OMRON

NEW

Vision sensor with built-in LCD monitor

"Smart Sensor" ZFX-C



"Essential Innovation for Future Generations"

realizing

Easy Vision Being Our Vision

The Omron's new ZFX-C Smart Vision Sensor is a total Image Processing system that includes everything from a camera with an integrated light source to an image-processing unit.

With Omron's newly developed proprietary measurement algorithm, the parameter can be set through only a few steps involving the operation of a touch-panel color monitor.

This "Smart" user interface provides simplicity of usage giving anyone all they can need to perform a complete image enhancement.

The new technology and style of the ZFX-C paves the way to a new era of vision sensors.



"Smart Recipe" with condensed know-how

Capturing the image processing know-how Omron has accumulated over many years, the world's first "Smart Recipe" has radically reduced setting up time allowing for greater productivity.

One-touch automatic setting

The essential skills for image processing are now packaged into Omron's unique algorithm. The setting that traditionally required much fumbling is now made easy with the "select from auto listed options" using recipes. Lighting setup, the longtime problem for image processing, and the tricky parameter details involved in measurement setup, can now be done automatically with just the flip of a switch.





Smart Recipe

Smart Recipe is on Omron's invention of 3-step setting procedure. By adopting a new algorithm to encapsulate "human know-how", the auto setup for lighting and measurement now possible. Anyone can rapidly perform a high level of image processing.

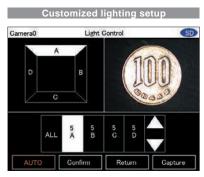
Choose best lighting

Patent pending

The know-how and trial and error that have been indispensable and required much time and effort up to now in lighting setup is now an automated process. By just selecting the best one from the candidate images automatically captured by changing the lighting pattern with the auto-lighting, anyone can easily find the optimal lighting. User can now easily determine settings for shiny work with high degrees of reflection and black monochrome work with low degrees of reflection, something very tricky before. In addition, when a more detailed setup is needed, the customized setup can be used to incorporate know-how.

Automatic lighting setup Camera0 Light Control Control

With automatic lighting setup, user can simply select the best image from thumbnail of candidate images.



A more detailed set up is possible with the customized lighting setup while looking at the image.

Built-in lighting camera that enables an advanced automatic lighting



The Built-in lighting camera and improved controller brings about an even higher degree of automatic lighting. With this camera you can produce up to a maximum of 1296 patterns of reflective lighting making the chore of choosing lighting equipment unnecessary. The lighting setup can be managed as digital data so it is possible to store the optimal setup for each job, and it smoothly handles the changing of settings. It is also possible to fine-tune the customized setup can be added.



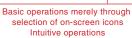


Step2

Choose measurement icon

The measurement method can be specified by just choosing the icon from out of a total of 9 measurement items for different types of inspection.













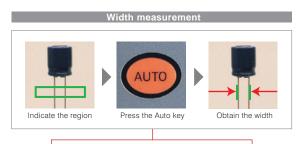
Step3

Draw region, press and go

Just specify the region of interest and press Auto key and the system will determine the most suitable parameters for the target image.

Now anyone can easily perform a complex and advanced parameter setting which used to require special knowledge and cumbersome steps.

Customized setting is also possible by fine tuning the parameters automatically set up. The time required to set up parameters can be significantly reduced.

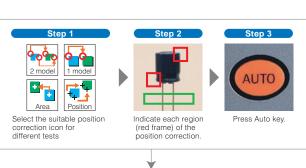


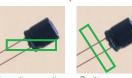
Appropriate filters and edge scan directions for width measurement can be automatically set by analyzing the target image.

Easily adjusts position

3-step position correction

Even when the position of work changes due to the conveyer condition, the excellent position correction function can come into play allowing adjustment using the work contours, two stage position correction and so on. With the auto setup, position difference can be easily adjusted to enable stable measurement.





No position correction Position corrected

In response to the position difference, the measurement region is automatically adjusted

Tailored Measurement item

Including two shape measurement items, the system contains 5 categories and 9 types of Shape, Size, Edge, Bright and Hue, Application measurement items. It responds to the variety of inspection requirements in the manufacturing sites.

Shape measurement item

Pattern search

Fastest in the industry

The shape measurement is a fundamental algorithm for image processing. By adopting a new image processor, the pattern search achieves a balance in the three factors of speed,

precision and stabilization, something that was an arduous task until now. It now supports a 360-degree revolving search and a sub-pixel processing of 1000 to 1 pixel units as well as a multi area searcher. The robust pattern search can respond to the multitude of inspects and measurements of any application.





A further improvement is the balance achieved in revolving searches that occur in pattern matching for a revolving work. The most time-consuming 360-degree revolving search can be performed with an excellent accuracy.

