

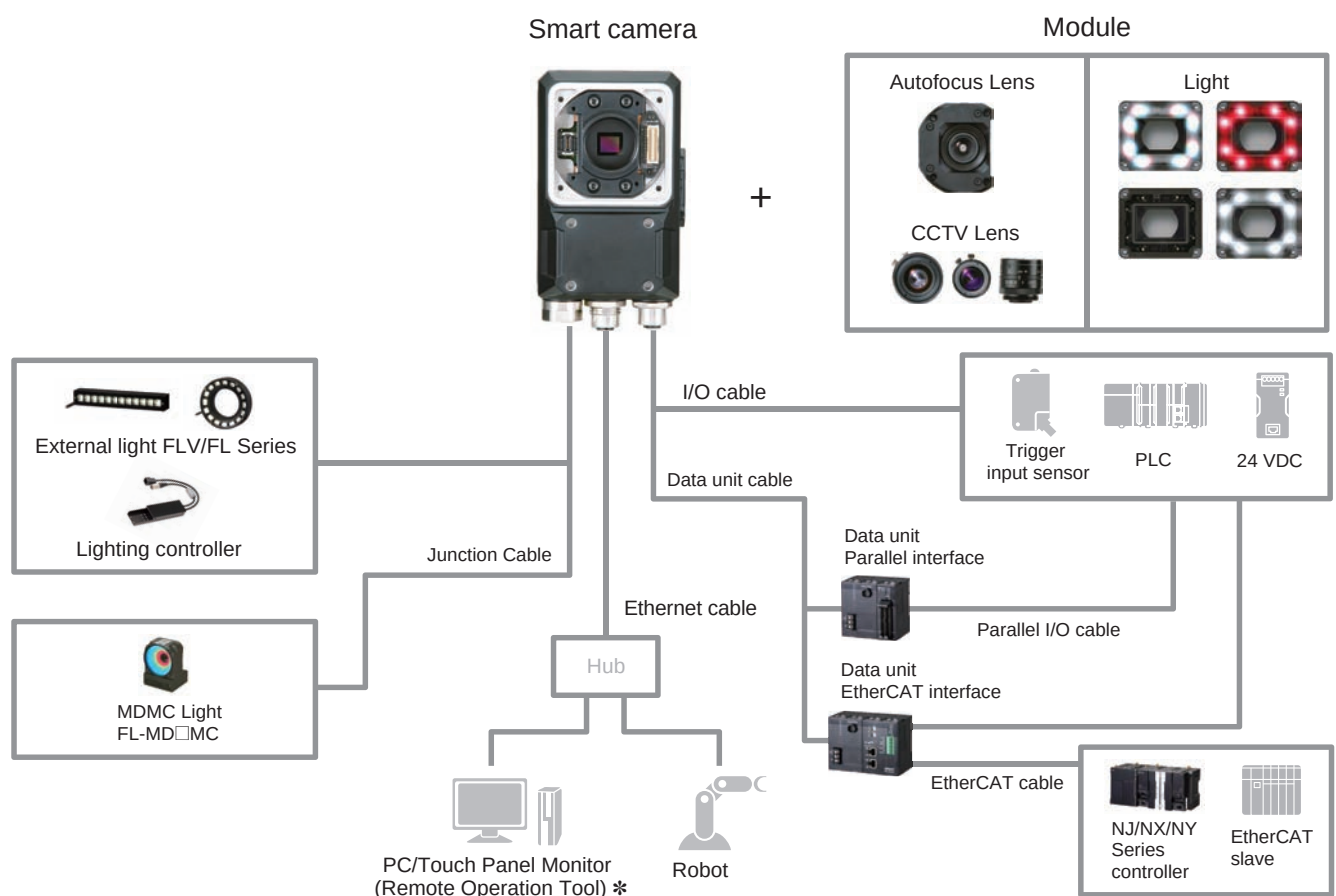
Smart Camera FHV7 Series

Ultimate flexibility to fit ever-changing production scene

- Modular structure for a wide range of applications
- Responding to changes of objects like human eyes
- Raising quality standard without sacrificing cycle time



System Configuration



* After purchasing the product, you can register as a member to download this for free. For details, see the member registration sheet included with the FHV7 Smart Camera.

Model Selection

To select a model of Smart Camera, use the WEB Selector.

http://www.ia.omron.com/fhv_select_e

Note: With certain module types, the operation of some combinations cannot be guaranteed. Use the Web Selector to select the correct combination of image sensor, lens, resolution, and light.



FHV7 Series

Model Number Structure

FHV7 Series Model Number Legend

Use this legend when determining the product specifications from the model number. When ordering, use a model number from the table in *Ordering Information*.

FHV7X-1234567

No.	Classification	Code	Meaning
1	Controller specification	X	64-bit OS model
2	Image sensors	M	Monochrome
		C	Color
3	Resolution	004	0.4 million pixels
		016	1.6 million pixels
		032	3.2 million pixels
		050	5 million pixels
		063	6.3 million pixels
		120	12 million pixels
4	Shutter type	-	Global shutter
		R	Rolling shutter
5	Lens	C	C mount
		H	High-speed lens module (autofocus)
		S	Standard lens module (autofocus)

No.	Classification	Code	Meaning
6	Focal length	06	6 mm
		09	9 mm
		12	12 mm
		16	16 mm
		19	19 mm
		25	25 mm
7	Light color	R	Red
		W	White
		IR	IR
		MC	Multi color

Configuration

For the Smart Camera FHV7 series, there are five configurations below by module combinations.

Smart camera		Lens	Internal lighting	Protective structure	Integrated model	Appearance	Configuration
0.4 million pixels 1.6 million pixels 3.2 million pixels 5 million pixels 6.3 million pixels 12 million pixels	FHV7X-□004-□ FHV7X-□016-□ FHV7X-□032-□ FHV7X-□050-□ FHV7X-□063R-□ FHV7X-□120R-□	C mount lens 3Z4SLE SV-□□□□V 3Z4SLE SV-□□□□H	N/A	IP40	FHV7X-□□□□□-C		C mount lens/IP40
				IP67 Waterproof Hoods required FHV-XHD-S FHV-XHD-L	N/A		C mount lens/IP67
0.4 million pixels 1.6 million pixels 3.2 million pixels 6.3 million pixels	FHV7X-□004-□ FHV7X-□016-□ FHV7X-□032-□ FHV7X-□063R-□	FHV lens module FHV-LEM-H□□ FHV-LEM-S□□	N/A	IP40	FHV7X-□□□□□-H□□ FHV7X-□□□□□-S□□		Lens module/IP40
				IP67 Waterproof Hoods required FHV-XHD-LEM	N/A		Lens module/IP67
			FHV-LTM-□□	IP67	FHV7X-□□□□□-H□□-□□ FHV7X-□□□□□-S□□-□□		Lens module /Internal lighting - IP67

Ordering Information

Smart Cameras

C Mount Models

Item	Resolution	Model	
		Color	Monochrome
	0.4 million pixels	FHV7X-C004-C	FHV7X-M004-C
	1.6 million pixels	FHV7X-C016-C	FHV7X-M016-C
	3.2 million pixels	FHV7X-C032-C	FHV7X-M032-C
	5 million pixels	FHV7X-C050-C	FHV7X-M050-C
	6.3 million pixels	FHV7X-C063R-C	FHV7X-M063R-C
	12 million pixels	FHV7X-C120R-C	FHV7X-M120R-C

Lens Modules

Item		Focal length	Model
	High-speed lens module (Autofocus)	6 mm	FHV-LEM-H06
		19 mm	FHV-LEM-H19
	Standard lens module (Autofocus)	6 mm	FHV-LEM-S06
		9 mm	FHV-LEM-S09
		12 mm	FHV-LEM-S12
		16 mm	FHV-LEM-S16
		25 mm	FHV-LEM-S25

* For the focal length and horizontal field of view, refer to specifications (P.33) and optical charts of the lens module (P.50).

Note: Refer to the *Vision Accessory Catalog* (Cat No. Q198) for details on C-mount lenses.

Lighting Modules

Item	Light color	Model
	Multi color	FHV-LTM-MC
	Red	FHV-LTM-R
	White	FHV-LTM-W
	IR	FHV-LTM-IR

FHV7 Series

All-in-one Models with Lens Module

Item	Resolution	Lens	Focal length	Model	
				Color	Monochrome
	0.4 million pixels	High-speed lens module (autofocus)	6 mm	FHV7X-C004-H06	FHV7X-M004-H06
			19 mm	FHV7X-C004-H19	FHV7X-M004-H19
		Standard lens module (autofocus)	6 mm	FHV7X-C004-S06	FHV7X-M004-S06
			9 mm	FHV7X-C004-S09	FHV7X-M004-S09
			12 mm	FHV7X-C004-S12	FHV7X-M004-S12
			16 mm	FHV7X-C004-S16	FHV7X-M004-S16
			25 mm	FHV7X-C004-S25	FHV7X-M004-S25
	1.6 million pixels	High-speed lens module (autofocus)	6 mm	FHV7X-C016-H06	FHV7X-M016-H06
			19 mm	FHV7X-C016-H19	FHV7X-M016-H19
		Standard lens module (autofocus)	6 mm	FHV7X-C016-S06	FHV7X-M016-S06
			9 mm	FHV7X-C016-S09	FHV7X-M016-S09
			12 mm	FHV7X-C016-S12	FHV7X-M016-S12
			16 mm	FHV7X-C016-S16	FHV7X-M016-S16
			25 mm	FHV7X-C016-S25	FHV7X-M016-S25
	3.2 million pixels	High-speed lens module (autofocus)	6 mm	FHV7X-C032-H06	FHV7X-M032-H06
			19 mm	FHV7X-C032-H19	FHV7X-M032-H19
		Standard lens module (autofocus)	6 mm	FHV7X-C032-S06	FHV7X-M032-S06
			9 mm	FHV7X-C032-S09	FHV7X-M032-S09
			12 mm	FHV7X-C032-S12	FHV7X-M032-S12
			16 mm	FHV7X-C032-S16	FHV7X-M032-S16
			25 mm	FHV7X-C032-S25	FHV7X-M032-S25
	6.3 million pixels	High-speed lens module (autofocus)	6 mm	FHV7X-C063R-H06	FHV7X-M063R-H06
			19 mm	FHV7X-C063R-H19	FHV7X-M063R-H19
		Standard lens module (autofocus)	6 mm	FHV7X-C063R-S06	FHV7X-M063R-S06
			9 mm	FHV7X-C063R-S09	FHV7X-M063R-S09
			12 mm	FHV7X-C063R-S12	FHV7X-M063R-S12
			16 mm	FHV7X-C063R-S16	FHV7X-M063R-S16
			25 mm	FHV7X-C063R-S25	FHV7X-M063R-S25

* For the focal length and horizontal field of view, refer to specifications (P.33) and optical charts of the lens module (P.50).

All-in-one Models with Lens and Lighting Modules

Item	Resolution	Lens	Focal length	Light color	Model	
					Color	Monochrome
	0.4 million pixels	High-speed lens module (autofocus)	6 mm	Multi color	FHV7X-C004-H06-MC	FHV7X-M004-H06-MC
				Red	---	FHV7X-M004-H06-R
				White	FHV7X-C004-H06-W	FHV7X-M004-H06-W
				IR	---	FHV7X-M004-H06-IR
			19 mm	Multi color	FHV7X-C004-H19-MC	FHV7X-M004-H19-MC
				Red	---	FHV7X-M004-H19-R
				White	FHV7X-C004-H19-W	FHV7X-M004-H19-W
				IR	---	FHV7X-M004-H19-IR
		Standard lens module (autofocus)	6 mm	Multi color	FHV7X-C004-S06-MC	FHV7X-M004-S06-MC
				Red	---	FHV7X-M004-S06-R
				White	FHV7X-C004-S06-W	FHV7X-M004-S06-W
				IR	---	FHV7X-M004-S06-IR
			9 mm	Multi color	FHV7X-C004-S09-MC	FHV7X-M004-S09-MC
				Red	---	FHV7X-M004-S09-R
				White	FHV7X-C004-S09-W	FHV7X-M004-S09-W
				IR	---	FHV7X-M004-S09-IR
			12 mm	Multi color	FHV7X-C004-S12-MC	FHV7X-M004-S12-MC
				Red	---	FHV7X-M004-S12-R
				White	FHV7X-C004-S12-W	FHV7X-M004-S12-W
				IR	---	FHV7X-M004-S12-IR
			16 mm	Multi color	FHV7X-C004-S16-MC	FHV7X-M004-S16-MC
				Red	---	FHV7X-M004-S16-R
				White	FHV7X-C004-S16-W	FHV7X-M004-S16-W
				IR	---	FHV7X-M004-S16-IR
			25 mm	Multi color	FHV7X-C004-S25-MC	FHV7X-M004-S25-MC
				Red	---	FHV7X-M004-S25-R
				White	FHV7X-C004-S25-W	FHV7X-M004-S25-W
				IR	---	FHV7X-M004-S25-IR
	1.6 million pixels	High-speed lens module (autofocus)	6 mm	Multi color	FHV7X-C016-H06-MC	FHV7X-M016-H06-MC
				Red	---	FHV7X-M016-H06-R
				White	FHV7X-C016-H06-W	FHV7X-M016-H06-W
				IR	---	FHV7X-M016-H06-IR
			19 mm	Multi color	FHV7X-C016-H19-MC	FHV7X-M016-H19-MC
				Red	---	FHV7X-M016-H19-R
				White	FHV7X-C016-H19-W	FHV7X-M016-H19-W
				IR	---	FHV7X-M016-H19-IR
		Standard lens module (autofocus)	6 mm	Multi color	FHV7X-C016-S06-MC	FHV7X-M016-S06-MC
				Red	---	FHV7X-M016-S06-R
				White	FHV7X-C016-S06-W	FHV7X-M016-S06-W
				IR	---	FHV7X-M016-S06-IR
			9 mm	Multi color	FHV7X-C016-S09-MC	FHV7X-M016-S09-MC
				Red	---	FHV7X-M016-S09-R
				White	FHV7X-C016-S09-W	FHV7X-M016-S09-W
				IR	---	FHV7X-M016-S09-IR
			12 mm	Multi color	FHV7X-C016-S12-MC	FHV7X-M016-S12-MC
				Red	---	FHV7X-M016-S12-R
				White	FHV7X-C016-S12-W	FHV7X-M016-S12-W
				IR	---	FHV7X-M016-S12-IR
			16 mm	Multi color	FHV7X-C016-S16-MC	FHV7X-M016-S16-MC
				Red	---	FHV7X-M016-S16-R
				White	FHV7X-C016-S16-W	FHV7X-M016-S16-W
				IR	---	FHV7X-M016-S16-IR
			25 mm	Multi color	FHV7X-C016-S25-MC	FHV7X-M016-S25-MC
				Red	---	FHV7X-M016-S25-R
				White	FHV7X-C016-S25-W	FHV7X-M016-S25-W
				IR	---	FHV7X-M016-S25-IR

