

# ZFX VISION SENSOR

Easy vision at a touch



» User guidance

» Touch, connect and go

» Interactive user interface

# High performance with an easy touch

*Omron's ZFX advanced vision sensor takes you into a new dimension of intuitive user guidance – Touch, Connect & Go*

*The built-in touch screen is easy to use and saves the user from getting involved with the complex technical details. It provides immediate feedback with live images and clear system messages during the entire set-up and inspection cycle. The ZFX offers assistance for lighting, filtering and automatic setting of parameters, which navigate users through the vision application.*

*The ZFX vision sensor comes as a one or two camera system, offering monochrome or colour functionality.*

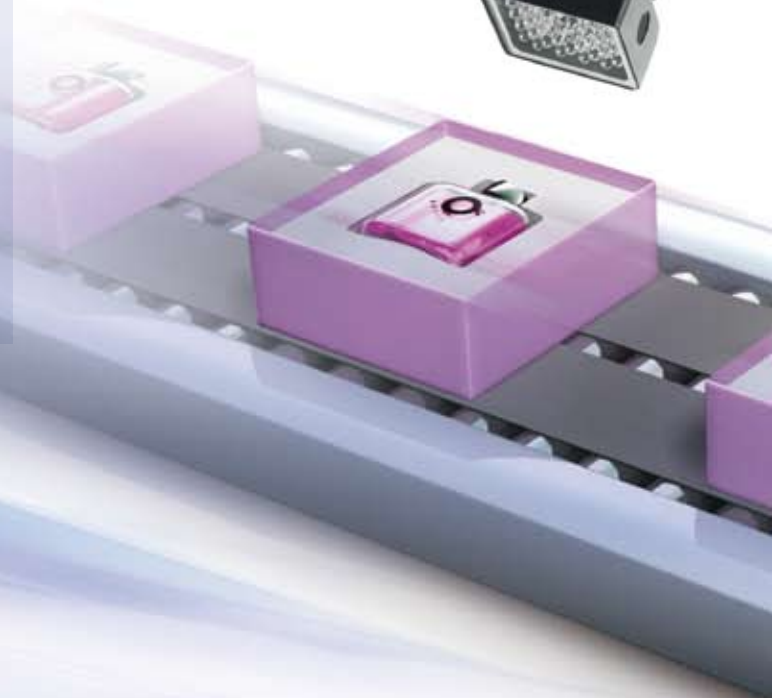
## Get in touch and get going

Simply touch the large built-in LCD screen of the new ZFX vision sensor. Interactive menus guide you through the simple set-up of individual tasks in three easy steps.

1. Select inspection tools
2. Choose inspection regions
3. Set inspection parameters

You'll be ready to go in a matter of minutes. There's no need to connect a PC for set-up, maintenance or operation. The LCD screen provides instant feedback – showing interactive menus and useful information on the inspection status.

The AUTO button accesses the intelligence of the ZFX, automatically setting the parameters which have been proposed.



# Complete set-up in minutes



Select inspection tools

Choose inspection regions

Set inspection parameters



# Master any job - with the ZFX

This vision sensor allows the configuration of multiple inspections per image and lets you select from up to 20 image inspection or inspection support tools. Depending on the connected camera, the tools will process a monochrome or colour image providing colour filters and colour pickup options. Powerful image pre-processing, position compensation, calibration and data logging tools complete the ZFX functionality.



Position

## Position compensation tools:

Allows compensation of the current object position in 360° rotation



Pattern

## Pattern matching:

Searches for an object or finds deviations to a programmed object in 360° rotation



