MV

Machine Vision General Catalog

Illumination Vol.001

MORITEX SCHOTT

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Unparalleled Expertise

Machine Vision Systems combine lighting, imaging, and data processing to inspect, monitor, and control industrial production processes. They have been employed in a variety of industries on a multitude of applications.

As experts in providing Lighting and Imaging solutions for today's vast machine vision market, MORITEX and SCHOTT offer standard and customized solutions for illumination, lens design, and front end optical systems.

With decades of experience, and extensive know-how, MORITEX and SCHOTT can provide the total machine vision illumination and imaging solution designed exclusively for you comprised from our vast product portfolio.

MORITEX and SCHOTT are leading global suppliers of illumination and imaging components for machine vision applications. Our unparalleled expertise in these areas makes us uniquely qualified to service all different levels from system design to integrated lighting and imaging system solutions. Please review the products featured in this catalog and let us know how we can best serve you!

Your Global Lighting and Imaging Alliance

Since 2007, MORITEX and SCHOTT have cooperated on a global scale. Our goal has always been to provide the ultimate products and services to our customers worldwide. By utilizing the bundled experience and expertise of these two established companies, we have made this goal a reality.

As an established leader in machine vision systems with an impeccable track record of innovation, MORITEX is the only provider that can service all different levels from system design to integrated system solutions.

The SCHOTT Lighting and Imaging division offers a broad range of LED and fiber optic solutions focusing on illumination, light and image transmission. In addition, SCHOTT also offers superior hybrid solutions utilizing the best of LED and fiber optic technologies.

For the first time, MORITEX and SCHOTT present their entire Machine Vision portfolio together in one catalog at your convenience and reference.

Thank you for taking the time to learn about MORITEX and SCHOTT and how we can provide you with the ultimate in Machine Vision solutions. If you would like more information about any of our products, please don't hesitate to contact us.

MORITEX and SCHOTT, Unparalleled Expertise!

Spanning the Globe

At MORITEX and SCHOTT we're here to serve you!
With locations spanning more then 40 countries across the globe, we're almost guaranteed to have an office near you.

This map represents some of our main offices serving the Machine Vision industry located in Asia, Europe and the USA.
Please don't hesitate to contact us if we can be of service to you. You may refer to the back cover page for contact information.

New Products

LED Illumination

MCV-Light Series

NEW

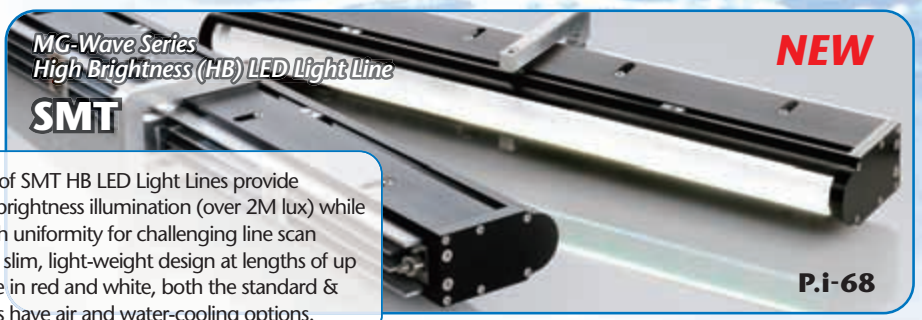
Designed to meet the rigorous needs of industrial applications, all constant voltage controlled MCV-Light Series models operate at 24V allowing for easy connection to available power supplies in addition to proprietary controllers. This series adds to the largest and most diverse product offering available in the industry.

P.i-10

MG-Wave Series
High Brightness (HB) LED Light Line

SMT

NEW



The latest series of SMT HB LED Light Lines provide extremely high brightness illumination (over 2M lux) while maintaining high uniformity for challenging line scan applications in a slim, light-weight design at lengths of up to 3m. Available in red and white, both the standard & reflective models have air and water-cooling options.

P.i-68

LLS2 / MHAA and MHAB Series
LED Light Source

LLS2

NEW

The LLS2 features optimal light output with parallel 8 bit digital and 0-5V analog control. This long-life, low power consumption light source can be used as a drop-in replacement for the Halogen based MHAA Series models.

P.i-98

System Flow Chart

LED Illumination

LED Controller
for MCV-Light Series
APS

Direct Ring Illumination
R / SQ
Low Angle Ring Illumination
RLA / RLA-00
Shadowless Illumination
FR / DR / DSQ
Bar Illumination
BA

LED Controller
for MG-Wave Series
MLEK

A080W Analog Series
A080W Digital Series
A230W Analog Series
A230W Digital Series
Multi Channel Series
High Wattage Series

Direct Ring Illumination
MDRL
Low Angle Ring Illumination
MLRL
Shadowless Illumination
MSRL / MSLL / MSQL
Bar Illumination
MBRL
Square Bar Type Illumination
MDQL
Dome Illumination
MDML

LED Controller
for MCEP/MSPP Series
MLEP

A035W Analog Series
A035W Digital Series
A070W Analog Series
A070W Digital Series

High Power LED Spot Illumination
MCEP
LED Spot Projectors
MSPP

LED Controller
for MLNX Series
MLEX
A600W Digi/Ana

(~720mm)

(840mm~)

High Brightness (HB) LED Light Line
MLNX

Fiber Optic Light Sources and Light Guides

Halogen Light Sources
MHAA / AB
MHAB-IR

LED Light Source
LLS2

Ring Light Guides
MRG/P
Straight Light Guides
MSG/P
Bifurcated Light Guides
MWG/P
Multifurcated Light Guides
M#G#
Plate Type Light Guides
MPP
Line Light Guides
MKG/P
Long Width Line Light Guides
MFKG/P

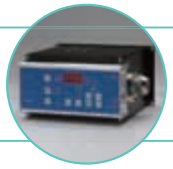
LED Light Source
LLS

Adapter
for MORITEX

Halogen Light Source
DCR® III
DCR® III Plus
DCR® IV

Halogen Light Source
ACE®

Universal Ringlight
Midi and Mini Ringlights
Ringlights, 66 mm /58 mm
Darkfield Ringlight
Single Bundles
Dual and Quad Bundles
Randomized and Calibrated Bundles
Single and Dual Goosenecks
Combination Goosenecks & Bundles
Lightlines, 1", 2", & 3"
Lightlines
Spatially Randomized Lightlines
Lightline, 45°
Lightline Lenses
Single and Dual Backlights
PANELite® Backlights



Xenon Flash Light Source
MaVi-S

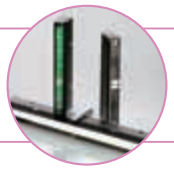
Square Bar Type Illumination
BAQ
Simulated Coaxial Illumination
CX
Direct Backlights (Chip Mount Type)
FL

Options

Simulated Coaxial Illumination
MSCL
Direct Backlights (Chip Mount Type)
MDBC / MQFC
Direct Backlights (Discrete Type)
MDBL
Edge Type Backlights
MEBL / MEBC
Collimated Backlight Illumination
MCBP
IR Illumination
IR

UV Illumination
UV
Variable Color RGB Illumination
RGB
Diffuse Chip Type Bar Illumination
MBRC
Line Illumination
MLNL
Coaxial Illumination
MCEC / MCEL

Options



High Brightness (HB) LED Light Line
SMT

Condenser Lenses
Light Guide Options

Darkfield Illuminator / Ringlight Adapters
Ringlight Polarizers & Analyzers
Diffuse Dome
Ringlight Reflector Rings / Ringlight Support Apparatus
Bundle Extenders
Gooseneck & Bundle Support Apparatus
Support Apparatus
Filters, Diffusers & Spot Lenses
Lightline Linear Polarizer Kits
Lightlines Support Apparatus

Quartz UV Light Guides
UV

Guidance

LED Illumination
MCV-Light Series

LED Illumination
MG-Wave Series

Fiber Optic Light Sources and Light Guides
MHAA and MHAB Series

Fiber Optic Light Sources and Light Guides
ColdVision Series

Quartz UV Light Guides

Special Application Light Guides

LED Illumination

Broad range of lighting solutions

MORITEX and SCHOTT's has the most complete LED illumination portfolio available with the constant current controlled "MG-Wave Series" and constant voltage controlled "MCV-Light Series" providing support for the entire range of modern-day users in various image processing environments.

Image processing total system solutions support

Our total system solutions approach provides customers with the best performance & efficiency through consideration of the 3 essential imaging fields of illumination, lens, and peripherals.

Making obscure and unrecognizable images become sharp and clear

Our total system solutions meet a wide range of needs for image processing applications.

MCV-Light Series NEW

Constant Voltage Control System / 24V DC / Industrial Design with Metal Connectors

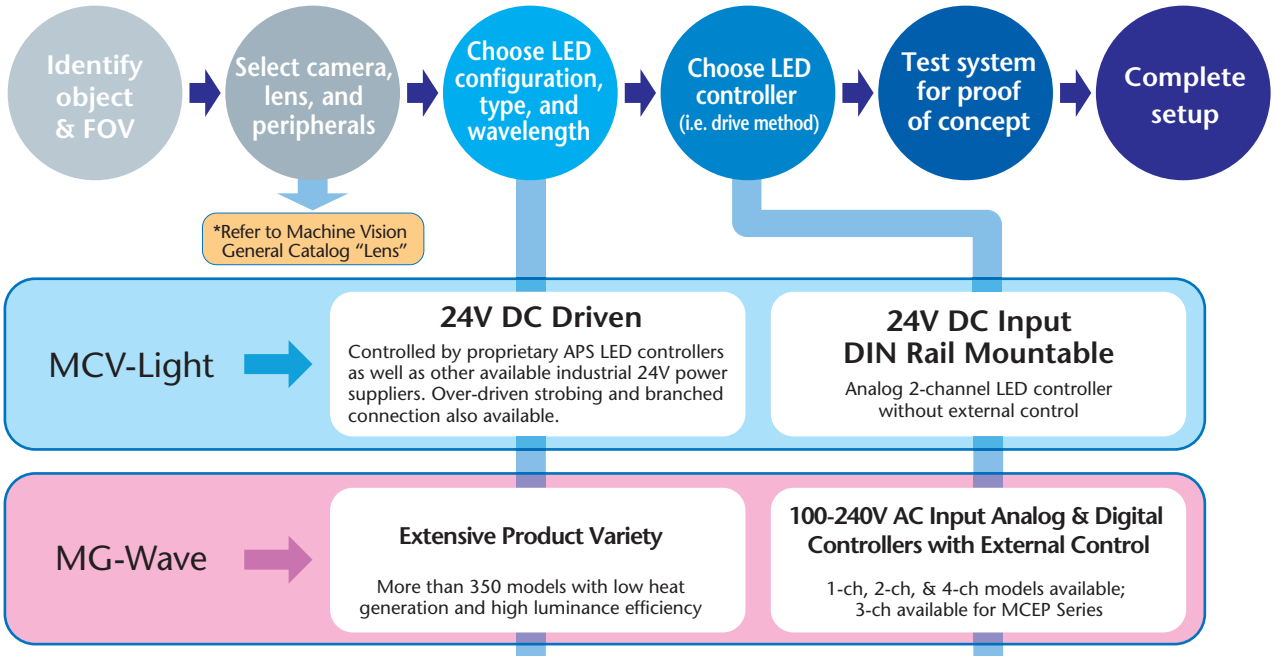
The MCV-Light Series constant voltage control LED illumination products are 24V DC driven and can be controlled by proprietary APS LED controllers as well as other available industrial 24V power supplies. Over-driven strobing is also possible for instantaneous, high intensity illumination. This series can be used in various machine vision imaging environments providing a broad range of lighting solutions.

MG-Wave Series

Constant Current Control System / Extensive Product Variety / Unique, High End Solutions

The MG-Wave Series is our original LED illumination product line designed with our patented highly sophisticated integrated constant current sensing control system that enables our LED controllers to identify the appropriate current value for each individual LED unit connected and control them separately. The constant current design successfully reduces heat generation to improve output intensity, efficiency, and stability.

Selection flowchart



LED Lineup Reference Table

Illumination Type	MCV-Light Sereis	MG-Wave Series
Direct Ring Illumination	R SQ	MDRL
Low Angle Ring Illumination	RLA RLA-00	MLRL
Shadowless Illumination	FR DR DSQ	MSRL MSLL MSQL
Bar Illumination	BA	MBRL
Square Bar Type Illumination	BAQ	MDQL
Dome Illumination	—	MDML
Simulated Coaxial Illumination	CX	MSCL
Direct Backlighting (Chip Mount Type)	FL	MDBC MQFC
Direct Backlighting (Discrete Type)	—	MDBL
Edge Type Backlighting	—	MEBL MEBC
Collimated Backlight Illumination	—	MCBP
High Brightness LED Light Line	—	MLNX SMT
Line Illumination	—	MLNL
Diffuse Chip Type Bar Illumination	—	MBRC
High Power LED Spot Illumination	—	MCEP
Coaxial Illumination	—	MCEC MCEL
LED Spot Projector	—	MSPP
IR Illumination	—	IR
UV Illumination	—	UV
Variable Color RGB Illumination	—	RGB

Input	MCV-Light	DC24V
	MG-Wave	AC100V~240V
Channel	MCV-Light	2ch
	MG-Wave	1ch, 2ch, 4ch
External Control	MCV-Light	N/A
	MG-Wave	Analog (0-5V) Digital (Pararell/8bit)

LED Controller Lineup Reference

Analog LED Controllers for MCV-Light Series

24V DC, DIN rail mountable

LED Controllers for MG-Wave Series

Constant current sensing control system

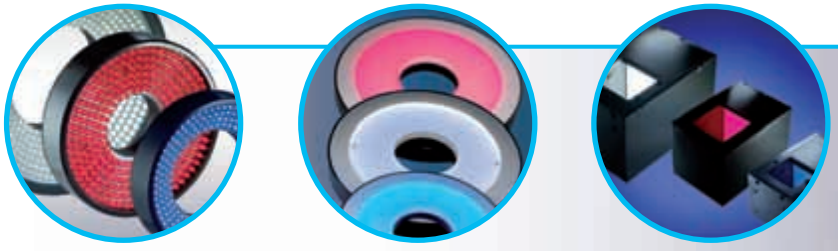
LED Controllers for MCEP/MSPP Series

For high power LED spot illumination

LED Controllers for MLNX Series

Applicable lighting length: 840-2880mm

LED Illumination



24V DC Driven / Industrial Design with Metal Connectors

MCV-Light Series

MCV-Light Series employs the constant voltage control system that can be controlled not only by APS LED controllers but also by industry available 24V DC power supplies directly. Overdriven strobing for instantaneous high intensity illumination is also available. The series can support customer's various image processing environments with a broad range of lighting solutions.

LED Controller for MCV-Light Series
APS

Direct Ring Illumination
R / SQ
Low Angle Ring Illumination
RLA / RLA-00
Shadowless Illumination
FR / DR / DSQ
Bar Illumination
BA
Square Bar Type Illumination
BAQ
Simulated Coaxial Illumination
CX
Direct Backlights (Chip Mount Type)
FL

Options

LED SAFETY STANDARD (CEI/IEC 62471:2006)

Groups	Definition and Emission limit
Exempt	Not more than 1.0 W·m^{-2}. Small source defined as one with <0.011 radian.
Low Risk	Not more than 1.0 W·m^{-2}
Moderate Risk	Not more than 400 W·m^{-2}
High Risk	Higher than 400 W·m^{-2}

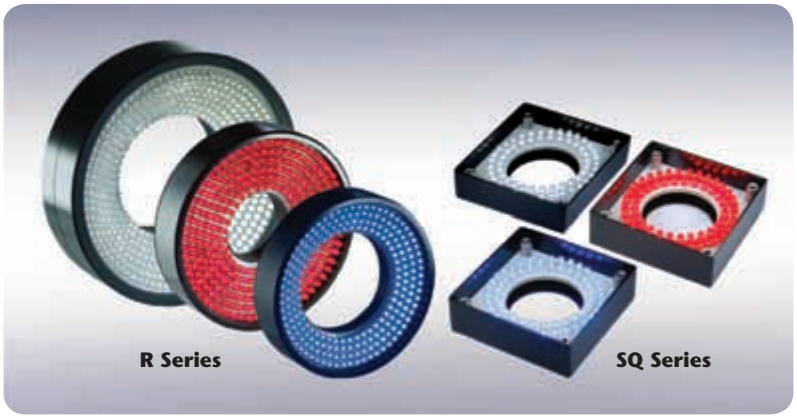
Lamp Classification based on IEC standards are applicable to LED lighting units. Criteria for classification is shown above. LEDs are narrow bandwidth light sources with emission levels based on "Blue light, small source" where the wavelength is from 300nm to 700nm. All MCV-Light Series products are considered to be in either the low risk or exempt group.

CE CE Marking

RoHS RoHS Directive

Direct Ring Illumination

R/SQ Series



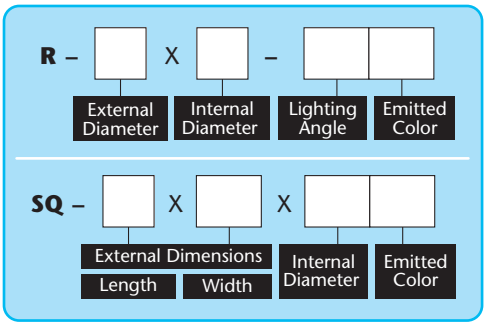
Direct Ring Illumination: R Series

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

Square Ring Illumination: SQ Series

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

Explanation of Model Code



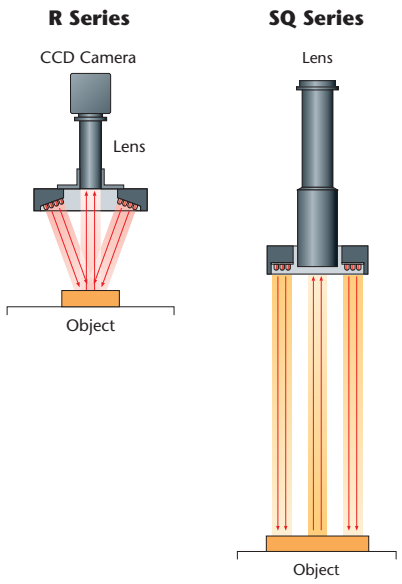
Lineup of Direct Ring Type LEDs

Model	Emitted Color	Power (W)	Internal Diameter (mm)	External Diameter (mm)	Lighting Angle	Weight (g)	Product Code
R-32X10-70R	Red	1.5	32	10	70°	50	A-2600
R-32X10-70B	Blue	2.1	32	10	70°	50	A-2602
R-32X10-70W	White	2.1	32	10	70°	50	A-2601
R-42X18-65R	Red	1.8	42	18	65°	75	A-2603
R-42X18-65B	Blue	2.8	42	18	65°	75	A-2605
R-42X18-65W	White	2.8	42	18	65°	75	A-2604
R-50X28-75R	Red	2.1	50	28	75°	75	A-2606
R-50X28-75B	Blue	3.6	50	28	75°	75	A-2608
R-50X28-75W	White	3.6	50	28	75°	75	A-2607
R-70X35-90R	Red	4.2	70	35	90°	150	A-2609
R-70X35-90B	Blue	6.6	70	35	90°	150	A-2611
R-70X35-90W	White	6.6	70	35	90°	150	A-2610
R-90X30-80R	Red	8.1	90	30	83°	250	A-2612
R-90X30-80B	Blue	9.6	90	30	83°	250	A-2614
R-90X30-80W	White	9.6	90	30	83°	250	A-2613
R-90X50-70R	Red	6.1	90	50	71°	200	A-2615
R-90X50-70B	Blue	8.3	90	50	71°	200	A-2617
R-90X50-70W	White	8.3	90	50	71°	200	A-2616
R-120X60-50R	Red	8.4	120	60	52°	550	A-2618
R-120X60-50B	Blue	17	120	60	52°	550	A-2620
R-120X60-50W	White	17	120	60	52°	550	A-2619

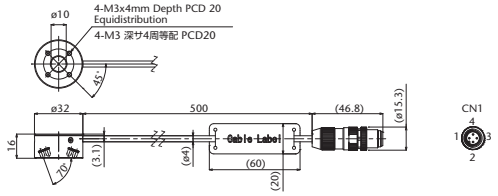
Lineup of Square Ring Type LEDs

Model	Emitted Color	Power (W)	External Dimensions (mm)		Internal Diameter	Weight (g)	Product Code
			Length	Width			
SQ-56X56X30R	Red	2.1	56	56	30	100	A-2776
SQ-56X56X30B	Blue	3.3	56	56	30	100	A-2778
SQ-56X56X30W	White	3.3	56	56	30	100	A-2777

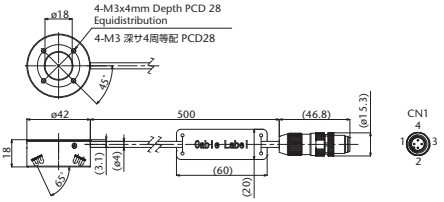
Illumination Structure



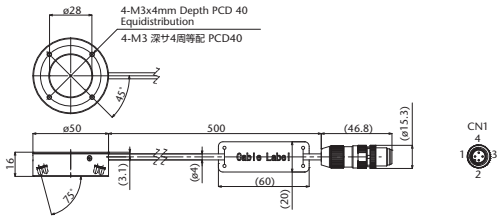
R-32X10-70R (B,W)



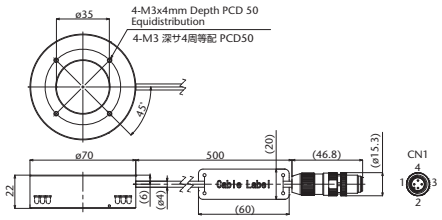
R-42X18-65R (B,W)



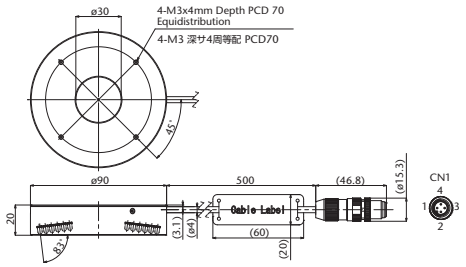
R-50X28-75R (B,W)



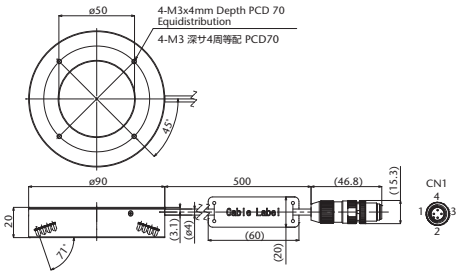
R-70X35-90R (B,W)



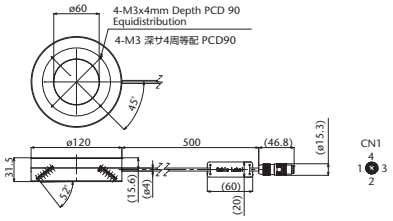
R-90X30-80R (B,W)



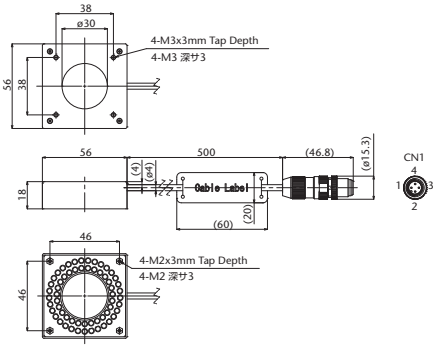
R-90X50-70R (B,W)



R-120X60-50R (B,W)

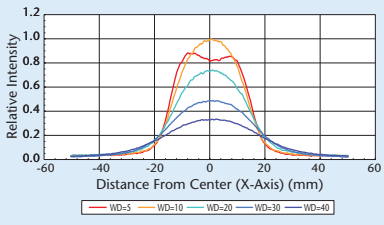


SQ-56X56X30R (B,W)

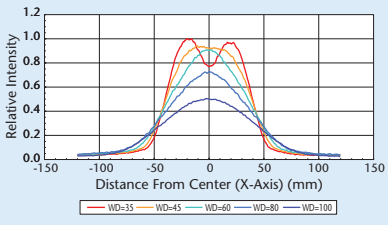


Light Distribution Characteristics

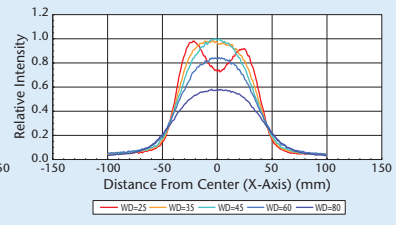
R-42X18-65W



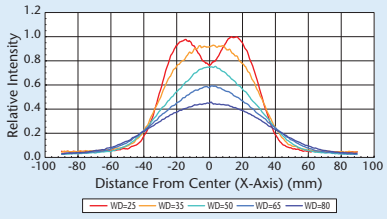
R-70X35-90W



R-90X50-70W



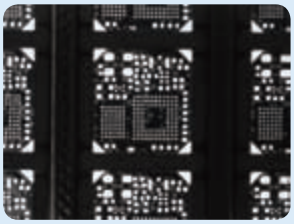
SQ-56X56X30W



Sample Images

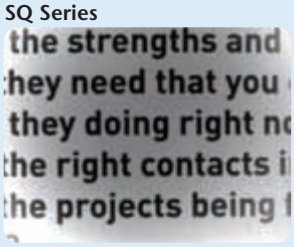
R Series

Foreign Object in Paper Cup

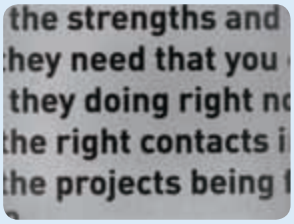


PCB Fabrication Inspection

SQ Series



Not Much Light at Short WD



Full Light at Longer WD

Accessories

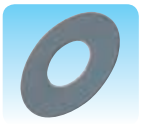
Adapter

AD-Rxx
Used to mount the diffuser or polarizer onto the LED lighting.

Diffuser

DF-Rxx
DF-SQxx
To be mounted in front of the LED lighting using the adapter. Used to soften the lighting output, so as to reduce the glare on specular surface.

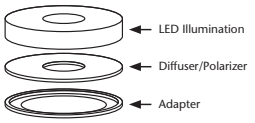
Polarizer



PL-Rxx
PL-SQxx
To be mounted in front of the LED lighting using the adapter. Use together with second polarizer(analyzer) to help reduce glare.

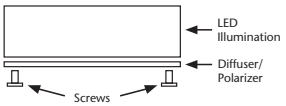
Method of Mounting

R Series



The adapter is used to hold the diffuser/ polarizer to the LED lighting.

SQ Series



The given screws are used to hold the diffuser/polarizer to the LED lighting.

Model	Product Type	Compatible Light Models	Product Code
AD-R32X10	Adapter	R-32x10-70R/B/W	A-2812
DF-R32X10	Diffuser	R-32x10-70	A-2813
PL-R32X10	Polarizer	R-32x10-70	A-2814
AD-R42X18	Adapter	R-42x18-65	A-2815
DF-R42X18	Diffuser	R-42x18-65	A-2816
PL-R42X18	Polarizer	R-42x18-65	A-2817
AD-R50X28	Adapter	R-50x28-75	A-2818
DF-R50X28	Diffuser	R-50x28-75	A-2819
PL-R50X28	Polarizer	R-50x28-75	A-2820
AD-R70X35	Adapter	R-70x35-90	A-2821
DF-R70X35	Diffuser	R-70x35-90	A-2822
PL-R70X35	Polarizer	R-70x35-90	A-2823
AD-R90X50	Adapter	R-90x50-70	A-2824
DF-R90X50	Diffuser	R-90x50-70	A-2825
PL-R90X50	Polarizer	R-90x50-70	A-2826
AD-R120X60	Adapter	R-120x60-50	A-2827
DF-R120X60	Diffuser	R-120x60-50	A-2828
PL-R120X60	Polarizer	R-120x60-50	A-2829
DF-SQ56X56X30	Diffuser	SQ-56x56x30	A-2858
PL-SQ56X56X30	Polarizer	SQ-56x56x30	A-2859

Low Angle Ring Illumination

RLA/RLA-00 Series

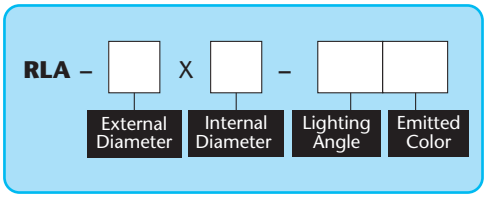
Low Angle Ring Illumination: **RLA** Series

- Reflection can be minimized by the low-angle, dark-field lighting configuration
- Ideal for imaging of uneven surfaces, eg. embossment and surface flaw detection

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

- Indirect, horizontal 360-degree inner diameter illumination
- Used at a short WD to the test object

Explanation of Model Code



Lineup of Low Angle Ring Type LEDs

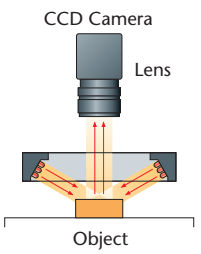
Model	Emitted Color	Power (W)	Internal Diameter (mm)	External Diameter (mm)	Lighting Angle	Weight (g)	Product Code
RLA-74X48-30R	Red	4.0	74	48	30°	120	A-2631
RLA-74X48-30B	Blue	5.4	74	48	30°	120	A-2633
RLA-74X48-30W	White	5.4	74	48	30°	120	A-2632
RLA-100X70-30R	Red	6.3	100	70	30°	190	A-2634
RLA-100X70-30B	Blue	9.8	100	70	30°	190	A-2636
RLA-100X70-30W	White	9.8	100	70	30°	190	A-2635
RLA-132X96-15R	Red	7.7	132	96	15°	300	A-2637
RLA-132X96-15B	Blue	14	132	96	15°	300	A-2639
RLA-132X96-15W	White	14	132	96	15°	300	A-2638

Lineup of Zero Angle Ring Type LEDs

Model	Emitted Color	Power (W)	Internal Diameter (mm)	External Diameter (mm)	Lighting Angle	Weight (g)	Product Code
RLA-75X46-00R	Red	1.7	75	46	0°	95	A-2640
RLA-75X46-00B	Blue	3.3	75	46	0°	95	A-2642
RLA-75X46-00W	White	3.3	75	46	0°	95	A-2641
RLA-96X60-00R	Red	2.1	96	60	0°	140	A-2643
RLA-96X60-00B	Blue	4.2	96	60	0°	140	A-2645
RLA-96X60-00W	White	4.2	96	60	0°	140	A-2644

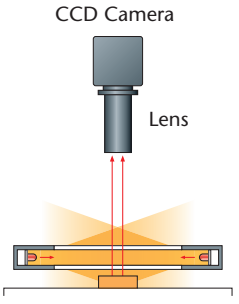
Illumination Structure

RLA Series

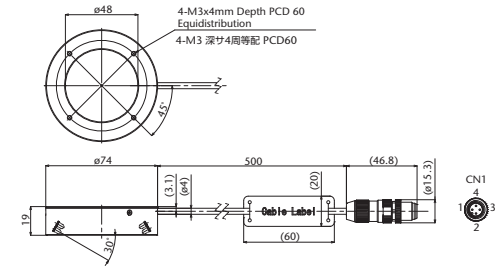


Illuminating the Object from a Low Position

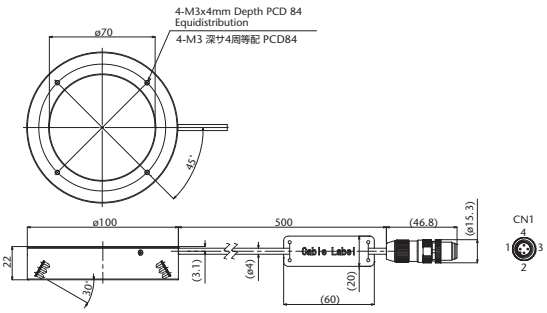
RLA-00 Series



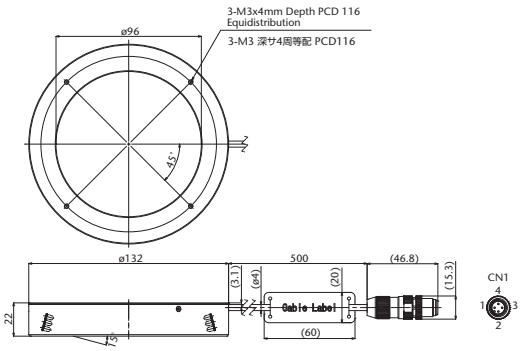
RLA-74X48-30R (B,W)



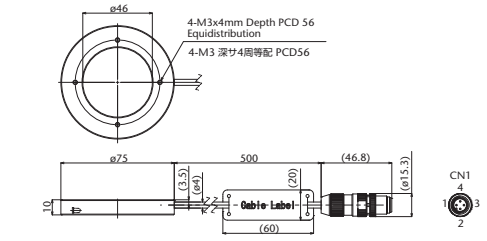
RLA-100X70-30R (B,W)



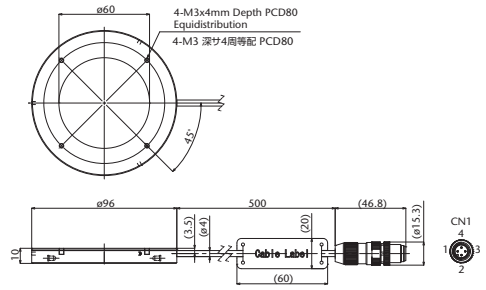
RLA-132X96-15R (B,W)



RLA-75X46-00R (B,W)

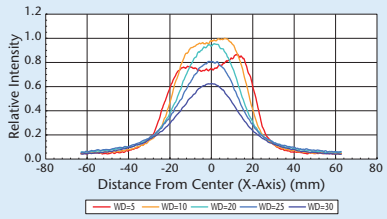


RLA-96X60-00R (B,W)

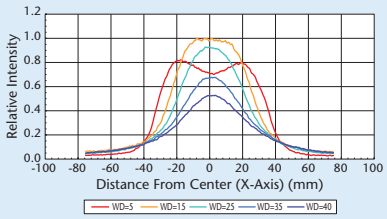


Light Distribution Characteristics

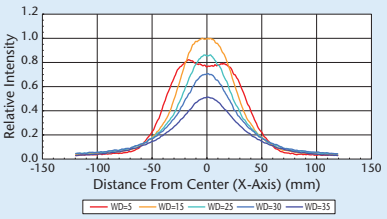
RLA-74X48-30W



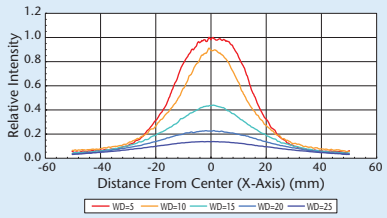
RLA-100X70-30W



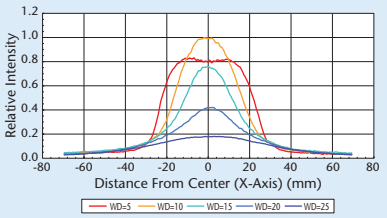
RLA-132X96-15W



RLA-75X46-00W



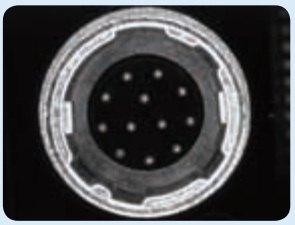
RLA-96X60-00W



Sample Images

RLA Series

Chamfer Checking on Metal Ring



12-Pin Connector

RLA-00 Series

Scratch on Glass Plate

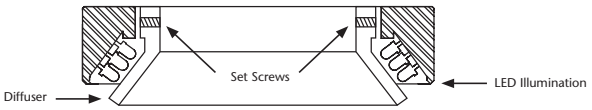
CD Imprint Inspection

Accessories

Diffuser Ring

DF-RLAxxx
Used to create a relatively non-directional light. Reduces glare on specular surfaces. Easily mount onto Low-Angle Ring light.

Method of Mounting



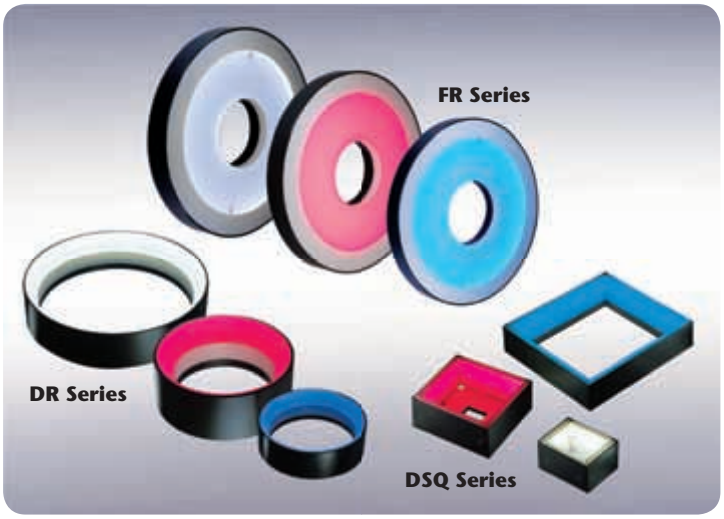
The diffuser is mounted to the inner side of the Low-Angle Ring Light by three set screws.

Model	Product Type	Compatible Light Models	Product Code
DF-RLA74X48	Diffuser Ring	RLA-74x48-30	A-2830
DF-RLA100X70	Diffuser Ring	RLA-100x70-30	A-2831
DF-RLA132X96	Diffuser Ring	RLA-132x96-15	A-2832

RoHS CE

Shadowless Illumination

FR/DR/DSQ Series



Shadowless Ring Illumination: **FR** Series

- Diffuse, shadowless illumination* Optimal soft, uniform light for shiny surfaces

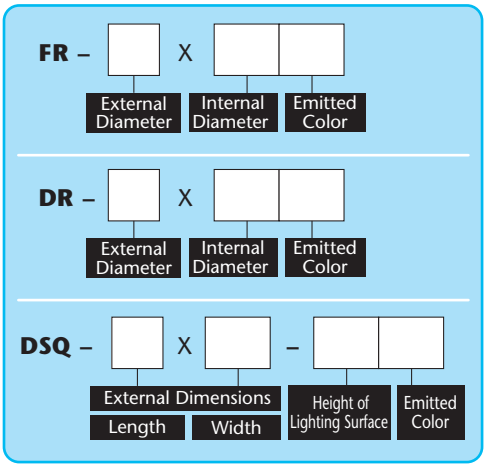
Shadowless Low Angle Ring Illumination: **DR** Series

- Shallow angle LED illumination that provides diffused, soft light
- Ideal for flaw or edge detection on reflective surfaces

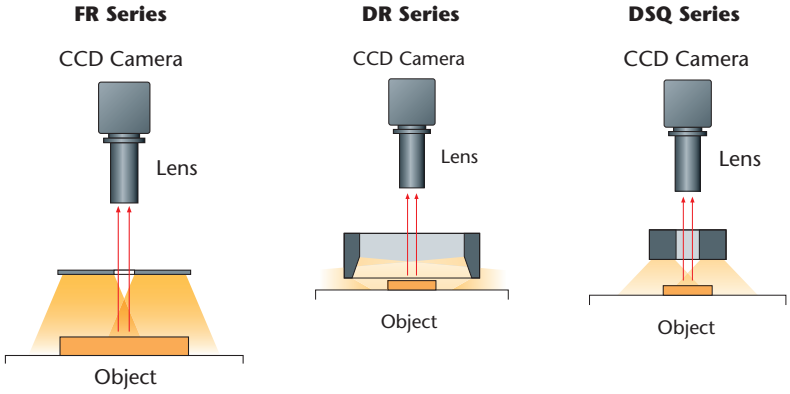
Square Shadowless Low Angle Illumination: **DSQ** Series

- Diffused illumination best suited for square shape objects, such as in BGA & QFP applications

Explanation of Model Code



Illumination Structure



Lineup of Shadowless Ring Type LEDs

Model	Emitted Color	Power (W)	Internal Diameter (mm)	External Diameter (mm)	Weight (g)	Product Code
FR-102X33R	Red	2.5	102	33	210	A-2656
FR-102X33B	Blue	5.1	102	33	210	A-2658
FR-102X33W	White	5.1	102	33	210	A-2657
FR-125X44R	Red	4.3	125	44	290	A-2659
FR-125X44B	Blue	6.3	125	44	290	A-2661
FR-125X44W	White	6.3	125	44	290	A-2660

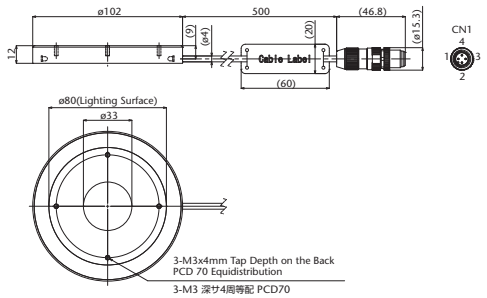
Lineup of Shadowless, Low Angle Ring Type LEDs

Model	Emitted Color	Power (W)	Internal Diameter (mm)	External Diameter (mm)	Weight (g)	Product Code
DR-100X73R	Red	4.2	100	73	260	A-2672
DR-100X73B	Blue	8.4	100	73	260	A-2674
DR-100X73W	White	8.4	100	73	260	A-2673
DR-136X109R	Red	6.3	136	109	340	A-2675
DR-136X109B	Blue	13	136	109	340	A-2677
DR-136X109W	White	13	136	109	340	A-2676
DR-180X153R	Red	8.3	180	153	450	A-2678
DR-180X153B	Blue	17	180	153	450	A-2680
DR-180X153W	White	17	180	153	450	A-2679

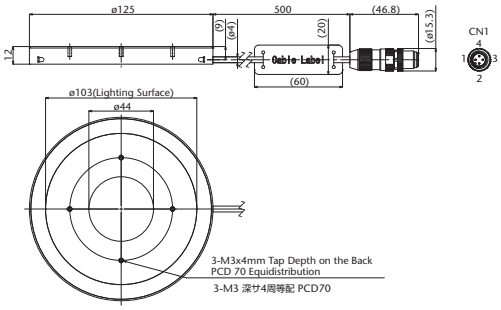
Lineup of Shadowless, Low Angle Square Type LEDs

Model	Emitted Color	Power (W)	External Dimensions (mm)		Height of Lighting Surface (mm)	Weight (g)	Product Code
			Length	Width			
DSQ-48X48-15R	Red	1.3	48	48	15	130	A-2789
DSQ-48X48-15B	Blue	2.6	48	48	15	130	A-2791
DSQ-48X48-15W	White	2.6	48	48	15	130	A-2790
DSQ-75X75-15R	Red	1.7	75	75	15	200	A-2792
DSQ-75X75-15B	Blue	3.4	75	75	15	200	A-2794
DSQ-75X75-15W	White	3.4	75	75	15	200	A-2793
DSQ-96X96-15R	Red	2.5	96	96	15	220	A-2795
DSQ-96X96-15B	Blue	5.1	96	96	15	220	A-2797
DSQ-96X96-15W	White	5.1	96	96	15	220	A-2796
DSQ-120X120-15R	Red	3.4	120	120	15	260	A-2798
DSQ-120X120-15B	Blue	6.7	120	120	15	260	A-2800
DSQ-120X120-15W	White	6.7	120	120	15	260	A-2799

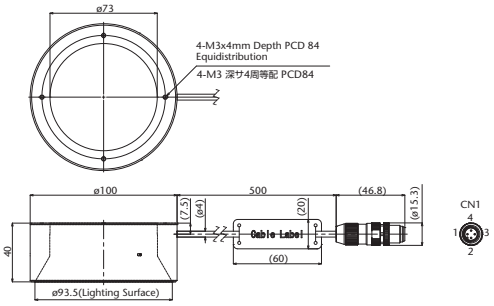
FR-102X33R (B,W)



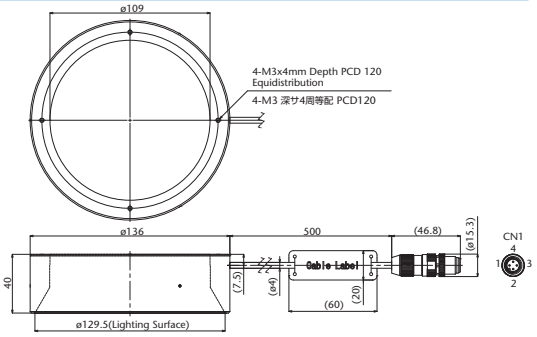
FR-125X44R (B,W)



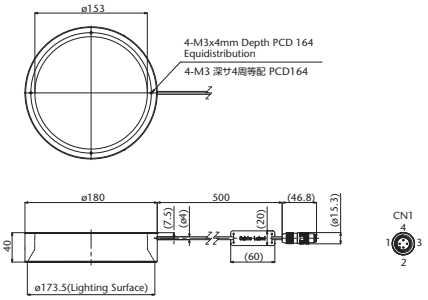
DR-100X73R (B,W)



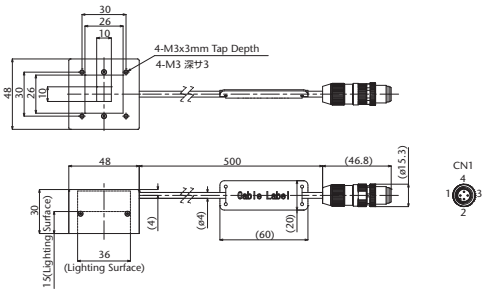
DR-136X109R (B,W)



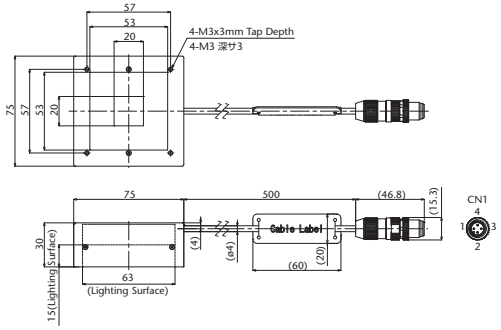
DR-180X153R (B,W)



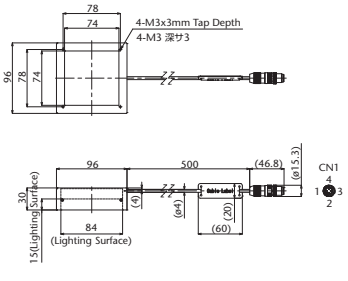
DSQ-48X48-15R (B,W)



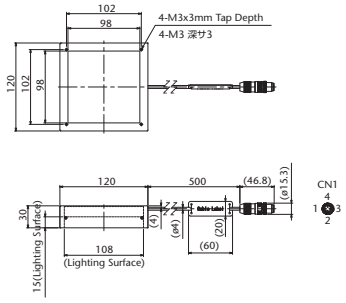
DSQ-75X75-15R (B,W)



DSQ-96X96-15R (B,W)

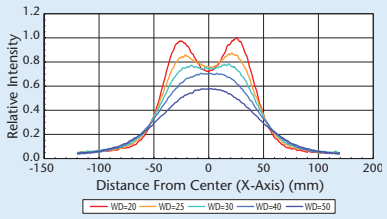


DSQ-120X120-15R (B,W)

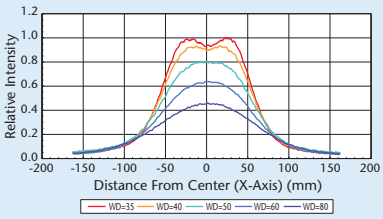


Light Distribution Characteristics

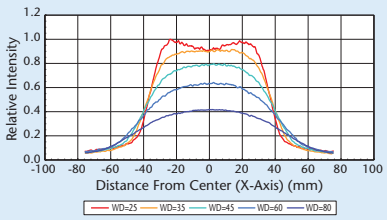
FR-102X33W



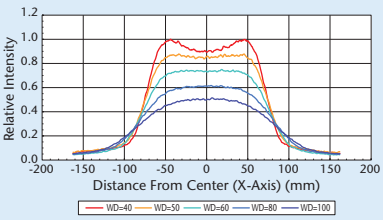
FR-125X44W



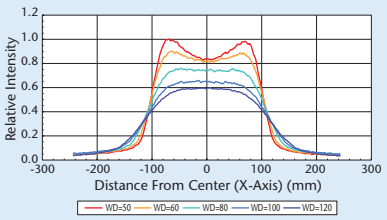
DR100X73W



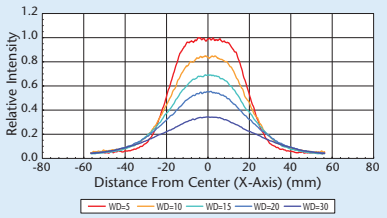
DR-136X109W



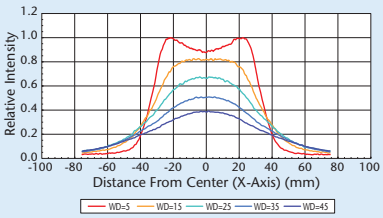
DR-180X153W



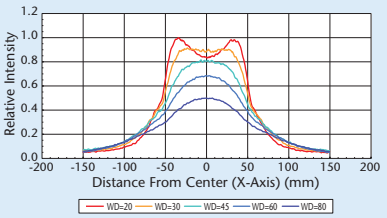
DSQ-48X48-15W



DSQ-75X75-15W



DSQ-120X120-15W



Sample Images

FR Series

CD Inspection

OCR on Brushed Metal Surface

DR Series

Cap Inspection

Silkscreen Printing Verification for Remote Control

DSQ Series

Connector Inspection

Ink Cartridge Print Head Inspection

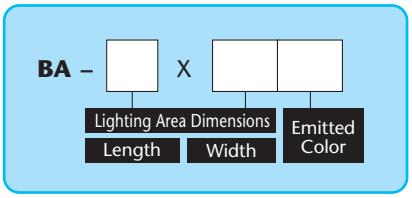
RoHS CE

Bar Illumination

BA Series

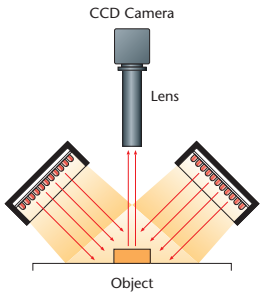
- High-intensity LED block array
- Can be directed at any angle to the surface for either direct or optimal oblique lighting

Explanation of Model Code

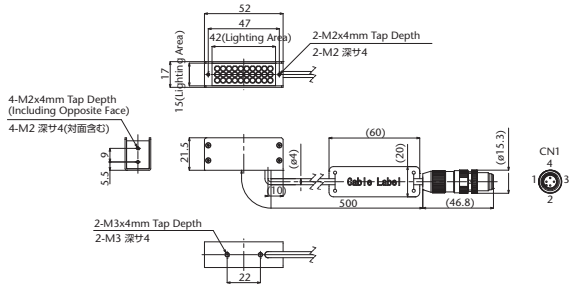


Model	Emitted Color	Power (W)	Lighting Area Dimensions (mm)		Weight (g)	Product Code
			Length	Width		
BA-42X15R	Red	1.4	42	15	65	A-2691
BA-42X15B	Blue	2.0	42	15	65	A-2693
BA-42X15W	White	2.0	42	15	65	A-2692
BA-74X27R	Red	3.1	74	27	130	A-2694
BA-74X27B	Blue	5.0	74	27	130	A-2696
BA-74X27W	White	5.0	74	27	130	A-2695
BA-82X15R	Red	2.1	82	15	85	A-2697
BA-82X15B	Blue	3.9	82	15	85	A-2699
BA-82X15W	White	3.9	82	15	85	A-2698
BA-130X15R	Red	3.4	130	15	130	A-2700
BA-130X15B	Blue	6.2	130	15	130	A-2702
BA-130X15W	White	6.2	130	15	130	A-2701

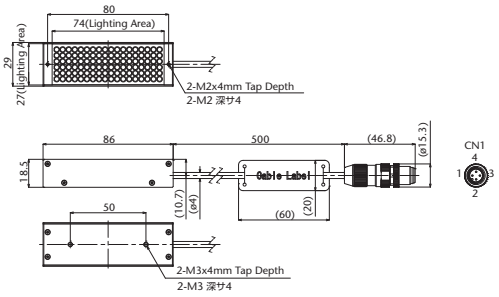
Illumination Structure



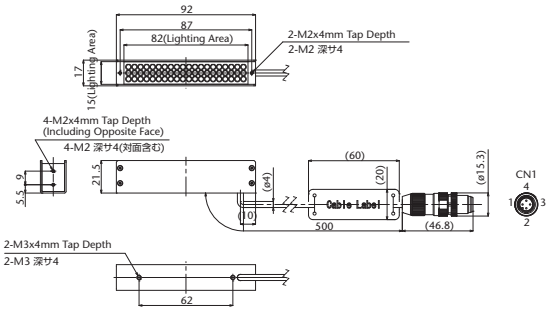
BA-42X15R (B,W)



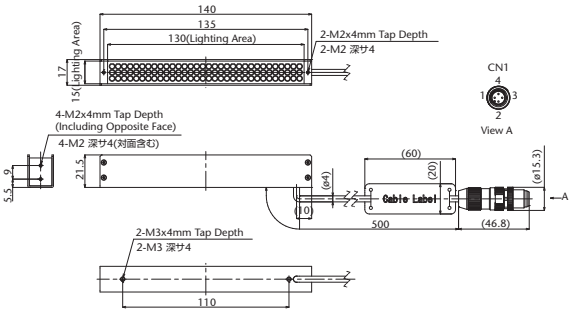
BA-74X27R (B,W)



BA-82X15R (B,W)

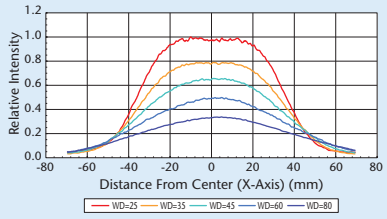


BA-130X15R (B,W)

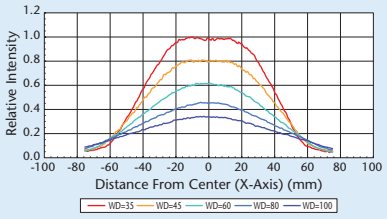


Light Distribution Characteristics

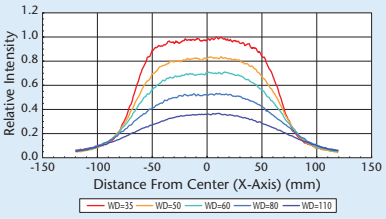
BA-74X27W



BA-82X15W



BA-130X15W



Sample Images

Character on Flexible Ribbon Cable

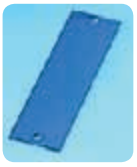
Silkscreen Printing on Faceplate

Accessories

Diffuser

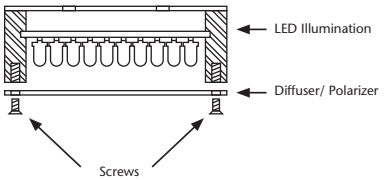
DF-BAxxx
To be mounted in front of the LED lighting using the screws provided. Used to soften the lighting output, so as to reduce the glare on specular surface.

Polarizer



PL-BAxxx
To be mounted in front of the LED lighting using the screws provided. Use together with second polarizer (analyzer) to help reduce glare.

Method of Mounting



Model	Product Type	Compatible Light Models	Product Code
DF-BA42X15	Diffuser	BA-42x15	A-2833
PL-BA42X15	Polarizer	BA-42x15	A-2834
DF-BA74X27	Diffuser	BA-74x27	A-2835
PL-BA74X27	Polarizer	BA-74x27	A-2836
DF-BA82X15	Diffuser	BA-82x15	A-2837
PL-BA82X15	Polarizer	BA-82x15	A-2838
DF-BA130X15	Diffuser	BA-130x15	A-2839
PL-BA130X15	Polarizer	BA-130x15	A-2840

Square Bar Type Illumination

BAQ Series

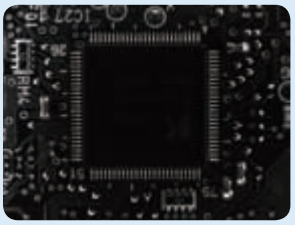
- 4 high-intensity bar LED arrangement
- Direct & oblique lighting from adjustable lighting angles

Explanation of Model Code

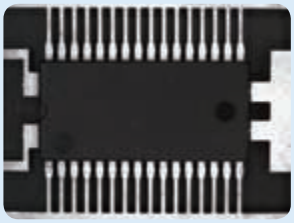
BAQ – □ X □□

External Dimensions: Length, Width
Emitted Color

Sample Images



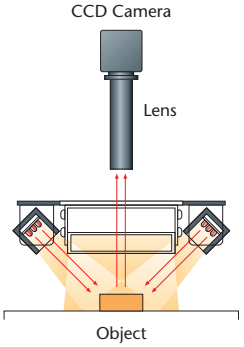
QFP Solder Inspection



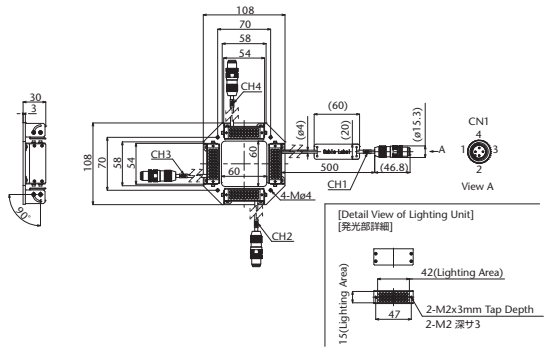
SSOP Pre-cut IC Package Inspection

Model	Emitted Color	Power (W)	Dimensions (mm)			Weight (g)	Product Code
			Length	Width	Internal		
BAQ-108X108R	Red	5.3	108	108	60	320	A-2713
BAQ-108X108B	Blue	7.8	108	108	60	320	A-2715
BAQ-108X108W	White	7.8	108	108	60	320	A-2714
BAQ-148X148R	Red	8.3	148	148	100	420	A-2716
BAQ-148X148B	Blue	16	148	148	100	420	A-2718
BAQ-148X148W	White	16	148	148	100	420	A-2717
BAQ-200X200R	Red	14	200	200	152	670	A-2719
BAQ-200X200B	Blue	25	200	200	152	670	A-2721
BAQ-200X200W	White	25	200	200	152	670	A-2720

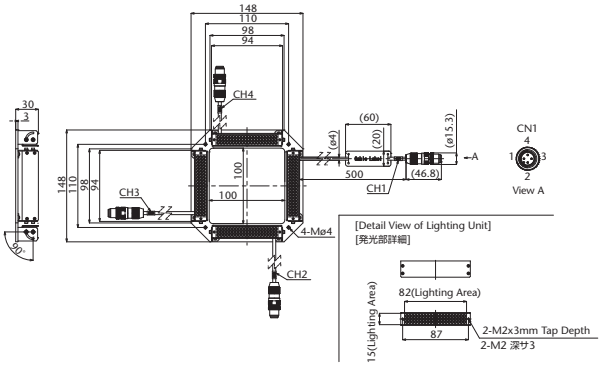
Illumination Structure



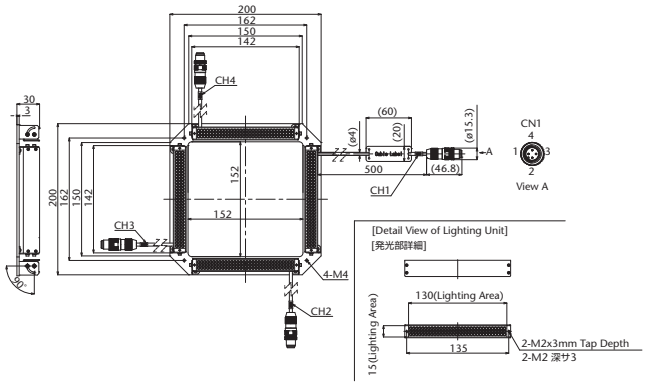
BAQ-108X108R (B,W)



BAQ-148X148R (B,W)

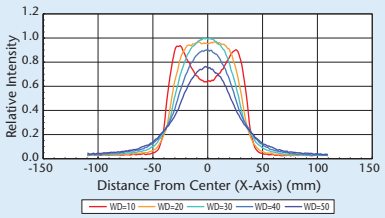


BAQ-200X200R (B,W)

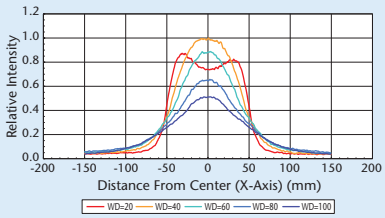


Light Distribution Characteristics

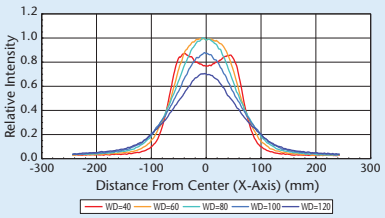
BAQ-108X108W



BAQ-148X148W



BAQ-200X200W



Accessories

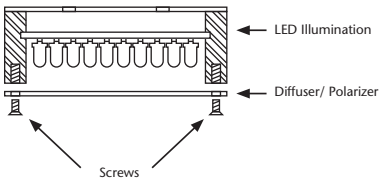
Diffuser

DF-BAQxxx
To be mounted in front of the LED lighting using the screws provided. Used to soften the lighting output, so as to reduce the glare on specular surface.

Polarizer

PL-BAQxxx
To be mounted in front of the LED lighting using the screws provided. Use together with second polarizer (analyzer) to help reduce glare.

Method of Mounting

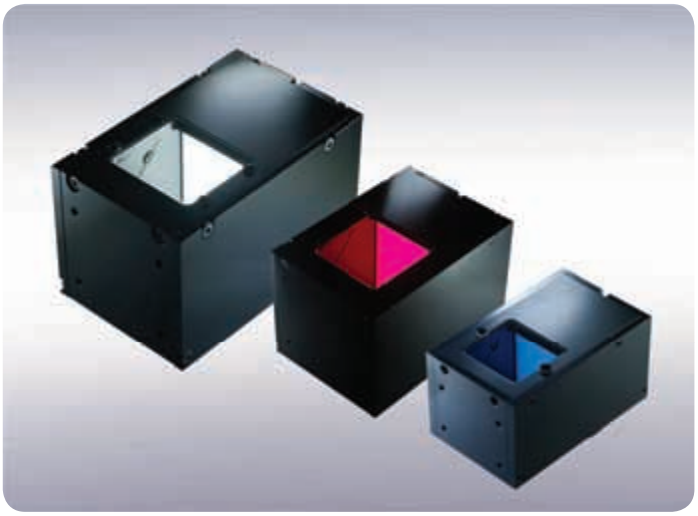


Model	Product Type	Compatible Light Models	Remarks	Product Code
DF-BAQ108X108	Diffuser	BAQ-108x108		A-2841
PL-BAQ108X108	Polarizer	BAQ-108x108	Two-piece set (horizontal/vertical ea.)	A-2842
DF-BAQ148X148	Diffuser	BAQ-148x148		A-2843
PL-BAQ148X148	Polarizer	BAQ-148x148	Two-piece set (horizontal/vertical ea.)	A-2844
DF-BAQ200X200	Diffuser	BAQ-200x200		A-2845
PL-BAQ200X200	Polarizer	BAQ-200x200	Two-piece set (horizontal/vertical ea.)	A-2846

RoHS CE

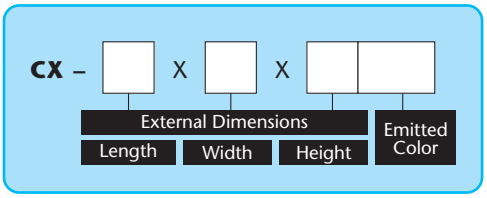
Simulated Coaxial Illumination

CX Series



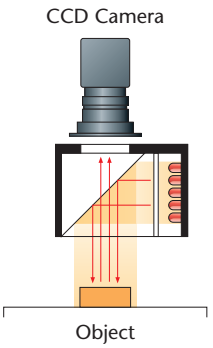
- Highly uniform pseudo-coaxial lighting
- Designed for use with our telecentric MML Series and other lenses without built-in coaxial illumination

Explanation of Model Code

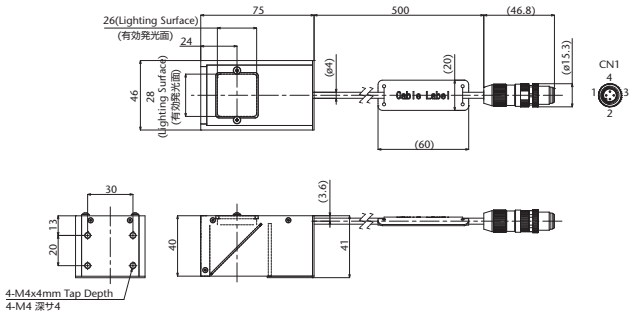


Model	Emitted Color	Power (W)	External Dimensions (mm)			Weight (g)	Product Code
			Length	Width	Height		
CX-75X46X40R	Red	1.7	75	46	40	200	A-2757
CX-75X46X40B	Blue	3.4	75	46	40	200	A-2759
CX-75X46X40W	White	3.4	75	46	40	200	A-2758
CX-94X60X58R	Red	4.6	94	60	58	330	A-2760
CX-94X60X58B	Blue	7.8	94	60	58	330	A-2762
CX-94X60X58W	White	7.8	94	60	58	330	A-2761
CX-120X84X79R	Red	9.2	120	84	79	590	A-2763
CX-120X84X79B	Blue	11	120	84	79	590	A-2765
CX-120X84X79W	White	11	120	84	79	590	A-2764

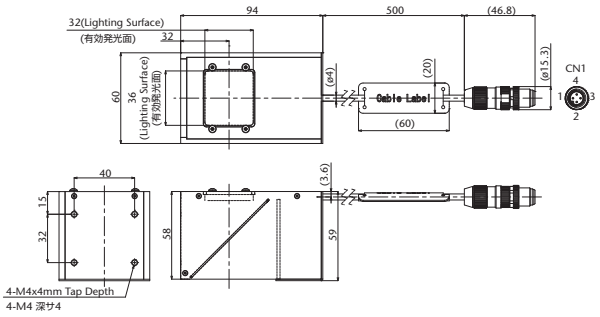
Illumination Structure



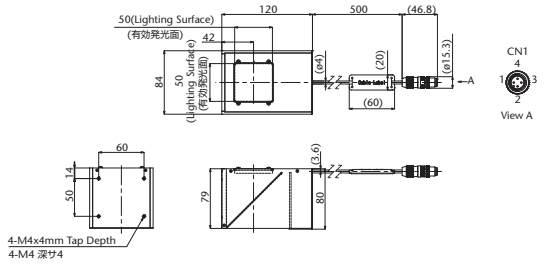
CX-75X46X40R (B,W)



CX-94X60X58R (B,W)

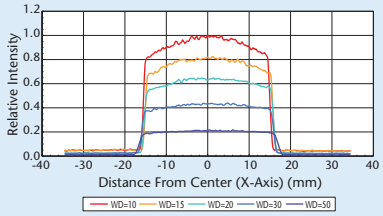


CX-120X84X79R (B,W)

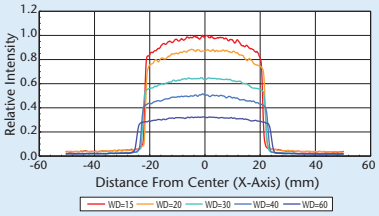


Light Distribution Characteristics

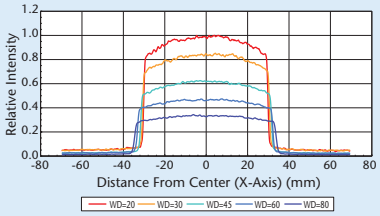
CX-75X46X40W



CX-94X60X58W

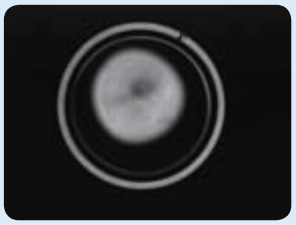


CX-120X84-79W



Sample Images

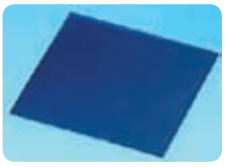
Screw Head Inspection



Glass Bottle Opening

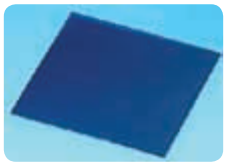
Accessories

Polarizer



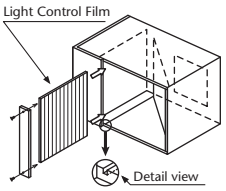
PL-CXxxx
To be mounted in front of the LED lighting using the screws provided. Use together with second polarizer (analyzer) to help reduce glare.

Light Control Film



LC-CXxxx
To be mounted inside the coxial lighting. This will make the coxial lighting produce a more collimated light, thus enhance the ability to see more surface defects.

Method of Mounting

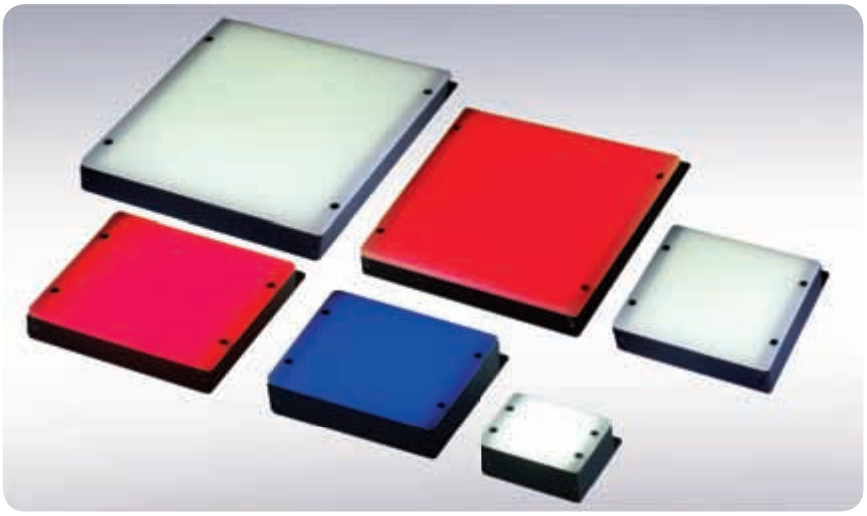


1. Peel protective film off Light Control Film
2. Insert Light Control Film into groove of illumination.
3. Optional cover fixed by screws.

