OMRON

ZFX VISION SENSOR

Easy vision at a touch

» User guidance

» Touch, connect and go

» Interactive user interface

realizing

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.
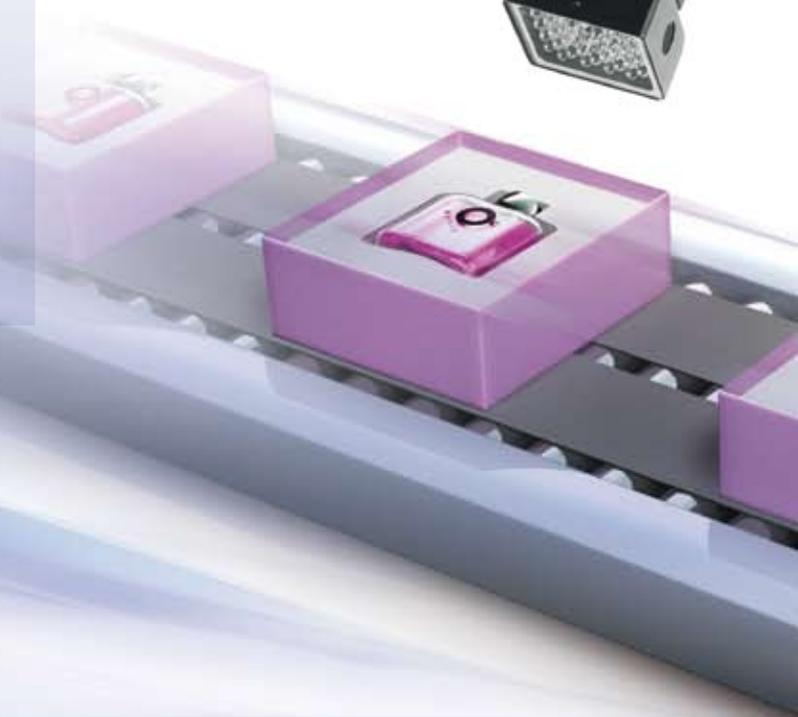
Complete set-up in minutes

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 compensation tools:
Allows compensation of the current object position in 360° rotation.

Pattern matching:
Searches for an object or finds deviations to a programmed object in 360° rotation.

Area:
Measures the size of objects.

Edge tools:
Finds the positions of edges, or measures the width of objects.

Defect tools:
Finds minute defects in surfaces.

Brightness/HUE:
Finds deviations in the brightness or colour of objects.

