

KEYENCE

NEW Vision Sensor with Built-in Lighting

IV Series



EtherNet/IP™



Amplifier-integrated models



Smallest in its class
ultra-compact models

NEW



1 Minute SETUP

A VISION SENSOR THAT ANYONE CAN USE



Intelligent sensor
I-SERIES

IV Series

NEW VISION SENSOR FOR PRESENCE DETECTION

NEW IDEAS

FOR HANDLING DIFFICULT DETECTION



AMPLIFIER-INTEGRATED MODELS

IV Series

APPLICATION



PRESENCE DETECTION



COLOUR



SHAPE



ORIENTATION

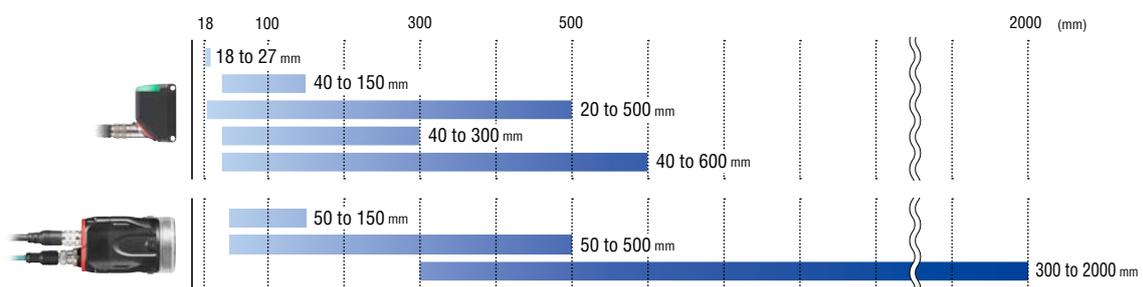


ULTRA-COMPACT MODELS

IV-G Series **NEW**

A LINEUP WITH SELECTABLE INSTALLATION DISTANCES

Covers a range up to 111x; from 18 mm for close range detection to 2000 mm for long distances.



1 Minute

SETUP IV Series

OUTSTANDING TECHNOLOGY

FOR STABLE DETECTION

Clear images are obtained with the high-intensity illumination and high-performance lenses, equipped as standard.

- FIRST-IN-CLASS AUTOMATIC FOCUS MECHANISM
- LOW DISTORTION
- LIGHTING ATTACHMENTS



EASY TO USE

1 MINUTE SETUP

Setup is completed in approximately 1 minute thanks to "Easy Navigation".

1 Minute **SETUP**

SIMPLE ONE-TOUCH SETUP



AFFORDABLY PRICED

REDUCE INTRODUCTION COSTS

Choose from 13 different sensor heads to suit your needs and reduce costs.

STABLE DETECTION

OUTSTANDING OPTICAL TECHNOLOGY



FIRST-IN-CLASS AUTOMATIC FOCUS

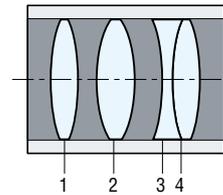
Our first-in-class automatic focus mechanism has evolved even further. We have newly developed this mechanism to be more compact and to have higher accuracy. By combining the automatic focus drive unit with the lens case and then designing them in the optimal manner, our mechanism is 40% more compact than conventional ones. Also, by improving the durability of the drive unit, this compact automatic focus mechanism can operate over a wider range than conventional mechanisms.



LOW DISTORTION

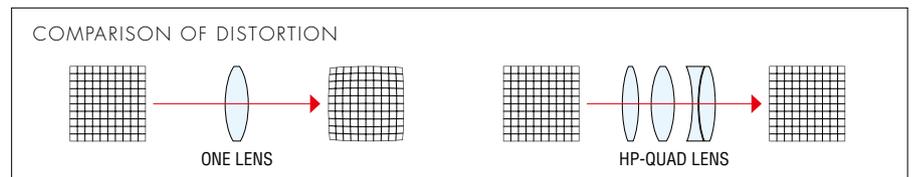
HP-QUAD* LENS

The newly developed lens contains 4 layers of glass that achieve low aberration with high light-gathering power. It captures bright, clear images with low distortion for stable detection.



The Quad lens captures an image of the entire field of view under uniform conditions.

*High Precision-Quad



LIGHTING ATTACHMENTS

DOME LIGHT



Effective in reducing glare. Generating indirect light from various directions ensures the object is uniformly illuminated. No external power supply is necessary, which reduces introduction costs to 1/10th of conventional lights.



Without dome attachment



With dome attachment [IV-D10]

POLARISED FILTER



Glare from glossy surfaces is reduced because only one direction of the light wave components is transmitted. The compact size enables easy installation.



Without polarised filter



With polarised filter [OP-87436]

*This method is more effective than a polarisation filter at reducing glare.

NEWLY DEVELOPED PATTERN TOOL FOR STABLE DETECTION

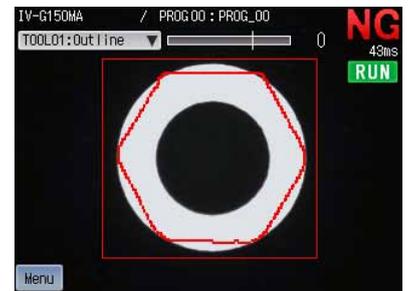
SHAPE DETECTION

The match percentage of the object is calculated based on the shape of the registered master image. Brightness differences or differences in individual surface conditions, which were previously difficult to handle with normalised correlation methods (pattern matching) can now be identified.

Detection of contour difference



PASS

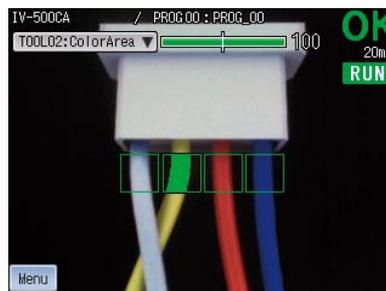


FAIL

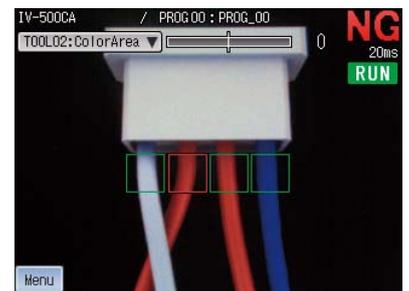
AREA

Using the registered master area (number of pixels) as reference, the difference in area from the inspection object is calculated. When using a colour model, judgement can be made based on the desired area of the specified colour. When using a monochrome model, brightness is judged by the area binarised in black and white.

Detection by cable colour difference



PASS



FAIL

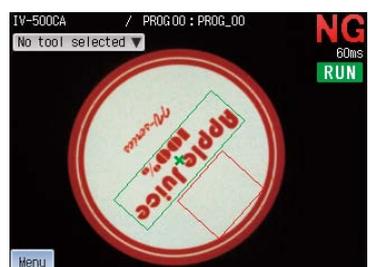
POSITION ADJUSTMENT

If the object is misaligned, 100% inspection cannot be achieved because the object may be outside the inspection area. The position adjustment function calculates the amount of misalignment from the master image in order to correct the position, and enable correct judgement. In addition, 360° rotation is supported for high speed tracking. This means you don't need to worry about misalignment of the targets.