Model	Product Type	Compatible Light Models	Product Code
LC-CX75X46X40	Light Control Film	CX-75x46x40	A-2852
PL-CX75X46X40	Polarizer	CX-75x46x40	A-2853
LC-CX94X60X58	Light Control Film	CX-94x60x58	A-2854
PL-CX94X60X58	Polarizer	CX-94x60x58	A-2855
LC-CX120X84X79	Light Control Film	CX-120x84x79	A-2856
PL-CX120X84X79	Polarizer	CX-120x84x79	A-2857

Direct Backlights (Chip Mount Type)

FL Series



- Densely packaged chip LEDs in thin chassis (10mm or 15mm)
- Provides diffuse area lighting

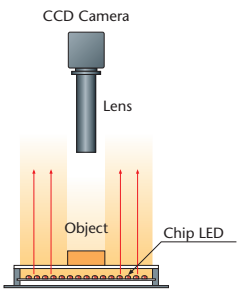
Explanation of Model Code

FL – □ X □□

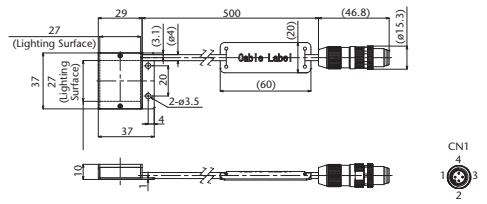
Lighting Surface Dimensions: Length, Width
Emitted Color

Model	Emitted Color	Power (W)	Dimensions (mm)					Weight (g)	Product Code
			Lighting Surface		External		Thickness		
			Length	Width	Length	Width			
FL-27X27R	Red	1.4	27	27	37	37	10	45	A-2732
FL-27X27B	Blue	1.4	27	27	37	37	15	55	A-2734
FL-27X27W	White	1.4	27	27	37	37	15	55	A-2733
FL-51X51R	Red	2.9	51	51	61	61	10	70	A-2735
FL-51X51B	Blue	2.9	51	51	61	61	15	80	A-2737
FL-51X51W	White	3.1	51	51	61	61	15	80	A-2736
FL-63X60R	Red	3.1	63	60	73	70	10	90	A-2738
FL-63X60B	Blue	3.9	63	60	73	70	15	110	A-2740
FL-63X60W	White	4.2	63	60	73	70	15	110	A-2739
FL-83X75R	Red	5	83	75	95	85	10	120	A-2741
FL-83X75B	Blue	5.6	83	75	95	85	15	140	A-2743
FL-83X75W	White	5.9	83	75	95	85	15	140	A-2742
FL-100X100R	Red	7.5	100	100	112	110	10	160	A-2744
FL-100X100B	Blue	8.1	100	100	112	110	15	190	A-2746
FL-100X100W	White	8.8	100	100	112	110	15	190	A-2745

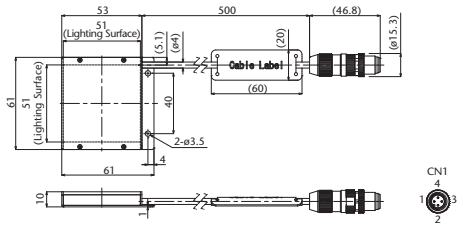
Illumination Structure



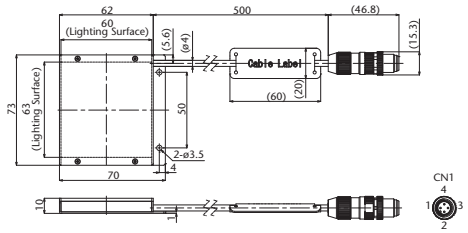
FL-27X27R (B,W)



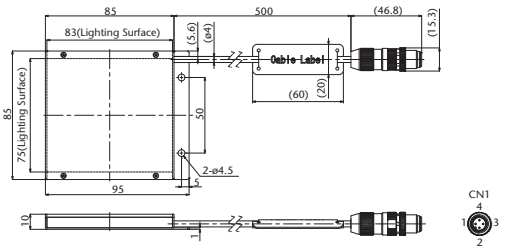
FL-51X51R (B,W)



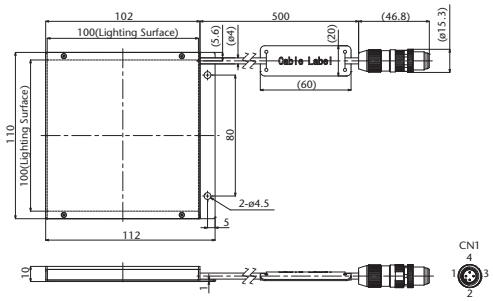
FL-63X60R (B,W)



FL-83X75R (B,W)

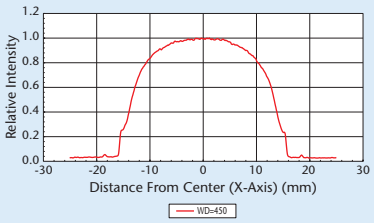


FL-100X100R (B,W)

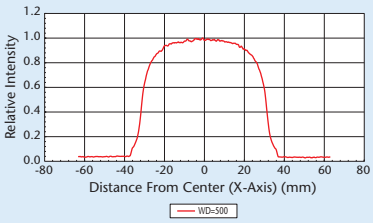


Light Distribution Characteristics

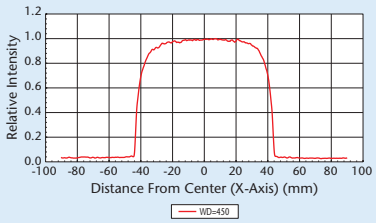
FL-27X27W



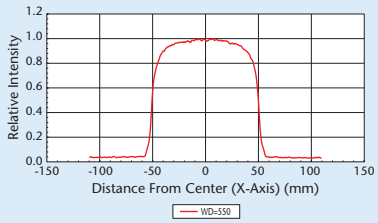
FL-63X60W



FL-83X75W



FL-100X100W



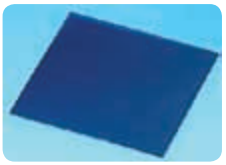
Sample Images

Cutter Disc Roundness Check

Candle Size Measurement

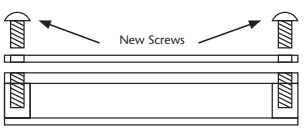
Accessories

Light Control Film



LC-FLxxx
To be mounted on top of the LED lighting using the screws provided. To collimate the light from the flat light so as to produce a sharper edged image.

Method of Mounting



1. Remove the existing screws
2. Place the Light Control Film on top of the diffuser plate
3. Used the set of new screws pack together with the film and mount the film onto the flat light

Model	Product Type	Compatible Light Models	Remarks	Product Code
LC-FL27X27	Light Control Film	FL-27x27	Two-piece set (horizontal/vertical ea.)	A-2847
LC-FL51X51	Light Control Film	FL-51x51	Two-piece set (horizontal/vertical ea.)	A-2848
LC-FL63X60	Light Control Film	FL-63x60	Two-piece set (horizontal/vertical ea.)	A-2849
LC-FL83X75	Light Control Film	FL-83x75	Two-piece set (horizontal/vertical ea.)	A-2850
LC-FL100X100	Light Control Film	FL-100x100	Two-piece set (horizontal/vertical ea.)	A-2851

RoHS CE

LED Controller

APS Series

- 24V DC Input
- DIN rail mountable
- Up to 30W over 2 available, individually adjustable channels

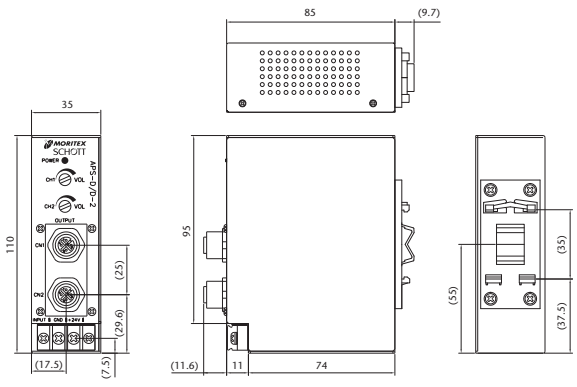
Explanation of Model Code

APS – □ – □

A:Analog PS:Power Supply	Input / Output	Channel

Model	APS-D/D-2B
Output Voltage	2 channel output max. 24V ± 2% for each channel (Connects to all MCV-Light series only)
Output Current	1 channel max.1.25A /Total max.1.25A
Output Power	Max.30W
Efficiency	80%
Input Voltage	DC24V ±10%
Input Current	1.6A (Input Voltage is 24V, Ambient Temperature is 25°C)
Operating Temperature/ Humidity	0°C to 45°C: Liner Decrease Down to 80%RH at 31°C and 50%RH at 40°C
Output System	DC Continuous output
Output Control System	Constant voltage control (variable voltage)
External Light Control	Not available
Output ON/OFF Function	Not available
Error Output	Not available
Cooling System	Natural cooling by air
Installation	DIN rail/Operation panel faces to front
Weight	Approximately 450g
Product Code	A-2893

APS-D/D-2

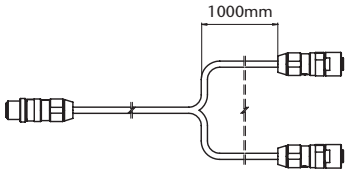


ECB, BCB Series

Extension Cable (M12) - ECB-X000R

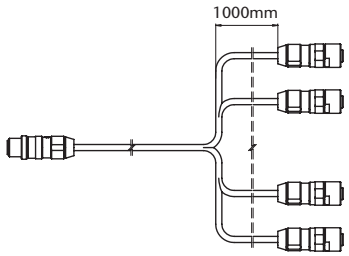
PART NO.	Item Description
ECB-1000R	Extension Cable, M12 to M12, 1000mm
ECB-2000R	Extension Cable, M12 to M12, 2000mm
ECB-3000R	Extension Cable, M12 to M12, 3000mm
ECB-5000R	Extension Cable, M12 to M12, 5000mm

Branch Cable - 2 way - BCB-X000R-2



PART NO.	Item Description
BCB-2000R-2	Branch Cable, M12 to M12, 2000mm, 2-way
BCB-3000R-2	Branch Cable, M12 to M12, 3000mm, 2-way
BCB-5000R-2	Branch Cable, M12 to M12, 5000mm, 2-way

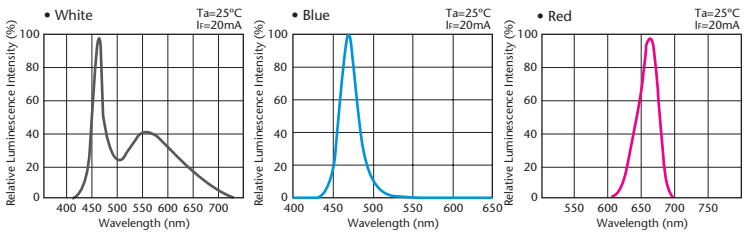
Branch Cable - 4 way - BCB-X000R-4



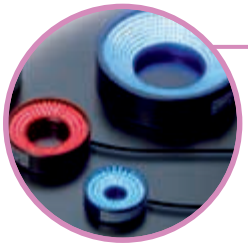
PART NO.	Item Description
BCB-2000R-4	Branch Cable, M12 to M12, 2000mm, 4-way
BCB-3000R-4	Branch Cable, M12 to M12, 3000mm, 4-way
BCB-5000R-4	Branch Cable, M12 to M12, 5000mm, 4-way

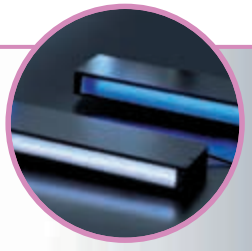
LED Spectral Characteristics

- The diagrams below illustrate the spectral characteristics of major LEDs used in the MCV-Light Series.
- We can also manufacture other lighting devices with different wavelengths. Please feel free to contact us.



LED Illumination



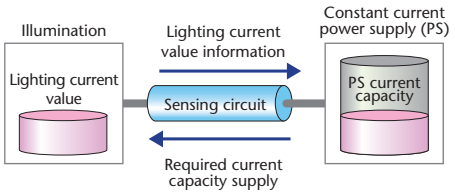


Constant Current Control System

MG-Wave Series

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

Schematic Diagram of Sensing Circuit System



LED Controller for MG-Wave Series
MLEK
A080W Analog Series
A080W Digital Series
A230W Analog Series
A230W Digital Series
Multi Channel Series
High Wattage Series

LED Controller for MCEP/MSPP Series
MLEP
A035W Analog Series
A035W Digital Series
A070W Analog Series
A070W Digital Series

LED Controller for MLNX Series
MLEX
A600W Digi/Ana

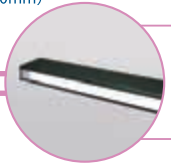
(840mm~)

MDRL *Direct Ring Illumination*
MLRL *Low Angle Ring Illumination*
MSRL/MSLL/MSQL *Shadowless Illumination*
MBRL *Bar Illumination*
MDQL *Square Bar Type Illumination*
MDML *Dome Illumination*
MSCL *Simulated Coaxial Illumination*
MDBC/MQFC *Direct Backlights (Chip Mount Type)*
MDBL *Direct Backlights (Discrete Type)*
MEBL/MEBC *Edge Type Backlights*

MCBP *Collimated Backlight Illumination*
IR *IR Illumination*
UV *UV Illumination*
RGB *Variable Color RGB Illumination*
MBRC *Diffuse Chip Type Bar Illumination*
MLNL *Line Illumination*
MCEC/MCEL *Coaxial Illumination*

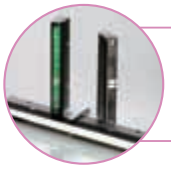
High Power LED Spot Illumination
MCEP
LED Spot Projectors
MSPP

(~720mm)



High Brightness (HB) LED Light Line
MLNX

Options



High Brightness (HB) LED Light Line
SMT

Before using MG-Wave Series

Selection Criteria of LED Controller

1. Confirm Illumination Model

Check maximum rated current of each illumination
(→ Product spec)

Example:
Direct ring illumination
MDRL-CR31 = 0.36A
MDRL-CW28 = 0.31A

2. Confirm LED Controller

Check current capacity of LED controller
MLEK-A 080 □
0.8A
(as current capacity)

Example:
Current capacity of
MLEK-A080W1LR
LED controller = 0.8A

3. Verify Suitability of Configuration

Total current value of illumination shall not exceed LED controller's current capacity

Total required current value ≦ Controller's current capacity
Example: 0.67A ≦ Example: 0.8A

Configured system is operable

● Note

- In the case of 2-channel LED controllers, they can work with up to 2 illumination devices simultaneously as long as the sum of rated current of the 2 devices stays within the current capacity of LED controller.
- Bifurcated or branch cables cannot be used.
- Custom-made devices and special design may be available on request.

- CE — CE Marking
- RoHS — RoHS Directive
- IP67 — Protection of Products from Solid Foregn Objects and Water
- Digital — Digital Intensity Control
- Analog — Analog Intensity Control
- Digi Ana — Digital & Analog Intensity Control
- 1ch — 1 Channnel Output
- 2ch — 2 Channnel Output
- 3ch — 3 Channnel Output
- 4ch — 4 Channnel Output

Direct Ring Illumination

MDRL Series

- High intensity LEDs deployed in high density to provide uniform direct, bright-field 360-degree lighting
- Standard LED illumination for a wide range of applications
- Models can be selected to match our lens models

Explanation of Model Code

MDRL-C □ □

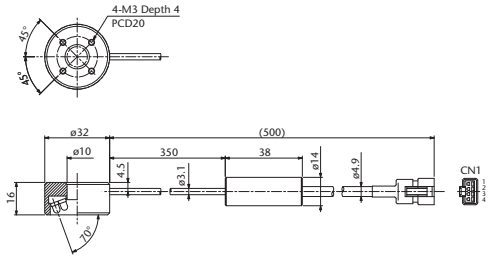
□ Emitted Color: R Red, G Green, B Blue, W White

□ Ring Internal Diameter

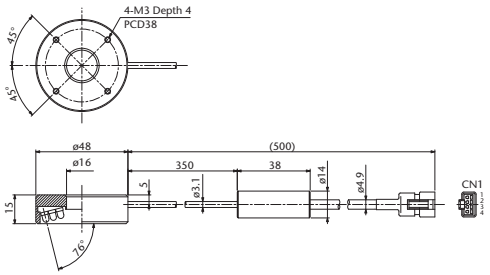
	Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Lighting Angle	Weight(g)	Product Code
	MDRL-CR10	Red	0.11	ø10	ø32	70°	50	A-2000
★	MDRL-CG10	Green	0.17	ø10	ø32	70°	50	A-2116
	MDRL-CB10	Blue	0.17	ø10	ø32	70°	50	A-2002
	MDRL-CW10	White	0.17	ø10	ø32	70°	50	A-2001
	MDRL-CR16	Red	0.24	ø16	ø48	76°	65	A-2006
★	MDRL-CG16	Green	0.37	ø16	ø48	76°	65	A-2117
	MDRL-CB16	Blue	0.37	ø16	ø48	76°	65	A-2008
	MDRL-CW16	White	0.37	ø16	ø48	76°	65	A-2007
★	MDRL-CR18	Red	0.15	ø18	ø42	65°	55	A-2407
★	MDRL-CG18	Green	0.24	ø18	ø42	65°	55	A-2408
★	MDRL-CB18	Blue	0.24	ø18	ø42	65°	55	A-2409
★	MDRL-CW18	White	0.24	ø18	ø42	65°	55	A-2410
	MDRL-CR28	Red	0.20	ø28	ø50	75°	65	A-2168
★	MDRL-CG28	Green	0.31	ø28	ø50	75°	65	A-2181
	MDRL-CB28	Blue	0.31	ø28	ø50	75°	65	A-2167
	MDRL-CW28	White	0.31	ø28	ø50	75°	65	A-2169
	MDRL-CR31	Red	0.36	ø31	ø66	75°	130	A-2009
★	MDRL-CG31	Green	0.55	ø31	ø66	75°	130	A-2118
	MDRL-CB31	Blue	0.55	ø31	ø66	75°	130	A-2011
	MDRL-CW31	White	0.55	ø31	ø66	75°	130	A-2010
	MDRL-CR36	Red	0.36	ø36	ø66	75°	120	A-2281
★	MDRL-CG36	Green	0.55	ø36	ø66	75°	120	A-2282
	MDRL-CB36	Blue	0.55	ø36	ø66	75°	120	A-2283
	MDRL-CW36	White	0.55	ø36	ø66	75°	120	A-2284
	MDRL-CR50	Red	0.64	ø50	ø90	70°	180	A-2012
★	MDRL-CG50	Green	0.96	ø50	ø90	70°	180	A-2119
	MDRL-CB50	Blue	0.96	ø50	ø90	70°	180	A-2014
	MDRL-CW50	White	0.96	ø50	ø90	70°	180	A-2013
	MDRL-CR56	Red	1.12	ø56	ø120	55°	520	A-2003
★	MDRL-CG56	Green	1.55	ø56	ø120	55°	520	A-2120
	MDRL-CB56	Blue	1.55	ø56	ø120	55°	520	A-2005
	MDRL-CW56	White	1.55	ø56	ø120	55°	520	A-2004

★Made-to-order products.

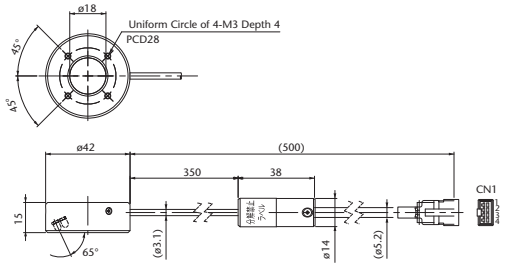
MDRL-CR (CG,CB,CW) 10



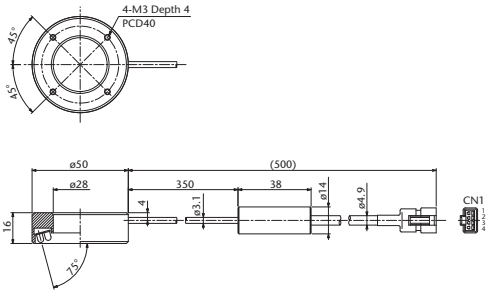
MDRL-CR (CG,CB,CW) 16



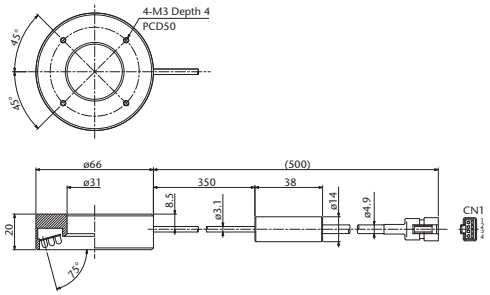
MDRL-CR (CG,CB,CW) 18



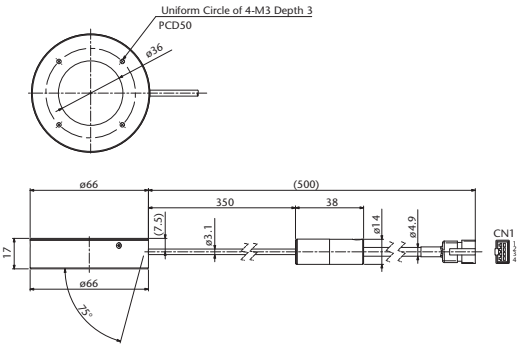
MDRL-CR (CG,CB,CW) 28



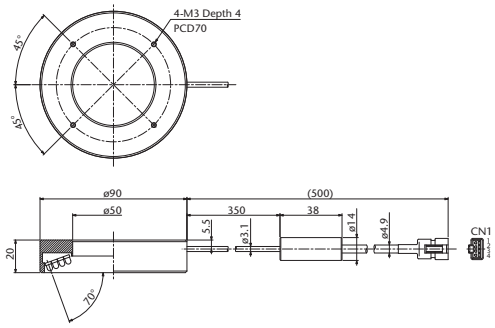
MDRL-CR (CG,CB,CW) 31



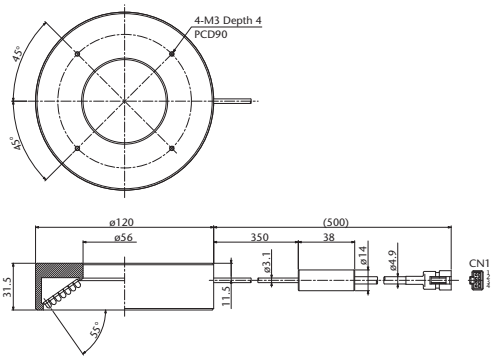
MDRL-CR (CG,CB,CW) 36



MDRL-CR (CG,CB,CW) 50

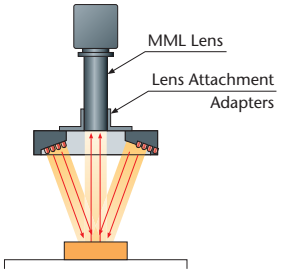


MDRL-CR (CG,CB,CW) 56



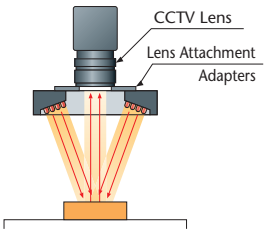
Illumination Structure

For MML Lens



A lens attachment adapter fitting the external diameter of each MML lens is available as an option.

For CCTV Lens



A lens attachment adapter fitting the external diameter of each CCTV lens is available as an option.

Sample Images

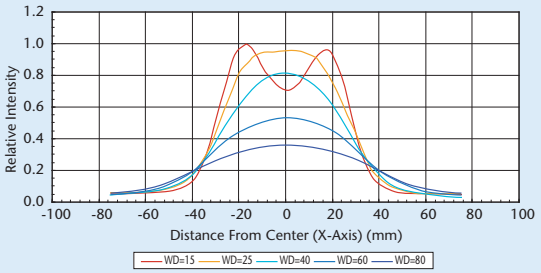
MDRL-CB56

Button Components for Mobile Phone

Grooves on Top of a Pull-Top Can

Light Distribution Characteristics

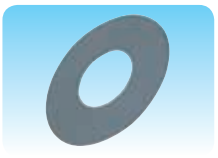
MDRL-CW31



Direct Ring Options

Diffuser and Polarizer are available to prevent the vignetting of images. Adapters for attachment to MORITEX Lenses are also available.

Diffuser



Polarizer

Adapters

Lens Attachment Adapter

Examples of PCB images with various accessories

MDRL

With Diffuser

With diffusion & Polarizer

In the first image significant vignetting is seen. Attaching a Diffuser alone reduced the vignetting slightly and attaching an additional Polarizer removed it completely.

Direct Ring Illumination

MDRL-NS Series

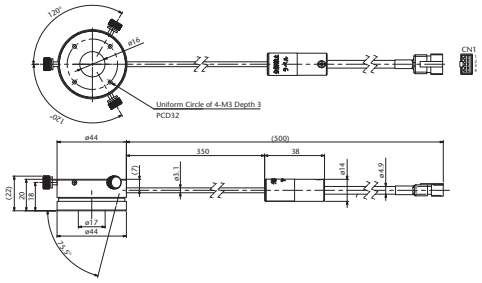
- The products with securing screws can be used easily and conveniently with MORITEX MML lenses.

Explanation of Model Code

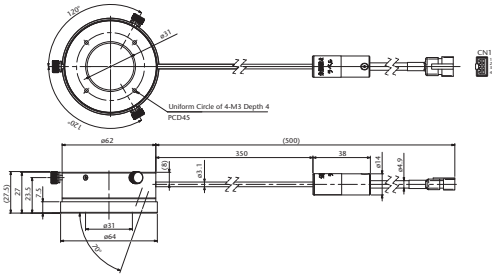
MDRL-C □ □ – **NS**

- □ Emitted Color: **R** Red, **G** Green, **B** Blue, **W** White
- □ Ring Internal Diameter
- **NS** Securing Screws

MDRL-CR (CG,CB,CW) 16-NS



MDRL-CR (CG,CB,CW) 31-NS

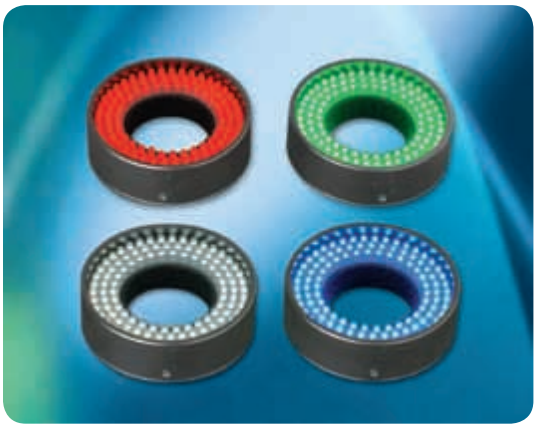


Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Lighting Angle	Weight(g)	Product Code
MDRL-CR16-NS	Red	0.15	ø16	ø44	75.5°	70	A-2273
★ MDRL-CG16-NS	Green	0.24	ø16	ø44	75.5°	70	A-2274
MDRL-CB16-NS	Blue	0.24	ø16	ø44	75.5°	70	A-2275
MDRL-CW16-NS	White	0.24	ø16	ø44	75.5°	70	A-2276
MDRL-CR31-NS	Red	0.17	ø31	ø62	70°	120	A-2277
★ MDRL-CG31-NS	Green	0.24	ø31	ø62	70°	120	A-2278
MDRL-CB31-NS	Blue	0.24	ø31	ø62	70°	120	A-2279
MDRL-CW31-NS	White	0.24	ø31	ø62	70°	120	A-2280

★Made-to-order products.

Long working distances

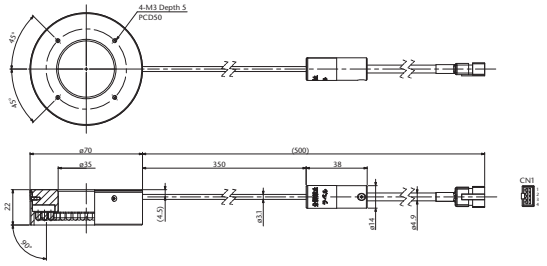
MDRL-C□35



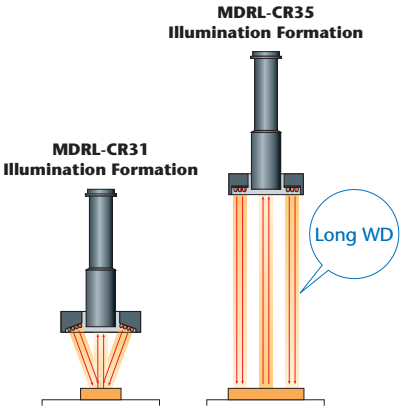
- The direct, long working distance illumination type makes a clear distinction from the conventional direct ring series.
- The recommended working distance is 65 mm or more. If the object surface is reflective, a working distance of about 200mm is acceptable.

* Be sure to check performance with a demonstration model before making a selection.

MDRL-CR (CG,CB,CW) 35

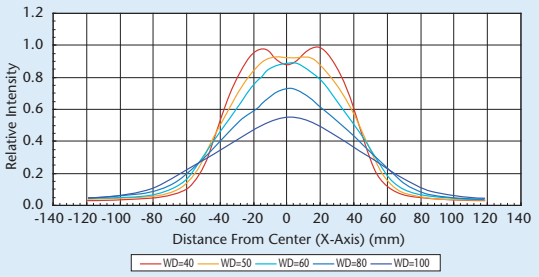


Illumination Structure

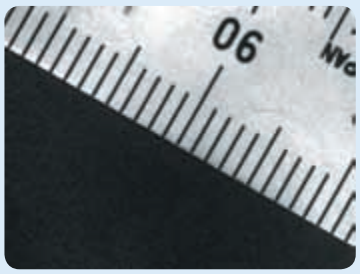


Light Distribution Characteristics

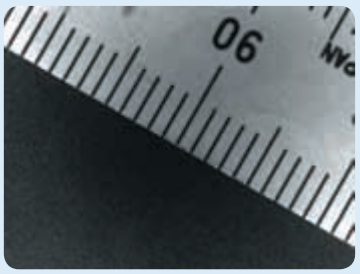
MDRL-CW35



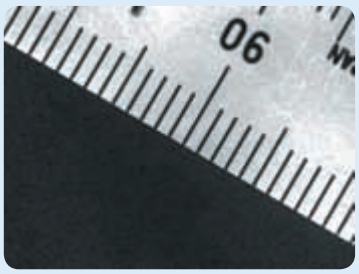
Sample Images



WD=40mm **MDRL-CR31**
Uniformly Illuminated



WD=40mm **MDRL-CR35**
Not Much Light at Short WD



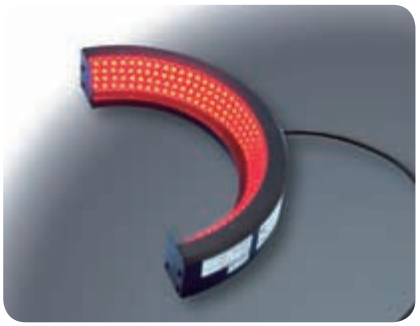
WD=60mm **MDRL-CR35**
Full of Light at This WD

Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Lighting Angle	Weight(g)	Product Code
MDRL-CR35	Red	0.34	ø35	ø70	90°	150	A-2285
★ **MDRL-CG35**	Green	0.52	ø35	ø70	90°	150	A-2286
MDRL-CB35	Blue	0.52	ø35	ø70	90°	150	A-2287
MDRL-CW35	White	0.52	ø35	ø70	90°	150	A-2288

★Made-to-order products.

Low Angle Ring Illumination

MLRL Series



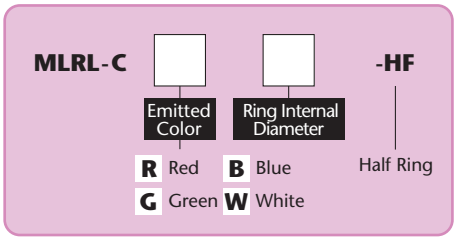
Low Angle Ring Illumination: **MLRL** Series

- Reflection can be minimized by the low-angle, dark-field lighting configuration
- Ideal for shiny shiny or uneven surfaces, eg. embossment and surface flaw detection
- MLRL-C*46 has an illumination angle of 0 degrees for short WD indirect illumination

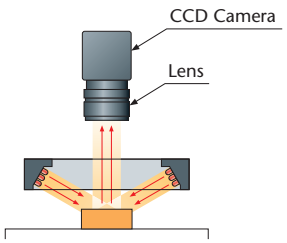
Low Angle Half-Ring Type Illumination: **MLRL-HF** Series

- Ideal for applications where only one section of a surface must be illuminated or where space does not allow for a full ring

Explanation of Model Code



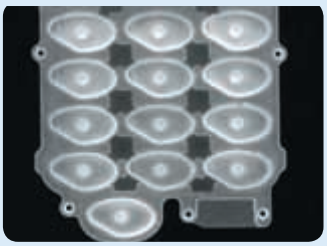
Illumination Structure



Illuminating the Object from a Low Position

Sample Images

MLRL-CW100



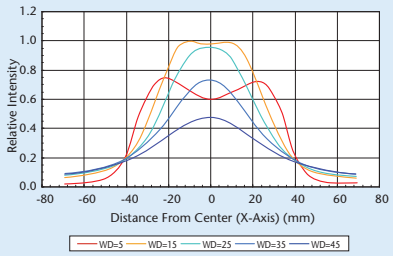
Button Components for Mobile Phone

MLRL-CW68

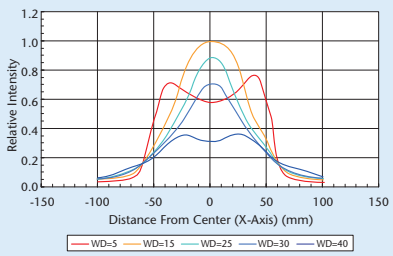
CD Inner Circumferential Scratch

Light Distribution Characteristics

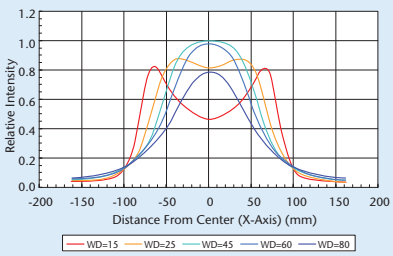
MLRL-CW68



MLRL-CW109



MLRL-CW172



Lineup of Low Angle Ring Type LEDs

Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Lighting Angle	Weight(g)	Product Code
MLRL-CR23	Red	0.09	ø23	ø40	20°	40	A-2390
★ MLRL-CG23	Green	0.14	ø23	ø40	20°	40	A-2391
MLRL-CB23	Blue	0.14	ø23	ø40	20°	40	A-2392
MLRL-CW23	White	0.14	ø23	ø40	20°	40	A-2393
MLRL-CR25	Red	0.15	ø25	ø50	30°	70	A-2015
★ MLRL-CG25	Green	0.24	ø25	ø50	30°	70	A-2121
MLRL-CB25	Blue	0.24	ø25	ø50	30°	70	A-2017
MLRL-CW25	White	0.24	ø25	ø50	30°	70	A-2016
MLRL-CR46	Red	0.17	ø46	ø75	0°	80	A-2024
★ MLRL-CG46	Green	0.27	ø46	ø75	0°	80	A-2122
MLRL-CB46	Blue	0.27	ø46	ø75	0°	80	A-2026
MLRL-CW46	White	0.27	ø46	ø75	0°	80	A-2025
MLRL-CR48	Red	0.30	ø48	ø74	30°	110	A-2021
★ MLRL-CG48	Green	0.47	ø48	ø74	30°	110	A-2123
MLRL-CB48	Blue	0.47	ø48	ø74	30°	110	A-2023
MLRL-CW48	White	0.47	ø48	ø74	30°	110	A-2022
MLRL-CR68	Red	0.57	ø68	ø100	30°	190	A-2027
★ MLRL-CG68	Green	0.61	ø68	ø100	30°	190	A-2124
MLRL-CB68	Blue	0.61	ø68	ø100	30°	190	A-2029
MLRL-CW68	White	0.61	ø68	ø100	30°	190	A-2028
MLRL-CR100	Red	0.96	ø100	ø140	15°	320	A-2018
★ MLRL-CG100	Green	1.03	ø100	ø140	15°	320	A-2125
MLRL-CB100	Blue	1.03	ø100	ø140	15°	320	A-2020
MLRL-CW100	White	1.03	ø100	ø140	15°	320	A-2019
★ MLRL-CR109	Red	0.32	ø109	ø146	0°	180	A-2411
★ MLRL-CG109	Green	0.50	ø109	ø146	0°	180	A-2412
★ MLRL-CB109	Blue	0.50	ø109	ø146	0°	180	A-2413
★ MLRL-CW109	White	0.50	ø109	ø146	0°	180	A-2414
★ MLRL-CR134	Red	0.90	ø134	ø170	20°	370	A-2415
★ MLRL-CG134	Green	1.31	ø134	ø170	20°	370	A-2416
★ MLRL-CB134	Blue	1.31	ø134	ø170	20°	370	A-2417
★ MLRL-CW134	White	1.31	ø134	ø170	20°	370	A-2418
★ MLRL-CR172	Red	1.01	ø172	ø208	25°	420	A-2419
★ MLRL-CG172	Green	1.39	ø172	ø208	25°	420	A-2420
★ MLRL-CB172	Blue	1.39	ø172	ø208	25°	420	A-2421
★ MLRL-CW172	White	1.39	ø172	ø208	25°	420	A-2422
★ MLRL-CR300	Red	1.49	ø300	ø332	30°	670	A-2423
★ MLRL-CG300	Green	1.90	ø300	ø332	30°	670	A-2424
★ MLRL-CB300	Blue	1.90	ø300	ø332	30°	670	A-2425
★ MLRL-CW300	White	1.90	ø300	ø332	30°	670	A-2426

★Made-to-order products.

Lineup of Low Angle Half Ring Type LEDs

Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Lighting Angle	Weight(g)	Product Code
★ MLRL-CR100-HF	Red	0.53	R50	R70	15°	170	A-2427
★ MLRL-CG100-HF	Green	0.80	R50	R70	15°	170	A-2428
★ MLRL-CB100-HF	Blue	0.80	R50	R70	15°	170	A-2429
★ MLRL-CW100-HF	White	0.80	R50	R70	15°	170	A-2430

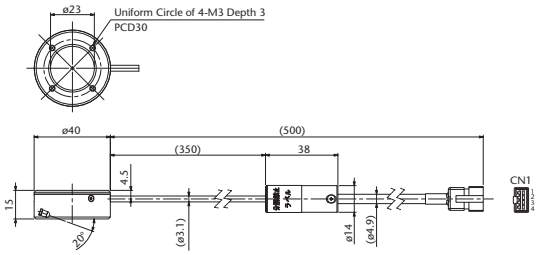
★Made-to-order products.

Options for Low Angle Ring Lights

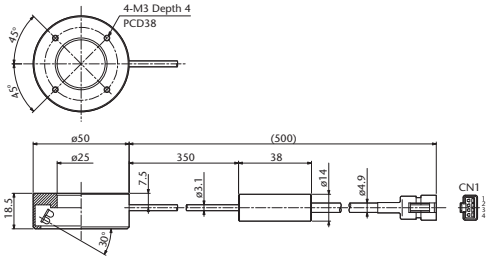
Diffuser Ring

Good for producing more uniform illumination than with direct lighting and for reducing glare and reflections.

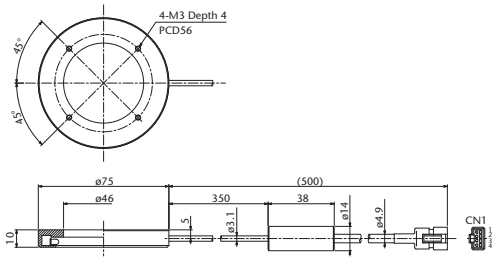
MLRL-CR (CG,CB,CW) 23



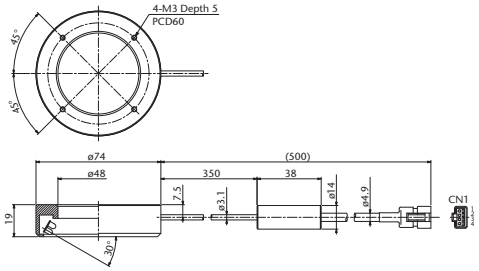
MLRL-CR (CG,CB,CW) 25



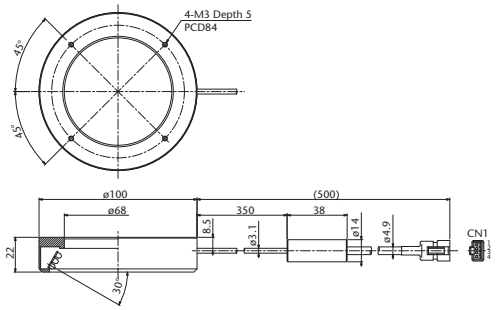
MLRL-CR (CG,CB,CW) 46



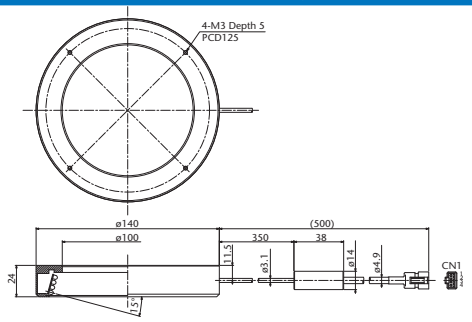
MLRL-CR (CG,CB,CW) 48



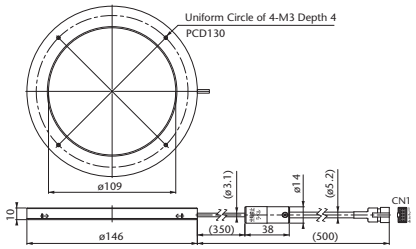
MLRL-CR (CG,CB,CW) 68



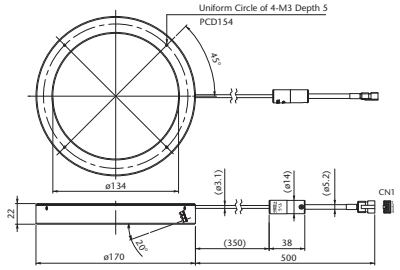
MLRL-CR (CG,CB,CW) 100



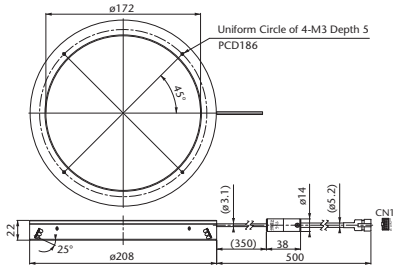
MLRL-CR (CG,CB,CW) 109



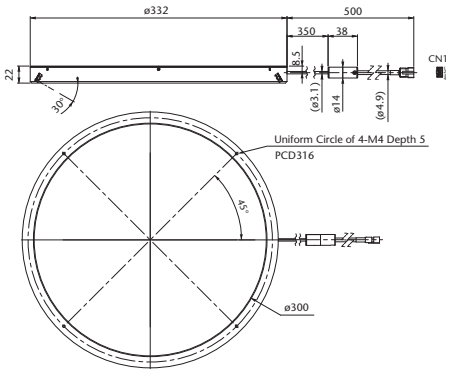
MLRL-CR (CG,CB,CW) 134



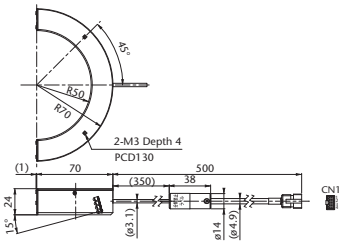
MLRL-CR (CG,CB,CW) 172



MLRL-CR (CG,CB,CW) 300

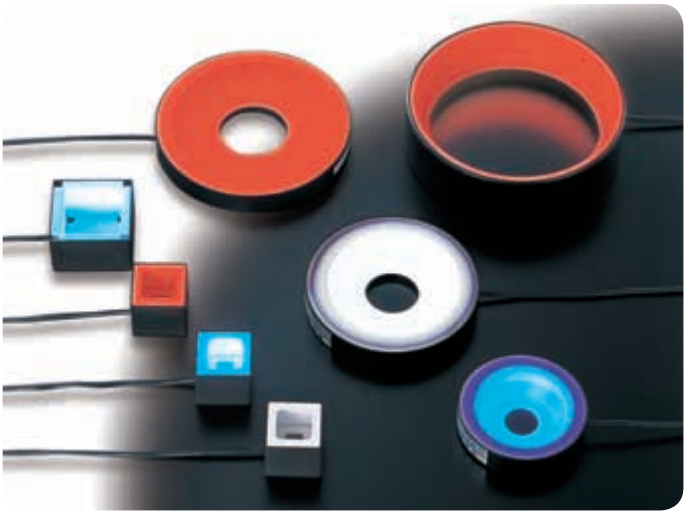


MLRL-CR (CG,CB,CW) 100-HF



Shadowless Illumination

MSRL/MSLL/MSQL Series



Shadowless Ring Illumination: **MSRL** Series

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

Shadowless Low Angle Ring Illumination: **MSLL** Series

- Shallow angle LED illumination that provides very diffuse & uniform light ideal for reflective surfaces
- MSLL-HF (Half-Ring) Series available for applications where only one section of a surface must be illuminated or where space does not allow for a full ring
- MSQL Series is best suited for square shape objects, such as in BGA & QFPs

Explanation of Model Code

Shadowless Ring Type LEDs

MSRL-C □ (Emitted Color) □ (Ring Internal Diameter)

R Red **B** Blue
G Green **W** White

Shadowless, Low Angle Ring Type LEDs

MSLL-C □ (Emitted Color) □ (Ring Internal Diameter) **-HF** (Half Ring)

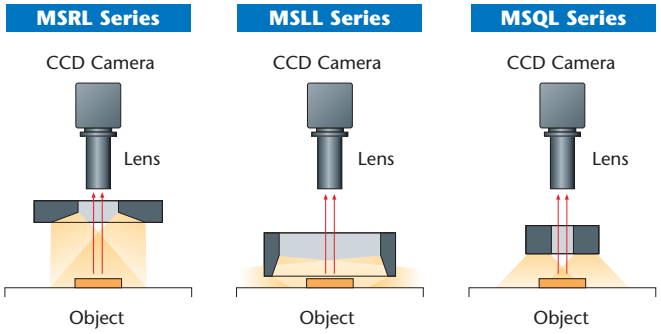
R Red **B** Blue
G Green **W** White

Shadowless, Low Angle Square Type LEDs

MSQL-C □ (Emitted Color) □ (External Dimensions)

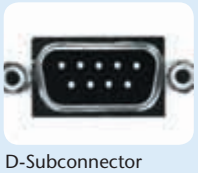
R Red **B** Blue
G Green **W** White

Illumination Structure



Sample Images

MSLL-CR109



D-Subconnector

Bottom of Can

Lineup of Shadowless Ring Type LEDs

Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Weight(g)	Product Code
MSRL-CR20	Red	0.32	ø20	ø74	140	A-2042
★ MSRL-CG20	Green	0.50	ø20	ø74	140	A-2126
MSRL-CB20	Blue	0.50	ø20	ø74	140	A-2044
MSRL-CW20	White	0.50	ø20	ø74	140	A-2043
MSRL-CR33	Red	0.45	ø33	ø104	210	A-2045
★ MSRL-CG33	Green	0.69	ø33	ø104	210	A-2127
MSRL-CB33	Blue	0.69	ø33	ø104	210	A-2047
MSRL-CW33	White	0.69	ø33	ø104	210	A-2046
MSRL-CR44	Red	0.57	ø44	ø123	270	A-2039
★ MSRL-CG44	Green	0.80	ø44	ø123	270	A-2128
MSRL-CB44	Blue	0.80	ø44	ø123	270	A-2041
MSRL-CW44	White	0.80	ø44	ø123	270	A-2040

★Made-to-order products.

Lineup of Shadowless, Low Angle Ring Type LEDs

Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Weight(g)	Product Code
MSLL-CR109	Red	0.62	ø109	ø136	320	A-2033
★ MSLL-CG109	Green	1.10	ø109	ø136	320	A-2129
MSLL-CB109	Blue	1.10	ø109	ø136	320	A-2035
MSLL-CW109	White	1.10	ø109	ø136	320	A-2034

★Made-to-order products.

Lineup of Shadowless, Low Angle Square Type LEDs

Model	Emitted Color	Maximum Rated Current IFM(A)	External Dimensions (mm)	Weight(g)	Product Code
MSQL-CR32	Red	0.09	32×32	80	A-2036
★ MSQL-CG32	Green	0.14	32×32	80	A-2130
MSQL-CB32	Blue	0.14	32×32	80	A-2038
MSQL-CW32	White	0.14	32×32	80	A-2037
MSQL-CR48	Red	0.13	48×48	120	A-2030
★ MSQL-CG48	Green	0.20	48×48	120	A-2131
MSQL-CB48	Blue	0.20	48×48	120	A-2032
MSQL-CW48	White	0.20	48×48	120	A-2031
★ MSQL-CR120	Red	0.38	120×120	240	A-2467
★ MSQL-CG120	Green	0.60	120×120	240	A-2468
★ MSQL-CB120	Blue	0.60	120×120	240	A-2469
★ MSQL-CW120	White	0.60	120×120	240	A-2470

★Made-to-order products.

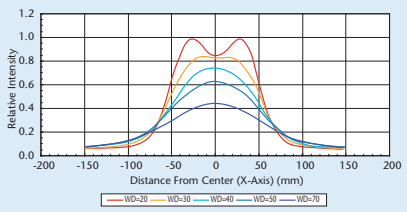
Lineup of Shadowless, Low Angle Half Ring Type LEDs

Model	Emitted Color	Maximum Rated Current IFM(A)	Ring Internal Diameter(mm)	Ring External Diameter(mm)	Weight(g)	Product Code
★ MSLL-CR109-HF	Red	0.30	R54.5	R70.5	250	A-2431
★ MSLL-CG109-HF	Green	0.47	R54.5	R70.5	250	A-2432
★ MSLL-CB109-HF	Blue	0.47	R54.5	R70.5	250	A-2433
★ MSLL-CW109-HF	White	0.47	R54.5	R70.5	250	A-2434

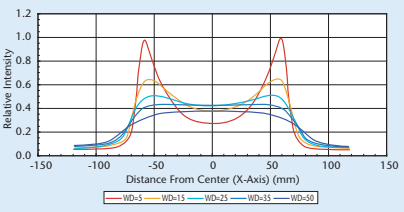
★Made-to-order products.

Light Distribution Characteristics

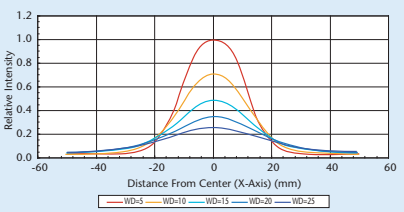
MSRL-CW44



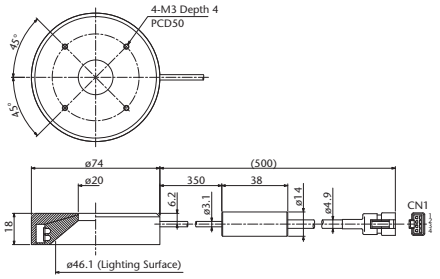
MSLL-CW109



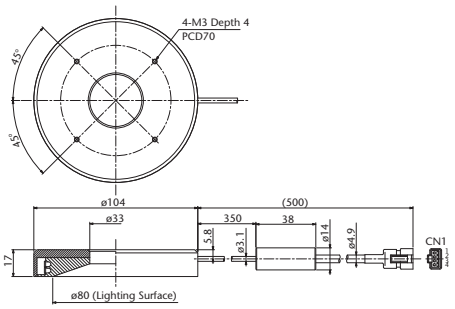
MSQL-CW32



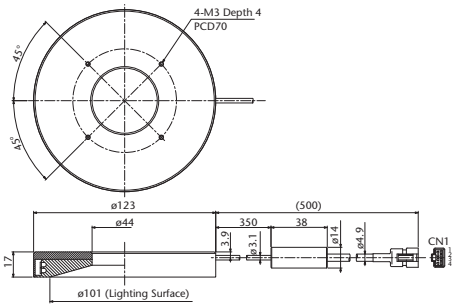
MSRL-CR (CG,CB,CW) 20



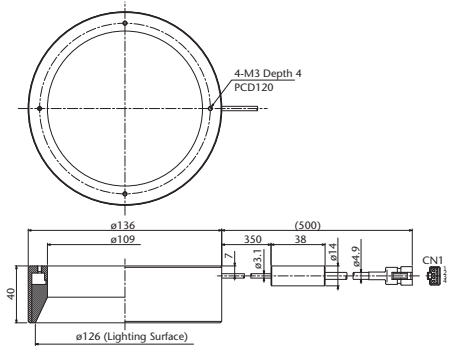
MSRL-CR (CG,CB,CW) 33



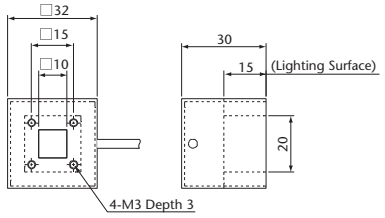
MSRL-CR (CG,CB,CW) 44



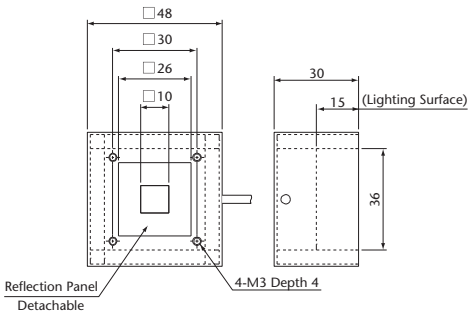
MSLL-CR (CG,CB,CW) 109



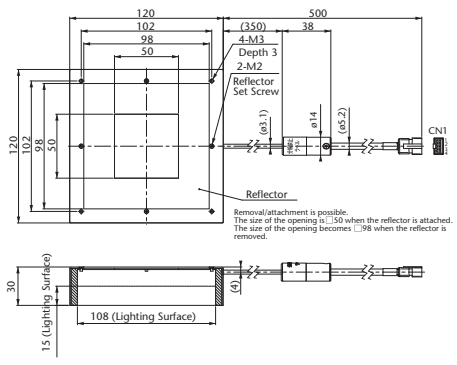
MSQL-CR (CG,CB,CW) 32



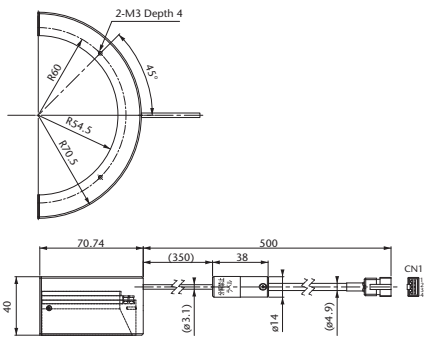
MSQL-CR (CG,CB,CW) 48



MSQL-CR (CG,CB,CW) 120



MSLL-CR (CG,CB,CW) 109-HF



Bar Illumination

MBRL Series

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

Explanation of Model Code

MBRL-C □ □

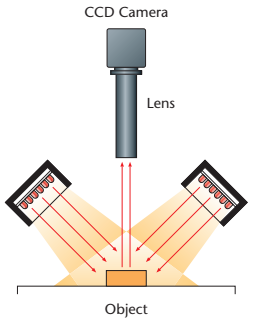
□ Emitted color: **R** Red, **G** Green, **B** Blue, **W** White

□ Lighting Area Dimensions (length · width)

Model	Emitted Color	Maximum Rated Current IFM(A)	Lighting Area Dimensions(mm)	Weight(g)	Product Code
★ MBRL-CR3408	Red	0.09	34×8.4	35	A-2435
★ MBRL-CG3408	Green	0.17	34×8.4		A-2436
★ MBRL-CB3408	Blue	0.17	34×8.4		A-2437
★ MBRL-CW3408	White	0.17	34×8.4		A-2438
MBRL-CR5015	Red	0.13	50×15	50	A-2084
★ MBRL-CG5015	Green	0.26	50×15		A-2148
MBRL-CB5015	Blue	0.26	50×15		A-2086
MBRL-CW5015	White	0.26	50×15		A-2085
MBRL-CR7530	Red	0.36	75×30	120	A-2081
★ MBRL-CG7530	Green	0.52	75×30		A-2149
MBRL-CB7530	Blue	0.52	75×30		A-2083
MBRL-CW7530	White	0.52	75×30		A-2082
MBRL-CR13015	Red	0.32	130×15	85	A-2087
★ MBRL-CG13015	Green	0.53	130×15		A-2160
MBRL-CB13015	Blue	0.53	130×15		A-2089
MBRL-CW13015	White	0.53	130×15		A-2088
★ MBRL-CR24015	Red	0.60	240×15	270	A-2439
★ MBRL-CG24015	Green	0.80	240×15		A-2440
★ MBRL-CB24015	Blue	0.80	240×15		A-2441
★ MBRL-CW24015	White	0.80	240×15		A-2442
★ MBRL-CR36015	Red	0.80	360×15	380	A-2443
★ MBRL-CG36015	Green	1.09	360×15		A-2444
★ MBRL-CB36015	Blue	1.09	360×15		A-2445
★ MBRL-CW36015	White	1.09	360×15		A-2446
★ MBRL-CR48015	Red	1.06	480×15	480	A-2447
★ MBRL-CG48015	Green	1.32	480×15		A-2448
★ MBRL-CB48015	Blue	1.32	480×15		A-2449
★ MBRL-CW48015	White	1.32	480×15		A-2450

★Made-to-order products.

Illumination Structure



Sample Images

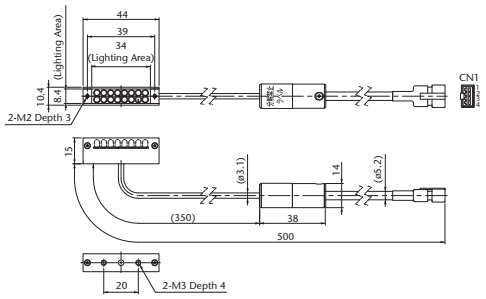
MBRL-CW7530 with MDF-BR7530

Wafer Characters

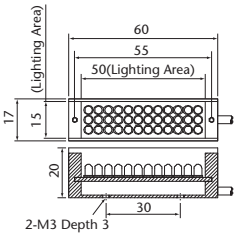
MBRL-CR7530

Razor Edge

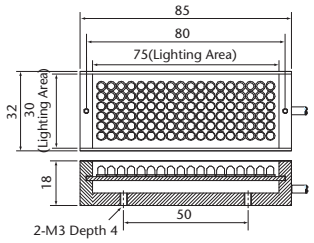
MBRL-CR (CG,CB,CW) 3408



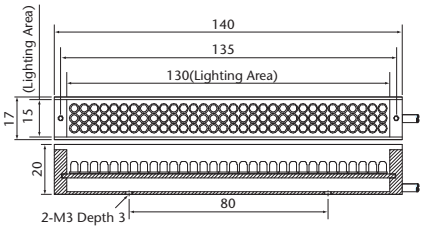
MBRL-CR (CG,CB,CW) 5015



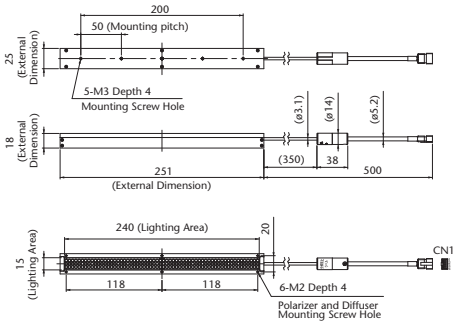
MBRL-CR (CG,CB,CW) 7530



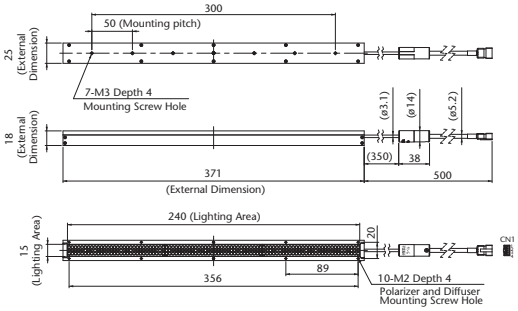
MBRL-CR (CG,CB,CW) 13015



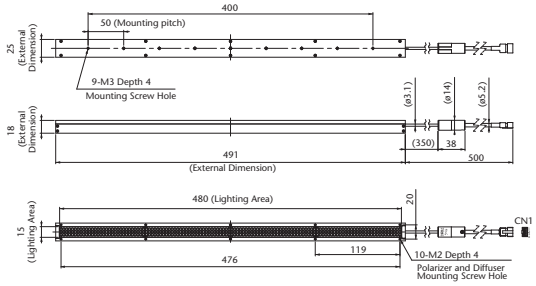
MBRL-CR (CG,CB,CW) 24015



MBRL-CR (CG,CB,CW) 36015

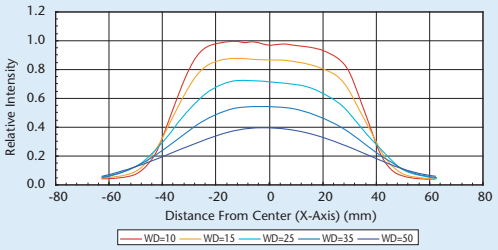


MBRL-CR (CG,CB,CW) 48015

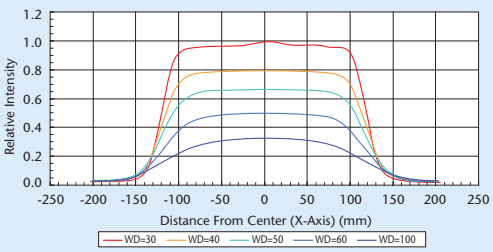


Light Distribution Characteristics

MBRL-CW7530

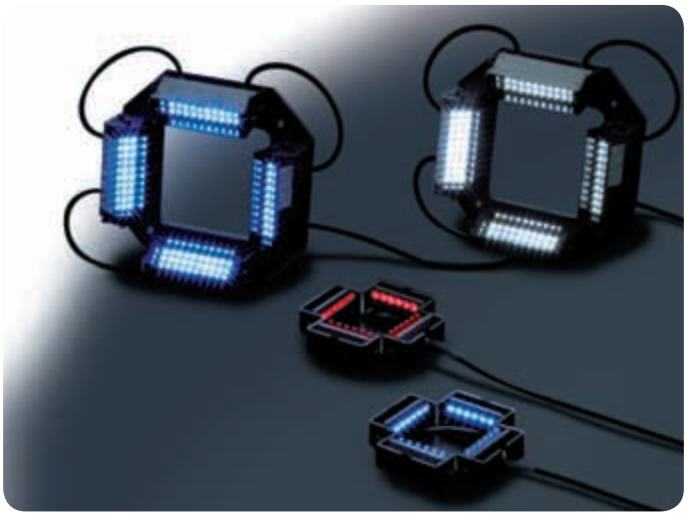


MBRL-CW24015



Square Bar Type Illumination

MDQL Series



- 4 high-intensity bar LED arrangement
- Direct & oblique lighting from adjustable lighting angles from bright to dark-field

Model	Emitted Color	Maximum Rated Current IFM(A)	Internal Dimensions(mm)	External Dimensions(mm)	Weight(g)	Product Code
MDQL-CR58	Red	0.09	□25	□58	55	A-2175
★ MDQL-CG58	Green	0.17	□25	□58		A-2182
MDQL-CB58	Blue	0.17	□25	□58		A-2174
MDQL-CW58	White	0.17	□25	□58		A-2176
MDQL-CR108	Red	0.42	□60	□108	210	A-2178
★ MDQL-CG108	Green	0.84	□60	□108		A-2183
MDQL-CB108	Blue	0.84	□60	□108		A-2177
MDQL-CW108	White	0.84	□60	□108		A-2179

★Made-to-order products.

Explanation of Model Code

MDQL-C □ □

□ Emitted Color: R Red, G Green, B Blue, W White

□ External Dimensions

Sample Images

MDQL-CR108+MSCL-CR74+MLMSC74

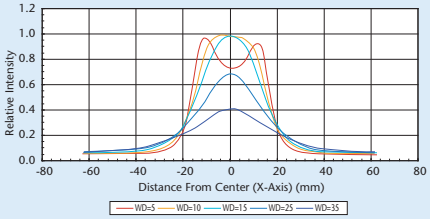
IC Pins

MDQL-CR108

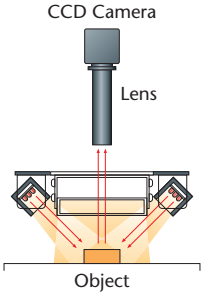
Mirror Edge of Optical Part

Light Distribution Characteristics

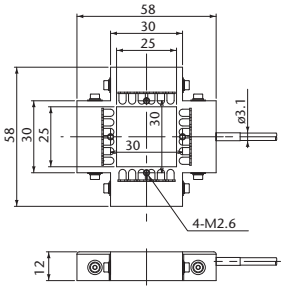
MDQL-CW58



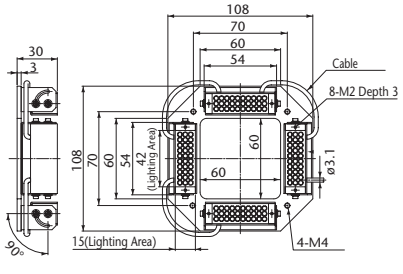
Illumination Structure



MDQL-CR (CG,CB,CW) 58



MDQL-CR (CG,CB,CW) 108

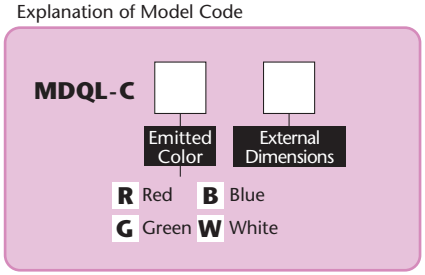


Dome Illumination

MDML Series

- Illuminates the surface of an object evenly by reflecting inbound light from the lower part of the dome onto the entire dome from 360°
- For large dome, a simulated coaxial box has been placed on the upper part of the dome and a low angle ring has been placed on the lower part of the dome to meet any lighting need.

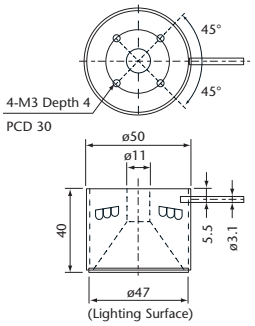
Explanation of Model Code



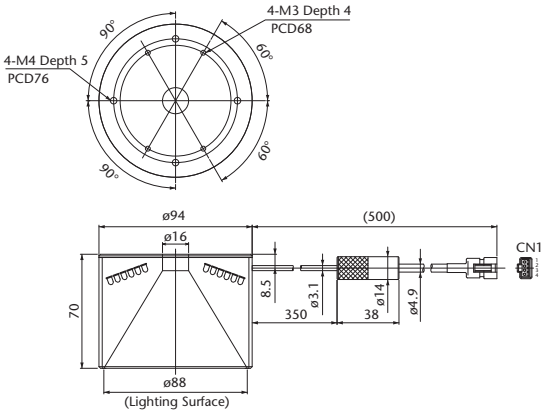
Model	Emitted Color	Maximum Rated Current IFM(A)					Internal Diameter of Dome (mm)	External Diameter of Dome (mm)	Weight(g)	Product Code
		Total	Coaxial Area	Light Transmittance Area	Reflective Area	Low Angle				
MDML-CR50	Red	0.24	—	—	—	—	ø11	ø50	130	A-2265
★ MDML-CG50	Green	0.37	—	—	—	—	ø11	ø50	130	A-2268
MDML-CB50	Blue	0.37	—	—	—	—	ø11	ø50	130	A-2267
MDML-CW50	White	0.37	—	—	—	—	ø11	ø50	130	A-2266
MDML-CR94	Red	0.80	—	—	—	—	ø16	ø94	530	A-2290
★ MDML-CG94	Green	1.19	—	—	—	—	ø16	ø94	530	A-2291
MDML-CB94	Blue	1.19	—	—	—	—	ø16	ø94	530	A-2292
MDML-CW94	White	1.19	—	—	—	—	ø16	ø94	530	A-2293
MDML-CR156	Red	1.16	0.16	0.36	0.32	0.32	ø26	ø156	1600	A-2172
★ MDML-CG156	Green	1.86	0.31	0.55	0.50	0.50	ø26	ø156	1600	A-2184
MDML-CB156	Blue	1.86	0.31	0.55	0.50	0.50	ø26	ø156	1600	A-2171
MDML-CW156	White	1.86	0.31	0.55	0.50	0.50	ø26	ø156	1600	A-2173

★Made-to-order products.

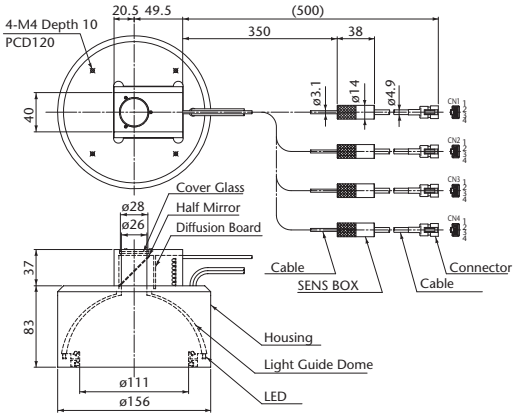
MDML-CR (CG,CB,CW) 50



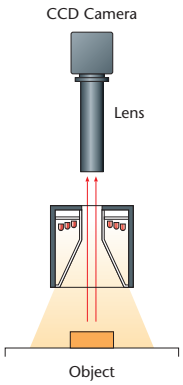
MDML-CR (CG,CB,CW) 94



MDML-CR (CG,CB,CW) 156

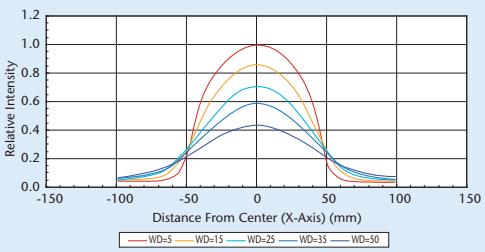


Illumination Structure



Light Distribution Characteristics

MDML-CW94

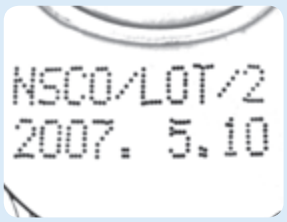


Sample Images

Can cover: It is difficult to recognize the characters under direct ring illumination because of the vignetting of the element and the slope, but clear under dome illumination because of illumination in all directions.

Direct Ring (MDRL-CR31)

Dome Light (MDML-CR156)



Direct Ring (MDRL-CW31)

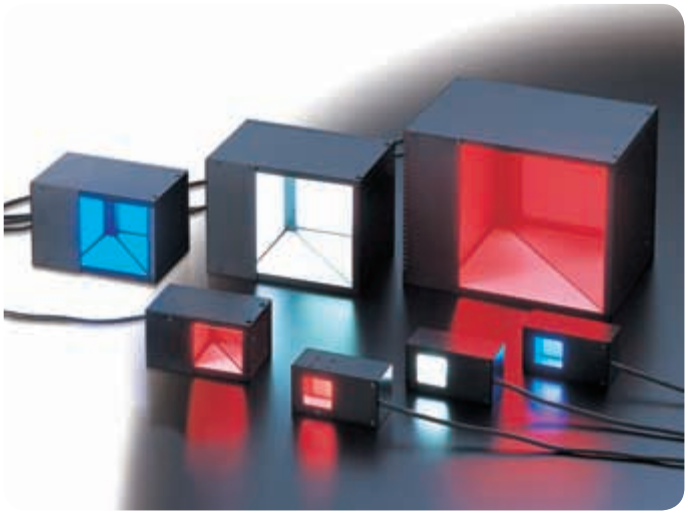
Mobile phone push button marking: Characters and shapes are unclear because of LED element vignetting.

Dome Light (MDML-CR156)

Characters and shapes are clear in all directions with no LED element vignetting.

Simulated Coaxial Illumination

MSCL Series



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

Explanation of Model Code

MSCL-C □ □ – □

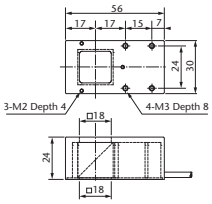
- □ Emitted Color: R Red, B Blue, G Green, W White
- □ Box Height
- □ Revision Code

Model	Emitted Color	Maximum Rated Current IFM(A)	Box Height (mm)	Dimensions of Lighting Surface(mm)	Optical Path Length Extension (mm)	Weight (g)	Product Code
MSCL-CR24	Red	0.09	24	18 X 18	6.8	110	A-2099
★ MSCL-CG24	Green	0.20	24	18 X 18			A-2143
MSCL-CB24	Blue	0.20	24	18 X 18			A-2101
MSCL-CW24	White	0.20	24	18 X 18			A-2100
MSCL-CR39	Red	0.16	39	ø28	1.2	160	A-2093
★ MSCL-CG39	Green	0.31	39	ø28			A-2144
MSCL-CB39	Blue	0.31	39	ø28			A-2095
MSCL-CW39	White	0.31	39	ø28			A-2094
★ MSCL-CR39-6625	Red	0.40	39	66 X 25	1.2	240	A-2459
★ MSCL-CG39-6625	Green	0.80	39	66 X 25			A-2460
★ MSCL-CB39-6625	Blue	0.80	39	66 X 25			A-2461
★ MSCL-CW39-6625	White	0.80	39	66 X 25			A-2462
MSCL-CR56-B	Red	0.33	56	ø28	1.2	320	A-2102
★ MSCL-CG56-B	Green	0.66	56	ø28			A-2145
MSCL-CB56-B	Blue	0.66	56	ø28			A-2104
MSCL-CW56-B	White	0.66	56	ø28			A-2103
MSCL-CR74-B	Red	0.62	74	50 X 50	1.2	520	A-2105
★ MSCL-CG74-B	Green	1.11	74	50 X 50			A-2146
MSCL-CB74-B	Blue	1.11	74	50 X 50			A-2107
MSCL-CW74-B	White	1.11	74	50 X 50			A-2106
MSCL-CR105-B	Red	2.14	105	77 X 77	1.2	920	A-2096
★ MSCL-CG105-B	Green	2.07	105	77 X 77			A-2147
MSCL-CB105-B	Blue	2.07	105	77 X 77			A-2098
MSCL-CW105-B	White	2.07	105	77 X 77			A-2097

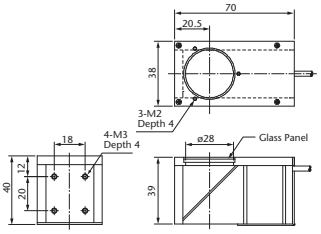
* MLM Series products (Light control film) on P.i-92 can be attached to MSCL-C□**-B products.
* MSCL-CX105 comes with an air-cooling fan.