FHV7 Series

Item	Resolution	Lens	Focal length	Light color	Model	
					Color	Monochrome
	3.2 million pixels	High-speed lens module (autofocus)	6 mm	Multi color	FHV7X-C032-H06-MC	FHV7X-M032-H06-MC
				Red	---	FHV7X-M032-H06-R
				White	FHV7X-C032-H06-W	FHV7X-M032-H06-W
				IR	---	FHV7X-M032-H06-IR
			19 mm	Multi color	FHV7X-C032-H19-MC	FHV7X-M032-H19-MC
				Red	---	FHV7X-M032-H19-R
				White	FHV7X-C032-H19-W	FHV7X-M032-H19-W
				IR	---	FHV7X-M032-H19-IR
		Standard lens module (autofocus)	6 mm	Multi color	FHV7X-C032-S06-MC	FHV7X-M032-S06-MC
				Red	---	FHV7X-M032-S06-R
				White	FHV7X-C032-S06-W	FHV7X-M032-S06-W
				IR	---	FHV7X-M032-S06-IR
			9 mm	Multi color	FHV7X-C032-S09-MC	FHV7X-M032-S09-MC
				Red	---	FHV7X-M032-S09-R
				White	FHV7X-C032-S09-W	FHV7X-M032-S09-W
				IR	---	FHV7X-M032-S09-IR
			12 mm	Multi color	FHV7X-C032-S12-MC	FHV7X-M032-S12-MC
				Red	---	FHV7X-M032-S12-R
				White	FHV7X-C032-S12-W	FHV7X-M032-S12-W
				IR	---	FHV7X-M032-S12-IR
			16 mm	Multi color	FHV7X-C032-S16-MC	FHV7X-M032-S16-MC
				Red	---	FHV7X-M032-S16-R
				White	FHV7X-C032-S16-W	FHV7X-M032-S16-W
				IR	---	FHV7X-M032-S16-IR
			25 mm	Multi color	FHV7X-C032-S25-MC	FHV7X-M032-S25-MC
				Red	---	FHV7X-M032-S25-R
				White	FHV7X-C032-S25-W	FHV7X-M032-S25-W
				IR	---	FHV7X-M032-S25-IR
	6.3 million pixels	High-speed lens module (autofocus)	6 mm	Multi color	FHV7X-C063R-H06-MC	FHV7X-M063R-H06-MC
				Red	---	FHV7X-M063R-H06-R
				White	FHV7X-C063R-H06-W	FHV7X-M063R-H06-W
				IR	---	FHV7X-M063R-H06-IR
			19 mm	Multi color	FHV7X-C063R-H19-MC	FHV7X-M063R-H19-MC
				Red	---	FHV7X-M063R-H19-R
				White	FHV7X-C063R-H19-W	FHV7X-M063R-H19-W
				IR	---	FHV7X-M063R-H19-IR
		Standard lens module (autofocus)	6 mm	Multi color	FHV7X-C063R-S06-MC	FHV7X-M063R-S06-MC
				Red	---	FHV7X-M063R-S06-R
				White	FHV7X-C063R-S06-W	FHV7X-M063R-S06-W
				IR	---	FHV7X-M063R-S06-IR
			9 mm	Multi color	FHV7X-C063R-S09-MC	FHV7X-M063R-S09-MC
				Red	---	FHV7X-M063R-S09-R
				White	FHV7X-C063R-S09-W	FHV7X-M063R-S09-W
				IR	---	FHV7X-M063R-S09-IR
			12 mm	Multi color	FHV7X-C063R-S12-MC	FHV7X-M063R-S12-MC
				Red	---	FHV7X-M063R-S12-R
				White	FHV7X-C063R-S12-W	FHV7X-M063R-S12-W
				IR	---	FHV7X-M063R-S12-IR
			16 mm	Multi color	FHV7X-C063R-S16-MC	FHV7X-M063R-S16-MC
				Red	---	FHV7X-M063R-S16-R
				White	FHV7X-C063R-S16-W	FHV7X-M063R-S16-W
				IR	---	FHV7X-M063R-S16-IR
			25 mm	Multi color	FHV7X-C063R-S25-MC	FHV7X-M063R-S25-MC
				Red	---	FHV7X-M063R-S25-R
				White	FHV7X-C063R-S25-W	FHV7X-M063R-S25-W
				IR	---	FHV7X-M063R-S25-IR

* For the focal length and horizontal field of view, refer to specifications (P.33) and optical charts of the lens module (P.50)

Optical Filters

Item			Model
	Polarization Filter	For visible light	FHV-XPL
	Polarization Filter	For both infrared light and visible light	FHV-XPL-IR
	Diffusion Filter		FHV-XDF

Waterproof Hoods

Required to ensure IP67 protection without using a lighting module.

Item		Model
	Waterproof Hood for Lens Modules	FHV-XHD-LEM
	Waterproof Hood for C-mount Lens (Short) *1	FHV-XHD-S
	Waterproof Hood for C-mount Lens (Long) *2	FHV-XHD-L

*1. Can be used with the following lenses.

3Z4S-LE SV-0614V, 3Z4S-LE SV-0813V, 3Z4S-LE SV-1214V, 3Z4S-LE SV-1614V, 3Z4S-LE SV-2514V

*2. Can be used with the following lenses.

3Z4S-LE SV-0614H, 3Z4S-LE SV-0814H, 3Z4S-LE SV-1214H, 3Z4S-LE SV-1614H,
3Z4S-LE SV-2514H, 3Z4S-LE SV-3514H, 3Z4S-LE SV-5014H

FHV7 Series

Cables

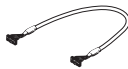
Item		Cable length	Model
	I/O Cable (Bend Resistant) *1	2m	FHV-VDB2 2M
		3m	FHV-VDB2 3M
		5m	FHV-VDB2 5M
		10m	FHV-VDB2 10M
		20m	FHV-VDB2 20M
	I/O Cable (Bend Resistant, Right-angle) *1	2m	FHV-VDLB2 2M
		3m	FHV-VDLB2 3M
		5m	FHV-VDLB2 5M
		10m	FHV-VDLB2 10M
		20m	FHV-VDLB2 20M
	I/O Cable (Super Bend Resistant) *1	5m	FHV-VDBX2 5M
		10m	FHV-VDBX2 10M
	I/O Cable (Super Bend Resistant, Right-angle) *1	5m	FHV-VDLBX2 5M
		10m	FHV-VDLBX2 10M
	Ethernet Cable (Bend Resistant)	2m	FHV-VNB2 2M
		3m	FHV-VNB2 3M
		5m	FHV-VNB2 5M
		10m	FHV-VNB2 10M
		20m	FHV-VNB2 20M
	Ethernet Cable (Bend Resistant, Right-angle)	2m	FHV-VNLB2 2M
		3m	FHV-VNLB2 3M
		5m	FHV-VNLB2 5M
		10m	FHV-VNLB2 10M
		20m	FHV-VNLB2 20M
	Ethernet Cable (Super Bend resistant)	5m	FHV-VNBX2 5M
		10m	FHV-VNBX2 10M
	Ethernet Cable (Super Bend resistant, Right-angle)	5m	FHV-VNLBX2 5M
		10m	FHV-VNLBX2 10M
	External Light Conversion Cable for MDMC Light/ Photometric Stereo Light	0.1m	FHV-VFLX-GD

*1. The FHV-VDB2/VDLB2/VDBX2/VDLBX2 I/O Cable cannot be connected when the smart camera data unit is used.
Use the FHV-VUB2/VULB2/VUBX2/VULBX2 Smart Camera Data Unit Cable.

Smart Camera Data Unit

Item	Model	
	Parallel interface	FHV-SDU10
	EtherCAT interface	FHV-SDU30

Smart Camera Data Unit Cable

Item	Cable length		Model
	Smart Camera data unit cable(Bend resistant) *1	2m	FHV-VUB2 2M
		3m	FHV-VUB2 3M
		5m	FHV-VUB2 5M
		10m	FHV-VUB2 10M
		20m	FHV-VUB2 20M
	Smart Camera data unit cable(Bend resistant, Right-angle) *1	2m	FHV-VULB2 2M
		3m	FHV-VULB2 3M
		5m	FHV-VULB2 5M
		10m	FHV-VULB2 10M
		20m	FHV-VULB2 20M
	Smart Camera data unit cable(Super Bend resistant) *1	5m	FHV-VUBX2 5M
		10m	FHV-VUBX2 10M
	Smart Camera data unit cable(Super Bend resistant, Right-angle) *1	5m	FHV-VULBX2 5M
		10m	FHV-VULBX2 10M
	Parallel I/O Cable	2m	XW2Z-S013-2
		5m	XW2Z-S013-5
	Parallel I/O Cable for Connector-terminal Conversion Unit Connector-Terminal Block Conversion Units can be connected (Terminal Blocks Recommended Products: OMRON XW2R-□34G-T)	0.5m	XW2Z-050EE
		1m	XW2Z-100EE
		1.5m	XW2Z-150EE
		2m	XW2Z-200EE
		3m	XW2Z-300EE
		5m	XW2Z-500EE
	Connector-Terminal Block Conversion Units, General-purpose devices *2	Phillips screw	XW2R-J34GD-T
		Slotted screw (rise up)	XW2R-E34GD-T
		Push-in spring	XW2R-P34GD-T

*1. The FHV-VDB2/VDLB2/VDBX2/VDLBX2 I/O Cable cannot be connected when this cable is used.

*2. Refer to the XW2R Series catalog (Cat. No. G077) for details.

FHV7 Series

Accessories

Item		Model
	Base Mount for Smart Cameras and Lighting Controllers	FHV-XMT-7
	Base Mount for Lighting Controllers	FHV-XMT-7-TCC
	Light Cover (for replacement) *1	FHV-XCV
	Waterproof Cap (for replacement)	for Ethernet Connector FHV-XWC-ECN2
		for Light Connector FHV-XWC-LCN
	Waterproof Packing *2 (for replacement, 5 pcs)	for Camera FHV-XWP-CAM
		for Lighting Module FHV-XWP-LTM
		for Waterproof Hood FHV-XWP-HD-SL
	Light-shielding for Lighting Module (for replacement, 3 pcs) *3	FHV-XLS-LTM
	Cover for High-speed Lens Module (for replacement, cover 1pcs, screws 5 pcs (including one spare piece))	FHV-XFC-LEM-H
	Cover for Standard Lens Module (for replacement, cover 1pcs, screws 5 pcs (including one spare piece))	FHV-XFC-LEM-S
	Cover for C-mount Lens (for replacement, cover 1pcs, screws 5 pcs (including one spare piece))	FHV-XFC-C
---	Screw for microSD card cover (for replacement, 10 pcs)	FHV-XSCR-MSD

*1. Adapted lighting module

FHV-LTM-W, FHV-LTM-R, FHV-LTM-IR, FHV-LTM-MC

*2. Always replace when a module is removed.

*3. It is considered a consumable item that will deteriorate. Please replace as needed.

Accessories

Item	Descriptions		Model
—	External Lights	LED	FLV Series
		High-brightness LED	FL-BR/DR Series
		Photometric Stereo Light	FL-PS Series
		MDMC Light (Built-in lighting controller)	FL-MD Series
—	Lighting controller	LED	FLV-TCC/ATC
		High-brightness LED	FL-TCC/STC
		For photometric Stereo Light	FL-TCC1PS
	Industrial Switching Hubs for EtherNet/IP and Ethernet	5 port	Current consumption: 0.07 A W4S1-05D

Lenses

Refer to the *Vision Accessory Catalog* (Cat. No. Q198) for details.

Resolution	Camera Model	Size of image element	Recommended lens		
			Standard Lens	Telecentric Lens	Vibrations and Shocks Resistant Lens
0.4 million-pixel	FHV7X-□004	1/2.9" equivalent	SV-V Series	VS-TCH Series	VS-MCA Series Non-telecentric Macro VS-MC Series
1.6 million-pixel	FHV7X-□016	1/2.9" equivalent			
3.2 million-pixel	FHV7X-□032	1/1.8" equivalent	SV-H Series		
5 million-pixel	FHV7X-□060	2/3" equivalent			
6.3 million-pixel	FHV7X-□063R	1/1.8" equivalent			
12 million-pixel	FHV7X-□120R	1/1.7" equivalent			

Recommended EtherCAT Communications Cables

Use Straight STP (shielded twisted-pair) cable of category 5 or higher with double shielding (braiding and aluminum foil tape) for EtherCAT.

Cable with Connectors

Item	Appearance	Recommended manufacturer	Cable length (m)	Model
Cable with Connectors on Both Ends (RJ45/RJ45) Standard RJ45 plugs type *1 Wire Gauge and Number of Pairs: AWG26, 4-pair Cable Cable Sheath material: LSZH *2 Cable color: Yellow *3		OMRON	0.3	XS6W-6LSZH8SS30CM-Y
			0.5	XS6W-6LSZH8SS50CM-Y
			1	XS6W-6LSZH8SS100CM-Y
			2	XS6W-6LSZH8SS200CM-Y
			3	XS6W-6LSZH8SS300CM-Y
			5	XS6W-6LSZH8SS500CM-Y
Cable with Connectors on Both Ends (RJ45/RJ45) Rugged RJ45 plugs type *1 Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Light blue		OMRON	0.3	XS5W-T421-AMD-K
			0.5	XS5W-T421-BMD-K
			1	XS5W-T421-CMD-K
			2	XS5W-T421-DMD-K
			5	XS5W-T421-GMD-K
			10	XS5W-T421-JMD-K
Cable with Connectors on Both Ends (M12 Straight/M12 Straight) Shield Strengthening Connector cable *4 M12/Smartclick Connectors Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	0.5	XS5W-T421-BM2-SS
			1	XS5W-T421-CM2-SS
			2	XS5W-T421-DM2-SS
			3	XS5W-T421-EM2-SS
			5	XS5W-T421-GM2-SS
			10	XS5W-T421-JM2-SS
Cable with Connectors on Both Ends (M12 Straight/RJ45) Shield Strengthening Connector cable *4 M12/Smartclick Connectors Rugged RJ45 plugs type Wire Gauge and Number of Pairs: AWG22, 2-pair Cable Cable color: Black		OMRON	0.5	XS5W-T421-BMC-SS
			1	XS5W-T421-CMC-SS
			2	XS5W-T421-DMC-SS
			3	XS5W-T421-EMC-SS
			5	XS5W-T421-GMC-SS
			10	XS5W-T421-JMC-SS

*1 Cables with standard RJ45 plugs are available in the following lengths: 0.2 m, 0.3 m, 0.5 m, 1 m, 1.5 m, 2 m, 3 m, 5 m, 7.5 m, 10 m, 15 m, 20 m.
Cables with rugged RJ45 plugs are available in the following lengths: 0.3 m, 0.5 m, 1 m, 2 m, 3 m, 5 m, 10 m, 15 m.

For details, refer to the Industrial Ethernet Connectors Catalog (Cat. No. G019).

*2 The lineup features Low Smoke Zero Halogen cables for in-cabinet use and PUR cables for out-of-cabinet use. Although the LSZH cable is single shielded, its communications and noise characteristics meet the standards.

*3 Cables colors are available in yellow, green, and blue.

*4 For details, contact your OMRON representative.

FHV7 Series

Cables / Connectors

Item		Recommended manufacturer	Model
Products for EtherCAT (100BASE-T/100BASE-TX) Wire gauge and number of pairs: AWG24, 4-pair cable	Cable	Hitachi Metals, Ltd.	NETSTAR-C5E SAB 0.5 x 4P CP *1
		Kuramo Electric Co.	KETH-SB *1
	RJ45 Connector	Panduit Corporation	MPS588-C *1
Products for EtherCAT (100BASE-TX/10BASE-T) Wire gauge and number of pairs: AWG22, 2-pair cable	Cable	Kuramo Electric Co.	KETH-PSB-OMR *2
		JMACS Japan Co., Ltd.	PNET/B *2
	RJ45 Assembly Connector 	OMRON	XS6G-T421-1 *2

*1 We recommend you to use the above Cable and RJ45 Connector together.

*2 We recommend you to use the above Cable and RJ45 Assembly Connector together.

Touch Panel Monitor

Ask Advantech about the warranty period and coverage of this product.

Item		Model	Recommended manufacturer
	Touch Panel Monitor	PPC-3100S-OMR	Advantech Find your local office on the Advantech website https://www.advantech.com/contact/offices/
	ARM VESA Standard (A-CLEVER) for PPC Series	PPC-ARM-A03	
	Wall mount kit for PPC Series	PPC-174T-WL-MTE	
	Stand for PPC Series	PPC-Stand-A1E	
	ADP A/D 100-240V 90W 19V W/PFC	96PSA-A90W19OT-3	
	Power cord 3P UL 10 A 125 V 1.8 m	1700001524	
	Power cord 3P Europe (WS-010+083) 1.83 m	170203183C	
	Power cord 3P/3P PSE 1.8 m	1700008921	
	Power cord 3P CCC (China) 1.8 m	96CB-POWER-B-1.8M	

Recommended Industrial Touch Panel IPC/ Monitor

If you require a more industrial solution or larger screensizes, our FHV7 smart camera's work perfect with Omron's Industrial PC systems (e.g. NYP-series)

Find your preferred Industrial PC systems at: <http://www.ia.omron.com/products/family/3633/>

Automation Software Sysmac Studio

Please purchase a DVD and licenses the first time you purchase the Sysmac Studio. DVDs and licenses are available individually. The license does not include the DVD.

