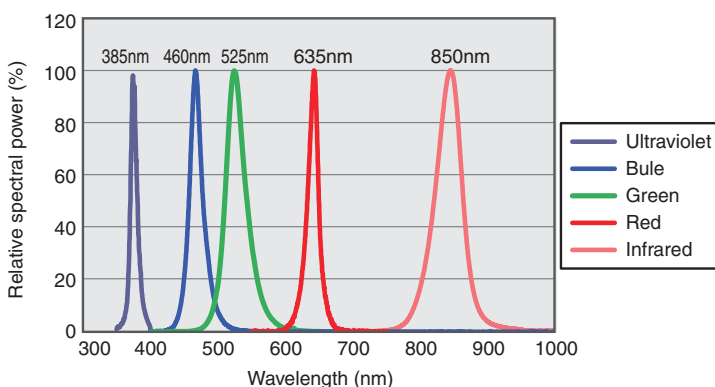
|                              |
|------------------------------|
| <b>NOTICE</b>                |
| IR emitted from this product |
| Risk Group 1<br>IEC 62471    |

D

|                           |
|---------------------------|
| Risk Group 1<br>IEC 62471 |
|---------------------------|

## Typical LED Spectral Distributions

Typical spectral distributions and peak wavelengths of each LED color are shown in the diagrams below.





# Lens Selection

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

## FH/FZ-series Vision System

| Camera              |                  | Recommended lens  |   |   |
|---------------------|------------------|---|---|---|
| Resolution          | Model            | Standard Lens   | Telecentric Lens  | Vibrations and Shocks Resistant Lens  |
|                     |                  | Lens for general inspection. Ideal for when a wide field of view, a long working distance, or cost-effectiveness is required. | Lens ideal for high-precision inspection and alignment. Images can be captured at high magnification, and distortion at edges of images is low. | Robust lens with improved resistance to vibrations and shocks is ideal for industrial use. Design without lock screws enables installation in narrow positions. |
| 0.3 million pixels  | FZ-SP/SPC/SF/SFC | FZ-LES Series<br>Product details: <b>Page 71</b><br>Optical chart: <b>Page 92</b>   | VS-TCH Series<br>Product details: <b>Page 76</b>  | VS-MCA Series<br>Product details: <b>Page 80</b><br>Optical chart: <b>Page 95</b><br><br>VS-MC Series<br>Product details: <b>Page 83</b>                        |
|                     | FZ-S□            | SV-V Series<br>Product details: <b>Page 72</b><br>Optical chart: <b>Page 92</b>   |   |   |
|                     | FZ-SH□           |   |   |   |
| 0.4 million pixels  | FH-S□            |   |   |   |
| 2 million pixels    | FH-SM□           |   |   |   |
|                     | FZ-S□2M          | SV-H Series<br>Product details: <b>Page 73</b><br>Optical chart: <b>Page 93</b>   |   |   |
| 4 million pixels    | FH-S□02          | VS-H1 Series<br>Product details: <b>Page 73</b><br>Optical chart: <b>Page 93</b>  | VS-TEV Series<br>Product details: <b>Page 79</b>  | VS-MCH1 Series<br>Product details: <b>Page 84</b><br>Optical chart: <b>Page 95</b>  |
|                     | FH-S□04          |   |   |   |
| 5 million pixels    | FH-S□05R         | SV-H Series<br>Product details: <b>Page 73</b><br>Optical chart: <b>Page 93</b>   | VS-TCH Series<br>Product details: <b>Page 76</b>  | VS-MCA Series<br>Product details: <b>Page 80</b><br>Optical chart: <b>Page 96</b><br><br>VS-MC Series<br>Product details: <b>Page 83</b>                        |
|                     | FZ-S□5M3         |   |   |   |
|                     | FH-S□X05         |   |   |   |
| 12 million pixels   | FH-S□X12         | VS-LDD Series<br>Product details: <b>Page 74</b><br>Optical chart: <b>Page 94</b>   | VS-TEV Series<br>Product details: <b>Page 79</b>  | —   |
|                     | FH-S□12          | VS-L/M42-10 Series<br>Product details: <b>Page 75</b><br>Optical chart: <b>Page 94</b>  | —   | VS-MCL/M42-10 Series<br>Product details: <b>Page 88</b><br>Optical chart: <b>Page 97</b>  |
| 20.4 million pixels | FH-S□21R         | VS-LDD Series<br>Product details: <b>Page 74</b><br>Optical chart: <b>Page 94</b>   | VS-TEV Series<br>Product details: <b>Page 79</b>  | VS-MCH1 Series<br>Product details: <b>Page 84</b><br>Optical chart: <b>Page 97</b>  |

## FHV7-series Smart Camera

| Camera             |               | Recommended lens  |   |   |
|--------------------|---------------|---|---|---|
| Resolution         | Model         | Standard Lens   | Telecentric Lens  | Vibrations and Shocks Resistant Lens  |
|                    |               | Lens for general inspection. Ideal for when a wide field of view, a long working distance, or cost-effectiveness is required. | Lens ideal for high-precision inspection and alignment. Images can be captured at high magnification, and distortion at edges of images is low. | Robust lens with improved resistance to vibrations and shocks is ideal for industrial use. Design without lock screws enables installation in narrow positions. |
| 0.4 million pixels | FHV7H-□004-C  | SV-V Series<br>Product details: <b>Page 72</b><br>Optical chart: <b>Page 98</b>   | VS-TCH Series<br>Product details: <b>Page 76</b>  | VS-MCA Series<br>Product details: <b>Page 80</b><br>Optical chart: <b>Page 99</b><br><br>VS-MC Series<br>Product details: <b>Page 83</b>                        |
| 1.6 million pixels | FHV7H-□016-C  |   |   |   |
| 3.2 million pixels | FHV7H-□032-C  | SV-H Series<br>Product details: <b>Page 73</b><br>Optical chart: <b>Page 98</b>   |   |   |
| 5 million pixels   | FHV7H-□050-C  |   |   |   |
| 6.3 million pixels | FHV7H-□063R-C |   |   |   |
| 12 million pixels  | FHV7H-□120R-C |   |   |   |

# Lens for FZ-series Small Cameras

## FZ-LES Series

- Product lineup includes two types of small camera lenses, a pen type with a 12-mm diameter and a flat type with a 17-mm thickness.

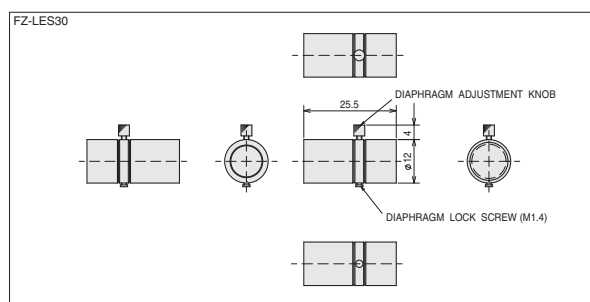
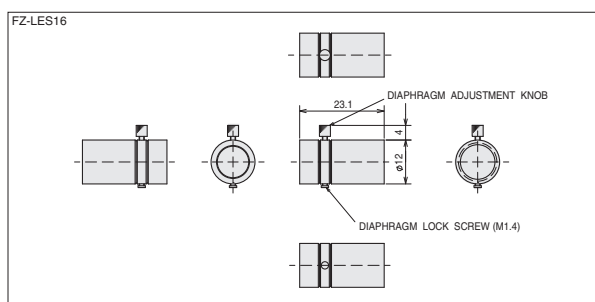
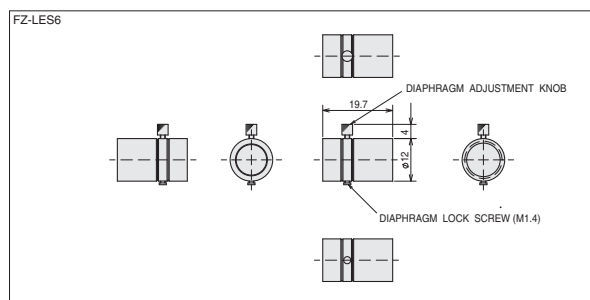
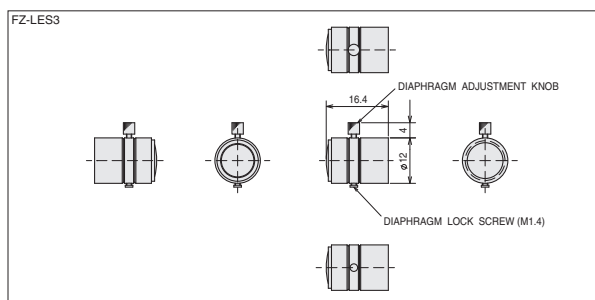


### Ordering Information

| Recommended cameras | Model           | Focal length (mm) | Aperture (F No.) |
|---------------------|-----------------|-------------------|------------------|
| FZ-SF□<br>FZ-SP□    | <b>FZ-LES3</b>  | 3                 | 2.0 to 16        |
|                     | <b>FZ-LES6</b>  | 6                 | 2.0 to 16        |
|                     | <b>FZ-LES16</b> | 16                | 3.4 to 16        |
|                     | <b>FZ-LES30</b> | 30                | 3.4 to 16        |

### Dimensions

(Unit:mm)



### Specifications

|                            |   |
|----------------------------|---|
| <b>Ambient temperature</b> | Operating: -10 to 50°C,<br>Storage: -20 to 70°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 0% to 90%,<br>Storage: 0% to 70% (with no condensation)              |

### Optical Chart

Refer to page 92.

# Lens for C-mount Cameras

# SV-V Series

- Standard CCTV lens.
- Lineup of 11 models with focal lengths ranging from 3.5 to 100 mm.
- Lock screws for focus and iris.
- More robust structure designed for machine vision.
- Lower distortion and higher resolution than previous CCTV lenses.



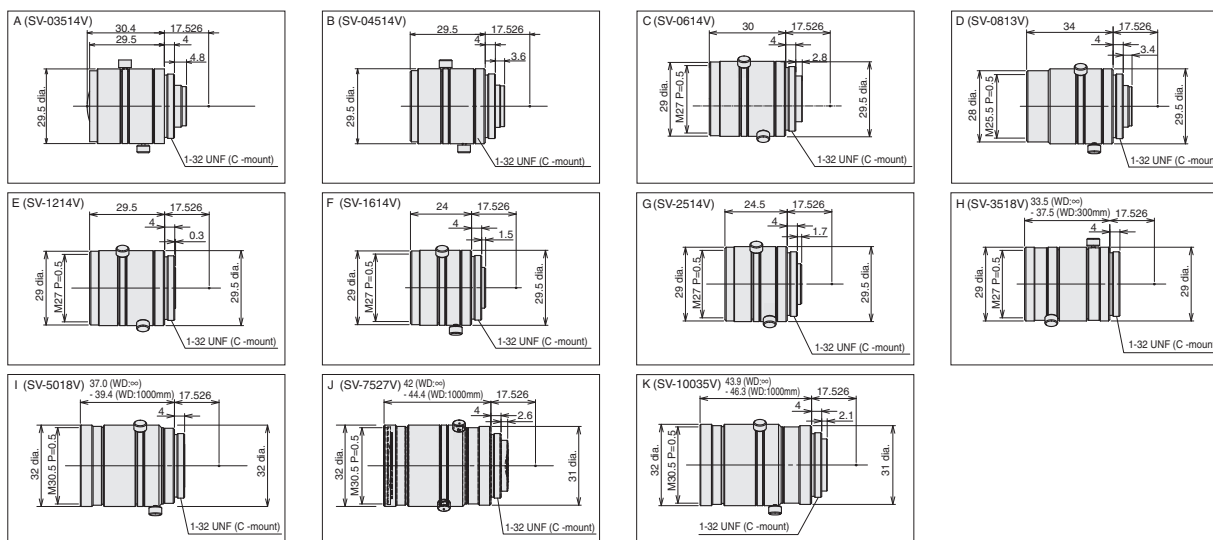
## Ordering Information

| Recommended camera                             | Model             | Dimensions | Focal distance (mm) | Aperture (F No) | Field of view (V × H) | Closest distance (mm) | Filter size | Weight (g) | Total length (mm) | Maximum compatible CCD |
|--|-------------------|------------|---------------------|-----------------|-----------------------|-----------------------|-------------|------------|-------------------|------------------------|
| FZ-S□<br>FZ-SH□<br>FH-S□<br>FH-S□X<br>FHV7H-□* | 3Z4S-LE SV-03514V | A          | 3.5                 | 1.4 to Close    | 77.8°×105.9°          | 200                   | -           | 53         | 30.4              | 1/3 inch               |
|  | 3Z4S-LE SV-04514V | B          | 4.5                 | 1.4 to Close    | 59.7°×79.9°           | 200                   | -           | 53         | 29.5              | 1/3 inch               |
|  | 3Z4S-LE SV-0614V  | C          | 6                   | 1.4 to Close    | 42.3°×54.6°           | 200                   | M27.0 P0.5  | 49         | 30                | 1/3 inch               |
|  | 3Z4S-LE SV-0813V  | D          | 8                   | 1.3 to Close    | 44.6°×57.3°           | 200                   | M25.5 P0.5  | 55         | 34                | 1/3 inch               |
|  | 3Z4S-LE SV-1214V  | E          | 12                  | 1.4 to Close    | 21.9°×38.9°           | 300                   | M27.0 P0.5  | 44         | 29.5              | 1/3 inch               |
|  | 3Z4S-LE SV-1614V  | F          | 16                  | 1.4 to Close    | 22.8°×30.1°           | 400                   | M27.0 P0.5  | 34         | 24                | 1/3 inch               |
|  | 3Z4S-LE SV-2514V  | G          | 25                  | 1.4 to Close    | 14.9°×19.8°           | 500                   | M27.0 P0.5  | 36         | 24.5              | 1/3 inch               |
|  | 3Z4S-LE SV-3518V  | H          | 35                  | 1.8 to Close    | 10.8°×14.4°           | 300                   | M27.0 P0.5  | 47         | 33.5 to 37.5      | 1/3 inch               |
|  | 3Z4S-LE SV-5018V  | I          | 50                  | 1.8 to Close    | 7.9°×10.5°            | 1000                  | M30.5 P0.5  | 67         | 37.0 to 39.4      | 1/3 inch               |
|  | 3Z4S-LE SV-7527V  | J          | 75                  | 2.7 to Close    | 3.6°×4.8°             | 1000                  | M30.5 P0.5  | 76         | 42.0 to 44.4      | 1/3 inch               |
|  | 3Z4S-LE SV-10035V | K          | 100                 | 3.5 to Close    | 2.9°×3.8°             | 1000                  | M30.5 P0.5  | 79         | 43.9 to 6.3       | 1/3 inch               |

\*The SV-V Series can be used with the FHV7 Smart Camera with 0.4 or 1.6 million pixels.

## Dimensions

(Unit:mm)



## Specifications

|                            |   |
|----------------------------|---|
| <b>Mounting</b>            | C mount   |
| <b>Ambient temperature</b> | Operating: 0 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%,<br>Storage: 35% to 90% (with no condensation)          |

## Optical Chart

Refer to page 92 and 98.

# High-resolution Lens for C-mount Cameras

## SV-H/V/S-H1 Series

- High-resolution lens for megapixel camera.
- Lineup of 7 models for 2/3-inch cameras, with focal lengths ranging from 6 to 100 mm, and 9 models for 1-inch cameras.
- Lock screws for focus and iris.
- Short expose time with bright F number of 1.4 for high-speed CMOS cameras.
- Compact design but minimized decrease in distortion and brightness.



SV-H Series for 2/3-inch image sensor

VS-H1 Series for 1-inch image sensor

### Ordering Information

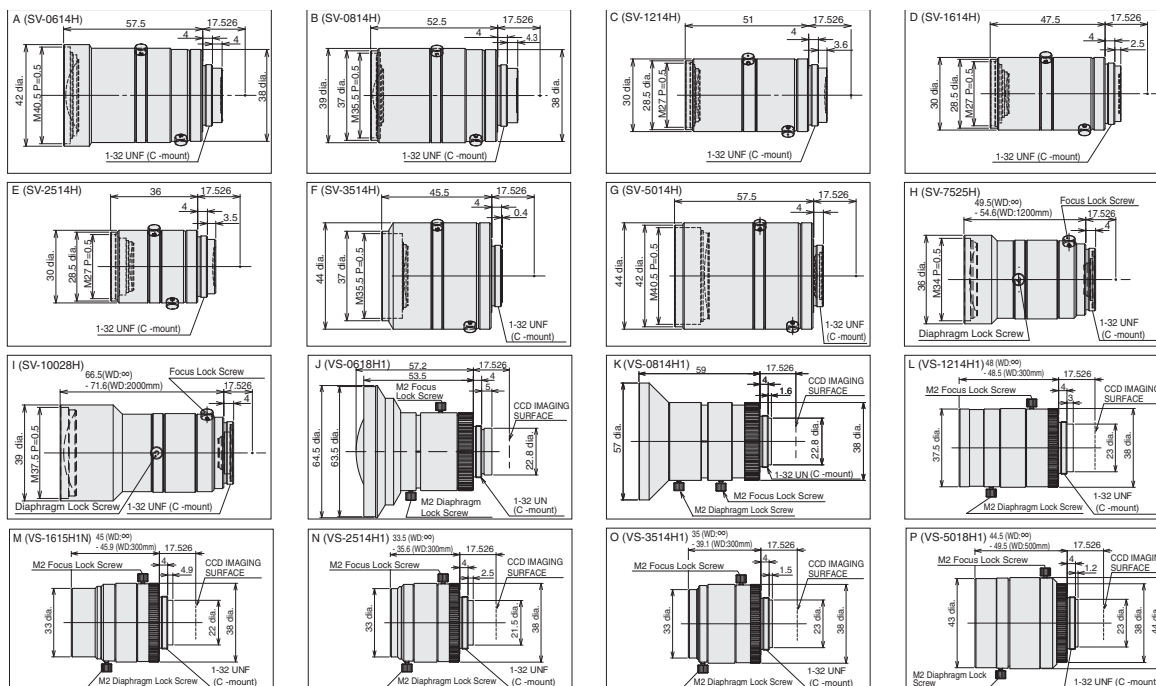
| Recommended camera                                     | Model              | Dimensions | Focal distance (mm) | Aperture (F No) | Field of view (V × H) | Closest distance (mm) | Filter size | Weight (g) | Total length (mm) | Maximum compatible CCD |
|--|--------------------|------------|---------------------|-----------------|-----------------------|-----------------------|-------------|------------|-------------------|------------------------|
| FZ-S□2M<br>FZ-S□5M3<br>FH-S□05R<br>FH-S□X05<br>FHV7H-□ | 3Z4S-LE SV-0614H   | A          | 6                   | 1.4 to 16       | 56.8°×71.5°           | 100                   | M40.5 P0.5  | 145        | 57.5              | 2/3 inch               |
|  | 3Z4S-LE SV-0814H   | B          | 8                   | 1.4 to 16       | 44.9°×57.6°           | 100                   | M35.5 P0.5  | 125        | 52.5              | 2/3 inch               |
|  | 3Z4S-LE SV-1214H   | C          | 12                  | 1.4 to 16       | 30.2°×39.6°           | 100                   | M27 P0.5    | 85         | 51                | 2/3 inch               |
|  | 3Z4S-LE SV-1614H   | D          | 16                  | 1.4 to 16       | 23.1°×30.6°           | 100                   | M27 P0.5    | 85         | 47.5              | 2/3 inch               |
|  | 3Z4S-LE SV-2514H   | E          | 25                  | 1.4 to 16       | 15.0°×20.0°           | 150                   | M27 P0.5    | 65         | 36                | 2/3 inch               |
|  | 3Z4S-LE SV-3514H   | F          | 35                  | 1.4 to 16       | 10.8°×14.3°           | 200                   | M35.5 P0.5  | 150        | 45.5              | 2/3 inch               |
|  | 3Z4S-LE SV-5014H   | G          | 50                  | 1.4 to 16       | 7.5°×10.0°            | 300                   | M40.5 P0.5  | 170        | 57.5              | 2/3 inch               |
|  | 3Z4S-LE SV-7525H   | H          | 75                  | 2.5 to Close    | 8.6°×8.6° *           | 1200                  | M34.0 P0.5  | 85         | 49.5 to 54.6      | 1 inch                 |
|  | 3Z4S-LE SV-10028H  | I          | 100                 | 2.8 to Close    | 6.6°×6.6° *           | 2000                  | M37.5 P0.5  | 105        | 66.5 to 71.6      | 1 inch                 |
| FH-S□02<br>FH-S□04                                     | 3Z4S-LE VS-0618H1  | J          | 6                   | 1.8 to 16       | 87.3°×87.3°           | 100                   | NA          | 200        | 57.2              | 1 inch                 |
|  | 3Z4S-LE VS-0814H1  | K          | 8                   | 1.4 to 16       | 71.8°×71.8°           | 100                   | M55.0 P0.75 | 170        | 59                | 1 inch                 |
|  | 3Z4S-LE VS-1214H1  | L          | 12                  | 1.4 to 16       | 50.8°×50.8°           | 300                   | M35.5 P0.5  | 140        | 48 to 48.5        | 1 inch                 |
|  | 3Z4S-LE VS-1614H1N | M          | 16                  | 1.4 to 16       | 38.6°×38.6°           | 300                   | M30.5 P0.5  | 120        | 45.0 to 45.9      | 1 inch                 |
|  | 3Z4S-LE VS-2514H1  | N          | 25                  | 1.4 to 16       | 25.1°×25.1°           | 300                   | M30.5 P0.5  | 90         | 33.5 to 35.6      | 1 inch                 |
|  | 3Z4S-LE VS-3514H   | O          | 35                  | 1.4 to 16       | 18.3°×18.3°           | 300                   | M30.5 P0.5  | 100        | 35.0 to 39.1      | 1 inch                 |
|  | 3Z4S-LE VS-5018H1  | P          | 50                  | 1.8 to 16       | 12.8°×12.8°           | 500                   | M40.5 P0.5  | 135        | 44.5 to 49.5      | 1 inch                 |

\*A field of view captured by a 1-inch CCD.

