MG-Wave®

Constant Current Control System

The MG-Wave® is designed and manufactured for optimum performance in Machine Vision applications operating on high-performance processing equipment and inspection systems or in critical conditions in manufacturing facilities. The “Constant Current Control System” enables reduction of heat generation and provides high intensity and stable illumination when compared to other conventional LED illumination and halogen light source systems. The unique patented sensing circuit system addresses one of the most prominent disadvantages of versatility, which other current control systems suffer from, by automatically detecting the required current value of each individual illumination unit upon connection to the controller.

Before using MG-Wave®

Selection Criteria of LED Controller

1. Confirm Illumination Model
   - Check maximum rated current of each illumination (Per Product specification).

2. Confirm LED Controller
   - Check current capacity of LED controller
   - Total current value of illumination shall not exceed LED controller's current capacity.

3. Verify Suitability of Configuration
   - Total required current value shall not exceed LED controller's current capacity. Configured system is operable.

LED Controllers

MLEP/MLEK Series

Spot / Coaxial Illumination
MCEP/MCEC/MCEL Series
Simulated Coaxial Illumination
MSCL Series

Direct Ring Illumination
MDRL Series
Low Angle Ring Illumination
MLRL Series

Shadowless Illumination
MSRL/MSLL/MSQL Series
Dome Illumination
MSDC/MDML Series

Bar Illumination
MBRL/MBRC/MHBC Series
Square Bar Type Illumination
MDQL Series

Backlight
MDBL/MDBC/MEBL/MEBC Series
Collimated Backlights
MCBP Series

Other Illumination
P14,15

P16,17

P4.5
P6.7
P8.9
P11
P12,13
P14,15

For detailed specifications of products, see our WEB site. (http://www.moritex.com)
Simulated Coaxial Illumination

**MCEP/MCEC/MCEL Series**

**MCEP 070-3 Series**
- Highest illumination in the industry!
- By employing state-of-the-art high-power LEDs and our unique heat dissipation technology that enhances luminance efficiency greatly, the series achieves triple illuminance compared to our conventional models.
- Newly developed collimator and light guiding rod ensure high illumination uniformity.

**MCEP Series**
- High power spot illumination also optimum for MML (Machine Micro Lens) Series coaxial illumination.
- 4 colors available for various test objects and applications.

**MCEC Series**
- Optimized for MML Series with high uniformity.
- Suitable for applications that require greater brightness than MCEP Series.
- Space-saving design with competitive prices.

**MCEL Series**
- Miniaturized coaxial illumination for MML Series.
- Best suited for objects with high-reflection or specular surface.
- Compact and low price.

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### Illuminance Comparison Data

**High Power LED Spot Illumination**

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Tip External Diameter A (mm)</th>
<th>Tip Length B (mm)</th>
<th>Lighting Area Size C (mm)</th>
<th>Housing Diameter D (mm)</th>
<th>Housing Length E (mm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCEP-C-R-070-3</td>
<td>R, G, B, W</td>
<td>0.7</td>
<td>3.0</td>
<td>φ8</td>
<td>12</td>
<td>φ24</td>
<td>62</td>
<td>45</td>
<td>MLEP-B070</td>
</tr>
<tr>
<td>MCEP-C-R</td>
<td>R, G, B, W</td>
<td>0.35</td>
<td>1.5</td>
<td>φ8</td>
<td>12</td>
<td>φ27</td>
<td>50</td>
<td>50</td>
<td>MLEP-B070</td>
</tr>
<tr>
<td>MCEP-C-R-2ZN</td>
<td>R</td>
<td>0.14</td>
<td>1.2</td>
<td>φ8</td>
<td>12</td>
<td>φ14</td>
<td>34</td>
<td>35</td>
<td>MLEX-A090</td>
</tr>
<tr>
<td>MCEP-C-R-2ZWN</td>
<td>R</td>
<td>0.04</td>
<td>0.4</td>
<td>φ8</td>
<td>12</td>
<td>φ14</td>
<td>30</td>
<td>35</td>
<td>MLEX-A090</td>
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**High Power LED Coaxial Illumination**

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Window Size D (mm)</th>
<th>Optical Path Extension E (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCL-C-24</td>
<td>R</td>
<td>0.09</td>
<td>1.1</td>
<td>56</td>
<td>30</td>
<td>24</td>
<td>78</td>
<td>6.8</td>
<td>110</td>
<td>MLEX-A080</td>
</tr>
<tr>
<td>MSCL-C-19</td>
<td>R</td>
<td>0.20</td>
<td>2.4</td>
<td>70</td>
<td>38</td>
<td>39</td>
<td>φ28</td>
<td>1.2</td>
<td>160</td>
<td>MLEX-A080</td>
</tr>
<tr>
<td>MSCL-C-56B</td>
<td>R</td>
<td>0.16</td>
<td>1.9</td>
<td>90</td>
<td>56</td>
<td>56</td>
<td>φ28</td>
<td>1.2</td>
<td>320</td>
<td>MLEX-A080</td>
</tr>
<tr>
<td>MSCL-C-74B</td>
<td>R</td>
<td>0.62</td>
<td>7.4</td>
<td>110</td>
<td>82</td>
<td>74</td>
<td>50</td>
<td>1.2</td>
<td>520</td>
<td>MLEX-A3210</td>
</tr>
<tr>
<td>MSCL-C-105B</td>
<td>R</td>
<td>2.14</td>
<td>28</td>
<td>145</td>
<td>110</td>
<td>105</td>
<td>77</td>
<td>1.2</td>
<td>920</td>
<td>MLEX-A2310</td>
</tr>
</tbody>
</table>

**Without MSCL-CR24**

Camera

Lens/Lenses

Object

WD=65mm

**With MSCL-CR24**

Camera

Lens/Lenses

MSCL-CR24

Object

WD=65+6.8mm

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About Installation

Because glass components are used in the MSCL units, the internal optical path length will change when used. Be aware of the extended optical path when installing in a vision system.

Made-to-order products.

For LED controllers, see P16-17.
**Direct Ring Illumination**

**MDRL Series**
- High intensity, bright-field, 360-degree uniform lighting
- Standard LED illumination for a wide range of applications

**MLRL Series**
- Ideal for shiny or uneven surfaces, such as embossment and surface flaw detection
- MLRL-CR(G,B,W)46 illuminates from 0 degree angle.

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**Direct Ring Illumination**

**MDRL-NS Series**

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**Low Angle Ring Illumination**

**MLRL Series**
**MORITEX Illumination**

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### Shadowless Ring Illumination

**MSRL Series**

- Optimal soft, uniform light for shiny surfaces
- Diffused, shadowless illumination preventing halation effect

![Image](MSRL.png)

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Internal Diameter A (mm)</th>
<th>External Diameter B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area Diameter D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSRL-C 20</td>
<td>R, G, B, W</td>
<td>0.35</td>
<td>3.6</td>
<td>Ø20</td>
<td>Ø74</td>
<td>18</td>
<td>Ø46.1</td>
<td>140</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MSRL-C 33</td>
<td>R, G, B, W</td>
<td>0.45</td>
<td>2.4</td>
<td>Ø33</td>
<td>Ø104</td>
<td>17</td>
<td>Ø80</td>
<td>210</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MSRL-C 44</td>
<td>R, G, B, W</td>
<td>0.57</td>
<td>1.7</td>
<td>Ø44</td>
<td>Ø123</td>
<td>17</td>
<td>Ø101</td>
<td>270</td>
<td>MLEK-A080</td>
</tr>
</tbody>
</table>

*Made-to-order products.