★Made-to-order products.

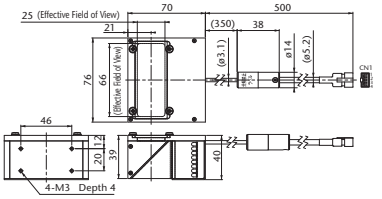
MSCL-CR (CG,CB,CW) 24



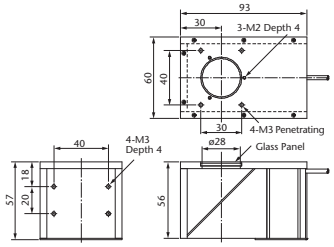
MSCL-CR (CG,CB,CW) 39



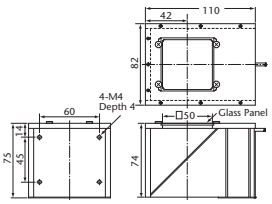
MSCL-CR (CG,CB,CW) 39-6625



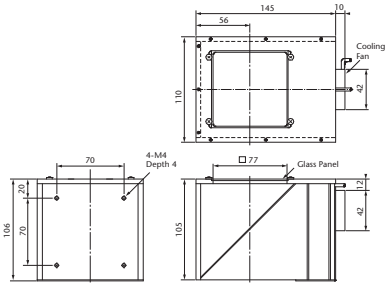
MSCL-CR (CG,CB,CW) 56-B



MSCL-CR (CG,CB,CW) 74-B

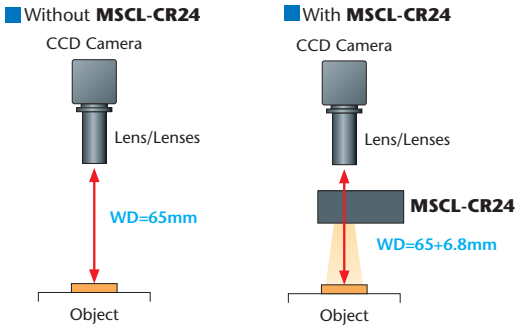


MSCL-CR (CG,CB,CW) 105-B



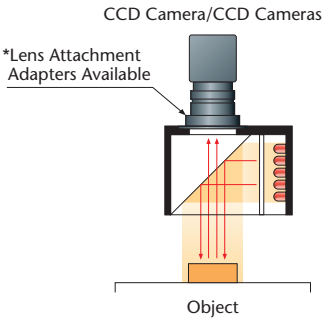
About Installation

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



With WD65mm Lenses

Illumination Structure



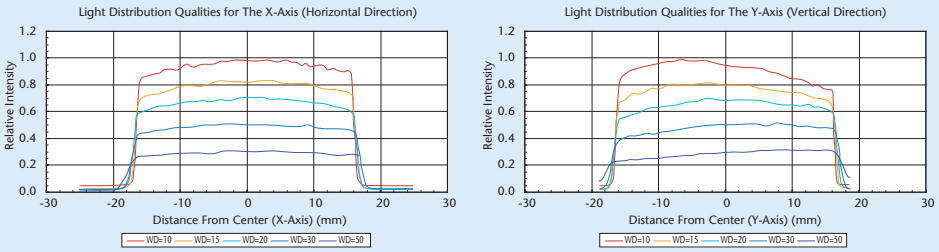
Sample Images

MSCL

Dry Cell | CD (Scratch) | Metal Parts

Light Distribution Characteristics

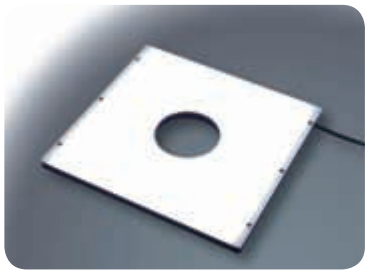
MSCL-CW56-B



(When Using MML2-HR65D)

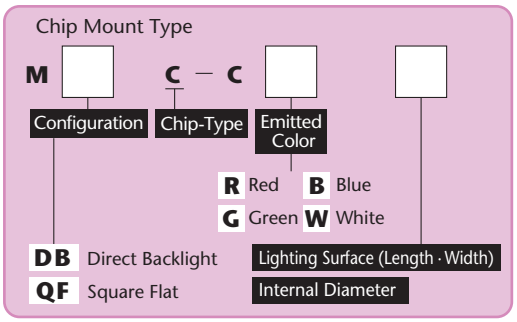
Direct Backlights (Chip Mount Type)

MDBC/MQFC Series



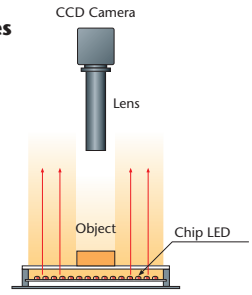
- Provide intense but diffused versatile lighting
- Because of the thin body design, these chip mounted units are ideal for saving space

Explanation of Model Code



Illumination Structure

MDBC Series



Model	Emitted Color	Maximum Rated Current IFM (A)	Dimensions of Lighting Surface (mm)	Internal Diameter(mm)	Weight (g)	Producat Code
★ MDBC-CR60	Red	0.25	63×60	—	70	A-2455
★ MDBC-CG60	Green	0.39	63×60	—		A-2456
★ MDBC-CB60	Blue	0.39	63×60	—		A-2457
★ MDBC-CW60	White	0.39	63×60	—		A-2458
MDBC-CR100	Red	0.81	100×100	—	170	A-2063
★ MDBC-CG100	Green	0.95	100×100	—		A-2140
MDBC-CB100	Blue	0.95	100×100	—		A-2065
MDBC-CW100	White	0.95	100×100	—		A-2064
MDBC-CR150	Red	0.99	150×150	—	310	A-2060
★ MDBC-CG150	Green	2.14	150×150	—		A-2141
MDBC-CB150	Blue	2.14	150×150	—		A-2062
MDBC-CW150	White	2.14	150×150	—		A-2061
★ MQFC-CR50	Red	2.05	150×150	ø50	270	A-2463
★ MQFC-CG50	Green	2.05	150×150	ø50		A-2464
★ MQFC-CB50	Blue	2.05	150×150	ø50		A-2465
★ MQFC-CW50	White	2.14	150×150	ø50		A-2466

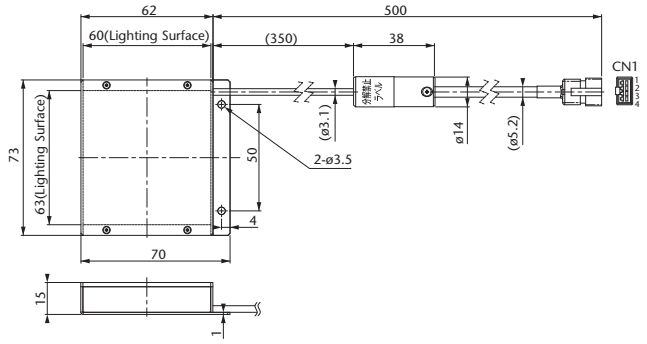
★Made-to-order products.

Sample Images

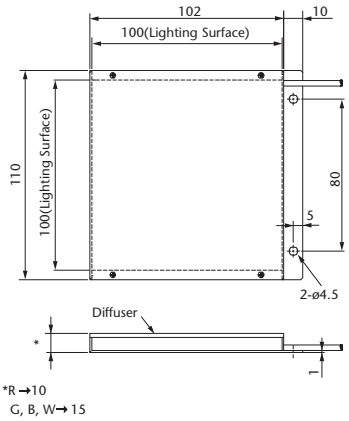
Beverage Bottle Liquid Level Detection

IC Pins

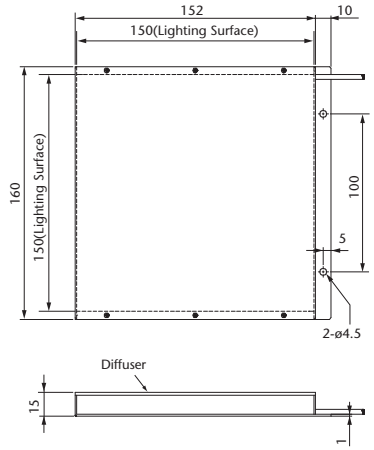
MDBC-CR(CG, CB, CW) 60



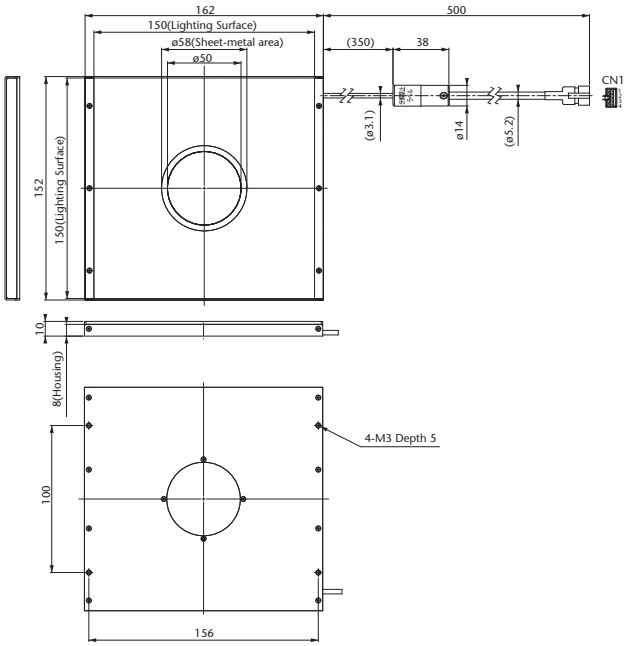
MDBC-CR(CG, CB, CW) 100



MDBC-CR(CG, CB, CW) 150

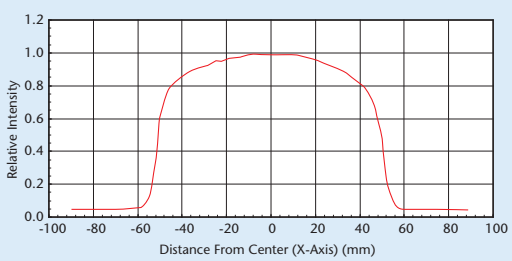


MQFC-CR(CG, CB, CW) 50

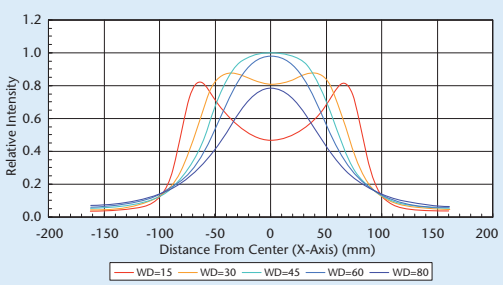


Light Distribution Characteristics

MDBC-CR150

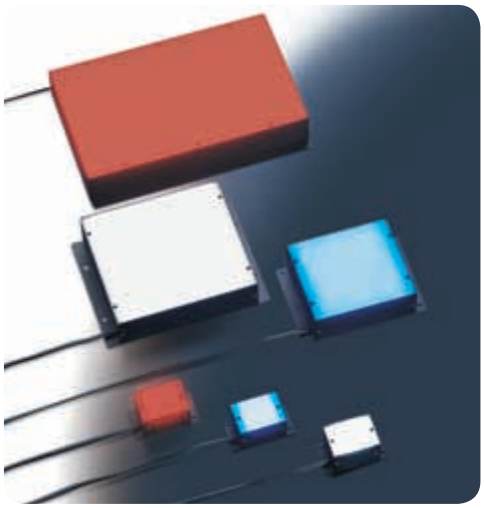


MQFC-CW50



Direct Backlights (Discrete Type)

MDBL Series



- Due to the LEDs mounted immediately beneath the diffusion plate surface, this unit achieves a higher luminance than the edge type backlights.
- Mount holds for easy installation

Explanation of Model Code

MDBL-C □ □

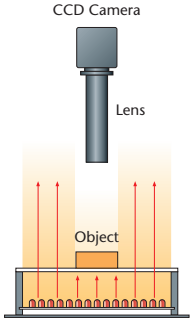
□: Emitted Color — R Red, B Blue, G Green, W White

□: Lighting Surface Dimensions(Length · Width)

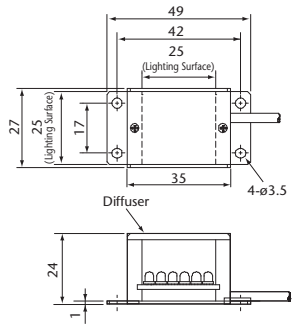
Model	Emitted Color	Maximum Rated Current IFM (A)	Dimensions of Lighting Surface (mm)	Weight(g)	Product Code
MDBL-CR25	Red	0.14	25×25	60	A-2048
★ MDBL-CG25	Green	0.27	25×25		A-2136
MDBL-CB25	Blue	0.27	25×25		A-2150
MDBL-CW25	White	0.27	25×25		A-2049
MDBL-CR70	Red	0.48	70×70	190	A-2051
★ MDBL-CG70	Green	0.96	70×70		A-2137
MDBL-CB70	Blue	0.96	70×70		A-2053
MDBL-CW70	White	0.96	70×70		A-2052
MDBL-CR100	Red	1.43	100×100	290	A-2057
★ MDBL-CG100	Green	1.55	100×100		A-2138
MDBL-CB100	Blue	1.55	100×100		A-2059
MDBL-CW100	White	1.55	100×100		A-2058
MDBL-CR180100	Red	2.30	180×100	520	A-2054
★ MDBL-CG180100	Green	2.30	180×100		A-2139
MDBL-CB180100	Blue	2.30	180×100		A-2056
MDBL-CW180100	White	2.30	180×100		A-2055

★Made-to-order products.

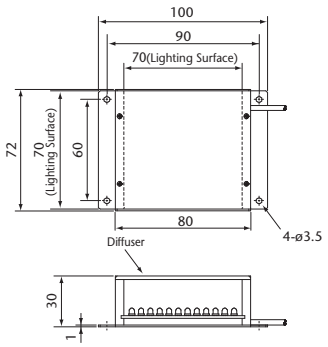
Illumination Structure



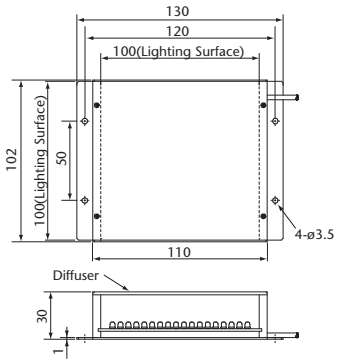
MDBL-CR (CG,CB,CW) 25



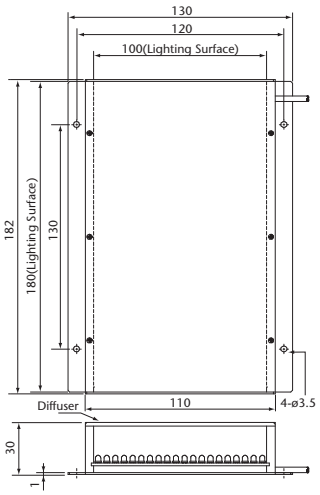
MDBL-CR (CG,CB,CW) 70



MDBL-CR (CG,CB,CW) 100



MDBL-CR (CG,CB,CW) 180100



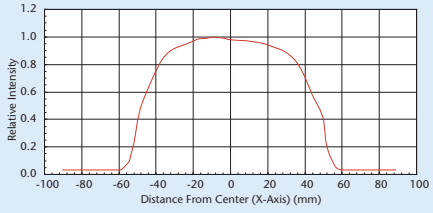
Sample Images

Connector

Plaster

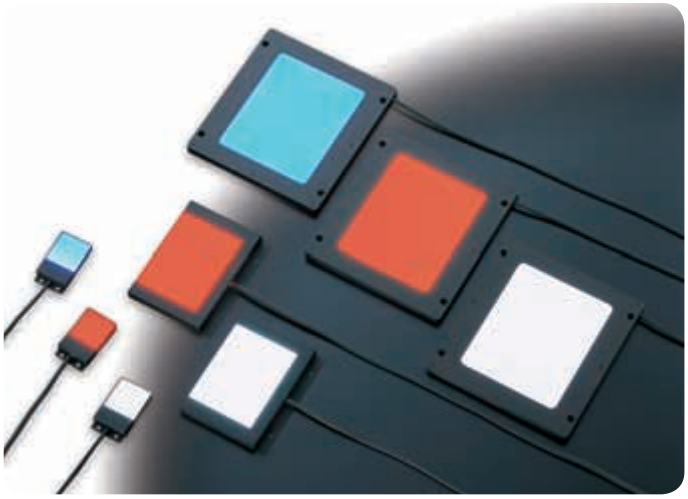
Light Distribution Characteristics

MDBL-CW100



Edge Type Backlights

MEBL/MEBC Series



- Requires very little space due to slim, compact design
- Provides very uniform, indirect light by means of a unique light transfer diffusion plate & additional diffusion sheets

Explanation of Model Code

MEBL-C □ □
- Discreet Type
- Emitted Color: **R** Red, **B** Blue, **G** Green, **W** White
- Lighting Surface Dimensions (Length · Width)

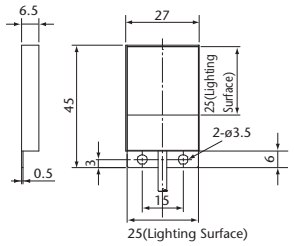
MEBC-C □ □
- Chip-Type
- Emitted Color: **R** Red, **B** Blue, **G** Green, **W** White
- Lighting Surface Dimensions (Length · Width)

Model	Emitted Color	Maximum Rated Current IFM(A)	Dimensions of Lighting Surface(mm)	Weight(g)	Product Code
MEBL-CR25	Red	0.03	25×25	45	A-2075
★ MEBL-CG25	Green	0.04	25×25		A-2132
MEBL-CB25	Blue	0.04	25×25		A-2077
MEBL-CW25	White	0.04	25×25		A-2076
MEBL-CR50	Red	0.17	50×50	110	A-2069
★ MEBL-CG50	Green	0.29	50×50		A-2133
MEBL-CB50	Blue	0.29	50×50		A-2071
MEBL-CW50	White	0.29	50×50		A-2070
MEBL-CR7050	Red	0.15	70×50	140	A-2078
★ MEBL-CG7050	Green	0.25	70×50		A-2134
MEBL-CB7050	Blue	0.25	70×50		A-2080
MEBL-CW7050	White	0.25	70×50		A-2079
MEBL-CR10080	Red	0.32	100×80	230	A-2072
★ MEBL-CG10080	Green	0.57	100×80		A-2135
MEBL-CB10080	Blue	0.57	100×80		A-2074
MEBL-CW10080	White	0.57	100×80		A-2073
MEBL-CR145	Red	0.45	145×145	460	A-2187
★ MEBL-CG145	Green	0.8	145×145		A-2189
MEBL-CB145	Blue	0.8	145×145		A-2186
MEBL-CW145	White	0.8	145×145		A-2188
★ MEBC-CR360250*	Red	2.38	360×250	2500	A-2451
★ MEBC-CG360250*	Green	3.96	360×250		A-2452
★ MEBC-CB360250*	Blue	3.96	360×250		A-2453
★ MEBC-CW360250*	White	3.96	360×250		A-2454

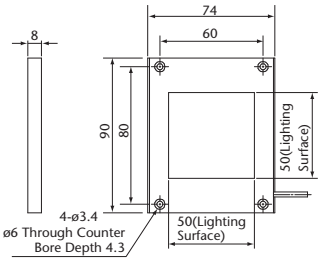
*MEBC-C□360250 requires a MLEK-A800 LED controller (P.i-86).

★Made-to-order products.

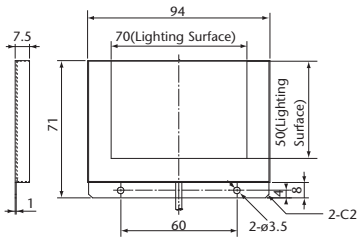
MEBL-CR (CG,CB,CW) 25



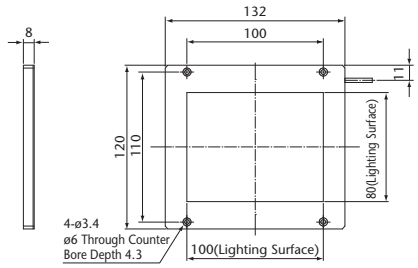
MEBL-CR (CG,CB,CW) 50



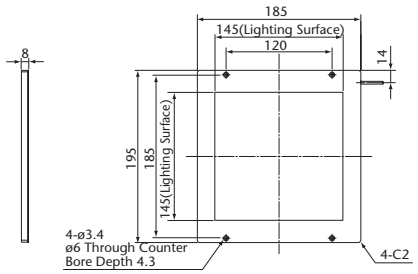
MEBL-CR (CG,CB,CW) 7050



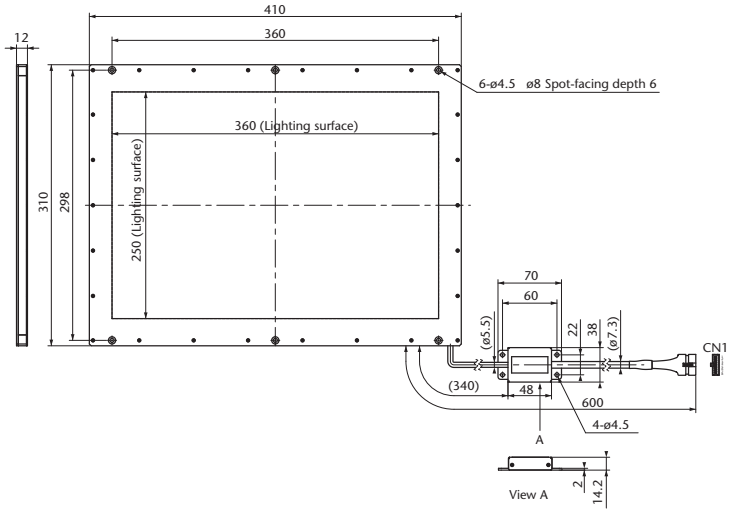
MEBL-CR (CG,CB,CW) 10080



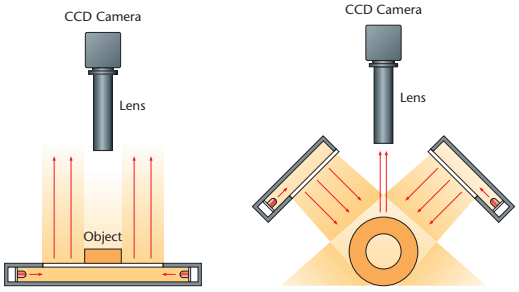
MEBL-CR (CG,CB,CW) 145



MEBC-CR (CG,CB,CW) 360250



Illumination Structure



The MEBL Series can also be used as a reflective light for a samples with local reflection.

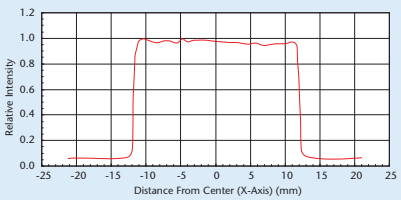
Sample Images

Bottle Liquid Level
MEBL-CR145

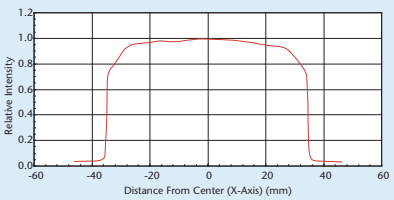
Electrodes on Liquid Crystal Glass
MEBL-CW7050

Light Distribution Characteristics

MEBL-CW25

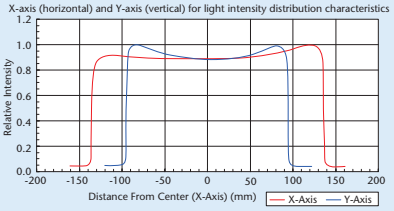


MEBL-CW7050



MEBC-CW360250

X-axis (horizontal) and Y-axis (vertical) for light intensity distribution characteristics



Collimated Backlight Illumination

MCBP Series

- Adjustable projected, collimated back light
- Capable of capturing the profile of an object with higher precision than other backlights

Model	Emitted Color	Maximum Rated Current IFM (A)	Lighting Area Dimensions(mm)	Weight (g)	Product Code
★ MCBP-CG3430	Green	0.07	34×30	260	A-2272
MCBP-CB3430	Blue	0.07	34×30	260	A-2271
MCBP-CW3430	White	0.07	34×30	260	A-2270

★Made-to-order products.

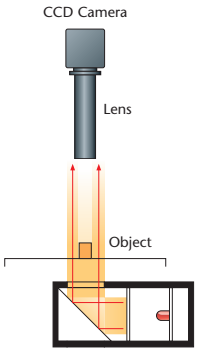
Explanation of Model Code

MCBP-C □ □

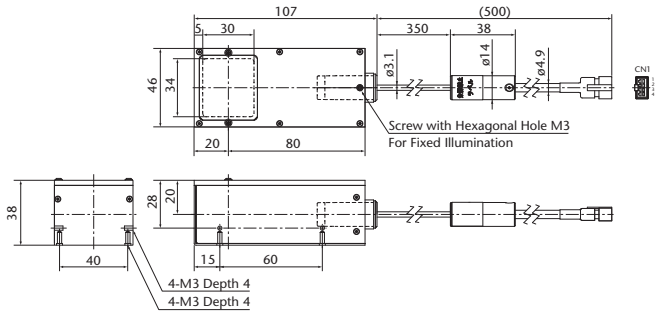
□ Emitted Color: G Green, B Blue, W White

□ Lighting Area Dimensions(Length · Width)

Illumination Structure



MCBP-CG (CB,CW) 3430



Sample Images

Screw

Direct Backlight
(**MDBL-CB70**)
Shape unclear because of stray, direct light.

Collimated Backlight
(**MCBP-CB3430**)
Easy to identify shape because effect of stray, direct light is eased by the Collimated light.

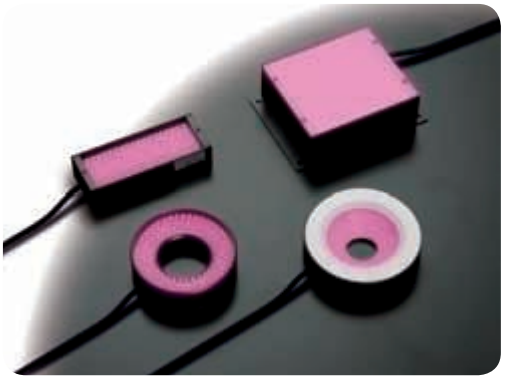
Embossed Characters On Clear Resin

Direct Backlight
(**MDBL-CB70**)
Ordinary light transmitted evenly through the entire object.

Collimated Backlight
(**MCBP-CB3430**)
Reflected light directed at characters for clear identification also makes external shape identification possible.

IR Illumination

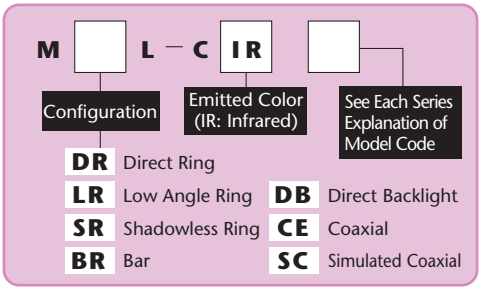
IR Series



- Provides image recognition at high contrast especially for items that are difficult to view in visible light
- Lighting is also affective for materials that chemically react to visible light rays.

Highly effective when used with an infrared camera.
Approximately 1.7 times higher reflecting rate for 500nm and 850 nm gold (Au).
The peak wavelength is 850nm. (MCEL-CIR8-940 is 940nm)

Explanation of Model Code



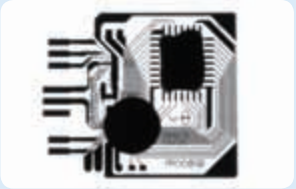
Model	Emitted Color	Maximum Rated Current IFM (A)	Internal Diameter (mm)	External Diameter (mm)	Lighting Angle	Optical Path Length Extension (mm)	Weight (g)	Product Code
★ MDRL-CIR16	Infrared	0.27	ø16	ø48	76°	—	65	A-2473
MDRL-CIR31	Infrared	0.42	ø31	ø66	—	—	130	A-2165
★ MLRL-CIR25	Infrared	0.16	ø25	ø50	30°	—	70	A-2474
★ MLRL-CIR46	Infrared	0.18	ø46	ø75	0°	—	80	A-2475
★ MLRL-CIR48	Infrared	0.33	ø48	ø74	30°	—	110	A-2476
MSRL-CIR20	Infrared	0.36	ø20	ø74	—	—	140	A-2163
MBRL-CIR7530	Infrared	0.40	75x30 (Illumination area dimensions)		—	—	120	A-2164
MDBL-CIR70	Infrared	0.53	70x70 (Illumination area dimensions)		—	—	190	A-2166
★ MDBL-CIR100	Infrared	1.35	100x100 (Illumination area dimensions)		—	—	290	A-2472
MCEL-CIR8-2	Infrared	0.06	—	ø8 (External diameter of head)	—	—	35	A-2318
★ MCEL-CIR8-940	Infrared	0.06	—	ø8 (External diameter of head)	—	—	35	A-2471
★ MSCL-CIR24	Infrared	0.09	24	□18	—	6.8	110	A-2477
★ MSCL-CIR39	Infrared	0.16	39	ø28	—	1.2	160	A-2478
★ MSCL-CIR56-B	Infrared	0.33	56	ø28	—	1.2	320	A-2479
★ MSCL-CIR105-B	Infrared	2.14	105	□77	—	1.2	920	A-2480

★Made-to-order products.

Sample Images

1.Substrate Pattern Recognition
(For IR, only the pattern is recognized clearly)

With an IR backlight LED (**MDBL-CIR70**)



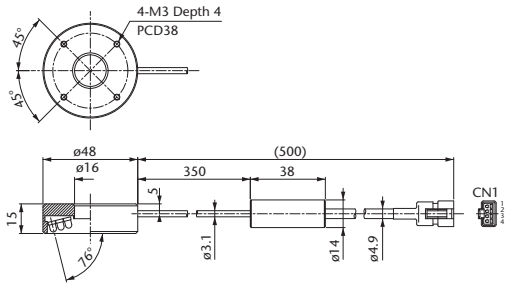
With a white backlight LED (**MDBL-CW70**)

2.Cheese Package Recognition
(For IR, specific patterns can be made invisible)

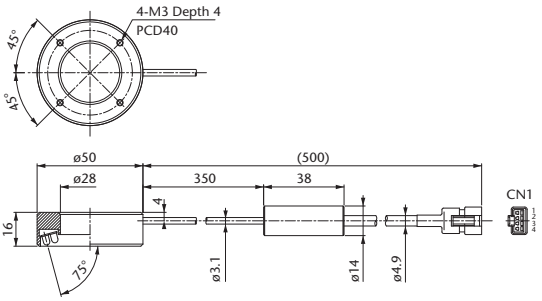
With an IR direct ring LED (**MDRL-CIR31**)

With a white, direct LED (**MDRL-CW31**)

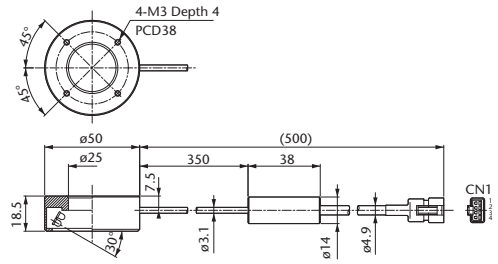
MDRL-CIR16



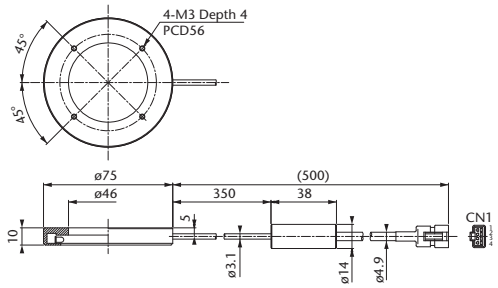
MDRL-CIR31



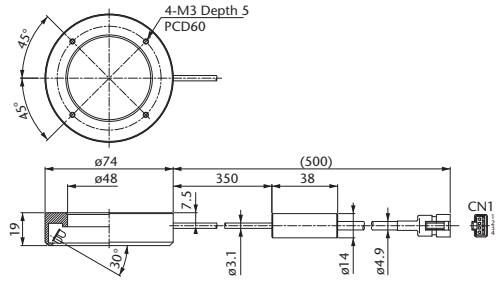
MLRL-CIR25



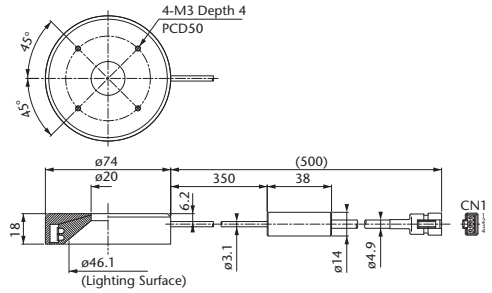
MLRL-CIR46



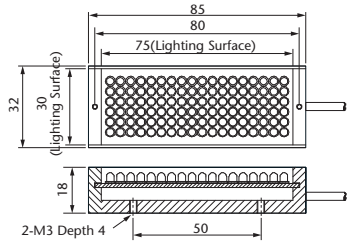
MLRL-CIR48



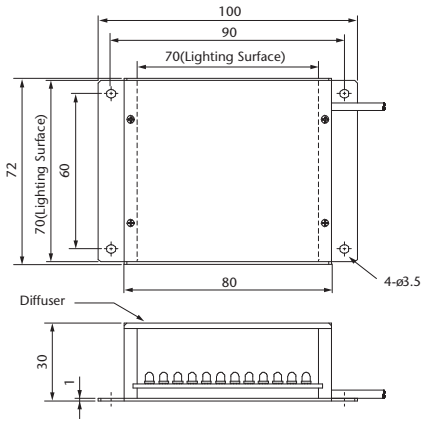
MSRL-CIR20



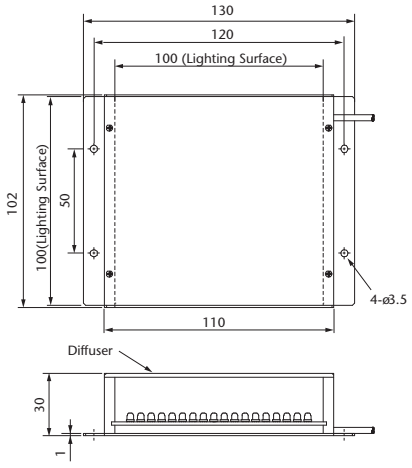
MBRL-CIR7530



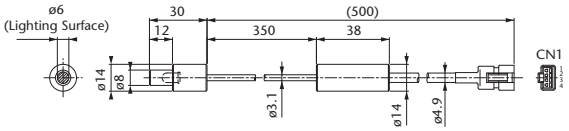
MDBL-CIR70



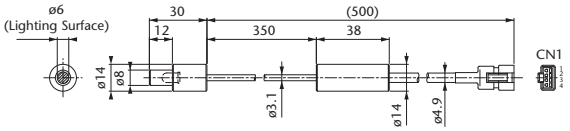
MDBL-CIR100



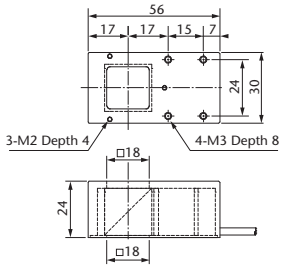
MCEL-CIR8-2



MCEL-CIR8-940

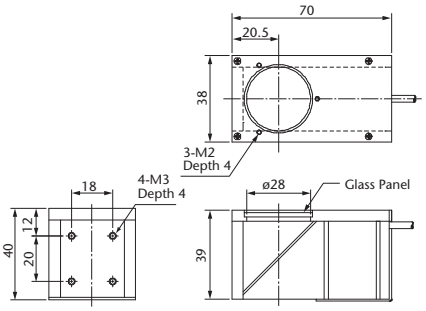


MSCL-CIR24

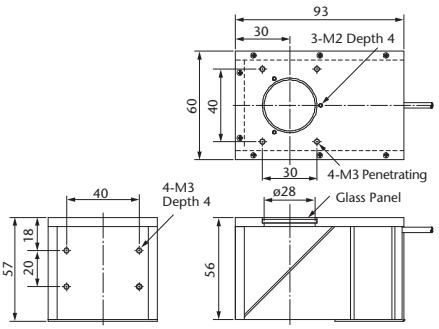


Because glass components are used in the case, the internal optical path length may change. Please refer to i-51 'About Installation'.

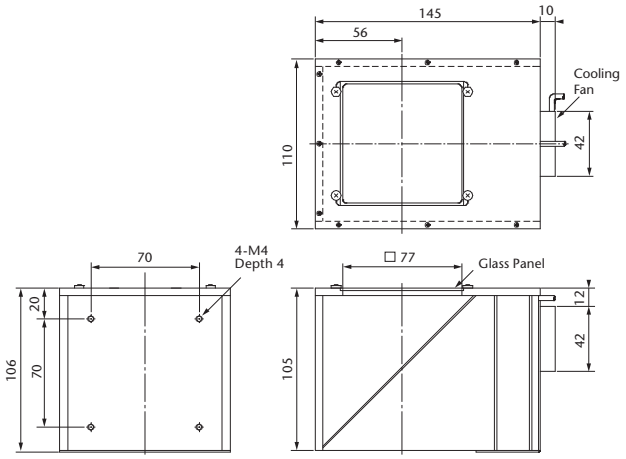
MSCL-CIR39



MSCL-CIR56-B

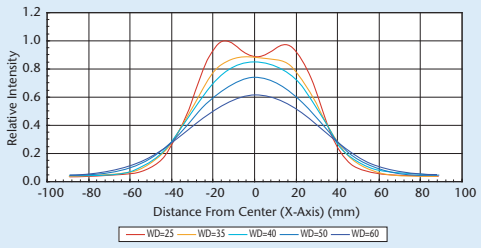


MSCL-CIR105-B

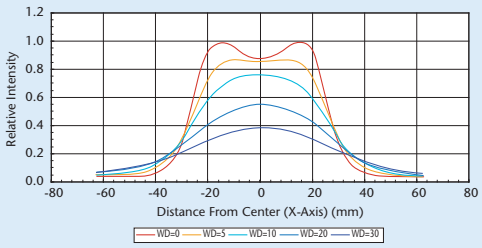


Light Distribution Characteristics

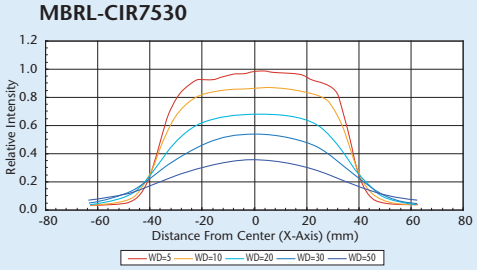
MDRL-CIR31



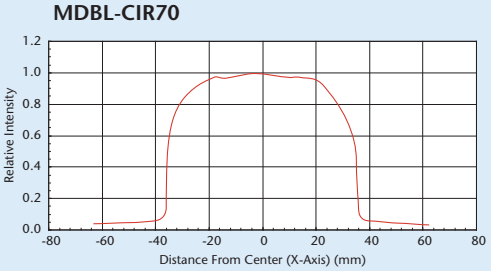
MSRL-CIR20



MBRL-CIR7530



MDBL-CIR70



UV Illumination

UV Series

*Image of illumination condition

- Provides image recognition at high contrast levels especially for images that are difficult to recognize with visible light
- Can be used for fluorescence applications
- Use with a UV light range CCD camera.
- Effective in detection of dirt on glass substrates and dust on CCD elements
- The peak wavelength is 365nm. (MCEL-CUV8-405 and MBRL-CUV7530-405 are 405nm)

Explanation of Model Code

M □ L – C UV □

- Configuration
- Luminescent Color (UV)
- See Explanation for Each Series

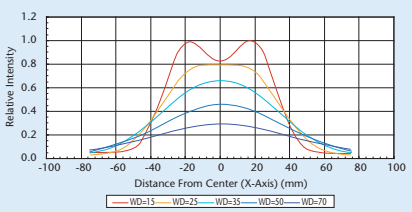
DR Direct Ring
BR Bar
DQ Square Oblique
CE Coaxial

Model	Emitted Color	Maximum Rated Current IFM(A)	Internal Diameter (mm)	External Diameter (mm)	Weight (g)	Product Code
MDRL-CUV31	UV	0.36	ø31	ø66	130	A-2262
MBRL-CUV7530	UV	0.36	75×30 (Lighting area dimensions)		120	A-2263
★ MBRL-CUV7530-405	UV	0.52	75×30 (Lighting area dimensions)		120	A-2482
MDQL-CUV108	UV	0.36	□60	□108	210	A-2264
★ MCEL-CUV8-405	UV	0.03	—	ø8	35	A-2481

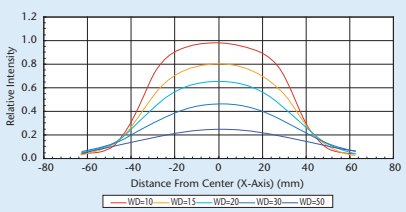
★Made-to-order products.

Light Distribution Characteristics

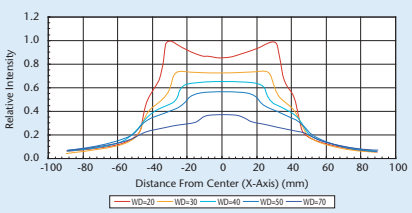
MDRL-CUV31



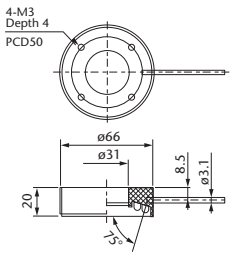
MBRL-CUV7530



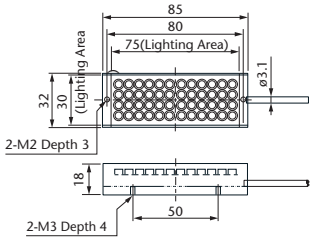
MDQL-CUV108



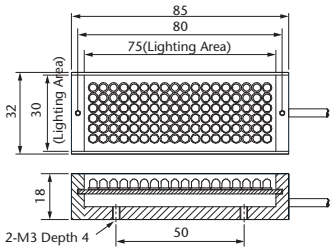
MDRL-CUV31



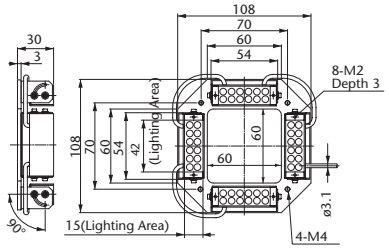
MBRL-CUV7530



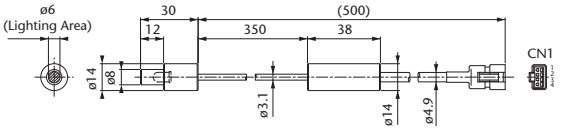
MBRL-CUV7530-405



MDQL-CUV108



MCEL-CUV8-405

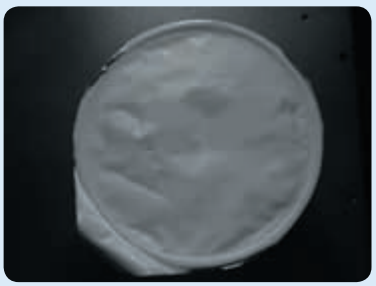


Sample Images

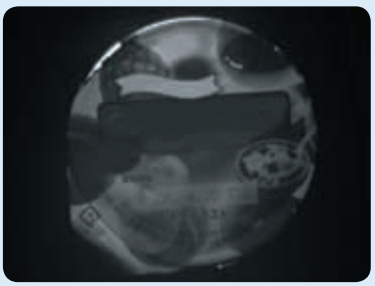
Yogurt Package

Color CCD with White LED

Visible, B/W CCD with White LED



IR-CCD with IR LED

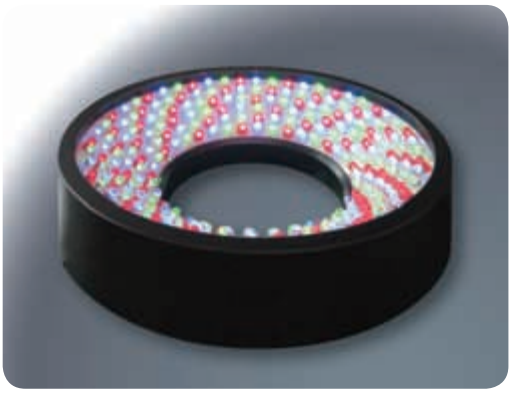


UV-CCD with UV LED

The print pattern not visible under IR can be seen clearly under UV

Variable Color RGB Illumination

RGB Series



- Multi-color edge type backlight, ring, and bar lights arranged with RGB LEDs in compact packages
- Capable of the individual control of each color (1 channel for each color)
- Optimum for ID inspection, experiment, and color filter inspection

Explanation of Model Code

M □ L-CRGB □ – 3CH

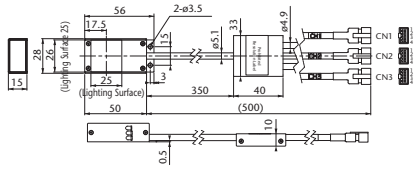
Configuration: EB Edge Type Backlights; DR Direct Ring; BR Bar

Lighting Area Dimensions (Length • Width)

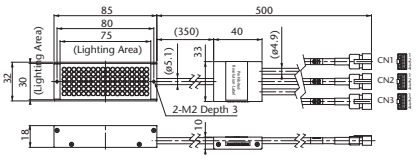
Model	Emitted Color	Maximum Rated Current IFM(A)	Internal Diameter (mm)	External Diameter (mm)	Lighting Angle	Weight (g)	Product Code
MEBL-CRGB25-3CH	RGB	R : 0.03 G : 0.04 B : 0.04	25x25 (Illumination area dimensions)		90°	80	A-2289
MEBL-CRGB10080-3CH	RGB	R : 0.28 G : 0.49 B : 0.49	100x80 (Illumination area dimensions)		90°	500	A-2396
★ MDRL-CRGB56-3CH	RGB	R : 0.25 G : 0.37 B : 0.37	ø56	ø120	55°	530	A-2483
★ MDRL-CRGB95-3CH	RGB	R : 0.29 G : 0.47 B : 0.47	ø95	ø140	60°	510	A-2484
★ MBRL-CRGB7530-3CH	RGB	R : 0.12 G : 0.18 B : 0.18	75x30 (Illumination area dimensions)		90°	140	A-2485

★Made-to-order products.

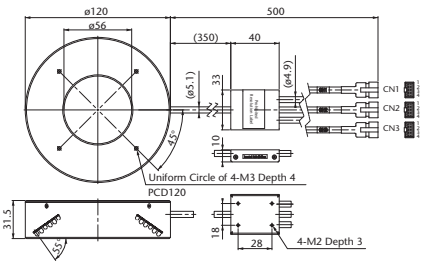
MEBL-CRGB25-3CH



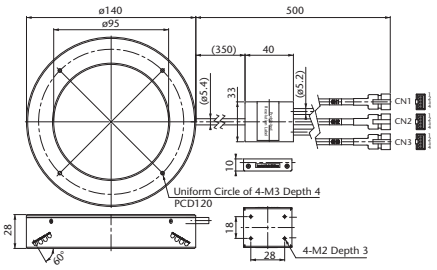
MBRL-CRGB7530-3CH



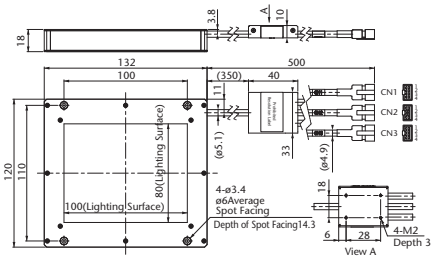
MDRL-CRGB56-3CH



MDRL-CRGB95-3CH

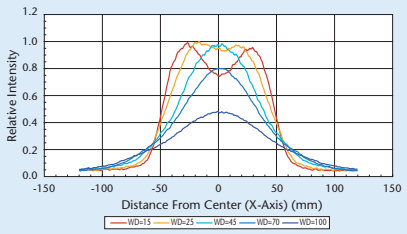


MEBL-CRGB10080-3CH

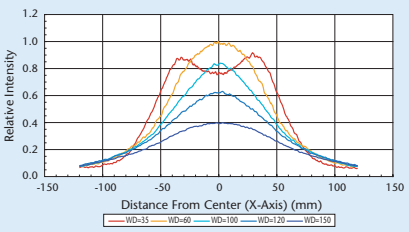


Light Distribution Characteristics

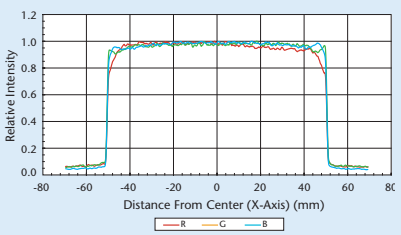
MDRL-CRGB56-3CH



MDRL-CRGB95-3CH



MEBL-CRGB10080-3CH



Diffuse Chip Type Bar Illumination

MBRC Series

- Highly uniform bar illumination using high brightness chip type LEDs
- The length of the emission area is in 150 mm units, and can be extended up to 1200 mm.
- Realization of a slim and lightweight compact design
- High brightness and high uniformity achieved by high density mounting of chip type LEDs

Explanation of Model Code

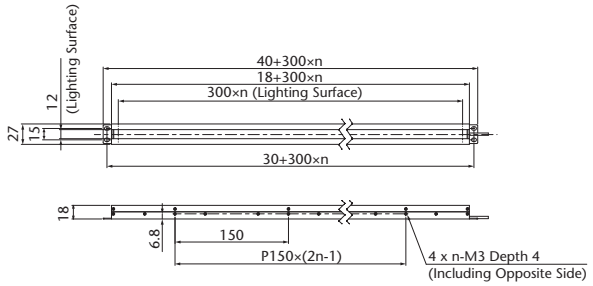
MBRC – C □ – □ – DF – □ CH

- MBRC: Chip LED
- C □: Emitted Color (R Red, B Blue, G Green, W White)
- □: Lighting Surface Dimensions (Length, Width)
- DF: Chip LED
- □ CH: Channel Number

Model	Emitted Color	Dimensions(mm)		Maximum Rated Current IFM(A)	Supported LED Controller	Weight (g)	Product Code
		Lighting Surface	External Dimension				
MBRC-CR15012-DF	Red	150	190	0.5	MLEK-A080	130	A-2370
★ MBRC-CG15012-DF	Green			0.55			A-2371
MBRC-CB15012-DF	Blue						A-2372
MBRC-CW15012-DF	White						A-2373
MBRC-CR30012-DF	Red	300	340	0.99	MLEK-A230	230	A-2374
★ MBRC-CG30012-DF	Green			1.1			A-2375
MBRC-CB30012-DF	Blue						A-2376
MBRC-CW30012-DF	White						A-2377
MBRC-CR60012-DF	Red	600	640	1.98		420	A-2378
★ MBRC-CG60012-DF	Green			2.2			A-2379
★ MBRC-CB60012-DF	Blue						A-2380
MBRC-CW60012-DF	White						A-2381
MBRC-CR90012-DF-2CH	Red	ch1 : 600 ch2 : 300	940	ch1 : 1.98 ch2 : 0.99	MLEK-D770	620	A-2382
★ MBRC-CG90012-DF-2CH	Green			ch1 : 2.2 ch2 : 1.1			A-2383
★ MBRC-CB90012-DF-2CH	Blue						A-2384
MBRC-CW90012-DF-2CH	White						A-2385
★ MBRC-CR120012-DF-2CH	Red	ch1 : 600 ch2 : 600	1240	ch1 : 1.98 ch2 : 1.98		810	A-2386
★ MBRC-CG120012-DF-2CH	Green			ch1 : 2.2 ch2 : 2.2			A-2387
★ MBRC-CB120012-DF-2CH	Blue						A-2388
★ MBRC-CW120012-DF-2CH	White						A-2389

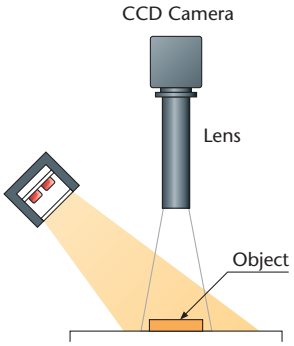
★Made-to-order products.

MBRC-CR(CG,CB,CW)**12-DF



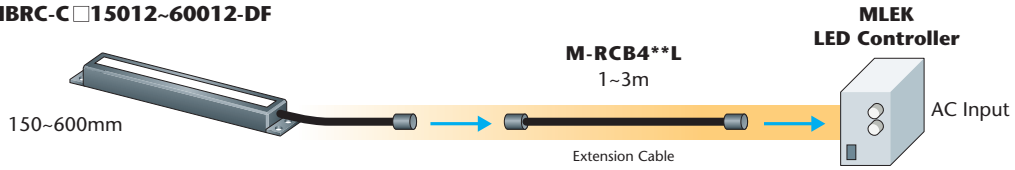
*Cables with 2 branches are required for lines with a length of 900mm or greater.

Illumination Structure

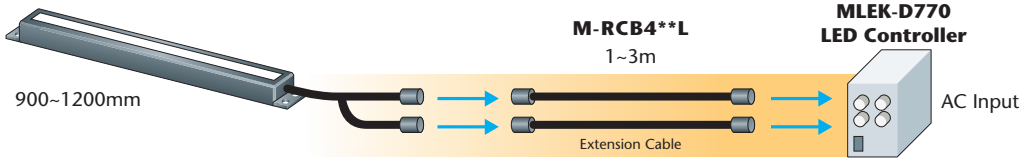


Illumination Structure

MBRC-C□15012~60012-DF

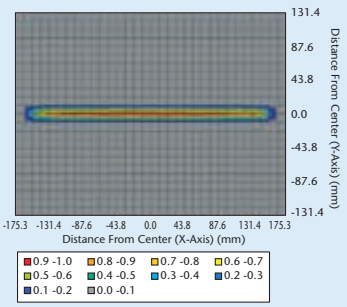


MBRC-C□90012~120012-DF

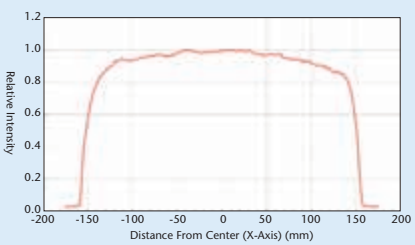


Light Distribution Characteristics

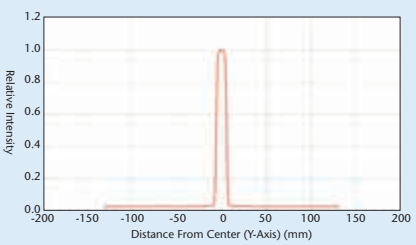
MBRC-CW30012-DF



Light Distribution for the X-axis (horizontal)



Light Distribution for the Y-axis (vertical)



NEW

High Brightness (HB) LED Light Line

SMT

These HB LED Light Lines provide extremely high brightness illumination (over 2M Lux) for challenging line scan and web inspection applications. The new SMT Light Line LED units, available in red or white wavelengths as standard, achieve high brightness lighting while maintaining high uniformity (+/-5%) in a slim, light-weight design. Air-cooling and water-cooling options are available to suit customers' needs.

Two variations are available, STD & RS, that are optimized for diffuse or reflective surfaces, respectively, to provide unparalleled uniformity and performance for even the most demanding applications. The modularity of the design allows lengths of 150 mm to 3,000 mm in increments of 150 mm.

- Ultra high-brightness: More than 2 mega lux *1
- High uniformity: +/-5% *2
- Slim and compact design
- Available lengths: 300 to 3,000mm in steps of 150mm

*1 The standard type with water-cooling
*2 Within a level flat illumination area of the reflective type

Aluminum slide frame (M6, up to 8mm depth) equipped on the slim chassis allows greater flexibility for mounting.

Electric control box part has 2-pin/5-pin LEMO connectors, LED indicators and an intensity adjustment device.

Light focusing can be optimized easily by turning the adjustment screw nut.

		Air-cooled	Water-cooled
Input Voltage		24 V DC ± 2 %	
Power Consumption	300 mm Module:	max. 72 W	max. 120 W
	450 mm Module:	max. 108 W	max. 180 W
Current	300 mm Module:	max. 3.0 A	max. 5.0 A
	450 mm Module:	max. 4.5 A	max. 7.5 A
Brightness		1300 klx (*1)	2100 klx (*2)
LED Color		White LEDs : Color temperature 5000 K to 5650 K	Red LEDs : 627nm
Storage Conditions		Temperature: + 5 °C ... + 35 °C Humidity: < 70 %	
Operating Conditions		Temperature: + 5 °C ... + 35 °C Humidity: < 70 %	no dust or oil saturated ventilation air
Approvals		CE and ETL according to Standard EN 61010, ROHS compliant	

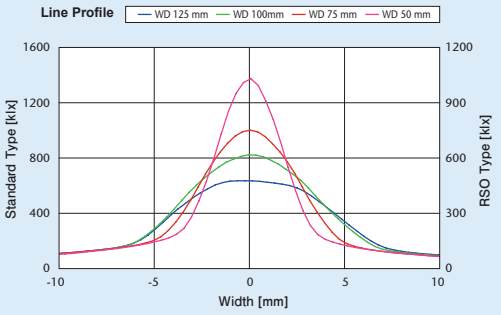
*1 Measured at the center of 300mm line illumination with the maximum 72W power at 50mm distance.
*2 Measured at the center of 300mm line illumination with the maximum 120W power at 50mm distance.

Length (mm)	Standard Type		Reflective Type	
	White LEDs	Red LEDs	White LEDs	Red LEDs
300	HB-LED-LL D300 WA*/W**	HB-LED-LL D300 RA*/W**	HB-LED-LL R300 WA*/W**	HB-LED-LL R300 RA*/W**
450	HB-LED-LL D450 WA*/W**	HB-LED-LL D450 RA*/W**	HB-LED-LL R450 WA*/W**	HB-LED-LL R450 RA*/W**
600	HB-LED-LL D600 WA*/W**	HB-LED-LL D600 RA*/W**	HB-LED-LL R600 WA*/W**	HB-LED-LL R600 RA*/W**
750	HB-LED-LL D750 WA*/W**	HB-LED-LL D750 RA*/W**	HB-LED-LL R750 WA*/W**	HB-LED-LL R750 RA*/W**
900	HB-LED-LL D900 WA*/W**	HB-LED-LL D900 RA*/W**	HB-LED-LL R900 WA*/W**	HB-LED-LL R900 RA*/W**
1050	HB-LED-LL D1050 WA*/W**	HB-LED-LL D1050 RA*/W**	HB-LED-LL R1050 WA*/W**	HB-LED-LL R1050 RA*/W**
1200	HB-LED-LL D1200 WA*/W**	HB-LED-LL D1200 RA*/W**	HB-LED-LL R1200 WA*/W**	HB-LED-LL R1200 RA*/W**
1350	HB-LED-LL D1350 WA*/W**	HB-LED-LL D1350 RA*/W**	HB-LED-LL R1350 WA*/W**	HB-LED-LL R1350 RA*/W**
1500	HB-LED-LL D1500 WA*/W**	HB-LED-LL D1500 RA*/W**	HB-LED-LL R1500 WA*/W**	HB-LED-LL R1500 RA*/W**
1650	HB-LED-LL D1650 WA*/W**	HB-LED-LL D1650 RA*/W**	HB-LED-LL R1650 WA*/W**	HB-LED-LL R1650 RA*/W**
1800	HB-LED-LL D1800 WA*/W**	HB-LED-LL D1800 RA*/W**	HB-LED-LL R1800 WA*/W**	HB-LED-LL R1800 RA*/W**
1950	HB-LED-LL D1950 WA*/W**	HB-LED-LL D1950 RA*/W**	HB-LED-LL R1950 WA*/W**	HB-LED-LL R1950 RA*/W**
2100	HB-LED-LL D2100 WA*/W**	HB-LED-LL D2100 RA*/W**	HB-LED-LL R2100 WA*/W**	HB-LED-LL R2100 RA*/W**
2250	HB-LED-LL D2250 WA*/W**	HB-LED-LL D2250 RA*/W**	HB-LED-LL R2250 WA*/W**	HB-LED-LL R2250 RA*/W**
2400	HB-LED-LL D2400 WA*/W**	HB-LED-LL D2400 RA*/W**	HB-LED-LL R2400 WA*/W**	HB-LED-LL R2400 RA*/W**
2550	HB-LED-LL D2550 WA*/W**	HB-LED-LL D2550 RA*/W**	HB-LED-LL R2550 WA*/W**	HB-LED-LL R2550 RA*/W**
2700	HB-LED-LL D2700 WA*/W**	HB-LED-LL D2700 RA*/W**	HB-LED-LL R2700 WA*/W**	HB-LED-LL R2700 RA*/W**
2850	HB-LED-LL D2850 WA*/W**	HB-LED-LL D2850 RA*/W**	HB-LED-LL R2850 WA*/W**	HB-LED-LL R2850 RA*/W**
3000	HB-LED-LL D3000 WA*/W**	HB-LED-LL D3000 RA*/W**	HB-LED-LL R3000 WA*/W**	HB-LED-LL R3000 RA*/W**

*Air-cooled **Water-cooled (Made-to-order)

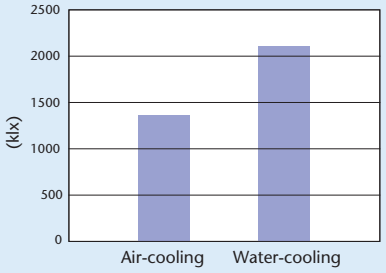
Line Profile Characteristics at Different WDs

Left: Standard type / Right: Reflective type



Intensity Comparison Between Cooling Methods

(WD = 50mm)



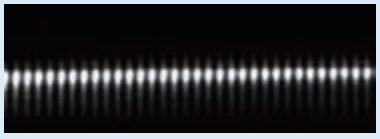
Standard Type
(For objects with diffusing surface)

Ultra high-intensity made possible by direct illumination of LED with condenser lens.

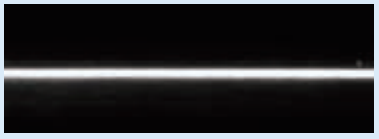
Reflective Type
(For objects with specular surface)

Superb uniformity even in high intensity illumination with the best combination of condenser lens and diffusing sheet.

Images of Reflective Surface



Standard type
(For objects with diffusing surface)



Reflective type
(For objects with specular surface)

High Brightness (HB) LED Light Line

MLNX Series

MLNX-DF

- High brightness line illumination using high power LEDs
- The length of the emission area is in 120 mm increments, and can be extended up to 2880 mm.
- Optical technology that has gained a reputation for excellence in fiber line light products
- Illumination units from 120 to 720 mm can be combined and used with the MLEK Series LED controller, reducing costs even further.
- Illumination units longer than 840mm can be extended to the limit of 2880mm with the supported LED controllers.

Explanation of Model Code

MLNX – C □ □ – DF – □ CH

- Emitted Color: R Red, G Green, B Blue, W White
- Line Length
- Number of Channels

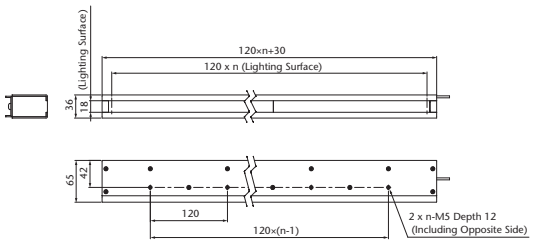
Model	Emitted Color	Dimensions(mm)		Maximum Rated Current IFM(A)	Supported LED Controller	Weight (g)	Product Code
		Lighting Surface	External Dimension				
★ MLNX-CR120-DF	Red	120	150	0.47	MLEK-A080	540	A-2346
★ MLNX-CG120-DF	Green			0.8			A-2347
★ MLNX-CB120-DF	Blue						A-2348
★ MLNX-CW120-DF	White						A-2349
★ MLNX-CR240-DF	Red	240	270	0.93	MLEK-A230	870	A-2350
★ MLNX-CG240-DF	Green			1.59			A-2351
★ MLNX-CB240-DF	Blue						A-2352
★ MLNX-CW240-DF	White						A-2353
★ MLNX-CR360-DF	Red	360	390	1.39		1300	A-2354
★ MLNX-CG360-DF	Green			2.3			A-2355
★ MLNX-CB360-DF	Blue						A-2356
★ MLNX-CW360-DF	White						A-2357
★ MLNX-CR480-DF	Red	480	510	1.85	MLEK-A230	1700	A-2358
★ MLNX-CG480-DF-2CH	Green	ch1 : 240 ch2 : 240		ch1 : 1.59ch2 : 1.59	MLEK-D770		A-2359
★ MLNX-CB480-DF-2CH	Blue						A-2360
★ MLNX-CW480-DF-2CH	White						A-2361
★ MLNX-CR600-DF	Red	600	630	2.3	MLEK-A230	2000	A-2362
★ MLNX-CG600-DF-2CH	Green	ch1 : 240 ch2 : 360		ch1 : 1.59 ch2 : 2.3	MLEK-D770	2100	A-2363
★ MLNX-CB600-DF-2CH	Blue						A-2364
★ MLNX-CW600-DF-2CH	White						A-2365
★ MLNX-CR720-DF-2CH	Red	ch1 : 360 ch2 : 360	750	ch1 : 1.39 ch2 : 1.39		2400	A-2366
★ MLNX-CG720-DF-2CH	Green			ch1 : 2.3 ch2 : 2.3			A-2367
★ MLNX-CB720-DF-2CH	Blue						A-2368
★ MLNX-CW720-DF-2CH	White						A-2369

★Made-to-order products.

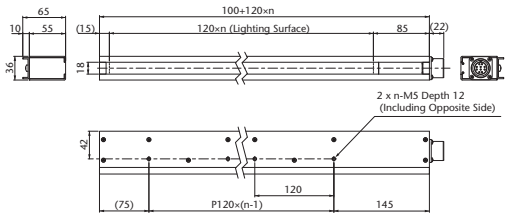
*Illumination units longer than 840mm can be produced and manufactured with the specifications for 1 channel with the use of supported LED controllers (in 120mm increments, 2880mm limit). See P.i-87 for details.

MLNX-CR(CG,CB,CW)* *-DF

Line Length : ~720mm

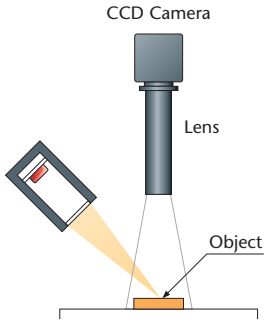


Line Length : 840mm~2880mm



1) represents number of LED Panels. 1 LED Panel is 7-24 Sheets

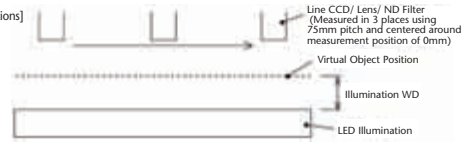
Illumination Structure



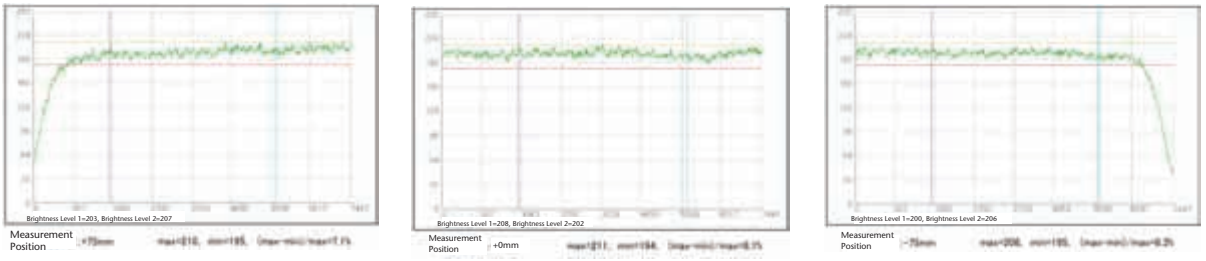
Uniform Measurement of High Wattage LED

[Product Name] **MLNX-C□240-DF**
[Measuring Equipment] Exclusive Measuring Equipment of MORITEX
Line Sensor : 7450bit / 4.7×4.7μm
Lens : ML-L047-200 (MORITEX) / ×0.47
ND Filter: Not Used
Lens WD: 198mm

[Measurement Conditions]



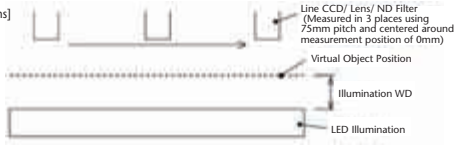
[Measurement Result: Illumination WD = 50mm]



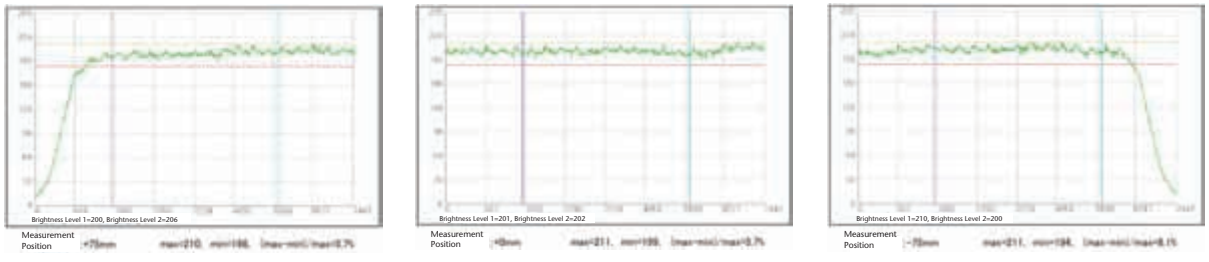
*Total Uniformity =211,min=194,(max-min)/max=8.1%

[Product Name] **MLNX-C□240-DF**
[Measuring Equipment]Exclusive Measuring Equipment of MORITEX
Line Sensor : 7450bit / 4.7×4.7μm
Lens : ML-L047-200 (MORITEX) / ×0.47
ND Filter: Not Used
Lens WD: 198mm

[Measurement Conditions]



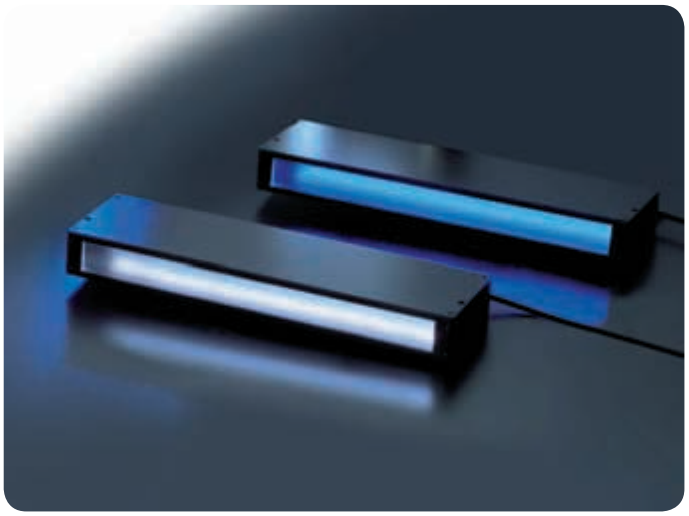
[Measurement Result: Illumination WD = 100mm]



*Total Uniformity max=211, min=194, (max-min)/max=8.1%

Line Illumination

MLNL Series



- These units are ideal for line type illumination and line scan CCD camera illumination.
- LED line position adjustable to change focus point

Model	Emitted Color	Maximum Rated Current IFM(A)	Line Length (mm)	Weight (g)	Product Code
MLNL-CR192	Red	0.18	192	420	A-2090
★ MLNL-CG192	Green	0.36	192		A-2161
MLNL-CB192	Blue	0.36	192		A-2092
MLNL-CW192	White	0.36	192		A-2091

★Made-to-order products.