Note: The FH-S□02/FH-S□04 with a focal length of 75 mm or 100 mm can be used with the 3Z4S-LE SV-7525H or 3Z4S-LE SV-10028H, respectively.

### Dimensions

(Unit:mm)



### Specifications

|                            |   |
|----------------------------|---|
| <b>Mounting</b>            | C mount   |
| <b>Ambient temperature</b> | Operating: 0 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%,<br>Storage: 35% to 90% (with no condensation)          |

### Optical Chart

Refer to page 92, 93, 98 and 99.



# VS-L/M42-10 Series

- Wide variety of lenses with focal lengths ranging from 18 to 100 mm.
- Hexagon socket head cap screws for focus and aperture lock screws can be tightened more than finger tight. This ensures vibration resistance even when large diameter lenses are used.



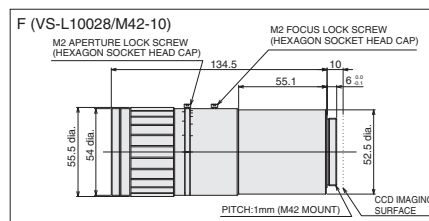
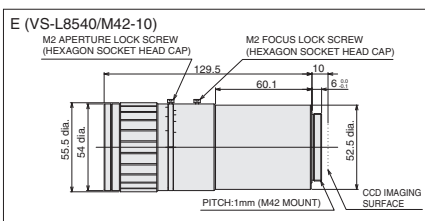
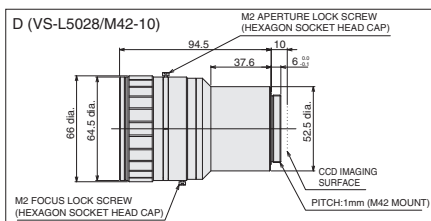
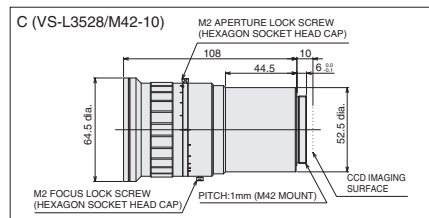
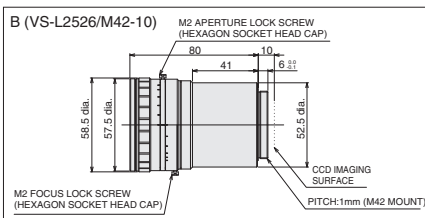
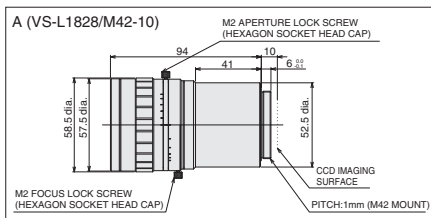
## Ordering Information

| Recommended camera | Model                    | Dimensions | Focal distance (mm) | Aperture (F No) | Optical magnification | Closest distance (mm) | Filter size | Weight (g) | Total length (mm) | Maximum compatible CCD |
|--------------------|--------------------------|------------|---------------------|-----------------|-----------------------|-----------------------|-------------|------------|-------------------|------------------------|
| FH-S□12            | 3Z4S-LE VS-L1828/M42-10  | A          | 18                  | 2.8 to 16       | 0.025x to 0.12x       | 137.9                 | M55.0 P0.75 | 330        | 94                | 1.8 inches             |
|                    | 3Z4S-LE VS-L2526/M42-10  | B          | 25                  | 2.6 to 16       | 0.025x to 0.12x       | 198.1                 | M55.0 P0.75 | 240        | 80                | 1.8 inches             |
|                    | 3Z4S-LE VS-L3528/M42-10  | C          | 35                  | 2.8 to 16       | 0.05x to 0.3x         | 112.8                 | M62.0 P0.75 | 345        | 108               | 1.8 inches             |
|                    | 3Z4S-LE VS-L5028/M42-10  | D          | 50                  | 2.8 to 16       | 0.05x to 0.3x         | 181.4                 | M62.0 P0.75 | 285        | 94.5              | 1.8 inches             |
|                    | 3Z4S-LE VS-L8540/M42-10  | E          | 85                  | 4.0 to 16       | 0.1x to 0.35x         | 285.0                 | M52.0 P0.75 | 340        | 129.5             | 1.8 inches             |
|                    | 3Z4S-LE VS-L10028/M42-10 | F          | 100                 | 2.8 to 16       | 0.05x to 0.3x         | 409.0                 | M52.0 P0.75 | 350        | 134.5             | 1.8 inches             |

Note: Vibrations and Shocks Resistant Lenses for M42-mount cameras are also available. Ask your OMRON representative for details.

## Dimensions

(Unit:mm)



## Specifications

|                            |   |
|----------------------------|---|
| <b>Mounting</b>            | M42 mount   |
| <b>Ambient temperature</b> | Operating: 0 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%,<br>Storage: 35% to 90% (with no condensation)          |

## Optical Chart

Refer to page 94.



# High-resolution Telecentric Lens for C-mount Cameras

## VS-TCH Series

- High-resolution telecentric lens for megapixel camera.
- Broad product selection.

Available in two different working distances, 65 or 110 mm, to fit installation spaces.

Comes in two shapes: straight and coaxial for coaxial lights. Five optical magnifications, 0.5x, 1.0x, 1.5x, 2.0x, and 4.0x, are available to cover a wide range of applications.

- Low-distortion design.

High quality images can be obtained from any part of the area. Ideal for high-precision alignment.



### Ordering Information

| Recommended camera   | Model                     | Dimensions | Optical magnification (±5%) | WD *1 (mm) | Effective FNO | Depth of field *2 (mm) | Resolution *3 (μm) | TV distortion | Shape    | Weight (g) | Maximum compatible CCD |
|--|---------------------------|------------|-----------------------------|------------|---------------|------------------------|--------------------|---------------|----------|------------|------------------------|
| FZ-S□<br>FZ-SH□<br>FH-S□<br>FH-S□X<br>FH-S□2M<br>FZ-S□5M3<br>FH-S□05R<br>FH-S□X05<br>FHV7H-□ | 3Z4S-LE VS-TCH05-65-O     | A          | 0.5x                        | 75.3       | 9.42          | 3                      | 12.43              | 0.02%         | Straight | 70         | 2/3 inch               |
|  | 3Z4S-LE VS-TCH05-65CO-O   | B          |                             |            |               |                        |                    |               | Coaxial  | 80         |                        |
|  | 3Z4S-LE VS-TCH05-110-O    | C          |                             | 110.8      | 9.49          | 3.04                   | 12.9               | 0.02%         | Straight | 100        |                        |
|  | 3Z4S-LE VS-TCH05-110CO-O  | D          |                             |            |               |                        |                    |               | Coaxial  | 110        |                        |
|  | 3Z4S-LE VS-TCH1-65-O      | E          | 1.0x                        | 68.8       | 9.94          | 0.8                    | 6.71               | 0.01%         | Straight | 70         |                        |
|  | 3Z4S-LE VS-TCH1-65CO-O    | F          |                             |            |               |                        |                    |               | Coaxial  | 80         |                        |
|  | 3Z4S-LE VS-TCH1-110-O     | G          |                             | 110.3      | 10.49         | 0.84                   | 6.99               | 0.02%         | Straight | 100        |                        |
|  | 3Z4S-LE VS-TCH1-110CO-O   | H          |                             |            |               |                        |                    |               | Coaxial  | 110        |                        |
|  | 3Z4S-LE VS-TCH1.5-65-O    | I          | 1.5x                        | 65         | 11.8          | 0.4                    | 5.24               | 0.01%         | Straight | 70         |                        |
|  | 3Z4S-LE VS-TCH1.5-65CO-O  | J          |                             |            |               |                        |                    |               | Coaxial  | 80         |                        |
|  | 3Z4S-LE VS-TCH1.5-110-O   | K          |                             | 110.8      | 11.97         | 0.43                   | 5.33               | 0.02%         | Straight | 90         |                        |
|  | 3Z4S-LE VS-TCH1.5-110CO-O | L          |                             |            |               |                        |                    |               | Coaxial  | 105        |                        |
|  | 3Z4S-LE VS-TCH2-65-O      | M          | 2.0x                        | 65         | 13.6          | 0.3                    | 4.53               | 0.03%         | Straight | 70         |                        |
|  | 3Z4S-LE VS-TCH2-65CO-O    | N          |                             |            |               |                        |                    |               | Coaxial  | 80         |                        |
|  | 3Z4S-LE VS-TCH2-110-O     | O          |                             | 110.8      | 13.5          | 0.27                   | 4.53               | 0.03%         | Straight | 95         |                        |
|  | 3Z4S-LE VS-TCH2-110CO-O   | P          |                             |            |               |                        |                    |               | Coaxial  | 110        |                        |
|  | 3Z4S-LE VS-TCH4-65-O      | Q          | 4.0x                        | 65         | 17.91         | 0.09                   | 3                  | 0.02%         | Straight | 90         |                        |
|  | 3Z4S-LE VS-TCH4-65CO-O    | R          |                             |            |               |                        |                    |               | Coaxial  | 100        |                        |
|  | 3Z4S-LE VS-TCH4-110-O     | S          |                             | 110.8      | 22.2          | 0.11                   | 3.73               | 0.03%         | Straight | 100        |                        |
|  | 3Z4S-LE VS-TCH4-110CO-O   | T          |                             |            |               |                        |                    |               | Coaxial  | 110        |                        |

\*1. The working distance is the distance from the end of the lens to the workpiece.

\*2. The depth of field is calculated using a permissible circle of confusion diameter of 0.04 mm.

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

Note: 1. Fixing the lens or other reinforcement may be required depending on the installation angle or operating environment (vibration/shock). When fixing the lens, insulate the lens from the fixture.

2. The above specifications are values calculated from the optical design and can vary depending on installation conditions.

### Camera and Field of View Table

| Camera             | Size of image element (inch) | Imaging area H × V (mm) | Field of view H × V (mm) |                 |                   |                 |                 |
|--------------------|------------------------------|-------------------------|--------------------------|-----------------|-------------------|-----------------|-----------------|
|                    |                              |                         | 0.5 × (VS-TCH05)         | 1.0 × (VS-TCH1) | 1.5 × (VS-TCH1.5) | 2.0 × (VS-TCH2) | 4.0 × (VS-TCH4) |
| FH-S□/FZ-S□/FZ-SH□ | 1/3" equivalent              | 4.8 × 3.6               | 9.6 × 7.2                | 4.8 × 3.6       | 3.2 × 2.4         | 2.4 × 1.8       | 1.2 × 0.9       |
| FH-S□X             | 1/2.9" equivalent            | 5.0 × 3.8               | 10.0 × 7.6               | 5.0 × 3.8       | 3.3 × 2.5         | 2.5 × 1.9       | 1.3 × 1.0       |
| FH-S□05R           | 1/2.5" equivalent            | 5.7 × 4.3               | 11.4 × 8.6               | 5.7 × 4.3       | 3.8 × 2.9         | 2.9 × 2.2       | 1.4 × 1.1       |
| FZ-S□2M            | 1/1.8" equivalent            | 7.0 × 5.3               | 14.0 × 10.6              | 7.0 × 5.3       | 4.7 × 3.5         | 3.5 × 2.7       | 1.8 × 1.3       |
| FH-S□X05/FZ-S□5M3  | 2/3" equivalent              | 8.4 × 7.1               | 16.8 × 14.2              | 8.4 × 7.1       | 5.6 × 4.7         | 4.2 × 3.6       | 2.1 × 1.8       |
| FHV7H-□004-C       | 1/2.9" equivalent            | 5.0×3.8                 | 10.0×7.6                 | 5.0×3.8         | 3.3×2.5           | 2.5×1.9         | 1.3×1.0         |
| FHV7H-□016-C       | 1/2.9" equivalent            | 5.0×3.8                 | 10.0×7.6                 | 5.0×3.8         | 3.3×2.5           | 2.5×1.9         | 1.3×1.0         |
| FHV7H-□032-C       | 1/1.8" equivalent            | 7.1×5.3                 | 14.2×10.6                | 7.1×5.3         | 4.7×3.5           | 3.6×2.7         | 1.8×1.3         |
| FHV7H-□050-C       | 2/3" equivalent              | 8.5×7.1                 | 17.0×14.2                | 8.5×7.1         | 5.7×4.7           | 4.3×3.6         | 2.1×1.8         |
| FHV7H-□063R-C      | 1/1.8" equivalent            | 7.4×5.0                 | 14.8×10.0                | 7.4×5.0         | 4.9×3.3           | 3.7×2.5         | 1.9×1.3         |
| FHV7H-□120R-C      | 1/1.7" equivalent            | 7.4×5.6                 | 14.8×11.2                | 7.4×5.6         | 4.9×3.3           | 3.7×2.8         | 1.9×1.4         |

Note: The field of view is a calculated value and not a guaranteed value.

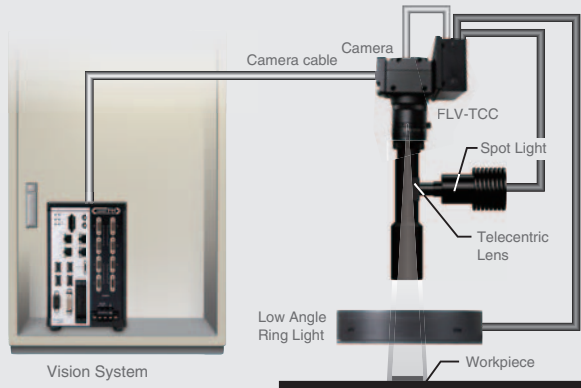
# High-resolution Telecentric Lens for C-mount Cameras VS-TCH Series

## Applications

### Detection of alignment marks

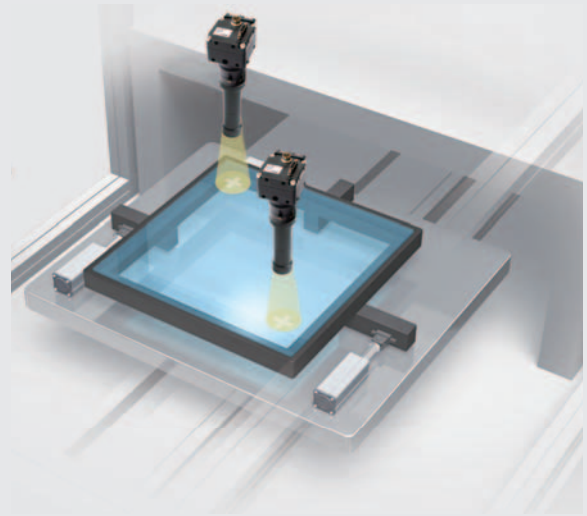
Combining the FLV-EP08-series Spot Light and Camera-mount Lighting Controller saves space and simplifies wiring.

Illustration of Combination of Spot Light and Controller



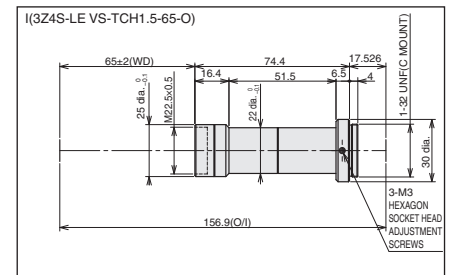
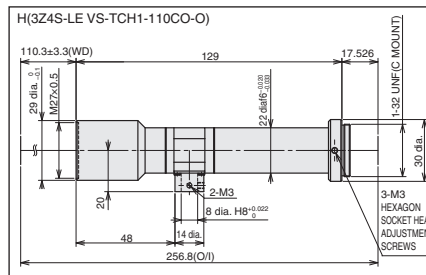
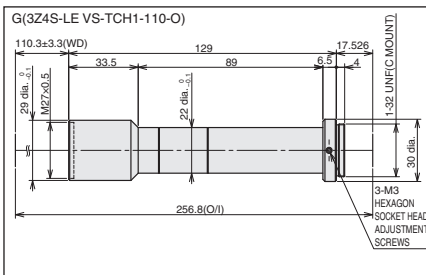
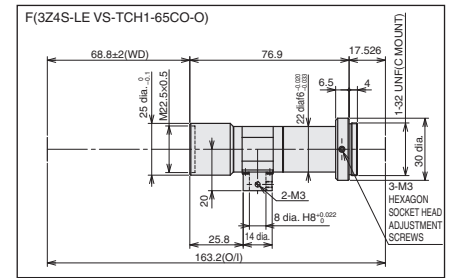
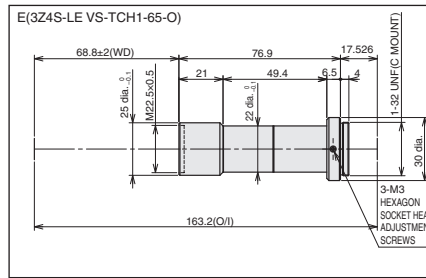
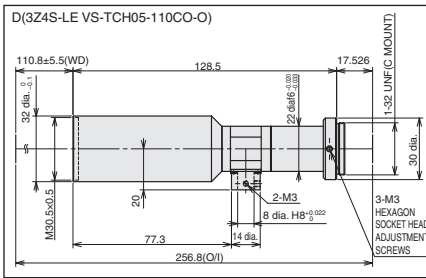
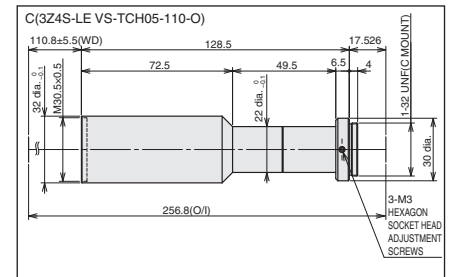
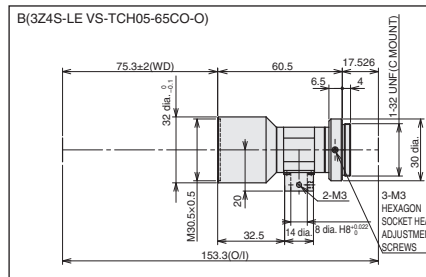
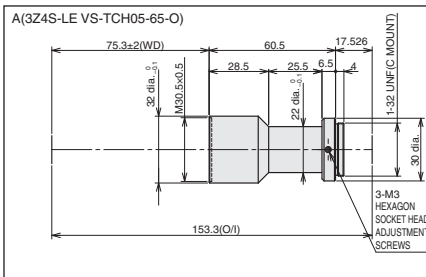
Only the camera cable is connected from control panel

Illustration of Alignment Mark Detection



## Dimensions

(Unit: mm)



Standard Models  
FLV Series

High-brightness Models  
FL Series

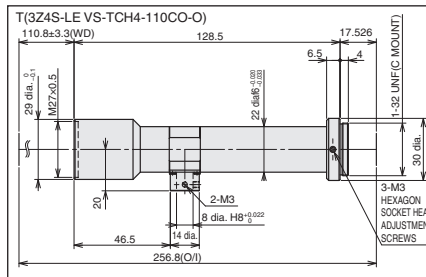
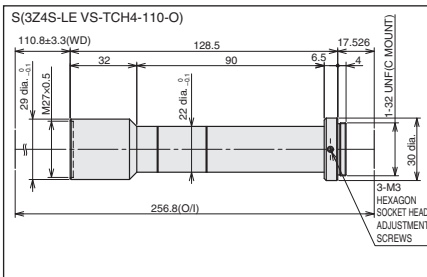
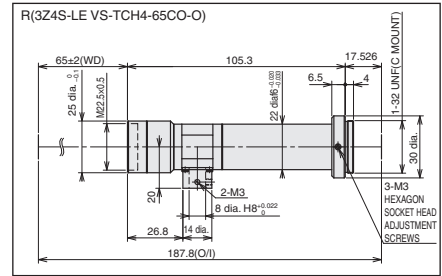
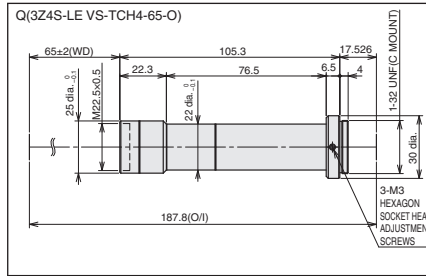
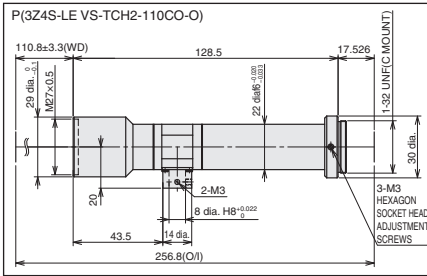
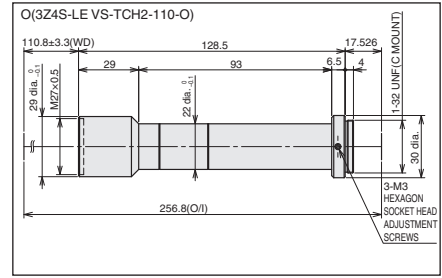
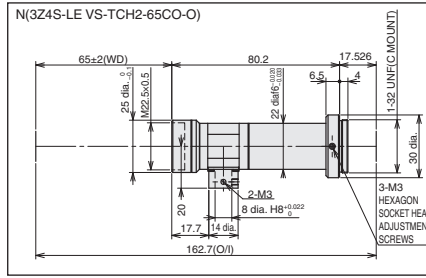
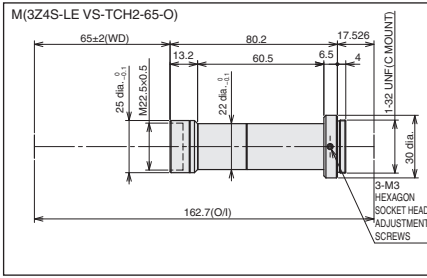
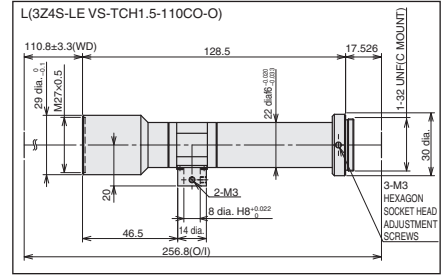
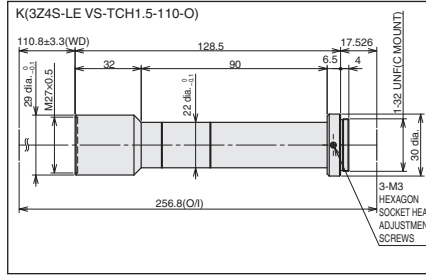
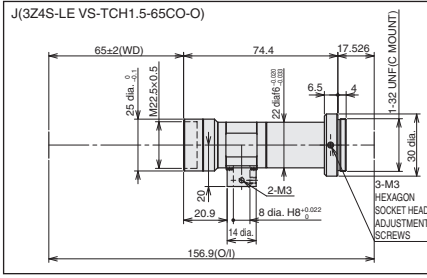
LED Characteristics

Lenses

# High-resolution Telecentric Lens for C-mount Cameras VS-TCH Series

## Dimensions

(Unit: mm)



## Specifications

|                            |   |
|----------------------------|---|
| <b>Ambient temperature</b> | Operating: 0 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%,<br>Storage: 35% to 90% (with no condensation)          |

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Ultra-high-resolution Telecentric Lens for C-mount Cameras

## VS-TEV Series

- Ultra-high-resolution telecentric lens for 1.1-inch cameras.
- Lineup of 3 models to meet various optical magnification requirements.
- Variable magnification for use at a wide range of working distances. Balance between depth of field and contrast can be adjusted.
- Low-distortion design.
- High-quality images can be obtained from any part of the area.
- Ideal for high-accuracy alignment.