Sensitive search

NEW

When it comes to the difficult processing of detecting small differences, the Omron's

unique sensitive search matches work at a smallest detail and in doing so makes such detection all the more possible. It resists variations in position and density to capture even the smallest detail in the complex patterns.





It is possible to detect even the smallest differences in the work.

Application specific measurement item —

Defect

It is used to detect smears, scratches, chipping and burrs on the work. Defects are displayed on the screen, which makes it ideal tool for visual inspection.



Almost indistinguishable scratches can be detected after enhancing contrast using the color filter.



Counts the number of scratches

Size measurement item

Region

Detects the existence of work within a region and measures its size based on the area to perform various classification.



LED illumination is determined based on the area of extracted color.





Bright and Hue measurement item

Hue

NEW

The three factors in color, i.e. hue, saturation and brightness value, are measured and digitalized. And whilst an accurate differentiation of the color is performed, it is also possible to measure the color variety with the deviation measurement function (with color camera connected).





The individual threshold for the hue, saturation and brightness value parameters can be set up so that even if one of them is different, it can be detected accurately and intensely. On the other hand, by expanding the range for the brightness value and saturation, and so on, it is possible to stabilize the color detection in the hue without any interference from illumination alterations.

Bright

Measures the brightness within a region. It can be used for checking the presense of a component etc., by generating average density and density deviation values.



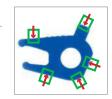


Based on the change in brightness, the presense of a screw (OK or NG) is determined.

Edge measurement item

Position

The existence or not and the position of the edge is measured. Oblique edges can now be measured even in complex conditions and even more



accurate position measurements can be taken. The peak bottom measurement function that can accurately capture the edges is now supported.

Width

The width of the edge is measured. By using the edge partitioning method, it is possible to measure the maximum and minimum width.



Count

The number of edges inside the area is counted. Based on the number of edges on the pre-registered good model, it counts the edges in the area and determines the correctness.



■ Functions to support optimal measurements

Up to 32 regions

In one captured image, it is possible to measure a multiple up to 32 regions. When carrying out difficult inspection, it is possible to set-up a color filter and color extraction for each measurement item.



Measures three regions.

Screen registration function

It is possible to register the image used in the setup. When you use the live image during setup sometimes the set up is not correct due to position differences in the work. However, with the registered image saved in the SD memory card as a "master image for setup", it can be easily verified when abnormal measurements occur.

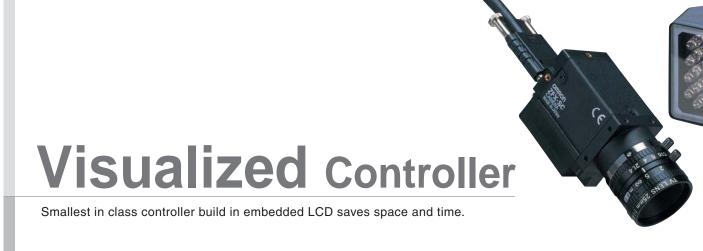
Gray filtering setup using double screen

For each measurement item, it is possible to run 8 types of gray filtering such as expansion and contraction to enable stable measurements. Through the "setup while looking" option that makes it possible to check the preview, the optimal gray filtering can be selected.



Calculations function

It is possible to make arithmetical calculations for measurement values, and calculations involving general functions, trigonometry, geometrical functions and logical functions. It is possible to setup internal variables, and complex calculations can be carried out.



Visualized setting and monitoring

Smallest in class

Despite its small form factor, the enlarged screen significantly improves the visibility and the ease of operation. The method of operation can be selected from 3way - the touch pen, key pad or console.





Simple setting with



Overview with thumbnail screen

Rich interface support

Automatically detects the connected camera and displays the appropriate menu. With rich selection of interface including parallel RS-232C/RS-422, USB 2.0, the extensibility is superior.







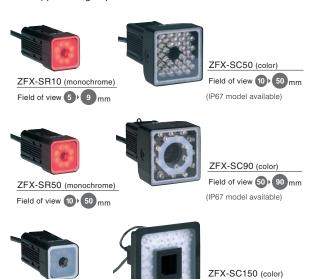
Intensive camera solutions

8 types of cameras that can be selected for different types of work to achieve optimal measurement.

Built-in lighting camera

Triple-speed camera (IP65)

Line up of 6 types of built-in lighting cameras that do not need lighting selection or setup. The color camera can respond to a wide range of work with a 5-150mm field of view. Through image compression and partial capturing, it can support a high-speed line.



C-mount camera unit

NEW

Triple-speed camera

This product line includes C-mount camera that can select the lens to match the field. It can be used in combination with optional lighting such as transmitted lighting, low angle lighting and bar lighting, etc. to support different inspection types.



