

OMRON

Model FH-SM12/SC12

Image Sensor for FH - 12 Megapixel
Digital Camera

INSTRUCTION SHEET

Thank you for selecting OMRON product. This sheet primarily describes precautions required in installing and operating the product.

Before operating the product, read the sheet thoroughly to acquire sufficient knowledge of the product. For your convenience, keep the sheet at your disposal.

TRACEABILITY INFORMATION:
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Manufacturer:
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Kyoto 600-8530 JAPAN

NOTICE:
This product meets CISPR11 class A. The intended use of this product is in an industrial environment only.



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PRECAUTIONS ON SAFETY

● Meaning of Alert Symbols



WARNING

Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death. Additionally there may be significant property damage.

● Alert statements



This product is not designed or rated for ensuring safety of persons. Do not use it for such purposes.

PRECAUTIONS FOR SAFE USE

Be sure to respect following items for safety.

- Tighten all screws securely during installation.
- Do not connect the Sensor to the products other than the dedicated camera cable (FZ-VS□□), controller (FH), lighting controller (FL-TCC1 and FLV-TCC□), extension unit (FZ-VSJ). If the Sensor is connected to non-dedicated products and turned the power on, the devices may be damaged and be heated to a high temperature.
- If you suspect an error or malfunction, stop using the Controller immediately, turn OFF the power supply, and consult your OMRON representative.
- Do not try to disassemble, repair, or modify the product.
- Be sure to dispose of the product as industrial waste.

PRECAUTIONS FOR CORRECT USE

Please observe the following precautions to prevent failure to operate, malfunction, or undesirable effect.

- Installation and storage of the product
 - Do not install in the following locations.
 - Locations where the ambient temperature exceeds the rated temperature range.
 - Locations subject to sudden temperature changes (where condensation will form).
 - Locations subject to relative humidity outside the range of 35 to 85%.

- Locations where there are corrosive or flammable gases.
- Locations where there is dust, salt, or iron powder.
- Locations where the device will be subject to direct vibration or shock.
- Locations where there is strong scattered light.
- Locations exposed to direct sunlight
- Locations where there is splashing of water, oil, or chemicals.
- Locations where there is a strong electrical or magnetic field.
- Locations close to high-voltage devices and/or power devices

2. Cables

- When connecting or disconnecting the camera cable or lighting controller cable, be sure to turn off the controller unit.
- Do not use the camera cable exceeding the specified length.
- When connecting the Sensor and the Controller (FH) with single camera cable, connect the cable to CH1 of the camera connector.
- When connecting the Sensor and the Controller (FH) with two camera cables, the type and length of the camera cable must be matched.
- When connecting the Sensor and the Controller (FH) with two camera cables, check the CH numbers of the Controller side and Camera side before connecting.
- Up to three camera cables can be connected using the extension unit FZ-VSJ. Be sure to use the recommended camera cable with FZ-VSJ.
- When connecting the camera cable, tighten the cable with the fixing screw with the recommended torque (0.15 N·m). Applying excessive force to the camera connector may cause failure of the product.
- Use the ferrite core equivalent to ZCAT2035-0930A (manufactured by TDK) at the controller side of the camera cable.
- The camera cable FZ-VS□□ has polarity. Be sure to connect the side with the name plate on it to the controller. Be sure to connect the side with the name plate on it to the controller.

3. Mounting

- Please tighten up securely by rated torque(M4 : 1.2N·m), when fixing the camera body.
- Please use an exclusive mounting bracket (Model : FH-SM12-XLC (separate sale)), when fixing this product and dedicated lighting controller (Model : FL-TCC1 and FLV-TCC□).
- Please tighten up securely by rated torque(M4 : 1.2N·m / M2 : 0.15N·m), when fixing the camera body, the mounting bracket and dedicated lighting controller.
- Please use M42 mount exclusive lens (Model : 3Z4S-LE VS-L□□□□ /M42-10).

4. Beam

- The beam center may vary for each camera. Be sure to confirm the center position of the image using the monitor before mounting. In the nature of the materials used, the beam center of this product may change for the number of pixels due to changes in ambient temperature.

5. Maintenance

- Avoid using thinner, alcohol, benzene, acetone or kerosene to clean the product.
- If there is large dirt or dust attached to the imaging element, blow them off with blower brush (for camera lens). Do not use your breath to blow the dust off.
- When the lens is not mounted, be sure to attach the M42-mount cap on the lens mount. If dirt or dust is attached to the image elements, false detection or failure may occur.
- Be sure to attach a connector cap on unused connectors at the back of the camera. Removing the connector cap may cause a foreign material entering in the camera, causing false operation or failure.
- Do not connect devices to the extension connector other than the dedicated ones (FL-TCC1 or FLV-TCC□).

6. Imaging element

- In the nature of imaging element, lines may appear in images due to measurement conditions or gain setting value. This does not indicate a malfunction. Although there may be multiple faulty pixels, this does not indicate a malfunction.

■ Ratings / Performance

● General specifications

Item	Model	FH-SC12 FH-SM12
Power consumption		6.2 W max. (13 VDC)
Vibration resistance		10 to 150Hz: half-amplitude: 0.35mm;(maximum acceleration: 50m/s ²), 10 times for 8 minutes each in 3 directions
Shock resistance		Shock resistance 150m/s ² ; 3 times each in 6 directions
Ambient Temperature		Operating: 0 to 40 °C (with no icing nor condensation) Storage: -25 to 65 °C (with no icing nor condensation)
Ambient humidity		Operating and storage: 35% to 85% (with no condensation)
Ambient environment		No corrosive gases
Degree of protection		IEC60529 IP40 (in-panel)
Center positional accuracy of optical axis		X, Y : ±0.31mm θx, θy : ±1.7°
Materials		Case: Aluminum
Weight		Approx. 320g
Accessories		Instruction Sheet (this sheet)
Cable length		High speed mode: 5 m max. Standard mode: Using FZ-VS(L)4: 15 m max. Using a dedicated product other than FZ-VS(L)4: 10 m max.
Dedicated lighting controller		FL-TCC1 FLV-TCC□ (Connection with the lighting, be sure to be 10W, 0.9A or less to the total value of the power consumption of the lighting controller.)