---

### Shadowless Low Angle Ring Illumination

**MSLL Series**

**MSLL-C 109**

![Image](MSLL.png)

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### Shadowless Low Angle Half-Ring Illumination

**MSLL-C 109-HF**

![Image](MSLL-HF.png)

---

### Shadowless Low Angle Square Illumination

**MSQL Series**

- Best suited for square shape objects, such as in BGA & QFPs

![Image](MSQL.png)

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Internal Diameter (mm)</th>
<th>External Diameter (mm)</th>
<th>Height (mm)</th>
<th>Window Size (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSQL-C 32</td>
<td>R, G, B, W</td>
<td>0.09</td>
<td>1.1</td>
<td>32</td>
<td>32</td>
<td>30</td>
<td>10</td>
<td>80</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MSQL-C 48</td>
<td>R, G, B, W</td>
<td>0.13</td>
<td>1.4</td>
<td>48</td>
<td>48</td>
<td>30</td>
<td>10 (With Reflector) 24 (Without Reflector)</td>
<td>120</td>
<td>MLEK-A080</td>
</tr>
</tbody>
</table>

*Made-to-order products.

---

### High Power Simple Dome Illumination

**MSDC Series**

- Perfectly diffused light provides extremely uniform illumination

![Image](MSDC.png)

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Internal Diameter (mm)</th>
<th>External Diameter (mm)</th>
<th>Height (mm)</th>
<th>Window Size (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSDC-C 156</td>
<td>R, G, B, W</td>
<td>1.49</td>
<td>18</td>
<td>Ø110</td>
<td>Ø136</td>
<td>66</td>
<td>350</td>
<td>270</td>
<td>MLEK-A230</td>
</tr>
</tbody>
</table>

*Made-to-order products.

---

### Dome Illumination

**MDML Series**

![Image](MDML.png)

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Internal Diameter (mm)</th>
<th>External Diameter (mm)</th>
<th>Height (mm)</th>
<th>Lighting Area Diameter (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDML-C 30</td>
<td>R, G, B, W</td>
<td>0.24</td>
<td>2.9</td>
<td>Ø11</td>
<td>Ø50</td>
<td>40</td>
<td>Ø47</td>
<td>110</td>
<td>MLEK-A080</td>
</tr>
</tbody>
</table>

*Made-to-order products.
**Bar Illumination**

**MBRL Series**

- Can be directed at any angle to the surface for either direct, bright-field lighting or optimal oblique, dark-field lighting.

**MHBC Series**

- High intensity illumination over wide areas
- Illuminated uniformly for A3 size area
- Integrated mounting rail system

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBRL-C_3408</td>
<td>B</td>
<td>0.09</td>
<td>1.1</td>
<td>44</td>
<td>10.4</td>
<td>15</td>
<td>34 x 8.4</td>
<td>2 x 6</td>
<td>35</td>
</tr>
<tr>
<td>MBRL-C_5015</td>
<td>B</td>
<td>0.17</td>
<td>2.0</td>
<td>60</td>
<td>17</td>
<td>20</td>
<td>50 x 15</td>
<td>3 x 12</td>
<td>50</td>
</tr>
<tr>
<td>MBRL-D_7510</td>
<td>B</td>
<td>0.36</td>
<td>4.3</td>
<td>85</td>
<td>32</td>
<td>18</td>
<td>75 x 10</td>
<td>6 x 18</td>
<td>120</td>
</tr>
<tr>
<td>MBRL-C_13015</td>
<td>B</td>
<td>0.52</td>
<td>3.8</td>
<td>140</td>
<td>17</td>
<td>20</td>
<td>150 x 15</td>
<td>3 x 32</td>
<td>85</td>
</tr>
<tr>
<td>MBRL-C_24015</td>
<td>B</td>
<td>0.80</td>
<td>9.6</td>
<td>251</td>
<td>25</td>
<td>18</td>
<td>240 x 15</td>
<td>3 x 60</td>
<td>270</td>
</tr>
<tr>
<td>MBRL-C_34015</td>
<td>B</td>
<td>0.80</td>
<td>9.6</td>
<td>371</td>
<td>25</td>
<td>18</td>
<td>360 x 15</td>
<td>3 x 90</td>
<td>380</td>
</tr>
</tbody>
</table>

**Diffuse Chip Type Bar Illumination**

**MBRC Series**

- Realization of a slim, lightweight compact design
- High brightness and high uniformity achieved by high density mounting of chip LEDs

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBRC-C_15012-DF</td>
<td>B</td>
<td>0.38</td>
<td>4.0</td>
<td>100</td>
<td>27</td>
<td>16</td>
<td>130 x 12</td>
<td>130</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MBRC-C_10012-DF</td>
<td>B</td>
<td>0.55</td>
<td>6.6</td>
<td>110</td>
<td>27</td>
<td>16</td>
<td>100 x 12</td>
<td>210</td>
<td>MLEK-A230</td>
</tr>
<tr>
<td>MBRC-C_60012-DF</td>
<td>B</td>
<td>0.99</td>
<td>12</td>
<td>140</td>
<td>27</td>
<td>16</td>
<td>600 x 12</td>
<td>420</td>
<td>MLEK-A230</td>
</tr>
<tr>
<td>MBRC-C_90012-DF-2CH</td>
<td>B</td>
<td>1.96</td>
<td>24</td>
<td>640</td>
<td>27</td>
<td>18</td>
<td>600 x 12</td>
<td>420</td>
<td>MLEK-A230</td>
</tr>
</tbody>
</table>

**High Power Bar Illumination**

**MHBC-C Series**

- Made-to-order products.

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area Length (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBRC-C_150-DF</td>
<td>B</td>
<td>1.15</td>
<td>14</td>
<td>200</td>
<td>50</td>
<td>45</td>
<td>130 x 42</td>
<td>50 (150mm)</td>
<td>450</td>
</tr>
<tr>
<td>MBRC-C_300-DF</td>
<td>B</td>
<td>2.1</td>
<td>28</td>
<td>150</td>
<td>50</td>
<td>45</td>
<td>200 x 42</td>
<td>50 (300mm, 150mm)</td>
<td>750</td>
</tr>
<tr>
<td>MBRC-C_450-DF-2CH</td>
<td>B</td>
<td>3.4</td>
<td>3.4</td>
<td>300 (Total)</td>
<td>120 (Total)</td>
<td>50</td>
<td>45</td>
<td>450 x 42</td>
<td>50 (300mm, 150mm)</td>
</tr>
</tbody>
</table>

**Square Bar Type Illumination**

**MDQL Series**

- Four high-intensity bar LED mounted to 1 single cable with individual angle adjustment from each bar LED

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Window Size (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDQL-C_58</td>
<td>B</td>
<td>0.08</td>
<td>5.1</td>
<td>58</td>
<td>58</td>
<td>12</td>
<td>60 x 25</td>
<td>55</td>
<td>MLEK-A008</td>
<td></td>
</tr>
<tr>
<td>MDQL-C_108</td>
<td>B</td>
<td>0.42</td>
<td>5.0</td>
<td>108</td>
<td>108</td>
<td>30</td>
<td>60 x 25</td>
<td>55</td>
<td>MLEK-A080</td>
<td></td>
</tr>
</tbody>
</table>

*Made-to-order products.*
Direct Backlights (Discrete Type)

**MDBL Series**

- Due to the LEDs mounted immediately beneath the diffusion plate surface, this unit achieves a higher luminance.