Calculation:
Allows calculations with tool results and the definition of data output.
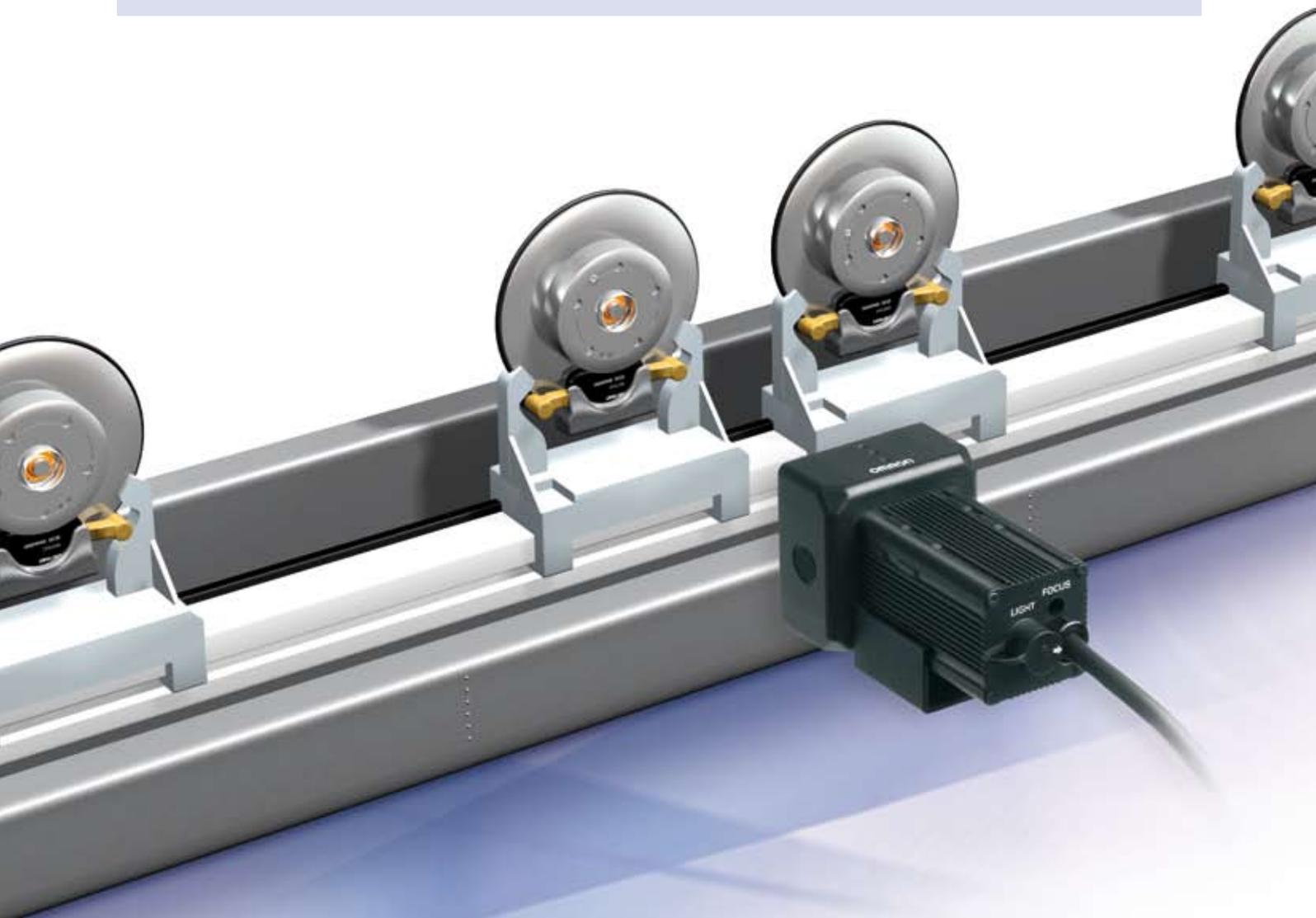
Multiple inspections

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.
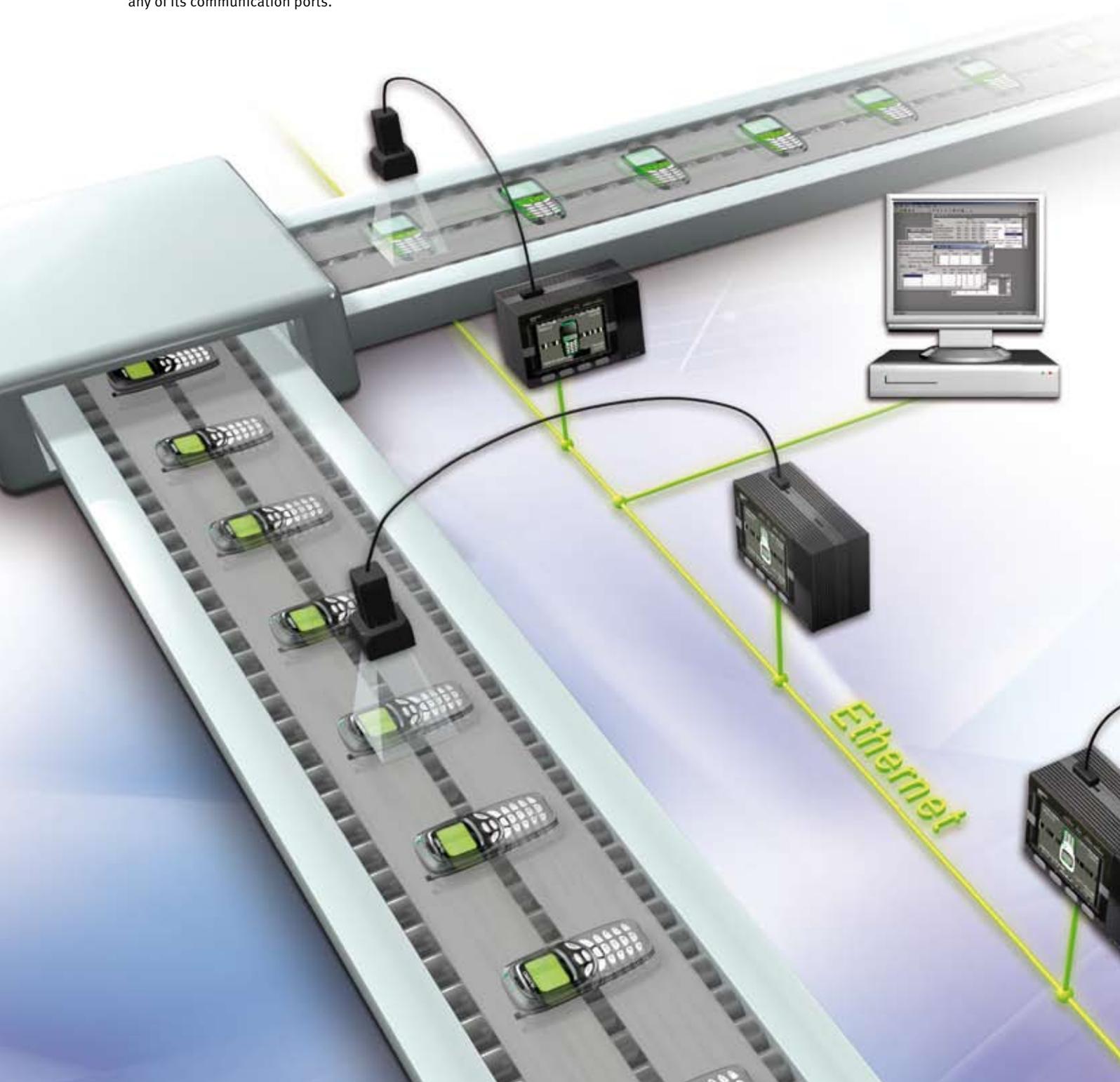
C-mount:	ZFX-SR10/SC10			
ZFX-S	FOV: 5 to 9 mm			
ZFX-SC	**ZFX-SR50**	**ZFX-SC50**	**ZFX-SC90**	**ZFX-SC150**
	FOV: 10 to 50 mm	FOV: 10 to 50 mm	FOV: 50 to 90 mm	FOV: 90 to 150 mm