Explanation of Model Code

MLNL-C □ □

□ Emitted Color: R Red, G Green, B Blue, W White

□ Line Length

Sample Images

MLNL-CW192

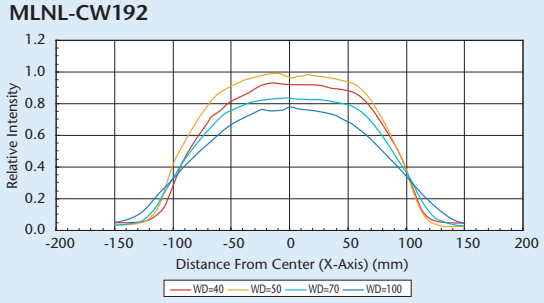
Connector

MLNL-CR192

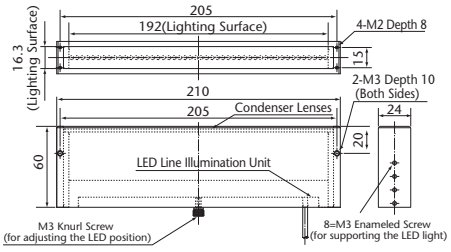
Transparent (Acrylic) Surface Scratch

Light Distribution Characteristics

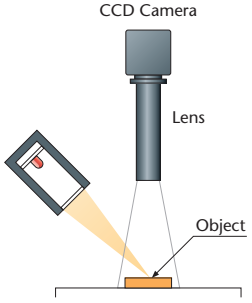
MLNL-CW192



MLNL-CR (CG,CB,CW) 192



Illumination Structure



IP67

LED Spot Projectors

MSPP Series

IP 67, ingress protection from dust and droplets, assures safe installation under harsh environments.

- For use in long working distance applications (up to 2m)
  - Can also be used at a short distance from inspection targets
  - Widens the operating range for robots and other automated tools
  - Can be installed to replace lights that produce large amounts of heat
- Structure allows for a variable illumination area range. Installation distance and lighting area can be adjusted easily.
- Two types offered for narrow and wide illumination areas
  - The illumination area range can be adjusted for each type.
- Ease of maintenance possible with glass cover replacement
- Use of of a versatile connector makes it possible to use cables which resist spatter.
- Low temperature emission and low energy consumption make it possible to reduce power usage and effects on the environment.

Explanation of Model Code

LED Spot Projectors

MSPP -C □ □

Emitted Color / Lighting Area Diameter

R Red **B** Blue

G Green **W** White

		Model	Emitted Color	Maximum Rated Current IFM (A)	Weight (g)	Product Code	Notes
Illumination Area (Wide Type)		**MSPP-CR42**	Red	0.7	460	A-2327	
	★	**MSPP-CG42**	Green	0.7	460	A-2328	
		MSPP-CB42	Blue	0.7	460	A-2329	
		MSPP-CW42	White	0.7	460	A-2330	
Replacement Cover Glass		**MGA-SP42**	—	—	—	A-9060	Illumination Option
Illumination Area (Narrow Type)		**MSPP-CR74**	Red	0.7	600	A-2342	
	★	**MSPP-CG74**	Green	0.7	600	A-2343	
		MSPP-CB74	Blue	0.7	600	A-2344	
		MSPP-CW74	White	0.7	600	A-2345	
Replacement Cover Glass		**MGA-SP74**	—	—	—	A-9061	Illumination Option
Extension Cable		**M-XS402C**	—	—	—	A-2336	L=2m (Waterproof)
		M-XS405C	—	—	—	A-2337	L=5m (Waterproof)
		M-XS410C	—	—	—	A-2338	L=10m (Waterproof)
MSPP-MLEP070 Replacement Cable		**M-RCB301XS**	—	—	—	A-2339	L=1m (Waterproof)
LED Controller		**MLEP-A070W1LR**	—	—	—	A-2314	Analog, 1Channel LED Controller
		MLEP-A070W3LR	—	—	—	A-2316	Analog, 3Channel LED Controller
		MLEP-A070W1LRD	—	—	—	A-2310	Digital, 1Channel LED Controller
		MLEP-A070W3LRD	—	—	—	A-2312	Digital , 3Channel LED Controller

See P.i-88~90 for details on LED controllers

★Made-to-order products.

MSPP-CR/G/B/W42

Wide Area Illumination Type

Wide lighting area range and uniformity

WD 2m····· ø300~800mm

WD 1m····· ø170~400mm

WD 0.5m····· ø80~230mm

(Tested Product: MSPP-CR42)

MSPP-CR/G/B/W74

Narrow Area Illumination Type

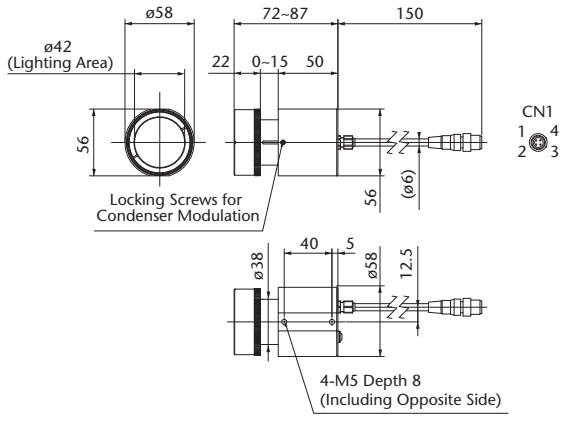
Amazing brightness

WD 2m At ø80mm·····2,000Lx

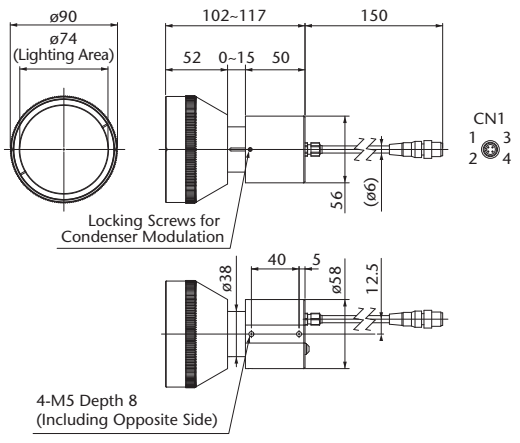
WD 2m At ø200mm·····Approximately 800 Lx

(Tested Product: MSPP-CW74)

MSPP-CR (CG,CB,CW) 42



MSPP-CR (CG,CB,CW) 74



Intensity and Lighting Area Range *Reference Values

MSPP-CR42

WD	Lighting Area Range	Intensity
500	80~230	3790~754
1000	170~400	1070~207
1500	240~600	493~101
2000	300~800	290~57

MSPP-CR74

WD	Lighting Area Range	Intensity
500	30~130	8400~1760
1000	70~210	3020~580
1500	110~250	1380~260
2000	150~380	810~160

MSPP-CW42

WD	Lighting Area Range	Intensity
500	80~220	8700~1400
1000	100~470	2350~330
1500	150~680	1046~150
2000	200~1000	583~50

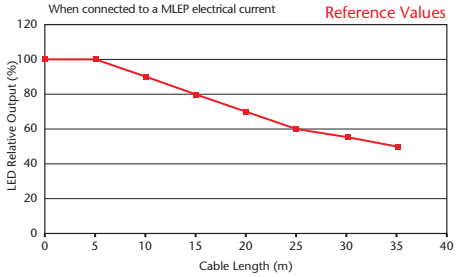
MSPP-CW74

WD	Lighting Area Range	Intensity
500	35~100	15700~2600
1000	50~190	7600~840
1500	75~300	3300~390
2000	200~1000	2080~240

*Illumination Area Range is 50% or greater for the maximum intensity

Relation Between Cable Length and Intensity

Affect of cable length on LED output

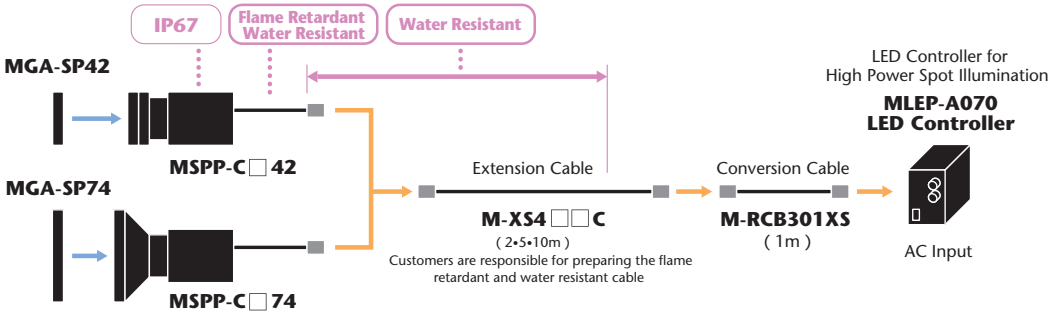


IP67 Leak Test

IP (Ingress Protection) is a set of standard measurements related to the protection of products from solid foreign objects and water. IP is prescribed by the Japanese Industrial Standards Committee (JISC0920) and the International Organization for Standardization (IEC60529).
IP67 classification refers to a level of ingress protection for enclosures, to provide complete no ingress of dust and water under conditions of immersion at depth of 1m for 30 minutes.

With regard to the condition of 30 minutes in a depth of 1 meter of water, a total inspection was performed for the presence of leaks by using an air pressure of 0.05 MPa for 30 seconds. 0.5 MPa is approximately twice the required condition

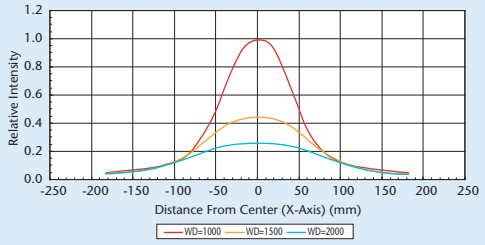
MSPP Illumination System Connection Flow



Light Distribution Characteristics (Measured In Condensed Condition)

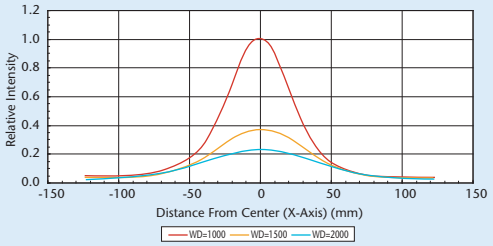
MSPP-CW42

Light Distribution for the X-axis (horizontal)



MSPP-CW74

Light Distribution for the X-axis (horizontal)



High Power LED Spot Illumination and Coaxial Illuminatuion

MCEP/MCEC/MCEL Series

4 product series ranging in level of intensity from the MCEP-070 Series to MCEL Series are available for customers diverse needs. The wide variety of choices can be used for applications requiring coaxial illumination (eg. MML Series) or spot illumination.

Ultra high intensity

High intensity

MCEP 070 Series

- Enhanced luminance efficiency through MORITEX's unique heat dissipation structure (design registered).
- 1.35x higher illumination intensity compared to conventional models.
- Newly-developed collimator and light guiding rod satisfy both high performance and high uniformity.

MCEP Series

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

MCEC Series

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

MCEL Series

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

Explanation of Model Code

High Power LED Spot Illumination

MCEP - C □ **8** — □

- Power LED
- Emitted Color: **R** Red, **B** Blue, **G** Green, **W** White
- Value for Maximum Rated Electrical Current: (blank) 0.35A, **070** 0.7A

Coaxial Illuminatuion

MCEC-C □ **8**

- Chip-Type
- Emitted Color: **R** Red, **B** Blue, **G** Green, **W** White

Coaxial Illuminatuion

MCEL-C □ **8**

- Discreet Type
- Emitted Color: **R** Red, **B** Blue, **G** Green, **W** White

High Power LED Spot Illumination

Model	Emitted Color	Dominant Wavelength Range*	Color Temperature	Maximum Rated Current IFM(A)	Weight (g)	LED Controller	Connector PIN	Product Code
MCEP-CR8-070	Red	620.5~645nm	—	0.7	45	MLEP-A070	3 PIN	A-2323
MCEP-CG8-070	Green	520~550nm	—	0.7	45	MLEP-A070	3 PIN	A-2324
MCEP-CB8-070	Blue	460~490nm	—	0.7	45	MLEP-A070	3 PIN	A-2325
MCEP-CW8-070	White	—	4500~10000K	0.7	45	MLEP-A070	3 PIN	A-2326
MCEP-CW8-070-2	White	—	5350~7500K	0.7	45	MLEP-A070	3 PIN	A-2404

* Wavelength of visible light on CIE chromatic coordinates.

Model	Emitted Color	Dominant Wavelength Range*	Color Temperature	Maximum Rated Current IFM(A)	Weight (g)	LED Controller	Connector PIN	Product Code
MCEP-CR8	Red	620.5~645nm	—	0.35	50	MLEP-A035	3 PIN	A-2111
MCEP-CG8	Green	520~550nm	—	0.35	50	MLEP-A035	3 PIN	A-2115
MCEP-CB8	Blue	460~490nm	—	0.35	50	MLEP-A035	3 PIN	A-2113
MCEP-CW8	White	—	4500~10000K	0.35	50	MLEP-A035	3 PIN	A-2112

* Wavelength of visible light on CIE chromatic coordinates.

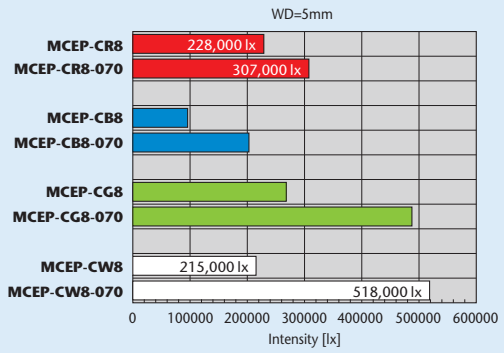
Coaxial Illuminatuion

Model	Emitted Color	External Diameter(mm)	Maximum Rated Current IFM(A)	Weight(g)	LED Controller	Connector Pin	Product Code
MCEC-CR8	Red	ø8	0.14	35	MLEK-A080	4 PIN	A-2319
MCEC-CG8	Green	ø8	0.17	35	MLEK-A080	4 PIN	A-2320
MCEC-CB8	Blue	ø8	0.17	35	MLEK-A080	4 PIN	A-2321
MCEC-CW8	White	ø8	0.17	35	MLEK-A080	4 PIN	A-2322

Model	Emitted Color	External Diameter(mm)	Maximum Rated Current IFM(A)	Weight(g)	LED Controller	Connector PIN	Product Code
MCEL-CR8	Red	ø8	0.04	35	MLEK-A080	4 PIN	A-2108
MCEL-CG8	Green	ø8	0.03	35	MLEK-A080	4 PIN	A-2142
MCEL-CB8	Blue	ø8	0.03	35	MLEK-A080	4 PIN	A-2110
MCEL-CW8	White	ø8	0.03	35	MLEK-A080	4 PIN	A-2109

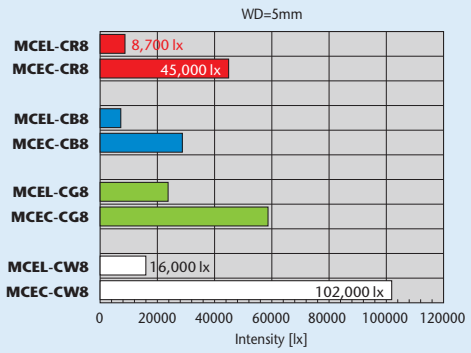
Intensity Comparison Data

High Power LED Spot Illumination

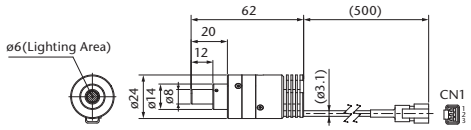


Intensity Comparison Data

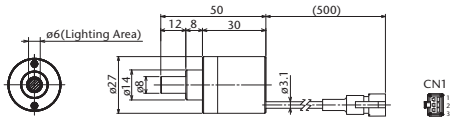
Coaxial Illuminatuion



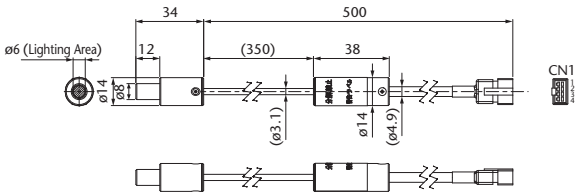
MCEP-C□8-070 / 070-2



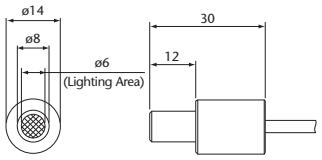
MCEP-CR (CG,CB,CW) 8



MCEC-CR (CG,CB,CW) 8



MCEL-CR (CG,CB,CW) 8



LED Controller

LED Controller for MCEP-070
MLEP-A070

(See P.i-90)

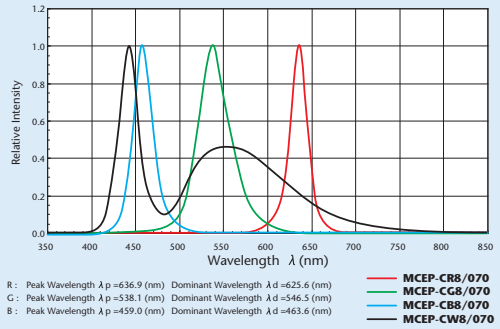
LED Controller for MCEP
MLEP-A035

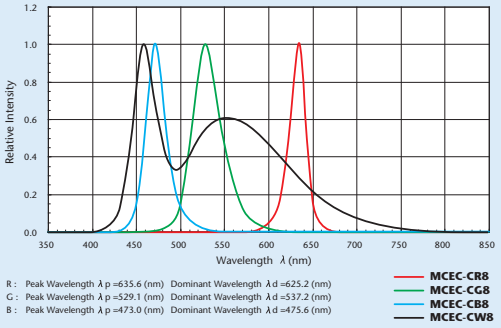
(See P.i-88)

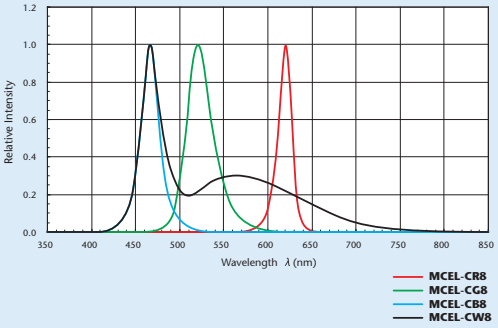
LED Controller for MCEC/MCEL
MLEK-A080

(See P.i-82)

Spectral Characteristic Data

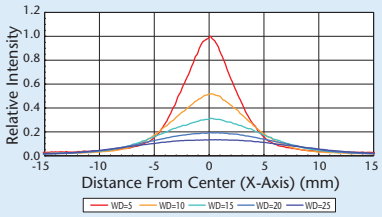




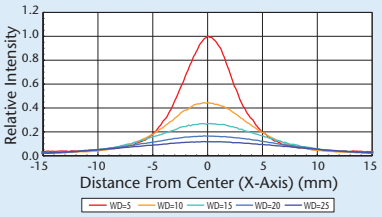


Light Distribution Characteristics

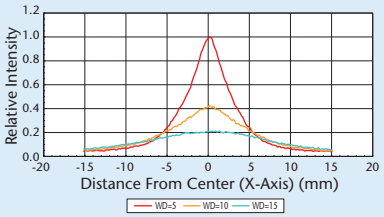
MCEP-CW8-070



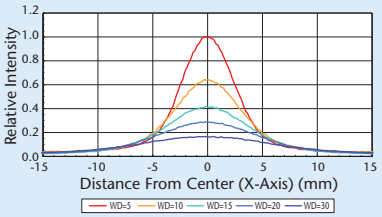
MCEP-CW8



MCEC-CW8

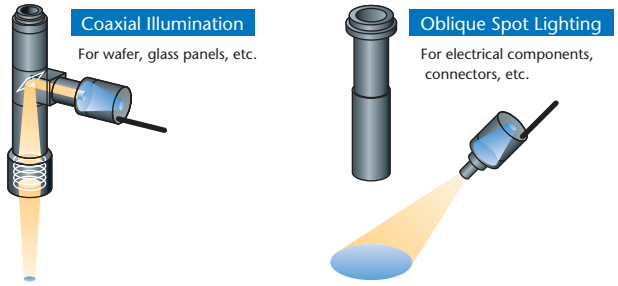


MCEL-CW8

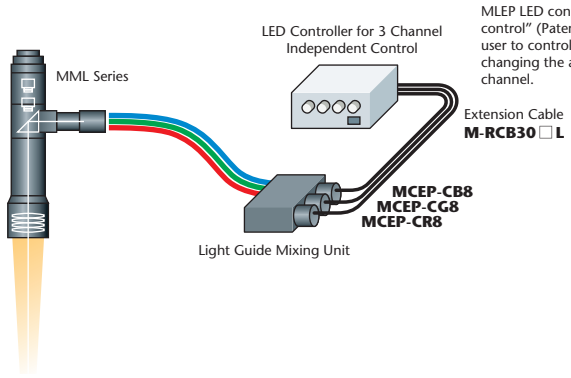


Use the MML Series for the optimal matching of high power LED spot LED illumination (MCEP Series) and a lens with coaxial incident illumination.
A lineup of 47 types of telecentric optical systems with low image distortion offer a variety of supportednumber of pixels, magnifications, widths, and camera mounts (only with coaxial incidence function)
An unparalleled variety of other illumination and lens products, along with technological know-how, is available to solve any problems that our customers may have.

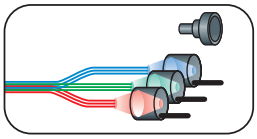
Typical Applications of the MCEP Series



Configuration and Example Application



MLEP LED controllers have "Integrated combination control" (Patent registered) function that enables user to control the overall lighting intensity without changing the adjusted intensity level of each color channel.

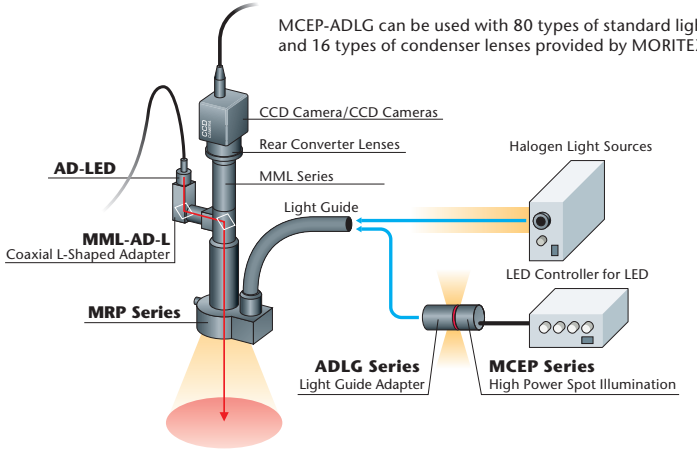


Optic Fibers Are Mixed Randomly Based On Random Numbers Enabling Uniform Illumination

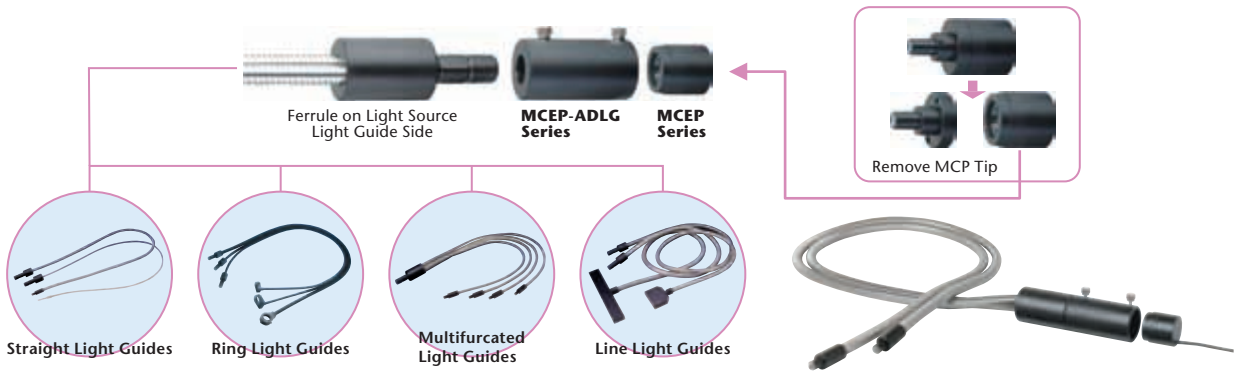
Example Application

Connection Diagram

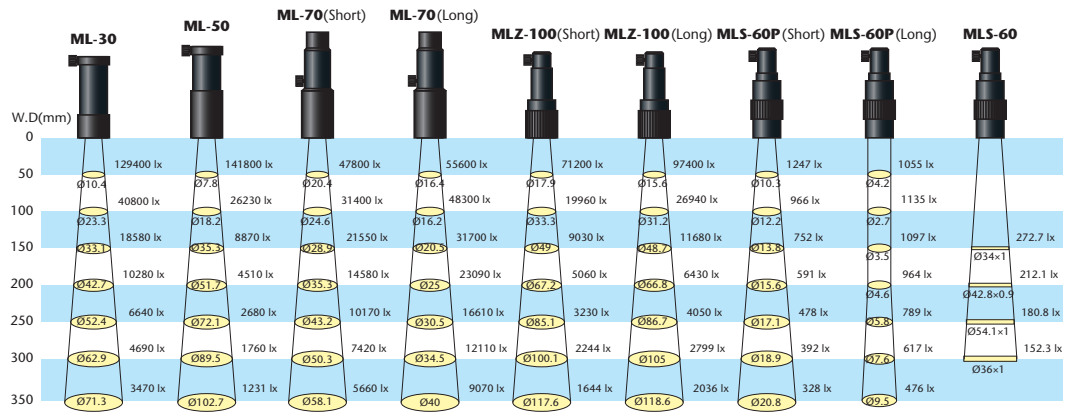
MCEP-ADLG can be used with 80 types of standard light guides and 16 types of condenser lenses provided by MORITEX.



Connection Diagram with Light Guide



Condenser Lenses for Spot Illumination



*Measurement values for ML-70, MLZ100, and MLS60P at longest and shortest lens length
*Measurement values for MLS-60 in condensed condition

*Measurement illumination is MCEP-CW8-070

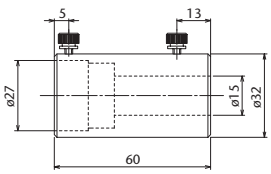
Fiber Connection Options

The MCEP Series can be connected with an optical fiber light guide and used as a small light source.
A small amount of light loss and high illuminance is achieved thanks to the use of MORITEX's optical fiber technology, which allows for the efficient introduction of light to the light guide.
The multi-adapter unit supports all types of standard light guides manufactured by MORITEX.

For use with MCEP-C□8

MCEP-ADLG

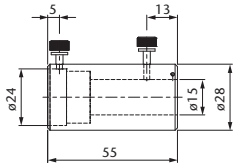
Light Guide Adapter



For use with MCEP-C□8-070

MCEP-ADLG24

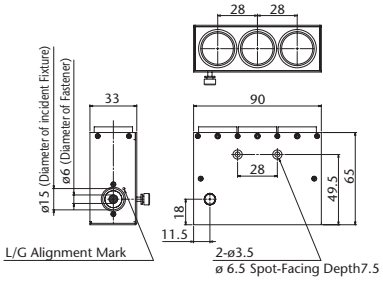
Light Guide Adapter



For use with both MCEP-C□8, MCEP-C□8-070

MCEP-AD3LGC

Light Guide Mixing Unit



Model	Type	Weight(g)	Product Code
MCEP-ADLG	1 Light Type	85	A-9001
MCEP-ADLG24	1 Light Type	60	A-9069
MCEP-AD3LGC	3 Light Type	270	A-9070

*Remove adapter from insertion area of illumination equipment when using MCEP-C□8

Analog Digital 1ch 2ch RoHS CE

LED Controllers for MG-Wave Series

MLEK Series

Constant current LED controller designed for all MG-Wave LEDs (except for the MCEP Series). As part of an initiative to address environmental issues, this model was designed in compliance with the Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS directive) to be introduced in Europe in July 2006.

Supports up to TOTAL 0.8A

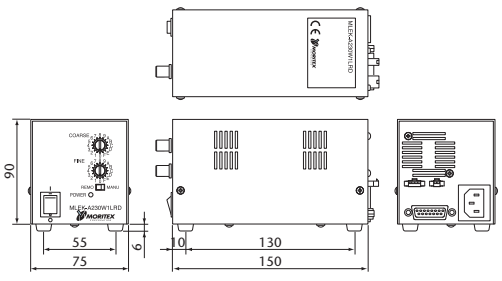
A080W Analog Series
A080W Digital Series

Supports up to TOTAL 2.3A

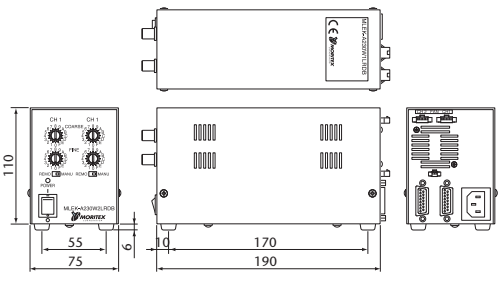
A230W Analog Series
A230W Digital Series

- 1 channel & 2 channel versions available in both analog and digital (8-bit, 256 level) external intensity control models
- Supports universal voltage input (100 to 240V AC) and is both RoHS compliant and CE marked.

MLEK-A080W1LR / 1LRD
MLEK-A230W1LR / 1LRD



MLEK-A080W2LR / 2LRD
MLEK-A230W2LR / 2LRDB



A080W Analog Series

Model	MLEK-A080W1LR		MLEK-A080W2LR	
Order Code	MLEK-A080W1LR-100V	MLEK-A080W1LR-200V	MLEK-A080W2LR-100V	MLEK-A080W2LR-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 0.8A (Connects to all lights except MCEP Series only)		2 channel output max. 0.8A for each channel/ Total max. 0.8A (Connects to all lights except MCEP Series only)	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.3/0.15A (At AC100/ 240V)		0.3/0.15A (At AC100/ 240V)	
Surge Current	15A or less (at AC100V) 35A or less (at AC 240V)		15A or less (at AC100V) 35A or less (at AC 240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (0-5V intensity control)		Yes (0-5V intensity control)	
Output ON/OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulaation type)	
Error Output	Yes(Photo-coupler insulation, control error)		Yes(Photo-coupler insulation, control error)	
Cooling System	Natural cooling by air		Natural cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	Approximately 1kg		Approximately 1.3kg	
product code	A-2300	A-2301	A-2302	A-2303

A080W Digital Series

Model	MLEK-A080W1LRD		MLEK-A080W2LRD	
Order Code	MLEK-A080W1LRD-100V	MLEK-A080W1LRD-200V	MLEK-A080W2LRD-100V	MLEK-A080W2RD-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 0.8A (Connects to all lights except MCEP Series only)		2 channel output max. 0.8A for each channel/ Total max. 0.8A (Connects to all lights except MCEP Series only)	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.3/ 0.15A (at AC100V/ 240V)		0.3/ 0.15A (at AC100V/ 240V)	
Surge Current	15A or less (at AC100V) 35A or less (at AC240V)		15A or less (at AC100V) 35A or less (at AC240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (8-bit digital)		Yes (8-bit digital for each independent channel)	
Output ON/OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Error Output	Yes (Photo-coupler insulation, control error)		Yes(Photo-coupler insulation, control error)	
Cooling System	Natural cooling by air		Natural cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	Approximately 1kg		Approximately 1.3kg	
Product Code	A-2231	A-2252	A-2232	A-2253

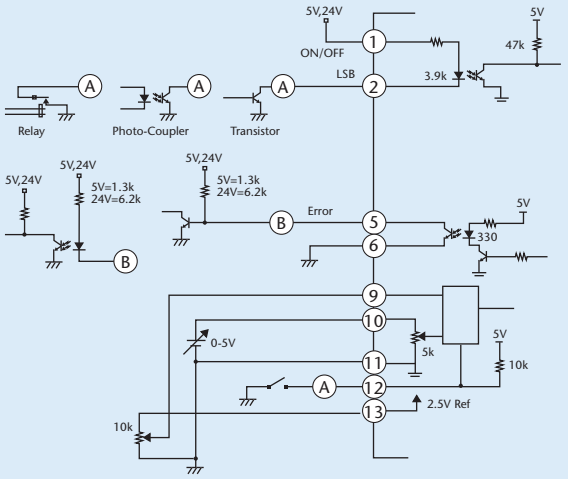
Connection Specifications

For the **MLEK-A080W1LR/2LR, MLEK-A230W1LR/2LR**

No.	Name	No.	Name
1	Output ON/ OFF signal +	9	External VR intensity control signal input
2	Output ON/ OFF signal -	10	External 0-5V analog intensity control signal input
3	NC	11	External Input GND
4	NC	12	External 0-5V/ External VR Input Switch
5	Control error signal (open collector)	13	DC2.5V/ Bias power output
6	Control error signal (open emitter)	14	NC
7	NC	15	NC
8	NC		

Input/Output Circuit Diagrams

With **MLEK-A080W1LR/2LR, MLEK-A230W1LR/2LR**



A230W Analog Series

Model	MLEK-A230W1LR		MLEK-A230W2LR	
Order Code	MLEK-A230W1LR-100V	MLEK-A230W1LR-200V	MLEK-A230W2LR-100V	MLEK-A230W2LR-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 2.3A (Connects to all lights except MCEP Series only)		2 channel output max. 2.3A for each channel/ Total max. 2.3A (Connects to all lights except MCEP Series only)	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.7/ 0.4A (at AC100/ 240V)		0.7/0.4A (at AC100/ 240V)	
Surge Current	15A or less (at AC100V) 30A or less (at AC240V)		15A or less (at AC100V) 30A or less (at AC240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (0-5V intensity control/ external VR intensity control		Yes (0-5V intensity control/ external VR intensity control	
Output ON/OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Error Output	Yes (Photo-coupler insulation, control error)		Yes (Photo-coupler insulation, control error)	
Cooling System	Forcible air cooling		Forcible air cooling	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	Approximately 1.1kg		Approximately 1.4kg	
Product Code	A-2304	A-2305	A-2306	A-2307

A230W Digital Series

Model	MLEK-A230W1LRD		MLEK-A230W2LRDB	
Order Code	MLEK-A230W1LRD-100V	MLEK-A230W1LRD-200V	MLEK-A230W2LRDB-100V	MLEK-A230W2LRDB-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 2.3A (Connects to all lights except MCEP Series only)		2 channel output max. 2.3A for each channel/ Total max. 2.3A (Connects to all lights except MCEP Series only)	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.7/ 0.4A (a AC100/ 240V)		0.7/ 0.4A (a AC100/ 240V)	
Surge Current	15A or less (at AC100V) 35A or less (at AC240V)		15A or less (at AC100V) 35A or less (at AC240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (8-bit digital)		Yes (8-bit digital for each independent channel)	
Output ON/OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Error Output	Yes (Photo-coupler insulation, control error)		Yes (Photo-coupler insulation, control error)	
Cooling System	Forcible cooling by air		Forcible cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	Approximately 1.1kg		Approximately 1.4kg	
Product Code	A-2233	A-2254	A-2234	A-2255

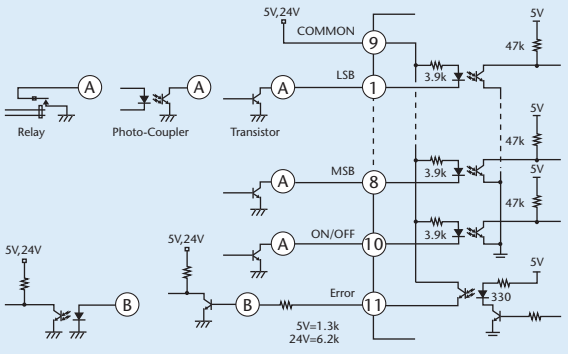
Connection Specifications

For the **MLEK-A080W1LRD/2LRD, MLEK-A230W1LRD/2LRD**

No.	Name	No.	Name
1	8-bit digital input 2^0 (LSB)	9	COMMON (+)
2	8-bit digital input 2^1	10	Output ON/ OFF signal (input)
3	8-bit digital input 2^2	11	Control error signal output
4	8-bit digital input 2^3	12	NC
5	8-bit digital input 2^4	13	NC
6	8-bit digital input 2^5	14	NC
7	8-bit digital input 2^6	15	NC
8	8-bit digital input 2^7 (MSB)		

Input/Output Circuit Diagrams

With **MLEK-A080W1LRD/2LRD, MLEK-A230W1LRD/2LRD**



Digital 4ch RoHS CE

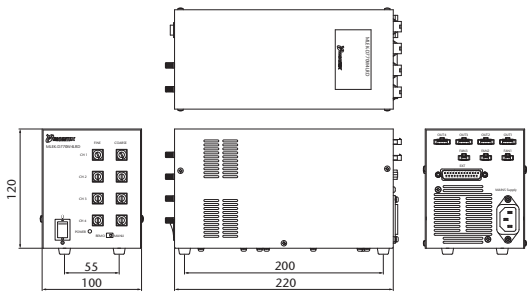
Supports up to TOTAL 7.7A

Multi Channel Series

- 4 independent channel digital controller
- External digital control with 10-bit, 1024 level capability
- Supports universal voltage input (100 to 240V AC) and is both RoHS compliant and CE marked.

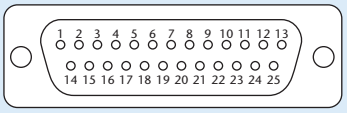
Model	MLEK-D770W4LRD	
Order Code	MLEK-D770W4LRD-100V	MLEK-D770W4LRD-200V
AC Type	100V	200V
Output	4 channel output CH1~CH3: 2.3A max. CH4: 0.8A max. Total max 7.7A (Connects to all lights except MCEP Series only)	
Input Voltage	AC100V-240V 50/60Hz	
Input Current	1.7/0.8A (at AC100/ 240V)	
Surge Current	18A or less (at AC100V) 41A or less (at AC230V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)	
Output System	DC Continuous output	
Output Control System	Constant current control (variable current)	
External Light Control	Yes (8-bit or 10-bit digital for each independent channel)	
Output ON/OFF Function	Yes (Photo-coupler insulation type)	
Error Output	Yes (Photo-coupler insulation, control error)	
Cooling System	Forcible cooling by air	
Installation	Rubber legs placed on flat surface	
Weight	Approximately 2kg	
Product Code	A-2235	A-2256

MLEK-D770W4LRD

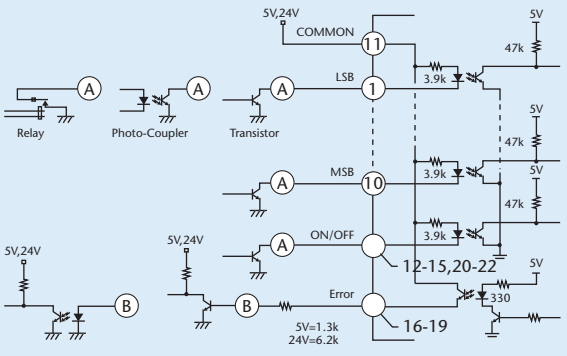


Connection Specifications

No.	Name	No.	Name
1	10-bit digital input 2^0 (10-bit/ LSB)	14	CH3 Output ON/ OFF signal (input)
2	10-bit digital input 2^1	15	CH4 Output ON/ OFF signal (input)
3	10-bit digital input 2^2 (8bit/LSB)	16	CH1 control error signal input
4	10-bit digital input 2^3	17	CH2 control error signal input
5	10-bit digital input 2^4	18	CH3 control error signal input
6	10-bit digital input 2^5	19	CH4 control error signal input
7	10-bit digital input 2^6	20	CH Select
8	10-bit digital input 2^7	21	CH Select
9	10-bit digital input 2^8	22	Write TRG
10	10-bit digital input 2^9 (MSB)	23	NC
11	COMMON (+)	24	NC
12	CH1 Output ON/ OFF signal (input)	25	NC
13	CH2 Output ON/ OFF signal (input)		



Input/Output Circuit Diagrams



Digital 2ch RoHS CE

High wattage Series

- High wattage LED controller with digital intensity control
- Supports universal voltage input (100 to 240V AC) and is both RoHS compliant and CE marked.
- 8-pin output connector is equipped to support high current lighting systems. A conversion cable is available for standard illumination products with 4-pin connectors. (See Note below)

Model	MLEK-A800W2LRD	
Order Code	MLEK-A800W2LRD-100V	MLEK-A800W2LRD-200V
AC Type	100V	200V
Output	2 channel output (Max. 4A for each channel)	
Input Voltage	AC100V-240V 50/60Hz	
Input Current	1.2/ 0.6A (at AC100/ 240V)	
Surge Current	18A or less (at AC100V) 41A or less (at AC230V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)	
Output System	DC Continuous output	
Output Control System	Constant current control (variable current)	
External Light Control	Yes (8-bit digital for each independent channel)	
Output ON/OFF Function	Yes (Photo-coupler insulation type)	
Error Output	Yes (Photo-coupler insulation, control error)	
Cooling System	Forcible cooling by air	
Installation	Rubber legs placed on flat surface	
Weight	Approximately 1.8kg	
Product Code	A-2308	A-2309

Note

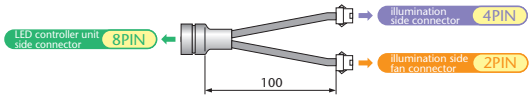
The specification for this LED Controller is an 8 PIN output.
Please use the following cable when using standard illuminations.
The specification for the large OEM illumination is designed for 8 PIN.

1. Common Matters and Notes

- For active illumination a conversion cable is essential when using connectors other than an 8 PIN.
- For illuminations with fans, the fan side connector (2 PIN) of the conversion cable must be connected.
- To extend the cable, use the appropriate extension cable for each connector.
  4 PIN extension cable for the illumination side: M-RCB4**L
  2 PIN extension cable for the fan side: M-RCB0**L
  *Complies with CE Marking to a limit of 2m.
  * **indicates a 2 digit length. (e.g. 01=1m, 02=2m, 03=3m)

2. M-RCB8R1LA (4 PIN)

- The following cable is essential when connecting MLEK-A Series illumination with the LED controller.
- Connect the 4 PIN connector of the illumination to the illumination side connector (4 PIN) of the conversion cable.

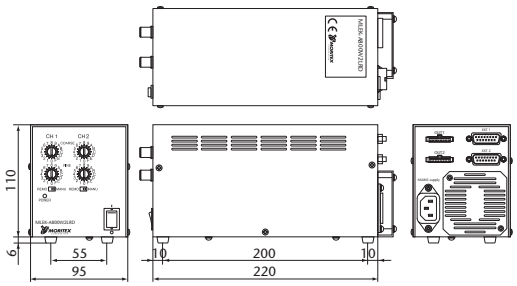


3. Other PIN numbers, etc.

- Only the illumination etc. of the 3 PIN illumination connector cannot be used.

Model	Product Code
M-RCB8R1LA	A-2397

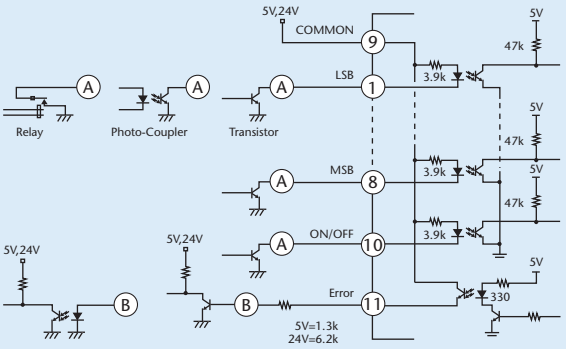
MLEK-A800W2LRD



Connection Specifications

No.	Name	No.	Name
1	8-bit digital input 2^0 (LSB)	9	COMMON (+)
2	8-bit digital input 2^1	10	Output ON/ OFF signal (input)
3	8-bit digital input 2^2	11	Control error signal output
4	8-bit digital input 2^3	12	NC
5	8-bit digital input 2^4	13	NC
6	8-bit digital input 2^5	14	NC
7	8-bit digital input 2^6	15	NC
8	8-bit digital input 2^7 (MSB)		

Input/Output Circuit Diagrams



LED Controller for MLNX Series

MLEX Series

- LED controller for long line LED illumination ranging from 840 to 2880mm (MLNX Series)
- External digital control with 8-bit, 256 level capability
- Supports universal voltage input (100 to 240V AC) and is both RoHS compliant and CE marked.

Model	MLEX-A600W1
Order Code	MLEX-A600W1-100V
AC Type	100V
Output	1 channel output
Input Voltage	AC100 - 240V 50/60Hz
Input Current	4.3/1.8A (At AC100/ 240V)
Surge Current	30A or less (at AC100V) 72A or less (at AC240V)
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)
Output System	DC Continuous Output
Output Control System	Constant Current Control
External Light Control	Yes (0-5V intensity control/ 8-bit digital)
Output ON/ OFF Function	Yes (Photo-coupler insulation type)
Cooling System	Forcible cooling by fan
Installation	Rubber legs placed on flat surface
Weight	Approximately 4Kg
Product Code	A-2399

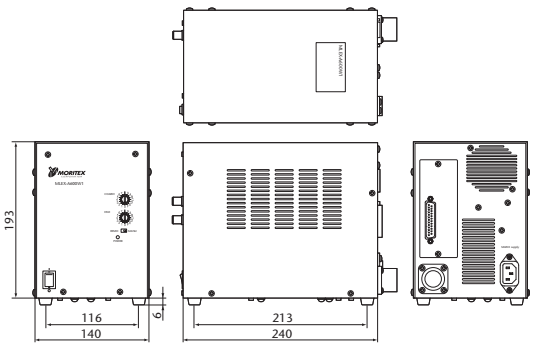
Note

LED controller for the MLNX-DF Series. Extension cable used exclusively with this LED controller

Model	Product Type	Applications	Length	Product Code
M-MS-A03T	Dedicated Extension Cable	MLNX-DF	3m	A-2401
M-MS-A05T	Dedicated Extension Cable	MLNX-DF	5m	A-2402
★ M-MS-A10T	Dedicated Extension Cable	MLNX-DF	10m	A-2403

★Made-to-order products.

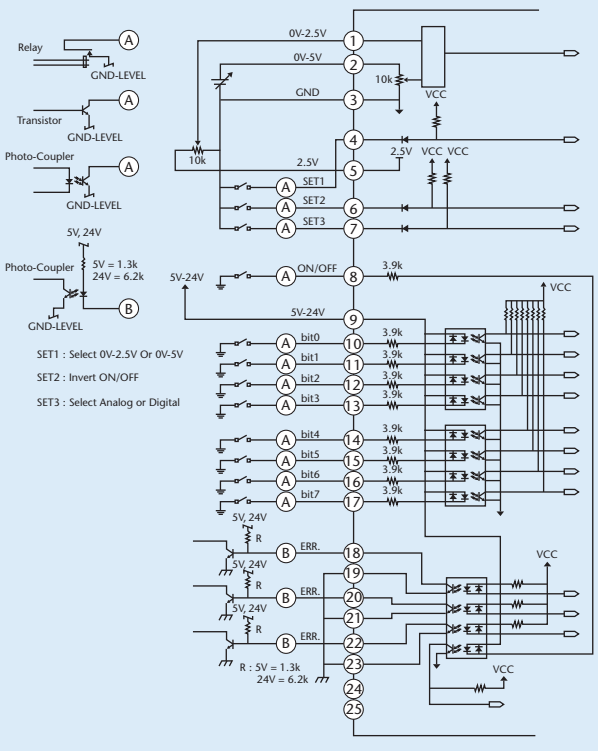
MLEX-A600W1



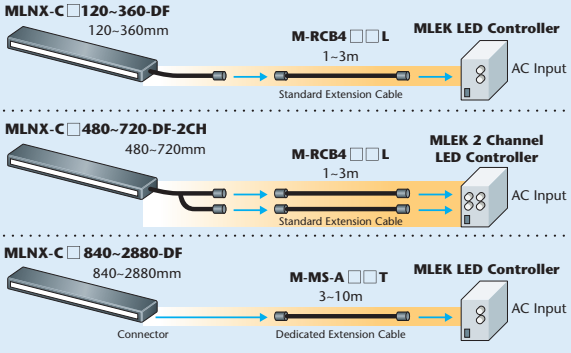
Connection Specifications

No.	Name	No.	Name
1	External VR Intensity Control Signal Input	14	Digital Signal Input bit4
2	External 0-5V Intensity Control Signal Input	15	Digital Signal Input bit5
3	External Input GND	16	Digital Signal Input bit6
4	External 0-5V/ External VR Input Switch Signal	17	Digital Signal Input bit7(MSB)
5	DC2.5V/ Bias Power Output	18	Overcurrent Error Signal Output (O.C.)
6	Illumination ON/OFF Logical Negation(not) Signal Input	19	Overcurrent Error Signal Output (O.E.)
7	External Analog/ Digital Switch Signal	20	Lighting Signal Output (O.C.)
8	Illumination ON/ OFF Signal Input	21	Lighting Signal Output (O.E.)
9	COMMON	22	Overheat Error Signal Output(O.C.)
10	Digital Signal Input bit0 (LSB)	23	Overheat Error Signal Output (O.E.)
11	Digital Signal Input bit1	24	NC
12	Digital Signal Input bit2	25	NC
13	Digital Signal Input bit3		

Input/Output Circuit Diagrams



Connection Flow



Note : MLNX-□□-DF white models of length 840 to 2880mm are CE compliant when used with 10m cable.

Analog Digital 1ch 3ch RoHS CE

LED Controllers for MCEP/MSPP Series

MLEP Series

Completed Patent Registration

Supports up to TOTAL 0.35A *for MCEP-C□8 Series*

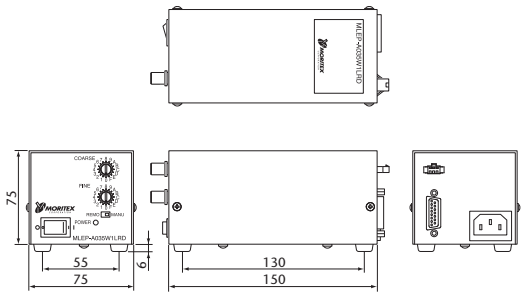
A035W Analog Series
A035W Digital Series

Supports up to TOTAL 0.70A *for MCEP-C□8-070/MSPP Series*

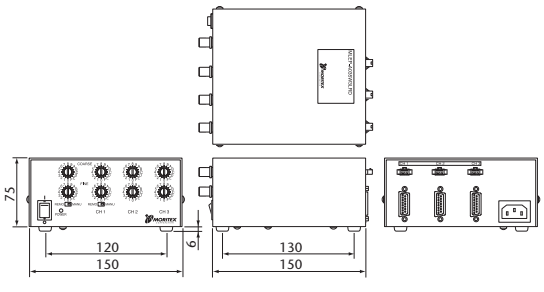
A070W Analog Series
A070W Digital Series

- LED controllers exclusively for the MCEP/MSPP Series. Choices are analog and digital intensity controls with universal voltage input (100 to 240V AC) 1-channel or 3-channel type. All models are RoHS compliant and CE marked.
- 3-channel controllers have "integrated combination control" (patent registered) function that enables user to control the overall light intensity without changing the intensity of each individual channel. This function proves to be very useful for color lighting applications which need RGB color adjustment and reproducibility.

MLEP-A035W1LR / 1LRD
MLEP-A070W1LR / 1LRD



MLEP-A035W3LR / 3LRD
MLEP-A070W3LR / 3LRD



A035W Analog Series

Model	MLEP-A035W1LR		MLEP-A035W3LR	
Order Code	MLEP-A035W1LR-100V	MLEP-A035W1LR-200V	MLEP-A035W3LR-100V	MLEP-A035W3LR-200V
AC Type	100V	200	100V	200V
Output	1 channel output max. 350 mA		3 channel output max. 350 mA for each channel	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.35/0.25A (At AC100/ 240V)		0.35/0.25A (At AC100/ 240V)	
Surge Current	20A or less (at AC100V) 40A or less (at AC 240V)		20A or less (at AC100V) 40A or less (at AC 240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (0-5V intensity control)		Yes (0-5V intensity control)	
Output ON/ OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Cooling System	Natural cooling by air		Natural cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	0.9kg		1.4kg	
product code	A-2296	A-2297	A-2298	A-2299

*MLEP-A035 Series is for use only with MCEP-C□8

A035W Digital Series

Model	MLEP-A035W1LRD		MLEP-A035W3LRD	
Order Code	MLEP-A035W1LRD-100V	MLEP-A035W1LRD-200V	MLEP-A035W3LRD-100V	MLEP-A035W3LRD-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 350 mA		3 channel output max. 350 mA for each channel	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.35/0.25A (At AC100/ 240V)		0.35/0.25A (At AC100/ 240V)	
Surge Current	20A or less (at AC100V) 40A or less (at AC 240V)		20A or less (at AC100V) 40A or less (at AC 240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (8-bit digital)		Yes (independent 8-bit digital for each channel)	
Output ON/ OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Cooling System	Natural cooling by air		Natural cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	0.9kg		1.4kg	
Product Code	A-2240	A-2250	A-2241	A-2251

*MLEP-A035 Series is for use only with MCEP-C□8

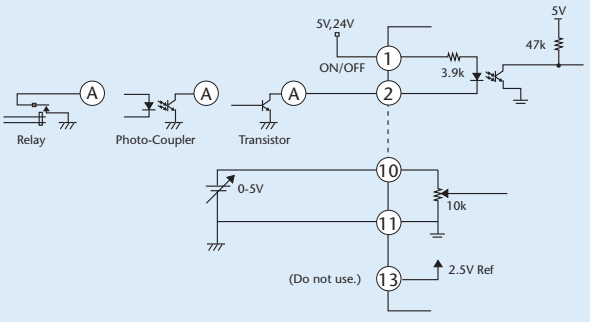
Connection Specifications

With **MLEP-A035W1LR/3LR, MLEP-A070W1LR/3LR**

No.	Name	No.	Name
1	Output ON/ OFF signal +	9	NC
2	Output ON/ OFF signal -	10	External 0-5V analog intensity control signal input
3	NC	11	External input GND
4	NC	12	NC
5	NC	13	DC 2.5V bias LED controller unit output
6	NC	14	NC
7	NC	15	NC
8	NC		

Input/Output Circuit Diagrams

With **MLEP-A035W1LR/3LR, MLEP-A070W1LR/3LR**



A070W Analog Series

Model	MLEP-A070W1LR		MLEP-A070W3LR	
Order Code	MLEP-A070W1LR-100V	MLEP-A070W1LR-200V	MLEP-A070W3LR-100V	MLEP-A070W3LR-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 700 mA		3 channel output max. 700 mA for each channel	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.35/0.25A (At AC100/ 240V)		0.35/0.25A (At AC100/ 240V)	
Surge Current	20A or less (at AC100V) 40A or less (at AC 240V)		20A or less (at AC100V) 40A or less (at AC 240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (0-5V intensity control)		Yes (0-5V intensity control)	
Output ON/ OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Cooling System	Natural cooling by air		Natural cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	0.9kg		1.4kg	
Product Code	A-2314	A-2315	A-2316	A-2317

*MLEP-A070 Series is for use only with MCEP-C□8-070 and MSPP LED controller

A070W Digital Series

Model	MLEP-A070W1LRD		MLEP-A070W3LRD	
Order Code	MLEP-A070W1LRD-100V	MLEP-A070W1LRD-200V	MLEP-A070W3LRD-100V	MLEP-A070W3LRD-200V
AC Type	100V	200V	100V	200V
Output	1 channel output max. 700 mA		3 channel output max. 700 mA for each channel	
Input Voltage	AC100 - 240V 50/60Hz		AC100 - 240V 50/60Hz	
Input Current	0.35/0.25A (At AC100/ 240V)		0.35 0.25A (At AC100/ 240V)	
Surge Current	20A or less (at AC100V) 40A or less (at AC 240V)		20A or less (at AC100V) 40A or less (at AC 240V)	
Operating Temperature	0 to 45°C (Humidity within 80%RH by 31°C and linearly down to 50%RH at 40°C)			
Output System	DC Continuous output		DC Continuous output	
Output Control System	Constant current control (variable current)		Constant current control (variable current)	
External Light Control	Yes (8-bit digital)		Yes (independent 8-bit digital for each channel)	
Output ON/ OFF Function	Yes (Photo-coupler insulation type)		Yes (Photo-coupler insulation type)	
Cooling System	Natural cooling by air		Natural cooling by air	
Installation	Rubber legs placed on flat surface		Rubber legs placed on flat surface	
Weight	0.9kg		1.4kg	
Product Code	A-2310	A-2311	A-2312	A-2313

*MLEP-A070 Series is for use only with MCEP-C□8-070 and MSPP LED controller

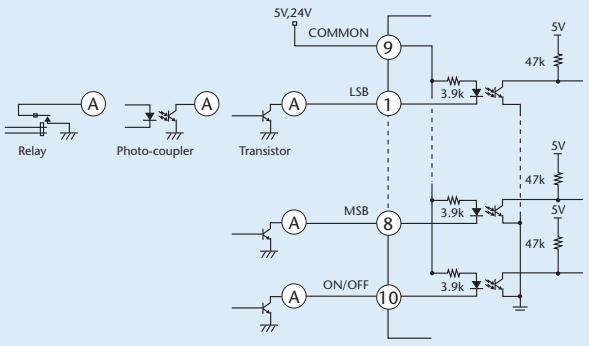
Connection Specifications

With **MLEP-A035W1LRD/3LRD, MLEP-A070W1LRD/3LRD**

No.	Name	No.	Name
1	8-bit digital input 20 (LSB)	9	COMMON (+)
2	8-bit digital input 21	10	Output ON/ Off signal (input)
3	8-bit digital input 22	11	NC
4	8-bit digital input 23	12	NC
5	8-bit digital input 24	13	NC
6	8-bit digital input 25	14	NC
7	8-bit digital input 26	15	NC
8	8-bit digital input 27 (MSB)		

Input/Output Circuit Diagrams

With **MLEP-A035W1LRD/3LRD, MLEP-A070W1LRD/3LRD**



Options

Options for Illumination

• The following optional accessories are available to improve the functionality of the lighting devices.

Diffuser: MDF Series

Attachment of the direct illumination type increases reach of the light Diffuser and reduces reflection and glare from the element.

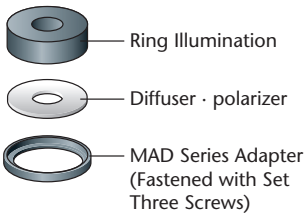
Model	Product Type	Compatible Light Models	Internal Diameter(mm)	Product Code
MDF-DR10	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 10	ø9	A-9010
MDF-DR16	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 16	ø14	A-9011
MDF-DR28	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 28	ø26	A-9044
MDF-DR31	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 31	ø28	A-9012
MDF-DR35	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 35	ø35	A-9062
MDF-DR36	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 36	ø36	A-9058
MDF-DR50	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 50	ø46	A-9013
MDF-DR56	Diffuser for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 56	ø54	A-9014
MDF-LR25	Diffuser for Low Angle Ring Illumination	MLRL-CR(CG,CB,CW)for 25	ø18	A-9015
MDF-LR48	Diffuser for Low Angle Ring Illumination	MLRL-CR(CG,CB,CW)for 48	ø40	A-9016
MDF-LR68	Diffuser for Low Angle Ring Illumination	MLRL-CR(CG,CB,CW)for 68	ø54	A-9017
MDF-LR100	Diffuser for Low Angle Ring Illumination	MLRL-CR(CG,CB,CW)for 100	ø82	A-9018
MDF-BR5015	Diffuser for Bar Illumination	MBRL-CR(CG,CB,CW)for 5015	—	A-9019
MDF-BR7530	Diffuser for Bar Illumination	MBRL-CR(CG,CB,CW)for 7530	—	A-9020
MDF-BR13015	Diffuser for Bar	MBRL-CR(CG,CB,CW)for 13015	—	A-9021
MDF-DQ108	Diffuser for Square Bar Type Illumination	MDQL-CR(CG,CB,CW)for 108, 4 pieces per set	—	A-9050

Adapter: MAD Series

Attachment of the direct illumination type increases reach of the light diffusion plate and reduces reflection and glare from the element.

Model	Product Type	Compatible Light Models	Product Code
MAD-DR10	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) 10	A-9005
MAD-DR16	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) 16	A-9006
MAD-DR28	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) 28	A-9046
MAD-DR31	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) use with both 31/36	A-9007
MAD-DR35	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) 35	A-9064
MAD-DR50	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) 50	A-9008
MAD-DR56	Plate Attachment Adapter for Direct Ring Illumination	MDRL-CR(CG,CB,CW) 56	A-9009

How to Use **MAD** Series



Polarizer: MPL Series

Attachment of the illumination system with the lens side and set reduces glare and reflection during image processing.

Model	Product Type	Compatible Light Models	Internal Diameter(mm)	Product Code
MPL-SC56	Polarizer for Simulated Coaxial Illumination	MSCL-CR(CG,CB,CW)for 56-B	—	A-9047
MPL-SC74	Polarizer for Simulated Coaxial Illumination	MSCL-CR(CG,CB,CW)for 74-B	—	A-9048
MPL-SC105	Polarizer for Simulated Coaxial Illumination	MSCL-CR(CG,CB,CW)for 105-B	—	A-9049
MPL-DR10-B	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 10	ø9	A-9022
MPL-DR16-B	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 16	ø14	A-9023
MPL-DR28-B	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 28	ø26	A-9045
MPL-DR31-B	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 31	ø28	A-9024
MPL-DR35	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 35	ø35	A-9063
MPL-DR36	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 36	ø36	A-9059
MPL-DR50-B	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 50	ø46	A-9025
MPL-DR56-B	Polarizer for Direct Ring Illumination	MDRL-CR(CG,CB,CW)for 56	ø54	A-9026
MPL-BR5015-B	Polarizer for Bar Illumination	MBRL-CR(CG,CB,CW)for 5015	—	A-9027
MPL-BR7530-B	Polarizer for Bar Illumination	MBRL-CR(CG,CB,CW)for 7530	—	A-9028
MPL-BR13015-B	Polarizer for Bar Illumination	MBRL-CR(CG,CB,CW)for 13015	—	A-9029
MPL-DQ108	Polarizer for Square Bar Type Illumination	MDQL-CR(CG,CB,CW)for 108, 4 pieces per set	—	A-9051

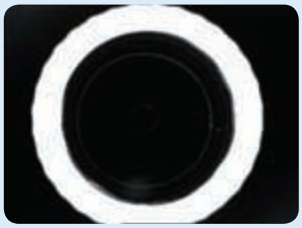
Polarizer (Analyzer): ML-PL Series

Enhanced polarizing effect can be expected by using ML-PL Series second polarizer on lens side, in combination with MPL Series polarizer.

Screw Pitch		Polarizer (LB: with Securing Screw)	
255	Model	**ML-PL255**	**ML-PL255LB**
	Product Code	A-8067	A-3130
270	Model	**ML-PL270**	**ML-PL270LB**
	Product Code	A-8068	A-3131
305	Model	**ML-PL305**	**ML-PL305LB**
	Product Code	A-8069	A-3132

Sample Images

Without polarizer



With polarizer (Sample image: A camera lens observed from the image side)

① Attach polarizer to the light emitting side of the illumination area.
② Attach second polarizer(analyzer) at end of lens on light-reception side.
③ When either polarizer is rotated, luminance distribution of the image is changed. At an arbitrary position regular reflection is cut and produces an image with the glare partly reduced.

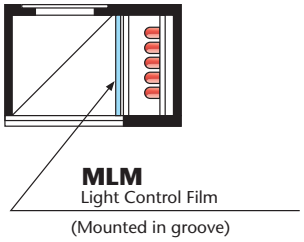
Light Control Film: MLM Series

The MLM Series are resin films that transform diffused illumination into parallel illumination. Attached to a simulated coaxial illumination, it makes the light distribution pattern smoother.

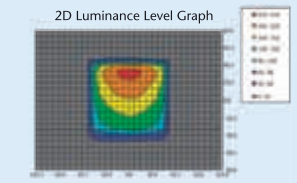
Model	Product Type	Compatible Light Models	Product Code
MLM-SC56	Light Control Film for Simulated Coaxial Illumination	MSCL-CR(CG,CB,CW) 56-B	A-9040
MLM-SC74	Light Control Film for Simulated Coaxial Illumination	MSCL-CR(CG,CB,CW) 74-B	A-9041
MLM-SC105	Light Control Film for Simulated Coaxial Illumination	MSCL-CR(CG,CB,CW) 105-B	A-9042

How to Use **MLM** Series

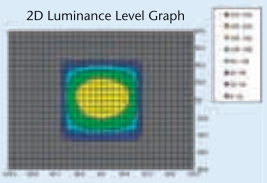
Cross-Section of Simulated Coaxial Unit



Luminous Intensity Distribution Characteristics (for MSCL-CR105-B)



Luminous intensity distribution characteristics without a light control film



Luminous intensity distribution characteristics with a light control film (with power source volume increased)

Illumination⇔Lens Options

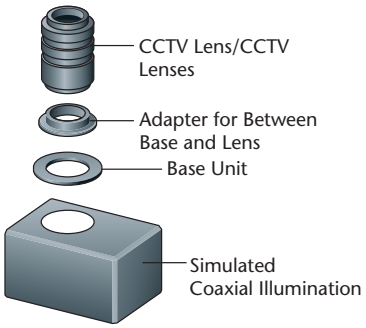
• Use the options with MORITEX lenses.

Simulated Coaxial Illumination ⇔ Lens Adapter: MLA-SC Series

Enables small simulated coaxial illumination to be mounted at the end of CCTV lenses.

Model	Product Type	Compatible Light Models	Compatible Lenses	Product Code
MLA-SCBS	Base for Simulated Coaxial Lens Attachment	MSCL-CR (CG,CB,CW) for 24/39/56	—	A-9036
MLA-SCM255	Adapter for Between Simulated Coaxial Illuminating Base and Lens		M25.5P0.5 lens	A-9037
MLA-SCM270	Adapter for Between Simulated Coaxial Illuminating Base and Lens		M27 P0.5 lens	A-9038
MLA-SCM305	Adapter for Between Simulated Coaxial Illuminating Base and Lens		M30.5P0.5 lens	A-9039

How to Use **MLA-SC** Series

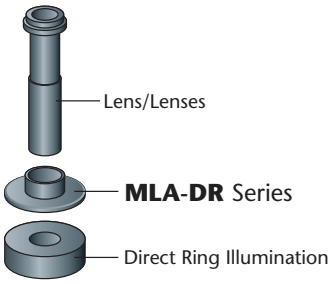


Direct Ring Illumination ⇔ Lens Adapters for MLA-DR Series

Enables small ring illumination to be attached to lens tips.

Model	Product Type	Compatible Light Models	Compatible Lenses	Product Code
MLA-DR1616	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 16	Ø6 lenses	A-9030
MLA-DR3125	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 31	Ø25 lenses	A-9031
MLA-DR3130	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 31	Ø30 lenses	A-9032
MLA-DR28M255	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 28	M25.5P0.5 lenses	A-9065
MLA-DR28M270	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 28	M27P0.5 lenses	A-9066
MLA-DR28M305	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 28	M30.5P0.5 lenses	A-9067
MLA-DR31M255	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 31	M25.5P0.5 lenses	A-9033
MLA-DR31M270	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 31	M27P0.5 lenses	A-9034
MLA-DR31M305	Lens Attachment Adapter	MDRL-CR (CG,CB,CW) 31	M30.5P0.5 lenses	A-9035

How to Use **MLA-DR** Series



Sharp Cut Filer ML-R Series

When using red illumination, attachment to the tip of the CCTV lens is effective in preventing ambient light.

Model	Product Type	Compatible Lenses	Product Code
ML-R60-25	Red filter for attachment to front of lenses	M25.5P0.5 lens	A-8031
ML-R60-27	Red filter for attachment to front of lenses	M27 P0.5 lens	A-8032
ML-R60-30	Red filter for attachment to front of lenses	M30.5P0.5 lens	A-8033
ML-R64-25	Sharp cut filter for attachment to end of lens	M25.5P0.5 lens	A-9055
ML-R64-27	Sharp cut filter for attachment to end of lens	M27 P0.5 lens	A-9056
ML-R64-30	Sharp cut filter for attachment to end of lens	M30.5P0.5 lens	A-9057

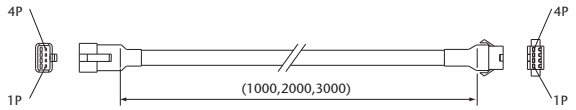
Extension Cables

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

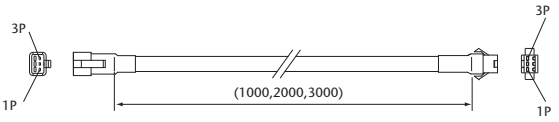
Model	Product Type	Application	Length	Product Code
M-RCB401L	4-Pin Type Extension Cable	For all illuminations (except MCEP Series)	1m	A-2203
M-RCB402L	4-Pin Type Extension Cable		2m	A-2204
M-RCB403L	4-Pin Type Extension Cable		3m	A-2205
M-RCB301L	3-Pin Type Extension Cable	For MCEP Series	1m	A-2215
M-RCB302L	3-Pin Type Extension Cable		2m	A-2216
M-RCB303L	3-Pin Type Extension Cable		3m	A-2217
M-RCB001L	2-Pin Type Extension Cable	For illuminations with built-in fan	1m	A-1027
M-RCB002L	2-Pin Type Extension Cable		2m	A-1028
M-RCB003L	2-Pin Type Extension Cable		3m	A-1029
★ **M-RCB801L**	8-Pin Type Extension Cable	For LED Controller MLEK-A800 Series	1m	A-2500
★ **M-RCB802L**	8-Pin Type Extension Cable		2m	A-2501
★ **M-RCB803L**	8-Pin Type Extension Cable		3m	A-2502

★Made-to-order products.

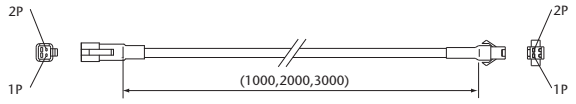
M-RCB4□□L *Straight Connection



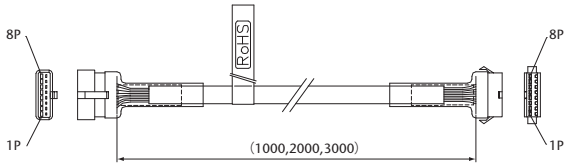
M-RCB3□□L *Straight Connection



M-RCB0□□L *Straight Connection



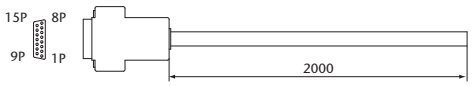
M-RCB8□□L *Straight Connection



External Control Cables

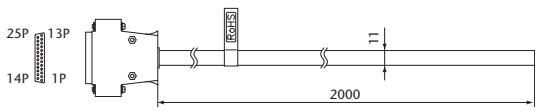
Model	Product Type	Length	Product Code
MC-EXC-02	Cable for External Control of DSUB15P	2m	A-8201
MC-EXC-07	Cable for External Control of DSUB25P	2m	A-9000

MC-EXC-02



PIN No.	Color	PIN No.	Color
1P	purple	9P	brown
2P	gray	10P	red
3P	white	11P	black
4P	sky blue	12P	orange
5P	white / red	13P	yellow
6P	white / black	14P	green
7P	white / green	15P	blue
8P	white / yellow		

MC-EXC-07



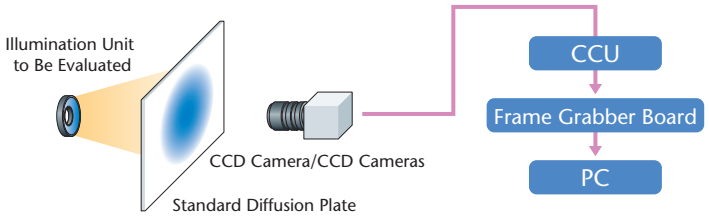
PIN No.	Color	PIN No.	Color	PIN No.	Color
1P	black	11P	sky blue	21P	orange / white
2P	white	12P	bright green	22P	orange / red
3P	red	13P	white / black	23P	orange / green
4P	green	14P	white / red	24P	orange / yellow
5P	yellow	15P	white / green	25P	orange / blue
6P	brown	16P	white / yellow	—	orange / purple
7P	blue	17P	white / brown	—	sky blue / black
8P	orange	18P	white / blue	—	sky blue / white
9P	purple	19P	white / purple	—	sky blue / red
10P	gray	20P	orange / black	—	sky blue / yellow

LED Controller Options

Model	Product Type	Product Code
MC-AC200A-2.0M	European Plug Type AC Cable	A-2246
MC-AC200B-2.0M	JIAS Plug Type AC Cable	A-2247
LBK-001	Power Supply Unit Installation Bracket	A-2340
LBK-002	Power Supply Unit Installation Bracket	A-2341

LED Illumination Data

MORITEX measures the distribution characteristics of lights with CCD cameras close to the operation condition.