Detection of sticker presence/absence by using position adjustment



PASS



FAIL

SIMPLY EASY

1 Minute SETUP

SIMPLE ONE-TOUCH SETUP



AUTOMATIC
BRIGHTNESS ADJUSTMENT

Brightness adjustment is completed with just the press of a button. Thanks to the built-in lighting, which is optimised for stable detection, there is no need to adjust settings such as the lighting type, colour, and installation distance. Additionally, fine adjustments requiring advanced imaging skills - such as adjustments to the gain and exposure time - are also automatically optimised.



START

AUTOMATIC
FOCUSING

Focusing is also completed with just one button press. The first-in-class automatic focus mechanism enables high-speed and highly accurate focusing, an operation that conventionally has been done manually while watching the screen.



Approximately 15 seconds

PC software is available

The IV Series can be set up with an intelligent monitor (IV-M30) or a PC. As PCs can have a larger display, setup procedures are even easier to understand and can be quickly set up by first time users.



JUST OUTLINE

TOOL SETUP

The tool setup, which establishes the detection details, can also be completed intuitively. For shape judgements, the user only has to outline the target. For colour judgements, the user only has to touch the target. The IV Series then recognises and detects the target automatically.



Approximately 45 seconds



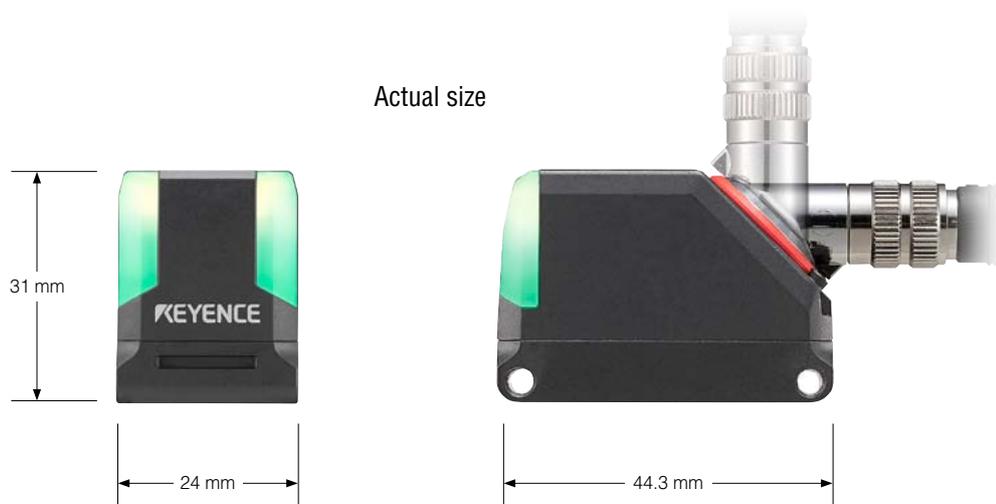
▶ 1 minute

INSTALL ANYWHERE

ULTRA-COMPACT MODEL THAT IS THE SMALLEST IN ITS CLASS

ULTRA-COMPACT MODEL NEW

Install anywhere with minimal space restrictions



FLEXIBLE LAYOUT A CONNECTOR THAT CAN ROTATE 330°

The cable connector can be rotated by up to 330° to match the available space and installation conditions. Together with the smallest head size in its class, this ensures a high degree of freedom when it comes to installations.

ADJUSTABLE FIELD OF VIEW AND DISTANCE

VAST LINEUP OF SENSOR HEADS

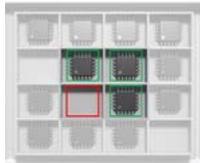
FIELD OF VIEW

WIDE 2.2 times more than conventional models (wide field of view model) **NEW**

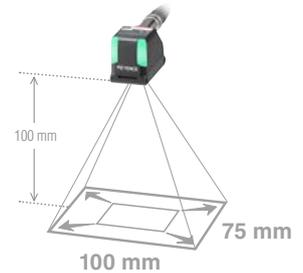
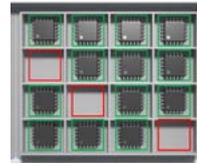
WIDE FIELD OF VIEW EVEN AT CLOSE RANGE

Installation distance: The field of view (the longer direction) makes use of a 1:1 wide-angle lens. This expands the size of the field of view to 2.2 times that of the standard sensor model at the same installation distance.

CONVENTIONAL
(standard sensor model)
IV-500MA



WIDE VIEW
(wide field of view sensor model)
IV-G600MA

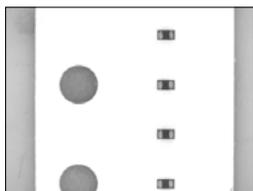


ZOOM 3 times more than conventional models (ultra-narrow field of view model) **NEW**

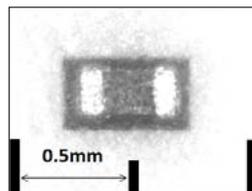
DETECTS EXTREMELY SMALL TARGETS

The sensor uses a magnifying lens with a minimum field of view of 4 x 3 mm (1 x 0.75 mm when using the digital zoom). This enables imaging with a zoom that is 3 times the conventional model.

CONVENTIONAL
(close range sensor model)
IV-150MA



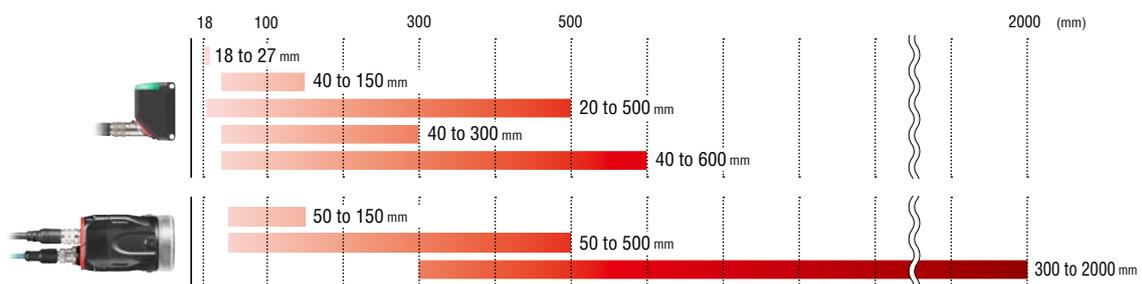
ULTRA-NARROW FIELD OF VIEW SENSOR MODEL
IV-G150MA + OP-87902



Magnifying lens attachment
OP-87902

A LINEUP WITH SELECTABLE INSTALLATION DISTANCES

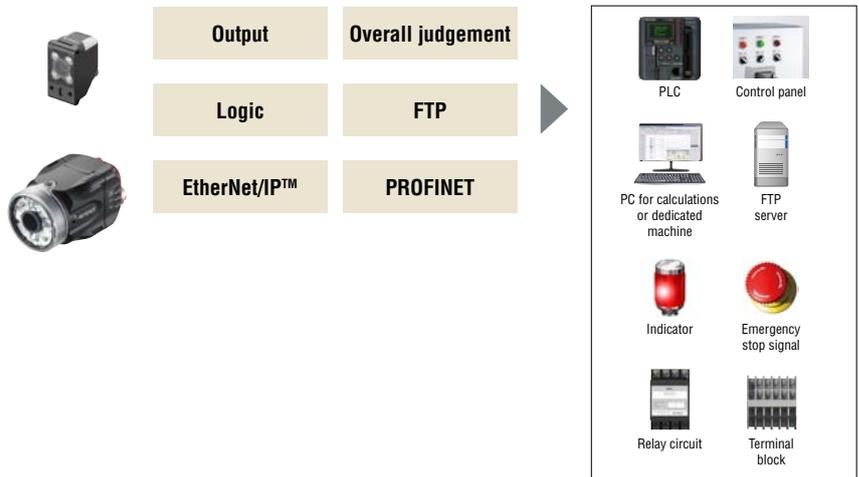
Covers a range up to 111x; from 18 mm for close range detection to 2000 mm for long distances.



