Lens focusing and optical fiber transmission devices

Solar lighting system

Himawari
The Himawari solar lighting system comfortably brightens your daily life.

As well as water and air, light will always be something to be particular about. The Himawari solar lighting system transmits high quality sunlight while screening out ultraviolet rays. Since the light is provided by the sun, it is gentle on the eyes and skin and creates a relaxed atmosphere which could never be provided by any artificial lighting system. The Himawari system enables sunlight to shine everywhere, from houses to offices and public spaces.
From houses to condominiums, offices, and public spaces, the Himawari system is used in a wide variety of places.

**HOME**

From now on, all your rooms have a southern exposure. Living rooms become sunny.

Sunlight issues raised in the center of a city will be immediately resolved with the Himawari system. You can lead a sunlit life by lighting up living rooms, north-facing rooms, and basements, which sunlight cannot reach, as well as the kitchen and the laveratory which often tend to be in dark areas.

**OFFICE**

Sunlight brings comfort. Gentle light improves office environment.

How would you like to improve your working environment by exposing your office to sunlight? This is a system best suited not only for offices, but also for elevator halls, lobbies, aquaria, and planted areas. Optical fibers make the Himawari system effective in any type of buildings.

**PUBLIC**

Friendly to the global environment, sunlight is best for lighting public spaces.

The Himawari system is used for public space such as underground passages, sculptures built in underground open spaces, and parking areas. This is a maintenance-free system that enables you to feel safe in the knowledge that you are saving both energy and costs.
The technologies that enable the Himawari system to develop the possible uses of sunlight in your life

- **Sunlight collection at maximum efficiency with a system—lens focusing + optical fiber transmission**

The Himawari system consists of a lens focusing unit and optical fiber devices. Its outdoor collector can collect sunlight always at maximum efficiency and transmit it through optical fibers to anywhere you want. Unlike conventional solar lighting systems which use skylights and mirrors, stable daylighting is possible all day long without suffering constraints imposed by room location, window orientation, and solar altitude.

- **Automatic tracking system to accurately detect sunbeams**

In order to accurately track the sun as it continuously changes its position from sunrise to sunset, Himawari is equipped with an automatic tracking system. A solar sensor and clock mechanism control the movement of the light-focusing lens so that it is always accurately aimed at the sun. Even when clouds block out the sun, the system can track the movement of the sun by calculating the trajectory and respond speedily to changes in the weather.

- **It’s ultraviolet-free light, so it’s gentle on the eyes and the skin**

- High-quality sunlight is what the Himawari system provides. The tone of the light is natural and gentle on the eyes, qualities that cannot be reproduced by any artificial illumination.
- By using the acrylic dome covering the lenses and chromatic aberration through single lens focusing, the sun’s UV can be eliminated. Therefore, the light consists predominantly of visible rays, a kind of light that is best suited for promoting photosynthesis in plants.
- Since the Himawari system screens out ultraviolet rays, it protects furniture and carpets from color fading.

- **High-purity optical fiber, enabling flexible transmission of sunlight**

Collected sunlight passes through quartz Glass optical fibers which transmit visible ray-dominated sunlight. Optical fibers are so thin and flexible that they can freely transmit light to rooms in any building, whether old or new.

- **Energy saving, and what’s more, maintenance-free**

- The running cost of the Himawari system is approximately 1 yen a day when equipped with a twelve-lens collector. By using an energy-saving type system that is powered by solar cells, you can reduce the electricity cost to zero yen.
- Once the Himawari system is installed, it operates automatically without any need for manual operation. Since the precision collector is covered with an acrylic dome, the daylighting is stable over a long duration, and free from the effects of rain and dust.
**Himawari system product line-up; enough to meet every need**

- **188-lens sunlight collector XF-160/188AS**
  - [Large model]
  - Capable of transmitting light to up to 53 terminals
  - Suitable for use in large-scale establishments which require a large quantity of light
  - Rated at AC 85 V – 264 V

- **90-lens sunlight collector XF-110S/90AS**
  - [Large model]
  - Capable of transmitting light to up to 15 terminals
  - Suitable for use in mid to large-scale establishments
  - Rated at AC 85 V – 264 V

- **36-lens sunlight collector XD-100S/36AS**
  - [Mid-size model]
  - Capable of transmitting light to up to 4 terminals
  - Suitable for use in mid-scale establishments
  - Rated at AC 85 V – 264 V

- **SB-type 36-lens sunlight collector XD-100S/36AS-SB**
  - [Solar cell-powered model]
  - Energy-saving model without the need of power supply
  - Can be adapted to a wide range of establishments
  - Rated at AC 85 V – 264 V

- **12-lens sunlight collector XD-50S/12AS**
  - [Small model]
  - Equipped with two optical fiber cables
  - Suitable for use in general housing
  - Rated at AC 85 V – 264 V

- **SB-type 12-lens sunlight collector XD-50S/12AS-SB**
  - [Solar cell-powered model]
  - Energy-saving model without the need of power supply
  - Can be adapted to a wide range of establishments
  - Rated at AC 85 V – 264 V

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**Optical fiber cable**

- Single cable consists of a bundle of six optical fibers with a core size of 1 mm².
- The single bundle cable can transmit sunlight collected by six lenses.

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**Light distribution and illuminance**

- Light is emitted at a spread angle of 58° from the edge of the optical cable.
- At two meters from the end of the optical cable, an approximate 2.2-m diameter circular region (area of 5.8 m²) is illuminated at approximately 100 lux on average.
- Two optical fibers (the number of light supplied by a single 12-lens collector) are required for illuminating an area of approximately 102 m².

