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

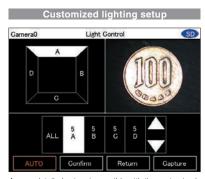
Smart Recipe is on Omron's invention of 3-step setting procedure. By adopting a new algorithm to encapsulate "human know-how", the auto setup for lighting and measurement now possible. Anyone can rapidly perform a high level of image processing.

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.

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.

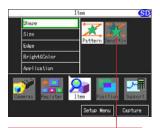


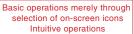


Step2

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.













Count

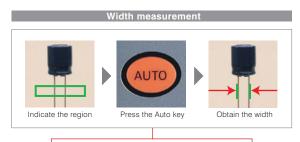
Step3

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.

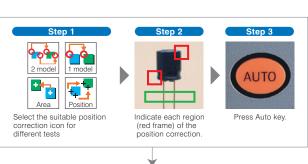


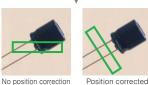
Appropriate filters and edge scan directions for width measurement can be automatically set by analyzing the target image.

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.





difference, the measurement region is automatically adjusted.

In response to the position

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.



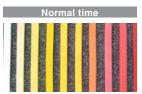


Bright and Hue measurement item

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.

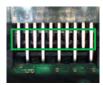
Width

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.

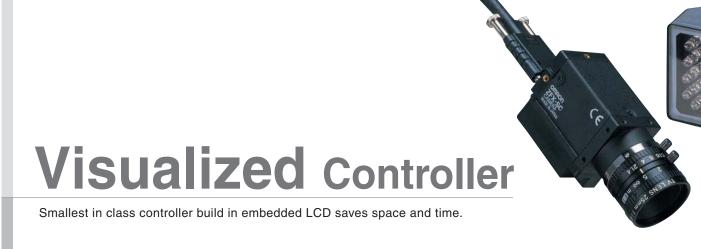
Gray filtering setup using double screen

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

ZFX-SC150 (color)
Field of view 80 > 150 mm

(IP67 model available)

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



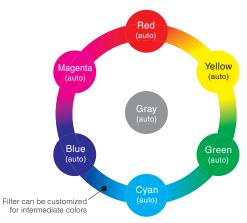
advanced Color Engine

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.



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.

Without filter (monochrome) (color)

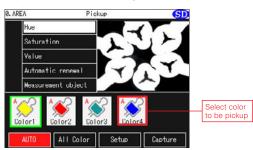
Choose desired color

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

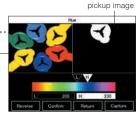
complex procedure, using simply the Auto key. The advanced color engine automatically detects the color distribution in the selected range and automatically lists up to 4 optional color pickup in the order of color area. After that, user can simply select the desired color to be pickup.



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

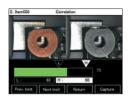
Stores up to 100 files of image data in the main memory without slowing measurement speed. Images data can be re-measured so even with a high-speed line, for example, the results of the measurements can be checked at leisure afterwards.



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.



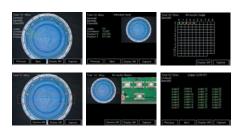
Variety adjustment can be controlled Simply using the adjust mode.

Visualized monitoring and analysis

NEW

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	DG21.6 t0 26.4V	NPN	ZFX-C20
		PNP	ZFX-C25

Cameras

Appearance	Туре		Setting distance	Sensing area	Model	Remarks	
	Camera with lighting	Managharan	34mm to 49mm	4.9mm x 4.9mm to 8.9mm x 8.9mm(variable)	ZFX-SR10 ZFX-SR10R (See note.)		
(ZFX-SC50)		Monochrome type	38mm to 194mm	9.8mm x 9.8mm to 49mm x 49mm(variable)	ZFX-SR50 ZFX-SR50R (See note.)		
		Color type	34mm to 49mm	4.9mm x 4.9mm to 8.9mm x 8.9mm(variable)	ZFX-SC10 ZFX-SC10R (See note.)		
			31mm to 187mm Color type	9.8mm x 9.8mm to 49mm x 49mm(variable)	ZFX-SC50 ZFX-SC50W(IP67) ZFX-SC50R (See note.)	Cable length:2m	
			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.)		
	Comerc only	Monochrome type	The CCTV lens is selected according to the range of		ZFX-S	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		Cable length	Model
Camera Cable	Normal type	3m,8m	ZFX-VS
(See note 1.)	Robot cable type	3m	ZFX-VSR
Right-angle Camera Cable (See note 2.)	Normal type (bending direction: A)	3m,8m	ZFX-VSLA 3M/8M
	Robot cable type (bending direction: A)	3m	ZFX-VSRLA 3M
	Normal type (bending direction: B)	3m,8m	ZFX-VSLB 3M/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,