SIMPLE OUTPUT AND COMMUNICATION

OUTPUT SPECIFICATIONS THAT SUPPORT ALL CONNECTED DEVICES

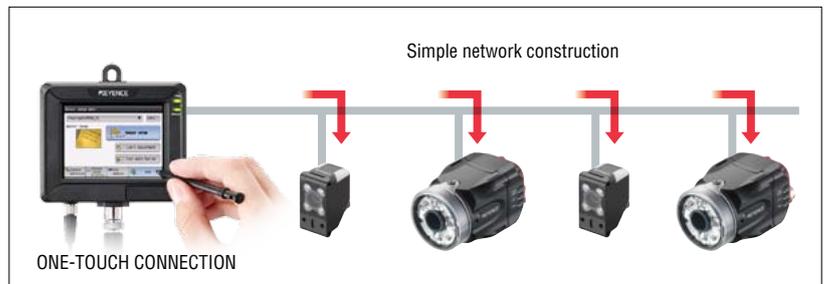
Up to 16 detection results can be freely combined to match the output destination and the usage conditions. The sensor can easily be attached to existing equipment and a PLC is not required. Also, the FTP client function supports image saving and global communication standards.



SIMPLE CONNECTION FUNCTION

REQUIRES NO INITIAL SETUP FOR REMOTE OPERATIONS AND NETWORKING:
[SIMPLE CONNECTION & SWITCHING FUNCTION]

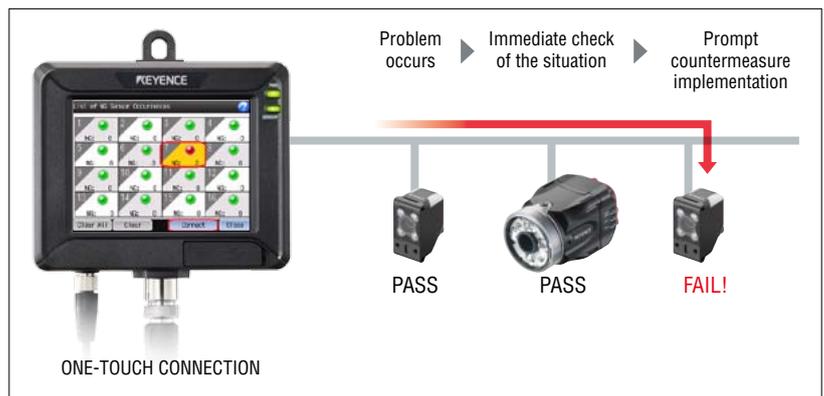
This function makes it easy to switch between sensors without troublesome initial setup such as assigning IP addresses and registering the devices to connect to. The result is major reductions in the initial setup, when operating remotely over Ethernet and when constructing a network with multiple units.



DETERMINE THE CAUSE OF PROBLEMS IMMEDIATELY:
[FAILING SENSOR LIST & SWITCH FUNCTION]

With this function, when multiple sensors are connected, it is possible to use one-touch control to switch to the sensor that made a failing judgement. This makes it possible to immediately check the situation when a problem occurs, which reduces the time spent tracking down the source of and resolving the problem.

*This function is provided with only IV-M30.



EXTENSIVE PC SOFTWARE AT AN AFFORDABLE PRICE

SOFTWARE FOR IV SERIES, IV-NAVIGATOR

IV-H1

The IV Series can be set up with an intelligent monitor (IV-M30) or a PC. As PCs can have a larger display, setup procedures are even easier to understand and can be quickly set up by first time users.

Setup flow shows the current step at a glance

Large, easy to see image

Parameter setup fields show the current value

Parameters can be set directly



SIMULATION FUNCTION

This function allows you to check and modify the program configurations and perform operation simulations based on the image history without connecting the sensor. This enables easy computation of the optimal thresholds while looking at the detection result statistics and histogram, even when you are away from the actual worksite.

Run operations using the sensor.
(The image history is recorded.)

Transfer the configuration from the sensor.



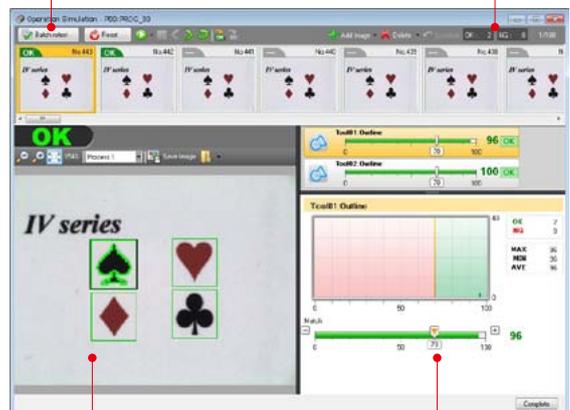
Transfer the configuration to the sensor.

NAVIGATOR Sensor Setup Simulation
Check/modify the configuration.

IV Sensor Simulation
Use the image history to check operations.

Rerun all tests button

OK/NG count



The operation screen is displayed.

The threshold can be changed.

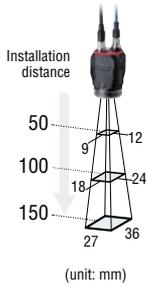
LINEUP CONTAINING 13 MODELS FOR A VARIETY OF SITUATIONS

AMPLIFIER-INTEGRATED MODELS

CLOSE RANGE SENSOR MODEL



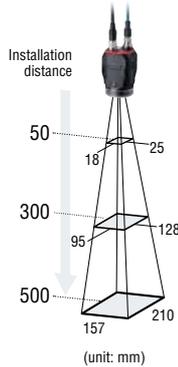
Monochrome AF type
IV-150MA
Monochrome MF type
IV-150M



STANDARD SENSOR MODEL



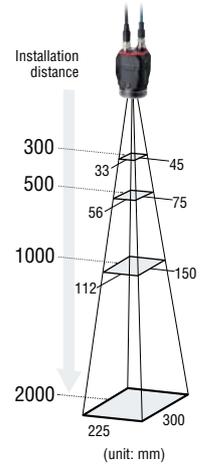
Colour AF type
IV-500CA
Colour MF type
IV-500C
Monochrome AF type
IV-500MA
Monochrome MF type
IV-500M



LONG RANGE SENSOR MODEL



Monochrome AF type
IV-2000MA
Monochrome MF type
IV-2000M



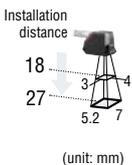
AF...Automatic focus model MF...Manual focus model
*View and optical axis has individual differences.