### Ordering Information

| Recommended camera                         | Model               | Dimensions | Optical magnification | WD *1 (mm) | Effective FNO<br>* Maximum aperture | Depth of field *2 (mm) | Resolution *3 (mm) | TV distortion | Weight (g) | Maximum compatible CCD |
|--|---------------------|------------|-----------------------|------------|-------------------------------------|------------------------|--------------------|---------------|------------|------------------------|
| FH-S□02<br>FH-S□04<br>FH-S□X12<br>FH-S□21R | 3Z4S-LE VS-TEV0305  | A          | 0.3 ×                 | 221.5      | 4.3                                 | 3.8                    | 9.59               | 0.03%         | 390        | 1.1 inches             |
|  |                     |            | 0.4 ×                 | 162.0      | 5.3                                 | 2.6                    | 8.83               | -0.04%        |            |                        |
|  |                     |            | 0.5 ×                 | 125.8      | 6.2                                 | 2.0                    | 8.39               | -0.04%        |            |                        |
|  | 3Z4S-LE VS-TEV05075 | B          | 0.5 ×                 | 173.2      | 5.0                                 | 1.6                    | 6.71               | 0.06%         | 350        |                        |
|  |                     |            | 0.75 ×                | 133.9      | 6.8                                 | 1.0                    | 6.10               | 0.04%         |            |                        |
|  |                     |            | 0.75 ×                | 133.9      | 6.8                                 | 1.0                    | 6.10               | 0.04%         |            |                        |
| 3Z4S-LE VS-TEV07510                        | C                   | 0.75 ×     | 133.9                 | 6.8        | 1.0                                 | 6.10                   | 0.04%              | 370           |            |                        |
|  |                     | 1.0 ×      | 114.0                 | 8.5        | 0.7                                 | 5.69                   | 0.02%              |               |            |                        |

\*1. The working distance is the distance from the end of the lens to the workpiece.

\*2. The depth of field is calculated using a permissible circle of confusion diameter of 0.04 mm.

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

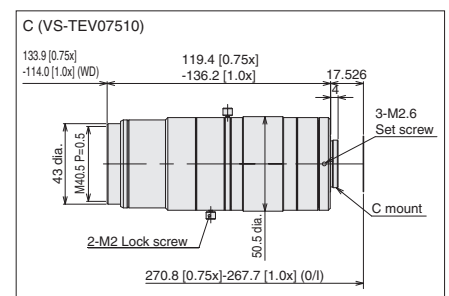
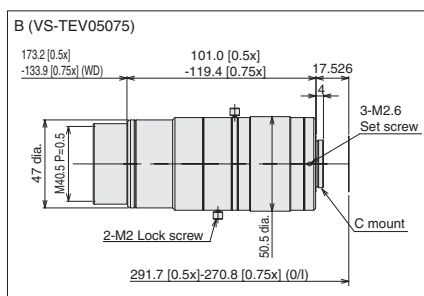
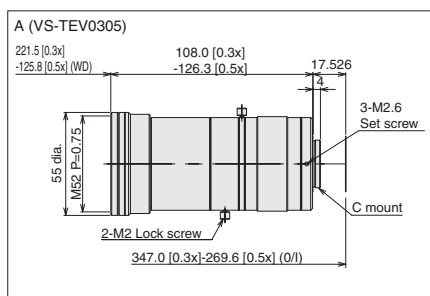
### Camera and Field of View Table

| Camera   | Size of image element (inch) | Imaging area H × V (mm) | Field of view H × V (mm) |                                       |  |                        |
|----------|------------------------------|-------------------------|--------------------------|---------------------------------------|--|------------------------|
|          |                              |                         | 0.3 ×<br>(VS-TEV0305)    | 0.5 ×<br>(VS-TEV0305/<br>VS-TEV05075) | 0.75 ×<br>(VS-TEV05075/<br>VS-TEV-07510) | 1.0 ×<br>(VS-TEV07510) |
| FH-S□02  | 2/3" equivalent              | 11.3 × 6.0              | 37.5 × 19.9              | 22.5 × 12.0                           | 15.0 × 8.0                               | 11.3 × 6.0             |
| FH-S□04  | 1" equivalent                | 11.3 × 11.3             | 37.5 × 37.5              | 22.5 × 22.5                           | 15.0 × 15.0                              | 11.3 × 11.3            |
| FH-S□X12 | 1.1" equivalent              | 14.1 × 10.4             | 47.1 × 34.5              | 28.2 × 20.7                           | 18.8 × 13.8                              | 14.1 × 10.4            |
| FZ-S□21R | 1" equivalent                | 13.3 × 8.9              | 44.4 × 29.6              | 26.6 × 17.7                           | 17.7 × 11.8                              | 13.3 × 8.9             |

Note: The field of view is a calculated value and not a guaranteed value.

### Dimensions

(Unit: mm)



### Specifications

|                            |  |
|----------------------------|--|
| <b>Mounting</b>            | C mount  |
| <b>Ambient temperature</b> | Operating: -5 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 0% to 80%,<br>Storage: 0% to 90% (with no condensation)             |

# Vibrations and Shocks Resistant Lens for C-mount Cameras

## VS-MCA Series

- Vibrations and shocks resistant lens for megapixel C-mount cameras.
- Lineup of 10 models with focal lengths ranging from 4 to 75 mm.
- The increased resistance to vibration enables application in environments where the lens is moved and where ambient vibrations occur.
- Install in narrow space without a lock screw.
- The hexagonal lock ring makes tightening easier.



### Ordering Information

| Recommended camera  | Model                | Dimensions | Focal distance (mm) | Aperture (fixed F No.) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field * (mm) | Maximum compatible CCD |          |
|---|----------------------|------------|---------------------|------------------------|-----------------------------|-------------------|-------------|---------|-----------------------|------------------------|----------|
| FZ-S□<br>FZ-SH□<br>FH-S□<br>FH-S□X<br>FH-S□05R<br>FHV7H-□ | 3Z4S-LE VS-MCA4      | A          | 4                   | 2                      | 31 dia.                     | 29.0 to 29.2      | M27.0 P0.5  | 403.2   | 1680.0                | 1/2 inch               |          |
|   |                      |            |                     |                        |                             |                   |             | 196.2   | 420.0                 |                        |          |
|   |                      |            |                     |                        |                             |                   |             | 92.7    | 105.0                 |                        |          |
|   | 3Z4S-LE VS-MCA4-F5.6 |            |                     | 403.2                  |                             | 4560.0            |             |         |                       |                        |          |
|   |                      |            |                     |                        |                             | 196.2             | 1140.0      |         |                       |                        |          |
|   |                      |            |                     |                        |                             | 92.7              | 290.0       |         |                       |                        |          |
|   | 3Z4S-LE VS-MCA4-F8   | 403.2      | 6480.0              |                        |                             |                   |             |         |                       |                        |          |
|   |                      |            | 196.2               | 1640.0                 |                             |                   |             |         |                       |                        |          |
|   |                      |            | 92.7                | 415.0                  |                             |                   |             |         |                       |                        |          |
|   | 3Z4S-LE VS-MCA6.5    | B          | 6.5                 | 2                      | 31 dia.                     | 23.1 to 23.4      | M27.0 P0.5  | 656.0   | 1840.0                |                        | 1/2 inch |
|   |                      |            |                     |                        |                             |                   |             | 209.6   | 204.4                 |                        |          |
|   |                      |            |                     |                        |                             |                   |             | 98.0    | 51.1                  |                        |          |
| 3Z4S-LE VS-MCA6.5-F5.6                                    | 656.0                |            |                     | 4560.0                 |                             |                   |             |         |                       |                        |          |
|   |                      |            |                     | 209.6                  |                             | 515.6             |             |         |                       |                        |          |
|   |                      |            |                     | 98.0                   |                             | 131.1             |             |         |                       |                        |          |
| 3Z4S-LE VS-MCA6.5-F8                                      | 656.0                | 6480.0     |                     |                        |                             |                   |             |         |                       |                        |          |
|   |                      | 209.6      | 728.9               |                        |                             |                   |             |         |                       |                        |          |
|   |                      | 98.0       | 188.9               |                        |                             |                   |             |         |                       |                        |          |
| 3Z4S-LE VS-MCA10  | C                    | 10         | 2                   | 31 dia.                | 24.2 to 25.5                | M27.0 P0.5        | 504.1       | 460.0   | 1/2 inch              |                        |          |
|   |                      |            |                     |                        |                             |                   | 94.0        | 19.2    |                       |                        |          |
|   |                      |            |                     |                        |                             |                   | 59.9        | 9.2     |                       |                        |          |
| 3Z4S-LE VS-MCA10-F5.6                                     |                      |            | 504.1               |                        | 1140.0                      |                   |             |         |                       |                        |          |
|   |                      |            |                     |                        | 94.0                        | 49.6              |             |         |                       |                        |          |
|   |                      |            |                     |                        | 59.9                        | 22.8              |             |         |                       |                        |          |
| 3Z4S-LE VS-MCA10-F8                                       | 504.1                | 1640.0     |                     |                        |                             |                   |             |         |                       |                        |          |
|   |                      | 94.0       | 70.4                |                        |                             |                   |             |         |                       |                        |          |
|   |                      | 59.9       | 32.7                |                        |                             |                   |             |         |                       |                        |          |
| 3Z4S-LE VS-MCA15  | D                    | 15         | 2                   | 31 dia.                | 27.9 to 32.0                | M27.0 P0.5        | 490.7       | 186.7   | 2/3 inch              |                        |          |
|   |                      |            |                     |                        |                             |                   | 65.4        | 4.8     |                       |                        |          |
|   |                      |            |                     |                        |                             |                   | 40.3        | 2.3     |                       |                        |          |
| 3Z4S-LE VS-MCA15-F5.6                                     |                      |            | 490.7               |                        | 515.6                       |                   |             |         |                       |                        |          |
|   |                      |            |                     |                        | 65.4                        | 13.4              |             |         |                       |                        |          |
|   |                      |            |                     |                        | 40.3                        | 6.5               |             |         |                       |                        |          |
| 3Z4S-LE VS-MCA15-F8                                       |                      |            | 490.7               |                        | 728.9                       |                   |             |         |                       |                        |          |
|   |                      |            |                     |                        | 65.4                        | 19.2              |             |         |                       |                        |          |
|   |                      |            |                     |                        | 40.3                        | 9.2               |             |         |                       |                        |          |

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Vibrations and Shocks Resistant Lens for C-mount Cameras VS-MCA Series

| Recommended camera   | Model            | Dimensions | Focal distance (mm) | Aperture (fixed F No.) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field * (mm) | Maximum compatible CCD |
|--|------------------|------------|---------------------|------------------------|-----------------------------|-------------------|-------------|---------|-----------------------|------------------------|
| FZ-S□<br>FZ-SH□<br>FH-S□<br>FH-S□X<br>FZ-S□2M<br>FZ-S□5M3<br>FH-S□05R<br>FH-S□X05<br>FHV7H-□ | 3Z4S-LE VS-MCA20 | E          | 20                  | 2                      | 31 dia.                     | 24.5 to 32.0      | M27.0 P0.5  | 516.8   | 105.0                 | 2/3 inch               |
|  |                  |            |                     |                        |                             |                   |             | 81.8    | 3.2                   |                        |
|  |                  |            |                     |                        |                             |                   |             | 50.7    | 1.5                   |                        |
|  |                  |            |                     | 5.6                    | 31 dia.                     | 24.5 to 32.0      | M27.0 P0.5  | 516.8   | 290.0                 |                        |
|  |                  |            |                     |                        |                             |                   |             | 81.8    | 9.0                   |                        |
|  |                  |            |                     |                        |                             |                   |             | 50.7    | 3.9                   |                        |
|  |                  |            |                     | 8                      | 31 dia.                     | 24.5 to 32.0      | M27.0 P0.5  | 516.8   | 415.0                 |                        |
|  |                  |            |                     |                        |                             |                   |             | 81.8    | 12.8                  |                        |
|  |                  |            |                     |                        |                             |                   |             | 50.7    | 5.6                   |                        |
|  | 3Z4S-LE VS-MCA25 | F          | 25                  | 2                      | 31 dia.                     | 27.0 to 38.5      | M27.0 P0.5  | 514.6   | 67.2                  | 2/3 inch               |
|  |                  |            |                     |                        |                             |                   |             | 106.6   | 3.2                   |                        |
|  |                  |            |                     |                        |                             |                   |             | 55.6    | 1.0                   |                        |
|  |                  |            |                     | 5.6                    | 31 dia.                     | 27.0 to 38.5      | M27.0 P0.5  | 514.6   | 188.8                 |                        |
|  |                  |            |                     |                        |                             |                   |             | 106.6   | 9.0                   |                        |
|  |                  |            |                     |                        |                             |                   |             | 55.6    | 2.7                   |                        |
|  |                  |            |                     | 8                      | 31 dia.                     | 27.0 to 38.5      | M27.0 P0.5  | 514.6   | 268.8                 |                        |
|  |                  |            |                     |                        |                             |                   |             | 106.6   | 12.8                  |                        |
|  |                  |            |                     |                        |                             |                   |             | 55.6    | 3.8                   |                        |
|  | 3Z4S-LE VS-MCA30 | G          | 30                  | 2                      | 31 dia.                     | 24.5 to 36.2      | M27.0 P0.5  | 513.5   | 53.3                  | 2/3 inch               |
|  |                  |            |                     |                        |                             |                   |             | 213.5   | 8.2                   |                        |
|  |                  |            |                     |                        |                             |                   |             | 80.1    | 1.3                   |                        |
|  |                  |            |                     | 5.6                    | 31 dia.                     | 24.5 to 36.2      | M27.0 P0.5  | 513.5   | 131.1                 |                        |
|  |                  |            |                     |                        |                             |                   |             | 213.5   | 22.8                  |                        |
|  |                  |            |                     |                        |                             |                   |             | 80.1    | 3.2                   |                        |
|  | 8                |            |                     | 31 dia.                | 24.5 to 36.2                | M27.0 P0.5        | 513.5       | 188.9   |                       |                        |
|  |                  |            |                     |                        |                             |                   | 213.5       | 32.7    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 80.1        | 4.6     |                       |                        |
| 3Z4S-LE VS-MCA35   | H                | 35         | 2                   | 31 dia.                | 32.0 to 45.7                | M27.0 P0.5        | 163.9       | 3.0     | 2/3 inch              |                        |
|  |                  |            |                     |                        |                             |                   | 145.9       | 2.2     |                       |                        |
|  |                  |            |                     |                        |                             |                   | 83.1        | 0.7     |                       |                        |
|  |                  |            | 5.6                 | 31 dia.                | 32.0 to 45.7                | M27.0 P0.5        | 163.9       | 8.4     |                       |                        |
|  |                  |            |                     |                        |                             |                   | 145.9       | 6.5     |                       |                        |
|  |                  |            |                     |                        |                             |                   | 83.1        | 1.7     |                       |                        |
|  |                  |            | 8                   | 31 dia.                | 32.0 to 45.7                | M27.0 P0.5        | 163.9       | 12.0    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 145.9       | 9.2     |                       |                        |
|  |                  |            |                     |                        |                             |                   | 83.1        | 2.5     |                       |                        |
| 3Z4S-LE VS-MCA50   | I                | 50         | 2                   | 31 dia.                | 44.0 to 63.4                | M27.0 P0.5        | 633.6       | 32.5    | 2/3 inch              |                        |
|  |                  |            |                     |                        |                             |                   | 270.1       | 6.0     |                       |                        |
|  |                  |            |                     |                        |                             |                   | 128.7       | 1.3     |                       |                        |
|  |                  |            | 5.6                 | 31 dia.                | 44.0 to 63.4                | M27.0 P0.5        | 633.6       | 75.0    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 270.1       | 13.4    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 128.7       | 2.9     |                       |                        |
|  |                  |            | 8                   | 31 dia.                | 44.0 to 63.4                | M27.0 P0.5        | 633.6       | 107.5   |                       |                        |
|  |                  |            |                     |                        |                             |                   | 270.1       | 19.2    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 128.7       | 4.1     |                       |                        |
| 3Z4S-LE VS-MCA75   | J                | 75         | 2                   | 31 dia.                | 70.0 to 105.5               | M27.0 P0.5        | 562.9       | 16.7    | 2/3 inch              |                        |
|  |                  |            |                     |                        |                             |                   | 404.4       | 9.2     |                       |                        |
|  |                  |            |                     |                        |                             |                   | 153.8       | 1.3     |                       |                        |
|  |                  |            | 5.6                 | 31 dia.                | 70.0 to 105.5               | M27.0 P0.5        | 562.9       | 28.6    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 404.4       | 13.4    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 153.8       | 2.5     |                       |                        |
|  |                  |            | 8                   | 31 dia.                | 70.0 to 105.5               | M27.0 P0.5        | 562.9       | 41.2    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 404.4       | 19.2    |                       |                        |
|  |                  |            |                     |                        |                             |                   | 153.8       | 3.6     |                       |                        |

Note: Vibrations and Shocks Resistant Lenses for 1-inch image sensors are also available. Ask your OMRON representative for details.

\* Calculated using a permissible circle of confusion diameter of 0.04 mm.