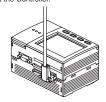
it doesn't use it. Note 2: Cable Bending Directions

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	Namedana	3m	ZFX-XC3A (See note.1)
Extension	Normal type	8m	ZFX-XC8A (See note.1)
Cable	Robot cable type	3m	ZFX-XC3AR (See note.1)
Camera	Extension cable (See note 2.)	15m,25m	ZFX-XC_BR
Extension Cable (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

Note 1: Op 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-VS\\
\times\varphi\sqrt{VSR}\\
\times\time

Other cable

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

Accessories

Тур	e	Model				
Console		ZFX-KP (2m / 5m)				
LCD Monitor		FZ-M08				
Panel Mount Adap	oters	ZFX-XPM				
	bar lighting	ZFV-LTL01				
Optional Lighting	bar double-lighting	ZFV-LTL02 ZFV-LTL04				
(See note 1.)	bar low-angle lighting					
	light source for through beam	ZFV-LTF01				
CCTV Lenses /Ex	tension Tubes	3Z4S-LE series				
External Lighting		3Z4S-LT series				
Strobe Controller	(See note 2.)	Manufactured by MORITEX Corporation 3Z4S-LT MLEK-C100E1TSX				

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

Note 2: It is possible to ZFX-S and ZFX-SC use it. It uses it so that the controller may control an external lighting. The Strobe Controller cannot be connected when using a Right-angle Camera Cable.

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)					
				C is connected:608				
		LCD monitor		.CD (320 x 240 pix				
Display		Indicator	"Measuring" indicator (color: green): RUN Trigger indicator (color: blue): ENABLE Judgment indicator (color: orange): OUTPUT Error indicator (color: red): ERROR					
		Input	12 points (RESET, DSA, DI0 to 8, TRIG)					
	Parallel interface	Output	23 points (OR, E	ERROR, RUN, EN	ABLE, GATE, STG	OUT0 to 1 (*1) , I	DO0 to 15)	
		Circuit type	NPN	PNP	NPN	PNP	NPN	PNP
		USB2.0	1 port, FULL SF	PEED, MINI-B conr	nector			1
External	Serial interface	RS-232C	1 port, max. 115	5200 bps (cannot b	e used simultaned	ously with RS-422	interface)	
I/F		RS-422	1 port, max. 115	5200 bps (cannot b	e used simultaneo	ously with RS-232	C interface)	
	Network communications	Ethernet	1 port, max. 115200 bps (cannot be used simultaneously with RS-232C interface) 1 port, 100BASE-TX/10BASE-T					
	Monitor output		Analog RGB output, 1 ch (resolution VGA: 640 x 480)					
	Memory card I/F		SD card slot 1 ch					
Operation I/F			Touch panel, ke	y operation, conso	le connection			
	Number of registered banks		32 banks					
	Number of setup items		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 items	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 search position, area, angle		
Additional	Image memory fu	nction	Max. 100 image	s (when 2 camera	s are connected, 5	i0 images/camera		<u> </u>
functions	Analysis function		Logging monitor					
Menu lang	uage		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	Across all lead v	wires and controlle	r case: 20 MΩ (by	250 V megger)		
		Dielectric strength	Across all lead v	wires and controlle	er case, 1000 VAC,	50/60 Hz, 1 min		
		Ambient temperature range	Across all lead wires and controller case, 1000 VAC, 50/60 Hz, 1 min Operating: 0 to +50°C, Storage: -15 to +60°C (with no icing or condensation)					
		Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)					
Operation	environment	Ambient atmosphere	No corrosive ga		,- (
robustnes		Degree of protection	IP20 (IEC60529					
		Vibration resistance (durability)	Vibration freque	ency: 10 to 150 Hz	Single-amplitude:	in0.35 mm		
Shock resistance (durability)		Acceleration: 50 m/s ² 10 times for 8 minutes in X, Y, and Z directons						
Material			150 m/s ² 3 times each in 6 directions (up/down, left/right, forward/backward)					
Weight			Case: Polycarbonate (PC), Plate face: PMMA Approx. 650 q Approx. 650 q					
Accessori	es		Approx. 650 g Touch pen (ZFX-TP), Exhaust unit (ZFX-EU), Terminal block adapter (ZFX-XTB) Terminal block adapter mounting screws (4 p'ces), Ferrite core (2 p'ces), Instruction Sheet, and Power connector					