Item	Specifications			Model
		Number of licenses	Media	
Sysmac Studio Standard Edition Ver.1.□□	The Sysmac Studio is the software that provides an integrated environment for setting, programming, debugging and maintenance of machine automation controllers including the NJ/NX-series CPU Units, NY-series Industrial PC, EtherCat Slave, and the HMI. Sysmac Studio runs on the following OS. *1 Windows 7 (32-bit/64-bit version) / Windows 8.1 (32-bit/64-bit version) / Windows 10 (32/64bit) / Windows 11 (64-bit version) This software provides functions of the Vision Edition. Refer to your local OMRON website for details such as supported models and functions.	-- (Media only)	Sysmac Studio (32bit) DVD *2	SYSMAC-SE200D
		-- (Media only)	Sysmac Studio (64bit) DVD *2	SYSMAC-SE200D-64
		1 license *3	—	SYSMAC-SE201L
Sysmac Studio Vision Edition Ver.1.□□ *4	Sysmac Studio Vision Edition is a limited license that provides selected functions required for Vision Sensor FH-series/Smart Camera FHV7-series/FO-M-series settings.	1 license	—	SYSMAC-VE001L

*1. Model "SYSMAC-SE200D-64" runs on Windows 10 (64bit) or higher.

*2. The same media is used for both the Standard Edition and the Vision Edition.

*3. Multi licenses are available for the Sysmac Studio (3, 10, 30, or 50 licenses).

*4. This product is a license only. You need the Sysmac Studio Standard Edition DVD media to install it.

Ratings and Specifications

Smart Camera

Item			Model	FHV7X-M004-C	FHV7X-C004-C	FHV7X-M016-C	FHV7X-C016-C	FHV7X-M032-C	FHV7X-C032-C	FHV7X-M050-C	FHV7X-C050-C	FHV7X-M063R-C	FHV7X-C063R-C	FHV7X-M120R-C	FHV7X-C120R-C
Specifications	Operation Mode	Standard	Yes												
		Double speed multi-input	Yes												
		Non-stop adjustment mode	Yes												
	Parallel processing		Yes												
	Possible No. of captured images		256			64		36		25		19		10	
	Possible No. of logging images to Smart Camera		645			161		79		50		39		19	
	Possible No. of scenes		128 *1												
	UI operation		Remote Operation Tool												
	Setup		Create the processing flow using Flow editing.												
Language		Japanese, English, Simplified Chinese, Traditional Chinese, German, French, Italian, Spanish, Korean, Vietnamese, Polish													
Imaging	CMOS Image elements		1/2.9-inch equivalent		1/2.9-inch equivalent		1/1.8-inch equivalent		2/3-inch equivalent		1/1.8-inch equivalent		1/1.7-inch equivalent		
	Color/Monochrome		Monochrome	Color	Monochrome	Color	Monochrome	Color	Monochrome	Color	Monochrome	Color	Monochrome	Color	
	Effective pixels (H x V)		720 × 540			1440 × 1080		2048 × 1536		2448 × 2048		3072 × 2048		4000 × 3000	
	Pixel size		6.9 × 6.9 μm			3.45 × 3.45 μm		3.45 × 3.45 μm		3.45 × 3.45 μm		2.4 × 2.4 μm		1.85 × 1.85 μm	
	Imaging area H × V (opposing corner)		5.0 × 3.8 (6.3 mm)			5.0 × 3.8 (6.3 mm)		7.1 × 5.3 (8.9 mm)		8.5 × 7.1 (11.1 mm)		7.4 × 5.0 (8.9 mm)		7.4 × 5.6 (9.3 mm)	
	Shutter system		Global Shutter									Rolling shutter (Global reset mode compatible)			
	Shutter function		Electronic shutter: Shutter speed can be set from 1 μs to 100 ms.									Electronic shutter: Shutter speed can be set from 55 μs to 100 ms.		Electronic shutter: Shutter speed can be set from 84 μs to 100 ms.	
	Partial function		4 to 540 lines (4-line increments)		4 to 1080 lines (4-line increments)		4 to 1536 lines (4-line increments)		4 to 2048 lines (4-line increments)		4 to 2048 lines (4-line increments)		4 to 3000 lines (4-line increments)		
	Frame rate (image acquisition time)		430 fps (2.3 ms)			224 fps (4.5 ms)		55 fps (18.0 ms)		35 fps (28.0 ms)		59 fps (16.7 ms)		19 fps (25.0 ms)	
	Lens mounting		C mount												
	Field of view, Installation distance		Selecting a lens according to the field of view and installation distance												
External Interface	Serial		RS-232C × 1												
	Ethernet		Protocol: Non-procedure (TCP/UDP) I/F: 1000BASE-T × 1												
	EtherNet/IP		Yes (Target/Ethernet port)												
	PROFINET		Yes (Slave/Ethernet port), Conformance class A												
	Parallel I/O		NPN/PNP common												
	Parallel I/O	Input signals	4 signals • STEP (Measurement trigger input) • DI 0 to 2 (Command input signal)												
		Output signals	5 signals • ERROR (ON when there is an error) • OR (Overall Judgement Result) • BUSY (Processing in progress) • READY (ON when Image input is allowed) • STGOUT/SHTOUT (Strobe trigger signal/Shutter output signal)												
	Encoder I/F		N/A												
	Monitor I/F		N/A												
	USB I/F		N/A												
SD Card I/F		microSD card: SDHC × 1													
Indicator Lamps		Main	PWR: Green, RUN: Green, LINK: Yellow, BUSY: Green, OR: Yellow, ERR: Red												
		SD	SD ACCESS: Yellow												
Supply Voltage			21.6 VDC to 26.4 VDC (When an I/O cable with 20 m is connected, it is 24.0 VDC to 26.4 VDC.)												
Current Consumption			With lighting modules: 4.2 A or less Without lighting modules: 0.60 A												

*1. The number of scenes can be increased up to 1,024 with the Conversion scene group data tool.

FHV7 Series

Item		Model	FHV7X-M004-C	FHV7X-C004-C	FHV7X-M016-C	FHV7X-C016-C	FHV7X-M032-C	FHV7X-C032-C	FHV7X-M050-C	FHV7X-C050-C	FHV7X-M063R-C	FHV7X-C063R-C	FHV7X-M120R-C	FHV7X-C120R-C
Usage Environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)												
	Ambient humidity range	Operating & Storage: 35 to 85%RH (With no condensation)												
	Ambient atmosphere	No corrosive gases												
	Vibration tolerance	Oscillation frequency: 10 to 150Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times With standard lens modules, FHV-LEM-S: Half amplitude: 0.15 mm (Others are the same as above.)												
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)												
	Noise immunity	Fast transient burst • DC power Direct infusion: 2kV, Pulse rising: 5 ns, Pulse width: 50 ns, Burst continuation time: 15 ms/0.75 ms, Period: 300 ms, Application time: 1 min. • I/O line Direct infusion: 1kV, Pulse rising: 5 ns, Pulse width: 50 ns, Burst continuation time: 15 ms/0.75 ms, Period: 300 ms, Application time: 1 min.												
	Grounding	Class D grounding (100 Ω or less grounding resistance) *2												
External shape	Dimensions	110 mm × 68.5 mm × 55.5 mm (H × W × D)												
	Weight	Approx. 670 g												
	Degree of protection	With lighting modules or waterproof hoods: IEC60529 - IP67 (except a connector cap removed) Other than the above: IEC60529 - IP40												
	Case material	Aluminum die-casting (ADC12)												
Accessories		• Connector cap for Ethernet cable (mounted on the body): 1 • Connector cap for an external lighting (mounted on the body): 1 • C mount cap (mounted on the body): 1 • C mount cover (mounted on the body): 1 • Instruction sheet: 1 • Membership registration: 1 • General Compliance Information and Instructions for EU: 1												

*2. Existing the third class grounding

Lens Modules

High-speed Lens Modules (Autofocus)

Item		FHV-LEM-H06	FHV-LEM-H19
System		Liquid lens auto focus	
Installation distance		102 to 650 mm	202 to 1050 mm
Horizontal field of view range *	0.4 million pixels	64 × 48 mm to 505 × 376 mm	50 × 37 mm to 266 × 200 mm
	1.6 million pixels		
	3.2 million pixels	92 × 68 mm to 731 × 539 mm	71 × 53 mm to 378 × 284 mm
	6.3 million pixels	97 × 63 mm to 766 × 499 mm	74 × 49 mm to 394 × 264 mm
Focal length *		6 mm	19 mm
Usage environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)	
	Ambient humidity range	Operating & Storage: 35 to 85%RH (With no condensation)	
	Ambient atmosphere	No corrosive gases	
	Vibration tolerance	Oscillation frequency: 10 to 150Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times	
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)	
External shape	Dimension	50 mm × 41.1 mm × 37.1 mm (H × W × D)	50 mm × 41.1 mm × 36.3 mm (H × W × D)
	Weight	Approx. 25 g	
	Case material	Polycarbonate	
Accessories		• Special cover for FHV-LEM-H: 1 • Screws: M3 × 8 mm: 5 (including one spare piece) • Instruction sheet : 1 • Compliance sheet: 1	

* Refer to optical chart (P.50) for details.

Standard Lens Modules (Autofocus)

Item		FHV-LEM-S06	FHV-LEM-S09	FHV-LEM-S12	FHV-LEM-S16	FHV-LEM-S25
System		Mechanical auto focus				
Focal length range *1		59 to 1,000 mm	60 to 1,000 mm	60 to 1,000 mm	110 to 2,000 mm	188 to 2,000 mm
Horizontal field of view range *1	0.4 million pixels	39 × 29 to 845 × 624 mm	24 × 18 to 543 × 407 mm	17 × 13 to 407 × 305 mm	27 × 20 to 614 × 461 mm	30 × 23 to 391 × 293 mm
	1.6 million pixels	57 × 42 to 1,234 × 905 mm	34 × 25 to 772 × 579 mm	24 × 18 to 579 × 434 mm	38 × 29 to 874 × 655 mm	43 × 33 to 556 × 417 mm
	3.2 million pixels					
	6.3 million pixels	50 × 39 to 1,293 × 836 mm	35 × 23 to 807 × 538 mm	25 × 17 to 606 × 404 mm	40 × 27 to 913 × 608 mm	45 × 30 to 581 × 387 mm
Focal length		6 mm	9 mm	12 mm	16 mm	25 mm
Usage environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)				
	Ambient humidity range	Operating & Storage: 35 to 85%RH (With no condensation)				
	Ambient atmosphere	No corrosive gases				
	Vibration tolerance	Oscillation frequency: 10 to 150Hz, Half amplitude: 0.15 mm *2, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times				
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)				
External shape	Dimension	50 mm × 41 mm × 31 mm (H × W × D)				
	Weight	Approx. 50 g				
	Case material	Polycarbonate				
Accessories		• Special cover for FHV-LEM-S: 1 • Screws: M3 × 8 mm: 5 (including one spare piece) • Instruction sheet : 1 • Compliance sheet: 1				

*1. Refer to optical chart (P.50) for details.

*2. When the lens module is mounted to the product, the vibration tolerance is applied for the specifications of the smart camera.

Lighting Modules

Model		FHV-LTM-W	FHV-LTM-R	FHV-LTM-IR	FHV-LTM-MC
Color		White	Red	Infrared light	Multi color
Peak wave length		-	Typ. 630 nm	Typ. 850 nm	R: Typ. 630 nm G: Typ. 525 nm B: Typ. 465 nm IR: Typ. 850 nm
Light source		LED	LED	LED	LED
Risk group		Group 2	Group 1	Group 1	R: Group 1 G: Group 2 B: Group 2 IR: Group 1
Usage environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)			
	Ambient humidity range	Operating & Storage: 35 to 85%RH (With no condensation)			
	Ambient atmosphere	No corrosive gases			
	Vibration tolerance	Oscillation frequency: 10 to 150Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times			
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)			
Dimensions		52 mm × 91 mm × 77 mm (H × W × D)			
Weight		270 g	270 g	270 g	270 g
Material		Aluminum die-casting (ADC12), polycarbonate			
Accessories		- Waterproof packing (small) FHV-XWP-CAM:1 - Waterproof packing (large) FHV-XWP-LTM: 1 - Light shielding sheet FHV-XLS-LTM: 1 - Lighting cover FHV-XCV: 1 - Hexagonal wrench (length: 60 mm): 1 - Instruction sheet: 1 - Compliance sheet: 1			

Optical Filters

Model		FHV-XDF	FHV-XPL	FHV-XPL-IR
Filter type		Diffusion filter	Polarization filter	Polarization filter
Wavelength		Visible to infrared	Visible	Visible to infrared
Adapted lighting module		FHV-LTM-W FHV-LTM-R FHV-LTM-IR FHV-LTM-MC	FHV-LTM-W FHV-LTM-R FHV-LTM-MC (Infrared light is not used.)	FHV-LTM-W FHV-LTM-R FHV-LTM-IR FHV-LTM-MC
Usage environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)		
	Ambient humidity range	Operating & Storage: 35 to 85%RH (With no condensation)		
	Vibration tolerance	No corrosive gases		
	Shock resistance	Oscillation frequency: 10 to 150Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times		
	Vibration tolerance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)		
Material		Aluminum (A6061), polycarbonate		
Weight		Approx. 70 g	Approx. 70 g	Approx. 70 g

Waterproof Hoods

Model		FHV-XHD-S	FHV-XHD-L	FHV-XHD-LEM
Suitable lens		3Z4S-LE SV-V series SV-0614V SV-0813V SV-1214V SV-1614V SV-2514V	3Z4S-LE SV-H series SV-0614H *1 SV-0814H *2 SV-1214H SV-1614H SV-2514H SV-3514H SV-5014H	FHV-LEM-S series FHV-LEM-S06 FHV-LEM-S09 FHV-LEM-S12 FHV-LEM-S16 FHV-LEM-S25 FHV-LEM-H series FHV-LEM-H06 FHV-LEM-H09
Usage environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)		
	Ambient humidity range	Operating & Storage: 35 to 85%RH (With no condensation)		
	Ambient atmosphere	No corrosive gases		
	Vibration tolerance	Oscillation frequency: 10 to 150Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times		
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)		
Material		Aluminum (A6061), polycarbonate		
Weight		Approx. 220 g	Approx. 220 g	Approx. 220 g

*1. This is not available in FHV7X-□050, FHV7X-□063R, FHV7X-□120R.

*2. This is not available in FHV7X-□050.