Area

## Area:

Measures the size of objects



BCR

## Code reading:

Reading and verification of barcodes and datamatrix



Position

## Edge tools:

Finds the positions of edges, or measures the width of objects



Defect

## Defect tools:

Finds minute defects in surfaces



Bright

## Brightness/HUE:

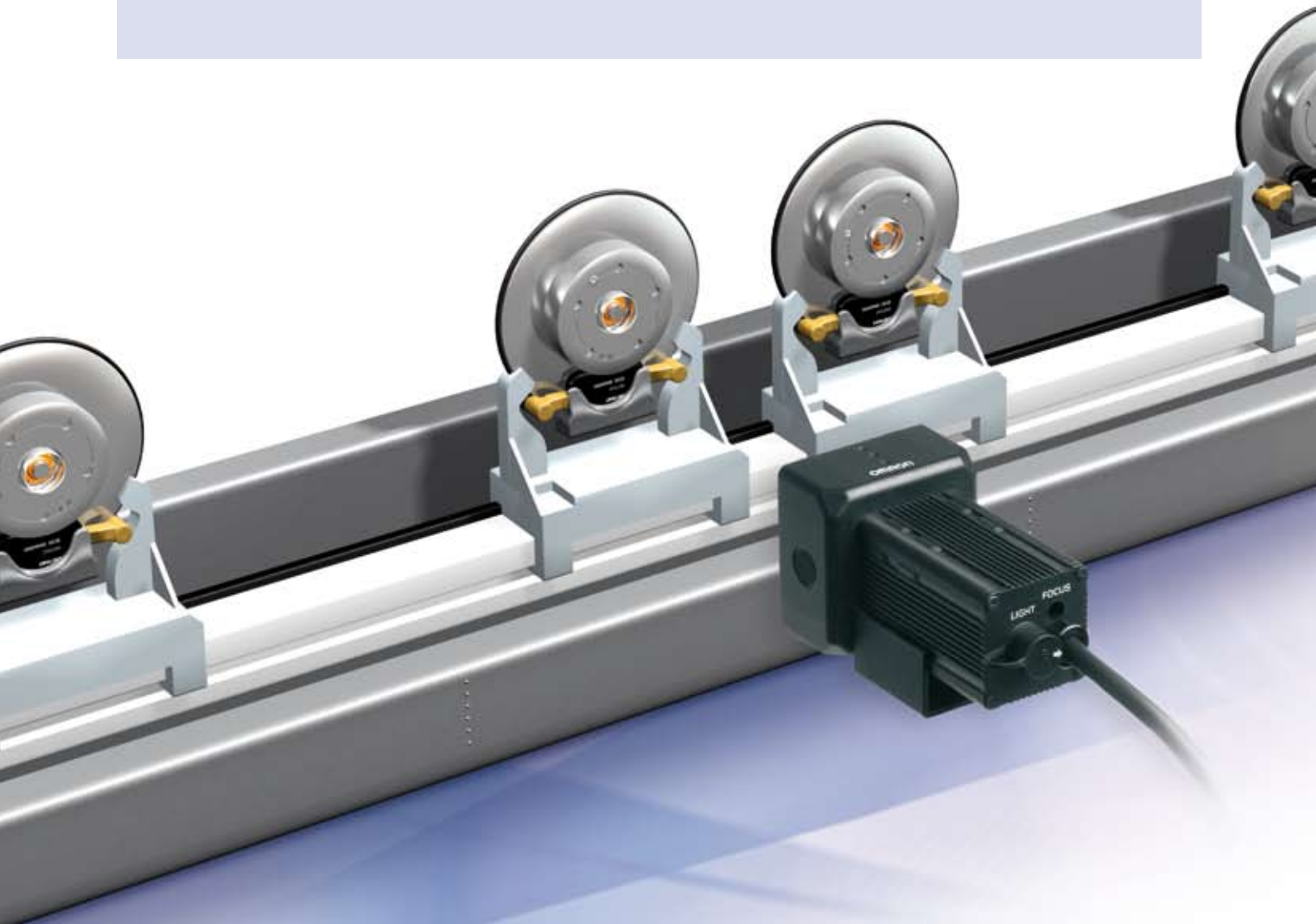
Finds deviations in the brightness or colour of objects