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length (A) (mm)</th>
<th>Housing Width (B) (mm)</th>
<th>Height (C) (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDBL-C-25</td>
<td>R</td>
<td>0.14</td>
<td>1.2</td>
<td>49</td>
<td>27</td>
<td>24</td>
<td>21</td>
<td>60</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MDBL-C-70</td>
<td>R</td>
<td>0.48</td>
<td>5.6</td>
<td>100</td>
<td>72</td>
<td>30</td>
<td>70</td>
<td>100</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MDBL-C-100</td>
<td>R, W</td>
<td>0.36</td>
<td>12</td>
<td>130</td>
<td>102</td>
<td>30</td>
<td>100</td>
<td>200</td>
<td>MLEK-A230</td>
</tr>
<tr>
<td>MDBL-C-180100</td>
<td>R, W, W</td>
<td>1.45</td>
<td>17</td>
<td>130</td>
<td>102</td>
<td>30</td>
<td>100</td>
<td>200</td>
<td>MLEK-A230</td>
</tr>
</tbody>
</table>

- Made-to-order products.

Direct Backlights (Chip Mount Type)

**MDBC Series**

- Provides intense and diffused versatile lighting

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length (A) (mm)</th>
<th>Housing Width (B) (mm)</th>
<th>Height (C) (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDBC-C-1100</td>
<td>R</td>
<td>0.80</td>
<td>9.6</td>
<td>112</td>
<td>110</td>
<td>15</td>
<td>100</td>
<td>170</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MDBC-C-1150</td>
<td>R</td>
<td>0.99</td>
<td>12</td>
<td>132</td>
<td>112</td>
<td>15</td>
<td>100</td>
<td>170</td>
<td>MLEK-A230</td>
</tr>
<tr>
<td>MDBC-C-125</td>
<td>R, W</td>
<td>0.54</td>
<td>6.4</td>
<td>162</td>
<td>160</td>
<td>15</td>
<td>150</td>
<td>170</td>
<td>MLEK-A230</td>
</tr>
<tr>
<td>MDBC-CW150-2</td>
<td>R, W</td>
<td>0.71</td>
<td>27</td>
<td>162</td>
<td>160</td>
<td>15</td>
<td>150</td>
<td>170</td>
<td>MLEK-A230</td>
</tr>
</tbody>
</table>

- Made-to-order products.

Edge Type Backlights

**MEBL/MEBC Series**

- Requires very little space due to slim, compact design
- Provides very uniform irradiation

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length (A) (mm)</th>
<th>Housing Width (B) (mm)</th>
<th>Height (C) (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEBL-C-25</td>
<td>R</td>
<td>0.33</td>
<td>1.2</td>
<td>70</td>
<td>27</td>
<td>6.5</td>
<td>25</td>
<td>45</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MEBL-C-50</td>
<td>R, W</td>
<td>0.49</td>
<td>4.5</td>
<td>70</td>
<td>27</td>
<td>6.5</td>
<td>25</td>
<td>45</td>
<td>MLEK-A080</td>
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<tr>
<td>MEBL-C-7010</td>
<td>R, W</td>
<td>0.57</td>
<td>5.0</td>
<td>70</td>
<td>27</td>
<td>6.5</td>
<td>25</td>
<td>45</td>
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</tr>
<tr>
<td>MEBL-C-10008</td>
<td>R, W</td>
<td>0.67</td>
<td>6.0</td>
<td>120</td>
<td>80</td>
<td>8.0</td>
<td>100</td>
<td>210</td>
<td>MLEK-A080</td>
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<tr>
<td>MEBL-C-145</td>
<td>R, W</td>
<td>0.45</td>
<td>3.8</td>
<td>120</td>
<td>80</td>
<td>8.0</td>
<td>100</td>
<td>210</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MEBL-C-360230</td>
<td>R, W</td>
<td>1.72</td>
<td>18</td>
<td>195</td>
<td>185</td>
<td>8.0</td>
<td>120</td>
<td>112</td>
<td>MLEK-A230</td>
</tr>
</tbody>
</table>

- Made-to-order products.
- Made-to-order products.

Collimated Backlights

**MCBP Series**

- Capable of capturing the shape of an object with higher precision due to decreasing a diffraction light

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Housing Length (A) (mm)</th>
<th>Housing Width (B) (mm)</th>
<th>Height (C) (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
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<tbody>
<tr>
<td>MDBC-C-1100</td>
<td>R</td>
<td>0.80</td>
<td>9.6</td>
<td>112</td>
<td>110</td>
<td>15</td>
<td>100</td>
<td>170</td>
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<tr>
<td>MDBC-C-1150</td>
<td>R</td>
<td>0.99</td>
<td>12</td>
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<td>112</td>
<td>15</td>
<td>100</td>
<td>170</td>
<td>MLEK-A230</td>
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<tr>
<td>MDBC-C-125</td>
<td>R, W</td>
<td>0.54</td>
<td>6.4</td>
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<td>160</td>
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<td>150</td>
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<td>0.71</td>
<td>27</td>
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<td>160</td>
<td>15</td>
<td>150</td>
<td>170</td>
<td>MLEK-A230</td>
</tr>
</tbody>
</table>

- Made-to-order products.

For LED controllers, see P16-17.
High Brightness LED Light Line

**MLNC Series**

- Realization 700,000 lux at W = 50mm
- Equipped with a light focusing position adjustment mechanism
- Outstanding high power output and the thinnest body with end width of only 25mm

**IR Illumination**

- Provides image recognition at high contrast especially for items that are difficult to view invisible light
- Effective for materials that chemically react to visible light rays or allow IR wavelength transmission

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Illumination Type</th>
<th>Housing External Size (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCEL-C688-2</td>
<td>IR</td>
<td>0.06</td>
<td>0.2</td>
<td>Coaxial Illumination</td>
<td>Ø14 x 30</td>
<td>35</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MCEL-C764-1</td>
<td>IR</td>
<td>0.10</td>
<td>1.1</td>
<td>Simulated Coaxial Illumination</td>
<td>56 x 35 x 24</td>
<td>170</td>
<td>MLEK-A210</td>
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<tr>
<td>MCEL-C956-1</td>
<td>IR</td>
<td>0.16</td>
<td>1.9</td>
<td>Simulated Coaxial Illumination</td>
<td>70 x 35 x 40</td>
<td>170</td>
<td>MLEK-A210</td>
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<tr>
<td>MCEC-UV80-2</td>
<td>IR</td>
<td>0.35</td>
<td>4.0</td>
<td>Simulated Coaxial Illumination</td>
<td>55 x 40 x 5.5</td>
<td>250</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MCEL-C1080-1</td>
<td>IR</td>
<td>0.20</td>
<td>2.6</td>
<td>Simulated Coaxial Illumination</td>
<td>145 x 110 x 136</td>
<td>920</td>
<td>MLEK-A210</td>
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<tr>
<td>MCEL-C1075-1</td>
<td>IR</td>
<td>0.16</td>
<td>2.0</td>
<td>Direct Ring Illumination</td>
<td>Ø8 x 73.5</td>
<td>70</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MDEL-C900-1</td>
<td>IR</td>
<td>0.42</td>
<td>5.0</td>
<td>Direct Ring Illumination</td>
<td>Ø66 x 20</td>
<td>130</td>
<td>MLEK-A210</td>
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<tr>
<td>MDEL-C911-1</td>
<td>IR</td>
<td>0.46</td>
<td>3.8</td>
<td>Direct Ring Illumination</td>
<td>Ø90 x 10</td>
<td>130</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MCEL-C946-1</td>
<td>IR</td>
<td>0.18</td>
<td>2.2</td>
<td>Low Angle Ring Illumination</td>
<td>Ø75 x 10</td>
<td>80</td>
<td>MLEK-A210</td>
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<tr>
<td>MCEL-C946-2</td>
<td>IR</td>
<td>0.31</td>
<td>4.0</td>
<td>Low Angle Ring Illumination</td>
<td>Ø75 x 10</td>
<td>80</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MCEL-C920-1</td>
<td>IR</td>
<td>0.56</td>
<td>4.1</td>
<td>Wavelength Ring Illumination</td>
<td>Ø75 x 18</td>
<td>140</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MDEL-C7150-1</td>
<td>IR</td>
<td>0.40</td>
<td>3.8</td>
<td>Bar Illumination</td>
<td>Ø85 x 12 x 18</td>
<td>130</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MDEL-C774-1</td>
<td>IR</td>
<td>0.15</td>
<td>2.1</td>
<td>Bar Illumination</td>
<td>Ø105 x 7 x 18</td>
<td>130</td>
<td>MLEK-A210</td>
</tr>
<tr>
<td>MDEL-C7100-1</td>
<td>IR</td>
<td>0.35</td>
<td>3.8</td>
<td>Bar Illumination</td>
<td>Ø150 x 12 x 10</td>
<td>220</td>
<td>MLEK-A210</td>
</tr>
</tbody>
</table>