Innovative triple-speed camera

Fastest in the industry

Performs fast transfer of 11.1ms that are 3 times faster than standard cameras and 1.5 times faster than high-speed cameras while maintaining a resolution of the whole screen. In addition, a super speed, minimum 3.2ms transfer is possible with image compressions and partial capturing.



Excellent ease of use

ZFX-SC10 (color)

Field of view 5 9 mm

Flexible installation

Flexible installation supported for different mounting site conditions. It can be mounted on DIN rail as well as on the control panel surface. (Optional panel mount adapter available.)

Hybrid interface

A new interface that supports both parallel I/O and terminal platform to dramatically improve the ease of wiring.

Field of view 80 > 150 mm

(IP67 model available)



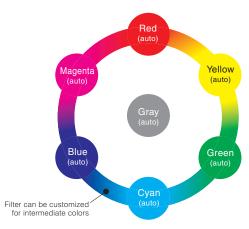
advanced Color Engine

The ZFX-C's advanced auto-color processing ability makes stable and accurate measurements a reality, even for usually difficult to detect contrast and low lighting work.

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Automatic color filter

Industry's first



Even for images clearly distinguishable in color, when converted to monochrome the contrast tends to become low. Color filter analyzer automatically selects the optimal color filter (auto color filter) based on the image analysis result to adjust the contrast, to allow for stable image measurement. Any intermediate color can be arranged for the color filter using custom settings.



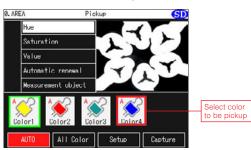
Choose desired color

NEW

Simply select from the list of colors

It is now possible to run an automatic pickup of color, something that used to be a

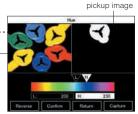
complex procedure, using simply the Auto key. The advanced color engine automatically detects the color distribution in the selected range and automatically lists up to 4 optional color pickup in the order of color area. After that, user can simply select the desired color to be pickup.



Specify the pickup area and press the Auto key to display 4 optional colors for pickup.

Fine-tuning by using dual-screen

The auto color pickup can fine-tune each of the hue, saturation and brightness value. Using double screens, the source image and the color pickup image can be compared and adjusted. This enables easy and stable pickup of colors with low illumination (traditionally difficult to pickup) and colors with large variation. The efficiency of operation is greatly increased.



Source image



Versatile support tool

The concept behind Smart Recipe that eradicates the pain of image processing has been leveraged in the system ramp-up and deployment.

Image storing and re-measurement

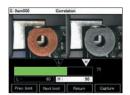
Stores up to 100 files of image data in the main memory without slowing measurement speed. Images data can be re-measured so even with a high-speed line, for example, the results of the measurements can be checked at leisure afterwards.



On-site fine adjustment

NEW

On site variety adjustment of work is essential. Without returning to the menu mode, the measurement region, color contrast setup and so on can be tuned in adjust mode, using double screen to compare with the original image. The measurement results of the stored images can also be displayed so the unnecessary rejects can be efficiently reduced.



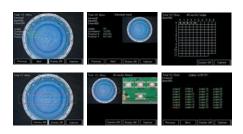
Variety adjustment can be controlled Simply using the adjust mode.

Visualized monitoring and analysis

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Through a list/individual view of measurement results, and a logging monitor display, user can easily understand the measurement situation. The results display can be

chosen from 9 patterns including individual results view (upper left, upper middle), lists of results/region view (lower left, lower middle), list of results/All results view (upper right), and data list view (bottom right). The results can be reviewed in detail which is useful for statistical analysis.



Password function

It is possible to set up a password that alters between operating mode and other. This protects against operational errors at the manufacturing site.

Display capture function

Display images can be captured and stored in the SD memory card. Useful for report documentation.

Ordering Information

Controllers

Appearance	Power supply	Circuit type	Model
1-camera model		NPN	ZFX-C10
	DC21.6 to 26.4V	PNP	ZFX-C15
2-camera model	B021.0 to 20.4V	NPN	ZFX-C20
1 111		PNP	ZFX-C25

Cameras

Appearance	Type		Setting distance	Sensing area	Model	Remarks	
		Monochrome type	34mm to 49mm	4.9mm x 4.9mm to 8.9mm x 8.9mm(variable)	ZFX-SR10 ZFX-SR10R (See note.)		
		Monochrome type	38mm to 194mm	ZFX-SR50 ZFX-SR50R (See note.)			
经规则	Company with lighting				ZFX-SC10 ZFX-SC10R (See note.)	Cable length:2m	
(ZFX-SC50)	Camera with lighting	Color type	31mm to 187mm Color type	9.8mm x 9.8mm to 49mm x 49mm(variable)	ZFX-SC50 ZFX-SC50W(IP67) ZFX-SC50R (See note.)		
			67mm to 142mm	49mm x 49mm to 89mm x 89mm(variable)	ZFX-SC90 ZFX-SC90W(IP67) ZFX-SC90R (See note.)		
			115mm to 227mm	89mm x 89mm to 148mm x 148mm(variable)	ZFX-SC150 ZFX-SC150W(IP67) ZFX-SC150R (See note.)		
	Monochrome type		The CCTV lens is	The CCTV lens is selected according to the range of		A Camera Cable	
	Camera only	Color type	detection and the installation distance.		ZFX-SC	is required.	