ULTRA-COMPACT MODELS NEW

ULTRA-NARROW FIELD OF VIEW SENSOR MODEL (WITH ATTACHMENT)



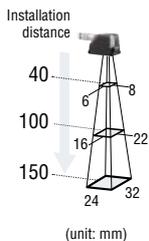
Monochrome AF type
IV-G150MA
+
Magnifying lens attachment
OP-87902



NARROW FIELD OF VIEW SENSOR MODEL



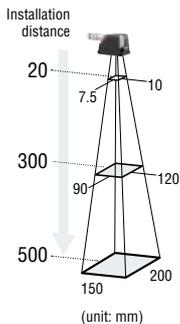
Monochrome AF type
IV-G150MA



STANDARD SENSOR MODEL



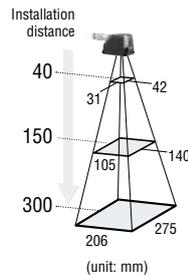
Colour AF type
IV-G500CA
Monochrome AF type
IV-G500MA



WIDE FIELD OF VIEW SENSOR MODEL (COLOUR)



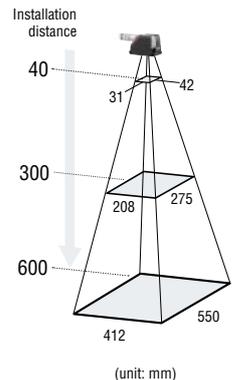
Colour AF type
IV-G300CA



WIDE FIELD OF VIEW SENSOR MODEL (MONOCHROME)



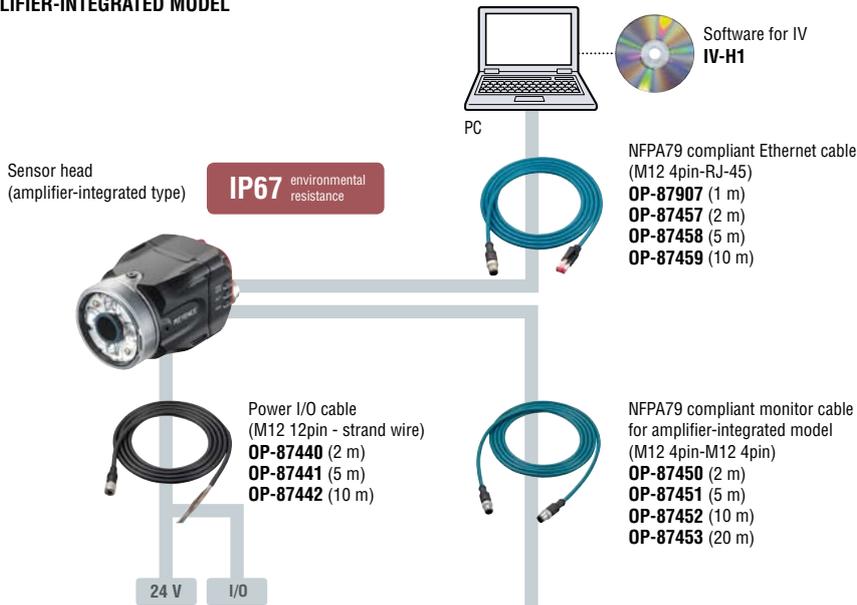
Monochrome AF type
IV-G600MA



AF...Automatic focus model
*View and optical axis has individual differences.

SYSTEM CONFIGURATION OF AN AMPLIFIER-INTEGRATED MODEL OR ULTRA-COMPACT HEAD MODEL

AMPLIFIER-INTEGRATED MODEL



Dome attachment **IV-D10**

Polarised visible light filter attachment **OP-87436**

Infrared polarised filter attachment **OP-87437**

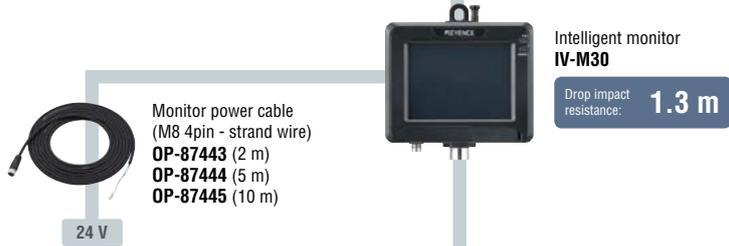
Mounting adapter **OP-87460**
 [Supplied with a sensor]

Front cover **OP-87461**
 [Supplied with the sensor]

Adjustable bracket **OP-87685**

Appearance of mounted **OP-87685**
 [Support pole not included]

MONITOR



Wall mounting adapter **OP-87464**
 [Supplied with the IV-M30]

Panel mounting adapter **OP-87465**

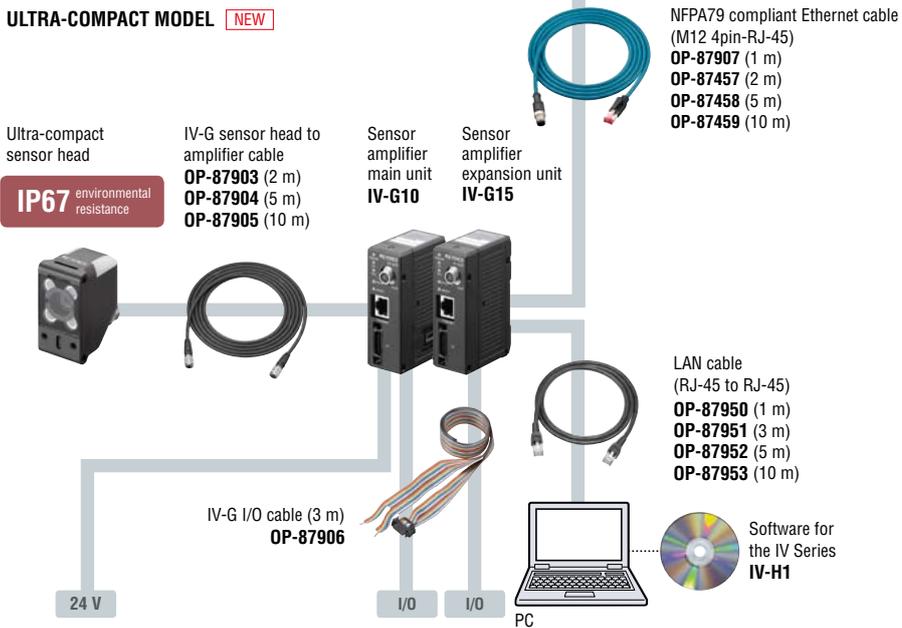
DIN mounting adapter **OP-87466**

Touch panel protective sheet **OP-87463**

Stylus **OP-87462**
 [Supplied with the IV-M30]

USB memory stick 1 GB **OP-87502**

ULTRA-COMPACT MODEL NEW



IV-G dome attachment (large) **IV-GD10**

IV-G dome attachment (small) **IV-GD05**

Magnifying lens attachment **OP-87902**

Narrow field of view & standard use polarised light filter attachment **OP-87899**