Smart Camera Data Unit

Item		Parallel interface	EtherCAT interface
Model		FHV-SDU10	FHV-SDU30
Input/output specifications	Parallel I/O	Input: 12 Output: 24 (NPN/PNP combined use)	Input: 1 Output: 2 (NPN/PNP combined use)
	EtherCAT communications	None	Yes (slave)
Smart Camera Interface		Special cable to connect No. of connectable cameras: 1	
Indicator	Main	POWER: Green, ERROR: Red, RUN: Green, BUSY: Green, CAMERA: Yellow, OR: Yellow	
	EtherCAT	None	ECAT RUN: Green, LINK/ACT IN: Green, LINK/ACT OUT: Green, ECAT ERROR: Red
Power supply voltage		21.6 to 26.4 VDC (Note: 24.0 to 26.4 VDC when a data unit cable with 20 m is connected.)	
Insulation resistance		Between DC terminal block and FG terminal: 0.5 MΩ (250V Megger)	
Current consumption		4.5 A or less	
Usage environment	Ambient temperature range	Operating: 0 to +50°C, Storage: -25 to +65°C (with no icing or condensation)	
	Ambient humidity range	Operating and storage: 35 to 85%RH (with no condensation)	
	Ambient atmosphere	No corrosive gases	
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.1 mm, Vibration direction: X/Y/Z, Sweep time: 8 minutes, Sweep count: 10 times	
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, Three times each (up/down, front/behind, left/right)	
	Noise immunity	Fast transient burst - DC power Direct infusion: 2 kV, Pulse rising: 5 ns, Pulse width: 50 ns, Burst continuation time: 15 ms / 0.75 ms, Period: 300 ms, Application time: 1 minute - I/O line Coupling clamp: 1 kV, Pulse rising: 5 ns, Pulse width: 50 ns, Burst continuation time: 15 ms / 0.75 ms, Period: 300 ms, Application time: 1 minute	
	Grounding	Class D grounding (100 Ω or less grounding resistance) * Existing the third class grounding	
External shape	Dimensions	H (90 mm) × W (93 mm) × D (65 mm)	H (90 mm) × W (124 mm) × D (65 mm)
	Weight	Approx. 250 g	Approx. 325 g
	Degree of protection	IEC60529 - IP20	
	Case material	PC+ABS, PC	
Accessories		- Instruction sheet: 1 - Compliance sheet: 1	

I/O cables

Bending Resistance Cables

Item		FHV-VDB2 2M	FHV-VDLB2 2M	FHV-VDB2 3M	FHV-VDLB2 3M	FHV-VDB2 5M	FHV-VDLB2 5M	FHV-VDB2 10M	FHV-VDLB2 10M	FHV-VDB2 20M	FHV-VDLB2 20M
Cable length		2 m		3 m		5 m		10 m		20 m	
Connector type		Straight connector	Rightangle connector	Straight connector	Rightangle connector	Straight connector	Rightangle connector	Straight connector	Rightangle connector	Straight connector	Rightangle connector
Cable type		Bending resistance cable									
Size	Power line	AWG21									
	Others	AWG26									
Outer diameter		8.8±0.3 mm dia.									
Min. bending radius		Fixed use: 40 mm, Sliding use: 70 mm									
Input/Output signals	Input signals	4 signals: STEP, DI 0 to 2									
	Output signals	5 signals: ERROR, OR, BUSY, READY, STGOUT/SHTOUT									
	RS-232C	2 signals: Transmission data, Reception data									
Usage environment	Ambient temperature range	Operating: -10 to +70°C, Storage: -25 to +85°C (with no icing or condensation)									
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)									
	Ambient atmosphere	No corrosive gases									
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times									
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)									
Material		Mold part: Nylon, PVC, Sheath part: PVC									
Weight		Approx. 250 g		Approx. 370 g		Approx. 590 g		Approx. 1,170 g		Approx. 2,310 g	

Super Bending Resistance Cables

Item		FHV-VDBX2 5M	FHV-VDLBX2 5M	FHV-VDBX2 10M	FHV-VDLBX2 10M
Cable length		5 m		10 m	
Connector type		Straight connector	Right angle connector	Straight connector	Right angle connector
Cable type		Super bending resistance cable			
Size	Power line	AWG19			
	Others	AWG26			
Outer diameter		7.2+0.7 mm dia.			
Min. bending radius		44 mm			
Input/Output signals	Input signals	1 signal: STEP			
	Output signals	3 signals: OR, READY, STGOUT/SHTOUT			
Usage environment	Ambient temperature range	Operating: -10 to +70°C, Storage: -25 to +85°C (with no icing or condensation)			
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)			
	Ambient atmosphere	No corrosive gases			
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times			
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)			
Material		Mold part: Nylon, PVC, Sheath part: PVC			
Weight		Approx. 420 g		Approx. 790 g	

Ethernet Cables

Bending Resistance Cables

Item		FHV-VNB2 2M	FHV-VNLB2 2M	FHV-VNB2 3M	FHV-VNLB2 3M	FHV-VNB2 5M	FHV-VNLB2 5M	FHV-VNB2 10M	FHV-VNLB2 10M	FHV-VNB2 20M	FHV-VNLB2 20M
Cable length		2 m		3 m		5 m		10 m		20 m	
Connector type		Straight connector	Rightangle connector	Straight connector	Rightangle connector	Straight connector	Rightangle connector	Straight connector	Rightangle connector	Straight connector	Rightangle connector
Cable type		Bending resistance cable									
Outer diameter		6.7±0.3 mm dia.									
Min. bending radius		Fixed use: 35 mm, Sliding use: 50 mm									
Usage environment	Ambient temperature range	Operating: -10 to +70°C, Storage: -25 to +85°C (with no icing or condensation)									
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)									
	Ambient atmosphere	No corrosive gases									
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times									
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)									
Material		Mold part: PVC, Sheath part: PVC									
Weight		Approx. 140 g		Approx. 200 g		Approx. 310 g		Approx. 590 g		Approx. 1,150 g	

Super Bending Resistance Cables

Item		FHV-VNBX2 5M	FHV-VNLBX2 5M	FHV-VNBX2 10M	FHV-VNLBX2 10M
Cable length		5 m		10 m	
Connector type		Straight connector	Right angle connector	Straight connector	Right angle connector
Cable type		Super bending resistance cable			
Outer diameter		6.6+0.7 mm dia.			
Min. bending radius		40 mm			
Usage environment	Ambient temperature range	Operating: -10 to +70°C, Storage: -25 to +85°C (with no icing or condensation)			
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)			
	Ambient atmosphere	No corrosive gases			
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times			
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)			
Material		Mold part: PVC, Sheath part: PVC			
Weight		Approx. 390 g		Approx. 730 g	

External Light Junction Cables for MDMC Light

Item		FHV-VFLX-GD
Cable length		0.1 m
Outer diameter		4.0±0.1 mm dia.
Min. bending radius		15 mm
Usage environment	Ambient temperature range	Operating: 0 to +40°C, Storage: -25 to +65°C (with no icing or condensation)
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)
	Ambient atmosphere	No corrosive gases
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)
Material		Shell part: Zinc alloy and Brass, Sheath part: Heat-resistant oilproof polyvinyl chloride
Weight		Approx. 30 g

Smart Camera Data Unit Cable

Bending Resistance Cables

Item		FHV-VUB2 2M	FHV-VULB2 2M	FHV-VUB2 3M	FHV-VULB2 3M	FHV-VUB2 5M	FHV-VULB2 5M	FHV-VUB2 10M	FHV-VULB2 10M	FHV-VUB2 20M	FHV-VULB2 20M
Cable length		2 m		3 m		5 m		10 m		20 m	
Connector type		Straight connector	Right angle connector	Straight connector	Right angle connector	Straight connector	Right angle connector	Straight connector	Right angle connector	Straight connector	Right angle connector
Cable type		Bending resistance cable									
Outer diameter		7.8±0.3 mm dia.									
Min. bending radius		Fixed use: 40 mm, Sliding use: 65 mm									
Usage environment	Ambient temperature range	Operating: -10 to +70°C, Storage: -25 to +85°C (with no icing or condensation)									
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)									
	Ambient atmosphere	No corrosive gases									
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times									
	Shock resistance	Impact force: 150 m/s ² , Test direction: 6 directions, three time each (up/down, front/behind, left/right)									
Material		Mold part: PVC, Sheath part: PVC									
Weight		Approx. 200 g		Approx. 290 g		Approx. 470 g		Approx. 900 g		Approx. 1,780 g	

Super Bending Resistance Cables

Item		FHV-VUBX2 5M	FHV-VULBX2 5M	FHV-VUBX2 10M	FHV-VULBX2 10M
Cable length		5 m		10 m	
Connector type		Straight connector	Right angle connector	Straight connector	Right angle connector
Cable type		Super bending resistance cable			
Outer diameter		7.5+0.6 mm dia.			
Min. bending radius		47 mm			
Usage environment	Ambient temperature range	Operating: -10 to +70°C, Storage: -25 to +85°C (with no icing or condensation)			
	Ambient humidity range	Operating & Storage: 0 to 93%RH (With no condensation)			
	Ambient atmosphere	No corrosive gases			
	Vibration tolerance	Oscillation frequency: 10 to 150 Hz, Half amplitude: 0.35 mm, Vibration direction: X/Y/Z, Sweep time: 8 minute/count, Sweep count: 10 times			
	Shock resistance	Impact force: 150 m/s², Test direction: 6 directions, three time each (up/down, front/behind, left/right)			
Material		Mold part: PVC, Sheath part: PVC			
Weight		Approx. 490 g		Approx. 920 g	

Touch panel monitor

Model		PPC-3100S-OMR (Advantech)
LCD	Display Type	10.4" TFT LCD (LED backlight)
	Resolution	1,024 × 768
	Luminance	350 cd/m ²
	Contrast Ratio	1,200
	Backlight Lifetime	30,000 hr (min.)
	Touch Type	Capacitive
External Interface	Ethernet	10/100/1,000 Mbps Ethernet × 2
	USB I/F	USB 2.0 × 1, USB 3.0 × 1
Power Consumption	Input Voltage	12 to 24 VDC
	Power Consumption	16 W
Environment	Ambient Temperature Range	Operating: 0 to 50°C Storage: -40 to 60°C
	Ambient Humidity Range	10% to 95% at 40°C (With no condensation)
	Vibration	Operating Random Vibration Test 5 to 500 Hz, 2 Grms, follow IEC 60068-2-64
	Shock	Operating 10 G peak acceleration (11 ms duration), follow IEC 60068-2-27
	EMC	CE, FCC Class B, BSMI
Safety		CB, CCC, BSMI, UL
Dimensions		272 × 217 × 46 mm
Weight		1.9 kg
Front Panel Protection		IP65 compliant
Mounting		Panel mount, VESA mount, Wall mount
Accessories		Instruction sheet, Connector for power supply, Mounting screws and brackets for panel mount

EtherCAT Communications Specifications

Item		Specifications
Communications standard		IEC61158 Type 12
Physical layer		100 BASE-TX (IEEE802.3)
Modulation		Base band
Baud rate		100 Mbps
Topology		Depends on the specifications of the EtherCAT master.
Transmission Media		Twisted-pair cable of category 5 or higher (double-shielded straight cable with aluminum tape and braiding)
Transmission Distance		Distance between nodes: 100 m or less
Node address setting		00 to 99
External connection terminals		RJ45 × 2 (shielded) IN: EtherCAT input data, OUT: EtherCAT output data
Send/receive PDO data sizes	Input	56 to 280 bytes/line (including input data, status, and unused areas) Up to 8 lines can be set. *
	Output	28 bytes/line (including output data and unused areas) Up to 8 lines can be set. *
Mailbox data size	Input	512 bytes
	Output	512 bytes
Mailbox		Emergency messages, SDO requests, and SDO information
Refreshing methods		I/O-synchronized refreshing (DC)

* This depends on the upper limit of the master.

Version Information

FHV7 Series and Programming Devices

Use the latest version of Sysmac Studio Standard Edition/Vision Edition.

Version of FHV7 Series	Corresponding version of Sysmac Studio Standard Edition/Vision Edition
Version 6.51 or higher	Supported by version 1.53 or higher.
Version 6.41 or higher	Supported by version 1.44 or higher.
Version 6.30 or higher	Supported by version 1.29 or higher.

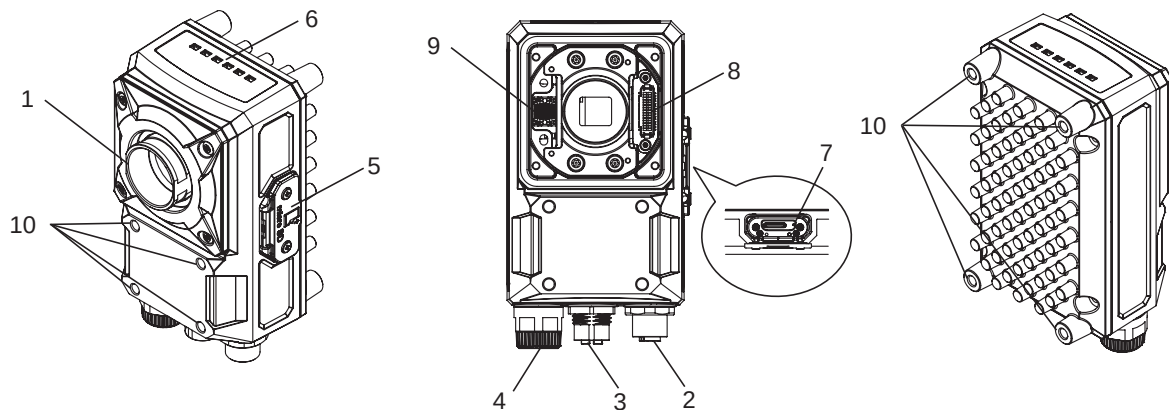
Recommended Operational Environment for Remote Operation Tool

Name	Description
CPU	Intel Pentium Processor (SSE2 or higher)
OS	- Windows 7 Professional (32/64-bit) or Enterprise (32/64-bit) or Ultimate (32/64-bit) - Windows 10 Pro (32/64-bit) or Enterprise (32/64-bit)
Memory	2GB (3GB or more recommended)
Hard disk space	2GB or more
Display	Resolution: 1280 x 1240 dots or more Color: True Color (32-bit)
Network	10BASE-T (100BASE-TX recommended)

Using the FH/FHV Launcher requires Microsoft .NET Framework 3.5 installed.

FHV7 Series

Parts and Names



No.	Name		Description
1	Imaging unit		Captures images.
2	Connector for I/O cable/Smart camera data unit cable		Use this connector when connecting the smart camera with its power supply or an external device using an I/O cable. Moreover, use this when connecting the smart camera with its data unit using its data unit cable. Dedicated I/O cable: FHV-VD□ Dedicated smart camera data unit cable: FHV-VU□
3	Connector for Ethernet cable		Use this connector when connecting the smart camera with a personal computer and so on using an Ethernet cable. Dedicated Ethernet cable: FHV-VN□□
4	Connector for external lighting		Use this connector when connecting an external lighting and the external lighting controller. Connectable external lighting controller: FL-TCC□ and FLV-TCC□ Connectable external light: FL-MD□MC
5	Connector to attach microSD card		Use this connector to attach a microSD card. Do not extract/insert the microSD card during processing. Otherwise, measurement time may be influenced or data may be broken.
6	Operation indicator	PWR (Green)	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.
7		SD ACCESS (Yellow)	Lights when accessing to the microSD card.
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		Recommended tightening torque: 2.3N·m

Processing Items

Group	Icon	Processing Item	
Measurement		Search	Used to identify the shapes and calculate the position of measurement objects.
		Search II	Even if the Search processing item cannot detect a model, the Search II can stably detect it by creating the optimal model according to the size and rotation of the measurement object.
		Flexible Search	Recognizing the shapes of workpieces with variation and detecting their positions.
		Sensitive Search	Search a small difference by dividing the search model in detail, and calculating the correlation.
		Shape Search III	Robust detection of positions is possible at high-speed and with high precision incorporating environmental fluctuations, such as differences in individual shapes of the workpieces, pose fluctuations, noise superimposition and shielding.
		Classification	Used when various kinds of products on the assembly line need to be sorted and identified.
		Edge Position	Measure position of measurement objects according to the color change in measurement area.
		Edge Pitch	Detect edges by color change in measurement area. Used for calculating number of pins of IC and connectors.

Group	Icon	Processing Item	
Measurement		Scan Edge Position	Measure peak/bottom edge position of workpieces according to the color change in separated measurement area.
		Scan Edge Width	Measure max/min/average width of workpieces according to the color change in separated measurement area.
		Circular Scan Edge Position	Measure center axis, diameter and radius of circular workpieces.
		Circular Scan Edge Width	Measure center axis, width and thickness of ring workpieces.
		Intersection	Calculate approximate lines from the edge information on two sides of a square workpiece to measure the angle formed at the intersection of the two lines.
		Color Data	Used for detecting presence and mixed varieties of products by using color average and deviation.
		Gravity and Area	Used to measure area, center of gravity of workpieces by extracting the color to be measured.
		Labeling	Used to measure number, area and gravity of workpieces by extracting registered color.
		Precise Defect	Check the defect on the object. Parameters for extraction defect can be set precisely.

