

OMRON

Model FHV7□-M□□□□□-C

Model FHV7□-C□□□□□-C

Smart 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.

TRACABILITY INFORMATION: Manufacturer: OMRON Corporation, Shiohji Horikawa, Shimogyo-ku, Kyoto. 600-8530 JAPAN

The following notice applies only to products that carry the CE mark:



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Safety Precautions

Meaning of signal words

- 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.
CAUTION: Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury, or may result in serious injury or death.

Meanings of Alert Symbols

- General Prohibition: No open flames, no smoking.
General Caution: Sharp edges, hot surfaces, etc.
Electrical Hazard: Danger of electric shock.
LED light: Harm from LED light.
High Temperature Caution: Danger of burns.

Alert statements in this Manual

- WARNING: This product must be used according to the instruction manual.
NEVER connect the AC power supply with this product.
Do not touch the terminals while the power supply is ON.
Please take external safety measures so that the system as a whole should be on the safe side.

CAUTION

- Minor burn may occur. Do not touch the case as it is very hot while the product is operating.
Tighten the screws securely when attaching the lighting module, lens module, or cover.

PRECAUTIONS FOR SAFE USE

Please observe the following precautions for safe use of the products.

- 1. Installation Environment: Do not use the product in areas where flammable or explosive gases are present.
2. Power Supply and Wiring: Make sure to use the product with the power supply voltage specified.
3. Camera installation: Do not connect the power supply with polarity reversed.
4. Others: For better heat radiation, use the separately sold fitting (FHV-XMT-7).

- 3. Mounting: When doing the following, be sure to turn OFF the power of the smart camera main unit.
- Cable connection and wiring
- Connector mounting/removal
- Lighting module mounting/removal
- Lens module mounting/removal

- 4. Others: Use only the dedicated cable (FHV-VN□/FHV-VD□/FHV-VU□), lighting controller (FL-TCC□/FLV-TCC□), lighting module (FHV-LTM-□), lens module (FHV-LEM-□), and external lighting (FL-MD□MC).
- To connect a lighting controller FL-TCC□PS or an external lighting FL-MD□MC to the smart camera, always attach the junction cable (FHV-VFXL-GD) in between.
- Do not use any damaged water-proof packings or light shielding sheet.

PRECAUTIONS FOR CORRECT USE

In order to prevent the product from becoming inoperable or malfunction, and to prevent other adverse effects to the performance or equipment, please observe the following.

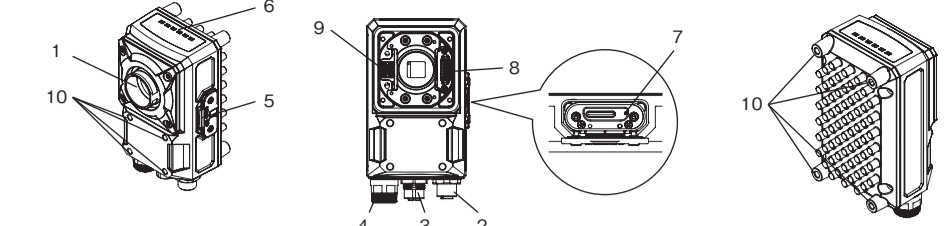
- 1. An installation location that meets the following conditions.
- A location where the ambient temperature does not exceed the rated range (operating: 0 to 40°C, storage: -25 to 65°C).
- A location where the temperature does not vary sharply.
- A location where relative temperature does not exceed a range of -35~85%RH.

- 3. Maintenance: Turn OFF the power and confirm safety before starting maintenance.
- Remove dirt on the lens using the special cloth for lens or an air brush.
- Do not use thinner, alcohol, benzene, acetone, or kerosene to clean his product.

- 4. Optical axis: The optical axis may vary product by product. When mounting this module, be sure to confirm the center position of the video on the monitor.
5. Image sensor: For this product, a line may appear depending on the measurement condition or sensitivity because of the specification of the image sensor.

- 6. Communication with upper equipment: Implement communication with upper equipment after confirming that this product has been started up.
7. Failsafe measures: If operating a stage or robot using the measurement result of the smart camera (axis moving distance output by the calibration or alignment measurement), take measures as follows: Be sure to operate the stage or robot after confirming the measurement result data on the stage or robot side that the data are within the movable range of the stage or robot.

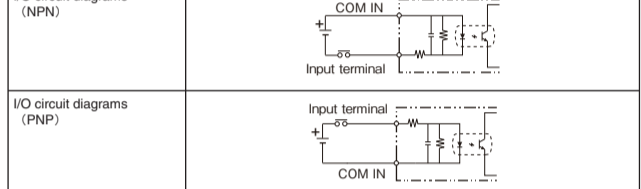
Part Names and Functions



No.	Name	Function
1	Imaging unit	Captures images.
2	I/O cable/SDU cable connector	Use this connector when connecting the smart camera with a power supply or an external device using an I/O cable.
3	Ethernet cable connector	Use this connector when connecting the smart camera with a personal computer and so on using an Ethernet cable.
4	External lighting connector	Use this connector when connecting an external lighting and the external lighting controller.
5	Connector to attach micro SD card	Use this connector to attach a micro SD card. Do not extract/insert the SD card during processing.
6	Operation indicator	lights while power is supplied. RUN (Green) lights when switching to the layout in which the RUN signal output is set ON. LINK (Yellow) lights when connected with Ethernet equipment and blinks during communication. BUSY (Green) lights while processing is in progress. OR (Yellow) lights when the overall judgment output signal is ON. ERR (Red) lights when an error occurs. SD ACCESS (Yellow) lights when accessing to micro SD card.
7		
8	Connector for lighting module (white)	Use this connector when mounting the lighting module.
9	Connector for lens module (Black)	Use this connector when mounting the lens module.
10	Mounting screw holes	Use them to screw up the smart camera. Recommended tightening torque : 2.3N·m

