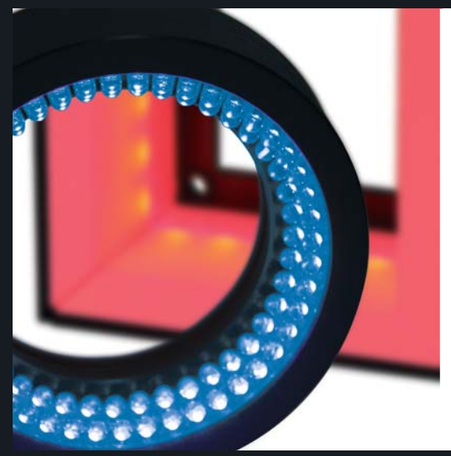
LED Lighting Catalog 2009

OP Series

www.optex-fa.com

www.optex-fa.jp



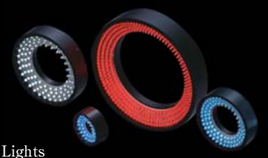
LED Lighting for Machine Vision

OPTEX FA CO., LTD.

OPTEX FA CO., LTD.
600-8815 Kyoto, Shimogyo-ku, Chudoji Awata 93, Japan
TEL. +81-(0)75-325-2920 FAX. +81-(0)75-325-2921
http://www.optex-fa.com
http://www.optex-fa.jp

74562-02-05960-0903

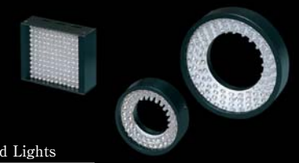
Contents



Direct Ring Lights
OPDR P03

Flat Ring Lights
OPDR-F P04

Ultraviolet Lights
UV P18



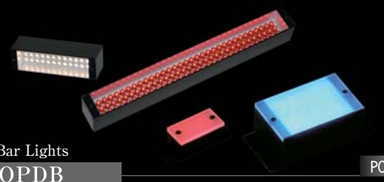
Infrared Lights
IR P18

Low-angle Ring Lights
OPDR-LA P05

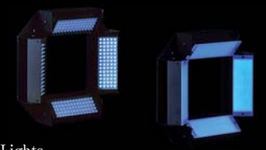
Horizontal Ring Lights
OPDR-H P06

Power supply selection guide
P19

Dual Mode Power Supply
OPPCW P20



Bar Lights
OPDB P07



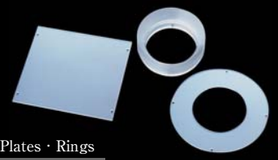
Square Bar Lights
OPDB-Q P08

Digital Control Power Supplies
OPPA P21

Analog Control Power Supplies
OPP,OPPW P22

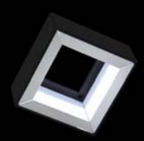
Diffuse Ring Lights
OPIR,OPIR-S P09

Diffuse Low-angle Ring Lights
OPLR P10



Diffusion Plates・Rings
DF P23

Polarizing Plates
PL P24



Diffuse Low-angle Square Lights
OPLQ P11

Full color Diffuse Bar Lights
OPDB-RGB P12

Cables
OP P25

Arm unit for Lighting Setting
OPAU P26

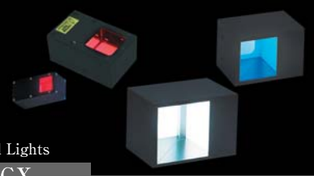
Full color Diffuse Low-angle Ring Lights
OPLR-RGB P12

Surface Mount Back Lights
OPSM P13

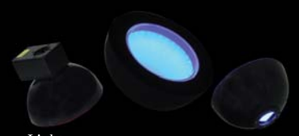
Features of LED lights
P27

LED lights selection guide
P28

Edge Mount Back Lights
OPEM P14



Coaxial Lights
OPCX P15

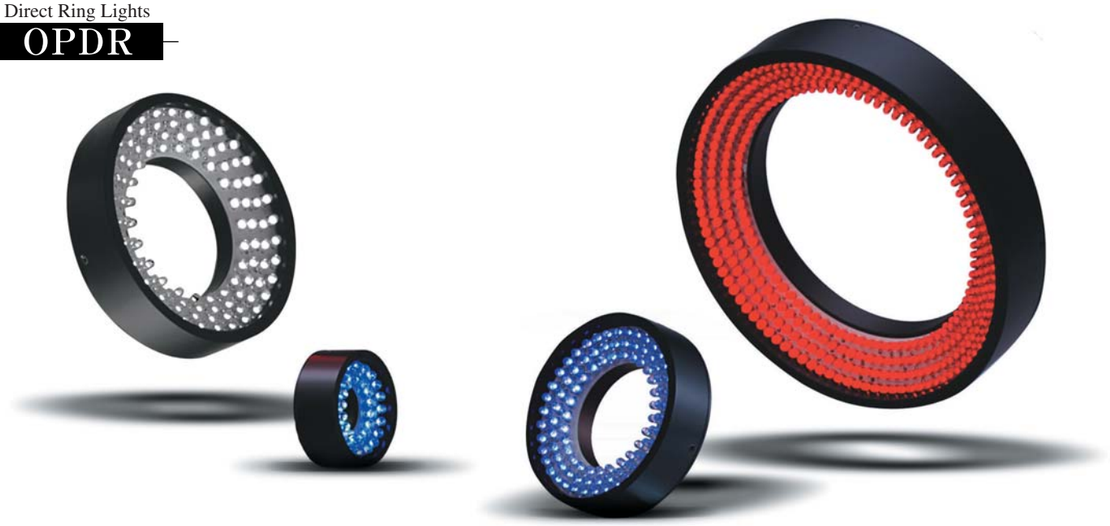


Diffuse Dome Lights
OPID P16

Spot Lights
OPS,OPHS P17

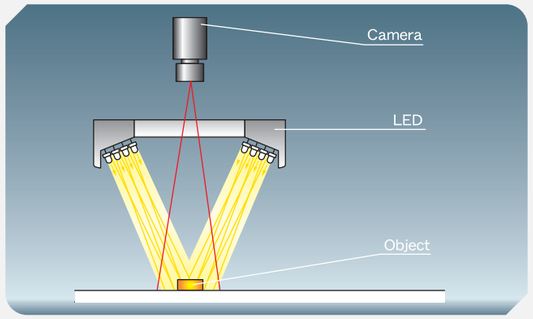
Direct Ring Lights

OPDR



■High illuminance by condensing light in the center.

Highly condensed light at the working distance by high-intensity LEDs mounted at an angle.
if an optional diffusing plate is mounted, illumination evenness is improved.

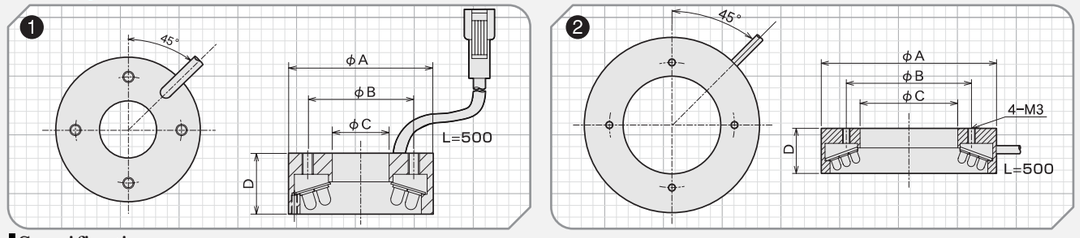


●Features

- ·High illuminance by condensing light
- ·High evenness due to illumination from the outer circumference of the ring
- ·Suitable for measuring the difference in reflectance between target objects

●Applications

- ·Imaging the alignment mark
- ·Identification of package characters
- ·Inspection of board parts
- ·Label inspection
- ·IC lead inspection



Specifications

Model	Dimension (mm)				LED color	The Number of LED	Power Consumption(W)	WD(mm)	Outline Drawing
	A	B	C	D					
OPDR-32-10R	32	20	10	16	Red	30	1.2	20～35	2
OPDR-32-10□	32	20	10	16	White, Blue, Green	30	2.4	20～35	
OPDR-38-15R	38	28	15	16	Red	36	1.5	20～35	1
OPDR-38-15□	38	28	15	16	White, Blue, Green	36	2.9	20～35	
OPDR-50-28R	50	40	28	16	Red	54	2.2	15～30	2
OPDR-50-28□	50	40	28	16	White, Blue, Green	45	3.6	15～30	
OPDR-66-36R	66	50	36	20	Red	114	4.6	40～70	
OPDR-66-36□	66	50	36	20	White, Blue, Green	90	7.2	40～70	
OPDR-70-39R	70	50	39	18	Red	120	4.8	25～60	
OPDR-70-39□	70	50	39	18	White, Blue, Green	96	7.7	25～60	
OPDR-90-50R	90	70	50	20.5	Red	216	8.7	40～90	
OPDR-90-50□	90	70	50	20.5	White, Blue, Green	108	8.7	40～90	
OPDR-110-60R	110	85	60	26	Red	252	10.1	35～90	
OPDR-110-60□	110	85	60	26	White, Blue, Green	159	12.8	35～90	
OPDR-140-95R	140	120	95	28	Red	360	14.4	50～110	
OPDR-140-95□	140	120	95	28	White, Blue, Green	180	14.4	50～110	

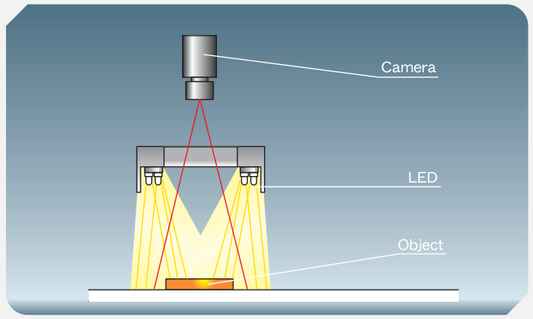
Either W (white), B (blue), or G (green) can be entered in □.
A diffusing plate (optional) can be mounted.
The numbers in the model number represent the dimensions. (OPDR-xx-xx = OPDR-outside diameter-inside diameter).

Flat Ring Lights

OPDR-F

■Wide illumination area.

The high-intensity LEDs are mounted on a flat ring-shaped board. Compared with a direct ring light, this Lighting is more suitable for illuminating a wider area, using the same number of elements. If an optional diffusing plate is mounted, illumination evenness is improved.

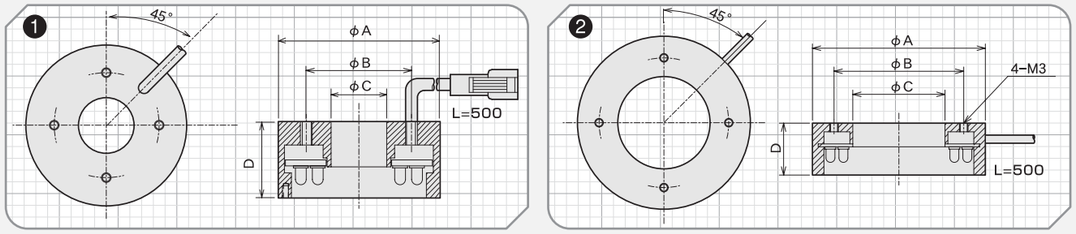


●Features

- ·A wide illumination area due to lack of focus point
- ·Suitable for measuring the difference in reflectance between target objects in a wide area

●Applications

- ·Inspection of board parts
- ·Label inspection



Specifications

Model	Dimension (mm)				LED color	The Number of LED	Power Consumption(W)	Outline Drawing
	A	B	C	D				
OPDR-F43-15R	43	28	15	20	Red	36	1.5	1
OPDR-F43-15□	43	28	15	20	White, Blue, Green	36	2.9	
OPDR-F50-15R	50	35	15	18	Red	54	2.2	2
OPDR-F50-15□	50	35	15	18	White, Blue, Green	54	4.4	
OPDR-F60-32R	60	45	32	18	Red	60	2.4	
OPDR-F60-32□	60	45	32	18	White, Blue, Green	60	4.8	
OPDR-F70-37R	70	50	37	18	Red	108	4.4	
OPDR-F70-37□	70	50	37	18	White, Blue, Green	93	7.5	
OPDR-F90-50R	90	70	50	18	Red	204	8.2	
OPDR-F90-50□	90	70	50	18	White, Blue, Green	102	8.2	
OPDR-F100-50R	100	70	50	20	Red	216	8.7	
OPDR-F100-50□	100	70	50	20	White, Blue, Green	108	8.7	
OPDR-F110-60R	110	85	60	22	Red	240	9.6	
OPDR-F110-60□	110	85	60	22	White, Blue, Green	159	12.8	

Either W (white), B (blue), or G (green) can be entered in □.
A diffusing plate (optional) can be mounted.
The numbers in the model number represent the dimensions. (OPDR-xx-xx = OPDR-outside diameter-inside diameter).

Low-angle Ring Lights

OPDR-LA

■For edge detection and inspection of glossy surface.

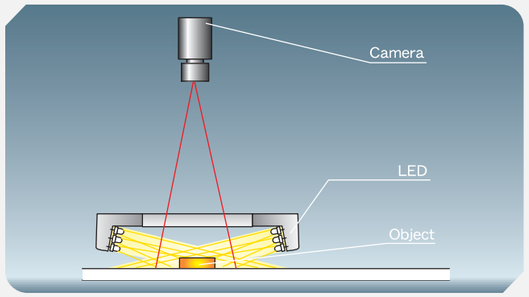
Designed to condense light for shorter working distance by high-intensity LEDs mounted angled.
If an optional diffusing plate is mounted, illumination evenness is improved.

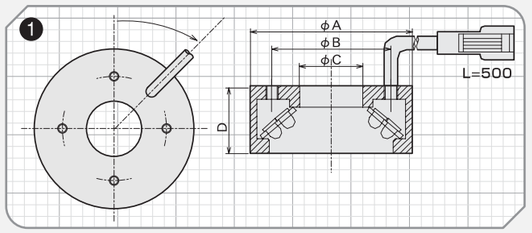
●Features

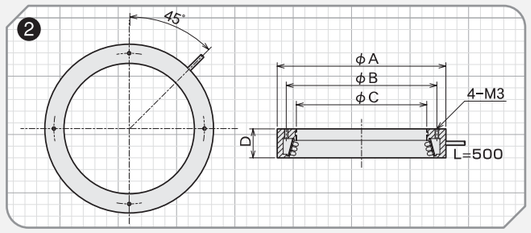
- ·Illumination from a shallow angle toward the object to detect any scratches on the surface
- ·Illumination from a diagonal angle to control reflection and to detect differences in the scattering rate

●Applications

- ·Marking reading by laser
- ·BGA soldering ball inspection
- ·Inspection for scratches or stains on the wafer or glass board
- ·Other inspections, such as edge detection
- ·Edge inspection of the board or sheet







Specifications

Model	Dimension (mm)				LED color	The Number of LED	Power Consumption(W)	WD(mm)	Outline Drawing
	A	B	C	D					
OPDR-LA38-15R-2	38	28	15	16	Red	36	1.5	5～10	1
OPDR-LA38-15□-2	38	28	15	16	White, Blue, Green	36	2.9	5～10	
OPDR-LA50-24R-2	50	36	24	18	Red	48	2.0	10～20	2
OPDR-LA50-24□-2	50	36	24	18	White, Blue, Green	48	3.9	10～20	
OPDR-LA74-48R-2	74	60	48	19	Red	90	3.6	15～30	
OPDR-LA74-48□-2	74	60	48	19	White, Blue, Green	90	7.2	15～30	
OPDR-LA100-68R-3	100	84	68	22	Red	180	7.2	20～40	
OPDR-LA100-68□-3	100	84	68	22	White, Blue, Green	90	7.2	20～40	
OPDR-LA120-70R-3	120	90	70	21	Red	228	9.2	20～40	
OPDR-LA120-70□-3	120	90	70	21	White, Blue, Green	114	9.2	20～40	
OPDR-LA140-108R-3	140	125	108	24	Red	264	10.6	15～40	
OPDR-LA140-108□-3	140	125	108	24	White, Blue, Green	132	10.6	15～40	
OPDR-LA200-170R-3	200	186	170	22	Red	396	15.9	40～45	
OPDR-LA200-170□-3	200	186	170	22	White, Blue, Green	315	25.2	40～45	

Either W (white), B (blue), or G (green) can be entered in □.
A diffusing plate (optional) can be mounted.
The numbers in the model number represent the dimensions. (OPDR-LA xx-xx = OPDR-LA outside diameter-inside diameter).