Add func

## Calculation:

Allows calculations with tool results and the definition of data output





+



+



+



#### Code reading (1D/2D) and inspections

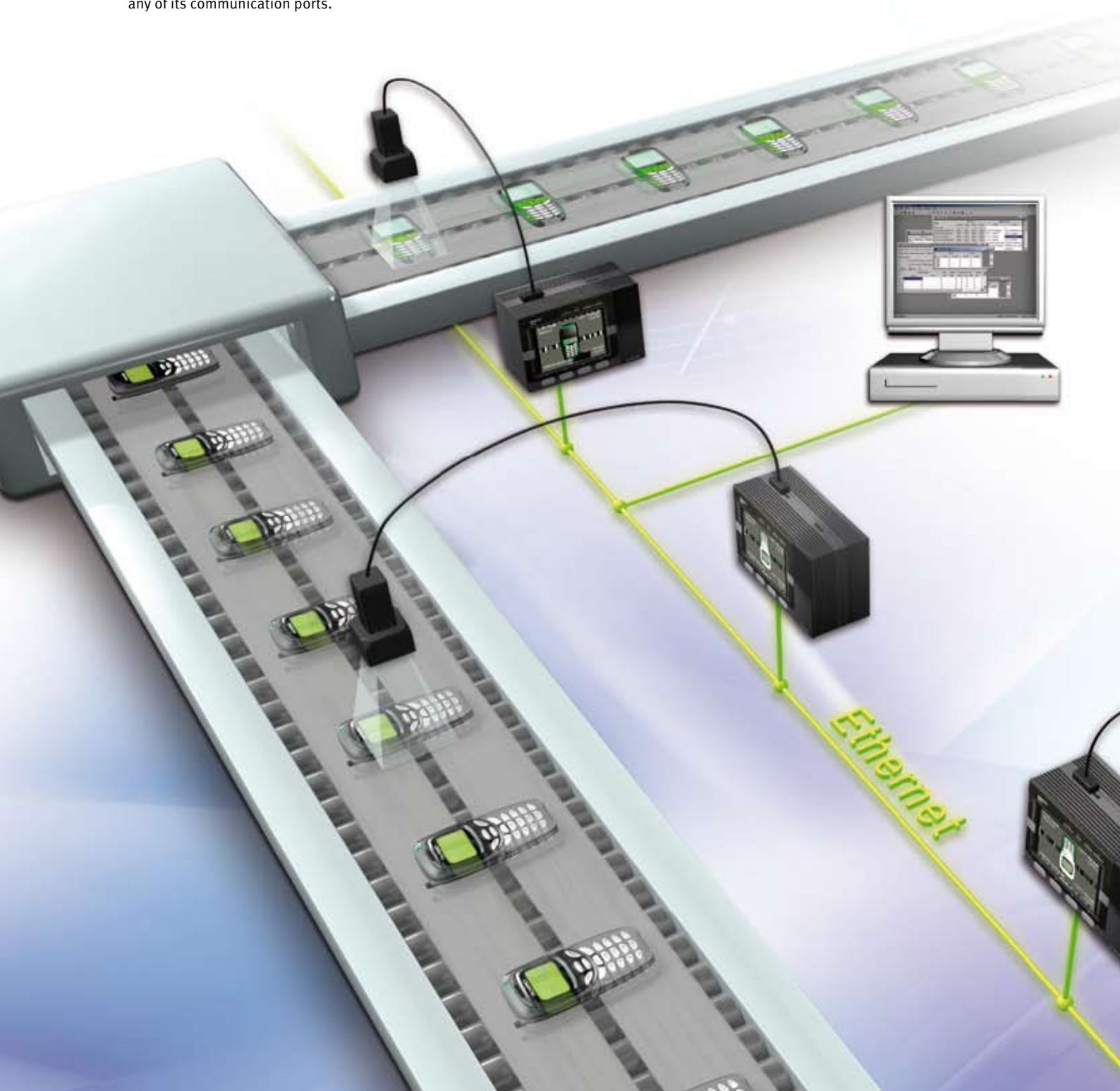
The combination of barcode/datamatrix and powerful inspection items inside ZFX simplifies operation and reduces the space for the mechanical integration.

#### Multiple inspections

Multiple inspections ensure the reliable identification of a brake system for assembly, e.g. detection of the correct model, presence of left and right parts, etc.

### Connect - Ethernet & more

The new ZFX features multiple interface options for smooth integration into any process environment, such as Ethernet, USB and digital I/O. This allows the communication of result data and images via the network, configuration uploads and downloads, the manipulation of settings, and much more. 20 digital I/O ports guarantee fast communication of time-critical control data like trigger inputs, binary result information, handshake or status outputs. A large number of documented communications commands enable the integration of the ZFX sensor into your existing process via any of its communication ports.





C-mount:  
ZFX-S  
ZFX-SC

**ZFX-SR10/SC10**

FOV: 5 to 9 mm

**ZFX-SR50**

FOV: 10 to 50 mm

**ZFX-SC50**

FOV: 10 to 50 mm

**ZFX-SC90**

FOV: 50 to 90 mm

**ZFX-SC150**

FOV: 90 to 150 mm

**One sensor fits all**

Pick the camera and controller suitable for the job. This guarantees maximum flexibility and helps minimise your investment costs.