● Performance specifications

Item	Model	FH-SC12	FH-SM12
Picture element		Color CMOS Corresponding to 1.76-inch	Monochrome CMOS Corresponding to 1.76-inch
Effective pixels		4084(H)×3072(V)	
Image size		22.5mm×16.9mm (Diagonal 28.14mm)	
Pixel size		5.5(μm)×5.5(μm)	
Scanning method		Progressive	
Frame rate	High speed mode※1	2CH:38.9fps 1CH:19.5fps	
	Standard mode※1	2CH:19.5fps 1CH:9.8fps	
Synchronization method		Internal	
Video output		Digital 8 bits	
Gain		1 to 5 times	
Shutter speed		60μs to 100,000μs	
Partial scanning		4 line to 3072 line (4 line unit)	
Operation indicator		Power ON : Green lighting / Power OFF : Black out	
Number of camera connections		Max 4 camera per 1 FH controller(Can be connected to up to eight by combining the camera of FH-S □ 12 other than in connection 8CH controller)	
Lens mounting ※2		M42 mount(Recommended lens : 3Z4S-LE VS-L□□□□/M42-10) F mount(F mount adapter : FH-ADF/M42-10)	

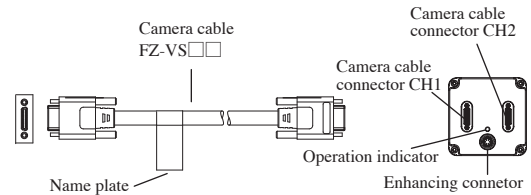
※1 This Sensor has high speed mode and standard mode according to your application. High speed mode can be set in the system settings.

※2 For optical diagrams, refer to FH manual or catalog.

■ Connecting

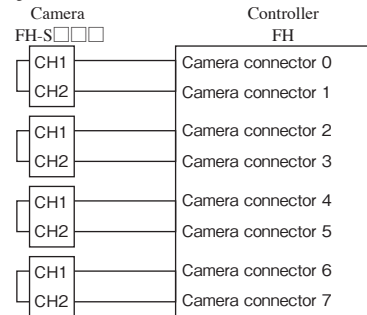
● Camera

Using the Camera cable FZ-VS□□(sold separately), connect the connector on the back of the camera and the camera connector on Controller FH series.



* The camera cable FZ-VS□□ has polarity. Be sure to connect the side with the name plate on it to the controller.

- When connecting the product to the Controller with a single camera cable, connect the cable to CH1 of the camera cable connector.
- When connecting the product to the Controller with two camera cables, connect it as shown below.
(connecting four Cameras)

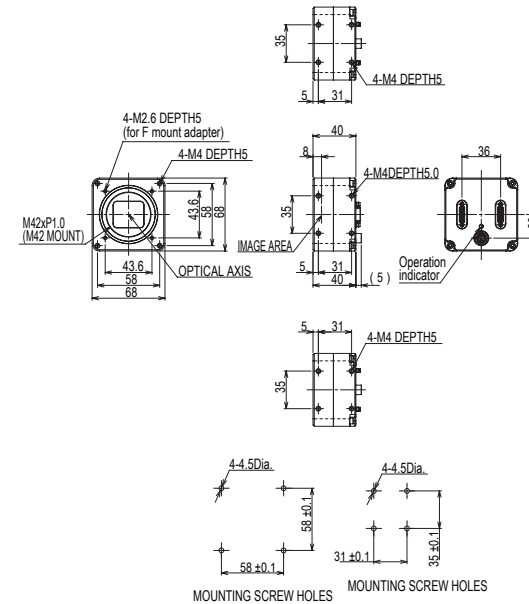


■ Mounting about exclusive mounting bracket (Model : FH-SM12-XLC (separate sale)) There are the following two ways of use.

- Please use this bracket when fixing this product and dedicated lighting controller (Model : FL-TCC1 and FLV-TCC□). Please use M2 screws and tighten up securely by rated torque(M2 : 0.15N·m), when fixing this product and dedicated lighting controller.
- Please use this bracket when fixing this product and the camera with 1/4-20UNC.

This bracket can be attached to all four sides of the direction of the camera. Please use M4 screws and tighten up securely by rated torque(M4 : 1.2N·m) ※ The camera body is recommending installation by a screw hole of the body. It's isn't necessary to use FH-SM12-XLC.

■ Dimensions (Unit:mm)



FH-S□12 camera body is recommending installation by a screw hole of the body. 5 mounting surface of the bottom front, top, and both sides are possible. (Rated torque M4 : 1.2N·m / M2.6 : 0.3N·m)

Suitability for Use

Omron Companies shall not be responsible for conformity with any standards, codes or regulations which apply to the combination of the Product in the Buyer's application or use of the Product. At Buyer's request, Omron will provide applicable third party certification documents identifying ratings and limitations of use which apply to the Product. This information by itself is not sufficient for a complete determination of the suitability of the Product in combination with the end product, machine, system, or other application or use. Buyer shall be solely responsible for determining appropriateness of the particular Product with respect to Buyer's application, product or system. Buyer shall take application responsibility in all cases.

NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCT(S) IS PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM. See also Product catalog for Warranty and Limitation of Liability.

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