



## IV4-400MA

Smart camera Narrow field of view model Monochrome



\*Please note that accessories depicted in the image are for illustrative purposes only and may not be included with the product.

## Specifications

Model	IV4-400MA	
Type	Narrow field of view model	
Installed distance	From 400 mm <b>15.75"</b> *1	
Tools	Available modes	Standard Mode, Sorting Mode, AI Through Count Mode
	Tool with standard mode	Standard/Sorting Modes: AI Differentiate, Outline, ColorArea *2, Area *3, EdgePixels, ColorAverage *2, Brightness Avg *3, Width, Diameter, Edge Presence, Pitch, Color Prohibit, Position Adjustment, Hi-Sp. Adj (1-axis/2-axis), Blob Count, AI Identify, AI Count, Total, AI OCR, AI Trigger AI Through Count Mode: Count, Total
	Number of tools	65 tools *4
Field of view	Installation distance 400 mm <b>15.75"</b> : 58 (H) × 44 (V) mm to Installation distance 3000 mm <b>118.11"</b> : 464 (H) × 348 (V) mm (reference value)	
Switch settings (programs)	128 programs (with SD card)/32 programs (without SD card)	
Image receiving element	Type	1/2.9 inch monochrome CMOS
	Number of pixels	1280 (H) × 960 (V)
Image history	Number of storable images	100 images *5
	Save conditions	Logging Settings 1: NG only/OK near NG threshold *6/All – selectable. Logging Settings 2: Manually configured number before/after NG/Fixed interval – selectable *5
Focus adjustment	Auto *7	
Image data transfer	Transfer destination	microSD card/FTP server/SFTP server – selectable
	Transfer format	BMP/JPEG/iv4p/txt: Selectable, file name can be changed
	Transfer conditions	OK/NG/NG and OK near threshold *6/OK near threshold *6/All/Judgment Complete – selectable
Exposure time	12 μs to 10 ms *8	
Analysis information	RUN display	Tool-specific list (judgment results, match, match bar display) *9
	RUN information	Switchable between OFF/histogram/processing time/count/output monitor Histogram: Histogram, match (MAX, MIN, AVG), OKs, NGs Processing time: Processing time (latest value, MAX, MIN, AVG), cap. time (latest value, MAX, MIN, AVG) Count: No. of triggers, OKs, NGs, no. of trigger errors, Output monitor: Output-specific ON/OFF status *9
Lights	Illumination	Infrared LED
	Lighting method	Pulse lighting
Other functions	Image capture function	Digital zoom (×2, ×4), HDR, high gain, color filters *2, white balance *2, brightness correction, Smart Image Optimization, preliminary capture, trapezoidal shape correction, mirror inversion correction Capture range settings (with high-speed filter disabled: 1280×960, 640×480, 320×240, 160×120. With high-speed filter enabled: 640×480, 320×240, 160×120, 80×60)

