

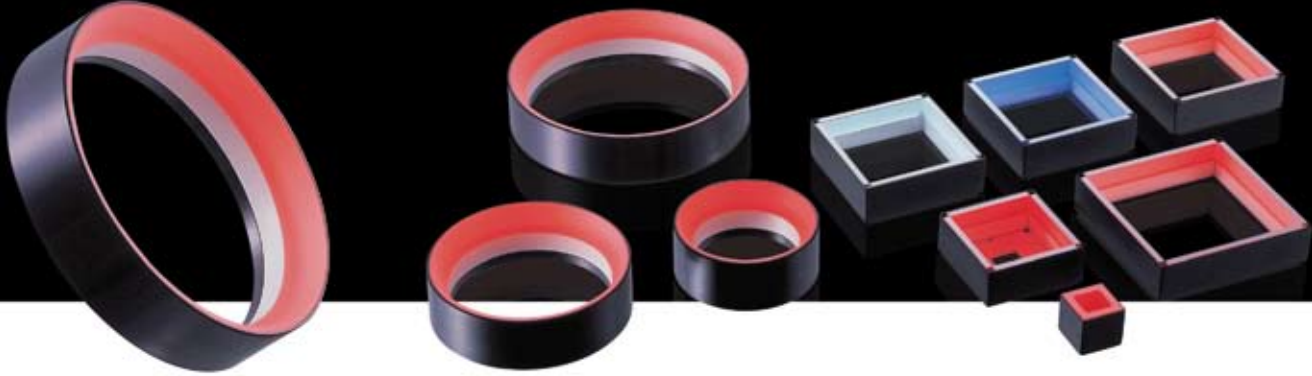


Low-angle Ring Lights / Low-angle Square Lights

FPR Series / FPQ Series

Even, diffused side lighting

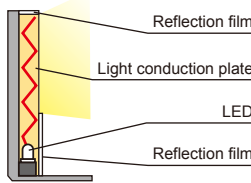
Low-angle, diffuse illumination enables characters and defects to be uniformly illuminated with no LED glare.



Diffused Lighting from Four Sides of the Square Case

To capture the image of rectangular workpiece uniformly such as a BGA or QFP, the four corners of the workpiece would be too close to the lighting if a round array is used. For this type of application, the rectangular FPQ Series is ideal.

Example of image using FPQ



Selectable lighting colors for optimal images

White, blue, and green colors are supported along with red. By selecting the illumination color to match the material and color of the work, a higher level of detection precision is possible.



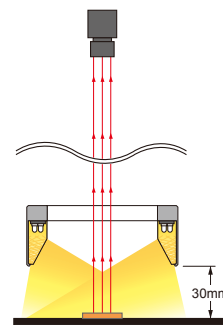
Even diffuse light enables optimal imaging

The image will vary depending on the distance between the workpiece and the light (light-workpiece distance = LWD) even when the light is the same.

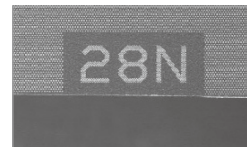
It is key to successful image processing to find the best illumination according to the surface state and the content of inspection.

Inspection of engraved letters on metal surface (Lighting: FPR-136)

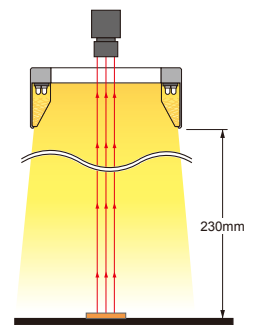
Imaging with LWD 30mm



Illumination from a low angle highlights the engraved letters white.



Imaging with LWD 230mm

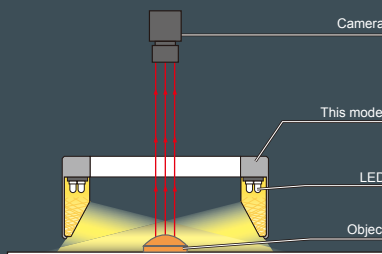


With diffuse light illuminated from LWD 230mm, the entire area is imaged in bright field.