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

Specifications

		ZFX-SR10	ZFX-SR50	ZFX-SC10	ZFX-SC50	ZFX-SC90	ZFX-SC150			
Item		/SR10R	/SR50R	/SC10R	/SC50W /SC50R	/SC90W /SC90R	/SC150W /SC150R			
Detection r	ange (H x V)									
D	etection	4.9 mm x 4.9 mm to 8.9 mm x 8.9 mm	9.8 mm x 9.8 mm to 49 mm x 49 mm	4.9 mm x 4.9 mm to 8.9 mmx 8.9 mm	9.8 mm x 9.8 mm to 49 mm x 49 mm	49 mm x 49 mm to 89 mm x 89 mm	89 mm x 89 mm to 148 mm x 148 mi			
range		(variable)	(variable)	(variable)	(variable)	(variable)	(variable)			
 	—————————————————————————————————————									
Setting dis		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			
		Setting distance (L)	Setting distance (L)	Setting distance (L)	Setting distance (L)	Setting distance (L)	Setting distance (L)			
Relationsh	ip between	49 h	194 mm	49 mm	187 t	142 f	227 A			
setting dist	•	34	38 -	34 mm - 1	31m	67m	115 -			
detection ra	ange	4.9mm 8.9mm	9.8mm 49mm	4.9mm 8.9mm	9.8mm 49mm	49mm 89mm	89mm 148mm			
		Detection range (H)	Detection range (H)	Detection range (H)	Detection range (H)	Detection range (H)	Detection range (H)			
		All-pixel capt	ure inter-line							
Image cap	ture element	transfe 1/3" CCD (m		All-p	pixel capture inter-line tr	ansfer type 1/3" CCD (d	color)			
Effective n	umber of pixels			659(H) x 494	(1)					
Pixel size	uniber of pixels			7.4 µm (H) x 7.4						
Shutter spe	eed			1/170s to 1/20						
Partial fund		Ol	FF		1/2 partial	1/4 partial				
(partial capt						-				
Image rate		Fine, Norma	l, High speed		Not av	allable				
Frame rate (at capture of	of entire screen)			90 fps						
Lens mour	nt			—— (with Le	ens)					
	Lighting method			Pulse lighti	ng					
LED		Red	LED		White LED					
Liabtina	Type	Available (center, measurement region)		Direct lighting Not available						
Lighting	Guide light Optional	<u> </u>			inot av	allable				
	lighting I/F	N	ot available		Available (ZF	FV-LT Series)	Not available			
	Indicator Class*1	_	_	Class 1	Class 2	Class 2	Class 1			
Power supply voltage (supplied from Controller			15 VDC			15 VDC, 48 VDC				
Ratings	Current			Approx. 350 mA (15 VDC: approx. 150 mA, 48 VDC: approx. 200 mA) (including current consumption when						
	consumption		Approx. 200 mA							
			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% (with no condensation)								
Incretion	Ambient atmosphere	No corrosive gases allowed								
Operation environment	Degree of protection	IP65 (IEC60529) ZFX-SC: IP65 (IEC60529), ZFX-SCW: IP67 (IEC60529)								
obustness	Dielectric strength	1000 VAC 50 Hz/60 Hz 1 min								
	Vibration resistance (durability)	10 to 150 Hz Single-amplitude 0.35 mm 10 times for 8 min each in X, Y, and Z directions								
	Shock resistance	150 m/s ² 2 times each in C diseasing (m/d								
	(destructive)		150 m/s ² 3 times each in 6 directions (up/down, left/right, forward/backward)							
Connection	n method			Cable built-in type (cab	le length: 2 m)					
Cable type		ZFX-SC□□□/SC□□□W/SR□□: Normal cable ZFX-SC□□□R/SR□□R: Robot cable								
		ZFX-SR10/SR50/SC10/SC50/SC50W/SC90/SC90W/SC150/SC150W/SC150R:								
Material		Case: ABS, mounting fixture: PBT ZFX-SR10R/SR50R/SC10R/SC50R/SC90R: Case: ABS, Mounting fixture (base): Aluminum, Mounting fixture (bracket): Stainless steel								
			,	. , ,	5 (2.23101	ZFX-SC90/SC90W:				
		7FY-9R10/9P5/	0/SC10: Approx 200 a /	including mounting fixtu	re and cable)	Approx. 300 g (including mounting				
Weight		ZFX-SR10R/SR	50R/SC10R: Approx. 27	'0 g (including mounting	fixture and cable)	fixture and cable)	Approx. 600 g (including mounting			
Tolgili				iding mounting fixture a nounting fixture and cabl		ZFX-SC90R: Approx. 400 g	fixture and cable)			
		2. X 0.10011. Ap	F. Sa. 100 g (moldding II	g intare and cabi	able) Approx. 400 g (including mounting fixture and cable)					
					7FV 0050/00===	,				
		ZFX-SR10/SR50			ZFX-SC50/SC50W Mounting fixture (Z	FV-XMF2) 1 p'ce,				
		Mounting fixture Instruction Shee	(ZFV-XMF) 1 p'ce, Ferr	ite core 2 p'ce,	Ferrite core 2 p'ce Instruction Sheet	s, Warning label 1,	Ferrite core 2 p'ces			
Accessorie	S	ZFX-SR10R/SR	50R/SC10R:		ZFX-SC50R/90R:	ELONE O	Instruction Sheet			
		Mounting fixture Instruction Shee	(ZFV-XMF3) 1 set, Feri t	rite core 2 p'ces,	Mounting fixture (2 Ferrite core 2 p'ce:					
					Ferrite core 2 p'ces, Warning label 1, Instruction Sheet					