	Tool functions	Additional Learning (AI Differentiate, AI Identify, AI OCR, AI Count, AI Trigger. AI Through Count Mode: Count), remove outline, masking function, color extraction/exclusion *2, color histogram function *2, monochrome histogram function *3, scaling function
	Utilities	List of NG sensor occurrences, NG hold, test run, I/O monitor, security settings (2-step password, Enhanced Security Mode), simulator *10, adding FTP image information, multiple position adjustment, adding multiple masters, high-speed program switching, automatic program switching, automatic settings backup/restore, mid-operation threshold changes, excessive input trigger time detection
Indicators		OUT, TRIG, STATUS, LINK/ACT, SD
Input	Type	Switchable between non-voltage input/voltage input For non-voltage input: ON voltage 2 V or lower, OFF current 0.1 mA or lower, ON current 2 mA (short circuit) For voltage input: Maximum input rating 30 V, ON voltage 18 V or higher, OFF current 0.15 mA or lower, ON current approx. 2 mA (at 24 V)
	Number of inputs	6, 3 of which are selectable between IN/OUT
	Function	IN1: External trigger. IN2, IN3, I/O1 to I/O3: Assign any desired function. Assignable functions: Program switching, error clear, ext. master image registration, SD card save stop, OCR serial no. increment, reset
Output	Type	Open collector output: Switchable between NPN/PNP and N.O./N.C. Maximum rating: 30 V, 50 mA, residual voltage 1.5 V or lower *11
	Number of outputs	6, 3 of which are selectable between IN/OUT
	Function	Assign any desired function. Assignable functions (Standard/Sorting Mode): Total status (OK/NG), operation, busy, trigger ready, strobe, position adjustment result, tool-specific judgment results, tool-specific logic calculation results, error, SD card error, parts judgment results, master judgment results, insufficient SD capacity, file transfer in progress, AI Trigger output Assignable functions (AI Through Count Mode): Operation, busy, error, tool-specific count up, tool-specific judgment result, tool-specific logic calculation result
Power/I/O	Connector	M12 12-pin A-code male connector
	PoE	PoE Power Class 4/6 *12
Ethernet	Standard	1000BASE-T/100BASE-TX
	Connector	M12 8-pin X-code female connector
Network function		FTP client, SFTP client, SNMP client, OPC UA server, MQTT client
Interface compatibility	Built-in Ethernet	EtherNet/IP, PROFINET CC-B *13, TCP/IP Nonprocedural Comm (x2 connections)
	Communication unit (IV4-CU1)	PROFINET CC-C *14, EtherCAT®
Expanded memory		microSD card (microSD/microSDHC) *15
Power supply	Power voltage	24 V +25%, -20% (including ripple) *16
	Power consumption	3.4 A or less (at 19.2 V), 2.7 A or less (at 24.0 V)(no AI imaging illumination unit; with communication unit; includes 120 mA output load) 3.3 A or less (at 19.2 V), 2.6 A or less (at 24.0 V)(no AI imaging illumination unit; no communication unit; includes 120 mA output load) 2.1 A or less (at 19.2 V), 1.8 A or less (at 24.0 V)(with AI imaging illumination unit; with communication unit; includes 120 mA output load) *17
	Average power consumption	9.3 W (without AI imaging illumination unit) 12.8 W (with AI imaging illumination unit)
Environmental resistance	Enclosure rating	IP67 *18
	Ambient temperature	0 to +50°C 32 to +122°F (no freezing) *19
	Relative humidity	85% RH or less (no condensation)
	Vibration resistance	Frequency: 10 to 500 Hz; Power spectral density: 0.816 G <sup>2</sup> /Hz; X, Y and Z directions *20
	Shock resistance	500 m/s <sup>2</sup> 1640.4 ft/s <sup>2</sup> 3 times in each of 6 directions *20
Material		Main unit case: Aluminum die-casting. Front cover: Acrylic (hard coating). Back plastic cover and plastic lid: PBT. Operation indicator cover: TPU.

	Power supply connector: PA/POM. Ethernet connector: Copper alloy + nickel plating. Label: PC. Power supply connector waterproof cap: PC + ABS alloy. Ethernet connector waterproof cap: PC *21
Weight	Approx. 370 g <b>13.06 oz</b> (no AI imaging illumination unit) Approx. 560 g <b>19.77 oz</b> (with AI imaging illumination unit)

\*1 If using at 3 m **9.8'** or more, it is recommended that the polarizing filter be removed before use.

\*2 Color type only.

\*3 Monochrome type only.

\*4 Can be placed on a program-specific basis. This is the total combined number of differentiation tools and position adjustment tools. Up to 64 differentiation tools can be placed. Up to 16 AI Count/AI OCR tools can be placed. In Sorting Mode, 8 differentiation tools can be placed. In AI Through Count Mode and High Speed/Standard Mode, the number of tools that can be placed is two AI Count tools and one Total tool. For high accuracy, six AI Count tools and two Total tools can be placed.

\*5 Saved to the sensor's internal memory. Images saved to the sensor's internal memory can be backed up to a PC using the PC software (IV-H1SN) or to a USB memory stick or microSD card plugged into the control panel (IV4-CP70) or Display Expansion Unit (IV4-DU10).

\*6 AI Differentiate, AI Identify, AI OCR(Show Matching Rate) only.

\*7 Focus position can be automatically adjusted during installation. It cannot be adjusted while running. Focus position can be registered separately for each program.

\*8 Maximum exposure time is 500 ms only when lighting is set to OFF.

\*9 Can be displayed on the control panel (IV4-CP70) or Display Expansion Unit (IV4-DU10), or via PC software (IV-H1SN).

\*10 Can be used with PC software (IV-H1SN).

\*11 Set total output to 120 mA or less. Residual voltage specifications apply to an output current of 20 mA or less. For an output current of 50 mA, the value is 2.0 V.

\*12 For PoE-powered devices, IEEE802.3at Power Class 4 or higher is recommended when using AI imaging illumination units; IEEE802.3bt Power Class 6 or higher is recommended when an AI imaging illumination unit is not in use. When using PoE, device operation may be restricted due to power limitations.

\*13 Conformance Class B, applicable protocols: LLDP, SNMP

\*14 Conformance Class C, applicable protocols: LLDP, SNMP, MRP

\*15 Use KEYENCE-recommended products.

\*16 24 VDC +25%/−10% (including ripple) when using OP-88656 (10 m **32.8'**).

\*17 The system is designed to lower its peak current when equipped with an AI imaging illumination unit. Without it, the peak current will be higher.

\*18 Except when polarizing filters (OP-88640/OP-88641/OP-88644/OP-88645) are installed.