Horizontal Ring Lights

OPDR-H

■Edge-on lighting to emphasize uneven surfaces.

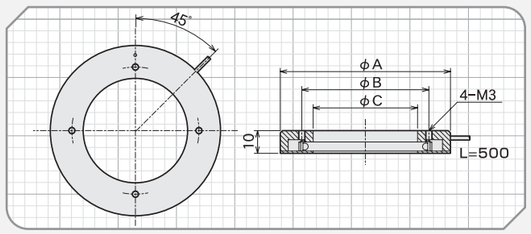
The high-intensity LEDs are mounted looking at center of the ring.

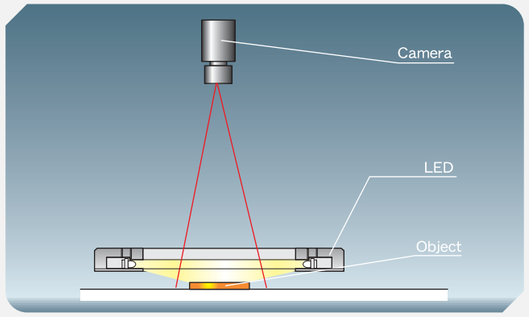
●Features

- ·Horizontal illumination emphasizes fine flaws and edges on the surface

●Applications

- ·BGA soldering ball inspection
- ·Inspection for scratches or stains on the wafer or glass board
- ·Other inspections, such as edge detection





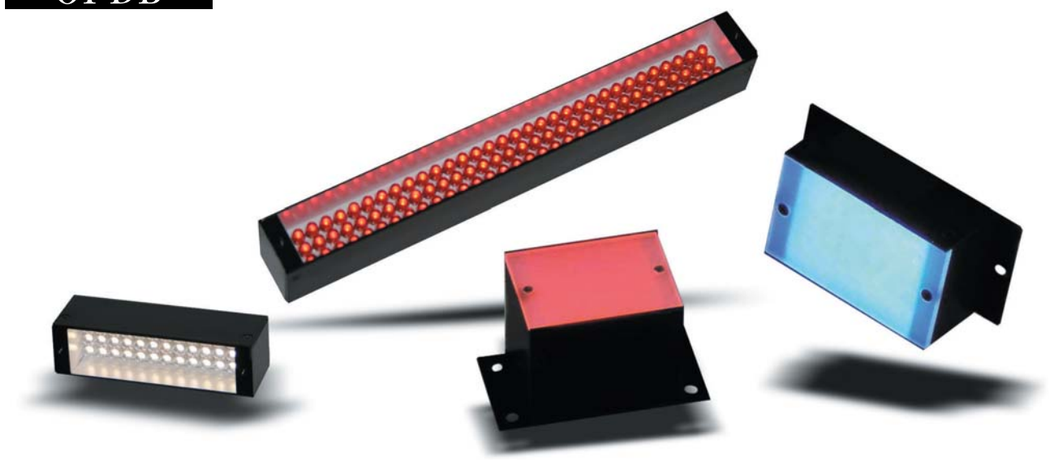
Specifications

Model	Dimension (mm)			LED color	The Number of LED	Outline Drawing
	A	B	C			
OPDR-H50-20R-1	50	36	20	Red	21	1.7
OPDR-H50-20□-1	50	36	20	White, Blue, Green	21	1.7
OPDR-H75-46R-1	75	56	46	Red	48	2.0
OPDR-H75-46□-1	75	56	46	White, Blue, Green	48	3.9
OPDR-H84-54R-1	84	70	54	Red	48	2.0
OPDR-H84-54□-1	84	70	54	White, Blue, Green	48	3.9
OPDR-H96-60R-1	96	80	60	Red	60	2.4
OPDR-H96-60□-1	96	80	60	White, Blue, Green	60	4.8
OPDR-H122-92R-1	122	110	92	Red	77	3.2
OPDR-H122-92□-1	122	110	92	White, Blue, Green	77	6.3
OPDR-H152-114R-1	152	130	114	Red	96	3.9
OPDR-H152-114□-1	152	130	114	White, Blue, Green	96	7.7
OPDR-H176-140R-1	176	160	140	Red	120	4.8
OPDR-H176-140□-1	176	160	140	White, Blue, Green	120	9.6
OPDR-H206-170R-1	206	190	170	Red	144	5.8
OPDR-H206-170□-1	206	190	170	White, Blue, Green	144	11.6

Either W (white), B (blue), or G (green) can be entered in □.
The numbers in the model number represent the dimensions. (OPDR-H xx-xx = OPDR-H outside diameter-inside diameter).

Bar Lights

OPDB



■Various Lighting options including light-tilting. or backlight!

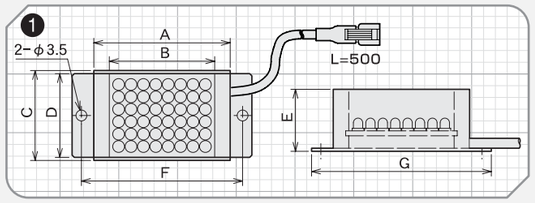
The high-intensity LEDs are mounted on the flat board.
Two types of diffusion plate are available, screw mounting type and plug-in type.

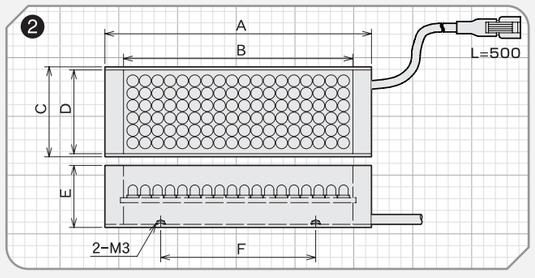
●Features

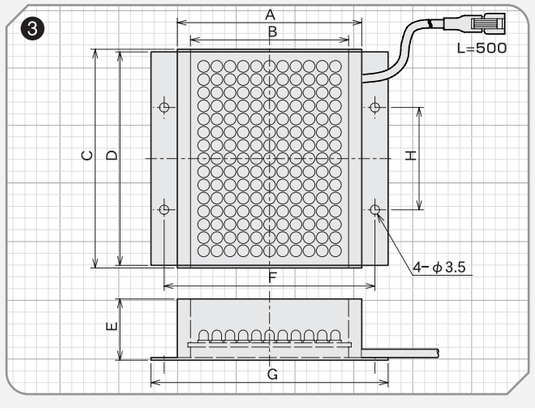
- Bar-shaped Lighting using LEDs mounted on a flat board
- Various illumination angles allowing illumination from the optimal position
- Reflection control by mounting a diffusion plate
- Flexible installation to enable a wide range of applications
- Usable as high-intensity surface lighting

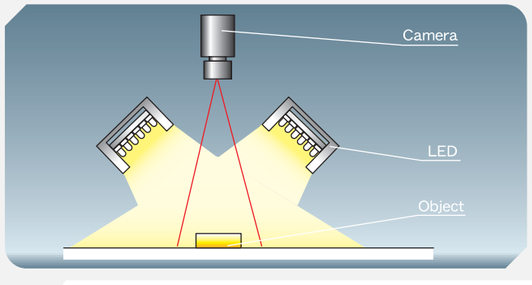
●Applications

- Crack/exterior inspection of molding
- Trimming/forming inspection of IC lead









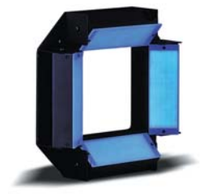
Note 1: 4-M3 pitch 40×40　　Note 2 : 3-M3 pitch 70
Either W (white), B (blue), or G (green) can be entered in □.
A diffusing plate (optional) can be mounted.
The letters "DF" in the model number represent the standard mounting specification of the diffusion plate.
The numbers in the model number represent the dimensions. (OPDB-xx×xx) represents the dimensions of the emission surface.
The position of the cable depends on the kind of Lighting. (For more details, please contact us.)

Specifications

Model	Dimension (mm) A	B	C	D	E	F	G	H	LED color	The Number of LED	Power Consumption(W)	Outline Drawing
OPDB-14×11R	24	14	14	11	12	30	36	—	Red	6	0.3	1
OPDB-14×11□	24	14	14	11	12	30	36	—	White, Blue, Green	6	0.4	
OPDB-34×27R	44	34	30	27	20.5	52	58	—	Red	48	2.0	
OPDB-34×27□	44	34	30	27	20.5	52	58	—	White, Blue, Green	48	2.9	
OPDB-50×15R	60	50	18	15	20.5	30	—	—	Red	36	1.5	2
OPDB-50×15□	60	50	18	15	20.5	30	—	—	White, Blue, Green	36	2.2	
OPDB-74×27R	86	74	30	27	20.5	50	—	—	Red	108	4.4	
OPDB-74×27□	86	74	30	27	20.5	50	—	—	White, Blue, Green	70	4.4	
OPDB-82×15R	92	82	18	15	18.5	—	—	—	Red	60	2.4	
OPDB-82×15□	92	82	18	15	18.5	—	—	—	White, Blue, Green	60	3.6	
OPDB-100×11R	110	100	14.2	11.2	20.7	80	—	—	Red	48	2.0	
OPDB-100×11□	110	100	14.2	11.2	20.7	80	—	—	White, Blue, Green	48	2.9	
OPDB-100×15R	110	100	18	15	20.5	80	—	—	Red	72	2.9	
OPDB-100×15□	110	100	18	15	20.5	80	—	—	White, Blue, Green	72	4.4	
OPDB-132×15R	142	132	18	15	20.5	80	—	—	Red	96	3.9	
OPDB-132×15□	142	132	18	15	20.5	80	—	—	White, Blue, Green	96	5.8	
OPDB-140×11R	150	140	14	11	20.5	80	—	—	Red	70	2.9	
OPDB-140×11□	150	140	14	11	20.5	80	—	—	White, Blue, Green	70	4.4	
OPDB-14×11R-DF	24	14	14	11	21	30	36	—	Red	6	0.3	1
OPDB-14×11□-DF	24	14	14	11	21	30	36	—	White, Blue, Green	6	0.5	
OPDB-25×25R-DF	35	25	28	25	30.5	15	—	—	Red	36	1.5	2
OPDB-25×25□-DF	35	25	28	25	30.5	15	—	—	White, Blue, Green	36	2.2	
OPDB-26×15R-DF	36	26	18	15	20.5	44	50	—	Red	18	0.8	1
OPDB-26×15□-DF	36	26	18	15	20.5	44	50	—	White, Blue, Green	18	1.1	
OPDB-50×48R-DF	62	50	51	48	30.5	40×40	—	—	Red	144	5.8	2
OPDB-50×48□-DF	62	50	51	48	30.5	40×40	—	—	White, Blue, Green	90	5.4	
OPDB-75×68R-DF	85	75	71	68	30.5	95	105	60	Red	168	6.8	3
OPDB-75×68□-DF	85	75	71	68	30.5	95	105	60	White, Blue, Green	168	10.1	
OPDB-100×100R-DF	110	100	103	100	32.5	120	130	80	Red	342	13.7	
OPDB-100×100□-DF	110	100	103	100	32.5	120	130	80	White, Blue, Green	342	20.6	
OPDB-186×30R-DF	198	186	39	30	22.5	70+70	—	—	Red	216	8.7	2
OPDB-186×30□-DF	198	186	39	30	22.5	70+70	—	—	White, Blue, Green	216	13.0	
OPDB-200×15R-DF	210	200	24	15	22.5	100	—	—	Red	147	6.0	
OPDB-200×15□-DF	210	200	24	15	22.5	100	—	—	White, Blue, Green	147	8.9	
OPDB-288×27R-DF	300	288	36	27	22.5	160	—	—	Red	426	17.1	
OPDB-288×27□-DF	300	288	36	27	22.5	160	—	—	White, Blue, Green	426	25.6	

Square Bar Lights

OPDB-Q



■Angle adjustable combined bar illumination.

Can arrange the bar lights in four directions and change the angle of illumination freely depending to the target object. Can also illuminate in all directions because each light can be moved independently.