The range of cameras provides a field of view from 10 mm to 150 mm, which allows you to inspect even large workpieces that previously could not be handled.

The ZFX features cameras with integrated lighting and a lens with adjustable focus. A c-mount camera, providing any lens/light combination, and a choice of controllers (with and without code reading) are also available. Depending on the connected camera, the controllers can work in monochrome or colour mode. The ZFX-C20/25 represents a two camera system for advanced applications.

## Optimize your set-up with a click

Auto settings is a sophisticated built-in support function that applies optimum measurement conditions just by selecting AUTO. Automatically made settings can be checked and changed in each of the set-up screens.

**Auto selection of colour filter**

Select the optimum colour filter.



**Step 1**

Just press AUTO to automatically improve the contrast.

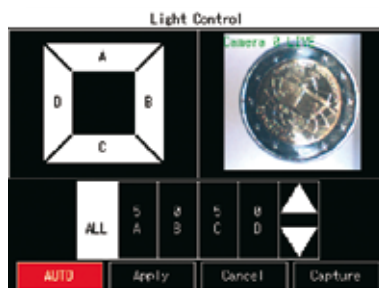


**Step 2**

The optimum filter is automatically selected from seven colour filters.

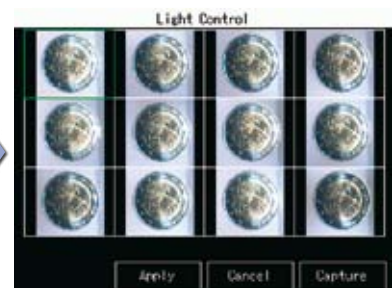
**Auto set-up for light control**

Set the perfect lighting in no time at all.



**Step 1**

Just press AUTO to automatically obtain optimum lighting measurements.



**Step 2**

Choose the correct lighting with just one click.

# ZFX



## Easy Vision – Touch, Connect & Go

- Easy vision – intuitive teach & go user interfaces
- Live – built-in LCD touch monitors for setup and immediate feedback
- Communication – centralized setup & inspection via Ethernet
- Versatile – app. 20 tools, 32/128 inspections per image
- Simplicity – auto-adjustment functions for easy image setup
- Flexible – 1 or 2 cameras, colour or monochrome
- Barcode and Datamatrix




## Ordering Information

### Controllers

Appearance	Power supply	Circuit type	Model	
				Code reading models
	DC21.6 to 26.4V	NPN	ZFX-C10	ZFX-C10-CD
		PNP	ZFX-C15	ZFX-C15-CD
	DC21.6 to 26.4V	NPN	ZFX-C20	ZFX-C20-CD
		PNP	ZFX-C25	ZFX-C25-CD

### Cameras

Appearance	Type		Setting distance	Sensing area	Model	Remarks
 (ZFX-SC50)	Camera with lighting	Monochrome type	34mm to 49mm	5mm x 4.9mm to 9mm x 8.9mm (variable)	ZFX-SR10	Cable length: 2m
			38mm to 194mm	10mm x 9.8mm to 50mm x 49mm (variable)	ZFX-SR50	
		Color type	34mm to 49mm	5mm x 4.9mm to 9mm x 8.9mm (variable)	ZFX-SC10	
			34mm to 187mm	10mm x 9.8mm to 50mm x 49mm (variable)	ZFX-SC50 ZFX-SC50W(IP67)	
			67mm to 142mm	50mm x 49mm to 90mm x 89mm (variable)	ZFX-SC90 ZFX-SC90W(IP67)	
			115mm to 227mm	90mm x 89mm to 150mm x 148mm (variable)	ZFX-SC150 ZFX-SC150W(IP67)	
	Camera only	Monochrome type	The CCTV lens is selected according to the range of detection and the installation distance.		ZFX-S	–
	Color type			ZFX-SC		

### Cables

Type	Cable length	Model	
Camera Cable <sup>1</sup>	Normal type	3m, 8m	ZFX-VS
	Robot cable type	3m	ZFX-VSR
Camera Extension Cable	Normal type	3m	ZFX-XC3A
	Robot cable type	8m	ZFX-XC8A
		3m	ZFX-XC3AR
Parallel I/O Cable	2m, 5m	ZFX-VP	
RS-232C Cable	2m	ZFX-XPT2A	
RS-422 Cable	2m	ZFX-XPT2B	
Monitor Cable	2m, 5m	FZ-VM	

<sup>1</sup> It is necessary for ZFX-S and ZFX-SC. ZFX-SR\_/SC\_ is a cable drawing out type, it doesn't use it.

