KEYENCE

Compact Colour Vision System

CV-301 Series

Keyence Revolutionises Machine Vision…

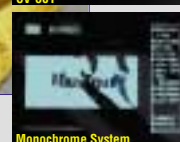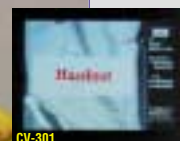**Just Point & Click**

Click **colour!**

SHINY/MIRRORED SURFACES

CV-301

Monochrome System

Easily detected in shadows and reflections...

ROUND/CYLINDRICAL OBJECTS

CV-301

Monochrome System

Detection of labels in the edge shadows...

COLOUR DIFFERENTIATION

CV-301

Monochrome System

Only the red capsule is detected...

CV-301

CE
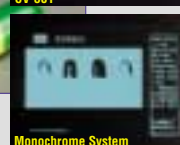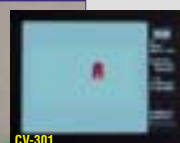
The world's smallest colour vision system…

Colour differentiation

The CV-301 quickly and reliably differentiates the target colour, making it ideal for applications that are impossible with black and white processing.

Easy operation

Simple "Point & Click" operation greatly reduces the time required for setting colour identification. No need for complex lighting techniques.

Inexpensive

With new technology reducing size and cost, colour inspection applications can now be solved with a minimal initial investment when compared to conventional systems.
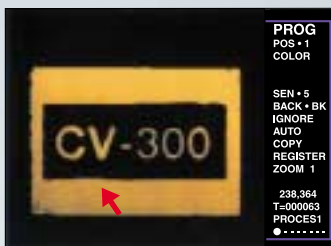
offers simple setup.
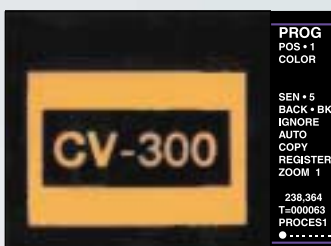
Simply "point & click" for accurate setting every time.

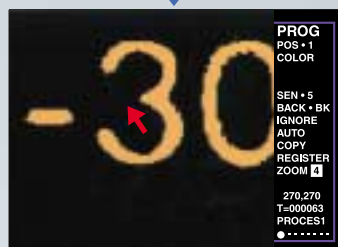## One click on the screen selects the colour at the cursor position.

PROG
POS • 1
COLOR
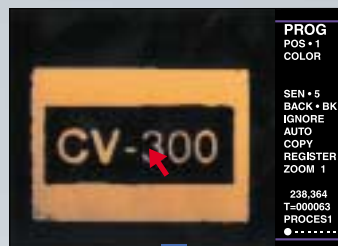
SEN • 5
BACK • BK
IGNORE
AUTO
COPY
REGISTER
ZOOM 1

196,272
T=000063
PROCES1

Click!

PROG
POS • 1
COLOR

SEN • 5
BACK • BK
IGNORE
AUTO
COPY
REGISTER
ZOOM 1

238,364
T=000063
PROCES1

Click!

PROG
POS • 1
COLOR

SEN • 5
BACK • BK
IGNORE
AUTO
COPY
REGISTER
ZOOM 1

238,364
T=000063
PROCES1

The Zoom function allows accurate cursor positioning.

PROG
POS • 1
COLOR

SEN • 5
BACK • BK
IGNORE
AUTO
COPY
REGISTER
ZOOM 1

238,364
T=000063
PROCES1

PROG
POS • 1
COLOR

SEN • 5
BACK • BK
IGNORE
AUTO
COPY
REGISTER
ZOOM 4

270,270
T=000063
PROCES1

8 windows can be set in one program to identify different colours. Up to 16 programs can be registered.

RUN
No 1
MODE
AREA•CON

WINDOW 1
MEASURE
001100

TOL
H=001500
L=000500

T=000017
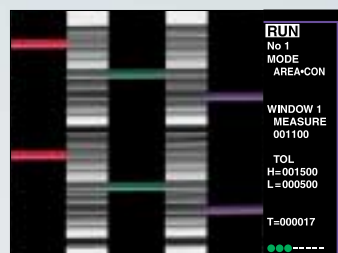
Monochrome display function
The area outside the window is displayed in black-and-white for clear differentiation between the chosen colour and other colours.