IV-G300CA polarised light filter attachment **OP-87900**

IV-G600MA polarised light filter attachment **OP-87901**

IV-G vertical mounting bracket **OP-87908**

IV-G rear mounting bracket **OP-87909**

IV-G adjustable bracket **OP-87910**

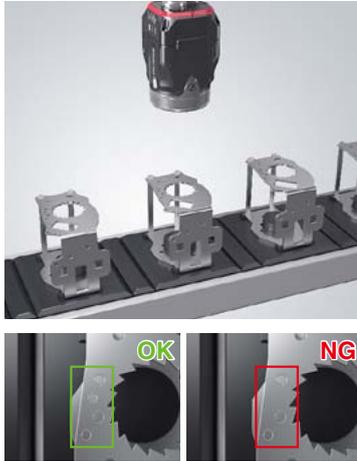
APPLICATIONS

PRESENCE DETECTION

COLOUR

SHAPE

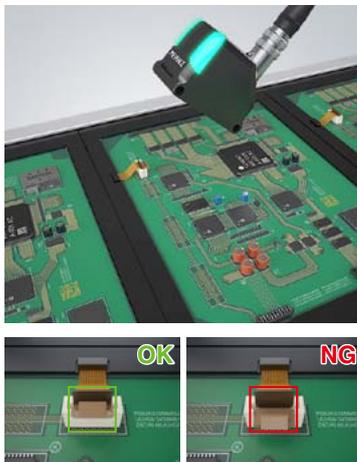
AUTOMOTIVE & METAL



FOOD & PHARMACEUTICAL



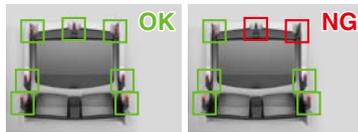
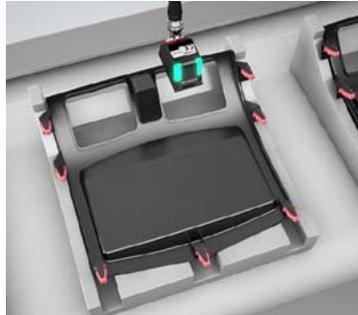
ELECTRIC & ELECTRONIC



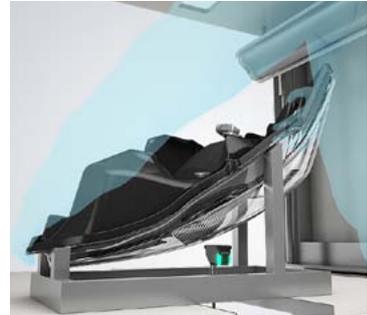
**ORIENTATION/
MISALIGNMENT**



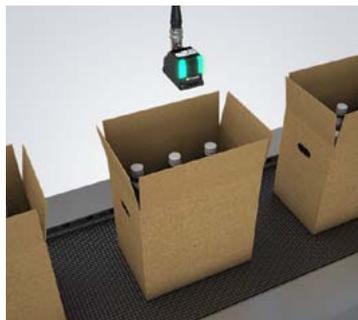
WIDE FOV



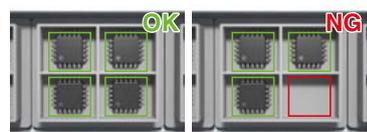
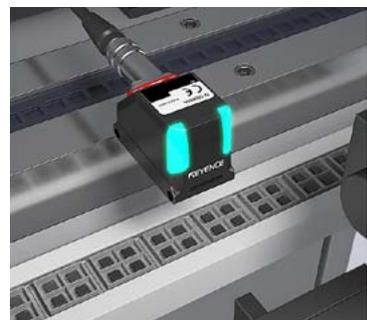
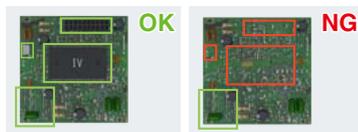
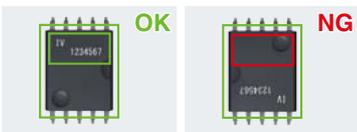
SPACE-SAVING



AUTOMOTIVE & METAL



FOOD & PHARMACEUTICAL



ELECTRIC & ELECTRONIC

SPECIFICATIONS



Sensor

Model	IV-500CA	IV-500C	IV-500MA	IV-500M	IV-150MA	IV-150M	IV-2000MA	IV-2000M
Type	Standard distance				Short range		Long range	
Installed distance	50 to 500 mm				50 to 150 mm		300 to 2000 mm	
View	Installed distance 50 mm: 25 (H) × 18 (V) mm to installed distance 500 mm: 210 (H) × 157 (V) mm				Installed distance 50 mm: 12 (H) × 9 (V) mm to installed distance 150 mm: 36 (H) × 27 (V) mm		Installed distance 300 mm: 45 (H) × 33 (V) mm to installed distance 2000 mm: 300 (H) × 225 (V) mm	
Image sensor	1/3 inch colour CMOS				1/3 inch monochrome CMOS			
Pixel	752 (H) × 480 (V)							
Focus adjustment	Auto*1		Manual		Auto*1		Manual	
Exposure time	1/10 to 1/50000		1/10 to 1/25000		1/20 to 1/25000		1/10 to 1/25000	
Lights	Illumination: White LED				Red LED		Infrared LED	
Lighting method	Pulse lighting/DC lighting is switchable							
Tools	Type: Shape detection, colour area*7, area*8, position adjustment							
Number*2	Detection tools: 16 tools, position adjustment tool: 1 tool							
Switch settings (programs)	32 programs							
Image history*3	100 images*4				300 images*5			
Condition	NG only/All is selectable							
Analysis information*6	OFF/Statistics/Histograms is switchable Statistics: Processing time (latest value, MAX, MIN, AVE), number of OKs, number of NGs, trigger numbers, trigger errors, judgement results list by tools Histograms: Histogram, matching degree (latest value, MAX, MIN, AVE), numbers of OKs, numbers of NGs							
Other functions	HDR, HighGain, Colour filters*7, Digital zoom*8, Brightness correction, Tilt correction, White balance*7, Mask outline, Mask area, Test run, ToolAutoTune, Input monitor, Output test, Security settings, Simulator*9							
Indicators	PWR/ERR, OUT, TRIG, STATUS, LINK/ACT							
Input	Non-voltage input/voltage input is switchable 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 26.4 V, ON voltage 18 V or higher, OFF current 0.2 mA or lower, ON current 2 mA (for 24 V)							
Inputs	6 inputs (IN1 to IN6)							
Function	IN1: External trigger, IN2 to IN6: Enable by assigning the optional functions Assignable functions: Program switching, Clear error, External master image registration							
Output	Open collector output NPN/PNP is switchable, N.O./N.C. is switchable For open collector NPN output: Maximum rating 26.4 V 50 mA, remaining voltage 1.5 V or lower For open collector PNP output: Maximum rating 26.4 V 50 mA, remaining voltage 2 V or lower							
Outputs	4 outputs (OUT1 to OUT4)							
Function	Enable by assigning the optional functions Assignable functions: Total judge result, RUN, BUSY, Error, Position adjustment result, Judge result of each tool, Result of the logical operation of each tool							
Ethernet*10	Standard				100BASE-TX/10BASE-T			
Connector	M12 4pin connector							
Network function	FTP client, EtherNet/IP™, PROFINET							
Rating	Power voltage		24 VDC ±10% (including ripple)					
Current consumption	0.6 A or less							
Environmental resistance	Ambient temperature		0 to +50°C (No freezing)					
Relative humidity	35 to 85% RH (No condensation)							
Vibration*11	10 to 55 Hz, 1.5 mm double amplitude, 2 hours each for X, Y, and Z axes							
Shock resistance*11	500 m/s ² 6 different directions in 3 times							
Enclosure rating*12	IP67							
Material	Main unit case: Aluminium die-casting, Packing: NBR, Front cover: Acrylic, Mounting adapter: POM							
Weight	Approx. 270 g							

*1. The focusing position can be automatically adjusted at the time of installation. Deactivated during the operation. Focusing position can be registered by program.