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 two controllers are also
available. Depending on the connected camera, both 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.
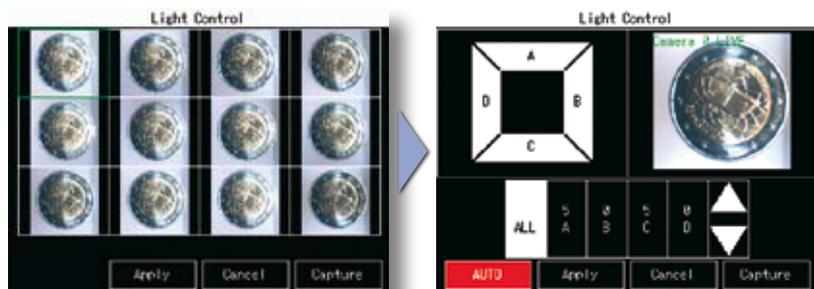
Step 1
Just press AUTO to automatically obtain
optimum lighting measurements.

Step 2
Choose the correct lighting with just
one click.

OMRON

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 inspections per image
- Simplicity – auto-adjustment functions for easy image setup

Ordering Information

Controllers

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

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[1]	Normal type	3m, 8m	ZFX-VS
	Robot cable type	3m	ZFX-VSR
Camera Extension Cable	Normal type	3m	ZFX-XC3A[2]
		8m	ZFX-XC8A[2]
	Robot cable type	3m	ZFX-XC3AR[2]
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

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

[2]. 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.

Accessories

Type		Model
Console		ZFX-KP (2m / 5m)
LCD Monitor		FZ-M08
Panel Mount Adapters		ZFX-XPM
Optional Lighting[1]	bar lighting	ZFV-LTL01
	bar double-lighting	ZFV-LTL02
	bar low-angle lighting	ZFV-LTL04
	light source for through beam	ZFV-LTF01
CCTV Lenses/Extension Tubes		3Z4S-LE series
External Lighting		3Z4S-LT series
Strobe Controller[2]		Manufactured by MORITEX Corporation 3Z4S-LT MLEK-C100E1TSX

[1]. It is possible to ZFX-SC50 and ZFX-SC90 use it.

[2]. It is possible to ZFX-S and ZFX-SC use it. It uses it so that the controller may control an external lighting.