\*19 When the operating ambient temperature exceeds 40°C **104°F**, install in accordance with KEYENCE instructions, taking appropriate measures for heat dissipation to ensure that the case temperature does not exceed the rated 75°C **167°F**. Refer to the instruction manual for more information.

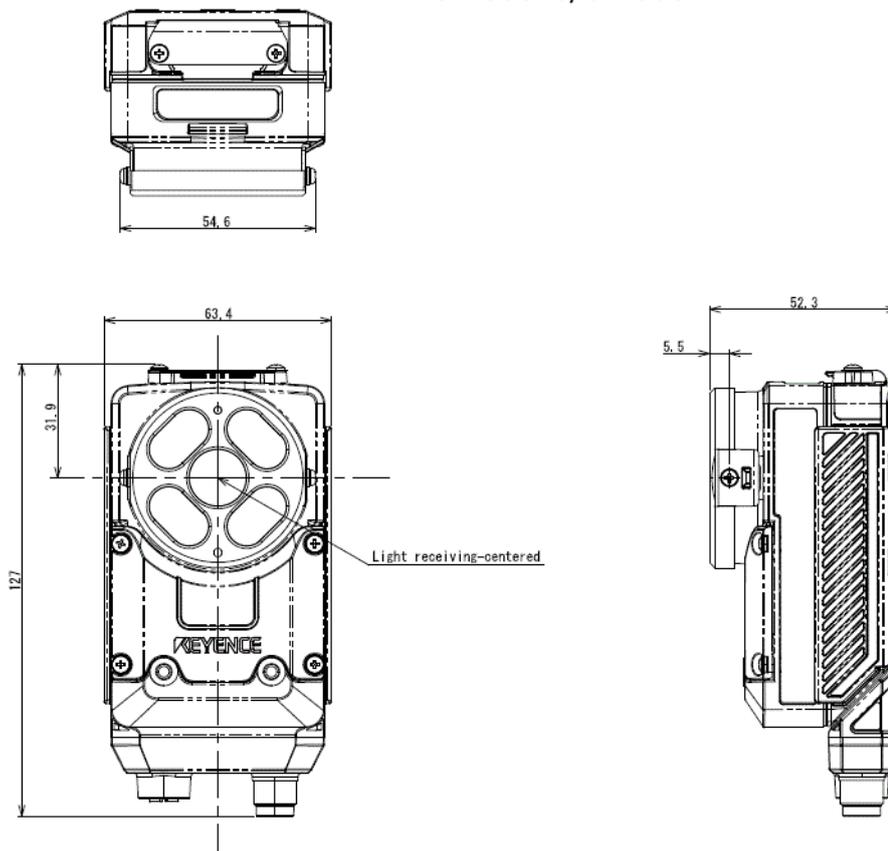
\*20 Except when dome attachment (IV3-D10) is installed.

\*21 ESD safe and IEC61340-5-1 compliant.

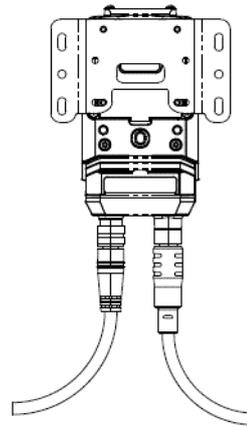
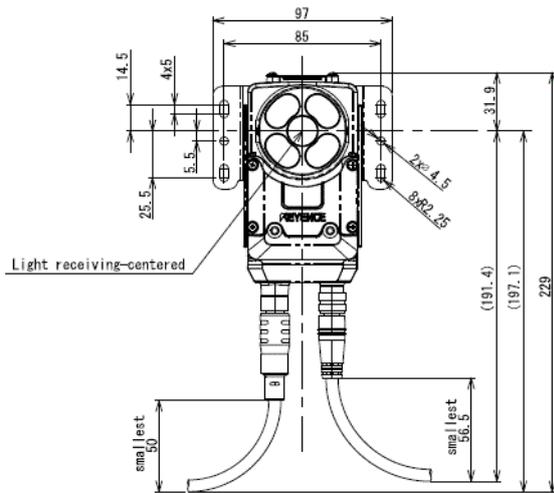
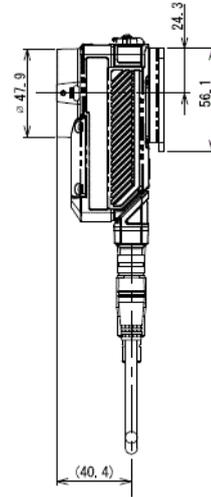
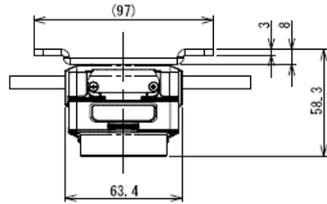
## Dimensions

\* Download CAD file or product manual for larger image/text and more detail.