Note. Equipped with a robot cable.

Camera Cables

Туре	Туре		Model
	Normal type	3m	ZFX-VS 3M
Camera Cable (See note 1.)	Normai type	8m	ZFX-VS 8M
(See Hote 1.)	Robot cable type	3m	ZFX-VSR
	Normal type	3m	ZFX-VSLA 3M
	(bending direction: A)	8m	ZFX-VSLA 8M
Right-angle Camera Cable	Robot cable type (bending direction: A)	3m	ZFX-VSRLA 3M
(See note 2.)	Normal type	3m	ZFX-VSLB 3M
	(bending direction: B)	8m	ZFX-VSLB 8M
	Robot cable type (bending direction: B)	3m	ZFX-VSRLB 3M

Note 1: It is necessary for ZFX-S and ZFX-SC. ZFX-SR_/SC_ is a cable drawing out type, it doesn't use it.

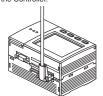
Note 2: Cable Bending Directions

Bending Direction A (Model numbers ending in "A")

The Cable bends downward at the Camera.



The Cable bends toward the front panel at the Controller.



Bending Direction B (Model numbers ending in "B") The Cable bends upward at the Camera.



The Cable bends toward the back panel at the Controller.



Camera extension cable

Туре		Cable length	Model
Camera	Normal type	3m	ZFX-XC3A (See note.1)
Extension	Normai type	8m	ZFX-XC8A (See note.1)
Cable	Robot cable type	3m	ZFX-XC3AR (See note.1)
	Extension cable	15m	ZFX-XC15BR
Camera Extension Cable	(See note 2.)	25m	ZFX-XC25BR
(long-distance	Digital equalizer (camera side)	0.2m	ZFX-XEQ01
type)	Digital equalizer (Controller side)	0.2m	ZFX-XEQ02

Note: The total combined length of the cables connected to the Controller and camera must not exceed 28.4 m (including the camera cable).

Note 1: Up to two camera extension cables can be connected to the camera cable as long as the total cable length between the controller and the camera does not exceed 19 m.

Note 2: Connect the ZFX-VSDIVSRDIC Camera Cable to the Camera and connect the ZFX-VCDA/XCDAR Extension Cable to the Controller.

Accessories

Accessories						
Тур	е		Model			
Console		2m	ZFX-KP 2M			
Corisole		5m	ZFX-KP 5M			
LCD Monitor			FZ-M08			
Panel Mount Adap	oters		ZFX-XPM			
	bar lighting		ZFV-LTL01			
Optional Lighting	bar double-lighting		ZFV-LTL02			
(See note 1.)	bar low-angle lighting		ZFV-LTL04			
	light source for through beam		ZFV-LTF01			
CCTV Lenses /Ex	tension Tubes		3Z4S-LE series			
External Lighting			FLV series			

Note 1:It is possible to ZFX-SC50 and ZFX-SC90 use it.

Other cable

Туре	Cable length	Model
Parallel I/O Cable	2m	ZFX-VP 2M
Taraner //O Gable	5m	ZFX-VP 5M
	2m	ZFX-XPT2A
RS-232C Cable	5m	ZFX-XPT5A
	15m	ZFX-XPT15A
	2m	ZFX-XPT2B
RS-422 Cable	5m	ZFX-XPT5B
	15 m	ZFX-XPT15B
Monitor Cable	2m	FZ-VM 2M
WOTHER CADIC	5m	FZ-VM 5M
Special USB cable	1.8 m	ZFX-XUSB