Input circuit

Item	Specifications	
Applicable signal	DIO/DI1/DI2	STEP
Input voltage	24 VDC±10%	24 VDC±10%
ON voltage *1	8.8V min.	8.8V min.
ON current *1	5 mA min.	5 mA min.
OFF voltage *2	1.1 V max.	0.8 V max.
OFF current *2	0.5 mA max.	0.5 mA max.
ON delay	5 ms max.	0.1 ms max.
OFF delay	0.7 ms max.	0.1 ms max.



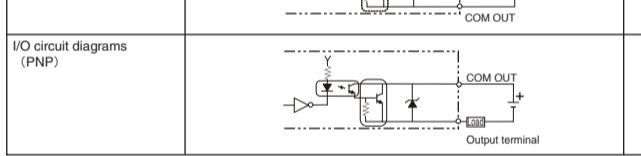
- *1 ON voltage/ON current: A voltage value or current value that turn the input from OFF to ON.
*2 OFF voltage/OFF current: A voltage value or current value that turn the input from ON to OFF.

Impotent Chattering countermeasure

The smart camera has a chattering prevention function but incorrect input due to chattering cannot be prevented when chattering of 100 μs or longer occurs.

Output circuit

Item	Specifications	
Applicable signal	READY/BUSY/OR/ERROR *1	STGOUT/SHTOUT *2
Output voltage	24 VDC±10%	24 VDC±10%
Load current *3	45 mA max.	45 mA max.
ON residual voltage	2 V max.	2 V max.
OFF leakage current	0.2 mA max.	0.2 mA max.



- *1 When using the READY/BUSY/OR/ERROR signal, connect the COMOUT terminal.
*2 When using the STGOUT/SHTOUT signal, connect the COMOUT and COMIN terminals.
*3 Use load current of the specified amperage or lower.

How to Mount Water-proof Hood

- 1. Remove the C mount cover.
2. Fit the packing and mount the hood base with the packing screws.
3. Mount the C mount lens, focus on an image and secure it.
4. Mount the water-proof hood.

Package Contents

- The following is packaged together with this product. Please confirm these items.
Smart camera only: Smart camera main unit x 1, Connector cap for Ethernet cable, Connector cap for external lighting, C-mount cap, C-mount cover, Instruction Sheet, Information about SYSMAC Member Registration, Compliance Information.
Smart camera with integrated lens module: Smart camera main unit x 1, Connector cap for Ethernet cable, Connector cap for external lighting, Cover for FHV-LEM-□, Instruction Sheet, Information about SYSMAC Member Registration, Compliance Information.

- Smart camera with integrated lens and lighting module: Smart camera main unit x 1, Connector cap for Ethernet cable, Connector cap for external lighting, Instruction Sheet, Information about SYSMAC Member Registration, Compliance Information.

Relevant Manuals

No.	Model	Manual name
Z408	FHV7□-□□□□	Setup Manual

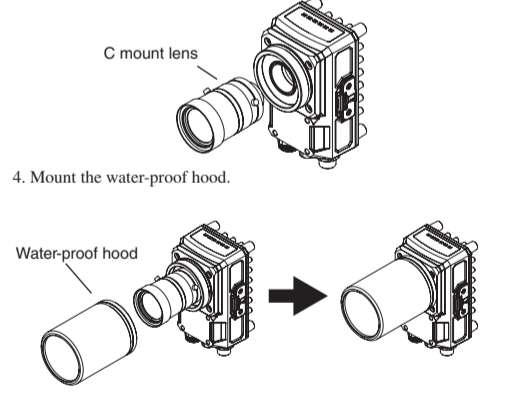
Regulation of KC marking: 이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.
Dispose of in accordance with WEEE Directive

I/O Cable (FHV-VD) Wiring colors

Signal name	Color	Stripe
DC24V	Blown (Thick wire)	N/A
0V	Blue (Thick wire)	N/A
COMIN	White	Black
COMOUT	Pink	Black
DI0	Gray	N/A
DI1	Green	N/A
DI2 *	Red	N/A
STEP	Pink	N/A
STGOUT/SHTOUT	Black	N/A
READY	Purple	N/A
BUSY	Yellow	N/A
OR	White	N/A
ERROR	Orange	N/A
RS-232C IN	Purple	Black
RS-232C OUT	Green	Black
RS-232C 0V	Light Blue	Black
NC	Yellow	Black
FG	Black (Thick wire)	N/A

* DI7 (execution) in operation.

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.
NEVER USE THE PRODUCT FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN PROPERLY DESIGNED 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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