Synchronizing shutter function
Images of fast moving targets can be reliably captured at the same position on the monitor screen each other. This enables accurate, high-precision inspection by capturing images using an external timing device.

Illumination adjustment function
Any brightness fluctuations due to changes in illumination over time are automatically corrected. External light interference is no longer a problem.

Tolerance output
Tolerances can be set and judged in each window. The judgment result is shown by the green or red indicator at the foot of the menu display. This judgment can be output from the controller to external devices such as PLC's.

Position adjustment function
The deviation of moving targets is corrected on the screen. This is useful for targets that cannot be easily positioned.

RS-232C
Data can be stored in and retrieved from a PC.

realizes superior inspection.

When the target colour is difficult to identify with monochrome image processing

As the illustration shows below, conventional binary imaging cannot differentiate between similar colours, e.g.green and blue.
A colour filter cannot be used to differentiate several colours and often requires complex settings.
The CV-301 differentiates images by the difference in colour. Several colours can be differentiated simultaneously by using individual windows (8 max.) which can be set into one program. (Up to 16 programs can be registered.)
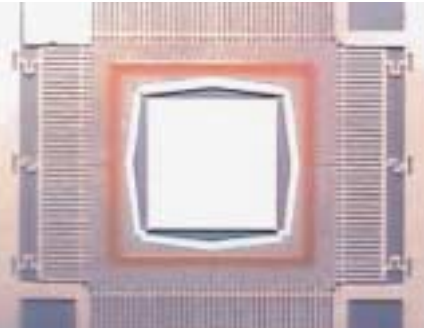

Real image

CV-301

With a black-and-white display, it is almost impossible to differentiate among red, green, and blue.

## When the target has little difference in shade

Binary conversion in black-and-white image-processing cannot be used for "gold plating", "silver solder",
"yellow mark on white background", and "dark blue on black background", because they have little difference in shade.
However, colour image-processing reliably identifies the colours of these targets. By identifying the colour component, the CV-301
even reliably differentiates metal targets which often have a shadow or halation due to uneven illumination or surface shape.
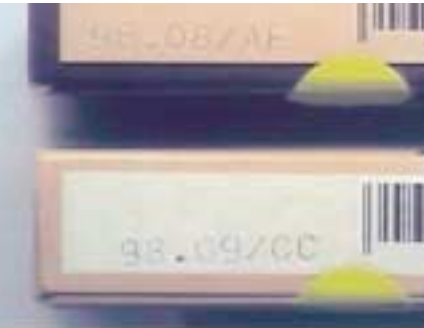

Real image

CV-301
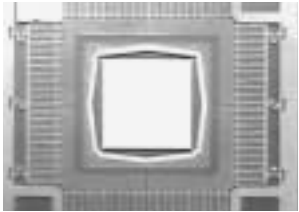
With a black-and-white display, the difference in shade between a copper frame and a square film part is hard to recognize.

When the background changes frequently

A black and white system requires changing the binary level or the color filter every time the background colour changes.
The CV-301 identifies only the specified colour. It is unnecessary to change any settings when the background colour changes.