Specifications

Controllers

Item			ZFX-C20	ZFX-C25	ZFX-C10H	ZFX-C15H	ZFX-C10	ZFX-C15
	f connected camer	as	2		1			
	ble camera		ZFX-SR_/SC_/S/SC					
	g resolution		When ZFX-SR_/SC_ is connected:464 (H) x464 (V) When ZFX-S/SC is connected:608 (H) x464 (V)					
		LCD monitor	3.5" TFT color LCD (320 x 240 pixels)					
Display Indicator		Indicator	"Measuring" indicator (color: green): RUN Trigger indicator (color: blue): ENABLE Judgment indicator (color: orange): OUTPUT Error indicator (color: red): ERROR					
		Input	12 points (RESE	ET, DSA, DI0 to 8,	TRIG)			
	Parallel Output		23 points (OR, E	ERROR, RUN, EN	ABLE, GATE, STO	GOUT0 to 1 (*1) , I	OO0 to 15)	
	intenace	Circuit type	NPN	PNP	NPN	PNP	NPN	PNP
		USB2.0	1 port, FULL SF	L PEED, MINI-B conr	nector			
External	Serial interface	RS-232C		5200 bps (cannot b		ously with RS-422	interface)	
I/F		RS-422		5200 bps (cannot b		-	•	
	Network communications Ethernet 1 port, 100BASE-TX/10BASE-T							
Monitor output		Analog RGB ou	tput, 1 ch (resoluti	on VGA: 640 x 480))			
Memory card I/F			SD card slot 1 c	h				
Operation I/F			Touch panel, ke	y operation, consc	ole connection			
Number of registered banks		32 banks						
	Number of setup	tems	128 items/1 bank		32 items/1 bank			
		Shape inspection	Pattern search, sensitive serch, flexible search, grapgic search				Pattern search, sensitive search	
Main		Size inspection	Area, labeling				Area	
functions	Measurement	Edge inspection	Position, width, count, angle				Position, width, count, angle	
	items	Brightness/color inspection	Brightness, HUE				Brightness, HUE	
		Application-based inspection	Defects, grouping				Defects	
	Position correction	1	1 model search, 2 model search, position, area, labeling, angle				1 model search, 2 model searc position, area, angle	
Additional	Image memory fu	nction	Max. 100 images (when 2 cameras are connected, 50 images/camera)					
functions	Analysis function		Logging monitor					
Menu lang	guage		Japanese/English (can be switched)					
	,	Power supply voltage	21.6 to 26.4 VDC (including ripple)					
		Current consumption	1.5 A max.		1.2 A max.		1.0 A max.	
Ratings		Insulation resistance		wires and controlle		250 V megger)		
		Dielectric strength	Across all lead wires and controller case: 20 M Ω (by 250 V megger) Across all lead wires and controller case, 1000 VAC, 50/60 Hz, 1 min					
		Ambient temperature range	Operating: 0 to + 50 C, Storage: -15 to +60 C (with no icing or condensation)					
		Ambient humidity range						
0		Ambient atmosphere	Operating and storage: 35% to 85% (with no condensation) No corrosive gases allowed					
Operation robustnes	environment s	Degree of protection	IP20 (IEC60529					
		Vibration resistance (durability)	Vibration freque	ency: 10 to 150 Hz	Single-amplitude:	in0.35 mm		
		Shock resistance (destructive)	Vibration frequency: 10 to 150 Hz Single-amplitude: in0.35 mm Acceleration: 50 m/s² 10 times for 8 minutes in X, Y, and Z directons 150 m/s² 3 times each in 6 directions (up/down, left/right, forward/backward)					
Material		onour resistance (destructive)				ngni, iorward/back	waruj	
Material			-	onate (PC), Plate f	ace: PMMA		Appr=:: 000	
Weight			Approx. 650 g Approx. 620 g Touch pen (ZFX-TP), Exhaust unit (ZFX-EU), Terminal block adapter (ZFX-XTB)					
Accessori	es			adapter mounting s				eet,

 $^{^{\}star}1$ Only STGOUT0 is functional on the ZFX-C10H/C15H/C10/C15.