Illumination structure of FPR-100

The object is illuminated from a low angle by uniform diffuse light through the light conduction plate.

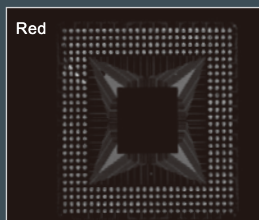


Examples of low-angle Ring Light images

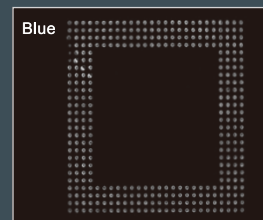
Inspecting a BGA solder balls

Blue light is used to eliminate the background gold pattern and to enhance the visibility of the solder balls.

Light used: FPQ-96



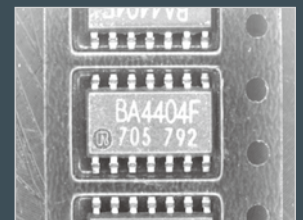
Light used: FPQ-96-BL



Inspecting SOP leads in embossed tape

There is minimal glare from the sides of the embossed tape.

Light used: FPQ-48



Direct Number : A direct number is a 7-digit number assigned to a CCS product. You can easily access the web page providing information on any desired product by simply entering the direct number in the space provided on the CCS website pages for machine vision. (Refer to the back cover of this brochure.)

Product Lineup Table

Series	Direct Number	Model Name	Color	Power Consumption	Option	Dimension
FPR	1005544	FPR-100RD2	●	24V / 6.1W	—	1
	1000083	FPR-100	●	12V / 6.0W		
	1004200	FPR-100SW2	○	24V / 7.6W		
	1000084	FPR-100-BL	●	24V / 8.2W		
	1000085	FPR-100-GR	●	24V / 9.1W	—	2
	1005545	FPR-136RD2	●			
	1000093	FPR-136	●	12V / 9.3W		
	1004201	FPR-136SW2	○	24V / 12W		
	1000094	FPR-136-BL	●	24V / 13W	—	3
	1000095	FPR-136-GR	●			
	1005546	FPR-180RD2	●	24V / 13W		
	1000101	FPR-180	●	12V / 13W		
	1004202	FPR-180SW2	○	24V / 16W	—	3
	1000103	FPR-180-BL	●	24V / 17W		
1000104	FPR-180-GR	●				

Existing RD-type Red Lights will be discontinued at the April 15, 2013. RD2-type Red Lights is recommended as replacement.
The RD-type and RD2-type Lights have different input voltages. Always use a 24-VDC Control Unit with RD2-type Lights. For a comparison between the RD-type and RD2-type Lights, refer to page 1.

Series	Direct Number	Model Name	Color	Power Consumption	Option	Dimension
FPQ	1000037	FPQ-32	●	12V / 1.2W	—	4
	1004187	FPQ-32SW2	○	24V / 1.6W		
	1000040	FPQ-32-BL	●			
	1000041	FPQ-32-GR	●			
	1000047	FPQ-48	●	12V / 2.4W	—	5
	1004188	FPQ-48SW2	○	24V / 3.1W		
	1000049	FPQ-48-BL	●	24V / 3.3W		
	1000050	FPQ-48-GR	●			
	1000059	FPQ-75	●	12V / 3.6W	—	6
	1004189	FPQ-75SW2	○	24V / 4.6W		
	1000060	FPQ-75-BL	●	24V / 4.9W		
	1000062	FPQ-75-GR	●			
	1000074	FPQ-96	●	12V / 4.8W	—	7
	1004190	FPQ-96SW2	○	24V / 6.1W		
	1000075	FPQ-96-BL	●	24V / 6.5W		
	1000076	FPQ-96-GR	●			
	1000031	FPQ-120	●	12V / 6.0W	—	8
	1004191	FPQ-120SW2	○	24V / 7.6W		
	1000032	FPQ-120-BL	●	24V / 8.2W		
			●			

Existing Low-angle Square Light FPQ series will be discontinued at the April 15, 2013. FPQ2 series is recommended as replacement.

Dimension Diagrams (Unit: mm)

