

High-performance Vision Sensor

# F250

*Advanced algorithm enables ultra high speed and maximum flexibility*



F250

## Features

Inspection and positioning that was difficult with previous vision sensors is now surprisingly easy!

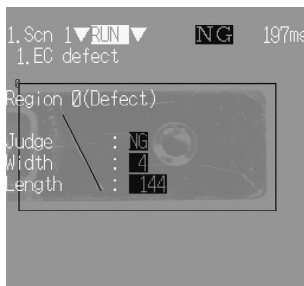
### ED defect inspection



High-precision detection of minute defects that could not be detected previously.



Certain detection of rubber packing deformities.

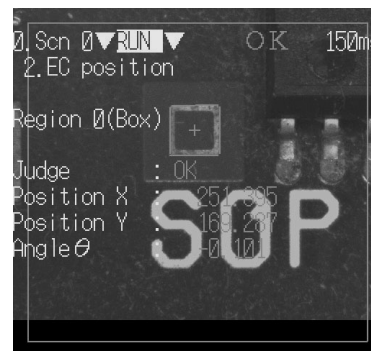


Detection of low-contrast defects on metal surfaces

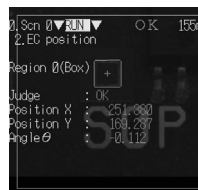
### EC positioning

High-precision position measurement even if the inside of the work changes or the view changes.

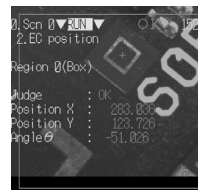
- Positioning of PWB fiducial marks



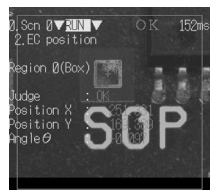
#### Low contrast



#### Revolution



#### Internal dirt



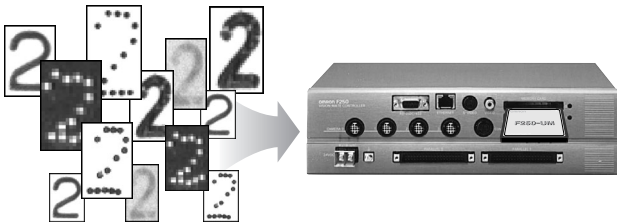
**Features**

**QUEST character checking**

Even if the shape or size of a character varies, "QUEST Logic" finds printed characters with certainty. The built-in dictionary makes "simple settings" possible.

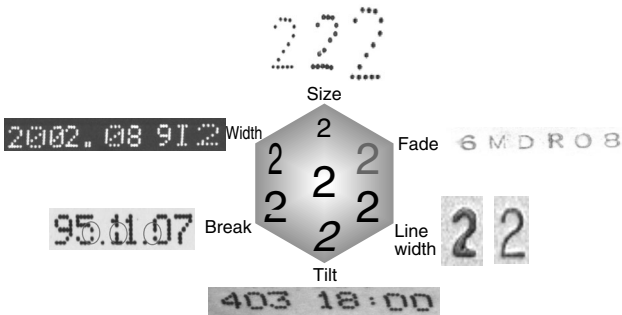
● **No need to store a character dictionary**

Various character fonts for factory automation have been pre-stored. This eliminates the need to store a dictionary or model names, and allows a dramatic reduction in man-hours for initial setup.



● **The "six character variations" can also be recognized with certitude.**

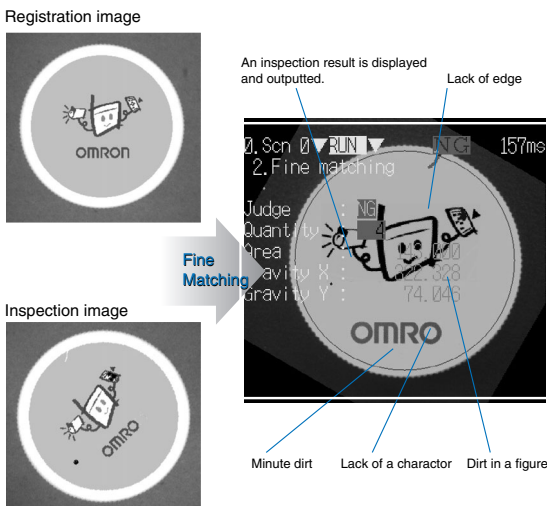
Checks characters printed on the production line such as "Best before" dates and lot numbers. Even if there are deviations in shape, size, or line width, the characters are accurately checked.