^{*1:} Applicable standards IEC60825-1:1993 +A1:1997 +A2:2001, EN60825-1:1994 +A2:2001 +A1:2002

Specifications

Cameras

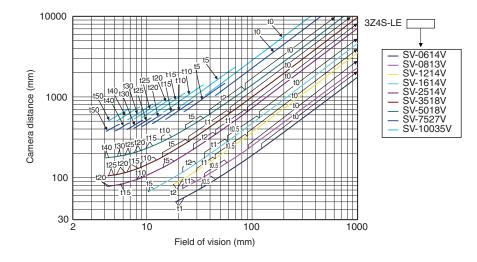
Cameras						
Item		ZFX-S (monochrome type)	ZFX-SC (color type)			
D	ange (H x V) etection range	The CCTV lens is selected according to the detection rar and the setting distance.				
Setting dist	tance (L)					
Relationshi setting dist detection ra	ance and					
Image capture element		All-pixel capture inter-line transfer type 1/3" CCD (monochrome)	All-pixel capture inter-line transfer type 1/3" CCD (color)			
Effective no	umber of pixels	659(H) x	494 (V)			
Pixel size			c 7.4 μm (V)			
Shutter spe		1/170s to	1/20000s			
Partial fund (partial capt		Not available	1/2 partial, 1/4 partial			
Image rate function		Fine, Normal, High speed	Not available			
Frame rate (at capture of entire screen)		90 fps				
Lens moun		C m	ount			
	Lighting method LED					
	Туре		_			
Lighting	Guide light					
gg	Optional lighting I/F	Available External lighting: 3Z4S-LT Series Flash Controller: made by Moritex Corporation 3Z4S-LT MLEK-C100E1TSX				
	Indicator Class*1					
	Power supply voltage (supplied from Controller)	15 VDC,	48 VDC			
Ratings	Current consumption	Approx. 160 mA				
	Ambient temperature range		5 to +65°C r condensation)			
Operation	Ambient humidity range	Operating and storage: 35% to				
Operation environment	Ambient atmosphere	No corrosive (
robustness	Degree of protection Dielectric strength	500VAC 50 H	<u> </u>			
	Vibration resistance (durability)	10 to 150 Hz Single-amp for 8 min each in X,	litude 0.35 mm 10 times			
	Shock resistance (destructive)	150 m/s ² 3 times e				
Connection	n method	Connector co (camera cable ZFX	nnection type (-VS/VSR required)			
Cable type		ZFX-SCOOR/SROOF	N/SR□□: Normal cable R: 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	rs	Instruction	on Sheet			