*Made-to-order products.

Peak wavelength is 850 nm. (* MCEL-C8B904 * is 940 nm. )

**UV Illumination**

- Provides image recognition at high contrast especially for items that are difficult to view invisible light
- Effective in detection of dirt on glass substrates and dust on elements

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Maximum Rated Current (A)</th>
<th>Power (W)</th>
<th>Illumination Type</th>
<th>Housing External Size (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCEL-CU1285-1</td>
<td>UV</td>
<td>0.05</td>
<td>0.2</td>
<td>Coaxial Illumination</td>
<td>Ø14 x 20</td>
<td>35</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MBRL-CU1272-1</td>
<td>UV</td>
<td>0.36</td>
<td>4.3</td>
<td>Direct Ring Illumination</td>
<td>Ø66 x 20</td>
<td>130</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MBRL-CU75310-2</td>
<td>UV</td>
<td>0.16</td>
<td>4.1</td>
<td>Bar Illumination</td>
<td>Ø85 x 12 x 18</td>
<td>130</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MBRL-CU7530-405</td>
<td>UV</td>
<td>0.32</td>
<td>6.0</td>
<td>Bar Illumination</td>
<td>Ø85 x 12 x 18</td>
<td>130</td>
<td>MLEK-A080</td>
</tr>
<tr>
<td>MDQL-CU1085-2</td>
<td>UV</td>
<td>0.36</td>
<td>4.3</td>
<td>Square Bar Type Illumination</td>
<td>104 x 10 x 10</td>
<td>210</td>
<td>MLEK-A080</td>
</tr>
</tbody>
</table>

*Made-to-order products.

Peak wavelength is 365 nm. (* MCEL-CUV8-405 * and *MBRL-CUV7530-405* are 405 nm. )

**Variable Color RGB Illumination**

- Individual control for each color (1 channel with 1 color)
- Ideal for ID inspection, experimental use and color filter inspection

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Total Maximum Rated Current (A)</th>
<th>Total Power (W)</th>
<th>Illumination Type</th>
<th>Housing External Size (mm)</th>
<th>Weight (g)</th>
<th>LED Controller</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBRL-CRG652-1</td>
<td>RGB</td>
<td>0.12</td>
<td>1.4</td>
<td>Edge Type Backlight</td>
<td>Ø12 x 20 x 15</td>
<td>40</td>
<td>MLEK-A070</td>
</tr>
<tr>
<td>MBRL-CRG65002-1</td>
<td>RGB</td>
<td>1.26</td>
<td>15</td>
<td>Edge Type Backlight</td>
<td>Ø12 x 20 x 18</td>
<td>100</td>
<td>MLEK-A070</td>
</tr>
<tr>
<td>MBRL-CRG6502-1</td>
<td>RGB</td>
<td>0.72</td>
<td>6.0</td>
<td>Edge Type Backlight</td>
<td>Ø12 x 20 x 18</td>
<td>100</td>
<td>MLEK-A070</td>
</tr>
<tr>
<td>MBRL-CRG7530-1</td>
<td>RGB</td>
<td>0.46</td>
<td>5.8</td>
<td>Bar Illumination</td>
<td>Ø85 x 12 x 18</td>
<td>140</td>
<td>MLEK-A070</td>
</tr>
</tbody>
</table>

*Made-to-order products.

For LED controllers, see P16-17.
**LED Controllers for MCEP/MSPP Series**

### MLEP Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Output Channel</th>
<th>Output Voltage</th>
<th>Input Current</th>
<th>Input Voltage</th>
<th>Operating System</th>
<th>External Light Control</th>
<th>Weight (g)</th>
<th>Size A x B x C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLEP-B070W1LR-100V</td>
<td>1CH</td>
<td>0.15 / 0.7A</td>
<td>AC100-240</td>
<td>0.11 / 0.80V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,000</td>
<td>90 x 75 x 150</td>
</tr>
<tr>
<td>MLEP-B070W2LR-100V</td>
<td>2CH</td>
<td>0.15 / 0.7A</td>
<td>AC100-240</td>
<td>0.22 / 0.80V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,300</td>
<td>90 x 75 x 150</td>
</tr>
<tr>
<td>MLEP-B070W1LRD-100V</td>
<td>1CH</td>
<td>0.15 / 0.7A</td>
<td>AC100-240</td>
<td>0.11 / 0.80V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,000</td>
<td>90 x 75 x 150</td>
</tr>
<tr>
<td>MLEP-B070W2LRD-100V</td>
<td>2CH</td>
<td>0.15 / 0.7A</td>
<td>AC100-240</td>
<td>0.22 / 0.80V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,300</td>
<td>90 x 75 x 150</td>
</tr>
</tbody>
</table>

**Multi Channel Series**

- Four independent channel digital controller
- External digital control with 10-bit, 1024 level capability

**High wattage Series**

- High wattage LED controller with digital intensity control

### MLEK Series

<table>
<thead>
<tr>
<th>Model</th>
<th>Output Channel</th>
<th>Output Voltage</th>
<th>Input Current</th>
<th>Input Voltage</th>
<th>Operating System</th>
<th>External Light Control</th>
<th>Weight (g)</th>
<th>Size A x B x C (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLEK-A080W1LR-100V</td>
<td>1CH</td>
<td>0.8A</td>
<td>AC100-240</td>
<td>0.3 / 2.40V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,000</td>
<td>90 x 75 x 150</td>
</tr>
<tr>
<td>MLEK-A080W2LR-100V</td>
<td>2CH</td>
<td>0.8A</td>
<td>AC100-240</td>
<td>0.3 / 2.40V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,400</td>
<td>90 x 75 x 150</td>
</tr>
<tr>
<td>MLEK-A080W1LRD-100V</td>
<td>1CH</td>
<td>0.8A</td>
<td>AC100-240</td>
<td>0.3 / 2.40V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,000</td>
<td>90 x 75 x 150</td>
</tr>
<tr>
<td>MLEK-A080W2LRD-100V</td>
<td>2CH</td>
<td>0.8A</td>
<td>AC100-240</td>
<td>0.3 / 2.40V</td>
<td>DC Continuous Output</td>
<td>Digital</td>
<td>1,400</td>
<td>90 x 75 x 150</td>
</tr>
</tbody>
</table>

**Supports up to 7.7A**
Diffuser Plates: MDF Series
These diffuser plates, which can be attached to the illumination using the dedicated adapters, help prevent unwanted lighting reflection.