●Features

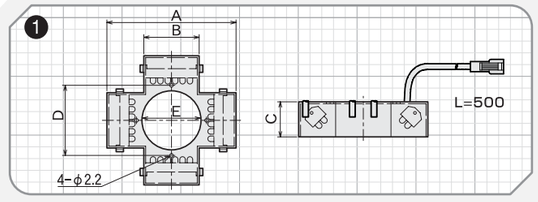
- Lighting with bar-shaped lights in four corners
- Each bar-shaped light is adjustable with an illumination angle of 0 to 90 degrees

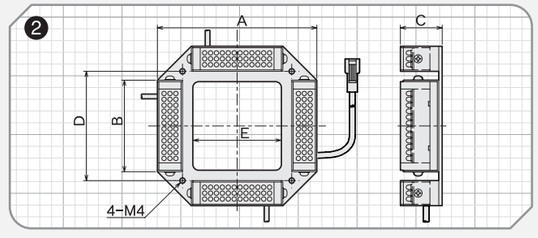
●Applications

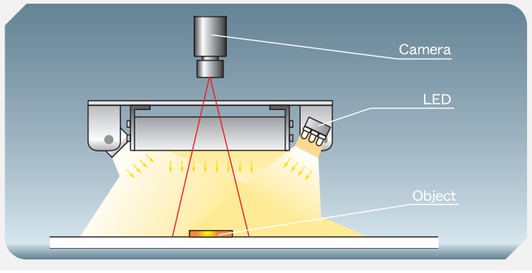
- IC package inspection for cracking, character and orientation
- Grinding line work of the metal board etc
- IC inspection within the taping

Specifications

Model	Dimension (mm) A	B	C	D	E	LED color	The Number of LED	Power Consumption (W)	Outline Drawing
OPDB-Q27X11R	71	31	19.5	38	φ32	Red	12×4	2.0	1
OPDB-Q27X11□	71	31	19.5	38	φ32	White, Blue, Green	12×4	3.2	
OPDB-Q50X15R	110	62	27.8	74	□60	Red	36×4	5.8	2
OPDB-Q50X15□	110	62	27.8	74	□60	White, Blue, Green	36×4	8.8	
OPDB-Q74X27R	157	88	34.5	100	□80	Red	108×4	17.3	
OPDB-Q74X27□	157	88	34.5	100	□80	White, Blue, Green	70×4	17.6	



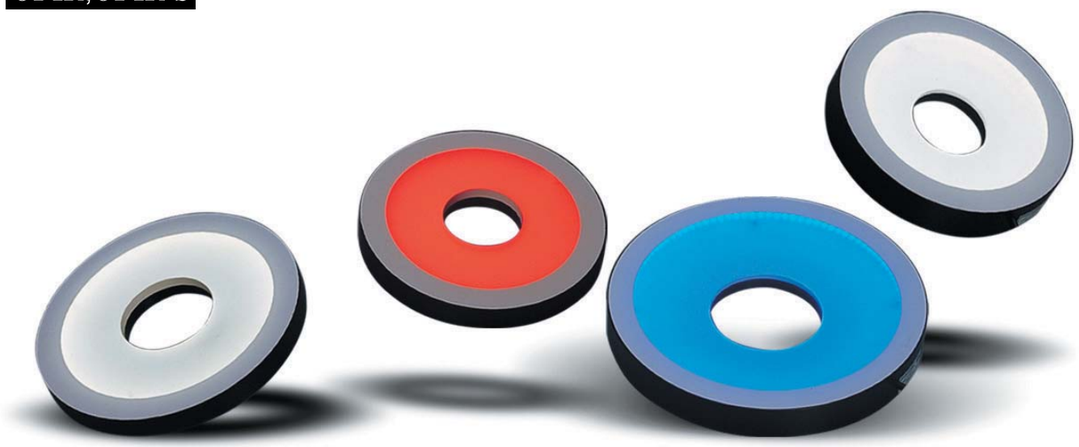




Either W (white), B (blue), or G (green) can be entered in □.
A diffusion/Polarizing plate(optional) can be mounted.(except OPDB-Q27X11)
The numbers in the model number represent the dimensions. (OPDB-Qxx×xx) represents the dimensions of the emission surface.

Diffuse Ring Lights

OPIR,OPIR-S



■Highly even illumination is possible.

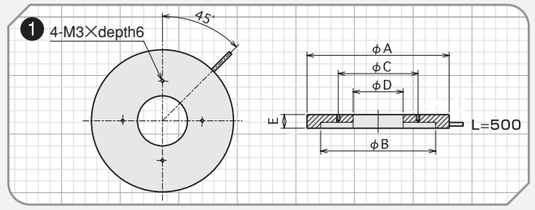
No reflection of each LED element from the object is achieved by mounting LEDs around the ring-shaped light guide. Effective for inspecting 3-dimensional objects.
The brightness is lower than that of the direct ring light, but the illumination is more even than that of the direct ring light with a diffusing plate attached.
OPIR-S is a model which has an angle of inclination on the luminescent surface and light is focused toward the center.

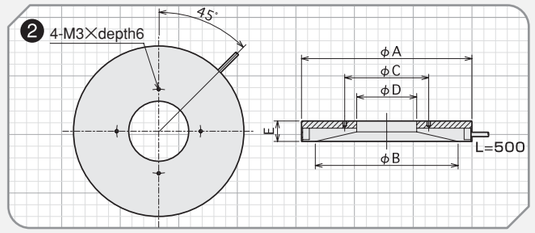
●Features

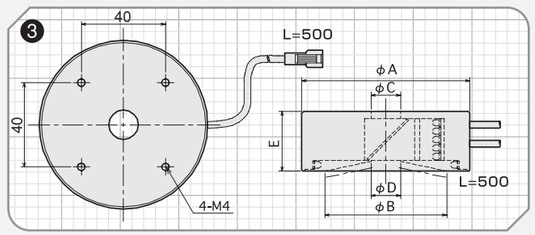
·Ring-shaped light with light guide.
·Diffusive light illumination with controlled flat element by LEDs mounted around the outer circumference.
·Surface emission allowing illumination to be even without LED reflection.

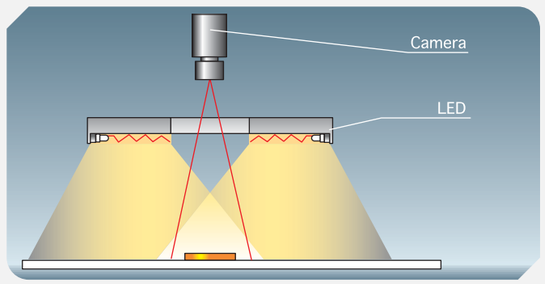
●Applications

·Coating inspection and burr inspection of the molding.
·Soldering inspection.
·Inspection of board parts.









Specifications

Model	Dimension (mm)					LED color	The Number of LED	Power Consumption(W)	Outline Drawing
	A	B	C	D	E				
OPIR-100R	102	78	70	33	12	Red	72	2.9	1
OPIR-100□	102	78	70	33	12	White, Blue, Green	72	5.8	
OPIR-130R	125	101	70	44	12	Red	90	3.6	
OPIR-130□	125	101	70	44	12	White, Blue, Green	90	7.2	
OPIR-S74R-2	74	49	50	20	18	Red	96	3.9	2
OPIR-S74□-2	74	49	50	20	18	White, Blue, Green	96	5.8	
OPIR-S100R	102	80	70	33	17	Red	72	2.9	
OPIR-S100□	102	80	70	33	17	White, Blue, Green	72	5.8	
OPIR-S150R	142	119	70	50	17	Red	102	4.1	
OPIR-S150□	142	119	70	50	17	White, Blue, Green	102	8.2	
OPIR-C80R	80	58	14	14	28.5	Red	25+54	1.2+2.2	3
OPIR-C80□	80	58	14	14	28.5	White, Blue, Green	25+54	2.2+4.4	

Either W (white), B (blue), or G (green) can be entered in □.

Diffuse light illumination from low angle

OPLR

■Highly even low-angle illumination.

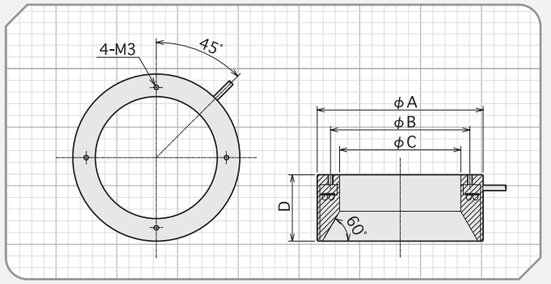
No reflection of each LED element from the object is achieved by mounting LEDs at edge of the light guide and diffused low-angle lighting. Effective for inspecting 3-dimensional objects.

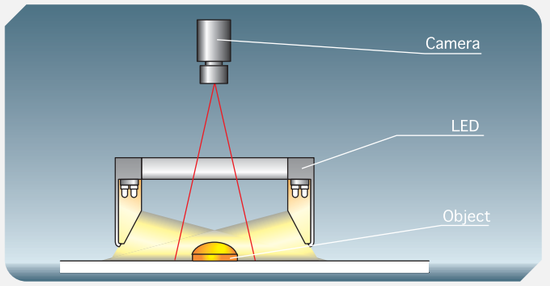
●Features

·Low angle light using a light guide.
·Diffuse light illumination from a low angle.

●Applications

·Plastic bottle cap appearance inspection.
·Bottle mouth inspection.
·Molded parts appearance inspection.





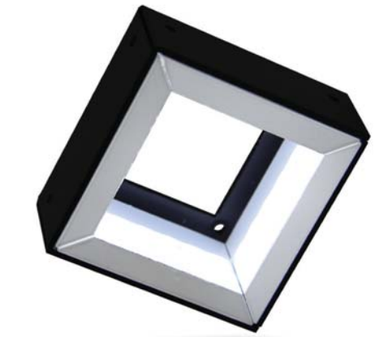
Specifications

Model	Dimension (mm)				LED color	The Number of LED	Power Consumption(W)
	A	B	C	D			
OPLR-100-73R	100	84	73	40	Red	132	5.3
OPLR-100-73□	100	84	73	40	White, Blue, Green	132	10.6
OPLR-136-109R	136	120	109	40	Red	180	7.2
OPLR-136-109□	136	120	109	40	White, Blue, Green	180	14.4
OPLR-180-153R	180	168	153	40	Red	258	10.4
OPLR-180-153□	180	168	153	40	White, Blue, Green	258	20.7

Either W (white), B (blue), or G (green) can be entered in □.
The numbers in the model number represent the dimensions. (OPLR- xx = OPLR- outside dimension).

Diffuse Low-angle Square Lights

OPLQ NEW

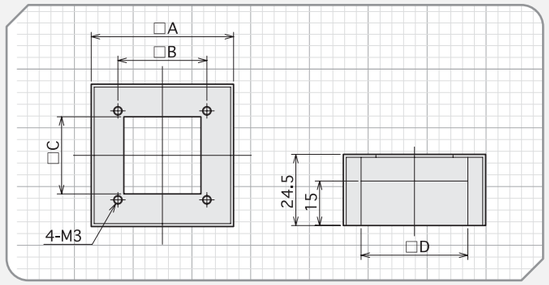


■High-intensity and highly even low-angle square illumination.

High-power LEDs double intensity of previous product.

Diffused low-angle lighting with LEDs mounted at edge of the light guide.

OPLQ is a box-typed surface Lighting in which the light is emitted from four surfaces. It can illuminate square-shaped objects etc evenly.

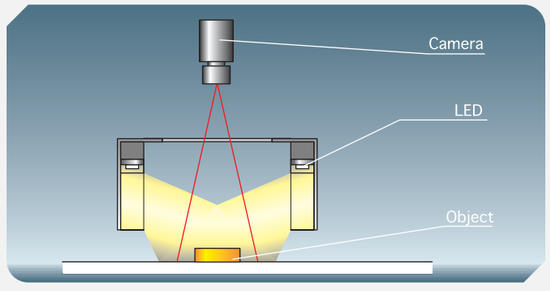


●Features

·Low angle light using a light guide
·Diffusive light illumination from a low angle

●Applications

·IC character inspection
·IC void inspection
·IC lead inspection within the embossed tape
·IC orientation identification, NG mark inspection



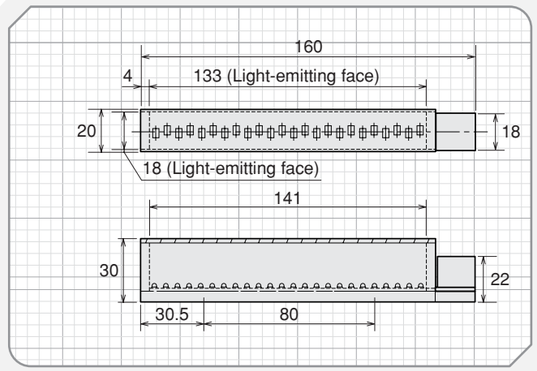
Specifications

Model	Dimension (mm)				LED color	The Number of LED	Power Consumption(W)
	A	B	C	D			
OPLQ-35□	35	15	10	20	Red, White, Blue, Green	12	3.4
OPLQ-51□	51	30	26	36	Red, White, Blue, Green	24	6.8
OPLQ-78□	78	57	53	63	Red, White, Blue, Green	36	10.1
OPLQ-99□	99	78	70	84	Red, White, Blue, Green	48	13.5
OPLQ-123□	123	102	98	108	Red, White, Blue, Green	60	16.8

Either R (red), W (white), B (blue), or G (green) can be entered in □.
The numbers in the model number represent the dimensions. (OPLQ- xx = OPLQ- outside dimension).

Full color Diffuse Bar Lights

OPDB-RGB NEW



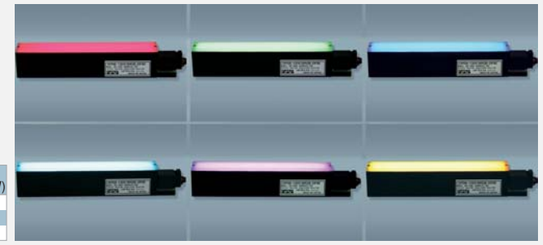
■The illumination color is fully adjustable adequately to object condition.

●Features

·Intensity is improved by high-power LED
Each RGB single color: 2 times, White: 4 times of previous product
·Designed to reduce internal heat by separating hot part

●Applications

·The light suitable for the spectral reflectance of the object is possible
·Efficient for changing inspection target object often by easy adjustable feature



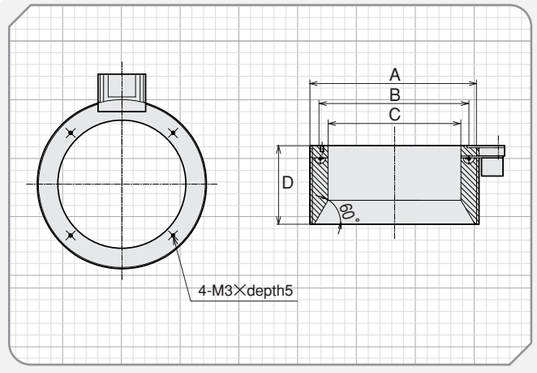
Specifications

Model	LED color	Wavelength (nm)	The Number of LED	Power Consumption(W)
OPDB-133×18RGB-DF60	Red	627	6	7.5
	Green	530	12	14.9
	Blue	470	6	7.5

Adapter is necessary for connection. Please contact our sales or distributors.
Extension Cable between the illumination and adapter.:OP-CB1-□-J2P1216 (□:2,3,5m)

Full color Diffuse Low-angle Ring Lights

OPLR-RGB



■The illumination color is fully adjustable adequately to object condition by RGB LEDs built in.

●Features

·Brightness is improved by high-power LED
Each RGB single color: 2 times, White: 4 times of previous product
·Designed to reduce internal heat by separating hot part
·Fast image processing is possible by using monochromatic camera and full color illumination

●Applications

·The appearance inspection of resin container in various color
·The appearance inspection of the many colors many kinds cap

Specifications

Model	LED color	Wavelength (nm)	Dimension (mm) A	B	C	D	The Number of LED	Power Consumption (W)
OPLR-100-70RGB	Red	627	100	84	70	60	6	7.5
	Green	530					12	14.9
	Blue	470					6	7.5
OPLR-140-110RGB	Red	627	140	120	110	65	9	11.2
	Green	530					18	22.4
	Blue	470					9	11.2

Adapter is necessary for connection. Please contact our sales or distributors.
Extension Cable between the illumination and adapter.:OP-CB1-□-J2P16 (□:2,3,5m)

Surface Mount Back Lights

OPSM

■High-intensity thin backlight

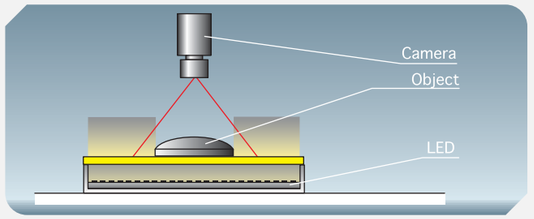
Backlight with SMD type LED mounted.
Also, it is densely mounted with chip LEDs, and thus even illumination is possible.It is also suitable for permeable lighting.