Group	Icon	Processing Item
Measurement		Fine Matching Difference can be detected by overlapping and comparing (matching) registered fine images with input images.
		Character Inspect Recognize character according correlation search with model image registered in [Model Dictionary].
		Date Verification Reading character string is verified with internal date.
		Model Dictionary Register character pattern as dictionary. The pattern is used in [Character Inspection].
		2DCode II *1 Recognize 2D code and display where the code quality is poor.
		2DCode *2 Recognize 2D code and display where the code quality is poor.
		Barcode *3 Recognize barcode, verify and output decoded characters.
		OCR Recognize and read characters in images as character information.
		OCR User Dictionary Register dictionary data to use for OCR.
		Glue Bead Inspection You can inspect coating of a specified color for gaps or runoffs along the coating path.
Input Image		Camera Image Input FHV To input images from cameras. And set up the conditions to input images from cameras. (For FHV only)
		Camera Image Input HDR Create high-dynamic range images by acquiring several images with different conditions.
		Photometric Stereo Image Input Capture images under different illumination directions using a photometric stereo light.
		Measurement Image Switching To switch the images used for measurement. Not input images from camera again.
		Multi-trigger Imaging The Multi-trigger Imaging processing item captures multiple images at user-defined timings and executes parallel measurement for each image. Insert the Multi-trigger Imaging to the top of the flow.
		Multi-trigger Imaging Task The Multi-trigger Imaging processing item captures multiple images at user-defined timings and executes parallel measurement for each image. Insert this processing item to the top of the processing which requires imaging for multiple times.
Compensate image		Position Compensation Used when positions are differed. Correct measurement is performed by correcting position of input images.
		Filtering Used for processing images input from cameras in order to make them easier to be measured.
		Background Suppression To enhance contrast of images by extracting color in specified brightness.
		Brightness Correct Filter Track brightness change of entire screen and remove gradual brightness change such as uneven brightness.
		Color Gray Filter Color image is converted into monochrome images to emphasize specific color.
		Extract Color Filter Convert color image to color extracted image or binary image.
		Anti Color Shading To remove the irregular color/pattern by uniformizing max.2 specified colors.
		Stripes Removal Filter II Remove the background pattern of vertical, horizontal and diagonal stripes.
		Polar Transformation Rectify the image by polar transformation. Useful for OCR or pattern inspection printed on circle.
		Trapezoidal Correction Rectify the trapezoidal deformed image.
		Image Subtraction The registered model image and measurement image are compared and only the different pixels are extracted and converted to an image.
		Advanced filter Process the images acquired from cameras in order to make them easier to measure. This processing item consolidates existing image conversion filtering into one processing item and adds extra functions.
Support measurement		Calculation Used when using the judge results and measured values of Proctem which are registered in processing units.
		Line Regression Used for calculating regression line from plural measurement coordinate.
		Circle Regression Used for calculating regression circle from plural measurement coordinate.
		Precise Calibration Used for calibration corresponding to trapezoidal distortion and lens distortion.
		Trend Monitor Used for displaying the information about results on the monitor, facilitating to avoid NG and analyze causes.
		Image Logging Used for saving the measurement images to the memory and USB memory.
		Image Conversion Logging Used for saving the measurement images in JPEG and BMP format.
		Elapsed Time Used for calculating the elapsed time since the measurement trigger input.
		Wait Processing is stopped only at the set time. The standby time is set by the unit of [ms].

Group	Icon	Processing Item
Support measurement		Parallelize A part of the measurement flow is divided into two or more tasks and processed in parallel to shorten the measurement time. This processing item is placed at the top of processing to be performed in parallel.
		Parallelize Task A part of the measurement flow is divided into two or more tasks and processed in parallel to shorten the measurement time. This processing item is placed immediately before processing to be performed in parallel between Parallelize and Parallelize End.
		Statistics Used when you need to calculate an average of multiple measurement results.
		Reference Calib Data Calibration data and distortion compensation data held under other processing items can be referenced.
		Position Data Calculation The specified position angle is calculated from the measured positions.
		Stage Data Sets and stores data related to stages.
		Robot Data Sets and stores data related to robots.
		Vision Master Calibration This processing item automatically calculates the entire axis movement amount of the control equipment necessary for calibration.
		Convert Position Data The position angle after the specified axis movement is calculated.
		Movement Single Position The axis movement that is required to match the measured position angle to the reference position angle is calculated.
		Movement Multi Points The axis movements that are required to match the measured position angles to the corresponding reference position angles are calculated.
		Camera Calibration By setting the camera calibration, the measurement result can be converted and output as actual dimensions.
		Scene The specified scene is copied to the current scene.
Branch		System Information Obtain system information (e.g., memory and disk space and I/O input signal status) of the Sensor Controller.
		End This Proctem must be set up as the last processing unit of a branch.
		Conditional Execution (If) The measurement flow is divided according to the comparison result obtained using the set expressions and conditions.
		Conditional Execution (Else) Insert between the Conditional Execution (If) processing item and End If processing item. The measurement flow is divided according to the comparison result obtained using the set expressions and conditions.
		Loop The set processes are repeated until the loop count reaches the specified number, and then the next process starts.
		Loop Suspension Insert between the Loop processing item and End Loop processing item. Used to stop the loop before the loop count reaches the specified number.
Output result		Select Execution (Select) Used to set conditions. The measurement flow is divided according to the comparison result obtained using the conditions given by expressions.
		Select Execution (Case) Used to make a judgment. The measurement flow is divided according to the comparison result obtained using the conditions given by expressions.
		Result Output (I/O) Output data to the external devices such as a programmable controller or a PC via PLC Link, Fieldbus interface (EtherCAT *4, EtherNet/IP (other than message communication), PROFINET).
		Result Output (Message) Output data to the external devices such as a programmable controller or a PC with non-procedure mode via Ethernet or RS-232C. This processing item allows you to save the logging data as a ".csv" file into the Sensor Controller as well.
Display result		Result output (Parallel I/O) Output measurement results and/or judgment results to the external devices such as a programmable controller or a PC via Parallel interface *5.
		Result Display Used for displaying the texts or the figures in the camera image.
		Display Last NG Image Display the last NG images.
		Display Image Hold Processing item to retain images, including measurement results.

- *1 2D Codes that can be read : Data Matrix (ECC200)
 *2 2D Codes that can be read : Data Matrix (ECC200), QR Code
 *3 Bar Codes that can be read : JAN/EAN/UPC (including add-on codes), Code 39, Codabar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code 128, GS1-128, GS1 DataBar (RSS-14 / RSS Limited / RSS Expanded), Pharmacode
 *4 The FHV-SDU30 EtherCAT Interface is required for EtherCAT connection.
 *5 The FHV-SDU10 Parallel Interface is required for Parallel I/O connection.

FHV7 Series

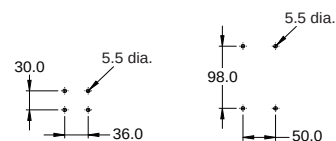
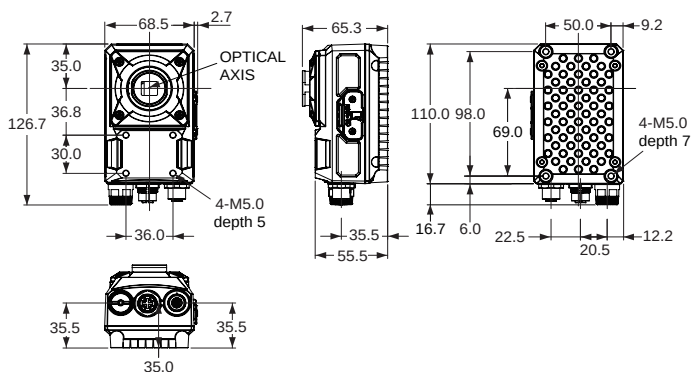
Dimensions

(Unit: mm)

Smart Cameras

C Mount Models

FHV7X-□□□□□-C

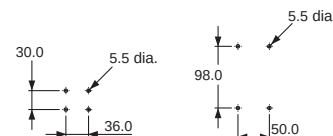
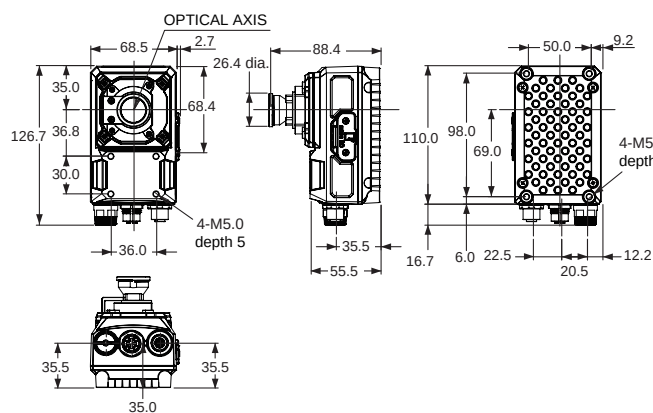


Mounting screw holes
(The tolerance: ± 0.1 mm)
Recommend tightening torque: 2.3N·m

All-in-one Models with Lens Module

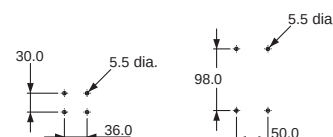
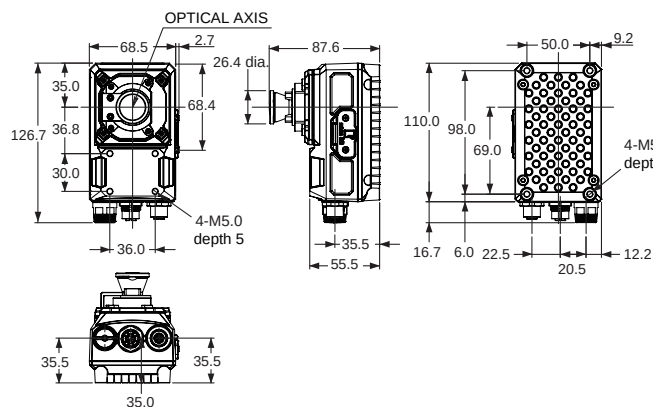
High-speed Lens Modules

FHV7X-□□□□□-H06



Mounting screw holes
(The tolerance: ± 0.1 mm)
Recommend tightening torque: 2.3N·m

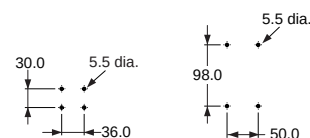
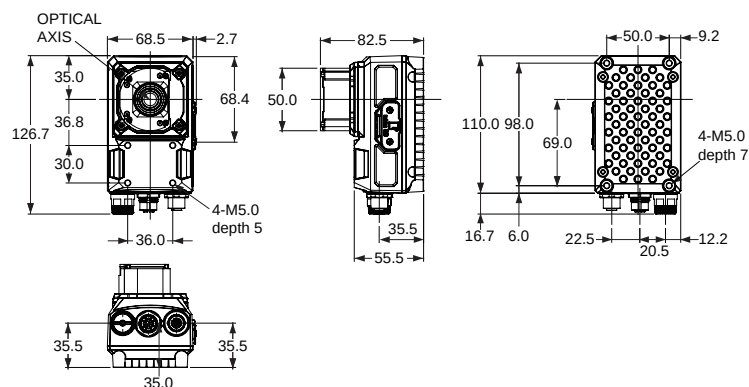
FHV7X-□□□□□-H19



Mounting screw holes
(The tolerance: ± 0.1 mm)
Recommend tightening torque: 2.3N·m

Standard Lens Modules

FHV7X-□□□□□-S□□

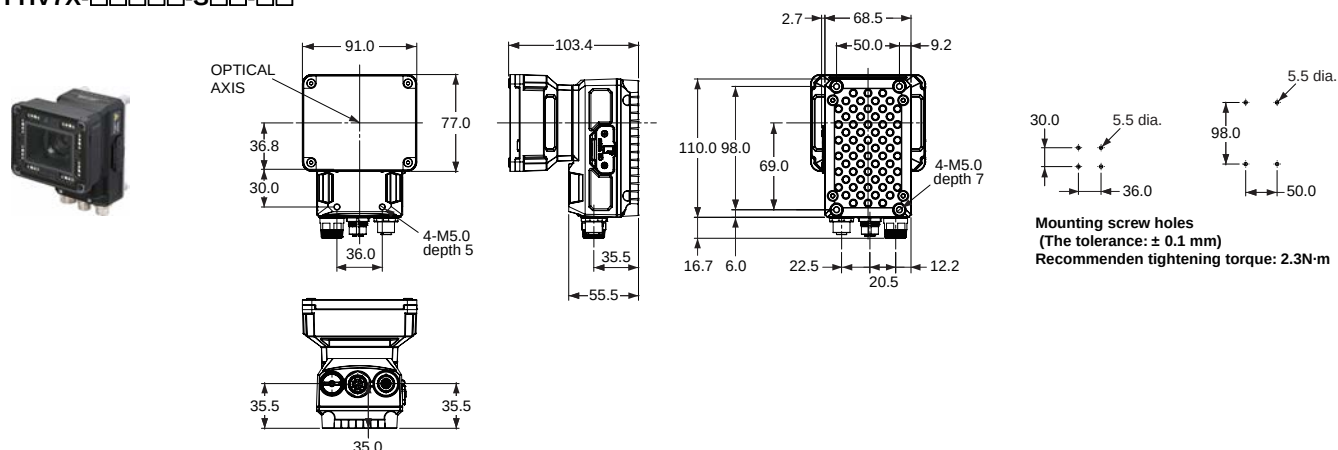


Mounting screw holes
(The tolerance: ± 0.1 mm)
Recommend tightening torque: 2.3N·m