Real image

CV-301

With a black-and-white display, when the colour of the case in the background changes, the sticker may not be detected.
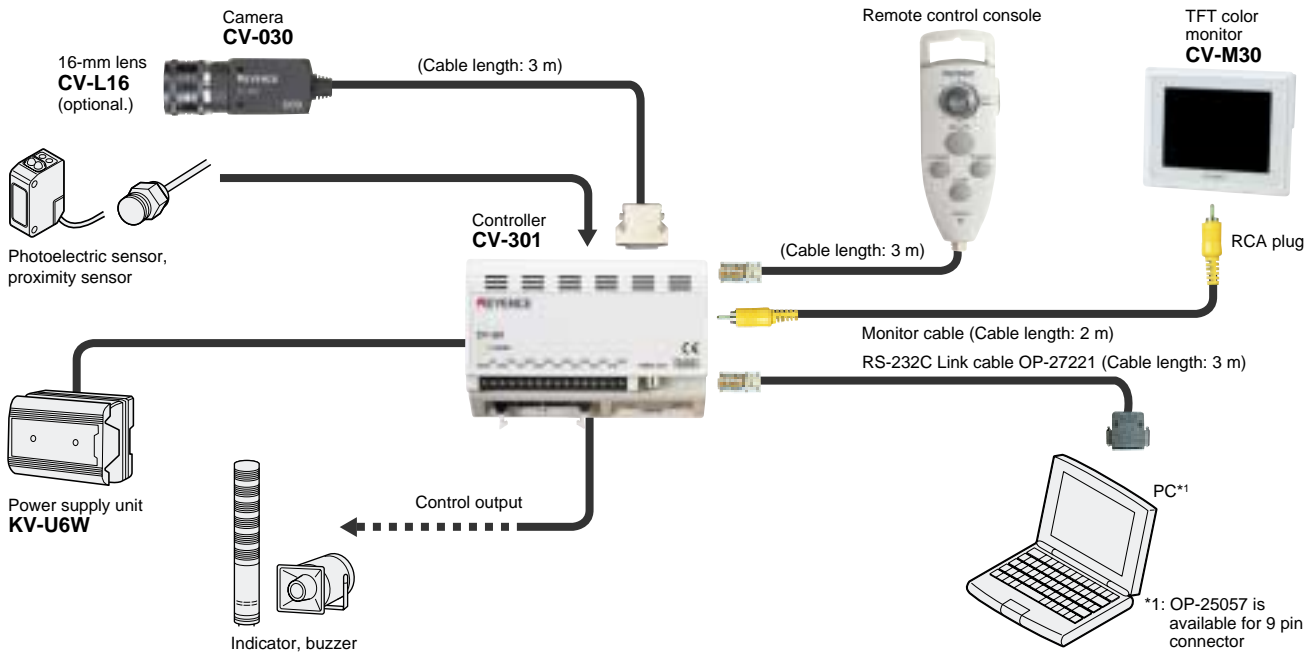
SPECIFICATIONS

Controller

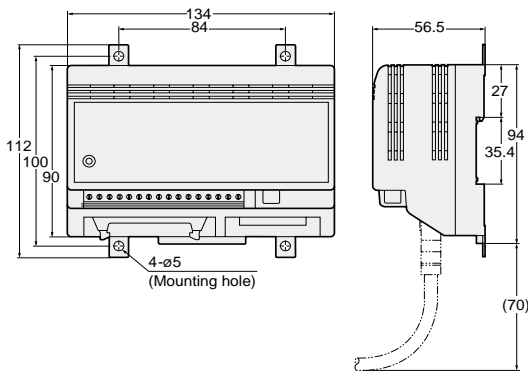| Model			CV-301
No. of pixels			500(H)X480(V), 240,000 pixels
Process cycle			60 cycle/sec. *Varies depending on setting.
Binary level			Resolution:16,770,000 colors, Setting available for each window (Area sensor: 8 windows, Position adjustment: 2 windows)
Program registration			16 programs *Can be selected externally.
Functions	Detection function	Area sensor	8 max./setting, Colour/background selection, Window shape: circle, rectangle
		Absolute position detection	1/setting, Pattern search and line sensor, Detection range setting allowed, Window shape: rectangle
		Relative position detection	1/setting, Pattern search and line sensor, Detection range setting allowed, Window shape: rectangle
	Adjustment function	Position adjustment	X-axis/Y-axis directions
		Illumination adjustment	1 Illmination adjustment window/setting
	Other	Screen registration	Can be set externally (non-voltage input)
Input	Camera input		1
	Control input	External trigger	1 (non-voltage input)
		Coordinate selection input	X-axis output/Y-axis output selection: 1 (non-voltage input)
		Program change input	4 points for data input, 16-program selection (non-voltage input)
Output	Comparator output		NPN open-collector: 9, 50 mA max. (30V max.)
	Numerical value output		NPN open-collector: Binary 9-bit output (X/Y coordinate output), 10mA max. (30V max.)
	Colour video output		Conforms to NTSC standards
	Monochrome video output		Conforms to NTSC standards, External synchronization available
Communi-cation (RS-232C interface)	Communi-cation protocol	Duplex	Full
		Synchronization	Start/stop
		Data format	ASCII
		Baud rate	9600/19200/38400 bits/sec.
		Data length	8 bits
		Parity check	None
		Stop bit length	1 bit
	Setting data I/O		Output setting: save/load, Setting: save/load, Registered screen: save/load, Pattern data: save/load, Screen registration, Program No.: load
	Control output		Program No.: save, Program/Run mode selection
	Data output		Comparator, No. of pixels, Coordinate, Matching rate, input screen: load
	Trigger input		Trigger input
Power supply			24 VDC ± 10%
Current consumption			600 mA
Ambient temperature			0 to + 40°C
Relative humidity			35 to 85%
Weight			Controller: Approx. 360 g, Remote control console: Approx. 160 g