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

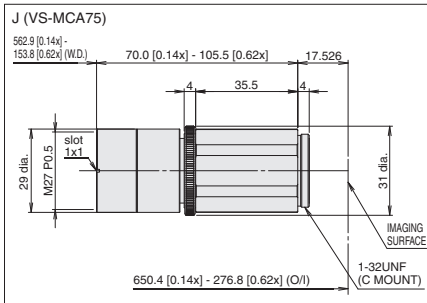
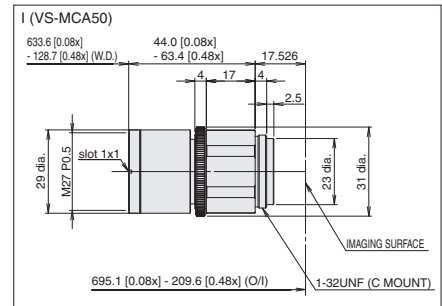
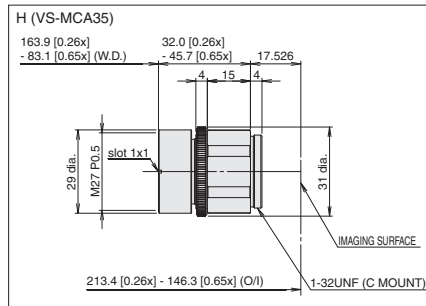
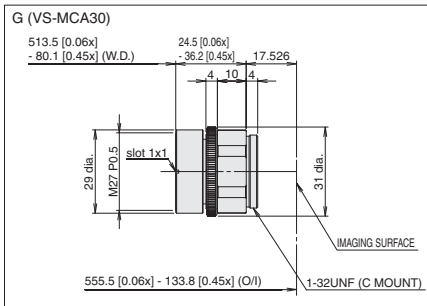
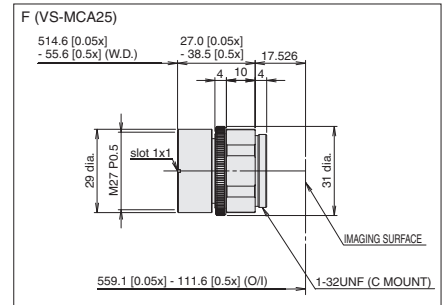
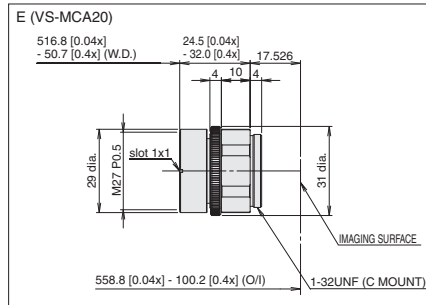
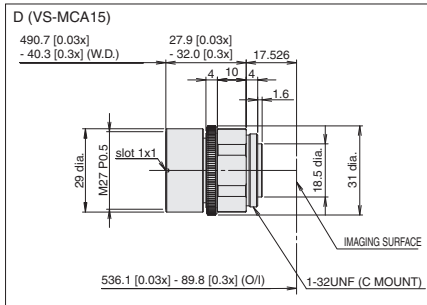
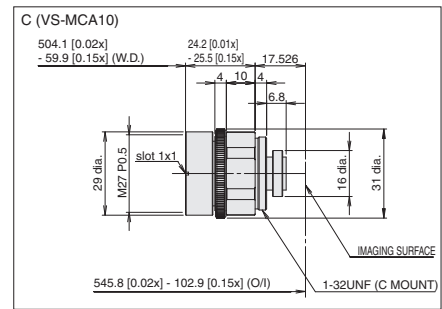
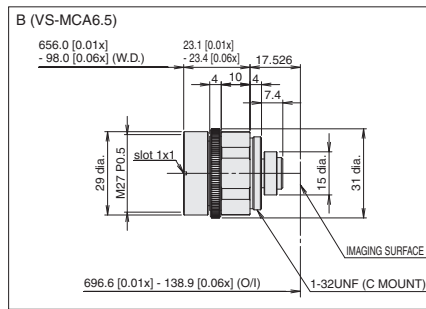
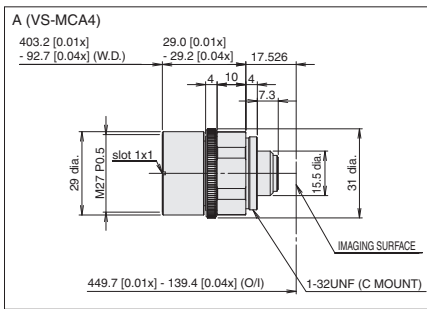
Lenses



# Vibrations and Shocks Resistant Lens for C-mount Cameras VS-MCA Series

## Dimensions

(Unit:mm)



## Specifications

|                            |  |
|----------------------------|--|
| <b>Mounting</b>            | C mount  |
| <b>Ambient temperature</b> | Operating: -5 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%,<br>Storage: 35% to 90% (with no condensation)           |

## Optical Chart

Refer to page 95, 96, 97, 99 and 100.

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Non-telecentric Macro Lens for C-mount Cameras

## VS-MC Series

- Lineup of 4 models with magnifications ranging from 0.1x to 1.0x and WD ranging from 82.4 to 325.5 mm.
- 16-mm-dia. simple mechanism with high resistance to vibration.



### Ordering Information

| Recommend camera   | Model                      | Dimensions | Magnification | Effective FNO | O/I (mm) | WD (mm) | Depth of field *1 (mm) | Resolution *2 (μm) | TV distortion |
|--|----------------------------|------------|---------------|---------------|----------|---------|------------------------|--------------------|---------------|
| FZ-S□<br>FZ-SH□<br>FH-S□<br>FH-S□X<br>FZ-S□2M<br>FZ-S□5M3<br>FH-S□05R<br>FH-S□X05<br>FHV7H-□ | <b>3Z4S-LE VS-MC01-330</b> | A          | 0.1x          | 4.43          | 364.5    | 325.5   | 35.4                   | 30.5               | 0.01% max.    |
|  | <b>3Z4S-LE VS-MC03-180</b> | B          | 0.3x          | 5.29          | 248.5    | 184.8   | 4.7                    | 11.6               | 0.00% max.    |
|  | <b>3Z4S-LE VS-MC05-130</b> | C          | 0.5x          | 6.10          | 198.8    | 126.3   | 2.0                    | 8.2                | 0.00% max.    |
|  | <b>3Z4S-LE VS-MC1-80</b>   | D          | 1.0x          | 8.14          | 176.8    | 82.4    | 0.7                    | 5.5                | 0.00% max.    |

\*1. Calculated using a permissible circle of confusion diameter of 0.04 mm.

\*2. Calculated using a wavelength of 550 nm.

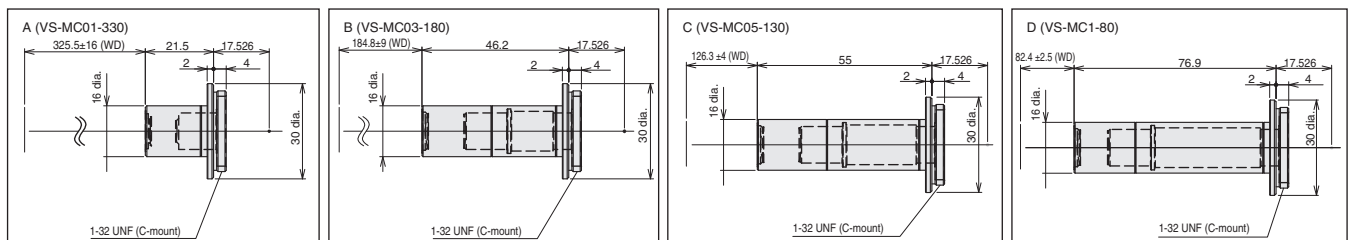
### Camera and Field of View Table

| Camera             | Size of image element (inch) | Imaging area H×V (mm) | Field of view H×V (mm) |                     |                     |                   |
|--------------------|------------------------------|-----------------------|------------------------|---------------------|---------------------|-------------------|
|                    |                              |                       | 0.1 × (VS-MC01-330)    | 0.3 × (VS-MC03-180) | 0.5 × (VS-MC05-130) | 1.0 × (VS-MC1-80) |
| FH-S□/FZ-S□/FZ-SH□ | 1/3" equivalent              | 4.8 × 3.6             | 48.0 × 36.0            | 16.0 × 12.0         | 9.6 × 7.2           | 4.8 × 3.6         |
| FH-S□X             | 1/2.9" equivalent            | 5.0 × 3.8             | 50.0 × 38.0            | 16.7 × 12.7         | 10.0 × 7.6          | 5.0 × 3.8         |
| FH-S□05R           | 1/2.5" equivalent            | 5.7 × 4.3             | 57.0 × 43.0            | 19.0 × 14.3         | 11.4 × 8.6          | 5.7 × 4.3         |
| FZ-S□2M            | 1/1.8" equivalent            | 7.0 × 5.3             | 70.0 × 53.0            | 23.3 × 17.7         | 14.0 × 10.6         | 7.0 × 5.3         |
| FH-S□X05/FZ-S□5M3  | 2/3" equivalent              | 8.4 × 7.1             | 84.0 × 71.0            | 28.0 × 23.7         | 16.8 × 14.2         | 8.4 × 7.1         |
| FHV7H-□004-C       | 1/2.9" equivalent            | 5.0×3.8               | 50.0×38.0              | 16.7×12.7           | 10.0×7.6            | 5.0×3.8           |
| FHV7H-□016-C       | 1/2.9" equivalent            | 5.0×3.8               | 50.0×38.0              | 16.7×12.7           | 10.0×7.6            | 5.0×3.8           |
| FHV7H-□032-C       | 1/1.8" equivalent            | 7.1×5.3               | 71.0×53.0              | 23.7×17.7           | 14.2×10.6           | 7.1×5.3           |
| FHV7H-□050-C       | 2/3" equivalent              | 8.5×7.1               | 85.0×71.0              | 28.3×23.7           | 17.0×14.2           | 8.5×7.1           |
| FHV7H-□063R-C      | 1/1.8" equivalent            | 7.4×5.0               | 74.0×50.0              | 24.7×16.7           | 14.8×10.0           | 7.4×5.0           |
| FHV7H-□120R-C      | 1/1.7" equivalent            | 7.4×5.6               | 74.0×56.0              | 24.7×18.7           | 14.8×11.2           | 7.4×5.6           |

Note: The field of view is a calculated value and not a guaranteed value.

### Dimensions

(Unit:mm)



### Specifications

|                            |   |
|----------------------------|---|
| <b>Mounting</b>            | C mount   |
| <b>Ambient temperature</b> | Operating: 0 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%,<br>Storage: 35% to 90% (with no condensation)          |

# High-resolution, Vibrations and Shocks Resistant Lens for C-mount Cameras

## VS-MCH1 Series

- Vibrations resistant lens with iris plate system for megapixel C-mount cameras
- Lineup of 6 models with focal lengths ranging from 8 to 50 mm
- Iris plate system to change F number
- Threaded iris plate system to lock the iris in place
- Hexagonal/octagonal lens mount, lock ring, and lens end make tightening easier
- Ideal for use in environments where the point-locked lens is moved under the effects of ambient vibration
- Install in narrow space without a lock screw



### Ordering Information

| Recommended camera             | Model             | Dimensions | Focal distance (mm) | Aperture (F No) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field * (mm) | Maximum compatible CCD |
|--------------------------------|-------------------|------------|---------------------|-----------------|-----------------------------|-------------------|-------------|---------|-----------------------|------------------------|
| FH-S□02<br>FH-S□04<br>FH-S□21R | 3Z4S-LE VS-MC08H1 | A          | 8                   | 1.4             | 59 dia.                     | 59.0 to 60.2      | M55.0 P0.75 | 302.6   | 179.0                 | 1 inch                 |
|                                |                   |            |                     | 5.6             |                             |                   |             | 55.4    | 12.0                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 27.9    | 5.7                   |                        |
|                                |                   |            |                     | 1.4             |                             |                   |             | 302.6   | 735.0                 |                        |
|                                |                   |            |                     | 5.6             |                             |                   |             | 55.4    | 49.3                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 27.9    | 22.9                  |                        |
|                                |                   |            |                     | 1.4             |                             |                   |             | 302.6   | 1050.0                |                        |
|                                |                   |            |                     | 5.6             |                             |                   |             | 55.4    | 70.4                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 27.9    | 32.7                  |                        |
|                                | 3Z4S-LE VS-MC12H1 | B          | 12                  | 1.4             | 38 dia.                     | 48.0 to 49.8      | M35.5 P0.5  | 465.4   | 179.0                 | 1 inch                 |
|                                |                   |            |                     | 5.6             |                             |                   |             | 103.8   | 12.0                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 63.6    | 5.7                   |                        |
|                                |                   |            |                     | 1.4             |                             |                   |             | 465.4   | 735.0                 |                        |
|                                |                   |            |                     | 5.6             |                             |                   |             | 103.8   | 49.3                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 63.6    | 22.9                  |                        |
|                                |                   |            |                     | 1.4             |                             |                   |             | 465.4   | 1050.0                |                        |
|                                |                   |            |                     | 5.6             |                             |                   |             | 103.8   | 70.4                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 63.6    | 32.7                  |                        |
|                                | 3Z4S-LE VS-MC16H1 | C          | 16                  | 1.4             | 36.5 dia.                   | 45.0 to 49.1      | M30.5 P0.5  | 648.1   | 179.0                 | 1 inch                 |
|                                |                   |            |                     | 5.6             |                             |                   |             | 176.6   | 12.0                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 58.1    | 2.3                   |                        |
|                                |                   |            |                     | 1.4             |                             |                   |             | 648.1   | 735.0                 |                        |
|                                |                   |            |                     | 5.6             |                             |                   |             | 176.6   | 49.3                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 58.1    | 9.0                   |                        |
| 1.4                            |                   |            |                     | 648.1           |                             |                   |             | 1050.0  |                       |                        |
| 5.6                            |                   |            |                     | 176.6           |                             |                   |             | 70.4    |                       |                        |
| 8                              |                   |            |                     | 58.1            |                             |                   |             | 12.8    |                       |                        |
| 3Z4S-LE VS-MC25H1              | D                 | 25         | 1.4                 | 36.5 dia.       | 33.5 to 42.4                | M30.5 P0.5        | 1007.9      | 179.0   | 1 inch                |                        |
|                                |                   |            | 5.6                 |                 |                             |                   | 245.3       | 12.0    |                       |                        |
|                                |                   |            | 8                   |                 |                             |                   | 63.7        | 1.2     |                       |                        |
|                                |                   |            | 1.4                 |                 |                             |                   | 1007.9      | 735.0   |                       |                        |
|                                |                   |            | 5.6                 |                 |                             |                   | 245.3       | 49.3    |                       |                        |
|                                |                   |            | 8                   |                 |                             |                   | 63.7        | 4.9     |                       |                        |
|                                |                   |            | 1.4                 |                 |                             |                   | 1007.9      | 1050.0  |                       |                        |
|                                |                   |            | 5.6                 |                 |                             |                   | 245.3       | 70.4    |                       |                        |
|                                |                   |            | 8                   |                 |                             |                   | 63.7        | 7.1     |                       |                        |
| 3Z4S-LE VS-MC35H1              | E                 | 35         | 1.4                 | 36.5 dia.       | 35.0 to 43.8                | M30.5 P0.5        | 1405.7      | 179.0   | 1 inch                |                        |
|                                |                   |            | 5.6                 |                 |                             |                   | 352.9       | 12.0    |                       |                        |
|                                |                   |            | 8                   |                 |                             |                   | 142.3       | 2.3     |                       |                        |
|                                |                   |            | 1.4                 |                 |                             |                   | 1405.7      | 735.0   |                       |                        |
|                                |                   |            | 5.6                 |                 |                             |                   | 352.9       | 49.3    |                       |                        |
|                                |                   |            | 8                   |                 |                             |                   | 142.3       | 9.0     |                       |                        |
|                                |                   |            | 1.4                 |                 |                             |                   | 1405.7      | 1050.0  |                       |                        |
|                                |                   |            | 5.6                 |                 |                             |                   | 352.9       | 70.4    |                       |                        |
|                                |                   |            | 8                   |                 |                             |                   | 142.3       | 12.8    |                       |                        |

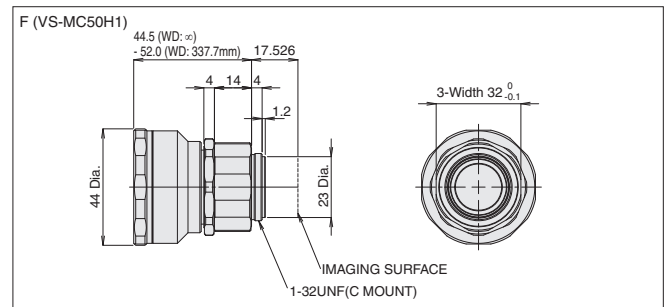
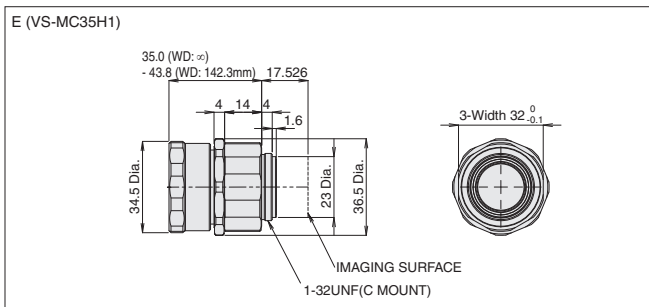
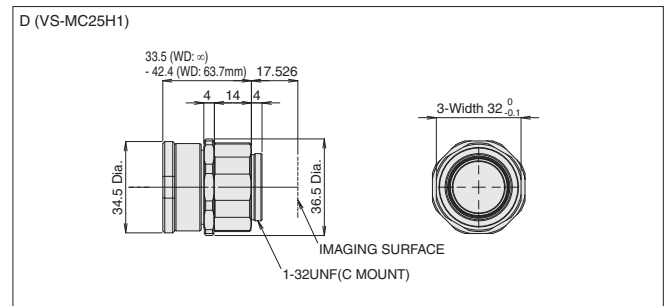
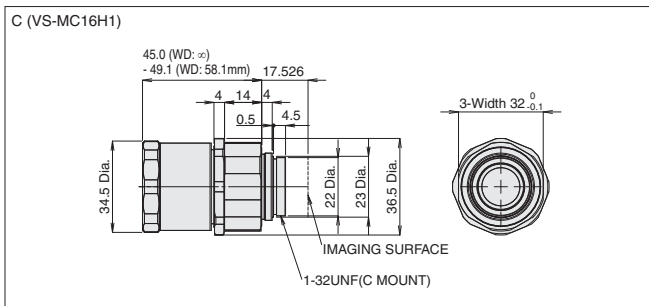
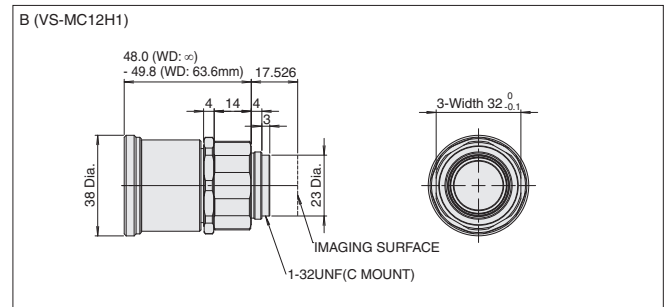
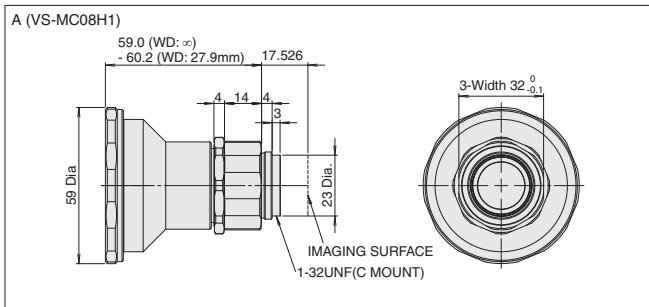
# High-resolution, Vibrations and Shocks Resistant Lens for C-mount Cameras VS-MCH1 Series

| Recommended camera             | Model             | Dimensions | Focal distance (mm) | Aperture (F No) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field * (mm) | Maximum compatible CCD |
|--------------------------------|-------------------|------------|---------------------|-----------------|-----------------------------|-------------------|-------------|---------|-----------------------|------------------------|
| FH-S□02<br>FH-S□04<br>FH-S□21R | 3Z4S-LE VS-MC50H1 | F          | 50                  | 1.4             | 44 dia.                     | 44.5 to 52.0      | M40.5 P0.5  | 2001.9  | 179.0                 | 1 inch                 |
|                                |                   |            |                     |                 |                             |                   |             | 504.1   | 12.0                  |                        |
|                                |                   |            |                     |                 |                             |                   |             | 337.7   | 5.7                   |                        |
|                                |                   |            |                     | 5.6             |                             |                   |             | 2001.9  | 735.0                 |                        |
|                                |                   |            |                     |                 |                             |                   |             | 504.1   | 49.3                  |                        |
|                                |                   |            |                     |                 |                             |                   |             | 337.7   | 22.9                  |                        |
|                                |                   |            |                     | 8               |                             |                   |             | 2001.9  | 1050.0                |                        |
|                                |                   |            |                     |                 |                             |                   |             | 504.1   | 70.4                  |                        |
|                                |                   |            |                     |                 |                             |                   |             | 337.7   | 32.7                  |                        |

\* Calculated using a permissible circle of confusion diameter of 0.04 mm.

## Dimensions

(Unit:mm)



## Specifications

|                            |  |
|----------------------------|--|
| <b>Mounting</b>            | C mount  |
| <b>Ambient temperature</b> | Operating: -5 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 0% to 80%,<br>Storage: 0% to 90% (with no condensation)             |

## Optical Chart

Refer to page 95.

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# High-resolution, Vibrations and Shocks Resistant Lens for C-mount Cameras

## VS-MCH Series

- Vibrations resistant lens for C-mount cameras.
- Lineup of 21 models: focal lengths from 12 to 100 mm and F-numbers of maximum aperture, 5.6, and 8.0.
- A lock ring locking the surface and the improved design of internal structure increase resistance to vibration in comparison to the previous model. This enables application in environments where the point-locked lens is moved under the effects of ambient vibration.
- Install in narrow space without a lock screw.