Adapters: MAD Series
Adapter for attaching dedicated diffuser plates and polarizing plate for MG-Wave ring illumination.

Polarizing Plate: MPL Series
Attaching these polarizing plates on the lens side (inside the polarizer) cuts specular reflection in particular areas and reduces glare in the resulting image.

Light Control Film: MLM Series
The MLM Series are resin films that transform diffused illumination into parallel illumination. Attaching to a simulated coaxial illumination makes the light distribution pattern smoother.

Sharp Cut Filter ML-R Series
When using red illumination, attachment to the tip of the CCTV lens is effective in preventing ambient light.

Extension Cables
Entire M-RCB Series meet robot cable requirements and all 1m & 2m products are CE compliant.

External Control Cables
MC-EXC-02
MC-EXC-07

Selection flowchart

LED SAFETY STANDARD (CEI/IEC 62471:2006)
Lamp Classification based on IEC standards are applicable to LED lighting units. Criteria for classification is shown above. LEDs are narrow bandwidth light sources with emission levels based on "blue light, small source" where the wavelength is from 300nm to 700nm. The LED illumination products listed in the catalog are considered to be in either the low risk or exempt group.
CompaVis® employs the constant voltage control system that can be controlled not only by APS MLEF LED controllers but also by industry available 24V DC power supplies directly. Overdriven strobing for instantaneous high intensity illumination is also available. The series can support customer’s various image processing environments with a broad range of lighting solutions.
**Low Angle Ring Illumination: CV-RLA Series**

- Ideal for imaging of uneven surfaces such as embossment and surface flaw detection

**Zero Angle Ring Illumination: CV-RLA-00 Series**

- Installation possible from close range of object from horizontal inner diameter illumination from 360-degree

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**Direct Ring Illumination: CV-R Series**

- High intensity uniform illumination by 360-degree lighting
- Standard LED illumination for a wide range of applications

**Square Ring Illumination: CV-SQ Series**

- Ring illumination with LEDs mounted vertically onto a planar substrate in a square chassis

---

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Internal Diameter A (mm)</th>
<th>External Diameter B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Angle D (Degree)</th>
<th>Weight (g)</th>
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<tbody>
<tr>
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<td>0.2</td>
<td>Ø10</td>
<td>Ø32</td>
<td>16</td>
<td>70</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>1.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CV-42X18-65</td>
<td>B</td>
<td>2.7</td>
<td>Ø18</td>
<td>Ø42</td>
<td>18</td>
<td>65</td>
<td>55</td>
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<td>CV-50X28-75</td>
<td>R</td>
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<td>Ø26</td>
<td>Ø50</td>
<td>16</td>
<td>75</td>
<td>55</td>
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<td></td>
<td>W</td>
<td>2.8</td>
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<td>CV-70X35-90</td>
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<td>Ø35</td>
<td>Ø70</td>
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<td></td>
<td>W</td>
<td>5.5</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>CV-90X30-80</td>
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<td>Ø30</td>
<td>Ø90</td>
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<td>83</td>
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<td>Ø30</td>
<td>Ø90</td>
<td>20</td>
<td>71</td>
<td>180</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>6.2</td>
<td>Ø50</td>
<td>Ø90</td>
<td>20</td>
<td>71</td>
<td>180</td>
</tr>
<tr>
<td>CV-120X58-50</td>
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<td>Ø58</td>
<td>Ø120</td>
<td>31.5</td>
<td>52</td>
<td>560</td>
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<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Internal Diameter A (mm)</th>
<th>External Diameter B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Angle D (Degree)</th>
<th>Weight (g)</th>
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<tbody>
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<td>CV-SQ-56X56X30</td>
<td>B</td>
<td>1.0</td>
<td>Ø30</td>
<td>56</td>
<td>56</td>
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<td>85</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>CV-SQ-70X70X34</td>
<td>B</td>
<td>2.0</td>
<td>Ø34</td>
<td>70</td>
<td>70</td>
<td>18</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>4.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Model Emitted Color Power (W) Internal Diameter A (mm) External Diameter B (mm) Height C (mm) Lighting Angle D (Degree) Weight (g)**

| CV-RLA-74X48-30 | B            | 2.2       | Ø48                      | Ø74                     | 19            | 10                        | 95         |
| CV-RLA-100X70-30: | B            | 1.5       | Ø70                      | Ø100                    | 22            | 10                        | 170        |
| CV-RLA-132-96X15: | R            | 2.5       | Ø96                      | Ø152                    | 22            | 15                        | 280        |

---

For LED controllers, see P28.
Shadowless Illumination

**CV-FR/DR/DSQ Series**

### Shadowless Ring Illumination: CV-FR Series
- Optimal soft, uniform light for shiny surfaces

### Shadowless Low Angle Ring Illumination: CV-DR Series
- Shallow angle LED illumination that provides diffused, soft light
- Ideal for flaw or edge detection on reflective surfaces

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Internal Diameter A (mm)</th>
<th>External Diameter B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area D (mm²)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-FR-102X35</td>
<td>B</td>
<td>1.2</td>
<td>55</td>
<td>102</td>
<td>12</td>
<td>80</td>
<td>190</td>
</tr>
<tr>
<td>CV-FR-125X44</td>
<td>B</td>
<td>2.5</td>
<td>75</td>
<td>125</td>
<td>12</td>
<td>102.5</td>
<td>280</td>
</tr>
<tr>
<td>CV-DR-100X27</td>
<td>B</td>
<td>1.7</td>
<td>75</td>
<td>100</td>
<td>40</td>
<td>95.5</td>
<td>230</td>
</tr>
<tr>
<td>CV-DR-116X109</td>
<td>B</td>
<td>8.6</td>
<td>109</td>
<td>136</td>
<td>40</td>
<td>129.5</td>
<td>340</td>
</tr>
<tr>
<td>CV-DR-180X153</td>
<td>B</td>
<td>10.5</td>
<td>153</td>
<td>180</td>
<td>40</td>
<td>171.5</td>
<td>420</td>
</tr>
</tbody>
</table>

### Square Shadowless Low Angle Illumination: CV-DSQ Series
- Diffused illumination best suited for square shape objects, such as in BGA & QFP applications

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Window Size D (mm²)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-DSQ-48X48-15</td>
<td>B</td>
<td>0.8</td>
<td>48</td>
<td>48</td>
<td>30</td>
<td>190</td>
<td>110</td>
</tr>
<tr>
<td>CV-DSQ-75X75-15</td>
<td>B</td>
<td>0.7</td>
<td>75</td>
<td>75</td>
<td>30</td>
<td>250</td>
<td>180</td>
</tr>
<tr>
<td>CV-DSQ-96X96-15</td>
<td>B</td>
<td>0.9</td>
<td>96</td>
<td>96</td>
<td>30</td>
<td>340</td>
<td>190</td>
</tr>
<tr>
<td>CV-DSQ-120X120-15</td>
<td>B</td>
<td>1.2</td>
<td>120</td>
<td>120</td>
<td>30</td>
<td>398</td>
<td>240</td>
</tr>
</tbody>
</table>