Specifications

Controller

Item			ZFX-C10	ZFX-C15	ZFX-C20	ZFX-C25
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	NPN	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	
	Postion 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 M (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^2 10 times for 8 minutes			
		Shock resistance (destructive)	150 m/s^2 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)	5 mm x 4.9 mm to 9 mm x 8.9 mm (variable)	10 mm x 9.8 mm to 50 mm x 49 mm (variable)	5 mm x 4.9 mm to 9 mm x 8.9 mm (variable)	10 mm x 9.8 mm to 50 mm x 49 mm (variable)	50 mm x 49 mm to 90 mm x 89 mm (variable)	90 mm x 89 mm to 150 mm x 148 mm (variable)	The CCTV lens is selected according to the detection range and the setting distance.	
Setting distance (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		
Relationship between setting distance and detection range	Setting distance (L) 49 mm 34 mm 5mm 9mm Detection range (H)	Setting distance (L) 194 mm 38 mm 10mm 50mm Detection range (H)	Setting distance (L) 49 mm 34 mm 5mm 9mm Detection range (H)	Setting distance (L) 187 mm 31 mm 10mm 50mm Detection range (H)	Setting distance (L) 142 mm 67 mm 50mm 90mm Detection range (H)	Setting distance (L) 227 mm 115 mm 90mm 150mm Detection range (H)		
Effective number of pixels	659(H) x 494 (V)							
Pixel size	7.4 µm (H) x 7.4 µm (V)							
Shutter speed	1/170s to 1/20000s							
Partial function (partial capture)	OFF		1/2 partial, 1/4 partial				Not available	1/2 partial, 1/4 partial
Image rate function	Fine, Normal, High speed		Not available				Fine, Normal, High speed	Not available
Frame rate (at capture of entire screen)	96 fps						90 fps	
Lens mount	– (with Lens)						C mount	
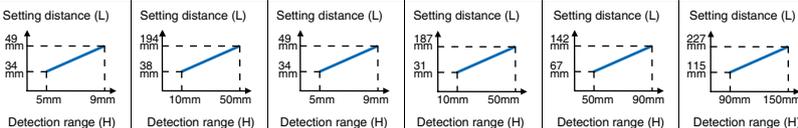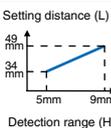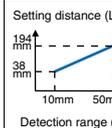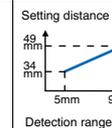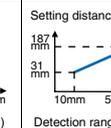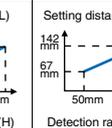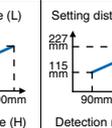
Item		ZFX-SR10	ZFX-SR50	ZFX-SC10	ZFX-SC50 /SC50W	ZFX-SC90 /SC90W	ZFX-SC150 /SC150W	ZFX-S (monochrome type)	ZFX-SC (color type)
Lighting	Lighting method	Pulse lighting						–	
	LED	Red LED		White LED					
	Type	Direct lighting							
	Guide light	Available (center, measurement region)		Not available					
	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*1	–		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/s² 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)	

*1. Applicable standards IEC60825-1:1993 +A1:1997 +A2:2001, EN60825-1:1994 +A2:2001