Specifications

Cameras									
Item		ZFX-SR10 /SR10R	ZFX-SR50 /SR50R	ZFX-SC10 /SC10R	ZFX-SC50 /SC50W /SC50R	ZFX-SC90 /SC90W /SC90R	ZFX-SC150 /SC150W /SC150R		
Detection range (H x V) Detection range V		4.9 mm x 4.9 mm to 8.9 mm x 8.9 mm (variable)	9.8 mm x 9.8 mm to 49 mm x 49 mm (variable)	4.9 mm x 4.9 mm to 8.9 mmx 8.9 mm (variable)	9.8 mm x 9.8 mm to 49 mm x 49 mm (variable)	49 mm x 49 mm to 89 mm x 89 mm (variable)	89 mm x 89 mm to 148 mm x 148 mm (variable)		
Setting dis	tance (L)	34 mm to 49 mm	38 mm to 194 mm	34 mm to 49 mm	31 mm to 187 mm	67 mm to 142 mm	115 mm to 227 mm		
Relationsh setting dist detection r		Setting distance (L) 49 mm 49 4.9mm 8.9mm Detection range (H)	Setting distance (L) 194 mm 9.8mm 9.8mm 49mm Detection range (H)	Setting distance (L) 49 mm 4.9mm 8.9mm Detection range (H)	Setting distance (L) 187 mm 31 mm 9.8mm 49mm Detection range (H)	Setting distance (L) 142 mm 67 mm 49mm 89mm Detection range (H)	Setting distance (L) 227 mm 115 mm 148mm Detection range (H)		
Image cap	ture element	All-pixel capture inter-line transfer type All-pixel capture inter-line transfer type 1/3" CCD (monochrome)					color)		
Effective n	umber of pixels			659(H) x 494	↓ (V)				
Pixel size				7.4 µm (H) x 7.4					
Shutter spe				1/170s to 1/20	0000s				
Partial fund (partial capt	ture)		FF			, 1/4 partial			
Frame rate		Fine, Normal, High speed Not available							
	of entire screen)	90 fps							
Lens mour	nt	—— (with Lens)							
	Lighting method			Pulse lighti	•				
	LED	Red	LED	Direct lighti	White	e LED			
Lighting	Type Guide light	Available (center, n	neasurement region)	Direct lighti	Not available				
Lighting	Optional lighting I/F	· · · · · · · · · · · · · · · · · · ·	ot available	<u> </u>	Available (ZFV-LT Series) Not available				
	Indicator Class			Risk Group 1 (IE	EC62471-2)				
	Power supply voltage (supplied from Controller)		15 VDC		15 VDC, 48 VDC				
Ratings	Current consumption		Approx. 200 mA			Approx. 350 mA (15 VDC: approx. 150 mA, 48 VDC: approx. 200 mA) (including current consumption when optional lighting is connected)			
	Ambient temperature range		Operating: 0 to + 4	0 C, Storage: -20 to +65	5 C (with no icing or condensation)				
	Ambient humidity range		Operating	and storage: 35% to 85	`	n)			
Operation	Ambient atmosphere	1505 (15		No corrosive gase					
environment	Degree of protection	IP65 (IE	C60529)	1000 VAC 50 Hz/60	C: IP65 (IEC60529),	ZFX-SCW: IP67 (IEC	(60529)		
robustness	Dielectric strength			1000 VAC 30 112/00	7112 1 111111				
	Vibration resistance (durability)	1	0 to 150 Hz Single-amp	olitude 0.35 mm 10 times	s for 8 min each in X, Y,	and Z directions			
	Shock resistance (destructive)		150 m/s ² 3 times e	each in 6 directions (up/o	down, left/right, forward/l	backward)			
Connection	n method			Cable built-in type (cab					
Cable type	•		ZFX	(-SCDDD/SCDDDW/SF	obot cable				
Material		ZFX-SR10/SR50/SC10/SC50/SC50W/SC90/SC90W/SC150/SC150W/SC150R: Case: ABS, mounting fixture: PBT ZFX-SR10R/SR50R/SC10R/SC50R/SC90R: Case: ABS, Mounting fixture (base): Aluminum, Mounting fixture (bracket): Stainless steel							
Weight		ZFX-SR10/SR50/SC10: Approx. 200 g (including mounting fixtu ZFX-SR10R/SR50R/SC10R: Approx. 270 g (including mounting ZFX-SC50/SC50W: Approx. 270 g (including mounting fixture a ZFX-SR50R: Approx. 400 g (including mounting fixture and cab			o g (including mounting fixture and cable) ding mounting fixture and cable) ZFX-SC90R: gipting and cable				
Accessorie	es	ZFX-SR10/SR50/SC10: Mounting fixture (ZFV-XMF) 1 p'ce, Ferrite core 2 p'ce, Instruction Sheet ZFX-SR10/SR50R/SC10R: Mounting fixture (ZFV-XMF3) 1 set, Ferrite core 2 p'ces, Instruction Sheet ZFX-SC50R/990R: Mounting fixture (ZFV-XMF4) 1 set, Ferrite core 2 p'ces, Instruction Sheet				ZFV-XMF2) 1 p'ce, s, Instruction Sheet ZFV-XMF4) 1 set,	Ferrite core 2 p'ces, Instruction Sheet		

