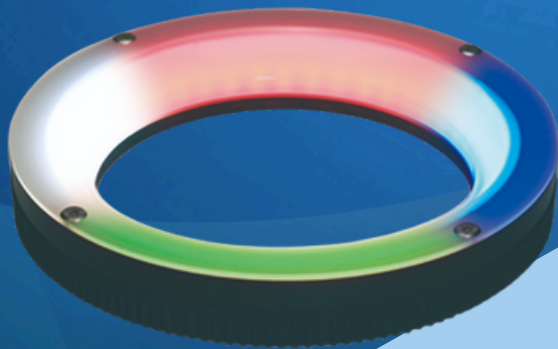


PHOTOMETRIC STEREO SOLUTION

Digital Control Units CD-VA Series
& Segmented Lights HPR2 Series



Segmented Lights
HPR2 Series



Digital Control Units
CD-VA Series

Introducing Photometric Stereo using Area Sensor Cameras

Photometric stereo is a lighting method that allows for detections of surface defects and 3D surface orientation. It can be visualized by lighting the workpiece from different angles, imaging them, and combining those images to make the final image.

Advantages of Photometric Stereo Method using Area Sensor Cameras:

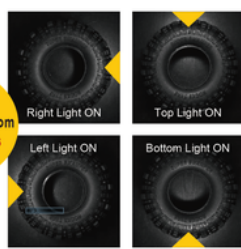
- Removes patterns on the surface of the workpiece and detects defects such as wrinkles and scratches
- Emphasizes bumps and unevenness to make letters appear clearer
- Effective for detecting characters and uneven shapes on workpieces whose surfaces are difficult to observe due to complex patterns and halation caused by illumination

Imaging Example:

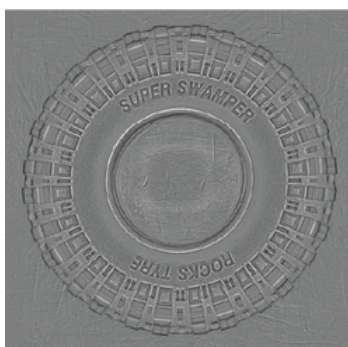


Rubber tire with color that is difficult to binarize

Imaged by illumination from 4 directions



Imaged from four different directions



Imaging result: The shadow in the center is removed allowing for the letters to be emphasized and clearly visible.

Market and Applications

Photometric stereo method using area sensor cameras can be used in inspections for various kinds of industries including packaging, tire, printing, steel, and so much more. It is becoming more popular worldwide in the machine vision industry in recent years.

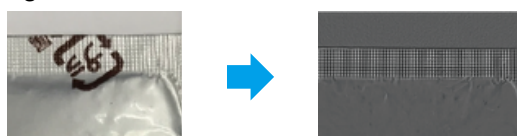
• Application 1. Tile

Patterns can be removed and unevenness extracted for easy character recognition and image acquisition.



• Application 2. Packaging

Patterns and halation are removed, enabling only the imaging of unevenness of the heat seal.



Our Solutions

By using our products Digital Control Units CD-VA Series and Segmented Lights HPR2 Series in your imaging system, you can realize the photometric stereo method for area-scan applications.

Segmented Light HPR2 Series



- Four standard independently controllable quadrants
- Highly flexible irradiation structure with high output power
- Usable from various irradiation positions
- Flexible customization: size, light emitting color, cable length, and number of segments or size ratio of segments

Digital Control Units CD-VA

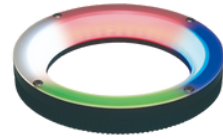
Our CD-VA series is a very compact and multifunctional, 24VDC controller with easy to use functions:



- Sequence control allows for registration of up to 16 sequence steps
- Up to 4 units connectable via infrared communication
- Supports 3 intensity control methods