*2. Tools can be installed by programs.

*3. Saves to the memory in the sensor. The images saved in the sensor can be backed up to the USB memory installed to the intelligent monitor (IV-M30) or to the PC by the software for IV (IV-H1).

*4. When using the FTP client function: 70 pictures

*5. When using the FTP client function: 210 pictures

*6. This can be displayed on the intelligent monitor (IV-M30) or by software for IV (IV-H1).

*7. Colour type only

*8. Possible with both the colour type and monochrome type

*9. Simulator can be used with the IV software (IV-H1).

*10. This is for connection with the intelligent monitor (IV-M30) or software for IV (IV-H1).

*11. Except when IV-G dome attachment (IV-D10) is mounted

*12. Except when polarised filter attachment (OP-87436/OP-87437) is mounted



MONITOR

Model	IV-M30	
Display	3.5" TFT colour LCD 320 × 240 dot (QVGA)	
Backlight	Method	White LED
	Duration	Approx. 50000 hours (25°C)
Touch panel	Method	Analogue resistive
	Actuating force	0.8 N or less
Indicators	PWR, SENSOR	
Ethernet*1	Standard	100BASE-TX/10BASE-T
	Connector	M12 4pin connector
Languages	Japanese/English/German/Simplified Chinese/Traditional Chinese/ Italian/French/Spanish/Portuguese/Korean	
Expanded memory	USB memory*2	
Rating	Power voltage	24 VDC ±10% (including ripple)
	Current consumption	0.2 A or lower
Environmental resistance	Ambient temperature	0 to +50°C (No freezing)
	Ambient humidity*3	35 to 80% RH (No condensation)
	Vibration	10 to 55 Hz, 0.7 mm double amplitude, 2 hours each for X, Y, and Z axes
	Drop impact resistance	1.3 m over the concrete (2 times each in the arbitrary direction)
Enclosure rating	IP40	
Material	Polycarbonate	
Weight	Approx. 180 g	

*1. This is dedicated for connection with IV Series sensor.

*2. Use the KEYENCE recommended product.

*3. If the ambient temperature is over 40°C, use it in the absolute humidity of 40°C 80% RH or lower.

SOFTWARE

Model	IV-H1	
System requirements	Interface	Equip the Ethernet (100BASE-TX) interface
	OS	Windows 7 Home Premium/Professional/Ultimate*1 Windows XP Professional/Home Edition; either of OS above needs to be pre-installed
	Languages	Japanese/English/German/Simplified Chinese/Traditional Chinese/ Italian/French/Spanish/Portuguese/Korean
	Processor	Windows 7: needs to be compliant with system requirements for OS Windows XP: Pentium III or better, Clock speed 1 GHz or faster
	Memory capacity	Windows 7: needs to be compliant with system requirements for OS Windows XP: 512 MB or more (1 GB or more is recommended)
	Required capacity for installation	1 GB or more
	Monitor	Resolution 1024 × 768 pixel or higher, Display colour High Colour (16 bit) or higher
	Operating conditions	.NET Framework 4.0 or 4.5 needs to be installed*2

*1. Supported for 32bit and 64bit version.

*2. If .NET Framework 4.0 or 4.5 is not installed, this will be automatically installed at the time of IV-H1 installation.

Sensor Head

Model	IV-G500CA	IV-G500MA	IV-G150MA	IV-G300CA	IV-G600MA
Type	Standard sensor model		Narrow field of view sensor model	Wide field of view sensor model	
Installed distance	20 to 500 mm		40 to 150 mm	40 to 300 mm	40 to 600 mm
View	Installed distance 20 mm: 10 (H) × 7.5 (V) mm to Installed distance 500 mm: 200 (H) × 150 (V) mm		Installed distance 40 mm: 8 (H) × 6 (V) mm to Installed distance 150 mm: 32 (H) × 24 (V) mm ^{*1}	Installed distance 40 mm: 42 (H) × 31 (V) mm to installed distance 300 mm: 275 (H) × 206 (V) mm	Installed distance 40 mm: 42 (H) × 31 (V) mm to installed distance 600 mm: 550 (H) × 412 (V) mm
Image sensor	1/3 inch colour CMOS	1/3 inch monochrome CMOS	1/3 inch monochrome CMOS	1/3 inch colour CMOS	1/3 inch monochrome CMOS
Pixel	752 (H) × 480 (V)				
Focus adjustment	Auto ^{*2}				
Exposure time	1/10 to 1/50000		1/20 to 1/50000	1/25 to 1/50000	1/50 to 1/50000
Lights	illumination	White LED			Infrared LED
Lighting method	Pulse lighting/DC lighting is switchable			Pulse lighting	
Indicators	2 (the same display details for both indicators)				
Environmental resistance	Ambient temperature	0 to +50°C (No freezing)			
	Relative humidity	35 to 85% RH (No condensation)			
	Vibration ^{*3}	10 to 55 Hz, 1.5 mm double amplitude, 2 hours each for X, Y, and Z axes			
	Shock resistance ^{*3}	500 m/s ² 6 different directions in 3 times			
Enclosure rating ^{*4}	IP67				
Material	Main unit case: Zinc die-casting, Front cover: Acrylic (hard coat), Operation indicator cover: TPU				
Weight	Approx. 75 g				

*1. Installed distance 18 mm: 4 (H) × 3 (V) mm to installed distance 27 mm: 7 (H) × 5.2 (V) mm when the magnifying lens attachment (OP-87902) is used

*2. The focusing position can be automatically adjusted at the time of installation. Deactivated during the operation. Focusing position can be registered by program

*3. Except when IV-G dome attachment (IV-GD05/IV-GD10) is mounted

*4. Except when polarised filter attachment (OP-87899/OP-87900/OP-87901/OP-87902) is mounted

Sensor Amplifier

Model	IV-G10 (main unit)	IV-G15 (expansion unit)
Tools	Type	Shape detection, area ^{*1} , colour area ^{*2} , position adjustment
	Number ^{*3}	Detection tools: 16 tools, position adjustment tool: 1 tool
Switch settings (programs)		32 programs
Image history ^{*4}	Numbers	When using a colour type head: 100 images ^{*5} , when using a monochrome type head: 300 images ^{*6}
	Condition	NG only/All is selectable
Analysis information ^{*7}		OFF/Statistics/Histograms is switchable Statistics: Processing time (latest value, MAX, MIN, AVE), number of OKs, number of NGs, trigger numbers, trigger errors, judgement results list by tools Histograms: Histogram, matching degree (latest value, MAX, MIN, AVE), numbers of OKs, numbers of NGs
Other functions		HDR, HighGain, Colour filters ^{*2} , Digital zoom (2×, 4×) ^{*8} , Brightness correction, Tilt correction, White balance ^{*2} , Mask outline, Mask area, Test run, ToolAutoTune, Input monitor, Output test, Security settings, Simulator, Mutual interference prevention, Total judgement result output, Direct connection (2 units or more), Failing sensor list, Failure hold
Indicators		PWR/ERR, OUT, TRIG, STATUS, LINK/ACT
Input	Inputs	Non-voltage input/voltage input is switchable 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 26.4 V, ON voltage 18 V or higher, OFF current 0.2 mA or lower, ON current 2 mA (for 24 V)
	Function	6 inputs (IN1 to IN6) IN1: External trigger, IN2 to IN6: Enable by assigning the optional functions Assignable functions: Program switching, Clear error, External master image registration, Main unit/expansion unit simultaneous input
Output	Outputs	Open collector output NPN/PNP is switchable, N.O./N.C. is switchable For open collector NPN output: Maximum rating 26.4 V 50 mA (20 mA when linked to an expansion unit [IV-G15]), remaining voltage 1.5 V or lower For open collector PNP output: Maximum rating 26.4 V 50 mA (20 mA when linked to an expansion unit [IV-G15]), remaining voltage 2 V or lower
	Function	8 outputs (OUT1 to OUT8) Enable by assigning the optional functions Assignable functions: Total judgement result, RUN, BUSY, Error, Position adjustment result, Judgement result of each tool, Result of the logical operation of each tool, Main unit/expansion unit logical output
Ethernet ^{*9}	Standard Connector	100BASE-TX/10BASE-T RJ-45 8pin connector
Network function		FTP client, EtherNet/IP™, PROFINET
Rating	Power voltage	24 VDC ±10% (including ripple)
	Current consumption	0.8 A or less. 1.5 A or less when also using an expansion unit (IV-G15). (The output load is excluded.)
Environmental resistance	Ambient temperature	0 to +50°C (No freezing) ^{*10}
	Relative humidity	35 to 85% RH (No condensation)
Material		Main unit case: Polycarbonate
Weight		Approx. 150 g