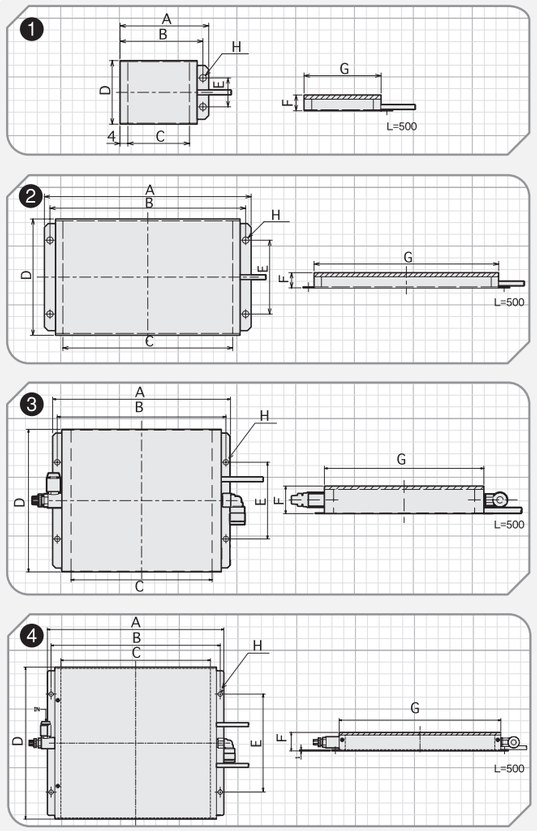
●Features

·Lighting with red chip LEDs mounted on the surface producing even light via a diffusion plate
·Can be used to judge the shape from the silhouette by illuminating from the back of an object

●Applications

·Inspection of dimension and shape of electronic parts
·Inspection of dimension and shape of lead frame
·Lighting inspection of liquid crystal panel
·IC lead inspection
·Recognition of alignment sign of glass board and 2D





Specifications

Model	Dimension (mm)								LED color	The Number of LED	Power Consumption(W)	Outline Drawing
	A	B	C	D	E	F	G	H				
OPSM-32X32R-T	48	45	32	34	15	11	42	2-φ3.5	Red	36	1.1	1
OPSM-32X32□-T	48	45	32	34	15	15	42	2-φ3.5	White, Blue, Green	30	1.8	
OPSM-62X32R-T	48	45	32	64	40	11	42	2-φ3.5	Red	72	2.2	
OPSM-62X32□-T	48	45	32	64	40	15	42	2-φ3.5	White, Blue, Green	60	3.6	
OPSM-62X62R-T	78	75	62	64	40	11	72	2-φ3.5	Red	144	4.4	2
OPSM-62X62□-T	78	75	62	64	40	15	72	2-φ3.5	White, Blue, Green	120	7.2	
OPSM-92X32R-T	114	108	92	34	15	11	102	4-φ3.5	Red	108	3.3	
OPSM-92X32□-T	114	108	92	34	15	15	102	4-φ3.5	White, Blue, Green	90	5.4	
OPSM-92X62R-T	114	108	92	64	40	11	102	4-φ3.5	Red	216	6.5	
OPSM-92X62□-T	114	108	92	64	40	15	102	4-φ3.5	White, Blue, Green	180	10.8	
OPSM-92X92R-T	114	108	92	94	60	11	102	4-φ3.5	Red	324	9.8	
OPSM-92X92□-T	114	108	92	94	60	15	102	4-φ3.5	White, Blue, Green	270	16.2	
OPSM-122X32R-T	144	138	122	34	15	11	132	4-φ3.5	Red	144	4.4	
OPSM-122X32□-T	144	138	122	34	15	15	132	4-φ3.5	White, Blue, Green	120	7.2	
OPSM-122X62R-T	144	138	122	64	40	11	132	4-φ3.5	Red	288	8.7	
OPSM-122X62□-T	144	138	122	64	40	15	132	4-φ3.5	White, Blue, Green	240	14.4	
OPSM-122X92R-T	144	138	122	94	60	11	132	4-φ3.5	Red	432	13.0	
OPSM-122X92□-T	144	138	122	94	60	15	132	4-φ3.5	White, Blue, Green	360	21.6	
OPSM-122X122R-T	144	138	122	124	80	11	132	4-φ3.5	Red	576	17.3	
OPSM-122X122□-T	144	138	122	124	80	15	132	4-φ3.5	White, Blue, Green	480	28.8	3
OPSM-152X122R-T	178	170	152	124	80	11	162	4-φ4.5	Red	720	21.6	2
OPSM-152X122□-T	178	170	152	124	80	15	162	4-φ4.5	White, Blue, Green	600	18+18	4
OPSM-182X122R-T	208	200	182	132	80	12.5	192	4-φ4.5	Red	864	26.0	2
OPSM-182X122□-T	208	200	182	132	80	16.5	192	4-φ4.5	White, Blue, Green	720	22+22	4
OPSM-212X122R-T	238	230	212	132	80	12.5	222	4-φ4.5	Red	1,008	30.0	2
OPSM-212X122□-T	238	230	212	132	80	16.5	222	4-φ4.5	White, Blue, Green	840	25+25	4

Either W (white), B (blue), or G (green) can be entered in □.
The numbers in the model number represent the dimensions. (OPSM- **×**) represents the dimensions of the emission surface.
White, Blue and Green light bigger than 122 x 122 have air cooling duct.
Utilize it to cool down when you use the light continuously high powered.

Edge Mount Back Lights

OPEM

■Low-heat-generating Power-saving Thin Backlight.

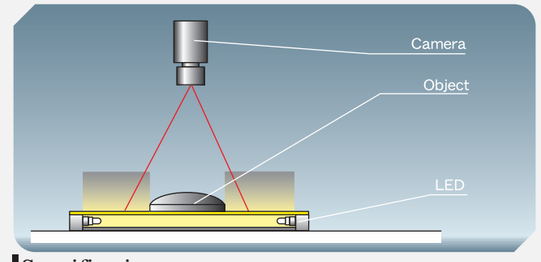
The LEDs illuminate from around a light guide on the whole surface, and thus the LED elements are not reflected and the illumination is even. The intensity is lower than bar lights and surface mount backlights, but this slim-type light can be used in narrow spaces. However, if the light area grows wider, light cannot reach the center and thus illuminance is decreased compared with the surrounding area.

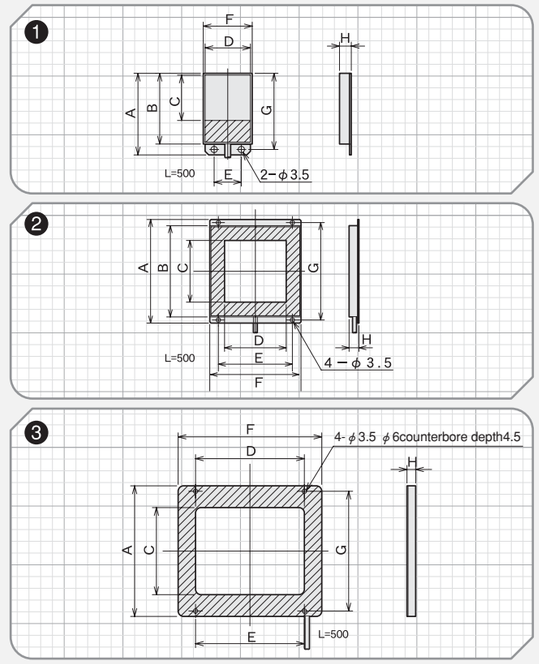
●Features

·Slim-type Lighting with LEDs mounted around the light guide to brighten it
·Even illumination on the surface allowing only the LED mounted outer circumference to be brightened

●Applications

·Inspection of dimension and shape of electronic parts
·Inspection of dimension and shape of lead frame
·IC lead inspection





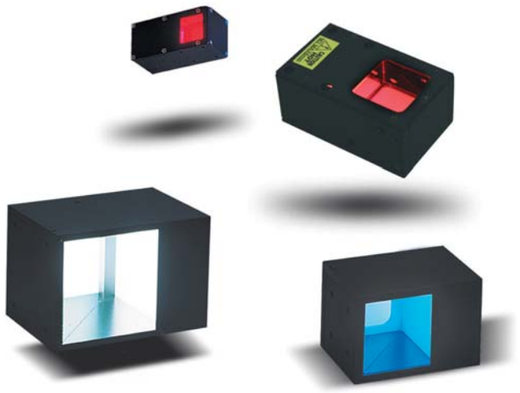
Specifications

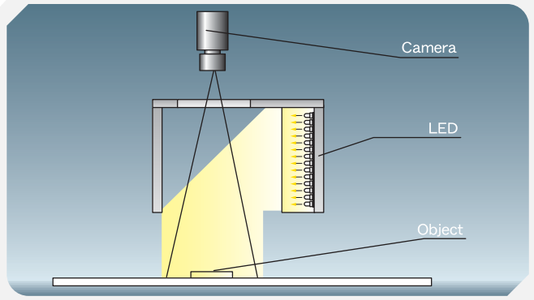
Model	Dimension (mm)								LED color	The Number of LED	Power Consumption(W)	Outline Drawing
	A	B	C	D	E	F	G	H				
OPEM-25×25R	45	38	25	25	15	26	42	7	Red	6	0.3	1
OPEM-25×25□	45	38	25	25	15	26	42	7	White, Blue, Green	6	0.5	
OPEM-41×30R	52	42	30	41	30	42	47	7	Red	10	0.5	
OPEM-41×30□	52	42	30	41	30	42	47	7	White, Blue, Green	10	1.2	
OPEM-50×50R	84	74	50	50	60	74	79	8.5	Red	48	2.0	2
OPEM-50×50□	84	74	50	50	60	74	79	8.5	White, Blue, Green	48	3.9	
OPEM-100×80R	122	—	80	100	100	134	110	8	Red	84	3.4	3
OPEM-100×80□	122	—	80	100	100	134	110	8	White, Blue, Green	84	6.8	
OPEM-100×100R	142	—	100	100	100	134	130	8	Red	96	3.9	
OPEM-100×100□	142	—	100	100	100	134	130	8	White, Blue, Green	96	7.7	
OPEM-180×135R	177	—	135	180	180	214	166	8	Red	144	5.8	
OPEM-180×135□	177	—	135	180	180	214	166	8	White, Blue, Green	144	11.6	
OPEM-200×150R	190	—	150	200	200	232	180	8	Red	168	6.8	
OPEM-200×150□	190	—	150	200	200	232	180	8	White, Blue, Green	168	13.5	

Either W (white), B (blue), or G (green) can be entered in □.
The numbers in the model number represent the dimensions. (OPEM- ** x **) represents the dimensions of the emission surface.

Coaxial Lights

OPCX





■Inspection of specular reflection light by coaxial lighting.

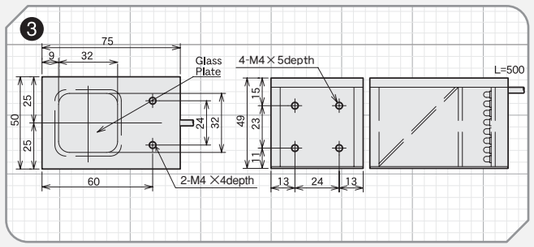
Coaxial lighting is available by half mirror.

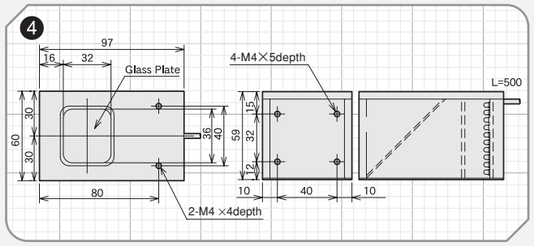
●Features

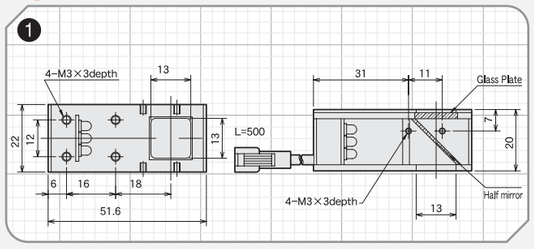
·Illumination from the coaxial side of a lens via a half mirror
·Illuminating light directly to the object for reflected images

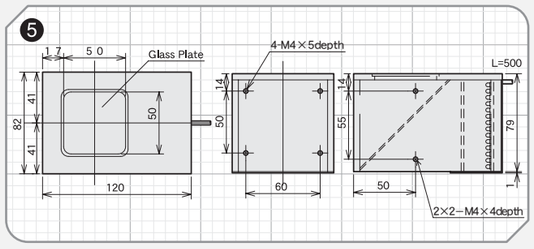
●Applications

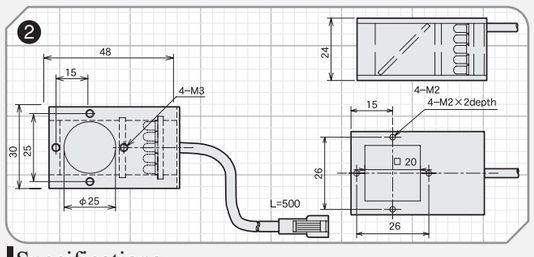
·IC void inspection
·Pattern inspection of the print board
·Alignment mark on the board
·Inspection for scratches on the chips and wafers
·Inspection for scratches on the surface of the glass board
·Inspection for dents on the lead frame

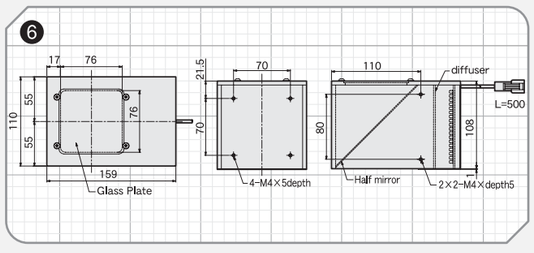


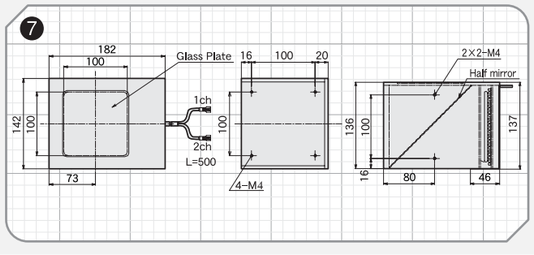












Specifications

Model	LED color	The Number of LED	Power Consumption(W)	Outline Drawing
OPCX-13R	Red	9	0.8	1
OPCX-13□	White, Blue, Green	9	0.8	
OPCX-20R	Red	25	1.2	2
OPCX-20□	White, Blue, Green	25	2.2	
OPCX-40R	Red	64	2.7	3
OPCX-40□	White, Blue, Green	49	4.8	
OPCX-50R	Red	100	4.8	4
OPCX-50□	White, Blue, Green	81	6.5	
OPCX-70R	Red	168	6.8	5
OPCX-70□	White, Blue, Green	168	13.5	
OPCX-100R	Red	324	13.0	6
OPCX-100□	White, Blue, Green	324	19.5	
OPCX-130R	Red	576	23.1	7
OPCX-130□	White, Blue, Green	576	17.3+17.3	

Either W (white), B (blue), or G (green) can be entered in □.