All-in-one Models with Lens and Lighting Modules

FHV7X-□□□□□-H□□-□□/

FHV7X-□□□□□-S□□-□□

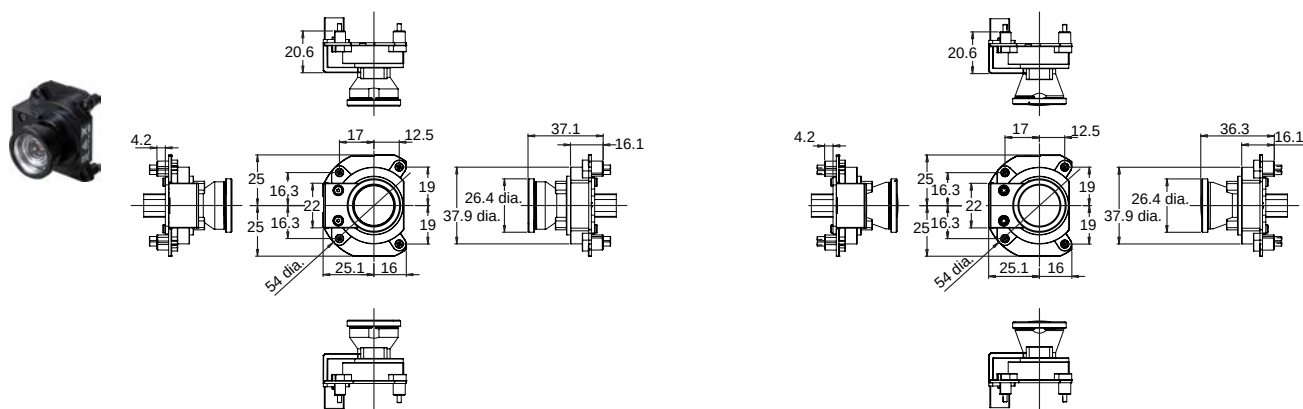


Lens Modules

High-speed Lens Modules

FHV-LEM-H06

FHV-LEM-H19

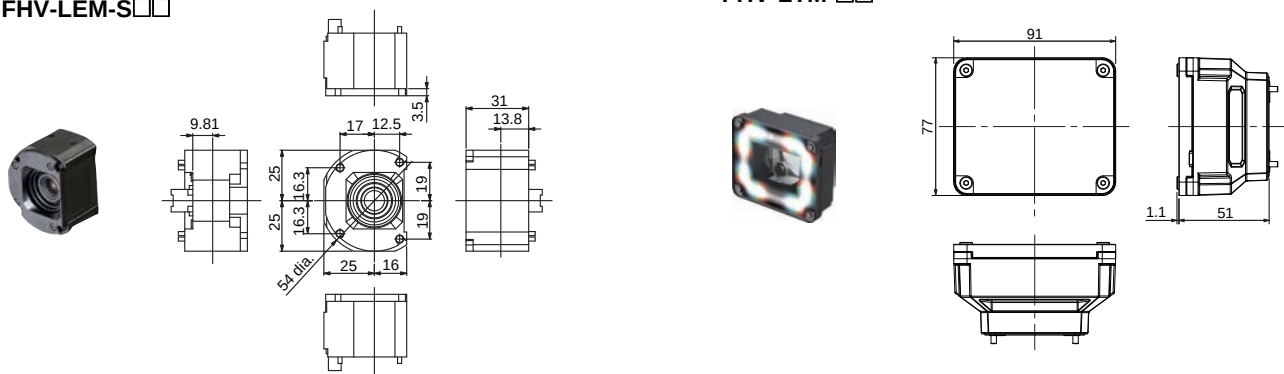


Standard Lens Modules

FHV-LEM-S□□

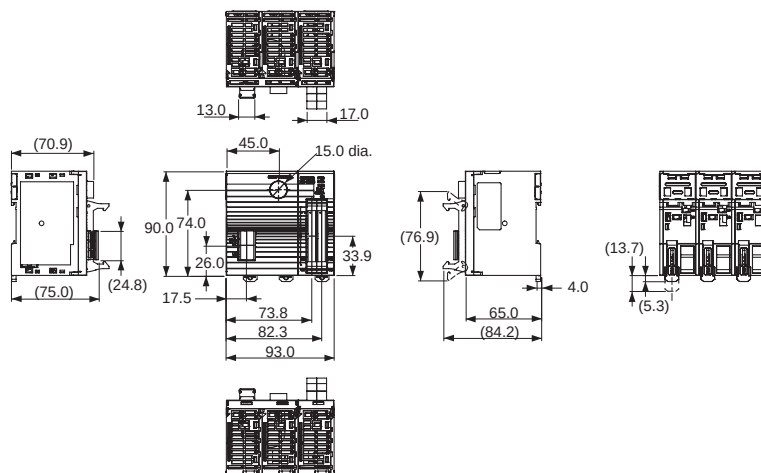
Lighting Modules

FHV-LTM-□□

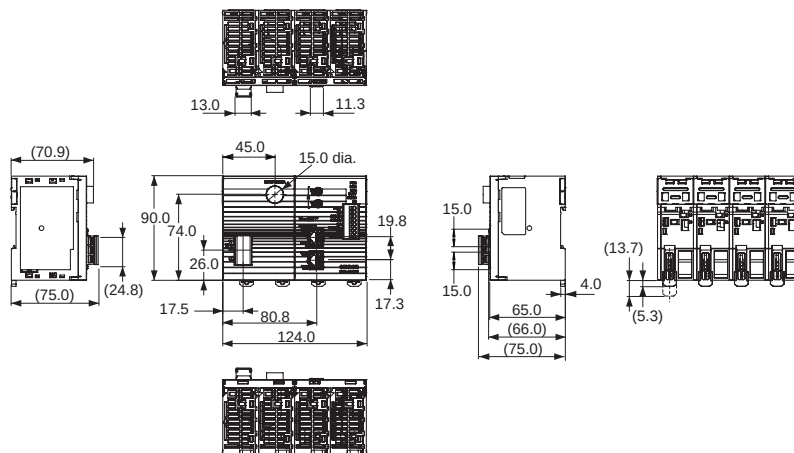


Smart Camera Data Unit

FHV-SDU10



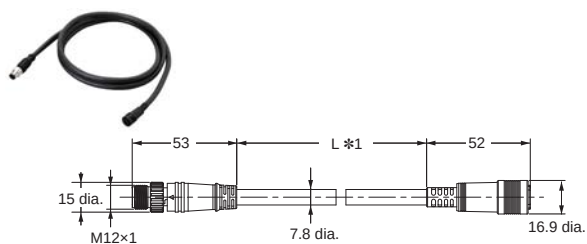
FHV-SDU30



Smart Camera Data Unit Cables

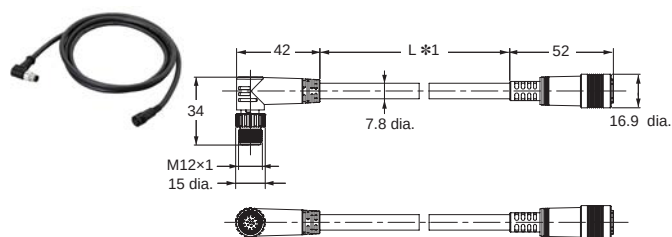
Bending Resistance Cables (Straight)

FHV-VUB2 □M



Bending Resistance Cables (Right angle)

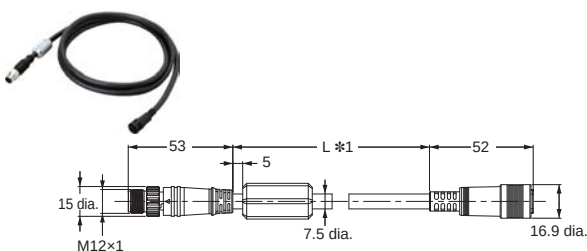
FHV-VULB2 □M



* Cable is available in 2m/3m/5m/10m/20m.

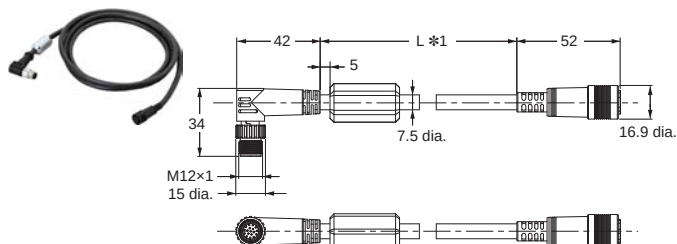
Super Bending Resistance Cables (Straight)

FHV-VUBX2 □M



Super Bending Resistance Cables (Right angle)

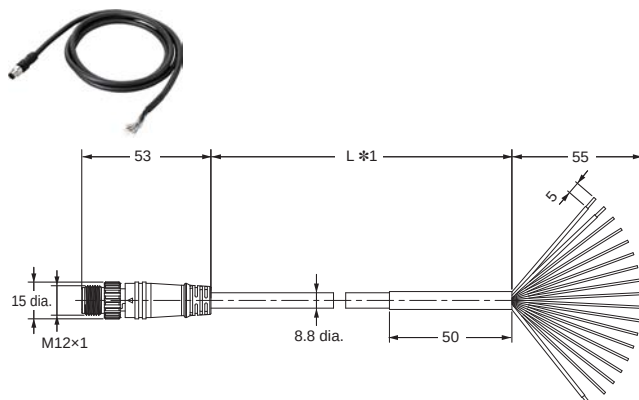
FHV-VULBX2 □M



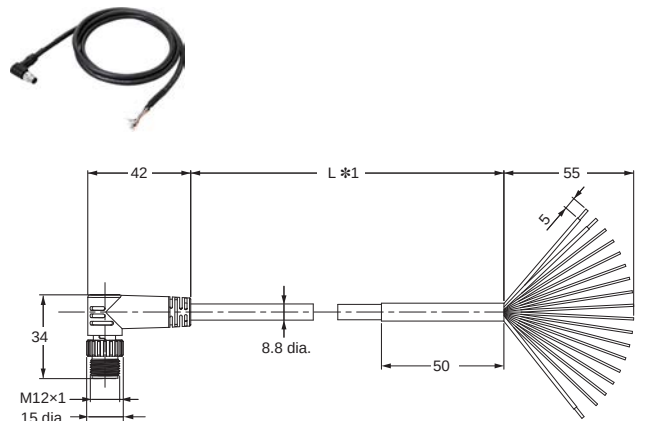
* Cable is available in 5m/10m.

Cables

I/O cable (Bend resistant, straight)
FHV-VDB2 □M

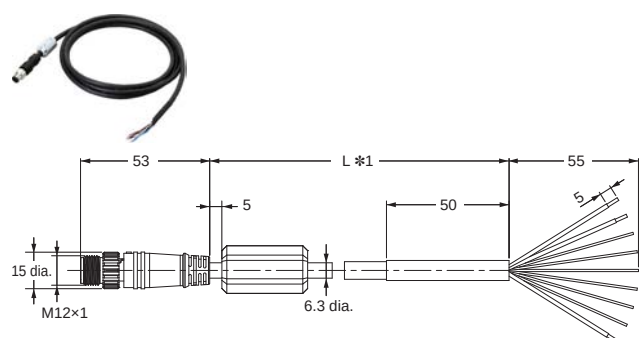


I/O cable (Bend resistant, right angle)
FHV-VDLB2 □M

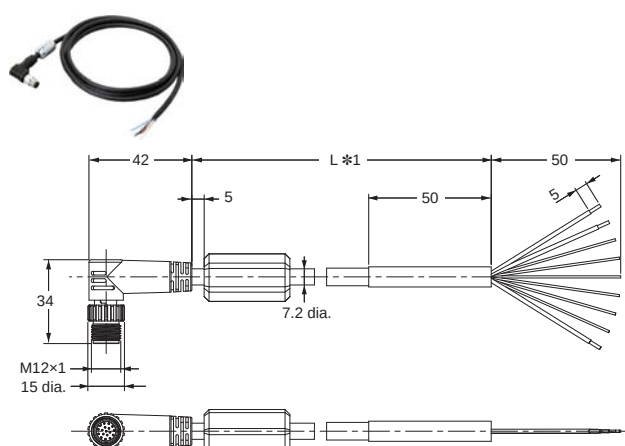


* Cable is available in 2m/3m/5m/10m/20m.

I/O cable (Super bend resistant, straight)
FHV-VDBX2 □M

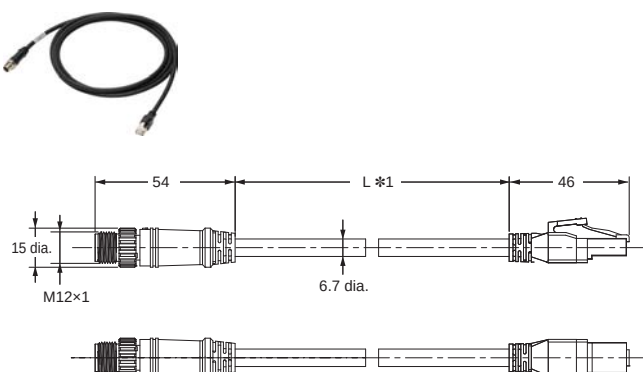


I/O cable (Super bend resistant, right angle)
FHV-VDLBX2 □M

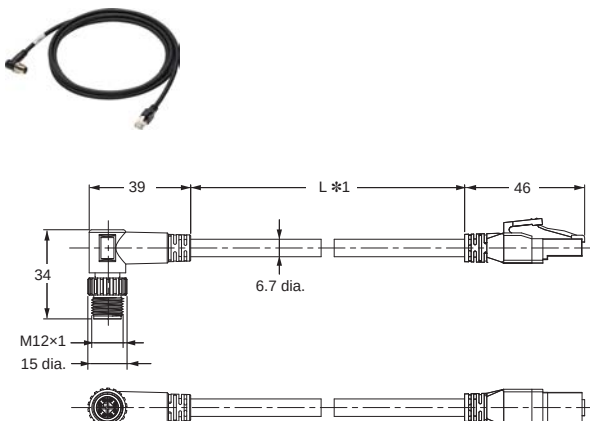


* Cable is available in 5m/10m.

Ethernet cable (Bend resistant, straight)
FHV-VNB2 □M



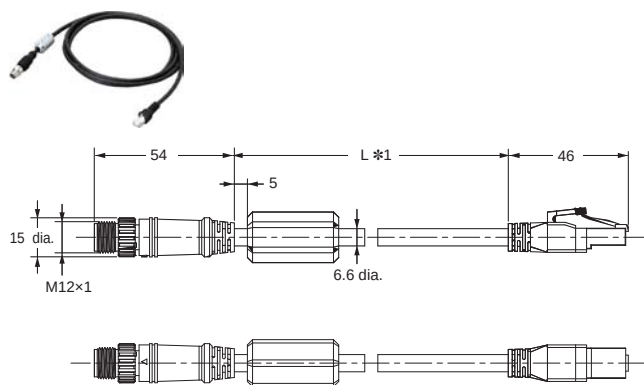
Ethernet cable (Bend resistant, right angle)
FHV-VNLB2 □M



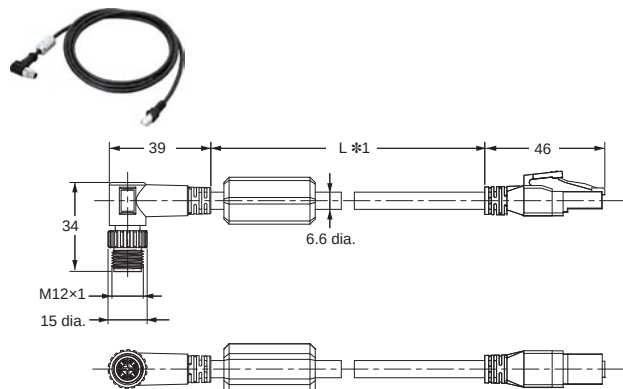
* Cable is available in 2m/3m/5m/10m/20m.

FHV7 Series

Ethernet cable (Super bend resistant, straight) FHV-VNBX2 □M



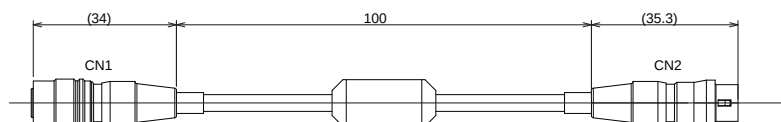
Ethernet cable (Super bend resistant, right angle) FHV-VNLBX2 □M



* Cable is available in 5m/10m.