Bar Illumination

**CV-BA Series**

- High-intensity LED block array
- Can be directed at any angle to the surface for either direct bright field or optimal oblique dark field lighting

### CV-BA-42X15
- B | 0.8 | 52 | 17 | 21.5 | 42 | 15 | 3 x 12 | 35
- W | 1.8 | 110

### CV-BAQ Series

- Four high-intensity bar LED mounted to 1 single cable with individual angle adjustment from each bar LED

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area D (mm²)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-BAQ-108X108</td>
<td>B</td>
<td>1.5</td>
<td>108</td>
<td>108</td>
<td>30</td>
<td>60</td>
<td>220</td>
</tr>
<tr>
<td>CV-BAQ-148X148</td>
<td>B</td>
<td>2.6</td>
<td>148</td>
<td>148</td>
<td>30</td>
<td>120</td>
<td>290</td>
</tr>
<tr>
<td>CV-BAQ-200X200</td>
<td>B</td>
<td>3.2</td>
<td>200</td>
<td>200</td>
<td>30</td>
<td>152</td>
<td>390</td>
</tr>
</tbody>
</table>
Direct Backlights (Chip Mount Type)

**CV-FL Series**

- Densely packaged chip LEDs in thin chassis (Height: 15 mm)

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Housing Length A (mm)</th>
<th>Housing Width B (mm)</th>
<th>Height C (mm)</th>
<th>Lighting Area Size D (mm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-FL-27X27</td>
<td>R</td>
<td>0.6</td>
<td>37</td>
<td>37</td>
<td>15</td>
<td>27</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>1.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-FL-51X51</td>
<td>R</td>
<td>4.5</td>
<td>61</td>
<td>61</td>
<td>15</td>
<td>51</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>5.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-FL-63X60</td>
<td>R</td>
<td>3.2</td>
<td>73</td>
<td>70</td>
<td>15</td>
<td>63 x 60</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>6.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-FL-83X75</td>
<td>R</td>
<td>4.7</td>
<td>85</td>
<td>95</td>
<td>15</td>
<td>83 x 75</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>7.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-FL-100X100</td>
<td>R</td>
<td>5.5</td>
<td>110</td>
<td>112</td>
<td>15</td>
<td>100</td>
<td>160</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>9.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-FL-230X230</td>
<td>R</td>
<td>29</td>
<td>240</td>
<td>268</td>
<td>15</td>
<td>230</td>
<td>760</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

IR Illumination

- Provides image recognition at high contrast especially for items that are difficult to view invisible light
- Effective for materials that chemically react to visible light rays or allow IR wavelength transmission

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Illumination Type</th>
<th>Housing External Size (mm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-BA-42X15IR</td>
<td>R</td>
<td>0.9</td>
<td>Bar Illumination</td>
<td>52 x 17 x 21.5</td>
<td>15</td>
</tr>
</tbody>
</table>

Coaxial Illumination

**CV-CE Series**

- Body design has been miniaturized and this series is even smaller than its compact predecessors
- L-shaped (right angle) illumination cable design enables further space savings

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Tip External Diameter (mm)</th>
<th>Tip Length (mm)</th>
<th>Lighting Area Size (mm)</th>
<th>Housing Diameter (mm)</th>
<th>Housing Length (mm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-CE-14X8</td>
<td>B</td>
<td>0.4</td>
<td>12</td>
<td>6</td>
<td>14</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>0.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Simulated Coaxial Illumination

**CV-CX Series**

- Highly uniform pseudo-coaxial (on-axis) lighting
- Designed for use with our lenses without built-in coaxial illumination

<table>
<thead>
<tr>
<th>Model</th>
<th>Emitted Color</th>
<th>Power (W)</th>
<th>Housing Length (mm)</th>
<th>Housing Width (mm)</th>
<th>Height (mm)</th>
<th>Window Face Height (mm)</th>
<th>Optical Path Length (mm)</th>
<th>Weight (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-CX-75.4X4X60</td>
<td>B</td>
<td>1.2</td>
<td>75</td>
<td>64</td>
<td>41</td>
<td>28 x 26</td>
<td>2.5</td>
<td>190</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>2.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-CX-79.4X6X30</td>
<td>B</td>
<td>4.4</td>
<td>94</td>
<td>60</td>
<td>59</td>
<td>36 x 32</td>
<td>2.5</td>
<td>350</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>6.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV-CX-120.8X6X90</td>
<td>B</td>
<td>3.8</td>
<td>120</td>
<td>84</td>
<td>80</td>
<td>50 x 90</td>
<td>2.5</td>
<td>580</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>5.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dedicated LED Digital Controller

MLEF Series

Two in one multifunctional digital controllers for Strobe/PWM

- Ethernet communication
  Ethernet/parallel (8-bit) port provided for external interfacing
- Mode selectable between strobe overdrive, strobe, and PWM
  Adaptable to various lighting modes ranging from strobe overdrive to continuous lighting
- Compact and lightweight body allows flexible installation to a DIN rail or direct mounting

Specifications

<table>
<thead>
<tr>
<th>Model name</th>
<th>MLEF-A015G2DT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input voltage</td>
<td>24VDC +/-10% (21.6-26.4V)</td>
</tr>
<tr>
<td>Input current</td>
<td>1.7A (Maximum)</td>
</tr>
<tr>
<td>Output channels</td>
<td>2 channels</td>
</tr>
<tr>
<td>Output power</td>
<td>PWM/STB: 10V (Two channel total), STBO: 16V (Two channel total)</td>
</tr>
<tr>
<td>Output voltage</td>
<td>PWM/STB: 0-30Vp-p, STBO: 40Vp-p</td>
</tr>
<tr>
<td>Variable output range</td>
<td>PWM/STB: 0 to 100%, STBO: 10 to 40V</td>
</tr>
<tr>
<td>Remote control</td>
<td>Ethernet LAN port / Parallel port</td>
</tr>
<tr>
<td>PWM mode</td>
<td>PWM frequency: 100kHz (Control step: 256 steps)</td>
</tr>
<tr>
<td>STB mode</td>
<td>Light emitting time: 0.1 to 15.0ms (99 steps or 0.1ms increments)</td>
</tr>
<tr>
<td>STBO mode</td>
<td>Light emitting time: 0 to 100μs (100 steps or 10μs increments)</td>
</tr>
<tr>
<td>Trigger input range</td>
<td>5 to 24VDC</td>
</tr>
<tr>
<td>Setup mode</td>
<td>STB: 5ms / 50ms, STBO: 10μs / 100μs</td>
</tr>
<tr>
<td>Memory function</td>
<td>Manual memory (ROM) - Up to 3 memory settings, Remote LAN memory (RAM) - Up to 4 memory settings, Remote parallel memory (RAM) - Up to 4 memory settings</td>
</tr>
<tr>
<td>Safety feature</td>
<td>Overcurrent / Overvoltage / STB(O) output overtime protection</td>
</tr>
<tr>
<td>Weight</td>
<td>Approx. 800g</td>
</tr>
</tbody>
</table>

CompaVis® Accessories

Diffuse Plates: CV-DF Series
These diffuser plates, which can be attached to the illumination using the dedicated adapters, help prevent unwanted lighting reflection.