Diffuse Dome Lights

OPID NEW

■High-intensity and highly even Dome illumination

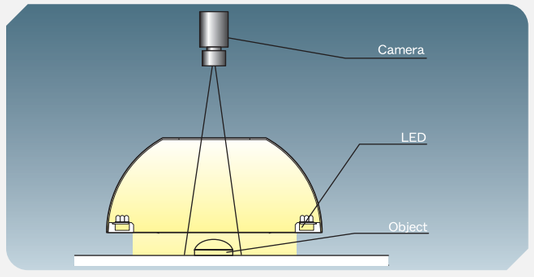
The light of the LED he LED elements are not reflected. Effective for illuminating objects at a close distance from various angles.
The light with Coaxial light and Dome light combined prevents reflection of camera hole from the object. Each Coaxial light and Dome light is switchable.

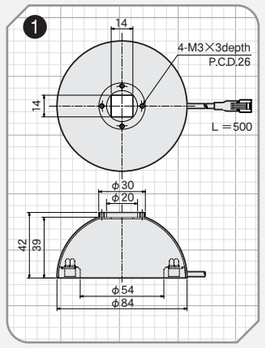
●Features

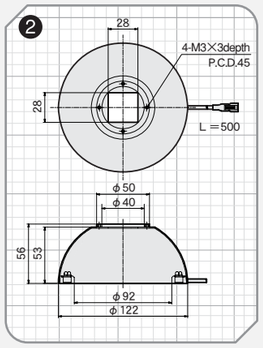
·LEDs illuminate inside the dome and the reflected light is used to illuminate the object.
·Even illumination of the object from all the directions

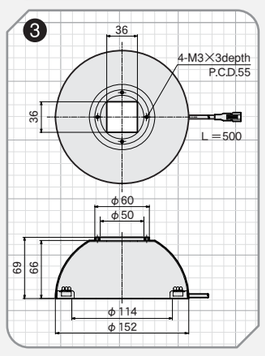
●Applications

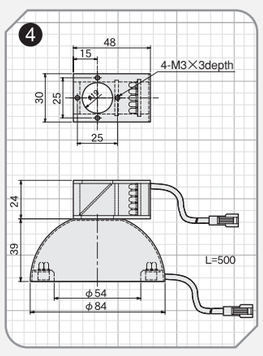
·Appearance and character inspections of objects with glossy surfaces
·Inspection of objects with rounded or curved surfaces

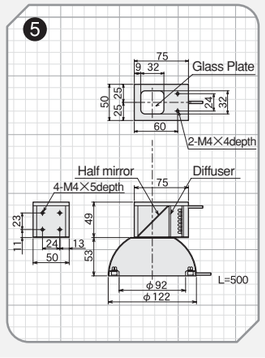


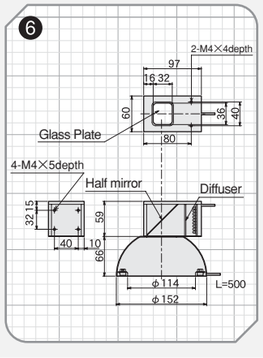












Specifications

Model	LED color	The Number of LED	Power Consumption(W)	Outline Drawing
OPID-84R	Red	96	3.9	1
OPID-84□	White, Blue, Green	72	5.8	
OPID-122R	Red	156	6.3	2
OPID-122□	White, Blue, Green	120	9.6	
OPID-152R	Red	270	10.8	3
OPID-152□	White, Blue, Green	216	17.3	
OPID-C84R	Red	25+96	1.2+3.9	4
OPID-C84□	White, Blue, Green	25+72	2.2+5.8	
OPID-C122R	Red	64+156	2.7+6.3	5
OPID-C122□	White, Blue, Green	49+120	4.8+9.6	
OPID-C152R	Red	100+270	4.8+10.8	6
OPID-C152□	White, Blue, Green	81+216	6.5+17.3	

Either W (white), B (blue), or G (green) can be entered in □.

Spot Lights

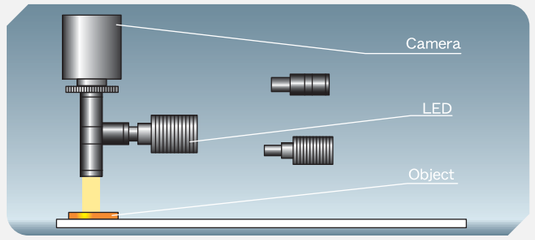
OPS.OPHS

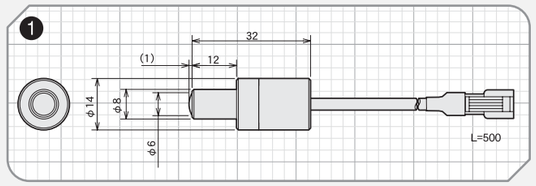
■Ultra-High-Intensity Small spot lighting !

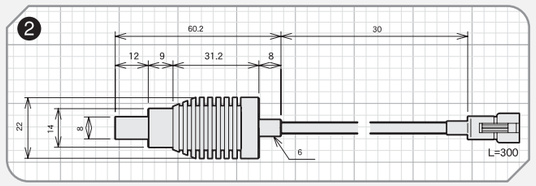
LED coaxial light that can replace halogen light for telecentric lens. OPHS3 type has high-power LED that is dozens of times brighter than conventional high-intensity LED. Constant current power supply, OPPCW, must be used for this type.

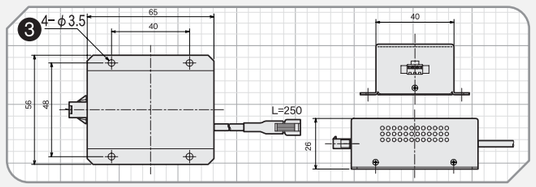
●3rd generation spot lights OPHS3 series

- ·High-brightness type for high resolution and high speed inspection
- ·Emitting surface : ϕ7mm, Evenness is improved when low magnification lens is used compared with conventional ϕ6mm type
- ·Designed compact outline : ϕ22mm
- ·Efficient heat dissipation by aluminum body with fins









Specification

Model	LED color	The Number of LED	Applicable power supply	Power Consumption(W)	Outline Drawing
OPS2-14R	Red	1	OPP、OPPW、OPPA	0.24	1
OPS2-14□	White, Blue, Green	1		0.24	

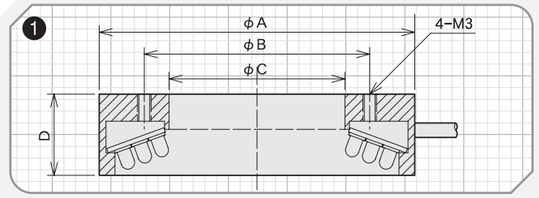
Model	LED color	The Number of LED	Adapter	Applicable power supply	Power Consumption (W)	Outline Drawing
OPHS3-C22R	Red	1	—	OPPCW-900M2	2.5	2
			RB-R12	OPP、OPPW、OPPA	9.0	
OPHS3-C22□	White Blue Green	1	—	OPPCW-900M2	3.5	
			RB-R12	OPP、OPPW、OPPA	9.0	

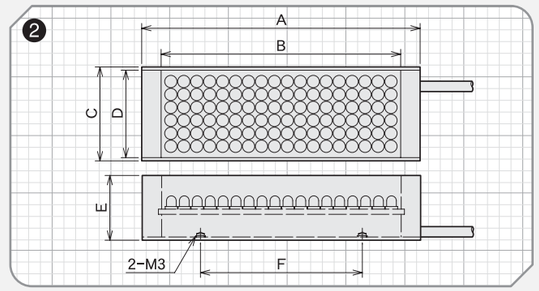
	Model	Applicable power supply	Outline Drawing
Extension Cable	OP-CB1-*	OPS2-14	—
	OP-CBCH1-*	OPHS3-C22	
Adapter	RB-R12	OPHS3-C22	3

Either W (white), B (blue), or G (green) can be entered in □.
Adapter (RB-R12) to be connected to OPHS3 series to use DC12V power supply (OPP, OPPW, OPPA).

Ultraviolet Lights

UV





■For inspection of fluorescent objects and utilizing its high dispersion.

UV375P type has 375nm wavelength ϕ5mm LEDs.

●Applications

- ·Fine flaw inspection
- ·Invisible code recognition
- ·Fluorescence inspection
- ·UV hardening

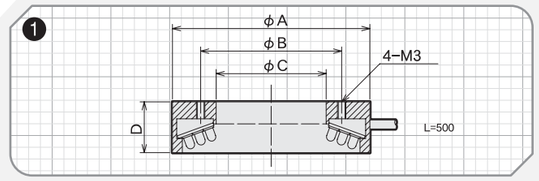
Specification

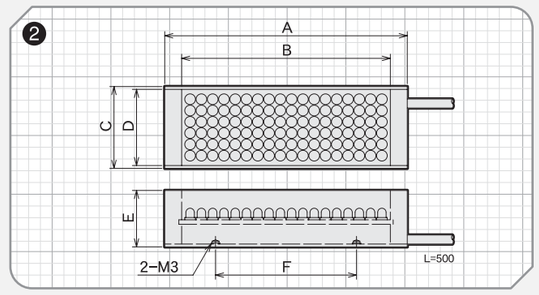
Model	Dimension (mm)						Wavelength (nm)	The Number of LED	Power Consumption (W)	Outline Drawing
	A	B	C	D	E	F				
OPDR-50-28UV375P	50	40	28	20	—	—	375	18	1.1	1
OPDR-110-60UV375P	110	85	60	30	—	—	375	90	5.4	
OPDB-50X15UV375P	60	50	18	15	20.5	30	375	12	0.8	2
OPDB-50X48UV375P	62	50	51	48	28.5	40x40	375	36	2.2	

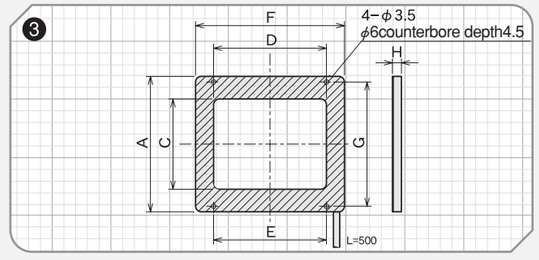
WARNING!
DO NOT EXPOSE EYES AND SKIN TO ULTRA-VIOLET LIGHT
RAYS MAY BE HARMFUL TO UNPROTECTED EYES AND SKIN.

Infrared Lights

IR







■For inspection utilizing its high transmittance.

We can provide IR LED lighting in shape of Ring, Bar, Dome, Backlight and any other shapes. 850nm is standard wavelength and 780nm, 810nm, 890nm and 940nm are available.

●Applications

- ·Permeation inspection
- ·Deleting color data

Specification

Model	Dimension (mm)							Wavelength (nm)	The Number of LED	Power Consumption (W)	Outline Drawing
	A	B	C	D	E	F	G	H				
OPDR-50-28IR-850	50	40	28	16	—	—	—	—	850	54	2.2	1
OPDR-90-50IR-850	90	70	50	20.5	—	—	—	—	850	108	4.4	
OPDB-50×15IR-850	60	50	18	15	20.5	30	—	—	850	36	1.5	2
OPDB-74×27IR-850	86	74	30	27	20.5	50	—	—	850	70	2.9	
OPDB-132×15IR-850	142	132	18	15	20.5	80	—	—	850	96	3.9	
OPEM-50×50IR-850	84	74	50	50	60	74	79	8.5	850	48	2.0	3
OPEM-100×80IR-850	122	—	80	100	100	134	110	8	850	84	3.4	

Please contact our sales or distributors for any inquiries.

Power supply selection guide

Product Type	Intensity control	External Control Input	Power supply	Output Voltage	Output wattage [W]	CH
OPP	aprox.60kHz, Pulse Width Modulation	ON/OFF	100～115VAC 50/60Hz	12VDC	10、30	2
OPPW	aprox.60kHz, Pulse Width Modulation		100～240VAC 50/60Hz	12VDC	10、30、50、100	2、4、8
OPPA	aprox.60kHz, 256 step Pulse Width Modulation	ON/OFF,8bit parallel	100～240VAC 50/60Hz	12VDC	10、30、50、100	1、2、4、8
OPPCW	78.125kHz, 256 step Pulse Width Modulation, Current control: 256 step constant current, 7 range	ON/OFF 8bit parallel and Analog 0 to 5V	100～240VAC 50/60Hz	12VDC 700mA	26.4	2

Intensity control by Pulse Width Modulation

Light is controlled using the Pulse Width Modulation (PWM) method.
[OPP,OPPW,OPPA: approx.60kHz, OPPCW: 78.125kHz].
It is controlled by changing the output time ratio during a cycle.

Advantages Even illuminance due to less affect from Vf fluctuation of LED elements.

Disadvantages As the shutter speed of the camera increases, the image brightness fluctuates.
(Fluctuation rate at shutter speed 1/4000 second: 60kHz: 6.7%, 78.125kHz: 5.1%)
This is because the start of imaging on the camera side and the pulse on the power supply side are not synchronized.

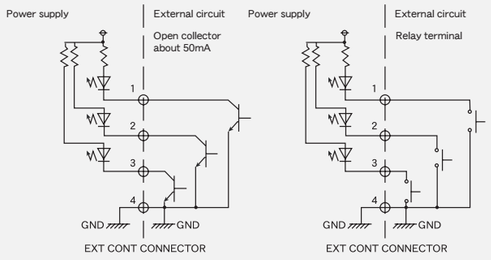
Output wattage of power supply

Please choose a power supply in which the total consumption power of lights connected to each channel does not exceed the volume of the power supply.
(Example) When the lights of 15W and 6W are connected to a power supply of channel 2, 15W+6W=21W and thus a power supply of 30W should be chosen.

Time lag when controlling light

The LED is a semiconductor, which has a high power-generation capability.
Turning the light on and off does not shorten its life.
Thus we recommend using the product with the ON/OFF control function for long use with minimum heat generation.