External Light Junction Cables for MDMC Light

FHV-VFLX-GD



Optical Filters

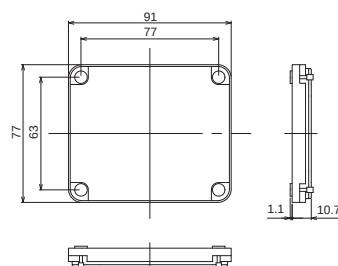
Polarization Filter, Diffusion Filter

FHV-XDFI-XPLI-XPL-IR



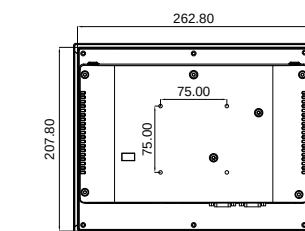
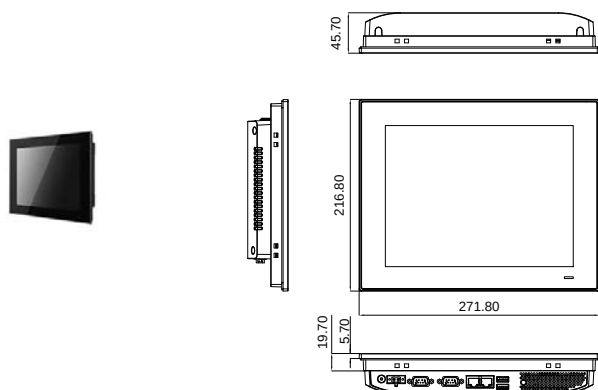
Light Cover

FHV-XCV



Touch Panel Monitor

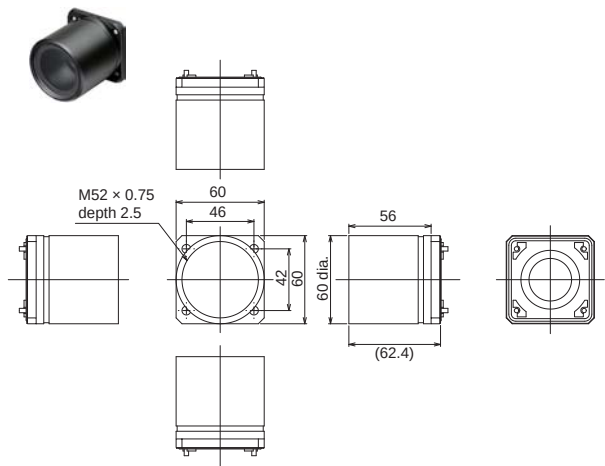
Advantech PPC-3100S-OMR



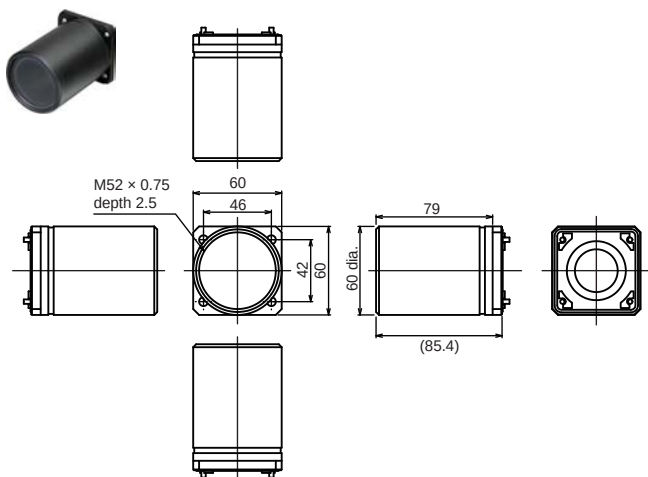
Panel Cutout Dimensions: 265 x 210 mm

Waterproof Hoods

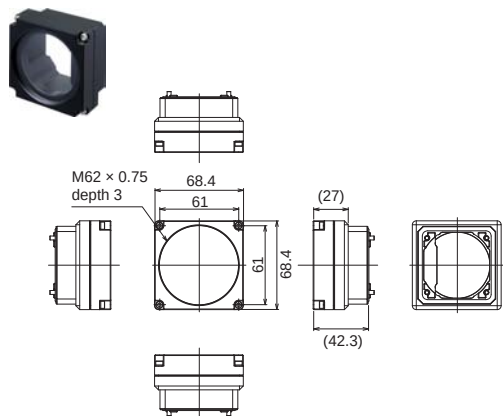
for C-mount Lens (Short)
FHV-XHD-S



for C-mount Lens (Long)
FHV-XHD-L



for Lens Modules
FHV-XHD-LEM

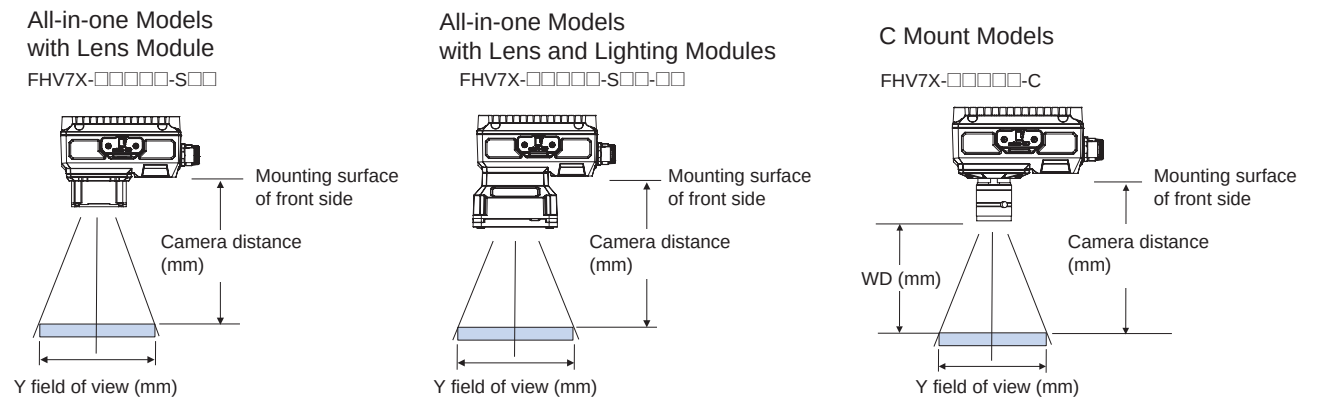


FHV7 Series

Meaning of Optical Chart

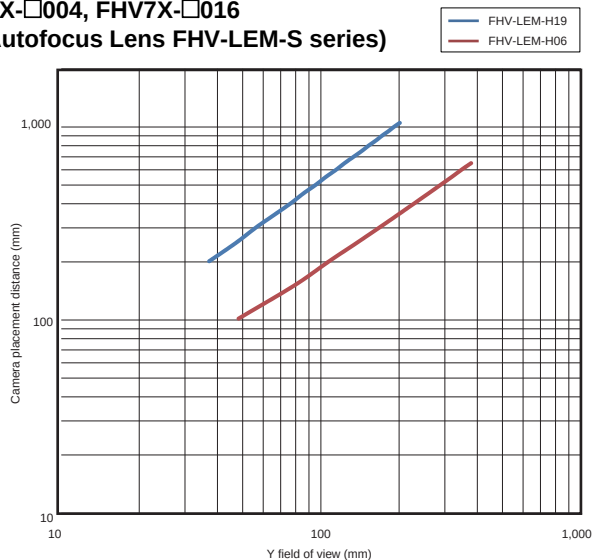
How-to View the Optical Chart

The X axis of the optical chart shows the field of vision (mm).
 The Y axis of the optical chart shows the camera installation distance (mm).
 The lengths of the fields of view given in the optical charts are the lengths of the Y axis.

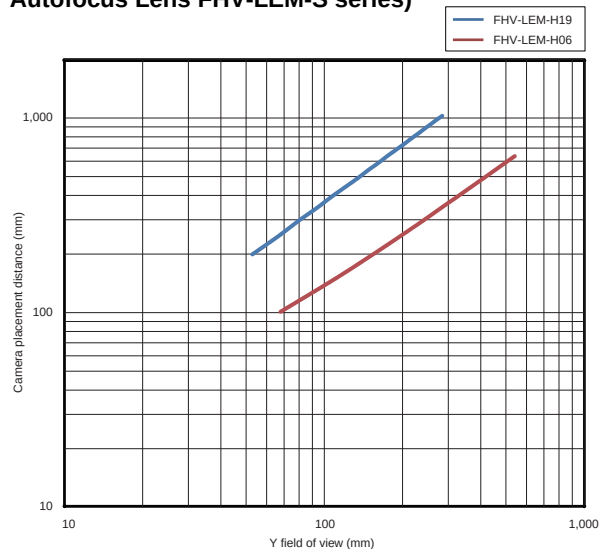


Lens Modules: High-speed Lens Modules (Autofocus)

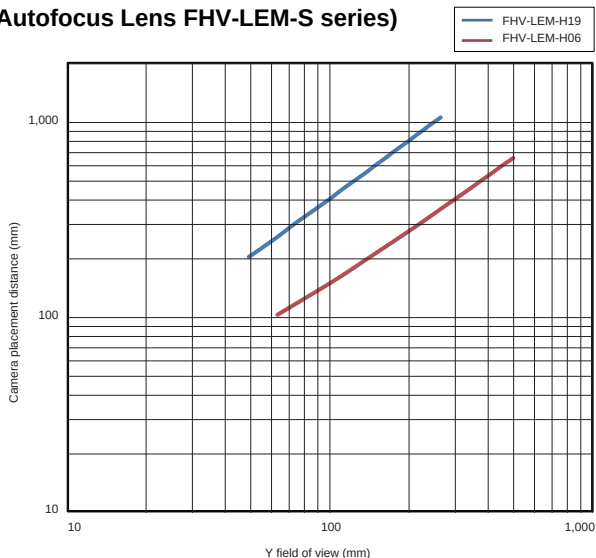
0.4 million pixels
 1.6 million pixels
 Smart Cameras:
 FHV7X-□004, FHV7X-□016
 (for Autofocus Lens FHV-LEM-S series)



3.2 million pixels
 Smart Cameras: FHV7X-□032
 (for Autofocus Lens FHV-LEM-S series)



6.3 million pixels
 Smart Cameras: FHV7X-□063R
 (for Autofocus Lens FHV-LEM-S series)



Lens Modules: Standard Lens Modules (Autofocus)

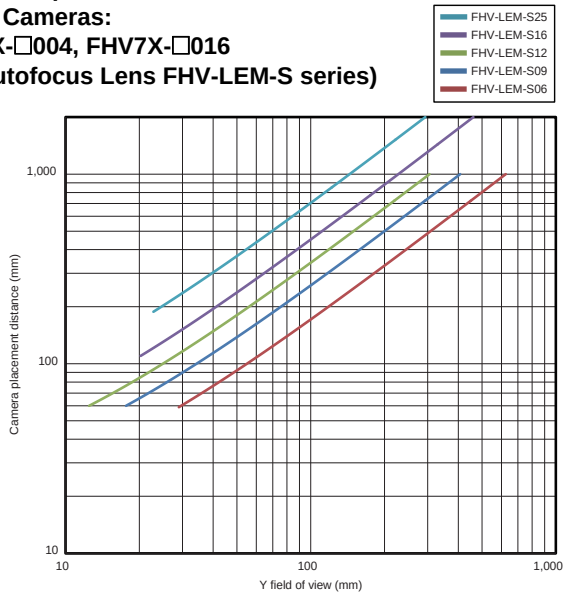
0.4 million pixels

1.6 million pixels

Smart Cameras:

FHV7X-□004, FHV7X-□016

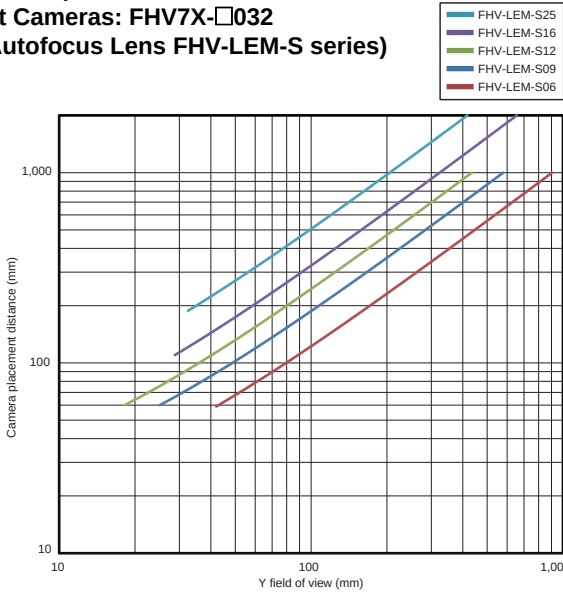
(for Autofocus Lens FHV-LEM-S series)



3.2 million pixels

Smart Cameras: FHV7X-□032

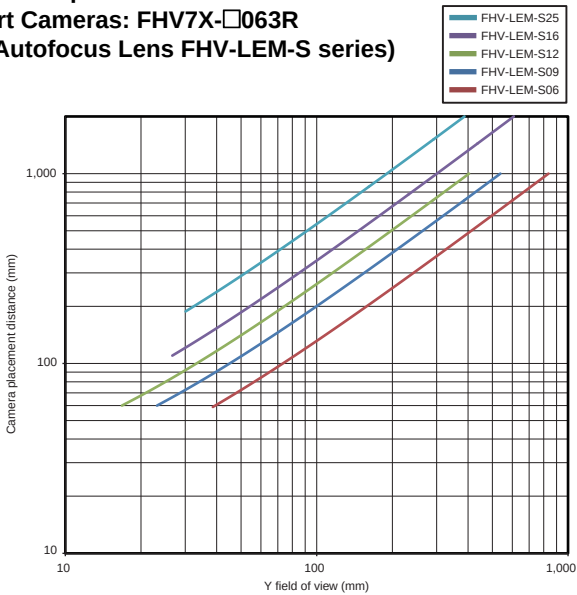
(for Autofocus Lens FHV-LEM-S series)



6.3 million pixels

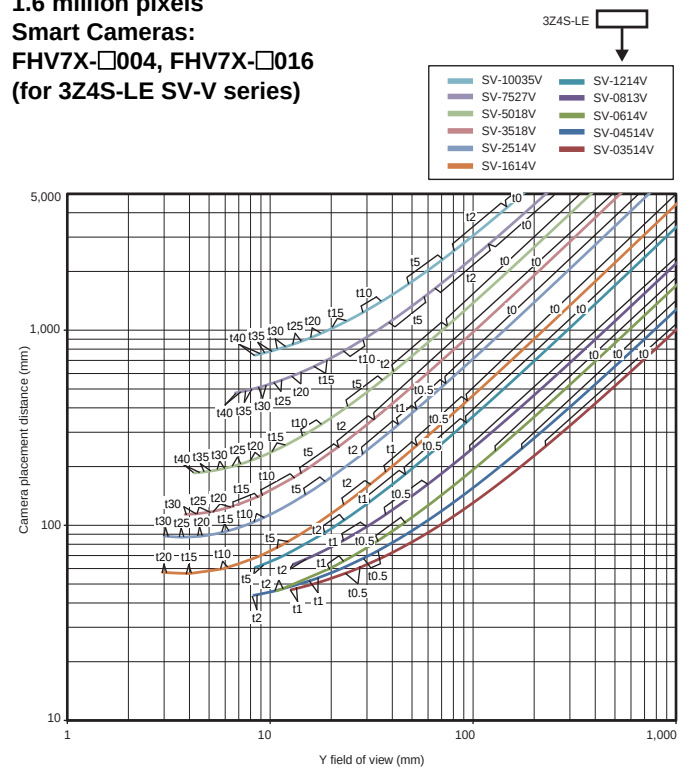
Smart Cameras: FHV7X-□063R

(for Autofocus Lens FHV-LEM-S series)