Adapters: CV-AD Series
Adapter for attaching dedicated diffuser plates and polarizing plate for CompaVis® ring illumination.

Polarizing Plate: CV-PL Series
Attaching these polarizing plates on the lens side (inside the polarizer) cuts specular reflection in particular areas and reduces glare in the resulting image.

Support Plates: CV-SP Series
This supporter plate to reduce the deflection of polarizing plate for bar.

Cable
The cable of M12 connector also is possible provided.

Extension Cable

Branch Cable - 2 Way

Branch Cable - 4 Way

Model name MLEF-A015G2DT
Input voltage 24VDC +/-10% (21.6-26.4V)
Input current 1.7A (Maximum)
Output channels 2 channels
Output power PWM/STB: 10V (Two channel total), STBO: 16V (Two channel total)
Output voltage PWM/STB: 0-30Vp-p, STBO: 40Vp-p
Variable output range PWM/STB: 0 to 100%, STBO: 10 to 40V
Remote control Ethernet LAN port / Parallel port
PWM mode PWM frequency: 100kHz (Control step: 256 steps)
STB mode Light emitting time: 0.1 to 15.0ms (99 steps or 0.1ms increments)
STBO mode Light emitting time: 0 to 100μs (100 steps or 10μs increments)
Trigger input range 5 to 24VDC
Setup mode STB: 5ms / 50ms, STBO: 10μs / 100μs
Memory function Manual memory (ROM) - Up to 3 memory settings, Remote LAN memory (RAM) - Up to 4 memory settings, Remote parallel memory (RAM) - Up to 4 memory settings
Safety feature Overcurrent / Overvoltage / STB(O) output overtime protection
Weight Approx. 800g
Advantages of Fiber Optic Light Guides:

- Compact Illuminating Unit Size
- Highest Intensity Output
- Uniform Light
- All Visible Wavelengths and IR When Required
- Directional Light Control
- External Heat and Noise From Illuminated Area

Light Sources and Available Light Guides

<table>
<thead>
<tr>
<th>Light Source</th>
<th>Light Guide</th>
<th>Other Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>MHAA-100W</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MHAB-100W</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MHAA-150W</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MHAB-150W</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

- The characteristics may be changed by deterioration under the operating environment.
- Deterioration may be caused by use at high output.
- This is when the product is used at the environmental temperature of 40˚C or less.
Options

Option Attachment Drawing for Halogen Light Sources

**Replacement Lamp**
- LM 100 (100W)
- LM 150 (150W)
- LM 150C (150W Long Life Type)

**Cable with External Remote Connector**
- MC-EXC-02 (L=2m)

**Light Source**
- Use Together with MHAA-100W and MHAB-150W

**Built-in Color Filter for Light Source**
- MLF-40R
- MLF-40G
- MLF-40Y
- MLF-40B-390
- MLF-40B-440
- MLF-40B-460

**Power Supply Internal Shutter**
- For light source compatibility and specifications, see corresponding pages.

- Not sold separately
- Special configurations and power source internal shutters exist for the 100W Light Sources

---

**Halogen Light Sources**

**MHAA-100W Series**

- Wide wavelength
- Realized illumination to close to natural light not to be emitted with an LED source
- Compact, lightweight
- Ease of maintenance possible with Lamp replacement

**MHAB-150W Series**

**MHAB-100W-IR**

- Large Diameter Light Guide Ferrule
- Power Supply Internal Shutter
- Built-in Color Filter for Light Source

**Options**

**Model**

**MHAA-100W-100V**

- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-100
- Average of Lamp Life Time (Hours Nominal): 1,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 127 x 258 x 74
- Weight (kg): 2

**MHAA-100W-200V**

- Input Voltage: AC200-240V
- Input Current: Not specified
- Compatible Lamp: LM-100
- Average of Lamp Life Time (Hours Nominal): 10,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 258 x 74
- Weight (kg): 2

**MHAB-150W-100V**

- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-150
- Average of Lamp Life Time (Hours Nominal): 1,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

**MHAB-150W-200V**

- Input Voltage: AC200-240V
- Input Current: Not specified
- Compatible Lamp: LM-150
- Average of Lamp Life Time (Hours Nominal): 10,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

**MHAB-100W-IR-100V**

- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-150-IR
- Average of Lamp Life Time (Hours Nominal): 1,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

**MHAB-100W-IR-200V**

- Input Voltage: AC200-240V
- Input Current: Not specified
- Compatible Lamp: LM-150-IR
- Average of Lamp Life Time (Hours Nominal): 10,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

---

**MHAA-100W-100V**

- AC100-120V
- AC200-240V (50/60Hz)
- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-100
- Average of Lamp Life Time (Hours Nominal): 1,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 258 x 74
- Weight (kg): 2

**MHAA-100W-200V**

- AC100-120V
- AC200-240V (50/60Hz)
- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-100
- Average of Lamp Life Time (Hours Nominal): 10,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 258 x 74
- Weight (kg): 2

**MHAB-150W-100V**

- AC100-120V
- AC200-240V (50/60Hz)
- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-150
- Average of Lamp Life Time (Hours Nominal): 1,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

**MHAB-150W-200V**

- AC100-120V
- AC200-240V (50/60Hz)
- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-150
- Average of Lamp Life Time (Hours Nominal): 10,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

**MHAB-100W-IR-100V**

- AC100-120V
- AC200-240V (50/60Hz)
- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-150-IR
- Average of Lamp Life Time (Hours Nominal): 1,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

**MHAB-100W-IR-200V**

- AC100-120V
- AC200-240V (50/60Hz)
- Input Voltage: AC100-240V
- Input Current: Not specified
- Compatible Lamp: LM-150-IR
- Average of Lamp Life Time (Hours Nominal): 10,000
- Color Temperature (K): 3,000
- External Light Control: 0/5V Analog
- Size A x B x C (mm): 119 x 278 x 120
- Weight (kg): 3.2

---

**Model**

**Input Voltage**

- AC100-240V
- AC200-240V (50/60Hz)

**Compatible Lamp**

- LM-100
- LM-150
- LM-150-IR

**Average of Lamp Life Time (Hours Nominal)**

- 1,000
- 10,000
- 1,000
- 10,000

**Color Temperature (K)**

- 3,000
- 3,000
- 3,000
- 3,000

**External Light Control**

- 0/5V Analog

**Size A x B x C (mm)**

- 127 x 258 x 74
- 119 x 258 x 74
- 119 x 278 x 120
- 119 x 278 x 120

**Weight (kg)**

- 2
- 2
- 3.2
- 3.2

---

* Not sold separately
* Special configurations and power source internal shutters exist for the 100W Light Sources

For light source compatibility and specifications, see corresponding pages.
Straight Light Guides

**MSG/P Series**

<table>
<thead>
<tr>
<th>Model</th>
<th>Fiber Type</th>
<th>Branches</th>
<th>Bundled Diameter of Object Side A (mm)</th>
<th>Light-guide Length B (mm)</th>
<th>Tip External Diameter C (mm)</th>
<th>Tip Length D (mm)</th>
<th>Housing Diameter E (mm)</th>
<th>Housing Length F (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSG6-1100S</td>
<td>Glass</td>
<td>2</td>
<td>0.4</td>
<td>3.0</td>
<td>1.5</td>
<td>12</td>
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<td>MSG6-1500S</td>
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<td>MSG6-10000S</td>
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<td>0.6</td>
<td>10.0</td>
<td>1.0</td>
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<td>15.0</td>
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<td>12</td>
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</table>