*1. Monochrome type only

*2. Colour type only

*3. Tools can be installed by programs.

*4. Saves to the sensor amplifier's internal memory. The images saved to the sensor amplifier can be backed up to the USB memory device inserted into the intelligent monitor (IV-M30) or to the PC by the software for the IV/IV-G Series (IV-H1).

*5. When using the FTP client function: 70 pictures

*6. When using the FTP client function: 210 pictures

*7. This can be displayed on the intelligent monitor (IV-M30) or by software for the IV/IV-G Series (IV-H1).

*8. Possible with both the colour type and monochrome type

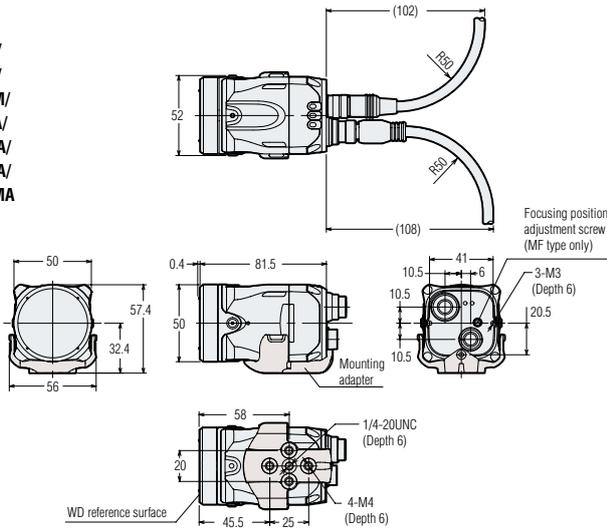
*9. This is for connection with the intelligent monitor (IV-M30) or software for the IV/IV-G Series (IV-H1).

*10. When attaching the sensor amplifier to a DIN rail, attach the sensor amplifier to a metal plate.

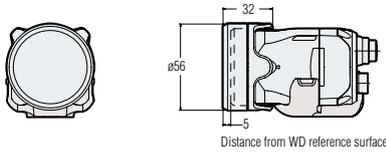
DIMENSIONS

AMPLIFIER-INTEGRATED MODEL

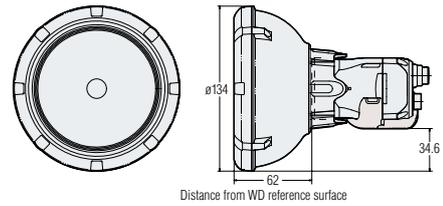
Sensor
**IV-500C/
 IV-150M/
 IV-500M/
 IV-2000M/
 IV-500CA/
 IV-150MA/
 IV-500MA/
 IV-2000MA**



With polarised filter attachment

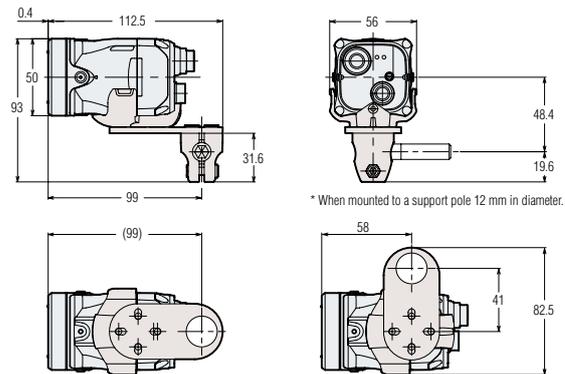


With dome attachment (IV-D10)



- When using dome attachment, please set the target within the range of 0 to 50 mm from the top.
- Dome attachment can be used for standard distance and close range types.

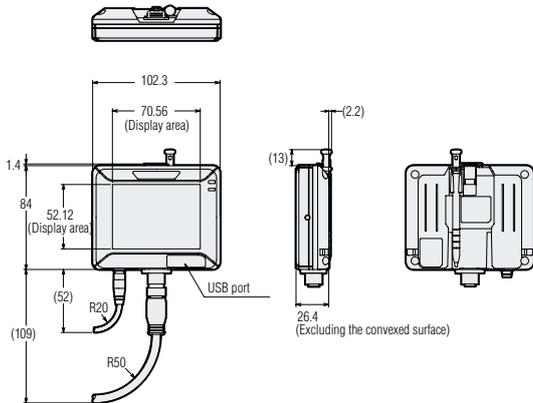
With adjustable bracket (OP-87685)



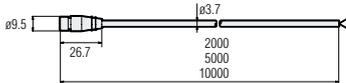
* When mounted to a support pole 12 mm in diameter.

INTELLIGENT MONITOR FOR AMPLIFIER-INTEGRATED AND ULTRA-COMPACT MODELS

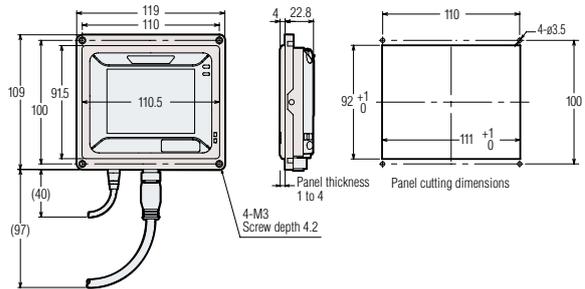
Intelligent monitor **IV-M30**



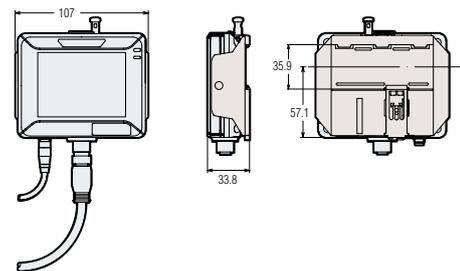
Monitor power cable
**OP-87443 (2 m)/
 OP-87444 (5 m)/
 OP-87445 (10 m)**



Using the panel mounting adapter



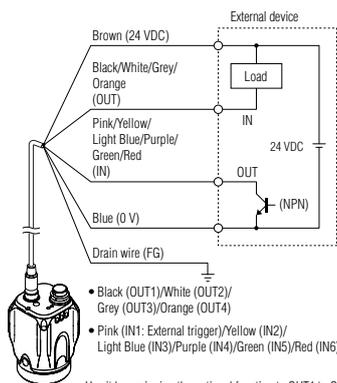
Using the DIN mounting adapter



WIRING/CIRCUIT DIAGRAM

SELECTING NPN OUTPUT

When NPN is selected in I/O format



- Black (OUT1)/White (OUT2)/Grey (OUT3)/Orange (OUT4)
- Pink (IN1: External trigger)/Yellow (IN2)/Light Blue (IN3)/Purple (IN4)/Green (IN5)/Red (IN6)

Use it by assigning the optional function to OUT1 to OUT4 and IN2 to IN6.

