

OMRON

Model FH-SM06R/SC06R

Image Sensor for FH - 6 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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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



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), Camera-mount Lighting controller (FL-TCC□□□□ and FLV-TCC□□), Lighting unit (FL-MD□□MC), 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. Do not put an impossible stress on the camera cable when you set it up. The cable is disconnected, and it becomes impossible might do a normal measurement.
- 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.
- Do not put an impossible stress on the camera cable when you set it up. The cable is disconnected, and it becomes impossible might do a normal measurement.

PRECAUTIONS FOR CORRECT USE

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

1. 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 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 Camera-mount Lighting controller cable, be sure to turn off the controller unit.
 - Do not use the camera cable exceeding the specified length.
 - 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 (except for FH-L series).
 - The camera cable FZ-VS□□ has polarity. Be sure to connect the side with the name plate on it to the controller.

3. Mounting

The camera case is connected to the 0 V line of the internal circuit. Observe the following precautions to prevent noise from entering the camera.

- Do not ground the camera unit.
- Be sure to use a base for installation. When mounting a base, engage it with the screw (M4) with the recommended torque (1.2 N·m).

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

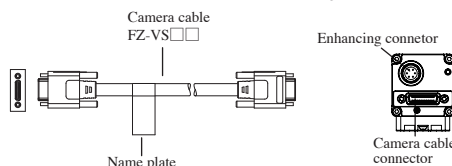
- Avoid using thinner, alcohol, benzene, acetone or kerosene to clean the product.
- If there is large dirt or dust attached to the imaging element, blow them off with blower brush (for camera lens). Do not use your breath to blow the dust off.
- When the lens is not mounted, be sure to attach the C-mount 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-TCC□□□□, FLV-TCC□□ or FL-MD□□MC).

6. Imaging element

In the nature of imaging element, lines may appear in images due to measurement conditions or sensitivities. This does not indicated a malfunction. Although there may be multiple faulty pixels, this does not indicate a malfunction. Please check the actual image before use.

Connecting

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.

■ Ratings / Performance

● General specifications

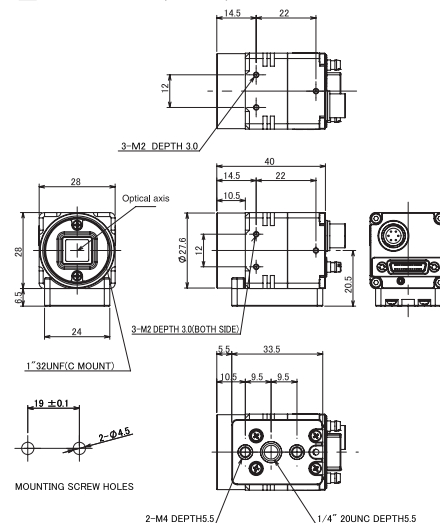
Model	Item
FH-SM06R	FH-SC06R
Power consumption	1.5 W max. (13 VDC)
Vibration resistance	10 to 150Hz: half-amplitude: 0.35mm;(maximum acceleration: 50m/s²) 10 times for 8 minutes each in 3 directions
Shock resistance	Shock resistance 150m/s² ; 3 times each in 6 directions
Ambient Temperature	Operating: 0 to 40 °C (with no icing nor condensation) Storage: -20 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 : ±0.3mm Δx, Δy : ±1.5°
Materials	Case: Aluminum Camera base: PC/ABS Mount screw: brass
Weight	Approx. 48 g (including base)
Accessories	Instruction Sheet (this sheet) General Compliance Information and Instructions for EU
Cable length	High-speed mode: 5 m max. Standard mode: When using FZ-VS4/VSL4: 15 m max. When using a dedicated product other than FZ-VS4/VSL4: 10 m max.

● Performance specifications

Item	Model	FH-SM06R	FH-SC06R
Picture element		1/1.8-inch monochrome CMOS	1/1.8-inch color CMOS
Effective pixels		3072(H) × 2048(V)	
Pixel size		2.4(μm) × 2.4(μm)	
Shutter		Rolling shutter	
Frame rate (Capture time *1)	High-speed mode *2	Rolling shutter mode: 27.4 fps (29.3 ms) *3,4 Global reset mode: 34.1 fps (29.3 ms) *3	
	Standard mode *2	Rolling shutter mode: 16.8 fps (52.9 ms) *3,4 Global reset mode: 18.9 fps (52.9 ms) *3	
Number of lines to be read *5, 6		2 lines to 2048 lines (in steps of 2 lines)	
Exposure time		200μs ~ 100,000μs	
Video output		Digital (8 bits)	
Gain		0 to +42.0 dB	
Lens mounting *7		C mount (Recommended: 3Z4S-LE SV-H series)	
Supported controller *8		FH-L series FH series (Software Ver. 6.70 or later)	

- *1 The image conversion processing time of the sensor controller is not included in the capture time.
- *2 This product has high-speed mode and standard mode. You can select the that best suits your application. To use high-speed mode, set the camera to high-speed mode from the system settings.
- *3 This product has rolling shutter mode and global reset mode. Select the mode that best suits your application. Set the mode according to your application from the reset mode setting on the screen setting of the processing item "Camera Image Input FH".
- *4 In rolling shutter mode, the frame rate is lower than in global reset mode because of the trigger inhibition period after image capture. The capture time (time from trigger input to image capture) is the same regardless of the reset mode.
- *5 The number of capture lines is fixed at 2048 lines for software version 6.70. For software version 6.73 or later, it can be configured "Number of lines to be read" on the setting screen of the processing item "Camera Image Input FH".
- *6 The frame rate remains fixed regardless of the setting for the number of capture lines.
- *7 For optical diagrams, refer to FH manual or catalog.
- *8 For the controller models supported by Ver. 6.70, refer to "Vision System FH Series Hardware Setup Manual (Z366)". For details, contact our sales department.

■ Dimensions (Unit:mm)



* The base at the bottom of the camera can be mounted to the bottom, top, and both sides. Remove the base mounting screw (M2x7) and correct the mounting position. (Recommended mounting screw torque: 0.23 N·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.

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