### Accessories

Type	Model	
Console	ZFX-KP (2m / 5m)	
LCD Monitor	FZ-M08	
Panel Mount Adapters	ZFX-XPM	
Optional Lighting	bar lighting	ZFV-LTL01
	bar double-lighting	ZFV-LTL02
	bar low-angle lighting	ZFV-LTL04
	light source for through beam	ZFV-LTF01

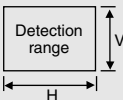
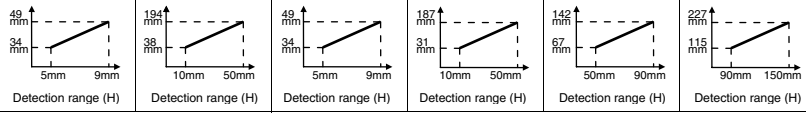


# Specifications

## Controller

Item		ZFX-C10(-CD)	ZFX-C15(-CD)	ZFX-C20(-CD)	ZFX-C25(-CD)	
Number of connected cameras		1		2		
Connectable camera		ZFX-SR_/SC_/S/SC				
Processing resolution		When ZFX-SR_/SC_ is connected:464 (H) x464 (V) When ZFX-S/SC is connected:608 (H) x464 (V)				
Display	LCD monitor	3.5" TFT color LCD (320 x 240 pixels)				
	Indicator	"Measuring" indicator (color: green): RUN Trigger indicator (color: blue): ENABLE Judgment indicator (color: orange): OUTPUT Error indicator (color: red): ERROR				
External I/F	Parallel Interface	Input	12 points (RESET, DSA, DI0 to 8, TRIG)			
		Output	22 points (OR, ERROR, RUN, ENABLE, GATE, STGOUT0, DO0 to 15)			
		Circuit type	NPN	PNP	PNP	
	Serial Interface	USB2.0	1 port, FULL SPEED, MINI-B connector			
		RS-232C	1 port, max. 115200 bps (cannot be used simultaneously with RS-422 interface)			
		RS-422	1 port, max. 115200 bps (cannot be used simultaneously with RS-232C interface)			
	Network communications	Ethernet	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, key operation, console connection				
Main functions	Number of registered banks		32 banks			
	Number of setup items		32 items/1 bank		128 items/1 bank	
	Measurement items	Shape inspection	Pattern, sensitive search		Pattern, sensitive, graphic, flexible search	
		Size inspection	Area		Area, labeling	
		Edge inspection	Position, width, count			
		Brightness/color inspection	Brightness, HUE			
		Application-based inspection	Defects		Defects, grouping	
		Code reading (-CD models only)	Barcode (WPC(JAN/EAN/UPC), Code 39, Codebar (NW-7), ITF (Interleaved 2 of 5), Code 93, Code 128, GS1-128, GS1 Databar, Pharmacode) Datamatrix (ECC200, QR Code, MicroQR Code, PDF417, MicroPDF417, Maxi Code, AZtec Code, Codablock)			
Position correction		1 model search, 2 model search, position, area				
Support	Image memory function		Max. 100 images		Max. 100 images (50 for 2 x cameras)	
Ratings	Power supply voltage		21.6 to 26.4 VDC (including ripple)			
	Current consumption		1.0 A max.		1.5 A max.	
	Insulation resistance		Across all lead wires and controller case: 20 MΩ (by 250 V megger)			
	Dielectric strength		Across all lead wires and controller case, 1000 VAC, 50/60 Hz, 1 min			
Operation environment robustness	Ambient temperature range		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)			
	Ambient atmosphere		No corrosive gases allowed			
	Degree of protection		IP20 (IEC60529)			
	Vibration resistance (durability)		Vibration frequency: 10 to 150 Hz Single-amplitude: 0.35 mm Acceleration: 50 m/s <sup>2</sup> 10 times for 8 minutes			
	Shock resistance (destructive)		150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward)			