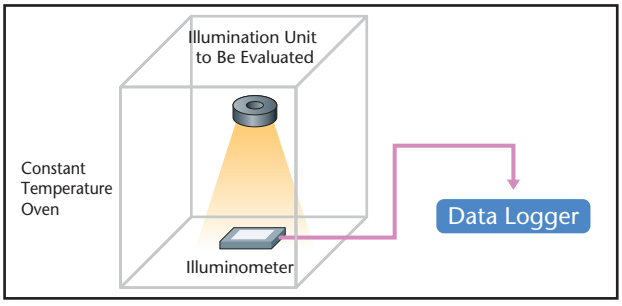
- The tested light is installed to face the CCD camera with a standard diffusion plate attached at the position of the working distance at which the measurement is performed. A lens that can cover the whole illumination pattern is attached, and the measurement conducted. The results are uploaded to a computer to obtain the data on 2D luminance level distribution and luminance level variation on the X and Y axes.Measurement data can also be produced using an illuminometer upon request.

• Equipment for measurement of light distributioncharacteristic

	Model	Manufacturer	Model	Notes
1	CCD Camera/CCD Cameras	Sony	XC-ES50	
2	CCD Camera/CCD Cameras	Sony	XC-EI50	IR
3	CCD Camera/CCD Cameras	Sony	XC-EU50	UV
4	Camera Power Supply	Sony	DC-700	
5	Camera Cable	Sony	CCXC-12P05N	5m
6	B&W Monitor	Sony	PVM-146J	14inch
7	CCTV Lens/CCTV Lenses	MORITEX	Each model ranging from f6 to f100	
8	MML	MORITEX	Each model ranging from x0.18 to x12	
9	Diffuser	Mitsubishi Rayon	#441	
10	Illuminometer	Minolta	T-10M	

*Each of the MORITEX lenses can be evaluated. Please inquire.

MORITEX obtains the temperature characteristics data in the following manner.



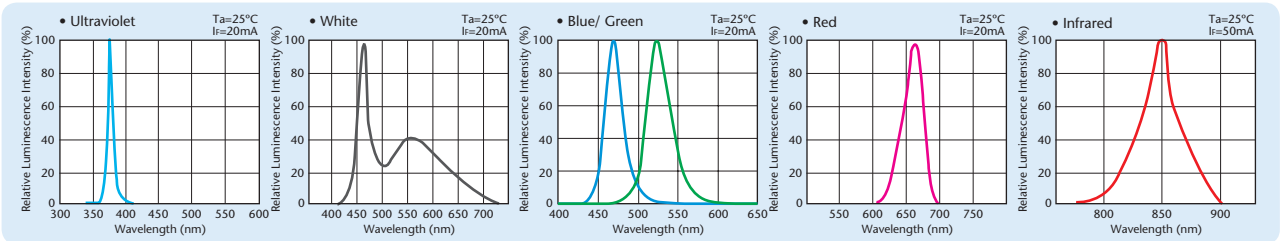
- The tested light equipped is installed in the constant-temperature bath with a thermocouple and the illuminometer are. The data is uploaded & imported to a computer to determine the variation in the heat and the light intensity over time.

• Constant temperature bath and other testing instruments

	Product Name	Manufacturer
1	Thermocouple	General-Purpose Model
2	Data Logger	keyence
3	Power Supply	Kenwood
4	Constant Temperature Oven	Tabai Espec

LED Spectral Characteristics

- The diagrams below illustrate the spectral characteristics of major LEDs used in the MG-Wave Series.
- We can also manufacture other lighting devices with different wavelengths. Please feel free to contact us.



Fiber Optic Light Sources and Light Guides


LLS2 / MHAA and MHAB Series

The MHAA / AB series Halogen light sources are compact with a robust design. These light sources are suitable for mounting. The complete product range includes: 100W, 150W and 100W NIR (1127nm). The light source can be controlled manually and through external controls, including 0-5 V analog control and parallel 8-bit digital control.

In addition, we offer the LLS2, a low-power consumption, long-life LED light source using the latest in high brightness LED technology.

These light sources can be used with fiber light guides that require less space and allow you to select from a huge range of lighting shapes and configurations.

Advantages of Fiber Optic Light Guides:

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

Halogen Light Sources
MHAA / AB
MHAB-IR

LED Light Source
LLS2

LED Light Source
LLS

Nosepiece adapter

Ring Light Guides
MRG/P
Straight Light Guides
MSG/P
Bifurcated Light Guides
MWG/P
Multifurcated Light Guides
M#G#
Plate Type Light Guides
MPP
Line Light Guides
MKG/P
Long Width Line Light Guides
MFKG/P

Condenser Lenses
Light Guide Options

Light Sources and Available Light Guides

Light Source	Light Guide				Other Options
	Plastic		Compound Glass		Internal Filter (*1)
	Fiber Bundle Diameter (Light Source Side)		Standard	Heat Resistant	
	Below 6 Dia.	6 Dia. or More			
MHAA-100W	○ *3	**KA-03** *3	○	○	○
MHAB-100W-IR	×	×	×	○	×
MHAB-150W	×	×	○	○	△*2
LLS2	○ *4	**KA-03** *4	○	○	—

*1 The characteristics may be changed by deterioration under the operating environment.
*2 Deterioration may be caused by use at high output.
*3 This is when the product is used at the environmental temperature of 40˚C or less.
*4 This is when the product is used at the environmental temperature of 35˚C or less.

- CE Marking
- RoHS Directive
- Digital & Analog Intensity Control
- Wattage
- Wattage
- Wattage
- LED Color

NEW

LLS 2 - LED Light Source

Long-life operation, low-power consumption, and high performance LED light source for fiber optic coupling.

The movement from Halogen lamp to LED can be simple and easy with the LLS2 since its external control pin assignment is identical to the MORITEX halogen light sources.

- Low power consumption design
- Compatible with all MORITEX fiber optic light guides, including plastic
- MHAA/AB halogen light source compatible external analog and digital controls supported
- For use with light guides up to 13mm (4-10mm active diameter recommended)
- RoHS compliant and CE marked

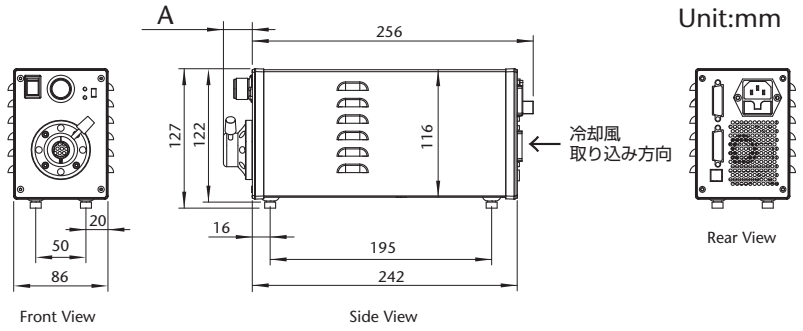
Optional Parts

AC Cable	MC-AC100B-2.0M

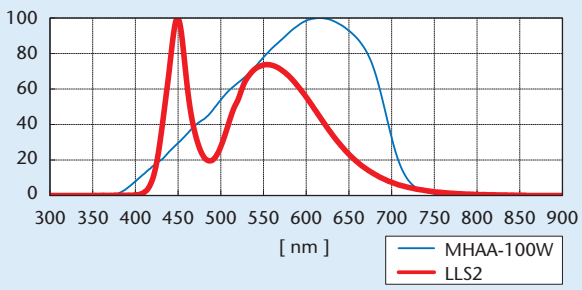
Model	LLS2
LED Color	White
Input Voltage	100-200V AC (50/60Hz)
Cooling Method	Forced air cooling
Input Voltage	AC100-120V/200-240V (50/60Hz)
LED Life	50,000hours (*1)
Light Intensity	175klx (*2)
Color Temperature	5500K
External Control	Analog input: 0-5V Digital input: 8bit
Weight	2.1kg
Security Function	Error signals: Off-temperature output and overcurrent
Operating Temperature	-10 to +45°C (humidity 20 to 90%)
Storage Temperature	-40 to +80°C (humidity 10 to 95%)
Product Code	A-4005

*1 Lumen maintenance factor 70%
*2 Measured with a 1,100mm/8mmØ light guide at 50mm distance

LLS 2 - LED Light Source

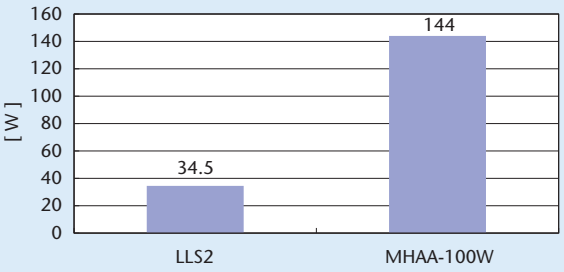


Spectral Characteristic Data



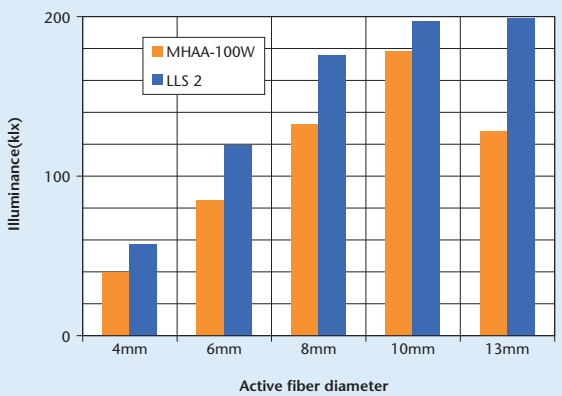
LG used for testing: MSG4-1100S

Power Consumption

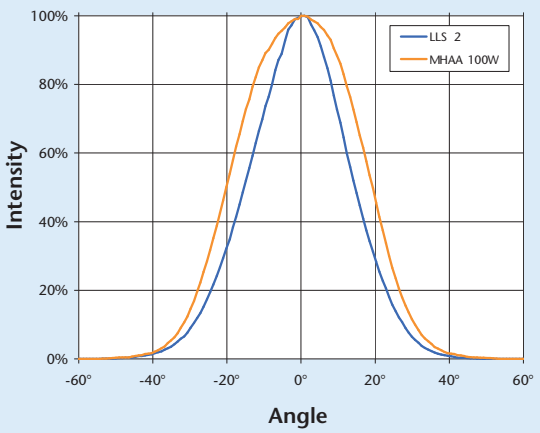


LG used for testing: MSG4-1100S

Illuminance of LLS 2 and Halogen Light Source at 50mm distance



Angular Light Distribution with 10 mm Light Guide



100 W RoHS CE

Halogen Light Sources

MHAA-100W Series

The 100W Halogen Light Source is the standard model in the Halogen Light Source Series because it exhibits excellent performance in all aspects.

- Worldwide power supply specifications (100/200V switch type)
- Compliance with CE Marking safety standards
- Environmentally friendly and in compliance with the RoHS Directive

Model	MHAA-100W	
Order Code	MHAA-100W-100V	★ MHAA-100W-200V
AC Type	100V	200V
Setting At Shipping	Input Voltage Selector: At 115 With 2.0-Meter AC Cable MC-AC 100A	Input Voltage Selector: At 230 With 2.0-Meter AC Cable MC-AC 200A
Input Voltage	AC100-120V/200-240V (50/60Hz)	
Input Voltage Switch*1	Input At AC100: Setting At 115 Input At AC200: Setting At 230	
Input Current (Typ)	2.4A (At AC 100V Input) 1.2A(At AC 200V Input)	
Compatible Lamp*2	LM-100 (12.0V,100W)	
Lamp Voltage	DC11.7V ±0.2V (Max.)	
Average of Lamp Life Time*3	1,000 Hours Nominal	
Average Illuminance*4	Approximately 30,000 Lx	
Color Temperature	3,100K	
Installation	Rubber legs placed on a flat surface	
Weight	Approximately 2.0kg	
Protection Function	Lamp Overcurrent Detection Function: Monitor output, cut off lamp power, LED (RED) on front panel ON Lamp Burn-out Detection Function: Monitor output, LED (RED) on front panel ON Internal High Temperature Detecting Function: Monitor output, cut off lamp power	
Operating Temperature and Humidity	0°C to 45°C :Linear Decrease Down to 80%RH at 31°C and 50%RH at 40°C	
Safety Standard*5	EN61010:2001 EN61000-6-2:2001/EN55011:1998,A1:1999, A2:2002	
Product Code	A-0510	A-0516

★ Made-to-order products.

*1 When the switch is set at 115V, do not apply AC 200V.
Doing so may damage the power supply.
When the input voltage selector is set at 230V, the device does not run on AC 100V.
*2 Only compatible lamps can be used.
*3 Many lamps are powered on at rated current and the time measurements until their filaments blow are normally distributed. The average time from the peak time until the survival ratio of 50% is called the average life time.
*4 The average luminance is at 50mm from the fiber output at maximum volume when a MORITEX standard light guide (MSG4-2200S) is attached.
*5 This is only when the voltage is -200V.
Note: May be unable to use with plastic fibers.

Optional Parts

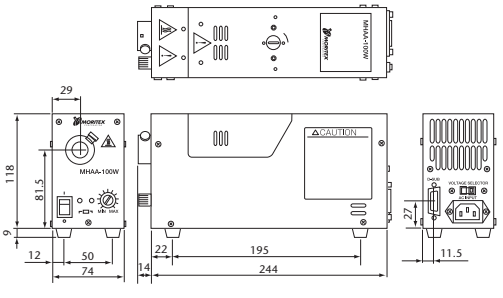
Cable with External Remote Connector	MC-EXC-02
External Remote Connector	D-SUB15S
Replacement lamp	LM-100

Special Power Supply Unit Specifications (AC100V Type)

Order code	Remarks	Product Code
★ MHAA-100W-SO-100V	Bult-in Shutter (Normally Open)	A-0512
★ MHAA-100W-SC-100V	Bult-in Shutter (Normally Open)	A-0511
MHAA-100W-D-100V	With External 8-Bit Digital Dimmer	A-0513
★ MHAA-100W-D-SO-100V	With External Digital Dimmer and Built-In Shutter (Normally Open)	A-0515
★ MHAA-100W-D-SC-100V	With External Digital Dimmer and Built-In Shutter (Normally Open)	A-0514

★ Made-to-order products.

MHAA-100W



Halogen Light Sources

MHAB-150W Series

150W Halogen Light Source of dual wattage, designed for 150W but also available for 100W if a 100W lamp is attached. The intensity is the most powerful among the Halogen Light Source Series.

- High illuminance model max 80,000 Lux (2.6 times a 100W light source)
- 100W/150W Dual Wattage Lamp
- Environmentally friendly and in compliance with the RoHS Directive
- Worldwide power supply specifications

Model	MHAB-150W	
Order Code	MHAB-150W-100V	★ MHAB-150W-200V
AC Type	100V	200V
Setting At Shipping	With 2.0-Meter AC Cable MC-AC 100A	With 2.0-Meter AC Cable MC-AC 200A
Input voltage	AC100V-240V (50Hz/60Hz)	
Compatible Lamp*1	LM-150 LM-150C LM-100	
Lamp Voltage	DC 14.7V±0.2V (Max.) (LM-150 LM-150C) DC 11.7V±0.2V (Max.) (LM-100.)	
Average Lamp Life*2	50 Hours (LM-150), 500 Hours (LM-150C), and 1,000 Hours (LM-100) Nominal	
Average Illuminance*3	Approx. 80,000 Lx (LM-150), 45,000 Lx (LM-150C), and 30,000 Lx (LM-100)	
Color Temperature	3400K (LM-150) 3200K (LM-150C) 3100K (LM-100)	
Installation Method	Rubber legs placed on flat surface	
Weight	Approximately 3.2kg	
Operating Temperature and Humidity	0°C to 45°C:Linear Decrease Down to 80%RH At 31°C and 50%RH At 40°C	
Protection Function	Lamp Overcurrent Detection Function: Monitor output, cut off lamp power, LED (RED) on front panel ON Lamp Burn-out Detection Function: Monitor output, LED (RED) on front panel ON Internal High Temperature Detecting Function: Monitor output, cut off lamp power	
Safety Standard*4	EN61010:2001 EN61000-6-2:2001/EN55011:1998, A1:1999, A2:2002	
Product Code	A-0520	A-0526

★Made-to-order products.

*1 Only compatible lamps can be used.
*2 Many lamps are powered on at rated current and the time measurements until their filaments blow are normally distributed. The average time from the peak time until the survival ratio of 50% is called the average life time.
*3 The average luminance is at 50mm from the fiber output at maximum volume when a MORITEX standard light guide (MSG4-2200S) is attached.
*4 This is only when the voltage is -200V.
Note: May be unable to use with plastic fibers.

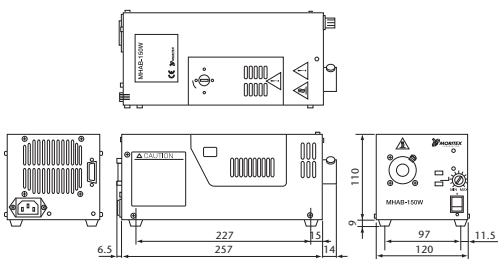
Optional Parts

Cable with External Remote Connector	MC-EXC-02
External Remote Connector	D-SUB15S
Replacement lamp	LM-100, LM-150, LM-150C

Special Power Supply Unit Specifications (AC100V Type)

Order code	Remarks	Product Code
MHAB-150W-D-100V	With External Digital Dimmer	A-0522

MHAB-150W



100W RoHS CE

Infrared 100W Halogen Light Source

MHAB-100W-IR

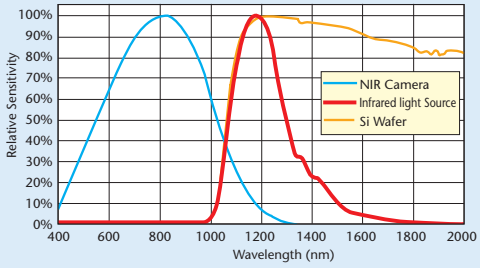
Completed Patent Registration

- Irradiation of silicon transmission wavelength (1127nm or more)
- Radiation mechanism due to unique technology

Model	MHAB-100W-IR	
Order Code	MHAB-100W-IR-100V	★ MHAB-100W-IR-200V
AC Voltage	100V	200V
Setting At Shipping	AC cable: With MC-AC100A-2.0M	AC cable: With MC-AC200A-2.0M
Input Voltage	AC100V-240V(50Hz/60Hz)	
Compatible Lamp*1	LM-100-IR(12.0V/100W)	
Lamp Voltage	DC 10.7± 0.2V(Max.)	
Average Of Lamp Life Time*2	1,000 Hours Nominal	
Installation	Rubber Legs Placed on Flat Surface	
Weight	Approximately 3.2Kg	
Intensity Control	Manual intensity control/ External volume intensity control/ External analog intensity control	
External Dimensions	W120 ×H110 ×D257mm*3	
Product Code	A-0524	A-0527

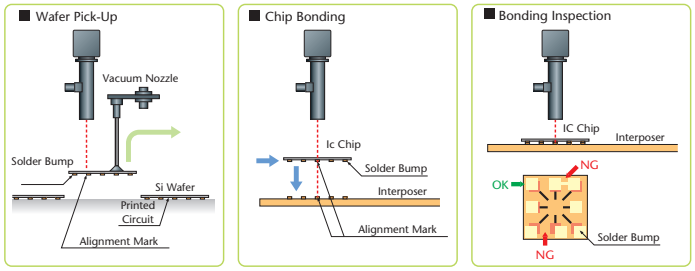
★ Made-to-order products.

Spectral Characteristic Data

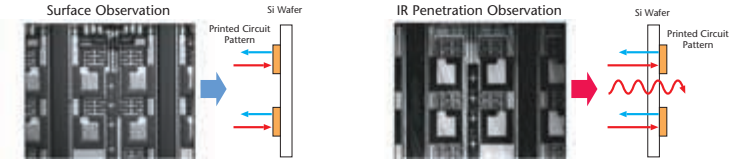


*1 Example application
*2 Many lamps are powered on at rated current and the time measurements until their filaments blow are normally distributed. The average time from the peak time until the survival ratio of 50% is called the average life time.
*3 Projections are not included.

Example Application



IR Coaxial Penetration Observation



Accessories for IR Systems

Replacement Lamp

Model	LM-100-IR
Specification	IR Reflection Coating for 100W
Product Code	A-8216

Lens Series for IR System

Model	MML4-80D-IR	MML6-80D-IR	MML8-80D-IR
Specification	For IR x4x6x8		
Product Code	A-0235	A-0236	A-0237

Heat Resistance Light Guide

Model	MSG4-1100S-HR
Specification	Heat Resistant
Product Code	A-0637

Note: Only heat-resistant light guides can be used.

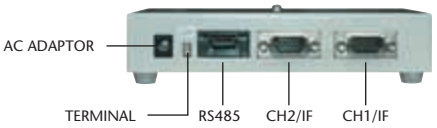
RoHS CE

RS-485 Communication Unit

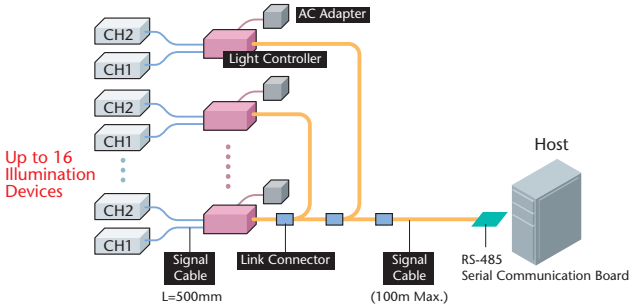
MCGA-204D

Light controller for the batch control of MORITEX standard light sources and power supplies by RS-485 communication

- Single unit for controlling 1 channel or 2 channels
- Batch control of up to 16 channels by unit connection
- Standard light sources and power supplies connectable (Some older models not supported)



General Configuration

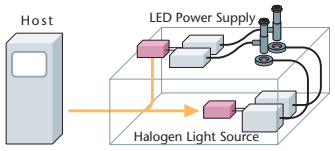


Model	Model	Product Code
MCGA-204D	RS-485 Communication Unit	A-1600
MCBB-24W-100V	ACadapters(100V)	A-1601
MC-EXC-08	Signal Cable L=500mm	A-8230
MU-EXC-01	Communication Cable L=10m	A-9004
MU-CON-01	Link Connector (2pcs)	A-1602

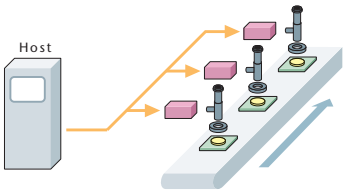
Communication Specifications	
Communication Interface	RS-485
Communication System	Asynchronous, Simplex
Transmission Speed	115.2 (19.2–115.2) Kbps

Example of Application

Halogen light source and LED power supply control by RS-485 communication



Batch control of production processes by RS-485 communication



Capable of connecting to MORITEX standard light sources and power supplies

MHF-V501 Series	LED Light Source
MHAA-100W Series	LLS2
MHAB-150W Series	
MHAB-100W-IR	

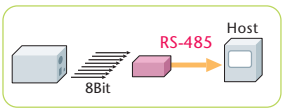
LED Controller
MLEK Series 1ch, 2ch
MCGA units shall be necessary for MLEP Series (3-channels).

RS-485 Communication Unit

External Control By 8-Bit Digital

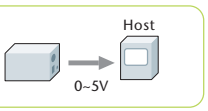
8 or More Ports Necessary on Control Side

One RS-485 Port Enough

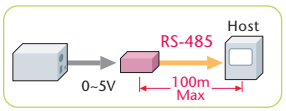


External Control By Analog (DC 0V-5V)

Limited Cable Extension Due to Noise

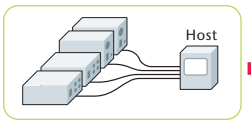


Extension Up to Up to Maximum 100m

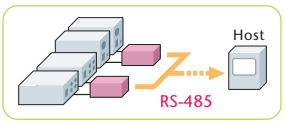


Control Of Multiple Light Sources and Power Supplies

Difficult to Route Many Cables

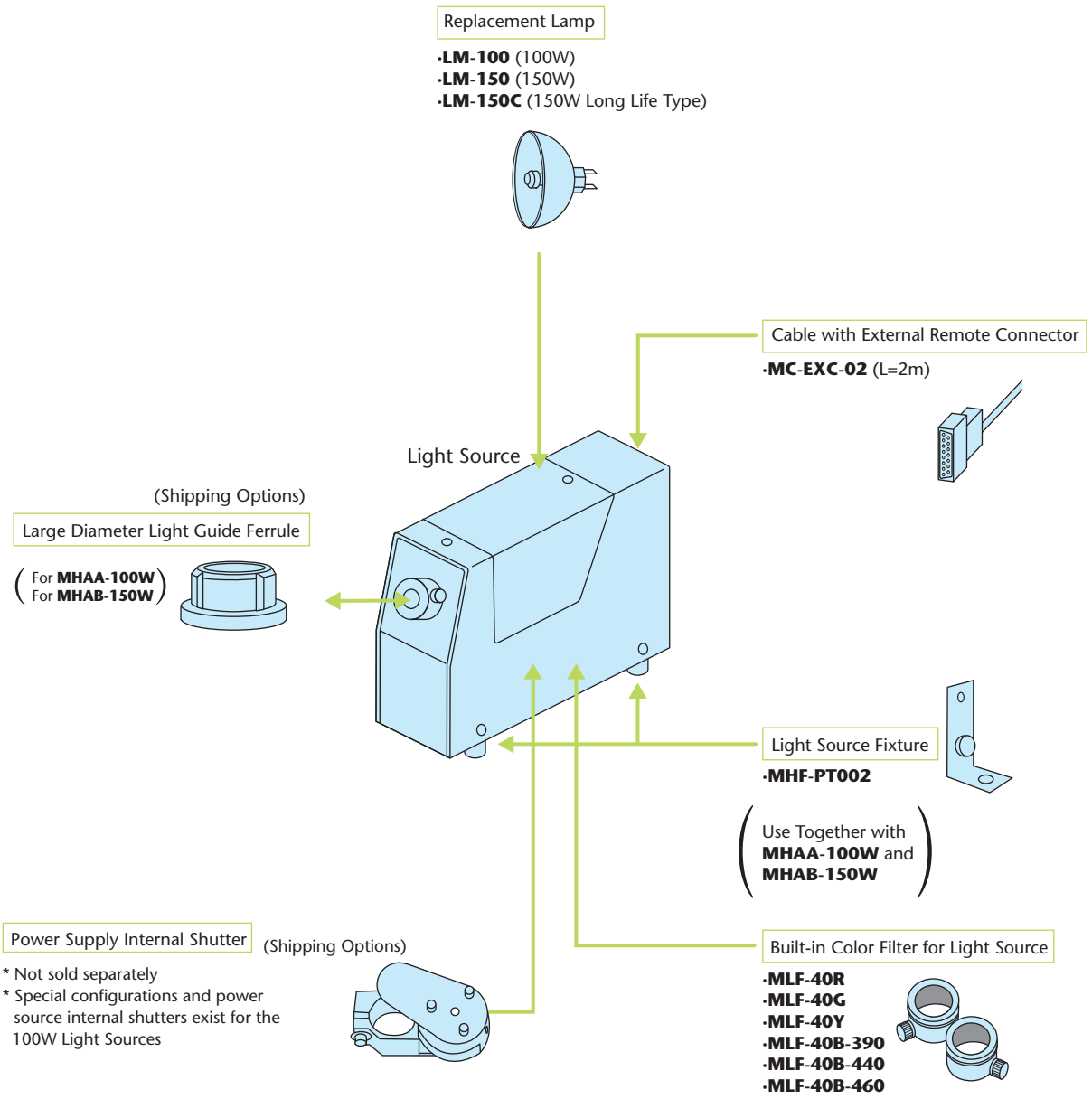


One Cable Enough



Options

Option Attachment Drawing for Halogen Light Sources



For light source compatibility, specifications and product codes of the options, see corresponding pages.

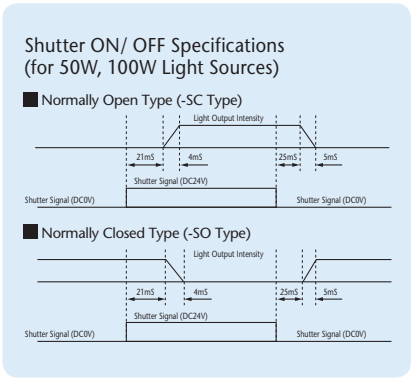
Light Source Equipment Options

Light Source Internal Shutter

Product (optional at time of shipping) **Made-to-order**

- Internal type means that installation space is not necessary.
- Achieves of a long life time that averages the shutter being opened and closed 50 million times
- Independent OPEN and CLOSE is possible regardless of modulation function.
- Either opening or closing for the shutter can be chosen when voltage is superimposed.

* Not sold separately as an individual item.
* For each of the 50W, 100W, and 150W light sources there are customized specification models each with an built-in power supply.



Specifications

- Operation input voltage: DC 24V 0.32A
- Shutter response speed

		50W, 100W	150W
Normally Open	Closed	25mS	33mS
	Open	30mS	
Normally Closed	Open	25mS	
	Closed	30mS	

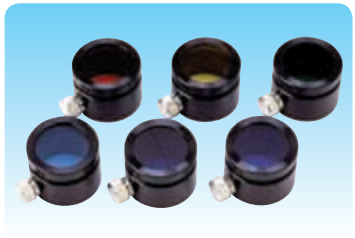
* Response speed for a fiber with a diameter of 4mm when no protective diode exists.
- Average life time for opening and closing of the shutter is approximately 50 million times (average for tests performed by MORITEX).

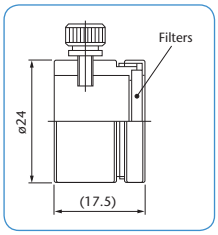
* The OPEN and CLOSE speed of the shutter may vary slightly depending on the capabilities of the power supply being used.

(Attachment of the model number for ordering)
(Example) When a normal open shutter is attached to MHAA-100W-100V: MHAA-100W-SO-100V.

Light Source Internal Color Filter

Made-to-order





Model	MLF-40R	MLF-40G	MLF-40Y	MLF-40B-390	MLF-40B-440	MLF-40B-460
Color	Red	Green	Yellow	Bluish purple	Blue	Light blue
Peak Wavelength (nm)	600	533	480	390	440	460
Product Code	A-8247	A-8248	A-8249	A-8250	A-8251	A-8252

* Attach the filter to the light guide retainer inside the light source as if to cover it.
* This filter cannot be used together with a built-in shutter.

Light Source Fixture

MHF-PT002 (4 pcs./set)

Model	MHF-PT002
Product Code	A-8200

*Contact MORITEX about the mounting dimensions.

Cable with External Remote Connector / External Remote Connector

Model	MC-EXC-02	D-SUB15S
Product Code	A-8201	A-8202

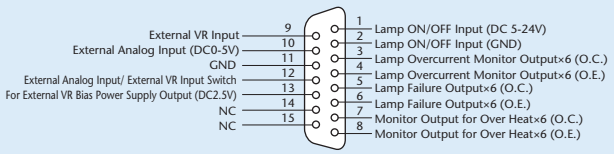
Halogen Lamp Series : Dedicated High, Highly reliable Halogen Lamp Series

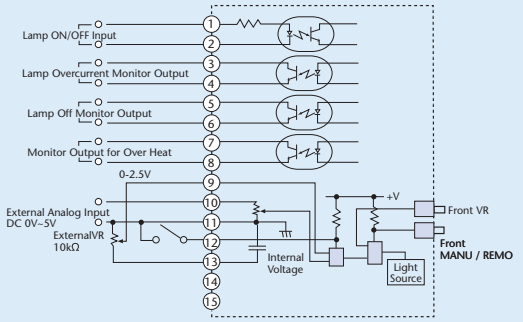
	LM-100	LM-150	LM-150C
Power Consumption	100W	150W	150W
Lamp Voltage	DC11.7V	DC14.7V	DC14.7V
Lamp Current	8.4A	10A	10A
Average Lamp Life *1	1,000hrs Nominal	50hrs Nominal	500hrs Nominal
Average Illuminance *2	Approx. 30,000	Approx. 80,000	Approx. 45,000
Color Temperature	3,100°K	3,400°K	3,200°K
Product Code	A-8213	A-8220	A-8221

*1 Many lamps are powered on at rated current and the time measurements until their filaments blow are normally distributed. The average time from the peak illumination until the survival ratio of 50% is called the average life time.
*2 The average illuminance is measured at 50mm from the fiber end at maximum intensity when a MORITEX standard light guide (MSG4-2200S) is attached.

For Use with MHAA-100W / MHAB-150W / LLS2

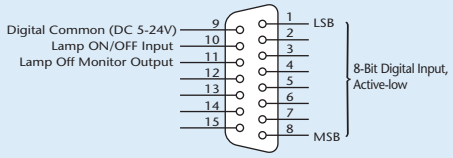
External Analog Control Connection Specifications



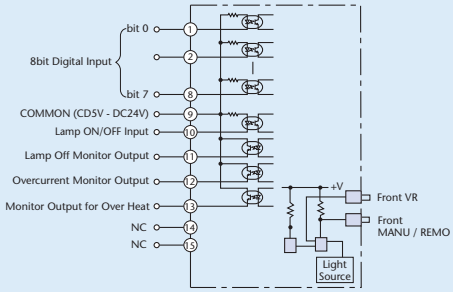


External 8-Bit Digital Control Connection Specifications

● External Analog Control Connection Specifications



● How to Use Connection Specifications and Switch Modes



● Digital Control Truth Table

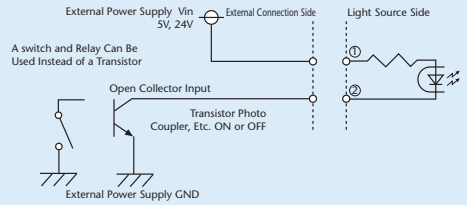
LAMP ON/OFF	LAMP Monitor	BIT7	BIT6	BIT5	BIT4	BIT3	BIT2	BIT1	BIT0	LAMP Output
0	0	×	×	×	×	×	×	×	×	OFF
1	1	×	×	×	×	×	×	×	×	Lamp Burn-Out
1	0	0	0	0	0	0	0	0	0	ON (Min.)
1	0	0	0	0	0	0	0	0	1	ON
1	0	0	0	0	0	0	0	1	0	ON
1	0	0	0	0	0	0	0	1	1	ON
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	
1	0	1	1	1	1	1	1	0	1	ON
1	0	1	1	1	1	1	1	1	0	ON
1	0	1	1	1	1	1	1	1	1	ON (Max.)

Note: X ON/ OFF Can Be Selected 0 Low 1 High

*LLS2 is equipped with 8bit modulation and "On/Off" logic pins, and capable of logic inversion.

Signal Output Detection Circuit Connection Example

● Signal Input Circuit Connection Example (Lamp ON/OFF Signal)



Operation

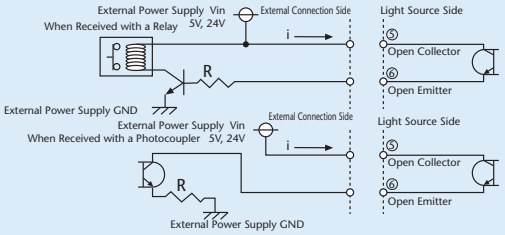
ON	OFF
OFF	Lamp on

With Transistor and Switch

* The relationship between external resistance and current is as follows:
Use a resistor of 1/4W power rating or greater capacity

Vin	Current
DC5V	Approximately 1~2mA
DC24V	Approximately 6~12mA

● Signal Output Detection Circuit Connection Example (Lamp Burn-Out Detection Function Signal)



*When Signal Is Outputting At i = 1mA Approximately 0.2v Between Pins No.5 and 6
At i = 5mA Approximately 1v Between Pins No.5 and 6

Signal	Between Pins No.5 and 6	Current
Lamp Normal	Not Conducted	Off
Lamp Burn-Out	Conducted	On

* The relationship between external resistance and current is as follows:
Use a resistor of 1/4W power rating or greater capacity

Vin	R(Ω)	Current I (mA)
DC5V	1~3.3k	Approx. 1to 4
DC24V	4.7~22k	Approx. 1to 5

* The resistance and current values differ depending on parts used. Check all values well before use.

Options

Light Guides

Ring Light Guides

- Illumination from 360˚ produces uniform light These light guides are optimum for CCD camera and microscope inspections.

Model	Product Code
MRP12-1500V	A-0600
MRP16-1500V	A-0601
MRP18-1500V	A-0617
MRP25-1500V	A-0618
MRP30-1500V	A-0619
MRG25-1500S	A-0602
MRG31-1000S	A-0603
MRG31-1500S	A-0604
MRP31-1000S	A-0605
MRP35-1500S	A-0606

Model	Product Code
MRG40-1500S	A-0607
MRG48-1000S	A-0608
MRG48-1500S	A-0609
MRG53-1000S	A-0610
MRG53-1500S	A-0611
MRG61-1000S	A-0612
MRG61-1500S	A-0613
MRG75-1000S	A-0614
MRG75-1500S	A-0615

Explanation of Model Code

MR | Internal Diameter | — | Length | — | Fiber Type | Tube Material | Special Function

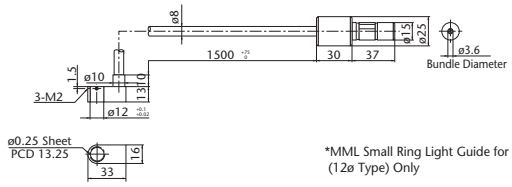
Fiber Type: **G** Glass, **P** Plastic

Tube Material: **S** SUS Flexible Tube, **V** SUS Flexible + PVC Tube

Special Function: **HR** Heat Resistant End 300℃ *Glass Type Only

MRP12-1500V

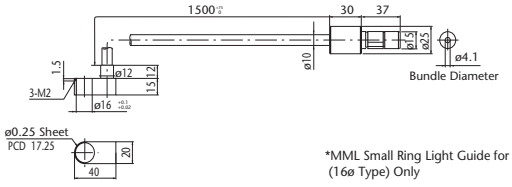
Minimum Bend R=30



*MML Small Ring Light Guide for MML (12ø Type) Only

MRP16-1500V

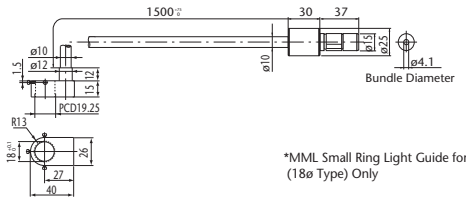
Minimum Bend R=30



*MML Small Ring Light Guide for MML (16ø Type) Only

MRP18-1500V

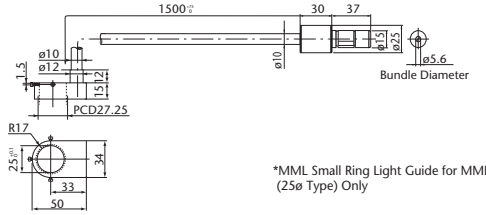
Minimum Bend R=30



*MML Small Ring Light Guide for MML (18ø Type) Only

MRP25-1500V

Minimum Bend R=30

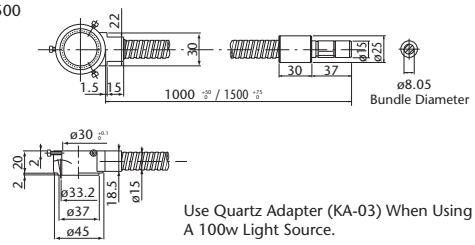


*MML Small Ring Light Guide for MML (25ø Type) Only

MRP30-1500V

Minimum Bend R=40

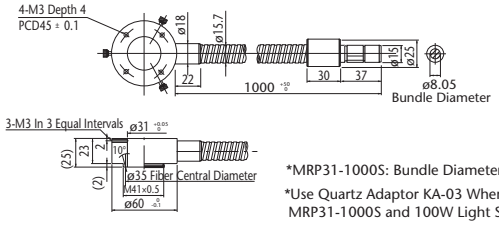
L=1500



Use Quartz Adapter (KA-03) When Using A 100w Light Source.

MRG31-1000S/1500S/MRP31-1000S

Minimum Bend R=40

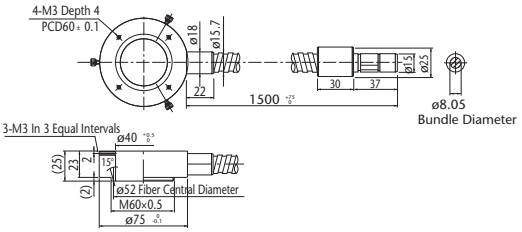


*MRP31-1000S: Bundle Diameter Ø8.7

*Use Quartz Adaptor KA-03 When Using MRP31-1000S and 100W Light Source

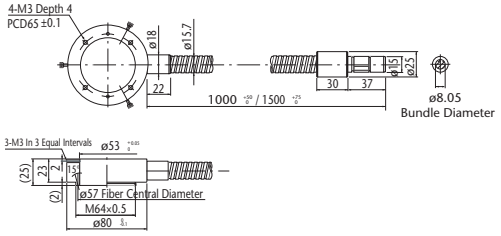
MRG40-1500S

Minimum Bend R=40



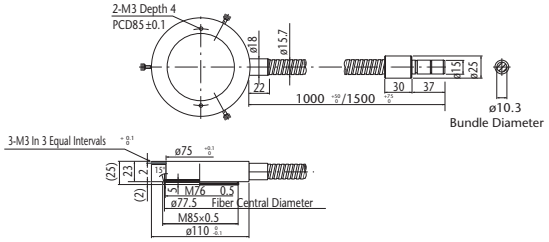
MRG53-1000S/1500S

Minimum Bend R=40



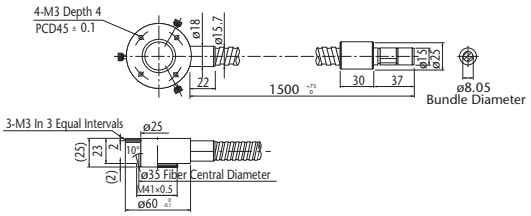
MRG75-1000S/1500S

Minimum Bend R=70



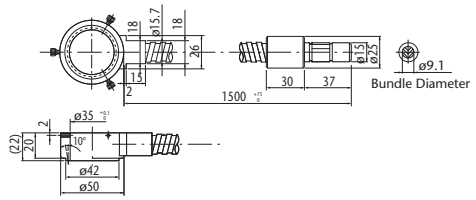
MRG25-1500S

Minimum Bend R=40



MRP35-1500S

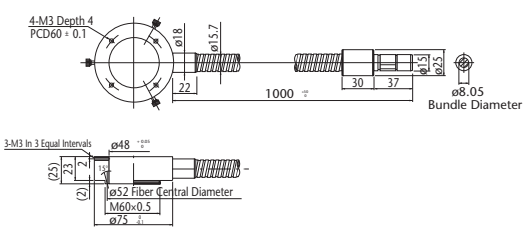
Minimum Bend R=40



*Use Quartz Adaptor KA-03 When Using 100w Light Source

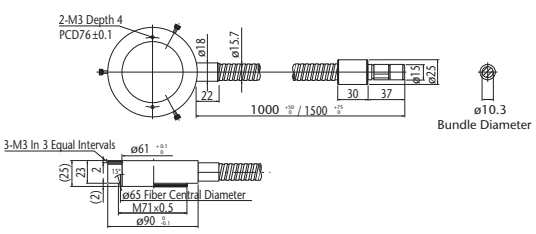
MRG48-1000S/1500S

Minimum Bend R=40

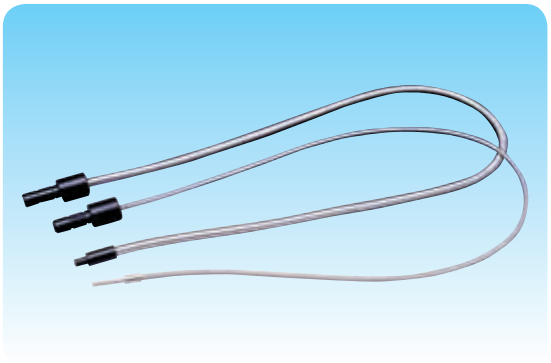


MRG61-1000S/1500S

Minimum Bend R=70



Straight Light Guides



- In addition to our standard straight type light guides, many different options are available such as random assembly, heat resistant, and small diameter types.
- These light guides are ideal for spot and coaxial illumination.Select a product to suit the application.

Model	Product Code
MSG3-1100S-SD	A-0622
MSG4-500R	A-0623
MSG4-1100S	A-0624
MSP4-1100S	A-0625
MSG4-2200S	A-0626
MSG4-1100S-RM	A-0627
MSG4-2200S-RM	A-0628
MSG6-1100S	A-0629

Model	Product Code
MSG6-2200S	A-0630
MSG6-1100S-RM	A-0631
MSG6-2200S-RM	A-0632
MSG8-1100S	A-0633
MSG8-2200S	A-0634
MSG10-1100S	A-0635
MSG10-2200S	A-0636

Explanation of Model Code

MS [ ][ ] — Length [ ] — [ ]

Fiber Type
- G Glass
- P Plastic

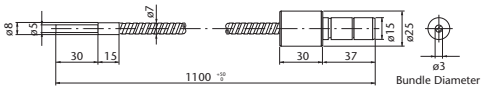
Bundle Diameter
- 3 ø3
- 4 ø4
- 6 ø6
- 8 ø8
- 10 ø10

Tube Material
- R Interlocking Tube
- S SUS Flexible Tube
- V SUS Flexible + PVC Tube

Special Function
- HR Heat Resistant End 300°C *Glass Type Only
- SD Small Diameter Type
- RM Random Assembly

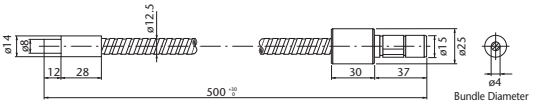
MSG3-1100S-SD

Minimum Bend R=25



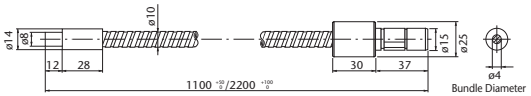
MSG4-500R (Interlocking Type)

Minimum Bend R=60



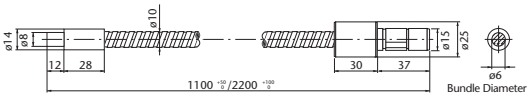
MSG4-1100S/2200S/MSP4-1100S MSG4-1100S-RM/MSG6-2200S-RM

Minimum Bend R=30



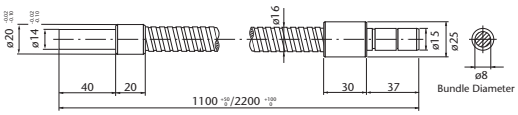
MSG6-1100S/2200S MSG6-1100S-RM/2200S-RM

Minimum Bend R=30



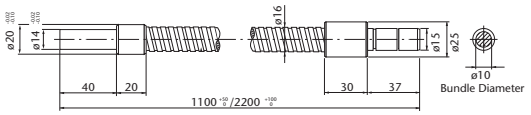
MSG8-1100S/2200S

Minimum Bend R=50



MSG10-1100S-SD/2200S

Minimum Bend R=60



Bifurcated Light Guides

- Use these light guides for applications where lighting from two directions is needed, for example when using a microscope or CCD camera, or for pattern recognition. Coatings and tube materials can be selected to suit the purpose. Interlock type tube material allows for any necessary bending and for fixing in position SUS flexible ("goose neck") type tube material allows you to move the light guide around freely in a small space.

Model	Product Code
MWG-500R	A-0647
MWG-L-650R	A-0648
MWG-1000S	A-0649
MWG-2000S	A-0650
MWG-1000V	A-0651

Model	Product Code
MWP-1000V	A-0652
MWG-1000SR	A-0653
MWG7-1000S	A-0654
MWG-1000S-SD	A-0655

Explanation of Model Code

MW □ — Length □ — □

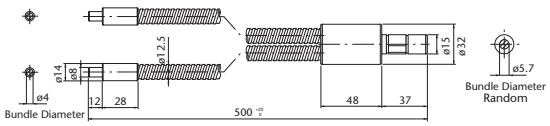
Fiber Type: G Glass; P Plastic

Tube Material: R Interlocking Tube; S SUS Flexible Tube; V SUS Flexible + PVC Tube; SR SUS Flexible + Interlock

Special Function: HR Heat Resistant End 300°C (*Glass Type Only); SD Small Diameter Type; L L-shape Type

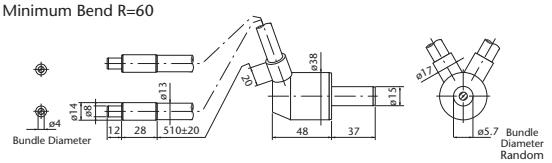
MWG-500R (Interlocking Type)

Minimum Bend R=120



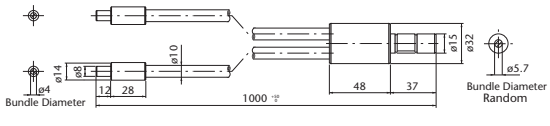
MWG-L-650R (Interlocking Type)

Minimum Bend R=60



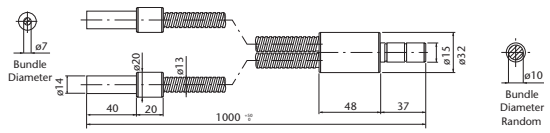
MWG-1000V/MWP-1000V

Minimum Bend R=30



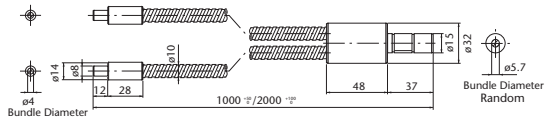
MWG7-1000S

Minimum Bend R=50



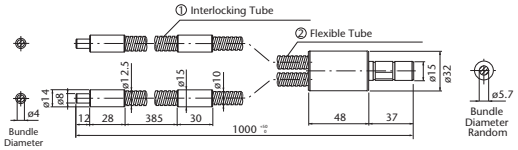
MWG-1000S/2000S

Minimum Bend R=30



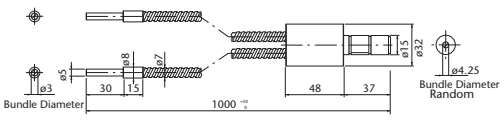
MWG-1000SR

Minimum Bend R ① =120, ② =30



MWG-1000S-SD

Minimum Bend R=25



Multifurcated Light Guides

- A 3 to 4 multifurcated light guide can be used when it is necessary to illuminate an object from many different angles, for example in the case of IC pin inspection.

Model	Product Code	Model	Product Code
M3G4-1000S	A-0663	**M3G3-1000S-SD**	A-0667
M3G4-2000S	A-0664	**M3G3-2000S-SD**	A-0668
M4G4-1000S	A-0665	**M4G3-1000S-SD**	A-0669
M4G4-2000S	A-0666	**M4G3-2000S-SD**	A-0670

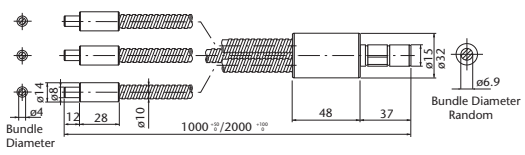
Explanation of Model Code

M [ ] **G** [ ] — Length **S** — [ ]

- [ ] Number of Branches: **3** 3-Branch; **4** 4-Branch
- [ ] Bundle Diameter: **3** ø3; **4** ø4
- Length: 1000 +20 +0 / 2000 +100 +0
- [ ] Special Function: **SD** Small Diameter Type

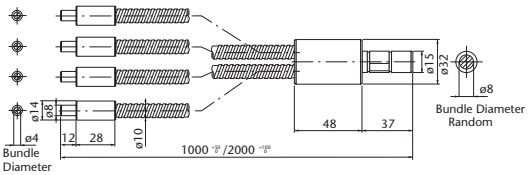
M3G4-1000S/2000S

Minimum Bend R=30



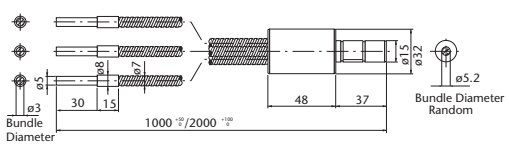
M4G4-1000S/2000S

Minimum Bend R=30



M3G3-1000S-SD/2000S-SD

Minimum Bend R=25



M4G3-1000S-SD/2000S-SD

Minimum Bend R=25

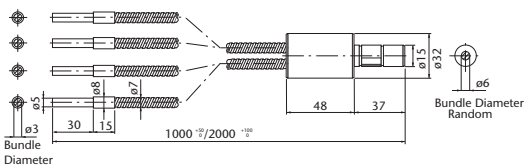
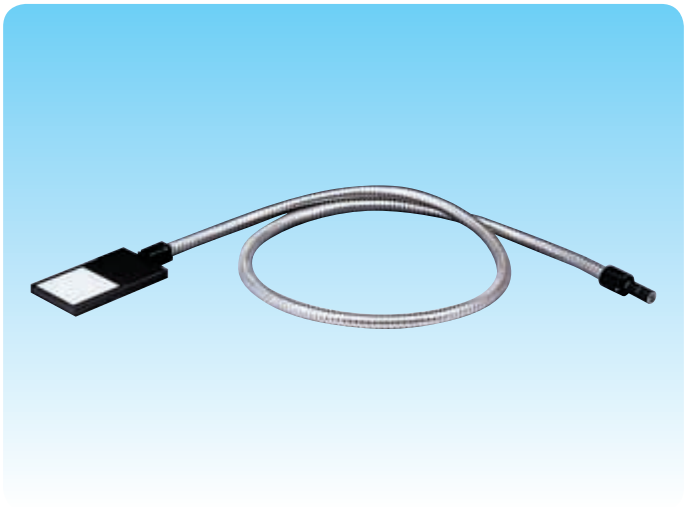


Plate Type Light Guides



- These plate type light guides do not require much space due to their slim, compact design.
- MORITEX's unique reflected light inducer allows for even and bright illumination. They can be used for multi-observation inspections that require transmitted and uniform illumination such as backlighting electronic components or semi-transparent surfaces.

Model	Product Code
MPP30-1500S-2	A-0679
MPP60-1500S-2	A-0680
MPP90-1500S-2	A-0681

Explanation of Model Code

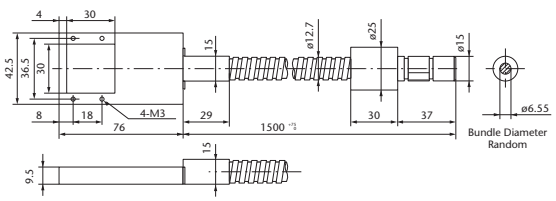
MPP □ – 1500S-2

Illuminating Area

30	30×30mm
60	60×60mm
90	90×90mm

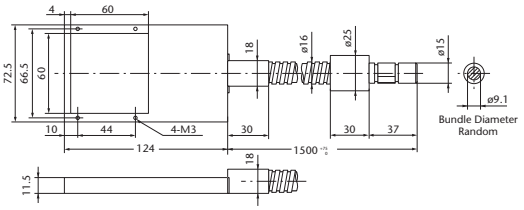
MPP30-1500S-2

Minimum Bend R=40



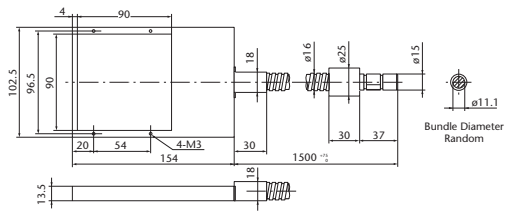
MPP60-1500S-2

Minimum Bend R=50



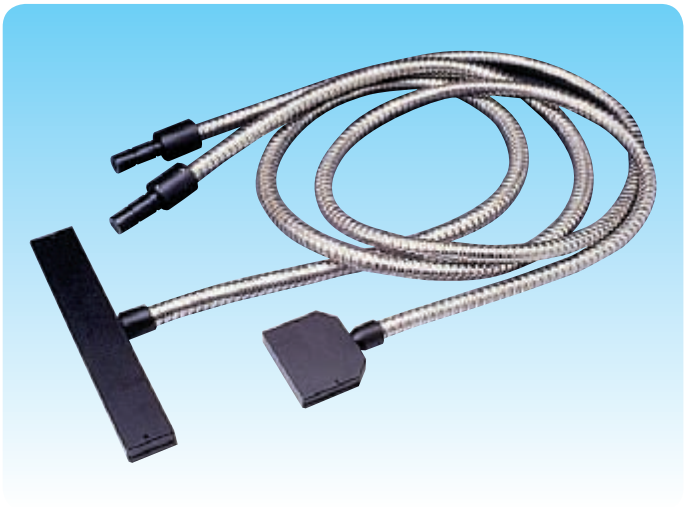
MPP90-1500S-2

Minimum Bend R=60



*Plastic light guides that cannot be used with 150W light sources: MPP30-1500S-2, MPP60-1500S-2, and MPP90-1500S-2.Use quartz adapter (KA-03) when using a 100W light source.

Line Light Guides



- These light guides can be used when line illumination or line scan CCD lighting is necessary.

Model	Product Code
MKG50-1500S	A-0684
MKG50×0.5W-1500S	A-0685
MKG180-1500S	A-0686
MKP180-1500S	A-0687

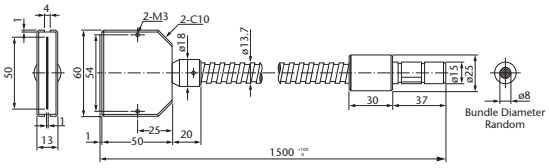
Explanation of Model Code

MK [ ] [ ] [ ] — Length S

Fiber Type: G Glass, P Plastic
Line Length: 50 50mm, 180 180mm
×0.5W 2-Branch

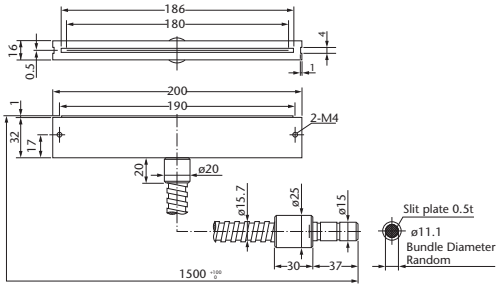
MKG50-1500S

Minimum Bend R=40



MKP180-1500S

Minimum Bend R=40

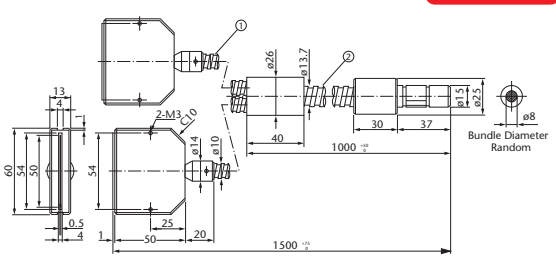


*150W light sources cannot be used with MKP180-1500S. Use quartz adapter (KA-03) when using a 100W light source.

MKG50x0.5W-1500S

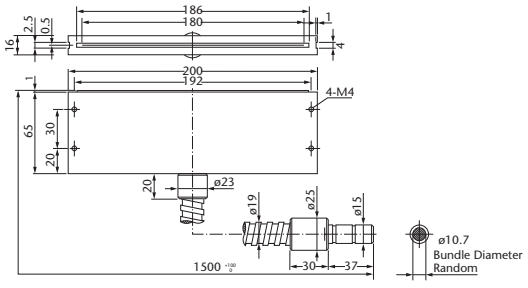
Minimum Bend R ① =30, ② =40

Made-to-order



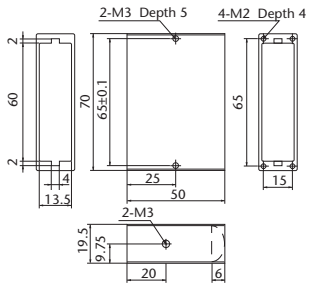
MKG180-1500S

Minimum Bend R=60



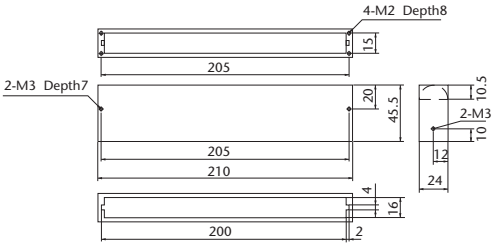
Condenser Lenses for Line Light Guides

MLK-50



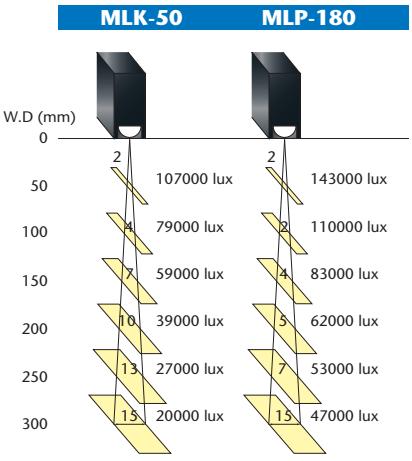
- Cylindrical focusing lens with the MKG50 light guide achieves a highly uniform beam with greater illuminance.

MLP-180



- Cylindrical focusing lens with the MKP180/ MKG180 light guides achieves a highly uniform beam with greater illuminance.

Model	Product Code
MLK-50	A-8307
MLP-180	A-8308



- Light source: 100W halogen light source (Volume: max)
- Fiber: MKG50-1500S for MLK-50
  MKP180-1500S for MLP-180

Long Width Line Light Guides

- Line light guides with a uniform line width of 180mm can be connected to produce seamless, uniform illumination of high intensity over long widths.
- These light guides are available in multiples of 180mm from 360mm to 1440mm long. Use these long width light guides for illumination when inspecting LCD, PDP, and other glass boards and substrates or sheet products with line CCD cameras. Please note that a variable number of light sources are needed for each individual unit depending on the length.

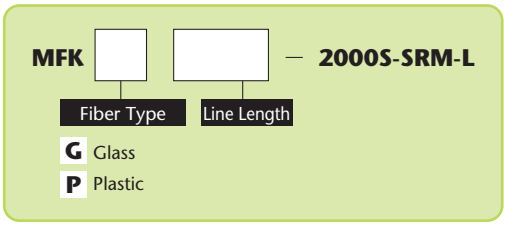
Made-to-order

MFKG Series
Line Light Guides (glass fiber)

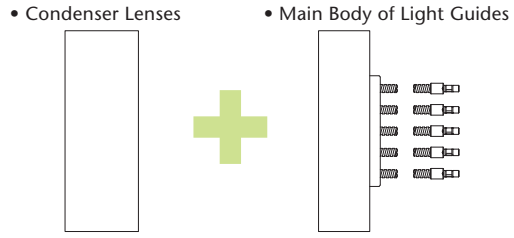
MFKP Series
Line Light Guides (plastic fiber)

Model	Fiber Type	Line Length(mm)	Required Quantity of Light Source	Product Code
MFKG360-2000S-SRM-L	Glass	360	2	A-0735
MFKG540-2000S-SRM-L	Glass	540	3	A-0736
MFKG720-2000S-SRM-L	Glass	720	4	A-0737
MFKG900-2000S-SRM-L	Glass	900	5	A-0738
MFKG1080-2000S-SRM-L	Glass	1080	6	A-0739
MFKG1260-2000S-SRM-L	Glass	1260	7	A-0740
MFKG1440-2000S-SRM-L	Glass	1440	8	A-0741
MFKP360-2000S-SRM-L	Plastic	360	2	A-0742
MFKP540-2000S-SRM-L	Plastic	540	3	A-0743
MFKP720-2000S-SRM-L	Plastic	720	4	A-0744
MFKP900-2000S-SRM-L	Plastic	900	5	A-0745
MFKP1080-2000S-SRM-L	Plastic	1080	6	A-0746
MFKP1260-2000S-SRM-L	Plastic	1260	7	A-0747
MFKP1440-2000S-SRM-L	Plastic	1440	8	A-0748

Explanation of Model Code

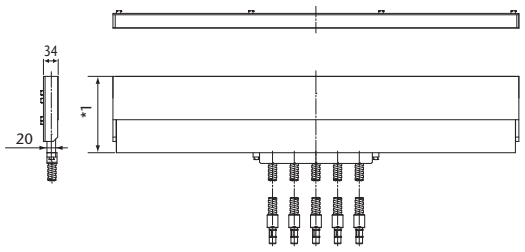


Structure of Long Width Line Light Guides



Long Width Line Light Guides are Composed of a Combination of Condenser Lenses and Line Light Guides

Light Guide



*1 Operable in Range from 159.5 to 194.5mm

Ultra-Uniform Fiber Illumination

MFKG-F1 Model Made-to-order

An ultra-uniform model for length line light guides. This model has made ultra-even possible through improvement of the falling of light intensity at the connection area, as well as through unique technology in which the light guide incidence sides give uniformity to irregularities in the light source equipment.

Usage

- Inspection of LCD glass panel inspection
- Inspection of color filters
- Inspection of sheet surface conditions

Features

- Improved uniformity through unique optical fiber manufacturing technology.
- Support for a line length of up to 3,600mm is possible.
- Ultra-uniform lighting is made possible for the condenser lens unit by using a uniquely designed optical system.
- Special optical elements that reduce light source irregularity can be installed in the light input bundle area. (Optional)
- The number of input dispersions and light source cap is specified by the customer.

(Approximate Measurements)
Standard : Maximum Band Diameter 11
Line Length possible up to 180mm x 0.5
Large Diameter Cap : Maximum Band Diameter 20
Line Length possible up to 500 mm x 0.5

Explanation of Model Code

MFKG □ – □ □ □ – □ □ □ □

Line Length	Fiber Length	Tube	F1	Number of Light Sources	Ferrule	Special Element	Special Function

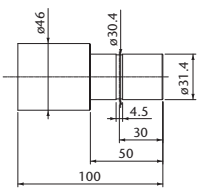
- **S** SUS Flexible
- **V** SUS Flexible + PVC Tube (Black)
- **G** SUS Flexible + PVC Tube (Antistatic Grey)

Tube: Standard; **L** Large Diameter Ferrule

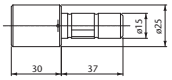
Ferrule: None; **D** Special Element

Special Function: **HR** Heat Resistant End 300°C; **REF** Reference

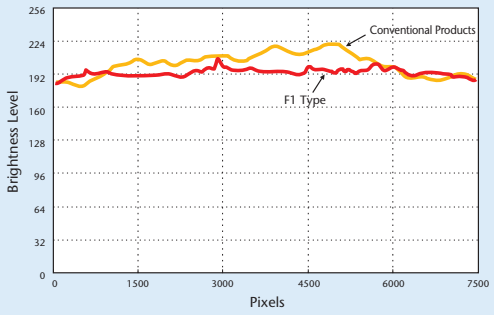
Large Diameter Ferrule



Standard



Line Sensor Brightness Level Graph

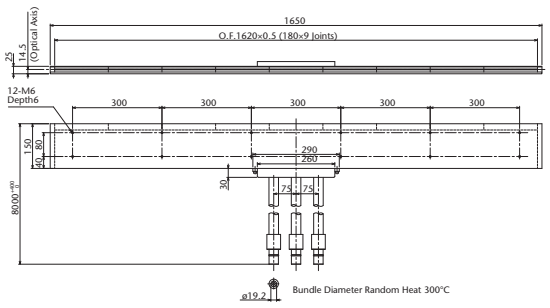


*Note: Graph and values are intended as a reference and are not a guarantee of the product's capabilities

Example of Production Record

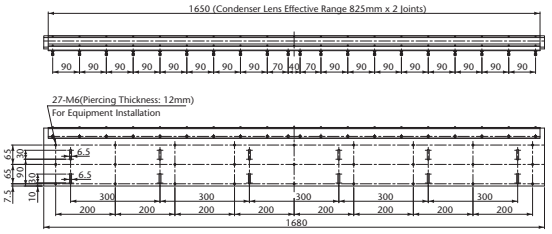
MFKG1620-8000G-F1-3LD-HR
Line Length : 1,620mm
Fiber Length : 8,000mm
Model : F1
Light Source : 3 light type large diameter cap /
Special element attached /
Heat resistant specification

Light Guide



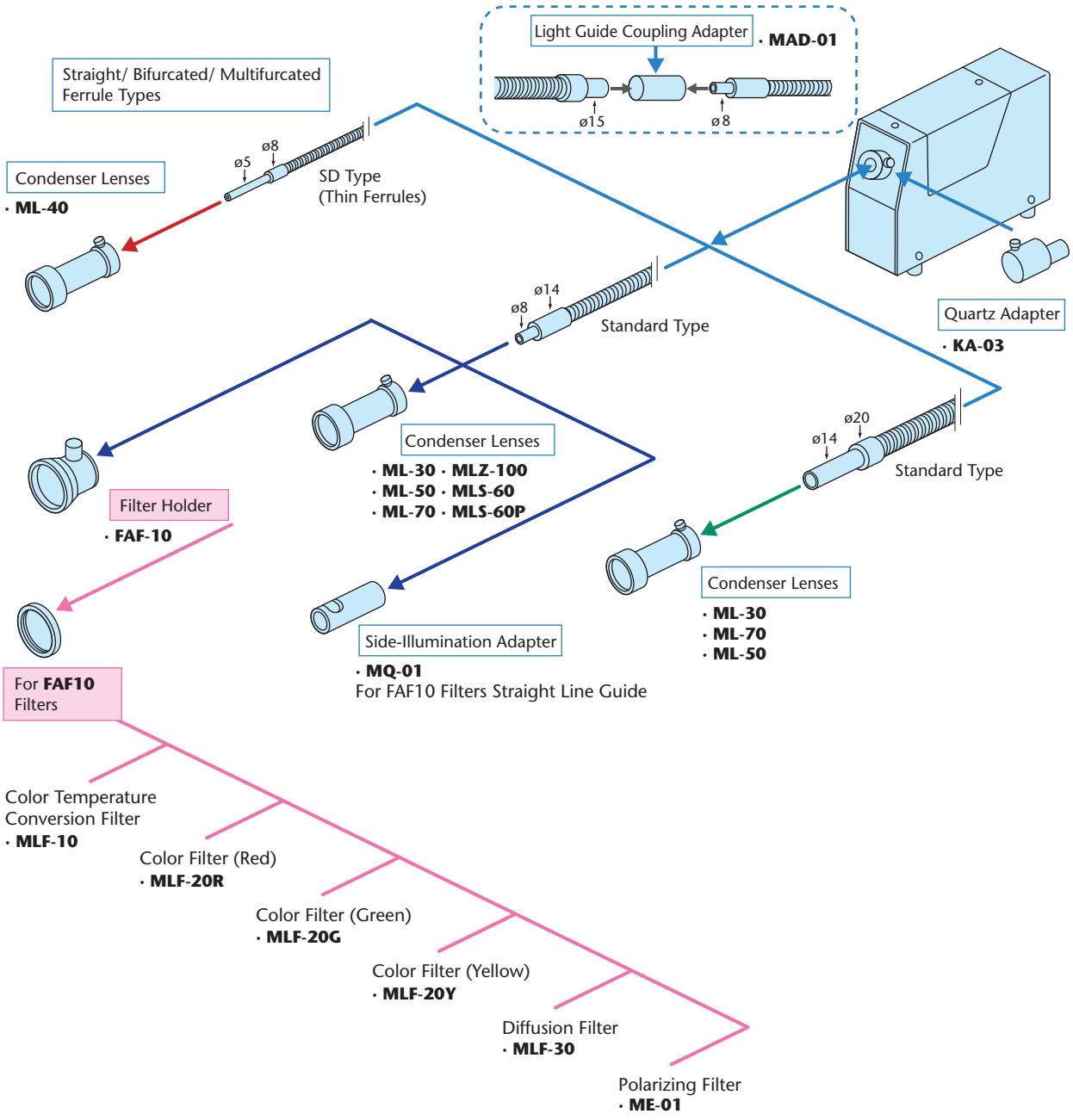
Condenser Lenses

Completed Patent Registration



Light Guide Options

Option Attachment Drawing for Straight/ Bifurcated/ Multifurcated Light Guides



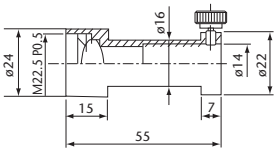
See corresponding pages for light guide compatibility, specifications, and option commodity codes.