Camera

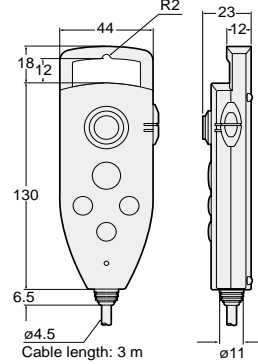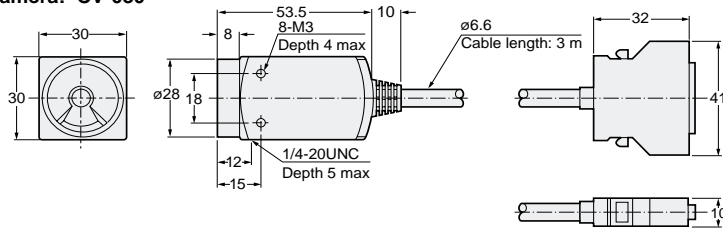| Model	CV-030
Video element	Colour CCD video element
Electronic shutter	1/60, 1/125, 1/250, 1/500, 1/1000, 1/2000, 1/4000, 1/10000
Lens mount method	C mount
Ambient temperature	0 to + 40°C
Relative humidity	35 to + 85%
Weight	Approx. 330 g (including 3 m cable)

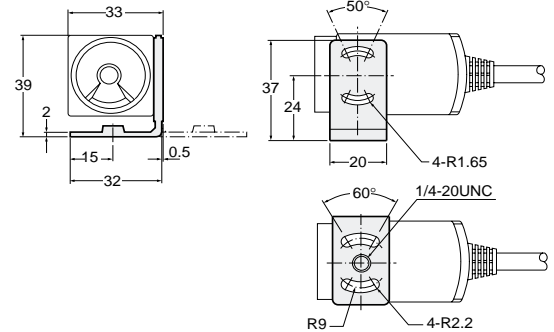# SYSTEM CONFIGURATIONS

▊DIMENSIONS

Controller: CV-301

4-ø5
(Mounting hole)

Remote control console

Cable length: 3 m

Camera: CV-030

8-M3
Depth 4 max

ø6.6
Cable length: 3 m

1/4-20UNC
Depth 5 max

When mounting bracket is attached.

4-R1.65

1/4-20UNC

R9   4-R2.2

▊OPTIONS

Ring lamp **CV-R11**

TFT colour monitor **CV-M30**

Power supply unit **KV-U6W**

Close-up adapter set

3.5 mm Lens **CV-L3**
6 mm Lens **CV-L6**
16 mm Lens **CV-L16**
50 mm Lens **CV-L50**

▊Monochrome vision system

CV-110

▊ The world's smallest vision system.

▊ Features grayscale imaging and a synchronizing shutter function.

Visit our website for Keyence products at http://www.keyence.co.jp/international

Specifications are subject to change without notice.