**Fine matching**

Detects differences from the stored "good" image quickly and with high accuracy. Dramatic improvement in ability to inspect characters and patterns with minute border defects.

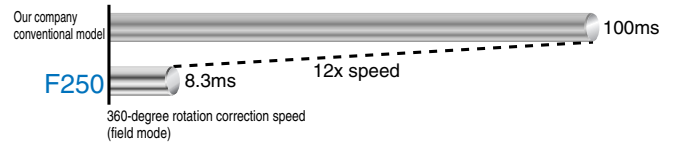
● **Example of application to soft drink cap inspection**



**For fast increasing line speeds and ever stricter quality demands.**

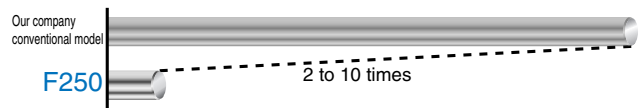
● **Real time Revolution Search is amazing**

Executes a real time search of 72 models. Even with works that rotate 360°, positioning corrections are completed at the same time as image read-in.



● **Fast image processing**

Inspection functions following camera image read-in are also up to 10 times faster thanks to a newly developed parallel processing technology.

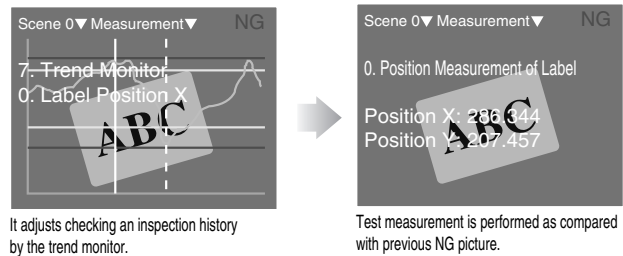


● **Fast image read-in**

The F160-S1 double-speed camera achieves a maximum image read-in speed of 8.3 ms.

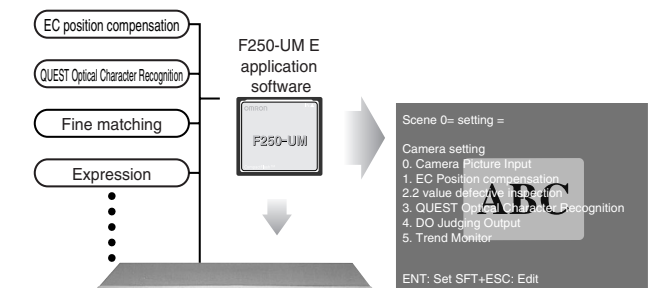
**"Non-stop" adjustment without stopping the line**

All settings can be adjusted and reset while inspection continues. There is no need to stop the line for adjustments, subsequently, no capacity drops.