Example of connection to External Control Input



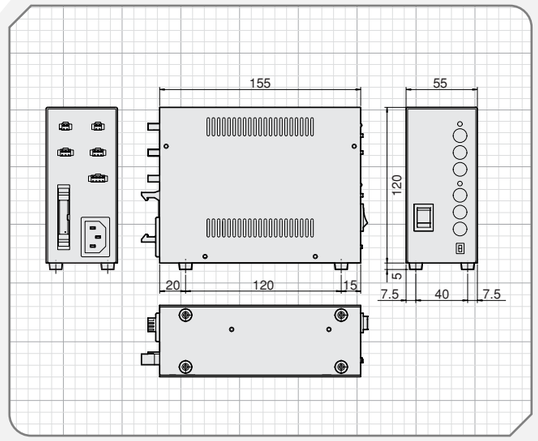
Applicable model : OPP, OPPW, OPPA

In order to make controlling from external input activate, short the "External Control" to "GND".
Then, controlling "ON/OFF" of Lamp Output is available by "LAMP1,2... ON/OFF".
"External Control" affects all output channel.

Power code included with the power supply is for 100VAC.
When it's used for over 125V, power code to be prepared separately by customers.

Dual Mode Powor Supply (PWM & Constant Current)

OPPCW NEW



- Dual mode output "PWM Mode" and "Constant Current Mode" 256 step Digital intensity control.
- 7 step Max. current range at Constant Current Mode.
- External control input "8bit parallel" and "Analog 0 to 5 V".
- Hi response time, less than 20 micro sec.
- Lamp output 2channels Independent, Total Output Wattage: 26.4W.

Specifications

Model		OPPCW-900M2
Power supply		AC100-240V ±10% 50/60Hz
Consumption Current		0.43A max. at AC100V input
Intensity control	PWM Mode	78.125kHz, 256 steps Pulse Width Modulation
	Constant Current Mode	256 step constant current , 7 step Max. current range
Output channels		2 Channels Independent
Output Voltage		12V ±5% p-p (PWM Mode) 1.5～17V (Constant Current Mode)
Output Current		0～2.2A / 2ch total (PWM Mode) 0.4mA～700mA ±5% (Constant Current Mode)
External control		Each Channel ON/OFF, Digital Control, Analog Control
Digital Input		OFF:±1.2V Max., ON:±5V Min. (Max.±26.4V) Input Impedance:6.8kΩ, Isolated
Analog Input		0～5V(max+30V),-0.5V,Input Impedance:220kΩ,Non-isolated
5V Output Current for Analog Input		max 20mA
Response Time		SYNC input：OFF→ON 7μs at 24V, : 14μs at 12V, ：135μs at 5V ON→OFF:120μs at all input voltage Analog input : approx. 2ms Other Digital input : approx. 1.2ms
Ambient Temp / Humid		-10 to 50℃ (no condensation), 35 to 85%/RH

Lamp Output

12V PWM	
Pins	Signals
1	+
2	-

Extension Cable Model:OP-CB1-(Cable Length)

CONSTANT CURRENT	
Pins	Signals
1	NC
2	-
3	+

Extension Cable Model:OP-CBCH1-(Cable Length)

External ON/OFF Controller

External ON/OFF Control Cable: OP-ECB2-(Cable Length)

Pins	Symbol	Function
1	SYNC1	LAMP1 ON
2	SYNC2	LAMP2 ON
3	EXSYN	External Control
4	SCOM	Common

External Intensity Controller

External Intensity Control Cable: OP-ECBCW-3

Pins	Symbol	Function
1	COM	Digital Input Common
2	EXCTRL	Digital Input Select
3	A0	OFF：LAMP1, ON：LAMP2
4	HOLD	D0-D7 HOLD
5	D7	bit7（MSB）
6	D6	bit6
7	D5	bit5
8	D4	bit4
9	D3	bit3
10	D2	bit2
11	D1	bit1
12	D0	bit0（LSB）
13	ANALOG	Analog/Digital Input Select (paired with 1COM)
14	N.C.	No Contact
15	N.C.	No Contact
16	N.C.	No Contact
17	AIN1	LAMP1 0～5V Analog Input
18	AIN2	LAMP2 0～5V Analog Input
19	5V	5V Output
20	ACOM	Common for AIN1/2

Power cable included with the power supply is for 100VAC.
When it's used for over 125V, power cable to be prepared separately by customers.

Digital Control Power Supplies

OPPA

・The Digital Control Power Supplies with 256 step adjustable intensity by PWM dimming.
・Controlling intensity of each channel individually by 8 bit Parallel I/F is available.
・Controlling ON/OFF of Lamps by External Control input is available.

Applied Models
OPPA-10M1
OPPA-10M2
OPPA-30M1
OPPA-30M2

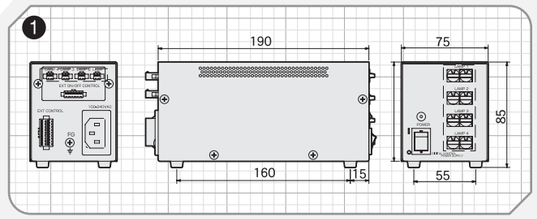
Specifications

Power supply	100-240VAC 50/60Hz
Output Voltage	12VDC
intensity control	aprox.60kHz、256 step Pulse Width Modulation
External ON/OFF Control	Controlling ON/OFF of each channel individually
External intensity Control	8bit Parallel Input
Operating Temp.	-10 to 40℃
Operating Humid.	20 to 70%RH (no condensation)

Model	CH	Output Wattage [W]	Consumption Current [A] at AC100V input	External ON/OFF Control Cable	Outline Drawing
OPPA-10M1	1	10	0.3max.	OP-ECB2-*	1
OPPA-10M2	2				
OPPA-10M4	4			OP-ECB4-*	
OPPA-30M1	1	30	0.8max.	OP-ECB2-*	
OPPA-30M2	2				
OPPA-30M4	4			OP-ECB4-*	
OPPA-30M8	8			OP-ECB8-*	2
OPPA-50M2	2	50	1.3max.	OP-ECB8-*	3
OPPA-50M4	4				
OPPA-50M8	8				
OPPA-100M2	2	100	2.4max.	OP-ECB8-*	
OPPA-100M4	4				
OPPA-100M8	8				

Lamp Output

Pins	Signals
1	+
2	-



External ON/OFF Controller

External ON/OFF Control Cable: OP-ECB (CH) - (Cable Length)

Pins	2ch	4ch	8ch
1	LAMP1 ON/OFF	LAMP1 ON/OFF	LAMP1 ON/OFF
2	LAMP2 ON/OFF	LAMP2 ON/OFF	LAMP2 ON/OFF
3	External Control	LAMP3 ON/OFF	LAMP3 ON/OFF
4	GND	LAMP4 ON/OFF	LAMP4 ON/OFF
5	—	External Control	LAMP5 ON/OFF
6	—	GND	LAMP6 ON/OFF
7	—	—	LAMP7 ON/OFF
8	—	—	LAMP8 ON/OFF
9	—	—	External Control
10	—	—	GND

Response Time
OFF→ON:1.6μsec, ON→OFF:33μsec

External intensity Controller

External intensity Control Cable: OP-ECBA- (Cable Length)

Pins	Signals	Insulator Color
1	2^0	White
2	2^1	Red
3	2^2	Green
4	2^3	Yellow
5	2^4	Brown
6	2^5	Blue
7	2^6	Ash
8	2^7	Orange
9	ch1/ch2 Write	Sky blue
10	ch3/ch4 Write	Pink
11	ch5/ch6 Write	Bright Green
12	ch7/ch8 Write	White/Black
13	RESERVED	Red/Black
14	OPEN:ODD CH、GND:EVEN CH	Green/Black
15	RESERVED	Yellow/Black
16	OPEN:INT、GND:EXT	Brown/Black
17	GND	Black
18	RESERVED	Ash/Black

Power cable included with the power supply is for 100VAC.
When it's used for over 125V, power cable to be prepared separately by customers.

Analog Control Power Supplies

OPP,OPPW

・The Analog Control Power Supplies with intensity control by PWM dimming.
・There are two types, one with rotary knob adjustable by hand and with trimmer adjustable by screw driver.

Applied Models
OPPW-10-□
OPPW-30-□
OPPW-50-□
OPPW-100-□

Specifications

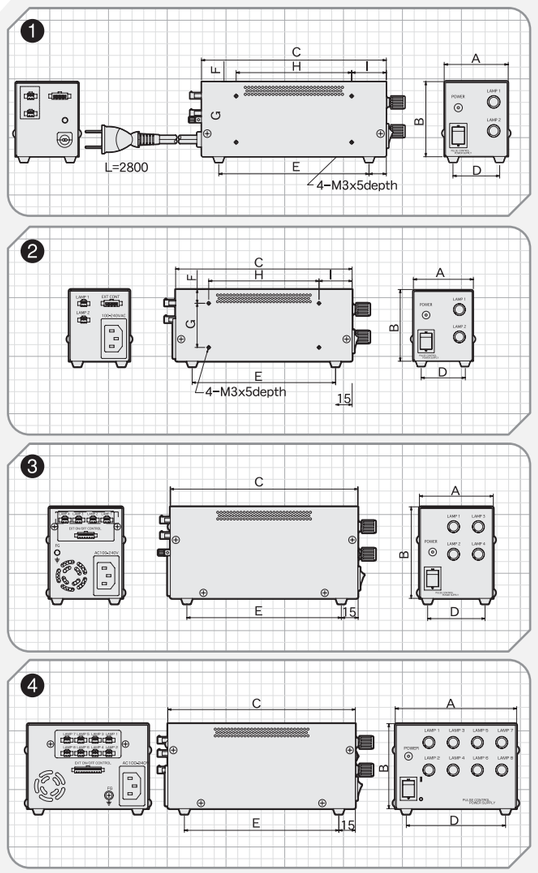
Series	OPP	OPPW
Power supply	100-115VAC 50/60Hz	100-240VAC 50/60Hz
Output Voltage	12VDC	
Intensity control	aprox.60kHz,Pulse Width Modulation	
External ON/OFF Control	Controlling ON/OFF of each channel individually	
Ambient Temp	-10 to 40℃	
Ambient Humid	20 to 70%RH (no condensation)	

Model	Dimension(mm) A	B	C	D	E	F	G	H	I	CH	Output Wattage [W]	Consumption Current [A] at AC100V input	Outline Drawing
OPP-10-□	45	58	120	30	90	6	40	70	25	2	10	0.3max.	1
OPP-30-□	55	65	160	40	130	12.5	40	100	30	2	30	0.8max.	
OPPW-10-□	50	60	131	35	100	7.25	44	80	25.5	2	10	0.3max.	2
OPPW-30-□	55	65	160	40	130	12.5	40	100	30	2	30	0.8max.	
OPPW-50-□	66	75	235	48	205	8	50	150	42.5	2	50	1.3max.	
OPPW-100-□	70	80	257	52	227	8	58	173	42	2	100	2.4max.	
OPPW-10-4□	67	83	170	52	140	—	—	—	—	4	10	0.3max.	3
OPPW-30-4□	67	83	170	52	140	—	—	—	—	4	30	0.8max.	
OPPW-50-4□	70	80	257	52	227	—	—	—	—	4	50	1.3max.	
OPPW-100-4□	70	80	257	52	227	—	—	—	—	4	100	2.4max.	
OPPW-30-8□	110	77	170	90	140	—	—	—	—	8	30	0.8max.	4
OPPW-50-8□	110	77	257	90	227	—	—	—	—	8	50	1.3max.	
OPPW-100-8□	110	77	257	90	227	—	—	—	—	8	100	2.4max.	

□ can be replaced by either H (semi-fixed type which requires adjustment by a screwdriver) or V (knob type which requires manual adjustment)

Lamp Output

Pins	Signals
1	+
2	-



External ON/OFF Controller

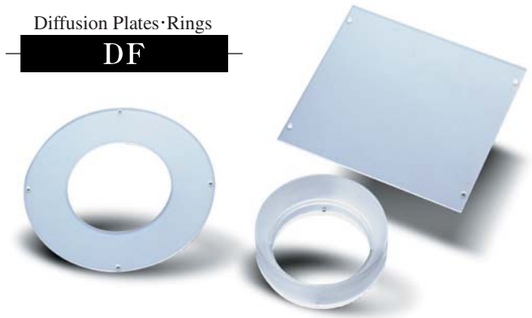
External ON/OFF Control Cable: OP-ECB(CH)-(Cable Length)

Pins	2ch Signals	4ch Signals	8ch Signals
1	LAMP1 ON/OFF	LAMP1 ON/OFF	LAMP1 ON/OFF
2	LAMP2 ON/OFF	LAMP2 ON/OFF	LAMP2 ON/OFF
3	**External Control**	LAMP3 ON/OFF	LAMP3 ON/OFF
4	GND	LAMP4 ON/OFF	LAMP4 ON/OFF
5	—	**External Control**	LAMP5 ON/OFF
6	—	GND	LAMP6 ON/OFF
7	—	—	LAMP7 ON/OFF
8	—	—	LAMP8 ON/OFF
9	—	—	**External Control**
10	—	—	GND

Power cable included with the power supply is for 100VAC.
When it's used for over 125V, power cable to be prepared separately by customers.

Diffusion Plates･Rings

DF



■Diffusing Plate for Bar and Ring Lighting.

This is a diffusing plate for a bar and ring lighting only. If the plate is mounted, it can reduce the reflection of LED elements on the object by diffusing the light.

An acrylic plate of 2mm thickness which has a rough surface and resin transparency diffuses the light. A standard type has a resin transparency of 80% and there are also models with a resin transparency of 60% and 30% with the same thickness.

■Diffusing Ring for Low Angle Ring Lighting.

This is a diffusing ring for low angle ring lighting only. If the plate is mounted, it can reduce the reflection of LED elements on the object by diffusing the light.

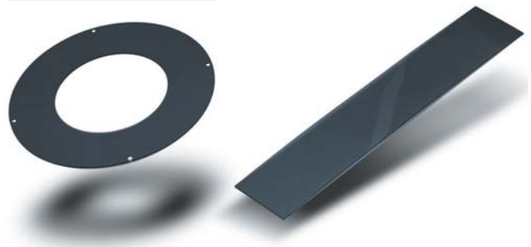
Specification

Series	Model	Applied Lighting
Direct Ring Lights	DF□□-OPDR-32-10	OPDR-32-10
	DF□□-OPDR-38-12	OPDR-38-15
	DF□□-OPDR-50-24	OPDR-50-28
	DF□□-OPDR-66-32	OPDR-66-36
	DF□□-OPDR-70-35	OPDR-70-39
	DF□□-OPDR-90-46	OPDR-90-50
	DF□□-OPDR-110-56	OPDR-110-60
	DF□□-OPDR-140-90	OPDR-140-95
Flat Ring Lights	DF□□-OPDR-F43-15	OPDR-F43-15
	DF□□-OPDR-F50-15	OPDR-F50-15
	DF□□-OPDR-F60-32	OPDR-F60-32
	DF□□-OPDR-F70-37	OPDR-F70-37
	DF□□-OPDR-F90-50	OPDR-F90-50
	DF□□-OPDR-F100-50	OPDR-F100-50
	DF□□-OPDR-F110-60	OPDR-F110-60
Low-angle Ring Lights	DF-OPDR-LA50-24	OPDR-LA50-24
	DF-OPDR-LA74-48	OPDR-LA74-48
	DF-OPDR-LA100-68	OPDR-LA100-68
	DF-OPDR-LA120-70	OPDR-LA120-70
	DF-OPDR-LA140-108	OPDR-LA140-108
	DF-OPDR-LA200-170	OPDR-LA200-170
Bar Lights	DF□□-OPDB-14×11	OPDB-14×11
	DF□□-OPDB-25×25	OPDB-25×25
	DF□□-OPDB-26×15	OPDB-26×15
	DF□□-OPDB-34×27	OPDB-34×27
	DF□□-OPDB-50×15	OPDB-50×15
	DF□□-OPDB-50×48	OPDB-50×48
	DF□□-OPDB-74×27	OPDB-74×27
	DF□□-OPDB-82×15	OPDB-82×15
	DF□□-OPDB-75×68	OPDB-75×68
	DF□□-OPDB-100×11	OPDB-100×11
	DF□□-OPDB-100×15	OPDB-100×15
	DF□□-OPDB-100×100	OPDB-100×100
	DF□□-OPDB-132×15	OPDB-132×15
	DF□□-OPDB-140×11	OPDB-140×11
	DF□□-OPDB-186×30	OPDB-186×30
	DF□□-OPDB-200×15	OPDB-200×15
	DF□□-OPDB-288×27	OPDB-288×27

□□ can be replaced by the transmission rate,80(%),60(%),or 30(%).