Specifications

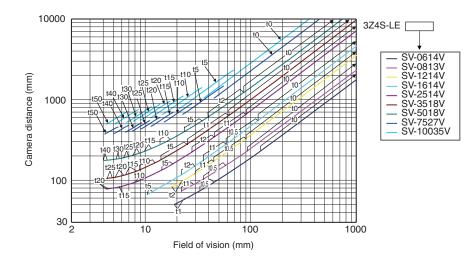
Cameras

Item		ZFX-S (monochrome type)	ZFX-SC (color type)			
D	ip between ance and	The CCTV lens is selected according to the detection range and the setting distance.				
Image capture element		All-pixel capture inter-line transfer type 1/3" CCD (monochrome)	All-pixel capture inter-line transfer type 1/3" CCD (color)			
Effective nu	umber of pixels	659(H) x	(494 (V)			
Pixel size		7.4 µm (H)	x 7.4 μm (V)			
Shutter spe	eed	1/170s to	1/20000s			
Partial fund (partial capti		Not available	1/2 partial, 1/4 partial			
Image rate function		Fine, Normal, High speed	Not available			
	of entire screen)	90 fps				
Lens moun	Lighting method	C m	ount			
	LED LED					
	Type	_	_			
Lighting	Guide light					
	Optional lighting I/F	Not available				
	Power supply voltage (supplied from Controller)	15 VDC, 48 VDC				
Ratings	Current consumption	Approx. 160 mA				
	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	o 85% (with no condensation)			
Operation	Ambient atmosphere		gases allowed			
environment	Degree of protection		C60529)			
robustness	Dielectric strength		Iz/60Hz 1 min			
	Vibration resistance (durability)		, Y, and Z directions			
	Shock resistance (destructive)		forward/backward)			
Connection	n method	(camera cable ZFX	nnection type K-VS/VSR required)			
Cable type		ZFX-SCOOOR/SROO: Normal cable ZFX-SCOOOR/SROOR: Robot cable				
Material		Case: Aluminum die-cast, Cover: Zinc-plated copper plate 0.5 mm thick, Camera mounting base: ABS				
Weight		Approx. 80 g				
Accessorie	es	Instructio	on Sheet			

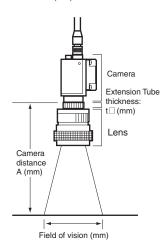
■CCTV Lenses

■ Optical Graph

If using the ZFX-S/SC Camera (Camera only), refer to the optical graph below and select the lens and Extension Tubes. The lens to be selected will depend on the size of the measurement object and the camera distance.



■ Meaning of Optical Graph The X axis of the graph shows the field of vision L (mm), and the Y axis shows the camera distance A (mm).



■ CCTV Lenses

Lens model	3Z4S-LE SV-0614V	3Z4S-LE SV-0813V	3Z4S-LE SV-1214V	3Z4S-LE SV-1614V	3Z4S-LE SV-2514V	3Z4S-LE SV-3518V	3Z4S-LE SV-5018V	3Z4S-LE SV-7527V	3Z4S-LE SV-10035V
Appearance	29 dia. 30.0	28 dia. 34.0	29 dia. 29.5	29 dia. 24.0	29 dia. 24.5	29 dia. 33.5	32 dia. 37.0	32 dia. 42.0	32 dia. 43.9
Focal length	6 mm	8 mm	12 mm	16 mm	25 mm	35 mm	50mm	75 mm	100 mm
Brightness	F1.4	F1.3	F1.4	F1.4	F1.4	F1.8	F1.8	F2.7	F3.5
Filter size	M27 P0.5	M25.5 P0.5	M27 P0.5	M27 P0.5	M27 P0.5	M27 P0.5	M30.5 P0.5	M30.5 P0.5	M30.5 P0.5

■ Extension Tubes

Model	3Z4S-LE SV-EXR
Contents	Set of seven tubes (0.5 mm, 1.0 mm, 2.0 mm, 5 mm, 10 mm, 20 mm, and 40 mm) Maximum outer diameter: 30 mm

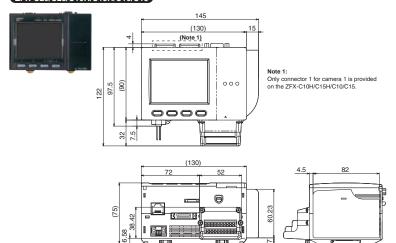
*Do not use the 0.5-mm, 1.0-mm, and 2.0-mm Extension Tubes next to each other.

These Extension Tubes are placed over the threaded section of the Lens or other Extension Tube. If more than one them are used together, the connection of the threaded section may not be secure.

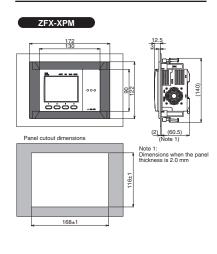
*Reinforcement is required to protect against vibration when Extension Tubes exceeding 30 mm are used.