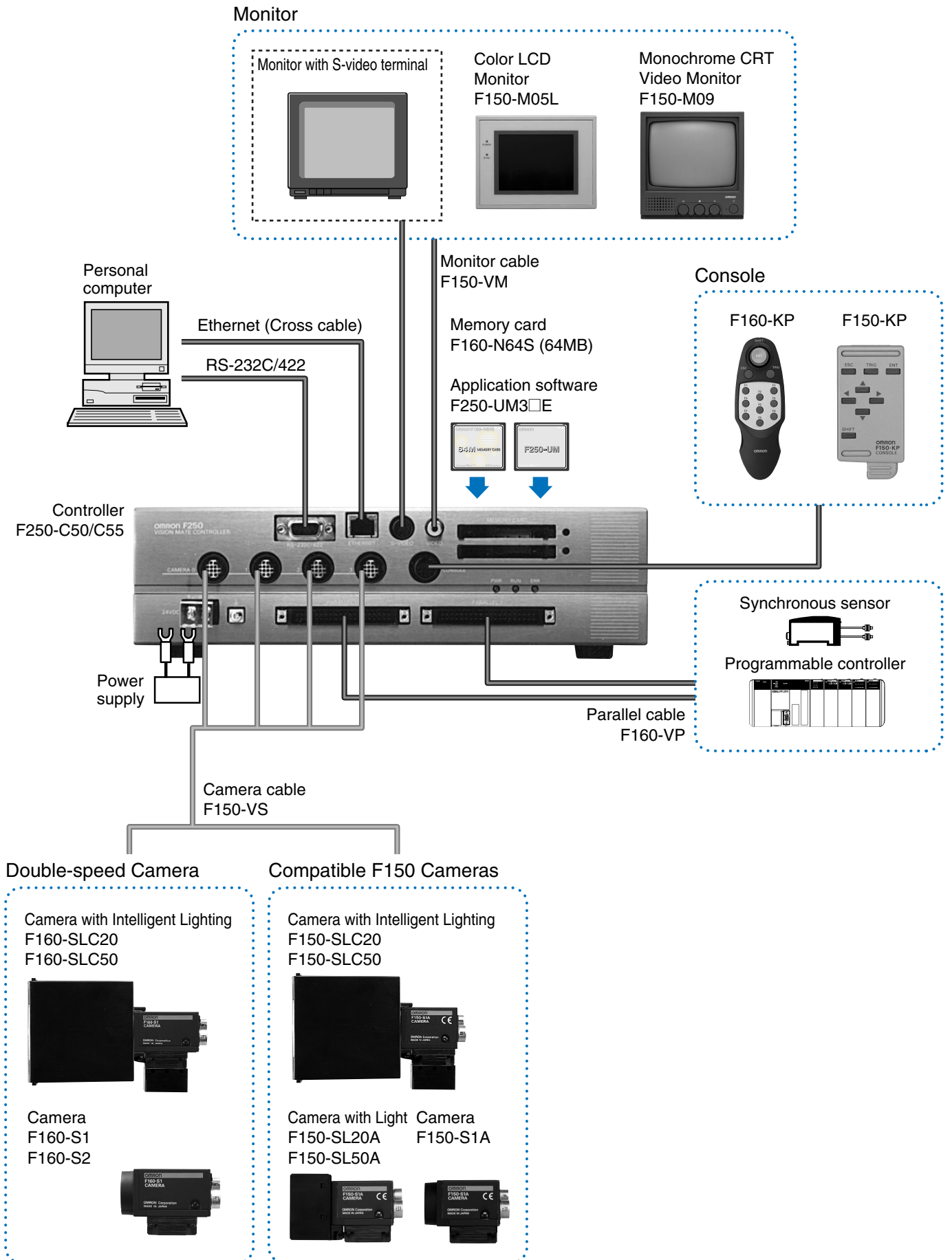
● **Easy and flexible settings by means of software application**

1. Functions needed for inspection are selected and installed from the software application.



2. Combine required inspection functions from the menu.

System configuration



F250

Ordering Information

Name		Model	Remarks
Controller		F250-C50	NPN Input/Output
		F250-C55	PNP Input/Output
Double-speed camera	Camera with intelligent lighting	F160-SLC20	
		F160-SLC50	
	Camera only	F160-S1	
		F160-S2	Includes Partial Scan functionality
F150 Compatible cameras	Camera with intelligent lighting	F150-SLC20	
		F150-SLC50	
	Camera with lighting	F150-SL20A	
		F150-SL50A	
	Camera only	F150-S1A	
Console		F160-KP	
		F150-KP	
LCD monitor		F150-M05L	
Video monitor		F150-M09	
Memory card		F160-N64S(S)	Memory capacity 64 MB
Application software		F250-UM3ME	with Macro function
		F250-UM3FE	without Macro function
Camera cable		F150-VS	Length of cable for double-speed camera and F150 common camera: 3 m
Monitor cable		F150-VM	Cable length: 2 m
Parallel cable		F160-VP	Length of pigtail cable for parallel input/output connector: 2 m

## Rating/Performance

### Controller: F250-C50/C55

Connected camera	F150-S1A/SL20A/SL50A/SLC20/SLC50, F160-S1/S2/SLC20/SLC50
Number of connectable cameras	4
Processing resolution	512(H) x 484(V)
Number of scenes	32 scenes (expansion possible using memory card)
Image storage function	Maximum 35 images
Image pre-processing	Smoothing (strong/weak), edge enhancement, edge extraction (horizontal, vertical, both), erosion, dilation, median, background deletion
Operation and Settings	Install measurement routines from a software application, combine and establish settings for measurement routines from menus.
Menu language	Japanese/English (changeable)
Operation customization function	Password function, short-cut key function
Screen customization function	Display items: Character strings (measured values, decisions, time, any character string, measurement area names), graphics (straight lines, rectangles, circles, cross-hair cursors) Parameters specified: display color, position, size
Non-stop adjustment function	Yes
Trend monitor function	Yes
Memory card slot	2 slots
Monitor	Composite video output: 1 CH, S-video output: 1 CH
Ethernet	10Base-T 1CH
Serial communication	RS-232C/422A 1CH
Parallel input/output	Inputs: 21 points, outputs: 46 points
Strobe	4 CH (included in parallel outputs)
Power supply voltage	20.4 to 26.4 VDC
Current consumption	Approximately 3.7 A (when four F160-SLC50 units are connected)
Ambient temperature	Operating: 0 to +50°C, storage: -25 to +65°C (no ice formation or condensation)
Ambient humidity	Operating/storage: 35 to 85% RH (with no condensation)
Dimensions	270(W) x 81(H) x 197(D)
Weight	Approximately 3.1kg (unit only)