Terminal number and wiring colour of the I/O cable for IV Series (OP-87440/OP-87441/OP-87442)

Wiring colour	Name	Assigning default value	Description	Wiring colour	Name	Assigning default value	Description
Brown	24 VDC	-	+ side of power	Yellow	IN2	OFF	Input assignable function • Program bit0 to bit4 • Clear Error • Ext. Master Save • OFF (not used)
Blue	0 V	-	- side of power GND of input-output cable	Light Blue	IN3	OFF	
Black	OUT1	Total Status (N.O.)	Output assignable function • Tot. Status • Tot. StatusNG • RUN • BUSY • Error • Pos. Adj. • Judge result of each tool (Tool 1 to Tool 16) • Logical operation result of each tool (Tool 1 to Tool 4) • OFF (not used)	Purple	IN4	OFF	
White	OUT2	BUSY (N.O.)		Green	IN5	OFF	
Grey	OUT3	Error (N.C.)		Red	IN6	OFF	
Orange	OUT4	OFF		Drain	FG	-	
Pink	IN1	External trigger ↑	Set external trigger. Rising timing (↑) or falling timing (↓) can be set.				

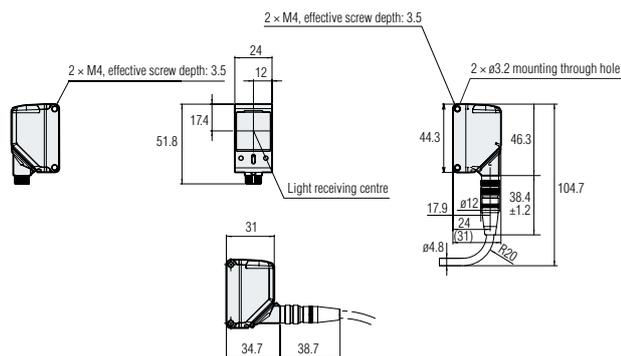
Cable specification

- Brown/Blue/Black/White/Grey/Orange : AWG25
- Pink/Yellow/Light Blue/Purple/Green/Red : AWG28
- With braided shield cable (with drain cable)

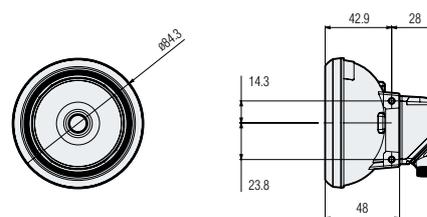
ULTRA-COMPACT MODEL

Sensor head

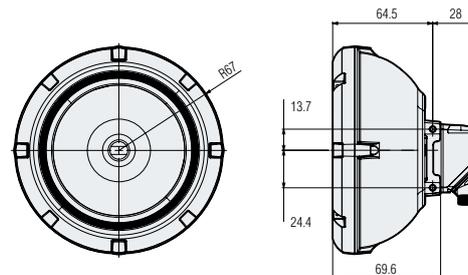
IV-G500CA/IV-G500MA/IV-G150MA/IV-G300CA/IV-G600MA



With small dome attachment for the IV-G (IV-GD05)

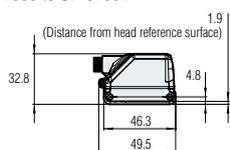


With large dome attachment for the IV-G (IV-GD10)

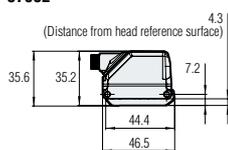


- When using an IV-G dome attachment (small), please set the target within the range of 0 to 30 mm from the top.
- When using an IV-G dome attachment (large), please set the target within the range of 0 to 50 mm from the top.

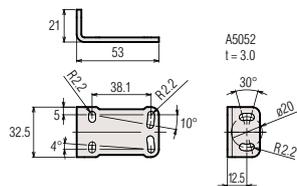
With polarised filter attachment
OP-87899 to OP-87901



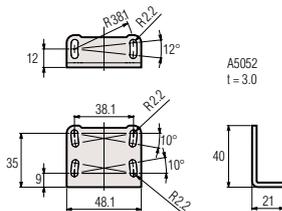
With magnifying lens attachment
OP-87902



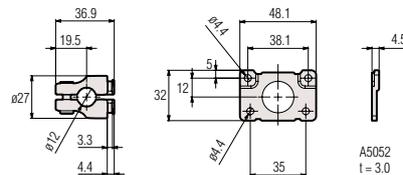
IV-G vertical mounting bracket OP-87908



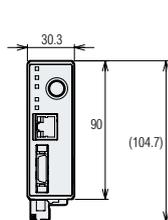
IV-G rear mounting bracket OP-87909



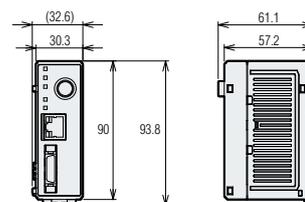
IV-G adjustable bracket OP-87910



Sensor amplifier main unit
IV-G10



Sensor amplifier expansion unit
IV-G15



WIRING/CIRCUIT DIAGRAM

Terminal number and wiring colour of the I/O cable for IV-G Series (OP-87906)

Terminal No.	Wiring colour	Name	Assigning default value	Description
A1	Brown	IN1	External trigger ↑	Set external trigger. Rising timing (↑) or falling timing (↓) can be set.
A2	Red	IN2	OFF	Input assignable function • Program bit0 to bit4 • Clear Error • Ext. Master Save • OFF (not used)
A3	Orange	IN3	OFF	
A4	Yellow	IN4	OFF	
A5	Green	IN5	OFF	
A6	Blue	IN6	OFF	
A7	Purple	Unused	Unused	Unused
A8	Grey	Unused	Unused	
A9	White	Unused	Unused	
A10	Black	Unused	Unused	

Terminal No.	Wiring colour	Name	Assigning default value	Description
B1	Brown	OUT1	Total Status (N.O.)	Output assignable function • Total Status • Total Status NG • RUN • BUSY • Error • Position Adjustment • Status result of each tool (Tool 1 to 16) • Logical operation result of each tool (Logic 1 to 4) • OFF (not used)
B2	Red	OUT2	BUSY (N.O.)	
B3	Orange	OUT3	Error (N.C.)	
B4	Yellow	OUT4	OFF	
B5	Green	OUT5	OFF	
B6	Blue	OUT6	OFF	
B7	Purple	OUT7	OFF	
B8	Grey	OUT8	OFF	
B9	White	Unused	Unused	
B10	Black	Unused	Unused	

Cable specification : AWG28

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SAFETY INFORMATION

Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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