For Straight/ Bifurcated/ Multifurcated Light Guides

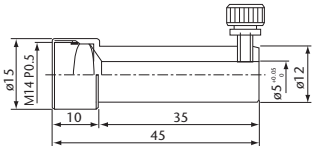
Condenser Lenses

- These high performance condenser lenses were uniquely developed by MORITEX for optical fiber light guides. Through careful design and production, MORITEX ensures high quality performance at reasonable cost.

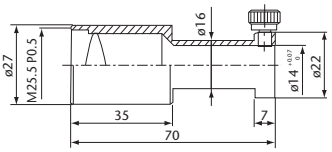
ML-30



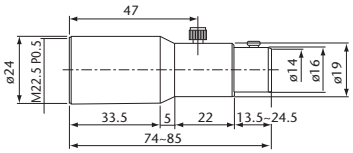
ML-40



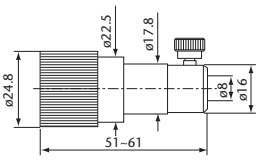
ML-50



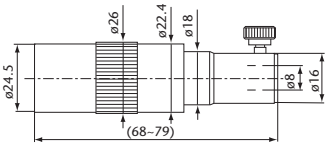
ML-70



MLZ-100



MLS-60P/MLS-60

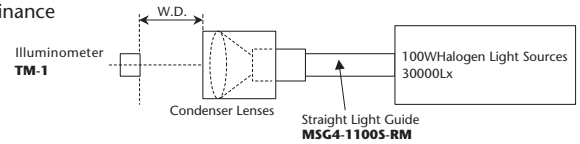


Illuminance Characteristic and Illumination Range of Condenser Lenses

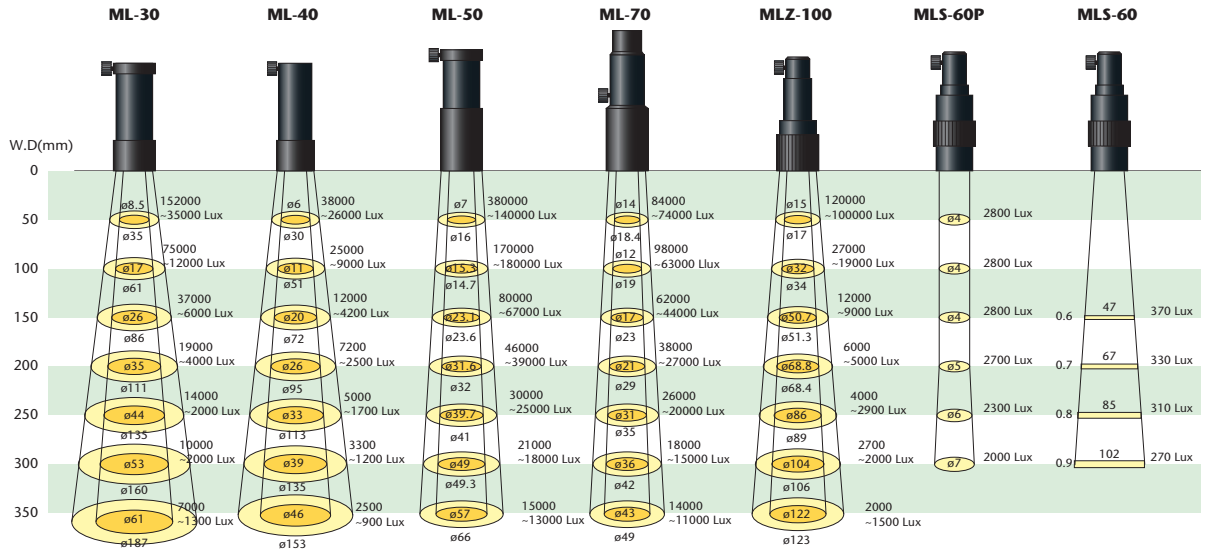
Measuring Method:

- Position the illuminometer visually at the center of the illumination range (narrow or wide) and measure the illuminance. Set the illuminance of the light source to 30,000Lx for standard measurement (measurement using the standard light guide and measuring instrument).
- If the illuminance of the light source set to 30,000Lx exceeds 99,900Lx (upper limit of the measuring instrument) in standard measurement, reduce the luminous energy to the measurable range and convert the value into the range of 30,000Lx later.

Central Illuminance



Model	Key Features	Product Code
ML-30	For straight or 2-branch light guides	A-8300
ML-40	For small diameter type (-SD)	A-8301
ML-50	Provides almost double the illuminance of the ML-30	A-8302
ML-70	For two lenses of two groups. Condenses into A uniform, comparatively small spot beam.	A-8303
MLZ-100	Uniform spot beam with each working distance. Adjustable focus function by helicoid.	A-8304
MLS-60P	Fine spot beam, focused by helicoid. Adjustable focus function by helicoid.	A-8306
MLS-60	Uniform and sharp slit beam, focused by helicoid. Adjustable focus function by helicoid.	A-8305



- Light source: 100W halogen light source (volume: max)
- Fiber: MSG4-1100S-RM for ML-30, ML-50, ML-70, MLZ-100, and MLS-60/60P
  MSG3-1100S-SD for ML-40

Filters and Adapters

A filter or adapter can be attached to the illumination port of MORITEX straight, bifurcated, or multifurcated light guide to change the color temperature of the fiber illumination, or to change the color to red, green, or yellow.

Filter Holder Made-to-order

FAF-10

- This filter holder fits a straight, bifurcated, or multifurcated light guide with irradiation port of 8.0 in the outside diameter. A color temperature conversion filter (MLF-10), color filter (MLF-20 Series of R, G, and Y colors) and diffusion filter (MLF-30) can be installed.

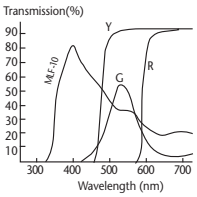
Model	Product Code
FAF-10	A-8321

Filters

Made-to-order

MLF-10
MLF-20
MLF-30

*Screw pitch M22.5x0.5



- By using a filter holder (FAF-10), the following filters can be attached:

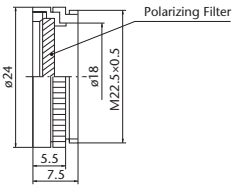
Model	Product Name	Product Code
MLF-10	Color Temperature Conversion Filter	A-8322
MLF-20	Color Filter Set (R/G/Y)	A-8323
MLF-30	Diffusion Filter	A-8324
MLF Filter Frame	MLF Filter frame	A-8325

Polarizing Filter for Straight Light Guides

ME-01 Made-to-order

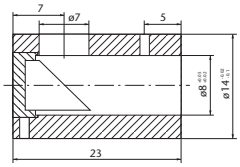
- Can be attached to either the filter holder (FAF-10) or various lenses.

Model	Product Code
ME-01	A-8340



Side-Illumination Adapter

MQ-01

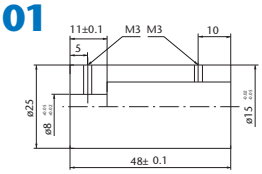


* Used to bend illumination 90° from the light guide output axis.

Model	Product Code
MQ-1	A-8346

Light Guide Coupling Adapter

MAD-01

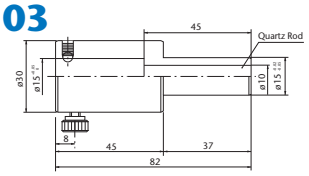


* This adapter joins the ferrules on the output side of one light guide to the input side of another.

Model	Product Code
MAD-01	A-8347

Quartz Adapter

KA-03



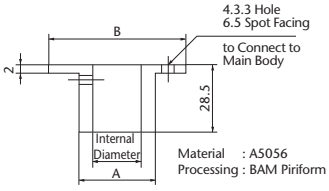
* Use this adapter when combining a 100W light source and a plastic light guide.

Model	Product Code
KA-03	A-8348

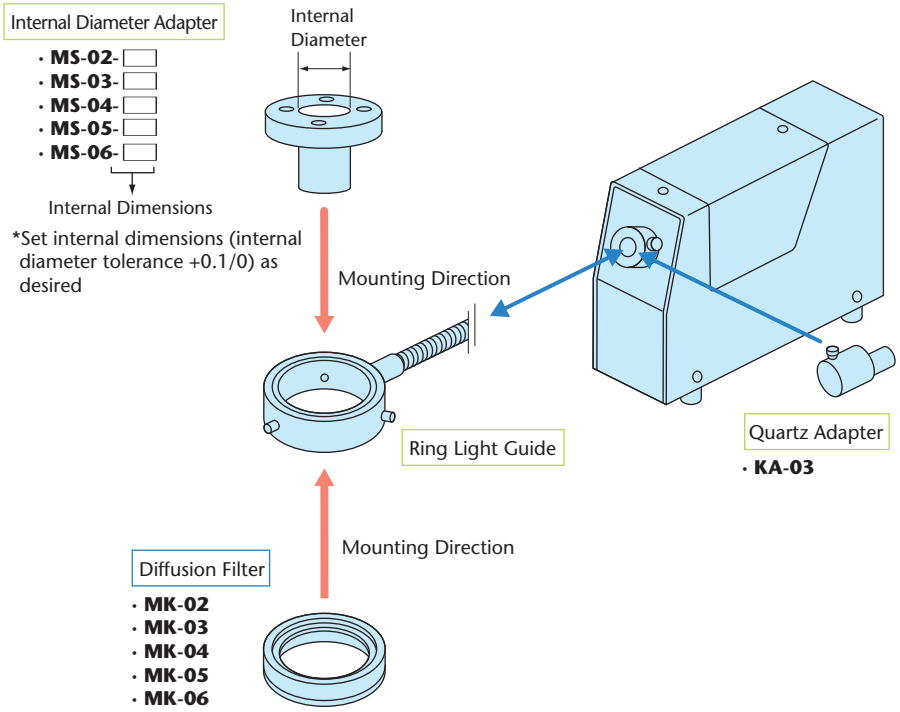
Inner Diameter Adapter Made-to-order

Model	Compatible model	Dimension A (mm)	Dimension B (mm)
MS-02-□	MRG-31	ø31	ø60
MS-03-□	MRG-48	ø48	ø75
MS-04-□	MRG-53	ø53	ø80
MS-05-□	MRG-61	ø61	ø90

* Specify the bore or internal diameter as required. The tolerance for the internal diameter is +0.1/+0.
* Coating processing not performed for the internal diameter.



System Chart for Ring Light Guides



See corresponding pages for light guide compatibility, specifications, and option commodity codes.

Ring Light Guide Options

Diffusion Filter

Model	Compatible Model	External Diameter	Thickness (mm)	Product Code
MK-02	MRG-31	ø46	5.5	A-8364
MK-03	MRG-48	ø65		A-8365
MK-04	MRG-53	ø69		A-8366
MK-05	MRG-61	ø76		A-8367
MK-06	MRG-75	ø90		A-8368

Setting this filter at the light irradiation end of a ring light guide suppresses illuminance irregularity, achieving a soft illumination effect.

Light Guide Data

Mechanical Characteristics and Environment Resistance

Mechanical Characteristics

●Minimum Bend Radius

The minimum bend radius of fiber optic light guides is determined mainly by the tube's bend radius. It is also influenced by the diameter and length of the fiber optic bundle. If you bend a light guide over its limit, it cannot perform properly because transmitted light quantity decreases due to bending or disconnection of optical fiber. Note that bend radius is larger for optical fiber with a random sequence.

●Durability for Repeated Bending

Although durability of optical fiber for repeated bending varies depending on types, it is not very good overall. Optical fiber breaks or deteriorates because of twisting, friction with other optical fiber, and friction within tubing (coating for a fiber optic bundle). When this happens, transmitted light quantity reduces and a light guide cannot perform sufficiently. Durability for repeated bending is even lower for optical fiber with a random sequence. If more durability is required, use a flexible light guide (special order) with a different internal structure and special coating agent.

Environment Resistance

●Heat Resistance

The normal heat resistance ranges for raw plastic fiber, multi-component glass fiber, and quartz fiber are 70, 430˚C (except oiling), and 1,000˚C (except coating) respectively. Upper limit temperature for light guides ends differs according to the heat resistance of adhesives and coating materials used to protect optical fiber. Upper limit temperature for raw plastic fiber, multi-component glass fiber, and quartz fiber are 70˚C, 200˚C, and 200˚C respectively.
If higher heat resistance is required, please use heat-resistant line guides (special order, 300˚C for multi-component glass fiber and quartz fiber). If even higher heat resistance is required, quartz fiber light guides that are resistant to 500˚C can be manufactured.
Life of raw optical fiber varies according to temperature that it is used at, and the amount and time of change in temperature. Please contact us before using light guides in special conditions.

Heat Resistance

Optical Fiber	Heat Resistance of Raw Fiber (˚C)	End Heat Resistances of Standard Products (˚C)	End Heat Resistance of Heat-Resistant Products (˚C)
Plastic	70	70	—
Multi-Component Glass	430 (Except Oiling)	200	300
Quartz	1,000 or More (Except Coating)	200	300, 500

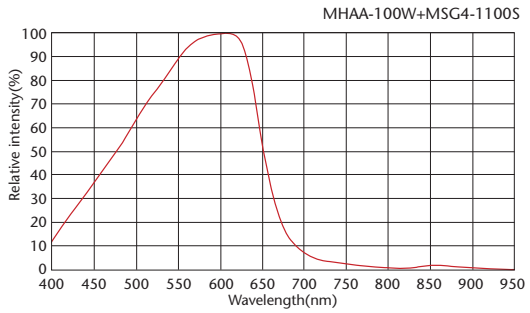
Transmittance Rate and Luminosity Distribution Characteristics

Optical Fiber Data

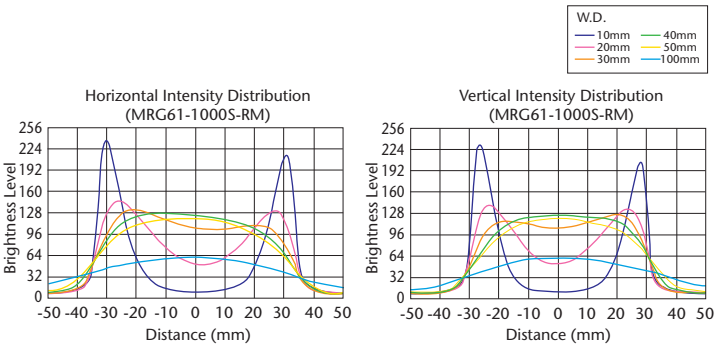
	Compound Glass	Plastic	Quartz
Fiber Diameter	50μm	250μm 500μm 750μm 1000μm 2000μm	208μm(Many Others)
Core Diameter	47.2μm	(3~5 μm Less Than Fiber Diameter)	200μm(Many Others)
Entrance Angle	Approx. 64°	Approx. 60°	Approx. 25°
Upper Temperature Limit for Light Gudie Ends*1	Standard Type 200°C Special Order 300°C	Standard Type 70°C	Standard Type 200°C Special Order 500°C
Durability	△	○	×
Heat Resistance	○	×	○
Transmittance*2 (Visible Light for Short Distance)	△	△	○
Values	○	○	×

○Excellent △Problems in certain conditions ×Not recommended
For reference only. Consult MORITEX for details
*1 Data of a bundle (not element wire data)
*2 Transmission at 10m or less

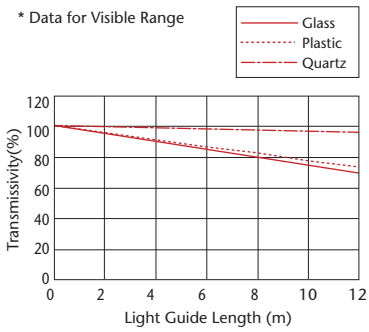
Distribution Characteristics of Light Guide and Halogen Light Source



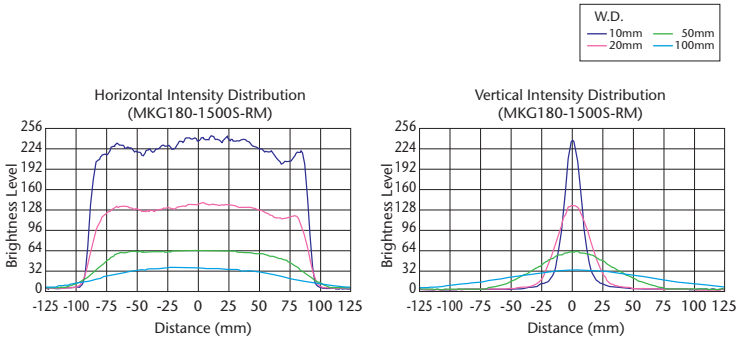
Luminance Distribution of Ring Light Guide



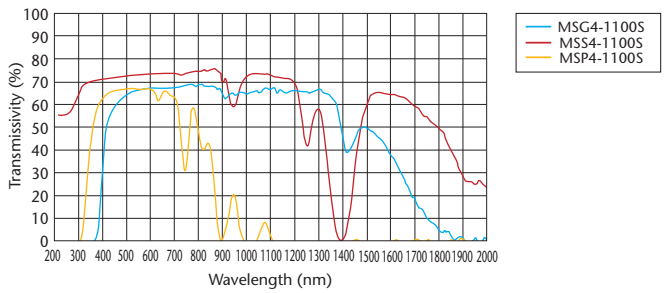
Length and Transmission of Light Guide



Luminance Distribution of Line Light Guide



Spectral Transmission of Different Light Guides



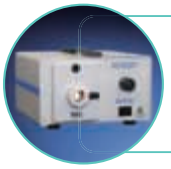
Fiber Optic Light Sources and Light Guides

ColdVision Series

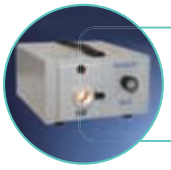
The ColdVision series provides an extensive offering of light sources, fiber optic light guides, and accessories designed to meet every illumination need for Machine Vision and Microscopy illumination.

Utilizing LED, Halogen and Xenon light sources and accessories for standard and customized solutions, the ColdVision series combines flexibility with versatility. All ColdVision products in the expansive portfolio are specifically designed to operate seamlessly together and represent your best choice for Machine Vision and Microscopy illumination world-wide.

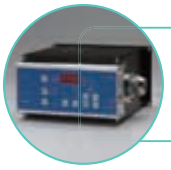
LED Light Source
LLS



Halogen Light Source
DCR® III
DCR® III Plus
DCR® IV



Halogen Light Source
ACE®



Xenon Flash Light Source
MaVi-S

Universal Ringlight
Midi and Mini Ringlights
66 mm / 58 mm Ringlights
Darkfield Ringlight
Single Bundles
Dual and Quad Bundles
Randomized and Calibrated Bundles
Single and Dual Goosenecks
Combination Goosenecks & Bundles
1", 2" & 3" Lightlines
Lightlines
Spatially Randomized Lightlines
45° Lightline
Lightline Lenses
Single and Dual Backlights
PANELite® Backlights

Darkfield Illuminator / Ringlight Adapters
Ringlight Polarizers & Analyzers
Diffuse Dome
Ringlight Reflector Rings / Ringlight Support Apparatus
Bundle Extenders
Gooseneck & Bundle Support Apparatus
Support Apparatus
Filters, Diffusers & Spot Lenses
Lightline Linear Polarizer Kits
Lightlines Support Apparatus

- CE Marking
- UL Listed
- CSA Marking
- RoHS Directive
- 75 W Wattage
- 150 W Wattage
- W (R/G/B) LED Color (Made-to-order Color)

W (R/G/B) RoHS CE

LLS - LED Light Source

LLS - LED Light Source, A20960

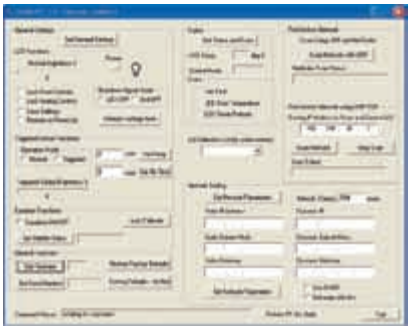
Long Life, Low Energy Consumption, High Performance

- Long life-time (50,000 hours)
- Fits all COLDVision light guides
- Fast triggered strobe capabilities (maximum 1 kHz pulse rate, maximum pulse width 1 msec, duty 1/10)
- Internal light feedback provides stabilized light output for the most demanding machine vision applicaitons.
- Low power consumption (less then 25 watts)
- Improved immunity to vibration and shock
- Small footprint and worldwide universally compatible power supply with interchangeable plugs
- RoHS compliant
- CE approved

LLS - LED Light Source, A20960. Rear View shows (from left to right): universal power input, multi-port input, Ethernet input, RS-232 input

Hybrid Solution pairs state-of-the-art LED technology with Fiber Optic Light Guides

- The LLS offers users 4 different modes of control interfaces - a continous intensity control knob, Ethernet, RS-232 or analog 0-5 Volt.
- The auto-sensing inputs eliminate the need to switch manually between the modes. The unit also features a user control lock-out via the Ethernet and RS-232 SCHOTT supplied software.

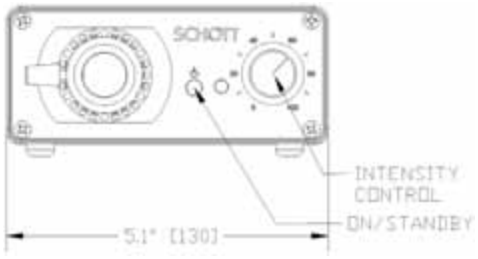


Screen shot of the supplied Ethernet software

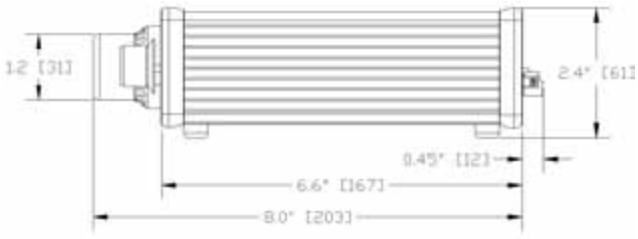
LLS - LED Light Source

Dimensions in ( ) are in mm

LLS A20960 Top View



Side View



Front View

Characteristics	
Dimensions	Length 197 mm (7.75 in)
	Width 129 mm (5.08 in)
	Height 63 mm (2.48 in)
Weight	862 grms (1.9 lbs)
Operating Temperature	5° C (41° F) to 40° C (104° F)
Color Temperature - White	6000K (Reference Values)

LLS Technical Information

Part No.	Color	Wavelength (nm) (+/- bandwidth 20 nm)	Light Output
★ A20960	Red	625	120 lm
A20960.1	White	---	275 lm
★ A20960.2	Green	525	100 lm
★ A20960.4	Blue	470	40 lm
★ A20955	Mounting Bracket		

★Made-to-order products.

Option

Nosepiece Adapter

Nosepiece Adapter

	Model
MORITEX Lightguides	LLS-LG-MTX
MegaLight	LLS-LG-MEGA

150 W CSA UL CE

DCR® III Light Source

DCR® III Light Source with EKE lamp, A20800

DC regulated light source provides intense, cool illumination

- DC-regulated light source limits light fluctuation to ± 0.5% due to line voltage variation
- Universal input voltage – accepts 90 to 265 VAC
- Current limiting – protects the unit from over heating due to defective andaging bulbs.
- Transient protection – allows remote location of bulb.
- Lamp change indicator light - LED located on front panel changes from green to red when lamp requires replacement.
- Soft start "lamp saver" circuitry
- IR filter for cool illumination
- Solid state dimmer control for continuous dimming
- Interchangeable Modulamp Units offer 2 lamp positions to maximize individual lamp efficiencies.
- Choice of three, 150 watt halogen lamps - EKE, EJA and DDL
- Can power the RS232 from the 9-pin connector
- Built-in 9-pin connector for analog remote control or RS-232 connection (A20601)
- Detachable IEC cord
- Quiet fan cooling
- CSA approved to UL spec, CE compliant to low voltage and EMC directives
- Low housing temp – slightly above ambient

DCR® III Light Source Models

Part No.	Description
Standard Light Sources with US Power Cord Included	
A20800	with EKE Lamp
A20800.1	with EJA Lamp
A20800.2	with DDL Lamp
Light Source without Modulamp Unit and US Power Cord Included	
★ **A20801**	No Lamp – Power Supply Only
Standard Light Sources EU Version - No Power Cord Included	
A20820	with EKELamp
A20820.2	with DDL Lamp

★ Made-to-order products.

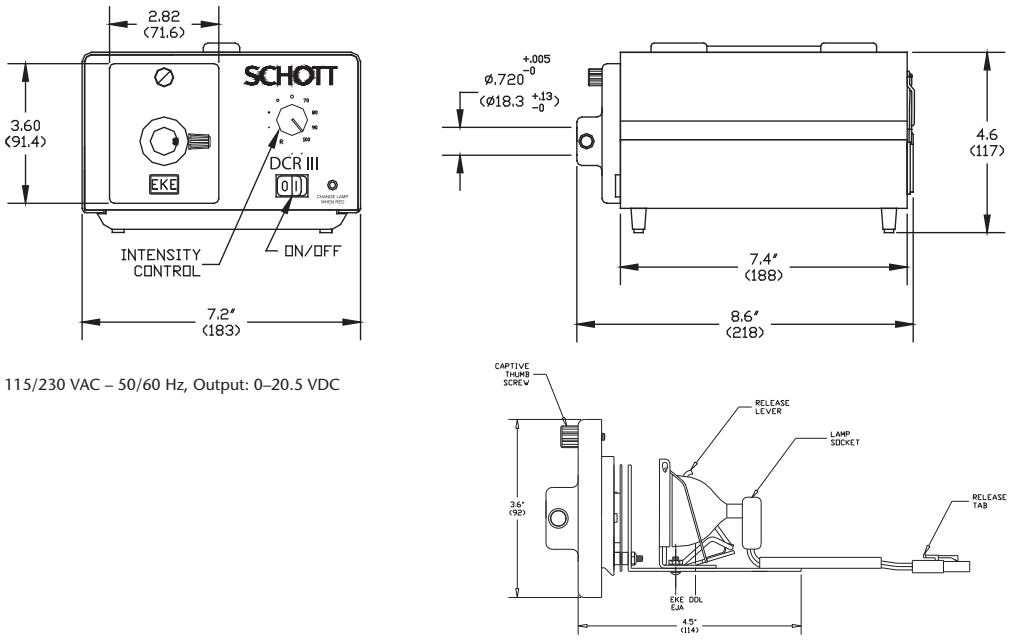
EKE, DDL, and EJA lamps and Modulamp units can be purchased separately.

Options

- Mechanical shutter.
- Wired, manual remote control andRS232 connection.
- Infinite setting, twelve blade irisdiaphragm version available to reduceintensity while maintaining color temperature.

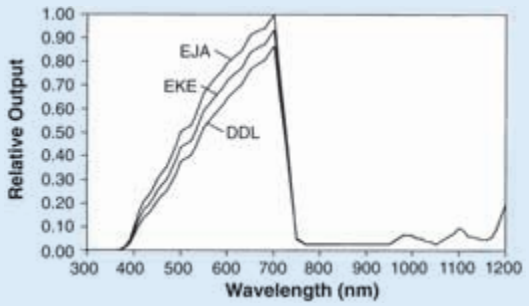
DCR® III Light Source

Dimensions in ( ) are in mm

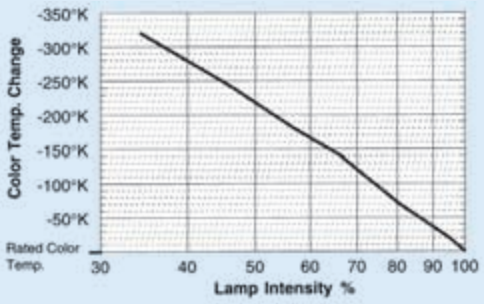


Input: 115/230 VAC – 50/60 Hz, Output: 0–20.5 VDC

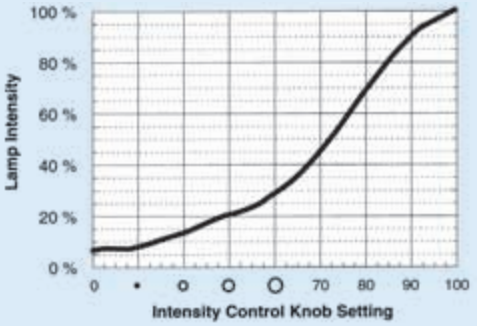
Spectral Curves w/Interference IR Filter



Color Temperature Change vs. Lamp Intensity



Lamp Intensity vs. Intersity Control Knob Setting



Modulamp... SCHOTT Innovation! Two positions optimize light intensity output, depending on the lamp in use. Entire housing is interchangeable for quick setup.

Choice of Lamps.. SCHOTT Versatility! Three different bulbs (EJA, EKE, DDL) offer light intensity and color temperature options to maximize productivity and accuracy.

Power Supply Specifications	
Rated Power Output	150 Watts
Output Voltage	0.0, 0.5 to 20.5 VDC
Input Voltage Rating, 50/60 Hz.	90 to 265 VAC
Power Factor Correction @ 230 VAC, 50 Hz.	> 0.99, < 4°
Hold-up Time, Nominal AC Input, Full Load	8.3 milliseconds
Line Regulation, Over Entire Input Range	±0.5%
Current Limit Set Point	8.5 Amps
Temperature Range:Operating	0° to 45°C
Storage	-25° to 85°C
Relative Humidity, Non-condensing	5% to 95%

Note: If the intensity control knob is turned to the R (Remote) position, lamp intensity control is switched to the rear 9-pin connector. Front panel intensity control will always override the remote intensity control.

150 W CSA UL CE

DCR® III Plus Light Source

DCR® III Plus Light Source , A20870

Includes all the standard features of the DCR® III plus a built-in RS232 interface providing intense, cool illumination via remote control

- Remote controllable using built-in integrated RS232 interface
- Designed to control up to three additional DCR® III units via a built-in 15-pin connector. Expansion cable and DCR® III light sources sold separately.
- Automatically restores user settings on power up
- Enhanced communications available by embedding error checking codes in command strings
- Easy programmability with simple command structure
- DC-regulated light source limits light fluctuation due to line voltage variation up to ±0.5%.
- Current limiting circuitry protects the unit from over heating due to defective and aging bulbs.
- Lamp change indicator light - LED located on front panel changes color from green to red when lamp requires replacement. Lamp status output on RS232 is available.
- Solid state intensity control adjusts from 0 to 100% light output.
- Interchangeable Modulamp units offer 2 lamp positions to maximize individual lamp efficiencies.
- Soft start "lamp saver" circuitry
- IR filter for cool illumination
- CSA certified to UL, CE compliant to low voltage and EMC directives
- Universal input voltage – accepts 90 to 265 VAC, 50/60 Hz

DCR® III Plus Light Source Models

Part No.	Description
Standard Light Sources US Power Cord Included	
A20870	with EKE Lamp
★ A20870.1	with EJA Lamp
A20870.2	with DDL Lamp
Standard Light Sources EU Version - No Power Cord Included	
A20875	with EKE Lamp
★ A20875.1	with EJA Lamp
A20875.2	with DDL Lamp
Expansion Cable	
A20665	Triple Cable with Plug, 12"

★ Made-to-order products.

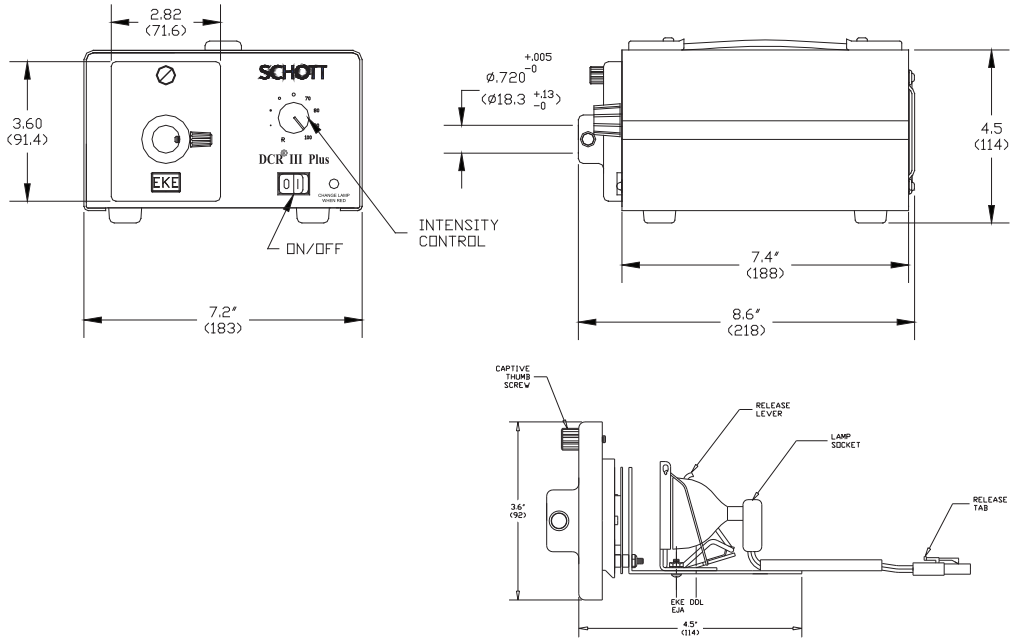
EKE, DDL, and EJA lamps and Modulamp units can be purchased separately.

Options

- Mechanical shutter.
- Infinite setting, twelve blade iris diaphragm version available to reduce intensity while maintaining color temperature.
- Expansion cable.
- Remote light source.

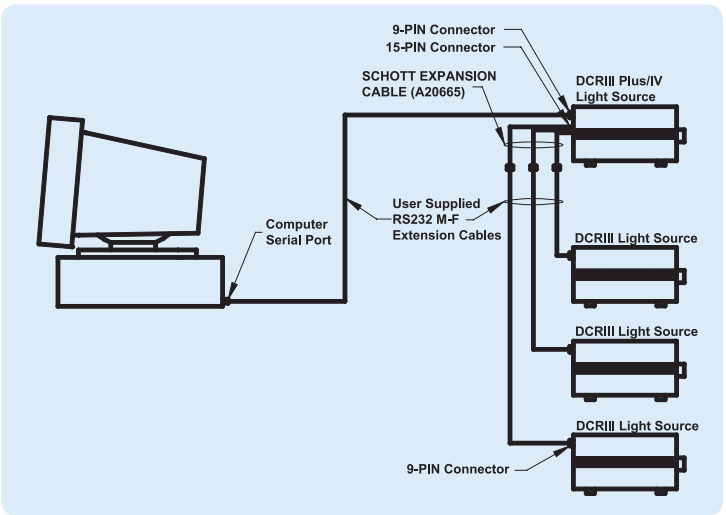
DCR® III Plus Light Source

Dimensions in ( ) are in mm



Modulamp... SCHOTT Innovation! Two positions optimize light intensity output, depending on the lamp in use. Entire housing is interchangeable for quick setup.

Choice of Lamps.. SCHOTT Versatility! Three different bulbs (EJA, EKE, DDL) offer light intensity and color temperature options to maximize productivity and accuracy.



Power Supply Specifications	
Rated Power Output	150 Watts
Output Voltage	0.0, 0.5 to 20.5 VDC
Input Voltage Rating, 50/60 Hz.	90 to 265 VAC
Power Factor Correction @ 230 VAC, 50 Hz.	> 0.99, < 4°
Hold-up Time, Nominal AC Input, Full Load	8.3 milliseconds
Line Regulation, Over Entire Input Range	±0.5%
Current Limit Set Point	8.5 Amps
Temperature Range: Operating	0° to 45°C
Storage	-25° to 85°C
Relative Humidity, Non-condensing	5% to 95%

Note: If the intensity control knob is turned to the R (Remote) position, lamp intensity control is switched to the RS232 interface. Front panel intensity control will always override the remote intensity control. Remote control of attached DCR® IIIs is dependent on each individual unit's setting, which should be in R (Remote) position for remote control.

150 W CSA UL CE

DCR® IV Light Source

DCR® IV Light Source with DDL lamp, A20890

DC regulated light source with integrated Equalizer light feedback to provide stabilized light output for the most demanding machine vision inspection applications (See DCR® III Plus datasheet for base description.)

- Stable lamp output over the life of the lamp and minimized lamp to lamp variation
- Remote controllable using integrated RS232 interface
- **Flexible** - Two configurations available:
- A. DCR® IV used with a reference Modulamp unit and off-the-shelf fiber optic, maintains DDL lamp output at ±2% over the life of the lamp and ±8% lamp to lamp
- B. For even greater control, use the DCR® IV with fiber optic products that have an integrated reference bundle; **special order only**. This will maintain DDL lamp output and lamp to lamp variation within ±1%.
- All of the features of the DCR® III Plus Light Source including control of up to three additional DCR® III light sources via an expansion cable
- LED's located on the front panel indicate that the lamp intensity is stabilized.
- Easy to use front panel controls for calibration and intensity control
- CSA certified to UL, CE compliant to low voltage and EMC directives
- Universal input voltage – accepts 90 to 265 VAC, 50/60 Hz

DCR® IV Light Source Models

Part No.	Description
Standard Light Sources US Power Cord Included	
★ **A20890**	Integrated Equalizer (complete with Reference Modulamp assembly and DDL Lamp). (Standard fiber)
★ **A20891**	Integrated Equalizer (complete with Modulamp assembly and DDL Lamp. Does not include reference bundle). (Custom Fiber)
Standard Light Sources EU Version - No Power Cord Included	
★ **A20895**	Integrated Equalizer (complete with Reference Modulamp assembly and DDL Lamp).

★ Made-to-order products.

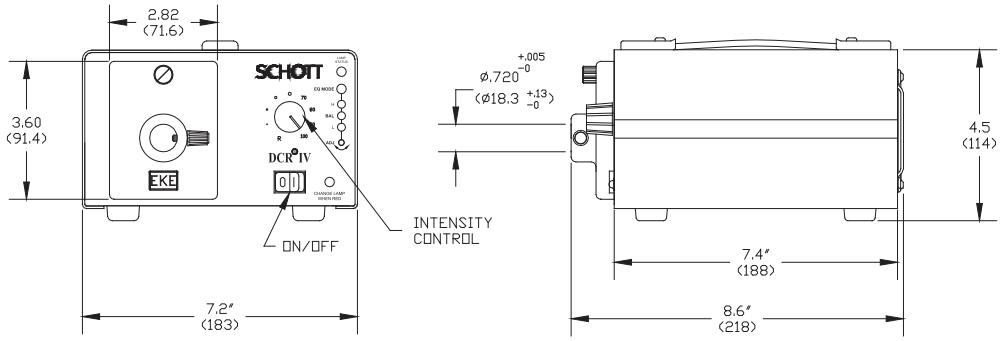
DDL lamp and Modulamp units can be purchased separately.

Options

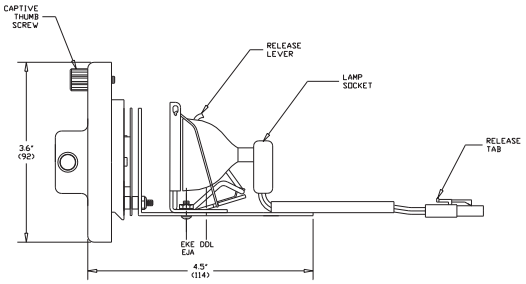
- Mechanical shutter.
- Infinite setting, twelve blade iris diaphragm unit available to reduce intensity while maintaining color temperature. Cannot be used with reference Modulamp.
- Expansion cable.

DCR® IV Light Source

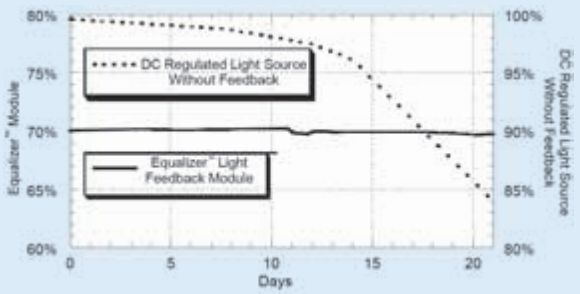
Dimensions in ( ) are in mm

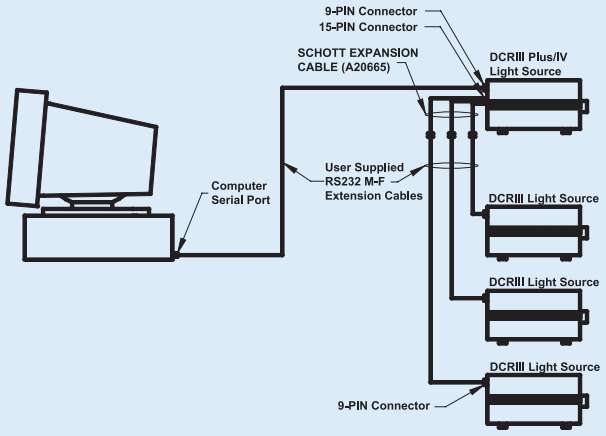


DDL lamp is offered as the standard lamp for this unit.



Lamp Intensity vs. Time





Note: If the intensity control knob is turned to the R (Remote) position, lamp intensity control is switched to the RS232 interface. Front panel intensity control will always override the remote intensity control. Remote control of attached DCR® IIIs is dependent on each individual unit's setting, which should be in R (Remote) position for remote control.

Performance Specifications	
Light Output with Reference Modulamp Unit	±2%
Light Output with Independent Reference Bundle	±1%
Lamp to Lamp Variation with Reference Modulamp Unit	±8%
Lamp to Lamp Variation with Independent Reference Bundle	±1%
Power Supply Specifications	
Rated Power Output	150 Watts
Output Voltage	0.0, 0.5 to 20.5 VDC
Input Voltage Rating, 50/60 Hz.	90 to 265 VAC
Power Factor Correction @ 230 VAC, 50 Hz.	> 0.99, < 4°
Hold-up Time, Nominal AC Input, Full Load	8.3 milliseconds
Line Regulation, Over Entire Input Range	±0.5%
Lamp Type	DDL, Ushio or GE, 150 W Halogen Bulb
Current Limit Set Point	8.5 Amps
Temperature Range: Operating	0° to 45°C
Storage	-25° to 85°C
Relative Humidity, Non-condensing	5% to 95%

CSA UL CE

Universal Light Source

Universal Light Source, A20855

For applications where DC power is already available and the need for an economical light source exists

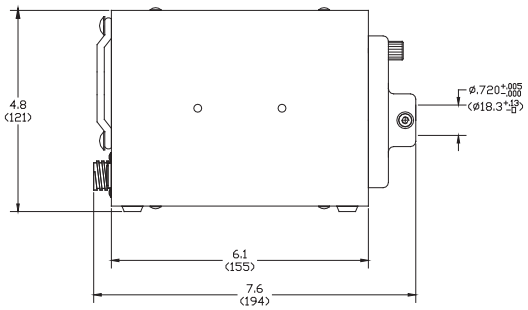
- Many of the same functional features as the Remote Light Source Kit
- Includes Modulamp
- Connectors are included.
- Power cable supplied by customer
- CE compliant to low voltage directive
- Will accept any MR-16 halogen lamp up to 150W/21V

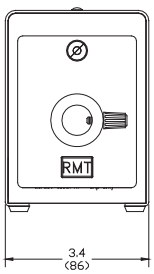
Light Source Accessories

Part No.	Description
A20855	Universal Light Source

A20855

Dimensions in ( ) are in mm





Input: 0 – 21 VDC

150 W CSA UL CE

ACE® Light Source

ACE® Light Source with EKE lamp, A20500

Compact, rugged, AC halogen light source with solid state dimmer for variable light intensity and maximizing lamp life

- Solid state dimmer for continuous control zero to full intensity
- Heavy duty, grounded metal housing
- 115 or 230 input voltage versions available
- IR interference filter for cool illumination
- Full illumination on .60" active diameter input
- Interchangeable Modulamp Units offer 2 positions to maximize individual lamp efficiencies.
- Choice of three, 150 watt halogen lamps - EKE, EJA, and DDL for intense, uniform illumination
- Built-in thermal shut down
- Quiet fan cooling
- CSA approved to UL spec, CE compliant to low voltage and EMC directives
- Low housing temperature
- Detachable IEC cord

Modulamp Unit with Iris Diaphragm

ACE® Light Source Models

115 Volt	230 Volt	Description
Standard Light Sources		
A20500	A20510	EKE Lamp
A20500.1	A20510.1	EJA Lamp
A20500.2	A20510.2	DDL Lamp
Light Source without Modulamp Unit		
★ A20500.115	★ A20510.230	No Lamp Power Supply Only

★ Made-to-order products.

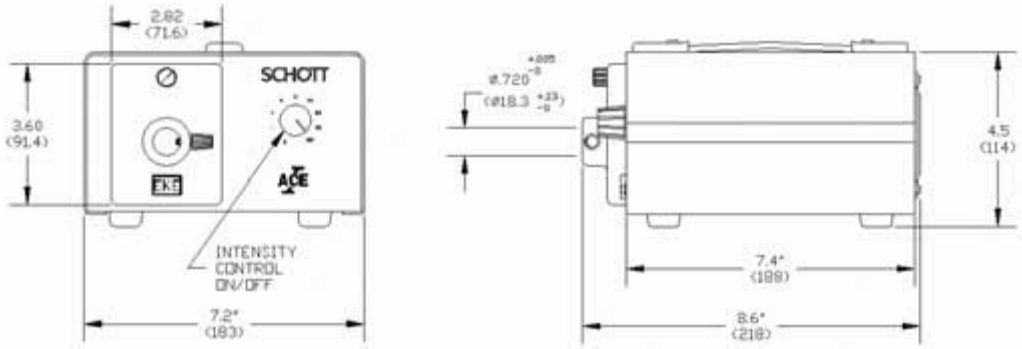
EKE, DDL, and EJA lamps and Modulamp units can be purchased separately.

Options

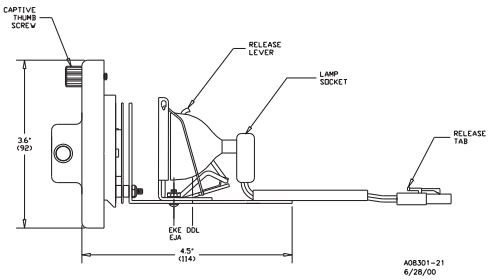
- Private labeling available.
- Infinite setting, twelve blade iris diaphragm version available to reduce intensity while maintaining color temperature.

ACE® Light Source

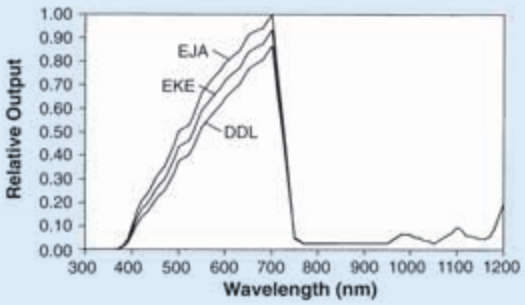
Dimensions in ( ) are in mm



Input: 115 VAC/60 Hz, 230 VAC/50/60 Hz, Output: 0–21 VAC



Spectral Curves w/Interference IR Filter

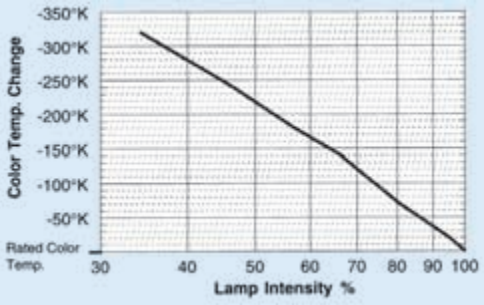


Modulamp... SCHOTT Innovation!
Two positions optimize light intensity output, depending on the lamp in use. Entire housing is interchangeable for quick setup.

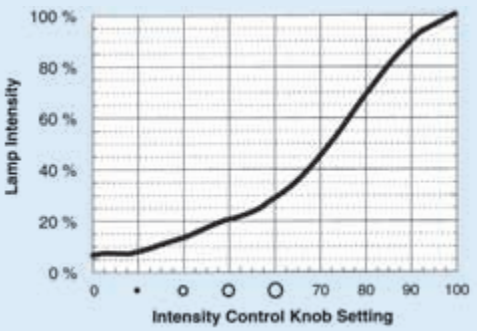
Choice of Lamps.. SCHOTT
Versatility! Three different bulbs (EJA, EKE, DDL) offer light intensity and color temperature options to maximize productivity and accuracy.

Power Supply Specifications	
Power Consumption	190 Watts (nominal)
Output Voltage	0 - 21 VAC
Fiber Receptacle	0.72" (13.3 mm)
Input Voltage	115 VAC / 60 Hz
	230 VAC / 50/60 Hz
Temperature Range: Operating	0° to 50°C

Color Temperature Change vs. Lamp Intensity



Lamp Intensity vs. Intersity Control Knob Setting



Solid State Dimmer..SCHOTT Control!
Continuous intensity control for lamp life management.

150 W CSA UL CE

ACE® Remote Light Source

115 Volt ACE® Remote Light Source with EKE lamp, A20560

All the features of our universally accepted ACE® light source with the added convenience of the following:

- 6' shielded black cable provides remote intensity control, including ON/OFF.
- Positive locking, quick disconnect cable will not pull out
- CSA approved to UL spec, CE compliant to low voltage and EMC directives
- 10' shielded extension available as an option
- Modulamp assembly purchased separately
- Heavy duty, grounded metal housing
- 115 input voltage version available
- IR interference filter for cool illumination
- Full illumination on .60" active diameter input
- Solid state dimmer control
- Interchangeable Modulamp Units offer 2 positions to maximize individual lamp efficiencies.
- Choice of three, 150 watt halogen lamps - EKE, EJA, and DDL for intense, uniform illumination
- Built-in thermal shut down
- Quiet fan cooling
- Zero to full intensity
- Low housing temperature
- Detachable IEC cord

10" Extension Cord with CPC connectors, A29505

ACE® Remote Light Source

ACE® Remote Power Supply	Modulamp/lamp not included
★ A20560.115	115 V Power Supply Only
Extension Cord	
A29505	10′ extension - CE and CSA Comp.

★ Made-to-order products.

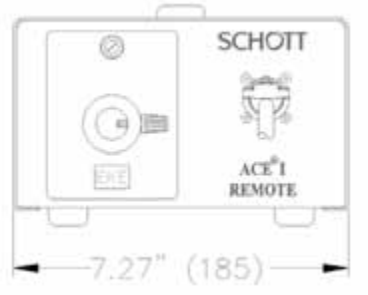
EKE, DDL, and EJA lamps and Modulamp units can be purchased separately.

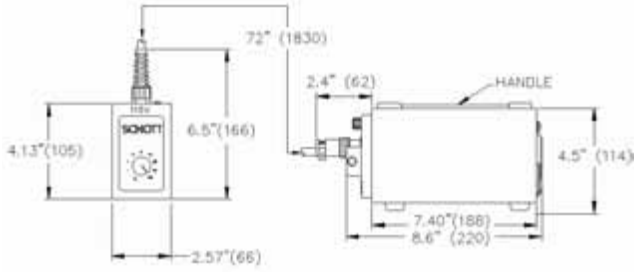
Options

- Infinite setting, twelve blade iris diaphragm version available to reduce intensity while maintaining color temperature.

ACE® Remote Light Source

Dimensions in ( ) are in mm





Input: 115 VAC/60 Hz, Output: 0–21 VAC shown with optional EKE modulamp sold separately.

Power Supply Specifications	
Power Consumption	190 Watts (nominal)
Output Voltage	0 - 21 VAC
Fiber Receptacle	0.72 (13.3)
Input Voltage	115 VAC / 60 Hz
Temperature Range: Operating	0° to 50°C

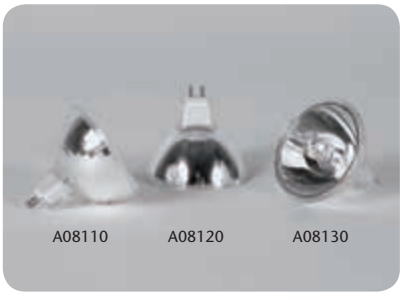
Halogen Lamps & Modulamp Assemblies

Lamp Features

- 150 watt tungsten halogen bulbs
- EJA, EKE and DDL types available
- Use with ACE® Series and DCR® Series light sources
- The correct lamp for your light source is specified on the label located on the front of the Modulamp unit.
- More specifications are in the chart on the left and on the back side of this page.

Modulamp Assembly Features

- Assures maximum light delivery to fiber optic components
- Use with all ACE® Series and DCR® Series light sources
- Full illumination on .60" (15 mm) active diameter input
- Interchangeable Modulamp units offer 2 lamp positions to maximize individual lamp efficiencies.
- Choice of three, 150 watt halogen lamps - EJA, EKE, DDL
- IR interference filter for cool illumination
- Iris version also available



EJA, EKE and DDL Lamps

Modulamp Assembly, A08301


Iris Diaphragm, A08321, A08321.1, A08321.2

150 Watt Halogen Lamps

Part No.	Type	Description
A08110	EJA	3350° K color temperature. 21 Volt. Most intense. Small spot size. Rated 40 hrs., 500 hrs. w/ a dimmer.*
A08120	EKE	3250° K color temperature. 21 Volt. High output for most applications. Rated 200 hrs., 2000 hrs. w/ a dimmer.*
A08130	DDL	3150° K color temperature. 20 Volt. Extremely uniform output. Rated 500 hrs., 5000 hrs. with a dimmer.*

*Voltage reduced to 80% of full intensity.

Modulamp Assemblies

Part No. Type	Description
Standard (without lamp)	
A08301	Lampholder for EKE Lamp
A08301.1	Lampholder for E J A Lamp
A08301.2	Lampholder for DDL Lamp
Iris Diaphragm (without lamp)	
A08321	Lampholder for EKE Lamp
A08321.1	Lampholder for E J A Lamp
A08321.2	Lampholder for DDL Lamp

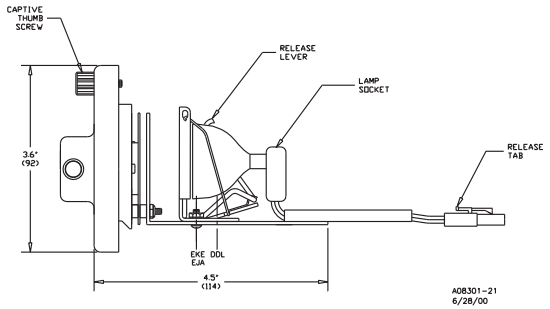

Lamp Socket

Lamp Socket

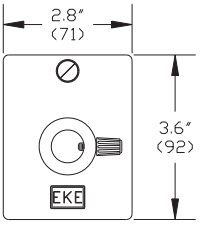
Part No.	Description
A29506	Lamp Socket for ACE® Series and DCR® Series light sources.

Halogen Lamps & Modulamp Assemblies

Dimensions in ( ) are in mm

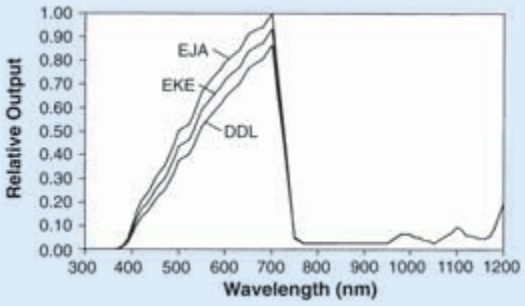


A08301, A08301.1 & A08301.2 - Modulamp Assemblies

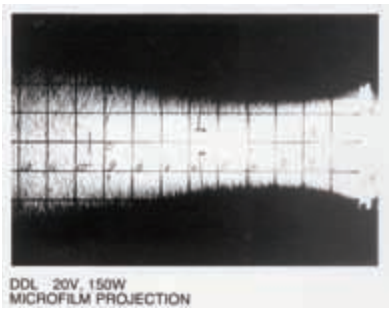


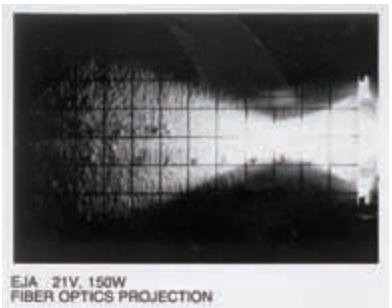
Front View of Modulamp Assembly

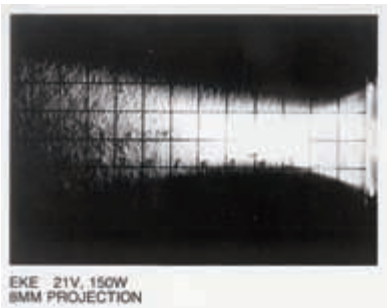
Spectral Curves w/Interference IR Filter



A08110, A08120 & A08130 - Lamp Beam Patterns







Beam Patterns are Courtesy of GE

Lamp Specifications

Bulb Type	Voltage	Wattage	Lamp Base	Bulb Finish	Burn Position	Shape	Color Temp.	Filament	Lamp Fill	Lamp Life	Overall Length (mm)	Reflector Design	Reflector Size (mm)	Working Distance (mm)
EJA	21	150	GX5.3	Clear	Base/Down Horiz.	MR-16	3350	CC-6	Halogen	40 Hrs.	44.5	Dichroic	50.7	28.0
EKE	21	150	GX5.3	Clear	Base/Down Horz.	MR-16	3250	CC-6	Halogen	200 Hrs.	44.5	Dichroic	50.7	44.5
DDL	20	150	GX5.3	Clear	Base/Down Horz.	MR-16	3150	CC-6	Halogen	500 Hrs.	44.5	Dichroic	50.7	194.5

RS232 Interface

A20650

A modular approach to computer control

- Can be used with any device requiring 0 to 5 volt control voltage input
- Scaling feature can convert output to 0.0 to 2.5 volts.
- Permits full range intensity control
- A single RS232 interface controls the intensity of up to three light sources. The intensity setting can vary for each.
- Lamp on/off feature is independent of intensity control. Manage on/off function of multiple light sources as one unit (DCR®III only)
- For maximized control from your computer, SCHOTT offers single, dual and triple RS232 cables (for DCR®III light sources only). This gives the computer the added cabability of reading lamp failure.
  - User must supply standard cables when connected to DCR® and DCR®II Series light sources.
- When used with SCHOTT's RS232 cables the interface can be powered from the 9-pin connector on the DCR®III light source, therefore a power supply is not required.
- RS232 single, dual, and triple cables are sold separately.
- Comes with LABVIEW® Driver, manuals, demo software and 5" Velcro® mounting strip
- CE compliant

LABVIEW® Driver, manuals, demo software, 5" Velcro® mounting strip, and wall transformer for the RS232 Interface.

RS232 Single Cable with Plug, A20661

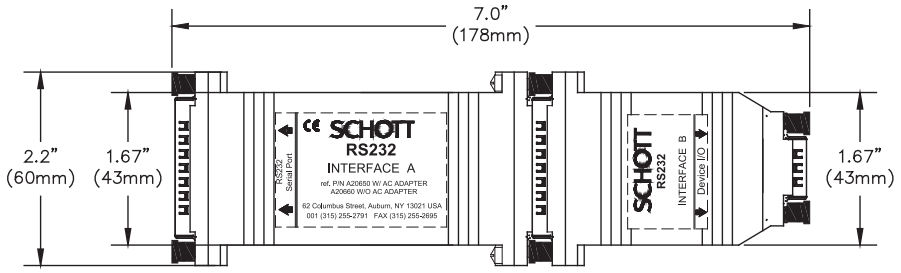
RS232 Interface

Part No.	Description
A20650*	RS232 Interface with UL approved 120V wall transformer
A20660*	RS232 Interface without wall transformer
RS232 Cables	
A20661	RS232 Single Cable with Plug
A20662	RS232 Dual Cable with Plug
A20663	RS232 Triple Cable with Plug

User supplies shielded DB-9 male/female connector and RS232 serial port to DB-25 Sub D type connector.

RS232 Interface

Dimensions in ( ) are in mm



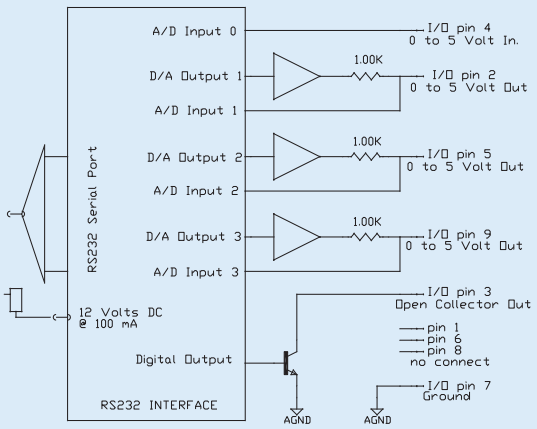
Power: 12 Volts DC @ 100 mA

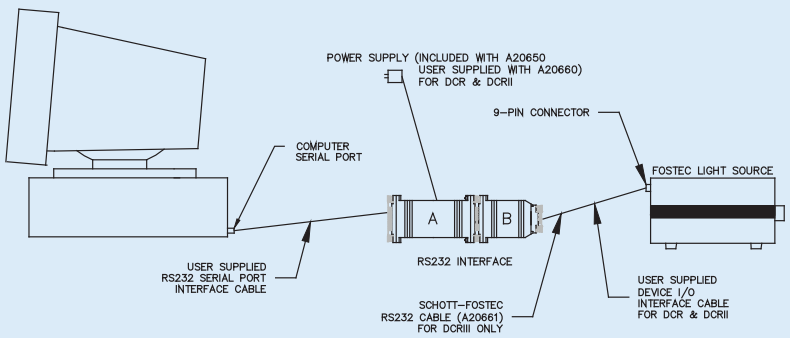
Connection: 2.5 mm sub-mini two connector plug

Data Format: 1200 - 9600 Baud (auto detect) 8 data bits, 1 stop bit, no parity

- Three buffered 0 to 5 Volt analog outputs with 8 bit resolution and x-2 scaling bit.
- One open collector output.
- Four 0.0 to 5.0 Volt analog inputs* with 12 bit resolution. Three are individually wired to the analog outputs for read back capability. One is available for general use.
- For specific lightsource I/O listings, please refer to the lightsource user's manual.

* DCR®II and DCR®III maintain stability regardless of intensity setting. DCR® may become unstable at voltage inputs less than 2 volts. Refer to RS232 User's Manual or contact SCHOTT for more information.





75 W RoHS CSA CE

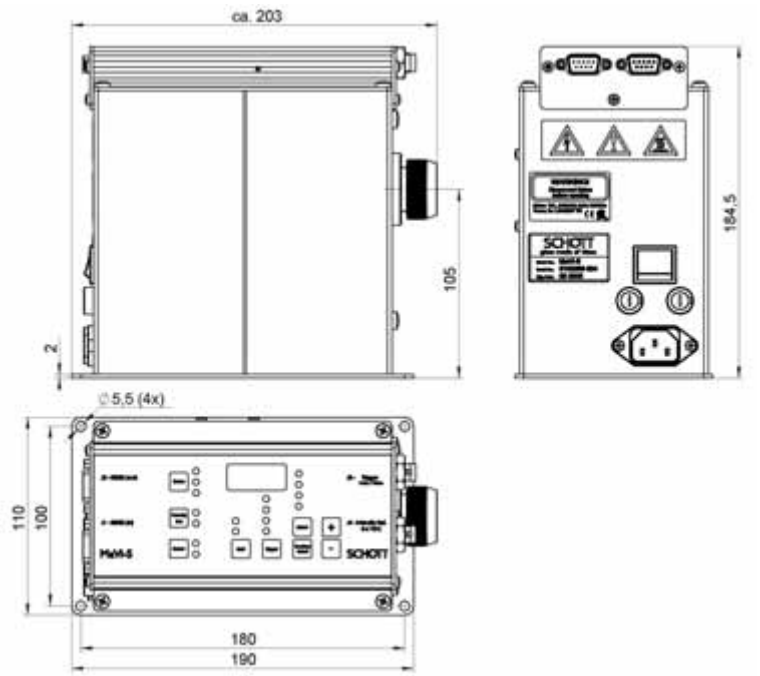
MaVi-S Light Source

High intensity xenon strobe light source for stop motion imaging

- Used together with SCHOTT light guides, the MaVi-S emits brief and intense light pulses that result in bright, clear and high-contrast images, a valuable tool for many applications, e.g. wafer inspection, bottle inspection, matric code reading and diamond quality control.
- High speed applications, short flash times are required as well as adjustable delays to capture the required images and information.
- CE Aproved
- ROHS compliant

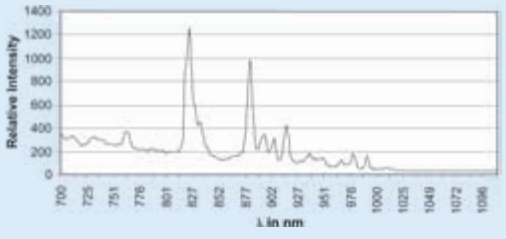
RS232 Interface

Dimensions in ( ) are in mm

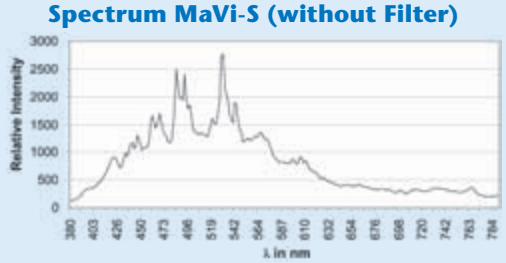


Technical Data	
Lamp type	Xenon Flashlamp
Maximum energy	Up to 2.16 J
Frequency range	1 Hz - 200 Hz
Flash duration	Approx. 6 µs
Pulse to pulse stability	2.5% from flash to flash with no loss of flashes
Electronic Data	
Intensity regulation	Via control panel computer (RS 232) or analog input
Computer interface	Control of up to 9 MaVi-S light sources
Burst function	Generation of several flashes by one trigger pulse
Power supply	100 V - 260 V. 50 Jz - 60 Hz
Power consumption	75 Watt
Fuses	1.6 A (slow blow)
Protection class	1 (protective grounding)
Electrical safety	IEC/EN 61010 and IEC/EN 6100
Ambient Conditions	
Operating temperature	0°C to 43°C
Storage temperature	- 40°C to 90°C
Relative humidity	Max. 80 %, non condensing
Housing	
Outer dimensions	110 mm x 200 mm x 180 mm
Weight	2 kg

IR Spectrum MaVi-S (without Filter)



Spectrum MaVi-S (without Filter)



Light Guides

Universal Ringlights

For 33 to 81 mm Objective Diameters

Universal Ringlight A08600 (classic clamp syle)

Universal Ringlight, A08600.1 (new clamp style)

SCHOTT ringlights emit intense, uniform, and shadow-free illumination for Machine Vision and Microscopy applications.

- Fits microscope and camera objectives from 33 to 81 mm with appropriate clamps
- Working distance is 1.5" to 6" (38 to 152 mm)
- 33" (838 mm) bundle length on all models
- The ringlight body is made of rugged, black anodized aluminum and the fiber bundle is protected with flexible PVC covered metal tubing.
- Two unique clamping/mounting systems for precise positioning. Most ringlights fit directly onto the microscope and camera objective without adapters.
- Input fits all ColdVision light sources. Ringlights can be used with other manufacturer's continuous light sources. Adapters may be required.
- Use ringlights with our Dichroic color filters, diffusers, polarizer/analyzers, and reflector rings for alternative lighting effects.
- Vertical exit bundle option increases work space and prevents the bundle from interfering with surrounding objects.
- Modified standard and custom ringlights are also available for your unique requirements.
- ESD (Electro Static Discharge) option is available on custom basis.


Anti-Slip Ringlight Clamps, A08614


Anti-Slip Ringlight Clamps, A08601


Anti-Slip Ringlight Clamps, A08602

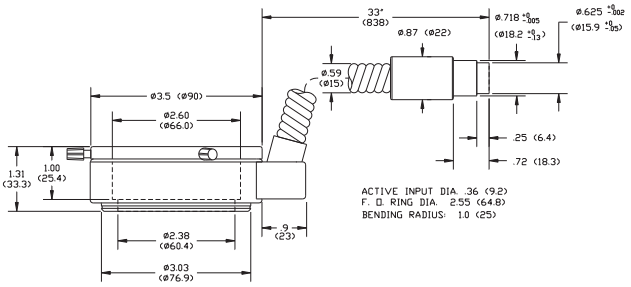
Amti Slip Ringlight Clamps:
For accurate positioning when using fiber optic components in industrial and laboratory environments.

Universal Ringlights

Dimensions in ( ) are in mm

Ringlight Input: Black Anodized Aluminum or Conductive Finish
Bundle Sheathing: PVC Covered Metal Tubing or Stainless Steel
Working Distance: 1.5" to 6" (38 to 152)

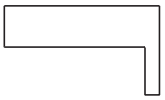
Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.



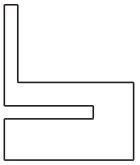
A08620 - 47 mm / 62 mm Ringlight with vertical exit (classic clamp)

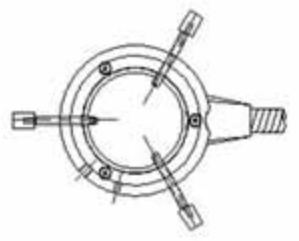
Clamp(s) for A08611 Clamp Ring, A08600 and A22000 Ringlights and A08614, Set of 3 Clamps 1.8 / 2.4" (47/62)

Clamp(s) for A08612 Clamp Ring, A08603 Ringlight and A08601, Set of 3 Clamps 1.3 / 1.8" (33/46)

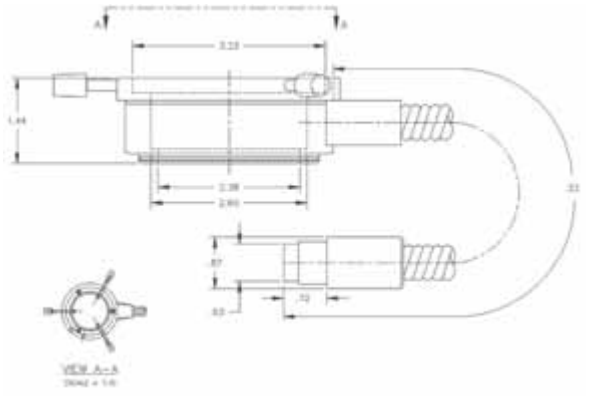


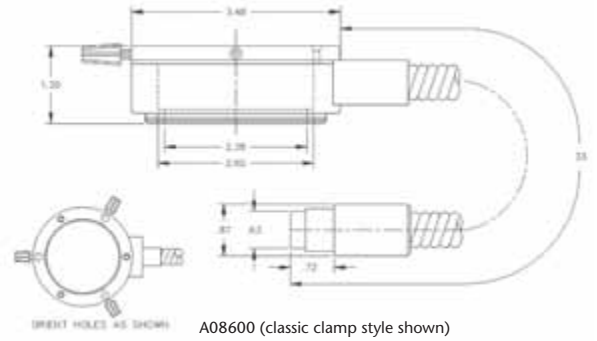
Clamp(s) for A08613 Clamp Ring, A08604 Ringlight, and A08602, Set of 3 Clamps 2.4 / 3.2" (62/81)





A08690 (new clamp style shown)





A08600 (classic clamp style shown)

Universal Ringlight

Part No.	Standard Exit	Vertical Exit	Minimum Working Distance	Objective diameter Camera and Microscope	Mounting	Polarizer/ System Analyzer
A08600	X		1.5" - 6"	47 to 62 mm	Clamps (classic)	A08615
A08600.1	X		1.5" - 6"	47 to 62 mm	Clamps (new)	A08615
A08620		X	1.5" - 6"	47 to 62 mm	Clamps (classic)	A08615
★ **A08690**	X		1.5" - 6"	33 to 81 mm	Clamps (classic)	A08615
A08601.1	Ringlight Screw					

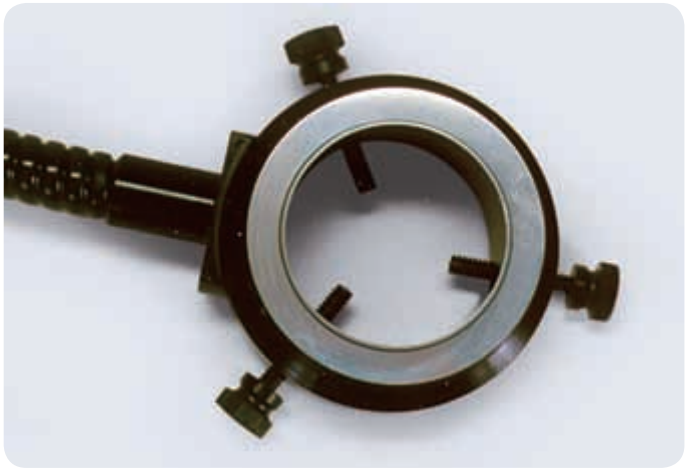
★ Made-to-order products.