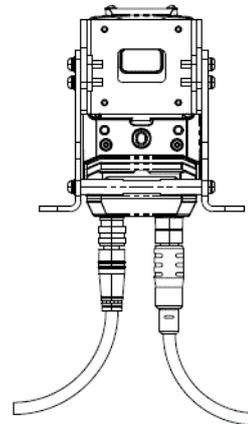
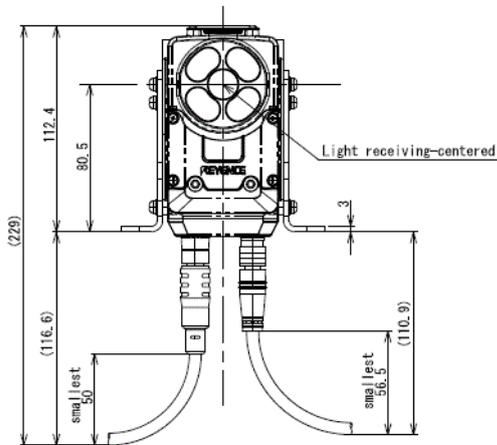
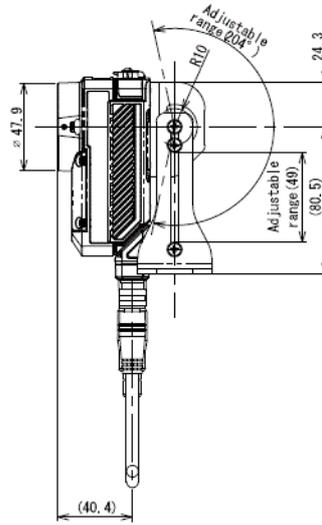
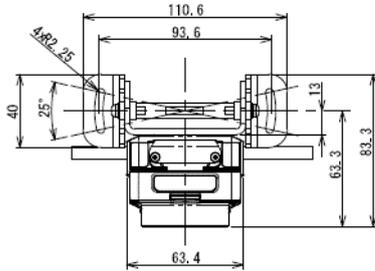
IV4-400CA/400MA/500CA/500MA/600CA/600MA  
OP-88640/OP-88641



IV4-400CA/400MA/500CA/500MA/600CA/600MA  
OP-88911

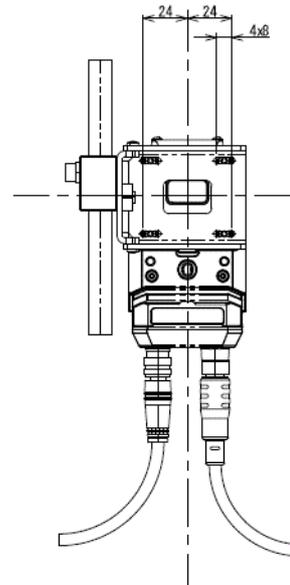
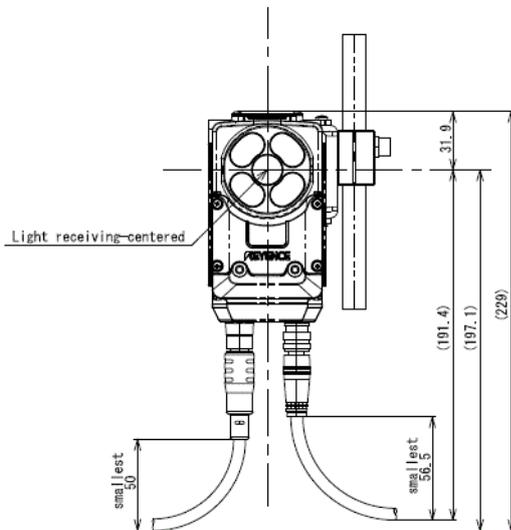
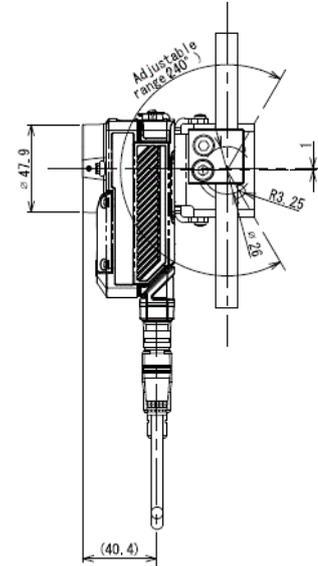
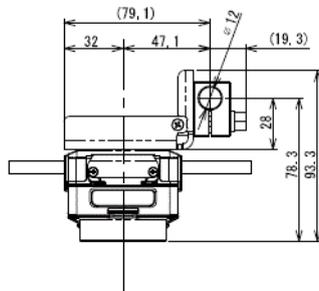