### Double-speed camera: F160-S1/S2

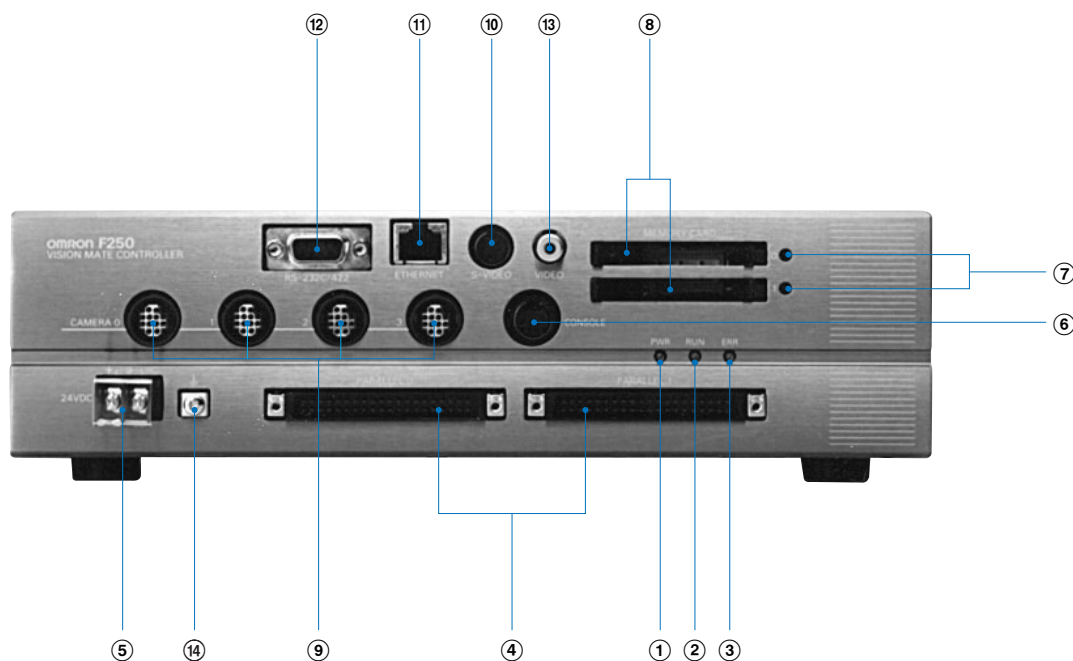
Picture element	1/3" Interline CCD
Effective pixels	659 x 44 (H x V)
Scanning method	1/60-s non-interlace (frame) mode, 1/120-s 2:1 interlace (field) mode
Shutter	Electronic shutter; select from 8 shutter-speed settings (1/120 to 1/20,000 s) using menu
Camera with Intelligent Lighting	F160-SLC20 (field of vision: 20 mm), F160-SLC50 (field of vision: 50 mm)
Ambient temperature	Operating: 0 to +50°C Storage: -25 to +60°C (with no icing or condensation)
Ambient humidity	Operating and Storage: 35 to 85% RH (with no condensation)
External Dimensions	31 x 40 x 54.5 (W x H x D) mm (not including connectors and other protruding parts)
Weight	Approx. 85 g (Camera only)

### Monitor

Item	Model number Name	F150-M05L Color LCD monitor	F150-M09 Monochrome CRT Video Monitor
Size		5.5 inches	9 inches
Type		Liquid crystal color TFT	CRT monochrome
Resolution		320 x 240 dots	800TV or min. (at center)
Input signal		NTSC composite video (1.0 V / 75 )	
Power supply voltage		20.4 to 26.4 VDC	100 to 240 VAC (-15%, +10%)
Current consumption		Approx. 700 mA	Approx. 400 mA
Ambient temperature		Operating: 0 to +50°C Storage: -25 to +65°C (with no icing or condensation)	Operating: -10 to +50°C Storage: -20 to +65°C (with no icing or condensation)
Ambient humidity		Operating or storage: 35% to 85% (with no condensation)	Operating or Storage: 10% to 90% (with no condensation)
Weight (Monitor only)		Approx. 610 g	Approx. 4.5 kg
Accessories		Instruction manual and 4 mounting brackets	Instruction manual