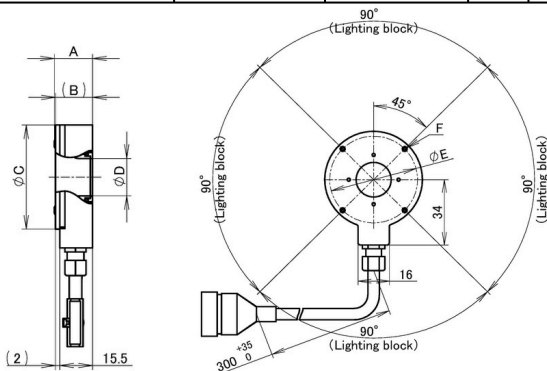
Segmented Light HPR2-DV4SM8 Series

Model Name	LED Color	Power Consumption	A	B	C	D	E	F
HPR2-50XX-DV4SM8*	RD (Red)	7.20W	18	17.5	50	18	45	4 x M3 x 4
	SW (White)	8.16W						
	FC (Full color)	3.46W						
HPR2-75XX-DV4SM8	RD (Red)	15.9W	26.4	25.5	91	41	83	4 x M4 x 5
	SW (White)	14.4W						
	FC (Full color)	8.16W						
HPR2-100XX-DV4SM8	RD (Red)	16.4W	26.4	25.5	116	66	108	4 x M4 x 5
	SW (White)	21.2W						
	FC (Full color)	10.4W						
HPR2-150XX-DV4SM8	RD (Red)	25.5W	26.4	25.5	166	116	158	4 x M4 x 5
	SW (White)	25.0W						
	FC (Full color)	13.9W						
HPR2-200XX-DV4SM8	RD (Red)	31.7W	26.4	25.5	216	166	208	4 x M4 x 5
	SW (White)	38.4W						
	FC (Full color)	17.5W						
HPR2-250XX-DV4SM8	RD (Red)	42.3W	26.4	25.5	266	210	258	4 x M4 x 5
	SW (White)	43.2W						
	FC (Full color)	22.5W						
HPR2-400XX-DV4SM8	RD (Red)	42.3W	19.2	18	424	360	412	4 x M6 x 6
	SW (White)	43.2W						
	FC (Full color)	27.7W						

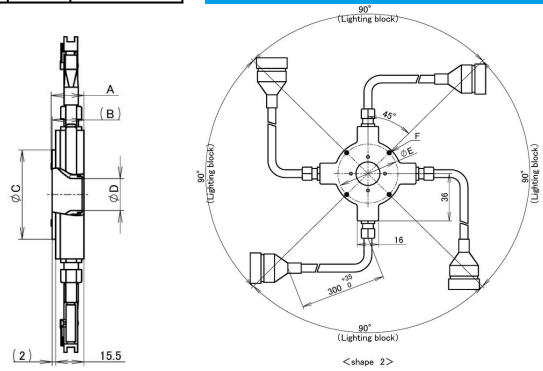


Color	Connector
RD (Red) SW (White)	SMR-08V-B 1 : CH1(+) 2 : CH1(-) 3 : CH2(+) 4 : CH2(-) 5 : CH3(+) 6 : CH3(-) 7 : CH4(+) 8 : CH4(-)
	SMR-08V-B 1 : R(+) 2 : R(-) 3 : G(+) 4 : G(-) 5 : B(+) 6 : B(-) 7 : NC 8 : NC

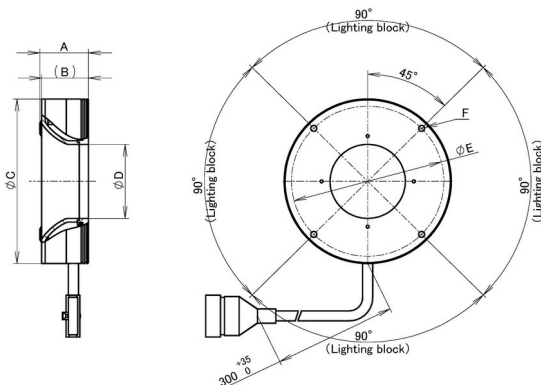
*XX: RD, SW, or FC
*Please contact your nearest sales representative for requests for other wavelengths (blue, IR, etc..) and light designs (e.g. square shaped FPQ3 series or bar lights).



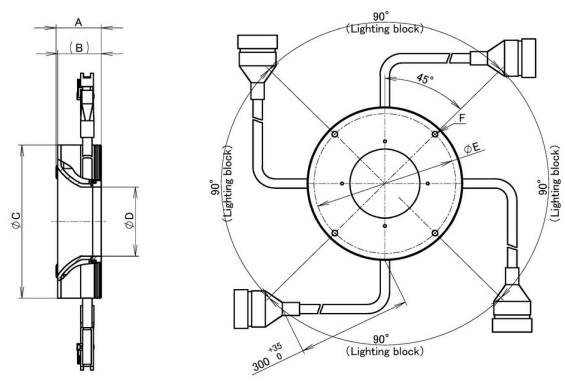
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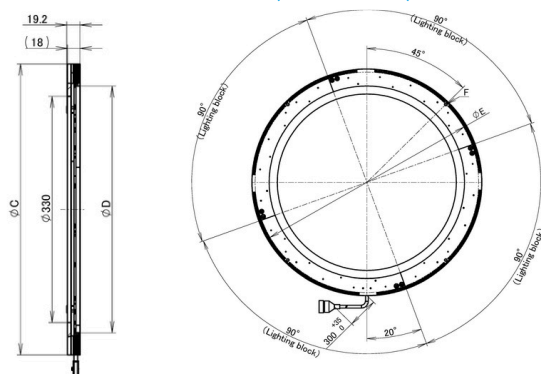
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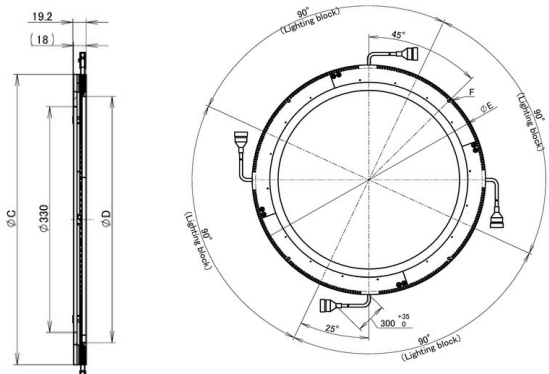
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< HPR2-(75~200FC)-DV4SM8 >