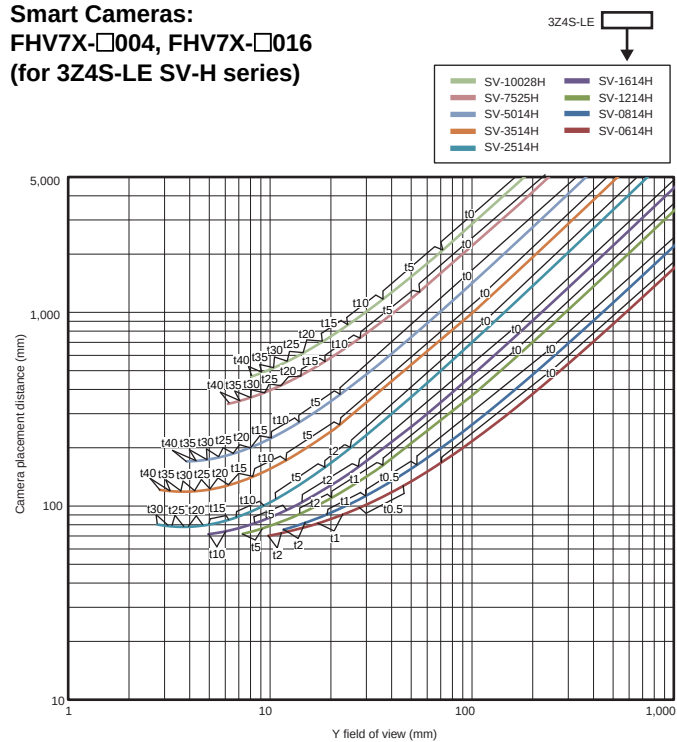


C Mount Lenses: Normal Lenses

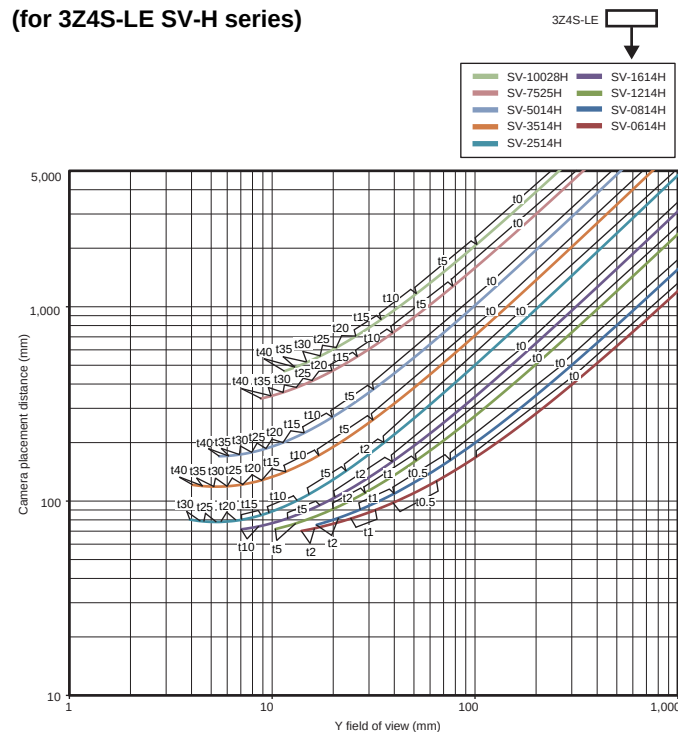
0.4 million pixels
1.6 million pixels
Smart Cameras:
FHV7X-□004, FHV7X-□016
(for 3Z4S-LE SV-V series)



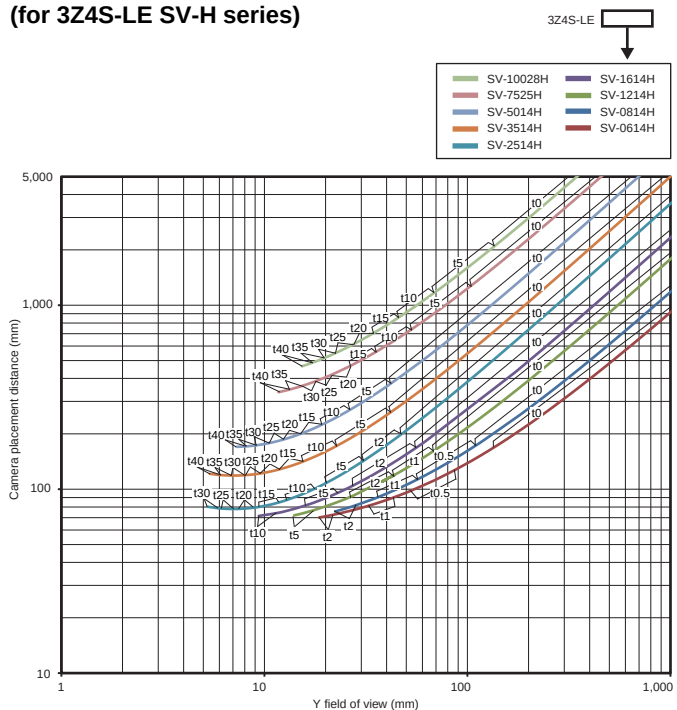
0.4 million pixels
1.6 million pixels
Smart Cameras:
FHV7X-□004, FHV7X-□016
(for 3Z4S-LE SV-H series)



3.2 million pixels
Smart Cameras: FHV7X-□032
(for 3Z4S-LE SV-H series)

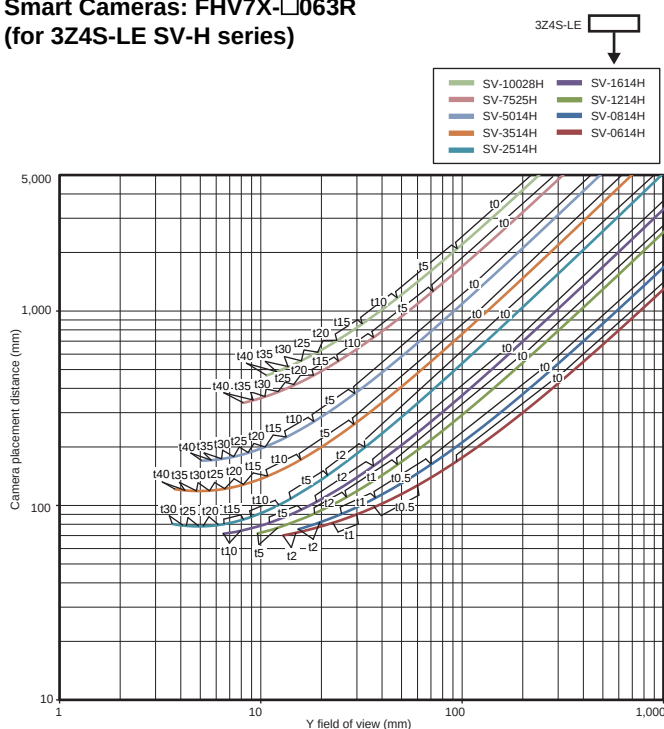


5 million pixels
Smart Cameras: FHV7X-□050
(for 3Z4S-LE SV-H series)



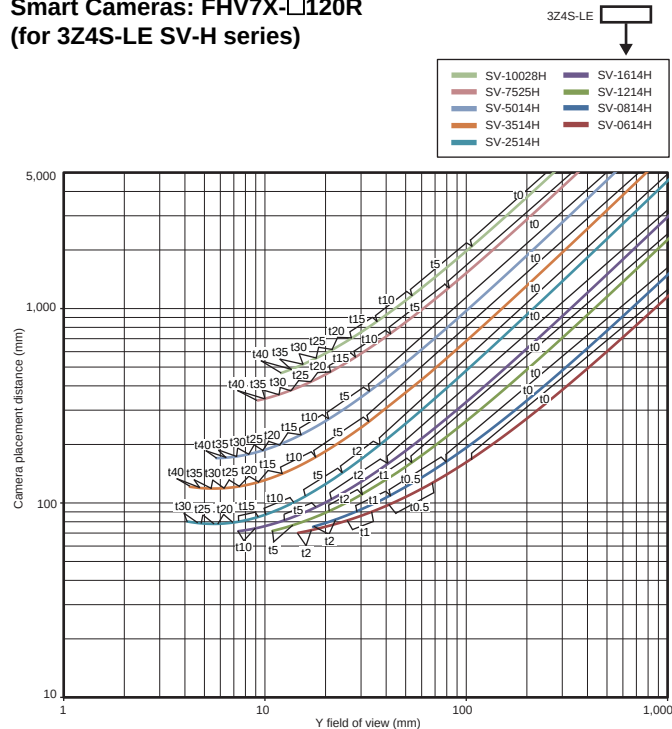
6.3 million pixels

Smart Cameras: FHV7X-□063R
(for 3Z4S-LE SV-H series)



12 million pixels

Smart Cameras: FHV7X-□120R
(for 3Z4S-LE SV-H series)

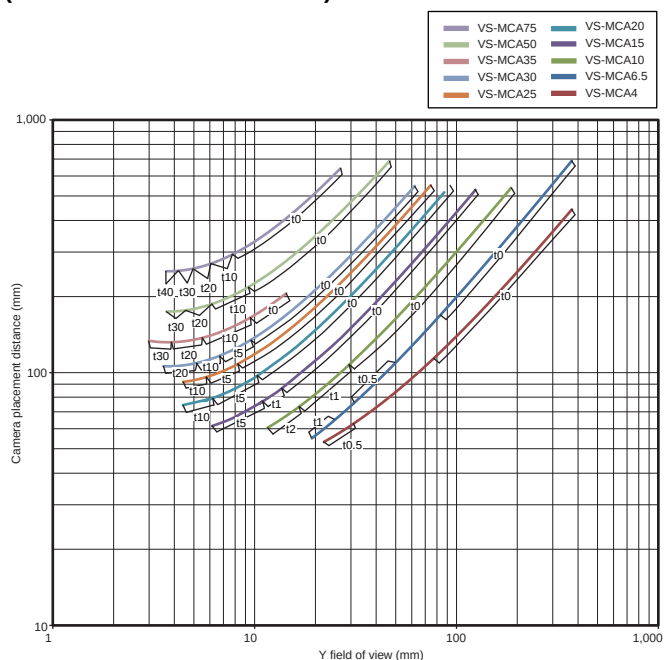


C Mount Lenses: Vibration/Shock-resistance Lens

400,000 pixels

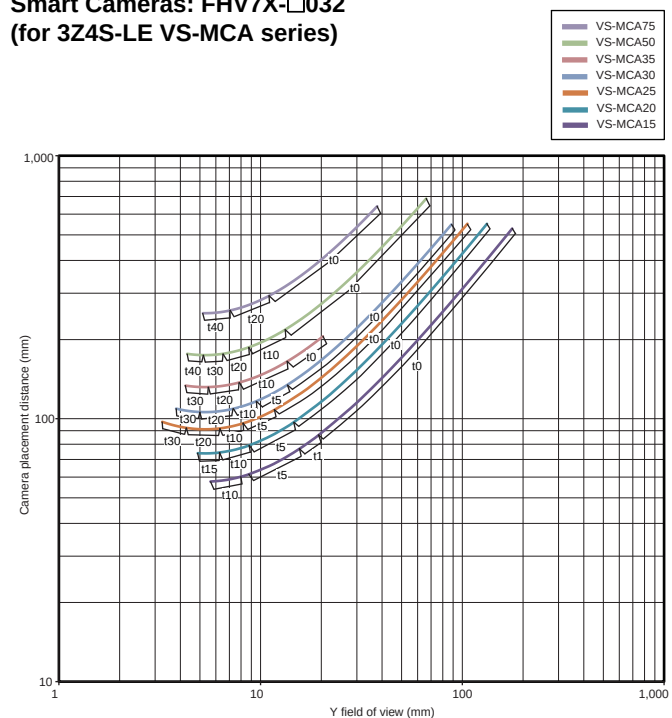
1.6 million pixels

Smart Cameras: FHV7X-□004, FHV7X-□016
(for 3Z4S-LE VS-MCA series)



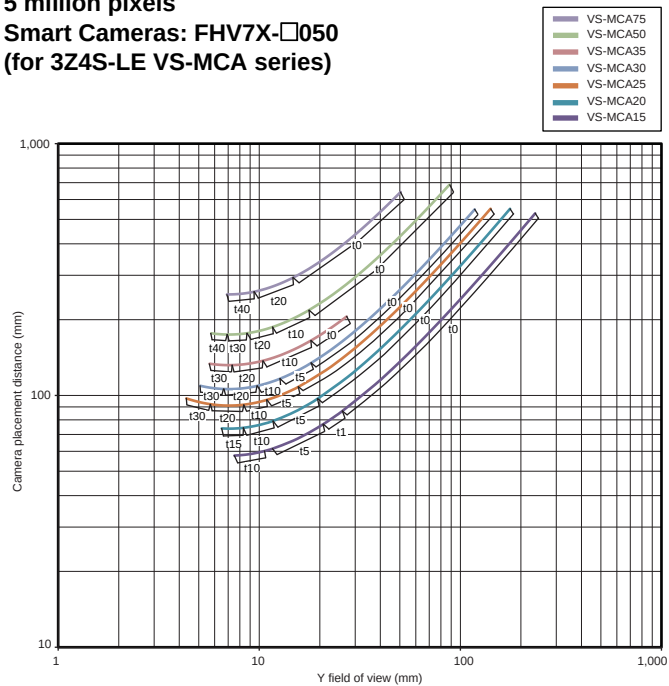
3.2 million pixels

Smart Cameras: FHV7X-□032
(for 3Z4S-LE VS-MCA series)

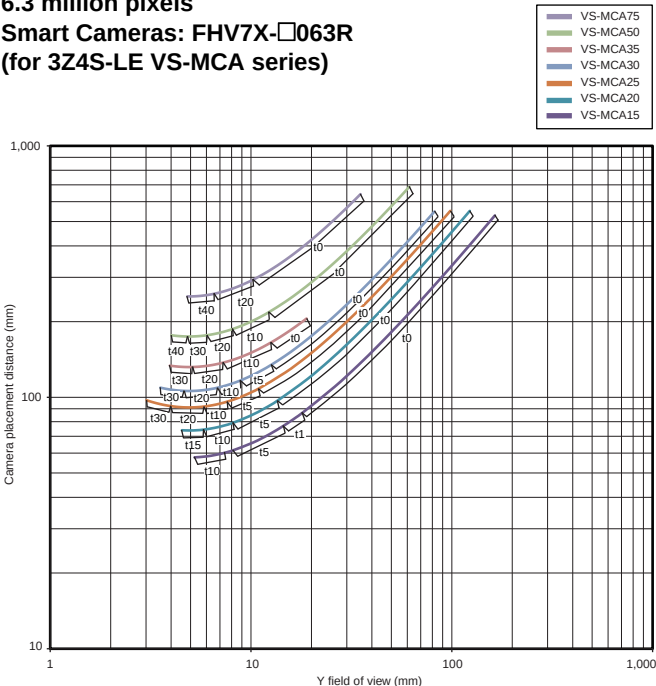


FHV7 Series

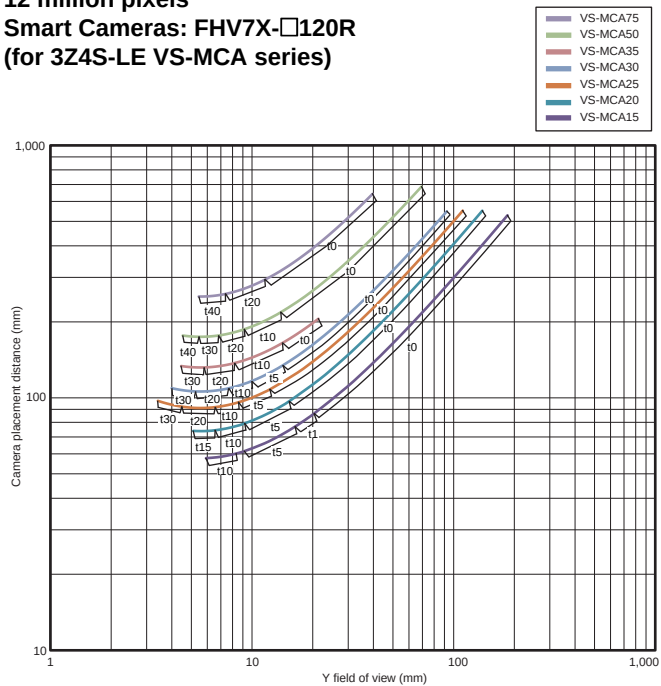
5 million pixels
Smart Cameras: FHV7X-□050
(for 3Z4S-LE VS-MCA series)



6.3 million pixels
Smart Cameras: FHV7X-□063R
(for 3Z4S-LE VS-MCA series)



12 million pixels
Smart Cameras: FHV7X-□120R
(for 3Z4S-LE VS-MCA series)



Related Manuals/Catalog

Cat. No.	Series	Manual
Z365	FH/FHV7	Vision System FH/FHV Series User's Manual
Z341	FH/FHV7	Vision System FH/FHV Series Processing Item Function Reference Manual
Z342	FH/FHV7	Vision System FH/FHV Series User's Manual for Communications Settings
Z408	FHV7	Smart Camera FHV Series Setup Manual
Q198	FLV/FL	FLV/FL Vision Accessory CATALOG

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