Polarizing Plates

PL



By attaching the PL filter to the light and the camera lens, it is possible to cancel the reflection element only.
The light intensity decreases because only the scattering light reaches the lens of camera.

Specification

Series	Model	Applied Lighting
Direct Ring Lights	PL-OPDR-32-10	OPDR-32-10
	PL-OPDR-38-12	OPDR-38-15
	PL-OPDR-50-24	OPDR-50-28
	PL-OPDR-66-32	OPDR-66-36
	PL-OPDR-70-35	OPDR-70-39
	PL-OPDR-90-46	OPDR-90-50
	PL-OPDR-110-56	OPDR-110-60
	PL-OPDR-140-90	OPDR-140-95
Flat Ring Lights	PL-OPDR-F43-15	OPDR-F43-15
	PL-OPDR-F50-15	OPDR-F50-15
	PL-OPDR-F60-32	OPDR-F60-32
	PL-OPDR-F70-37	OPDR-F70-37
	PL-OPDR-F90-50	OPDR-F90-50
	PL-OPDR-F100-50	OPDR-F100-50
	PL-OPDR-F110-60	OPDR-F110-60
Bar Lights	PL-OPDB-14×11	OPDB-14×11
	PL-OPDB-25×25	OPDB-25×25
	PL-OPDB-26×15	OPDB-26×15
	PL-OPDB-34×27	OPDB-34×27
	PL-OPDB-50×15	OPDB-50×15
	PL-OPDB-50×48	OPDB-50×48
	PL-OPDB-74×27	OPDB-74×27
	PL-OPDB-75×68	OPDB-75×68
	PL-OPDB-82×15	OPDB-82×15
	PL-OPDB-100×11	OPDB-100×11
	PL-OPDB-100×15	OPDB-100×15
	PL-OPDB-100×100	OPDB-100×100
	PL-OPDB-132×15	OPDB-132×15
	PL-OPDB-140×11	OPDB-140×11
	PL-OPDB-186×30	OPDB-186×30
	PL-OPDB-200×15	OPDB-200×15
	PL-OPDB-288×27	OPDB-288×27

Cables

OP

Extension Cable

Type	Model	Length[m]	Outline Drawing
1ch	OP-CB1-2	2	1
	OP-CB1-3	3	
	OP-CB1-5	5	
2ch	OP-CB2-2	2	2
	OP-CB2-3	3	
	OP-CB2-5	5	
OPHS3専用 1ch	OP-CBCH1-2	2	1
	OP-CBCH1-3	3	
	OP-CBCH1-5	5	

Extension Robot Cable

Type	Model	Length[m]	Outline Drawing
1ch	OP-RCB1-2	2	1
	OP-RCB1-3	3	
	OP-RCB1-5	5	
2ch	OP-RCB2-2	2	2
	OP-RCB2-3	3	
	OP-RCB2-5	5	

Extension Diverged Cable

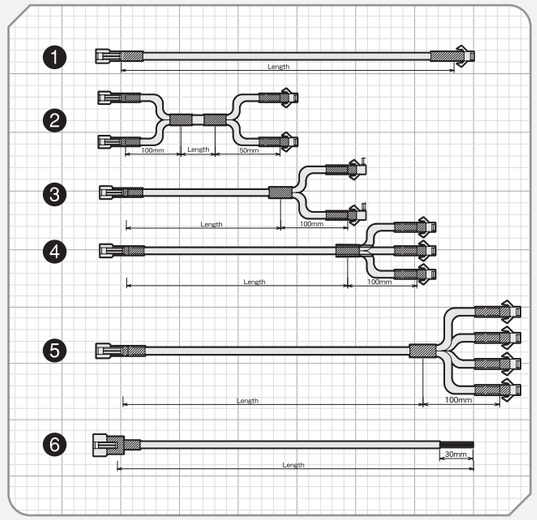
Type	Model	Length[m]	Outline Drawing
2Branch	OP-CBD2-2	2	3
	OP-CBD2-3	3	
	OP-CBD2-5	5	
3Branch	OP-CBD3-2	2	4
	OP-CBD3-3	3	
	OP-CBD3-5	5	
4Branch	OP-CBD4-2	2	5
	OP-CBD4-3	3	
	OP-CBD4-5	5	

External ON/OFF Control Cable

Type	Model	Length[m]	Outline Drawing
1ch、2ch	OP-ECB2-2	2	6
	OP-ECB2-3	3	
	OP-ECB2-5	5	
4ch	OP-ECB4-2	2	
	OP-ECB4-3	3	
	OP-ECB4-5	5	
8ch	OP-ECB8-2	2	
	OP-ECB8-3	3	
	OP-ECB8-5	5	

External ON/OFF Control Cable Core Identification

Model	Pins	Insulator Color
OP-ECB2-*	1	White
	2	Green
	3	Red
	4	Black
OP-ECB4-*	1	White
	2	Yellow
	3	Brown
	4	Green
	5	Red
	6	Black
OP-ECB8-*	1	White
	2	Yellow
	3	Brown
	4	Green
	5	Blue
	6	Ash
	7	Orange
	8	Light Blue
	9	Red
	10	Black



External Light Control Cable

	Model	Length[m]	Outline Drawing
for OPPA	OP-ECBA-2	2	6
	OP-ECBA-3	3	
	OP-ECBA-5	5	
for OPPCW	OP-ECBCW-3	3	-

External Light Control Cable Core Identification

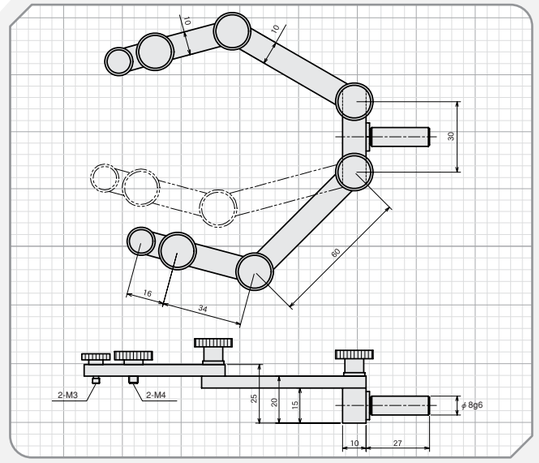
Model	Pins	InsulatorColor
OP-ECBA-*	1	White
	2	Red
	3	Green
	4	Yellow
	5	Brown
	6	Blue
	7	Ash
	8	Orange
	9	Sky Blue
	10	Pink
	11	Bright Green
	12	White/Black
	13	Red/Black
	14	Green/Black
	15	Yellow/Black
	16	Brown/Black
	17	Black
	18	Ash/Black

Model	Pins	InsulatorColor
OP-ECBCW-3	1	Black
	2	Blue
	3	Black/White
	4	Blue/White
	5	Red
	6	Ash
	7	Red/White
	8	Ash/White
	9	Green
	10	Orange
	11	Green/White
	12	Orange/White
	13	Yellow
	14	Purple
	15	Yellow/White
	16	Purple/White
	17	Brown
	18	Bright Green
	19	Brown/White
	20	Bright Green White

Arm unit for Lighting Setting

OPAU

Suitable for installing ring Lighting and available for setting tenporarily and experimenting.



Specification

Model	Specification
OPAU-150A	Available for attaching a Lighting device with an angle of 30-150mm to the part.

Features of LED lights

- Flexible in shape
- Allows light directivity
- Selectable wavelength
- Long life
- High efficiency, low power consumption
- Low total running cost
- Very fast response time
- Durable against switching

Elements required for image processing Lighting:

1. Image with high SN rate

For a stable image processing inspection, the imags to be inspected must be as clear as possible.
The LED lights create an image with a high SN rate, by selecting the optimal shape and wavelength for the target object, which leads to high inspection quality.

2. Even lighting

Even illumination intensity in the imaging area is required when extracting the inspection item by LED light. Unevenness of illumination intensity prevents correct reflection of the object's surface condition and causes unstable inspection.

3. Stable illumination intensity

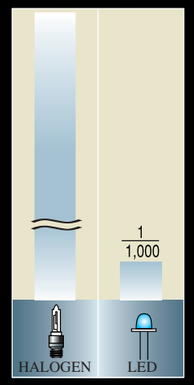
A large change in illumination intensity over time or due to the surrounding environment can cause inspection accuracy to decrease.
Even with a low initial cost, light which needs frequent maintenance will increase long-term costs.
Installing long lasting and stable illumination reduces the total running cost.

Comparison list of LED lights and other lights

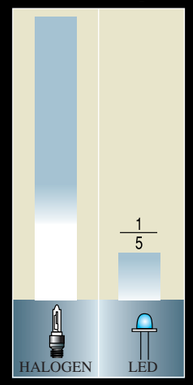
Light source	Life	Brightness	Wave length selection	Shape flexibility	Evenness	Directivity	Cost	Switching characteristics	Power consumption
LED Lights	◎	○	◎	◎	◎	◎	○	◎	◎
Halogen	×	◎	△	△	△	△	○	△	×
Fluorescent Lamp	△	○	×	×	◎	△	◎	△	○
Xenon	×	◎	△	△	△	△	○	◎	×

The reason the LED light is selected as a light source for image processing is because it facilitates optimal lighting for inspection.

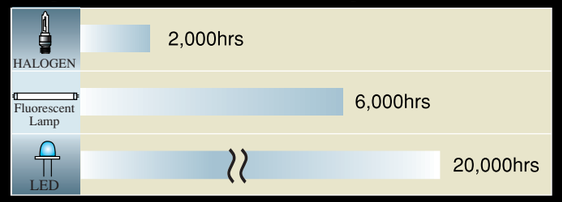
Response speed



Power consumption



Comparison with the lifetimes of other power sources



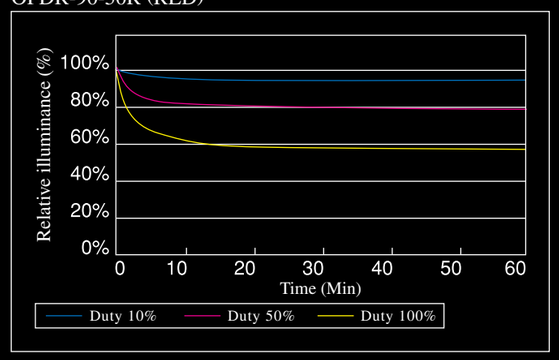
Illuminance drift chart by Duty setting

Condition:
Measured how much the illuminance changed from starting point with each Duty (10%, 50%, 100%) of power supply.

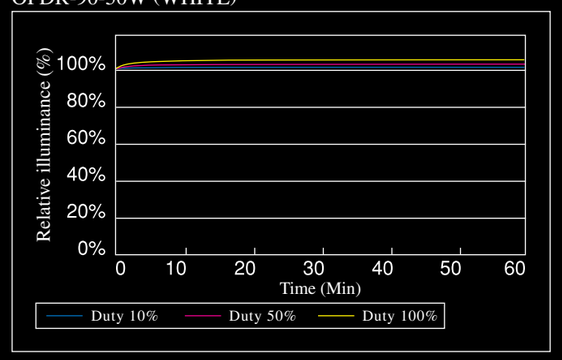
Duty setting (Ambient temp.=25℃)

Duty	10%	50%	100%
Cycle [sec]	1	1	1
ON Time [sec]	0.1	0.5	1

OPDR-90-50R (RED)

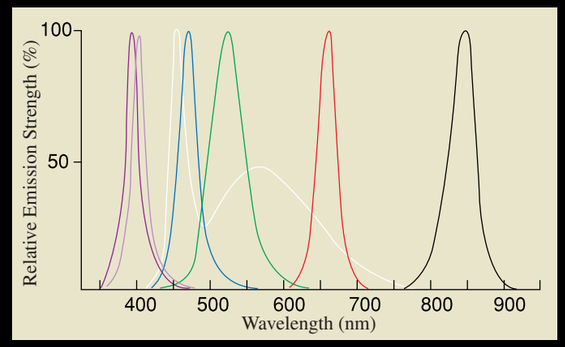


OPDR-90-50W (WHITE)

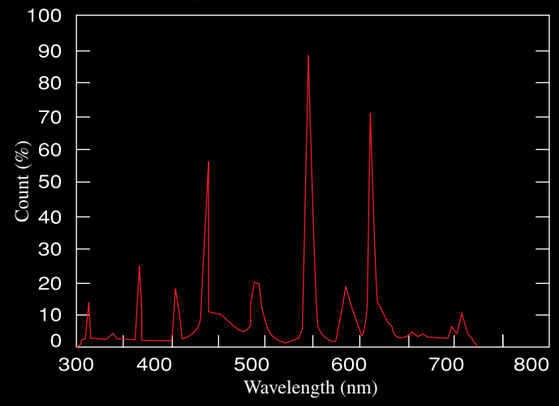


Emission Spectral Distribution

A fluorescent lamp and Halogen have wide wavelength distribution, but LED includes a specific emission of light wavelength in each. When selecting a wavelength, please consider the points below:



Fluorescent Spectral Distribution

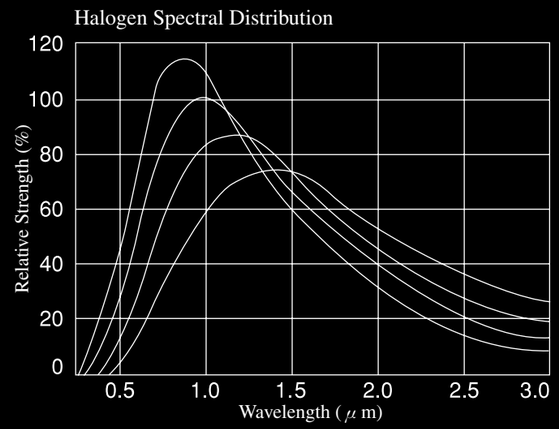


Scattering Rate:

The comparative scattering rate for each wavelength is shown when the red scattering rate is counted as 1. The scattering rate increases as the wavelength gets shorter.
When using a wavelength with a high scattering rate, it becomes easier to observe scattering light from the object surface. However, please note that when using a wavelength shorter than green, the camera's sensitivity may decrease.
When using a long wavelength, permeability increases. Infrared lighting, in particular, is effective for inspecting permeability.