## External Dimensions

### Controllers (Unit: mm)
ZFX-C_
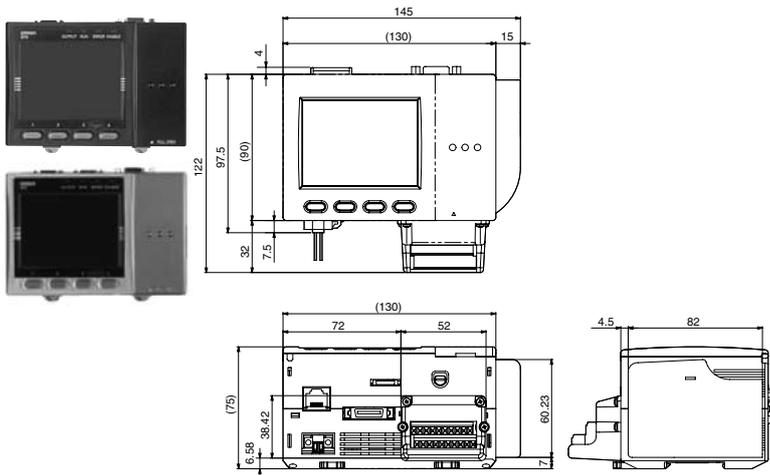
Cameras

ZFX-SR10/SR50
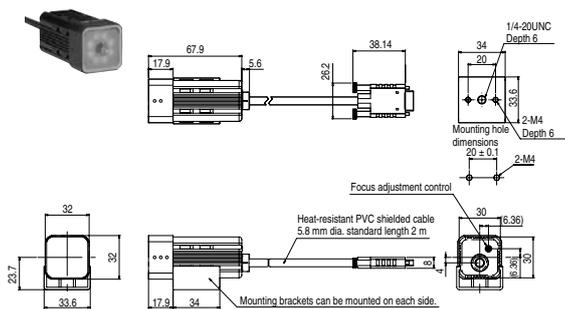
ZFX-SC90/90W
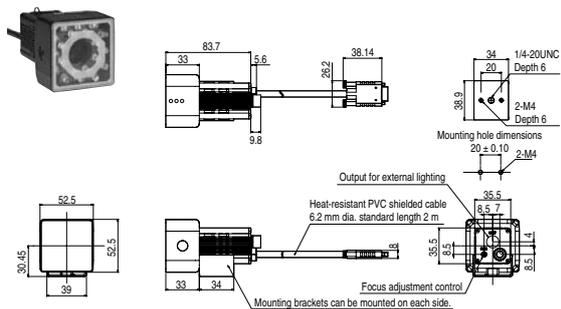
ZFX-SC10
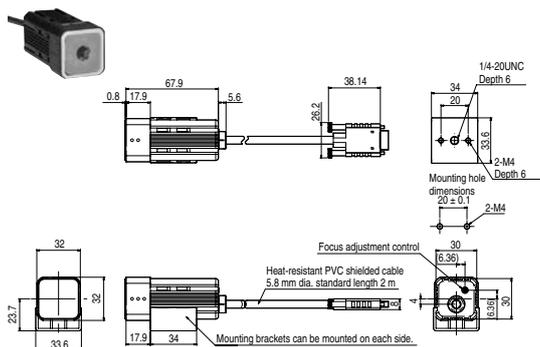
ZFX-SC150/150W
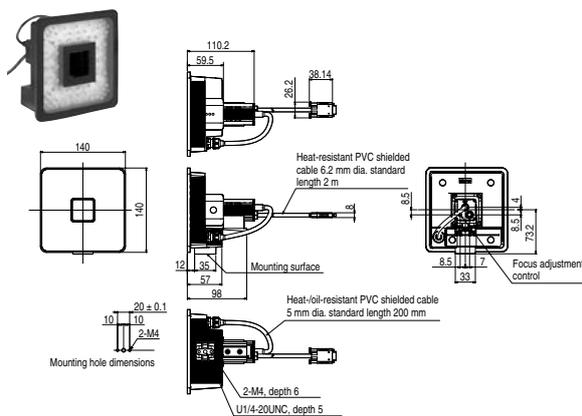
ZFX-SC50/50W

ZFX-S/SC

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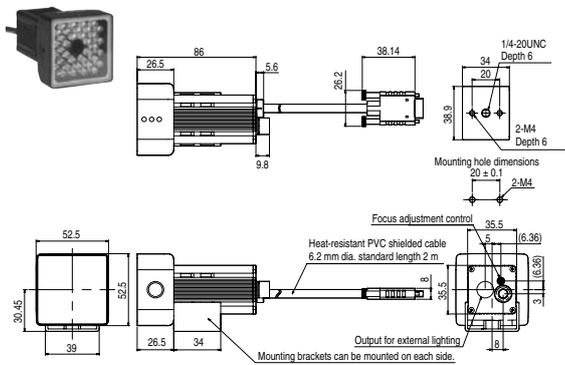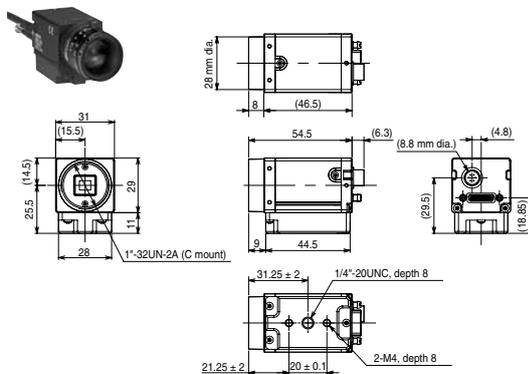
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