Holders, Clamp Rings, and Anti-slip Pads

Part No.	Description
A08614	Anti-slip Ringlight Clamps for ringlight models A08600, A08620. (3 clamps in package) (47 mm to 62 mm)
A08601	(33 mm to 46 mm)
A08602	(62 mm to 81 mm)

Midi, Mini and Maxi Ringlights

For 19 to 53 mm Objective Diameters



Mini Ringlight, A08650

SCHOTT ringlights emit intense, uniform, and shadow-free illumination for Machine Vision and Microscopy applications.

Mini Features

- Fit microscope and camera objectives from 19 to 32.5 mm
- Working distance is .5" to 4" (13 to 102)

Midi Features

- Fit microscope and camera objectives from 38 to 53 mm
- Working distance is 1.25" to 3.5" (32 to 89)*

Midi & Mini Ringlight Features

- Thumbscrew mounting system for precise positioning. Ringlights fit directly on most microscope and camera objectives without adapters. For instances when adapters are necessary, see the Accessories section of the catalog.
- Vertical exit bundle option increases work space and prevents the bundle from interfering with surrounding objects.
- The ringlight body is made of rugged, black anodized aluminum. The fiber bundle is protected with flexible PVC covered metal tubing.

4" Ringlight

- Fiber ring diameter is 4.5" (114*)
- Working distance ranges from 2" to 8" (51 to 203)
- Light exits at 40 degree angle for specular-free illumination
- Randomized fiber bundle maximizes uniformity.
- The ringlight body is made of rugged, black anodized aluminum and the fiber bundle is protected with flexible PVC covered metal tubing.

8" Ringlight

- Low Profile ringlights for working distances from 2.5" to over 4.5 (64 to 114)
- #1/4-20 mounting threads in the coupler (front and top)
- The ringlight body is made of rugged, black anodized aluminum and the fiber bundle is protected with stainless steel tubing.

4" Ringlight, A08700

8" Ringlight, A08710

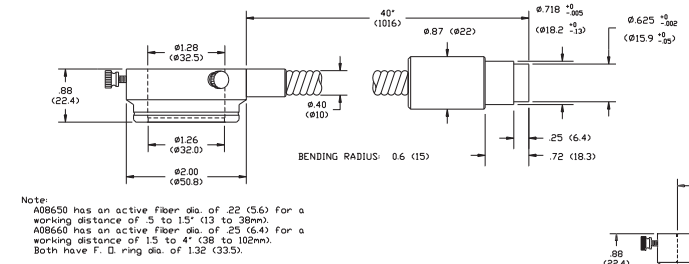
DCR® III Light Source

Dimensions in ( ) are in mm

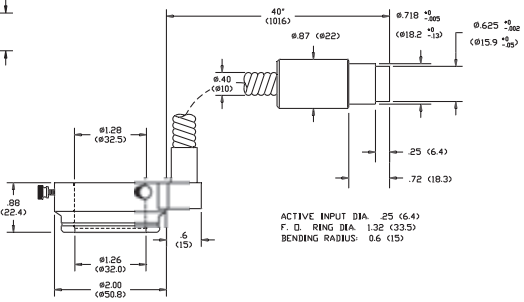
Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Ringlight Input: Black Anodized Aluminum or Conductive Finish

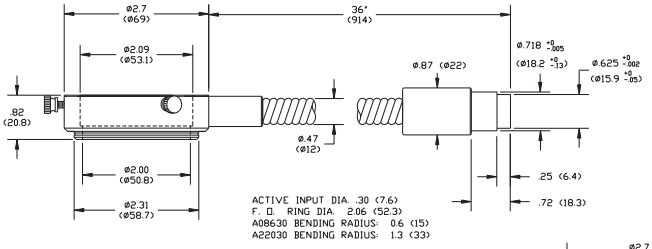
Bundle Sheathing: PVC Covered Metal Tubing or Stainless Steel



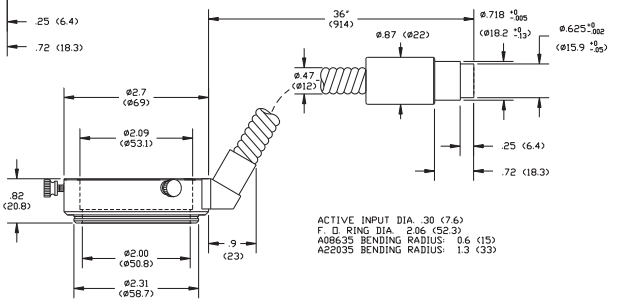
A08650 - A08660 - 19 / 32.5 mm Ringlights



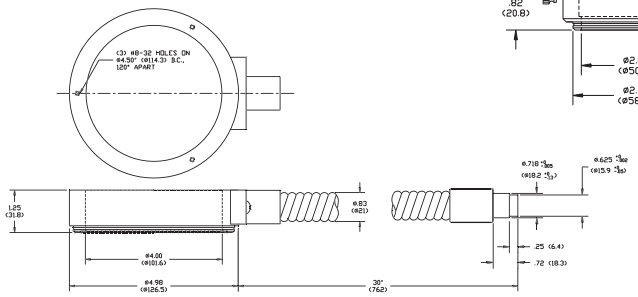
A08670 - 19 / 32.5 mm Ringlight with Vertical Exit



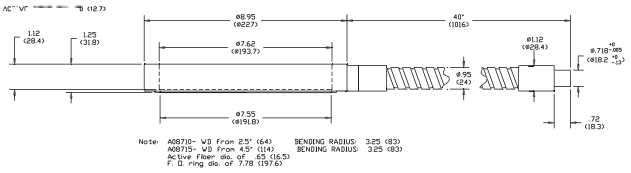
A08635 & A22035 - 38 / 53 mm Ringlights with Vertical Exit



A08630 & A22030 - 38 / 53 mm Ringlights with Vertical Exit



A08700 4" Ringlights



A08710 8" Ringlights

Maxi Ringlights

Part No.	ID	OD	Working Distance	Bundle Length	Polarizer/ Analyzer
A08700	4" (102)	9.98" (127)	2" - 8" (51 - 203)	30" (762)	A08705
★ **A08710**	7.5" (191)	8.95" (227)	2.5" - 4.5" (64 - 114)*	40" (1016)	★ A08712

Use ringlights with our Dichroic color filters, diffusers, and polarizers for alternative lighting effects. Maci Ringlights will require an adapter, part number A08931, due to the size of the input.

Mini Ringlights

Part No.	Standard Exit	Vertical Exit	Working Distance	Polarizer/ Analyzer
A08650	X		.5" - 1.5" (13 - 38)	A08632
A08660^	X		1.5" - 4" (38 - 102)*	★ A22032
A08670^		X	1.5" - 4" (38 - 102)*	A08627
Midi Ringlights				
A08630	X		1.25" - 3.5" (32 - 89)*	A08632
A08635		X	1.25" - 3.5" (32 - 89)*	A22032

★ Made-to-order products.

^ 29% more fiber than A08650 ringlight

*Dimensions in ( ) are in mm

Ringlights, 66mm

66 mm Ringlight, A08625

For intense, uniform, and shadow-free illumination

- Ringlights fit 66 mm microscope and camera objectives. Also shown on this sheet is a tapered inner-body ringlight for the Nikon SMZ 645/600 microscope. See model number A22040^.
- Working distance is 1.5" to 6" (38 to 152)
- 33" (838) bundle length on all models
- The ringlight body is made of rugged, black anodized aluminum and the fiber bundle is protected with flexible PVC covered metal tubing except the ESD (Electro Static Discharge) models.
- ESD ringlights are made conductive by replacing the black anodized finish with a conductive finish and the PVC metal tubing with stainless steel tubing. Each ringlight is checked for conductivity from inner body to light source adapter. (Available custom)
- Thumbscrew clamping/mounting system for precise positioning (except for model number A22040). Ringlights fit directly onto most microscope and camera objectives without adapters.
- Clamp rings for the Universal ringlights also fit the 66 mm ringlights for use with a different diameter objective microscope or with the Ringlight Holder. (See the Support Apparatus for Ringlights section of the catalog for more information.)
- Input fits all ColdVision light sources. Ringlights can be used with other manufacturer's continuous light sources. Adapters may be required.
- Use ringlights with our Dichroic color filters, diffusers, polarizer/analyzers and reflector rings for alternative lighting effects.
- Modified standard and custom ringlights are also available for all your unique requirements.

ESD 66 mm Ringlight (custom)

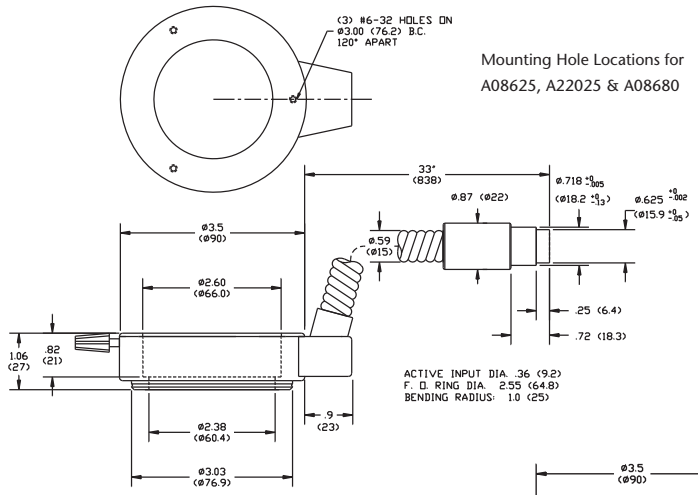
Vertical Exit 66 mm Ringlight, A08680

Ringlights, 66mm

Dimensions in ( ) are in mm

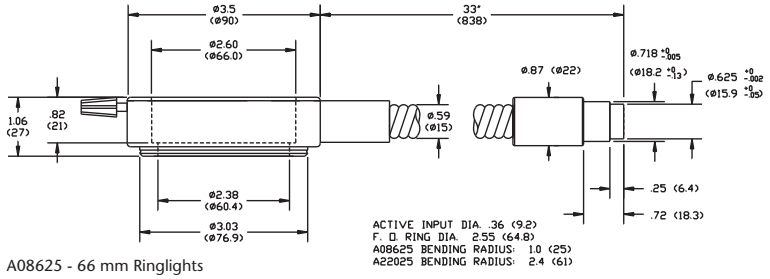
Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Ringlight Input: Black Anodized Aluminum or Conductive Finish
Bundle Sheathing: PVC Covered Metal Tubing or Stainless Steel
Working Distance: 1.5" to 6" (38 to 152)

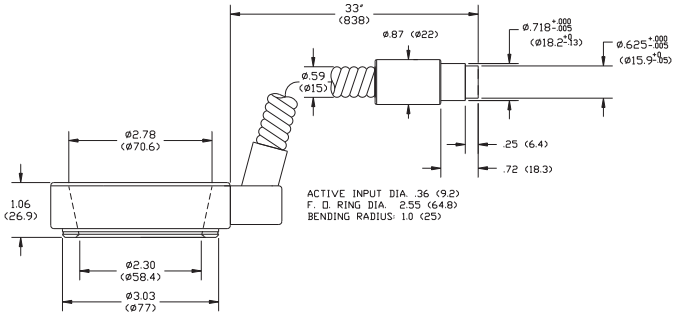


Mounting Hole Locations for
A08625, A22025 & A08680

A08680 - 66 mm Ringlight with Vertical Exit



A08625 - 66 mm Ringlights



A22040 - Nikon SMZ 645/660 Ringlight with Vertical Exit and Retaining Ring

Ringlights, 66mm

Part No.	Standard Exit	Vertical Exit	ESD	Objective Diameter	Mounting System	Polarizer/ Analyzer
A08625	X			66 mm	Thumbscrew	A08615*
A08680		X		66 mm	Thumbscrew	A08615*
Custom			X	66 mm	Thumbscrew	N/A

* If using the A08626 adapter, use A08627 polarizer/analyzer

Ringlights, 58mm

Ringlight, A22040 with Retaining Ring

Designed to fit Nikon SMZ and Leica S4E and S6E microscopes

- Working distance is 1.5" to 6" (38 to 152)
- 33" (838) bundle length on all models
- The ringlight body is made of rugged, black anodized aluminum and the fiber bundle is protected with flexible PVC covered metal tubing except the ESD (Electro Static Discharge) models.
- ESD ringlights are made conductive by replacing the black anodized finish with a conductive finish and the PVC metal tubing with stainless steel tubing. Each ringlight is checked for conductivity from inner body to light source adapter.
- Vertical exit bundle increases work space and prevents the bundle from interfering with surrounding objects.
- Retaining ring mounting for the A22040 ringlight offers secure positioning.
- Thumbscrew clamping/mounting system for precise positioning on the A22050 & A22060 models. Ringlights fit directly onto microscope and camera objectives without adapters.
- A22050 and A22060 ringlights will fit on all auxiliary lenses for the S4E and S6E microscopes.
- Use ringlights with our Dichroic color filters, diffusers, polarizer/analyzers, and reflector rings for alternative lighting effects.
- Modified standard and custom ringlights are also available for all your unique requirements.

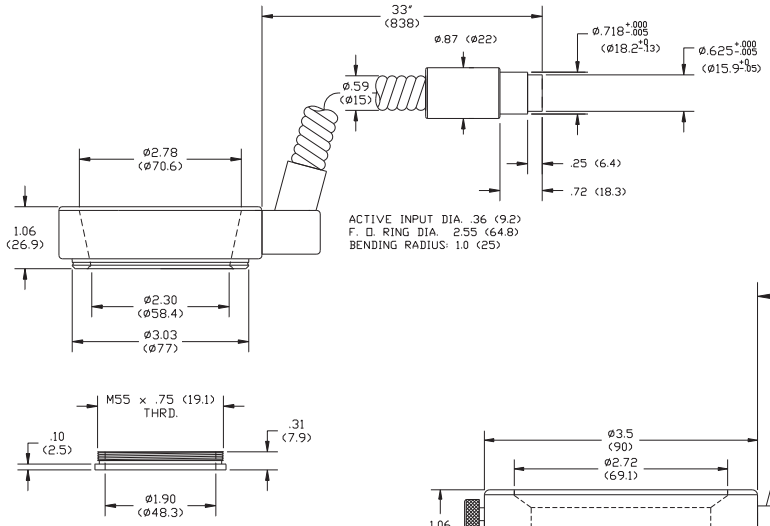
Ringlight, A22050

Ringlights, 58mm

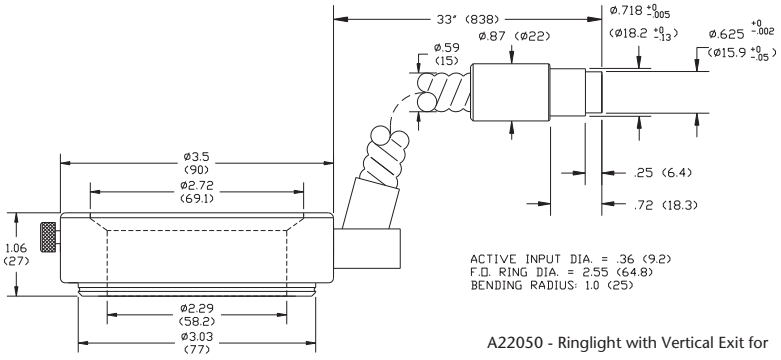
Dimensions in ( ) are in mm

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

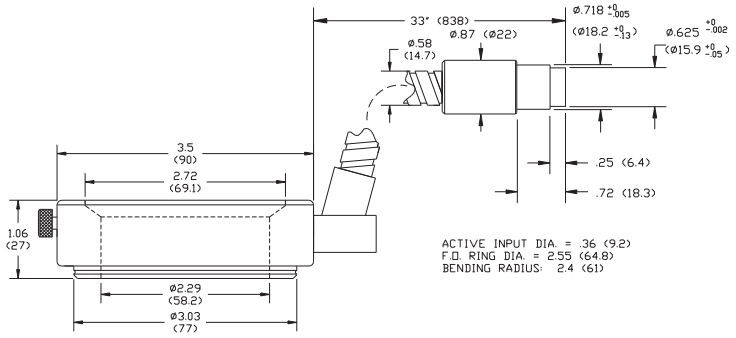
Ringlight Input: Black Anodized Aluminum or Conductive Finish
Bundle Sheathing: PVC Covered Metal Tubing or Stainless Steel
Working Distance: 1.5" to 6" (38 to 152)



A22040 - Ringlight with Vertical Exit and Retaining Ring for Nikon SMZ 645/660 Microscopes



A22050 - Ringlight with Vertical Exit for Leica S4E/S6E Microscopes



A22060 - ESD Ringlight with Vertical Exit for Leica S4E/S6E Microscopes

Ringlights, 58mm

Part No.	ESD	Objective Diameter	Mounting System	Polarizer/ Analyzer
A22040*		Nikon SMZ 645/660	Retaining Ring	★ A22042
A22050		Leica S4E/S6E	Thumbscrew	★ A22052
A22060	X	Leica	Thumbscrew	Custom

★ Made-to-order products.

*The A22040 ringlight has a tapered ring diameter to use with SMZ 645/660 microscope. A retaining ring is used for mounting instead o a thumbscrew

Darkfield Ringlight

Darkfield Ringlight, A22780

Unique parabolic reflector ring creates a radial "light sheet" for oblique lighting effects.

- Eliminates need for a quad lightline and mounting hardware to create similar lighting effects
- Randomized bundle creates extremely uniform light output.
- Remove the reflector ring to create a long working distance ringlight.
- Can be used with continuous or strobe light sources. Standard input adapter accepts the full range of all our color filters.
- Three #8-32 threaded mounting holes in the top of the ringlight body facilitate fixturing.
- Rugged aluminum body and light source adapter with black anodized finish
- PVC covered metal tubing protects the fiber bundle.

Typical Applications

- BGA (Ball Grid Array) inspection
- Illuminating scratches on highly reflective surfaces
- Water contamination inspection

Actual image of BGA (Ball Grid Array) chip illuminated by a Darkfield ringlight clearly identifies where solder balls are missing.

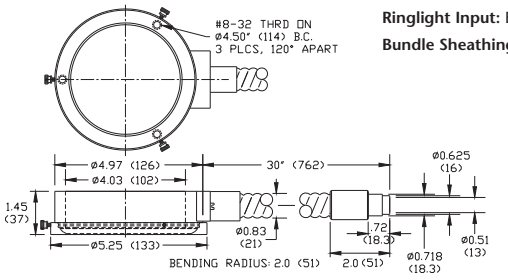
Darkfield Ringlights

Part No.	Standard Exit	ID	OD	Working Distance	Bundle Length
A22780	X	4.03" (102)	5.25" (134)	0" - .25" 0"-6.35)	30" (762)

*Dimensions in ( ) are in mm

Darkfield Ringlight

Dimensions in ( ) are in mm

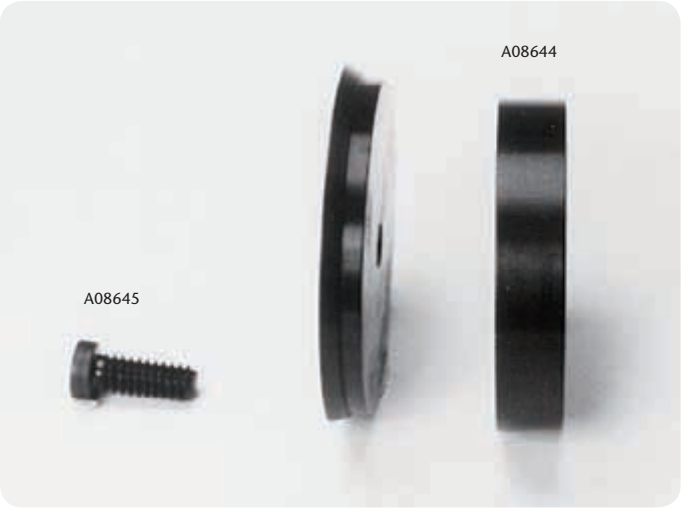


Ringlight Input: Black Anodized Aluminum
Bundle Sheathing: PVC Covered Metal Tubing or Stainless Steel

A22780
Darkfield Ringlight

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Darkfield Illuminator / Ringlight Adapters



Darkfield Illuminator, Adapter, A08645 and Spacer Ring, A08644

Ringlight adapters for microscope objectives and darkfield lighting.

- Fiber optic full annular ring configuration.
- Dovetail adapters for a variety of microscopes attach to slide the illuminator into place under the microscope stage. See chart on left for adapter specifications. Please note that a spacer ring, A08644, is required for the A08645 model adapter.
- Does not interfere with microscope operation
- Light exits at a nominal 20° horizontal angle and will illuminate a 1" (25.4)* diameter area
- Ringlight comes with a fixed size aperture to shield optic from light.
- Working distance from .10" (2.5) to .38" (9.7)
- Optional Iris Aperture allows adjustment of the darkfield spot size for light sensitive applications.

Darkfield Illuminator & Accessories

Part No.	Description
★ A08644	Darkfield Spacer Axio 2 for A08645 Adapter
Dovetail Adapters	
★ A08645	Dovetail Adapter for Zeiss Axioplan (see A08644)
★ A08646	Dovetail Adapter for Leitz Laborlux, DMR
★ A08647	Dovetail Adapter for Olympus
★ A08649	Dovetail Adapter for Zeiss Axioskop

★ Made-to-order products.

Ringlight to Microscope Adapters

A08606

A08607

A08608

A08609

A08626

A08628

Ringlight Adapters

Part No.	Ringlight	Microscope	Mounting
A08606	**A08600**	B&L Zoom 4	Screws into Objective
A08607	**A08625**	Leica SZ4/SZ6 with auxiliary lens	Three Thumscrews
A08608	**A08625**	Leica SZ4/SZ6 without auxiliary lens	Screws into objective
A08609	**A08630**	Leica SZ7	#6 - 32 Hex Set Screw
A08626	**A08625**	Olympus SZ	Screw-on Retaining Ring
A08628	**A08600, A08620**	SMZ 645/660	Screws on Objective

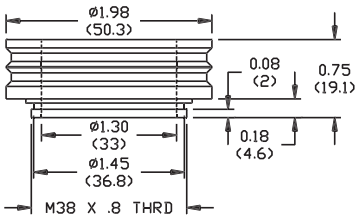
Note:
Adapters are machined to order. Pricing and Availability subject to market conditions.
Drawings are available.

Ringlight Adapters

Dimensions in ( ) are in mm

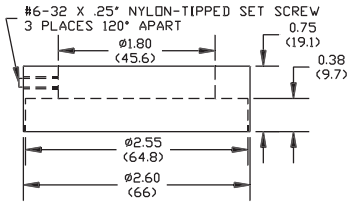
A08606

Ringlight Adapter



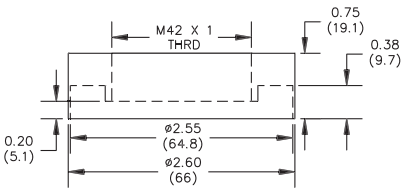
A08607

Ringlight Adapter



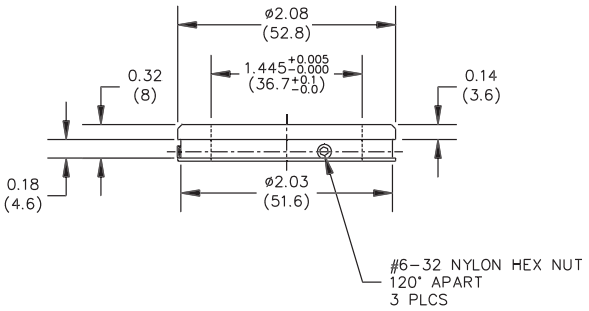
A08608

Ringlight Adapter



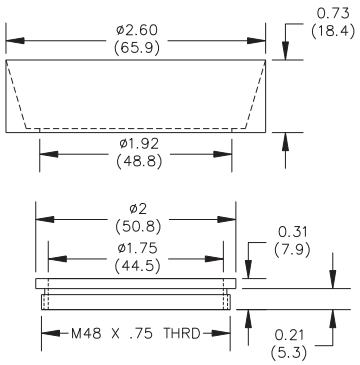
A08609

Ringlight Adapter



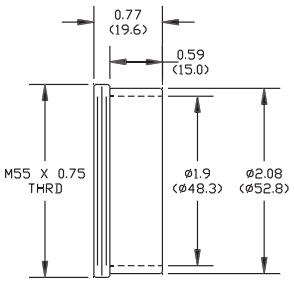
A08626

Ringlight Adapter

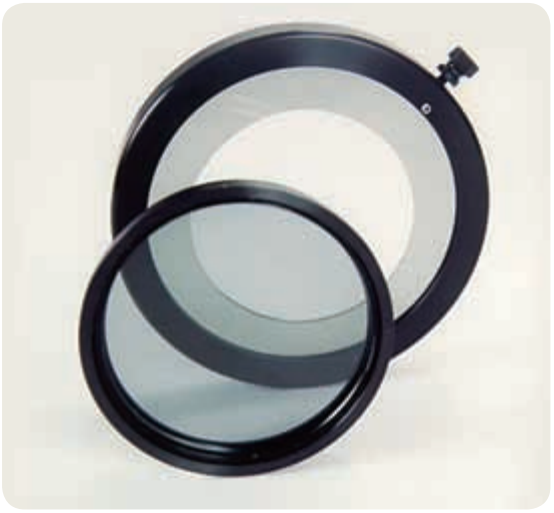


A08628

Ringlight Adapter



Ringlight Polarizers & Analyzers



Polarizer/Analyzer, A08615

The polarizing effect enhances contrast on highly reflective surfaces for Microscopy and Machine Vision Applications.

- The polarizer/analyzer reduces reflection and glare.
- The A08615 and A08632 polarizers were designed to easily snap-fit onto the ringlight. The analyzer is dropped through the top of the ringlight and positioned on top of the polarizer.
- To prevent the polarizer/analyzer from moving due to vibration, a knurled thumb-screw locks the polarizer assembly into position. In addition, it makes the holder easier to adjust. To further prevent vibration, a set-screw stops the polarizer disk from turning within the assembly. These features are found on polarizer / analyzer model numbers A08615 and A08627.

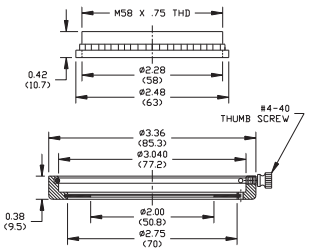
Polarizers & Analyzers

Part No.	Corresponding Ringlights
A08615	A08600, A08620, A08625, A08680, A08600.1
A08627	A08625 & Olympus Adapter, part number A08626
A08632	A08630, A08635
A08652	A08650, A08660, A08670
A08705^	A08700

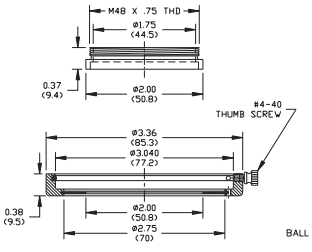
^Polarizer ring only. User must supply analyzer.

Ringlight Polarizers & Analyzers

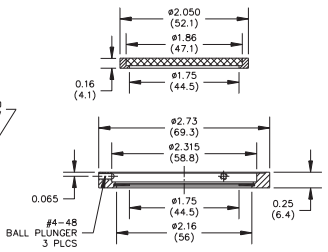
Dimensions in ( ) are in mm



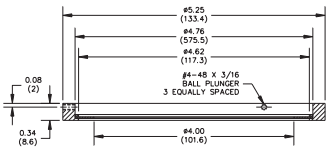
A08615
Polarizer/Analyzer



A08627
Polarizer/Analyzer



A08632
Polarizer/Analyzer



A08705
Polarizer/Analyzer

Diffuse Dome

For use with 4″ Fiber Optic Ringlight A08700

Diffuse Dome A25045 with Ringlight, A08700 (Ringlight not included)

Diffuse dome to eliminate specular reflection on shiny surfaces.

Standard Features

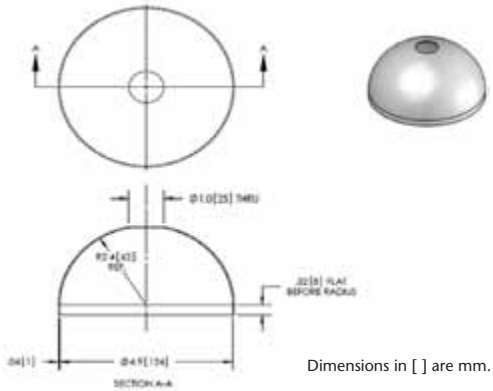
- Eliminates specular glints and/or shadows on reflective parts
- Used in conjunction with 4″ diameter ringlight A08700
- 4.9″ (124 mm) diameter x 2.70″ (69 mm) height (without ringlight)
- Viewing aperature: 0.98 (25 mm)

Typical Applications

- Data matric code reading
- OCR/OCV
- Semiconductor wafer inspection
- Foil inspection
- Can inspection

Diffuse Dome

Dimensions in ( ) are in mm



Dimensions in [ ] are mm. All other dimensions are Inches.

Ringlight Reflector Rings / Ringlight Support Apparatus

For use with 4" Fiber Optic Ringlight A08700

Reflector Ring, A08616

Reflector rings create special lighting effects.

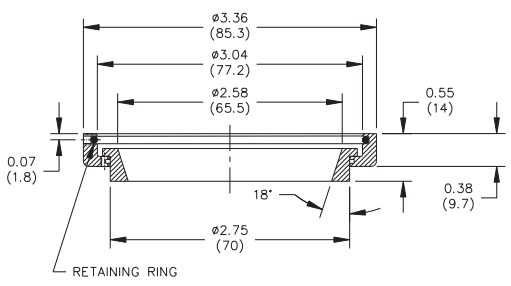
- Illuminates scratches on highly reflective surfaces
- The A08616 reflector ring fits our Universal and 66 mm Series of ringlights. See chart below for part numbers.
- The A08616 reflector ring comes in two separate parts; the retaining ring and the reflector ring. The reflector ring drops inside the retaining ring which snap-fits onto the ringlight.
- The reflector ring is made of mirror polished aluminum. The retaining ring is made of aluminum with a black anodized finish.

Ringlight Reflector Rings

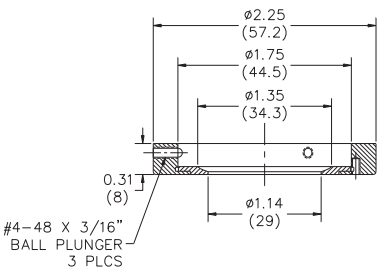
Part No.	Ringlights
A08616	A08600, A08603, A08604, A08620, A08625, A08680, A08600.1

Ringlight Reflector Rings

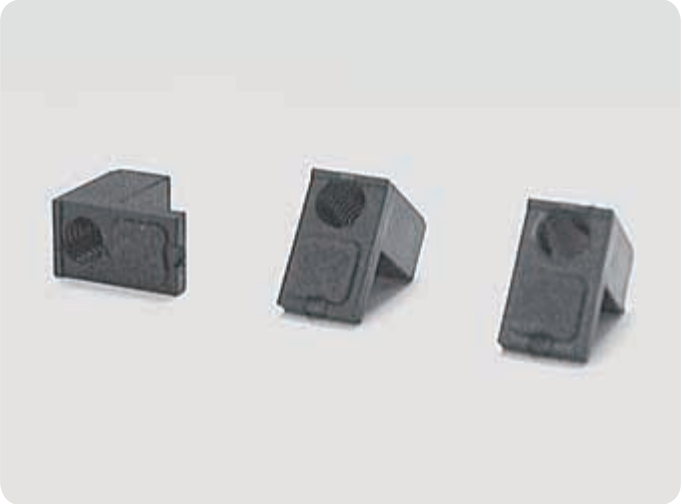
Dimensions in ( ) are in mm



A08616 Ringlight Reflector Ring



A08653 Ringlight Reflector Ring



Anti-Slip Ringlight Clamps, A08614

For accurate positioning when using fiber optic components in industrial and laboratory environments

Support Apparatus

Holders, Clamp Rings, and Anti-slip Pads	
Part No.	**Description**
A08614	Anti-slip Ringlight Clamps for ringlight models A08600, A08620. (3 clamps in package)

Ringlight Support Apparatus

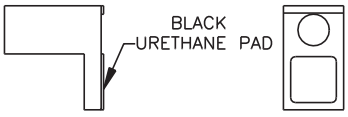
Dimensions in ( ) are in mm

Clamp(s) for
A08611 Clamp Ring,
A08600 and A22000
ringlights and
A08614,Set of 3 Clamps
1.8 / 2.4" (47/62)

Clamp(s) for
A08612 Clamp Ring,
A08603 ringlight and
A08601, Set of 3 Clamps
1.3 / 1.8" (33/46)

Clamp(s) for
A08613 Clamp Ring,
A08604 ringlight, and
A08602, Set of 3 Clamps
2.4 / 3.2" (62/81)

A08614
Clamps with Anti-slip Pads
(Set of 3)



Single Bundles

Single Bundle, A08031.60

Flexible bundles give the user versatility when routing and positioning light.

- Tight bending radius for easy routing
- A variety of standard sizes. See chart below for part numbers and specifications. Dual and quad bundles are found on a separate page in the product catalog.
- The standard output ferrules accept spot lenses accept polarizing caps. (See the Accessories section of the product catalog for more details.)
- Standard input accepts Dichroic color filters, diffusers and ColdVision Series light sources.
- Support products are available in the Support Apparatus section of the product catalog. Adaptors may be required.
- Custom configurations are available. Additional lead time is required.

Bundle

Part No.	Active Input Fiber Diameter	Distal Ferrule Diameter	Tubing Diameter	Bundle Length
A08020.40	.20″ (5)	.393″ (10)	.39″ (10)	40″ (1016)
A08020.60	.20″ (5)	.393″ (10)	.39″ (10)	60″ (1524)
A08025.40	.25″ (6)	.393″ (10)	.47″ (12)	40″ (1016)
A08025.60	.25″ (6)	.393″ (10)	.47″ (12)	60″ (1524)
A08031.40	.30″ (8)	.393″ (10)	.47″ (12)	40″ (1016)
A08031.60	.30″ (8)	.393″ (10)	.47″ (12)	60″ (1524)
A08031.80	.30″ (8)	.393″ (10)	.47″ (12)	80″ (2032)
A08051.40	.51″ (13)	.625″ (16)	.75″ (19)	40″ (1016)
A08051.60	.51″ (13)	.625″ (16)	.75″ (19)	60″ (1524)
A21200	.40″ (10)	.507″ (13)	.69″ (18)	30″ (762)

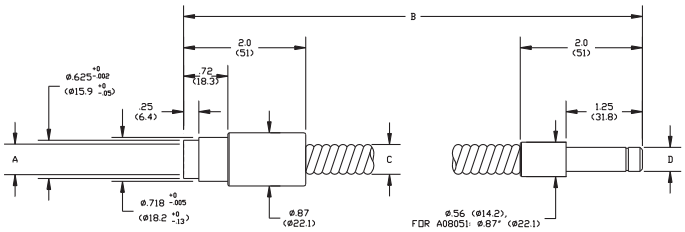
Dimensions in ( ) are in mm

Single Bundles

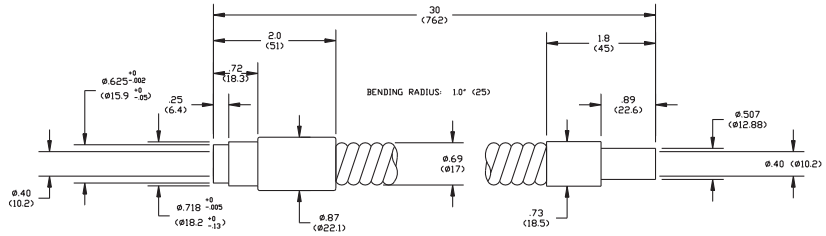
Dimensions in ( ) are in mm

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Ringlight Input: Black Anodized Aluminum
Bundle Sheathing: PVC Covered Metal Tubing



A08020.40 - A08051.60
Single Bundles



A21200
Bundle

Matrix for A08020.40 - A08051.60 Bundles

Part No.	A	B	C	Bend Radius	D
A08020.40	.20" (5)	40" (1016)	.39" (10)	.5" (13)	.393" (10)
A08020.60	.20" (5)	60" (1524)	.39" (10)	.5" (13)	.393" (10)
A08025.40	.25" (6)	40" (1016)	.47" (12)	.6" (15)	.393" (10)
A08025.60	.25" (6)	60" (1524)	.47" (12)	.6" (15)	.393" (10)
A08031.40	.30" (8)	40" (1016)	.47" (12)	.6" (15)	.393" (10)
A08031.60	.30" (8)	60" (1524)	.47" (12)	.6" (15)	.393" (10)
A08031.80	.30" (8)	80" (2032)	.47" (12)	.6" (15)	.393" (10)
A08051.40	.51" (13)	40" (1016)	.75" (19)	1.4" (36)	.625" (16)
A08051.60	.51" (13)	60" (1524)	.75" (19)	1.4" (36)	.625" (16)
A21200	.40" (10)	30" (762)	.69" (18)	1.0" (25)	.507" (13)

Dual and Quad Bundles

Quad Bundle, A08545

Flexible bundles give the user versatility when routing and positioning the light.

- Tight bending radius for easy routing
- A variety of standard sizes in dual and quad configurations (See chart below for dual and quad bundle part numbers and specifications.)
- Multi-leg bundles are illuminated with one light source.
- The standard output ferrules accept spot lenses with or without polarizing caps. (See Accessories section of the product catalog for more details.)
- Standard input accepts Dichroic color filters, diffusers and ColdVision Series light sources.
- Support products are available in the Support Apparatus section of the product catalog.
- Custom configurations are available. Lead time is required.

Dual Bundle, A08550.72

Dual and Quad Bundles

Part No.	Active Input Fiber Diameter	Distal Ferrule Diameter	Tubing Diameter	Bundle Length
Dual Bundles				
A08530	.30″ (8)	.393″(10)	.40″ (10)	40″(1016)
A08540	.36″ (9)	.393″ (10)	.47″ (12)	40″(1016)
A08550	.43″ (11)	.393″ (10)	.47″ (12)	40″(1016)
A08550.72	.43″ (11)	.393″ (10)	.47″ (12)	72″ (1829)
Quad Bundles				
A08545	.50″ (13)	.393″ (10)	.47″ (12)	40″ (1016)

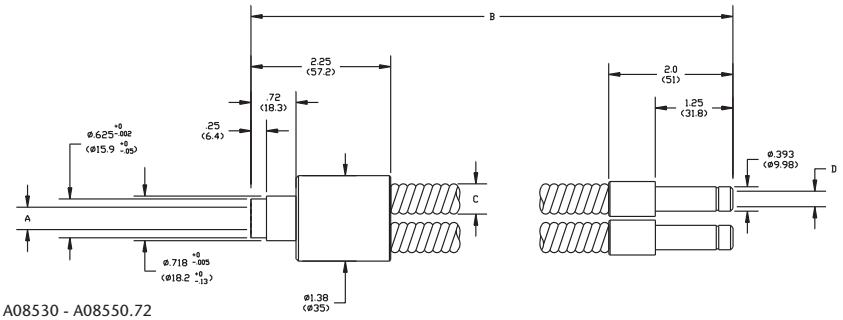
Dimensions in ( ) are in mm

Dual and Quad Bundles

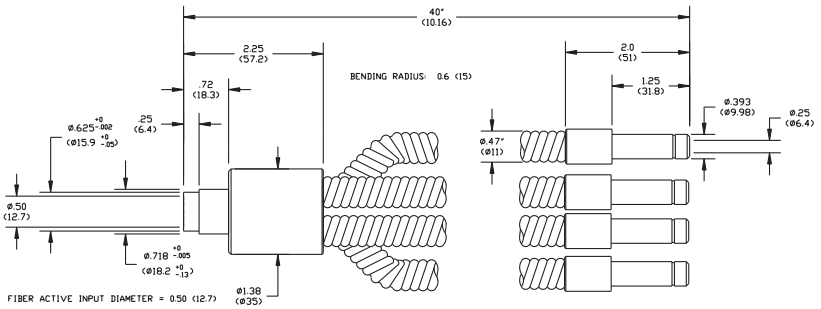
Dimensions in ( ) are in mm

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Ringlight Input: Black Anodized Aluminum
Bundle Sheathing: PVC Covered Metal Tubing



A08530 - A08550.72
Dual Flexible Bundles



A08545
Quad Flexible Bundles

Matrix for A08530 - A08550.72 Dual Bundles

Part No.	A	B	C	Bend Radius	D
A08530	.30" (8)	40" (1016)	.40" (10)	.5" (13)	.21" (5.3)
A08540	.36" (9)	40" (1016)	.47" (12)	.6" (15)	.25" (6.4)
A08550	.43" (11)	40" (1016)	.47" (12)	.6" (15)	.30" (7.6)
A08550.72	.43" (11)	72" (1829)	.47" (12)	.6" (15)	.30" (7.6)

Randomized and Calibrated Bundles

Quad Randomized and Calibrated Bundle, A21045

Designed to increase uniformity of light output for Machine Vision applications

- Fibers are randomized to improve spot uniformity.
- For specific uniformity requirements, calibrated outputs on dual and quad bundles were designed to be interchangeable for Machine Vision inspection applications. Interchangeability was achieved by maintaining light intensity within 10% bundle to bundle.
- We assure consistency by adding a 12" (305)* randomized common end at the input. This extra 12" (305) of fiber scrambles the light, distributing any hot or cold spots from the lamp throughout each of the legs. Then, each one of the legs is calibrated so the output from each leg is within 5% of each other.
- Tight bending radius for easy routing
- A variety of standard sizes include single, dual, and quad configurations. See chart on left for part numbers and specifications.
- Multi-leg bundles are illuminated with one light source.
- The standard output ferrules accept spot lenses with or without polarizing caps. (See Accessories section of the product catalog for more details.)
- Custom configurations are available. Lead time is required.

Single Randomized Bundle, A08031.40R

Single Bundle, A08031.60R

Randomized and Calibrated Bundles

Part No.	Configuration	Active Input Fiber Diameter	Distal Ferrule Diameter	Tubing Diamter	Bundle Length
Randomized Bundles					
A08031.40R	Single	.30"(8)	.393" (10)	47"(12)	40"(1016)
★ **A08031.60R**	Single	.30"(8)	.393" (10)	47"(12)	60"(1524)
★ **A08031.80R**	Single	.30"(8)	.393" (10)	47"(12)	80"(2032)
Randomized and Calibrated Bundles - 12"(305) Common Bundle Length					
A21040	Dual	.36" (9)	.393" (10)	.60" (15)	48"(1219)
A21045	Quad	.51" (13)	.393" (10)	.83" (21)	48"(1219)
A21050	Dual	.43" (11)	.393" (10)	.67" (17)	48"(1219)

★ Made-to-order products.

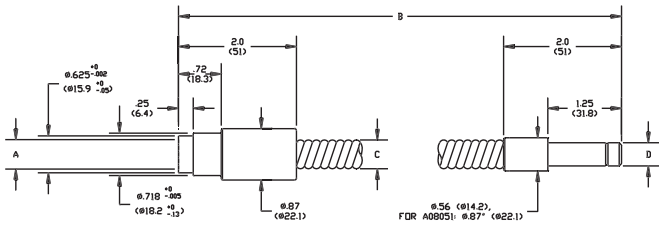
Dimensions in ( ) are in mm

Randomized and Calibrated Bundles

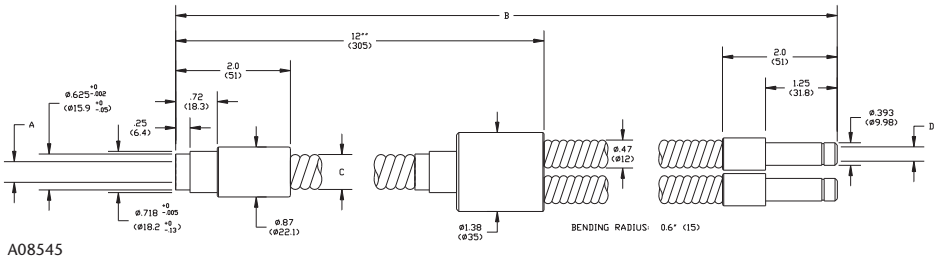
Dimensions in ( ) are in mm

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

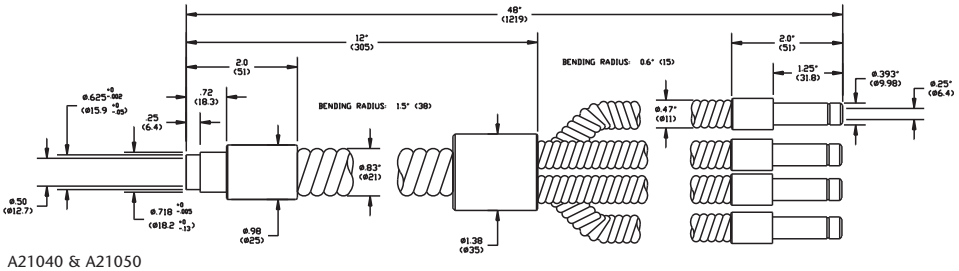
Ringlight Input: Black Anodized Aluminum
Bundle Sheathing: PVC Covered Metal Tubing



A08031.40R - A08031.80R
Single Randomized Bundles



A08545
Quad Flexible Bundles



A21040 & A21050
Dual Randomized &
CalibratedBundles

Matrix for A08031.40R - A08031.80R

Part No.	A	B	C	Bend Radius	D
A08031.40R	.30" (78)	40" (1016)	.47" (12)	.6" (15)	.393" (10)
A08031.60R	.30" (78)	60" (1524)	.47" (12)	.6" (15)	.393" (10)
A08031.80R	.30" (78)	80" (2032)	.47" (12)	.6" (15)	.393" (10)

Matrix for A21040 & A21050

Part No.	A	B	C	Bend Radius	D
A21040	.36" (9)	48" (1219)	.60" (15)	1.0" (25)	.25" (6.4)
A21050	.43" (11)	48" (1219)	.67" (17)	1.2" (30)	.30" (7.6)

Bundle Extenders

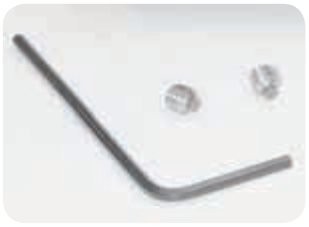
Bundle Extender, A08035

Extend the working length of standard fiber optic components using a SCHOTT bundle and these couplers

- Reduces the requirement for custom fiber optic lengths
- Provides the user with additional work space since the light source can be placed in a more remote area.
- Extends length of all standard SCHOTT ringlights, bundles, goosenecks, lightlines, and backlights* that have a .310" (8) or .510" (13) active fiber diameter
  - Use Part Number A08035 with A08031.40, A08031.40R, A08031.60,A08031.60R, A08031.80, A08031.80R to extend products with an active fiber diameter of .310" (8) or less.
  - Use Part Number A08055 with A08051.40 and A08051.60 to extend products with an active fiber diameter greater than .310" (8) but less than .510" (13).
- Black anodized aluminum with nylon tipped set screws

PLEASE NOTE: Using a bundle extender results in a 30-40% light loss. If your application requires maximum intensity, we recommend ordering a modified standard component.

*Backlight adapter, part number A08931 is required in order for the bundle extender to be used with SCHOTT standard backlights.



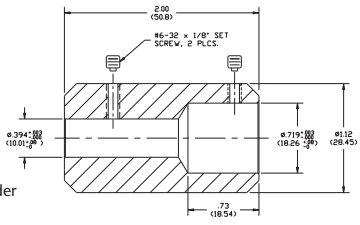
Bundle Extender Nylon Tipped Set Screws

Bundle Extender

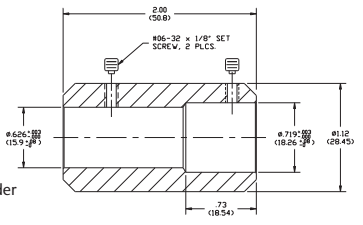
Bundle Extender Part No.	Single Bundle Part No.
A08035	A08031.40
	A08031.60
	A08031.80
	A08031.40R
	A08031.60R
	A08031.80R
A08055	A08051.40
	A08051.60

Bundle Extenders

Dimensions in ( ) are in mm



A08055
Bundle Extender



A08035
Bundle Extender

Single and Dual Goosenecks

Single Black Gooseneck, A08410

Obedient, incident illumination for space constrained applications

- Made with chrome plated semi-obedient metal or black dekabon semi-rigid gooseneck tubing
- The standard output ferrules accept spot lenses with or without polarizing caps. (See Accessories section of the product catalog for details.)
- Model number A08575 is a dual focusing gooseneck that has permanently attached spot lenses. Easily focused by turning the knurled lens barrel(s).
- Custom configurations are available. Lead time is required.
- Precise positioning offers complete control of light placement.
- Gooseneck legs placed in opposing positions create near shadow-free illumination.
- Easily adjustable
- Dual models illuminate workspace with a single light source.

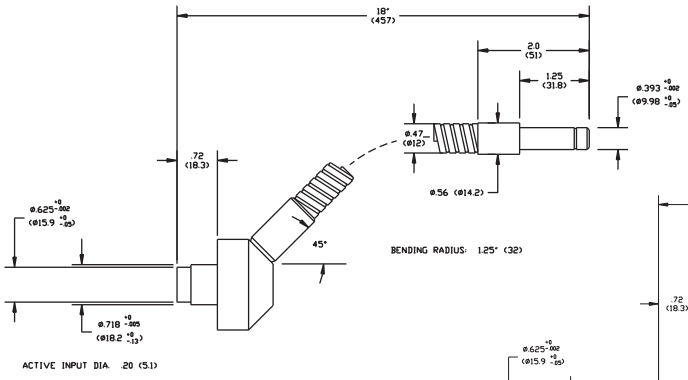
Dual Chrome Gooseneck, A08500

Single and Dual Goosenecks

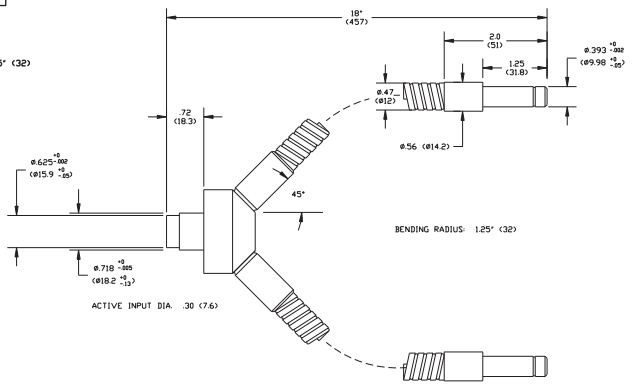
Dimensions in ( ) are in mm

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

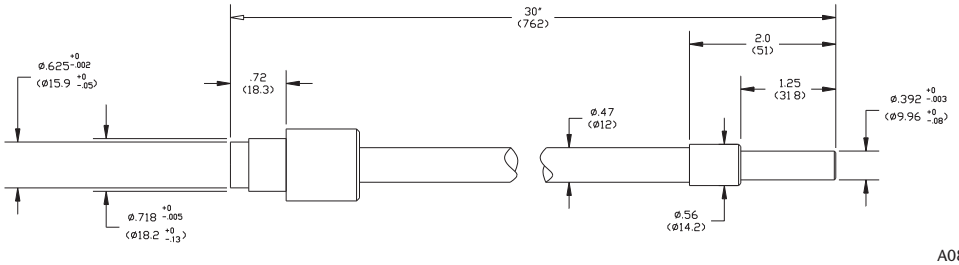
Ringlight Input: Black Anodized Aluminum
Bundle Sheathing: Chrome or Black Decabon



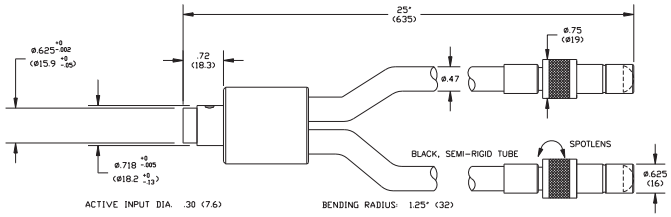
A08500
Dual Chrome Gooseneck



A08400
Single Chrome Gooseneck



A08575
Dual Black Gooseneck



A08410
Single Black Gooseneck

Goosenecks

Part No.	Tubing	Distal Ferrule Diameter	Active Input Fiber Diameter	Gooseneck Tubing Diameter	Gooseneck Length
Single					
A08400	Chrome	.20" (5)	.393" (10)	.47" (12)	18" (457)
A08410	Black	.20" (5)	.393" (10)	.47" (12)	30" (762)
Dual					
A08500	Chrome	.30" (8)	.393" (10)	.47" (12)	18"(457)
A08575	Black	.30" (8)	.21" (5)	.47" (12)	23" (584)

Dimensions in ( ) are in mm

Combination Goosenecks & Bundles

Combination Dual Gooseneck with Bundle, A08520

Obedient, incident illumination for space constrained applications

- The bundle sheathing is made of PVC covered metal tubing and the gooseneck is made of semi-obedient, chrome-plated metal gooseneck tubing.
- Bend radius of the chrome gooseneck tubing is 2-3" (51 - 76)*.
- The standard output ferrules accept spot lenses with or without polarizing caps. (See Accessories section of the product catalog for details.)
- Custom configurations are available. Lead time is required.
- Precise positioning of a spot of light
- Gooseneck legs placed in opposing positions create shadow-free illumination.
- Re-adjust with ease
- Dual models illuminate a workspace with a single light source.

Combination Gooseneck, Bundle, and Bracket, A08512 for Olympus SZX Series Microscopes

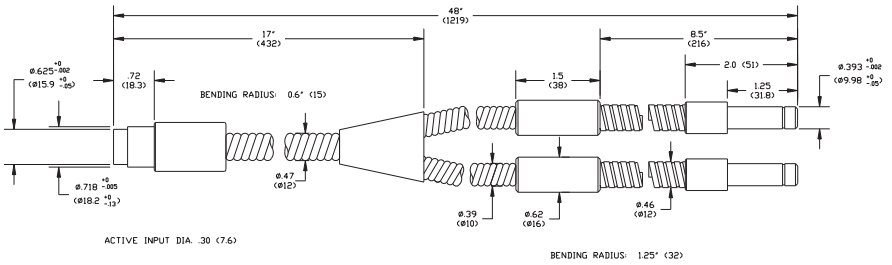
Combination Goosenecks & Bundles

Dimensions in ( ) are in mm

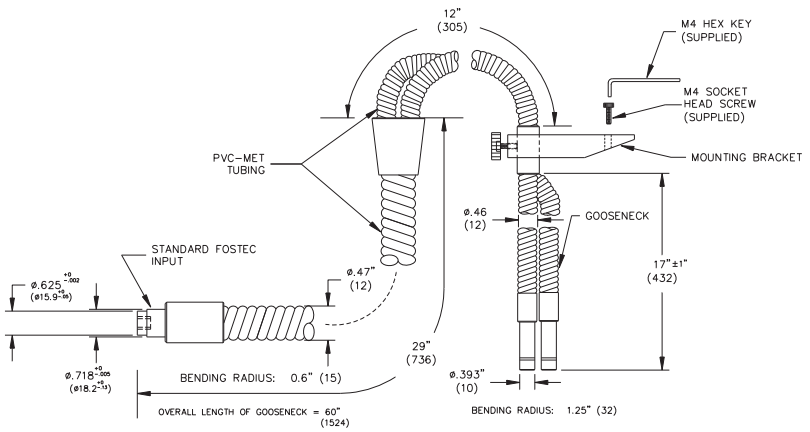
Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Ringlight Input: Black Anodized Aluminum
Bundle Sheathing: PVC Covered Metal Tubing
Gooseneck Sheathing: Chrome Plated Steel

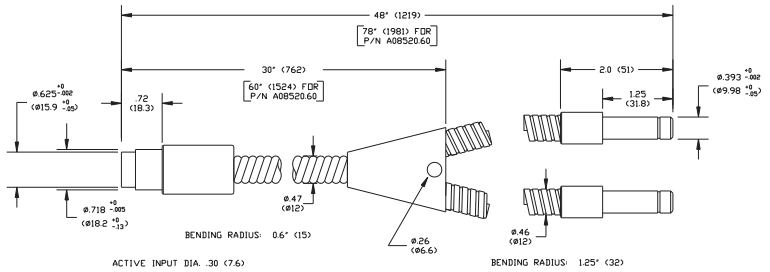
A08510
Combination Gooseneck and Bundle



A08512
Combination Gooseneck and Bundle



A08520 - A08520.60
Combination Gooseneck and Bundle



Combination Goosenecks and Bundles

Part No.	Active Input Fiber	Active Output Fiber Diameter	Bundle Tubing Diameter	Gooseneck Tubing Diameter	Bundle Length Diameter	Gooseneck Length
Combination Goosenecks and Bundle(s)						
A08510	.30" (8)*	.21" (5)	.47" (12)	.46" (12)	17" (432)	8.5"(216)
A08512	.30" (8)	.21" (5)	.47" (12)	.46" (12)	29" (737)	17"(432)
A08520	.30" (8)	.21" (5)	.47" (12)	.46" (12)	30" (762)	18"(457)
A08520.60	.30" (8)	.21" (5)	.47" (12)	.46" (12)	60" (1524)	18"(457)

Dimensions in ( ) are in mm

Gooseneck & Bundle Support Apparatus

A08522

For accurate positioning in both industrial and laboratory environments

Support Apparatus

Part No.	Desscrripttion
A08508	Bundle holder with .565" (14.4) dia. hole for all bundle diameters up to .51" (13). Has an M6 thread.
Universal Post Clamps	
★ **A08522**	Ring for 18 mm post. Zeiss IVB Stereo, IB, III, IV, IVB
★ **A08523**	Ring for 20 mm
★ **A08524**	Ring for 24.5 mm
★ **A08525**	Ring for 25 mm
★ **A08526**	Ring for 32 mm
★ **A08527**	Ring for 22 mm
★ **A08528**	Ring for 29 mm

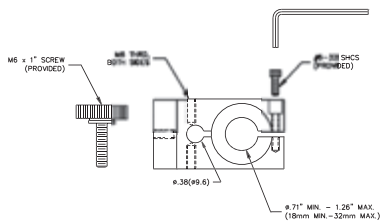
★ Made-to-order products.

A08508

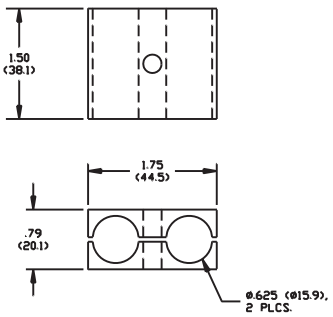
Gooseneck & Bundle Support Apparatus

Dimensions in ( ) are in mm

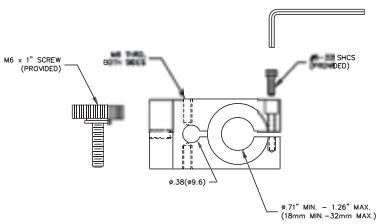
A08522



A08502
Clamp Set



A08522 - A08528
Clamps



Support Apparatus

Articulated Arm, A08505

For accurate positioning when using fiber optic components in industrial and laboratory environments.

Support Apparatus

Part No.	Description
A08505	Articulated arm with M6 thread on one end (will attach to heavy base and V-clamp) and M8 thread on the other end which will fit our A08592 dual V-clamp.
A08506	Articulated arm with M6 threads on both ends. Versatile accessory easily locked into place with only one knob. Can be used with our base and V-clamp and will accept all holders.
A08507	3 1/2 lb. Base for attaching up to three support arms and/or posts at once. M6 threads only.
A08590	Spring Clamp with M6 thread. Industrial strength universal clamp that can be used with our articulated arms to hold bundles, light lines and other equipment. Secure to tabletops or other like sur faces.
A08591	V-Clamp with two M6 threaded holes to use as a table clamp and will accept all our holders.

Articulated Arm, A08506

Spring Clamp, A08590

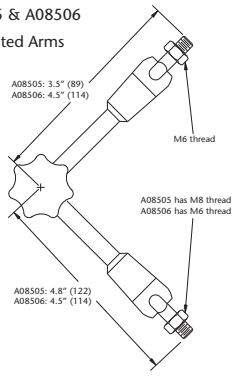
Base, A08507

Bundle Extender Nylon Tipped Set Screws

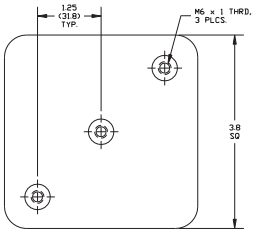
Support Apparatus

Dimensions in ( ) are in mm

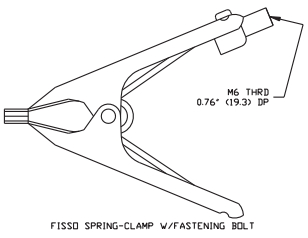
A08505 & A08506
Articulated Arms



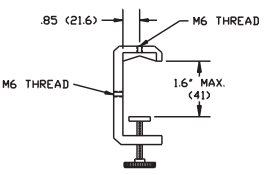
A08507
Base



A08590
Spring Clamp



A08591
V-Clamp



Filters, Diffusers & Spot Lenses

Color Filters, A08070-A08074

Filters and Adapter

- Available in red, green, blue, yellow, and daylight. These Dichroic filters will not darken or alter spectral response over time, regardless of light intensity or duration. The daylight filter increases existing color temperature to approximately 3000 K when used with EKE, EJA, and DDL lamps at their rated voltages.
- Dichroic color filters reflect heat versus absorbing it, eliminating the need for a thermal expansion split.
- Clear anodized aluminum housing is used on the filters. Black anodized aluminum housing is used on the adapter.

Diffusers

- Input lens diffuser, part number, A08086, homogenises beam with minimal light loss and minimizes black hole phenomenon from fiber bundles.
- Opal diffuser option, part number, A08087, creates the most uniform light - almost flat illumination, but reduces output by 40%.
- Diffusers fit on all ColdVision standard inputs.

Spot Lenses

- Used on distal ends of goosenecks and bundles to focus the light

A08931 Color Filter Adapter

A08087 & A08086 Input Lens Diffusers

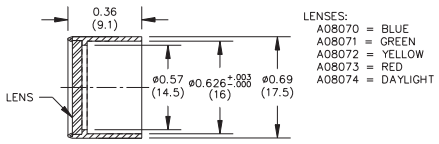
Spot lens models, A08080,A08084, A08082

Polarizing cap, A08090, for spot lens, A08080

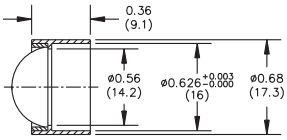
Filters, Diffusers & Spot Lenses

Dimensions in ( ) are in mm

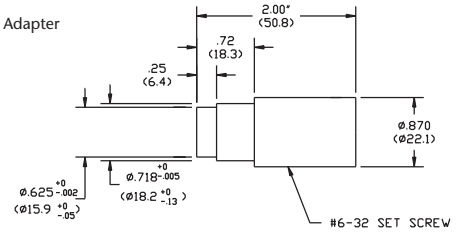
A08070 - A08074
Dichroic Color Filters



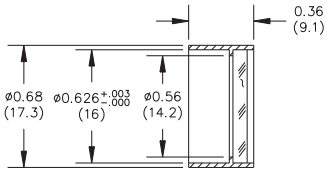
A08086
Input Lens Diffuser



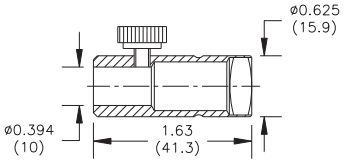
A08931
Color Filter Adapter



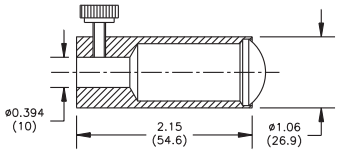
A08087
Input Opal Diffuser



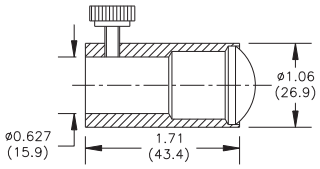
A08080
Spot Lens



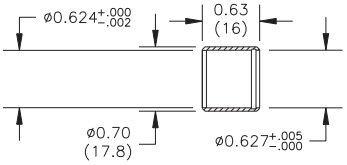
A08082
Small Spot Lens



A08084
Spot Lens



A08090
Polarizing Cap



Part No.	First Spot Location	First Spot Diameter	Second Spot Location	Second Spot Diameter
A08080	40 mm	45 mm	80 mm	90 mm
A08082	40 mm	30 mm	80 mm	60 mm
A08084	40 mm	30 mm	80 mm	60 mm

- Polarizing cap, part number, A08090, is available for spot lens model, A08080, to eliminate glare and reflections. Five spare polarizing discs are included with the product.

Filters, Diffusers & Spot Lenses

Part No.	Description		
Dichroic Color Filters & Adapter			
A08070	Blue	**A08073** Red	**A08931** Color Filter Adapter
A08071	Green	**A08074** Daylight	
A08072	Yellow	**A08075** UV Filter, Cut-off	
Diffusers			
A08086	Input lens diffuser		
A08087	Input opal diffuser		
Spot Lenses			
A08080	Spot lens for std. bundles except A08051.40 & A08051.60		
A08082	Small spot lens for std. bundles except A08051.40 & A08051.60		
A08084	Spot lens for models A08051.40 & A08051.60		
Polarizing Cap (for A08080)			
A08090	Polarizing cap for A08080 (fits on A08575)		

Lightlines, 1", 2", & 3"

1" (25) Dual Lightline, A08579

Alternative to round fiber optic bundles for narrower and elongated illumination for Microscopy and Inspection applications

- Small, uniform field of view
- Narrow body design and offset position of the line on 1" (25) and 2" (51) bodies allows close positioning for darkfield effect.
- 3"(76)* models are calibrated with DDL-bulb to ±8 gray scale levels at a mean of 200 with a gamma setting of 1.0 to deliver optimum uniformity (see chart). Uniformity of 1"(25) and 2"(51) lines is better than ±8 gray scales. Refer to section25.02.01 for more information on uniformity of fiber optic products.
- Standard input ferrule fits ColdVision Series light sources. Can also be used with strobes.
- Rugged aluminum body and light source ferrule with black anodized finish. PVC covered metal tubing protects the fiber bundle.
- M6 threads are provided on the 1"(25) and 2"(51) lightline bodies for easy mounting. See drawing on back.
- Lightline holders and support products available in Support Apparatus for Lightlines section of the product catalog
- Custom lengths, bundle exits, multiple combinations (dual, quad, etc.) and line widths can be designed for your unique requirements. In addition, combine lightlines with other fiber optic components in a single input to create unique lighting effects. Lead-time required.
- Cylindrical and apertured lenses are available as standard products for most lightline models. They can be custom made for all models.

One leg of Dual or Quad 3" (76) Lightline with Cylindrical Lens

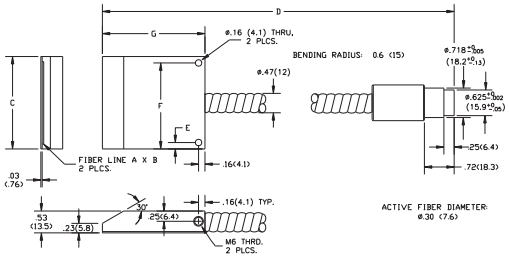
Lightlines, 1", 2", & 3"

Dimensions in ( ) are in mm

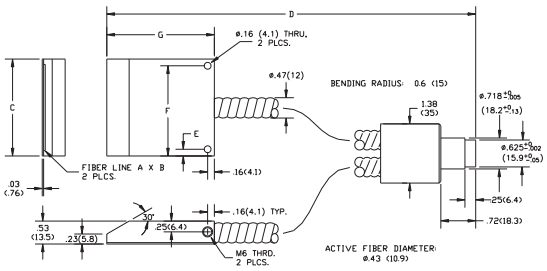
Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Input: Black Anodized Aluminum
Body: Black Anodized Aluminum
Sheathing: PVC Covered Metal Tubing

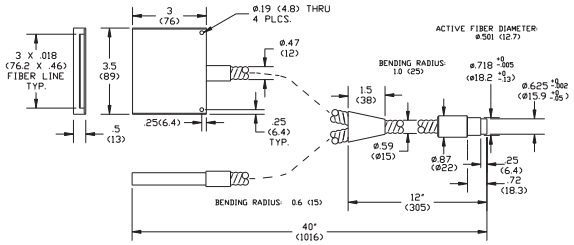
A08588 & A08589
Single Lightlines



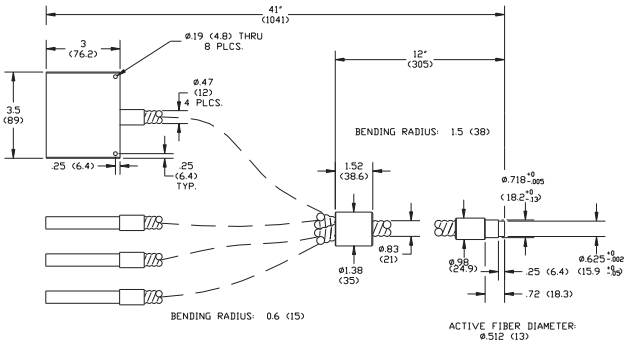
A08579 & A08583
Dual Lightlines



A08580
Dual Lightline



A08584
Quad Lightline



Lightlines, 1", 2", & 3" and Lenses

Part No.	Line Dimensions Length x Width	Input Active Fiber Dia.	Gray Scale Uniformity^	Part No. for Lens Cylindrical	Apertured
Single line configuration w/36" bundle length					
A08588	1" x .070" (25 x 1.8)*	.30" (7.6)	< ± 8	★ A08571	★ A08573
A08589	2" x .035" (51 x .89)	.30" (7.6)	< ± 8	★ A08572	★ A08574
Dual line configuration w/36" bundle length					
A08579	1" x .070" (25 x 1.8)	.43" (10.9)	< ± 8	A08571	A08573
A08583	2" x .035" (51 x .89)	.43" (10.9)	< ± 8	A08572	A08574
A08580	3" x .018" (76 X .46)	.36" (9.1)	± 8	A08582	Custom
Quad line configuration w/36" bundle length					
A08584	3" x .018" (76 X .46)	.51" (13.0)	± 8	★ A08582	Custom

★ Made-to-order products.