## Camera

Item	ZFX-SR10	ZFX-SR50	ZFX-SC10	ZFX-SC50 /SC50W	ZFX-SC90 /SC90W	ZFX-SC150 /SC150W	ZFX-S (monochrome type)	ZFX-SC (color type)
Detection range (H x V) 	5x4.9 mm to 9x8.9 mm (variable)	10x9.8 mm to 50x49 mm (variable)	5x4.9 mm to 9x8.9 mm (variable)	10x9.8 mm to 50x49 mm (variable)	50x49 mm to 90x89 mm (variable)	90x89 mm to 150x148 mm (variable)	The CCTV lens is selected according to the detection range and the setting distance.	
Setting distance (L)	34 to 49 mm	38 to 194 mm	34 to 49 mm	31 to 187 mm	67 to 142 mm	115 to 227 mm		
Relationship between setting distance and detection range 	Setting distance (L) 49 mm / 34 mm vs 5mm / 9mm		Setting distance (L) 49 mm / 34 mm vs 5mm / 9mm		Setting distance (L) 187 mm / 31 mm vs 10mm / 50mm		Setting distance (L) 142 mm / 67 mm vs 50mm / 90mm	
Image rate function	All-pixel capture inter-line transfer type 1/3" CCD (monochrome)		All-pixel capture inter-line transfer type 1/3" CCD (color)				All-pixel capture inter-line transfer type 1/3" CCD (monochrome)	All-pixel capture inter-line transfer type 1/3" CCD (color)
Lens mount	- (with Lens)						C mount	

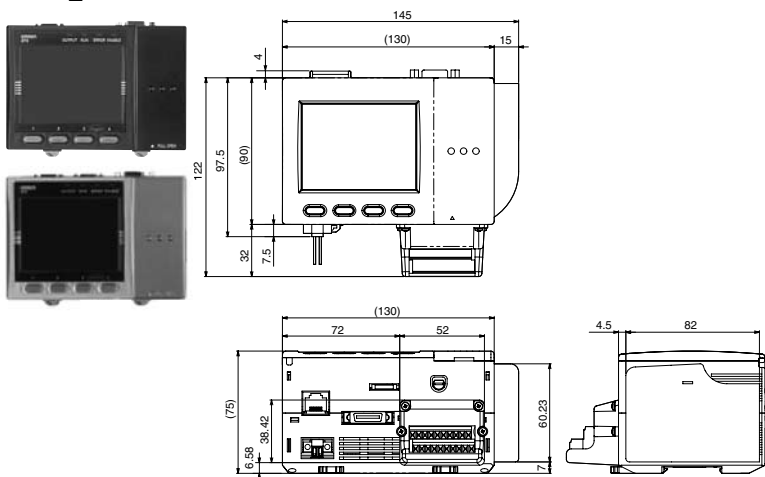
Item		ZFX-SR10	ZFX-SR50	ZFX-SC10	ZFX-SC50 /SC50W	ZFX-SC90 /SC90W	ZFX-SC150 /SC150W	ZFX-S (monochrome type)	ZFX-SC (color type)
Lighting	Lighting method	Pulse lighting						-	
	LED	Red LED		White LED					
	Type	Direct lighting							
	Guide light	Available (center, measurement region)			Not available				
	Optional lighting I/F	Not available		Not available	Available (ZFV-LT Series)		Not available	Available External lighting: 3Z4S-LT Series Flash Controller: made by Moritex Corporation 3Z4S-LT MLEK-C100E1TSX	
	Indicator Class <sup>1</sup>	-		Class 1	Class 2	Class 2	Class 1	-	
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)			Approx. 100 mA	
Operation environment robustness	Ambient temperature range	Operating: 0 to + 40°C, Storage: -20 to +65°C (with no icing or condensation)						Operating: 0 to + 50°C, Storage: -20 to +65°C (with no icing or condensation)	
	Ambient humidity range	Operating and storage: 35% to 85% (with no condensation)							
	Ambient atmosphere	No corrosive gases allowed							
	Degree of protection	IP65 (IEC60529)			ZFX-SC__ : IP65 (IEC60529), ZFX-SC__W: IP67 (IEC60529)			IP20 (IEC60529)	
	Dielectric strength	1000 VAC 50 Hz/60 Hz 1 min						500VAC 50 Hz/60Hz 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 (destructive)	150 m/s <sup>2</sup> 3 times each in 6 directions (up/down, left/right, forward/backward)							
Connection method	Cable built-in type (cable length: 2 m)						Connector connection type (camera cable ZFX-VS/VSR required)		

<sup>1</sup>: Applicable standards IEC60825-1:1993 +A1:1997 +A2:2001, EN60825-1:1994 +A2:2001