< HPR2-400XX-DV4SM8 >



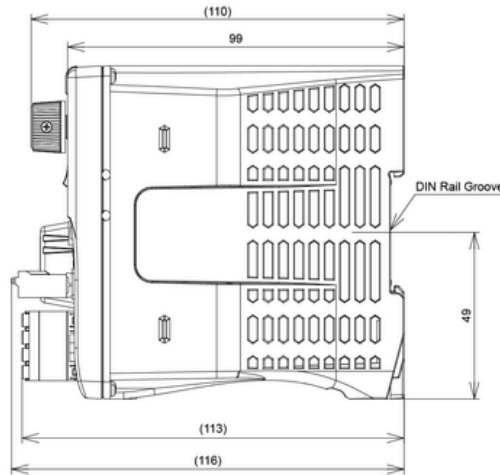
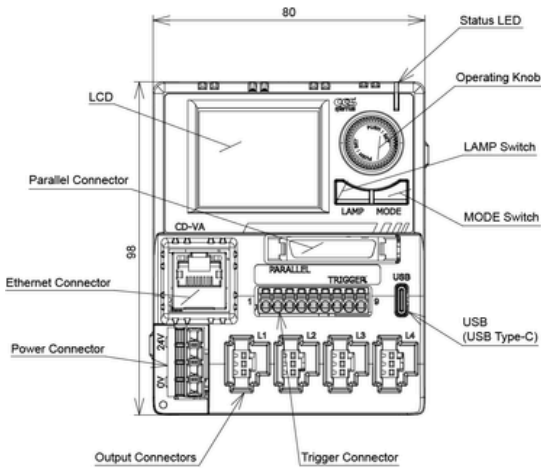

< HPR2-400FC-DV4SM8 >

CD-VA Series


PWM Control	Variable-Voltage Control	Strobe Overdrive
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Model Name	Number of Channels	Ethernet Communication	Output Channels	Communication Method	Voltage Input	Power Output
CD-VA20024-4	4	-	2/4-channel (max. 16 channels*)	Ethernet Parallel USB RS-232C*	24 VDC Input	200W (max. 50 W/channel)
CD-VA20024-4PE	4	○	*With 4 control units connected	*using parallel terminals		

- Controllers with 2 channels also available
- All models have same external dimensions

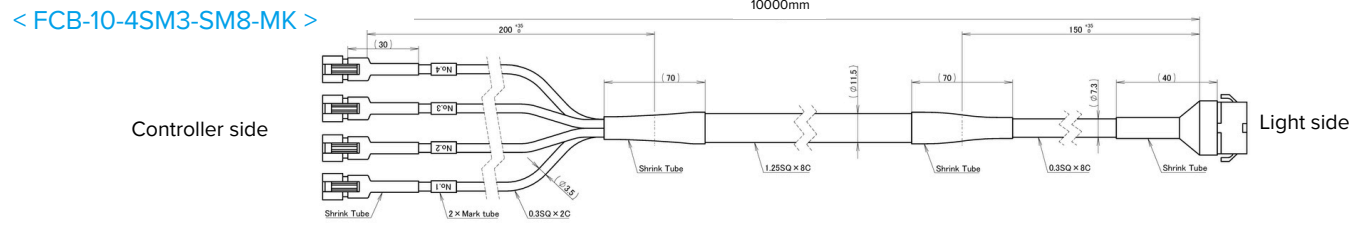
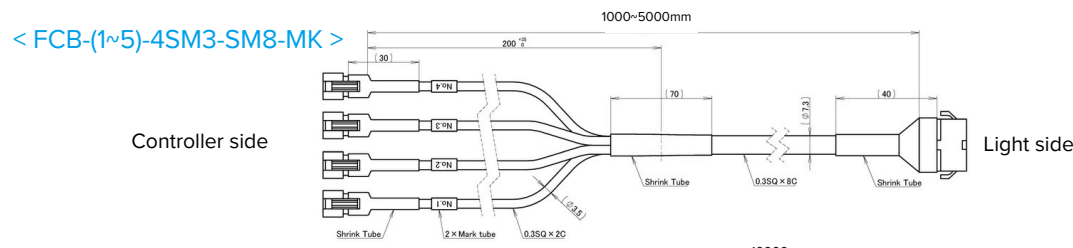



For more details about the CD-VA series, please scan or click the QR code to go to our global website.



Extension Cable

Model Name	Length of Cable (mm)	Input Connector (Light Side)	Output Connector (Controller Side)
FCB-1-4SM3-SM8-MK	1000 (+50/0)	4 x SMR-03V-B (3 pins)	SMP-08V-BC (8 pins)
FCB-2-4SM3-SM8-MK	2000 (+100/0)		
FCB-3-4SM3-SM8-MK	3000 (+150/0)		
FCB-5-4SM3-SM8-MK	5000 (+250/0)		
FCB-10-4SM3-SM8-MK	10000 (+500/0)		



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CCS China Inc. (Shenzhen)
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