IV4-400CA/400MA/500CA/500MA/600CA/600MA  
OP-88912

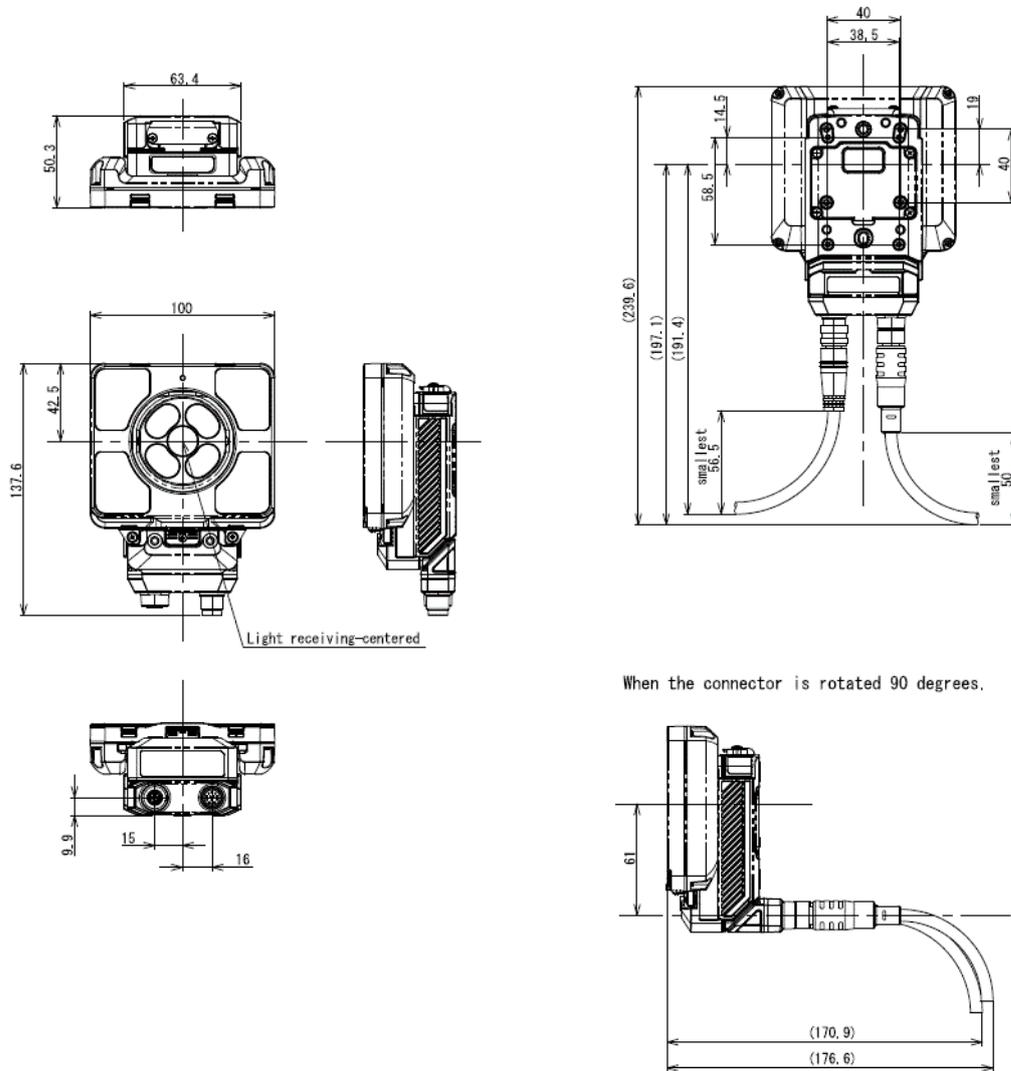


IV4-400CA/400MA/500CA/500MA/600CA/600MA  
OP-88913

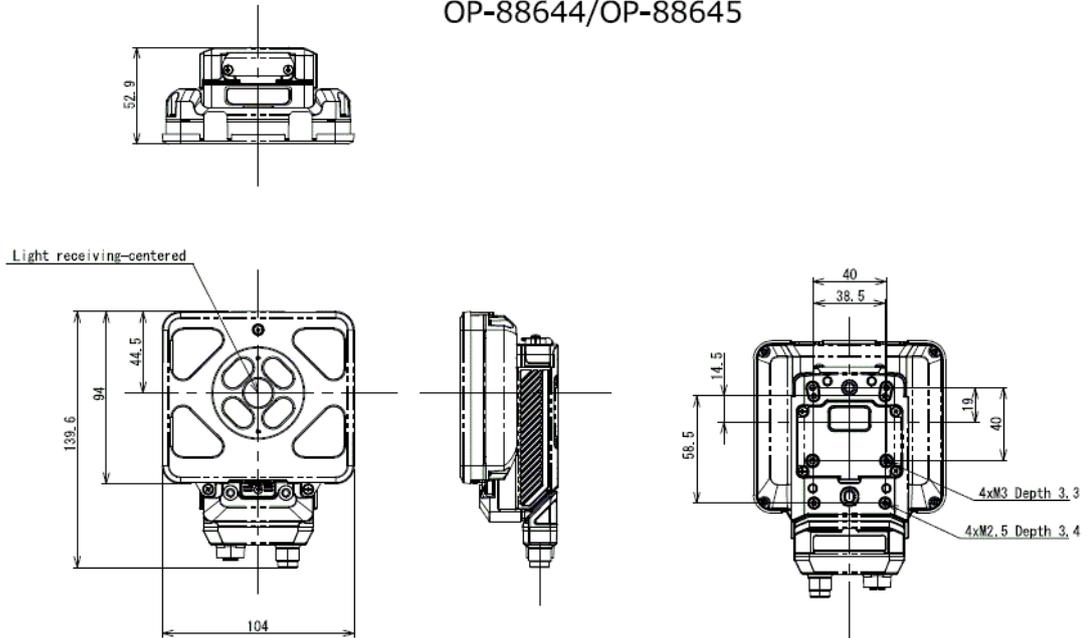