**Note:** Orders for VS-MCH series have been discontinued at the end of March 2021.

### Ordering Information

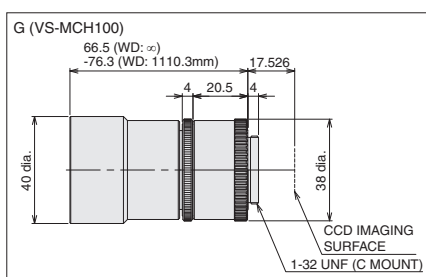
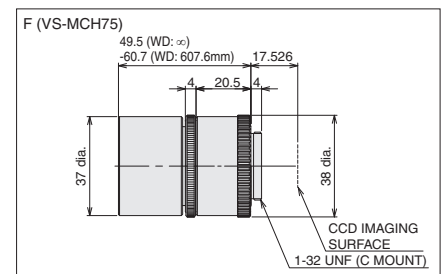
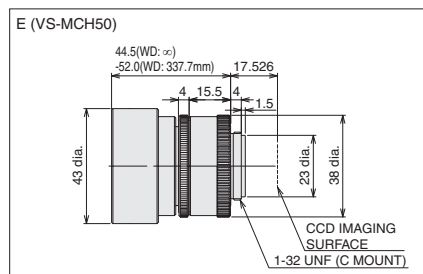
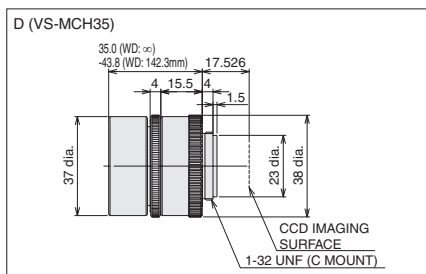
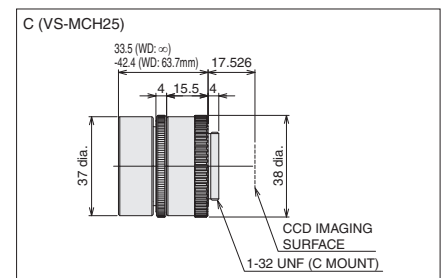
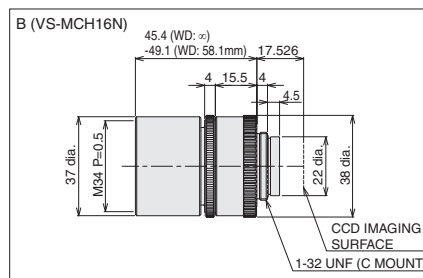
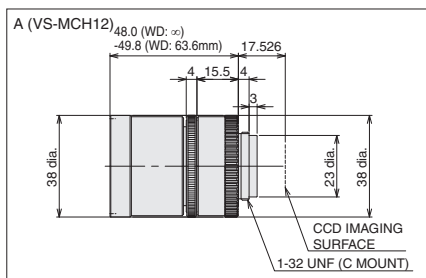
| Recommended camera             | Model                   | Dimensions | Focal distance (mm) | Aperture (F No) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field (mm) | Maximum compatible CCD |        |      |
|--------------------------------|-------------------------|------------|---------------------|-----------------|-----------------------------|-------------------|-------------|---------|---------------------|------------------------|--------|------|
| FH-S□02<br>FH-S□04<br>FH-S□21R | 3Z4S-LE VS-MCH12        | A          | 12                  | 2               | 38 dia.                     | 48.0 to 49.8      | M35.5 P0.5  | 465.4   | 262.0               | 1 inch                 |        |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 103.8               |                        | 17.6   |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 63.6                |                        | 8.2    |      |
|                                | 3Z4S-LE VS-MCH12-FNO56  |            |                     | 5.6             | 38 dia.                     | 48.0 to 49.8      | M35.5 P0.5  | 465.4   | 735.0               |                        | 103.8  | 49.3 |
|                                |                         |            |                     |                 |                             |                   |             |         | 63.6                |                        | 22.9   |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 465.4               |                        | 1050.0 |      |
|                                | 3Z4S-LE VS-MCH12-FNO80  | 8          | 38 dia.             | 48.0 to 49.8    | M35.5 P0.5                  | 103.8             | 70.4        | 63.6    | 32.7                |                        |        |      |
|                                | 3Z4S-LE VS-MCH16N       | B          | 16                  | 2               | 38 dia.                     | 45.4 to 49.1      | M34.0 P0.5  | 648.1   | 262.0               | 1 inch                 |        |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 176.6               |                        | 17.6   |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 58.1                |                        | 3.2    |      |
|                                | 3Z4S-LE VS-MCH16N-FNO56 |            |                     | 5.6             | 38 dia.                     | 45.4 to 49.1      | M34.0 P0.5  | 648.1   | 735.0               |                        | 176.6  | 49.3 |
|                                |                         |            |                     |                 |                             |                   |             |         | 58.1                |                        | 9.0    |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 648.1               |                        | 1050.0 |      |
|                                | 3Z4S-LE VS-MCH16N-FNO80 | 8          | 38 dia.             | 45.4 to 49.1    | M34.0 P0.5                  | 176.6             | 70.4        | 58.1    | 12.8                |                        |        |      |
|                                | 3Z4S-LE VS-MCH25        | C          | 25                  | 2               | 38 dia.                     | 33.5 to 42.4      | M34.0 P0.5  | 1007.9  | 262.0               | 1 inch                 |        |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 245.3               |                        | 17.6   |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 63.7                |                        | 1.8    |      |
|                                | 3Z4S-LE VS-MCH25-FNO56  |            |                     | 5.6             | 38 dia.                     | 33.5 to 42.4      | M34.0 P0.5  | 1007.9  | 735.0               |                        | 245.3  | 49.3 |
|                                |                         |            |                     |                 |                             |                   |             |         | 63.7                |                        | 4.9    |      |
|                                |                         |            |                     |                 |                             |                   |             |         | 1007.9              |                        | 1050.0 |      |
|                                | 3Z4S-LE VS-MCH25-FNO80  | 8          | 38 dia.             | 33.5 to 42.4    | M34.0 P0.5                  | 245.3             | 70.4        | 63.7    | 7.1                 |                        |        |      |
| 3Z4S-LE VS-MCH35               | D                       | 35         | 2                   | 38 dia.         | 35.0 to 43.8                | M34.0 P0.5        | 1405.7      | 262.0   | 1 inch              |                        |        |      |
|                                |                         |            |                     |                 |                             |                   |             | 352.9   |                     | 17.6                   |        |      |
|                                |                         |            |                     |                 |                             |                   |             | 142.3   |                     | 3.2                    |        |      |
| 3Z4S-LE VS-MCH35-FNO56         |                         |            | 5.6                 | 38 dia.         | 35.0 to 43.8                | M34.0 P0.5        | 1405.7      | 735.0   |                     | 352.9                  | 49.3   |      |
|                                |                         |            |                     |                 |                             |                   |             | 142.3   |                     | 9.0                    |        |      |
|                                |                         |            |                     |                 |                             |                   |             | 1405.7  |                     | 1050.0                 |        |      |
| 3Z4S-LE VS-MCH35-FNO80         | 8                       | 38 dia.    | 35.0 to 43.8        | M34.0 P0.5      | 352.9                       | 70.4              | 142.3       | 12.8    |                     |                        |        |      |
| 3Z4S-LE VS-MCH50               | E                       | 50         | 2                   | 43 dia.         | 44.5 to 52.0                | M40.5 P0.5        | 2001.9      | 262.0   | 1 inch              |                        |        |      |
|                                |                         |            |                     |                 |                             |                   |             | 504.1   |                     | 17.6                   |        |      |
|                                |                         |            |                     |                 |                             |                   |             | 337.7   |                     | 3.2                    |        |      |
| 3Z4S-LE VS-MCH50-FNO56         |                         |            | 5.6                 | 43 dia.         | 44.5 to 52.0                | M40.5 P0.5        | 2001.9      | 735.0   |                     | 504.1                  | 49.3   |      |
|                                |                         |            |                     |                 |                             |                   |             | 337.7   |                     | 22.9                   |        |      |
|                                |                         |            |                     |                 |                             |                   |             | 2001.9  |                     | 1050.0                 |        |      |
| 3Z4S-LE VS-MCH50-FNO80         | 8                       | 43 dia.    | 44.5 to 52.0        | M40.5 P0.5      | 504.1                       | 70.4              | 337.7       | 32.7    |                     |                        |        |      |

# High-resolution, Vibrations and Shocks Resistant Lens for C-mount Cameras VS-MCH Series

| Recommended camera             | Model                  | Dimensions | Focal distance (mm) | Aperture (F No) | Maximum outer diameter (mm) | Total length (mm) | Filter size   | WD (mm) | Depth of field (mm) | Maximum compatible CCD |
|--------------------------------|------------------------|------------|---------------------|-----------------|-----------------------------|-------------------|---------------|---------|---------------------|------------------------|
| FH-S□02<br>FH-S□04<br>FH-S□21R | 3Z4S-LE VS-MCH75       | F          | 75                  | 2.5             | 38 dia.                     | 49.5 to 60.7      | M34.0<br>P0.5 | 3105.9  | 262.0               | 1 inch                 |
|                                | 857.4                  |            |                     |                 |                             |                   |               | 17.6    |                     |                        |
|                                | 607.6                  |            |                     |                 |                             |                   |               | 8.2     |                     |                        |
|                                | 3105.9                 |            |                     | 735.0           |                             |                   |               |         |                     |                        |
|                                | 857.4                  |            |                     | 49.3            |                             |                   |               |         |                     |                        |
|                                | 607.6                  |            |                     | 22.9            |                             |                   |               |         |                     |                        |
|                                | 3Z4S-LE VS-MCH75-FNO56 | 8          | 38 dia.             | 49.5 to 60.7    | M34.0<br>P0.5               | 3105.9            | 1050.0        |         |                     |                        |
|                                | 857.4                  |            |                     |                 |                             | 70.4              |               |         |                     |                        |
|                                | 607.6                  |            |                     |                 |                             | 32.7              |               |         |                     |                        |
|                                | 3Z4S-LE VS-MCH75-FNO80 | G          | 100                 | 2.8             | 40 dia.                     | 66.5 to 76.3      | M37.5<br>P0.5 | 4043.7  | 262.0               | 1 inch                 |
|                                | 2088.1                 |            |                     |                 |                             |                   |               | 94.1    |                     |                        |
|                                | 1110.3                 |            |                     |                 |                             |                   |               | 17.6    |                     |                        |
| 3Z4S-LE VS-MCH100              | 5.6                    | 40 dia.    | 66.5 to 76.3        | M37.5<br>P0.5   | 4043.7                      | 735.0             |               |         |                     |                        |
| 2088.1                         |                        |            |                     |                 | 188.2                       |                   |               |         |                     |                        |
| 1110.3                         |                        |            |                     |                 | 49.3                        |                   |               |         |                     |                        |
| 3Z4S-LE VS-MCH100-FNO56        | 8                      | 40 dia.    | 66.5 to 76.3        | M37.5<br>P0.5   | 4043.7                      | 1050.0            |               |         |                     |                        |
| 2088.1                         |                        |            |                     |                 | 268.8                       |                   |               |         |                     |                        |
| 1110.3                         |                        |            |                     |                 | 70.4                        |                   |               |         |                     |                        |

## Dimensions

(Unit:mm)



## Specifications

|                            |  |
|----------------------------|--|
| <b>Mounting</b>            | C mount  |
| <b>Ambient temperature</b> | Operating: -5 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 0% to 80%,<br>Storage: 0% to 90% (with no condensation)             |

## Optical Chart

Refer to page 96, and 97.

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses



# Vibrations and Shocks Resistant Lens for M42-mount Cameras

## VS-MCL/M42-10 Series

- Vibrations resistant lens for M42-mount cameras.
- Lineup of 18 models: focal lengths from 18 to 100 mm and F-numbers of maximum aperture, 5.6, and 8.0.
- A lock ring locking the surface and the improved design of internal structure increase resistance to vibration in comparison to the previous model. This enables application in environments where the point-locked lens is moved under the effects of ambient vibration.
- Install in narrow space without a lock screw.



### Ordering Information

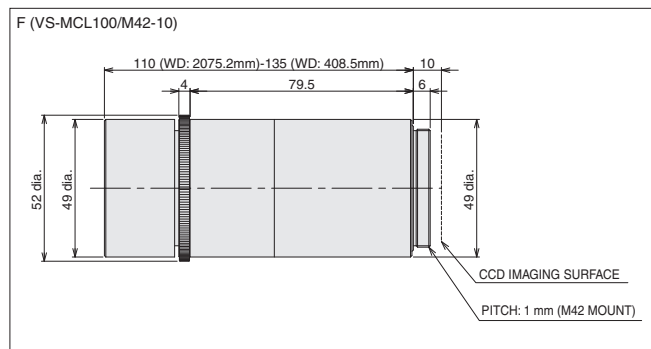
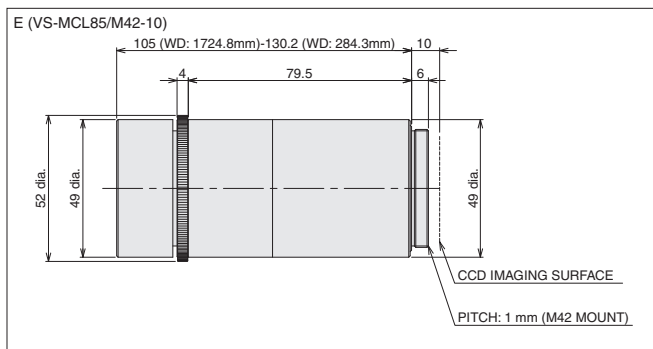
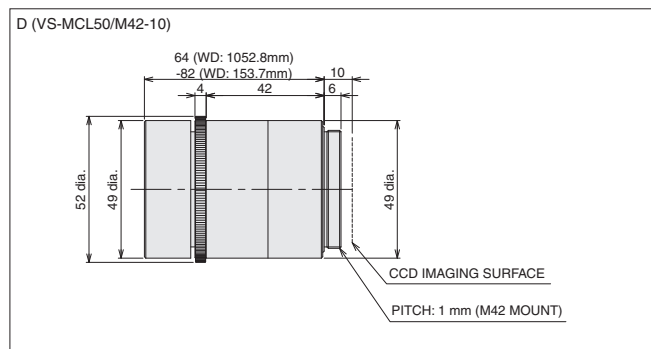
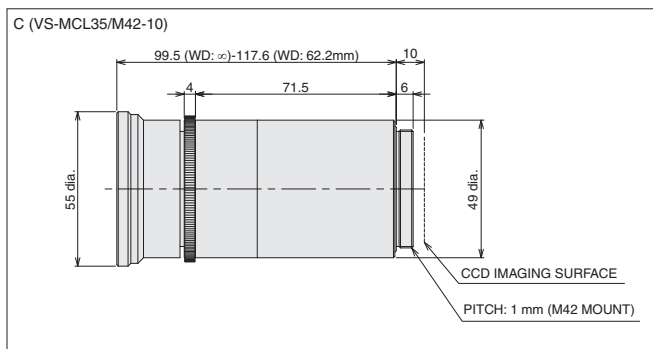
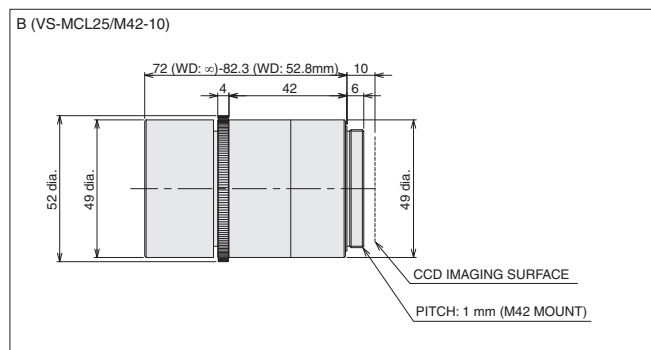
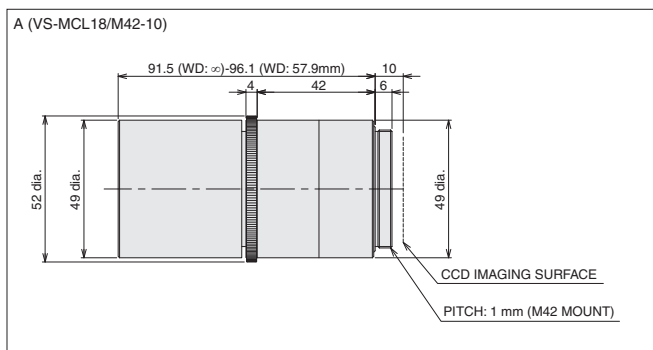
| Recommended camera            | Model                         | Dimensions | Focal distance (mm) | Aperture (F No) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field (mm) | Maximum compatible CCD |
|-------------------------------|-------------------------------|------------|---------------------|-----------------|-----------------------------|-------------------|-------------|---------|---------------------|------------------------|
| FH-S□12                       | 3Z4S-LE VS-MCL18/M42-10       | A          | 18                  | 2.8             | 52 dia.                     | 91.5 to 96.1      | M46.0 P0.75 | 722.9   | 367.0               | 1.8 inches             |
|                               |                               |            |                     |                 |                             |                   |             | 168.4   | 24.6                |                        |
|                               |                               |            |                     |                 |                             |                   |             | 57.9    | 4.5                 |                        |
|                               | 3Z4S-LE VS-MCL18-FNO56/M42-10 |            |                     | 5.6             | 91.5 to 96.1                | M46.0 P0.75       | 722.9       | 735.0   |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 168.4       | 188.0   |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 57.9        | 9.0     |                     |                        |
|                               | 3Z4S-LE VS-MCL18-FNO80/M42-10 |            |                     | 8               | 91.5 to 96.1                | M46.0 P0.75       | 722.9       | 1050.0  |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 168.4       | 269.0   |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 57.9        | 12.8    |                     |                        |
|                               | 3Z4S-LE VS-MCL25/M42-10       | B          | 25                  | 2.6             | 52 dia.                     | 72.0 to 82.3      | M46.0 P0.75 | 1010.8  | 367.0               | 1.8 inches             |
|                               |                               |            |                     |                 |                             |                   |             | 496.6   | 94.0                |                        |
|                               |                               |            |                     |                 |                             |                   |             | 52.8    | 1.8                 |                        |
|                               | 3Z4S-LE VS-MCL25-FNO56/M42-10 |            |                     | 5.6             | 72.0 to 82.3                | M46.0 P0.75       | 1010.8      | 735.0   |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 496.6       | 188.0   |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 52.8        | 3.9     |                     |                        |
|                               | 3Z4S-LE VS-MCL25-FNO80/M42-10 |            |                     | 8               | 72.0 to 82.3                | M46.0 P0.75       | 1010.8      | 1050.0  |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 496.6       | 269.0   |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 52.8        | 5.6     |                     |                        |
| 3Z4S-LE VS-MCL35/M42-10       | C                             | 35         | 2.8                 | 55 dia.         | 99.5 to 117.6               | M52.0 P0.75       | 1437.4      | 367.0   | 1.8 inches          |                        |
|                               |                               |            |                     |                 |                             |                   | 346.8       | 24.6    |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 62.2        | 1.3     |                     |                        |
| 3Z4S-LE VS-MCL35-FNO56/M42-10 |                               |            | 5.6                 | 99.5 to 117.6   | M52.0 P0.75                 | 1437.4            | 735.0       |         |                     |                        |
|                               |                               |            |                     |                 |                             | 346.8             | 49.3        |         |                     |                        |
|                               |                               |            |                     |                 |                             | 62.2              | 2.7         |         |                     |                        |
| 3Z4S-LE VS-MCL35-FNO80/M42-10 |                               |            | 8                   | 99.5 to 117.6   | M52.0 P0.75                 | 1437.4            | 1050.0      |         |                     |                        |
|                               |                               |            |                     |                 |                             | 346.8             | 70.4        |         |                     |                        |
|                               |                               |            |                     |                 |                             | 62.2              | 3.8         |         |                     |                        |
| 3Z4S-LE VS-MCL50/M42-10       | D                             | 50         | 2.8                 | 52 dia.         | 64.0 to 82.0                | M46.0 P0.75       | 1025.0      | 97.6    | 1.8 inches          |                        |
|                               |                               |            |                     |                 |                             |                   | 513.7       | 24.6    |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 153.7       | 2.0     |                     |                        |
| 3Z4S-LE VS-MCL50-FNO56/M42-10 |                               |            | 5.6                 | 64.0 to 82.0    | M46.0 P0.75                 | 1025.0            | 188.0       |         |                     |                        |
|                               |                               |            |                     |                 |                             | 513.7             | 49.3        |         |                     |                        |
|                               |                               |            |                     |                 |                             | 153.7             | 3.9         |         |                     |                        |
| 3Z4S-LE VS-MCL50-FNO80/M42-10 |                               |            | 8                   | 64.0 to 82.0    | M46.0 P0.75                 | 1025.0            | 269.0       |         |                     |                        |
|                               |                               |            |                     |                 |                             | 513.7             | 70.4        |         |                     |                        |
|                               |                               |            |                     |                 |                             | 153.7             | 5.6         |         |                     |                        |
| 3Z4S-LE VS-MCL85/M42-10       | E                             | 85         | 4                   | 52 dia.         | 105.0 to 130.2              | M46.0 P0.75       | 1724.8      | 134.0   | 1.8 inches          |                        |
|                               |                               |            |                     |                 |                             |                   | 452.5       | 9.6     |                     |                        |
|                               |                               |            |                     |                 |                             |                   | 285.0       | 3.5     |                     |                        |
| 3Z4S-LE VS-MCL85-FNO56/M42-10 |                               |            | 5.6                 | 105.0 to 130.2  | M46.0 P0.75                 | 1724.8            | 188.0       |         |                     |                        |
|                               |                               |            |                     |                 |                             | 452.5             | 13.4        |         |                     |                        |
|                               |                               |            |                     |                 |                             | 285.0             | 4.9         |         |                     |                        |
| 3Z4S-LE VS-MCL85-FNO80/M42-10 |                               |            | 8                   | 105.0 to 130.2  | M46.0 P0.75                 | 1724.8            | 269.0       |         |                     |                        |
|                               |                               |            |                     |                 |                             | 452.5             | 19.2        |         |                     |                        |
|                               |                               |            |                     |                 |                             | 285.0             | 7.1         |         |                     |                        |

# Vibrations and Shocks Resistant Lens for M42-mount Cameras VS-MCL/M42-10 Series

| Recommended camera | Model                          | Dimensions | Focal distance (mm) | Aperture (F No) | Maximum outer diameter (mm) | Total length (mm) | Filter size | WD (mm) | Depth of field (mm) | Maximum compatible CCD |
|--------------------|--------------------------------|------------|---------------------|-----------------|-----------------------------|-------------------|-------------|---------|---------------------|------------------------|
| FH-S□12            | 3Z4S-LE VS-MCL100/M42-10       | F          | 100                 | 2.8             | 52 dia.                     | 110.0 to 135.0    | M46.0 P0.75 | 2050.2  | 94.1                | 1.8 inches             |
|                    |                                |            |                     |                 |                             |                   |             | 1075.2  | 24.6                |                        |
|                    |                                |            |                     |                 |                             |                   |             | 408.5   | 3.2                 |                        |
|                    | 3Z4S-LE VS-MCL100-FNO56/M42-10 |            |                     | 5.6             | 52 dia.                     | 110.0 to 135.0    | M46.0 P0.75 | 2050.2  | 188.0               |                        |
|                    |                                |            |                     |                 |                             |                   |             | 1075.2  | 49.3                |                        |
|                    |                                |            |                     |                 |                             |                   |             | 408.5   | 6.5                 |                        |
|                    | 3Z4S-LE VS-MCL100-FNO80/M42-10 |            |                     | 8               | 52 dia.                     | 110.0 to 135.0    | M46.0 P0.75 | 2050.2  | 269.0               |                        |
|                    |                                |            |                     |                 |                             |                   |             | 1075.2  | 70.4                |                        |
|                    |                                |            |                     |                 |                             |                   |             | 408.5   | 9.2                 |                        |

## Dimensions

(Unit:mm)



## Specifications

|                            |  |
|----------------------------|--|
| <b>Mounting</b>            | M42 mount  |
| <b>Ambient temperature</b> | Operating: -5 to 50°C,<br>Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 0% to 80%,<br>Storage: 0% to 90% (with no condensation)             |

## Optical Chart

Refer to page 97.

Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

# Lens Option

## Polarizing Filter SV-PL Series

- Prevents diffused reflection.
- Available for lenses for C-mount cameras.



## Ordering Information

| Item              | Size                | Anti-rotation mechanism: Provided |                  | Anti-rotation mechanism: Not provided |            |
|-------------------|---------------------|-----------------------------------|------------------|---------------------------------------|------------|
|                   |                     | Model                             | Weight (g)       | Model                                 | Weight (g) |
| Polarizing Filter | M22.5 P0.5          | 3Z4S-LE SV-PL225-SS               | 5                | –                                     | –          |
|                   | M25.5 P0.5          | 3Z4S-LE SV-PL255-SS               | 6                | 3Z4S-LE SV-PL255                      | 5.5        |
|                   | M27.0 P0.5          | 3Z4S-LE SV-PL270-SS               | 6.5              | 3Z4S-LE SV-PL270                      | 6          |
|                   | M30.5 P0.5          | 3Z4S-LE SV-PL305-SS               | 8                | 3Z4S-LE SV-PL305                      | 7.5        |
|                   | M34.0 P0.5          | 3Z4S-LE SV-PL340-SS               | 10               | 3Z4S-LE SV-PL340                      | 9.5        |
|                   | M35.5 P0.5          | 3Z4S-LE SV-PL355-SS               | 10               | 3Z4S-LE SV-PL355                      | 9.5        |
|                   | M37.5 P0.5          | 3Z4S-LE SV-PL375-SS               | 12               | 3Z4S-LE SV-PL375                      | 11.5       |
|                   | M40.5 P0.5          | 3Z4S-LE SV-PL405-SS               | 12.5             | 3Z4S-LE SV-PL405                      | 12         |
|                   | M52.0 P0.75         | 3Z4S-LE SV-PL520-SS               | 19               | 3Z4S-LE SV-PL520                      | 18.5       |
|                   | M55.0 P0.75         | 3Z4S-LE SV-PL550-SS               | 21               | 3Z4S-LE SV-PL550                      | 20.5       |
| M62.0 P0.75       | 3Z4S-LE SV-PL620-SS | 28.5                              | 3Z4S-LE SV-PL620 | 27.5                                  |            |

## Specifications

|                            |  |
|----------------------------|--|
| <b>Ambient temperature</b> | Operating: 0 to 50°C, Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%, Storage: 35% to 90% (with no condensation)          |

## Protection Cover Filter SV-GA Series

- Used to protect lens surface from dust.
- Available for lenses for C-mount cameras.



## Ordering Information

| Item                    | Model            | Size        | Weight (g) |
|-------------------------|------------------|-------------|------------|
| Protection Cover Filter | 3Z4S-LE SV-GA225 | M22.5 P0.5  | 4          |
|                         | 3Z4S-LE SV-GA255 | M25.5 P0.5  | 4.5        |
|                         | 3Z4S-LE SV-GA270 | M27.0 P0.5  | 5.5        |
|                         | 3Z4S-LE SV-GA305 | M30.5 P0.5  | 6.5        |
|                         | 3Z4S-LE SV-GA340 | M34.0 P0.5  | 8          |
|                         | 3Z4S-LE SV-GA355 | M35.5 P0.5  | 8.5        |
|                         | 3Z4S-LE SV-GA375 | M37.5 P0.5  | 9          |
|                         | 3Z4S-LE SV-GA405 | M40.5 P0.5  | 10.5       |
|                         | 3Z4S-LE SV-GA520 | M52.0 P0.75 | 15         |
|                         | 3Z4S-LE SV-GA550 | M55.0 P0.75 | 16         |
|                         | 3Z4S-LE SV-GA620 | M62.0 P0.75 | 25         |

## Specifications

|                            |  |
|----------------------------|--|
| <b>Ambient temperature</b> | Operating: 0 to 50°C, Storage: -10 to 60°C (with no icing or condensation) |
| <b>Ambient humidity</b>    | Operating: 35% to 80%, Storage: 35% to 90% (with no condensation)          |

**Extension Tubes**

**Ordering Information**

| Lenses                        | Model              | Contents   |
|-------------------------------|--------------------|--|
| For C-mount Lens              | 3Z4S-LE SV-EXR     | Set of 7 tubes *1,*2<br>(40 mm, 20 mm, 10 mm, 5 mm, 2mm, 1 mm, 0.5 mm)<br>Maximum outer diameter: 30 mm dia. |
| For M42-mount Cameras         | 3Z4S-LE VS-EXR/M42 | Set of 5 tubes *1<br>(20 mm, 10 mm, 8 mm, 2 mm, and 1 mm)<br>Maximum outer diameter: 47.5 mm dia.            |
| For Small Digital CCD Cameras | FZ-LESR            | Set of 3 tubes (15 mm, 10 mm, 5 mm)<br>Maximum outer diameter: 12 mm dia.                                    |



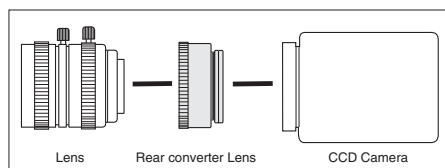
- \*1. Do not use the 0.5-mm, 1.0-mm, and 2.0-mm Extension Tubes attached to each other. Since these Extension Tubes are placed over the threaded section of the Lens or other Extension Tube, the connection may loosen when more than one 0.5-mm, 1.0-mm or 2.0-mm Extension Tube are used together. Reinforcement is required to protect against vibration when Extension Tubes exceeding 30 mm are used. When using the Extension Tube, check it on the actual device before using it.
- \*2. These Extension Tubes are also available individually. Order using the following model number, replacing the box with the desired length: 3Z4SLE SV-EXR□. (0.5, 1, 2, 5, 10, 15, 20, 25, 30, 40, 50 mm)

**Rear Converter Lens**

**Ordering Information**

| Model              |
|--------------------|
| 3Z4S-LE SV-1.5X *1 |
| 3Z4S-LE SV-2.0X *2 |

● Configuration



- \*1. In the following lenses, it is necessary to use it together with the extension tubes of 5 mm or more.  
SV-0614H, SV-0814H, SV-1214H, SV-2514H, SV-0614V, SV-0813V
- \*2. In the following lenses, it is necessary to use it together with the extension tubes of 5 mm or more.  
SV-0614H, SV-0814H, SV-1214H, SV-2514H, SV-0813V

**M42 - F Mount Conversion Adapter**

**Ordering Information**

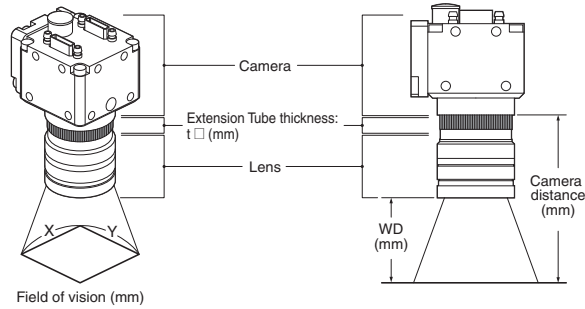
| Cameras             | Lenses  | Model         |
|---------------------|---------|---------------|
| FH-S□12 (M42 mount) | F mount | FH-ADF/M42-10 |

# Optical Chart

## Optical Chart

### Meaning of Optical Chart

The X axis of the optical chart shows the field of vision (mm) (\*1), and the Y axis of the optical chart shows the camera installation distance (mm) (\*2).



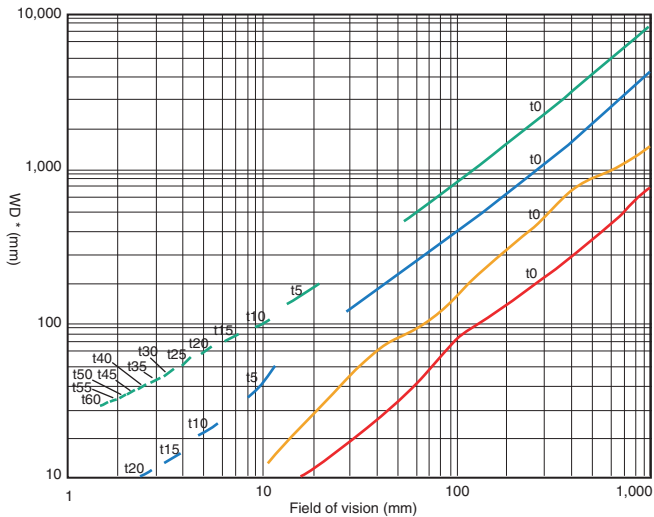
\*1. The lengths of the fields of vision given in the optical charts are the lengths of the Y axis.  
\*2. The vertical axis represents WD for small cameras.

## Vision system FH/FZ Series Standard Lenses

### Small Digital CCD Cameras

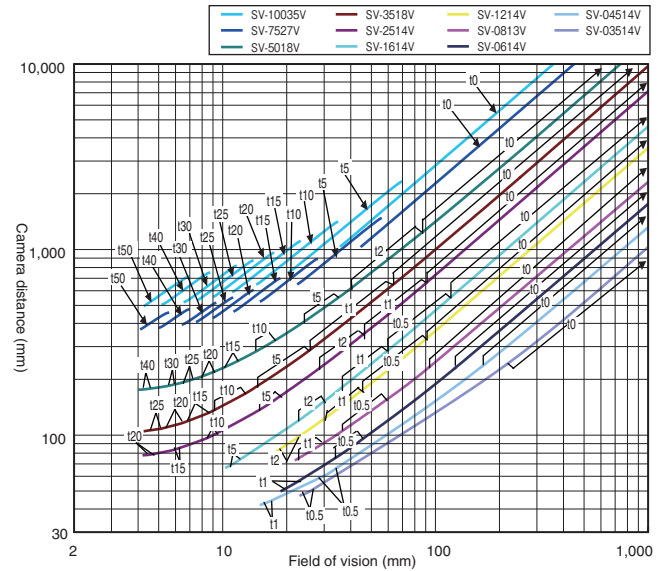
FZ-SF□,  
FZ-SP□

0.3 million-pixel  
(Using FZ-LES Series)



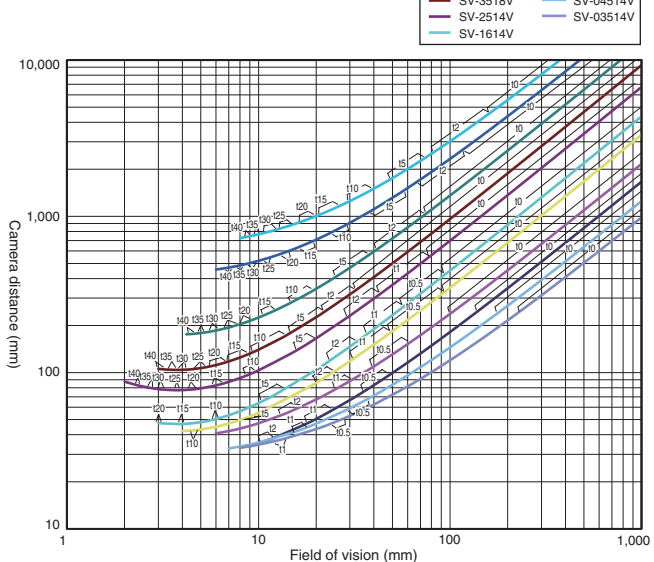
\* The vertical axis represents WD, not installation distance.

### High-speed Digital CMOS Camera FH-S□, High-speed Digital CCD Camera FZ-SH□, Digital CCD Camera FZ-S□ 0.3 million-pixel (Using 3Z4S-LE SV-V Series)



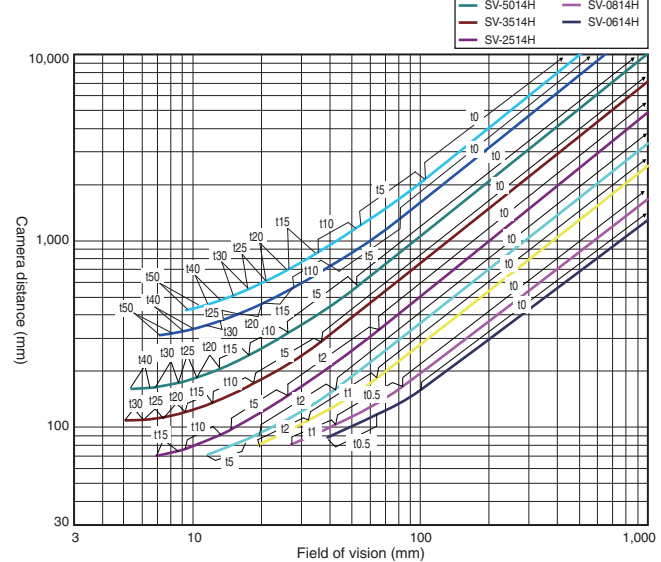
### High-speed Digital CMOS Camera FH-S□X

0.4 million-pixel  
(Using 3Z4S-LE SV-V Series)




### Digital CCD Camera FZ-S□2M

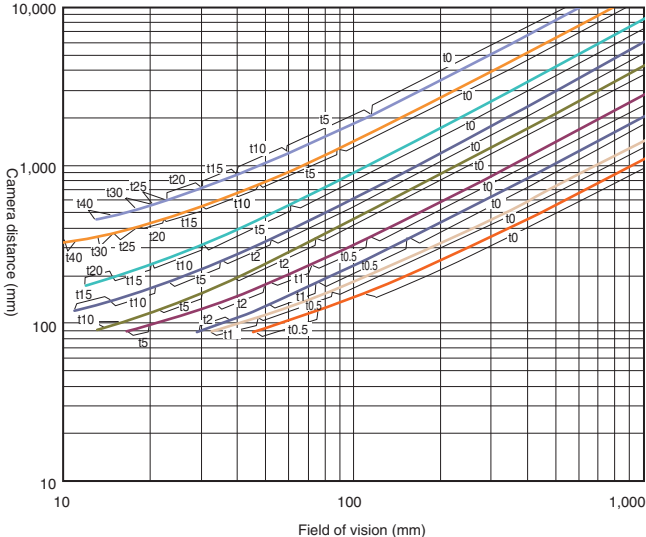
2 million-pixel  
(Using 3Z4S-LE SV-H Series)



**High-speed Digital CMOS Camera  
FH-S□02  
2 million-pixel  
(Using 3Z4S-LE SV-H/VS-H1 Series)**

3Z4S-LE 

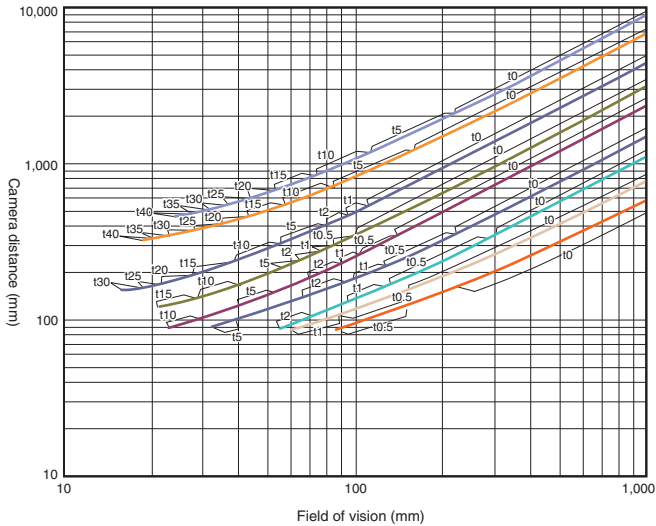
- SV-10028H
- SV-7525H
- VS-5018H1
- VS-3514H1
- VS-2514H1
- VS-1614H1N
- VS-1214H1
- VS-0814H1
- VS-0618H1



**High-speed Digital CMOS Camera  
FH-S□04  
4 million-pixel  
(Using 3Z4S-LE SV-H/VS-H1 Series)**

3Z4S-LE 

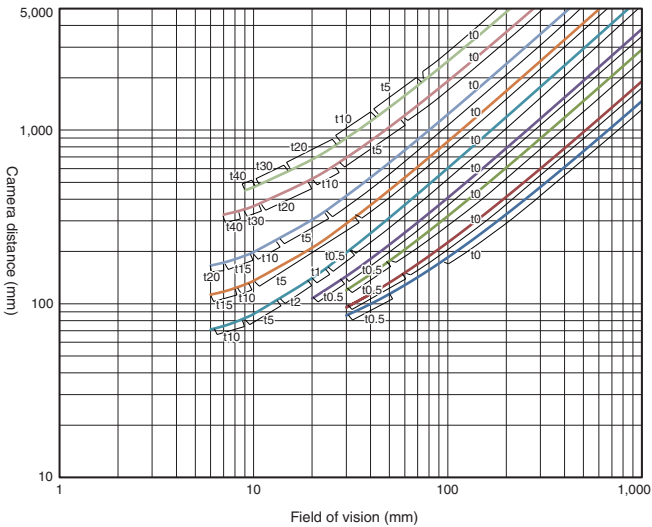
- SV-10028H
- SV-7525H
- VS-5018H1
- VS-3514H1
- VS-2514H1
- VS-1614H1N
- VS-1214H1
- VS-0814H1
- VS-0618H1




**Digital CMOS Camera  
FH-S□05R  
5 million-pixel  
(Using 3Z4S-LE SV-H Series)**

3Z4S-LE 

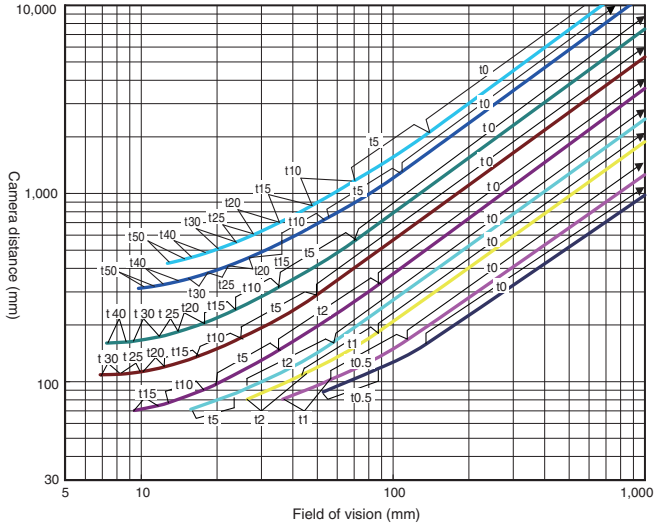
- SV-10028H
- SV-7525H
- SV-5014H
- SV-3514H
- SV-2514H
- SV-1614H
- SV-1214H
- SV-0814H
- SV-0614H



**Digital CMOS Camera FZ-S□5M3,  
High-speed Digital CMOS Camera  
FH-S□X05  
5 million-pixel  
(Using 3Z4S-LE SV-H Series)**

3Z4S-LE 

- SV-10028H
- SV-7525H
- SV-5014H
- SV-3514H
- SV-2514H
- SV-1614H
- SV-1214H
- SV-0814H
- SV-0614H





# Optical Chart

Standard Models  
FLV Series

High-brightness Models  
FL Series

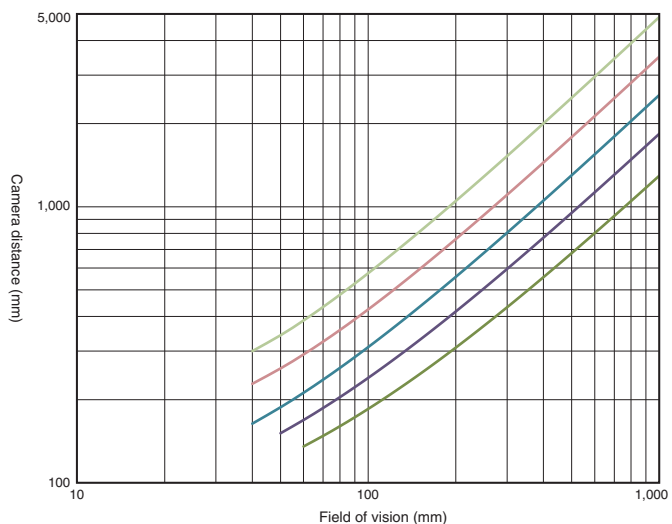
LED Characteristics

Lenses

## High-speed Digital CMOS Camera FH-S□X12 12 million-pixel (Using 3Z4S-LE VS-LLD Series)

Note: The 3Z4S-LE VS-LDD Series cannot be used with an extension tube.