## External Dimensions

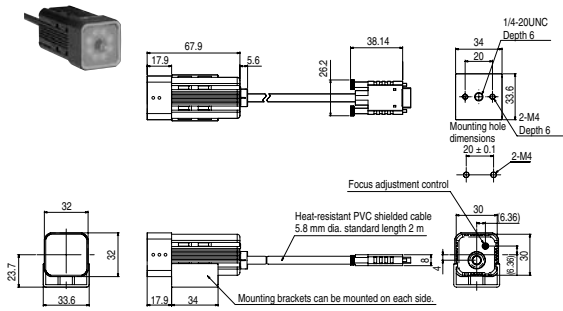
### Controllers (Unit: mm)

ZFX-C\_

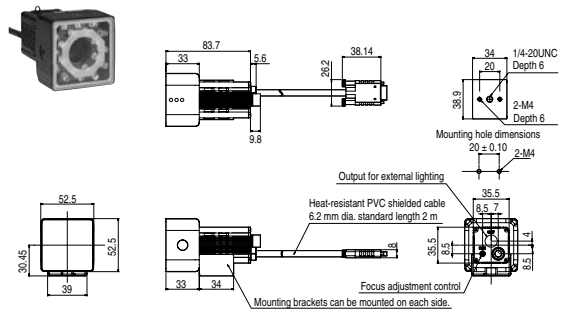


Cameras

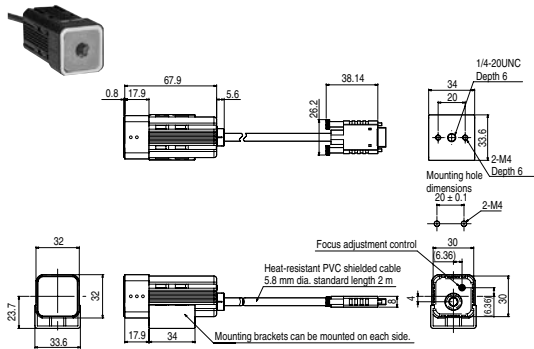
ZFX-SR10/SR50



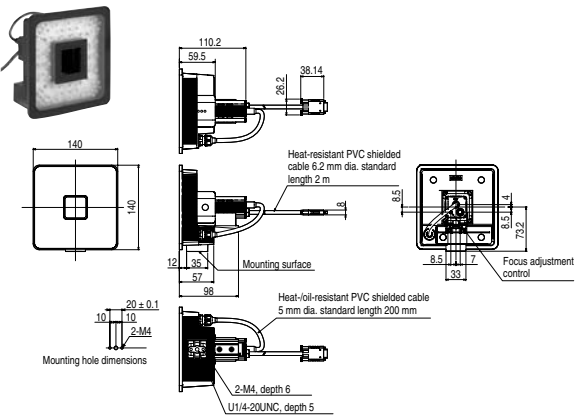
ZFX-SC90/90W



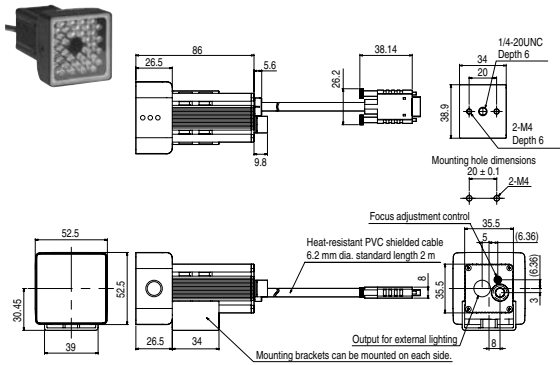
ZFX-SC10



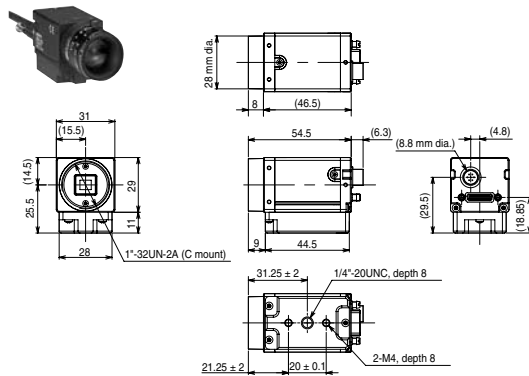
ZFX-SC150/150W



ZFX-SC50/50W



ZFX-S/SC



Cat. No. E381-E1-02

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