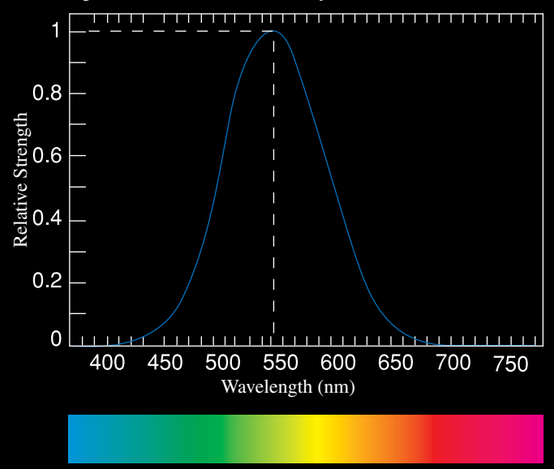
	Peak Wavelength	Main Inspection Uses	Scattering Rate
White	—	Color treating, etc.	—
Ultraviolet	375nm	Inspection for fine scratches, etc.	Approx. 9
	400nm		Approx. 8
Blue	470nm	Inspection for scratches, etc.	Approx. 4
Green	525nm	Visual Inspection, etc.	Approx. 2.5
Red	660nm	Used for backlight, etc.	1
Infrared	850nm	Permeable Illumination	Approx. 0.4

Halogen Spectral Distribution

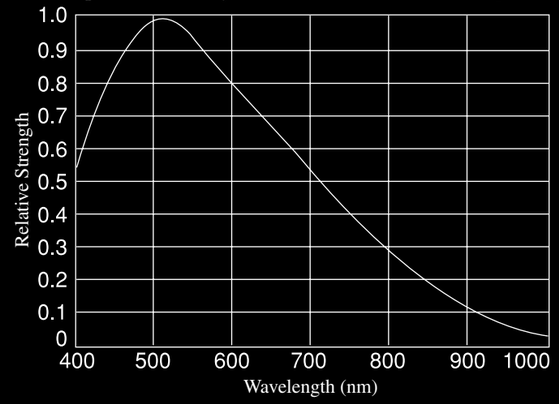


Visible light is light that can be seen by human eyes. Visible light generally has a wavelength of between 380nm and 780nm. Light with a wavelength higher than 780nm is infrared and light with a wavelength lower than 380nm is ultraviolet.
The human eye is most sensitive to green light with a wavelength of 555nm. Sensitivity decreases if the wavelength increases or decreases. The sensitivity curve when this 555nm is counted as 1 is called the Spectral Luminous Efficiency. Measurements of brightness such as lux and cd/m2 are coefficients of this Spectral Luminous Efficiency.
The spectral sensitivity of a camera does not necessarily have the same distribution as the Spectral Luminous Efficiency. The sensitivity of some cameras is set to match infrared or ultraviolet ranges. When setting Lighting, please check that the light distribution matches the camera you are using.

Spectral Luminous Efficiency Curve

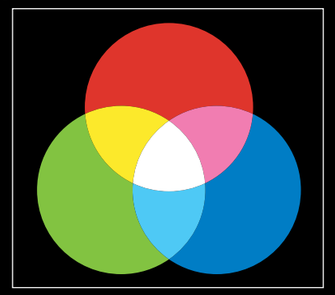


Spectral Sensitivity Characteristic of a Camera rep. value



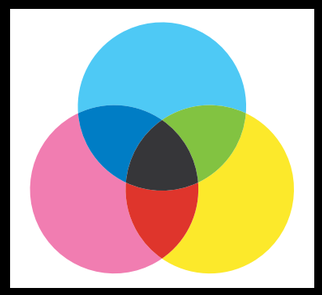
During image processing, because generally a CCD or CMOS camera is used, illumination brightness must be evaluated with the camera, and not human eyes.

LED Lights selection guide



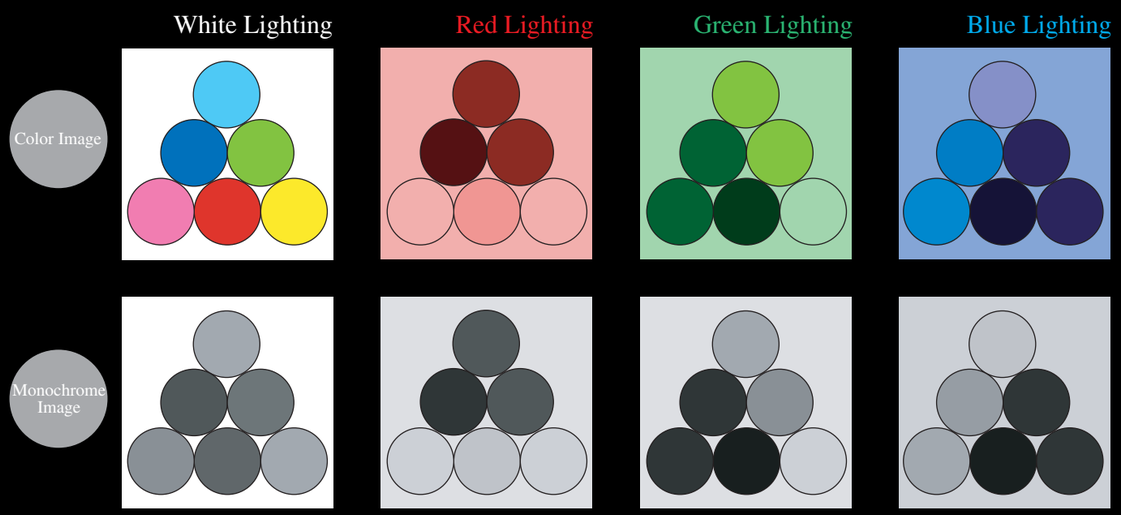
Additive Primary Colors

By combining the light of red, green and blue (additive primary colors) you can create other colors. Green(G) and blue(B) make Cyan(C), B and red(R) make Magenta(M), and R and G make yellow(Y). By combining R, G, and B lights of the same strength, white(W) is created. Combining colors in this way is called additive color mixing.
Colors can also be created by absorbing parts of light. C absorbs R, M absorbs G, and Y absorbs B. C, M, and Y absorb all of the light, and black(K) is created. Combining colors in this way is called subtractive color mixing and CMY are called subtractive primary colors.



Subtractive Primary Colors

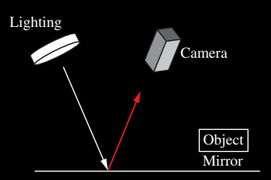
The color pattern using CMY is shown below. Also, color images using white, red, green, and blue and the monochrome image are shown. The contrast varies depending on the color of the light. When recognizing the object during image processing, it is important that there is sufficient contrast. During image processing, please select a light color where there is a large contrast between the object color and background color, referring to the color patterns below.



Differences in observation light due to the relative positions of the Lighting, camera and object.

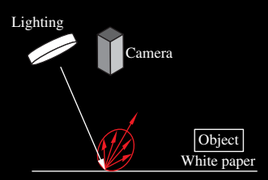
Depending on the type of object, positional differences of the Lighting, camera and object can affect the image.
Each situation is described below:

Observing mirror-reflected light (bright field)



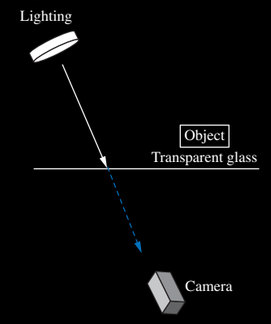
The camera and Lighting are on the same side of the mirror, and it is the same as looking directly at the Lighting. Only the direction of the light is different, and the reflected light is captured by the camera. The reflected light and the camera are along the same axis. Evenness rather than brightness is required of the reflected light. Irregularities on the surface and areas of low reflectance are comparatively dark.

Observing scatter reflection light (dark field)



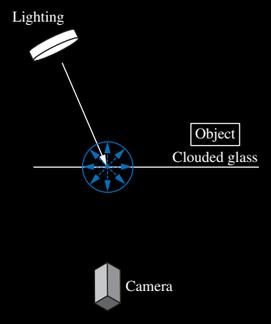
The camera captures images of a part of scattered light reflected off the surface. Light is reflected in every direction so the camera's observation axis is not restricted. Since only a part of the light can be captured, brightness rather than evenness is required. Irregularities on the surface and areas of high reflectance are comparatively bright.

Observing specular transmission light (bright field)



The camera and Lighting are on opposite sides of the glass, and it is the same as looking directly at the Lighting. The camera is aligned with the direction of the light, and the reflected light is captured by the camera. The transmitted light and the camera are along the same axis. Evenness rather than brightness is required of the reflected light. Irregularities on the surface and areas of low reflectance are comparatively dark.

Observing scatter transmission light (dark field)



The camera captues images of a part of scattered light transmitted from the surface. Light is reflected in every direction so the camera's observation axis is not restricted. Since only a part of the light can be captured, brightness rather than evenness is required. Irregularities on the surface and areas of high reflectance are comparatively bright.

Points when setting the Lighting

When setting the Lighting it is necessary to consider several factors.
Even when using the same Lighting, if the set height is different the captured images are completely different. Also, if the Lighting wavelength (color) is different, the images change. When setting Lighting, please consider the points below:

Testing Conditions
- Testing Items
- Extraction Point of Features
- Surface Condition
- Configuration
- Reflectance, Transmittance
- Quality of Material

etc.

▶

Testing System Specs
- Camera System
- Optical Specs
- Visual Field
- Line Speed
- Method of Sending
- Dimension Restrictions

etc.

▶

Lighting Specs
- Lighting System
- Configuration
- Size
- Wavelength
- Parallelism
- Brightness

etc.

How to Use and Maintain LED Lighting

To get the best performance from LED Lighting:

1. Please avoid using LED lights in a high-temperature environment. Doing so may lower the illuminance and facilitate deteriortion.
If the LED element becomes heated, illuminance is reduced and general performance deteriorates. The half-life of the illuminance of an LED element is said to be about 20,000 hours (Typ.), but if the element is continuously used in a high-temperature environment, its performance may deteriorate quicker.

2. To prevent illuminance reduction and performance deterioration due to the generation of heat:
●Improve the heat dissipation of the LEDs.
・ Mount the Lighting on a bracket with good heat conductivity.
・ Install a ventilating device.
・ Install a fan.
We recommend creating a cool environment which allows easy heat dissipation.

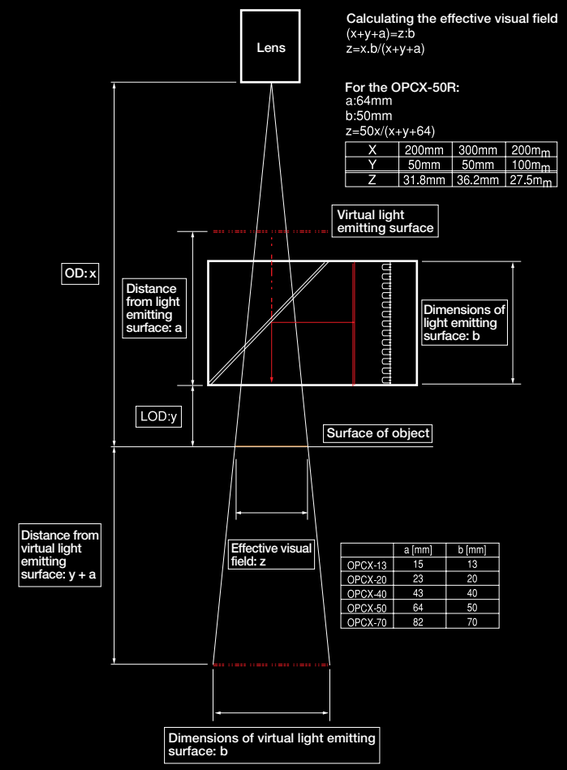
● Turn the Lighting on only when imaging.
The performance of LED Lighting is not affected much by switching the power on and off.
To extend the LED's life, utilize the on/off function controlled by external signals powered by this company, and only turn the LED on when necessary.

● Use lights at low volumes.
If the light is set to a low volume, the current flowing into the LED decreases and the heat generation is suppressed.
To choose Lighting with sufficient brightness, evaluate each Lighting when the camera's aperture is as open as possible.
If using the Lighting continuously, we recommend a volume of 50%.
(Even if performance deteriorates and illuminance is reduced, normal use can be restored by increasing the volume.)

3. Use the Lighting as close as possible to the target object.
Since the element itself is small, LEDs can manufactured as small and lightweight lights. The illumninance is inversely proportionate to the square of the distance, and thus using the Lighting at a close distance can increase the light intensity greatly.

The Visual Field of Coaxial Lighting

Coaxial Lighting is a type of Lighting in which the surface emitting part of the LED emits light along the same axis as the camera lens, via a half-mirror. The effective visual field of coaxial lighting is dependent upon the distance between the camera and object (OD), the distance between the Lighting and object (LOD), and the size of the light emitting surface. If the OD increases, the visual field grows, but if the LOD increases, the visual field shrinks. The method of calculating the effective visual field is shown below. It is necessary to keep the object within the effective visual field, especially for objects with a high reflectance. This effective visual field is calculated based on the size of the light emitting surface. It is recommended that you set a sufficient visual field, taking into consideration the lower luminance in the surrounding area.



	a [mm]	b [mm]
OPCX-13	15	13
OPCX-20	23	20
OPCX-40	43	40
OPCX-50	64	50
OPCX-70	82	70

Notes for use

・ Do not look at the source of light directly.
・ Do not disassemble or reconstruct the light or power supply.
・ Do not touch a product under operation with wet hands.
・ Do not use in a high-temperature or high-humidity environment.
・ Avoid installing in a dusty place.
・ Please use following the recommended guidelines concerning heat generation.
・ Please do not use a power supply other than the one provided.
・ The AC power supply should have a different power supply from the motive power, electromagnetic valve etc.
・ A power supply with an earth terminal should be grounded.
・ When installing Lighting, follow all instructions carefully.

※ Please note that the specifications of our products are subject to change without prior notice.

Warranty

●Period of Warranty : The warranty period of this device is one year from delivery.
●The manufacturer will repair or replace the device free of charge.if a malfunction occurs where the manuafacturer is liable, during the warranty period.
However, malfunctions caused by the following shall be excluded from the manufacturer's warranty.

1. Damage caused by abuse, misuse, or misapplication
2. Damage where the cause is not the delivered product
3. Damage caused by an unapproved modification or repair.
4. Damage due to natural or other disasters
5. Damage caused by use which exceeds standard product use
6. Damage caused by failure to adhere to guidelines or warnings

The warranty stated herein shall cover only the delivered product.
Damage or injury sustained due to a malfunction to this product is not covered by this warranty.