Bifurcated Light Guides

**MWG/P Series**

<table>
<thead>
<tr>
<th>Model</th>
<th>Fiber Type</th>
<th>Branches</th>
<th>Bundled Diameter of Object Side A (mm)</th>
<th>Light-guide Length B (mm)</th>
<th>Tip External Diameter C (mm)</th>
<th>Tip Length D (mm)</th>
<th>Housing Diameter E (mm)</th>
<th>Housing Length F (mm)</th>
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</thead>
<tbody>
<tr>
<td>MWG4-4000S</td>
<td>Glass</td>
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<td>MWG4-6000S</td>
<td>Glass</td>
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<tr>
<td>MWG4-10000S</td>
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<td>0.4</td>
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Multifurcated Light Guides

**M3G/M4G Series**

<table>
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<tr>
<th>Model</th>
<th>Fiber Type</th>
<th>Branches</th>
<th>Bundled Diameter of Object Side A (mm)</th>
<th>Light-guide Length B (mm)</th>
<th>Tip External Diameter C (mm)</th>
<th>Tip Length D (mm)</th>
<th>Housing Diameter E (mm)</th>
<th>Housing Length F (mm)</th>
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<tbody>
<tr>
<td>M3G3-2000S</td>
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<td>M3G4-2000S</td>
<td>Glass</td>
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<td>0.4</td>
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<td>M4G4-2000S</td>
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Ring Light Guides

**MRG/P Series**

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<thead>
<tr>
<th>Model</th>
<th>Fiber Type</th>
<th>Branches</th>
<th>Bundled Diameter of Object Side A (mm)</th>
<th>Light-guide Length B (mm)</th>
<th>Tip External Diameter C (mm)</th>
<th>Tip Length D (mm)</th>
<th>Housing Diameter E (mm)</th>
<th>Housing Length F (mm)</th>
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<tbody>
<tr>
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<td>0.4</td>
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<tr>
<td>MRG6-1000S</td>
<td>Glass</td>
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Plate Type Light Guides

**MPP Series**

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<thead>
<tr>
<th>Model</th>
<th>Fiber Type</th>
<th>Branches</th>
<th>Bundled Diameter of Object Side A (mm)</th>
<th>Light-guide Length B (mm)</th>
<th>Tip External Diameter C (mm)</th>
<th>Tip Length D (mm)</th>
<th>Housing Diameter E (mm)</th>
<th>Housing Length F (mm)</th>
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<td>MPP4-2000S</td>
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<td>0.4</td>
<td>4.0</td>
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<td>12</td>
<td>14</td>
<td>76</td>
</tr>
</tbody>
</table>
**Light Guide Accessories**

**Accessory Attachment Drawing for Straight/ Bifurcated/ Multifurcated Light Guides**

- **Condenser Lenses**
  - ML-40

- **SD Type** (Thin Ferrules)

- **Quartz Adapter**
  - KA-03

- **Filter Holder**
  - FAF-10

- **Color Temperature Conversion Filter**
  - MLF-10
  - MLF-20R

- **Color Filter (Red)**
  - MLF-20Y

- **Diffusion Filter**
  - MLF-30

- **Polarizing Filter**
  - ME-01

- **Internal Diameter Adapter**
  - MS-02
  - MS-03
  - MS-04
  - MS-05
  - MS-06

- **Mounting Direction**

- **Diffusion Filter**
  - MK-02
  - MK-03
  - MK-04
  - MK-05
  - MK-06

- **Polarizing Filter**
  - ME-01

For light source compatibility and specifications, see corresponding pages.

**Light Guide Accessories**

**Condenser Lenses for Line Light Guides**

- **MLK-50**

- **MLP-180**

**Long Width Line Light Guides**

**MFKG/P Series**

- **Model**
  - MFKG/P-1500S
  - MFKG/P-3000S
  - MFKG/P-6000S

- **Fiber Type**
  - Glass

- **Shape Type**
  - Straight

- **Number of Branches**
  - 1

- **Light Guide Length**
  - 1500 mm

- **Lighting Area Length**
  - 1500 mm

For light source compatibility and specifications, see corresponding pages.
Quartz UV Light Guide

**Glossary**

**UV**
- Measured Light Quantity Filter Lamp Fiber
- Light Flex (lumen): The quality of light emitted from a light source. The unit is lumen (lm).
  \[1 \text{lm} = 1 \text{cd} \times 1 \text{m}^2 \]
- Luminous Intensity (candela): Light source quantity representing the quantity of light emitted from a light source per unit solid angle. The unit is candela (cd).
- Intensity (lux): Brightness on an object surface irradiated by light emitted from a light source. The unit is lux (lx).
  \[1 \text{lx} = 1 \text{lm} / \text{m}^2 \]
- Color Temperature K: Color temperature representing the spectral energy distribution of light emitted from a light source. The unit is kelvin (K).
- Polarizing Filter: A filter to block light being reflected from glass, metal, or liquid surfaces that is too strong and detrimental.
- ND Filter: A filter to reduce the light quantity only, without affecting color reproduction. Also known as a gray filter.
- Color Temperature Conversion Filter: A filter to change the color temperature. The wavelength can be selected.
- Diffusion Filter: A filter to diffuse light from a light source and suppress illumination irregularity.
- IR Cut Filter: This filter can be classified into two types: heat-ray absorbing filters (or, catathermic filters), which absorb infrared rays, and cold filters, which reflect infrared rays by a multilayer film.
- Light Control Film: By laminating a micro-louver film with PET or other types of film, diffused light becomes more parallel.

**MSS5-1000S-UVIII**
- ø5 x 2-Branch x 1000L
- ø3.5 x 2-Branch x 1000L

**MWS5-1000S-UVIIIM4S5-1000S-UVIIIMSS3.5-1000S-UVIII**
- ø5 x 4-Branch x 1000L
- ø3.5 x 4-Branch x 1000L

**M3S3.5-1000S-UVIII**
- ø3.5 x 3-Branch x 1000L

**M4S3.5-1000S-UVIII**
- ø3.5 x 2-Branch x 1000L

**M3S10-1000S-UVIII**
- ø5 x 10-Branch x 1000L

**MKS50-1000S-UVIIIMKS50X0.4W-1000S-UVIII**
- ø3.5 x 4-Branch x 1000L

**Catalog Icon Key**
- CE: It means that the product has declared conformity to CE standards and RoHS (2011/65 / EU), or has obtained third party certification.
- IP: (Ingress Protection) is a set of standard measurements related to the protection of products from solid foreign objects and water. IP is prescribed by the Japanese Industrial Standards Committee (JISC0920) and the International Organization for Standardization (IEC60529). IP67 is a level of protection that can withstand being submerged in water at a depth of 1 meter for 30 minutes.
- LED: A Light Emitting Diode (LED) is a semiconductor element that applies a fixed-direction current to a crystalline substance with a semiconductor PN junction, generating energy in the substance and emitting the energy as light. The basic theory was found early in the 20th century and silicon carbide LED was confirmed, experimentally, to emit light if a current was applied. Following this research, the current technology was established in the 1960's. Red and green were developed first, yellow in the 1970's, blue in 1993 and white in 1996.

**IP67**

**Catalog Icon Key**
- CE: It means that the product has declared conformity to CE standards and RoHS (2011/65 / EU), or has obtained third party certification.
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