^{*1:} Applicable standards IEC60825-1:1993 +A1:1997 +A2:2001, EN60825-1:1994 +A2:2001 +A1:2002

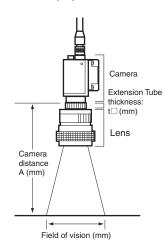
CCTV Lenses

■ 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 dia.	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

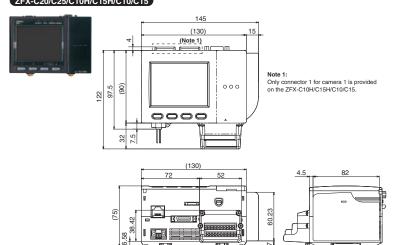
Tubes next to each other.

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.

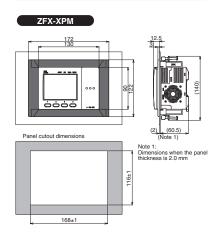
*Reinforcement is required to protect against vibration when Extension Tubes exceeding 30 mm are used.

Controllers

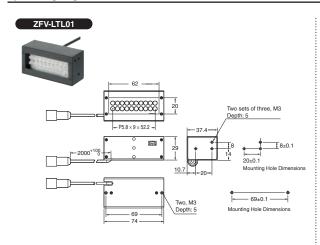
ZFX-C20/C25/C10H/C15H/C10/C15

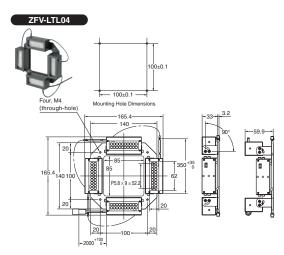


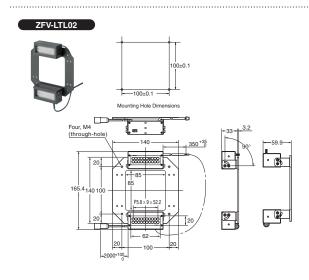
Panel Mount Adapters

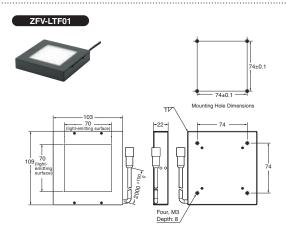


Optional Lighting









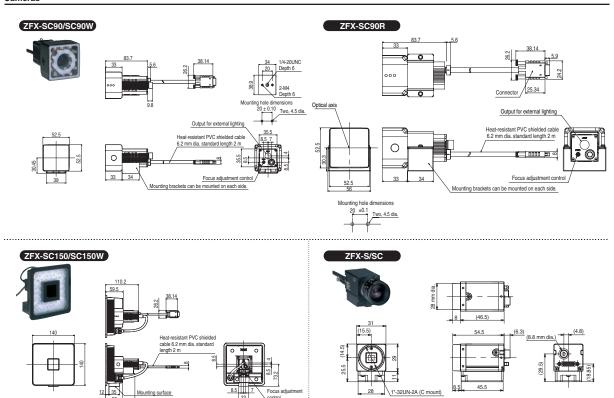
ZFX-SR10/SR50 ZFX-SR10R/SR50R Focus adjustment cont ZFX-SC10 ZFX-SC10R Focus adjustment cont Two, 4.5 dia. ZFX-SC50/SC50W ZFX-SC50R Heat-resistant PVC shielded cable 6.2 mm dia. standard length 2 m

20±0.1 Two, 4.5 dia.

Nounting brackets can be mounted on each side.

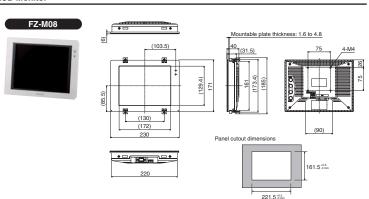
Output for external lighting

Mounting brackets can be mounted on each side.



LCD Monitor

20 ± 0.1 10 Two, 4.5 dia.