A support pipe of  $\phi 12$  is not included  
in OP-88913.



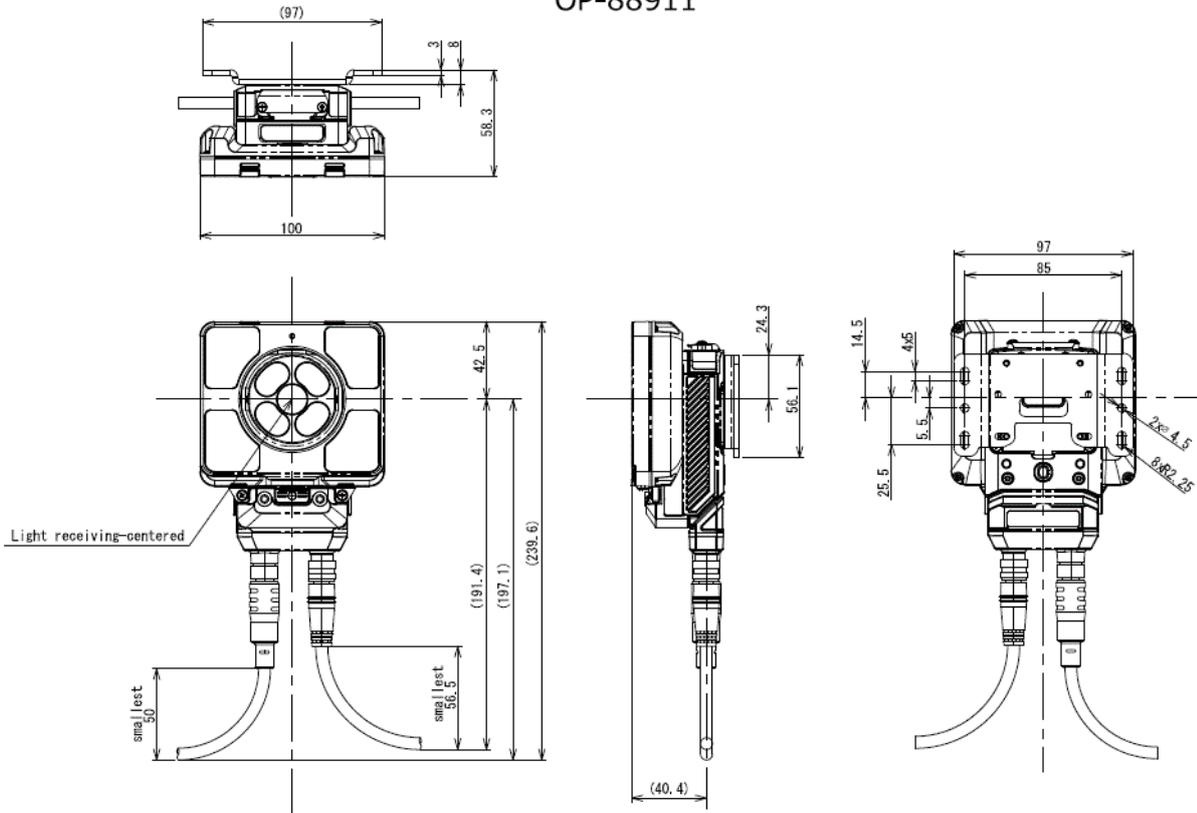
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 IV4-L4C/L4M/L5C/L5M/L6C/L6M