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**Light fittings**

- Various light fittings are available to safely fit the end of the optical fiber cable into ceilings.

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**Sunlight collector specification list**

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of lenses</th>
<th>Lens area (mm²)</th>
<th>Light receiving area (mm²)</th>
<th>Dome diameter (mm)</th>
<th>Weight (kg)</th>
<th>Number of cables</th>
<th>Total sunlight (lux)</th>
<th>Electric power supply</th>
<th>Power consumption</th>
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<tbody>
<tr>
<td>AS series</td>
<td></td>
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<tr>
<td>XF-160S/188AS*</td>
<td>196</td>
<td>14,035</td>
<td>1,630</td>
<td>2,500</td>
<td>628</td>
<td>33</td>
<td>63,360</td>
<td>AC85V – 264V</td>
<td>15W</td>
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<td>XF-110S/90AS*</td>
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<td>6,877</td>
<td>1,170</td>
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<td>346</td>
<td>15</td>
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<tr>
<td>XD-100S/36AS</td>
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<td>2,552</td>
<td>1,000</td>
<td>1,475</td>
<td>88</td>
<td>6</td>
<td>11,520</td>
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<td>5W</td>
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<tr>
<td>XD-60S/12AS</td>
<td>12</td>
<td>851</td>
<td>520</td>
<td>810</td>
<td>14</td>
<td>2</td>
<td>3,840</td>
<td></td>
<td>2W</td>
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<td>17</td>
<td>2</td>
<td>3,840</td>
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</tbody>
</table>

*This product is supplied in order basis. Please consult us.*

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**Sunlight collector dimension list**

- The outside dimensions of 12 lens, and 36 lens AS-series collectors are the same as that of SB-series collector.

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**Spotlight**

- Color: white
- Dimensions: W 110 mm x H 167 mm
- Minimum ceiling clearance: 300 mm
- Available as a point source light

**Down light C model**

- Can be embedded in a ceiling
- Color: white
- Dimensions: W 150 mm x H 10 mm
- Minimum ceiling clearance: 270 mm
- Available as a point source light

**Down light NA model**

- Color: white
- Dimensions: W 110 mm x H 95 mm
- Minimum ceiling clearance: 300 mm
- Available as a point source light

**Down light ND model**

- Color: white
- Dimensions: W 85 mm x H 73 mm
- Minimum ceiling clearance: 300 mm
- Available as a point source light

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*Note: Measurement standards and illuminance levels for sunlight collectors may vary depending on the measuring apparatus and parameter. Please consult us for more information.*
From offices to houses, the Himawari systems are used in a range of spaces.

Bring natural light into the rooms of your new house or remodel with Himawari.

Office (Holland Hills, Mori Building)  Illuminating the coral in the entrance aquarium
Carbon dioxide reduction/ Biotechnologies

Vegetables grown with efficient photosynthesis reduces carbon dioxide, and thus reducing global warming. Ultraviolet-free Himawari’s light provides innovative potential culture techniques, since ultraviolet rays could be factors responsible for mutations and growth failure when cells are grown for breeding.

Improvement of the underground environment

The Himawari system is expected to be used to light spaces deep underground. Even in subterranean spaces at a depth of more than 50 m, solar lighting provided by the Himawari can liberate people from the stresses of being below ground, making them feel like they are on the surface. The potential provided by using underground spaces should be planned for in a constructive way.

Improvement of the submarine environment

The Himawari system aims to clean up seawater and promote the food chain in the sea by transmitting sunlight to parts of the sea where sunlight cannot reach directly. Growth of phytoplankton through photosynthesis decomposes eutrophic components to dechlorinate the water. Consequently, zooplankton proliferates and subsequent food chains develop cyclically, thereby enriching the sea.

Notes on safety

Installation warning
1. Choose a place where there is no object that will block out direct sunlight.
2. For advice on wind and earthquake resistance under certain circumstances, contact us.
3. Ensure access is preserved for maintenance.
4. In the case of using it in regions with heavy snowfall, contact us for advice.
5. Since the Himawari is a precision apparatus, handle it with care and avoid impacting it.
6. Carry out the installation in accordance with the manual.
7. Since the Himawari has to be installed due south, check the direction beforehand.
8. Avoid installing the Himawari in very windy, snowy, or rainy conditions to prevent mishaps.

Warnings for use
1. Be sure to read the instruction manual carefully before use, and use the Himawari appropriately.
2. Attach a lighting apparatus or protection cap to the end of the optical fiber cable. Do not use the Himawari without attaching a light fitting or protection cap. Failure to follow this warning could result in fire.
3. Do not bring combustible materials such as clothes, paper, wood, or plastics into close contact with the end of the optical fiber cable. Failure to follow this warning could result in fire.
4. Do not apply undue stress to the optical fiber cable by bending it into an angle with radius of less than 20 cm, treading on it, or stretching it. Failure to follow this warning could result in fire or an injury due to fracture.
5. When you enjoy the sunlight emitted by the optical fiber cable, do not bring the end closer than 20 cm from the body. Failure to follow this warning could result in burns.
6. Since the sunlight emitted from the optical fiber cable is intense, do not look directly into the end of the optical fiber cable. Failure to follow this warning could result in injury to your eyes.

Notes
1. This product cannot provide light under conditions without sunlight, such as rainy or cloudy days or at night. Please use together with illumination equipment according to your needs.
2. Since the quantity of light may deteriorate according to weather conditions, please use the Himawari together with artificial illumination equipment.
3. Please contact our delivery agents or manufacturers for installation or relocation work.
4. The product specifications and design are subject to change without notice.
5. The color of products etc., shown in this catalogue may be slightly different from that of actual products.