^ Gamma setting of 1.0
Dimensions in ( ) are in mm

Matrix for A08588 & A08589 Lightlines

Part No.	A	B	C	D	E	F	G
A08588	1"(25)	.07"(1.8)	1.25"(31.8)	38"(965.2)	.16"(4.1)	1.1"(28)	2"(50.8)
A08589	2"(51)	.035"(.89)	2.25"(57.2)	38.5"(978)	.16"(4.1)	2.1"(53)	2.5"(63.5)

Matrix for A08579 & A08583 Lightlines

Part No.	A	B	C	D	E	F	G
A08579	1"(25)	.07" (1.8)	1.25"(31.8)	38"(965.2)	.16"(4.1)	1.1"(28)	2"(50.8)
A08583	2"(51)	.035"(.89)	2.25"(57.2)	38.5"(978)	.16"(4.1)	2.1"(53)	2.5"(63.5)

Lightlines

12" Lightline, A08912

Uniform lines of light ideal for Machine Vision and line scan applications

- Calibrated with DDL-bulb to a specified number of gray scale levels (see chart below) at a mean of 200 with a gamma setting of 1.0 to deliver optimum uniformity. Refer to section 25.02.01 for information on uniformity of fiber optic products.
- Assembly method accurately positions the fiber line within the body on all three planes, to a tolerance of ± .004"(0.1)†. The technique assures the fiber axis will be parallel with the mounting surface of the body.
- Fiber bundle exit locations include back-side (standard exit), back-center, and true-side
- Standard input ferrule fits ColdVision Series light sources. Can also be used with strobes.
- Rugged aluminum body with black anodized finish
- PVC covered metal or stainless steel tubing protect the fiber bundle.
- Lightline holders and support products available
- Custom lengths, bundle exits, line widths, and multiple combinations (dual, quad, etc.) can be designed for your unique requirements. Lead time required.
- Cylindrical and apertured lenses are available as standard products for most lightline models. They can be custom made for all models.

Dual Lightines, A08975

Apertured Lens, A08806, Cylindrical Lens, A08826

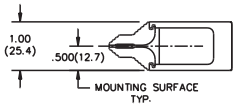
Lightlines

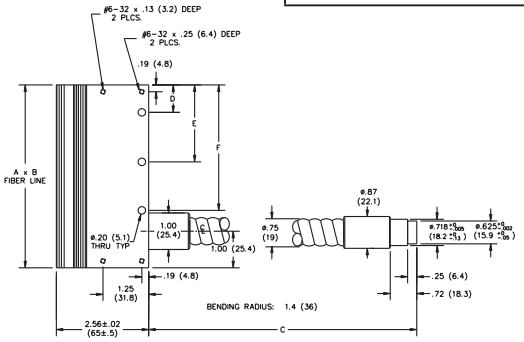
Dimensions in ( ) are in mm

Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

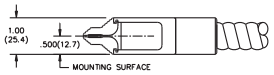
Input: Black Anodized Aluminum
Body: Black Anodized Aluminum
Sheathing: PVC Covered Metal Tubing

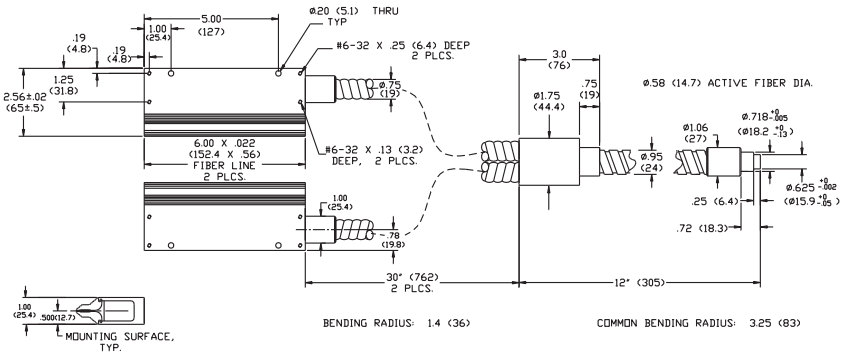
A08903 – A08916
Lightlines





A08975
Dual Lightline





Lightlines and Lenses

Part No.	Line Dimensions	Input Active Fiber Dia.	Gray Scale Uniformity^	P/N Lens	
	Length x Width			Cylindrical	Apertured
Single line configuration w/30"bundle length and back-side single exit					
A08903	3" x .040" (76 x 1.02)	.39" (10)†	± 8	★**A08823**	★**A08803**
A08904	4" x .036" (102 x .91)	.43" (11)	± 8	★**A08824**	★**A08804**
A08905	5" x .040" (127 x 1.02)	.51" (13)	± 8	★**A08825**	★**A08805**
A08906	6" x .033" (152 x .84)	.51" (13)	± 8	★**A08826**	★**A08806**
★**A08907***	7" x .029" (178 x .74)	.51" (13)	± 8	★**A08827**	**Custom**
A08908	8" x .025" (203 x .64)	.51" (13)	± 8	★**A08828**	★**A08808**
★**A08909***	9" x .022" (229 x .56)	.51" (13)	± 8	★**A08829**	**Custom**
A08910	10" x .020" (254 x .51)	.51" (13)	± 8	★**A08830**	★**A08810**
★**A08911***	11" x .018" (279 x .46)	.51" (13)	± 8	★**A08831**	**Custom**
A08912	12" x .016" (305 x .41)	.51" (13)	± 8	★**A08832**	★**A08812**
★**A08913***	13" x .015" (330 x .38)	.51" (13)	± 10	★**A08833**	**Custom**
Custom	14" x .014" (356 x .36)	.51*(13)	± 10	★**A08834**	**Custom**
★**A08915***	15" x .013" (381 x .33)	.51" (13)	± 10	★**A08835**	**Custom**
A08916	16" x .012" (406 x .30)	.51" (13)	± 10	★**A08836**	★**A08816**
Dual line configuration w/true-side bundle exit (see photo above)					
A08975	6" x.022" (152 x .56)	.58" (16)	± 8	**A08826**	**A08806**

★ Made-to-order products.

* Items are made to order, and may require additional 3-4 weeks delivery.^ Gamma setting of 1.0
†Dimensions in ( ) are in mm

Matrix for A08903 - A08916 Lightline Drawing

Part No.	A	B	C	D	E	F
A08903	3" (76)	.040" (1.0)	30" (762)	.75" (19.1)	1.5" (39)	n/a
A08904	4" (102)	.036" (.91)	30" (762)	.75" (19.1)	2.5" (64)	n/a
A08905	5" (127)	.040" (1.02)	30" (762)	.75" (19.1)	3.5" (89)	n/a
A08906	6" (152)	.033" (.84)	30" (762)	.75" (19.1)	4.5" (114)	n/a
A08907	7" (178)	.029" (.74)	30" (762)	.75" (19.1)	5.5" (140)	n/a
A08908	8" (203)	.025" (.64)	30" (762)	.75" (19.1)	6.5" (165)	n/a
A08909	9" (229)	.022" (.56)	30" (762)	.75" (19.1)	7.5" (191)	n/a
A08910	10" (254)	.020" (.51)	30" (762)	.75" (19.1)	8.5" (216)	n/a
A08911	11" (279)	.018" (.46)	30" (762)	.75" (19.1)	9.5" (241)	n/a
A08912	12" (305)	.016" (.41)	30" (762)	.75" (19.1)	10.5" (267)	n/a
A08913	13" (330)	.015" (.38)	30" (762)	.75" (19.1)	6.13" (156)	11.5"(292)
Custom	14" (336)	.014" (.38)	30" (762)	.75" (19.1)	6.63" (168)	12.5"(316)
A08915	15" (381)	.013" (.33)	30" (762)	.75" (19.1)	7.13" (181)	13.5"(343)
A08916	16" (406)	.012" (.30)	30" (762)	.75" (19.1)	7.63" (194)	14.5"(368)

Spatially Randomized Lightlines

Continuous Lightline, A08940

A patented exclusive! 24" and 40" lines of for web and line scanning applications

- Manufactured using a patented process called spatial randomization. The process allows light from each input to be distributed over the entire length of the line. Therefore, should a light source fail while using multiple inputs, intensity is evenly reduced over the length of the line, rather than losing all light in a section of the line.
- Calibrated to ±15 gray scale levels at a mean of 200 with a gamma setting of 1.0 to deliver optimum uniformity. Refer to section 25.02.01for information on uniformity of fiber optic products.
- Assembly method accurately positions the fiber line within the body on all three planes, to a tolerance of ± .004" (.1)*. The technique assures the fiber axis will be parallel with the mounting surface of the body.
- Standard input ferrule fits ColdVision Series light sources. Can also be used with strobes.
- The 24" (610) lightline accepts our dichroic filters and diffusers. To use color filters on the 40" (1016) line, part number A08931, color filter adapter, is required.
- Rugged aluminum body with a black anodized finish
- Stainless steel tubing protects the fiber bundle.
- Cylindrical lenses are available. They are designed to collect light exiting the lightline to increase intensity up to a factor of 10.
- Custom length, bundle exits, line widths and configuration are available. (Additional lead time required)

Continuous Lightine, A08964

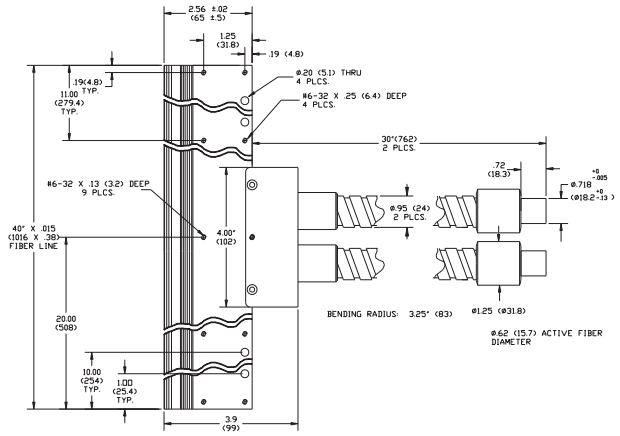
Spatially Randomized Lightlines

Dimensions in ( ) are in mm

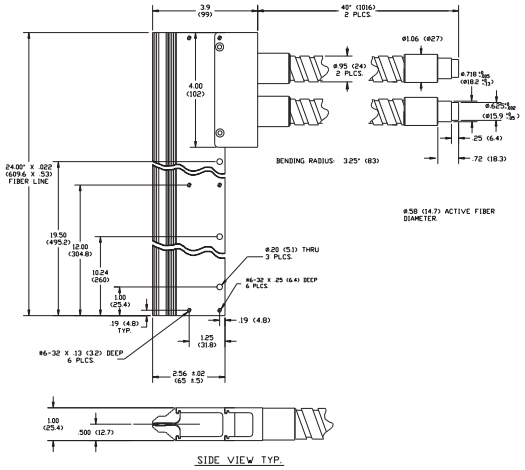
Warning : This product is manufactured with glass fiber. Not for use in cable/hose carrier. Call SCHOTT to discuss moving cable/hose carrier applications.

Input: Black Anodized Aluminum
Body: Black Anodized Aluminum
Sheathing: Stainless Steel Covered Metal Tubing

A08940
40″ (1016) Lightline



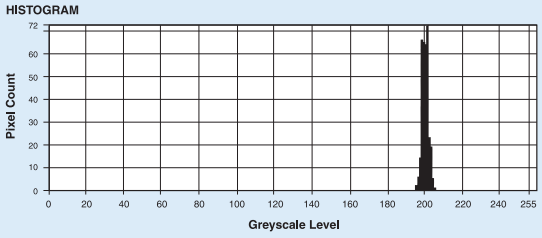
A08964
24″ (610) Lightline



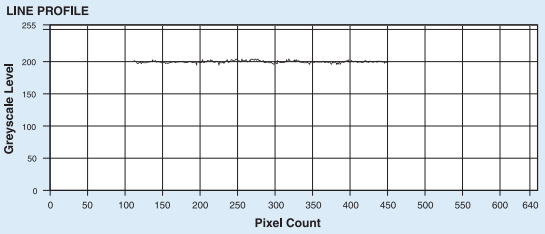
Global Report

Mean Value	Maximal Value	Minimal Value	Standard Variation	Area (pixels)	%
199.78	205.00	195.00	1.74	337	1.40

Histogram



Example of Line Scan Results



Lightlines and Lenses

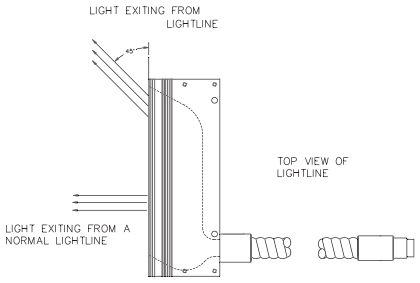
Part No.	Line Dimensions Length x Width	Input Active Fiber Dia.	Gray Scale Uniformity	Bundle Length	Part No. for Lens	
					Cylindrical	Apertured
A08940	40″x.015″ (1016x.38)	.62″ (16)*	± 15	30″ (762)	★ A08860	Custom
A08964	24″x.022″ (610x.56)	.57″ (14)	± 15	40″ (1016)	★ A08864	Custom

★ Made-to-order products.

Lightline, 45°

Engineered and designed to emit light at a 45° angle along the length of the line

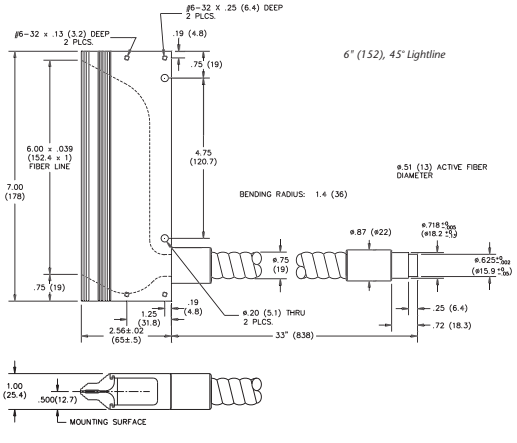
- The output fibers are angled 30° to the nosepiece, as a result they are polished on a bias, which causes emitted light to exit at 45° to the nosepiece. The line can be positioned off-axis to the object, illuminate the field-of-view without loss of uniformity, while avoiding interference with the camera; an important consideration in space constrained systems.
- Useful for illuminating a rectangular surface area where the features are perpendicular to the line body.
- Standard input ferrule fits ColdVision Series light sources. Can also be used with strobes.
- The lightline is calibrated to ± 8 gray scales at a mean of 200 with a gamma setting of 1.0, for optimum uniformity with DDL-lamp.
- Assembly method accurately positions the fiber line within the body on all three planes, to a tolerance of ± .004"(.102). The technique assures the fiber axis will be parallel with the mounting surface of the body.
- Rugged aluminum body with black anodized finish
- PVC covered metal tubing protects the fiber bundle.
- Refer to section 25.02.01 for more information on uniformity of fiber optic products.
- Custom configurations can be engineered for unique requirements.
- The cylindrical and apertured lenses are adjustable and easy to attach.



Lightline, 45°

Dimensions in ( ) are in mm

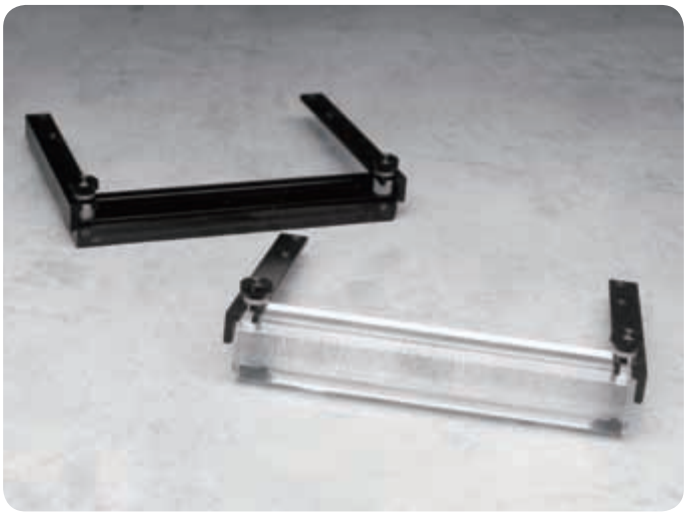
Input: Black Anodized Aluminum
Body: Black Anodized Aluminum
Sheathing: PVC Covered Metal Tubing



Lightline, 45°

Part No.	Line Dimensions	Input Active Fiber Dia.	Gray Scale Uniformity^	Part No. for Lens	
	Length x Width			Cylindrical	Apertured
Custom	6" x .039" (152 x 1.0)	.51" (13)	±8	Custom	Custom

Lightline Lenses



Cylindrical and apertured lenses, A08806 & A08826

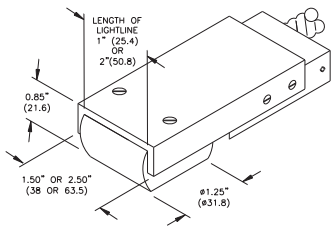
Cylindrical and apertured lenses for 1" to 16" lightlines

- Cylindrical and apertured lenses are available as standard products for most lightline models. They can be custom made for all models.
- Cylindrical lens attachments are designed to collect light exiting the lightline to increase intensity up to a factor of 10.
- Apertured lens attachments are designed to project a more collimated line of light, not to increase light intensity.
- The lenses are adjustable and easily attach to SCHOTT lightlines.
- Custom length and configurations are available. Lead time is required.

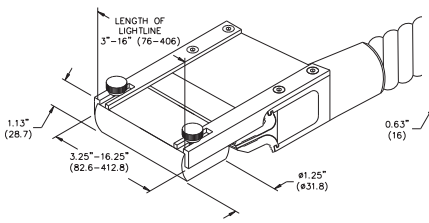
DCR® III Light Source

Dimensions in ( ) are in mm

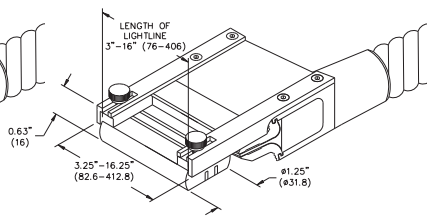
A08571
Cylindrical and Apertured Lenses



A08824, A08826, A08832
Cylindrical Lenses



A08806
Apertured Lenses



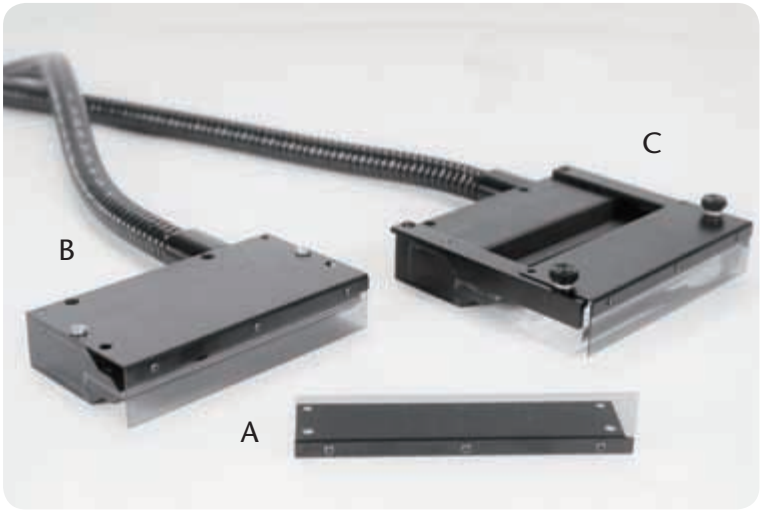
3" (76 mm) Lightline with A08582 Cylindrical Lens

Lenses and Polarizer Kits

Lightline Part No.	Lens Part No.	
	Cylindrical	Apertured
1", 2", & 3" Lightlines		
A08579	★ A08571	Custom
A08580	★ A08582	Custom
A08583	★ A08572	Custom
A08584	A08572	Custom
A08588	A08571	Custom
A08589	A08572	Custom
3" to 16" Continuous Lightlines		
A08903	A08823	Custom
A08904	A08824	Custom
A08905	A08825	Custom
A08906	A08826	Custom
A08907	A08827	Custom
A08908	A08828	Custom
A08909	A08829	Custom
A08910	A08830	Custom
A08911	A08831	Custom
A08912	A08832	Custom
A08913	A08833	Custom
A08914	A08834	Custom
A08915	A08835	Custom
A08916	A08836	Custom
A08975	A08826	A08806
24" to 40" Continuous Lightlines		
A08940	A08860	Custom
A08964	A08864	Custom
45 Degree Lightline		
Custom	Custom	Custom

★ Made-to-order products.

Lightline Linear Polarizer Kits



(A) Lightline polarizer assembly, A08845, (B) Polarizer affixed to a 5" lightline, (C) Polarizer affixed to a cylindrical lens on a lightline

- Developed for use with 3" to 16" (227 to 406 mm) lightlines to enhance contrast on highly reflective surfaces for area and line scanning applications.
- Easily mount on SCHOTT lightlines alone or with cylindrical and apertured lenses affixed to the lightline.
- The polarizer(s) should be used with an analyzer supplied by the customer. The analyzer is typically attached to the camera objective.
- Two polarizers are included in the kit; one polarizes in the horizontal axis and the other polarizes in the vertical axis.
- Custom length configurations are available. Lead time is required.

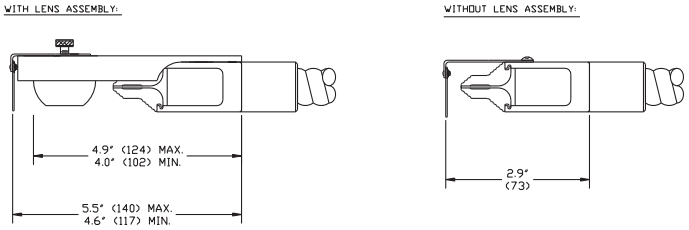
Linear Polarizer Kits

Lightline Part No.	Polarizer Kits Part No.
A08903	Custom
A08904	★ A08844
A08906	Custom
A08908	Custom
A08910	Custom
A08912	Custom
A08914	Custom
A08916	Custom
A08975	Custom

★ Made-to-order products.

DCR® III Light Source

Dimensions in ( ) are in mm



A08843 - A08856
Polarizers

Lightlines Support Apparatus

3" Lightline, A08903, with Holder, A08901, supported by an articulated arm, A08506, and base, A08507

For accurate positioning in both industrial and laboratory environments

Support Apparatus

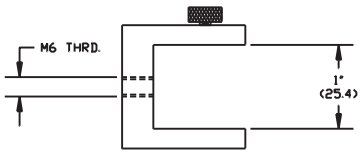
Part No.	Description
A08901	**Lightline holder** with M6 thread. Will support 3" (76) to 10" (254) single lightlines when attached to an articulated ard and base.

Lightline Holder, A08901

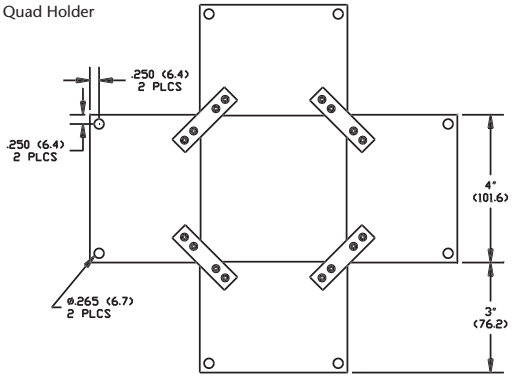
Lightlines Support Apparatus

Dimensions in ( ) are in mm

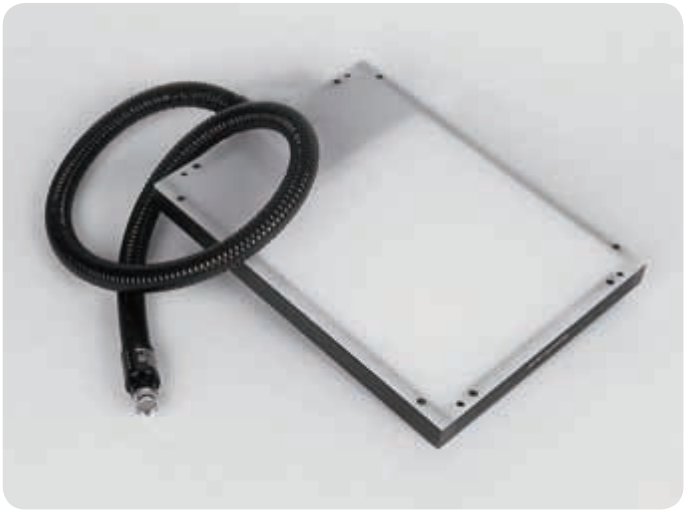
A08901
Holder



Quad Holder



Single and Dual Backlights



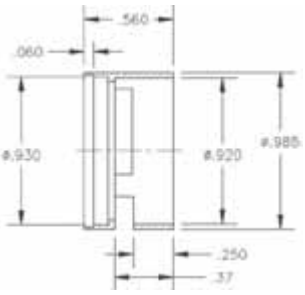
8" x 8" Backlight, A08927

Patented SCHOTT Backlights are calibrated to provide bright, even illumination for Microscopy and Machine Vision applications.

- Calibrated with DDL-bulb from ±13 to ±15 gray scale levels at a mean of 200, gamma setting of 1.0, using a patented process to create diffuse, uniform illumination within the active area. Uniformity scans are available upon request.
- The white acrylic diffuser plate provides the optimum combination of uniformity and intensity. The backlight housing is made of rugged, black anodized aluminum. The plastic fiber bundle is protected with flexible PVC covered metal tubing.
- Use with strobes and ColdVision Series light sources. Other sources, particularly those without an IR filter, may damage the plastic fibers.
- ColdVision dichroic color filters can be used on the products in conjunction with the A08931 backlight color filter adapter (see photo to left). More details can also be found in the Fiber Optic Accessory section of the product catalog.
- IR - Filter in every unit
- Compact, low profile housing fits in small spaces.
- Can be used to create a crisp edge definition, or soft, diffuse incident light
- Dual and quad backlights increase lighting versatility. Additional combinations and sizes can be custom ordered.

Dual 2" x 2" Backlight, A08922

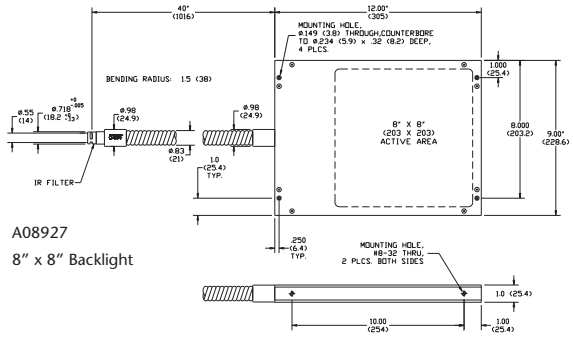
IR Filter A08921 with measurements



Single and Dual Backlights

Dimensions in ( ) are in mm

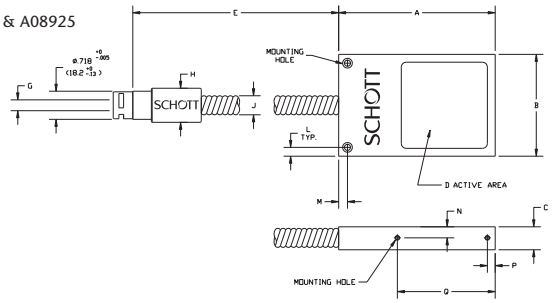
Input: Black Anodized Aluminum
Bundle Sheathing: PVC Covered Metal Tubing
Max Fiber Temperature: 70°

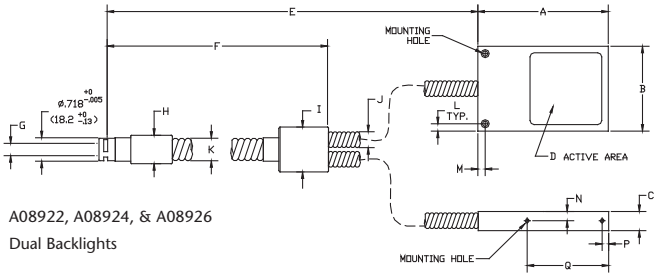


A08927
8" x 8" Backlight

Warning : The IR filter on the input protects the fibers from damage caused by IR absorption.

A08920, A08923, & A08925
Single Backlights





A08922, A08924, & A08926
Dual Backlights

Backlights

Part No.	Active Area	Housing Dimensions	Gray Scales	Bundle Length	Common Bundle Length
Single Configuration					
A08920	2" x 2" (51 x 51)	4" x 2.6" x .59" (102 x 66 x 14.9)	±13	40" (1016)	N/A
A08923	3" x 3" (76 x 76)	6" x 3.5" x .75" (152 x 89 x 16)	±13	40" (1016)	N/A
A08925	4" x 4.88" (102 x 124)	9" x 5" x .78" (229 x 127 x 19.7)	±13	40" (1016)	N/A
A08927	8" x 8" (203 x 203)	12" x 9" x 1" (305 x 229 x 25.4)	±15	40" (1016)	N/A
Dual Configuration					
A08922	2" x 2" (51 x 51)	4" x 2.6" x .59" (102 x 66 x 14.9)	±13	42" (1067)	10" (254)
A08926	4" X 4.88" (102 X 124)	9" X 5" X .78" (229 X 127 X 19.7)	±13	37" (940)	10" (254)

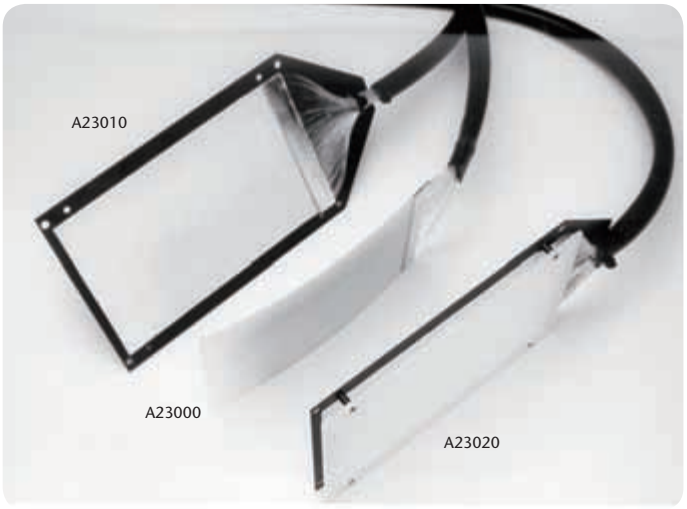
Matrix for Single and Dual Backlights

Part No.	Housing Dimensions LX W X H	Active Area	Overall Bundle Length
Ref. Letter	**A, B, C**	**D**	**E**
A08920	4"x2.6"X.59" (102x66x14.9)	2"X2" (51x51)	40" (1016)
A08922	4"x2.6"x.59" (102x66x14.9)	2"x2" (51x51)	42" (1067)
A08923	6"x3.5"x.75" (152x89x19.1)	3"x3" (76x76)	40" (1016)
A08924	6"x3.5"x.75" (152x89x15.9)	3"x3" (76x76)	40" (1016)
A08925	9"x5"x.78" (229x127x19.7)	4"x4.88" (102x124)	37" (940)
A08926	9"x5"x7.8'' (229x127x19.8)	4"x4.88" (102x124)	37" (940)

Matrix for Single and Dual Backlights (Continuation)

Part No.	Common Bundle Length	Active Input Dia.	Ferrule Dia	Coupler Dia	Tubing Dia	Top Mounting Hole Location	Top Mounting Hole Dimensions	Side Mounting Hole Location	Side Mounting Hole Dimensions	Bend Radius
Ref. Letter	**F**	**G**	**H**	**I**	**JK**	**L/M**	**THRU/DIA/C'BORE DIA/DEPTH**	**N/P/Q**	**THREAD/DEPTH**	
A08920	N/A	.28" (7.0)	.87" (22.1)	N/A	.47" (12)	.225"/.225" (5.72/5.72)	.156"/.25"/.150" (4.0/6.4/3.8)	28"/.20"/2.50" (7.2/5.1/63.5)	#4-40 UNC 2A/.38 (9.6)	.6" (15)
A08922	10" (254)	.39" (9.9)	.87" (22.1)	1.38" (34.9)	.47"/.67" (12/17)	.225"/.225" (5.72/5.72)	.156"/.25"/.150" (4.0/6.4/3.8)	.28"/.20"/2.50" (7.16/5.1/63.5)	#4-40 UNC 2A/.38 (9.6)	.6"/1.2" (15)/(30)
A08923	N/A	.32" (8.1)	.87" (22.1)	N/A	.60" (15)	.187"/.187" (4.75/4.75)	.177"/.28"/.165" 4.5/7.1/4.2	.32"/100"/5.00" (8.1/25.4/127)	#6-32/.25" (6.4)	1" (25)
A08925	N/A	.39" (9.9)	.87" (22.1)	N/A	.68" (17.3)	.425"/.425' (10.80/10.80)	.250"/.50"/.300" (6.4/12.7/7.6)	.36"/.20"/5.75" (9.1/5.08/151)	#6-32 UNC2A/.38 (9.6)	1" (25)
A08926	10" (254)	.55" (13.8)	.98" (24.9)	1.50" (38.1)	.68"/.83" (17/21)	.425"/.425" (10.80/10.80)	.250"/.50"/5.00" (6.4/12.7/7.6)	.36"/.20"/5.75" (9.1/5.08/146)	#6-32 UNC 2A/.38" (9.6)	1/1.5" (25)/(38)

PANELite® Backlights



A versatile addition to the extensive line of our patented backlights

- Patented process creates diffuse, uniform† illumination within the active area.
- Slim profile to fit the most restrictive space requirements
- Same dependable performance built into three standard configurations
- Flexible panel (A23000) can create a seamless, curved background.
- When used with a curved diffuser (customer supplied), the PANELite® backlight is ideal for multiple camera inspection of cylindrical surfaces.
- PANELite® backlight, A23000 can be trimmed to final size.
- Use with strobes and ColdVision Series light sources. Other sources, particularly those without an IR filter, may damage the plastic fibers.
- All our dichroic color filters can be used on the products in conjunction with the A08931 backlight color filter adapter. More details can also be found in the Fiber Optic Accessory section of the product catalog.
- 40" (1016)* flexible fiber bundle
- Economical - works without a housing
- IR filter on every unit

Note: Uniformity Tolerances varies with size of active area. See technical specifications on reverse side.


PANELite® Backlight with adhesive back, A23000

Special Configuration

- PANELite® backlights can be manufactured with different active areas, placement of outputs and mounting hole locations. Lead time required. Call for a custom quote.

Typical Applications

- Glass inspection
- Edge detection
- Photography
- Instrumentation display

PANELite® Backlights

Dimensions in ( ) are in mm

Transmits visible light - from 400nm to 700nm
Temperature limit 0° to 70°C

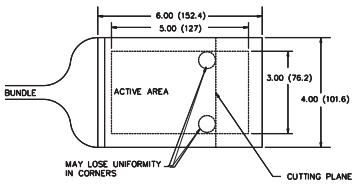
Uniformity Specification

- Area of calibration is 3"x 5" (76 x 127)
- Calibrated to ±15 gray scale levels at a mean of 200, gamma setting of 1.0
- Tested with a .118"(3mm) white acrylic plate, spaced .3" (7.6) from panel. (Call manufacturer for set up specification)

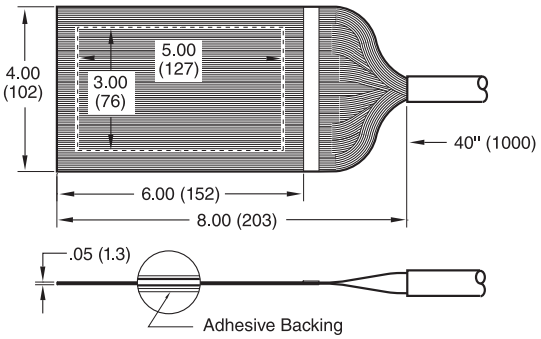
Please Note: A .3" (7.62) border does not meet this specification on panels larger than 1.5" x 1.5" (38x38). Uniformity specification for custom panels smaller than 1.5" x 1.5" (38 x 38) or larger than 4" x 6" (102 x 152) will be provided with quote.

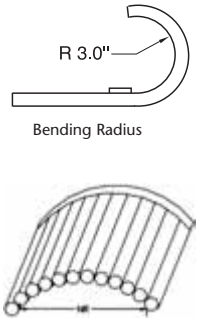
Warning : This product contains plastic fibers. To avoid fiber damage use only with **SCHOTT** or other approved light sources. Do not use input filters or diffusers without a **SCHOTT** adapter. Thermal transfer may cause damage to the fibers. All PANELite® Backlights have permanent input IR filters which must be kept clean. Clean panels with isopropanol only. OTHER SOLVENTS will damage the fiber and affect uniformity.

A23000
PANELite® Backlight



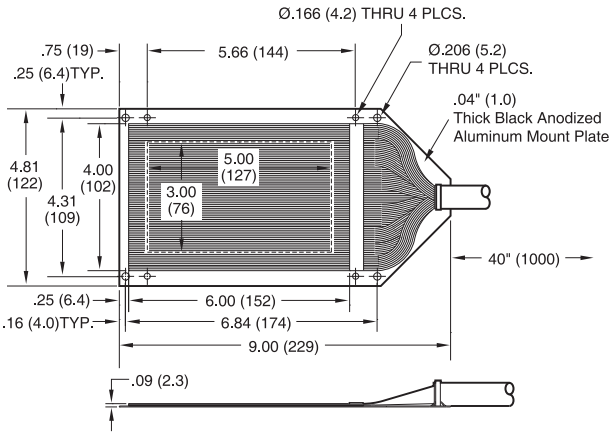
The A23000 PANELite® backlight can be trimmed in either direction with a good pair of scissors.
NOTE: Trimming affects uniformity in the corners along the trimmed edge.



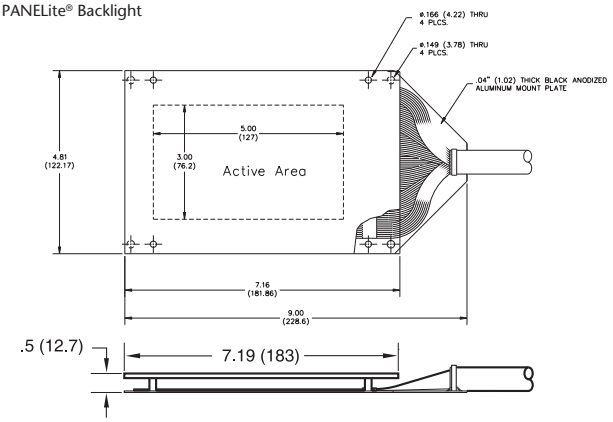


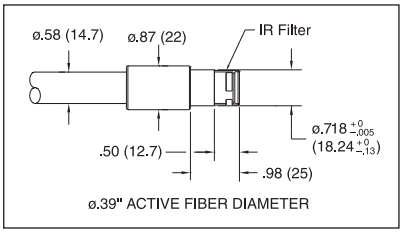
Do not bend parallel to fiber direction.

A23010
PANELite® Backlight



A23020
PANELite® Backlight





All standard PANELite® backlight configurations have the same input dimensions.

PANELite® Backlights

Part No.	Description	Calibrated Area	Panel Size	Overall Thickness
A23000	Flexible, adhesive back	3" x 5" (76 x 127)*	4" x 6" (102 x 152)	.05" (1.3)
A23010	Non-flexible, black anodized aluminum back	3" x 5" (76 x 127)	4.8" x 9" (122 x 229)	.09" (2.3)
A23020	Non-flexible, black anondized aluminum plate with acrylic diffuser plate	3" x 5" (76 x 127)	4.8" x 9" (122 x 229)	.5" (12.7)
Options				
A08931	Color filter adapter	Fits backlight light source adapters with .718" (18.2) diameter input size		

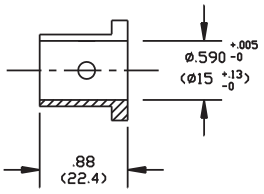
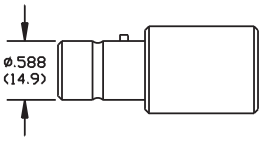
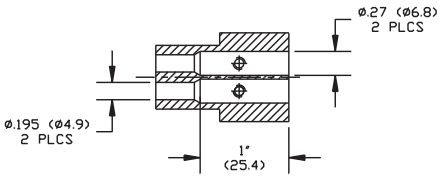
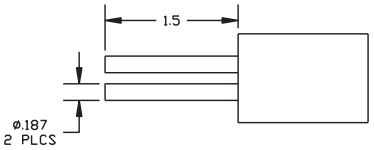
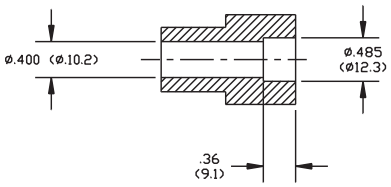
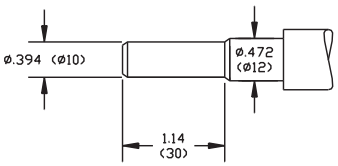
Input Adapters

For DCR® Series and ACE® Series Light Sources

SCHOTT provides a series of adapter bushings which fit into the DCR® Series and ACE® Series light sources.

The corresponding ferrule sizes they will accept, are shown below. The bushing attaches to the fiber bundle ferrule with a set screw. The bundle is then inserted into the light source receptacle. These adapters guarantee proper fiber bundle positioning in the focal plane of the lamp to receive the maximum light output.

Input Adapters

PartNumber	Adapter	Ferrule	
★ A08009			Volpi
A08010			
A08013			SCHOTT KL Series

Dimensions in ( ) are in mm

★ Made-to-order products.

Fiber Specifications

A2 Fiber

Material: Glass

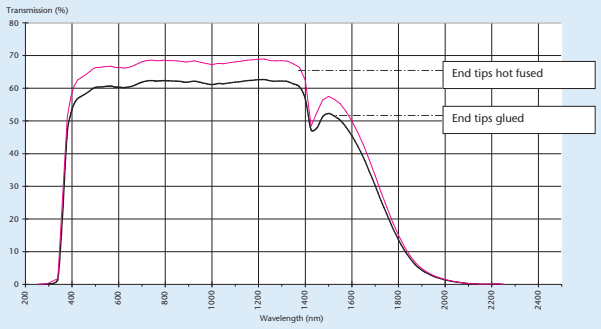
Characteristics: High transmission, performs best in the visible spectrum, large aperture angle and low color shift

Specifications:

Numerical Aperture NA:	0.64
Acceptance angle:	80°
Color temperature (D 65 illumination):	5475K
Fiber diameter (µm):	30,50,70
Bundle length (M):	≤10

Note: Longer lengths available upon request

Spectral Transmission for 1 M Bundle, Fiber Type A2



B3 Fiber

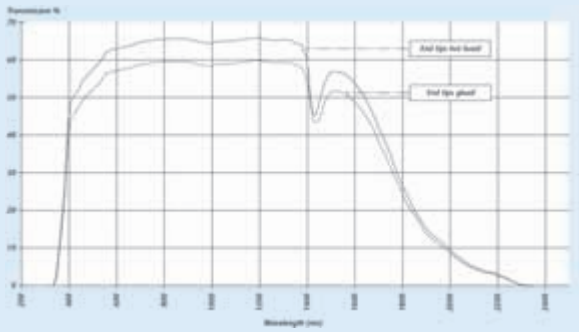
Material: Glass

Characteristics: Excellent transmission, performs best in visible spectrum, high acceptance angle and extremely colorless.

Specifications:

Numerical Aperture NA:	0.54
Acceptance angle:	65°
Color temperature (D 65 illumination) :	5870 K
Fiber diameter (µm):	30,50,70
Bundle length (M):	≤10

Spectral Transmission for 1 M Bundle, Fiber Type B3



FDS Fibers

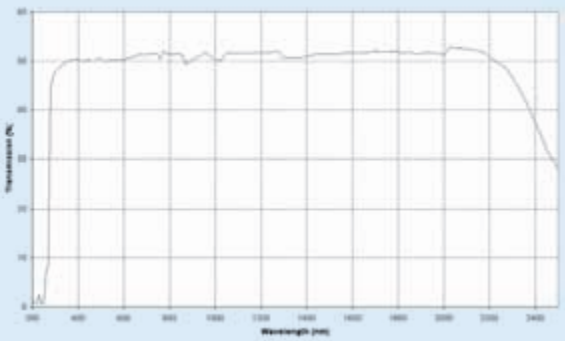
Material: Fluorine Doped Fused Silica (FDS)

Characteristics: Low OH. Performs good in UV spectrum, but better in the IR.

Specifications:

Numerical Aperture NA:	0.22 (+/-.02)
Acceptance angle:	25° (+/-2°)
Fiber diameter (µm):	240
Bundle length:	Quoted

Spectral Transmission for 1 M Bundle, Fiber Type FDS Low OH



FDS Fibers

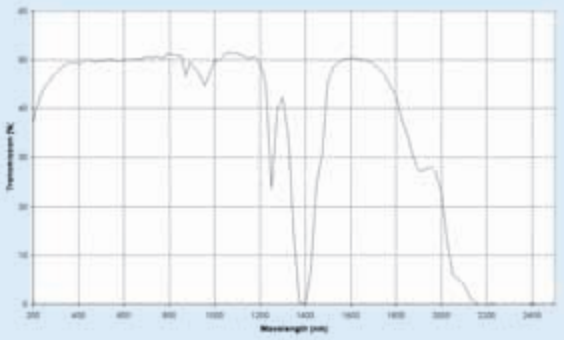
Material: Fluorine Doped Fused Silica (FDS)

Characteristics: High OH. Performs best in the UV spectrum.

Specifications:

Numerical Aperture NA:	0.22 (+/-.02)
Acceptance angle:	25° (+/-2°)
Fiber diameter (µm):	107, 240
Bundle length:	Quoted

Spectral Transmission for 1 M Bundle, Fiber Type FDS High OH



W Fiber

Material: Glass

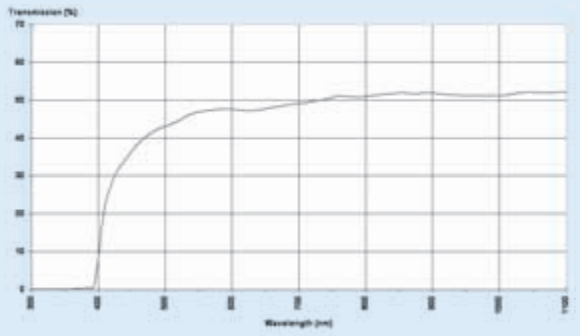
Characteristics: Used for the visible region of the spectrum when a wide aperture angle is required.

Specifications:

Numerical Aperture:	0.87
Acceptance angle:	119°
Color temperature (D 65 illumination):	4700 K
Fiber Diameter (µm):	30
Bundle length (M):	≤10

Note: Longer lengths available upon request

Spectral Transmission for 1 M Bundle, Fiber Type W



PCS Fiber

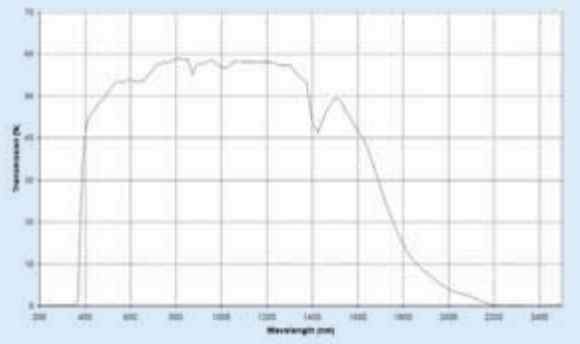
Material: Plastic Clad Silica (PCS)

Characteristics: High OH. Performs good in visible spectrum. Economic alternative to Fused Doped Silica.

Specifications:

Numerical Aperture NA:	Short Lengths (<2 M) 0.40 Long Lengths (>40 M) 0.30
Acceptance angle:	Short 47° Long 35°
Fiber diameter (µm):	275
Bundle length:	Quoted

Spectral Transmission for 1 M Bundle, Fiber Type PCS High OH



PCS Fiber

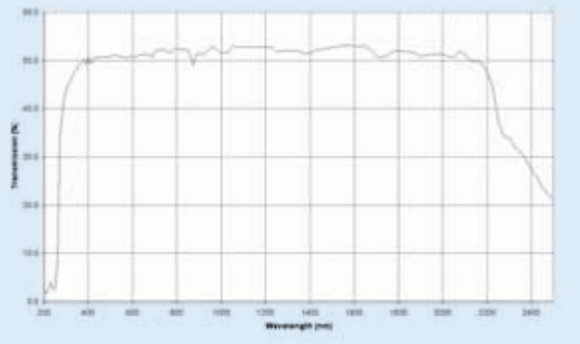
Material: Plastic Clad Silica (PCS)

Characteristics: Low OH. Performs good across UV, visible, and IR spectrum. Economic alternative to Fused Dope Silica.

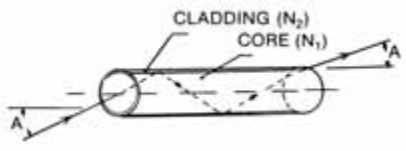
Specifications:

Numerical Aperture NA:	Short Lengths (<2 M) 0.40 Long Lengths (>40 M) 0.30
Acceptance angle:	Short 47° Long 35°
Fiber diameter (µm):	275
Bundle length:	Quoted

Spectral Transmission for 1 M Bundle, Fiber Type PCS Low OH



Fiber Characteristics



Fiber Composition

Most optical fibers consist of two different types of optically transmittive materials. The core, about 75-90% of the fiber depending on the fiber diameter, has a higher refractive index than the cladding. This creates a reflecting interface between core and cladding which keeps the light within the core due to total reflection.

Most optical fibers are made from glass, plastic or synthetic fused silica (often refered to as "quartz"). Each fiber has different properties producing various advantages. Due to their low attenuation silica fibers are commonly used in data communication. Glass is still the best choice for illumination and sensing applications, due to a reasonale cost-benefit ratio. Plastic fibers can be used for assemblies not requiring heat above 175°F/80°C. Single plastic fibers are usually larger in diameter than glass fibers, which results in restricted bending radii.

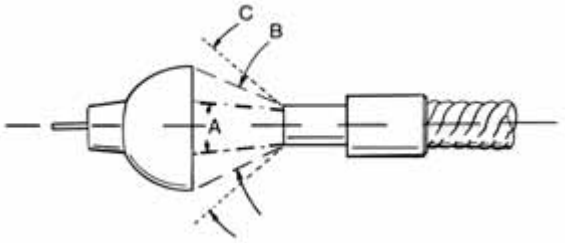
Numerical Aperture

The sketch above shows a typical fiber. The core has a refractive index of N1 and the cladding an index of N2. Light enters the fiber at angle A and is transmitted through the fiber. If the angle A is too large, the light will not be transmitted. We call the angle beyond which the light cannot be carried through the fiber the Critical Angle. This is calculated using the two refraction indices. The sine of the Critical Angle is the Numerical Aperture or NA The Acceptance Angle of the fiber is two times the Critical Angle.

$$NA = \sqrt{(N_1)^2 - (N_2)^2} \qquad f^{\#} = 1/2\ NA$$

EXAMPLE: If N1 is 1.62 and N2 is 1.52, the NA will be .56 which equals a Critical Angle of 34° and an Acceptance Angle of 68°. The f number/equivalent will be f/0.89.

Optical fibers tend to preserve the angle of incidence during the light transmission and therefore in the figure above, the angle A is shown at both the entrance and exit ends of the fiber. The sketch below shows a typical projecting lamp illuminating a fiber bundle. The angle A is the Acceptance Angle of a .25 NA fiber (29°). Angle B is the Incident Angle from the lamp and angle C is the Acceptance Angle of a .66 NA fiber (83°).



The calculated minimum NA. required for the 45° Angle of Incidence is .38. Therefore, a fiber with an NA. of .66 will accept all of the light from the lamp, but the output angle will only be 45° and not the 83° which might be expected. However, the .25 NA. fiber which cannot accept all of the light, will have an output angle of 20°. Using a low NA. fiber will not focus the light from a lamp because it can't receive any light beyond its Critical Angle and therefore has a narrow output cone. Multicomponent glass fibers typically reach NA values up to 0.9, whereas quartz silica fibers typically do not exceed 0.4 NA values.

Transmission Characteristics of Optical Fibers
High quality optical glass (crown and flint glass) is used for the light transmitting core and an optical glass with a different refractive index for the cladding. Wavelengths between 400 and 900 nm are transmitted uniformly, with only minor variations.

In this range SCHOTT's standard multicomponent glass fibers (A2, B3) have attenuation levels between 150 and 300 dB/km. Transmission in the UV range is very low and wavelengths below 350 nm are not transmitted. However, the near infrared range (0.8 µm to 1.3 µm) is transmitted very well by glass fibers. At 1.4 micron, all fibers except those specifically designed for IR transmission, show a significant drop in transmission due to OH-Absorption within the glass. In the range from 1.4 up to 2.0 µm specifically designed glass fibers for IR-transmission can be used.

For improved transmission over the entire range from 250 nm up to 3.0 µm quartz (fused silica) fibers are the best choice, but have a lower NA.

Transmission Characteristics of Optical Fiber Bundles
Although specific information on the performance of a single fiber is valuable, it is important to understand how optical fibers perform when manufactured into bundles. Due to total reflection, a portion of the light will be reflected at the polished glass surface of the fiber at the entrance as well as the exit. In addition, the interstitial gaps between the fibers, usually filled with epoxy glue, will not transmit any light. The losses due to these two effects can be estimated at appoximately 25 % -30 %, depending on the polishing quality. The loss of the interstitial gaps can be reduced by hotfusing the entrance end instead of glueing the fibers together. Thus, transmission can be increased up to 15 %. In addition, transmission loss will be caused with increasing length of the lightguide. A 3-foot/1m lightguide will transmit approximately 60% of the light emitted by the lamp towards the fiber bundle within the NA. A 10-foot/3m light guide will transmit about 55% of the light and a 30-foot/10 meter lightguide roughly of 40 %.

Uniformity of Fiber Optic Products

SCHOTT North America, Inc. manufactures two product lines which require a uniformity specification across a given area: lightlines, also referred to as spot to line converters, or cross-section transformers and backlights.

The uniformity of lightlines and backlights can be evaluated utilizing a Machine Vision System:
· CCD area scan camera
· a framegrabber card
· image analysis software.

Backlights
The backlight is placed directly under the camera at a defined distance based on the size of the active area. The camera will be focussed onto the top surface of the backlight diffuser. Then the uniformity is measured by using an area of interest (AOI) histogram. The AOI will be slightly smaller than the active area to compensate for edge fall-off. The light source used for backlight calibration is a DCR® III with an EKE lamp.

Lightlines
Lightlines smaller than 16" (406 mm) in length are mounted on a 45 degree angle fixture. The fixture has a diffuser plate which is located .5" (13 mm) above the fiber line. The line is projected onto the diffuser plate, which is positioned directly below an area scan camera. The distance from the camera to the diffuser is determined by line length but is approximately 24" (610 mm). The camera's focus is adjusted to the top surface of the diffuser. The uniformity is then measured by taking a line profile of the image. The line profile will be approximately .5"-1" (13 mm-25 mm) shorter than the product to compensate for fall-off. The light source used for lightline calibration is a DCR® III with a DDL lamp. The above information is an overview of our calibration process.

Using these set-ups, backlights and lightlines will be calibrated to predefined uniformity values. Details are provided on the individual data sheets.

Lamp Intensity versus Lamp Life

Halogen Bulbs
All SCHOTT Halogen cold light sources (including the ACE®, DCR®III, KL 1500 LCD, KL 2500 LCD and KL 200) allow the user to adjust light intensity from zero to the full rated voltage of the lamp. However, voltage to the lamp effects lamp life. As a rule of thumb, a 10% reduction in voltage of most halogen lamps increases the anticipated life time to 400%. SCHOTT recommends using the minimum intensity setting needed to maximize the life of the lamp.

The Halogen Cycle is the operating principle of all Quartz Halogen lamps. At full voltage, the temperature of the glass envelope is hot enough to keep evaporated tungsten (thrown off from the filament) from collecting on the glass surface. The tungsten is cycled back to the filament and thus increases its lifetime. As voltage is reduced, the temperature of the glass envelope also decreases, which might effect the halogen cycle. For this reason the lamp life might not be increased as expected when the voltage is dimmed below 75%.

All types of quartz Halogen bulbs used in SCHOTT cold light sources (DDL, EKE, EJA, EFR and ELC) operate in the same manner.

Quartz UV Light Guides

Our Quartz fiber light guides are ideal for light transmission and high-power spot curing in combination with a UV light source.

Because we control the entire production process from fiber drawing to final assembly, we can not only offer an assortment of standard products, but also a multitude of custom solutions ranging in shapes, branches, lengths and diameters. Depending on the application, we can adapt and meet many different requirements.

Quartz Fiber Light Guide Applications

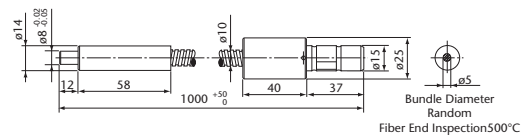
- UV Curing
- Florescence Analysis
- Lighting in Vacuum & Special Environments
- Specialized Medical Illumination
- LCD & Semiconductor Lithography

Quartz UV Light Guide

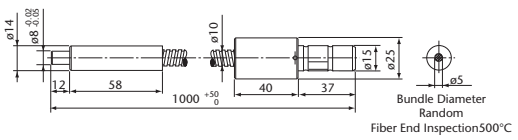
- MORITEX draws raw quartz fibers, processes, and bundles them according to application.
- Straight, multi-branch, and other various configurations of light guides can be manufactured including light guides made to customer specifications.

	Model	Notes	Product Code
Standard Model	**MSS5- 1000S-UV III**	ø5×1000L	A-1260
	MWS5- 1000S-UV III	ø5 x 2-Branch x 1000L	A-1261
	M4S5- 1000S-UV III	ø5 x 4-Branch x 1000L	A-1262
Made-to-order	**MSS3.5- 1000S-UV III**	ø3.5×1000L	A-1263
	MWS3.5- 1000S-UV III	ø3.5 x 2-Branch x 1000L	A-1264
	M3S3.5- 1000S-UV III	ø3.5 x 3-Branch x 1000L	A-1265
	M4S3.5- 1000S-UV III	ø3.5 x 4-Branch x 1000L	A-1266
	MSS10- 1000S-UV III	ø10×1000L	A-1267
	MKS50- 1000S-UV III	Line Width: 50mm	A-1268
	MKS50×0.4W- 1000S-UV III	Line Width: 50mm x 0.4mm (2-Branch Type)	A-1269

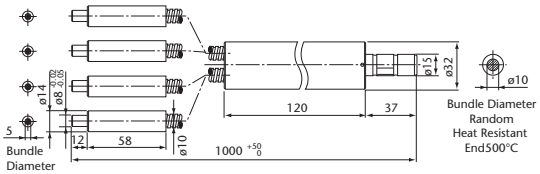
MSS5-1000S-UV III



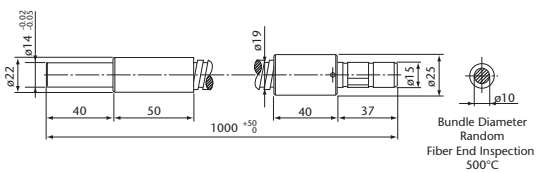
MWS5-1000S-UV III



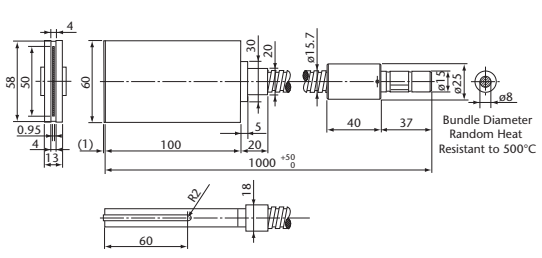
M4S5-1000S-UV III



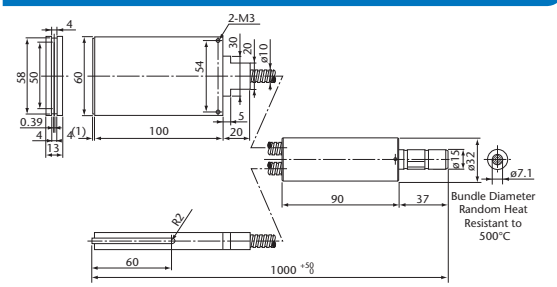
MSS10-1000S-UV III



MKS50-1000S-UV III

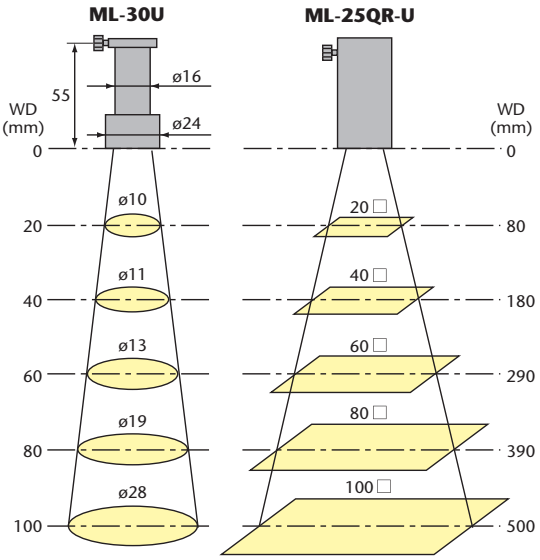


MKS50x0.4W-1000S-UV III



Quartz UV Light Guide Options

Unit for Condenser Lenses



Model	Notes	Product Code
ML-30U	Condenser Lenses	A-8590
ML-25QR-U	Uniform Light Irradiate Quartz Lens	A-8591

Quartz UV Light Guide Data

UV Visible Range Quartz Fiber Characteristics

Optical Fiber Data

NA and Stucture Dimensions	NA		0.22±0.02
	Diameter	Core(μm)	200±3
		Clad(μm)	208±3
		Primary Coating (μm)	240±10
	Permissable Bend Radius (mm)		20
Materials	Core		Pure SiO^2
	Clad		With F SiO^2

Note: Fiber diameter (core/ clad) may be changed without any notice.

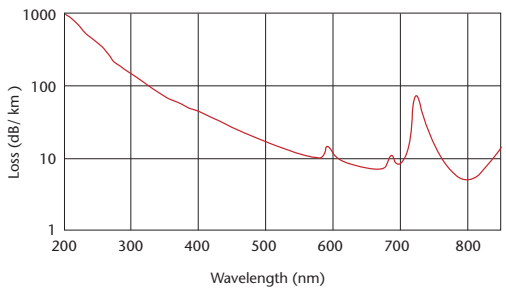
Features

- Suitable for UV-ray transmission because of high OH contents
- Prices are low because of rational production system.
- Transmittance rate is stable for a long time when used for UV light guides.
- Can be used for i, g, and h rays
- The thorough quality control of transmission performance and dimensional precision realizes easy processing with less dispersion and produces good-quality products.
- The technology, experience, and know-how of MORITEX, accumulated over a long period enables various fiber processing.

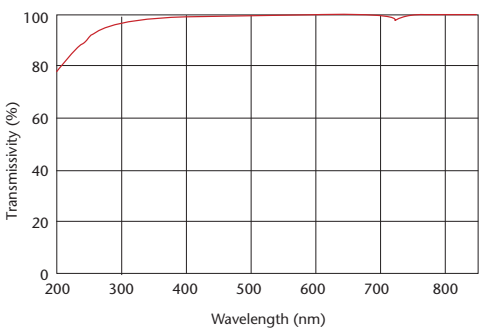
Applications

- Light guides for UV spot light sources
- Advanced light guides for semiconductors and liquid crystal exposure devices
- Light guides for analyzers
- Fiber probes for sensors
- Light guides for fluorometric analysis
- Light guides for medical use

Wavelength Loss Characteristics



Wavelength Transmittance Rate Characteristics (Per Meter Excluding Fresnel Reflection)



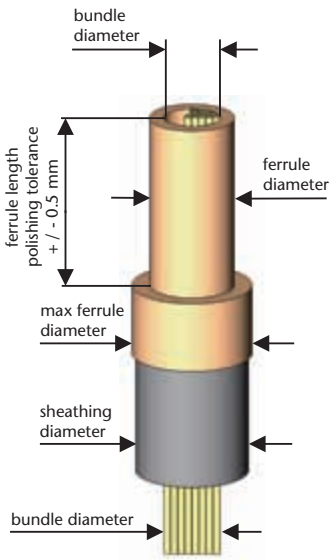
Special Application Light Guides

We offer the following choices for the light guide end termination:

Epoxy End Termination:

Standard temperature resistance up to 200°C depending on application

High Temperature resistance up to 300°C on request



Epoxy Process

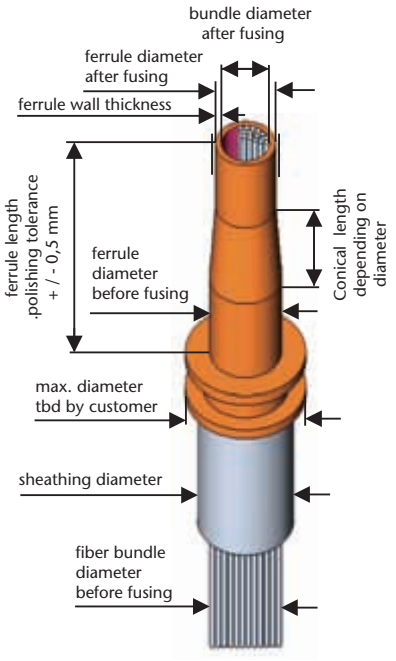
Note: Transmission of glued bundle is approximately 10 % lower than the fused bundle with same diameter after fusing.

*Note: All dimensions in the drawings depend on the bundle diameter

Fused Fiber Bundle Termination:

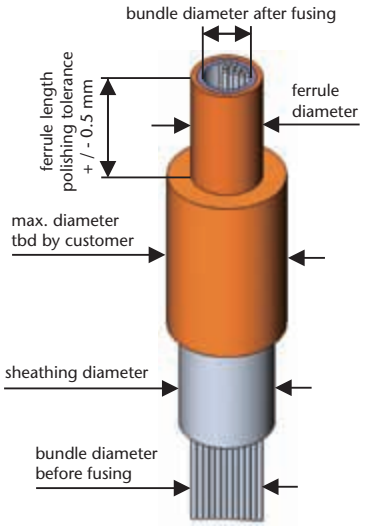
The end face of these light guides have a temperature resistance up to 350°C and approximately 10 % higher transmission values than epoxied fibre bundles with the same bundle diameter

Hot Forming
Diameter range 2.5 – 21.0 mm after fusing



Hot Forming Process

Hot Fusing (on request)
Diameter values 4.0 and 4.7mm after fusing



Hot Fusing Process

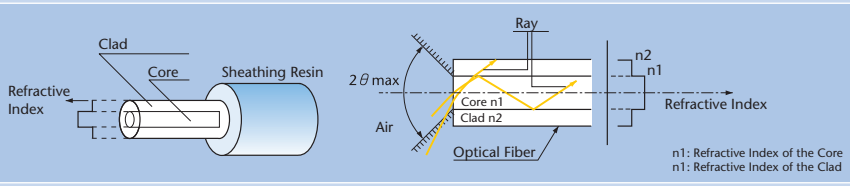
Sheathings:

Stainless steel, metal / PVC or metal / silicone sheathings, other sheathings on request

Fiber diameter values:
50 µm and 70 µm

Special applications:
Temperature resistance at the proximal end of up to 500°C can be achieved using quartz fibres and a special epoxy

Glossary

Measured Light Quantity	**Light Flux (lm)**	The quality of light emitted from a light source. The unit is lumen (lm)
	luminous Intensity (cd=lm/sr)	Light source quantity representing the quantity of light emitted from a light source per unit solid angle. The unit is candela (cd) = lm/ sr (solid angle)
	Intensity (lx=lm/m²)	Brightness on an object surface irradiated by light emitted from a light source. The unit is lux (lx) = lm/ m² where m² is the area of the object surface
	Illuminance (nt=cd/m²)	Light source quantity representing the luminous intensity of light emitted from a light source per unit area. The unit is nit (nit) = cd/m² or stilb = cd/ cm²
Filter	**Color Temperature K**	Color temperature representing the spectral energy distribution of light emitted from a light source. The unit is kelvin (k). A light source of a low value is reddish and one of a high value is bluish. To change the color temperature of a light source, use a color temperature conversion filter.
	Polarizing Filter	A filter to block light being reflected from glass, metal, or liquid surfaces that is too strong and detrimental .
	ND Filter	A filter to reduce the light quantity only, without affecting color reproduction. Also known as a gray filter.
	Color Temperature Conversion Filter	A filter to change the color temperature. The wavelength can be selected.
	Diffusion Filter	A filter to diffuse light from a light source and suppress illumination irregularity.
	IR Cut Filter	This filter can be classified into two types: heat-ray absorbing filters (or, catathermic filters), which absorb infrared rays, and cold filters, which reflect infrared rays by a multilayer film.
	Light Control Film	By laminating a micro-louver film with PET or other types of film, diffused light becomes more parallel.
Lamp	**Halogen Lamp**	An incandescent lamp with a trace of halogen gas added to the sealed gas. The halogen cycle prevents the blackening of the bulb wall. The optical output and color temperature are stable with less attenuation compared with that of an ordinary incandescent.
	Metal Halide Lamp	A lamp of great color rendering and high intensity using illumination by various metal halogen compounds and mercury.
	LED	A Light Emitting Diode (LED) is a semi-conductor element that applys a fixed-direction current to a crystalline substance with a semi-conductor PN junction, generating energy in the substance and emitting the energy as light. The basic theory was found early in the 20th century and silicon carbide was confirmed, experimentally, to emit light if a current was applied. Following this research, the current technology was established in the 1960's. Red and green were developed first, yellow in the 1970's, blue in 1993 and white in 1996.
	Constant-Current Power Supply	A power supply that can supply a fixed current even if infinite impedance and load voltage change.
	Constant-Voltage Power Supply	A power supply that can supply a fixed voltage even if 0 impedance and load voltage change.
	Resistance	Resistance (R) represents the difficulty of a current to pass: R = V/I. The unit is ohm (Ω). If the potential of a current drops by 1 volt (V) per ampere (A), the resistance is 1Ω.
Fiber	**Optical Fiber**	
	Numerical Aperture NA	The characteristic of receiving rays transmitted through the end face of an optical fiber. This is determined by the refractive indexes of the core and clad of the optical fiber. $NA=\sqrt{n_1^2-n_2^2}$
	Light-Reception Angle θ	An angle where the optical fiber can receive light. $\theta=2\sin^{-1}(NA)$

Catalog Icon Key

CE

The CE marking (CE mark) is a mandatory conformity mark on many products placed on the single market in the European Economic Area (EEA). The CE marking certifies that a product has met EU consumer safety, health or environmental requirements.

UL

To comply with fire/safety codes, products sold in the United States should be certified to comply with the requirements set by OSHA. A well-known company providing this service in the United States is UL (Underwriters Laboratories®). The UL Mark on a product means that UL has tested and evaluated programs, product and manufacturing facility and they meet UL requirements. The UL Marks may be only used on or in connection with products certified by UL. In addition to these marks, UL also provides access to the marks required in a number of other world markets. There are many types of UL Marks, each with its own specific meaning.

CSA

CSA is a Canadian counterpart of UL, given permission by OSHA to test and certify to OSHA safety standards.

RoHS

Restriction of Hazardous Substances Directive (RoHS). The Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment 2002/95/EC was adopted in February 2003 by the European Union. The RoHS directive took effect on 1 July 2006, and is required to be enforced and become law in each member state. This directive restricts the use of six hazardous materials in the manufacture of various types of electronic and electrical equipment.

IP67

IP (Ingress Protection) is a set of standard measurements related to the protection of products from solid foreign objects and water. IP is prescribed by the Japanese Industrial Standards Committee (JISC0920) and the International Organization for Standardization (IEC60529).
IP67 is a level of protection that can withstand being submerged in water at a depth of 1 meter for 30 minutes.

50 W 75 W 100 W 150 W

Indicates Wattage i.e. 50 W = 50 Watt

Analog Digital Digi Ana

External intensity control type - Analog = 0-5 V, Digital = 8 bit or 10 bit
Digi/Ana type has both of Analog and Digital control.

1ch 2ch 3ch 4ch

The number of channels for output power
i.e. 1 ch = 1 channel output, 2 ch = 2 channel output

W W (R/G/B)

LED color
W = White, R = Red, G = Green, B = Blue, (R/G/B) = Made-to-order

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