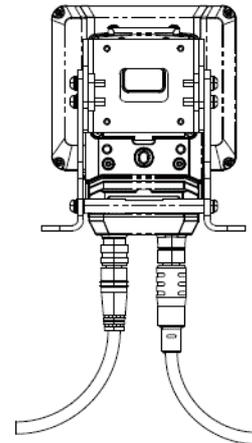
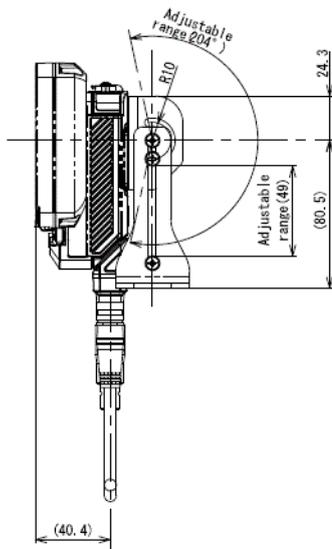
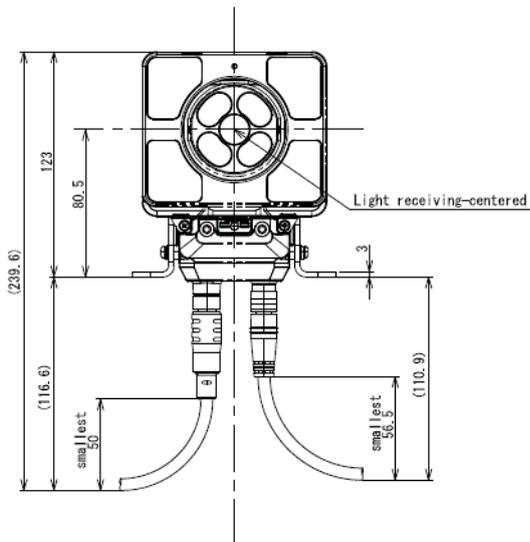
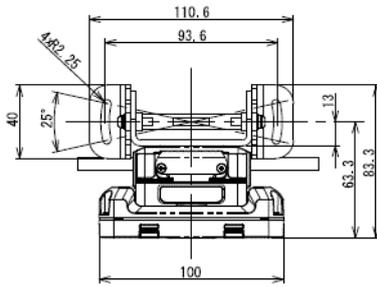
IV4-400CA/400MA/500CA/500MA/600CA/600MA  
 IV4-L4C/L4M/L5C/L5M/L6C/L6M  
 OP-88644/OP-88645