Controllers

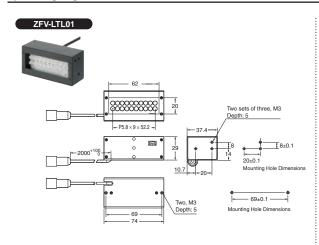
ZFX-C20/C25/C10H/C15H/C10/C15

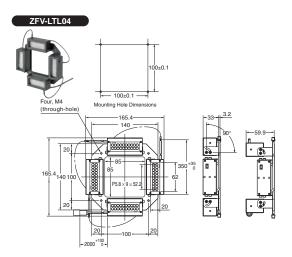


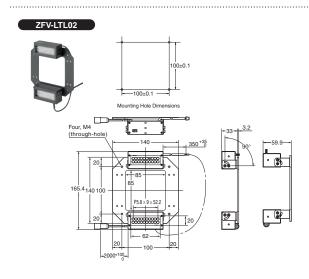
Panel Mount Adapters

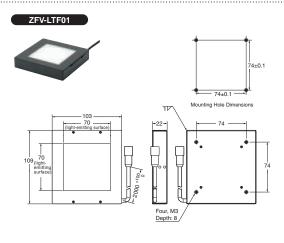


Optional Lighting







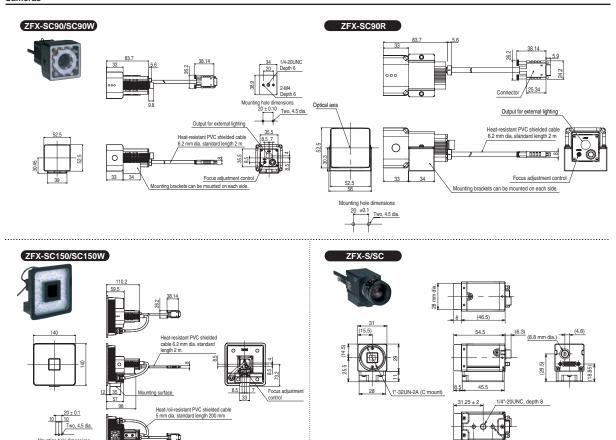


ZFX-SR10/SR50 ZFX-SR10R/SR50R Focus adjustment cont ZFX-SC10 ZFX-SC10R Focus adjustment cont ZFX-SC50/SC50W ZFX-SC50R Heat-resistant PVC shielded cable 6.2 mm dia. standard length 2 m Output for external lighting

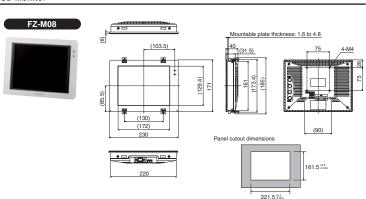
20±0.1 Two, 4.5 dia.

Nounting brackets can be mounted on each side.

Mounting brackets can be mounted on each side.



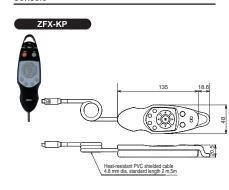
LCD Monitor



2-M4, depth 6

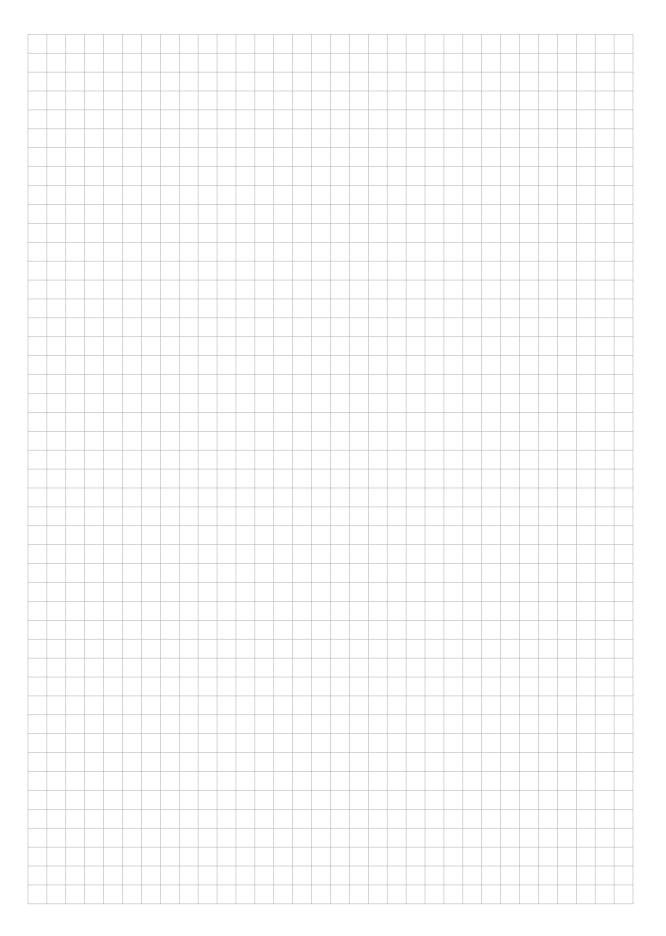
Console

21.25 ± 2



2-M4, depth 8

MEMO



MEMO



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This document provides information mainly for selecting suitable models. Please read the User's Manual (Z251-E1-01) carefully for information that the user must understand and accept before purchase, including information on warranty, limitations of liability, and precautions.

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