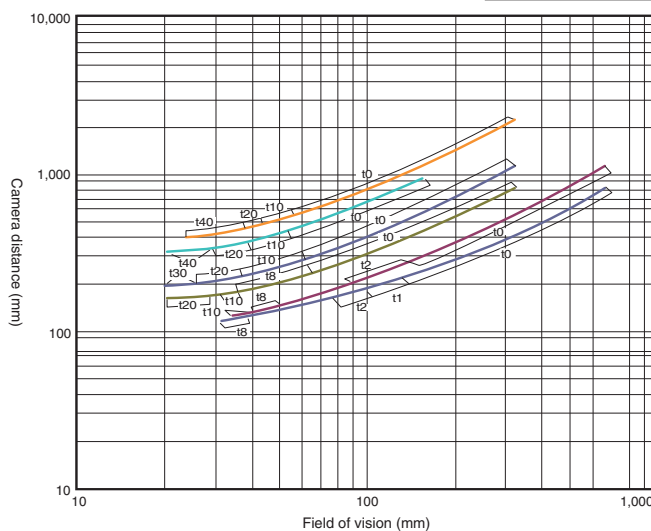
- VS-LLD50
- VS-LLD35
- VS-LLD25
- VS-LLD18
- VS-LLD12.5



## High-speed Digital CMOS Camera FH-S□12 12 million-pixel (Using 3Z4S-LE VS-L/M42-10 Series)

3Z4S-LE □

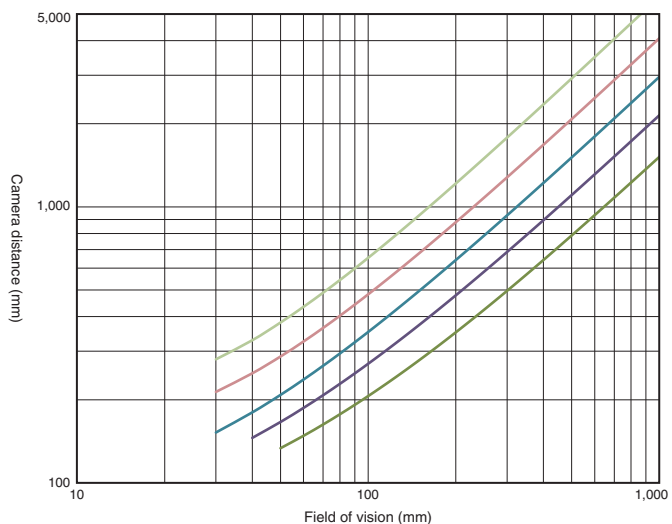
- VS-L10028/M42-10
- VS-L8540/M42-10
- VS-L5028/M42-10
- VS-L3528/M42-10
- VS-L2526/M42-10
- VS-L1828/M42-10



## Digital CMOS Camera FH-S□21R 20.4 million-pixel (Using 3Z4S-LE VS-LLD Series)

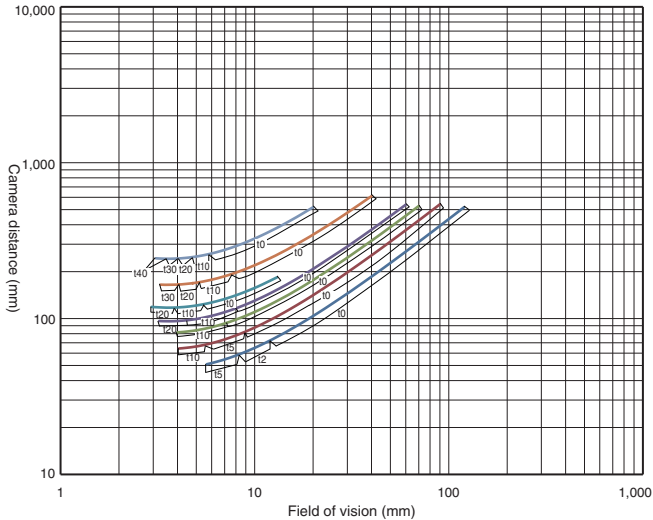
Note: The 3Z4S-LE VS-LDD Series cannot be used with an extension tube.

- VS-LLD50
- VS-LLD35
- VS-LLD25
- VS-LLD18
- VS-LLD12.5

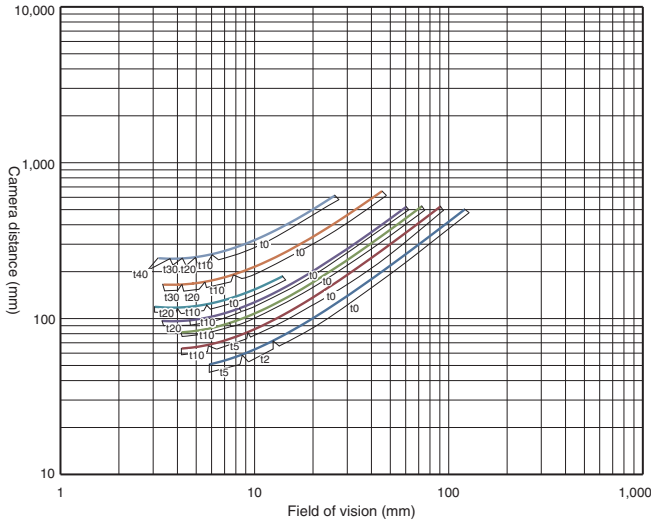
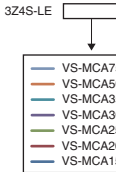


### Vibrations and Shocks Resistant Lenses/Telecentric Lenses

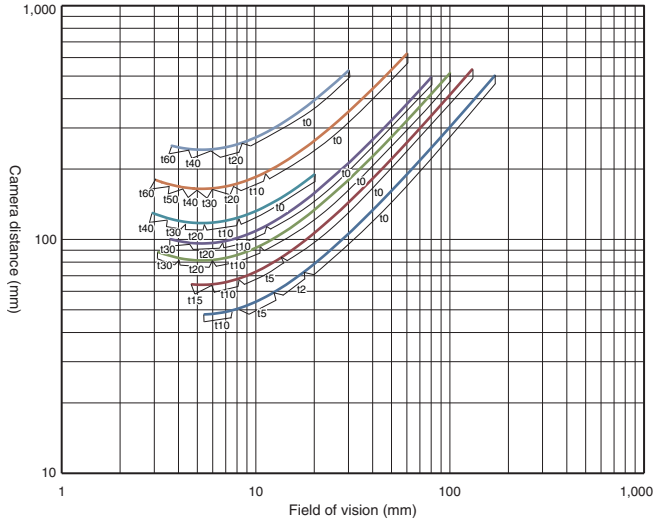
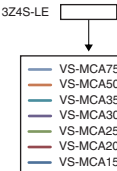
High-speed Digital CMOS Camera  
FH-S□, High-speed Digital CCD Camera  
FZ-SH□, Digital CCD Camera  
FZ-S□  
0.3 million-pixel  
(Using 3Z4S-LE VS-MCA Series)



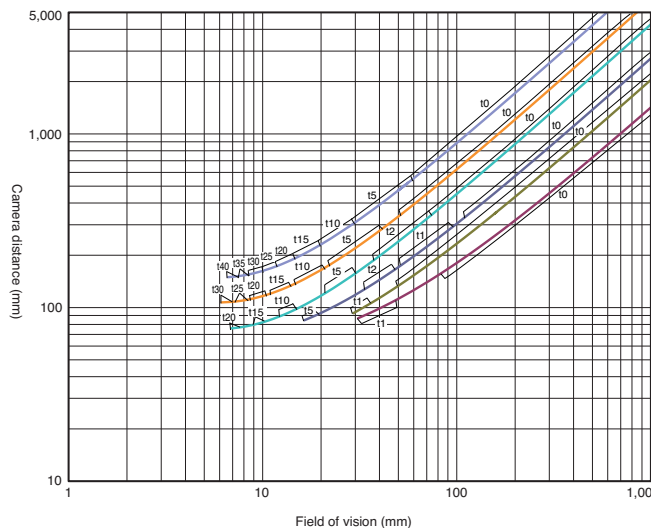
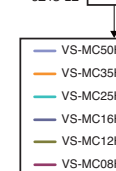
High-speed Digital CMOS Camera  
FH-S□X  
0.4 million-pixel  
(Using 3Z4S-LE VS-MCA Series)



Digital CCD Camera  
FZ-S□2M  
2 million-pixel  
(Using 3Z4S-LE VS-MCA Series)

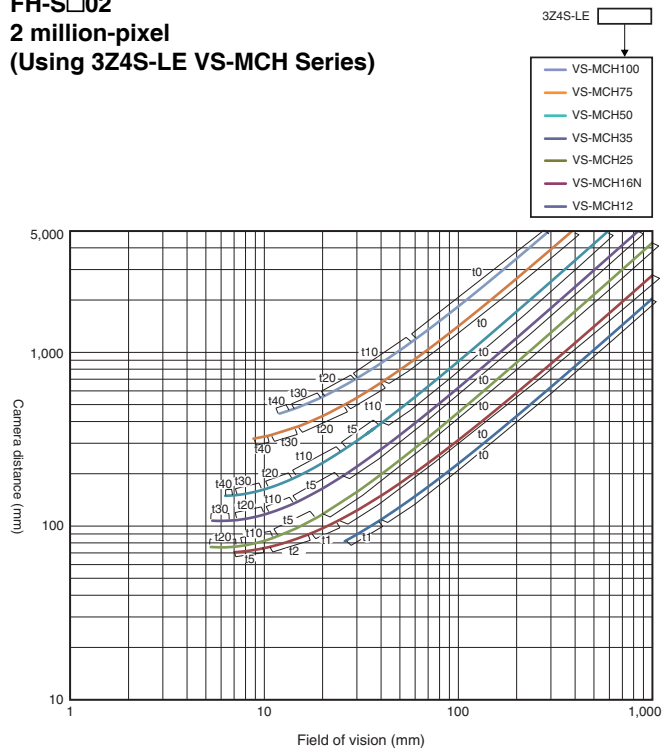


High-speed Digital CMOS Camera  
FH-S□02  
2 million-pixel  
(Using 3Z4S-LE VS-MCH1 Series)

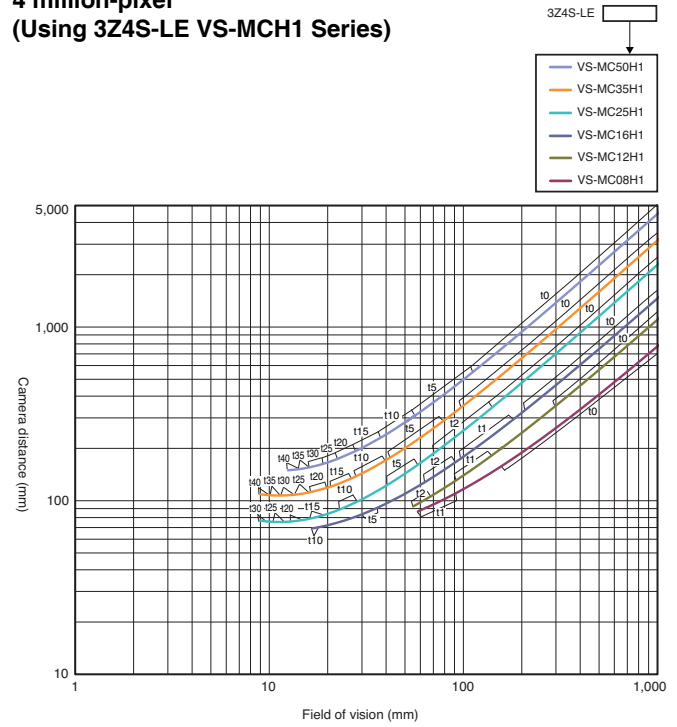


# Optical Chart

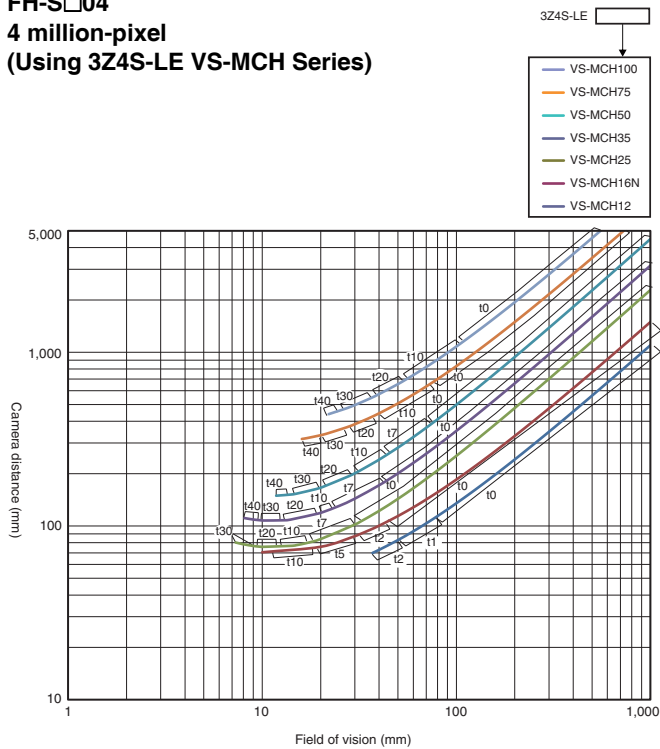
## High-speed Digital CMOS Camera FH-S□02 2 million-pixel (Using 3Z4S-LE VS-MCH Series)



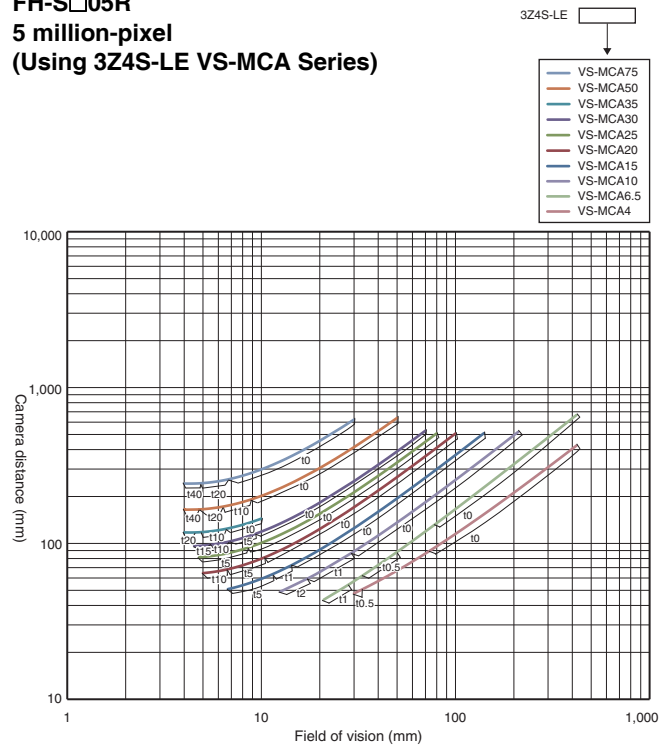
## High-speed Digital CMOS Camera FH-S□04 4 million-pixel (Using 3Z4S-LE VS-MCH1 Series)



## High-speed Digital CMOS Camera FH-S□04 4 million-pixel (Using 3Z4S-LE VS-MCH Series)



## Digital CMOS Camera FH-S□05R 5 million-pixel (Using 3Z4S-LE VS-MCA Series)



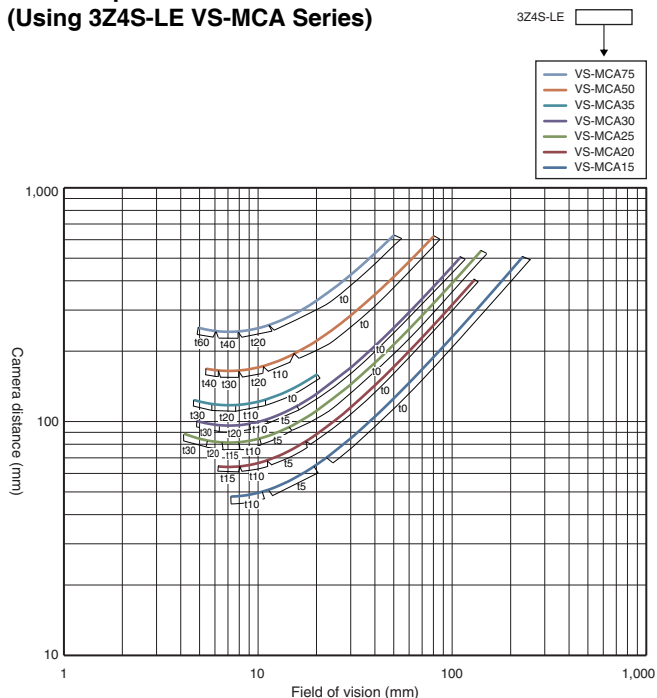
Standard Models  
FLV Series

High-brightness Models  
FL Series

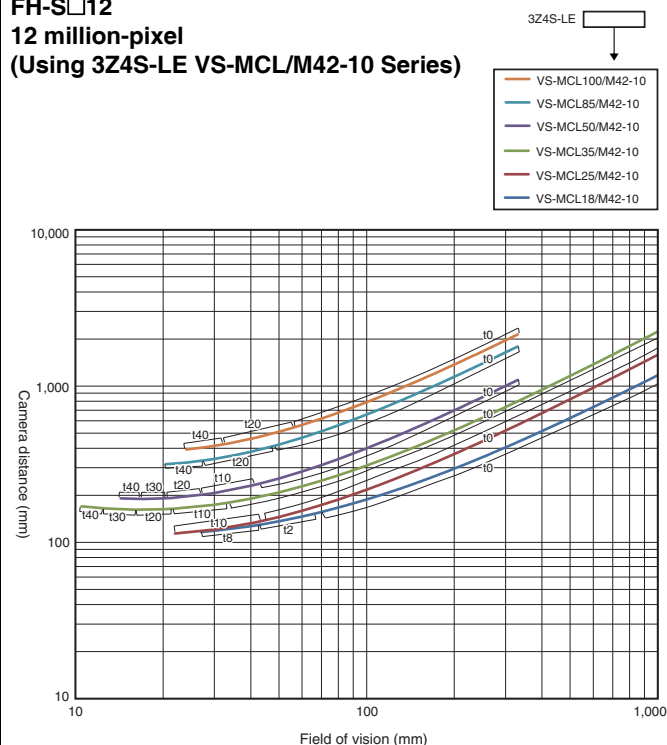
LED Characteristics

Lenses

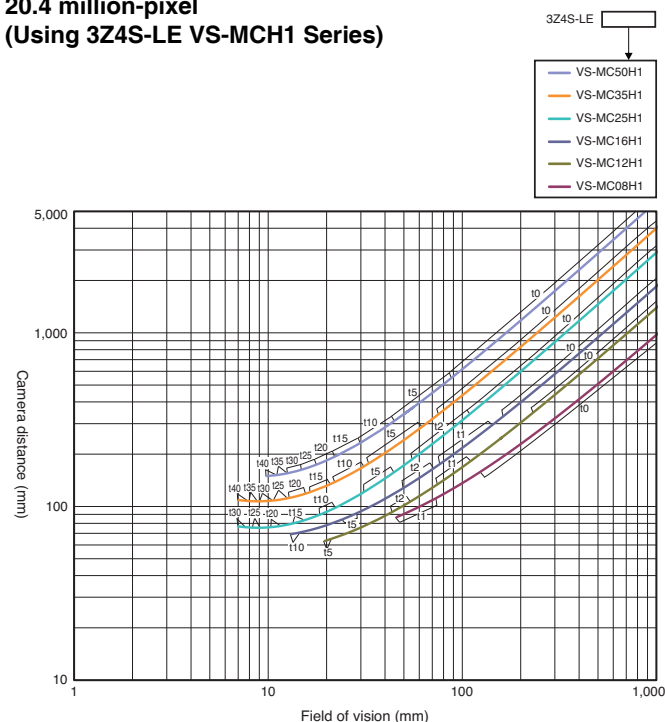
**Digital CMOS Camera FZ-S□5M3,  
High-speed Digital CMOS Camera FH-S□X05  
5 million-pixel  
(Using 3Z4S-LE VS-MCA Series)**