## Name and function of each part

Controller: F250-C50/C55



- |   |   |
|---|---|
| <p>① <b>POWER LED (green)</b><br/>Illuminates while the power is on.</p> <p>② <b>RUN LED (orange)</b><br/>Illuminates while the system is in measurement mode.</p> <p>③ <b>ERROR LED (red)</b><br/>Illuminates when a problem occurs.</p> <p>④ <b>Input connectors 0, 1</b><br/>Connects to a synchronous sensor or programmable controller.</p> <p>⑤ <b>Power terminal</b><br/>Connects to a DC power supply.</p> <p>⑥ <b>Console connector</b><br/>Connects to the console.</p> <p>⑦ <b>Memory card LEDs 0, 1</b><br/>Illuminates while power is supplied to the memory card.</p> | <p>⑧ <b>Memory card slots 0, 1</b><br/>A memory card or software application is inserted here.</p> <p>⑨ <b>CAMERA 0 - 3 connectors</b><br/>Connects to a camera.</p> <p>⑩ <b>Monitor connector (S-Video output)</b><br/>Connects to a monitor with an S-Video input</p> <p>⑪ <b>Ethernet connector</b><br/>Connects to a computer.</p> <p>⑫ <b>RS-232C/422 connector</b><br/>Connects to a computer or programmable controller.</p> <p>⑬ <b>Monitor connector (composite video output)</b><br/>Connects to a monitor.</p> <p>⑭ <b>Ground terminal</b><br/>Connect the ground wire to this terminal.</p> |
|---|---|

## Function menu

### Processing routine list

The F250-UME application software contains approximately 50 processing routines.

#### Image input related

- Camera image input
- Camera switch
- Pre-processing change
- Repeat preprocessing

#### Position compensation related

- Binary position correction
- Model position correction
- Circular work position correction
- Edge position correction
- EC position correction
- Scroll return
- Scroll

#### General measurement related

QUEST character checking	Dark-light edge position
Binary defect inspection	ECM search
Density defect inspection	EC positioning
Fine matching	Lot number
Pattern inspection	checking 1
Sorting	Dark-light edge number
EC defect inspection	Density average/ deviation
EC circular piece count inspection	Labeling
Rotation positioning	Label data

#### Measurement supplement related

- Computing
- Acquire processing unit data
- Set processing unit data
- Wait
- Elapsed time
- Trend monitor

#### Branch control related

- Condition branch
- DI branch
- End

#### Result output related

- Memory card data output
- DO data output
- Significant link data output
- Non-protocol data output
- DO decision output

#### Result display related

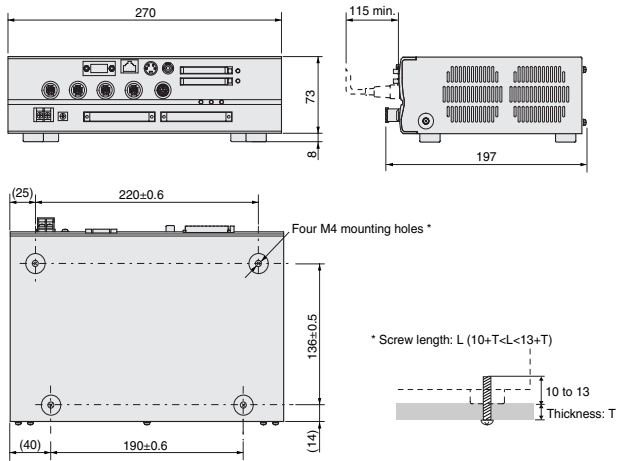
- Any character display
- Measured value display
- Decision character display
- Processing task name display
- Measurement time display
- Fixed graphic display
- Straight line result display
- Rectangle result display
- Circle result display
- Cross-hair cursor result display



Dimensions (Unit: mm)