IV4-400CA/400MA/500CA/500MA/600CA/600MA  
 IV4-L4C/L4M/L5C/L5M/L6C/L6M  
 OP-88911

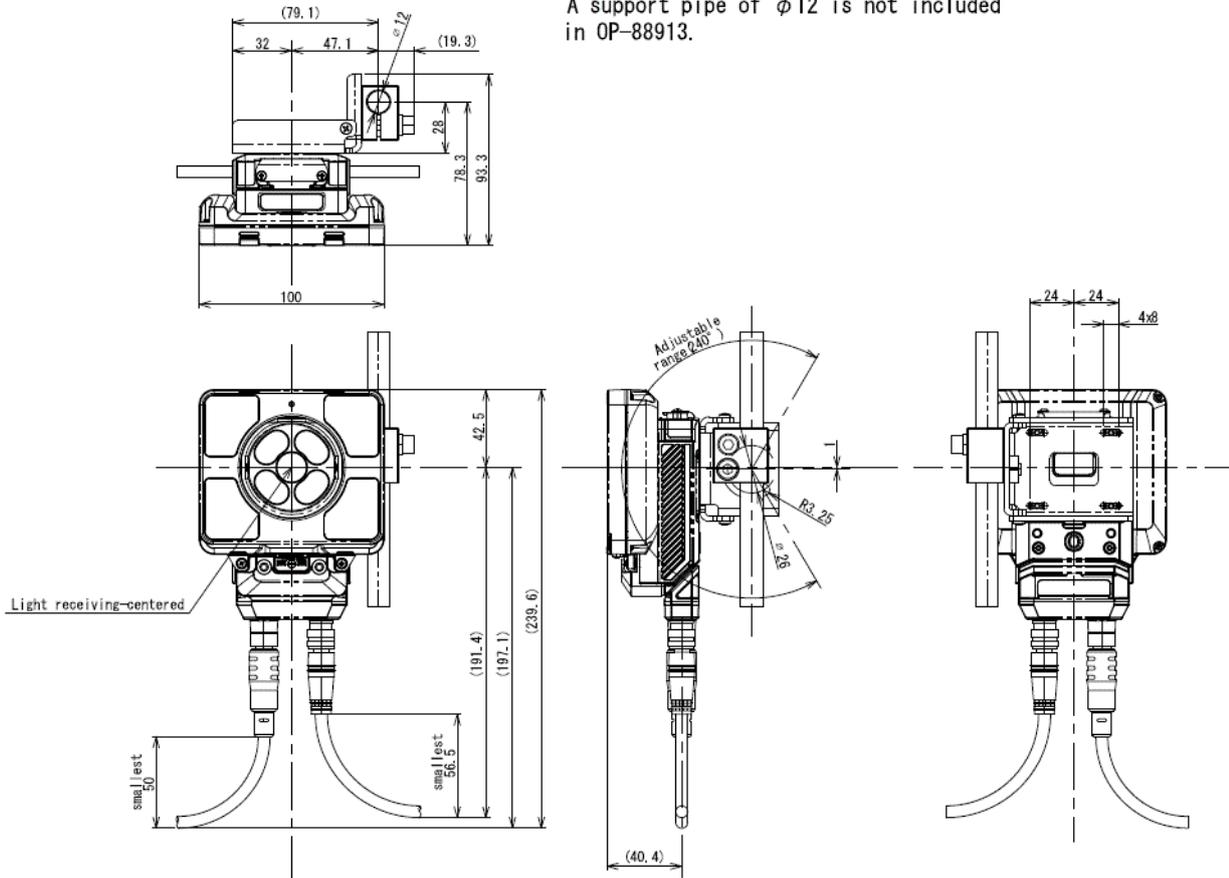


IV4-400CA/400MA/500CA/500MA/600CA/600MA  
 IV4-L4C/L4M/L5C/L5M/L6C/L6M  
 OP-88912

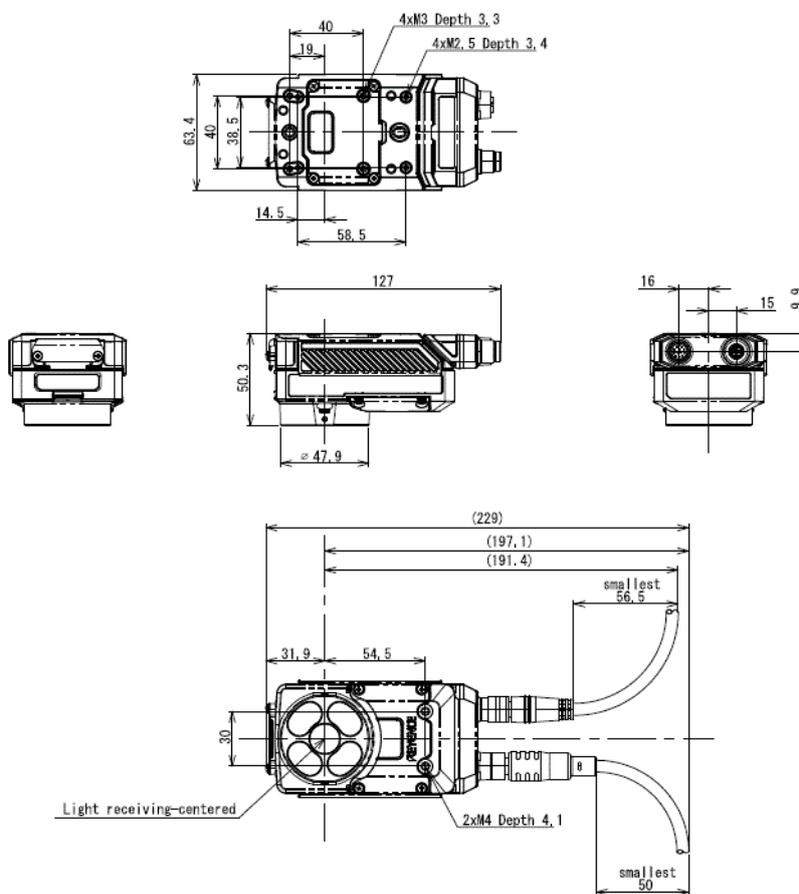


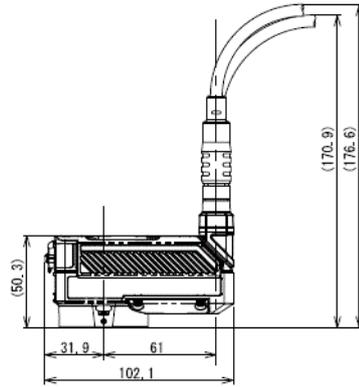
IV4-400CA/400MA/500CA/500MA/600CA/600MA  
 IV4-L4C/L4M/L5C/L5M/L6C/L6M  
 OP-88913

A support pipe of  $\phi 12$  is not included  
 in OP-88913.



IV4-400CA/400MA/500CA/500MA/600CA/600MA





When the connector is rotated 90 degrees.