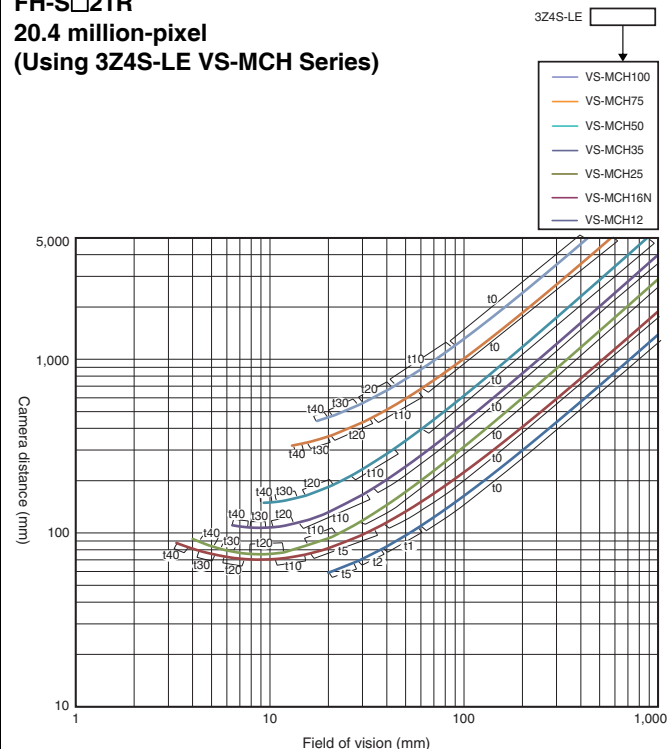
**High-speed Digital CMOS Camera  
FH-S□12  
12 million-pixel  
(Using 3Z4S-LE VS-MCL/M42-10 Series)**



**Digital CMOS Camera  
FH-S□21R  
20.4 million-pixel  
(Using 3Z4S-LE VS-MCH1 Series)**



**Digital CMOS Camera  
FH-S□21R  
20.4 million-pixel  
(Using 3Z4S-LE VS-MCH Series)**



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses

## Smart Camera FHV7 Series

### Standard Lenses

0.4 million pixels

1.6 million pixels

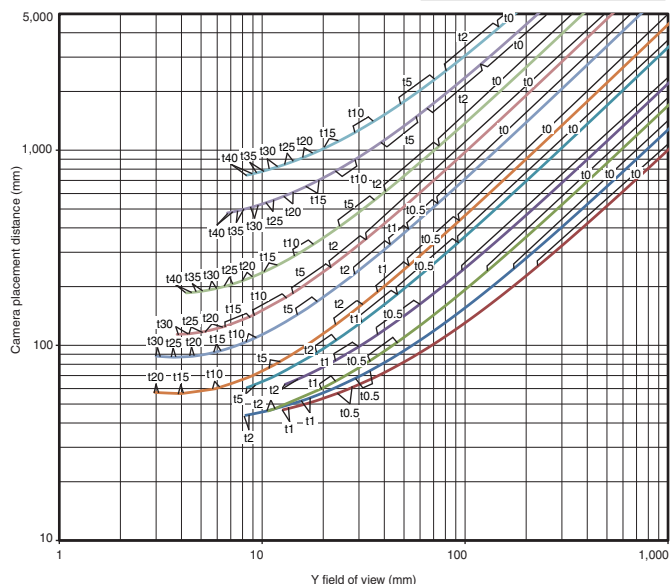
Smart Cameras:

FHV7H-□004, FHV7H-□016

(for 3Z4S-LE SV-V series)

3Z4S-LE

- |           |           |
|-----------|-----------|
| SV-10035V | SV-1214V  |
| SV-7527V  | SV-0813V  |
| SV-5018V  | SV-0614V  |
| SV-3518V  | SV-04514V |
| SV-2514V  | SV-03514V |
| SV-1614V  |           |



0.4 million pixels

1.6 million pixels

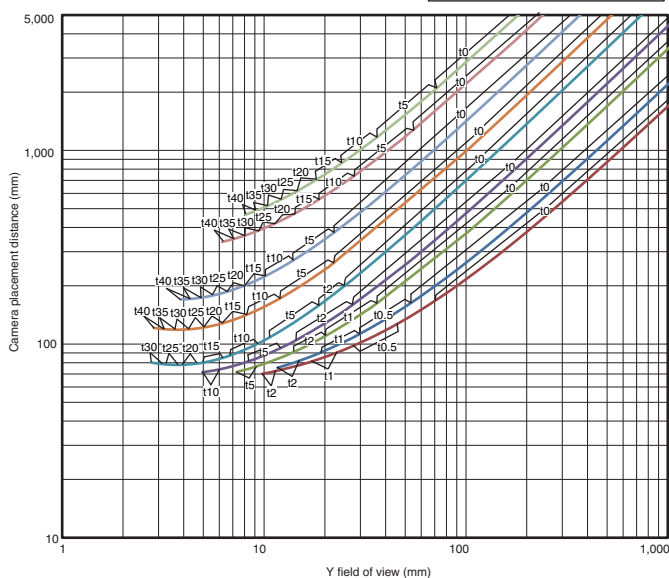
Smart Cameras:

FHV7H-□004, FHV7H-□016

(for 3Z4S-LE SV-H series)

3Z4S-LE

- |           |          |
|-----------|----------|
| SV-10028H | SV-1614H |
| SV-7525H  | SV-1214H |
| SV-5014H  | SV-0814H |
| SV-3514H  | SV-0614H |
| SV-2514H  |          |



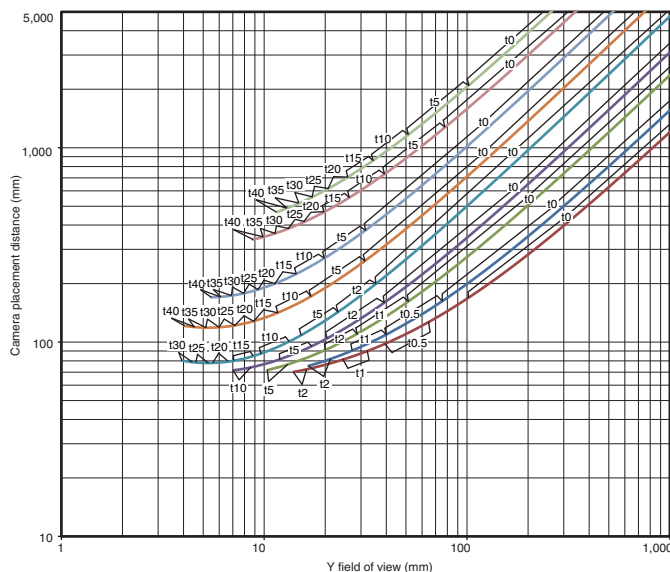
3.2 million pixels

Smart Cameras: FHV7H-□032

(for 3Z4S-LE SV-H series)

3Z4S-LE

- |           |          |
|-----------|----------|
| SV-10028H | SV-1614H |
| SV-7525H  | SV-1214H |
| SV-5014H  | SV-0814H |
| SV-3514H  | SV-0614H |
| SV-2514H  |          |



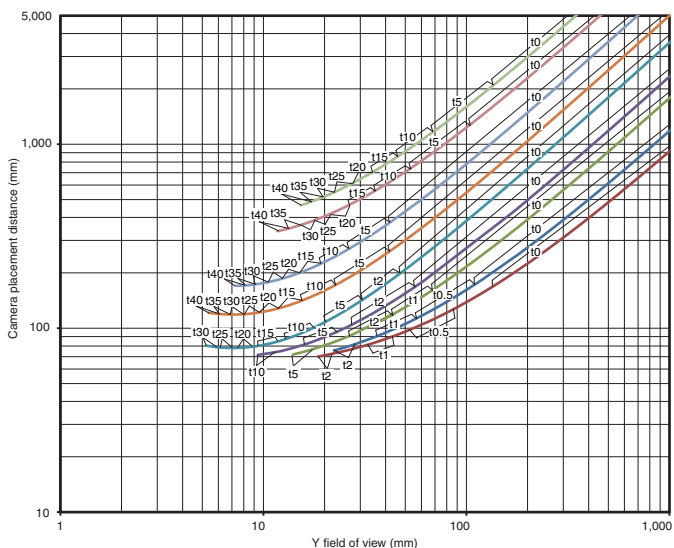
5 million pixels

Smart Cameras: FHV7H-□050

(for 3Z4S-LE SV-H series)

3Z4S-LE

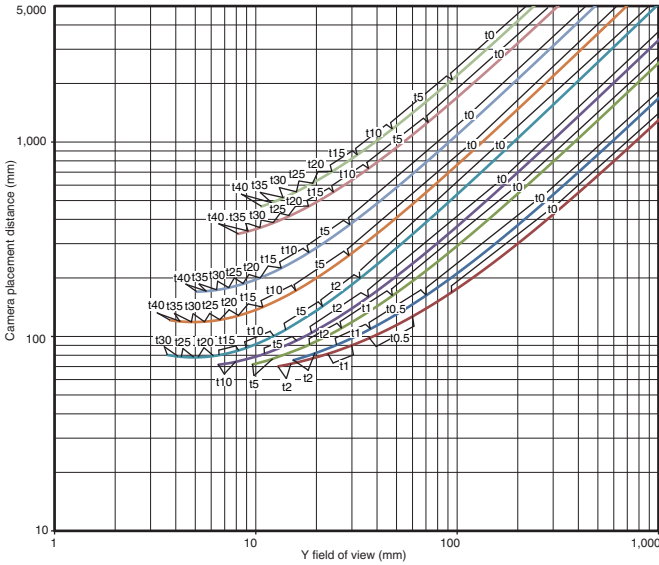
- |           |          |
|-----------|----------|
| SV-10028H | SV-1614H |
| SV-7525H  | SV-1214H |
| SV-5014H  | SV-0814H |
| SV-3514H  | SV-0614H |
| SV-2514H  |          |



**6.3 million pixels**  
**Smart Cameras: FHV7H-□063R**  
 (for 3Z4S-LE SV-H series)



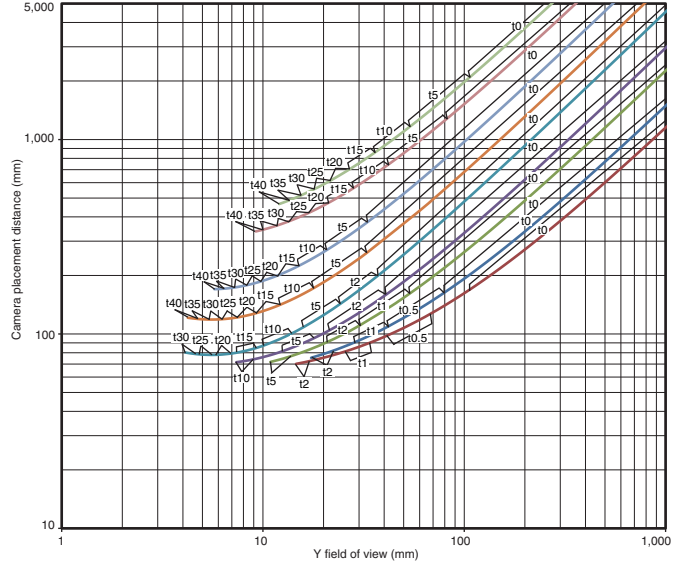
- SV-10028H
- SV-7525H
- SV-5014H
- SV-3514H
- SV-2514H
- SV-1614H
- SV-1214H
- SV-0814H
- SV-0614H



**12 million pixels**  
**Smart Cameras: FHV7H-□120R**  
 (for 3Z4S-LE SV-H series)



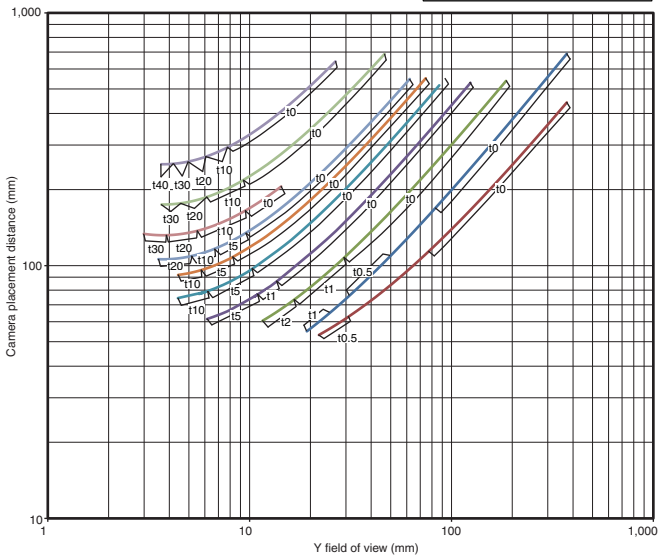
- SV-10028H
- SV-7525H
- SV-5014H
- SV-3514H
- SV-2514H
- SV-1614H
- SV-1214H
- SV-0814H
- SV-0614H



**Vibrations and Shocks Resistant Lenses**

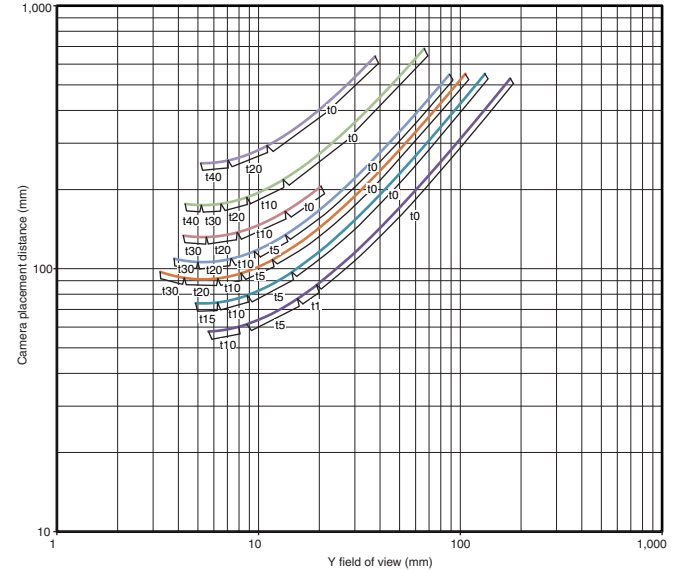
**0.4 million pixels**  
**1.6 million pixels**  
**Smart Cameras: FHV7H-□004, FHV7H-□016**  
 (for 3Z4S-LE VS-MCA series)

- VS-MCA75
- VS-MCA50
- VS-MCA35
- VS-MCA30
- VS-MCA25
- VS-MCA20
- VS-MCA15
- VS-MCA10
- VS-MCA6.5
- VS-MCA4



**3.2 million pixels**  
**Smart Cameras: FHV7H-□032**  
 (for 3Z4S-LE VS-MCA series)

- VS-MCA75
- VS-MCA50
- VS-MCA35
- VS-MCA30
- VS-MCA25
- VS-MCA20
- VS-MCA15



Standard Models  
FLV Series

High-brightness Models  
FL Series

LED Characteristics

Lenses



# Optical Chart

Standard Models  
FLV Series

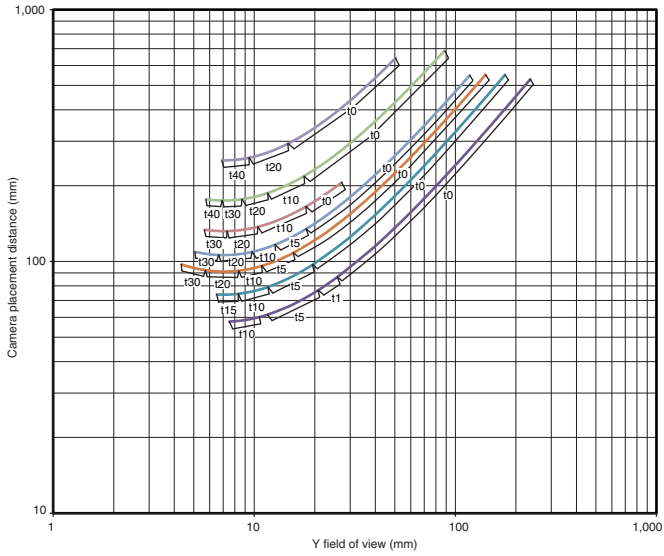
High-brightness Models  
FL Series

LED Characteristics

Lenses

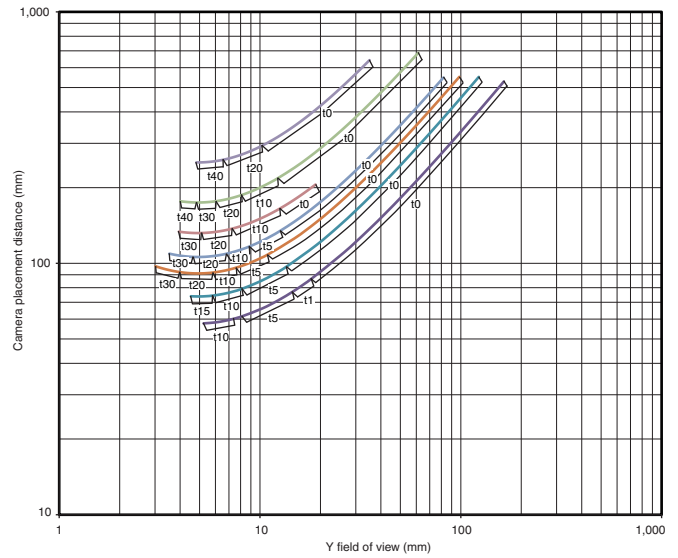
## 5 million pixels Smart Cameras: FHV7H-□050 (for 3Z4S-LE VS-MCA series)

- VS-MCA75
- VS-MCA50
- VS-MCA35
- VS-MCA30
- VS-MCA25
- VS-MCA20
- VS-MCA15



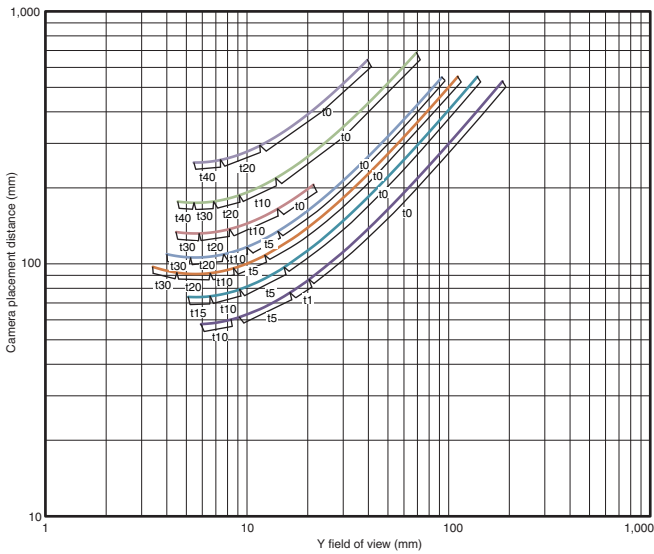
## 6.3 million pixels Smart Cameras: FHV7H-□063R (for 3Z4S-LE VS-MCA series)

- VS-MCA75
- VS-MCA50
- VS-MCA35
- VS-MCA30
- VS-MCA25
- VS-MCA20
- VS-MCA15



## 12 million pixels Smart Cameras: FHV7H-□120R (for 3Z4S-LE VS-MCA series)

- VS-MCA75
- VS-MCA50
- VS-MCA35
- VS-MCA30
- VS-MCA25
- VS-MCA20
- VS-MCA15



## Safety Precautions

### Precautions on Safety

#### ● Meaning of Signal Word

In order for the product to be used safely, the following indication is used in this catalog to draw your attention to the cautions. The cautions with the indication describe the important contents for safety.



**WARNING**

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.



**CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or property damage.

#### ● Meaning of Alert Symbol



Indicates general prohibitions for which there is no specific symbol.

#### ● Alert Statements



**WARNING**

This product is not designed or rated for ensuring safety of persons. Do not use it for such purposes.



It may cause permanent damage to vision. Do not look directly at the sun through the lens.



### Precautions for Safe Use

The following points are important to ensure safety, so make sure that they are strictly observed.

#### 1. Installation and Storage Sites

Do not install and store the product in locations subjected to the following conditions:

- Ambient temperature outside the rating
- Rapid temperature fluctuations (causing condensation)
- Presence of corrosive or flammable gases
- Presence of dust, salt, or iron particles
- Direct vibration or shock
- Strong ambient light (such as other laser beams or light from arc-welding machines)
- Direct sunlight or near heaters
- Water, oil, or chemical fumes or spray
- Near high-voltage equipment or power equipment

#### 2. Installation

- Make sure to tighten all installation screws securely

#### 3. Others

- Do not attempt to dismantle, repair, or modify the product.
- Do not drop, impose excessive vibration or shock on the product.
- If you notice an abnormal condition, immediately stop using the product and consult your OMRON representative.
- Be sure to dispose of the product as industrial waste.

### Precautions for Correct Use

Observe the following precautions to prevent failure to operate, malfunctions, or undesirable effects on product performance.

#### 1. Maintenance

- Clean the lens with a lens-cleaning cloth or air brush.
- Avoid blowing off foreign matter with your breath. Do not use thinner, benzene, acetone, or kerosene.

#### 2. Using with Product from Other Manufacturer

- Refer to the manual of the product from other manufacturer for installation and replacement.

#### 3. Others

- After removing the lens from the camera, do not leave it in a place exposed to direct sunlight. Failure to do so may cause a fire.



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**CSM\_12\_4**

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