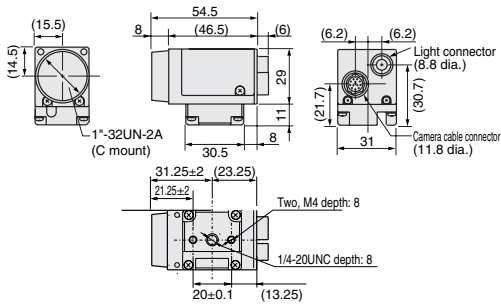
Controller

F250-C50/C55

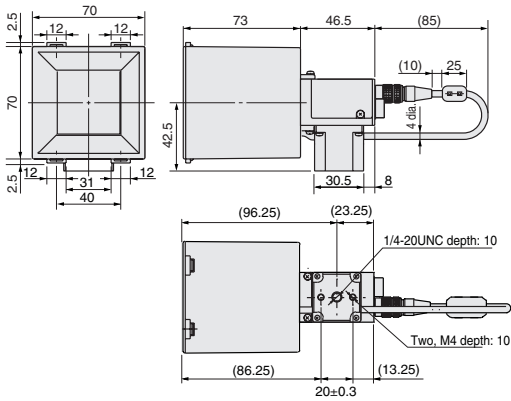


Double-speed camera

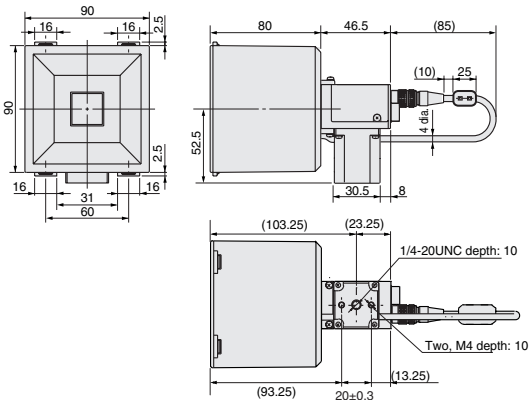
F160-S1/S2



F160-SLC20 (with F150-LTC20 intelligent lighting)

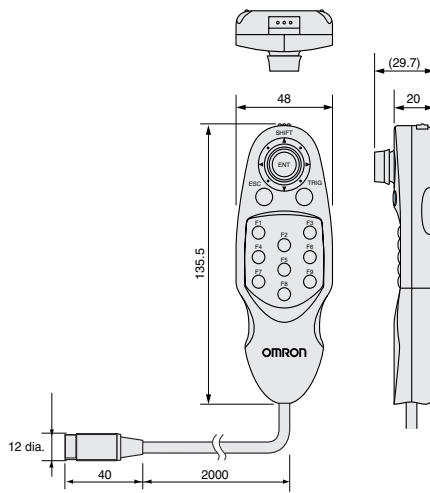


F160-SLC50 (with F150-LTC50 intelligent lighting)

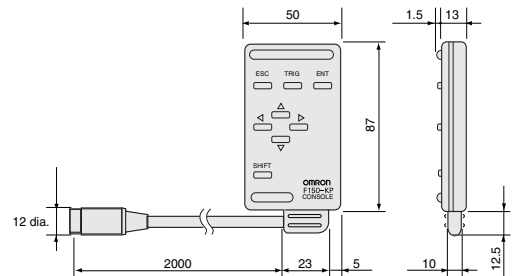


Console

F160-KP

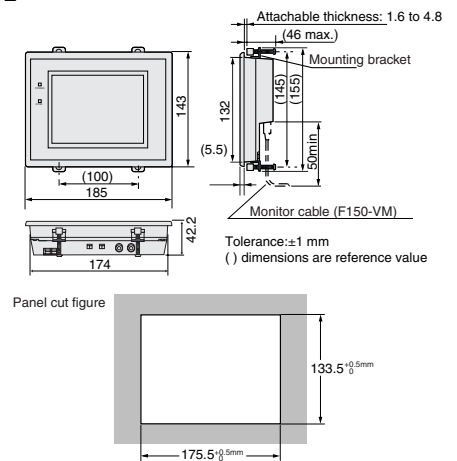


F150-KP



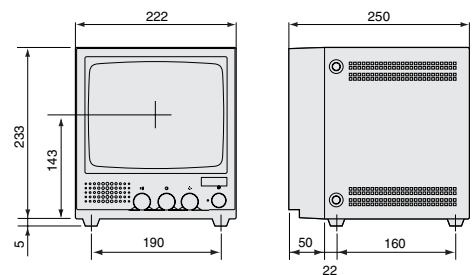
LCD monitor

F150-M05L



Video monitor

F150-M09







ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.

To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.