Heat-/oil-resistant PVC shielded cable 5 mm dia. standard length 200 mm

2-M4, depth 6

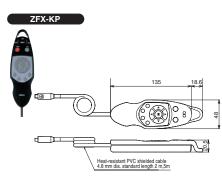
Console

21.25 ± 2

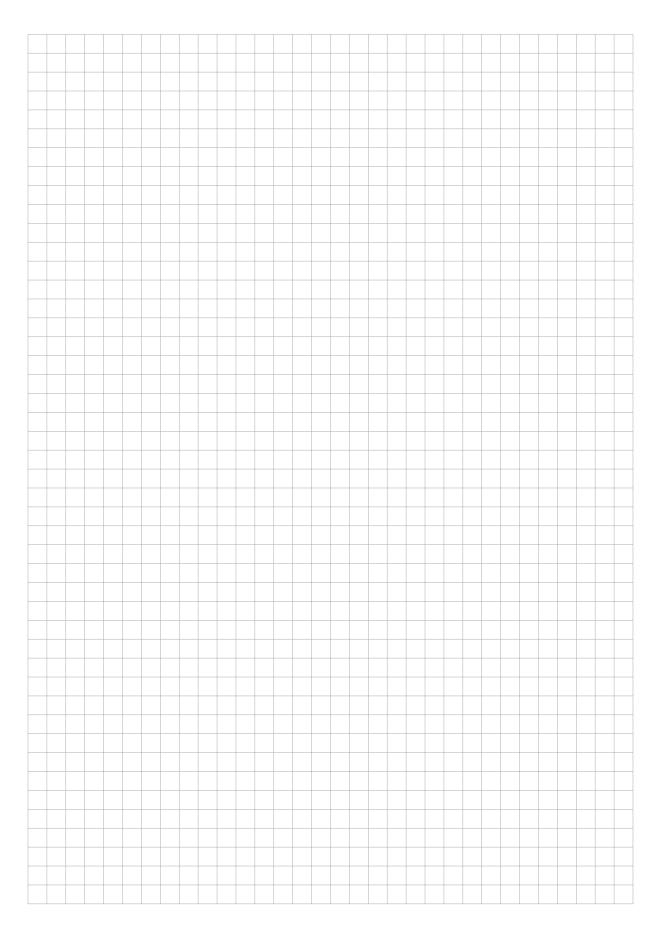
31.25 ± 2,

1/4"-20UNC, depth 8

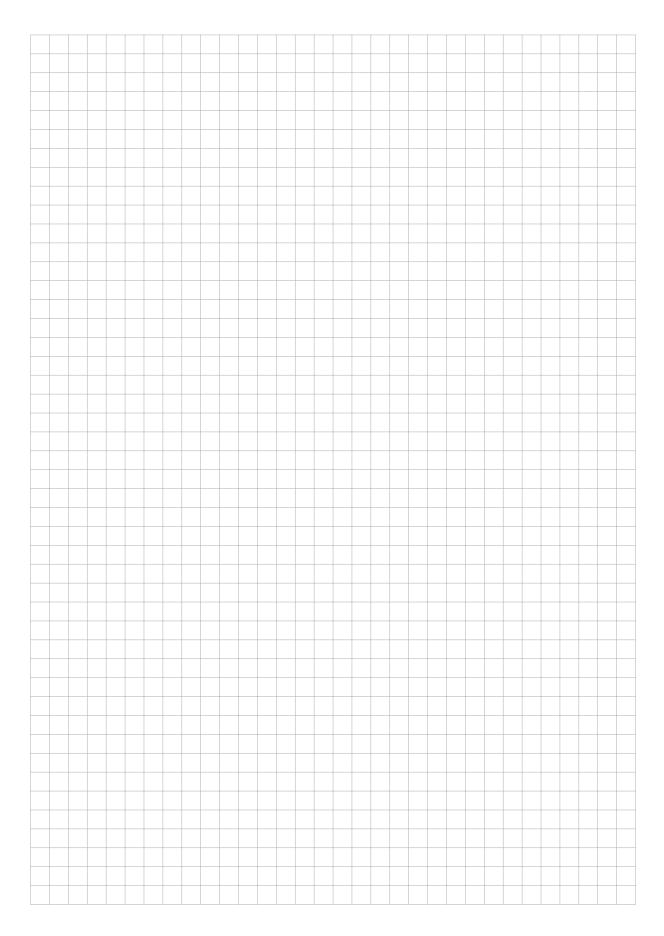
2-M4, depth 8



MEMO



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